SunStar

USER'S MANUAL

SJS/A-PS/A
SJS/A-PS/B

Direct Drive Automatic Pocket Setter Sewing Machine (Electric/Electronic)

1) FOR AT MOST USE WITH EASINESS, PLEASE CERTAINLY READ THIS MANUAL BEFORE STARTING USE.
2) KEEP THIS MANUAL IN SAFE PLACE FOR REFERENCE WHEN THE MACHINE BREAKS DOWN.

SunStar CO., LTD.

MEE-090929

1. Thank you for purchasing our product. Based on the rich expertise and experience accumulated in industrial sewing machine production, SUNSTAR will manufacture industrial sewing machines, which deliver more diverse functions, high performance, powerful operation, enhanced durability, and more sophisticated design to meet a number of user's needs.
2. Please read this user's manual thoroughly before using the machine. Make sure to properly use the machine to enjoy its full performance.
3. The specifications of the machine are subject to change, aimed to enhance product performance, without prior notice.
4. This product is designed, manufactured, and sold as an industrial sewing machine. It should not be used for other than industrial purpose.

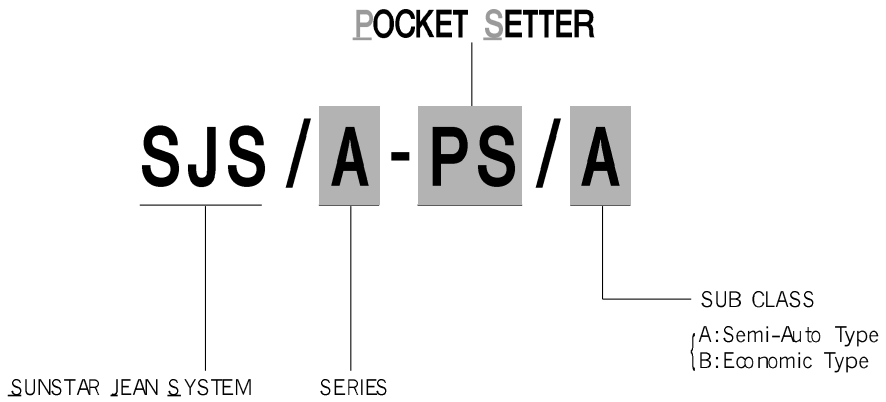
SunStar CO., LTD.

Contents

1

Direct Drive, Automatic Pocket Setter Sewing Machine

SJS/A-PS/A Series Model Label Structure



Model type	SJS/A-PS/A	SJS/A-PS/B
Machine Type	Direct Drive, High Speed, 1-Needle, Lock-Stitch M/C	
Sewing Scope	250mm(X) × 250mm(Y)	
Sewing Speed	3600 spm (Stitch length: 3mm or below)	
Stitch Length	0.1mm ~ 6mm	
Needle	DP × 17 #20 (#18 ~ 22)	
Needle Bar Stroke	34.6mm	
Presser Foot Stroke	Standard 4mm (0.5~10mm)	
Presser Foot Lift	20mm	
Trimmer	Mounted	
Emergency Stop Function	Available	
Hook In Use	Double-capacity Rotary Hook	
Memory	3.5″ Floppy Disk, CF Card	
Number of Max. Input Patterns	Max. 691 Patterns	
Lubrication	Automatic	
Pneumatic Pressure	120N ℓ /min.	
Voltage	Rated supply voltage ±10% 50/60 Hz	
Motor	MAIN MOTOR : 500W AC SERVO MOTOR	
	X-MOTOR : 1Kw AC SERVO MOTOR	
	Y-MOTOR : 750W AC SERVO MOTOR	
Power consumption	600VA	
Stacker	Auto	Manual

2

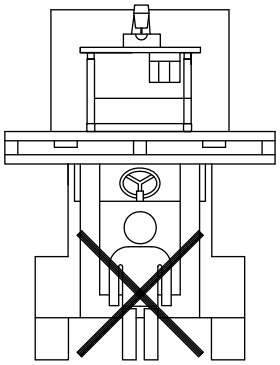
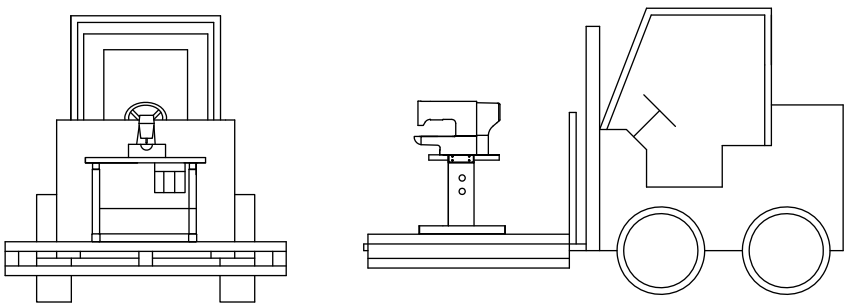
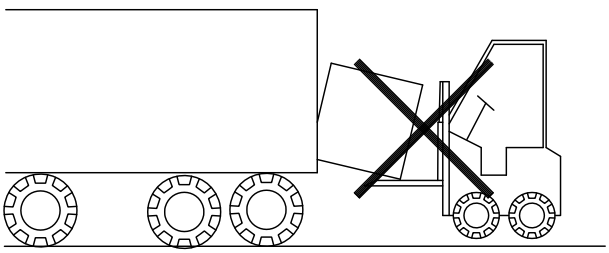
Safety Rules

2.1) Safety Stickers

The safety stickers in this user's manual are divided into **Caution**, **Danger**, and **Warning**. They indicate that if the safety rules are not kept, injury or damage to machine might occur as a result.

No.	Name	Description
	Caution	If the machine is not properly handled, it may cause injury to users or physical damage to the machine.
	Warning	If the machine is not properly handled, it may cause death or severe injury to users.
	Danger	If the machine is not properly handled, it may cause death or severe injury to users, and the urgency of the danger is very high.

2.2) Machine Delivery

Mark	Description
Danger  Ban people from standing under the machine and remove obstacles near the machine.	The machine delivery shall be conducted by the persons who are knowledgeable about the safety instructions and rules. The following safety rules must be observed: **2.2.1) Manual delivery** When the machine is delivered by persons, they shall wear special shoes and tightly hold the machine on the left and right sides. **2.2.2) Forklift delivery** 1) A forklift shall be big enough to endure the weight of the sewing machine and carry the machine. 2) Use the palette when lifting the machine. Set the center of gravity of the machine (center of the left and right sides) at the fork arm of the forklift and carefully lift the machine.  Warning: Make sure to maintain the balance of the machine when unloading the machine by using a forklift or crane to prevent the deformation of the machine or to prevent people from being exposed to danger. 

2.3) Machine Installation

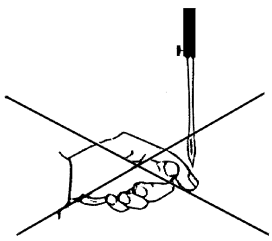
Caution

Depending on the installation environment, function errors, breakdown, or other physical damage might result. Make sure to meet the following conditions for machine installation:

1) The workbench or table where the machine is installed should be durable enough to endure the weight of the machine (see the name plate).
2) Dust and humidity are the cause of machine pollution and erosion. Please install an air conditioner and conduct regular maintenance of the machine.
3) Install the machine at the place where it is not exposed to direct sunlight (if the machine is exposed to direct sunlight for a long time, it may cause discoloration or deformation).
4) Secure the space around the machine. Place the machine at least 50cm away from the left, right, and rear walls to secure sufficient space for maintenance activities.
5) Explosion risk : To prevent possible explosion, immediately stop the machine operation if there are inflammable materials in the air.
6) Lighting : The machine does not offer lighting devices. When necessary, install needed lighting.
7) Overturn risk : Do not install the machine on the unstable stand or table. If the machine drops, it may cause injury or severe impact on the machine. If the machine is suddenly stopped or the external impact is imposed, the machine might be capsized.

2.4) Machine Operation

Warning



The machine body is attached with Caution and Warning stickers at each dangerous part to emphasize safety instructions. With the full understanding of the safety instructions, make sure to observe the following during machine operation:

1) Before turning on the power, read this manual thoroughly and have a full understanding of machine operation.
2) Get properly dressed. Long hair, necklace, bracelet, or wide sleeve might be fed into the machine during operation. Wear slip-free shoes to prevent slipping on the floor.
3) Check the moving scope of machine before its operation to find out whether the scope is proper.
4) Keep hands and head away from the machine parts where accidents might occur (needle, hook, thread take-up lever, pulley, etc.) during operation.
5) Do not remove the safety cover which protects pulley and shaft during machine operation for user's safety.
6) Cut the power supply before disassembling the electric box such as the control box, and double-check that the power switch is "Off."
7) Make sure that the power switch is "Off" when the upper shaft is manually rotated.
8) Stop the machine when the needle is replaced or when inspecting the machine after sewing work is done.
9) Make sure to follow the cautions below. Otherwise, physical damage to the machine such as malfunction and breakdown might result:
   - Do not put articles on the S/M table.
   - Avoid using a crooked needle or the needle with damaged tip.
   - Use the presser foot appropriate to working conditions.

2.5) Repair and Maintenance

When repair is needed, properly trained SunStar A/S engineers should be called to conduct the repair.

1) Cut off the main power before machine cleaning and repair. Wait for four minutes until the machine is completely discharged.

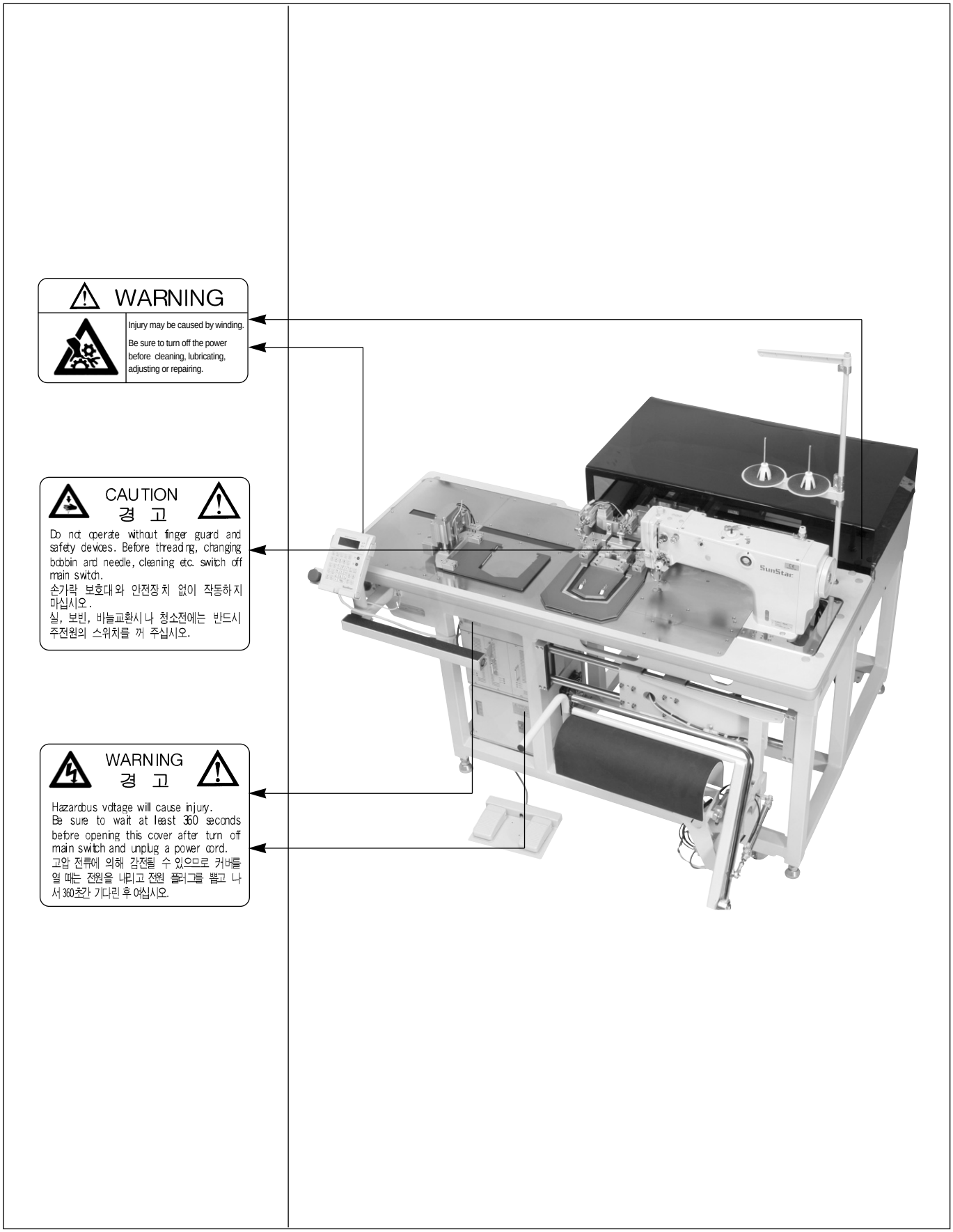
For cleaning or repairing the main shaft motor and the X/Y drive box, wait for ten minutes for complete discharge after the power is cut off.

2) Do not change the machine specifications or parts without substantial consultation with SunStar because this may cause safety issues during machine operation.
3) Use authentic SunStar parts for repair or part replacement during A/S activity.
4) Put back all safety covers which are removed for repair activities after repair is completed.

2.6) Safety Labels

	Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning, etc., turn off the main switch.
	High-voltage current will cause injury. Be sure to wait at least 360 seconds before opening this cover after turning off main switch and unplugging a power cord.
	Make sure to close the cover before operating the machine. Keep hands away from moving parts of the machine during operation. It may cause injury.

2.7) Location of Safety Labels



3

Voltage and Power Cord Connection

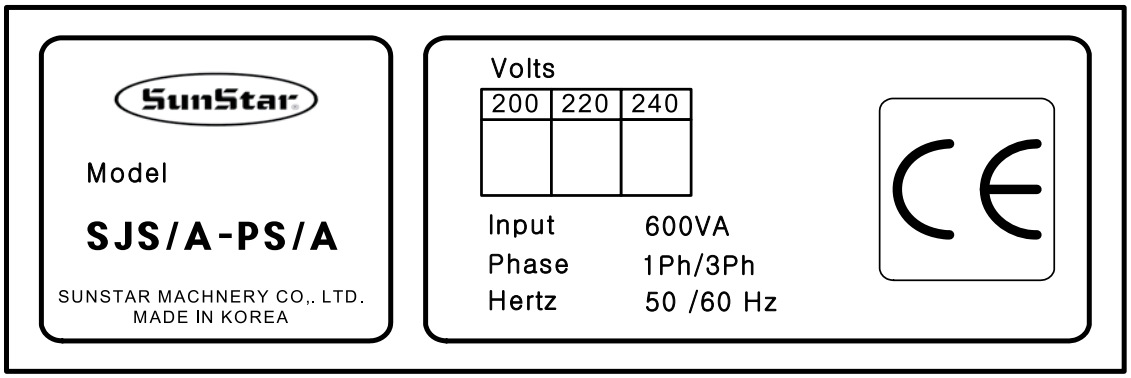
1) Voltage Specifications

Phase	1-Phase	3-Phase
Input Voltage (V)	AC 240V	AC 240V
	AC 220V	AC 220V
	AC 200V	AC 200V

A. Do not operate the machine if the voltage specifications are different.

2) Voltage Specifications Display

A. The voltage is displayed on the side of the control box as in the figure



Caution

If the voltage specifications are as follows, use a different transformer box.

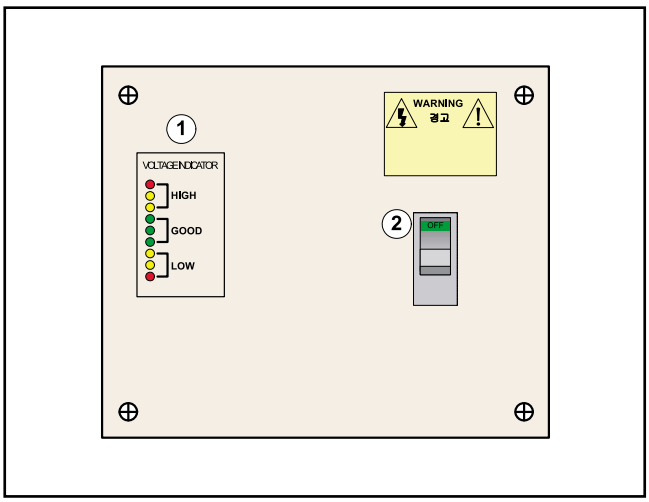
Phase	1-Phase	3-Phase
Voltage Specifications (V)	AC 415	AC 415
	AC 400	AC 400
	AC 380	AC 380
	AC 120	AC 120
	AC 110	AC 110
	AC 100	AC 100

Check the voltage specifications when placing a purchase order.

4

Voltage LEDs and Wiring Circuit Breaker

1) Front Side of AMP Box



No.	Name
①	Voltage LED
②	Wiring Circuit Breaker

2) Voltage LED Check

A. LEDs on the front side of the AMP box are changed depending on input voltage.

Input Voltage (V) [error +/- 5V]	LED Color	Voltage Status
Above AC 270	Red [High]	Overvoltage: Use the circuit breaker switch to cut off the power supply to the control box. Check the input voltage status.
AC 270 ~ AC 243	Amber [High]	Overvoltage: Check the input voltage status.
AC 243 ~ AC 193	Green [Good]	Normal voltage
AC 193 ~ AC 160	Amber [Low]	Undervoltage: Check the input voltage status.
Below AC 160	Red [Low]	Undervoltage: Use the circuit breaker switch to cut off the power supply. Check the input voltage status.

3) Circuit Breaker Activation and Reactions

A. When input voltage is overvoltage or undervoltage, the circuit breaker is activated.
B. When the circuit breaker is activated, check if the input voltage is within the machine specifications.
C. To check the input voltage, turn on the sewing machine power. If voltage LED is green, the voltage is normal. If amber or red LED blinks, it means the input voltage is beyond the machine specifications.
D. If voltage LED is red or amber, it means the input voltage is beyond the machine specifications. In this case, inquire A/S engineer for resolution.

Caution

Do not use the circuit breaker switch as the power switch.
Operate the circuit breaker switch with hands only.
If the circuit breaker is frequently activated, inquire the A/S engineer.

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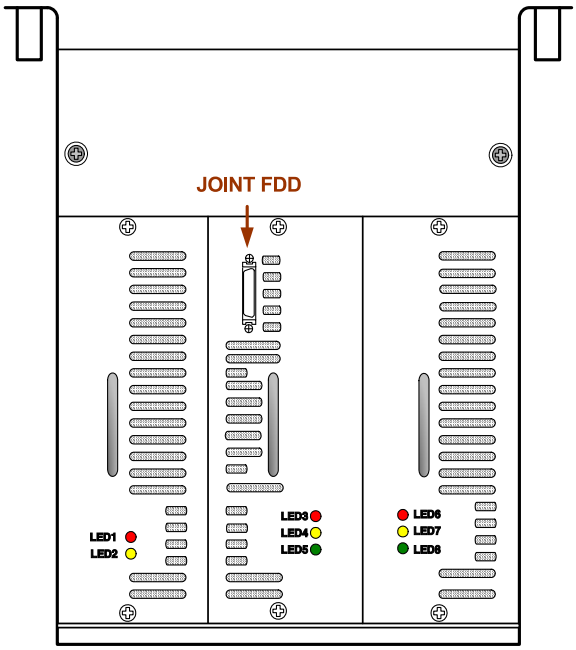
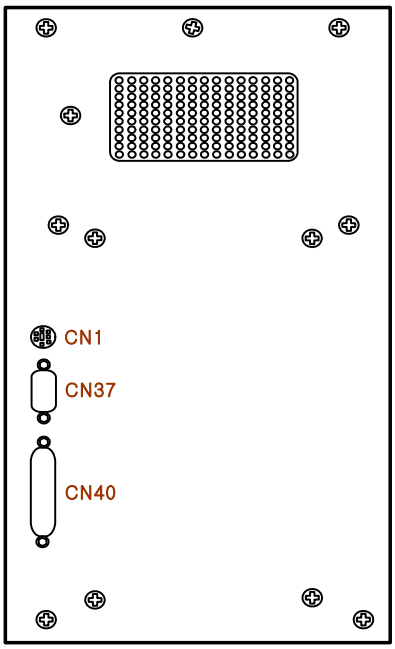
Control Part Specifications

1) Control Box Components

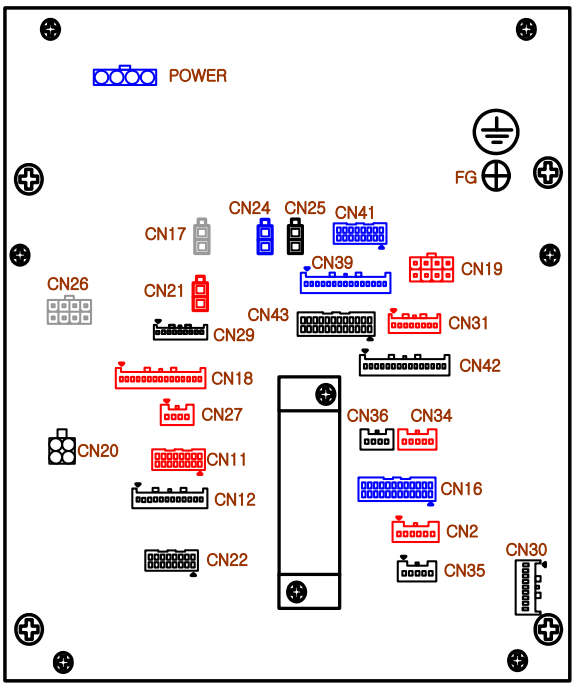
1-1) Structure of Control Box Connectors



[Front Side of Control Box]



[Left, Right Sides of Control Box]



[Rear Side of Control Box]

1-2) Description of Control Box Connectors

No.	Connector Name	Description	Connection Cable Name
1	POWER	User's power input	Power input cable
2	FG	Ground wire connection to the control box	Ground wire cable
3	JOINT FDD	Connection to the portable FDD	Portable FDD connection cable
4	CN1	Connection to F3 PU	Connection to F3 PU
5	CN2	Main-shaft portable synchro input	Portable synchro input cable
6	CN11	Subordinate input 1	-
7	CN12	Laser point output	Laser point connection cable
8	CN16	X-Y AMP signal connection	X-Y AMP signal input cable
9	CN17	Presser foot solenoid connection	-
10	CN18	Lower shaft AMP signal connection	-
11	CN19P	P-shaft step motor output	
12	CN20	Main shaft motor power output	Main shaft mid-connection cable (PS)
13	CN21	Clamp solenoid connection	-
14	CN22	Subordinate input 3	-
15	CN24	Trimmer solenoid connection	-
16	CN25	Wiper solenoid connection	-
17	CN26	Power connection to AMP Box	X-Y AMP Box power input cable (PS)
18	CN27	Subordinate input 4	-
19	CN29	Connection of emergency stop, thread detection, and start signals	Connection of emergency stop and start switches
20	CN30	Connection to foot pedal	Food pedal 1-1
21	CN31	P-shaft encoder signal input	
22	CN34	CAN communication connection	-
23	CN35	Main pneumatic switch signal input	Main pneumatic value & pneumatic pressure sensor cable
24	CN36	Power connection to circuit breaker	-
25	CN37	Main shaft motor encoder signal input	Main shaft motor encoder mid-connection cable
26	CN39	Pneumatic signal output 2	Pneumatic output cable2 (PS)
27	CN40	OP unit signal connection	OP unit connection cable
28	CN41	Pneumatic signal output 1	Pneumatic output cable 1 (PS)
29	CN42	External sensor input 1	External sensor mid-connection cable
30	CN43	X-Y shaft sensor input	X-Y shaft sensor mid-connection cable

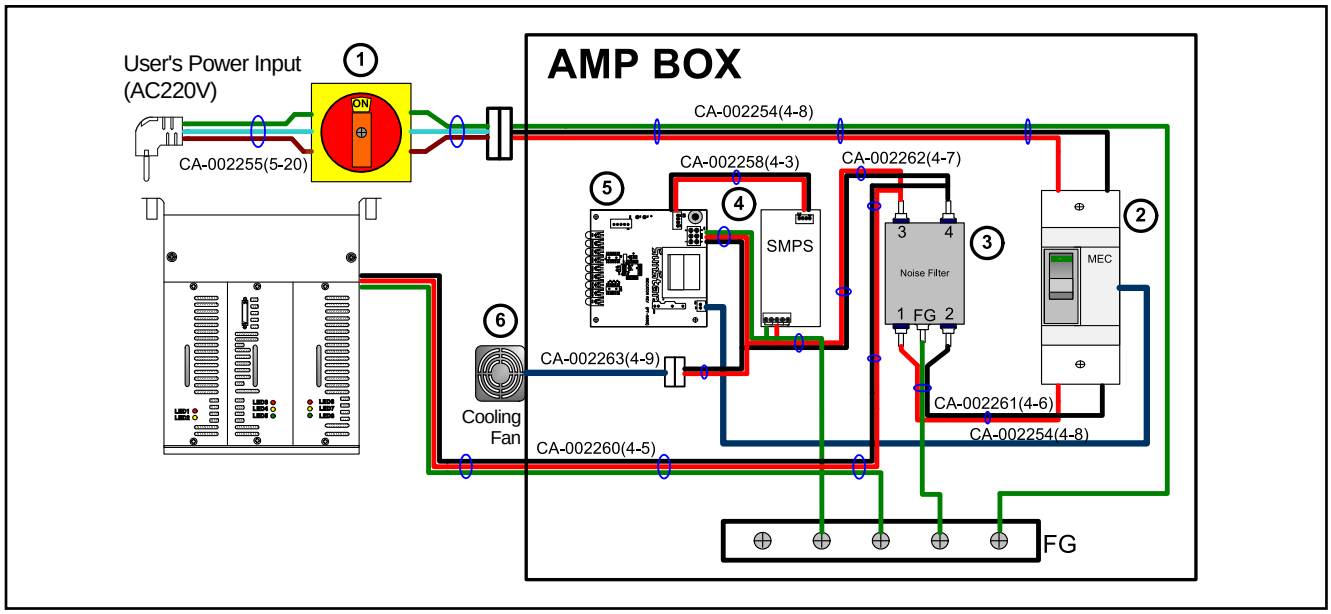
A. When F3PU is connected to Connector CN1, OP unit does not show an error or any abnormal operation.

2) Structure of AMP Box

Danger	**Do not operate the sewing machine while the AMP box cover is open. It may cause electric shock.** **Power switch must be turned off before cleaning or repairing the AMP Box. After ensuring that the circuit breaker switch and the power switches are off, wait for ten minutes until the machine is completely discharged.** **When repairing is needed, ensure that it is conducted by properly trained and SunStar designated A/S engineers.**

2-1) Structure of Power Input Part

A. The figure below shows the structure of the AMP Box front side input power.



No	Part Name	Use
①	Main power switch	It is the main power switch of the sewing machine.
②	Circuit breaker	The power supply of the sewing machine is cut off in time of overvoltage or undervoltage.
③	Noise filter	Noise flowing in through the power line is blocked.
④	DC+5V SMPS	It is for power supply to the indicator board.
⑤	Voltage indicator board	It monitors the input voltage and activates the circuit breaker in time of overvoltage or undervoltage.
⑥	Cooling fan	It cools off the AMP Box.

2-2) Structure of X, Y-shaft Driving AMP Box

A The X, Y-shaft driving AMP Box is installed on the rear side of the AMP Box.
B. The operating status of the X, Y-shaft AMP Box can be checked from the AMP Box cover window.

No	Shaft	AMP Box
①	X-shaft	QS1A05AA (Sanyo Denki 50A)
②	Y-shaft	QS1L03AA (Sanyo Denki 30A)

3) Transformer Box (optional)

3-1) Voltage Specifications of Transformer Box

A. Use a transformer box if 1-phase or 3-phase voltage specifications are as below.

Phase	1-Phase	3-Phase
Voltage specifications (V)	AC 415	AC 415
	AC 400	AC 400
	AC 380	AC 380
	AC 120	AC 120
	AC 110	AC 110
	AC 100	AC 100

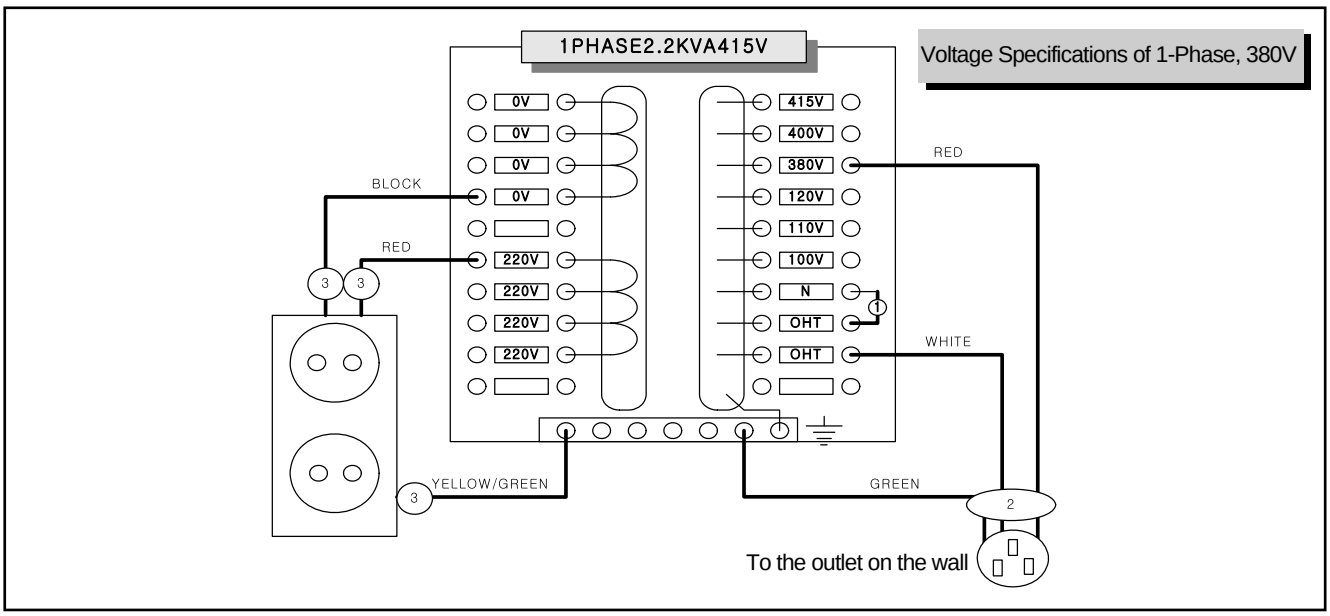
3-2) Transformer Box Power Cable Connection

A. Depending on the input voltage specifications, connect red lines to No. 2 of the cable specifications.

Input Voltage (V)	Location of transformer connection
AC 415	Connect the No.2 red line to 415V.
AC 400	Connect the No.2 red line to 400V.
AC 380	Connect the No.2 red line to 380V.
AC 120	Connect the No.2 red line to 120V.
AC 110	Connect the No.2 red line to 110V.
AC 100	Connect the No.2 red line to 100V.

3-3) Transformer Box Wiring Diagram

A. The following is the example of the wiring diagram when the input voltage is 1-phase, 380V.

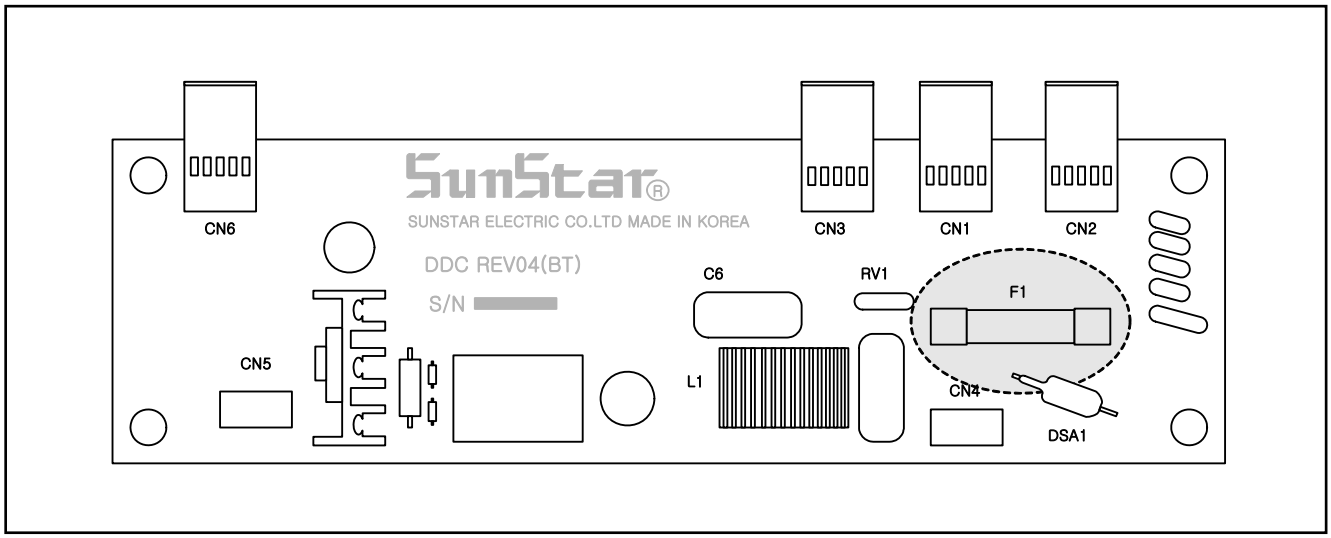


4) Fuse Replacement

Danger	**To prevent electric shock, wait for five minutes after power-off and open the cover. Make sure to turn off the power. Then open the control box and replace with a fuse of designated capacity.**

4-1) Fuse Connection Part

A. Open the cover on the top of the control box and replace the fuse on the DDC board (shaded part).



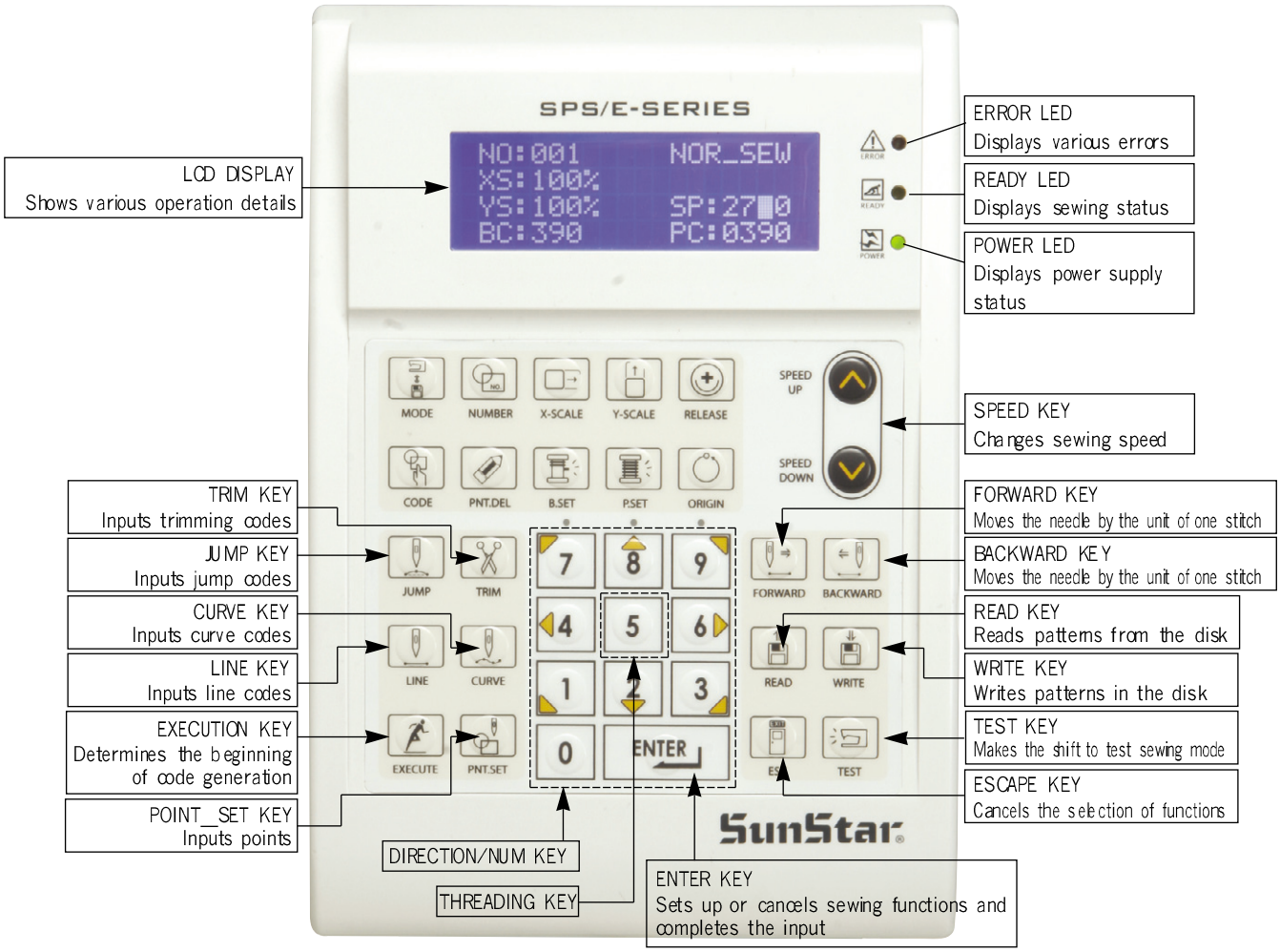
4-2) Capacity and usage of the fuse

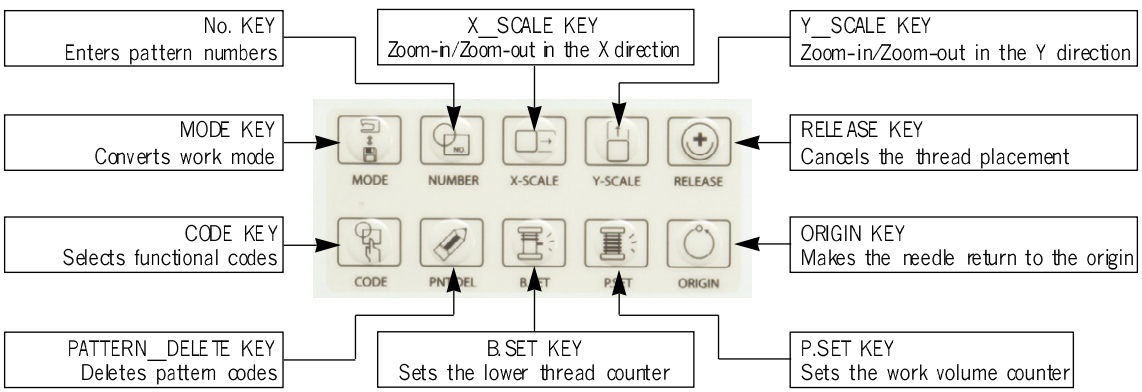
Number	Capacity	Use
F1	15A	For main power protection

6

BASIC OPERATIONAL METHOD

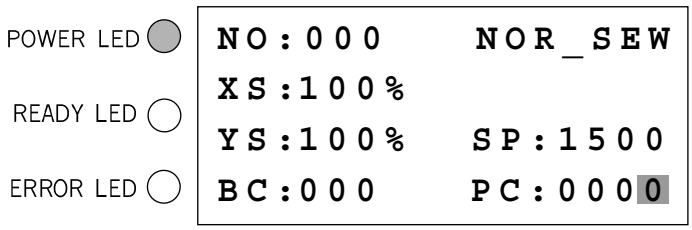
1) Name and Roles of Each Key on Operation Unit





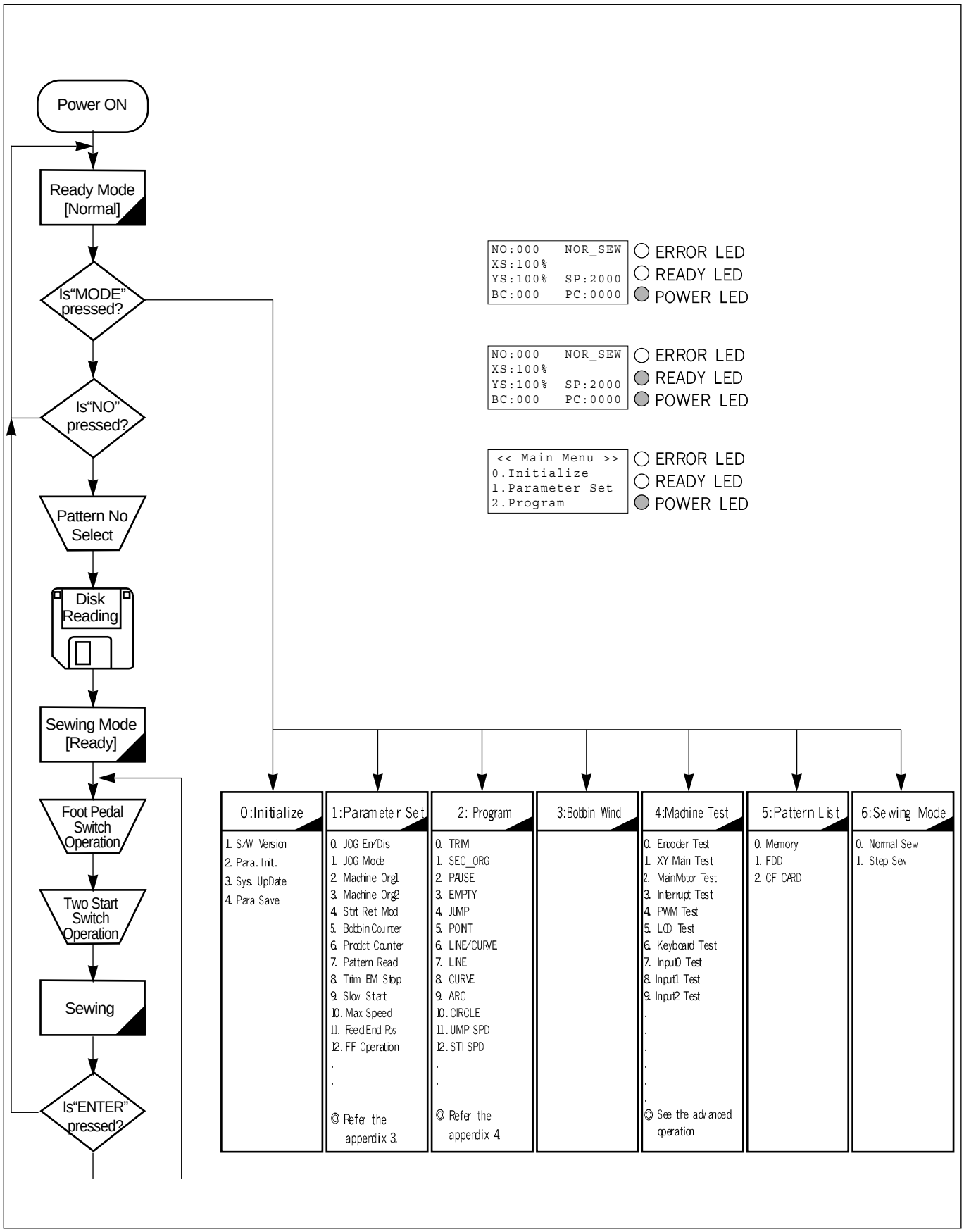
2) Name and Description of Each Display Contents on General Operation Mode

It is an initial screen when power is on for the first time, but display of screen can be changed according to the general sewing related parameter.

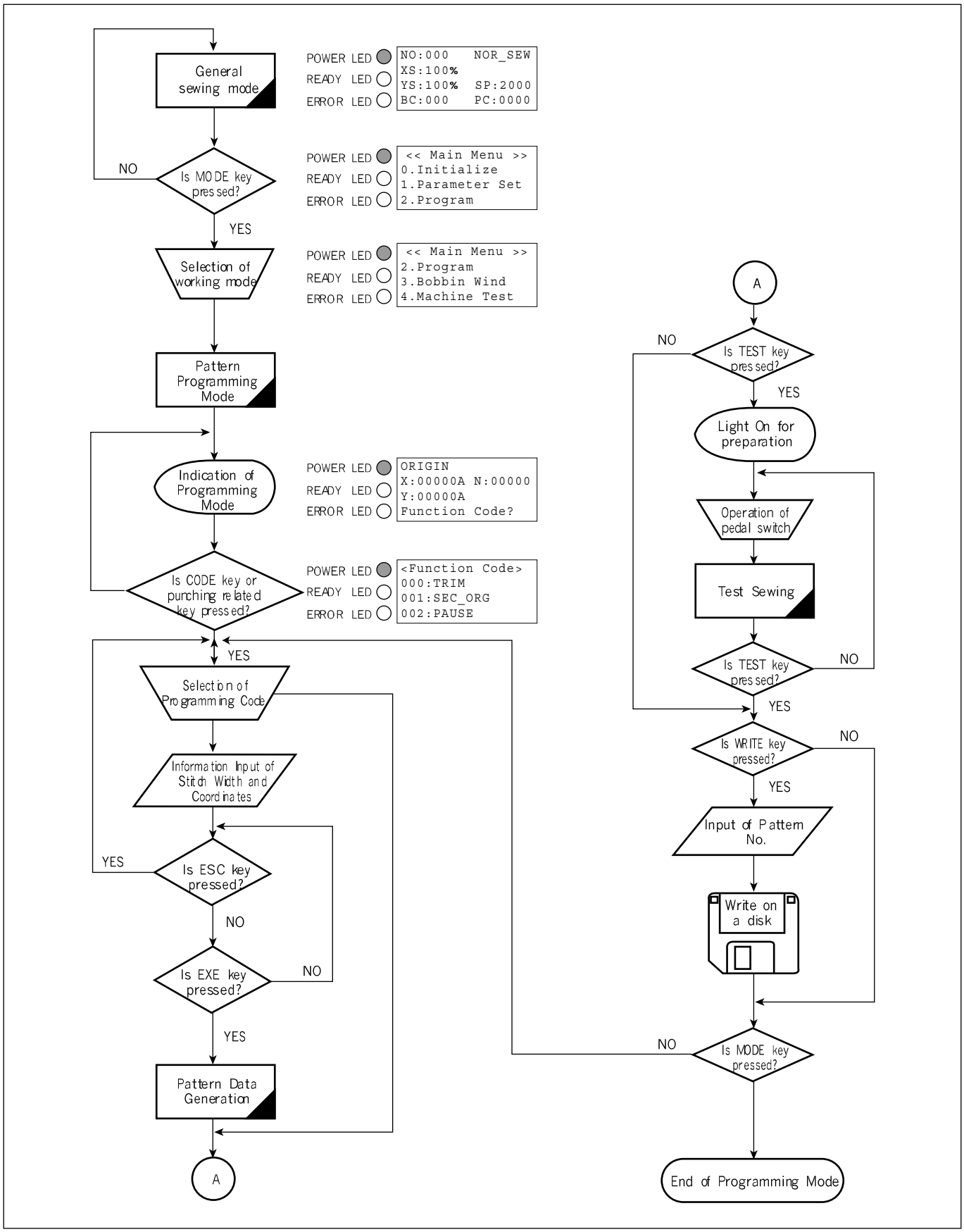


A. "POWER LED" : When you turn on the power, this lamp also comes to light on.
B. "READY LED" : This lamp comes to light on when a machine is ready to work by reading patterns. During reading or writing the patterns, the lamp flickers. If you press ENTER, you can get out of the "READY" state.
C. "ERROR LED" : When errors including sensing thread and emergency stop happen this lamp comes to light on.
D. "NO" : It indicates pattern No. Press NO key and input the pattern number you want by pressing digit keys. (000 ~ 999)
E. "XS" : It indicates a rate of enlargement and reduction for width. You can change the value at your option by using digit keys after pressing down X SCALE key. (001[%] ~400[%])
F. "YS" : It indicates a rate of enlargement and reduction for length. You can change the value at your option by using digit keys after pressing down Y SCALE key. (001[%] ~400[%])
G. "SP" : It indicates sewing speed. You can change the speed you want by pressing down SPEED key. (200[SPM] ~2500[SPM])
※ Maximum sewing speed varies depending on the sewing machine. See "Setting-Up the Speed".
H. "BC" : It indicates setting value of bottom thread exchange counter. You can change the value at your option by using digit key after pressing down B. SET key. (000 ~ 999)
I. "PC" : It indicates setting value of working capacity. You can change the value at your option by using digit keys after pressing down P. SET key. (0000 ~9999)
J. "NOR_SEW": It indicates a work status. There are two work statuses including normal sewing and step sewing. "NOR_SEW" indicates normal sewing, while "STP_SEW" indicates step sewing.
※See the methods for using applied operations for more details on "STP_SEW."

3) Flow Chart of General Operation



4) Work Flow of Pattern Programming



5) Storage Media

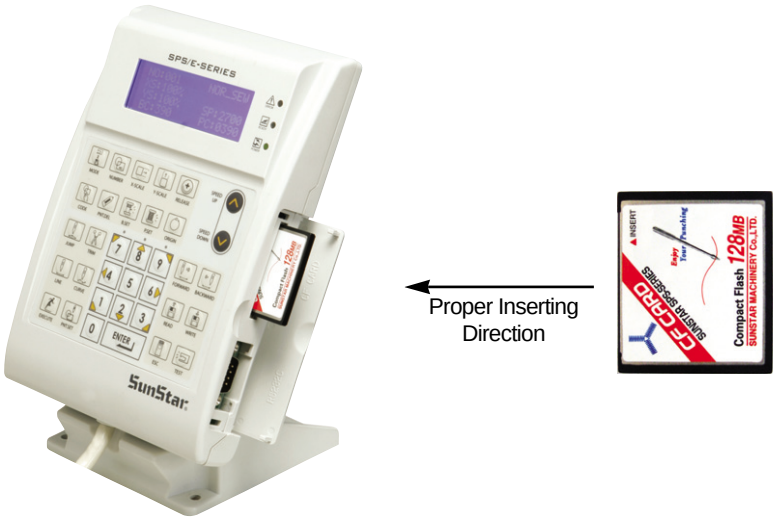
5-1) CF CARD

Multi-purpose CF Card can be used. CF Card refers to Compact Flash Memory, and it is widely used as a storage media.
SunStar offers 128M CF Card, which has 90 times bigger capacity compared with a floppy diskette.
Users can purchase CF Card like a floppy diskette. Regardless of the size of patterns, it can be used, but when the pattern has a large capacity, it might tale more time to read and write.
When a user saves designs in CF Card, "SPS" folder is automatically generated, and designs are saved within the "SPS" folder. The method of using it is same to that of a floppy diskette.
In addition, to access CF Card from PC, CF Card reader is required. CF Card Reader is a multi-purpose device and can be easily purchased. For purchase, contact the nearest PC supplies store.
To use a commercial CF Card, make sure the formatting method is either FAT or FAT16. In general, the commercial CF Card is formatted as FAT32. CF Card can be formatted again on PC by using CF Reader.

Notice

Sometimes, the reading error of CF Cards occurs. It may result from the fact that they are manufactured by different companies. When problems occur, replace the CF Cards which developed problems with the CF Cards of other manufacturer.

① Keep CF Card away from the articles emitting magnetism like TV or magnet.
② Keep CF Card away from heat, humidity, and direct sunlight.
③ Do not remove CF Card from the disk drive during formatting or while data input/output is conducted.
④ Check whether CF Card is properly inserted.
⑤ Do not insert CF Card while the machine power is on. If not, error might occur.

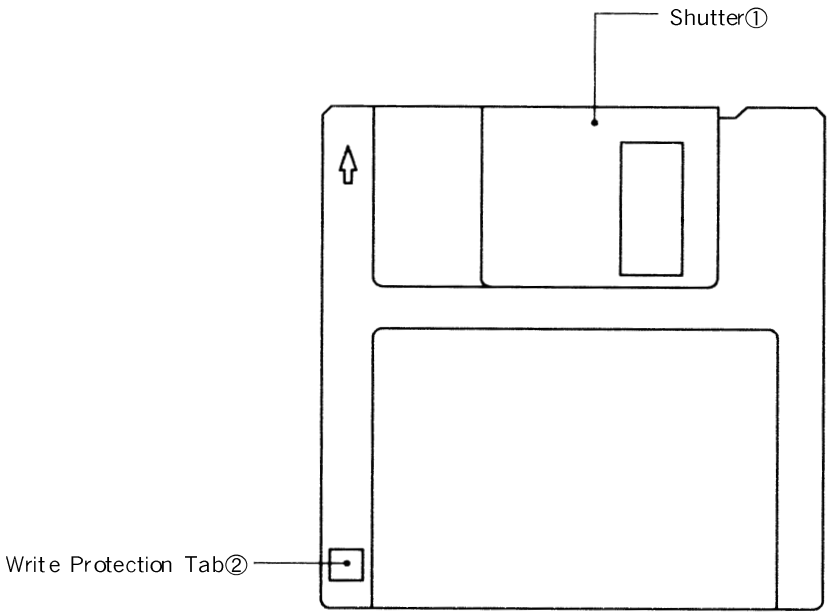


5-2) Floppy Diskette

When handling a floppy diskette, the following should be strictly observed.

Notice	**It is possible to use a floppy diskette available in the market, but make sure to use the certified product.**

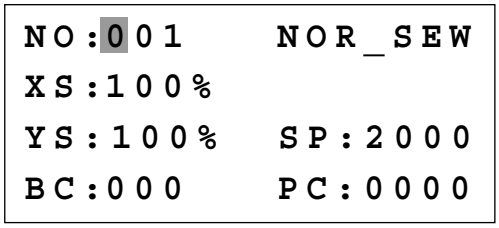
① Keep a floppy diskette away from the articles emitting magnetism like TV or magnet
② Keep a floppy diskette away from heat, humidity, and direct sunlight.
③ Do not place heavy objects on the floppy diskette.
④ Do not remove the floppy diskette from the disk drive during formatting or while data input/output is conducted.
⑤ Do not keep the cover of the floppy disk drive open.
⑥ If the write protection tab is open, data input to the floppy diskette is not allowed.
⑦ If read and write operations are repeatedly conducted by using one floppy diskette, it might develop an error.
⑧ It is safer to save important design data in two floppy diskettes.

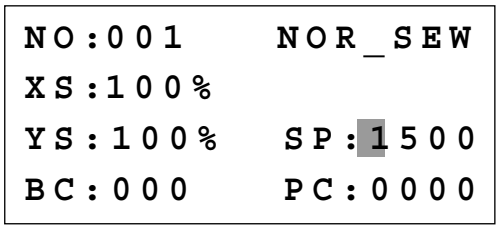


6) Reading design patterns from a floppy diskette or CF Card

※Caution : If READY LED turns on or upper feed plate is under, some keys are not available.
It happened, operate the keys after lifting the upper feed plate or pressing ENTER↵ key.

A. Insert a floppy diskette or CF Card which has sewing patterns into the appropriate drive.
B. After pressing NO key, input the pattern number by using digit keys. (If you want to work with "001" pattern, press [0][0][1])
C. Press ENTER↵ key. Read the pattern and change to sewing available mode.
D. At the moment, the upper thread plate comes to descend, then ascend again after moving to the sewing start point. The READY LED comes to light on.
E. Press SPEED key and adjust the speed properly.
F. If you step on the pedal switch on the right side, the upper feed plate comes to descend, and if you step on the pedal switch on the left side, the machine starts relevant work.
G. When you finish operating, the machine backs to the origin or sewing start point, and the upper feed plate comes to ascend.

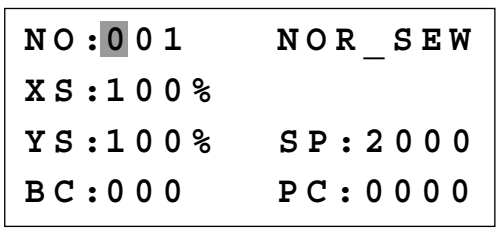


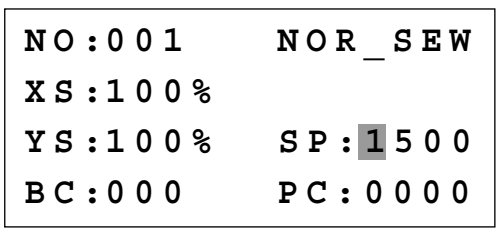


※ Target drive can be set at Parameter 044. SAVE TYPE. To read patterns from CF Card, select 'CF Card'. In case of using CF Card, make sure to insert the card before power-on.

7) Checking sewing patterns read from a floppy diskette or CF Card

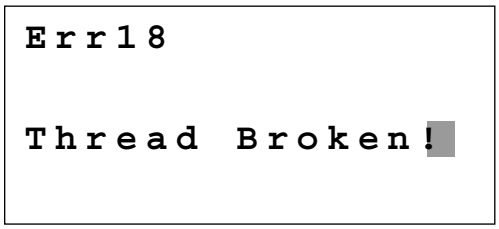
A. Insert a floppy diskette or CF Card into the floppy drive or CF drive.
B. After pressing NO key, input the pattern number by using digit keys. (If you want to work with "001" pattern, press [0][0][1]) To read pattern numbers, the memory type setting should be done in advance to read it on 044. SAVE TYPE.
C. Press ENTER↵ key. Read the pattern and change to sewing available mode.
D. At the moment, the upper thread plate comes to descend, then ascend again after moving to the sewing start point. The READY LED comes to light on.
E. Press SPEED key and adjust the speed properly.
F. If you step on the pedal switch on the right side, the upper feed plate comes to descend.
G. If you press FORW and BACK keys to progress and reverse 1 stitch, you can confirm the real shape to be sewn. If you press continuously, it moves to the start or to the end of pattern data consecutively.
H. If you want to finish working, press ORIGIN key.
I. If you want to continue sewing at the forward or backward point, step on the left pedal switch.
J. When you finish operating, the machine backs to the origin or sewing start point, and the upper feed plate comes to ascend.

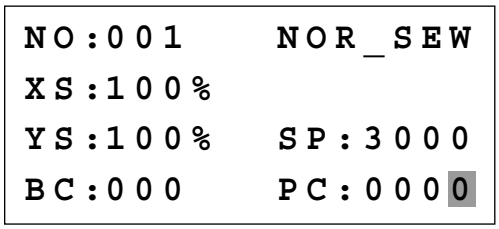




8) When the Machine Is Stopped after Thread Breaking

A. The message appears as in the figure.
B. If you want to continue sewing, conduct threading in the needle, and press the TWO Start button again. If you want to resume sewing one stitch ahead or one stitch back, use the FORW and BACK key. When the needle movement is complete, press the TWO Start button.
C. If you want to stop sewing and start sewing all over again, press the ORGIN key. Then the inner/outer presser plate moves to the origin and ascends.
D. If the current work is complete, the inner/outer presser plate moves the origin and ascends.

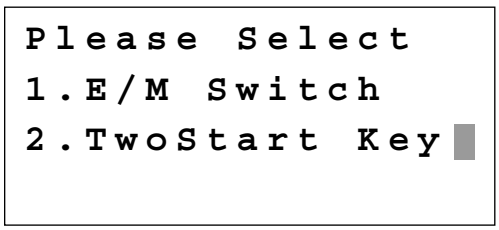


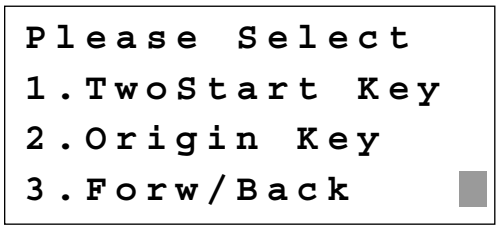


9) Emergency Stop in the middle of Sewing

A. When the emergency stop switch is pressed, sewing is immediately suspended. The message appears asin the figure.
B. If you want to continue sewing, press the TWO Start switch. If you want to stop sewing, press the Emergency Stop switch once again.

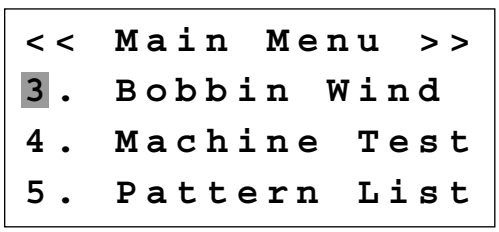
C. After trimming (in case where manual trimming after emergency stop is set), the message in the figure appears. To continue sewing, press the Two Start key. To conduct sewing all over again, press ORIGIN Key. User can move the needle to the desired position using FORW/BACK key and press Two Start switch.

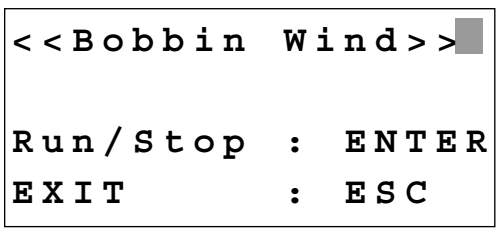




10) Thread Winding

A. Insert the empty bobbin into the sewing machine head.
B. Press MODE.
C. Use the direction keys ▲ ▼ to move to "3. Bobbin Wind" and press ENT-ER↵. Then the upper feed plate descends.
D. When the ENTER↵ key is pressed, thread reeling is conducted. When the ENTER↵ key is pressed once again, the thread reeling is suspended for a time being.
E. When the bobbin winding is completed, press the right step switch or ESC to end the bobbin winding.





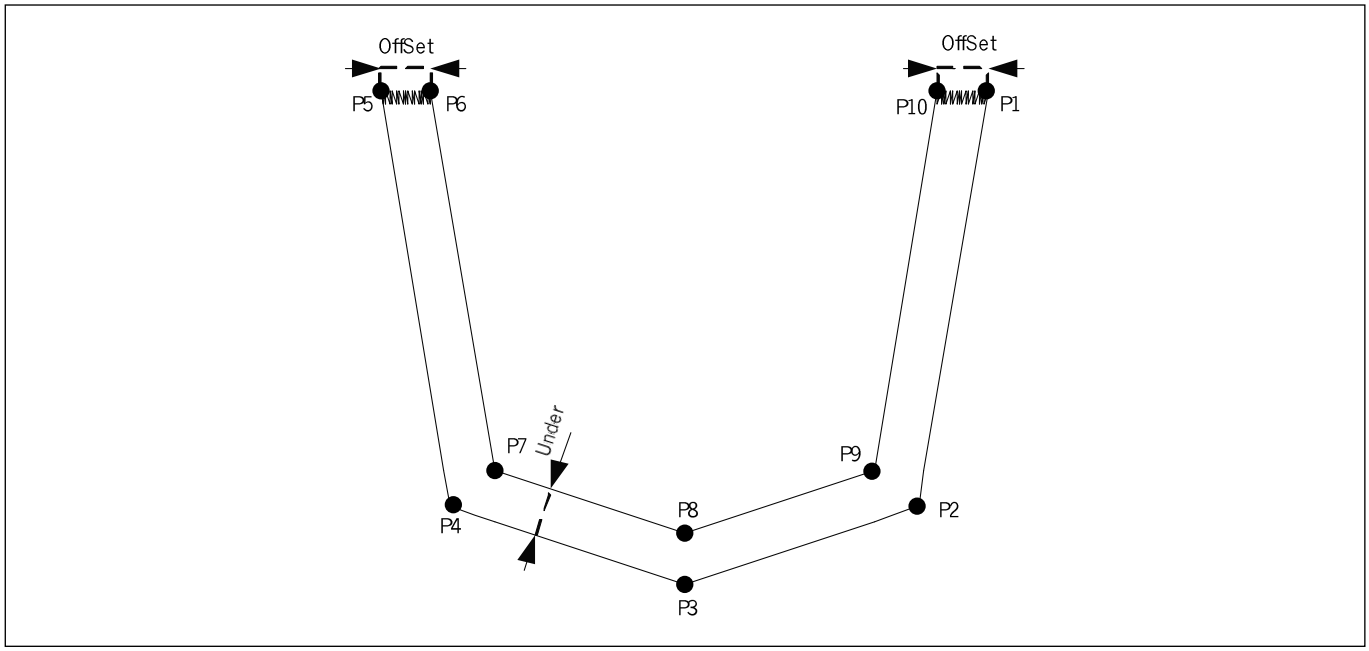
7

Applied Operations

1) Pocket Design Data Creation

1-1) Pocket Design Date Quick Creation Function

A. When CODE 065. POCKET is used on the program mode



1. Select Program Mode Mode.

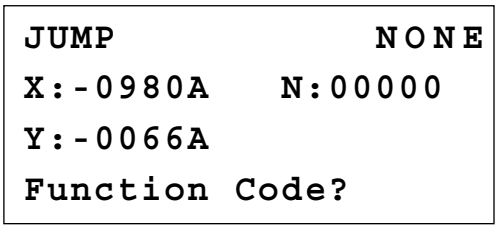
```
<< Main Menu >>
2. Program
<-
3. Bobbin Wind
```

```
ORIGIN          NONE
Y:00000A   N:00000
Y:00000A
Function Code?
```

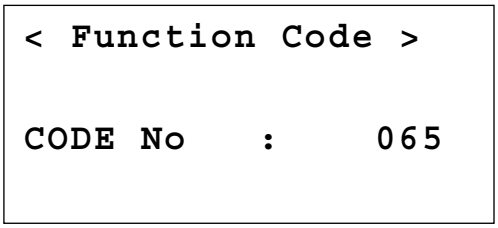
2. Press the JUMP key and use the direction keys to move to P1. Then press the PNT SET key.

```
JUMP
X:-0980A
Y:-0066A
N:001
```

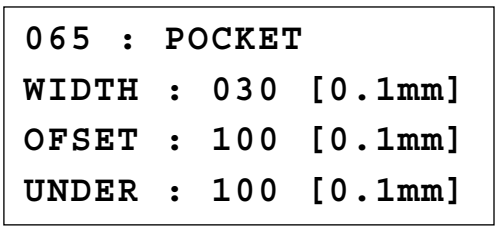
3. When the EXE key is pressed, pattern data is calculated, and the presser plate moves in accordance with the calculation result.



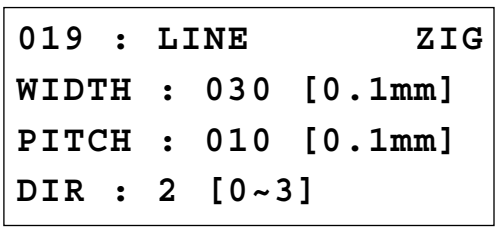
4. Press the CODE key. If the pattern programming-related function number is known, press the three-digit number. If it is not known, press the ENTER↵ key and use the direction keys (▲ ▼) to select 065. POCKET, and then press the ENTER↵ key.



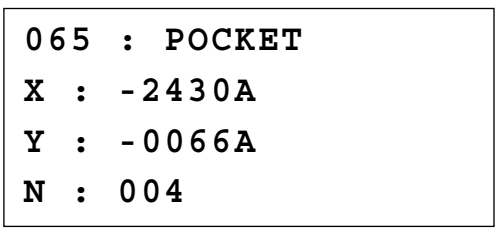
5. Use number keys and and press.
(Description) WIDTH : Stitch width
OFSET : Distance between inner line and outer line (distance b/w P1 and P10, distance b/w P5 and P6)
UNDER : Distance between two lines except for ZigZag part (distance b/w P2 and P9, distance b/w P3 and P8, distance b/w P4 and P7)



(Description) WIDTH : ZigZag stitch length
PITCH : ZigZag stitch distance
DIR : ZigZag design created (Default : 2)



6. Use the direction keys and press PNT SET at P2 ~ P5 to enter the coordinate of each point.



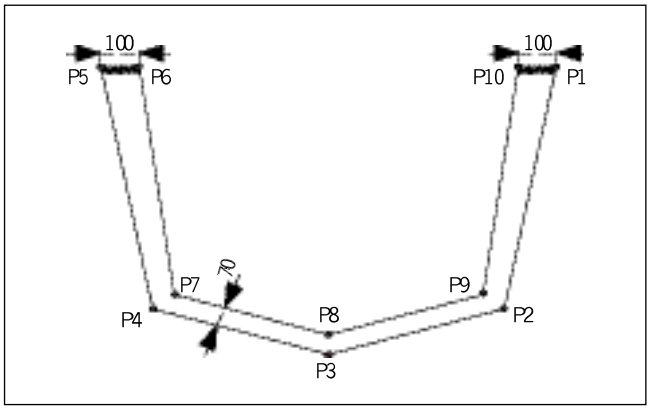
7. When the EXE key is pressed, pattern data is calculated, and the machine returns to the origin. At this time, TRIM(thread trimming) code is automatically inserted.

B. Design change based on UNDER value

a.

```
 065 : POCKET
WIDTH : 030 [0.1mm]
OFSET : 100 [0.1mm]
UNDER : 070 [0.1mm]
```

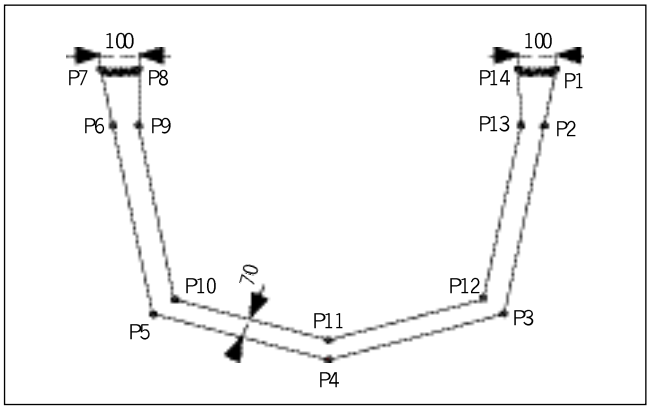
In the case of



b.

```
 065 : POCKET
WIDTH : 030 [0.1mm]
OFSET : 100 [0.1mm]
UNDER : 070 [0.1mm]
```

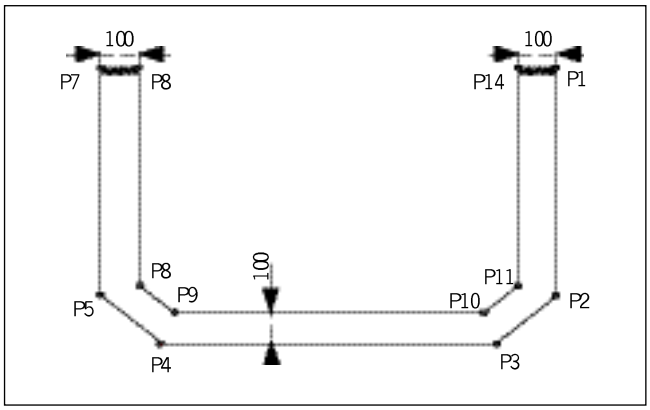
In the case of



c.

```
 065 : POCKET
WIDTH : 030 [0.1mm]
OFSET : 100 [0.1mm]
UNDER : 100 [0.1mm]
```

In the case of

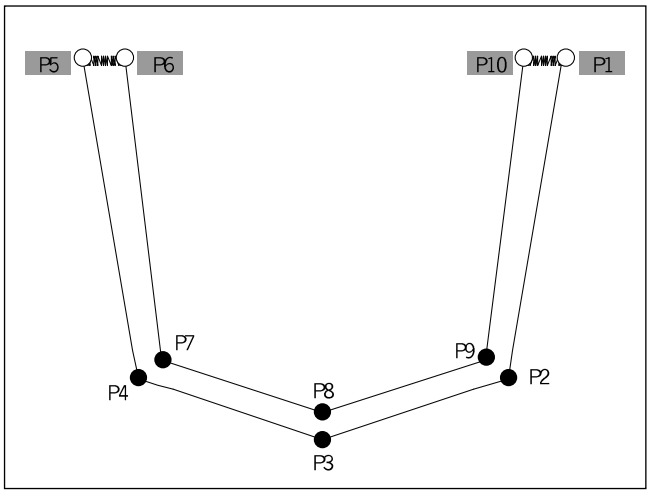


C. Auto insertion of CODE 063.PF_SET in pocket code At P5, P6, P10, and P1 of the right figure, 063. 2ndPFSet code is automatically inserted.

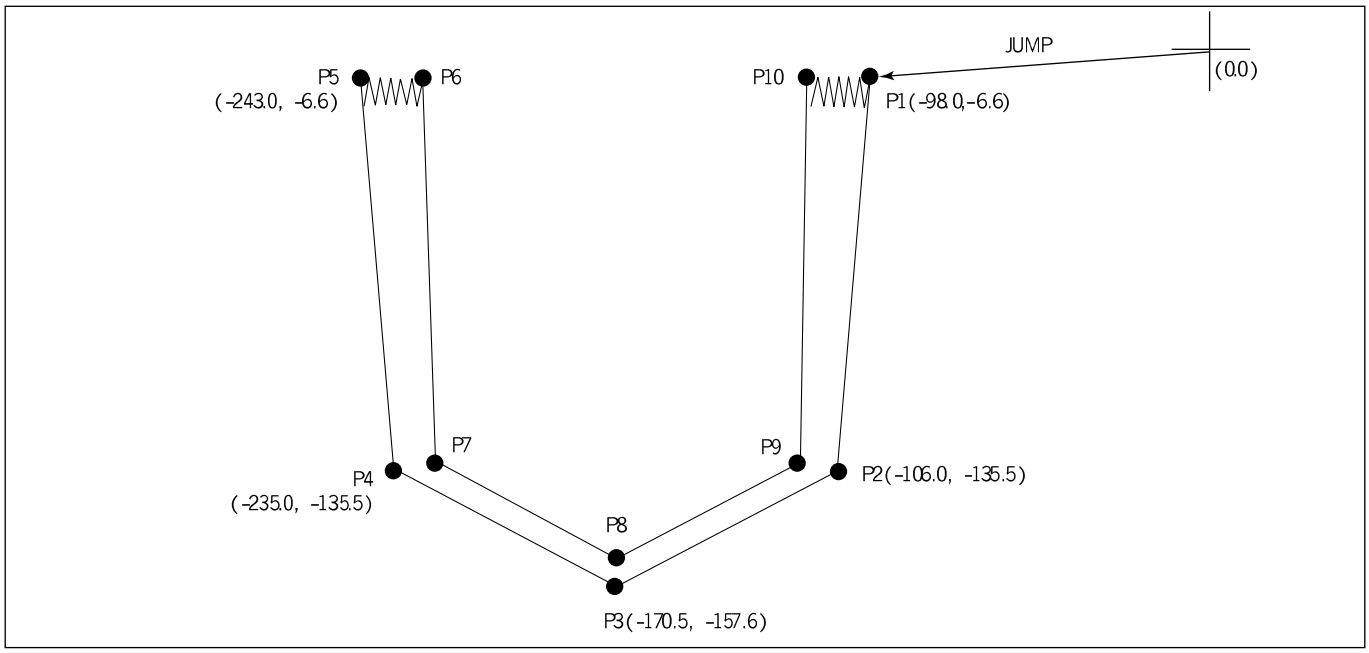
Notice **When 065. POCKET code is not used, user can enter the code at his/her desired point.**

D. Auto insertion of CODE 066. GuideEndPnt in pocket code At P5 of the right figure, 066. GuideEndPnt code is automatically inserted.

Notice **When 065. POCKET code is not used, make sure to enter the code at P5 (starting point of zigzag).**



1-2) Program Exercise 1: Simple line pocket design creation



A. Press MODE.

B. Press ESC to move to the main menu screen. Use the direction keys ▲ ▼ to move to "2. Program" and then press ENTER↵.

```
<<Main Menu>>
0.Initialize
1.Parameter Set
2.Program
```

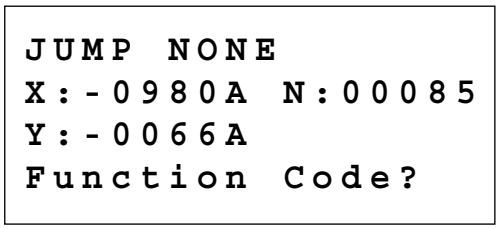
The inner/outer presser plate moves to the origin.

```
ORIGIN        NONE
X:0000A  N:00000
Y:0000A
Function Code?
```

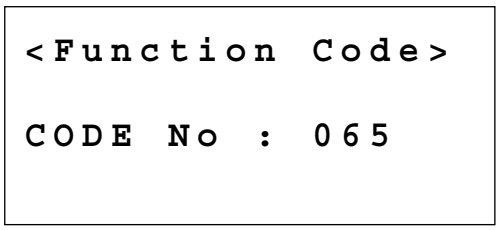
C. Press JUMP and use the direction keys to move to the initial start position. Press PNT SET.

```
004:JUMP
X:-0980A
Y:-0066A
N:001
```

D. When EXE is pressed, pattern data is calculated, and the inner/outer presser plate moves depending on the calculated data.

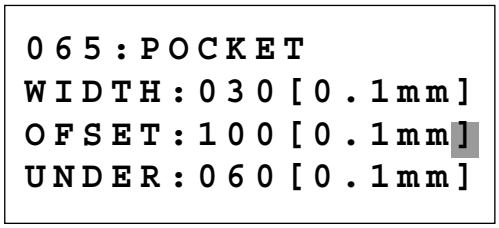


E. Press CODE. If user knows programming-related function number, press a three-digit number. If user does not know it, press ENTER↵ and use direction keys ▲ ▼ to move to "065: Pocket." And press ENTER↵.



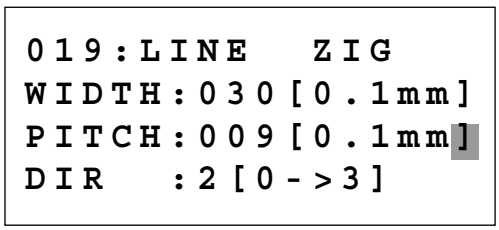
F. Use number keys to enter the stitch length and press the ENTER↵. Enter the offset value and press the ENTER↵. And then enter the UNDER value.

※ OFSET = distance between P1 and P10
UNDER = Distance between P2 and P9, distance between P3 and P8, distance between P4 and P7

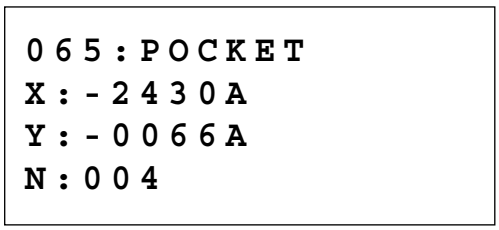


G. If the line zigzag-related data appears for the P1-P10 section as in the figure, enter the stitch length and press ENTER↵. Enter the pitch value and press ENTER↵. And then enter the direction (DIR) value.

※ The default of DIR is 2.

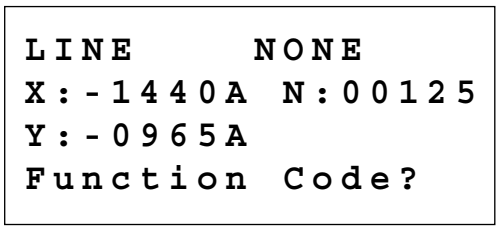


H. Use the direction keys to move to each corner of a pocket model and press PNT SET respectively to enter the coordinates of each point of the corner. Whenever PNT SET is pressed, the numbers on the screen increase.

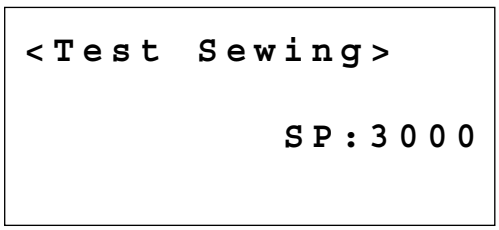


I. When EXE is pressed, pattern data is calculated. Then the needle moves to the origin.
※ TRIM (trimming) code is automatically entered.

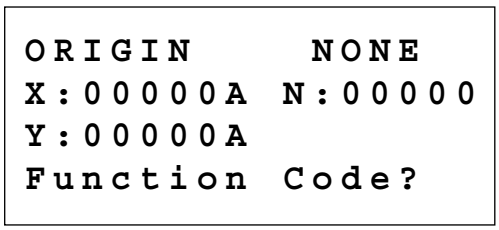
J. Press BACK and FORW to check the real shape for sewing. Whenever they are pressed, the needle moves by one stitch, and the work pattern and coordinates are displayed on the screen. For test sewing, move to the next step. If the buttons are kept pressed, the needle consecutively moves from start to end of the pattern data.



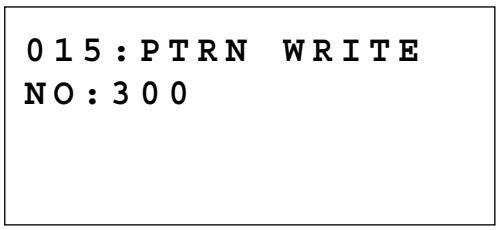
K. Press TEST.
The inner/outer presser plate moves to the origin, and the READY LED is on. Press SPEED and adjust the sewing speed appropriately for test sewing.
Press the right pedal switch.
When TWO Start switch is pressed, test sewing is conducted. When test sewing is completed, the inner/outer presser plate moves to the origin and ascends.
※ Use the clamp button and the start button in case of PS/B Type.



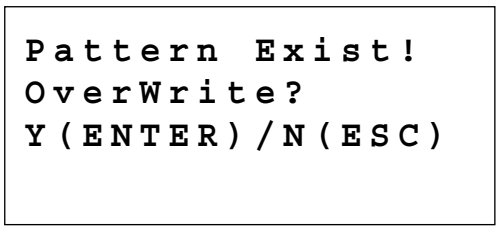
L. Press the TEST key again to end test sewing. The inner/outer presser plate descends, and READY LED is turned off.



M. Press WRITE. Use the number keys to enter a desired number and press ENTER ↵. Then the created pattern data is saved in the floppy diskette under the number. During the pattern saving, READY LED is blinking.

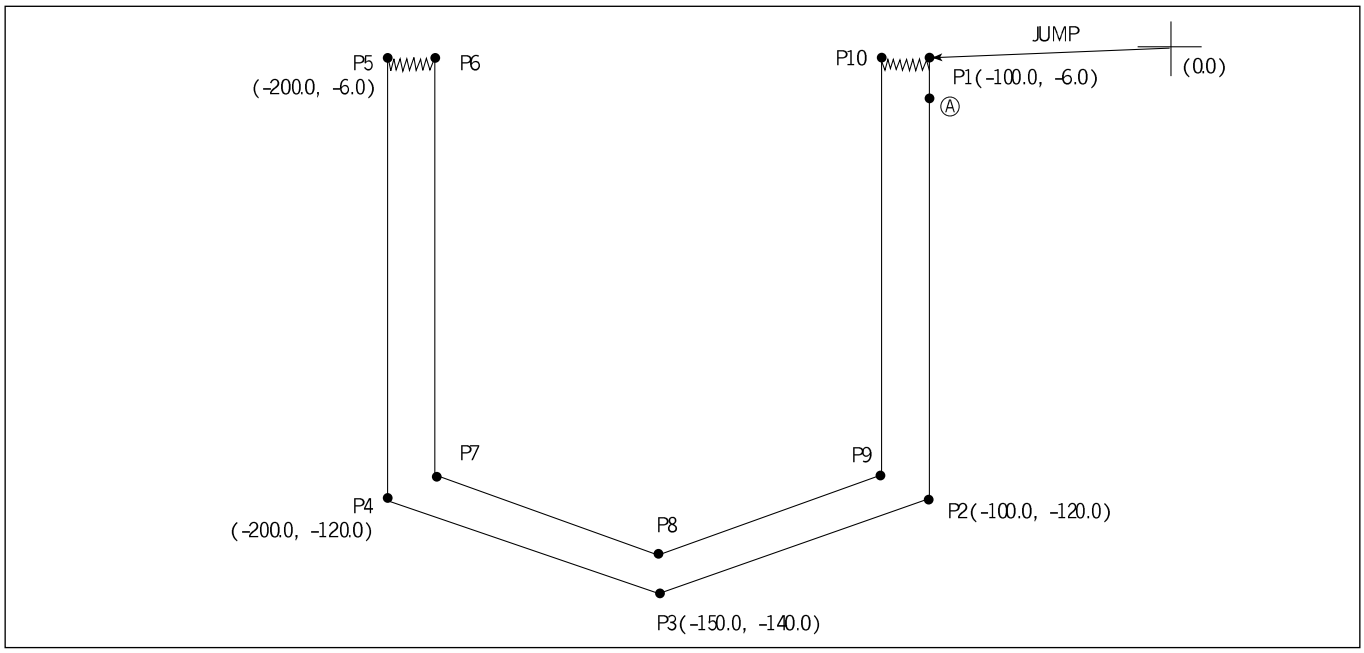


N. If there is a pattern data saved under the same number, the screen in the right figure appears. To enter the data under the same number, press ENTER ↵. To enter the data under other number, press ESC and enter other number for saving.



O. To end pattern creation, press ESC and return to the initial screen.

1-3) Program Exercise 2: General Creation of Line Pocket Design



A. Press MODE.

B. Use the direction keys ▲ ▼ to move to "2. Program" and press ENTER ↵.

```
<<Main Menu>>
0.Initialize
1.Parameter Set
2.Program
```

The inner/outer presser plate returns to the origin.

```
ORIGIN          NONE
X:00000A  N:00000
Y:00000A
Function Code?
```

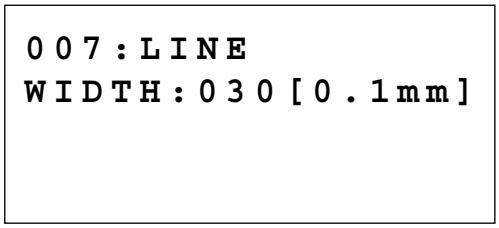
C. Press JUMP and use the direction keys to move to the start position. Press PNT SET.

```
004:JUMP
X:-1000A
Y:-0060A
N:001
```

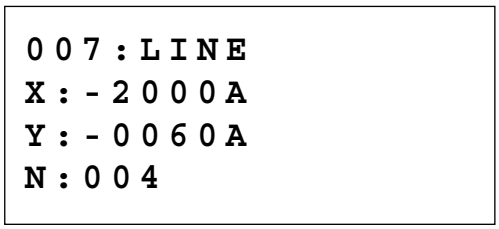
D. Press EXE to start the calculation of pattern data. Based on the calculation result, the inner/outer presser plate moves.

```
JUMP            NONE
X:-1000A  N:00090
Y:-0060A
Function Code?
```

E. Press LINE. Use the number keys to enter stitch width and press ENTER. (in case where 3mm is desired for stitch width, press [030]).

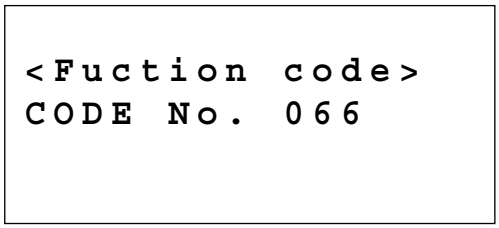


F. Use the direction keys to move to each corner of the P1-P5 section. Press PNT SET for each corner respectively to enter their coordinates. Whenever PNT SET is pressed, the number (N) increases.

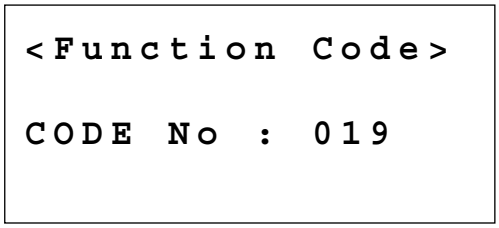


G. When EXE is pressed, pattern data is calculated. Based on the calculated data, the inner/outer presser foot moves.

H. Press the CODE key at P5. Select 066.GuideEndPnt and press the ENTER key for input.



I. Press CODE. If user knows the pattern programming-related function number, enter a three-digit number. If user does not know the number, press ENTER. Use the direction keys to move to "0.19: LINE ZIG" and press ENTER.



J. The screen on the right shows the line zigzag-related data for the P5-P6 section. Press the stitch width and press ENTER. Enter the pitch value and press ENTER. Enter the direction value (DIR).
※ The default of DIR is 2.

```
019:LINE      ZIG
WIDTH:030[0.1mm]
PITCH:009[0.1mm]
DIR   :2[0->3]
```

K. Use the direction keys to move to PNT SET. Press PNT SET to enter coordinates.

```
019:LINE      ZIG
X:-1850A
Y:-0060A
N:001
```

L. When EXE is pressed, the pattern data is calculated. The inner/outer presser plate moves according to the calculated value.

M. Repeat E~L to create design for the P6-P10 section.

N. Press LINE. Use the number keys to enter stitch width and press ENTER.

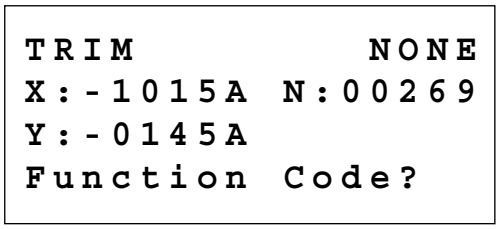
```
007:LINE
WIDTH:030[0.1mm]
```

O. Use the direction keys to move to point Ⓐ and enter its coordinate by pressing the PNT SET key.

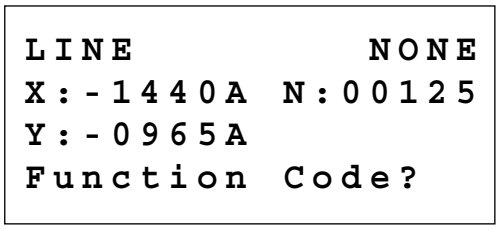
```
007:LINE
X:-1006A
Y:-0160A
N:001
```

P. When EXE is pressed, the pattern data is calculated. The inner/outer presser plate moves according to the calculated value.

Q. Press TRIM to enter a trimming code. In a moment, "000:TRIM" appears on the screen, and the screen in the right side appears.

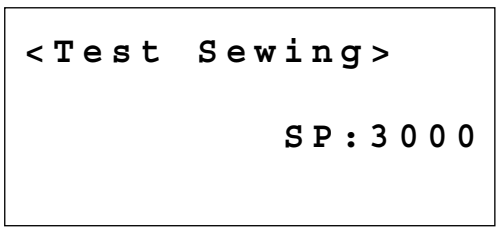


R. Press BACK and FORW to check the actual shape. Whenever the button is pressed, the needle moves by a stitch showing a pattern and coordinates. For test sewing, move to the next step. When the buttons are kept being pressed, the needle repeatedly moves to the start or end of the pattern data.

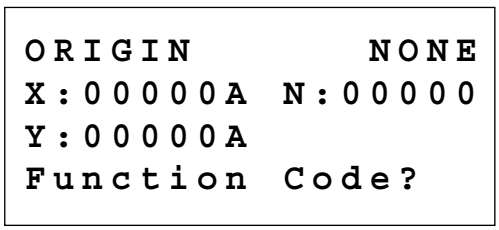


S. Press TEST. The inner/outer presser plate moves to the origin, and then ascends. When READY LED is on, press SPEED to properly adjust the test sewing speed. Press the right foot pedal switch and the TWO Start switch for test sewing. When test sewing is complete, the inner/outer presser plate moves to the origin and then ascends.

※ Use the clamp button and the start button in case of PS/B Type.



T. Press TEST again to end test sewing. The inner/outer presser plate descends, and READY LED is off.

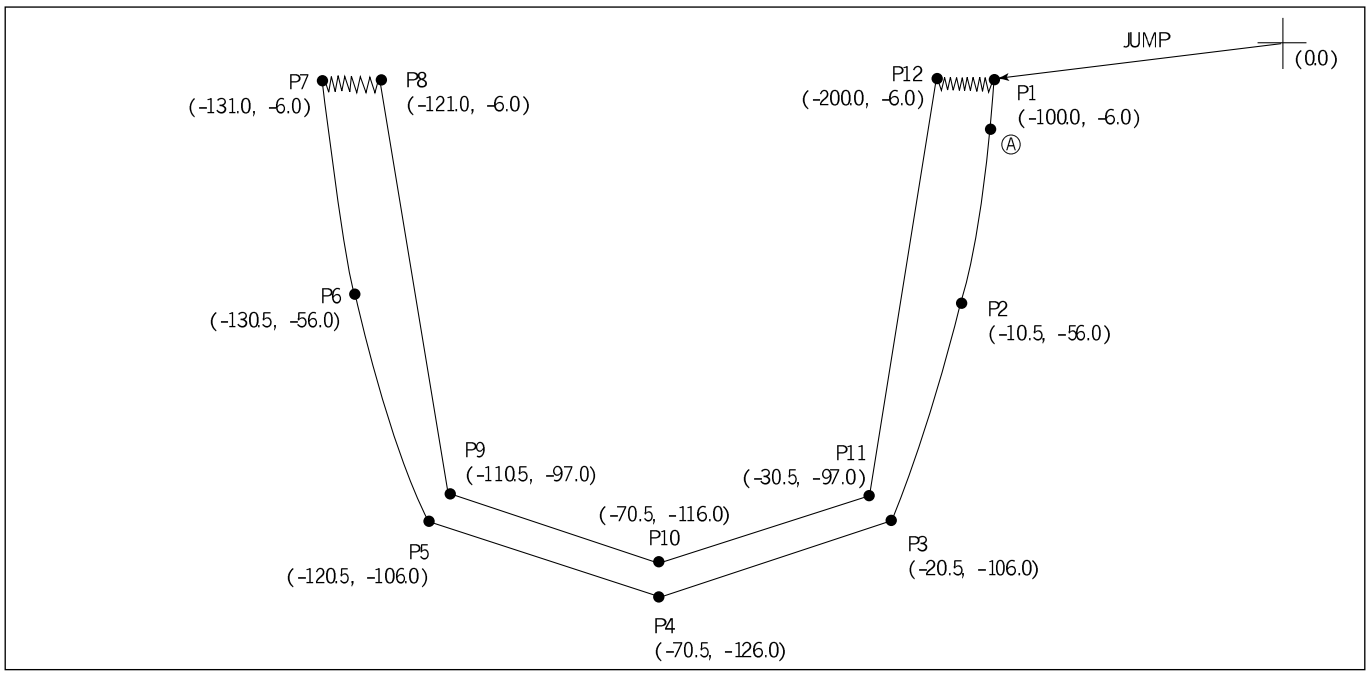


U. Press WRITE. Use the number keys to enter a desired number and press ENTER. Then a crated pattern data is saved in a floppy diskette under the number. While the pattern is being saved, READY LED blinks. If there is a pattern saved under the same number in the floppy diskette, press ENTER to overlap or press ESC and another number to save the pattern under a different number.

```
015:PTRN WRITE
NO  :300
```

V. To end the pattern creation, press ESC to return to the initial screen.

1-4) Program Exercise 3: General Creation of ROUND Pocket Design



A. Press MODE.

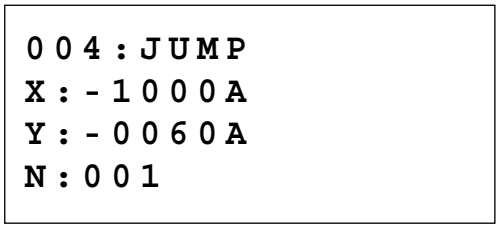
B. Use the direction keys to move to "2. Program" and press ENTER.

```
<<Main Menu>>
0.Initialize
1.Parameter Set
2.Program
```

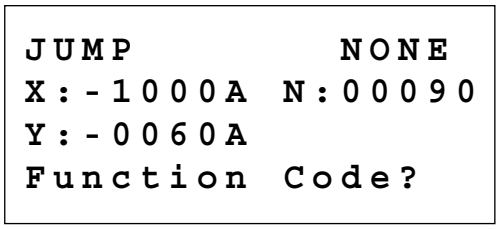
Then the inner/outer presser plate moves to the origin.

```
ORIGIN        NONE
X:00000A N:00000
Y:00000A
Function Code?
```

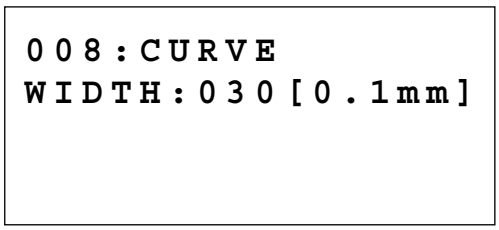
C. Press JUMP and use the direction keys to move to the start position.
Press PNT SET.



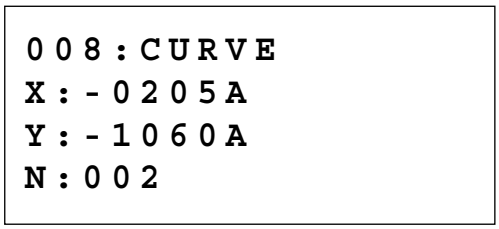
D. When EXE is pressed, the pattern data is calculated. The inner/outer presser plate moves according to the calculated result.



E-1. Press CURVE. Use the number keys to enter stitch width and press ENTER ↵. (for example, if 3mm is desired for stitch width, enter [030]).

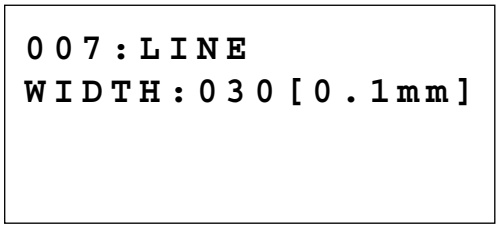


E-2. Use the direction keys to enter the coordinates of P1 and P3 by using PNT SET respectively. Whenever PNT SET is pressed, the number (N) on the screen increases.

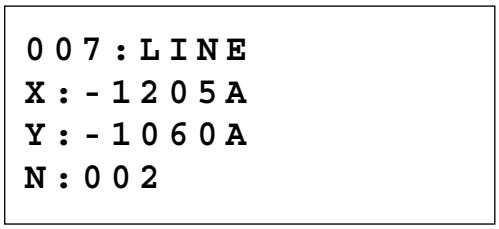


E-3. Press EXE to calculate the pattern data. According to the calculated result, the inner/outer presser plate moves.

F-1. Press LINE. Use the number keys to enter stitch width and press ENTER (for example, if 3mm is desired for stitch width, enter [030]).



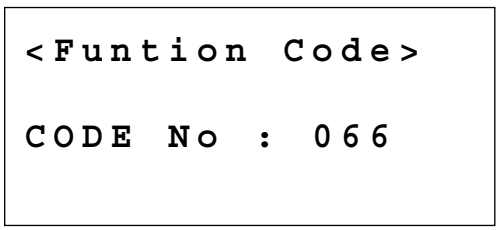
F-2. Use the direction keys to move to each corner of the P3-P5 section. Press PNT SET respectively to enter the coordinates of each corner. Whenever pressing PNT SET, the number (N) on the screen increases.



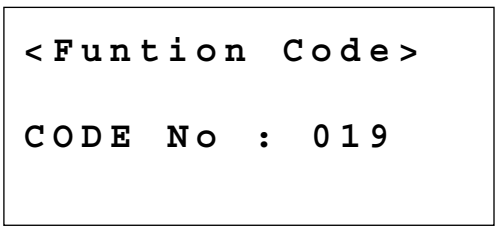
F-3. When EXE is pressed, the pattern data is calculated. The inner/outer presser plate moves according to the calculated result.

G. Repeat E1~E3 to create a design for the P5-P7 section.

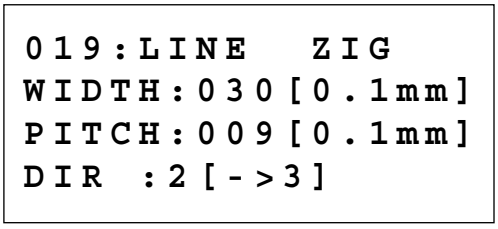
H. Press the CODE key at P7. Select 066.GuideEndPnt and press the ENTER key for input.



I-1. Press CODE. If user knows pattern programming-related function number, enter a three-digit number. If user does not know the number, press ENTER. Use the direction keys to move to "019: LINE ZIG" and press ENTER.

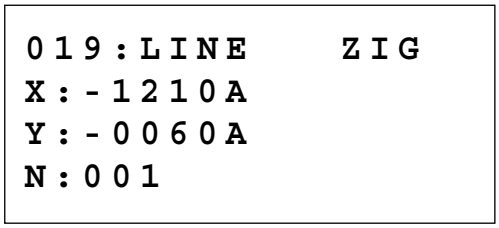


I-2. When the line zigzag data for the P7-P8 section appears as in the right screen, enter stitch width and press ENTER. Enter stitch pitch and press ENTER. Enter the direction value (DIR).
※ The default of DIR is 2.

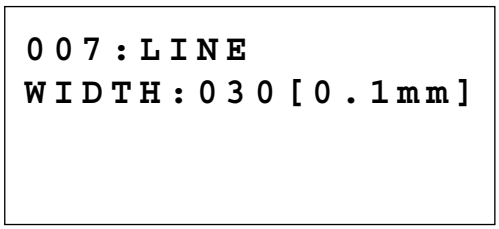


I-3. Use the direction keys to move. Press PNT SET to enter coordinates.

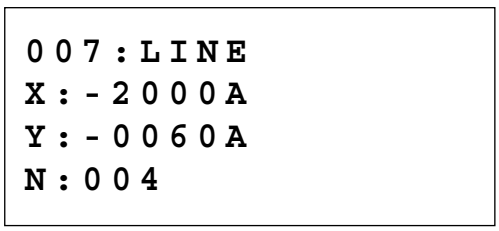
I-4. When EXE is pressed, pattern data calculation is conducted. The inner/outer presser plate moves according to the calculated result.



J-1. Press LINE. Use the number keys to enter stitch width and press ENTER ↵ (for example, if desired stitch width is 3mm, enter [030]).



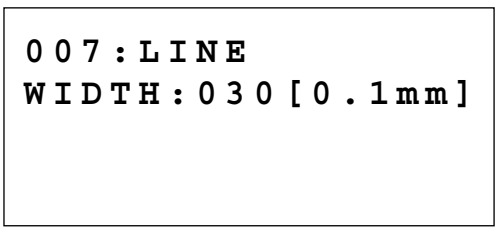
J-2. Use the direction keys to move each corner of the P8-P12 section. Press PNT SET to enter coordinates of each corner.
Whenever PNT SET is pressed, the number (N) on the screen increases.



J-3. When EXE is pressed, pattern data calculation is conducted. The inner/outer presser plate moves according to the calculated result.

K. Repeat I1~I4 to create designs for the P12-P1 section.

L. Press LINE. Use the number keys to enter stitch width and press ENTER ↵



M. Use the direction keys to move to point Ⓐ and enter its coordinate by pressing the PNT SET key.

```
007:LINE
X:-1016A
Y:-0151A
N:001
```

N. When EXE is pressed, the pattern data is calculated. The inner/outer presser plate moves according to the calculated value.

O. Press TRIM to enter a trimming code. In a moment, "000:TRIM" appears on the screen, and the right screen shows up.

```
TRIM            NONE
X:-1015A  N:00269
Y:-0145A
Function Code?
```

P. Press BACK and FORW to check the actual shape of the pattern. Whenever the buttons are pressed, the needle moves by a stitch showing a pattern and coordinates. For test sewing, move to the next step. When the buttons are kept being pressed, the needle repeatedly moves to the start or end of the pattern data.

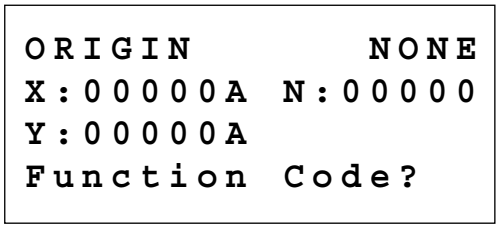
```
CURVE           NONE
X:-1001A  N:00165
Y:-0065A
Function Code?
```

Q. Press TEST. The inner/outer presser plate moves to the origin, and then ascends. When READY LED is on, press SPEED to properly adjust the test sewing speed. Press the right foot pedal switch and the TWO START switch for test sewing. When test sewing is complete, the inner/outer presser plate moves to the origin and then ascends.

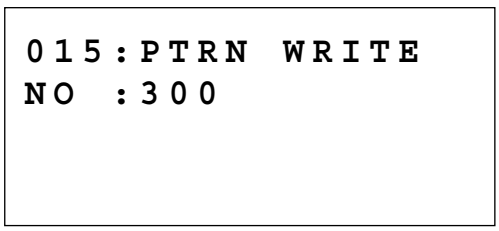
※ Use the clamp button and the start button in case of PS/B Type.

```
<Test Sewing>

          SP:3000
```

R. Press TEST again to end test sewing. Otherwise, the inner/outer presser plate descends, and READY LED is off.



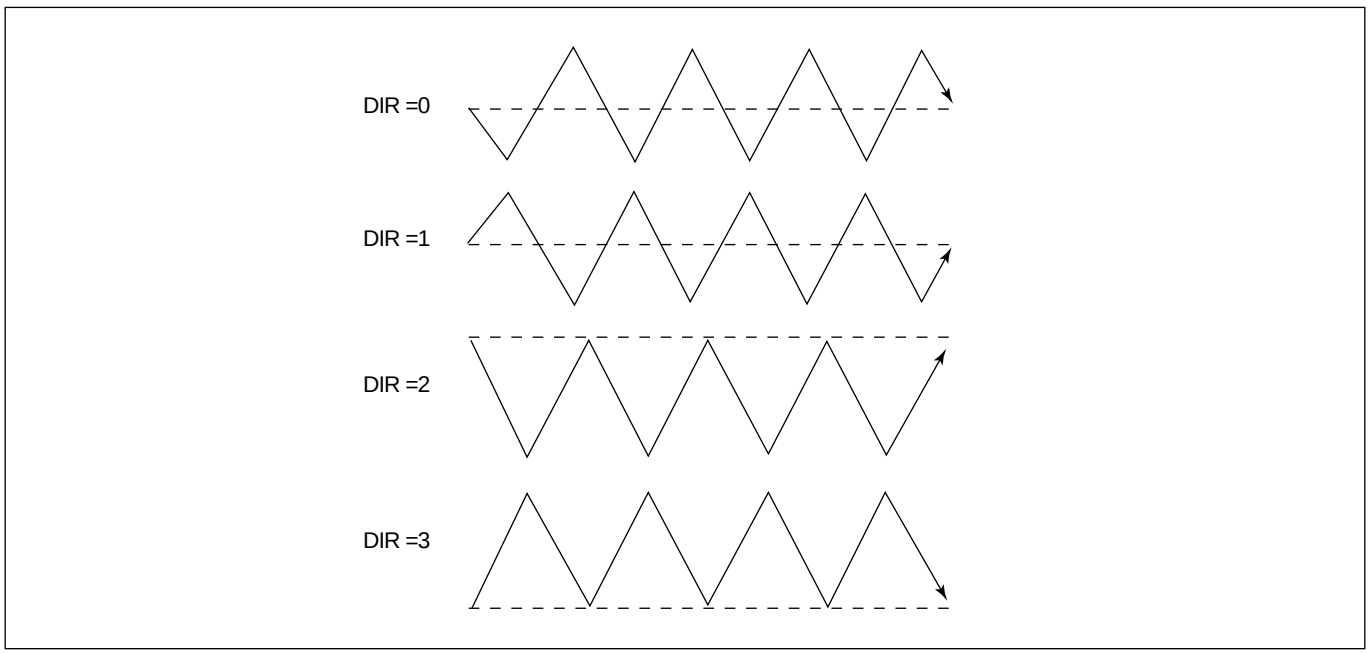
S. Press WRITE. Use the number keys to enter a desired number and press ENTER. Then a crated pattern data is saved in a floppy diskette under the number. While the pattern is being saved, READY LED blinks. If there is a pattern saved under the same number in the floppy diskette, press ENTER to overlap or press ESC and enter another number to save the pattern under a different number.



T. Press ESC to end pattern creation. Then the screen returns to the initial screen.

1-5) Zigzag Shape Selection When Creating Zigzag Pattern

When creating line zigzag, curve zigzag, arc zigzag, and circle zigzag, there are three parameters to select. Among them, four kinds of values including 0, 1, 2, and 3 could be entered for "DIR."



A. Press CODE. If user knows pattern programming-related function number, enter a three-digit number. If user does not know the number, press ENTER. Use the direction keys ▲ ▼ to move to "019: LINE ZIG" and press ENTER.

```
<Function Code>

CODE No : 019
```

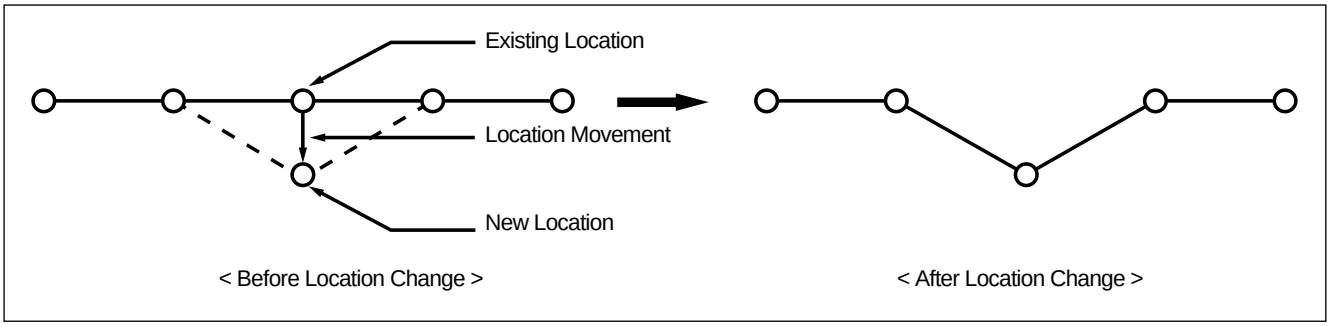
B. If line zigzag-related data appears as in the right figure, enter stitch width and press ENTER. Enter stitch pitch and press ENTER. Enter the direction value (DIR).
   * The default of DIR is 2.

```
019:LINE ZIG
WIDTH:030[0.1mm]
PITCH:009[0.1mm]
DIR   :2[0->3]
```

2) Pattern Data Edit Function

2-1) One Stitch Movement Function

It uses when correcting the location of one stitch in the formed sewing shape.



A. Insert floppy diskette containing the pattern to change movement of a stitch.

B. Press MODE key.

```
<< Main Menu >>
2. Program     <
3. Bobbin Wind
4. Machine Test
```

C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ key. At this time, the upper feed plate comes down and move the original point.

```
ORIGIN
X:00000A N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number to change movement of a stitch by moving the digit key and read in the pattern by pressing ENTER ↵ key. (For example, to read pattern number 001, input [0][0][1]).

```
014:PTRN     READ
NO   :001
```

E. Go to the location of stitch to correct by using FORW and BACK key.

```
LINE
X:-0001A N:00059
Y:00000A
Function Code?
```

F. After pressing CODE key, if you know the function number 051 related to pattern programming, input three figure of digit number and if you do not know the number, press ENTER ↵ key and move to "051:STITCH DRAG" by using direction key ▲ ▼. Then, press ENTER ↵ key.

```
<Function Code>
051:STITCH DRAG<
052:STITCH DEL
053:MOV SEWSTAR
```

G. Move to the location desired movement of one stitch by using direction key.
※ X-Y coordinate value is different according to location of needle.

```
051:STITCH   DRAG
X:-00001
Y:-00060
N:000
```

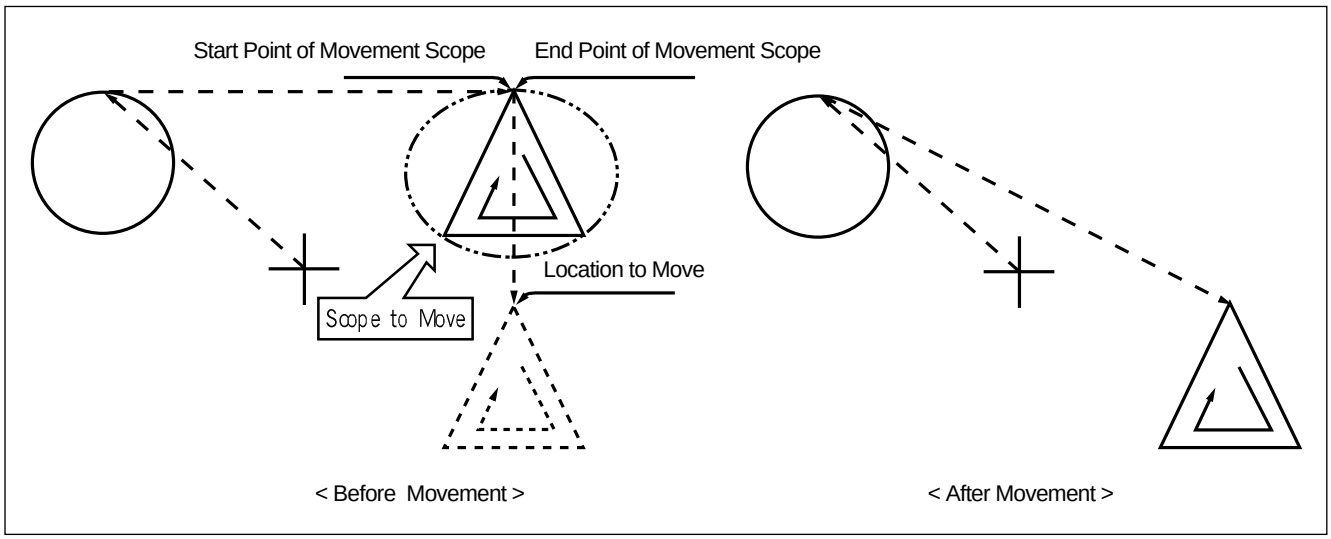
H. If you press EXE key, change to new needle location is completed.

I. Confirm if needle location was changed to the desired location by using FORW and BACK key.

```
LINE
X:-0001A  N:00059
Y:-0060A
Function Code?
```

2-2) Partial Movement Function of Pattern Data

Move part of pattern to different location among the sewing shape.



A. Insert partial pattern data into the floppy diskette containing the pattern to move and change.

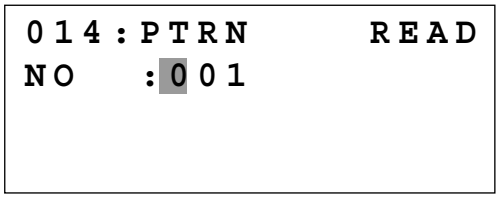
B. Press MODE key.

```
<< Main Menu >>
2. Program     <
3. Bobbin Wind
4. Machine Test
```

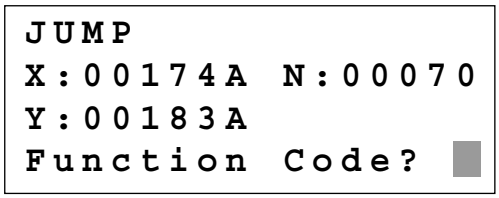
C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ key. At this time, the upper feed plate comes down and moves to the original point.

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

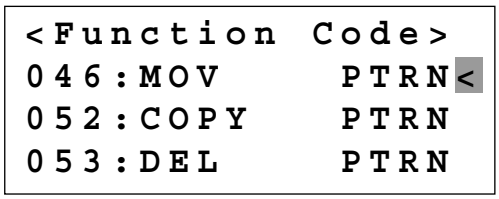
D. After pressing READ key, input the pattern number to move and change partial pattern data by using digit key and read in the pattern by pressing ENTER key. (For example, input [0][0][1] to read the pattern number 001.)



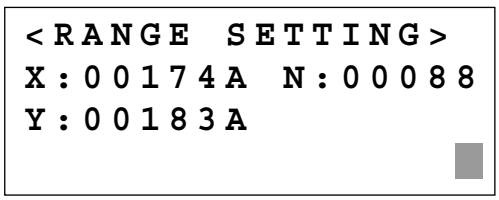
E. Go to the needle location to partially move by using FORW and BACK key.
Reference) Location of the needle for partial movement should be placed at the first start needle location that actually sews. Therefore, if the sewing data that has line property after jump appears, the last location of JUMP data is the first start location of needle correction.



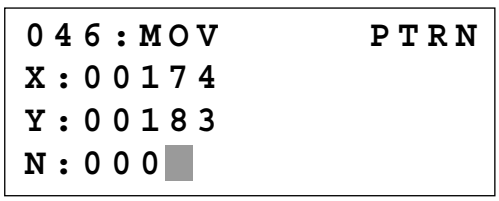
F. After pressing CODE key, if you know the function number related to pattern programming, input three figure digit number 046, but if you do not know the number, press ENTER key. Then after move to "046:MOV PTRN" by using direction key ▲ ▼, press ENTER key.



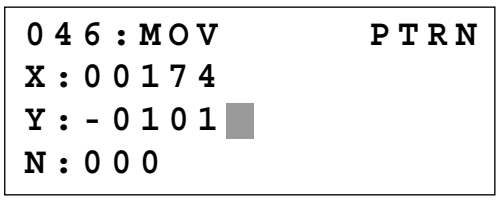
G. Go to the last location of pattern to move by using FORW key.
※ The indicated values are different according to current location.



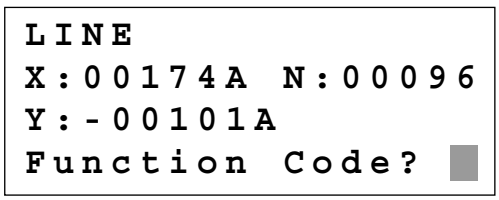
H. If you press EXE key, it becomes the state that the selected pattern for partial movement can move to the optional location.



I. Move to the location to move by pressing direction key.



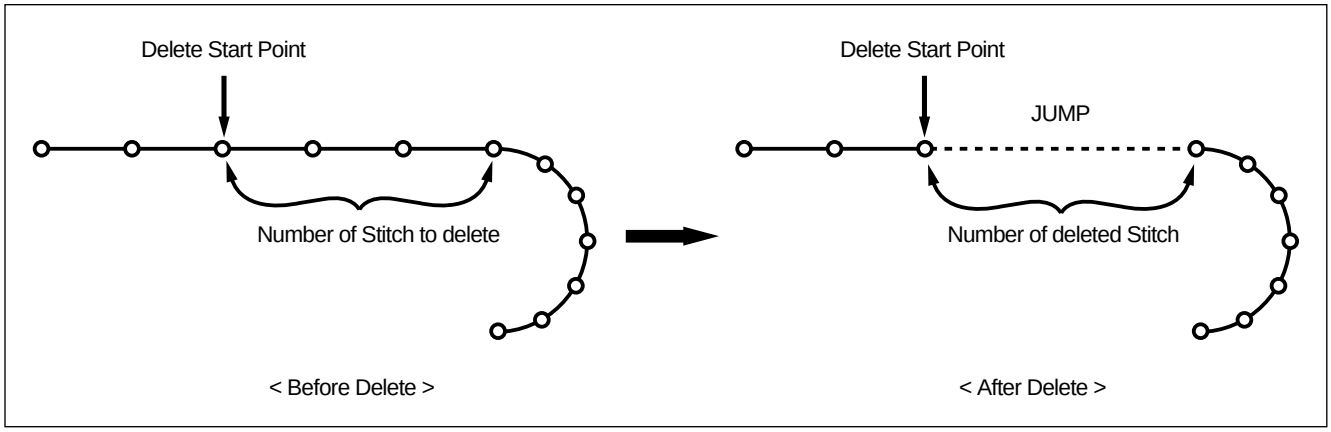
J. If you press EXE key, movement is completed.



K. Confirm if movement was properly made by using FORW and BACK key.

2-3) A Fixed Number of Stitch Delete Function

Delete 1-99 stitch in the pattern data shape after the start point to delete at present.



A. Insert floppy diskette containing the pattern to delete stitches.

B. Press MODE key.

C. After moving to " 2. Program " menu by using direction key ▲ ▼, press ENTER ↵ key. At this time, the upper feed plate comes down and moves to the original point.

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number to delete stitch by using the digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern 001.)

```
014:PTRN      READ
NO   :001
```

E. Go to needle location to delete by using FORW and BACK key.

※ X-Y coordinate value is different according to needle location.

```
LINE
X:-0025A  N:00059
Y:00000A
Function Code?
```

F. After pressing CODE key, if you know the function number 052 related to pattern programming, input three-figure digit number and if you do not know, press ENTER ↵ key. Then after moving to " 052:STITCH_DEL " by using direction key ▲ ▼ , press ENTER ↵ key.

```
<Function Code>
052:STITCH_DEL <
053:MOV SEWSTRT
054:MOV 2ndORG
```

G. Input the number of stitch to delete behind from current location.

```
052:STITCH  DEL
NUM:10[STITCH]
```

H. Press ENTER key.

I. Stitch is deleted as many as the input number.

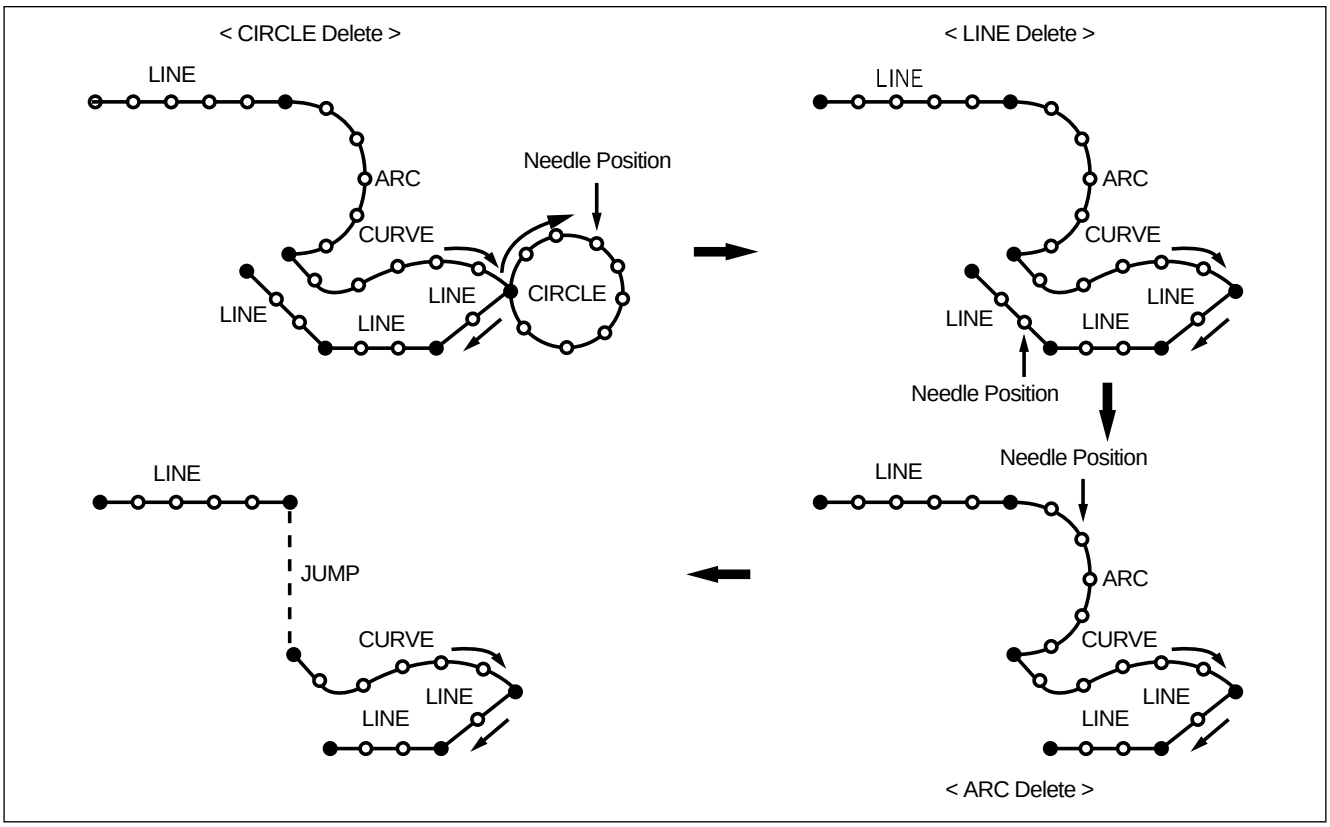
Reference) After deleting as much as the number of defined stitches, if end point and start point of two sewing data existing at both sides do not match and have distances, a jump is automatically made between the two sewing data. If you want to input automatic thread trimming, you can set up at "057:AUTO TRM".

```
TRIM
X:-0233A  N:00033
Y:00120A
Function Code?
```

J. Confirm if the stitches were deleted as many as desired number by using FORW and BACK key.

2-4) Partial Pattern Data Delete Function

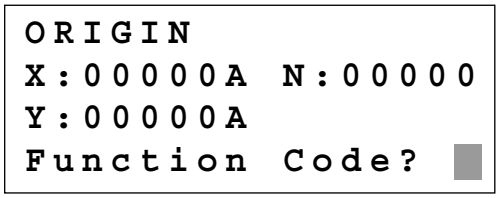
Delete one of the generated pattern data shapes selectively (For example: Jump, Line, Curve, Arc, Circle).



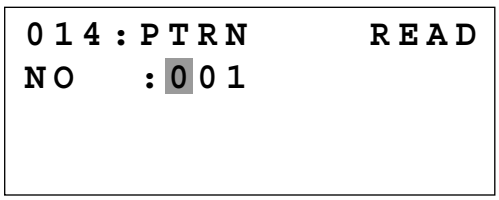
A. Insert floppy diskette containing the partial pattern to delete.

B. Press MODE key.

C. After moving to "2. Program" menu by using direction key ▲ ▼ press ENTER ↵ key. At this time, the upper feed plate comes down and moves to the original point.

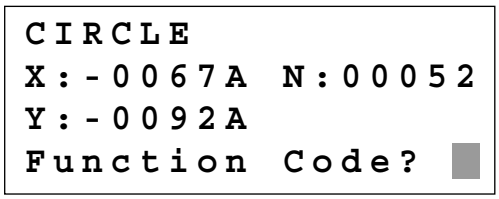


D. After pressing READ key, input the pattern number to delete partial pattern by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001).



E. Go to the pattern that the shape to delete exists by using FORW and BACK key.

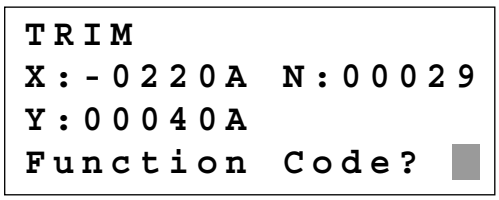
※ X-Y coordinate value is different according to needle location.



F. Delete is available by two methods as below.
- After pressing CODE key, input Function code 039 and press ENTER ↵ key.
- Or press PTN.DEL key of OP.

G. Press PTN.DEL key on operation box (OP).

Reference) After deleting as much as the number of defined stitches, if end point and start point of two sewing data existing at both sides do not match and have distances, a jump is automatically made between the two sewing data. If you want to input automatic thread trimming, you can set up at "057:AUTO TRM".

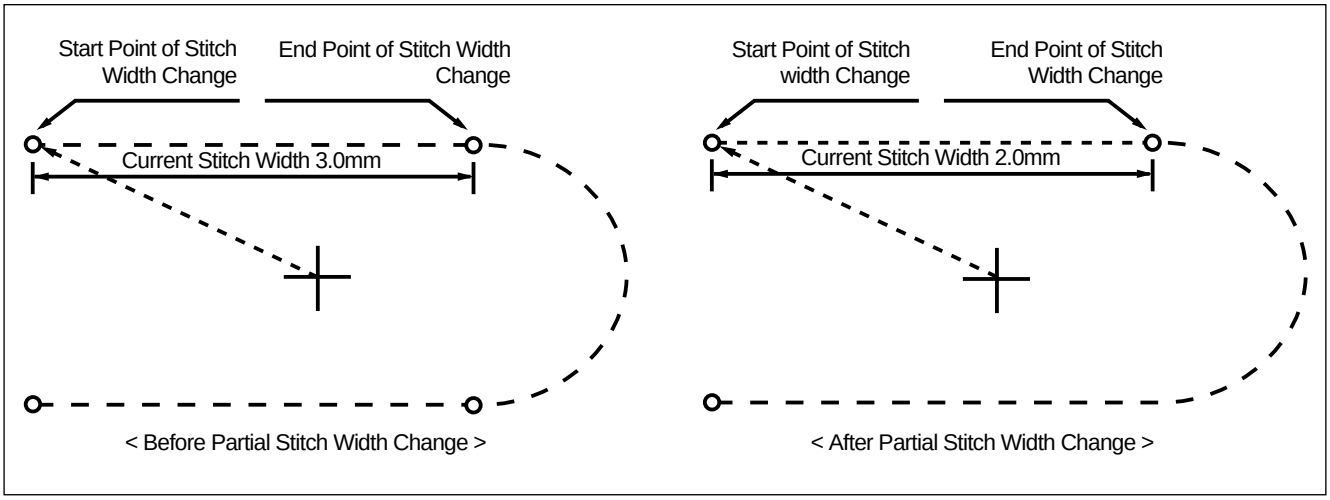


H. Confirm if desired partial pattern shape was deleted by using FORW and BACK key. (Line is deleted by once.)

I. Delete the partial pattern data to delete repeatedly in the order of E-F-G.

2-5) Partial Stitch Width Changing Function

Change stitch width by selecting a fixed part from the pattern shape.



A. Insert floppy diskette containing the pattern to change stitch width.

B. Press MODE key.

C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ key. At this time, the upper feed plate comes to descend.

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number to change stitch width by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

```
014:PTRN      READ
NO   :001
```

E. Go to the location to start change of stitch width by using FORW and BACK key.

※ X-Y coordinate value is different according to needle location.

```
LINE
X:-0070A  N:00021
Y:00140A
Function Code?
```

F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 013, and if you do not know, press ENTER ↵ key.
Then after moving to "013:STI WIDT" by using direction key ▲ ▼, press ENTER ↵ key.

```
<Function Code>
013:STI     WIDT<
014:PTRN    READ
015:PTRN   WRITE
```

G. Input the stitch width value to change and press ENTER ↵ key.

```
013:STI       READ
WIDTH:020[0.1mm]
```

H. Move to the location to complete stitch width change by using FORW and BACK key.

```
<RANGE SETTING>
X:00142A N:00029
Y:00089A
```

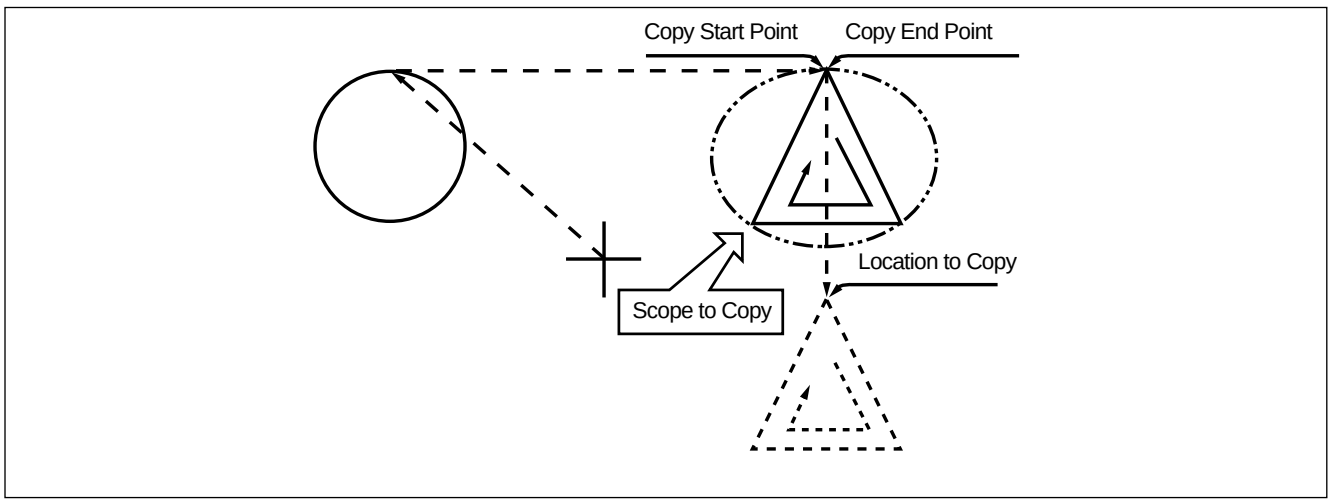
I. If you press EXE key, change of stitch width is completed.
※ X-Y coordinate values are different according to current location.

```
ARC
X:00133A N:00052
Y:00061A
Function Code?
```

J. Confirm if change of stitch width was made properly by using FORW, BACK key.

2-6) Pattern Partial Copy Function

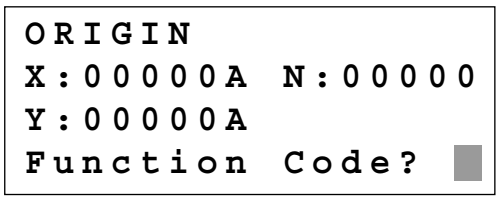
Set a fixed part of pattern shape and copy to desired location.



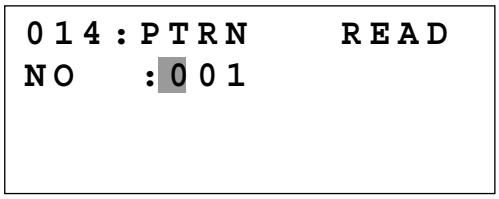
A. Insert floppy diskette containing partial pattern to make partial copy.

B. Press MODE key.

C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ key. At this time, the upper feed plate comes down and moves to the original point.

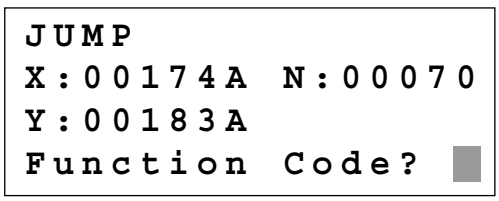


D. After pressing READ key, input the pattern number to copy partial pattern by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

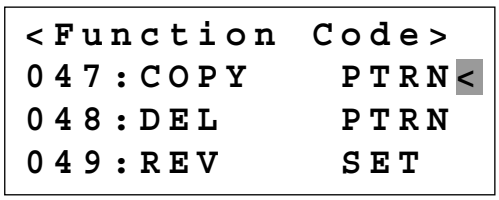


E. Go to copy start location by using FORW and BACK key.

Reference) Location of the needle for partial copy should be placed at the first start needle location that actually sews. Therefore, if the sewing data that has line property next jump appears, the last location of JUMP data is the first start location of needle correction.

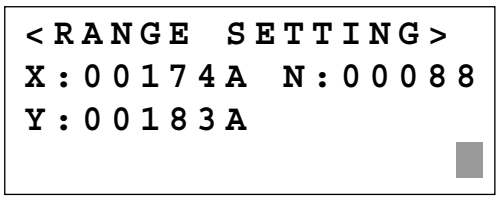


F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 047, and if you do not know the number, press ENTER ↵ key. Then, after moving to "047:COPY PTRN" by using direction key ▲ ▼, press ENTER ↵ key.

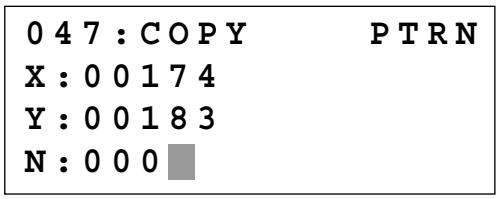


G. Go to the copy completing location of pattern by using FORW key.

※ X-Y coordinate values are different according to current location.



H. If you press EXE key, it becomes the state to move to the location to copy.



I. Move to the location to copy by pressing direction key.

※ The indicated values are different according to current location.

```
047:COPY      PTRN
X:00174
Y:-0133
N:000
```

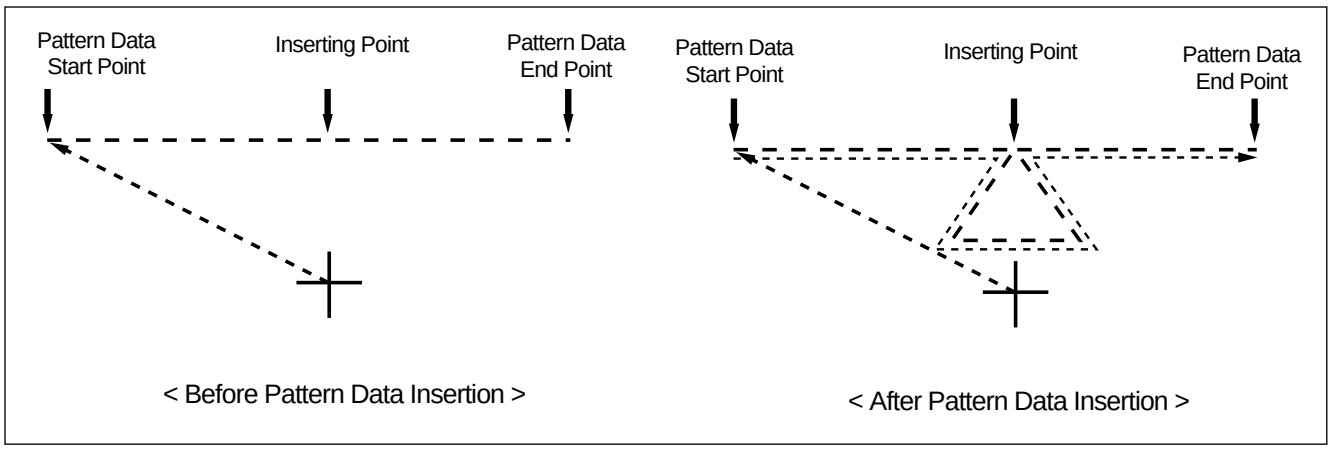
J. If you press EXE key, copy is completed.

```
LINE
X:00174A  N:00088
Y:00183A
Function Code?
```

K. Confirm if copy was made properly by using FORW and BACK key.

2-7) Pattern Data Inserting Function

It is the function made that pattern data inserting is available because the behind data is protected though new pattern data is added in the middle of pattern data.



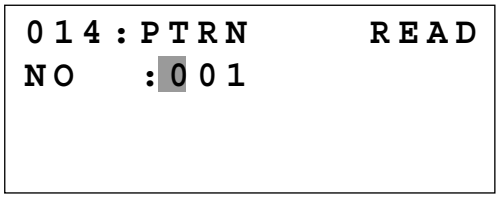
A. Insert floppy diskette containing the pattern to nsert.

B. Press MODE key.

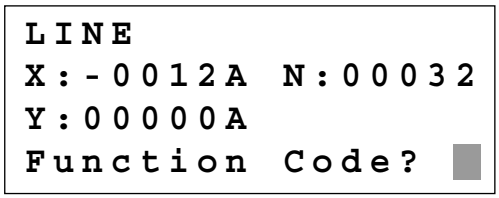
C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ key. At this time, the upper feed plate comes down and moves to the original point.

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

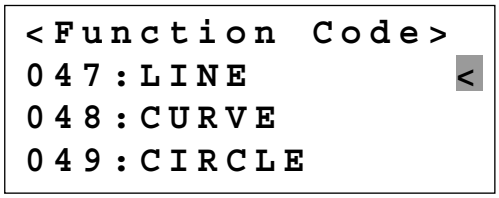
D. After pressing READ key, input the pattern number to insert pattern by using digit key and read in the pattern by pressing ENTER key. (For example, input [0][0][1] to read the pattern number 001.)



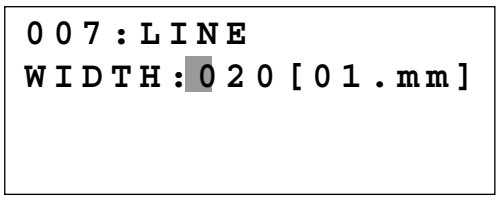
E. Go to the location of data to insert by using FORW and BACK key.



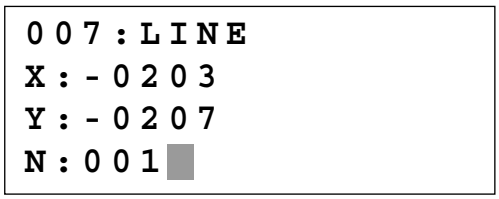
F. Select LINE of operation box (OP) of the function code to insert. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number and if you do not know the number, press ENTER key. Then after selecting the function number by using direction key ▲ ▼, press ENTER key.



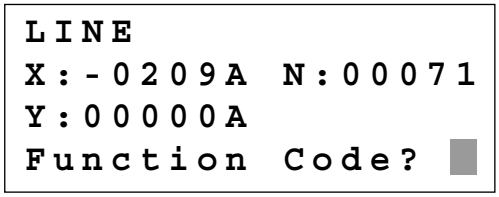
G. Input stitch width and press ENTER key.



H. Insert data of the shape to insert by using direction key. (Same as sewing data generation by using LINE)

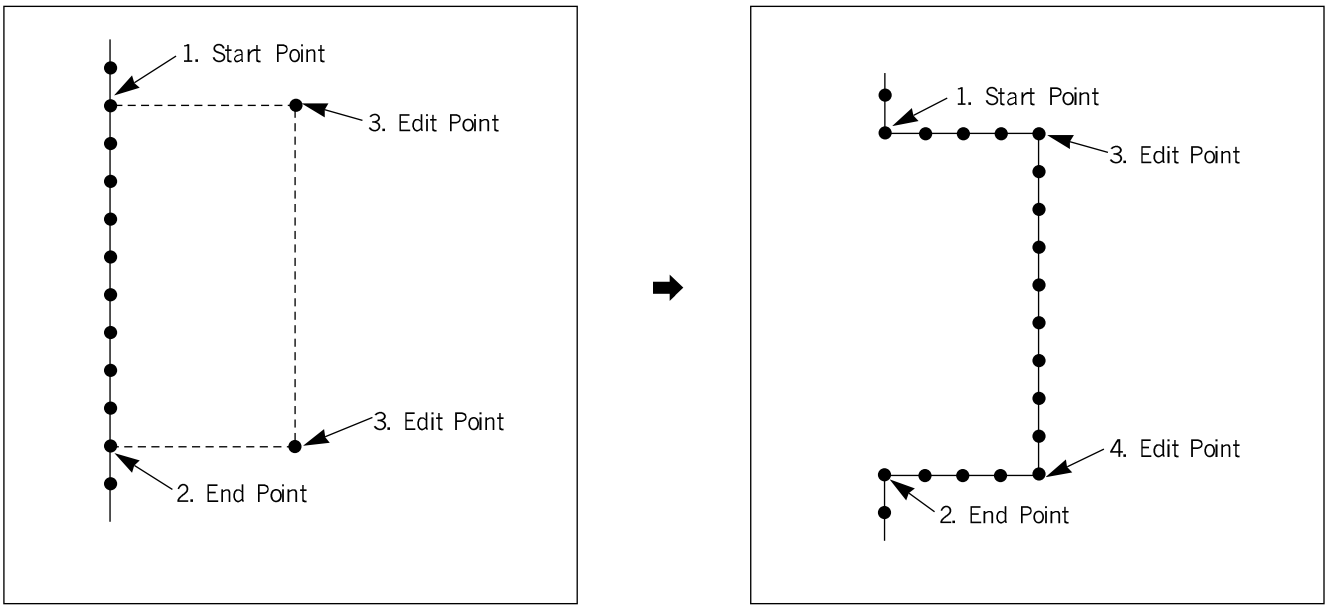


I. If you input data of the shape to insert each, press EXE key.



J. Confirm if new pattern data was inserted properly by using FORW and BACK key.

2-8) Revision of pattern data section



A. Select Program Mode Mode.

```
<< Main Menu >>
2. Program     <-
3. Bobbin Wind
4. Machine Test
```

B. Read the pattern data subject to section revision.

```
015 : PTRN     READ
NO : 300
```

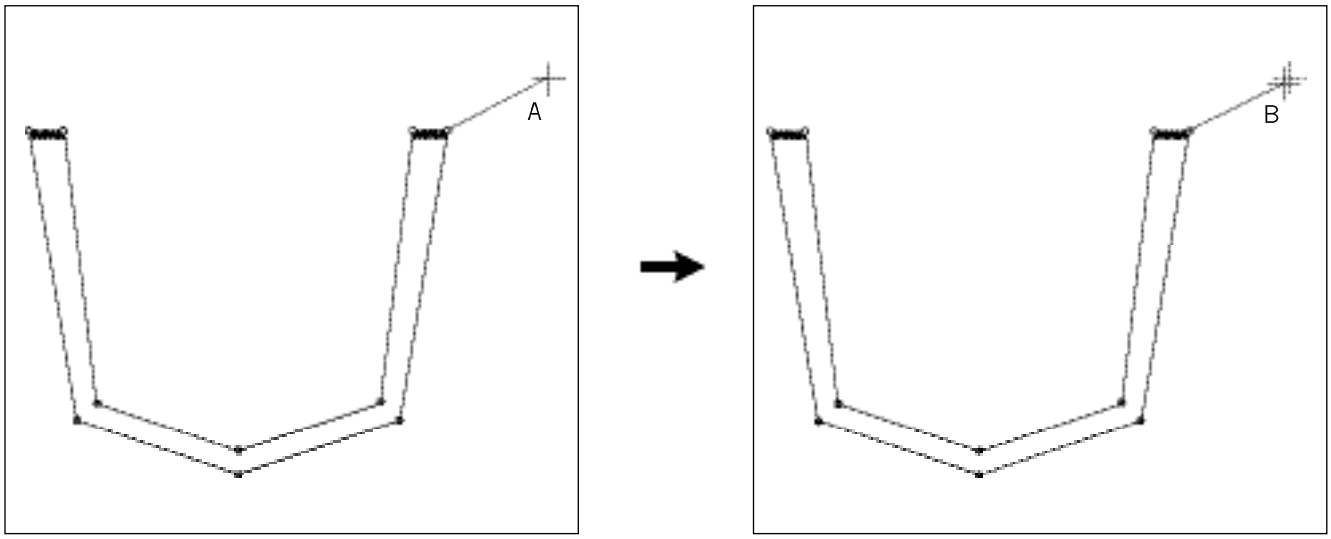
C. Use the FORW / BACK Key to move to the new position for setting.

```
JUMP              NONE
X:-0980A   N:00125
Y:-0066A
Function Code?
```

D. Select CODE 064. MODIFY.

```
< Function Code >

CODE No   :    064
```

2-9) Change of origin by design



A. Select Program Mode Mode.

```
<< Main Menu >>
2. Program     <-
3. Bobbin Wind
4. Machine Test
```

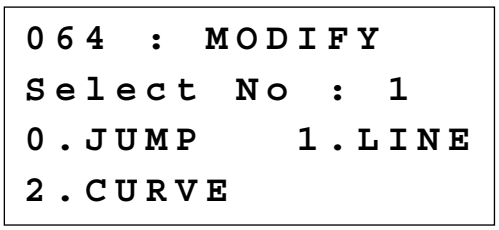
B. Read pattern designs to change the origin.

```
015 : PTRN     READ
NO : 300
```

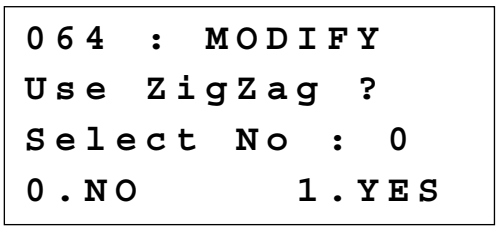
C. Select CODE 067. MOV POCKET.

```
< Function Code >

CODE No   :    067
```

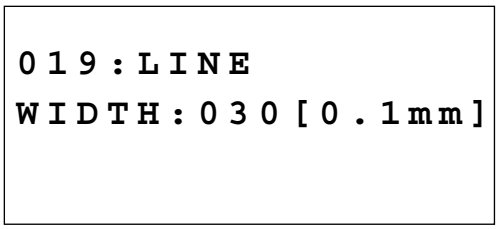
a) Select an attribute for section revision.
0. Jump
1. Line
2. Curve



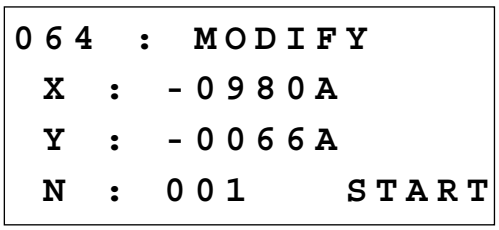
b) Decide if zigzag is used.
0. No zigzag
1. Zigzag



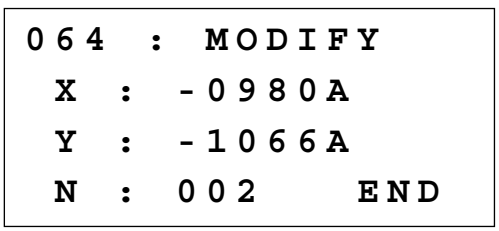
c) Use number keys to set newly created attributes.



E. Press the FORW Key to move to the Start Point, and press the PNT SET key to enter the coordinate.

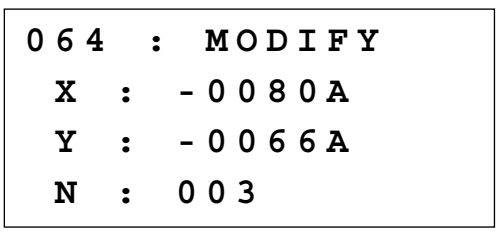


F. Press the FORW Key to move to the End Point, and press the PNT SET key to enter the coordinate.



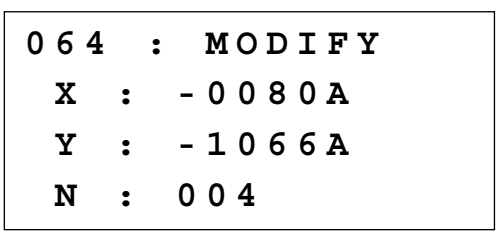
G. Press the JOG Key to move to the Edit Point, and press the PNT SET key to enter the coordinate.

Note)
1. If Edit Point is not entered, the calculation will be only based on the coordinates of Start Point and End Point.



H. When the EXT key is pressed, pattern data calculation is conducted, and the inner/outer presser plate moves to the start point.

I. Use the FORW, BACK keys to check if attributes and positions are changed as desired.



D. Press the JOG key to move from A(0, 0) to B(-1, -0.8). Press the PNT SET key to change the coordinate value.

```
067 : MOV POCKET
 X : -0010A
 Y : -0008A
 N : 001
```

E. When the EXT key is pressed, pattern data is calculated.

※ Note

This function is used when origins are slightly different by design.

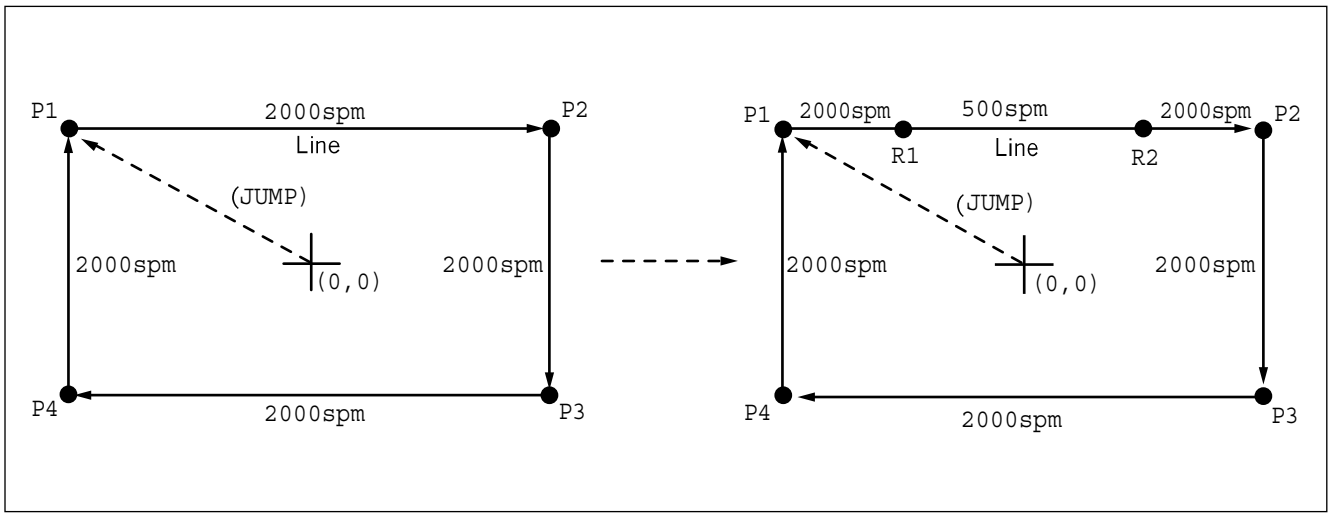
3) Pattern Data Application

3-1) Program Example 5 : Change of Sewing Speed Within a Pattern

There are two ways to change sewing speed within a pattern.
1) Changing the sewing speed from an existing pattern data
2) Changing the sewing speed with creating new pattern data

※ Ref. : Several sections of speed change is available, but they should be within real sewing range.

3-1-1) Changing the Sewing Speed from an Existing Pattern Data



(1) Reading the Pattern that is Supposed to Change the Sewing Speed

A. Insert the floppy diskette of a pattern that is supposed to change the sewing speed.
B. Press MODE key.
C. By using direction keys ▲ ▼, move to "2. Program" menu, then press ENTER ↵ key. At this time the upper feed plate descends, and moves to the origin.

```
<< Main Menu >>
2. Program
3. Bobbin Wind
4. Machine Test
```

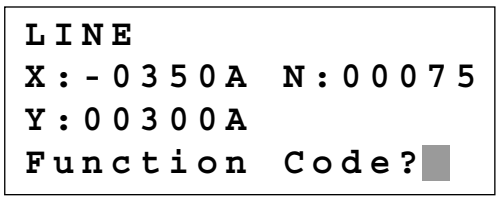
```
ORIGIN
X:00000A N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number that is supposed to change the sewing speed by using digit keys, then press ENTER ↵ to read the pattern. (For example, to read the pattern number 500, input [5][0][0].)

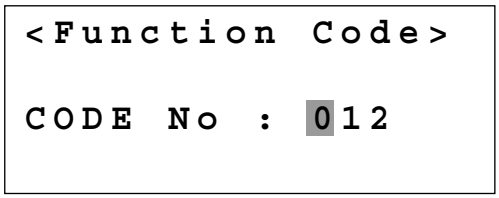
```
014:PTRN    READ
NO   :500
```

(2) Setting up the Range of Sewing Speed Change

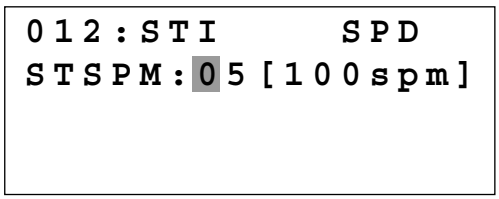
A. By using FORW, BACK keys, move to the start point (R1) of section that the sewing speed is supposed to change.



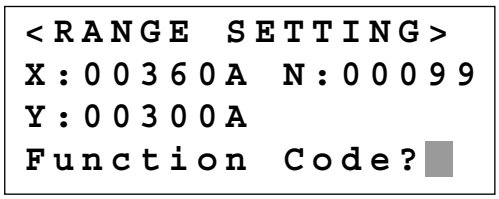
B. After pressing CODE key, input three digit numbers if you know the pattern programming related function code, but if you don't know it press ENTER key and move to the "012: STI SPD" by using direction keys ▲ ▼, then press ENTER again.



C. By using digit keys, input the sewing speed you want to change, then press ENTER key. (For example, if you want to change the speed into 500spm, input [0][5])

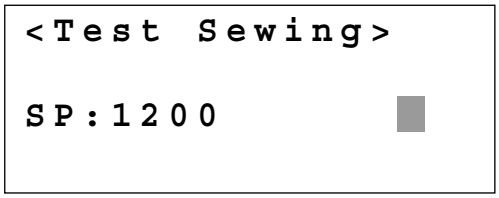


D. By using FORW, BACK keys, move to the end point (R2) of section that the sewing speed is supposed to change. Then after pressing PNT SET key, press EXE key.

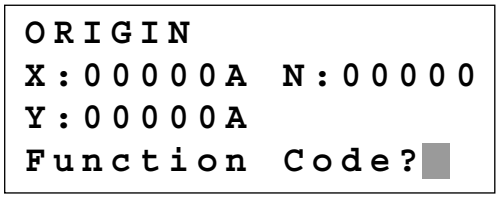


(3) Test Sewing

A. Press TEST.
After the inner/outer presser plate returns to the origin and is lifted, READY LED is on. Press SPEED to properly adjust the test sewing. When the Right Pedal Switch is pressed once, the inner/outer presser plate descends. When TWO Start Switch is pressed, test sewing is conducted. When test sewing is completed, the inner/outer presser plate returns to the origin and then is lifted.

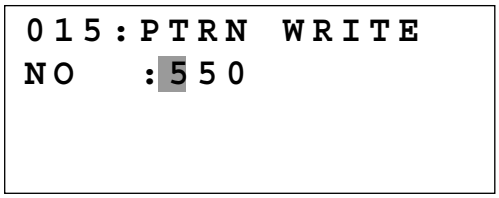


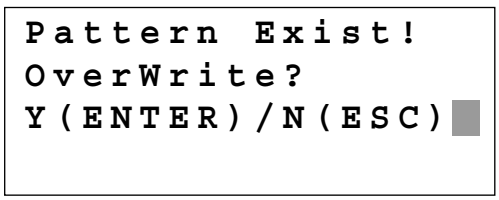
B. Press TEST again to complete test sewing. Then the inner/outer presser plate descends, and READY LED is off.

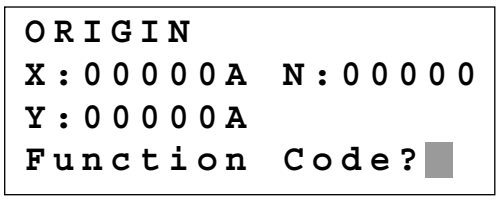


(4) Saving as New Pattern Number

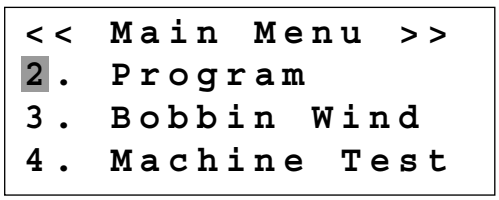
A. After pressing WRITE key, input the number you want to save by using digit keys.
then press ENTER ↵ key. Save the generated pattern data in a floppy diskette as a relevant number. (For example, if you want to save the pattern number as 550, input [5][5][0].) During saving the pattern, the READY LED flickers. When a pattern of same number is in a floppy diskette and if you want to save another pattern as same number, press ENTER ↵ key. If you want to save the pattern as another number, press ESC key and save it as another number.
When saving is completed, READY LED is off.



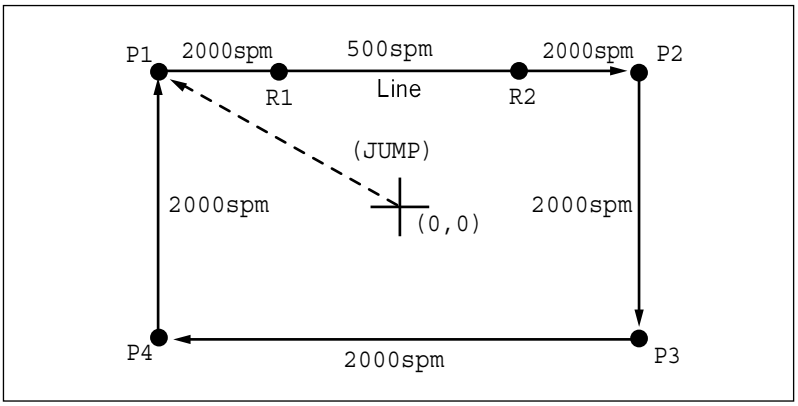




B. For finishing pattern generation, press MODE key.
Press ESC key to back to the initial screen.



3-1-2) Changing the Sewing Speed by Making New Pattern Data



A. Insert a floppy diskette into floppy disk drive.
B. Press MODE key.
C. By using direction keys ▲ ▼, move to "2. Program" menu, then press ENTER ↵ key. At this time, the inner/outer presser plate returns to the origin.

```
<< Main Menu >>
2. Program
3. Bobbin Wind
4. Machine Test
```

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

D. After pressing JUMP key, move to the initial point of square by using direction keys, then press PNT SET key.

```
004:JUMP
X:-0650
Y:00300
N:001
```

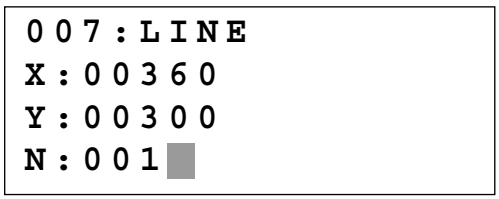
E. When EXE is pressed, pattern data is calculated, and the inner/outer presser plate moves according to the calculated data.

```
JUMP          NONE
X:-0650A  N:00065
Y:00300A
Function Code?
```

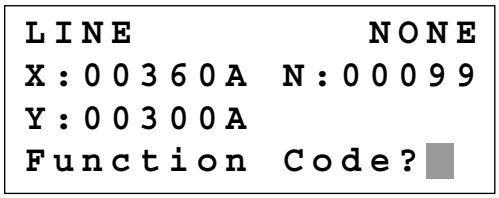
F. After pressing LINE key, input the stitch width by using digit keys, then press ENTER ↵ key. (For example, if you want to set up the stitch width as 3mm, input [0][3][0].)

```
007:LINE
WIDTH:030[0.1mm]
```

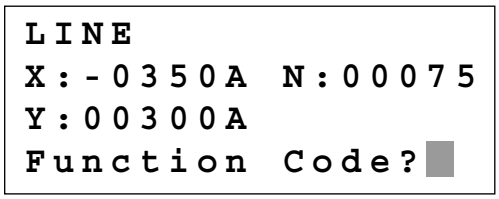
G. By using direction keys, move to the end point(R2) of section that the sewing speed is supposed to change and press PNT SET key.



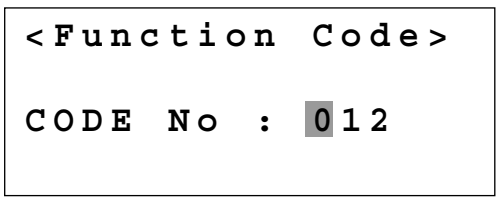
H. When EXE is pressed, pattern data is calculated, and the inner/outer presser plate moves according to the calculated data.

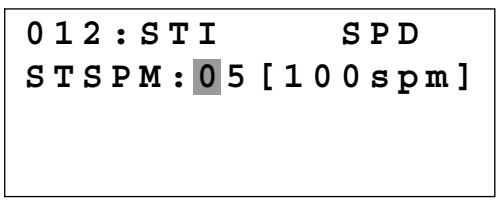


I. By using FORW, BACK keys, move to the start point (R1) of section that the sewing speed is supposed to change.

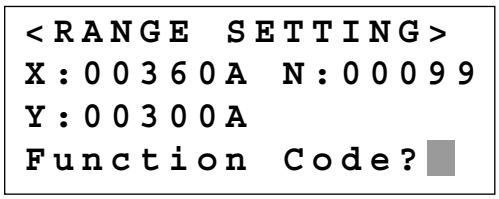


J. After pressing CODE key, input the three digit numbers if you know the pattern programming related function code, but if you don't know it, press ENTER key and move to "012. STI SPD" by using direction keys ▲ ▼, then press ENTER key.





K. By using digit keys, input the sewing speed you want to change, then press ENTER key. (For example, if you want to change the speed into 500spm, input [0][5])

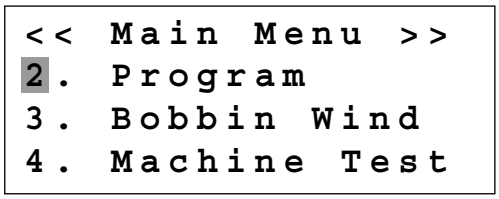


L. By using FORW, BACK keys, move to the end point (R2) of section that the sewing speed is supposed to change. Then after pressing PNT SET key, press EXE key.

M. Complete the program for the rest part of the square by using LINE.

N. After performing test sewing, store the programmed pattern with new number.

O. To complete pattern creation, press MODE key. Return to the initial screen by pressing ESC key.

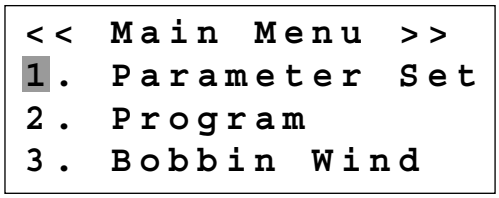


3-2) Using the Extension/Reduction Modes

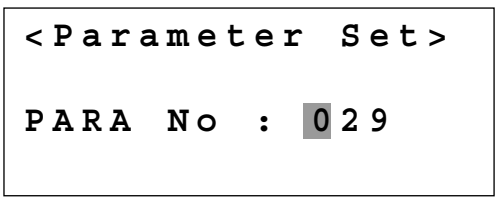
It is used when you want to extend or reduce the already programmed sewing patterns, and you should be careful not to exceed the transfer limit during the setting for rate of extension/reduction. You can extend or reduce with STITCH_LEN by the stitch width, and with STITCH_NUM by the numbers of stitches. To use these functions, the parameter number related to general sewing, "053. Extension/Reduction mode" should be set to "2)STITCH_LEN" or "3)STITCH_NUM".

(1) Setting the Extension/Reduction Mode

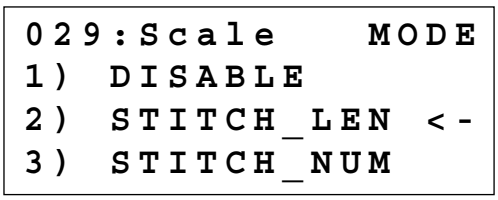
A. Press MODE key.
B. Move to "1. Parameter Set" by using direction keys ▲ ▼.



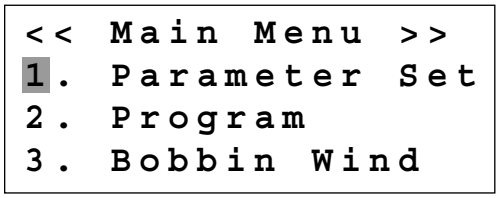
C. If you press ENTER ↵, you can get the screen like a figure on the right side, then input [0][2][9].
※ Appendix : Refer "Parameter number related to general sewing."



D. After pressing ENTER ↵ key, decide whether you use extension/reduction or not by using direction keys ▲ ▼. Here set we "2)STITCH_LEN: Extension/ Reduction by stitch length".

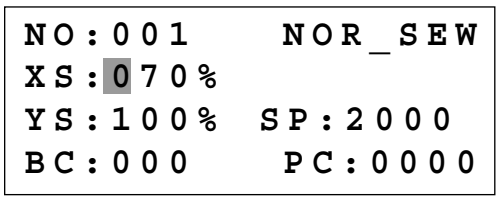


E. Press ENTER key.
Press ESC key to back to the initial screen.

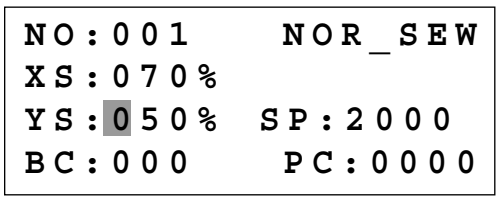


(2) Setting the Rate for Extension/Reduction

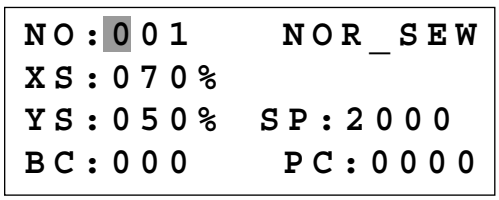
A. Press X SCALE and set the rate you want. For example, if you want to reduce 70%, input [0][7][0]



B. Press Y SCALE and set the rate you want. For example, if you want to reduce 50%, input[0][5][0].

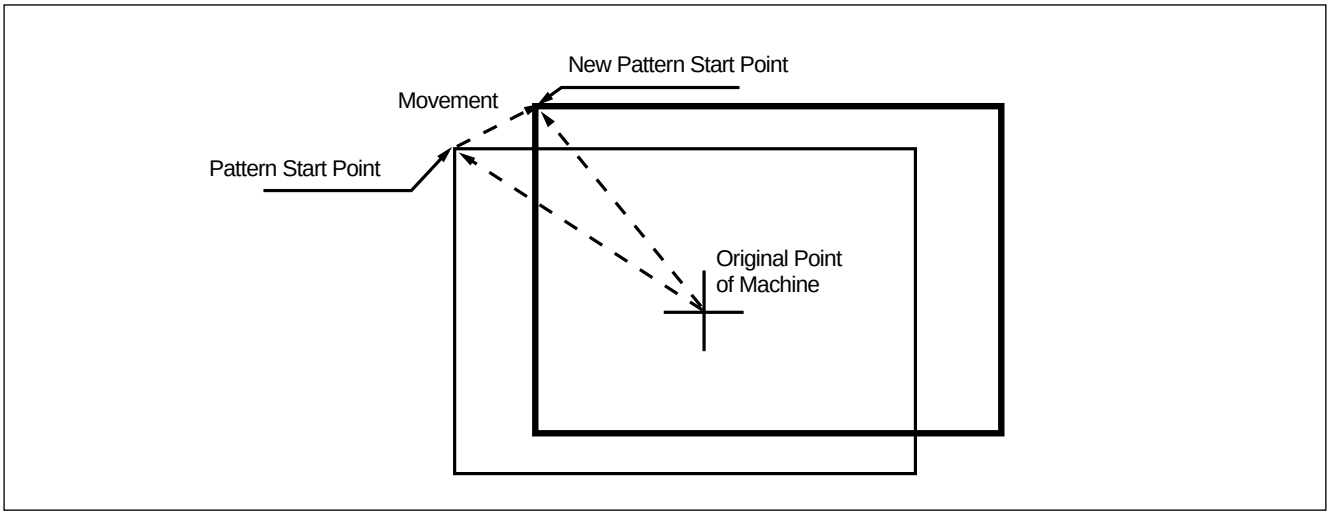


C. Press NO key and input the pattern number by using digit keys. (For example, if you want to work with "001" pattern, input [0][0][1].)
D. Press ENTER key to read patterns and to be sewing available mode.



3-3) Change/Saving Function of Pattern Data Start Point

Change and save pattern data start point already set up when punching.



A. Insert floppy diskette containing the pattern to change start point.

B. Press MODE key.

C. After moving "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ key. At this time, the inner/outer presser plate returns to the origin.

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number to change start point by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

```
014:PTRN      READ
NO   :001
```

E. Go to sewing start point by using FORW and BACK key.

Reference) It does not matter if you place needle location to change start point at the optional location of actual sewing.

```
JUMP
X:-0400A  N:00038
Y:00200A
Function Code?
```

F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 053, and if you do not know the number, press ENTER ↵ key. Then, after moving to "053:MOV SEWSTRT" by using direction key ▲ ▼, press ENTER ↵ key.

※ X-Y coordinate value is different according to sewing start point.

```
<Function Code>
053:MOV SEWSTAR<
054:MOV 2ndORG
000:TRIM
```

```
053:MOV SEWSTAR
X:-0400
Y:00200
N:000
```

G. Move to new pattern start point by using direction key.

```
053:MOV  SEWSTAR
X:-0600
Y:00280
N:000
```

H. Complete input of new pattern start point by pressing EXE key.

```
JUMP
X:-0600A  N:00056
Y:00280A
Function Code?
```

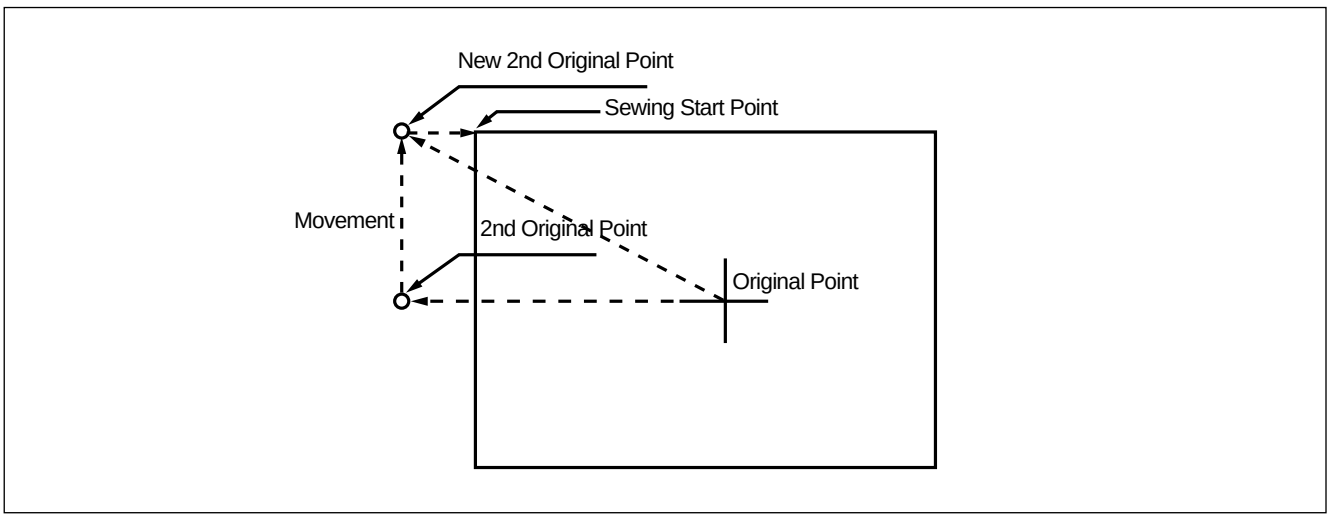
I. Confirm if change was made properly by using FORW and BACK key.

J. Save the pattern of changed start point by pressing WRITE key.

```
015:PTRN    WRITE
NO   :007
```

3-4) Change/Saving Function of Pattern 2nd Original Point

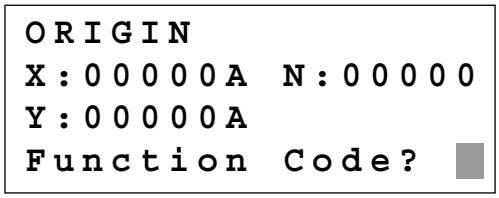
Change the already setup 2nd original point to new 2nd original point and save it.



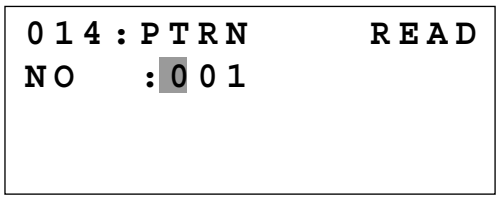
A. Insert floppy diskette containing the pattern to change the 2nd original point.

B. Press MODE key.

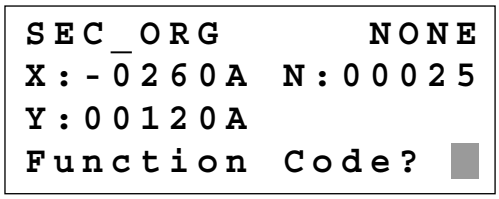
C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ Key.
At this time, the inner/outer presser plate returns to the origin.



D. After pressing READ key, input the pattern number to change the 2nd original point by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

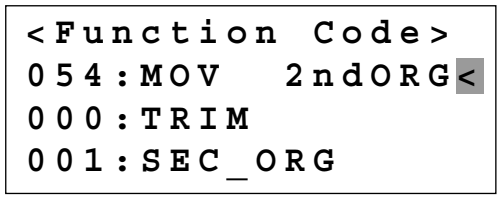


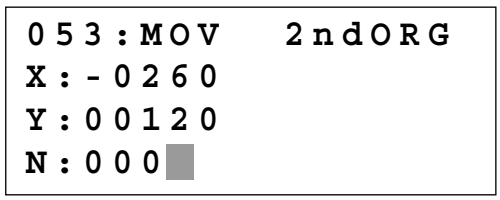
E. Go to the location of 2nd original point by using FORW and BACK key.



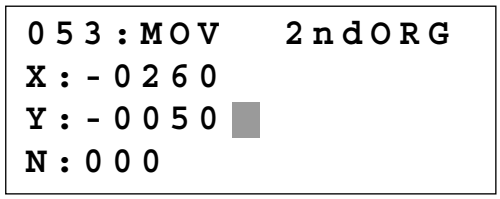
F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 054 and if you do not know the number, press ENTER ↵ key. Then, after moving to "054:MOV 2nd ORG" by using direction key ▲ ▼, press ENTER ↵ key.

※ X-Y position value may differ according to the 2nd original point.

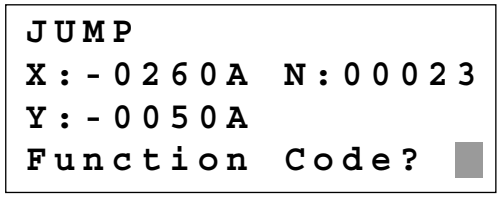




G. Move to new 2nd original point by using direction key.

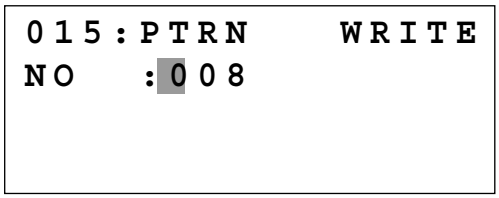


H. Complete input of new 2nd original point by pressing EXE key.



I. Confirm if change was made properly by using FORW and BACK key.

J. Save the pattern of the changed 2nd original point by pressing WRITE key.



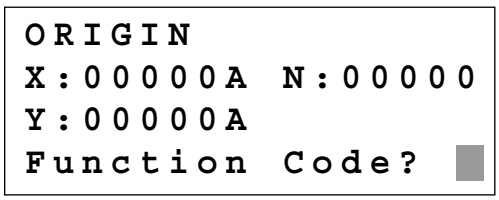
3-5) Change/Saving Function of Maximum Pattern Sewing Speed and Extension/Reduction Rate

Set up maximum sewing speed and extension/reduction rate by pattern.

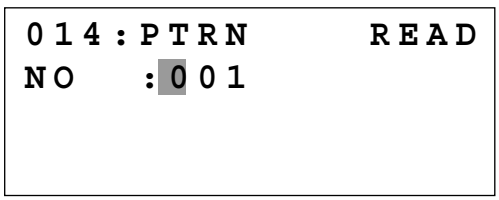
A. Insert floppy diskette containing the pattern to change maximum sewing speed and extension/reduction rate.

B. Press MODE key.

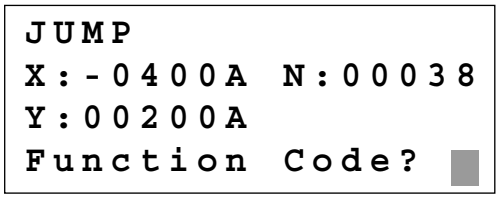
C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ Key. At this time, the inner/outer presser plate returns to the origin.



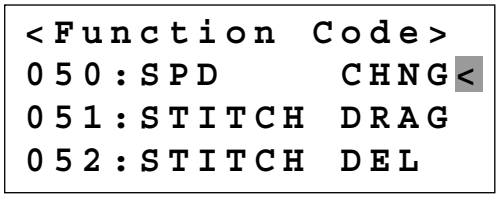
D. After pressing READ key, input the pattern number to change maximum sewing sped and extension/reduction rate by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)



E. Go to pattern data start location by using FORW and BACK key.



F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 050 and if you do not know, press ENTER ↵ key. Then, after moving to "050:SPD CHNG" by using direction key ▲ ▼, press ENTER ↵ key.



G. Input maximum sewing speed value STSPM and press ENTER key.

```
050:SPD      CHNG
STSPM:25[100spm]
```

H. Input XSCAL, the extension/reduction rate for X-direction and press ENTER key.

```
050:SPD      CHNG
STSPM:25[100spm]
XSCAL:100%
```

I. Input YSCAL, the extension/reduction rate for Y-direction and if you press ENTER key, all setting is completed.

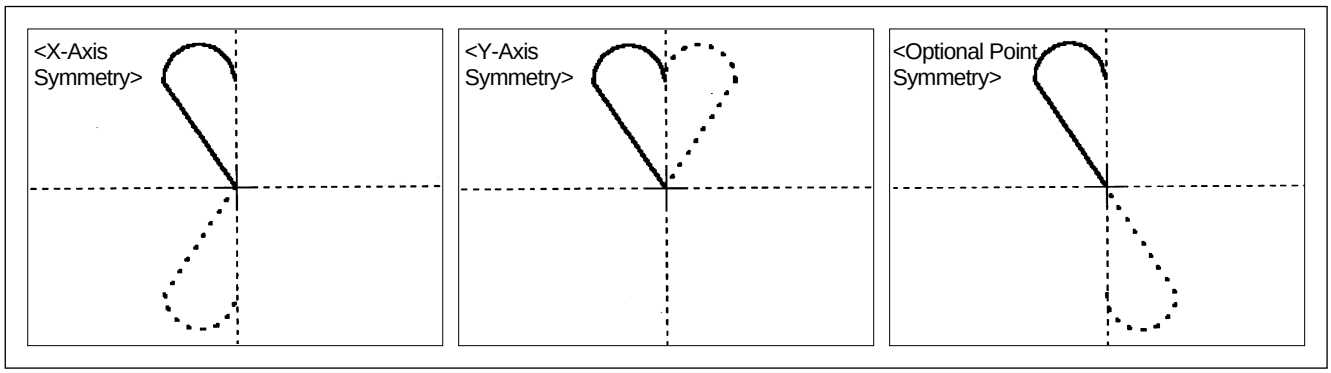
```
050:SPD      CHNG
STSPM:25[100spm]
XSCAL:100%
YSCAL:100%
```

J. Save the pattern by pressing WRITE key.

```
015:PTRN     READ
NO   :009
```

3-6) Symmetrical Shape Creating Function of Pattern

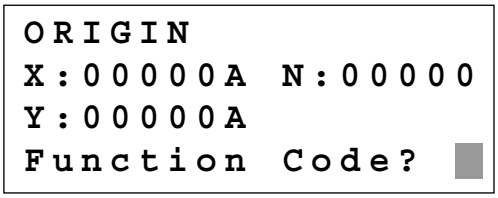
Make three types of symmetrical shapes for optional point in X and Y axes.



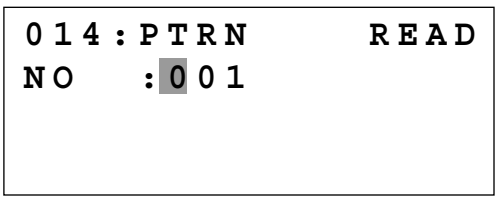
A. Insert floppy diskette containing the pattern to create symmetrical shape.

B. Press MODE key.

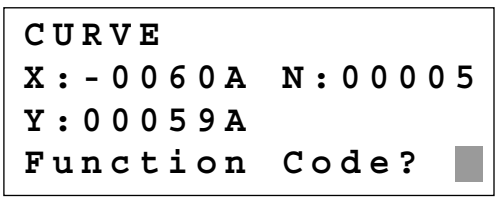
C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ Key.
At this time, the inner/outer presser plate returns to the origin.



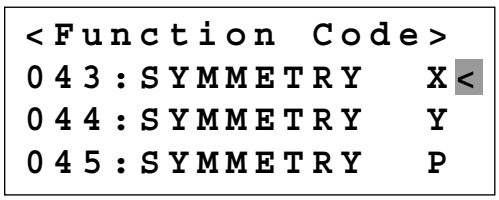
D. After pressing READ key, input the pattern number to create symmetrical shape by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)



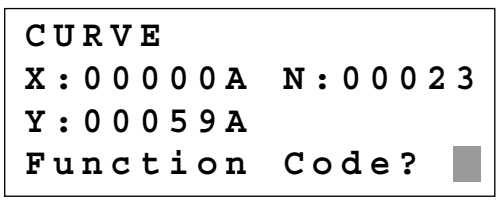
E. Go to pattern data start location by using FORW and BACK key.
(Reference) You may place the needle location to create symmetrical shape in X and Y axes at the optional needle location to sew. However, symmetry by the optional point becomes symmetric on the basis of the end point of sewing data and so you should place needle location at the end point of sewing data.



F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 043 and if you do not know the number, press ENTER ↵ key. Then, after moving to "043:SYMMETRY X" by using direction key ▲ ▼, press ENTER ↵ key.
- X-axis symmetry is Function Code 043
- Y-axis symmetry is Function Code 044
- Optional point symmetry is Function Code 045

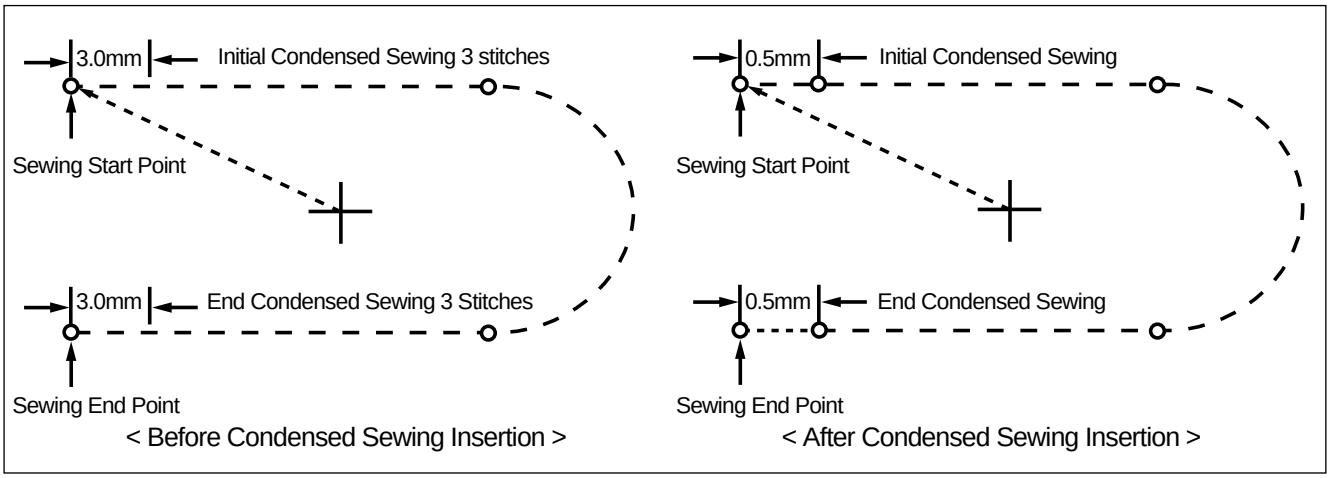


G. Confirm if symmetrical shape was made properly by using FORW and BACK key.



3-7) Condensed Sewing Stitch Inserting Function

It is the function to prevent stitches from being untangled by making stitch width condensed in sewing start part and sewing end part of pattern data.



A. Insert floppy diskette containing the pattern to insert condensed sewing stitch.

B. Press MODE key.

C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ Key. At this time, the inner/outer presser plate returns to the origin.

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

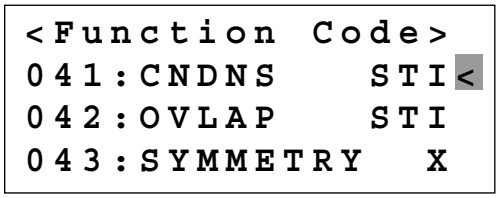
D. After pressing READ key, input the pattern number to insert condensed sewing stitch by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

```
014:PTRN      READ
NO   :001
```

E. Go to pattern data end location by using FORW and BACK key.

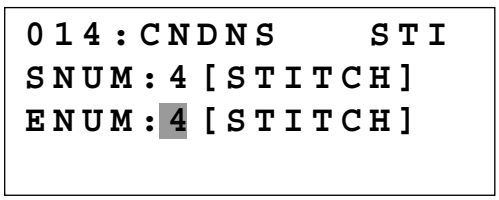
```
CURVE
X:-0060A  N:00040
Y:00039A
Function Code?
```

F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 041 and if you do not know the number, press ENTER ↵ key. Then, after moving to "041:CONDNS STI" by using direction key ▲ ▼, press ENTER ↵ key.



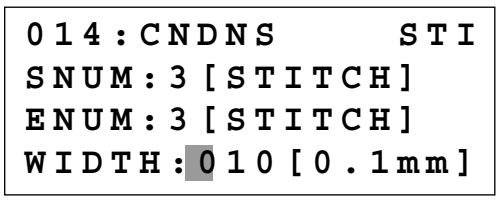
G. After inputting the number of initial condensed sewing stitch (1~9 stitch), press ENTER ↵ key.

H. After inputting the number of final condensed sewing stitch (1~9 stitch), press ENTER ↵ key.

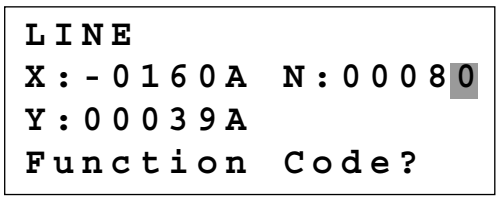


I. After inputting condensed stitch width, if you press EXE or ENTER ↵ key, input of condensed sewing stitch is completed.

※ The stitch width of the number of stitches set up at sewing start point(the number of initial condensed sewing stitch) and sewing end point(the number of end condensed sewing stitch) is changed into condensed stitch sixth.

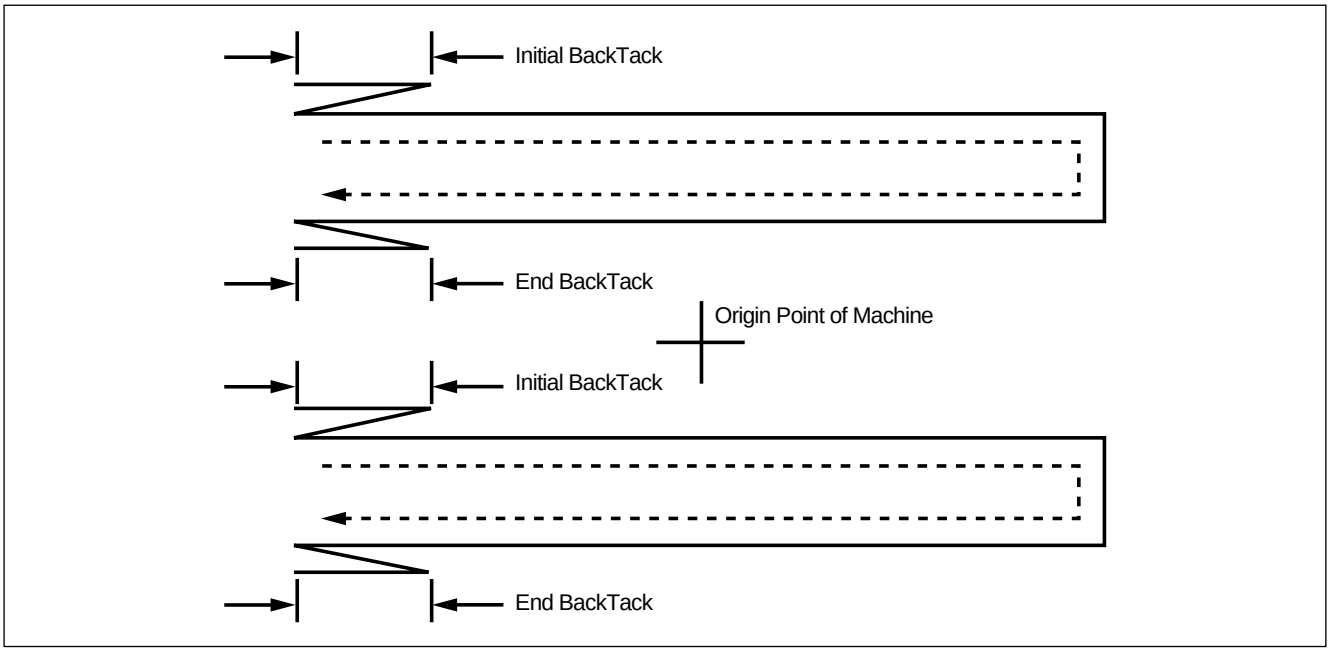


J. Confirm if the number of condensed sewing stitch was made properly by using FORW and BACK key.



3-8) Automatic Back Tack(B/T) Inserting Function

You can apply automatic back tack inserting function for several pattern.



A. Insert floppy diskette containing the pattern to insert automatic back tack.

B. Press MODE key.

C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ Key.
At this time, the inner/outer presser plate returns to the origin.

```
ORIGIN
X:00000A  N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number to insert automatic back tack by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

```
014:PTRN      READ
NO   :001
```

E. Go to the location that pattern data ends by using FORW and BACK key.

```
LINE
X:-0160A  N:00040
Y:00039A
Function Code?
```

F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 040 and if you do not know the number, press ENTER ↵ key. Then, after moving to "040:BACK TACK" by using direction key ▲ ▼, press ENTER ↵ key.

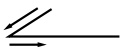
```
<Function Code>
040:BACK   TACK<
041:CNDNS  STI
042:OVLAP  STI
```

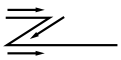
G. Input the number of back tack to insert and press ENTER ↵ key.

```
040:BACK     TACK
BTNUM:4[STITCH]
```

H. Input back tack mode. Press ENTER ↵ key.

Mode Type

Mode 0: 

Mode 1: 

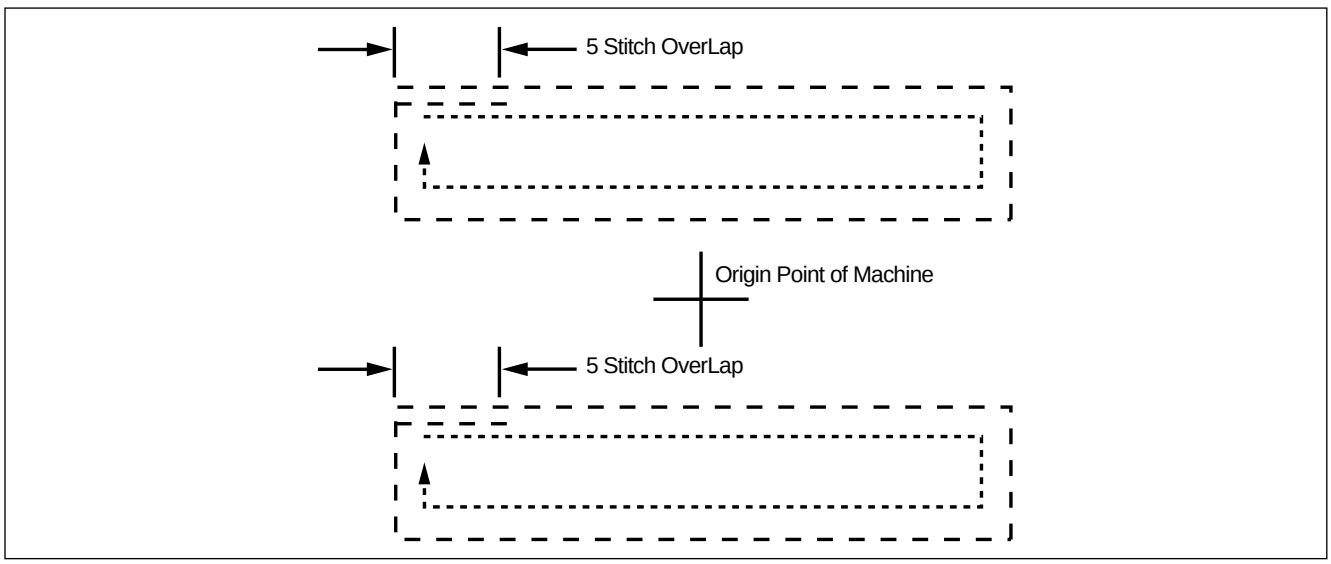
```
040:BACK     TACK
BTNUM:4[STITCH]
BTMOD:0[0/1]
```

I. Confirm if back tack was made properly by using FORW and BACK key.

```
LINE
X:-0160A  N:00040
Y:00039A
Function Code?
```

3-9) OverLap Sewing Stitch Inserting Function

You can apply automatic overlap sewing stitch inserting function for several patterns.



OverLap function can apply to the pattern design of closed roof that start point and end point meet. Except, though it is not closed roof type of pattern and start point and end point have 1mm of distance, OverLap function can use.
Be able to select a maximum of 20 stitch.

A. Insert floppy diskette containing the pattern to insert overlap sewing stitch.

B. Press MODE key.

C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ Key.
At this time, the inner/outer presser plate returns to the origin.

```
ORIGIN
X:00000A N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number to insert overlap sewing stitch by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

```
014:PTRN     READ
NO   :001
```

E. Go to the location that pattern data ends in order to apply overlap function by using FORW and BACK key.

```
CIRCLE
X:00000A N:00030
Y:00100A
Function Code?
```

F. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 042 and if you do not know the number, press ENTER ↵ key. Then, after moving to "042:OVLAP STI" by using direction key ▲ ▼, press ENTER ↵ key.

```
<Function Code>
042:OVLAP    STI<
043:SYMMETRY    X
044:SYMMETRY    Y
```

G. Input the number of overlap stitch to insert and press ENTER ↵ key.

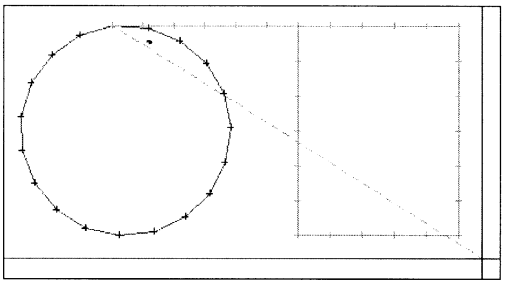
```
042:OVLAP    STI
OVNUM:4[STITCH]
```

H. Use FORW, BACK keys to check if overlapping sewing stitches are properly made.

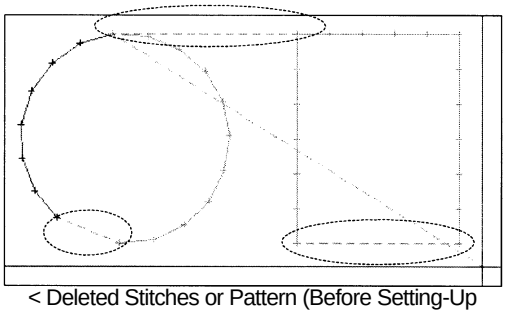
```
CIRCLE
X:-0092A N:00034
Y:00037A
Function Code?
```

3-10) Automatic Insertion of Thread Trimmer Code when Deleting Stitches

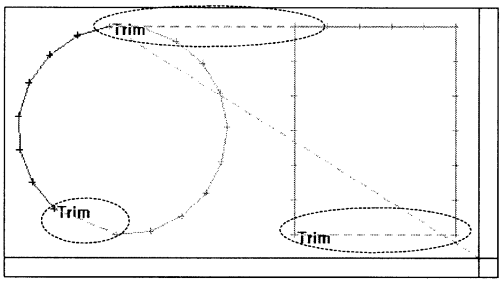
If the user deletes any section of pattern or the stitches, the user can define whether to insert thread trimmer code on the related location.



< Pattern Design >



< Deleted Stitches or Pattern (Before Setting-Up Automatic Insertion of Thread Trimmer >



< After Setting-Up Automatic Insertion of Thread Trimmer >

A. Use direction key ▲ ▼ to select "2. Program", and then press ENTER ↵.

```
<< Main Menu >>
2. Program
3. Bobbin Wind
4. Machine Test
```

B. Press code key again on the Operation Box.

```
ORIGIN          NONE
X:00000A  N:00000
Y:00000A
Function Code?
```

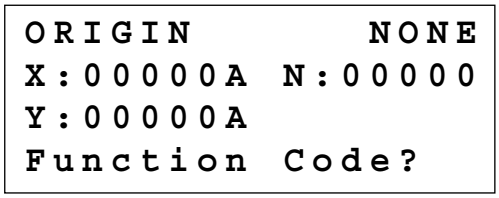
C. If the function CODE No. related to the pattern programming were known, enter three digits of number, 055. If not, press ENTER ↵ and use direction key ▲ ▼ to move the cursor on "055: AUTO TRIM", and then press ENTER ↵.

```
<Function Code>

CODE NO   :055
```

D. On the following screen, press "1" to change "0" to "1", and then press ENTER ↵ to set automatic thread trimmer function.

```
055:AUTO TRIM

TRIM:1[0/1]
```

E. When deleting stitches or pattern, the user can confirm the automatic insertion of thread trimmer by either making new design or retrieving the existing design saved in a disk. Please refer to "2-3) Delete Number of Stitches" and "2-4) Partially Delete Pattern Data".

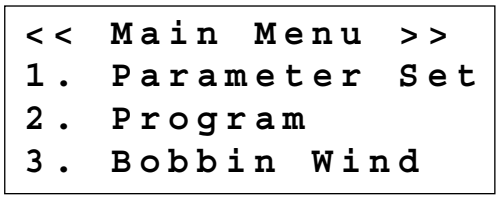


3-11) Setting-Up Reference Point for Zooming

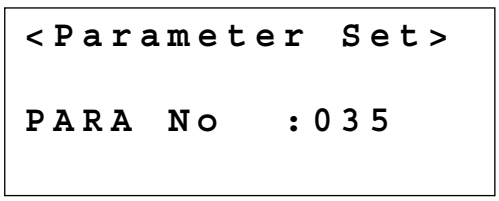
On the sewing mode, the user can zoom design based on machine origin, second origin, sewing starting point or user-defined reference point. However, the second origin and user-defined reference point must be set in the pattern design before zooming based on those reference points.

A. Press MODE.

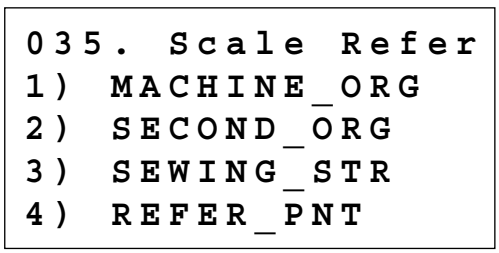
B. Use direction key ▲ ▼ to select "1. Parameter Set" menu.



C. Press ENTER ↵ to open a screen shown on the right. Input [0][3][5] and press ENTER ↵ to move onto the 035. Scale Refer item.



D. The following four items of zooming reference point are displayed. By default, it is set on MACHINE_ORG. Use direction key ▲ ▼ to select the item desired, and then press ENTER ↵ to set.



Descriptions of each item are as follows:
MACHINE_ORG : Zooming based on the machine origin.
SECOND_ORG : Zooming based on the second origin.
SEWING_STR : Zooming based on the sewing starting point.
REFER_PNT : Zooming based on the point defined by user at program code No. 056 of Function Code.

E. Setting-Up Reference Point for Punching.

① After creating any pattern design, use back/forth stitch function to move it to the reference point to be set, and then press code key.

```
<Function Code>

Code No   :056
```

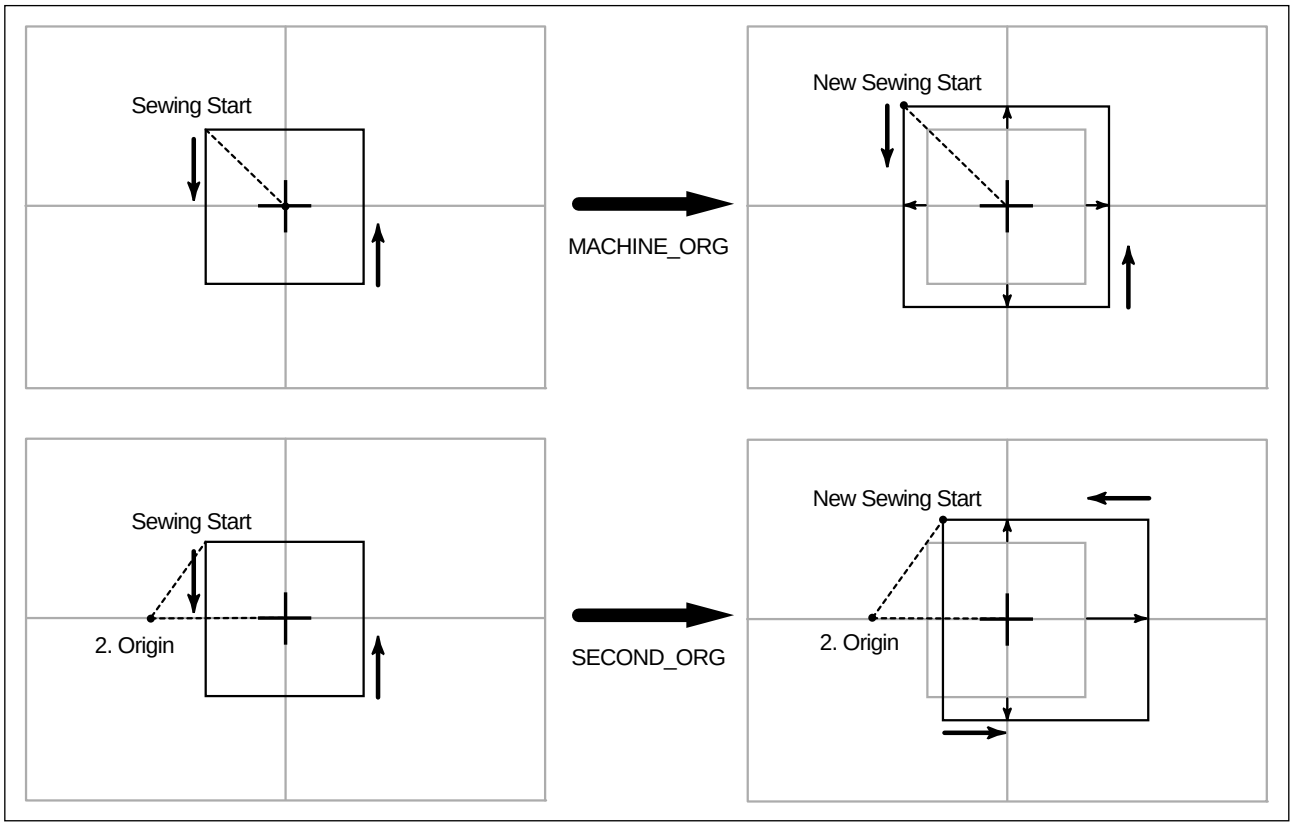
② Input 056 for the code No., and press ENTER ↵.

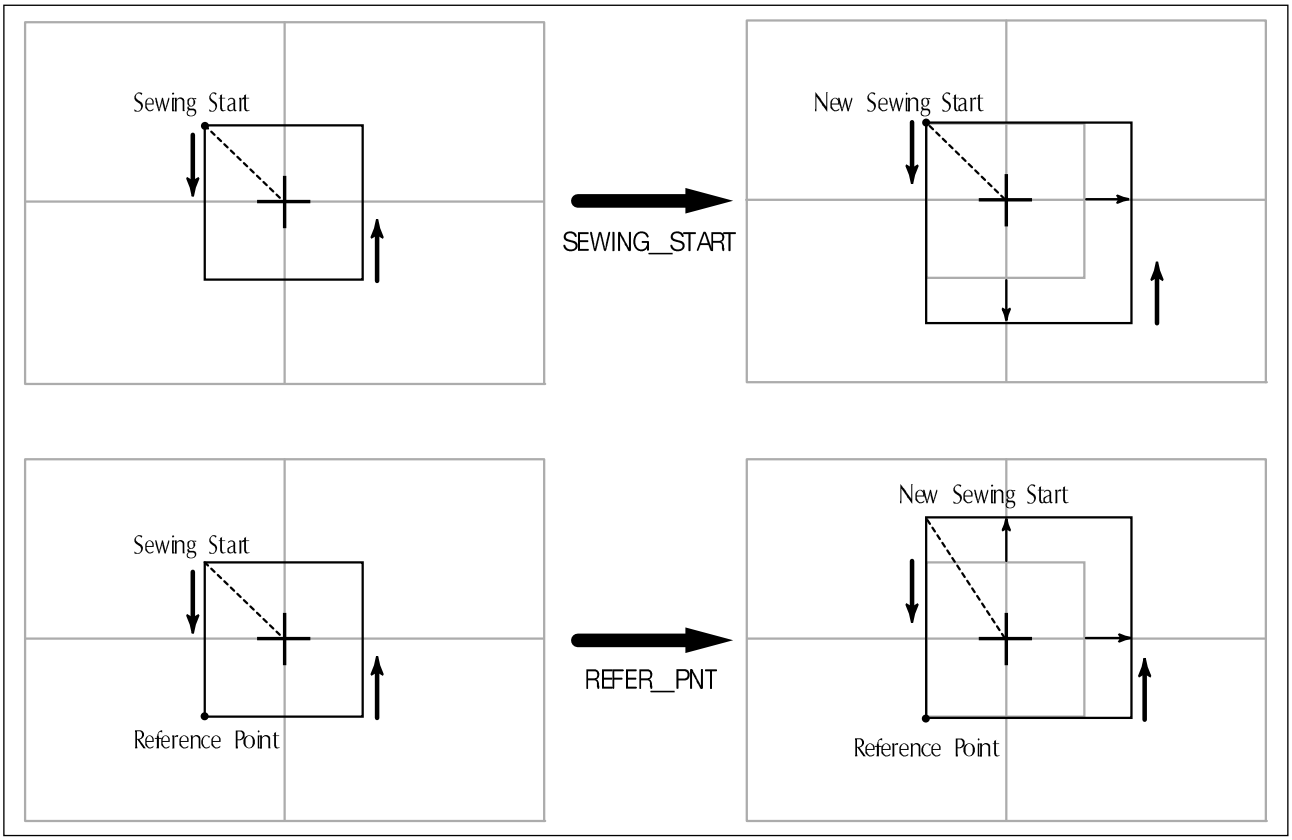
```
SCALE REFER NONE
X:-0300A N:00097
Y:-0300A
Function Code?
```

③ On the following SCALE REFER item, use back/forth stitch function to confirm whether the reference point would be inserted.

F. After setting-up the reference point item and the reference point, store the decided design into floppy diskette, press ESC to return to the sewing mode, and then apply the scale desired.

The following illustration shows the zooming functions for each reference point item.





3-12) Sewing Limit Function

This function for setting sewing limit is designed to expand the mechanical sewing limit of the machine.
First mechanically expand the X-Y feeding area of the machine, and set the sewing limit in the parameter in accordance with the expanded area.

※In case of C-Series, the area can be expanded up to 25000 ×25000mm.

Refer to the following for set-up.

A. Press MODE and select Parameter Set in Main Menu.

```
<< Main Menu >>
1. Parameter Set
2. Program
3. Bobbin Wind
```

B. Use the direction change cursor in the Parameter Set and select 036. Sewing Limit.

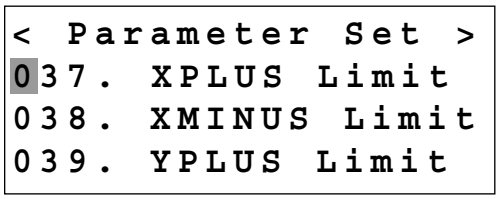
```
< Parameter Set >
036. Sewing Limit
037. XPLUS Limit
038. XMINUS Limit
```

C. Sewing Limit is defaulted at 1) DISABLE.

```
067.Sewing Limit
1) DISABLE <
2) ENABLE
```

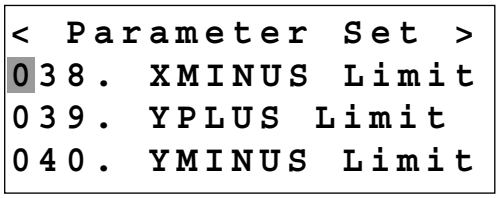
D. Use the direction change cursor to select 2) ENABLE and press ENTER ↵.

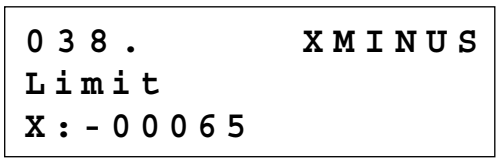
E. Use the direction change cursor to select 037. XPLUS Limit.
The default value is set at 65mm (for SPS-1306 machines). Use the up/down direction key ▲ ▼ to increase the limit as desired.



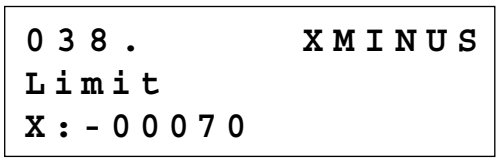
※ Ex) If you increase the X-axis mechanical feeding limit to a maximum 140mm, you can set up to 70mm in the X-axis plus direction.

F. To increase limit in the opposite direction, select 038. XMINUS Limit.
The default value is set at -65mm (for SPS-1306 machines). Use the up/down direction key ▲ ▼ to increase the limit as desired.

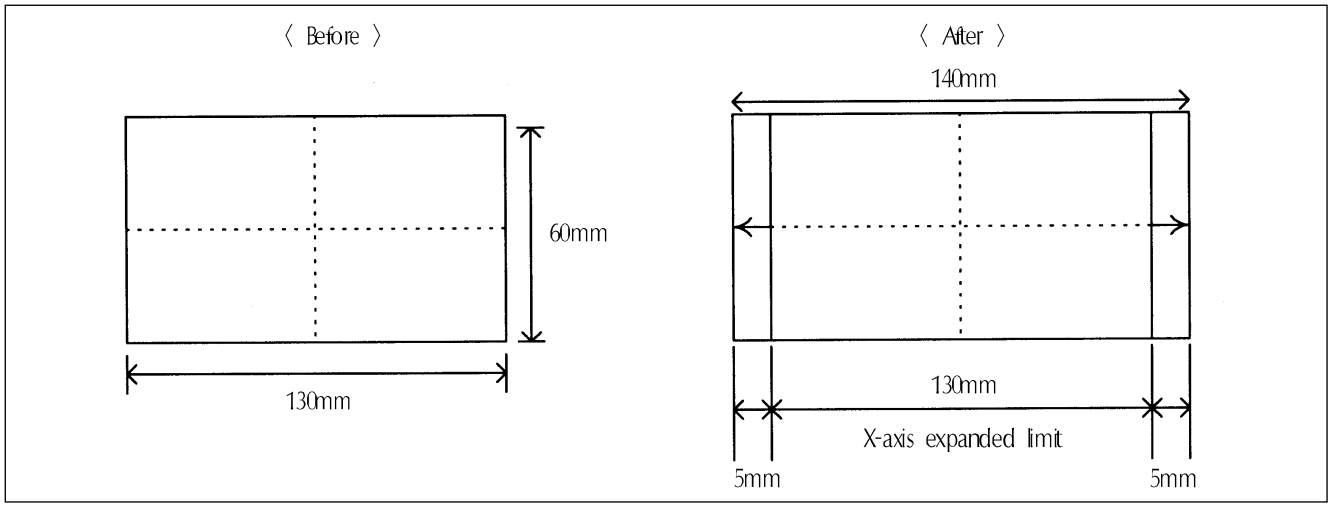




※ Ex) If you increase the X-axis mechanical feeding limit to a maximum 140mm, you can set up to -70mm in the X-axis minus direction.



G. If you increased the mechanical feeding limit of Y-axis, refer to the above instructions to expand the feeding limit. After setting the sewing limit in accordance with the mechanically expanded limit, you can check if the machine feeds to the actual expanded limit. Use the X-Y Jog Test function in Machine Test function to check whether the machine feeds to the actual expanded limit.



Caution) The sewing limit function is always defaulted at DISABLE and the sewing limit is set at the standard size for each type at the factory.

3-13) Laser Point Function

The laser point set-up function is designed to get an accurate position of sewing materials during sewing work. The default value is set at DISABLE. Change the setting as follows.

Refer to the following for set-up.

A. Press MODE to select Parameter Set in Main Menu.

```
<< Main Menu >>
1. Parameter Set
2. Program
3. Bobbin Wind
```

B. Use the direction change cursor in Parameter Set to select 041. Laser Point.

```
< Parameter Set >
041. Laser Point
042. RevAfterTrim
043. ReverseAngle
```

C. 041. Laser Point is defaulted at 1) DISABLE. This sets the laser point function not to be used all the time.

```
041.Laser Point
1) DISABLE   <
2) ENABLE
```

D. Use the direction change button ▲ ▼ to select 2) ENABLE and press ENTER ↵. This sets the laser point function to be used all the time.

```
041.Laser Point
1) DISABLE
2) ENABLE    <
```

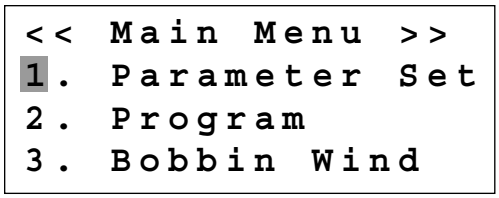
As above, when it returns to the initial screen, the cross-shape guiding light is displayed if it is equipped with a later pointer. Regarding the laser point function setting, the function will be turned on only when READY LED is on.

3-14) Setting Reverse Rotation after Trimming

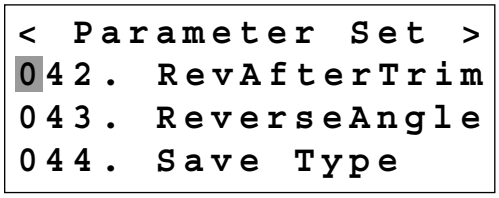
Function of Reverse rotation after trimming is as follows. When sewing material is thick, the thick material can interfere with needle if the needle is placed at the highest point of thread take-up. In that case, the interference will be prevented if the needle is placed in reverse order. Therefore, after trimming, set the point of reverse rotation as the applicable angle by using the reverse rotation function. If sewing material is not thick, don't use the function.

Setting method is as follows.

A. Choose Parameter Set from Main Menu by pushing MODE key.



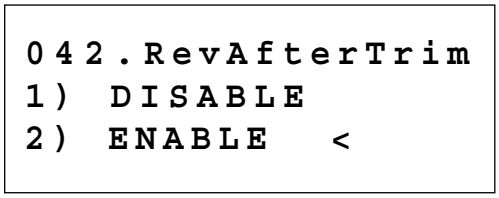
B. Choose 076. RevAfterTrim from Parameter Set by using direction keys ▲ ▼.



C. When choosing, 042. RevAfterTrim is set at 1)DISABLE.

1)DISABLE : After trimming, don't use the reverse rotation function after trimming.

2)ENABLE : After trimming, use the reverse rotation function after trimming.



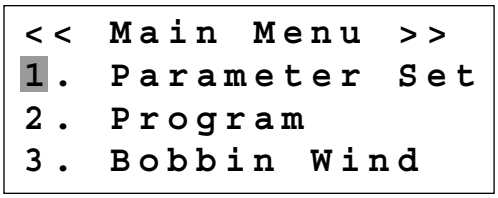
D. Move to 2)ENABLE and press ENTER ↵ key in order to use this function

3-15) Setting the Angle of Reverse Rotation after Trimming

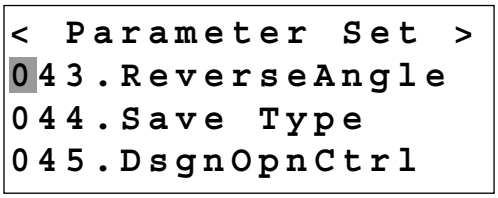
How to set the angle of reverse rotation, after trimming, is described below.
This function is available only when post-trimming reverse rotation function of 042. RevAfterTrim mentioned above is set at Enable.

Setting method is as follows.

A. Press MODE key and choose Parameter Set from Main Menu.

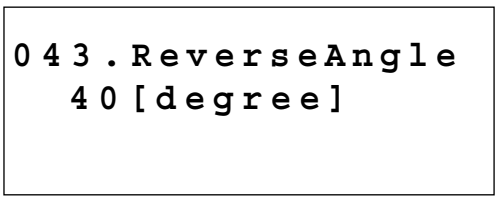


B. Choose 043. ReverseAngle from Parameter Set by pressing direction keys ▲ ▼.



C. 043. ReverseAngle is originally set at 15[degree].
The angle can be reset from 1 to 40[degree].
Angle can be reset by pressing direction keys ▲ ▼ on the OP box.

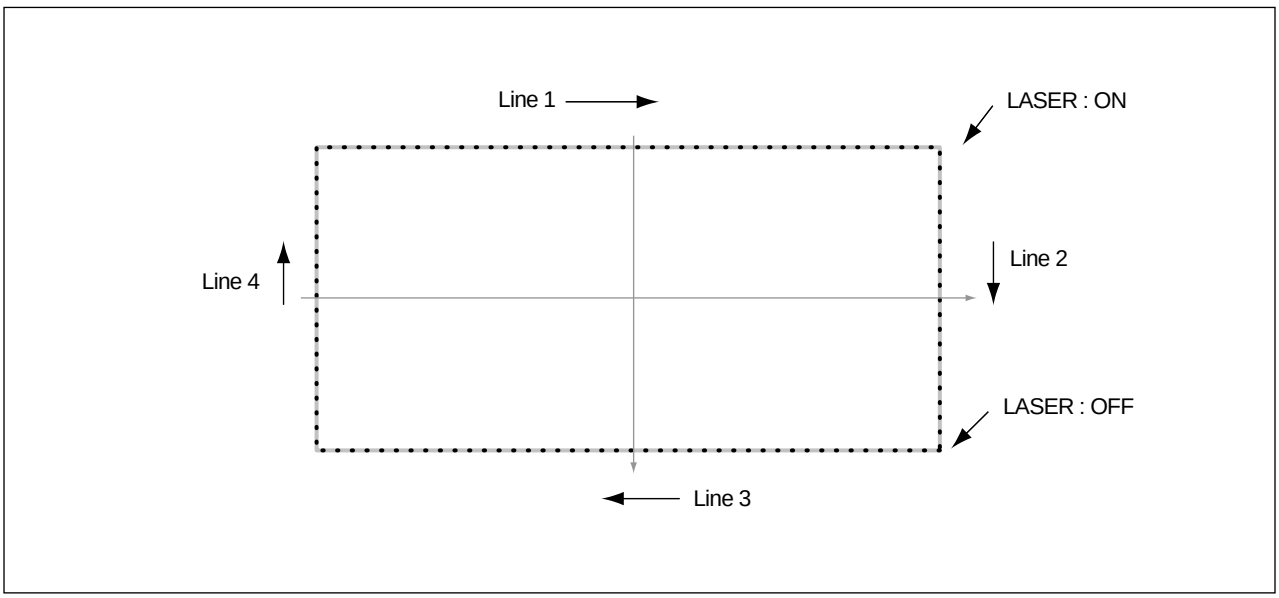
D. Press ENTER ↵ key to save the reset angle.



3-16) Setting Output Port

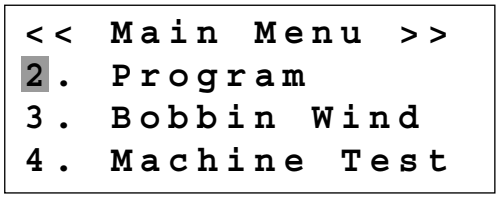
The function is that a user can program devices that are set to certain places when punching. The list of the devises is as follows.

NO	Device	Content
02	TT	Trimming
08	FD_UD	Feed Clamp Up/Down
09	FF_OUT	Outer Presser Plate
10	FF_IN	Inner Presser Plate
11	TR	Thread Release
12	PF	Presser Foot
13	FD_FEED	Feed Clamp
14	FD_STK	Feed Stacker
15	WP_COOL	Air Wiper
16	STACK1	Stacker 1
17	STACK2	Stacker 2
27	AIR VAL	Air Pressure Power
41	LASER	Laser Point
Other numbers	Other ports	Not used

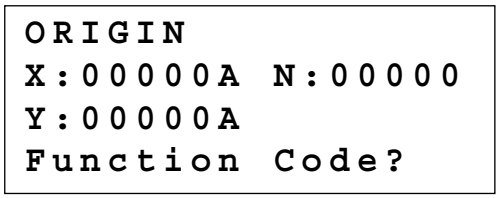


The following is the process of programming the Laser Point to be activated at a certain section of a regular square pattern.

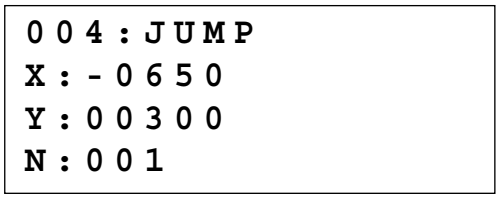
A. Press MODE key.



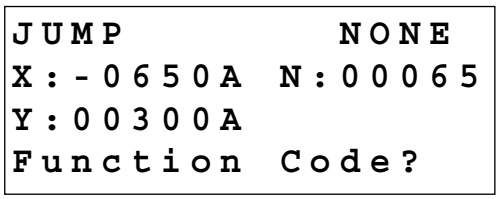
B. Move to "2. Program" by pressing direction keys ▲ ▼ and press ENTER ↵ key.
At this time, the inner/outer presser plate returns to the origin.



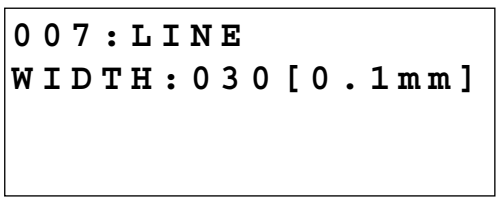
C. Press JUMP key and move to the original position of the square by pressing direction keys ▲ ▼.
And then press PNT.SET key.



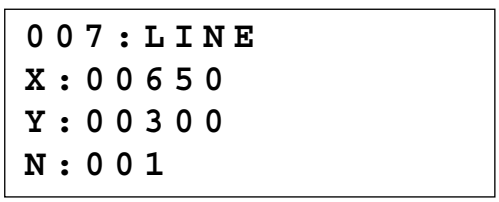
D. Pressing EXE key will move feed plate according to the computed data after computing pattern data.



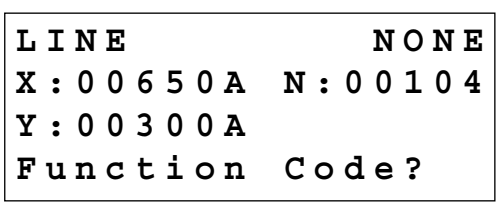
E. Press LINE key, input stitch width by pressing number keys and then press ENTER ↵ key.
(Ex. Press [0][3][0] to set stitch width at 3mm.)



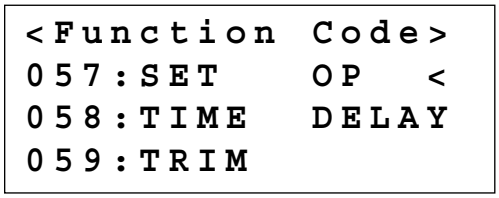
F. Move to the first point position of LINE by pressing direction keys ▲ ▼.
Press PNT.SET key.



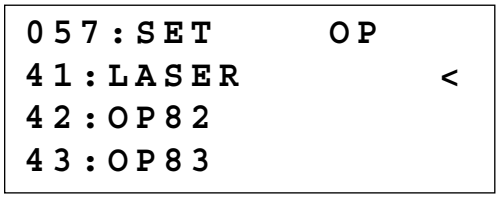
G. Register the first point position of square by pressing EXE key.
Calculate the pattern data and then the inner/outer presser plate is moving according to the calculated data.



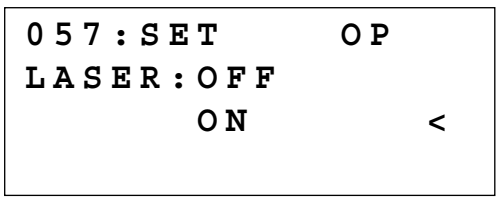
H. Press CODE key to program TR3(Thread Release 3) Function code is number 57. If function code number is not identified, press ENTER ↵ key to see function code list and then move to number 57 SET OP by pressing direction keys ▲ ▼.



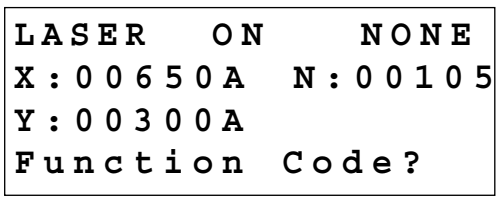
I. Press ENTER ↵ and move the cursor to No. 41 LASER on the Set OP function list. Press ENTER ↵.



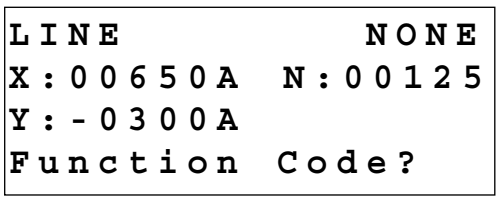
J. Press ENTER ↵, and the screen below appears. Set the cursor at ON and press ENTER ↵. Upon pressing ENTER ↵, LASER POINT is programmed to start moving from LINE END.



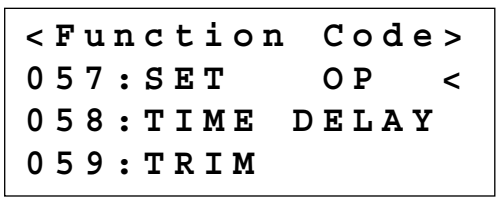
K. Return to the initial screen. To create Second Line, input switch width by using Line key.



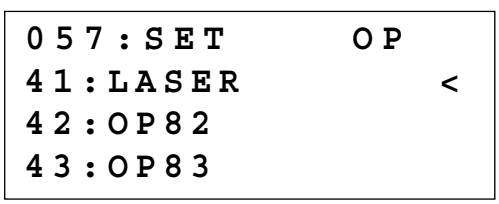
L. Press PNT.SET key and then resister Second Line by using EXE key.
After computing pattern data, feed plate moves according to the data.



M. Press CODE to program LASER POINT. Function code is No. 57. When user does not know the code number, press ENTER ↵ to display the function code list. Use the direction keys ▲ ▼ to move to No. 57 SET OP.



N. Press ENTER ↵ and move the cursor to No. 41 LASER on the SET OP function list. Press ENTER ↵ again.



O. When ENTER is pressed, the screen below appears. To cancel the LASER setting, move the cursor to OFF, and press ENTER. Upon pressing the button, LASTER POINT is programmed to move at the end of created line.

```
057:SET      OP
LASER:OFF        <
      ON
```

P. Return to the initial screen.

```
LASER    OFF   NONE
X:00650A  N:00126
Y:-0300A
Function Code?
```

Q. Same as the first and second lines, create the third and fourth line as in the figure. Press TEST to check the proper operation of LASER. In the fourth line, LASER is off. In the beginning of the second LINE, LASER is turned ON. When sewing is completed, LASER is OFF at the end of the second line.

R. If there is no problem with sewing, press TEST key again, and then press WRITE key to save design.

3-17) Setting Time Delay when Output Port is Being Used

The function is to program applicable time delay when output port is being used.
The program will be explained later in J. of 3-23) Setting Output Port.

A. Pressing ENTER key will show following page. Move to ON and press ENTER key. At the same time, thread control device 3 will be programmed at the end of the created line.

```
057:SET      OP
TR3:OFF
     ON          <
```

B. Return to the initial page of program.
Program Time Delay before creating second LINE.

```
TR3      ON    NONE
X:00650A  N:00105
Y:00300A
Function Code?
```

C. Press CODE key to program Time Delay. Function code is number 58. If function code number is not identified, press ENTER key to see function code list and then move to number 58 TIME DELAY by pressing direction keys ▲ ▼.

```
<Function   Code>
058:TIME DELAY <
000:TRIM
001:SEC_ORG
```

D. Press ENTER key to set Time Delay.
Time Delay is originally set at 0[ms].
Time delay unit is 4[ms]. Set desired Time delay by using number keys. Input 50[ms]. If 50[ms] is input, the real Time Delay is 200[ms].

```
058:TIME DELAY
DELAY:0050[x4ms]
```

E. Return to the initial screen.
To create Second Line, input switch width by using Line key.

```
TIME DELAY   NONE
X:00650A  N:00106
Y:00300A
Function Code?
```

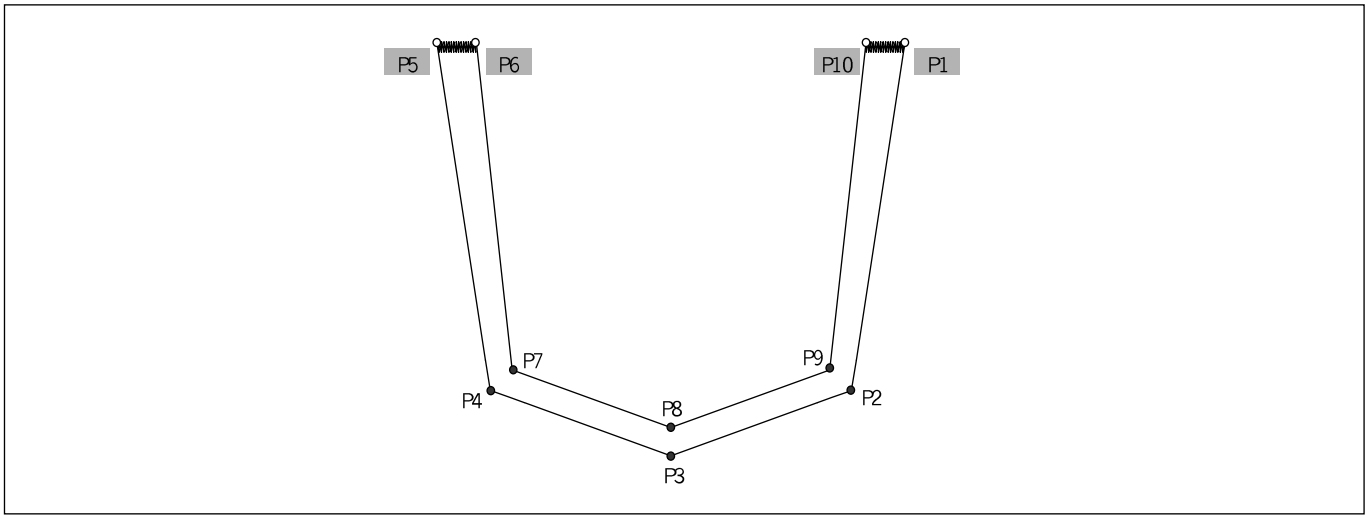
F. After pressing PNT.SET key, register Second Line by using EXE.
After computing pattern data, feed plate moves according to the data.

```
LINE         NONE
X:00650A  N:00126
Y:-0300A
Function Code?
```

G. The rest part is the same with L~R in 3-23) Output Port Setting Function.

So, when time delay is programmed, TR3 will operate shortly before second Line sewing following first Line sewing. And the operation will discontinue for 200[ms] shortly before sewing and then second Line sewing will start. By doing so, a user can set delay time at each designated device and take motion when operating device related output port.

3-18) Presser foot setting for height difference



1. Select the Parameter Set.

```
<< Main Menu >>
1. Parameter Set <
2. Program
3. Bobbin Wind
```

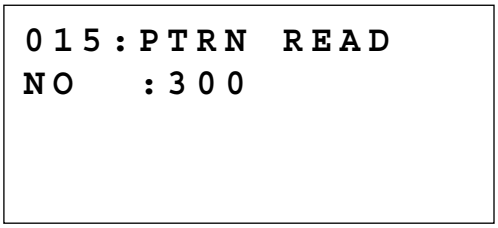
2. Check if No. 058 “Use 2nd PF” is enabled. Otherwise, select “Enable.” (Default value is Enable).

```
058:Use 2nd PF
1) ENABLE      <
2) DISABLE
```

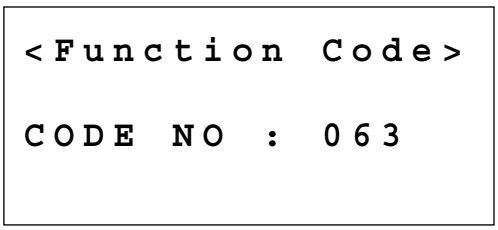
3. Select the Program Mode.

```
<< Main Menu >>
2. Program    <
3. Bobbin Wind
4. Machine Test
```

4. Read the pattern designs.



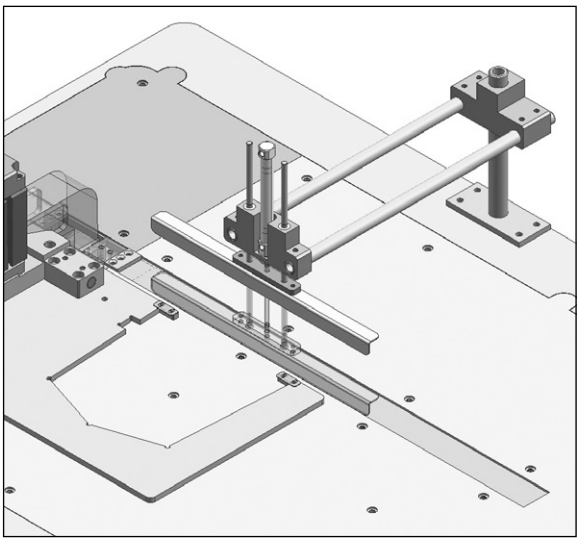
5. If the presser foot function for different height is needed at P5, P6, P10, and P11 as in the figure above, go to “CODE 063.PF_SET.”



6. Depending on the PF_SET values, the motion of the presser foot for height difference is determined as follows:
   0 : Presser foot pneumatic pressure solenoid motion OFF
   1 : Presser foot pneumatic pressure solenoid motion ON

3-19) Fabric Guide Bar Setting

To properly place fabric as in the figure, adjust the guide bar position before assembly.



> **Caution** **The guide bar is operated by the left foot pedal switch.**

1. Select “Parameter.”

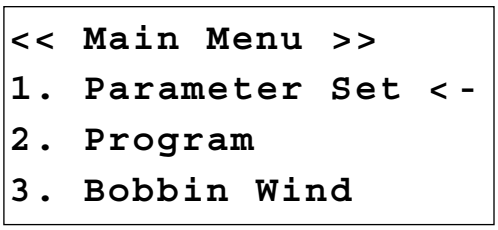
```
<< Main Menu >>
1. Parameter Set <-
2. Program
3. Bobbin Wind
```

2. Go to Parameter No. 062 to check if Feeder Guide is set as ENABLE, and if not, set it as ENABLE (Default value is ENABLE.)

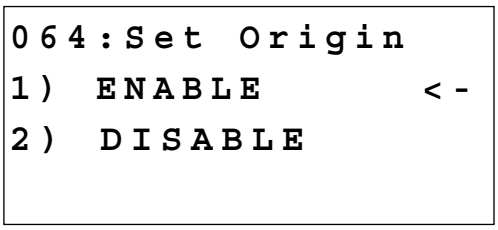
```
062:Feeder Guide
1) ENABLE      <-
2) DISABLE
```

3-20) Machine Origin Setting

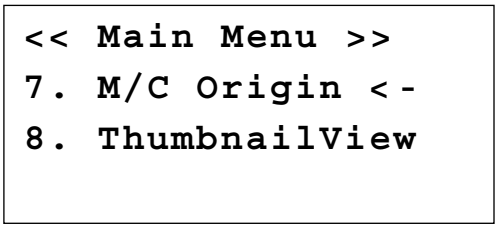
1. Select “Parameter.”



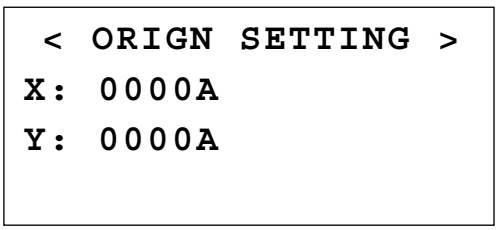
2. Go to Parameter No. 064 to check if Set Origin is set as ENABLE, and if not, set it as ENABLE (Default value is ENABLE.)



3. Return to the main menu and select “7.M/C Origin.”

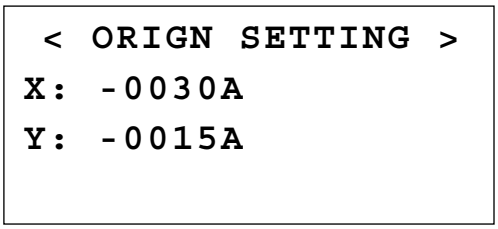


4. Then the initial screen appears as in the figure.



5. Use the Release key to move the feed clamp left or right.

6. Use the direction keys to move the presser plate and press ENTER. Then the origin’s coordinates are saved.



※ Key Points

1. If Parameter No. 64.Set Origin is set as DISABLE, the modified machine origin coordinates cannot be used.
2. After origin modification, existing designs cannot be used.
   (Therefore, if users desire to use existing designs continuously, they are advised to change the sewing start point. (Code.053 MovSewStrt))

3-21) Other Pocket Exclusive Functions

Parameter No.	Functions	Contents	Description
47	Pocket design's repeated stitch number setting	4[stitch]	This function enables the setting of repeated stitching to create pocket exclusive design codes in the program mode.
48	Pocket design's bartack speed setting	2000[spm]	This function enables the setting of the zigzag bartack speed to create pocket exclusive design codes in the program mode.
50	Stacker setting	DISABLE	This function decides to enable or disable the stacker (automatic stacking device of sewing materials). Semi Auto-Using the stacker at one position Auto- Using the stacker by moving it left or right
		Semi Auto	
		AUTO	
51	Repeated sewing setting	DISABLE	This function enables repeated sewing by pressing the start switch after setting sewing material once.
		ENABLE	
52	Feed clamp setting	DISABLE	This function decides to enable or disable the feed clamp. DISABLE-In/Outer Clamp is used only.
		ENABLE	
55	Needle bar cooler setting	NOT	This function decides to enable or disable the needle bar cooler.
		HALF	
		FULL	
56	Thread release setting when the presser bar descends	DISABLE	This function enables the upper thread tension adjuster when the presser foot descends.
		ENABLE	
57	Extended inner clamp setting	DISABLE	This function decides to enable or disable the Inner Clamp's enlarging or reducing motion.
		ENABLE	
59	Switch to a pattern sewing machine setting	DISABLE	This function enables the switch of the sewing machine to be a pattern sewing machine.
		ENABLE	
60	Clamp safety function setting	DISABLE	This function prevents the clash of clamps. (Consult with the A/S engineer to utilize this function.)
		ENABLE	
61	Main shaft temporary suspension setting during inner clamp operation	DISABLE	This function enables temporary suspension of the main shaft operation when the inner clamp moves for enlargement or reduction.
		ENABLE	

4) Pattern Data General Function

4-1) Checking and Deleting the Pattern Number

It is used to check or delete the pattern number in floppy diskette and inner memory.

A. Press MODE key.
B. By using direction keys ▲ ▼, move to "5. Program List" menu.

```
<< Main Menu >>
5.Pattern List
6.EMB CALL
```

C. If you press ENTER ↵ key, the screen of the right sides appears. To check the pattern number in inner memory, press digit key, 0, and to check the pattern number in a floppy diskette, press digit key, 1

```
Memory(0)/FDD(1)
CF Card(2)
To Exit(ESC)...
```

D. If you press digit key, 1. the pattern number in a floppy diskette is shown.

```
<<Pattern List>>
002              <-
003
004
```

E. If a pattern number is not indicated on one screen, check it by using direction key ▲ ▼, with moving forward and downward.

```
<<Pattern List>>
004              <-
005
006
```

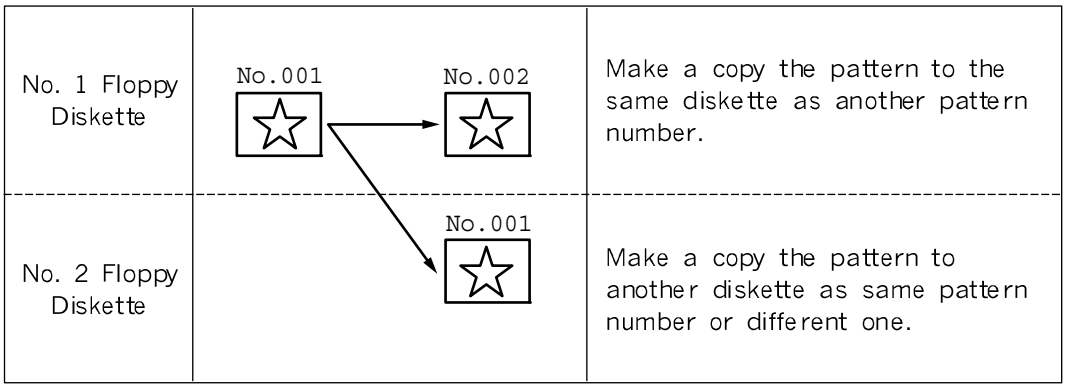
F. After moving to the pattern number that you want to delete by using direction keys ▲ ▼, if you press PTN DEL key, the screen of the right side appears. To delete the pattern, press ENTER ↵ key, and to cancel, press ESC key.

```
Are YOU Sure?

Y(ENTER)/N(ESC)
```

G. By pressing ESC key, complete the check of pattern number. By pressing ESC key, back to the initial screen.

4-2) Making a Copy the Pattern to Another Number or Diskette

It is used to make a copy the pattern to another number or diskette. It is available to check, make a copy or delete the pattern number.



A. Insert a floppy diskette that you want to make a copy.
B. Press MODE key.
C. By using direction keys ▲ ▼, move to "2. Program" menu, then press ENTER ↵ key.
   At this time, the inner/outer presser plate returns to the origin.

```
<< Main Menu >>
2. Program
3. Bobbin Wind
4. Machine Test
```

```
ORIGIN
X:00000A N:00000
Y:00000A
Function Code?
```

D. After pressing READ key, input the pattern number that is to be copied by using digit keys.
   (For example, to make a copy "001", input [0][0][1].)

```
014:PTRN READ
NO  :001
```

E. Press ENTER ↵ key. The READY LED flickers during reading the pattern data.

```
ORIGIN
X:00000A N:00000
Y:00000A
Function Code?
```

F. After the READY LED turns off, if you want to make a copy the pattern to the same floppy diskette as another pattern number, press WRITE key and input the pattern number that is to be copied by using digit keys. (For example, input [0][0][2] to make a copy as "002".)
Press "0" to select the floppy drive for copy. The copy to the inserted floppy begins. To make a copy to other floppy diskette, take out the existing diskette and insert other floppy diskette, then press WRITE key to input the pattern number you want to make a copy by using digit keys. (For example, input [0][0][1] to make a copy as "001".)

```
015:PTRN WRITE
NO   :002
```

G. After leaving the programming menu by pressing MODE key, back to the initial screen by pressing ESC key.
※ Referring to "Pattern Number Check", check the copied pattern number.

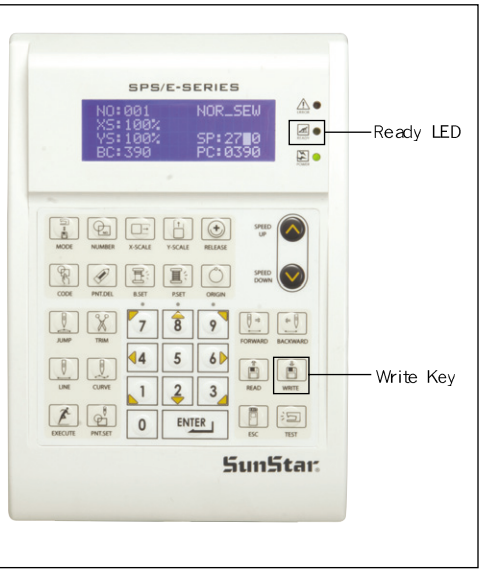
```
<< Main Menu >>
2. Program
3. Bobbin Wind
4. Machine Test
```

4-3) Pattern Store Function (Floppy drive: Optional)

This function is designed to summon pattern design data stored in CPU memory and store it in the floppy disk while the machine is in sewing mode. In the past, users themselves punched designs in the program mode and stored in floppy disk, but could not call design data in CPU memory and store them in floppy disk during sewing mode.

Refer to the following for set-up.

A. Before saving a design, select 1) SAVE FDD on the parameter of 044. SAVE TYPE.
B. Design saving should be conducted on the sewing mode.
C. While the machine is in the sewing mode, key in the desired pattern design number and press ENTER ↵.
D. If the machine is in the sewing mode, a light will come up in Ready LED located at the upper left corner.
E. Press ENTER ↵ again. The sewing mode will be turned off and the light will go off in Ready LED.
F. By following the step A, B, C, D only once, stored designs in CPU memory can be stored in floppy disks.
G. After inserting a diskette into a floppy drive, press the save key at the right-side bottom of the OP Box.
H. In the LCD display of the OP Box, the sewing mode will be changed to storing mode.
I. Enter the number of designs to be saved and press ENTER ↵. Then the design is saved under the set number in the diskette.



4-4) Pattern Copy from Flash Memory to CF CARD

This function is to save pattern design data from CPU memory to CF Card on the sewing mode.

The saving methods are as follows:

A. A. Before saving a design, select 3) CF CARD on the parameter of 044. Save Type.
044. The selected item on the Save Type is saved or read primarily upon design saving or reading.
In addition, before turning off CF CARD, make sure that it is already inserted into the OP Box CF slot.

B. Call the target designs for copying and make the machine ready for sewing.

C. When the machine is in the sewing mode, the light is on the Ready LED at the upper left side.

D. When ENTER is pressed, the sewing mode is canceled, and Ready LED is turned off.

E. Press the save key at the right bottom of OP Box.

F. OP Box's LCD shows the change from the sewing mode to the saving mode.

G. Enter a design number and press ENTER for saving. Then the design is saved in CF CARD under the set number.

```
<Parameter Set>
044.Save Type
045.PocketOffset
046.PocketOvLap
```

```
044. Save Type
1) SAVE FDD
2) SAVE FLASH
3) CFCARD      <-
```

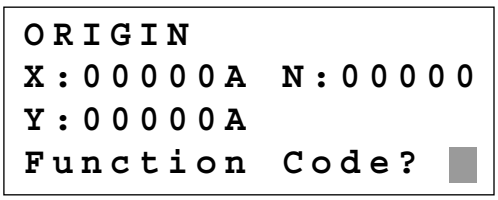
4-5) Pattern Information Displaying Function

Upon punching, it displays various information on the pattern currently saved in the memory.

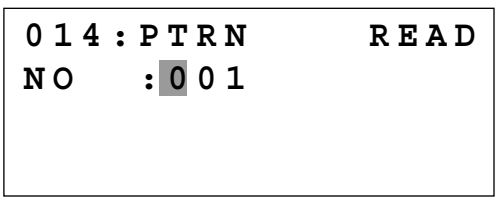
A. Insert floppy diskette containing the pattern to use pattern information displaying function.

B. Press MODE key.

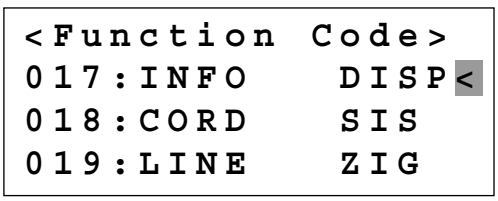
C. After moving to "2. Program" menu by using direction key ▲ ▼, press ENTER ↵ Key. At this time, the inner/outer presser plate returns to the origin.



D. After pressing READ key, input the pattern number to display pattern information by using digit key and read in the pattern by pressing ENTER ↵ key. (For example, input [0][0][1] to read the pattern number 001.)

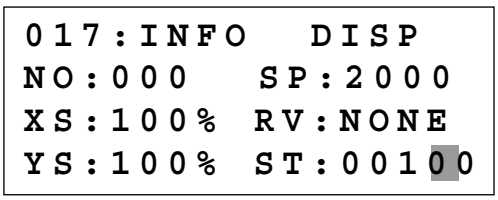


E. After pressing CODE key, if you know the function number related to pattern programming, input three-figure digit number 017 and if you do not know the number, press ENTER ↵ key. Then, after moving to "017:INFO DISP" by using direction key ▲ ▼, press ENTER ↵ key.



F. The meaning of information being displayed on the screen is as follows:

NO - Pattern number
XS - Extension/reduction rate of X-axis direction.
YS - Extension/reduction rate of Y-axis direction.
SP - Maximum sewing speed
RV - Whether to use a reversal device.
NONE (not use) YES (use)
ST - Total number of actually sewed stitches

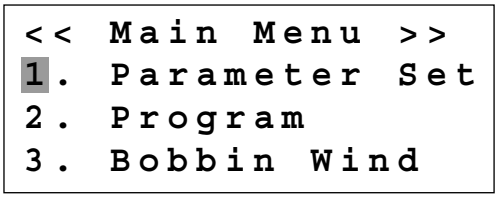


G. If you press ESC key, return to previous state.

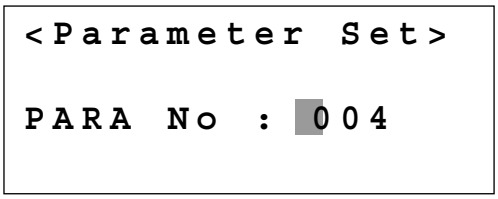
4-6) Change of Parameter Related to General Sewing

It is used when you want to change the working condition of electrically controlled pattern sewing machine to be best for working efficiency and user's need.

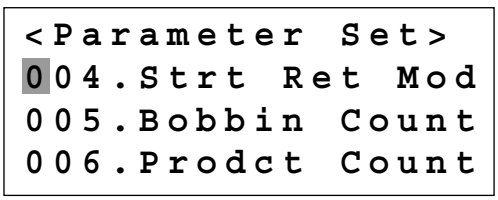
A. Press MODE key.
B. Move to "1. Parameter Set" by using direction keys ▲ ▼.



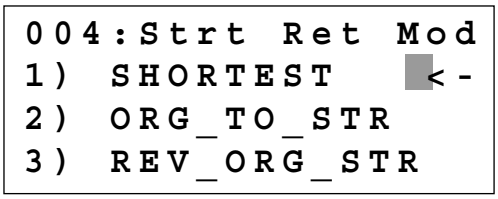
C. When you press ENTER ↵ key, you can get the screen like a figure on the right side. If you know the parameter number related to general sewing, input the three digit parameter number. For example, if you want to change "004:Strt Ret Mod", input [0][0][4]. At this time, you should input [0] twice for the first and second digits.
※ Appendix :
Refer "Parameter number related to general sewing."



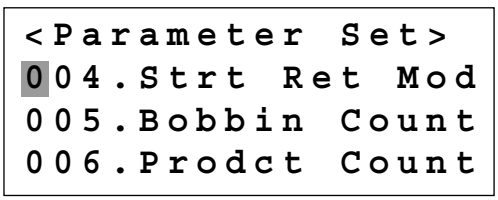
D. If you don't know any relevant number, press ENTER ↵ key to move to the parameter number you want by using direction keys ▲ ▼.
※ Appendix :
Refer "Parameter number related to general sewing."



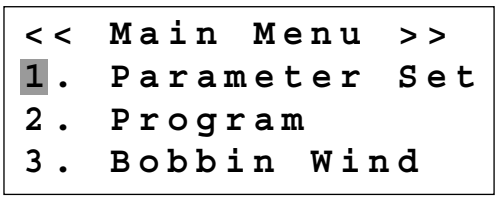
E. After pressing ENTER ↵ key, change the setting value or any state you want by using direction keys ▲ ▼.



F. If you press ENTER ↵, the changed condition will be valid and the machine backs to the previous menu. If you don't want any change, press ESC to cancel it.



G. If you want to back to the previous menu, press ESC key.



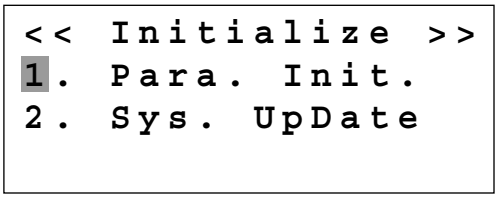
H. Press ESC key to back to the initial screen.
※ When sewing is completed, the pocket setter sewing machine returns to the origin.

4-7) Initialization of Parameter Related to General Sewing

It is used for parameter related to general sewing to back to the factory-installed setting value. It is recommendable that only professional A/S engineer handles it.

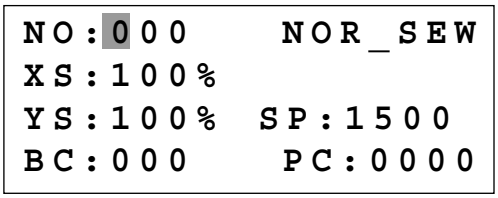
A. Press MODE key.

B. Press ENTER ↵ key.



C. After moving to "1. Para. Init." menu by using direction keys ▲ ▼, press ENTER ↵ key. Then you can see the screen like a figure on the right side. When a parameter initialization is finished, previous screen appears.

D. Press ESC key to back to the general sewing mode.



4-8) System Program Update

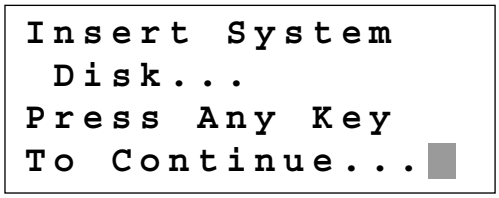
It is used for the system program that handles electrically controlled pattern sewing machine to be updated. Only professional A/S engineers allow to operate it.

A. Insert a floppy disk having system program that you want to update into a floppy disk drive.

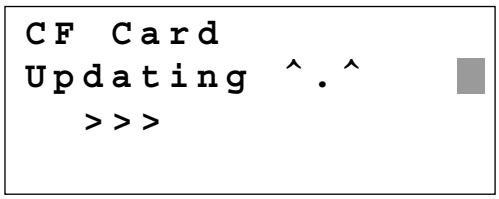
B. After pressing MODE key, press ENTER ↵ key.
※Caution
If READY LED turns on or upper feed plate is under, some keys are not available. It happened, operate the keys after lifting the upper feed plate or pressing ENTER ↵ keys.

C. Move to "2. Sys. Update" by using direction keys ▲ ▼, then press ENTER ↵ key.

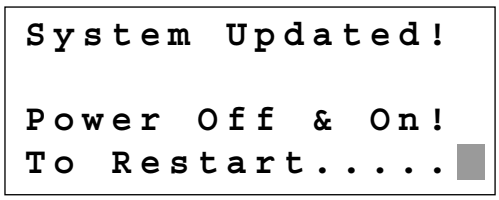
D. You can see the screen like a figure on the right side.



E. When any key is entered, system program is read from CF Card and updated. During the update, READY LED blinks.
※Caution
Do not take out CF Card or turn the power off during CF Card update or while CF Card is being read.



F. When update is finished, you can see the screen like a figure on the right side. By rebooting after turning off the power, the update on the system program is completed.
※If system update to FDD is desired, insert FDD and start an update. Although the default value of parameter 044. SAVE TYPE is 3) CF CARD, if there is no CF Card inserted, FDD is automatically read and updated.



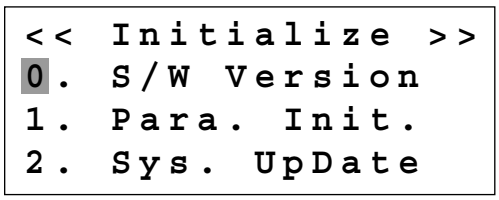
4-9) Confirmation for Version of System Program

A. Press MODE key.

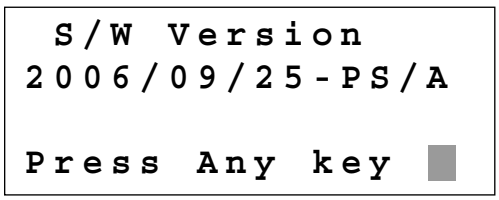
※Caution

If READY LED turns on or upper feed plate is under, some keys are not available. It happened, operate the keys after lifting the upper feed plate or pressing ENTER ↵ keys.

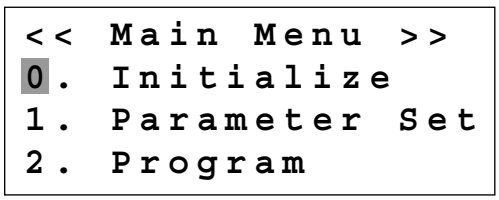
B. Press ENTER ↵ key.



C. If you press ENTER ↵ key, you can get the screen like a figure on the right side. You can confirm the date when the system program was made.



D. Press any key to confirm the version, then back to the initial screen by pressing ESC key.



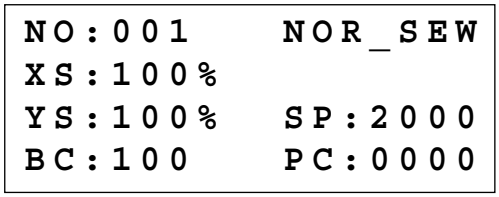
4-10) Bobbin counter setting by design

In the old versions, the value of bobbin counter, once set, stayed the same regardless of pattern design unless the user changed the value. (Except for initialization) However, for updated versions, the user can set and store the value of bobbin counter for the pattern design created.

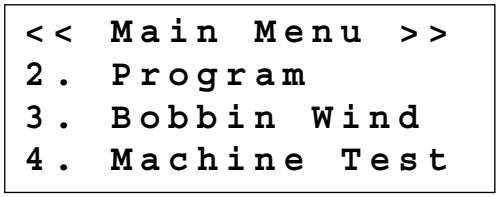
There are two ways to set bobbin counter.

Method 1 : Setting during design creation.

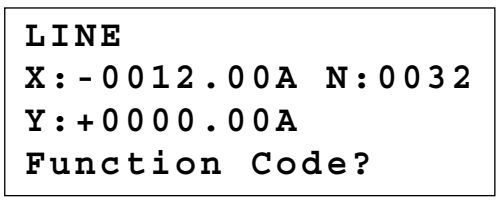
A. In the initial screen, press B.SET to set the value of bobbin counter as the user desires.



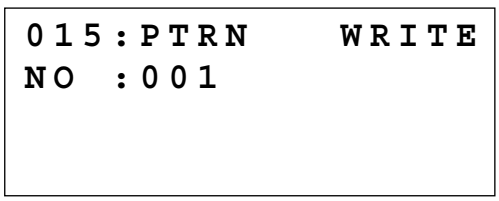
B. Go to Program Mode in Main Menu.



C. Create a design as desired.



D. Save the design in FDD.



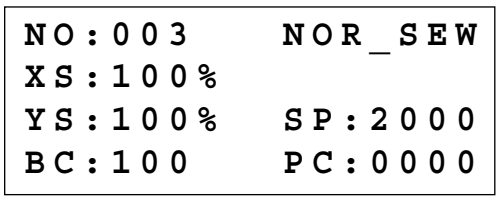
E. In 001 design created, the value of bobbin counter will be saved as 100.

When reading 001 design, the value of bobbin counter in the initial screen will be set as 100.

Method 2: Pattern Copy from Flash Memory to CF Card

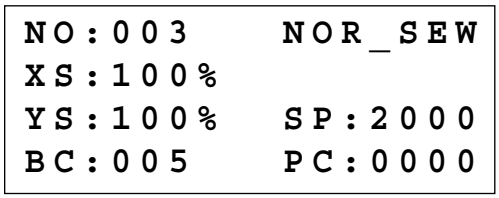
A. Insert CF Card into the CF slot.

B. Input pattern number you wish to read from the initial screen, and press ENTER ↵ to read design.

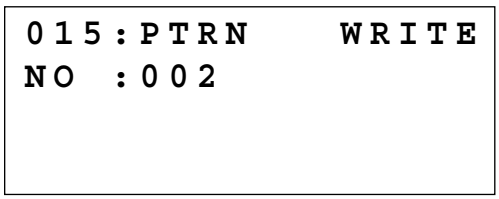


C. With READY LED activated on OP box, press ENTER ↵ to turn off READY.

D. Press B. SET bobbin counter button in the initial screen to set the desired value of bobbin counter.



E. Press WRITE from OP Box to save designs into CF Card. Make the copy with same or different names.



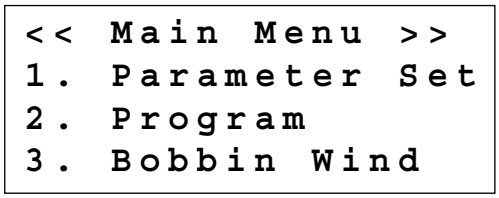
F. New value of bobbin counter will be saved in design

4-11) Pattern Design Creation and Design Saving

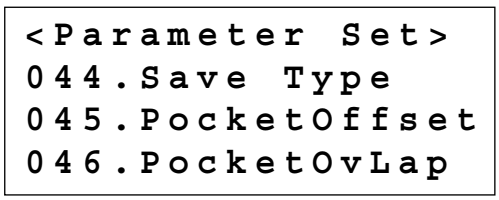
Previously, the users had to create pattern designs using OP Box and save them in FDD unconditionally. However, a new function was added to enable the saving of pattern designs into the flash memory and CF Card. When saving designs, the users need to select the place for saving from Parameter Set.

The details on setting are as follows:

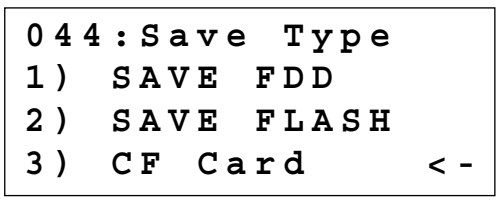
A. Press the MODE key to move to the Parameter Set of the Main Menu.



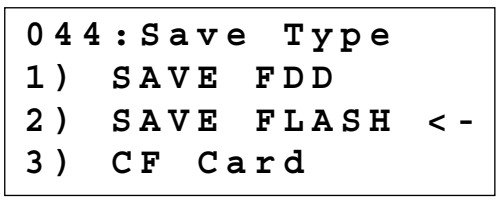
B. Press ENTER ↵ and move to 044. Save Type.



C. The default value is 3) CF CARD.



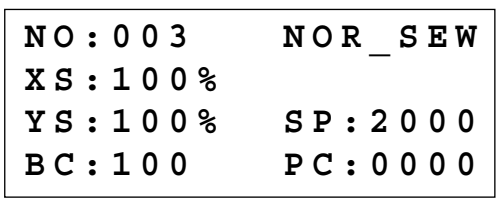
D. Move the cursor to 2) SAVE FLASH to save the patterns in the internal memory and press ENTER ↵.



E. Under the above setting, when the user uses OP Box to create and save pattern designs on the program mode, the patterns will be saved in Flash Memory, not CF Card.

※When CF Card is set, the pattern designs are saved in CF Card.

F. Return to the main screen and press the number of saved pattern and then ENTER ↵. The concerned pattern design will be read for sewing.



5) Parameter save function

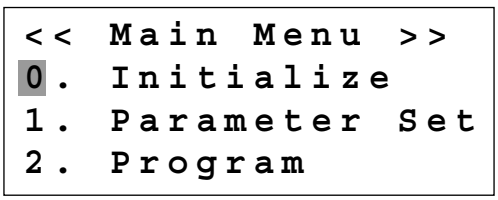
This function enables user to save user-defined parameter data in external storage devices (FDD) while using the pattern device.
The parameter data saved in external storage devices (FDD) can be used to replace the current parameter data all the time.

> **Caution**
>
> **When using the parameter data saved in external storage device (FDD), the parameter data of the current device is replaced with the parameter data of external storage device (FDD).**

5-1) Parameter Write

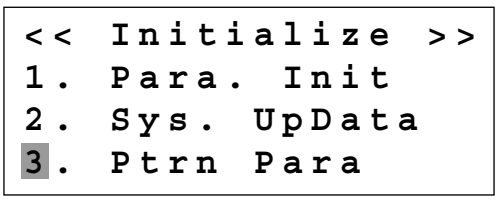
This is how to save changed parameters in line with user setting in external storage device.
The procedures are as follows:

A. Press the MODE key on the initial screen and select Initialize on the main menu.



B. Select No.3 Ptrn Para.

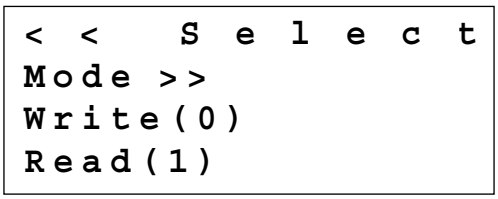
Then the Select Mode screen is displayed.
To write parameter data, select 0. Write.



C. Select 0 on the keypad.

D. Ready LED blinks, and the device's data is saved in the external storage device (FDD).
Data is automatically saved in the set route as below:

FDD route) A:\\SPS\\PARA



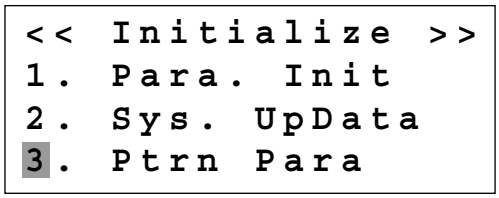
5-2) Parameter Read

This is how to replace the revised parameter data in the pattern device with the parameter data saved in the external storage device. The procedures are as follows.
The procedures are as follows:

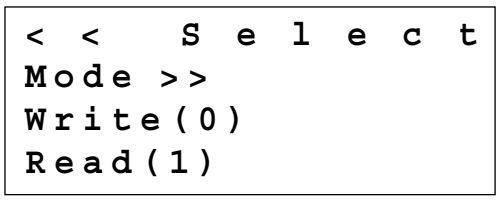
A. Press the MODE key on the initial screen and select Initialize on the main menu.

B. Select No.3 Ptrn Para.

Then the Select Mode screen is displayed.
To read parameter data, select 1. Read.



C. Select No. 1 on the key pad.



D. Ready LED blinks, and the parameter data saved in the device is replaced with the parameter data saved in the external device (FDD).

8

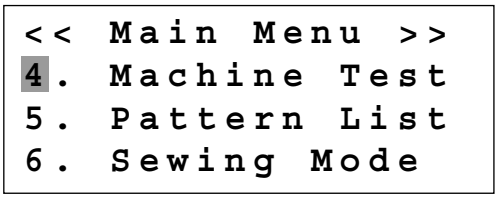
HIGH OPERATING METHOD

1) Understanding the Function of Machine Test

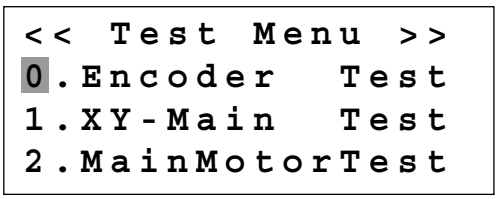
1-1) Encoder Test

It is a test if input of encoder and synchronizer is proper along with the present position of needle bar.

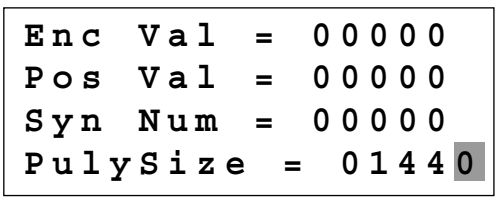
A. Press MODE key.



B. After moving to "4. Machine Test" by using direction keys ▲ ▼, press ENTER ↵ key.



C. Press ENTER ↵ key. Upper feed plate comes to descend, and moves to origin. At this time, if you slowly turn the upper shaft pulley manually, the pulse value of encoder, relative position of the upper shaft synchronizer sensor, and turning times of upper shaft will be marked.



D. If you want to finish encoder test, press ESC key. If you want to finish test menu, press ESC also.

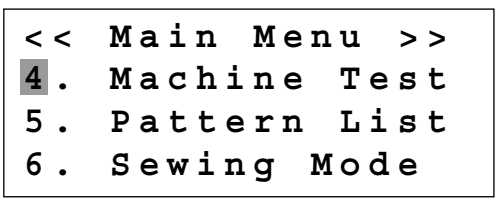
E. Back to the general sewing mode by pressing ESC key.

1-2) Step Motor-Main Shaft Motor Test (X-Y Main Test)

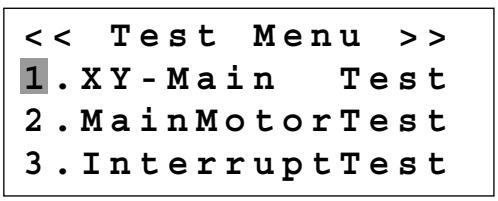
It is a test if a step motor and main shaft motor works properly at the same time.

A. Press MODE key.

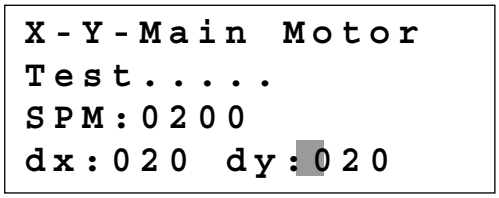
B. After moving to "4. Machine Test" by using direction keys ▲ ▼, press ENTER ↵ key.



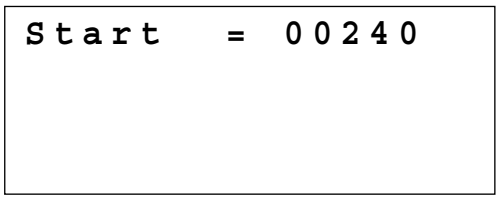
C. After moving to "1. XY-Main Test" by using direction keys ▲ ▼, press ENTER ↵ key. The upper feed plate descends and moves to the origin.



D. Input the speed of main shaft and distance of transfer, then press ENTER key. If you want to test with the factory-installed setting value, just press ENTER key. You can see the beginning angle of upper shaft transfer,turning times of upper shaft and number of stitches. Drive the step motor and main shaft motor SPM/10times, then finish the step motor-main shaft motor test automatically.



E. If you want to finish test menu, press ESC key. Press ESC one more time to back to the initial screen.

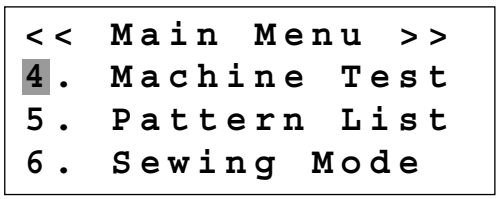


1-3) Main Motor Test

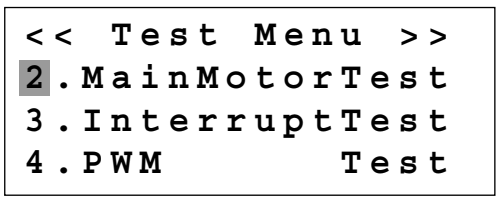
It is to test if the main shaft motor operates properly.

A. Press MODE key.

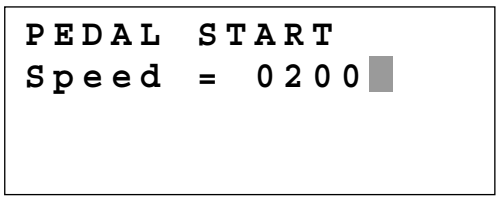
B. After moving to "4. Machine Test" by using direction keys ▲ ▼, press ENTER key.



C. After moving to "2. Main Motor Test" by using direction keys ▲ ▼, press ENTER key.



D. Upper feed plate comes to descend. Press ENTER key. If you want to change the speed of main shaft, press SPEED key.



E. If you want to finish main shaft motor test, press ESC key. If you want to finish test menu, press ESC key.

F. Back to the initial screen by pressing ESC key.

1-4) Interrupt Test

It is to test if the CPU board operates properly.

A. Press MODE key.

B. Move to "4. Machine Test" by using direction keys ▲ ▼, then press ENTER ↵ key.

```
<< Main Menu >>
4. Machine Test
5. Pattern List
6. Sewing Mode
```

C. Move to "3. Interrupt Test" by using direction keys ▲ ▼, then press ENTER ↵ key.

```
<< Test Menu >>
3.InterruptTest
4.PWM       Test
5.LCD       Test
```

D. IRQ1 indicates the times that key is pressed, and IRQ4 means the times of synchronizer counted. IRQ5 indicates the sensing times of main power off, IRQ7 shows the timer operation of inside CPU. At this time, if you press a key or turn the upper shaft manually, the relevant value will be changed.

```
IRQ1 : 0000000
IRQ4 : 0000000
IRQ5 : 0000000
IRQ7 : 0000000
```

E. If you want to finish Interrupt Test, press ESC key. If you want to finish test menu, press ESC key also.

F. Back to the initial screen by pressing ESC key.

1-5) PWM Test

It is to test if solenoid works properly. Only professional A/S engineers allow to handle it.

A, Press MODE key.

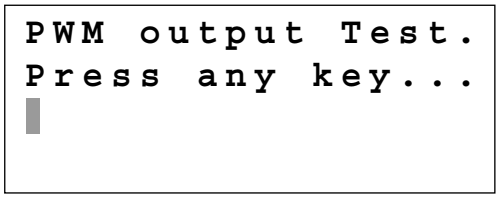
B. After move to "4. Machine Test" by using direction keys ▲ ▼, then press ENTER ↵ key.

```
<< Main Menu >>
4. Machine Test
5. Pattern List
6. Sewing Mode
```

C. After move to "4. PWM Test" by using direction keys ▲ ▼, then press ENTER ↵ key.

```
<< Test Menu >>
4.PWM       Test
5.LCD       Test
6.Keyboard Test
```

D. Press any key to perform the test.



E. If you want to finish PWM test, press ESC key.
If you want to finish test menu, press ESC key.

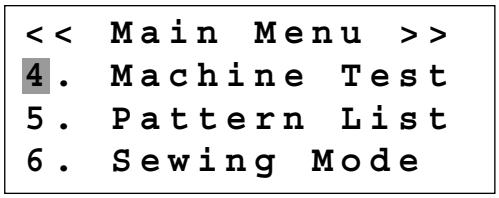
F. Back to the initial screen by pressing ESC key.

1-6) LCD Testa

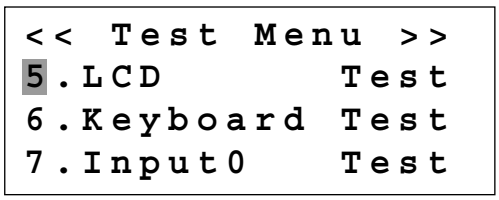
It is to test if LCD works aproperly. If you press a key, the relevant key appears on the screen.

A. Press MODE key.

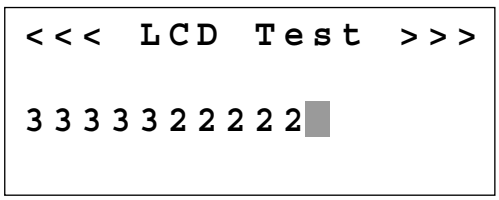
B. After moving to "4. Machine Test" by using direction keys ▲ ▼, press ENTER ↵ key.



C. After moving to "5. LCD Test" by using direction keys ▲ ▼, press ENTER ↵ key.



D. If you press a key, relevant key value appears on the screen.



E. If you want to finish LCD test, press ESC key.
If you want to finish test menu, press ESC key.

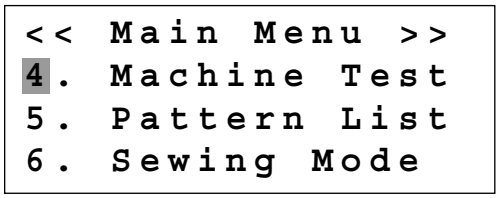
F. Back to the initial screen by pressing ESC key.

1-7) Keyboard Test

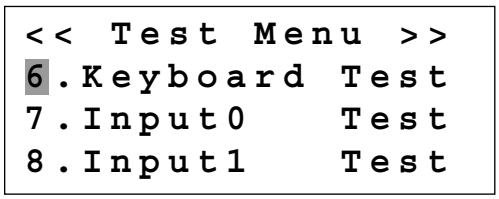
It is to test if key work properly. If you press a key, value of the relevant key appears on the screen.

A. Press MODE key.

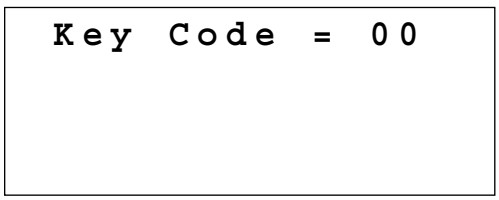
B. After moving to "4. Machine Test" by using direction keys ▲ ▼, press ENTER ↵ key.



C. After moving to "6. Keyboard Test" by using direction keys ▲ ▼, press ENTER ↵ key.



D. If you press a key, value of the relevant key appears on the screen.



E. If you want to finish keyboard test, press ESC key.
If you want to finish test menu, press ESC key.

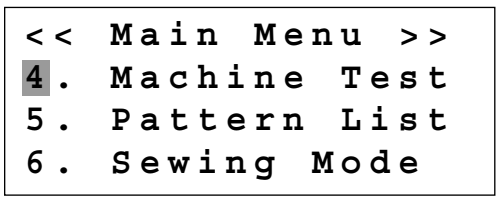
F. Back to the general sewing mode by pressing ESC key.

1-8) Input 0 Test

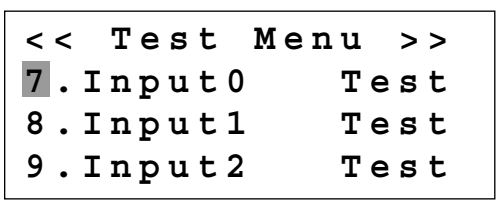
It is to test if each sensor input signal works properly. For testing, separate step motor output connector from control box.

A. Press MODE key.

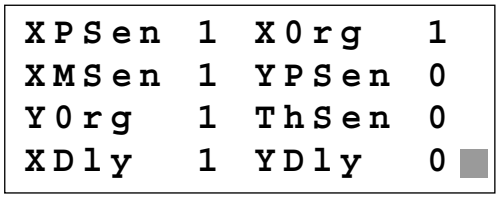
B. After moving to "4. Machine Test" by using direction keys ▲ ▼, press ENTER ↵ key.



C. After moving to "7. Input 0 Test" by using direction keys ▲ ▼, press ENTER ↵ key.



D. Check if the values of X0rg and Y0rg are changed when the feed plate passes on origin making it move manually to X and Y shaft. Confirm if the value of ThSen is changed when you release a take up lever spring after pulling slightly.



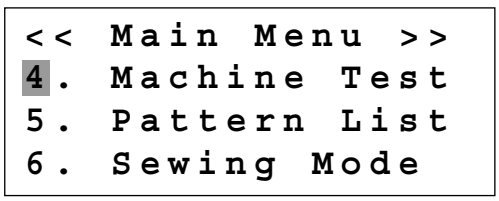
E. If you want to finish Input0 test, press ESC key.
If you want to finish test menu, press ESC key.

F. Back to the initial screen by pressing ESC key.

1-9) Input 1 Test

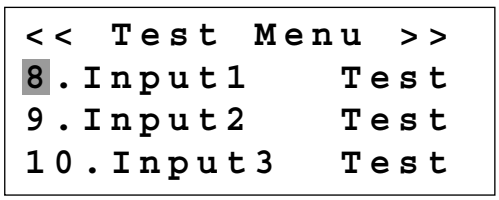
It is to test if peripheral switch input among all input signals works properly.

A. Press MODE key.

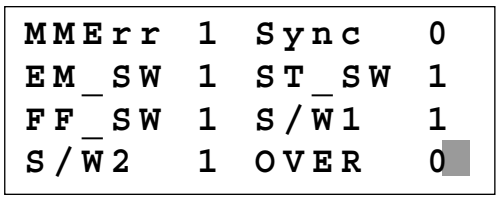


B. After moving to "4. Machine Test" by using direction keys ▲ ▼, press ENTER ↵ key.

C. After moving to "8. Input 1 Test" by using direction keys ▲ ▼, press ENTER ↵ key.



D. Press the emergency stop switch. Check if FF_SW value is changed when the right pedal is pressed or ST_SW value is changed when the left pedal is pressed. Check if S/W1 and S/W2 values are changed when TWO Start switch is pressed.
In case of over-voltage, OVER is changed to "1."



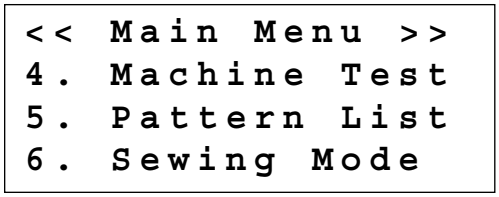
E. If you want to finish Input1 test, press ESC key.
If you want to finish test menu, press ESC key.

F. Back to the initial screen by pressing ESC key.

1-10) Input 2 Test

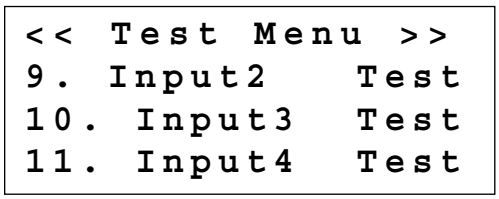
This function can be used to check whether, of the input signals, air pressure input signals and inputs related to direct connection are working properly.

A. Press MODE key.

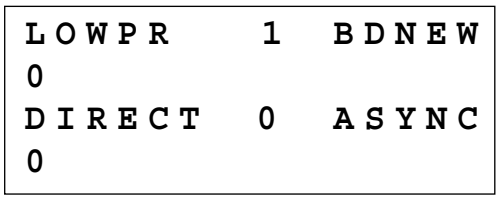


B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "9. Input2 Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



D. LOWPR : Air pressure error (normal: 1)
BDNEW : New I/O Board (0)
DIRECT : Direct connection type (0)
ASYNC : Communication between main shaft board and main shaft motor (0), if direct connection is used.
IOB21 : If IO Board is number 21, (0).
NEWOP : If OP is old, it is set at (1). If OP is new, it is set at (0).
UNDER : It changes to "1" when the low voltage is approved.
GRAPH : Set at "1" when Graphic OP is applied.



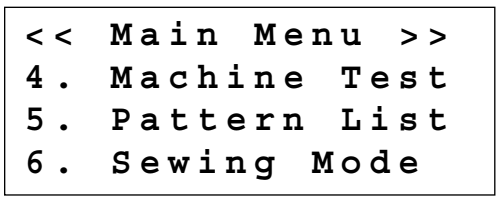
E. Press ESC key to end Input 2 Test. Press ESC key to end Test Menu.

F. Press ESC key to return to the initial page.

1-11) Input 3 Test

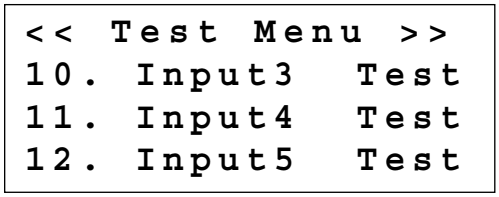
This function is to test whether or not each input signal is working properly.

A. Press MODE key.

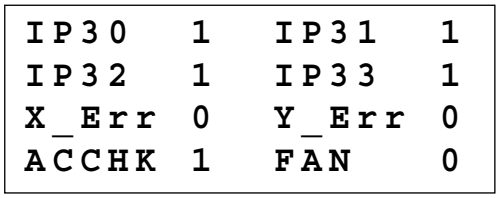


B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "10.Input3 Test" by using direction keys ▲ ▼ and press ENTER ↵ key.



D. Input port 3 is not currently used.
X_Err : Changed to "1" in case of X-shaft motor error.
Y_Err : Changed to "1" in case of Y-shaft motor error.
ACCHK : Changed to "0" in case of AC voltage check error.
FAN : Changed to "1" in case of FAN error.



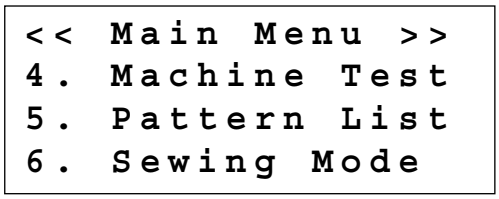
E. To end Input3 Test, press ESC. To end Test Menu, press ESC.

F. Return to the initial screen by pressing ESC.

1-12) Input 4 Test

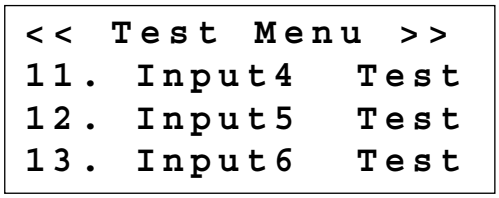
This is used to check whether or not X-Y Motor Error input signal is working properly.

A. Press MODE key.

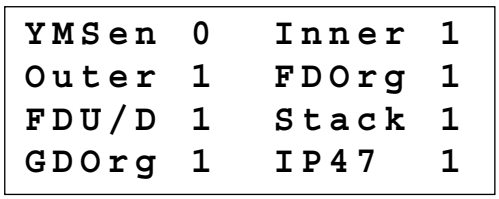


B. Move to "4 Machine Test" by using direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "C11.Input4 Test" by using direction keys ▲ ▼ and press ENTER ↵ key.



D. YMSen : Signal appearing when the Y-shaft's (-) direction movement is detected.
Inner : Signal appearing when the inner presser foot position is detected.
Outer : Signal appearing when the outer presser plate position is detected.
FDOrg : Signal appearing when the feed clamp position is detected.
FDU/D : Signal appearing when the feed claim up/down position is detected.
Stack : Signal appearing when the stack position is detected.



E. To end Input 4 Test, press ESC. To end Test Menu, press ESC.

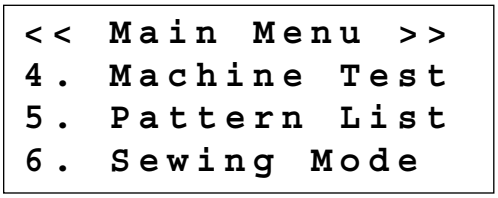
F. Return to the initial screen by pressing ESC.

1-13) Input 5 Test

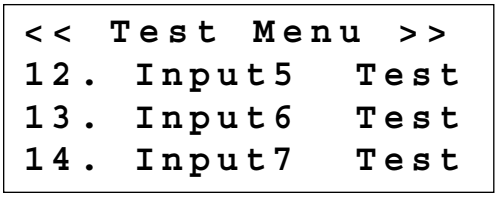
The is used to check whether the DIP switch is properly operating.

A. Press MODE key

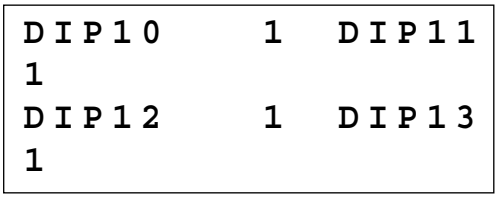
B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



C. Move to "12.Input5 Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



D. It shows the setting of the DIP switch.



E. Press the ESC key to finish the DIP switch test. To exit the test menu, press the ESC key.

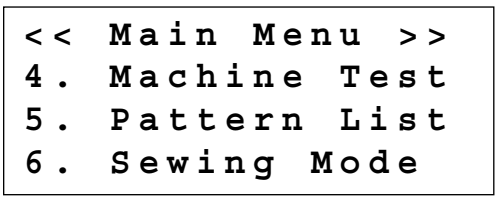
F. Press ESC key to return to initial page.

1-14) Input 6,7 Test

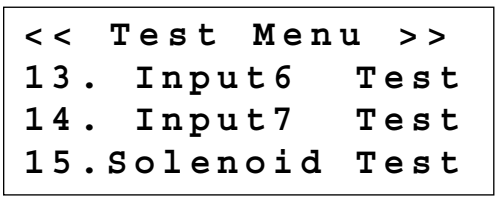
This is used to check whether the margin input signal is properly operating.

A. Press MODE key.

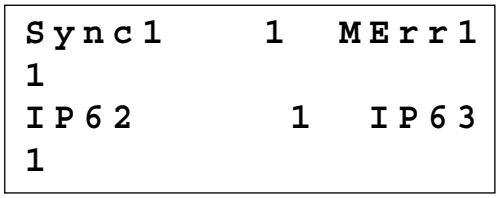
B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



C. Move to "13.Input6 Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



D. Currently, the in-port 6,7 is not used.



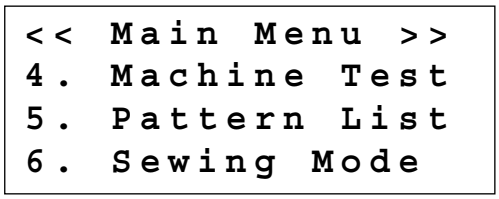
E. To end Input 6,7 Test, press ESC. To end Test Menu, press ESC

F. Return to the initial screen by pressing ESC.

1-15) Solenoid Test

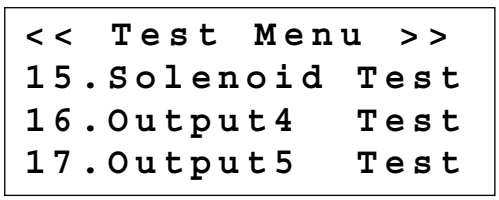
This is used to check whether or not Solenoid is working properly.

A. Press MODE key.

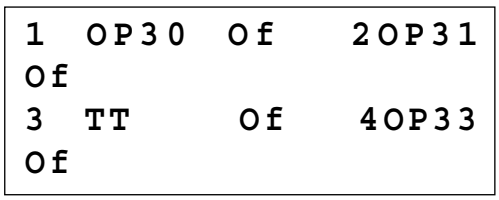


B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "15.Solenoid Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



D. Repeat turning on and off relevant solenoid by pressing the number of solenoid to be tested.
1. TT: Trimming



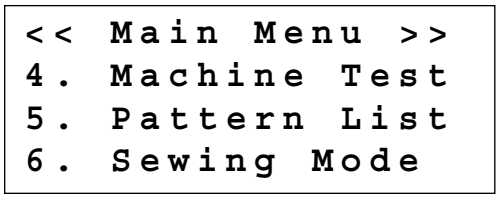
E. Press ESC key to end solenoid test. Press ESC key to end Test Menu.

F. Press ESC key to return to initial page.

1-16) Output 4 Test

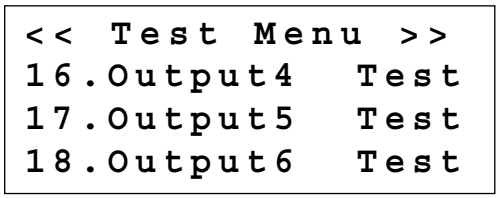
This function can be used to check whether or not air pressure devices are working properly.

A. Press MODE key.



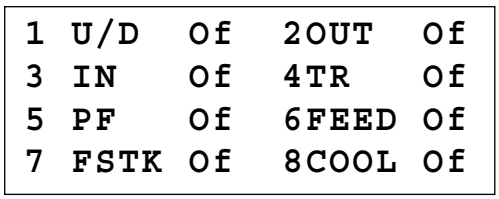
B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "16.Output4 Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



D. Repeat turning on and off relevant air pressure port by pressing the number of air pressure port to be tested.

1. U/D : Feed clamp up/down
2. OUT : Outer presser foot plate
3. IN : Inner presser foot plate
4. TR : Thread release
5. PF : Presser foot
6. FEED : Feed clamp
7. FSTK : Stacker feed
8. COOL : Air wiper



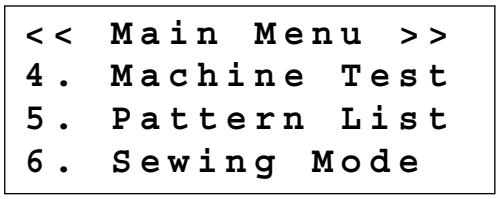
E. To end air pressure port test, press ESC key. To end test menu, press ESC key.

F. Return to the initial screen by pressing ESC key.

1-17) Output5 Test

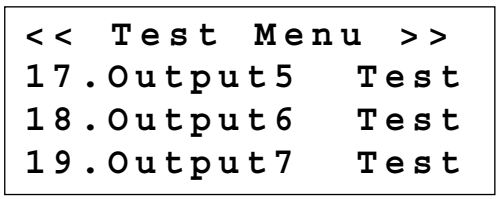
This is used to check whether the pneumatic device is properly operating.

A. Press MODE key.

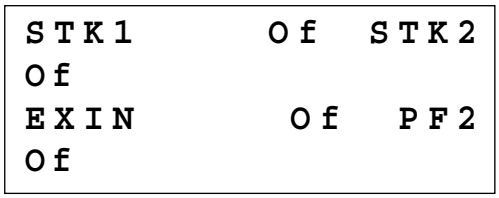


B. Move to "4 Machine Test" by using direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "17. Output5 Test" by using direction keys ▲ ▼ and press ENTER ↵ key.



D. Currently, Output 5 is not used.
However, the OP57 port is connected to IRQ9.
STK1 : Stacker1 (Holds the fabric)
STK1 : Stacker2 (Pulls the fabric)
EXIN : Expand or reduce the inner clamp
(Expanded Inner Clamp)
PF2 : Presser foot height difference control cylinder
TR3 : Upper thread holder



E. Press ESC key to end air pressure port test. Press ESC key to end Test Menu.

F. Press ESC key to return to initial page.

1-18) Output Port 6 Testing (Outport 6)

Output 6 is used as the X-Y motor drive output signal.
Do not use the port except relevant technical engineers.

A. Press the MODE key.

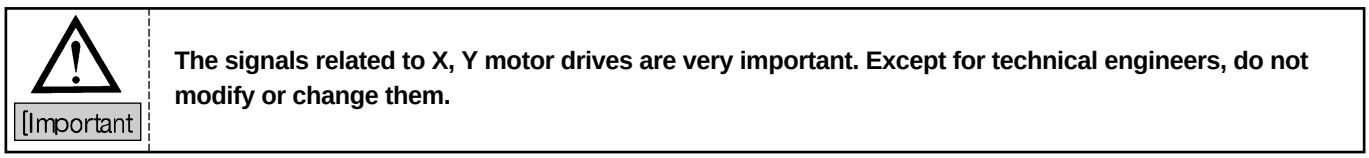
```
<< Test Menu >>
018.Output6 Test
019.Output7 Test
020.Output8 Test
```

B. Use the direction keys ▲ ▼ to move to "4. Machine Test" and press the ENTER ↵ key.

C. Use the direction keys ▲ ▼ to move to "18. Output6" and press the ENTER ↵ key.

```
1OP60Of   2XRSTOf
3YRSTOf   4AIRVOf
5OP64Of   6OP65Of
7OP66Of   8OP67Of
```

D. The following is about the XY motor drive output signals.
XRST : X-shaft driver reset
YRST : Y-shaft driver reset
AIRV : Pneumatic power signal



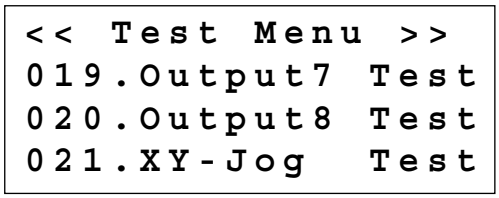
1-19) Output 7, 8 Test

The Output 7, 8 test the reserve output ports, which are in normal conditions.

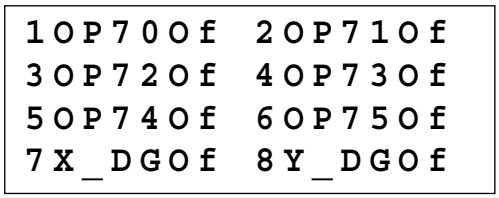
A. Press the MODE key.

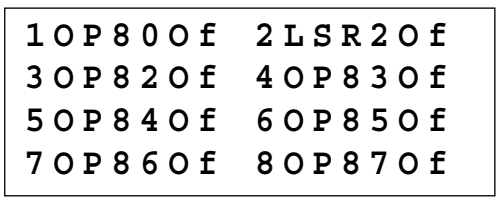
B. Use the direction keys ▲ ▼ to move to "4.Machine Test" and press the ENTER ↵ key.

C. Use the direction keys ▲ ▼ to move to "19.Output7 Test" and press the ENTER ↵ key.



D. Output 7 : ① X_DG : X-shaft dual gain
② Y_DG : Y-shaft dual gain
Output 8 : ①LSR2 : Laser point

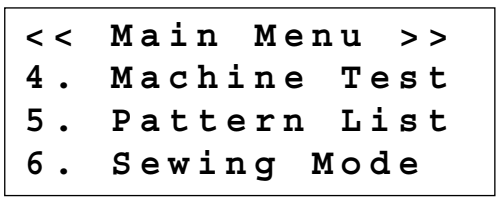




1-20) Manual Operation Test of Step Motor (XY Jog Test)

This function can be used to manually test XY step motor.

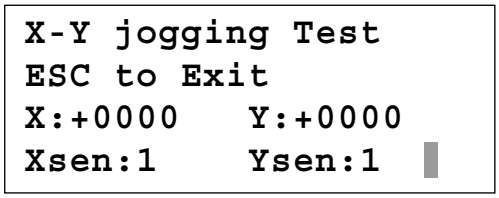
A. Press MODE key.



B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "21.XY-Jog Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

D. If you press direction keys ▲ ▼, the position shows coordinates of X and Y shaft and present position among 4 section moving to a step each.



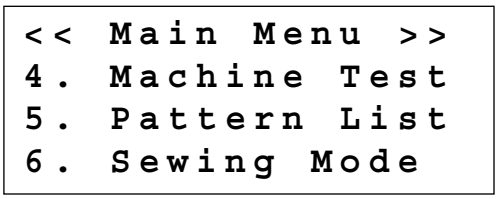
E. To end manual operation of step motor, press ESC key. To end test menu, press ESC key.

F. Return to the initial screen by pressing ESC key.

1-21) Origin Test

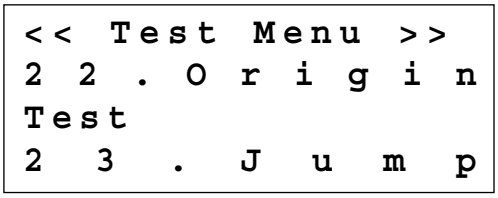
This is used to check whether or not movement of original point is working properly.

A. Press MODE key.

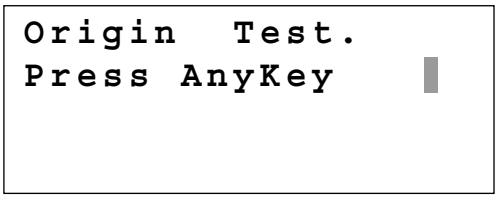


B. Move to "4 Machine Test" by using direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "22.Origin Test" by using direction keys ▲ ▼ and press ENTER ↵ key.



D. Pressing any key will go to original point and original test automatically.



E. To end test menu, press ESC key.

F. Return to the initial screen by pressing ESC key.

1-22) Jump Test

This is used to check whether or not XY step motor is working properly and do jump test.

A. Press MODE key.

```
<< Main Menu >>
4. Machine Test
5. Pattern List
6. Sewing Mode
```

B. Move to "4 Machine Test" by using direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "23.Jump Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

```
<< Test Menu >>
23.Jump        Test
24.Motor Type  Test
25.Async       Test
```

D. Input the time for repeating Jump transfer distance of XY and press ENTER ↵ key. Just press ENTER ↵ key to conduct test with the factory-installed setting value.

```
X-Y Jump Test
Delay : 0007[ms]
jmp_dx : 0020
jmp_dy : 0020
```

E. Press ESC key to end Test Menu.

F. Return to the initial screen by pressing ESC key.

1-23) Motor Type Test

The function above is to check the type of the currently linked main shaft motor.

A. Press the MODE key and select "Machine Test" on the main menu.

B. Press the direction keys of OP Box to move to "024. Motor Type Test" and press the Enter key.

```
<< Test Menu >>
024.MotorTypeTest
025.Async Test
```

C. The screen displays the messages below.
In case of DIRECT F-IV, Fortuna IV Motor is displayed.
In case of DIRECT Sanyo, Sanyo motor is displayed.

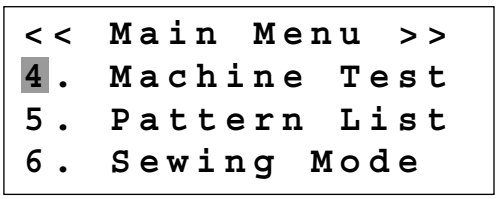
D. Turn the hand pulley.
When the hand pulley is turned two circles, the pulley size is displayed.
PulySize: 1440 refers to the pulley size for Fortuna IV.
PulySize: 8000 refers to the pulley size for Sanyo.

```
Motor Type...
DIRECT F-IV
SynNum = 1
PulySize = 1440
```

1-24) Communication Test between the Main Shaft Board and the CPU/IO Board (Async Test)

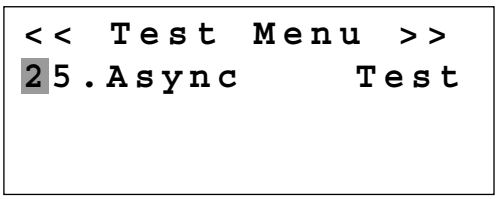
The communication function with the main shaft driver has been added to set up the phase stopping position as parameter in the direct models. The test shall be done according to the following procedure.

A. Press MODE key.

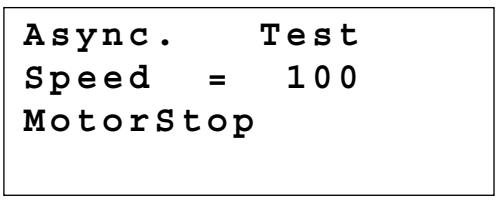


B. Move to "4. Machine Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.

C. Move to "25.Async Test" by pressing direction keys ▲ ▼ and press ENTER ↵ key.



D. Initial speed setting value has been set up by 100, it is shown by "MotorStop". Press ENTER ↵ key.



E. At the moment the ENTER ↵ key is pressed, the main shaft will turn one time. And it will show "MotorRun" on the LCD characters.

When you will press the ENTER ↵ key continually as above, the main shaft motor will turn one time. Therefore, to progress such movements signifies to go on the communication between the main shaft board and the I/O board normally. (This function is applied only for the direct type motors, for reference.)

F. Press ESC key to end Test Menu.

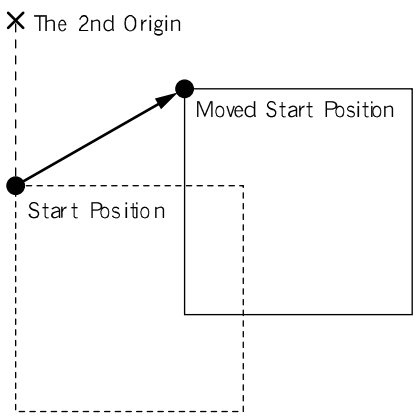
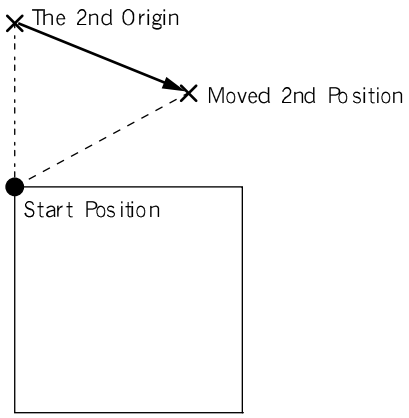
G. Press ESC key to return to initial page.

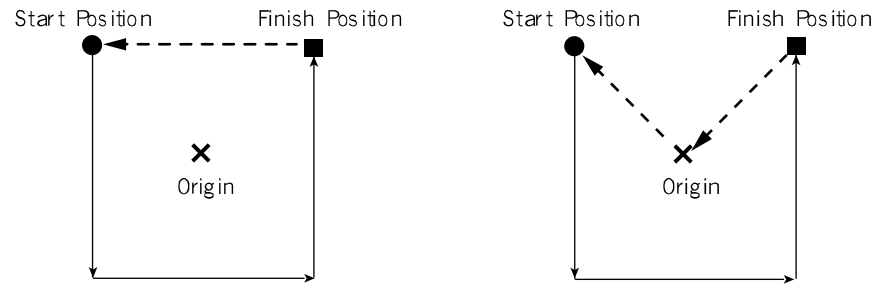
9

DESCRIPTION ON PARAMETER RELATED TO GENERAL SEWING OPERATION

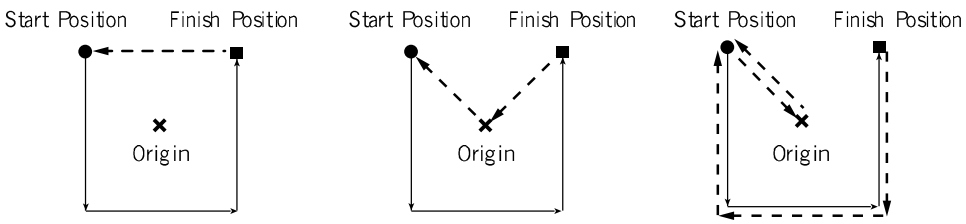
※ The shadow area indicates factory-installed condition.

Function No. : 000		Function Name : Manual Operation En/Dis
000. Jog En/Dis		It is to set moving of feed plate manually by using direction keys.
Setting Value	1) DISABLE	It is impossible for feed plate to move by using direction keys.
		[Contents] It is impossible to make the feed plate move manually by using direction keys in the sewing available mode. [Caution] It is possible to make the feed plate move manually by using direction keys without having relation to setup, under the condition of pattern programming. It you set up for "Disable", you can't use the Function No 001 'Moving to start position/the 2nd origin by manual drive'.
	2) ENABLE	It is possible to make the feed plate move by using direction keys. (Factory installed condition)
		[Contents] It is possible to make the feed plate move manually by using direction keys in the sewing available mode. [Caution] It is only possible when upper feed plate is down.

Function No. : 001		Function Name : Moving to start position/the 2nd origin by manual drive
001. Jog Mode		It is to set to move to the sewing start position or the 2nd origin by using direction keys after making the feed plate move manually in the sewing available mode.
Setting Value	1) PTN_STR_POS	It is to set up for sewing start position. (Factory installed condition)
		[Contents] Provided that the feed plate moves manually by using direction keys in the sewing available mode, the sewing operation will be started in that point without relation to the programmed sewing start position. [Caution] Before getting out of the sewing available mode after setup, the sewing operation starts at the position where the feed plate moves manually. However, if you once get out of the sewing available mode, the set sewing available mode becomes unavailable and the machine starts from the sewing operation starts machine for programmed pattern.
	2) SECND_ORG	It is to set up for the second origin.
		[Contents] Provided that the feed plate moves manually by using direction keys in the sewing available mode, the sewing operation will be started in that point without relation to the programmed the 2nd origin. [Caution] Before getting out of the sewing available mode after setup, the sewing operation starts as a 2nd position at the position where the feed plate moves manually. However, if you once get out of the sewing available mode, the set 2nd origin becomes unavailable whereas the programmed 2nd origin becomes available.
		 [Setup for sewing start Position]  [Setup for the 2nd origin]

Function No. : 002		Function Name : Return to the machine origin after finishing sewing operation
002. Machine Org1		It is to decide whether it moves directly to the sewing start position without passing through the machine origin after finishing sewing operation or it moves to the sewing start position through the machine origin.
Setting Value	1) DISABLE	It is to move directly to the sewing start position without passing through machine origin. (Factory installed condition)
		[Contents] It moves directly to the sewing start position without passing through machine origin after finishing sewing operation. But if it reads patterns newly, the machine moves to the sewing start position after passing through origin. [Caution] You should set a return mode for sewing start in the Function No. 004 as '1) SHORTEST' for making the above setup available
	2) ENABLE	It is to move to the sewing start position after passing through the machine origin.
		[Contents] The machine moves to the sewing start position after passing through the origin every after finishing sewing
		 [The moves to the start position directly without passing through the machine origin] [The moves to the start position after passing through machine origin]

Function No. : 003		Function Name : Return to the origin when limit error occurs
003. Machine Org2		When a feed plate exceed transfer limit during sewing operation, limit error occurs. At this time, if you press ESC key, you can decide whether the machine moves to the sewing start position without passing through the machine origin, or moves to the sewing start position after passing through the machine origin.
Setting Value	1) DISABLE	It is to move directly to the sewing start position without passing through machine origin.
		[Contents] When a feed plate exceed transfer limit during sewing operation, limit error occurs. At this time, if you press ESC key, you can move directly to the sewing start position without passing through the machine origin.
	2) ENABLE	It is to move to the sewing position after passing through the machine origin. (Factory-installed condition)
		[Contents] When a feed plate exceed transfer limit during sewing operation, limit error occurs. At this time, if you press ESC key, you can move directly to the sewing start position after passing through the machine origin.

Function No. : 004		Function Name : Return mode to the sewing start position
004. Strt Ret Mod		It is to set the moving mode to the sewing start position after finishing sewing operation.
Setting Value	1) SHORTEST	It is to moves to the sewing start position through the shortest route.(Factory installed condition)
		[Contents] It moves directly to the sewing start position without passing through machine origin after finishing sewing operation by the shortest route. But if it reads patterns newly, the machine moves to the sewing start position after passing through origin. [Caution] You should set return to the machine origin after finishing sewing operation in the function No. 002 as '1) DISABLE' for making the above setup available.
	2) ORG_TO_STR	It is to move to the sewing start position after passing through the machine origin.
		[Contents] The machine moves to the sewing start position after passing through the machine origin everytime after finishing sewing.
	3) REV_ORG_STR	It is to move to the sewing start position after returning to the machine origin by the reverse tracing of sewing patterns.
		[Contents] After finishing the sewing operation, the machine moves in reverse according to the sewing patterns, then it passes through the machine origin to move to the sewing start position.
		 [Movement after returning to the origin] [Movement after tracing the reverse direction]

Function No. : 005		Function Name : Counting method for bobbin count
005. Bobbin Count		It is to set the counting mode for bobbin counter.
Setting Value	1) UP_COUNT	It counts with rising figures. (Factory installed condition)
		[Contents] Whenever each operation finishes, count the bobbin counter which indicates how many times the machine sews same patterns after winding the bobbin once with rising figures. When you use the bobbin for the first time after winding, set the bobbin counter as "0". As the bobbin runs out, let the bobbin counter remember the figure of that time, and set the counting method as "DN_COUNT" and set the figure as an initial default for bobbin counter. [Caution] It does not indicate the time of bobbin exchange.
	2) DN_COUNT	It counts with getting down figures.
		[Contents] Whenever each operation finishes, count the bobbin counter marked on the LCD screen with getting down figures. Use that after properly setting the initial default of bobbin counter. [Caution] When the bobbin counter reaches "0", sewing operation will be stopped and "Reset Counter" appears to indicate the exchange time of bobbin. Upon that showing, exchange the bobbin and press ESC, then the initial default of bobbin counter will return to the previous default. The initial default of bobbin counter should be set upon changing the patterns.

Function No. : 006		Function Name : Use of products counter
006. Prodct Count		It is to set use of products counter.
Setting Value	1) DISABLE	It is not to use the products counter
		[Contents] Products counter is not used that informs products quantity whenever each operation finishes figure increases once by one. [Caution] Products counter on the LCD screen is not used.
	2) ENABLE	It is to use the products counter. (Factory installed condition)
		[Contents] Products counter is used that informs products quantity whenever each operation finishes figure increases one by one.

Function No. : 007		Function Name : Time for reading patterns
007. Pattern Read		It is to set the time to read pattern from floppy diskettes or memory.
Setting Value	1) JOB__SETUP	It is available to read patterns just before the preparation for sewing operation.
		[Contents] The machine can read patterns under the condition that ready lamp for sewing operation turns off. Upon reading patterns, the ready lamp for sewing operation turns on and becomes sewing available condition. Under the condition, NO key does not operate. [Caution] After Pressing ENTER↵ key to make the ready lamp turn off, you can read the pattern again.
	2) JOB__READY	It can read patterns even after finishing sewing preparation.(Factory installed condition)
		[Contents] The machine can read patterns in the sewing available mode just as sewing ready lamp turns off. Upon reading patterns, the ready lamp turns on and becomes sewing available condition. Under the condition, if you press NO key, the preparation lamp turns off, and the machine can read the patterns again.

Function No. : 008		Function Name : Trimming during emergency stop
008. Trim EM Stop		It is to set trimming method, either automatic or manual, when you stop the machine by pressing the emergency stop switch.
Setting Value	1) AUTO__TRIM	It is to trim automatically when emergency stop occurs.
		[Contents] The machine performs trimming automatically if you press the emergency stop switch during sewing operation.
	2) MANU__TRIM	It trims by pressing emergency stop switch. (Factory installed condition)
		[Contents] The machine stops if you press emergency stop switch during sewing operation. If you press emergency stop switch one more time to perform trimming after the machine stops. [Caution] If you step on pedal for starting operation under the condition that trimming is not available, the sewing operation will be restarted. The ORIGIN key does not operate.

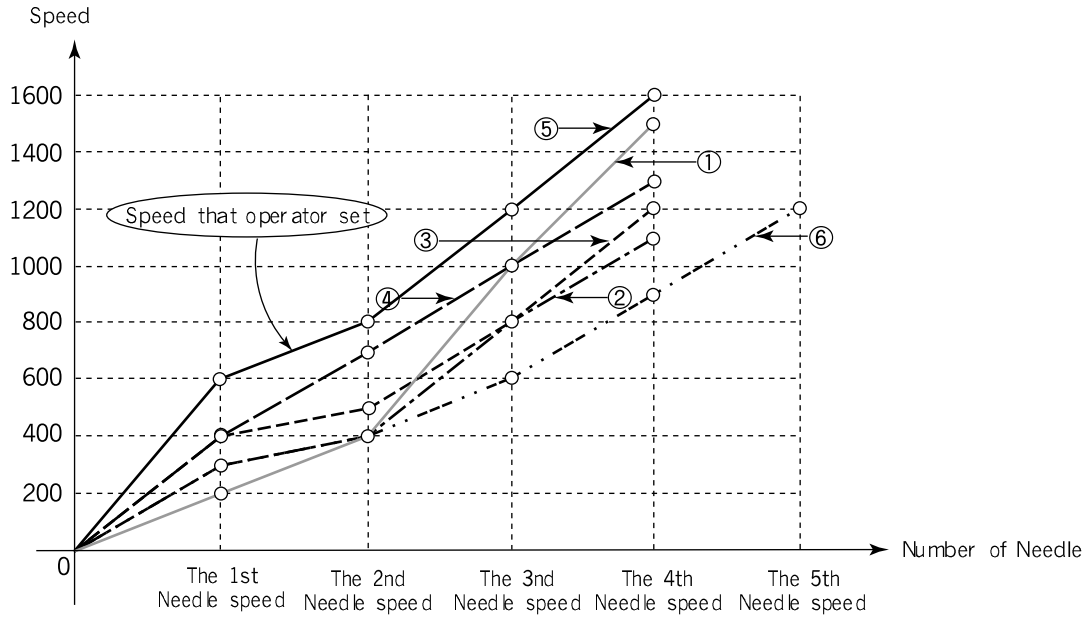
Function No. : 009	Function Name : Acceleration characteristics of main-shaft speed
009. Slow Start	It is to set acceleration characteristics of sewing speed when sewing operation starts. Factory default : SLOW__STRT5 The set values below are the values for 1306 and 1507 respectively

Setting Value

Speed of Needle / Characteristics	The 1st Needle Speed	The 2st Needle Speed	The 3st Needle Speed	The 4st Needle Speed	The 5st Needle Speed	Ref.
1) SLOW__STRT0	200	400	1000	1500		
2) SLOW__STRT1	300	400	800	1100		
3) SLOW__STRT2	400	500	800	1200		
4) SLOW__STRT3	400	700	1000	1300		
5) SLOW__STRT4	600	800	1200	1600		
6) SLOW__STRT5	300	400	600	900	1200	

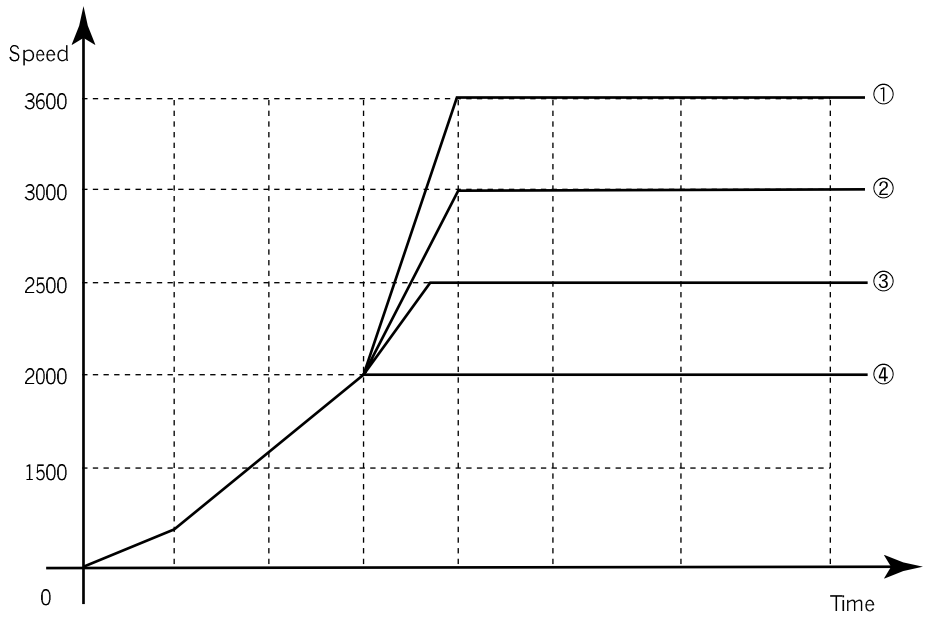
[Caution] When sewing speed that operator set is less than needle speed, the sewing speed has priority.

※ The set values could vary depending on machine type, and are up to change to improve the machine function.



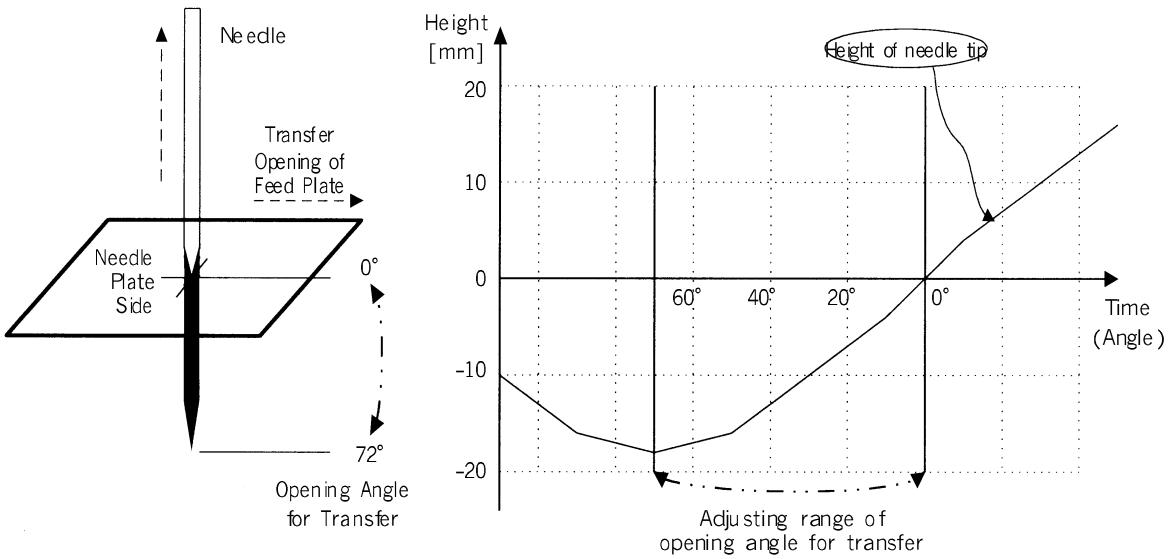
[Acceleration characteristics of sewing speed]

Function No. : 010		Function Name : Maximum speed limit of sewing
010. Max Speed		It limits the maximum speed of sewing machine.
Setting Value	1) 3600spm	It limits the speed under 3600spm.
	2) 3200spm	It limits the speed under 3200spm.(Factory installed condition)
	3) 2500spm	It limits the speed under 2500spm.
	4) 2000spm	It limits the speed under 2000spm.
		[Caution] The sewing speed set within patterns has priority than maximum sewing speed. For example, though the maximum speed of sewing set as 3000spm if the sewing speed within patterns is set as 2500spm, the real speed of sewing is 2500spm.



[Limit of maximum sewing speed]

Function No. : 011		Function Name : Opening angle of feed plate transfer
011. Feed End Pos		It is to adjust an opening angle of feed plate transfer based on needle bar.
Setting Value	0 ~ 72°	It is to adjust an opening angle of feed plate transfer according to the thickness of sewing materials. (Factory default : 50°)
		[Contents] You should adjust the opening angle of feed plate transfer based on needle bar according to the thickness of sewing materials. As seen in the below fig. the opening angle of feed plate transfer indicates relative position of needle tip based on the needle plate side. Set as 0° when the needle tip is positioned on the needle plate side. [Caution] Below figure shows not the real time of feed plate transfer, but an adjustment of time(angle) which an order for feed plate transfer. Until the transfer starts after transmitting the order of feed plate transfer, delay time exists, so the real time(angle) to start the feed plate transfer is when a needle is positioned on the needle plate side.



[Opening angle of feed plate transfer]

Function No. : 012		Function Name : Signal mode of Pedal 1
012. Pedal 1 Mode		It is to set how to treat signal of pedal 1(pedal for upper feed plate).
Setting Value	1) LATCH	The upper feed plate goes down when you step on a pedal once and take off your foot from the pedal. (Factory installed condition)
	2) FLIP	The upper feed plate goes down just when you step on a pedal.

Function No. : 013		Function Name : Signal mode of pedal 2
013. Pedal 2 Mode		It is to set how to treat the signal of pedal 2(Pedal for sewing start).
Setting Value	1) LATCH	Sewing operation starts when you step on a pedal once and take off your foot from the pedal. (Factory installed condition)
		[Contents] If you step on the pedal (pedal for sewing start) once, the signal is treated as effective one even though you take off foot from the pedal, and the sewing operation will be started. [Ref.] As above LATCH means a signal system that if once a signal comes(when you step on a pedal), the signal is treated as an effective one though the signal is cancelled(even when you take off foot from the pedal).
	2) FLIP	The sewing operation performs just when you step on a pedal.
		[Contents] The sewing operation performs just when you step on the pedal (pedal for sewing start), but if you take off foot from the pedal 1, the sewing operation will be stopped. [Ref.] As above, FLIP means a signal system that the signal is treated as an effective one just when the signal is coming(just when you step on a pedal).

Function No. : 014		Function Name : Setup for presser foot operation
014. PF Operation		It is to set the operation condition of presser foot.
Setting Value	1) ALWAYS__DN	It is to maintain the presser foot down all the time.
		[Contents] The machine maintains the presser foot down all the time even not in use.
	2) SEW__DN	The presser foot is up except during sewing operation. (Factory installed condition)
		[Contents] The machine goes down the presser foot just when the sewing operation performs. When the sewing operation stops or finishes, the presser foot goes up. [Ref.] If you press 5 key, the presser foot goes down to make thread inserted.
	3) TRIAL__DN	The machine goes down the presser foot in the progress or reverse of one stitch as well as in the sewing operation.
		[Contents] The presser foot goes down not only in the progress and reverse of one stitch but during the sewing operation.

Function No. : 015		Function Name : Setup for descent time of presser foot
015. PF Down Mode		It is to set the descent time of presser foot. [Caution] This function is not available if Function No. 014. Pf Operation sets as 1)ALWAYS__DN.
Setting Value	1) WITH__STRT	The presser foot goes down at the same time as main shaft turns. (Factory installed condition)
		[Contents] When the main shaft turns, the presser foot goes down simultaneously.
	2) WITH__FEED	The presser foot goes down at the same time as the upper feed plate descend.
		[Contents] When the upper feed plate descends, the presser foot goes down simultaneously.

Function No. : 016		Function Name : Setup for thread detection
016. Thrd Detect		It is not to set to detect thread [Related functions] Function No. 017 "Thrd. Stitch 1" Function No. 018 "Thrd. Stitch 2"
Setting Value	1) DISABLE	It is not to use the function of thread detection.
		[Contents] The machine does not stop working till pattern working finishes even though thread runs out or cuts.
	2) ENABLE	It is to use the function of thread detection. (Factory installed condition)
		[Contents] If thread runs out or cuts, the machine stops working with a message on the LCD screen.

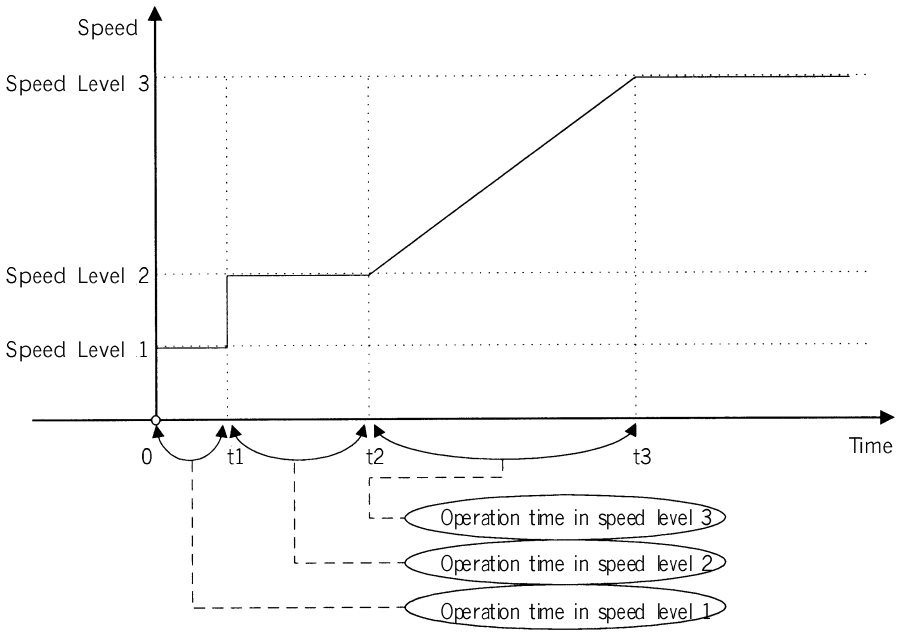
Function No. : 017		Function Name : Detecting the stitch number in starting sewing
017. Thrd Stitch 1		It is to set the number of stitches when sewing operation starts. [Caution] This function is not available of Function No. 016. "Thrd Dectect" sets as "1) DISABLE".
Setting Value	0 ~ 15	It is to set to detect the number of stitches. (Factory installed condition : "5")
		[Contents] If you start sewing operation under the condition that there's no thread or thread is cut, the machine detects the condition directly and make a decision when operation stops. For example, if you set "0", as soon as the machine detects no thread available, the machine stops operation. [Caution] In case that set value is small, misdetection can occur.

Function No. : 018		Function Name : Detecting the stitch number during sewing
018. Thrd Stitch 2		It is to set the number of stitches during operation. [Caution] This function is not available if Function No. 016. "Thrd Detect" sets as "1) DISABLE".
Setting Value	0 ~ 15	It is to set to detect the number of stitches. (Factory installed condition : "3")
		[Contents] If thread is cut during operation, the machine detecting the condition directly and make a decision when operation stops, For example, if you set "0", as soon as the machine detects no thread available, the machine stops operation. [Caution] In case that set value is small, misdetection can occur.

Function No. : 019		Function Name : Use of trimming function
019. Trim En/Dis		It is to set if the machine uses the trimming function or not.
Setting Value	1) DISABLE	Trimming function is not available.
		[Contents] If the machine gets trimming code within pattern data or detects thread cut during operation, the machine does not perform the trimming function.
	2) ENABLE	Trimming function is available. (Factory installed condition)
		[Contents] If the machine gets trimming code within pattern data or detects thread cut during operation, the machine performs the trimming function.

Function No. : 020		Function Name : Manual operation time in speed level 1
020. Jog Time 1		It is to set the manual operation of the feed plate to speed up.
Setting Value	0 ~ 9900ms	It is to set the time for operation in speed level 1. (Factory installed condition : "400ms")
		[Contents] When the feed plate is manually operated by the direction keys, it sets the time for feed plate transfer speed level 1.

Function No. : 021		Function Name : Manual operation time in speed level 2
021. Jog Time 2		It is to set the manual operation of the feed plate to speed up.
Setting Value	0 ~ 9900ms	It is to set the time for operation in speed level 2. (Factory installed condition : "900ms")
		[Contents] When the feed plate is manually operated by the direction keys, it sets the time for feed plate transfer speed level 2.

Function No. : 022		Function Name : Manual operation time in speed level 3
022. Jog Time 3		It is to set the manual operation of the feed plate to speed up.
Setting Value	0 ~ 9900ms	It is to set the time for operation in speed level 3. (Factory installed condition : "1500ms")
		[Contents] When the feed plate is manually operated by the direction keys, it sets the time for feed plate transfer speed level 3.
		

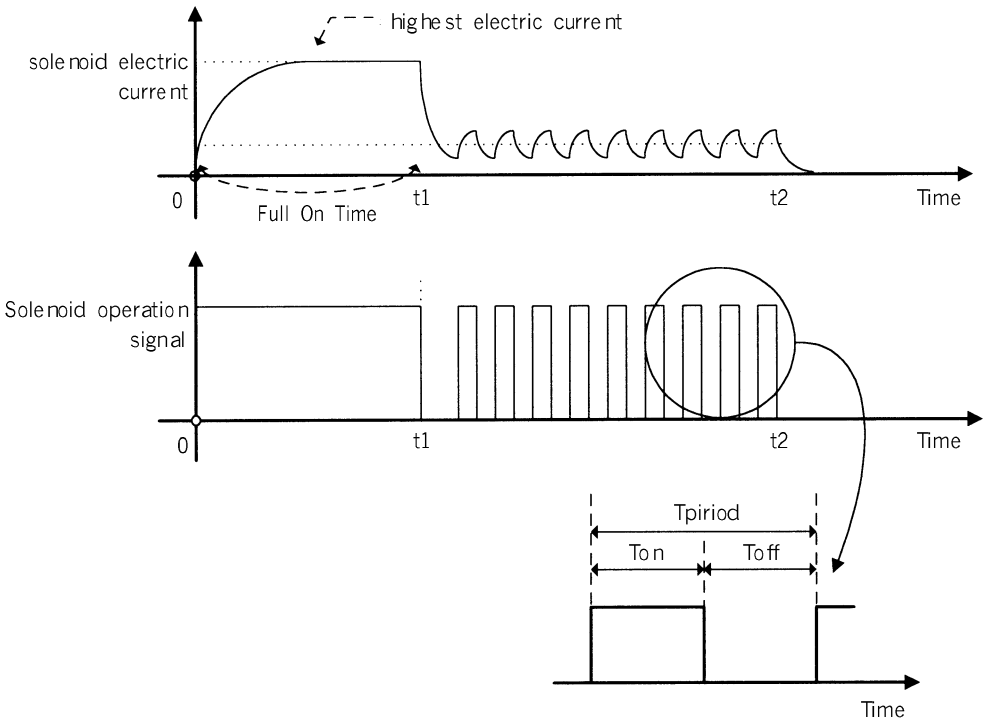
Function No. : 023		Function Name : Time for function of the speed level 1 key
023. Con Key Tm 1		It is to set the feed plate transfer to speed up.
Setting Value	0 ~ 9900ms	It is to set the time for operation in speed level 1. (Factory installed condition: "200ms")
		[Contents] When pressing the FORW, BACK keys continuously to move the feed plate, set the time for the transfer speed at level 1.

Function No. : 024		Function Name : Time for function of the speed level 2 key
024. Con Key Tm 2		It is to set the feed plate transfer to speed up.
Setting Value	0 ~ 9900ms	It is to set the time for operation in speed level 2. (Factory installed condition: "100ms")
		[Contents] When pressing the FORW, BACK keys continuously to move the feed plate, set the time for the transfer speed at level 2.

Function No. : 025		Function Name : Time for function of the speed level 3 key
025. Con Key Tm 3		It is to set the feed plate transfer to speed up.
Setting Value	0 ~ 9900ms	It is to set the time for operation in speed level 3. (Factory installed condition: "1000ms")
		[Contents] When pressing the FORW, BACK keys continuously to move the feed plate, set the time for the transfer speed at level 3.

Function No. : 026		Function Name : Presser foot full on time
026. TT Full On Tm		It is to set the beginning strength of the presser foot solenoid.
Setting Value	0 ~ 1020ms	It is to set the time period the highest electric current passes through the solenoid. (Factory installed condition : "100ms")
		[Contents] When thread trimming with electric solenoids, the strength of the trimming operation at the beginning can be adjusted by adjusting the Full on time. [Caution] If set too low, the solenoid may not operate, and when set too high, too much electric current may overheat and damage the solenoid and fuse. [Reference] The operation time and strength of the actuators (presser foot, trimmer, wiper) which use the solenoid, can be adjusted by adjusting the electric current of the solenoid. Full on time is the period when the solenoid's electric current is at the highest point.

0 ~ t1 : Full On Time (Period of highest electric current)
0 ~ t2 : Solenoid operation time
t1 ~ t2 : Period when electric current flows from duty



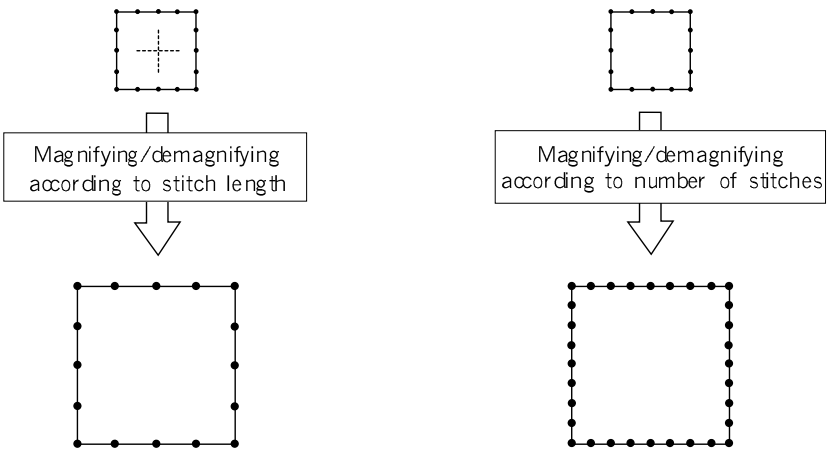
$$*\text{Duty}=\frac{\text{Ton}}{\text{Tpiriod}} \times 100(\%)$$

*Duty is the rate of time the signal light is lighted during a period of time. For example, when the duty is 50%, Ton and Toff are the same.

Function No. : 027		Function Name : Thread trimming duty
027. TT Duty		It is to set the maintenance capacity of the thread trimming solenoid.
Setting Value	30 ~ 80%	It is to set the amount of maintenance current permitted to solenoid. (Factory installed condition : 30%)
		[Description] In case of electronic solenoid-driven trimming, electric current is adjusted by Duty and sent to the solenoid. It determines the force of maintaining trimming motion. [Caution] If the set value is too small, the solenoid is unable to maintain its position after its motion and thereby return to the original position. In this case, sewing is impossible. If the set value is too high, excessive electric current might flow in the solenoid, causing heat. If heat is too severe, it may damage the solenoid and fuse. [Note] As in the figure, Duty is the ratio of time when a signal is turned on compared to the cycle time. If the input voltage is low, raise the duty value 5% higher than the normal level.

Function No. : 028		Function Name : Pattern data reading mode
028. PTRN RD MODE		It is to set the mode of searching and reading the pattern data.
Setting Value	1) DISABLE	Searches and reads from the floppy diskette. [Contents] When reading a new pattern data, in other words, when the pattern data is being read while the ready lamp is off, the pattern data is searched and read only from the floppy diskette. After a pattern data has once been read from the disk, the data is saved in the internal memory. And the pattern is sewn with the data from the internal memory while the ready lamp is on. [Caution] The work may take long, as it takes relatively long time in reading data from the diskette.
	2) ENABLE	The pattern is first read from the internal memory. (Factory installed condition) [Contents] When a new pattern data is read, it is first searched from the internal memory. If the data does not exist in the internal memory, it is searched and read from the floppy disk. [Contents] If you want to exit from the current sewing work and move to the programming status to program new pattern, you can store your new pattern in the same pattern number as the one before on the floppy disc. However, internal memory will still retain the previous pattern shapes, thus the previous pattern will be called and you might think that your new programmed pattern is not stored properly. Refer to 2 ~ 3 "Check and delete pattern number" to delete pattern number stored in internal memory. Please keep in mind that it is most desirable to use a different number to store your new patterns to prevent such mix-up with the previous patterns.

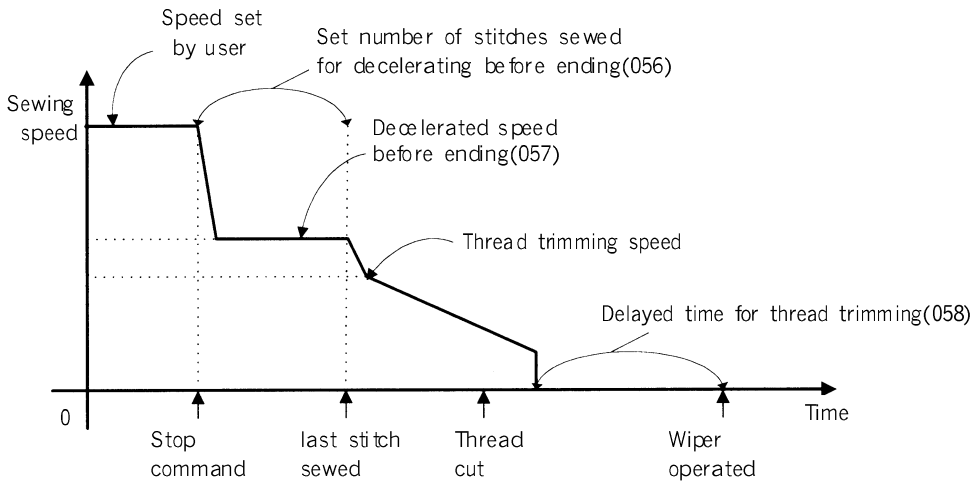
Floppy Diskette	Memory	About the Processes
No. 003  No. 003 	No. 003  No. 003 	There is star pattern No. 003 in the floppy diskette. When the pattern is read, the data is copied and saved into the internal memory. And the pattern is sewn with the data read from the internal memory. In the programming mode, a circle pattern is written and saved as No. 003. When pattern No. 003 is read from the internal memory, the star pattern which had already existed before the circle pattern, is called. As the star pattern is sewn, it seems as though the circle pattern has not been saved in floppy disk.

Function No. : 029		Function Name : Setting the magnifying/demagnifying mode
029. Scale Mode		It is to select and set the magnifying/demagnifying mode.
Setting Value	1) DISABLE	The Magnifying/demagnifying function is not used.
		[Contents] The machine uses the pattern data in the programmed size. As the magnifying/demagnifying function is not selected, the X scale , Y scale keys are not operated. Adjust the "XS" and "YS" indicated on the screen to 100%
	2) STITCH_LEN	It is to set the magnifying/demagnifying mode using the stitch length. (Factory installed condition)
		[Contents] While the number of stitches are the same, the length of the stitches along the X and Y axis are adjusted according to the magnifying/demagnifying rate. Set the rate within the feed plate transfer limit.
	3) STITCH_NUM	It is to set the magnifying/demagnifying mode using the number of stitches.
	* It is not applied (It is going to apply later)	[Contents] While the length of stitches are the same, the number of stitches are adjusted along the X and Y axis. Set the rate within the feed plate transfer limit.
		

Function No. : 030		Function Name : Number of stitches to decelerate before ending work
030. Decel Stitch		It is to set the stitch number of when to decelerate before ending the work.
Setting Value	2~16 Stitch	It is to set the number of stitches when the machine should decelerate. (Factory installed condition : 4)
		[Contents] It is to set the number of stitches when the machine should start decelerating before ending the operation.

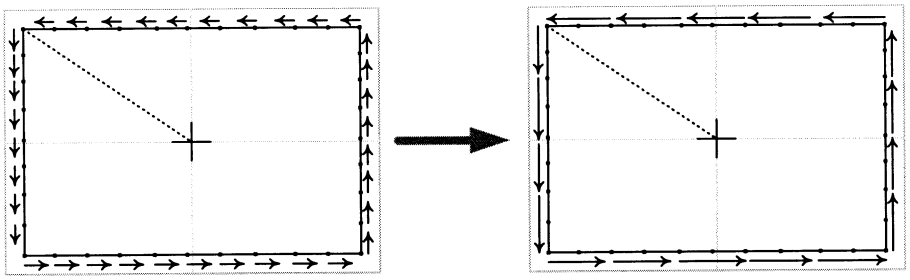
Function No. : 031		Function Name : Decelerating speed before ending work
031. Decel SPM		It is to set the speed the machine should decelerate before ending the work.
Setting Value	200~500spm	It is to set the speed to decelerate before ending the work. (Factory installed condition : "400")
		[Contents] The speed must be decelerated before ending the work. The decelerating speed is set here.

Function No. : 032		Function Name : Thread trimming delayed time
032. Trim Delay		It is to set the delayed time before the wiper is operated after the thread is trimmed.
Setting Value	52~1020ms	It is to set the delayed time after thread trimming. (Factory installed condition : "72")
		[Contents] It is to set the delayed time of the wiper operation after the thread has been cut.



[The ending Process of Sewing]

Function No. : 033		Function Name : The selection of the low pressure detecting device
033. Low Pressure		With machines using air pressure, it is selected whether to use the low pressure detecting device or not.
Setting Value	1) DISABLE	Low pressure detecting device is not used. (Factory installed condition)
		[Contents] With machines using air pressure, it is ignored when the pressure of the compressor goes below the principle limit.
	2) ENABLE	The low pressure detecting device is used.
		[Contents] If the pressure of compressure is below regulations, in case pneumatic kinds, the error is marked on the screen to inform users.

Function No. : 034		Function Name : Back/Forth jump stitches
034. ConKey3 Num		User can define stitch value to move. 1~100[Stitch]
Setting Value	1	[Contents] To confirm the pattern with the back/forth stitch function, the user can set the stitch value to reduce the time to retrieve stitches.
	 ConKey3 Num=1 [Before Setting-Up] ConKey3 Num=3 [After Setting-Up]	

Function No. : 035		Function Name : Setting-up reference point for zooming
035. Scale Refer		On sewing mode, the user can zoom design based on machine origin, second origin, sewing starting point and user-defined reference point.
Setting Value	1) MACHINE_ORG	Zooming based on the machine origin (Factory Default)
		[Contents] Scaling up/down based on the current machine origin.
	2) SECOND_ORG	Zooming based on the second origin set by user.
		[Contents] Scaling up/down based on the second origin set by user at any location.
	3) SEWING_STRT	Zooming based on the reference on the sewing starting point
		[Contents] Zooming based on the first stitch of any pattern design.
	4) REFER_PNT	Zooming based on th reference point defined by user at any location.
		[Contents] Zooming based on the reference point defined by user at program code No.058 of 〈Function Code〉.

Function No. : 036		Function Name : Sewing limit set-up
036. Sewing Limit		Designed to ensure the user to increase the mechanical sewing limit of the machine as desired
Setting Value	1) DISABLE	Not in use (When shipped out from the factory)
		[Contents] The sewing limit cannot be expanded. Use the sewing limit as defined by type.
	2) ENABLE	In use
		[Contents] The user can expand the sewing limit. [Caution] On condition that sewing limit is changed in accordance with mechanically expanded limit. Otherwise, the machine can be damaged.

Function No. : 037		Function Name : X-axis forward direction sewing limit set-up
037. XPLUS Limit		The user can increase the X-axis forward direction as desired.
Setting Value	1 ~ 255mm	Set the size of X-axis forward direction as desired. (At the time of the factory shipping, machines are set in line with their sewing limit by type) Ex: 75mm for 1507 type
		[Contents] The user can expand the size of sewing limit in the program. [Caution] The feeding axis must be changed in line with the size of sewing limit where mechanical feeding is possible. If the user increases the set-up value in the program and begins feeding, the machine can be severely damaged.

Function No. : 038		Function Name : X-axis reverse direction sewing limit set-up
038. XMINUS Limit		The user can increase the X-axis reverse direction of the sewing limit
Setting Value	-1 ~ -255mm	Set the size of X-axis reverse direction as desired. (At the time of the factory shipping, machines are set in line with their sewing limit by type) Ex: -75mm for 1507 type
		[Contents] The user can expand the size of sewing limit in the program. [Caution] The feeding axis must be changed in line with the size of sewing limit where mechanical feeding is possible. If the user increases the set-up value in the program and begins feeding, the machine can be severely damaged.

Function No. : 039		Function Name : Y-axis forward direction sewing limit set-up
039. YPLUS Limit		The user can increase the Y-axis forward direction of the sewing limit
Setting Value	1 ~ 255mm	Set the size of Y-axis forward direction as desired. (At the time of the factory shipping, machines are set in line with their sewing limit by type) Ex: 35mm for 1507 type
		[Contents] The user can expand the size of sewing limit in the program. [Caution] The feeding axis must be changed in line with the size of sewing limit where mechanical feeding is possible. If the user increases the set-up value in the program and begins feeding, the machine can be severely damaged.

Function No. : 040		Function Name : Y-axis reverse direction sewing limit set-up
040. YMINUS Limit		The user can increase the Y-axis reverse direction of the sewing limit
Setting Value	-1 ~ -255mm	Set the size of Y-axis reverse direction as desired. (At the time of the factory shipping, machines are set in line with their sewing limit by type) Ex: 35mm for 1507 type
		[Contents] The user can expand the size of sewing limit in the program. [Caution] The feeding axis must be changed in line with the size of sewing limit where mechanical feeding is possible. If the user increases the set-up value in the program and begins feeding, the machine can be severely damaged.

Function No. : 041		Function Name : Laser Point
041. Laser Point		The function is to set the accurate position of the fabric during sewing work.
Setting Value	1) DISABLE	Not in use (at the factory)
		[Contents] The Laser Point function is not applied.
	2) ENABLE	In use.
		[Contents] The Laser Point function is applied. When the Laser Point function is enabled, the laser point signal is displayed during the sewing only.

Function No. : 042		Function Name: Setting reverse rotation after trimming
042. RevAfterTrim		It is to set reverse rotation after trimming.
Setting Value	1) DISABLE	Not in use
		[Contents] It will not apply reverse rotation after trimming.
	2) ENABLE	In use(at the factory)
		[Contents] It will apply reverse rotation after trimming. In case of SPS/C-Series, it is possible to apply reverse rotation after trimming, contrary to existing pattern machines. Therefore, if sewing materials are too thick, motion of needle may be interfered with by sewing materials and clamp during the jump motion after trimming. In this case user can avoid the interference by setting reverse rotation.

Function No. : 043		Function Name: Set reverse rotation angles after trimming
043. ReverseAngle		The function is to set reverse rotation angles during reverse rotation operation of machine.
Setting Value	1° ~ 40°	It is available to set reverse rotation angles. (Factory installed condition: "15°")
		[Contents] It is possible to set reverse rotation angle. The reverse rotation angle, set when reverse rotation after trimming mentioned in Function No.: 76 is set at ENABLE, will be applied.

Function No. : 044		Function Name: Save Type Setting
044. Save Type		This function is to decide the place of saving the pattern design after the design is created.
Setting Value	1) SAVE_FDD	The design will be saved in FDD.
		[Contents It is same as FDD saving.
	2) SAVE FLASH	The design will be saved in Flash Memory.
		[Contents] If FDD is faulty or there is no FDD, the design can be saved in Flash Memory.
	3) CF CARD	The design will be saved in CF Card (default).
		[Contents] IInsert CF Card first before turning on the power of the machine. When CF Card is set, designs will be saved in CF Card.

Function No. : 045		Function Name: Deleting Other Designs When Opening New Design
045. DsgnOpnCtrl		This function is to set whether other designs will be deleted when a new design is opened.
Setting Value	1)SAVE	Design Saving in Flash Memory (default)
		[Contents] When a design is opened from a floppy diskette or CF Card, save the designs opened from Flash Memory. If other designs need to be opened continuously, they could be saved in Flash Memory and it might cause memory save shortage. Therefore it would be better to save up to 16 designs (100kbyte per design).
	2) DELETE	Deleting Designs from Flash Memory
		[Contents] When designs are opened from Flash Memory, the designs will be deleted consecutively one by one. Therefore, whenever designs are opened from Flash Memory continuously, the current design will remain saved, while other designs are deleted.

Function No. : 046		Function Name: Set the jump speed
046. Jump Speed		It sets the jump speed.
Setting Value	1) SLOW_SPEED	Set the slowest jump speed.
		[Contents]
	2) MIDDLE_SPEED	Set the medium jump speed. (default)
		[Contents]
	3) FAST_SPEED	Set the fastest jump speed.
		[Contents] To reduce work hours, set the jump speed at the highest. Substantial amount of time can be saved.

Function No. : 047		Function Name: Overlapping Stitch Setting for Pocket Design
047. PocketOvLap		When the pocket design auto creation code is used, it sets the overlapping stitch number.
Setting Value	0 ~ 10 stitch	Set the overlapping stitch number (default value: 4 stitches).
		[Contents] Set the overlapping stitches before sewing is over.

Function No. : 048		Function Name: BarTack Speed Setting for Pocket Design
048. BarTackSpeed		When the pocket design auto creation code is used, it sets the speed for the bartack section.
Setting Value	1000 ~ 2300 spm	Set the speed for the bartack section. (default value: 2300 [spm]).
		[Contents]

Function No. : 049		Function Name: Emergency stop switch setting in case of jumping
049. Jump EM Stop		During the jump operation, it checks the operation of the emergency stop switch
Setting Value	1) DISABLE	Not used. (default)
		[Contents] If the emergency stop switch is activated during the jump operation, the machine will make an emergency stop after the jump operation.
	2) ENABLE	Used.
		[Contents] If the emergency stop switch is activated during the jump operation, the machine will make an emergency stop after the jump operation.

Function No. : 050		Function Name: Stacker Setting
050. Stacker		It enables or disables the stacker which automatically stacks blue jeans after sewing is completed.
Setting Value	1) DISABLE	Not used.
		[Contents]
	2) ENABLE	Used. (default)
		[Contents]

Function No. : 051		Function Name: Sewing Repeat Function Setting
051. Auto Start		The function makes next sewing fabric ready for sewing in the middle of sewing.
Setting Value	1) DISABLE	Not used.
		[Description] After sewing is done, Two Start switch can be pressed.
	2) ENABLE	Used. (default)
		[Contents] Place sewing fabric on the machine and press the Two Start switch. Then when sewing is completed, the sewing fabric returns to the starting point.

Function No. : 052		Function Name: Feed Clamp Setting
052. Feed Clamp		It enables or disables the feed clamp which feeds sewing fabric to the sewing machine.
Setting Value	1) DISABLE	Not used.
		[Contents] Without the feed clamp, conduct sewing using the inner/outer presser plate only.
	2) ENABLE	Used. (default)
		[Contents]

Function No. : 053		Function name: Extended I/O board
053. EX_IO BD SET		It sets the receipt of external signals and the transmission of internal signals.
Setting Value	1) DISABLE	Not used. (default)
		[Contents] If the function is unused, the way of using the machine is same as before.
	2) ENABLE	Input/output signals are used.
		[Contents] It starts sewing with input signal or sends out signals during sewing.

Function No. : 054		Function name: Set the design preview
054. Thumbnail Set		Press the number button at the initial stage to check saved designs and set the calling method. (Supported by Graphic OP only)
Setting Value	1) DISABLE	Not used. (default)
		[Contents] If the function is unused, the way of using the machine is same as before.
	2) ENABLE	Preview function can be used.
		[Contents] Press number buttons at the initial stage to select one among Memory, FDD, and CF Card to call saved designs.

Function No. : 055		Function name: Set the use of needle bar cooler
055. Air Cooler		It sets the use of needle bar cooler to cool off a needle during sewing.
Setting Value	1) NOT	Not used.
		[Contents] If the function is unused, the way of using the machine is same as before.
	2) HALF	Used to sew inner pocket lines. (default)
		[Contents] The needle bar cooler starts moving from the zigzag sewing point.
	3) FULL	Used across all sections.
		[Contents] During sewing, across all sections, the needle bar cooler starts operating.

Function No. : 056		Function name: Set the thread release motion when the presser bar descends
056. Set TR2Thrd		When No.5 key is pressed, and the presser bar is descending, the thread release starts operating. This function can test the upper thread tension.
Setting Value	1) DISABLE	Not used. (default)
		[Contents] If the function is unused, the way of using the machine is same as before.
	2) ENABLE	The thread release starts operating.
		[Contents]

Function No. : 057		Function name: Extended inner clamp setting
057. Inner GUIDE		It determines whether to use the extended inner clamp.
Setting Value	1) DISABLE	Not used.
		[Contents] If the extended inner clamp is not used, the function needs to be set only in case of sewing the outline or using the inner clamp simply as a presser.
	2) ENABLE	Used. (default)
		[Contents]

Function No. : 058		Function name: PF climb range setting
058. Use 2nd PF		It determines whether to set different PF dimbs.
Setting Value	1) DISABLE	Not used.
		[Contents] If the function is not used, PF is used same as before.
	2) ENABLE	Used. (default)
		[Contents]

Function No. : 059		Function name: Pattern sewing machine function setting
059. Use Pattern		It determines whether the sewing machine is used as a pattern sewing machine.
Setting Value	1) DISABLE	Not used. (default)
		[Contents] It determines whether to set different PF climbs.
	2) ENABLE	Used.
		[Contents] To use the machine as a pattern sewing machine, the inner/outer clamp should be removed, and the pattern clamp should be attached instead. After the pattern clamp attachment, the machine is operated by the pedal only as in the existing pattern sewing machines.

Function No. : 060		Function name: Clamp safety function setting
060. Safe Feeder Feeding		It identifies the clamp position and prevents clash with the outer clamp.
Setting Value	1) DISABLE	Not used. (default)
		[Contents] It determines whether to set different PF climbs.
	2) ENABLE	Used.
		[Contents] This function can be used only when the sensor is attached to the lower part of the feeding clamp below the table.

Function No. : 061		Function name: Temporary suspension of main shaft during inner clamp operation
061. Guide Stop		This function enables temporary suspension of the main shaft operation when the inner clamp moves for enlargement or reduction.
Setting Value	1) DISABLE	Not used. (default)
		[Contents] It determines whether to set different PF climbs.
	2) ENABLE	Used.
		[Contents] The main shaft stops temporarily. After the inner clamp starts operating, the main shaft resumes its normal operation.

Function No. : 062		Function name: Sewing material guide bar setting
062. Feeder Guide		This function sets the proper position of sewing material.
Setting Value	1) DISABLE	Not used. (default)
		[Contents] It determines whether to set different PF climbs.
	2) ENABLE	Used.
		[Contents] When it is enabled, press the left presser plate to use this function.

Function No. : 063		Function name: Program mode lock
063. Program Lock		This function locks the program mode under the main menu.
Setting Value	1) DISABLE	Not used. (default)
		[Contents] It determines whether to set different PF climbs.
	2) ENABLE	Used.
		[Contents] When it is enabled, users cannot enter the program mode.

Function No: 064		Function Name: Origin setting
064. SetOrigin		It sets the X, Y origins of the machine.
Setting Value	1) DISABLE	The origin setting function is not being used(default when released from factory).
		[Description]
	2) ENABLE	The origin setting function is being used.
		[Description] When the feed clamp and the XY clamp are not located in the same place, the function will be used.

Function No. : 065		Function Name: Set up the positions to stop the needle bar
065. UpStop Pos		The function to set up the positions to stop the needle bar is to stop the needle bar at the positions of the established values when the motor stops. (It is applied only for the Direct Models.)
Setting Value	50	It is available to set up the values within a range of 0° ~ 360°. (Factory installed condition: 0°.)
		[Contents] The angles of the needle bar positions shall be changed as follows. It will show the change of the angle values when turning the hand pulley counterclockwise. The current angle values will be set up at the changed position by pressing the ENTER key. However, value of SPS/C-Series is originally set at 97°, upon shipment, because main shaft motor is installed at the 90° changed position due to the rise of HEAD.

1) Function No. Related to Pattern Programming

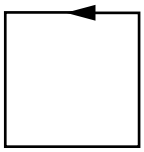
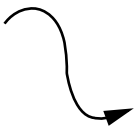
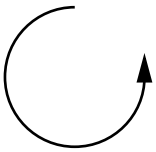
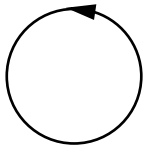
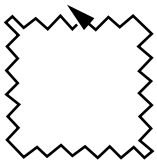
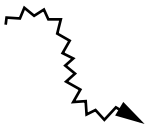
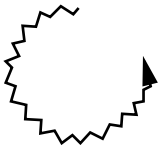
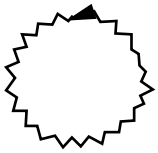
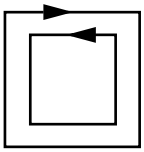
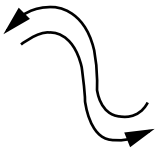
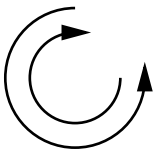
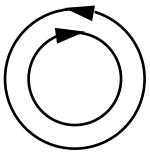
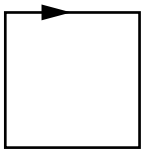
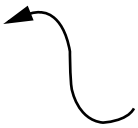
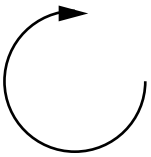
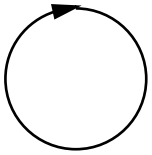
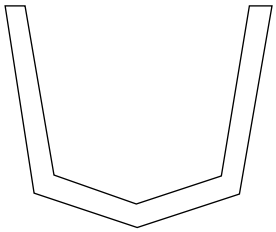
(Function numbers might be different depending on machine type.)

NO.	Function	Contents
000	Trimming	Addition of trimming code.
001	2nd origin	Set of the 2nd origin.
002	Temporary suspension	Temporary suspension in a particular point.
003	One turn of sewing machine	Processing without sewing.
004	JUMP	Feed needle bar without sewing.
005	Point sewing	User inputs every stitch to create the sewing data.
006	Linear/Curving line sewing	Use straight line/curve to create the sewing data.
007	Linear sewing	Use Straight line to create the sewing data.
008	Spline sewing	use curve to create the sewing data.
009	Arc sewing	use arc to create the sewing data.
010	Circle sewing	Use circle to create the sewing data.
011	Change of jump speed	
012	Change of stitching speed	Use when changing embroidery speed within one work pattern.
013	Partial Sewing Stitch Width Change	Change stitch width by selecting a fixed part of sewing shape.
014	Pattern data reading from floppy diskette	Read the stored pattern from floppy diskette.
015	Pattern data writing to floppy diskette	Store the programmed pattern into floppy diskette.
016	Floppy diskette formatting	Format the floppy diskette.
017	Information indication of present pattern data	Number of stitches, Speed, Backlash, X-magnification, Y-magnification, Tracing, R-Pattern N0. W-Pattern No.
018	Coordinates setting	Absolute coordinate system/relative coordinate system.
019	Linear zig-zag sewing	Use straight line to create the zigzag sewing data.
020	Spline zig-zag sewing	Use curve to create the zigzag sewing data.
021	Arc zig-zag sewing	Use arc to create the zigzag sewing data.
022	Circle zig-zag sewing	Use circle to create the zigzag sewing data.
023	Linea offset sewing	Set the distance based on straight line to create the offset sewing data.
024	Spline offset sewing	Set the distance based on curve to create the offset sewing data.
025	Arc offset sewing	Set the distance based on arc to create the offset sewing data.
026	Circle offset sewing	Set the distance based on circle to create the offset sewing data.
027	Linear double sewing	Create the same sewing data as that created by straight line.
028	Spline double sewing	Create the same sewing data as that created by curve.
029	Arc double sewing	Create the same sewing data as that created by arc.
030	Circle double sewing	Create the same sewing data as that created by circle.
031	Straight line dual reverse sewing	Create sewing data, which is opposite to straight line sewing data.
032	Curved line dual reverse sewing	Create sewing data, which is opposite to curved line sewing data.

NO.	Function	Contents
033	Circular arc dual reverse sewing	Create sewing data, which is opposite to circular arc sewing data.
034	Round dual reverse sewing	Create sewing data, which is opposite to round sewing data.
035	Linear reverse sewing	Create the opposite sewing data of the straight line data.
036	Spline reverse sewing	Create the opposite sewing data of curve data.
037	Arc reverse sewing	Create the opposite sewing data of arc data.
038	Circle reverse sewing	Create the opposite sewing data of circle data.
039	Partial Pattern Data Delete Function	Delete by selecting one from created pattern shapes.
040	Addition of automatic back-tack	Automatic back tacking.
041	Condensed Sewing Stitch Adding	It is the function to prevent stitches from being untangled by making stitch width condensed in sewing start part and sewing end part of pattern data.
042	Addition of overlap stitch	Additionally proceed sewing as many numbers of stitches as the user wants.
043	X-axis Symmetrical Data Addition	Add pattern data selected on the basis of X-axis.
044	Y-axis Symmetrical Data Addition	Add pattern data selected on the basis of Y-axis.
045	Point Symmetrical Data Addition	Add by making symmetric pattern data on the basis of end point of pattern data.
046	Partial Movement of Pattern Data	Move part of pattern to different location among the sewing shape.
047	Copying Function of Pattern Data to Specific Location	Set a fixed part of pattern shape and copy to desired location.
048	Deletion of pattern data	Delete sewing data on any part of pattern.
049	Partial Pattern Data Delete Function	Delete one of the generated pattern data shapes selectively (For example: Jump, Line, Curve, Arc, Circle).
050	Change/Saving Function of Maximum Pattern Sewing Speed and Extension/Reduction Rate	Set up maximum sewing speed and extension/reduction rate by pattern.
051	One stitch move function	Amend the position of one stitch of the created pattern.
052	A Fixed Number of Stitch Delete Function	Delete 1-99 stitch in the pattern data shape after the start point to delete at present.
053	Change/Saving Function of Pattern Data Start Point	Change and save pattern data start point already set up when punching.
054	Change/Saving Function of Pattern 2nd Original Point	Change the already setup 2nd original point to new 2nd original point and save it.
055	Setting-up automatic thread trimmer	Delete stitch or pattern to automatically insert thread trimmer code.
056	Setting-up user-defined reference point for zooming	Scaling up/down based on the reference point set on any pattern.
057	Output port user setting	Set the output port at the desired place during punching.
058	Input port user setting	Set the input port at the desired place during punching.
059	Delay time setting when output port is used	Set the corresponding delay time when output port is used.
061	Extended board's output port setting	Create same sewing data as straight line sewing data.

NO.	Function	Contents
062	Extended board's input port setting	Create same sewing data as curved line sewing data.
063	3rd thread release	Set the proper position for 3rd thread release.
080	Presser foot control by height difference	When height difference is found in sewing material, it sets the change in height of presser foot.
081	Section modification/change	It can set the section for JUMP, LINE and CURVE operation.
082	Pocket-dedicated design creation	Set the pocket-dedicated design creation function.
083	Pocket guide end-point setting	Set the point where the sewing of the pocket outer line is finished.
084	Origin change by design	It can change the origin by design when the origins are different depending on pocket design.

2) Pattern chart (Function numbers might be different depending on machine type.)

	Linear sewing	Spline sewing	Arc sewing	Circle sewing
Basic Sewing	NO. : 007 Name : Linear sewing 	No. : 008 Name : Spline sewing 	NO. : 009 Name : Arc sewing 	No. : 010 Name : Circle sewing 
Zig-Zag Sewing	No. : 019 Name : Linear zig-zag sewing 	No. : 020 Name : Spline zig-zag sewing 	No. : 021 Name : Arc zig-zag sewing 	No. : 022 Name : Circle zig-zag sewing 
Double Sewing	No. : 027 Name : Linear double sewing 	No. : 028 Name : Spline double sewing 	No. : 029 Name : Arc double sewing 	No. : 030 Name : Circle double sewing 
Reverse Sewing	No. : 035 Name : Linear reverse sewing 	No. : 036 Name : Spline reverse sewing 	No. : 037 Name : Arc reverse sewing 	No. : 038 Name : Circle reverse sewing 
Pocket-dedicated design Function				

3) Parameter Number Related to General sewing

NO.	Function name	Contents	Explanation and factory-installed setting value	Unit
000	Manual moving		★ Transfer of the feed plate by using direction keys	0/1
		1) DISABLE	1) Disable	
		2) ENABLE	2) Enable	
001	Starting position 2nd origin by manual moving	1) PTRN_STRT_POS	1) Moving the sewing starting position by using direction keys	0/1
		2) SECND_ORG	2) Setting to the 2nd origin by using direction keys	
002	Returning to the origin 1 after completing work		★ Returning to the origin 1 after completing work	0/1
		1) DISABLE	1) It does not return	
		2) ENABLE	2) It returns	
003	Returning when limit error happens		★ If it reaches transfer limit of the feed plate, it returns	0/1
		1) DISABLE	1) It does not return to the origin of machine	
		2) ENABLE	2) It returns to the origin of machine	
004	Returning method of starting point	1) SHORTEST	1) Returning through the shortest route	0 ~ 2
		2) ORG_TO_STRT	2) After returning to the original point, return to the starting point	
		3) REV_ORG_STRT	3) After returning to the origin point by tracing the pattern shape back	
005	Counter mode of bottom thread	1) UP_COUNT	1) Count up	0/1
		2) DN_COUNT	2) Count down	
006	Mark of product counter	1) DISABLE	1) No use	0/1
		2) ENABLE	2) Use	
007	Time for pattern counter	1) JOB_SETUP	1) Before completion for sewing preparation	0/1
		2) JOB_READY	2) After completion for sewing preparation	
008	Trimming in emergency stop during the operation	1) AUTO_TRIM	1) Performing the automatic trimming	0/1
		2) MANU_TRIM	2) Performing the manual trimming	
009	Speed setting of main shaft	1) SLOW_STRT0	1) 200 → 400 → 1000 → 1500spm	0 ~ 5
		2) SLOW_STRT1	2) 300 → 400 → 800 → 1100spm	
		3) SLOW_STRT2 : SPS-2516	3) 400 → 500 → 800 → 1200spm	
		4) SLOW_STRT3	4) 400 → 700 → 1000 → 1300spm	
		5) SLOW_STRT4	5) 600 → 800 → 1200 → 1600spm	
		6) SLOW_STRT5	6) 300 → 400 → 600 → 900 → 1200spm	
010	Limit to maximum sewing speed	1) 3600spm/3.0mm		0 ~ 4
		2) 3200spm/3.0mm		
		3) 2500spm/3.0mm		
		4) 2000spm/3.0mm		
011	Transfer starting angle of the feed plate	50	Setting it to fit the thickness of sewing materials : 0 ~ 72°	1
012	Signal treatment of pedal 1	1) LATCH		0/1
		2) FLIP		
013	Signal treatment of pedal 2	1) LATCH		0/1
		2) FLIP		
014	Operation state of presser foot	1) ALWAYS_DN	Prohibiting the operation(Keeping the downward suspension all the time)	0/1
		2) SEW_DN	Keeping the downward suspension during sewing	
		3) TRIAL_DN	Keeping the downward suspension When a stitch proceeding /reversing	
015	Lowering timing of presser foot	1) WITH_STRT	Descending whit the main shaft turn at the same time	0/1
		2) WITH_FEED	Descending whit the feeding at the same time	
016	Thread broken sensor mode	1) DISABLE	1) No use	0/1
		2) ENABLE	2) Use	
017	Detected no. of broken stitches when starting sewing	5[STITCH]	0 ~ 15 Stitches	1
018	Detected no. of broken stitches during the normal sewing	3[STITCH]	0 ~ 15 Stitches	1
019	Trimming mode	1) DISABLE	No use	0/1
		2) ENABLE	Use	
020	Time of 1st-step jog speed	400[ms]	1 ~ 99 × 100ms	100
021	Time of 2nd-step jog speed	900[ms]	1 ~ 99 × 100ms	100
022	Time of 3sd-step jog speed	1500[ms]	1 ~ 99 × 100ms	100
023	1st-step key-continued pressing time	200[ms]	1 ~ 99 × 100ms	100

NO.	Function name	Contents	Explanation and factory-installed setting value	Unit
024	2nd-step key-continued pressing time	100[ms]	1~99×100ms	100
025	3rd-step key-continued pressing time	1000[ms]	1~99×100ms	100
026	Trimming Full On Time	200[ms]	0~1020ms	4
027	Trimming Duty	50%	30~80%	10
028	Reading order when number of same pattern data exist in memory		★ The reading order when the same pattern data numbers exist in the internal memory	0/1
		1) DISABLE	1) Read first from a floppy disk	
		2) ENABLE	2) Read first from a internal memory	
029	Extension/Reduction mode Stitch-NUM:It is not applied (It is going to apply later)		★ It settles the way of reduction and extension for pattern	0~2
		1) DISABLE	Extension and reduction are impossible	
		2) STITCH_LEN	Extension and reduction by a stitch width	
		3) STITCH_NUM	Extension and reduction by a number of stitch	
030	Reduction stitch before work completion	3[STITCH]	Change to 2~16	1
031	Reduction speed before work completion	400[spm] SPS/C-Series : 200[spm]	200~500spm	100
032	Thread trimming delayed time	72[ms]	52~1020[ms]	4
033	Whether to use the function to detect fall of pressure	1) DISABLE(for 1306)	1) Do not use pressure reduction sensor.	
		2) ENABLE	2) Use pressure reduction sensor.	
034	Back/forth jump stitches	1	User can define stitch value to move. 1~100 [Stitch]	0/1
035	Setting-up reference point for zooming	1) MACHINE_ORG	Zooming based on the machine origin.	0~3
		2) SECOND_ORG	Zooming based on the second origin set by user.	
		3) SEWING_STRT	Zooming based on sewing starting point.	
		4) REFER_PNT	Zooming based on the reference point defined by user at any location.	
036	Sewing limit set-up	1) DISABLE	Not used (at the factory)	
		2) ENABLE	Used	
037	X-axis forward direction sewing limit set-up	75 (mm) (For 1507)	Sets the size of X-axis forward direction as desired (1mm~255mm)	1
038	X-axis reverse direction sewing limit set-up	-75 (mm) (For 1507)	Sets the size of X-axis backward direction as desired (-1mm~-255mm)	1
039	Y-axis forward direction sewing limit set-up	35 (mm) (For 1507)	Sets the size of Y-axis forward direction as desired (1mm~255mm)	1
040	Y-axis reverse direction sewing limit set-up	-35 (mm) (For 1507)	Sets the size of Y-axis backward direction as desired (-1mm~-255mm)	1
041	Laser Point set-up	1) DISABLE	Laser point function not used	
		2) ENABLE	Laser point function used	
042	Reverse Rotation after Trimming Setting Function	1) DISABLE	Do not set function of reverse rotation after trimming	
		2) ENABLE	Do set function of reverse rotation after trimming	
043	Reverse Rotation Angle after Trimming Setting Function	15°	Reverse Rotation Angle after Trimming Setting (1~40°)	1°
044	Designate the place of saving pattern designs	1) SAVE FDD	Disabled	
		2) SAVE FLASH	Disabled	
		3) CF CARD	Enabled (default)	
045	Deleting Other Designs When Opening New Design	1) SAVE	Design Saving in Flash Memory. (default)	0~1
		2) DELETE	Deleting Designs from Flash Memory	
046	Set the jump speed	1) SLOW_SPEED	Set the slowest jump speed.	0~2
		2) MILDE_SPEED	Set the medium jump speed. (default)	
		3) FAST_SPEED	Set the fastest jump speed.	
047	Overlapping Stitch Setting for Pocket Design	4 [stitch]	Set the overlapping stitch number	1
048	Pocket design's bartack speed setting	2300 [spm]	Bartack section speed setting	100
049	Emergency stop switch setting in case of jumping	1) DISABLE	Not used (at the factory)	0~1
		2) ENABLE	Used	
050	Stacker enabled	1) DISABLE	Not used	0~1
		2) ENABLE	Used (at the factory)	

NO.	Function name	Contents	Explanation and factory-installed setting value	Unit
051	Sewing repeat function setting	1) DISABLE	Not used	0~1
		2) ENABLE	Used (at the factory)	
052	Feed clamp enabled	1) DISABLE	Not used	0~1
		2) ENABLE	Used (at the factory)	
053	Extended I/O board	1) DISABLE	It sets the receipt of external signals and the transmission of internal signals.	
		2) ENABLE		
054	Set the design preview	1) DISABLE	Press the number button at the initial stage to check saved designs and set the calling method.	
		2) ENABLE		
055	Needle Bar Cooler(Air Cooler) Setting	1) NOT	Not used	0~1
		2) HALF	Used to sew inner pocket lines.	
		3) FULL	Used across all sections.	
056	Set the thread release motion when the presser bar descends	1) DISABLE	Not used (at the factory)	
		2) ENABLE	Used.	
057	Extended inner clamp setting	1) DISABLE	Not used	
		2) ENABLE	Used. (at the factory)	
058	PF climb range setting	1) DISABLE	Not used	
		2) ENABLE	Used. (at the factory)	
059	Pattern sewing machine function setting	1) DISABLE	Not used(at the factory)	
		2) ENABLE	Used.	
060	Clamp safety function setting	1) DISABLE	Not used(at the factory)	
		2) ENABLE	Used.	
061	Temporary stop of the main shaft during inner clamp operation	1) DISABLE	Not used(at the factory)	
		2) ENABLE	Used.	
062	Sewing material guide bar setting function	1) DISABLE	Not used(at the factory)	
		2) ENABLE	Used.	
063	Program mode lock function	1) DISABLE	Not used(at the factory)	
		2) ENABLE	Used.	
064	Origin setting function	1) DISABLE	Not used(at the factory)	
		2) ENABLE	Used.	
065	Needle Bar Stop Position Setting	0°	When motor the position of needle bar at the set mode (0~360°)	

4) Error List

No.	Err List	Message	Meaning
1	Err 1	Main Motor Err!	Error occurs in main motor
2	Err 2	Synchro Err!	Error occurs in synchronizer
3	Err 3	Pattern Not Found!	Related pattern is not available on the diskette
4	Err 4	FDD Empty	Floppy disk drive is empty
5	Err 5	Disk-Read Err!	Machine can't read a diskette
6	Err 6	Disk-Write Err!	Machine can't write any data on the diskette
7	Err 7	Disk-Format Err!	A diskette is not formatted
8	Err 8	Disk-Full!	Diskette is full
9	Err 9	Scale Over!	Error occurs in enlargement and reduction
10	Err 10	Too Many Stitch !	It exceeds maximum number of stitches
11	Err 11	Reset Counter !	Counter should be reset
12	Err 12	Combination Not Completed!	Design combination is not completed
13	Err 13	Needle Position Err!	Needle bar is not in the proper position
14	Err 14	Limit Over!	it exceeds X-Y limit
15	Err 15	Calculation Err!	Calculation error occurs inside
16	Err 16	The Data Bad!	Pattern data is damaged
17	Err 17	Emergency Stop!	Emergency stop switch is pressed during the operation
18	Err 18	Thread Broken!	Thread is broken
19	Err 19	X-Y Error!	X-Y transferring is not performed
20	Err 20	System Program not Found	Program that you want to update does not exist in the diskette
21	Err 21	Internal Memory Err!	Internal operation error occurs
22	Err 22	Write Protected!	Diskette is write protected
23	Err 23	Insufficient Internal Memory	Internal memory is insufficient
24	Err 24	Low Pressure!	When air pressure is weak in case of pneumatic type
25	Err 25	Drag-Limit Over!	When it gets out of the sewing area after moving a stitch during editing stitch.
26	Err 28	Emergency Sw\n Not Released!	In case that the Emergency Switch is pressed when Power On.
27	Err 29	Start Sw\n Not Released!	In case that the Start Switch is pressed when Power On.
28	Err 30	Right Sw\n Not Released!	In case that the Right Switch is pressed when Power On.
29	Err 31	Left Sw\n Not Released!	In case that the Left Switch is pressed when Power On.
30	Err 32	TwoStage Sw\n Not Released!	In case that the TwoStage Switch is pressed when Power On.
31	Err 33	Ser. Com. Err!	Abnormalities on the communication between the main shaft and the I/O board.
32	Err 38	Y Motor Err\n Push EXIT Key\n Or Power Off / On!	A problem detected in Y shaft motor.
33	Err 39	X Motor Err\n Push EXIT Key\n Or Power Off / On!	A problem detected in X shaft motor.
34	Err 40	Timer Err\n Push POWER S/W\n Or Power Off / On!	In case where errors are found in timer signals
35	Err 41	Main Motor Err!\nDismatch!\n999!	If the main shaft motor type is inappropriate, the following errors occur:
36	Err 42	Over Current\nOver tem\n133!	The IPM over-current on the main shaft board will be cut off.
37	Err 43	Over Current\nAbnormal\n131!	The motor over-current and connector errors occur.
38	Err 44	Over Load Err!\n129!	The motor overload occurs.
39	Err 45	EncoderRST Err!\n128!	When there is no encoder RST signal, an error occurs.
40	Err 46	Encoder AB Err!\n127!	When the encoder RST's upward direction and the AB direction mismatch,

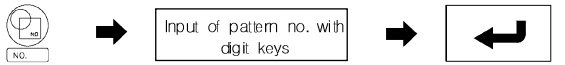
No.	Err List	Message	Meaning
41	Err 47	Synchro!\nCon.Inserted!\n60!	When the position detecting sensor is touched while the machine power is on,
42	Err 48	Synchro!\nCon.Pulled Out!\n61!	When the position detecting sensor is removed while the machine power is on,
43	Err 49	Reverse!\nComm. Error!\n126!	When the revolving magnet and the fixed current coil mismatch in their direction,
44	Err 50	EEPROM!\nAccess error!\nEEPR!	the ROM access error occurs.
45	Err 51	Ser.Com.Err!\nMotor Info Err!	The motor type communication error occurs.
46	Err 57	FAN Error	Fan motion error
47	Err 58	AC Check Err	Voltage check error
48	Err 59	Over Voltage Err	Overvoltage error
49	Err 60	Under Voltage Err	Undervoltage error
50	Err 53	Enlargement!\Reduction \ Err!	the error in zoom-in/zoom-out occurs.
51	Err 61	Feeding Clamp\n Up Down Err	Feed clamp up/down error
52	Err 62	Feeding Clamp\n Position Err	Feed clamp position error
53	Err 63	Inner Clamp\n Up Down Err	Inner presser plate up/down error
54	Err 64	Outer Clamp \n Up Down Err	Outer presser plate up/down error
55	Err 65	In/Out Clamp\n Up Down Err	Inner/outer presser plate up/down error
56	Err 66	Feed, In/Outer\n EM STOP!	While the feed clamp is in operation and when the emergency stop button is pressed.
57	Err 67	Safety Error!\n Move Feed Clamp\n & Push ESC Key	Feed clamp position error
58	Err 68	Main Motor Power OFF Err!	Main shaft motor power-off error
59	Err 69	Main Motor Power ON Err!	Main shaft motor power-on error
60	Err 70	Main Motor RX Com Err!	Main shaft motor serial communications RX error
61	Err 71	Main Motor TX Com Err!	Main shaft motor serial communications TX error
62	Err 72	Main Motor Exter P/U Con Err!	Main shaft motor P/U connection error
63	Err 73	Main Motor Built P/U Con Err!	Main shaft motor P/U connection error
64	Err 74	Main Motor Synchro Err!	Main shaft motor synchro error
65	Err 75	Main Motor Safety switch Err!	Main shaft motor safety switch error
66	Err 76	Main Motor Rate over Err!	Main shaft motor specifications error

BASIC MANUAL

SunStar

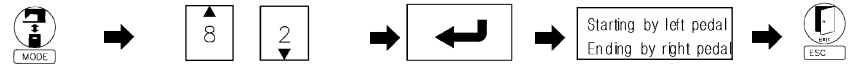
SPS/E Series

1 Calling the pattern : Calling patterns from memory or floppy disks



Calling the pattern

2 Bobbin wind



Mode key "3. BOBBIN WIND"

3 Using the counter : Using the bottom thread counter and quantity control counter

Input of initial value of bottom thread counter

Input of initial value of quantity control counter

4 Setting the extension and reduction

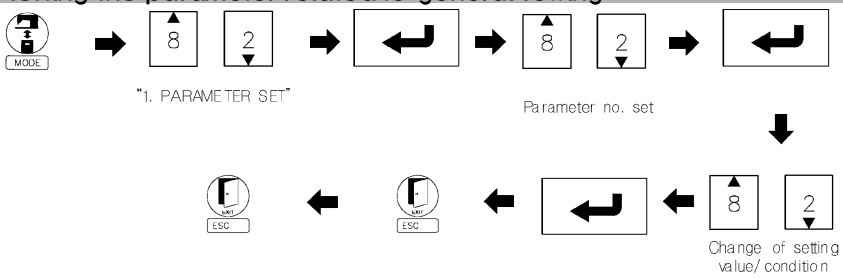
Rate for horizontal ext./red.

Rate for vertical ext./red.

* Reference

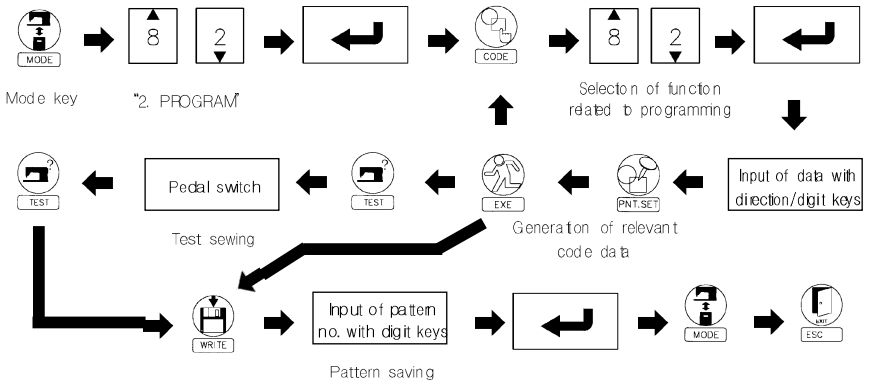
1. If the READY LAMP turns on or the upper feed plate is on the bottom, it can be impossible to use a specific key. In that case, operate the machine after pressing [↵] key.
2. After pressing [5] key, perform thread insertion.

6 Setting the parameter related to general sewing



Parameter number related to general sewing			
0)	J.O.G En/Dis	(Manual Operation En/Dis)
1)	J.O.G Mode	(Moving to start position/the 2nd origin by manual drive)
2)	Machine Org1	(Return to the machine origin after finishing sewing operation)
3)	Machine Org2	(Return to the origin when limit error occurs)
4)	Strt Ret Mod	(Return mode to the sewing start position)
5)	Bobbin Count	(Counting method for bobbin count)
6)	Prodct Count	(Use of products counter)
7)	Pattern Read	(Time for reading patterns)
8)	Trim EM Stop	(Trimming during emergency stop)
9)	Slow Start	(Acceleration characteristics of main-shaft speed)
10)	Max Speed	(Maximum speed limit of sewing)
11)	Feed End Pos	(Opening angle of feed plate transfer)
12)	Pedal1 Mode	(Signal mode of Pedal 1)
13)	Pedal2 Mode	(Signal mode of pedal 2)
14)	PF Operation	(Setup for presser foot operation)
15)	PF Down Mode	(Setup for descent time of presser foot)
16)	Thrd Detect	(Setup for thread detection)
17)	Thrd Stitch1	(Detecting the stitch number in starting sewing)
18)	Thrd Stitch2	(Detecting the stitch number during sewing)
19)	Trim En/Dis	(Use of trimming function)
20)	Jog Time1	(Manual operation time in speed level 1)
21)	Jog Time2	(Manual operation time in speed level 2)
22)	Jog Time3	(Manual operation time in speed level 3)
23)	Con Key Tm1	(Time for function of the speed level 1 key)
24)	Con Key Tm2	(Time for function of the speed level 2 key)
25)	Con Key Tm3	(Time for function of the speed level 3 key)
26)	TT FullOn Tm	(Presser foot full on time)
27)	TT Duty	(Thread trimming duty)
28)	PTRN RD MODE	(Pattern data reading mode)
29)	Scale MODE	(Setting the magnifying/demagnifying mode)
30)	Decel Stitch	(Number of stitches to decelerate before ending work)
31)	Decel SPM	(Decelerating speed before ending work)
32)	Trim Delay	(Thread trimming delayed time)
33)	Low Pressure	(The selection of the low pressure detecting device)
34)	Corkey3 Fum	(Back/Forth jump stitches)
35)	Scale Refer	(Setting-up reference point for zooming)
36)	Sewing Limit	(Sewing limit set-up)
37)	XPLUS Limit	(X-axis forward direction sewing limit set-up)
38)	XMINUS Limit	(X-axis reverse direction sewing limit set-up)
39)	YPLUS Limit	(Y-axis forward direction sewing limit set-up)
40)	YMINUS Limit	(Y-axis reverse direction sewing limit set-up)
41)	Laser point	(Laser Point)
42)	RevAfterTrim	(Setting reverse rotation after trimming)
43)	ReverseAngle	(Set reverse rotation angles after trimming)
44)	Save Type	(Save Type Setting)
45)	DsgnOpCtrl	(Design deletion setting upon design opening)
46)	JumpSpeed	(Jump speed setting)
47)	PocketOvLap	(pocket design's redundant sewing stitch setting)
48)	BarTackSpeed	(pocket design's bartack speed setting)
49)	Jump EM Stop	(emergency stop switch setting in case of jumping)
50)	Stacker	(stacker setting)
51)	Auto Start	(sewing machine's repeat function setting)
52)	Feed Clamp	(feed clamp setting)
53)	EX_IO BD SET	(External I/O function setting)
54)	Thumbnail Set	(Design preview setting)
55)	Air Cooler	(Needle Bar Cooler Setting)
56)	Set TR2Thrd	(Thread release setting while presser foot descends)
57)	Inner GUIDE	(Extended inner clamp setting)
58)	Use 2nd PF	(PF dimb range setting)
59)	Use Pattern	(Pattern sewing machine function setting)
60)	Safe Feeder Feeding	(Clamp safety function setting)
61)	Guide stop	(It stops the main shaft when the inner clamp is in motion.)
62)	Feeder guide	(It sets the sewing material guide bar.)
63)	Program lock	(It enables the program lock setting.)
64)	Set origin	(It sets the origin of the machine.)
65)	Upstop Pos	(It sets the needle bar stop position.)

7 Pattern programming : Generating the pattern that users want



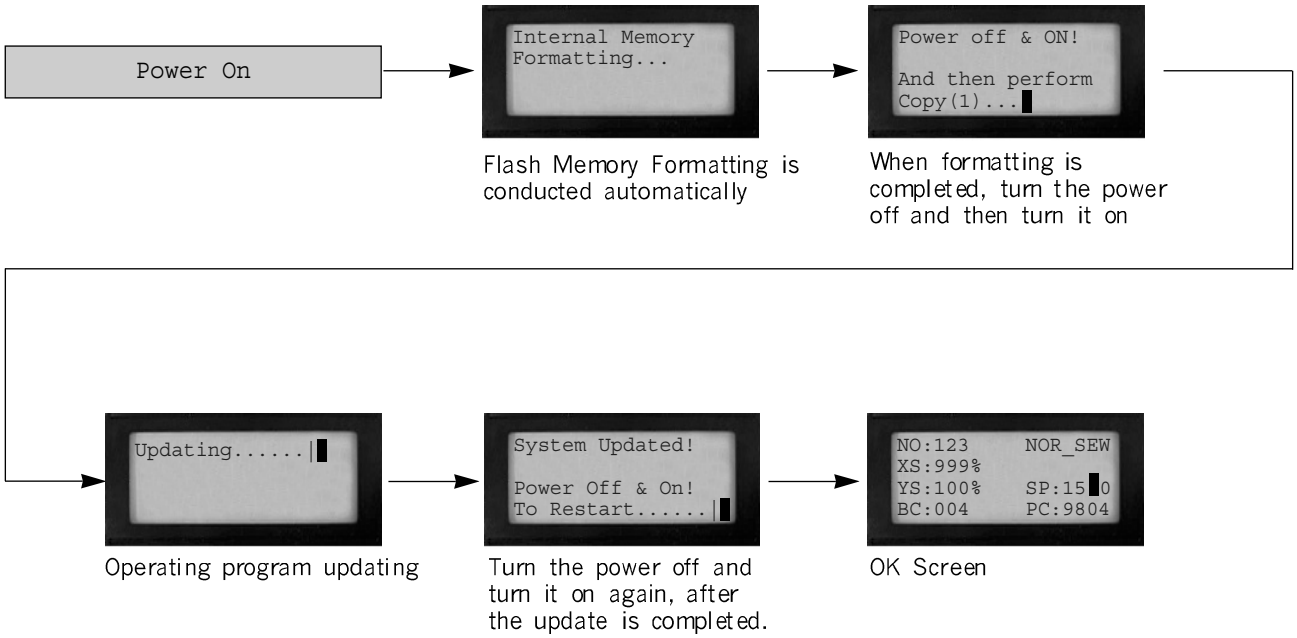
Function number related to pattern programming			
0)	TRIM	(Trimming)
1)	SEC-ORG	(2nd origin)
2)	PAUSE	(Temporary suspension)
3)	EMPTY	(One turn of sewing machine)
4)	JUMP	(JUMP)
5)	POINT	(Point sewing)
6)	LINE/CURVE	(Linear/Curving line sewing)
7)	LINE	(Linear sewing)
8)	CURVE	(Spline sewing)
9)	ARC	(Arc sewing)
10)	CIRCLE	(Circle sewing)
11)	JUMP SPD	(Change of jump speed)
12)	STI SPD	(Change of stitching speed)
13)	STI WIDT	(Partial Sewing Stitch Width Change)
14)	PTRN READ	(Pattern data reading from floppy diskette)
15)	PTRN WRITE	(Pattern data writing to floppy diskette)
16)	FORMAT	(Floppy diskette formatting)
17)	INFO DISP	(Information indication of present pattern data)
18)	COORD SYS	(Coordinates setting)
19)	LINE ZIG	(Linear zig-zag sewing)
20)	CURVE ZIG	(Spline zig-zag sewing)
21)	ARC ZIG	(Arc zig-zag sewing)
22)	CIRCLE ZIG	(Circle zig-zag sewing)
23)	LINE OFST	(Linea offset sewing)
24)	CURVE OFST	(Spline offset sewing)
25)	ARC OFST	(Arc offset sewing)
26)	CIRCLE OFST	(Circle offset sewing)
27)	LINE DBL	(Linear double sewing)
28)	CURVE DBL	(Spline double sewing)
29)	ARC DBL	(Arc double sewing)
30)	CIRCLE DBL	(Circle double sewing)
31)	LINE DREV	(Straight line dual reverse sewing)
32)	CURVE DREV	(Curved line dual reverse sewing)
33)	ARC DREV	(Circular arc dual reverse sewing)
34)	CIRCLE DREV	(Round dual reverse sewing)
35)	LINE REV	(Linear reverse sewing)
36)	CURVE REV	(Spline reverse sewing)
37)	ARC REV	(Arc reverse sewing)
38)	CIRCLE REV	(Circle reverse sewing)
39)	PTRN DEL	(Partial Pattern Data Delete Function)
40)	BACK TACK	(Addition of automatic back-tack)
41)	CNDNS STI	(Condensed Sewing Stitch Adding)
42)	OVLAP STI	(Addition of overlap stitch)
43)	SYMMETRY X	(X-axis Symmetrical Data Addition)
44)	SYMMETRY Y	(Y-axis Symmetrical Data Addition)
45)	SYMMETRY P	(Point Symmetrical Data Addition)
46)	MOVE PTRN	(Partial Movement of Pattern Data)
47)	COPY PTRN	(Copying Function of Pattern Data to Specific Location)
48)	DEL PTRN	(Deletion of pattern data)
49)	REV SET	(Partial Pattern Data Delete Function)
50)	SPD CHNG	(Change/Saving Function of Maximum Pattern Sewing Speed and Extension/Reduction Rate)
51)	STITCH DRAG	(One stitch move function)
52)	STITCH DEL	(A Fixed Number of Stitch Delete Function)
53)	MOV SEWSTRT	(Change/Saving Function of Pattern Data Start Point)
54)	MOV 2ndORG	(Change/Saving Function of Pattern 2nd Original Point)
55)	Auto TRIM	(Setting-up automatic thread trimmer)
56)	SCALE REFER	(Setting-up user-defined reference point for zooming)
57)	SET_OPnn	(Output port user setting)
58)	CHK_IPnn	(Input port user setting)
59)	TIME_DELAY	(Delay time setting when output port is used)
61)	CAN_OPnn	(Extended board's output port setting)
62)	CAN_IPnn	(Extended board's input port setting)
63)	TR3_SET	(3rd thread release)
80)	PF_SET	(Presser foot control by height difference)
81)	MODIFY	(Section modification/change)
82)	POCKET	(Pocket-dedicated design creation)
83)	GUIDE_END	(Inner Clamp Reduction Position Setting)
84)	MOV POCKET	(Origin change by design)

10

EMERGENCY RECOVERY

1) Emergency Recovery When Problems Occur in Flash Memory

1-1) When the Flash Memory (D:\> Drive) is not recognized



Flash Memory Formatting is conducted automatically

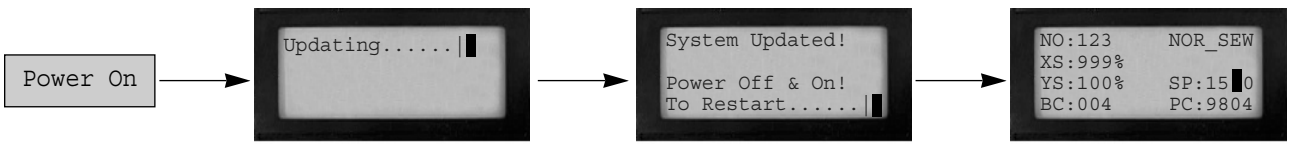
When formatting is completed, turn the power off and then turn it on

Operating program updating

Turn the power off and turn it on again, after the update is completed.

OK Screen

1-2) When Pattern0.exe is deleted in Flash Memory (D:\> Drive)



Operating program updating

Turn the power off and turn it on again, after the update is completed.

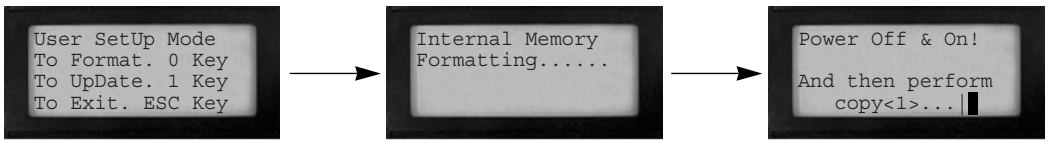
OK Screen

2) User's emergency self-restoration and operating program installation

Follow the order as below.

Turn the power on and press the "EXE" key of the Operation Box at the same time. Then, the screen as below appears.

2-1) Flash Memory Formatting

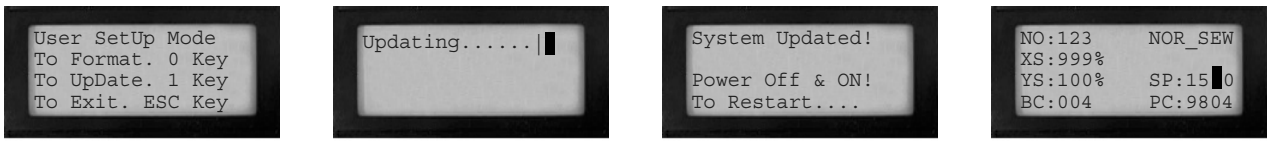


Press "0"

Flash Memory Formatting...

Turn the power off and turn it on again after formatting is completed.

2-2) Program Updating



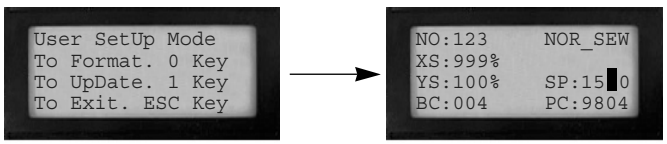
Press "1"

Operating program updating

Turn the power off and turn it on again, after the update is completed.

OK Screen

2-3) Return to the initial program screen



Press "ESC"

OK Screen