JUKI®

# SC-500

# ENGINEER'S MANUAL

40019500
No.E359-00

# PREFACE

This Engineer's Manual is written for the technical personnel who are responsible for the service and maintenance of the machine.

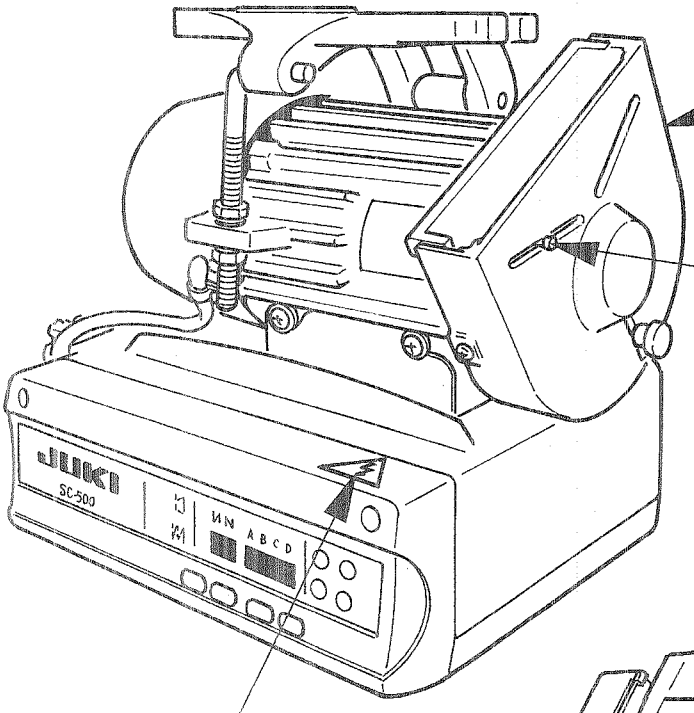
The Instruction Manual for these machines intended for the maintenance personnel and operators at an apparel factory contains operating instructions in detail. And this manual describes "Standard Adjustment", Adjustment Procedures", "Results of Improper Adjustment", and other important information which are not covered in the Instruction Manual.

It is advisable to use the relevant Instruction Manual and Parts List together with this Engineer's Manual when carrying out the maintenance of these machines.

This manual gives the "Standard Adjustment" on the former page under which the most basic adjustment value is described and on the latter page the "Results of Improper Adjustment" under which stitching errors and troubles arising from mechanical failures and "How To Adjust" are described.

# SAFETY DEVICE

Safety devices described below vary in accordance with the destination and specifications.

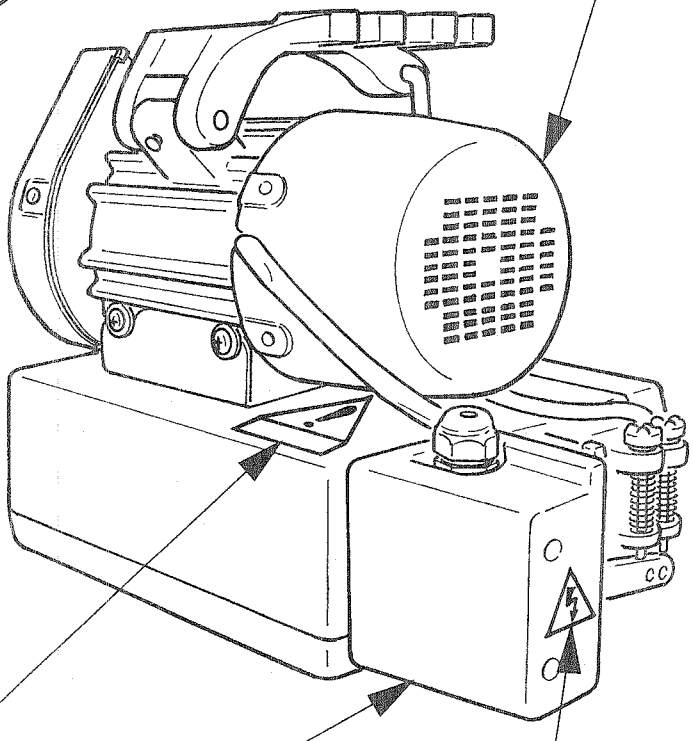



| Motor pulley cover |
| --- |
| Cover to prevent motor pulley and V belt from coming in contact with each other. |

| Roll-in prevention pin |
| --- |
| Pin to prevent roll-in by V belt. |

| Motor fan cover |
| --- |
| Cover to prevent motor fan from coming in contact with other components. |

| Electric shock danger label |
| --- |
| This label indicates that there is a danger of electric shock in the cover on which the label is pasted. |



| Power voltage danger label |
| --- |
| Cautions for usable power voltage are described. |

| Power connector cover |
| --- |
| Cover to prevent connectors from electric shock due to high voltage section. |

| Electric shock danger label |
| --- |
| This label indicates that there is a danger of electric shock in the cover on which the label is pasted. |

# CONTENTS

# 1. SPECIFICATIONS

| | | | |
|---|---|---|---|
| Supply voltage | Single phase 100 to 120V | 3-phase 200 to 240V | Single phase 200 to 240V |
| Frequency | 50 Hz / 60 Hz | 50 Hz / 60 Hz | 50 Hz / 60 Hz |
| Operating temperature range | Temperature : 0 to 40°C | Temperature : 0 to 40°C | Temperature : 0 to 40°C |
| Operating humidity range | Humidity : 90% or less | Humidity : 90% or less | Humidity : 90% or less |
| Power consumption | 390VA<br>(460VA when LZ-228* is used) | 390VA<br>(460VA when LZ-228* is used) | 390VA<br>(460VA when LZ-228* is used) |

**(Caution) 1. Power consumption is the mean power consumption when SC-500 is mounted on DDL-8700 in accordance with the operating conditions JUKI settles.**
**2. Power consumption varies in accordance with the operating conditions and the machine head on which SC-500 is mounted. So, be careful.**
**3. There are cases where the momentary maximum power consumption is 1.5 times or more than the mean power consumption.**

# 2. OUTLINE

## (1) Features

1) Voltage changeover function of single phase 100 to 120V/3-phase 200 to 240V is provided. (Adapting to a part of specifications only)
The control box with voltage changeover function can be used either for single phase 100 to 120V or for 3-phase 200 to 240V by replacing the power cord up to the power switch and setting the voltage changeover connector inside the control box.
2) The operation panel is assembled in the control box as standard and it is possible to operate the machine with the single unit of the control box.
By connecting the optional operation panel, CP-160, function and operability are further improved.
3) The conventional JUKI optional devices can be used without any adjustment.
However, it is necessary to separately purchase the optional circuit board.

# 3. MODEL CONSTRUCTION

## (1) SC-500

Electric equipment corresponding to new servo motor (for export)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| S | C | 5 | 0 | 0 | □ | □ | - | A | A | △ |

| 6 | Control box classification |
|---|---|
| S | JUS (LA) : Single phase 100 to 120V PFL |
| D | JUS, general export : 3-phase 200 to 240V PFL |
| K | General export : Single phase 200 to 240V PFL |
| N | CE : Single phase 200 to 240V PFL |
| U | China : Single phase 200 to 240V PFL |

| 7 | Electric equipment type classification |
|---|---|
| S | Standard |

| 9 | Destination spec. classification |
|---|---|
| A | Standard |

| 10 | Accessory spec. classification |
|---|---|
| A | Standard |

| 11 | Delivery voltage classification |
|---|---|
| 3 | 100 to 120V |
| 4 | 200 to 240V |

## (2) M-50

Servo motor for SC-500 (for export)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| M | 5 | 0 | □ | □ | △ | △ | - | □ | A | 4 |

| 4 | Voltage classification |
|---|---|
| K | Single phase 200 to 240V |
| D | 3-phase 200 to 240V |

* SC-500 : In case of JUS (LA), select D.

| 5 to 7 | Pulley and belt classification | |
|---|---|---|
| Code | Pulley and belt | Applicable model |
| Q41 | ø110 : M41 inch | DDL-8700-7 |

* Pulley diameter: outer diameter is indicated.

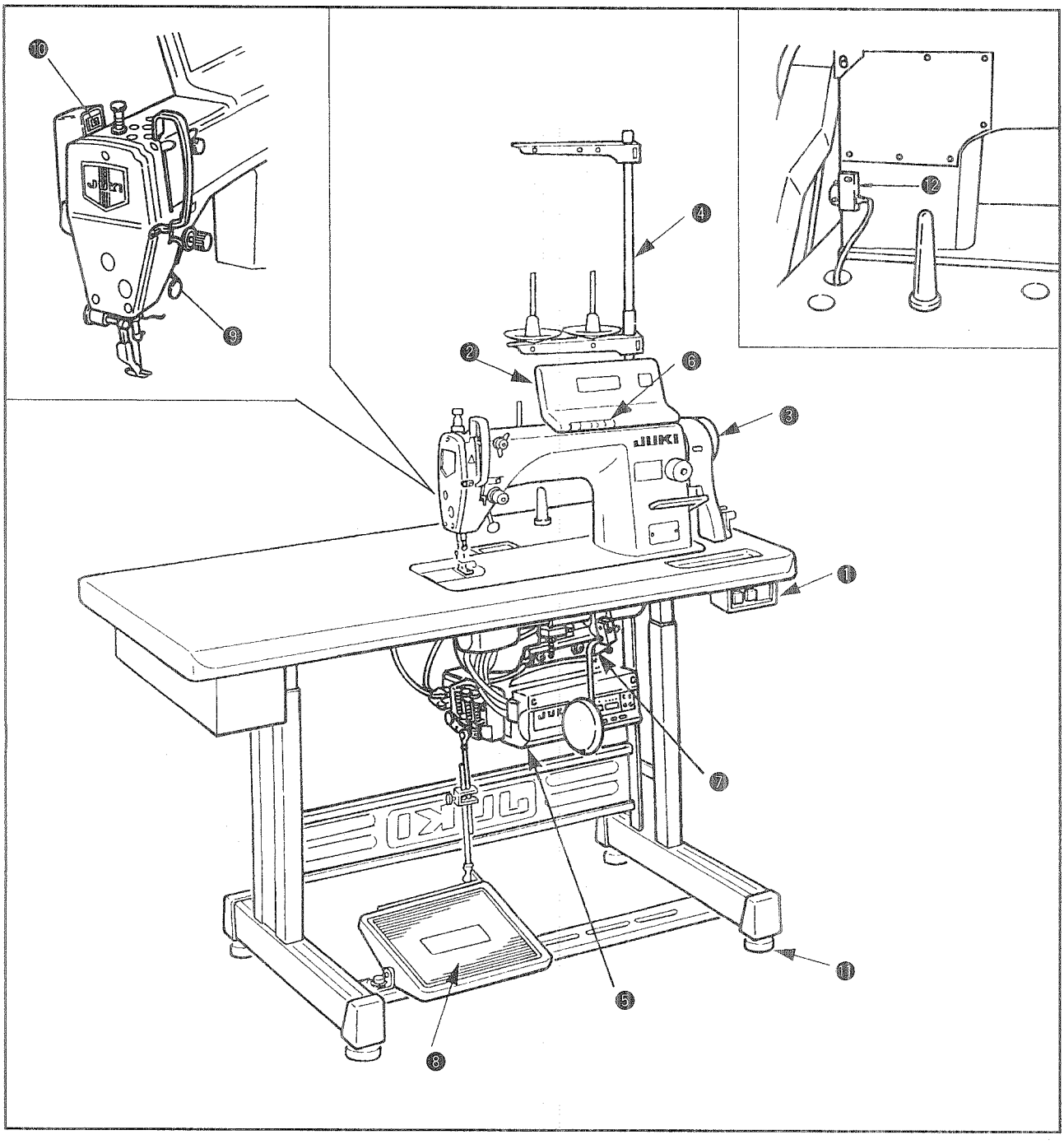
| 9 | Destination spec. classification |
|---|---|
| A | Standard, Hong Kong, Singapore |
| B | Europe |
| D | America (including LA) |
| G | China |

| 10 | Accessory spec. classification |
|---|---|
| A | Standard |

| 11 | Delivery voltage classification |
|---|---|
| 4 | 200 to 240V |

# 4. CONFIGURATION

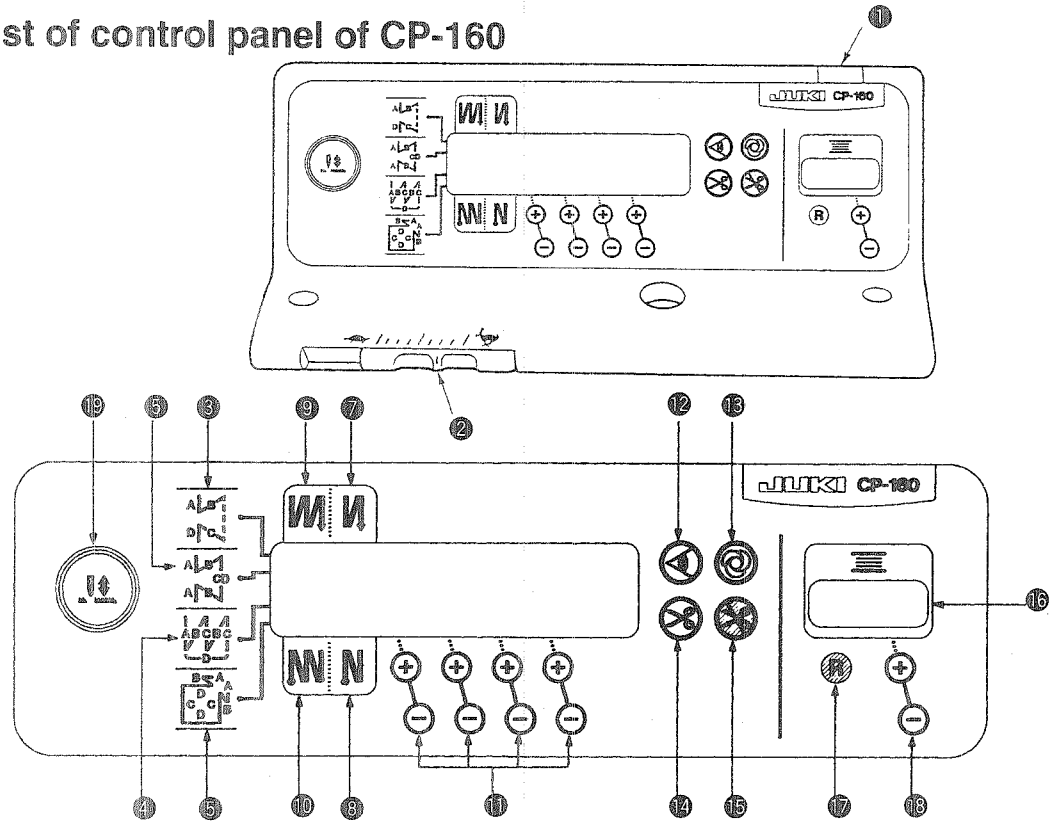
## (1) DDL-8700/SC-500/M-50




1. Power switch
2. Control panel
3. Synchronizer
4. L-shaped thread stand
5. PSC box (SC-500)
6. Max. speed control knob
7. Motor (M-50)
8. Operation pedal
9. Touch-back switch
10. Thread wiping (wiper) device
11. Screw or caster for level adjustment of table / stand
12. Resistor pack

# 5. EXPLANATION OF OPTIONAL CONTROL PANEL

## (1) List of control panel of CP-160

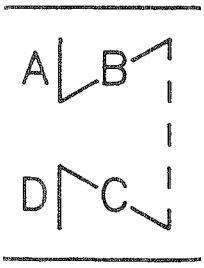



1) For the connecting destination of the connector, refer to the item (5) of 8. CONNECTING PROCEDURE WITH JUKI OPTIONAL DEVICES.
2) By connecting of CP-160, all displays of standard operation panel of SC-500 go off.
However, error code No. is displayed only at the time of occurrence of error.

| No | Description |
|---|---|
| 1 | **Power indication LED :** Lights up when the power switch is turned ON. |
| 2 | **Max. speed limit variable resister :** Maximum speed is limited when this resister is moved in the left direction (◄). |
| 3 | **Reverse stitching pattern switch :** Used for specifying the reverse stitching pattern to be sewn. |
| 4 | **Overlapped stitching pattern switch :** Used for specifying the overlapped stitching pattern to be sewn. |
| 5 | **Constand dimension stitching pattern switch :** Used for specifying the constant dimension stitching pattern to be sewn. |
| 6 | **Rectangular stitching pattern switch :** Used for specifying the rectangular stitching pattern to be sewn. |
| 7 | **Automatic reverse stitching at the start of sewing switch :** Used for turning ON / OFF the automatic reverse stitching at the start of sewing. |
| 8 | **Automatic reverse stitching at the end of sewing switch :** Used for turning ON / OFF the automatic reverse stitching at the end of sewing. |
| 9 | **Automatic double reverse stitching at the start of sewing switch :** Used for turning ON / OFF the automatic double reverse stitching at the start of sewing. |
| 10 | **Automatic double reverse stitching at the end of sewing switch :** Used for turning ON / OFF the automatic double reverse stitching at the end of sewing. |
| 11 | **Switches for setting the number of stitches :** Used for setting the number of stitches to be sewn in processes A through D. |
| 12 | **Material edge sensor ON / OFF switch :** Rendered effective when the material edge sensor is installed on the machine. Used for selecting whether or not the material sensor is used during sewing. |
| 13 | **One-shot automatic stitching switch :** Start the sewing machine with this switch, and the sewing machine will run automatically until the material edge is detected or the end of the set number of stitches is reached. |
| 14 | **Automatic thread trimming switch :** When the material edge is detected, the machine will perform thread trimming even when keeping depressing the front part of the pedal. |
| 15 | **Thread trimming prohibition switch :** Used for prohibiting thread trimming at any occasion. |
| 16 | **Bobbin thread counter :** Indicates the amount of bobbin thread while counting it by subtracting from the set value. When the bobbin thread remaining amount detecting device is installed on the machine, the counter indicates the number of times of detecting. |
| 17 | **Bobbin counter reset switch :** Used for returning the value shown on the bobbin thread counter to the initial value. |
| 18 | **Bobbin thread amount setting switch :** Used for setting the amount of bobbin thread. |
| 19 | **Needle up/down compensating switch :** Used when performing needle up / down compensating stitching. |

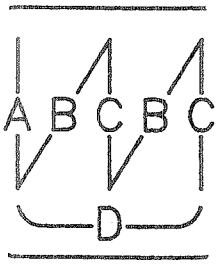
## (2) Explanation of control panel CP-160

### 1) Reverse stitching pattern



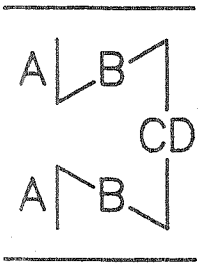

When the sewing machine performs the free stitching operation, the machine performs the reverse stitching operation at the start and end of sewing.
The reverse stitching operation can set the ON and OFF settings. Furthermore, single and double reverse stitching patterns can be selected.
Setting of number of stitches or other settings can be performed by operating the control panel.
A, B, C and D = 0 to 19 stitches

### 2) Overlapped stitching pattern



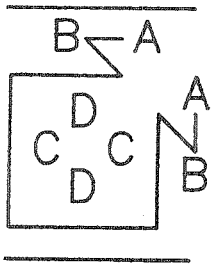

The sewing machine repeats the normal stitching and reverse stitching by the predetermined time, and performs the line bartacking. Then, the machine makes the thread trimmer actuate and stop to complete the overlapped stitching procedure.
Change of the number of stitches or the number of times of repetition can be performed by operating the control panel.
A, B and C = 0 to 19 stitches
D = 0 to 9 times

### 3) Constant-dimension stitching pattern




The free stitching process in the reverse stitching pattern becomes the set value of the number of stitches. The sewing machine will automatically stop (automatically perform thread trimming if the automatic thread trimming is selected.) after the machine finishes the predetermined number of stitches in the process of CD.
If the automatic thread trimming is not selected, operate the touch-back switch after the machine has automatically stopped. Then, the machine runs at a low speed (stitch compensation operation). Also, if the pedal is returned to its neutral position and depressed its front part again, the sewing can be continued regardless of the setting of number of stitches.
Setting of number of stitches or selection of automatic thread trimming can be performed by operating the control panel.
A and B = 0 to 19 stitches CD = 0 to 500 stitches

### 4) Rectangular stitching pattern

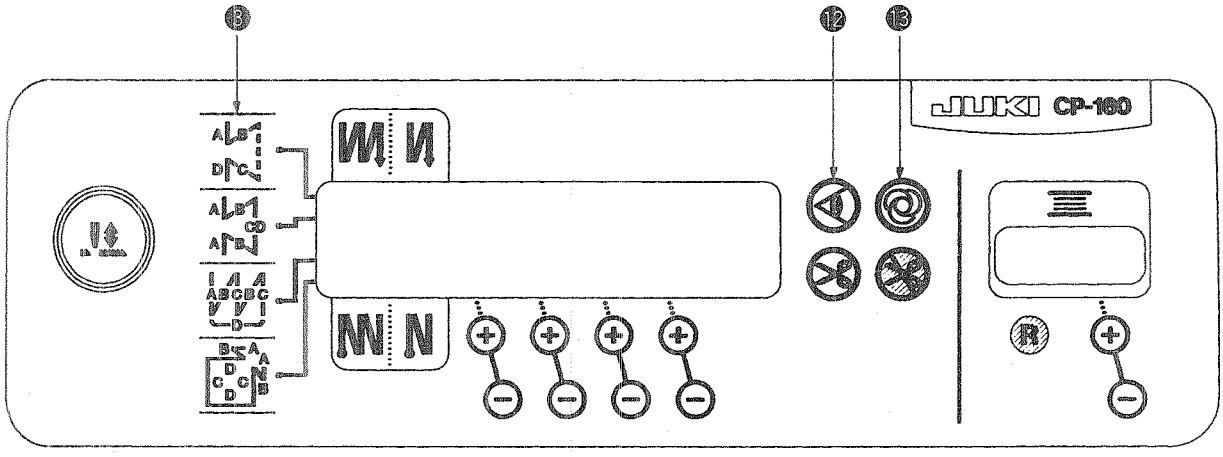



There are 4 operation steps in the process of constant-dimension stitching pattern. At each operation step the sewing machine automatically stops after sewing the predetermined number of stitches. At this time, if the touch-back switch is operated, the sewing machine runs at a low speed (stitch compensation operation). Also, in case of the last operation step, if the pedal is returned to its neutral position and depressed its front part again, the sewing can be continued regardless of the setting of number of stitches. However, if the automatic thread trimming is set, the machine will perform thread trimming. Setting of number of stitches or selection of automatic thread trimming can be performed by operating the control panel.
A and B = 0 to 19 stitches C and D = 0 to 99 stitches

## (3) Example of application

### 1) When the CP-160 is used together with the material end sensor (ED : optional), it can be used as a small edge-controller.

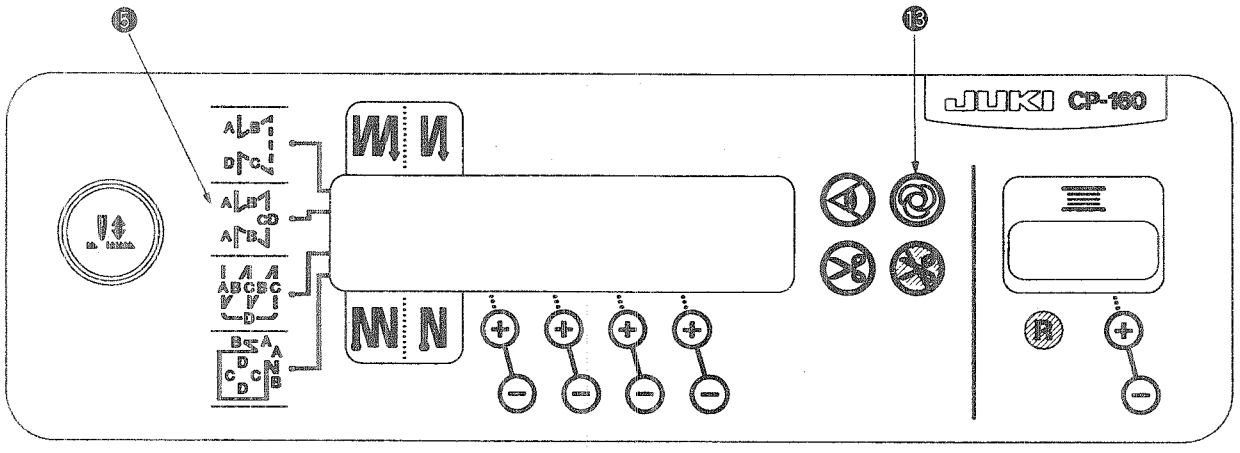
(Method) Adjust the position to mark ⑤ of the CP-160, turn ON material end sensor ON/OFF switch ⑫ of the CP-160, and turn ON mark ⑬ of the automatic one-shot stitching.



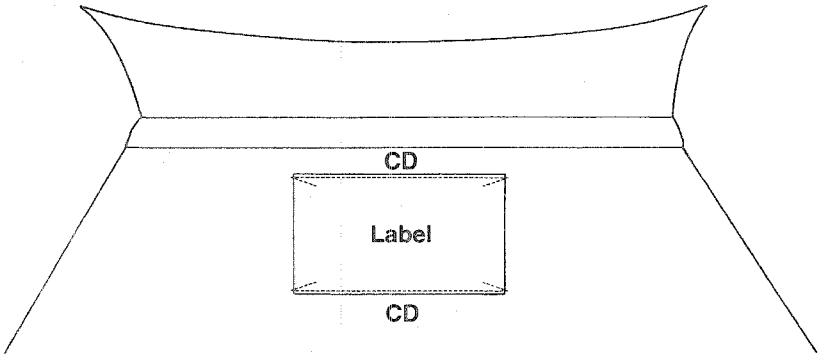

Caution) **Number of rotations of the automatic one-shot stitchig can be changed by the function setting (No. 38).**

### 2) Label attaching is performed by the automatic one-shot stitching with the CP-160

(Method) Select mark ⑤ on the CP-160, and turn ON mark ⑬ of the automatic one-shot stitching.

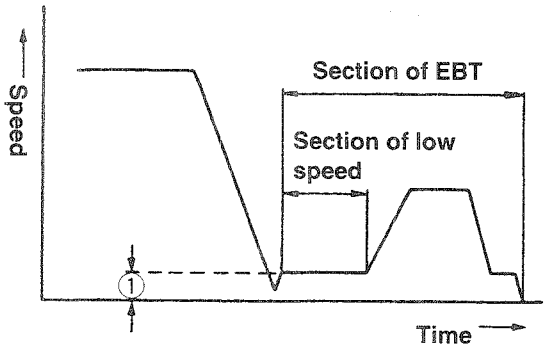



Explanation) Number of stitches at the section CD can be set up to 500 stitches. If the stitch length is 2 mm, it is possible to sew approximately 1,000 mm (1 m).
This function can perform the automatic one-shot stitching without using the material end sensor (ED : optional). Therefore, the sewing machine performs the sewing to the last according to the sewing pattern even if the label is not located at the end of material when the pedal is depressed once.



### 3) Seam joining of the reverse feed stitching at the end of sewing (For thick materials)

Especially some sewing machine heads for thick materials are likely to fail joining the seam at the section of the following figure even if the timing of reverse feed stitching at the end of sewing is compensated.

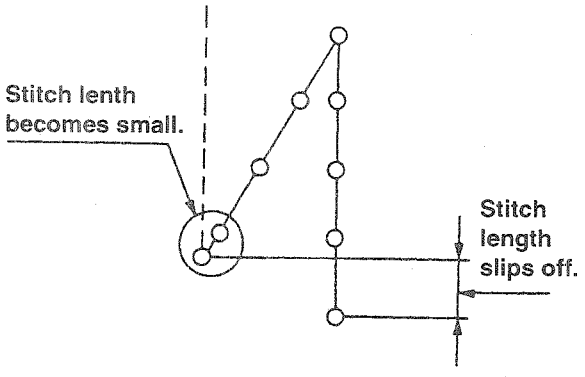



① At the timing to move to the reverse feed stitching action, the rotating speed at the section where the sewing machine is rotated at a low speed can be changed.
SC-500 function setting No. 64
(0 to 250 rpm changeable : 200 rpm was fixed in the past.)

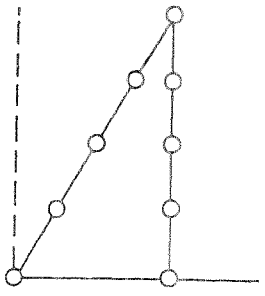
Example) Use for reference.

Standard

| Condition | Machine head of DDL-8700H (for thick materials) | |
|---|---|---|
| | Stitch length | 4 mm |
| | Number of stitches | 4 stitches |
| | ITEM No. 64 | 170 rpm |




| Condition | Machine head of DDL-8700H (for thick materials) | |
|---|---|---|
| | Stitch length | 4 mm |
| | Number of stitches | 4 stitches |
| | ITEM No. 64 | "0" rpm |



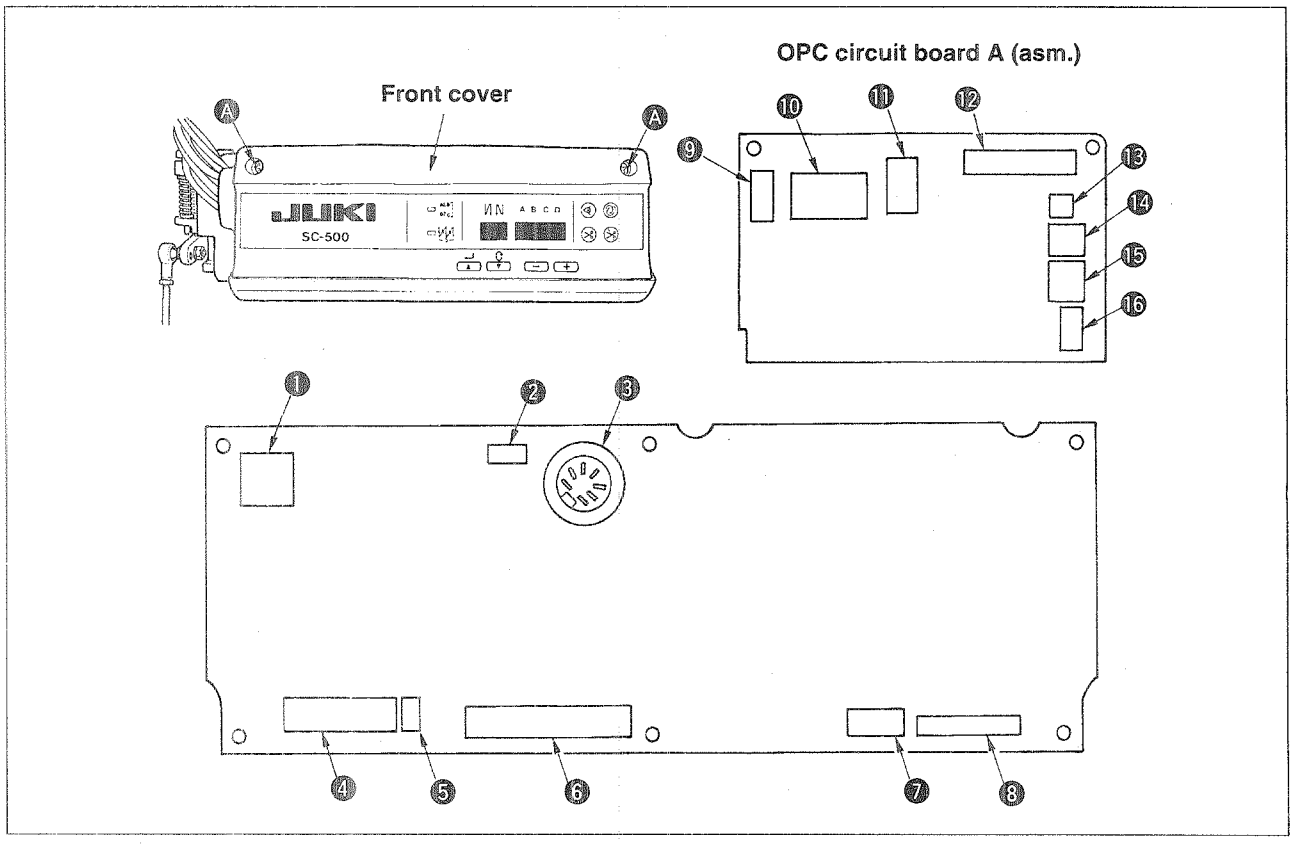
# 6. CONTROL BOX (SC-500)

## (1) Arrangement of connectors

**WARNING :**

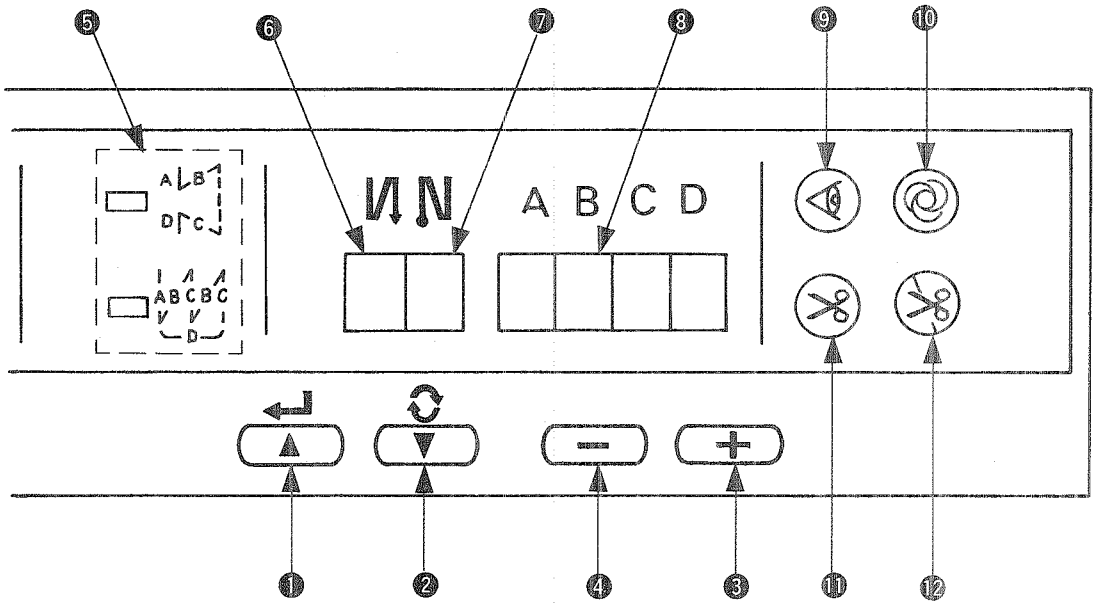
- **To prevent personal injury caused by abrupt start of the sewing machine, carry out the work after turning OFF the power switch and a lapse of 5 minutes or more.**
- **To prevent damage of device caused by maloperation and wrong specifications, be sure to connect all the corresponding connectors to the specified places.**
- **To prevent personal injury caused by maloperation, be sure to lock the connector with lock.**
- **As for the details of handling respective devices, read carefully the Instruction Manuals supplied with the devices before handling the devices.**

Following connectors are prepared when loosening the front cover fixing screws Ⓐ of SC-500 and opening the cover. Connect the machine head connectors to the positions corresponding to each other so as to fit the devices mounted on the machine head.




| | | |
|---|---|---|
| ❶ | CN30 | Motor signal connector |
| ❷ | CN32 | Machine head connector |
| ❸ | CN33 | Needle bar position detector connector |
| ❹ | CN36 | Machine head solenoid connector |
| ❺ | CN37 | Presser foot lifter solenoid connector |
| ❻ | CN38 | CP-160 panel connector |
| ❼ | CN39 | Standing machine pedal connector |
| ❽ | CN40 | Signal for extension connector |
| ❾ | CN51 | Not used |
| ❿ | CN52 | Not used |
| ⓫ | CN53 | Bobbin thread remaining amount detection solenoid connector |
| ⓬ | CN189 | External interface signal connector |
| ⓭ | CN59 | Bobbin thread count-up output connector |
| ⓮ | CN55 | Material end detection sensor (ED) connector |
| ⓯ | CN58 | Standing machine pedal connector |
| ⓰ | CN57 | Bobbin thread remaining amount detection sensor connector |

## (2) How to use the standard operation panel




❶ ↵ / ▲ switch : Used for determining the contents of setting.
When this switch is pressed, flashing stops and the contents of setting are determined.

❷ ↻ / ▼ switch : Used for changing the contents of setting.
When this switch is pressed, changeable positions flash on and off.
By pressing the switch, flashing position shifts in the right direction.

❸ + switch : Used for changing the contents of the selected display (flashing section).When this switch is pressed, the contents of the display increase.

❹ − switch : Used for changing the contents of the selected display (flashing section).
When this switch is pressed, the contents of the display decrease.

❺ PATTERN SELECTION display : The selected pattern is displayed.

❻ REVERSE STITCHING AT START display : Rendered effective when reverse stitching pattern is selected.
"▬" Without reverse stitching display / " " Reverse stitching display/ " " Double reverse stitching display

❼ REVERSE STITCHING AT END display : Rendered effective when reverse stitching pattern is selected.
"▬" Without reverse stitching display / " " Reverse stitching display/ " " Double reverse stitching display

❽ NUMBER OF STITCHES display : Number of stitches of reverse stitching or overlapped stitching is displayed.

❾ MATERIAL EDGE SENSOR display : Lights up when the material edge sensor setting is selected.
Function setting No. 2

❿ ONE-SHOT AUTOMATIC STITCHING display : Lights up when the one-shot automatic stitching is selected.
Function setting No. 76

⓫ AUTOMATIC THREAD TRIMMING display : Lights up when the automatic thread trimming by depressing the front part of the pedal is selected.
Function setting No. 3

⓬ THREAD TRIMMING PROHIBITION display : Lights up when the thread trimming prohibition is selected.
Function setting No. 9

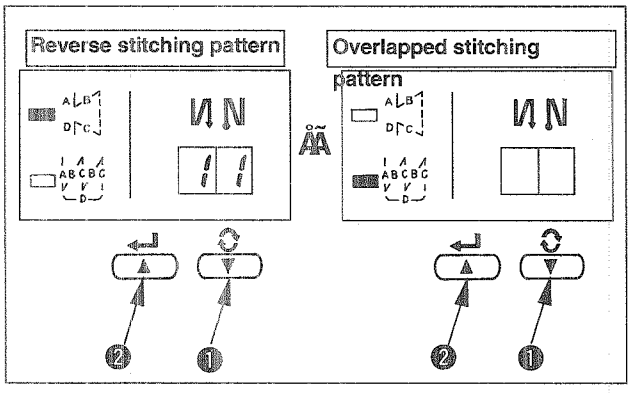
## Operating procedure of the sewing pattern

1. Reverse stitching pattern

Reverse stitching patterns below can be set by using the operation panel.

### Reverse stitching patterns that can be set

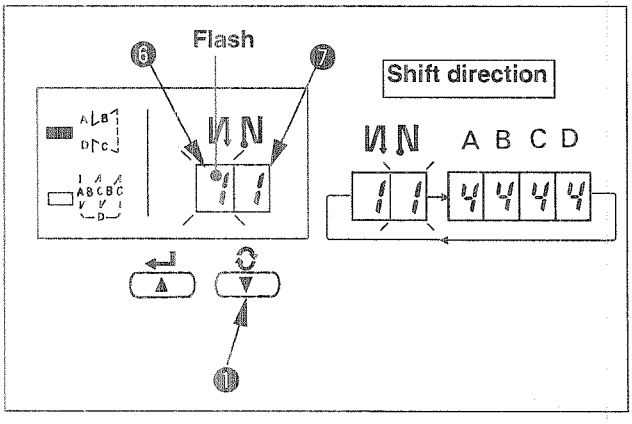
| Reverse stitching at start display | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sewing pattern | | | | | | | | | |
| Reverse stitching at end display | | | | | | | | | |




**[ Setting procedure of the reverse stitching ]**

(1) Hold pressing / switch ❶, and press / switch ❷ to select the reverse stitching pattern.

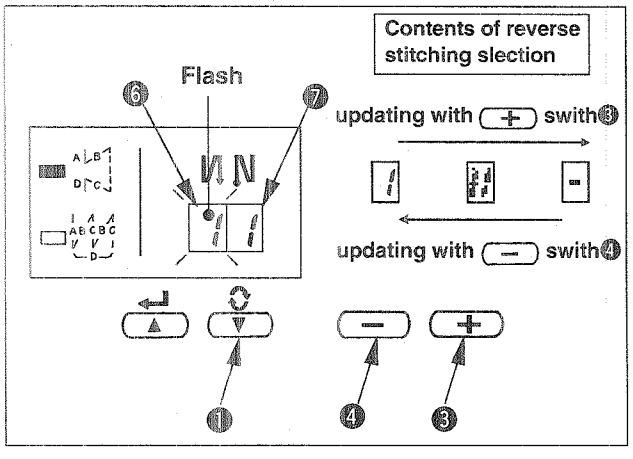
(Every time / switch ❷ is pressed, reverse stitching pattern/overlapped stitching pattern change over alternately.)




(2) Press / switch ❶ to make reverse stitching at start display ❻ flash on and off.

Every time / switch ❶ is pressed, the flashing position shifts in the right direction.

**(Caution) The sewing machine does not start in the flashing state.**




(3) Press + switch ❸ or − switch ❹ and select the reverse stitching pattern.

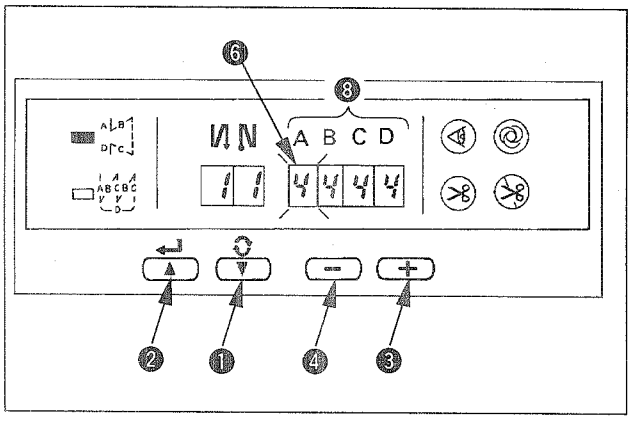
Reverse stitching patterns and displays are as follows.

: Reverse stitching

: Double reverse stitching

: Without reverse stitching

(4) Press / switch ❶ to make reverse stitching at end display ❼ flash on and off, and set the pattern in the same way as step 3).



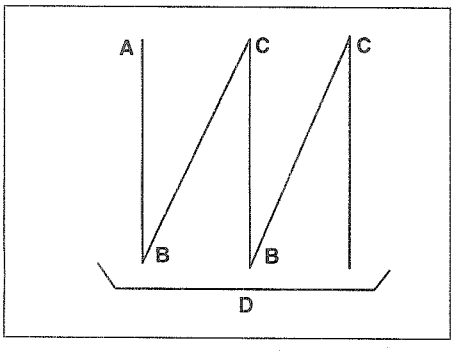

(5) Press ↻ / ▼ switch ❶ to make number of stitches display ❻ flash on and off, and set the number of stitches for the respective processes of the stitching.

(6) Press + switch ❸ or − switch ❹ to change the number of stitches.
The number of stitches can be changed up to as many as 15 stitches for the A, B, C, and D processes respectively.
However, displays are as follows.
10 stitches = A, 11 stitches = b, 12 stitches = c, 13 stitches = d, 14 stitches =E and 15 stitches = F

(7) When the setting of all items has been completed, press ↵ / ▲ switch ❷ to determine the contents of the setting. (Flashing stops.)

2. Overlapped stitching pattern

Overlapped stitching patterns below can be set by using the operation panel.



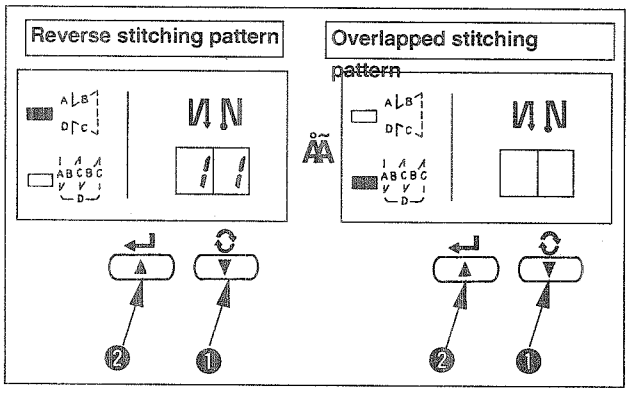

A : Number of stitches of normal stitching setting
0 to 15 stitches

B : Number of stitches of reverse stitching setting
0 to 15 stitches

C : Number of stitches of normal stitching setting
0 to 15 stitches

D : Number of times of repetition
0 to 9 times

**(Caution) When process D is set to 5 times, the sewing is repeated as A → B → C → B → C.**




**[Setting procedure of the overlapped stitching]**

(1) Hold pressing ↻ / ▼ switch❶, and press ↵ / ▲ switch ❷ to select the overlapped stitching pattern.
(Every time ↵ / ▲ switch ❷ is pressed, reverse stitching pattern/overlapped stitching pattern change over alternately.)

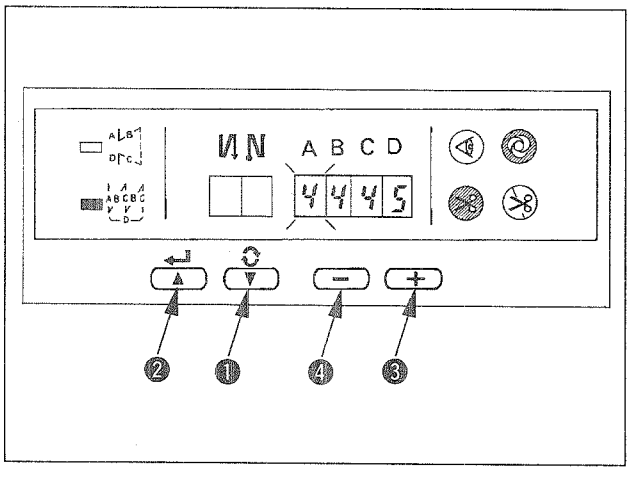
(2) The number of stitches for process A becomes in flashing state.

(3) Every time ↻ / ▼ switch ❶ is pressed, the flashing position shifts in the right direction and the display of the process where setting can be changed flashes on and off.

(4) Press + switch ❸ or − switch ❹ to change the number of stitches.

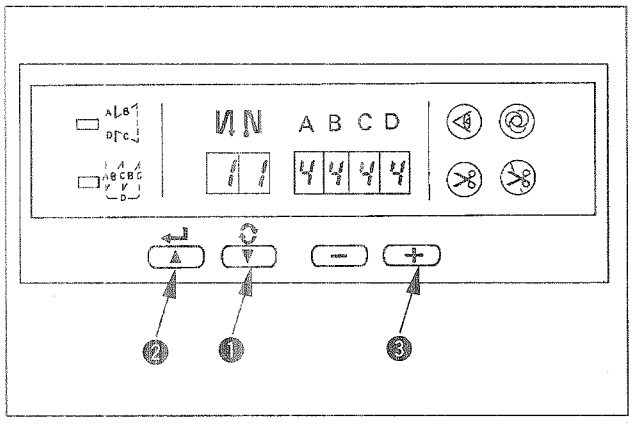
(5) When the setting of all processes has been completed, press ↵ / ▲ switch ❷ to determine the contents of the setting. (Flashing stops.)

**(Caution) When the overlapped stitching is selected, the automatic operation display flashes on and off. It is not possible to release the automatic operation.**



3. Special setting

For material end sensor function, automatic thread trimming function, one-shot automatic stitching function and thread trimming prohibition function which are displayed in the front panel, it is possible to change the set value by directly moving to the function setting mode while the power is turned ON in addition to the normal function setting procedure.

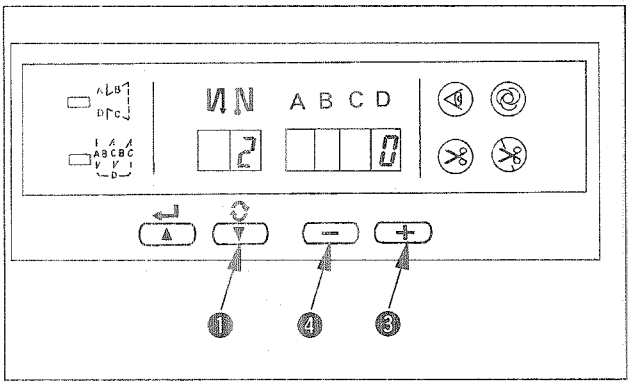



**[ Moving procedure to the function setting mode ]**

(1) Hold pressing ↻ / ▼ switch ❶, and press + switch ❸ to move to the function setting mode.

**(Caution) Function setting No. 2 is displayed immediately after the changeover.**

(2) When returning to the normal mode, press ↵ / ▲ switch ❷ and determine the contents of the setting.



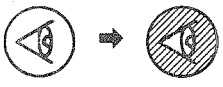

1) Material end sensor function setting (Function setting No. 2)

It is rendered effective when connecting the optional material end sensor.

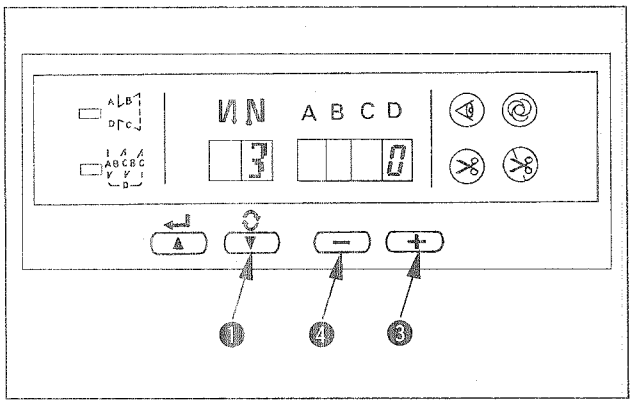
It is possible to change the set value with + switch ❸ or − switch ❹

0 : Material end sensor function is prohibited.

1 : Material end sensor function is effective.



When "1" is selected, material end sensor display lights up when the mode has returned to the normal one.



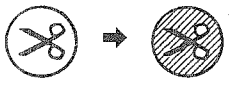

2) Thread trimming operation after material end stop setting (Function setting No. 3)

Press ↻ / ▼ switch ❶ to advance to the function setting No. 3.

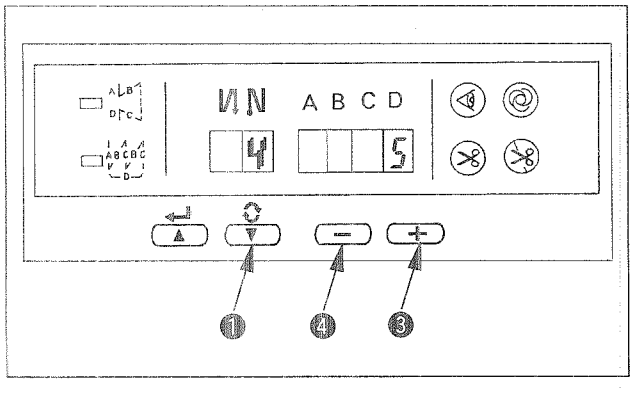
It is possible to change the set value with + switch ❸ or − switch ❹.

0 : Material end stop

1 : Automatic thread trimming after detection of material end



When "1" is selected, the automatic thread trimming display lights up when the mode is returned to the normal one.



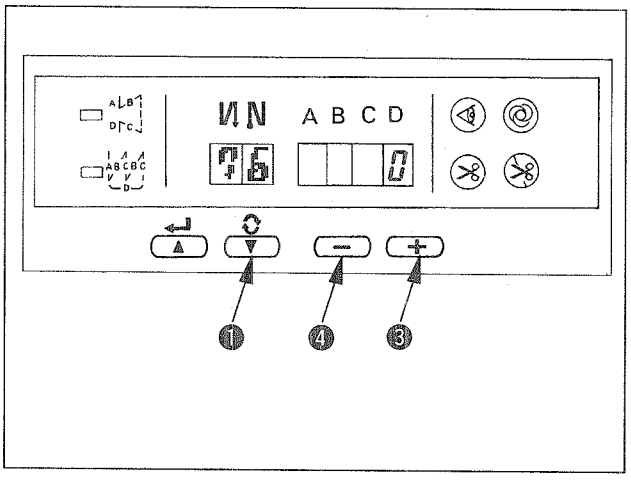

3) Number of stitches to stop the sewing machine after detection of material end setting (Function setting No. 4)

Press ↻ / ▼ switch ❶ to advance to the function setting No. 4.

It is possible to change the set value with + switch ❸ or − switch ❹.

Specified number of stitches : 0 to 19 stitches

**(Caution) When the specified number of stitches is insufficient, there is a case where the sewing machine cannot stop within the specified number of stitches depending on the speed of rotation of the sewing machine.**




4) One-shot automatic stitching setting function (Function setting No. 76)

Press ↻ / ▼ switch ❶ to advance to the function setting No. 76.

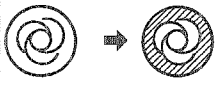
It is possible to change the set value with + switch ❸ or − switch ❹.

0 : Pedal designated speed is prior.

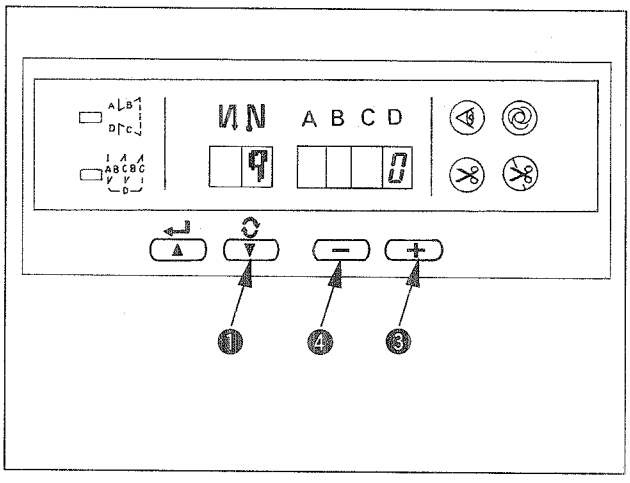
1 : Automatic operation

**(Caution) 1. It is rendered effective when the material end sensor function is set. It is not possible to prohibit the one-shot operation at the time of the verlapped stitching operation.**

**2. Speed of rotation is the speed set at the function setting No. 38.**



When "1" is selected, the one-shot automatic stitching display lights up when the mode is returned to the normal one.




5) Thread trimming prohibition function setting (Function setting No. 9)

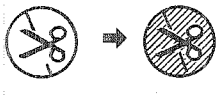
Thread trimming operation at normal stitching and overlapped stitching can be prohibited by selecting the thread trimming prohibition.

Press ↻ / ▼ switch ❶ to advance to the function setting No. 9.

It is possible to change the set value with + switch ❸ or − switch ❹.

0 : Thread trimming is effective.

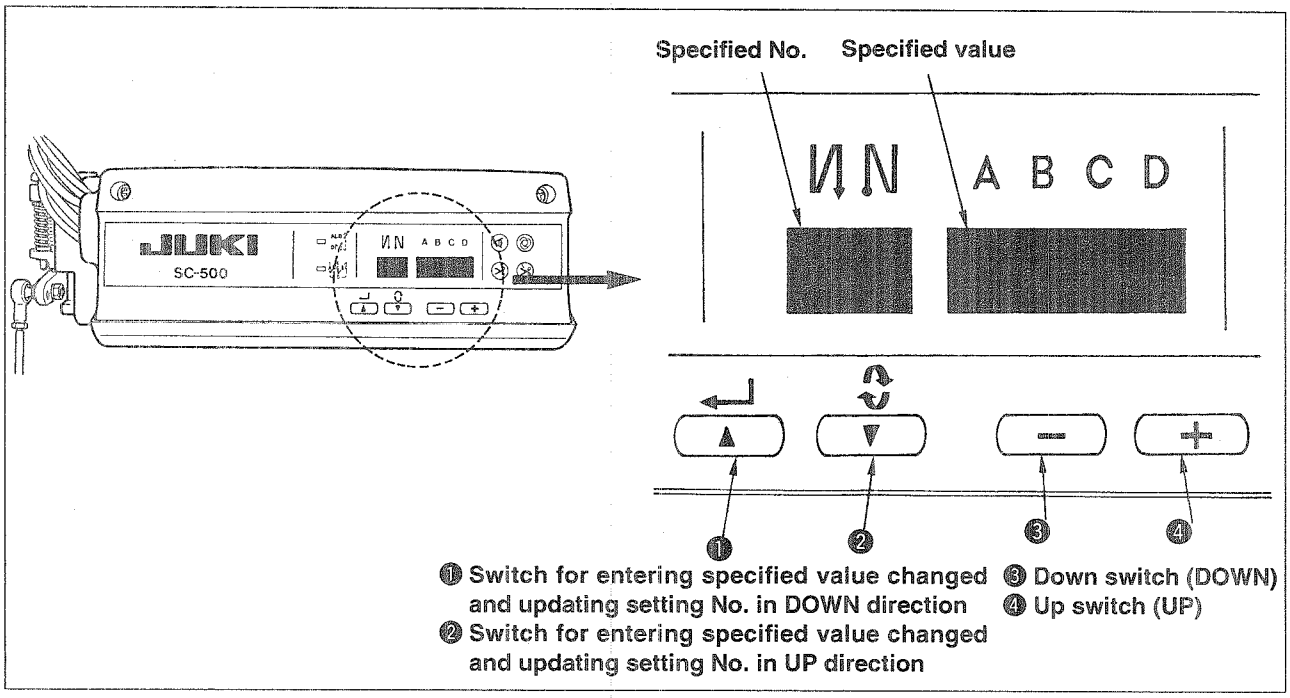
1 : Thread trimming is prohibited.



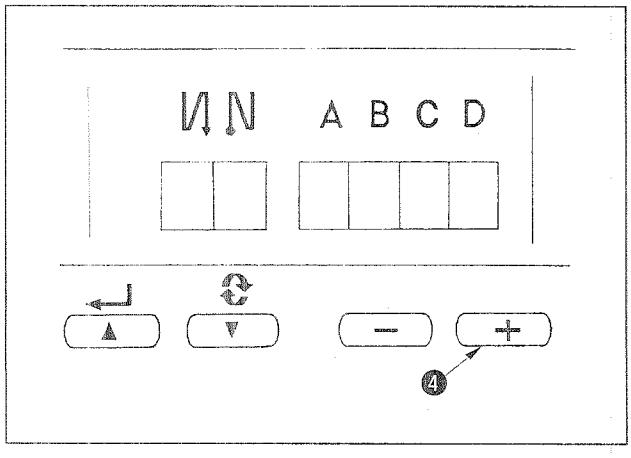
When "1" is selected, the thread trimming prohibition display lights up when the mode is returned to the normal one.

## (3) Setting for functions of SC-500

Functions can be selected and specified by means of the four setting switches and light emitting diode located inside the front cover of the SC-500.

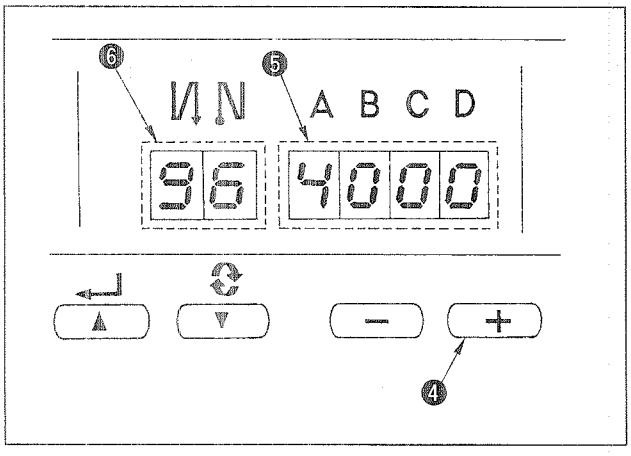



(Caution) **1. Do not perform switch operations other than those described in the following explanations.**
**2. Be sure to re-turn the power switch ON after one second or more has passed. If the power is turned ON immediately after turning it OFF, the sewing machine may not work normally. In this case, turn ON the power again.**

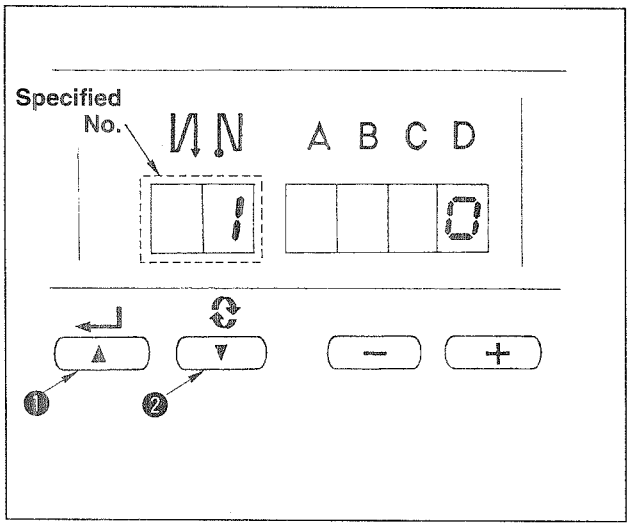



**How to change over to the function setting modo**

(1) Turn OFF the power to the unit.
(2) Pressing switch ❹, turn ON the power to the unit.

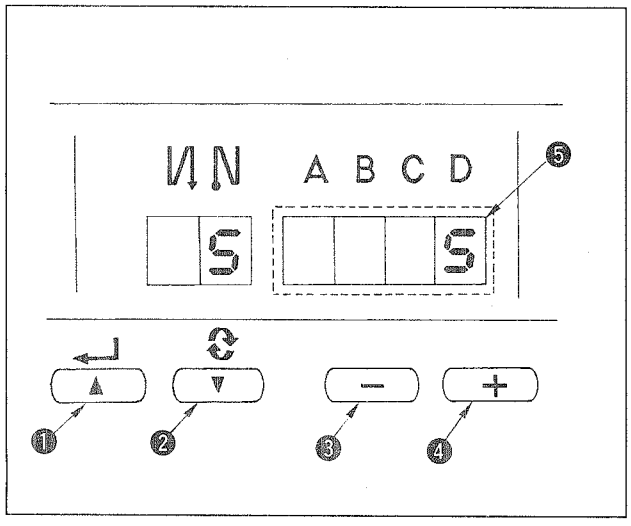



(3) Indication ❺, ❻ will be shown on the display. (If the indication fails to change, re-perform the procedures 1) and 2).



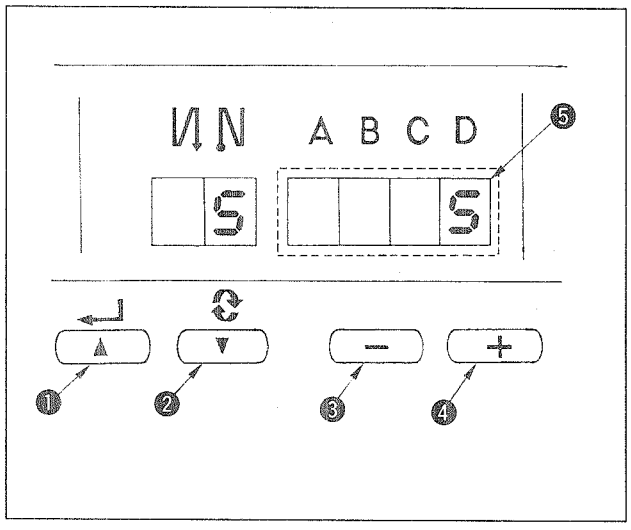

(4) When you want to advance the setting No., press switch ❷ to advance the setting No.
When you want to return the setting No., press switch ❶ to return the setting No.

**(Caution) 1. When switch 1 (switch 2) is held pressing, the setting No. will return (will advance) continuously.**
**2. When the setting No. is advanced (returned), the contents which are before by one (after by one) will be determined. So, be careful when changing the contents (up/down switch is touched).**




**EXAMPLE) CHANGING THE FLICKER REDUCING FUNCTION (SETTING No. 5)**
Press switch ❷ five times to set the setting No. to "5".
Press switch ❹ five times to change the set No. to "5" since the current set value is displayed on LED ❺.
(Standard : "0")

**(Caution) Keep pressing switch ❹ or switch ❸, and the setting vaue can be changed continuously.**




(5) When the change has been completed, press switch ❶ or ❷ to specify the changed value.
**(Caution)**

1. **When turning OFF the power before performing this work, the contents which have been changed are not updated.**
2. **Press switch ❶, and screen display will change to the contents of the setting No. which is before by one.**
3. **Press switch ❷, and screen display will change to the contents of next setting No. After completing the operation, turn OFF the power and turn ON the power again to return to the normal operation.**

After completing the operation, turn OFF the power and turn ON the power again to return to the normal operation.

## (4) Function setting list

| No. | Item | Description | Setting range | Indication of function setting | Ref. page |
|---|---|---|---|---|---|
| 1 | Soft start function | The number of stitches to be sewn at a low speed when the soft-start function is used at the start of sewing.<br>0 : Soft-start function is not operative. | 0 to 9 (Stitches) | 1 0 | 19 |
| 2 | Material end sensor function | Material end sensor function (used in case of without panel).<br>0 : Material end detection function is not operative.<br>1 : After detecting material end, the specified number of stitches (No. 4) will be sewn, and the sewing machine will stop. | 0/1 | 2 0 | 19 |
| 3 | Thread trimming function by material end sensor | Thread trimming function by material end sensor (used in case of without panel).<br>0 : Automatic thread trimming function after detection of material end is not operative.<br>1 : After detecting material end, the specified number of stitches (No. 4) will be sewn, and the sewing machine will stop and perform automatic thread trimming. | 0/1 | 3 0 | 19 |
| 4 | Number of stitches for material end sensor | Number of stitches for material end sensor (used in case of without panel).<br>Number of stitches from detection of material end to stop of the sewing machine. | 0 to 19 (Stitches) | 4 5 | 19 |
| 5 | Flicker reducing function | Flicker reducing function (If the hand lamp flickers).<br>0 : Flicker reducing function is not operative.<br>1 : Less effective → 8 : Highly effective | 0 to 8 | 5 0 | 19 |
| 6 | Bobbin thread counting function | Bobbin thread counting function<br>0 : Bobbin thread counting function is not operative.<br>1 : Bobbin thread counting function is operative. | 0/1 | 6 1 | 19 |
| 7 | Unit of bobbin thread counting down | Unit of bobbin thread counting down<br>0 : Count/10 stitches<br>1 : Count/15 stitches<br>2 : Count/20 stitches | 0 to 2 | 7 0 | |
| * 8 | Number of rotation of reverse feed stitching | Sewing speed of reverse feed stitching | 150 to 3,000 (r.p.m.) | 8 1900 | |
| 9 | Thread trimming prohibiting function | Thread trimming prohibiting function (used in case of without panel).<br>0 : Thread trimming prohibiting function is not operative.<br>1 : Thread trimming is prohibited.<br>(Output of solenoid is prohibited. : Thread trimmer and wiper) | 0/1 | 9 0 | 19 |
| 10 | Setting of needle bar stop position when the sewing machine stops. | Position of needle bar is specified when the sewing machine stops.<br>0 : Predetermined lowest position<br>1 : Predetermined highest position | 0/1 | 10 0 | 19 |
| 11 | Click sound of key switch mounted on PSC | Click sound of key switch mounted on PSC is specified.<br>0 : Click is not operative.<br>1 : Click is operative. | 0/1 | 11 1 | 20 |
| 12 | Optinal switch function selection | Switching of function of optional switch.<br>0 : No function<br>1 : Needle up/down compensating stitching<br>2 : Back compensating stitching<br>3 : Function of canceling once reverse feed stitching at the end of sewing<br>4 : Thread trimming function<br>5 : Presser foot lifting function<br>6 : One stitch compensating stitching<br>7 : Function of simultaneously canceling reverse feed stitching at the start and end of sewing<br>8 : Presser foot lifting function when pedal is neutral | 0 to 8 | 12 0 | 20 |
| 13 | Function of prohibiting start of the sewing machine by bobbin thread counter | Function of prohibiting start of the sewing machine by bobbin thread counting<br>0 : When counting is out (-1 or less) Function of prohibiting start of the sewing machine is not operative.<br>1 : When counting is out (-1 or less) Function of prohibiting start of the sewing machine after thread trimming is operative.<br>2 : When counting is out (-1 or less), the sewing machine stops once. Function of prohibiting start of the sewing machine after thread trimming is operative. | 0 to 2 | 13 0 | |
| 14 | Sewing counter | Counting function of sewing (number of completion of process)<br>0 : Sewing counter function is not operative.<br>1 : Sewing counter function is operative. | 0/1 | 14 1 | 20 |
| 15 | Number of times of detection of run-out of bobbin thread remaining amount | Number of times of detection of run-out of bobbin thread remaining amount<br>0 : Function of bobbin thread remaining amount is not operative.<br>1 to 19 : Number of times during which the signal is not made even if run-out of bobbin thread remaining amount is detected. | 0 to 19 | 15 1 | |
| 21 | Function of neutral presser lifting | Function of lifting presser foot when the pedal is in neutral position.<br>0 : Function of neutral automatic presser lifting is not operative.<br>1 : Selection of function of neutral presser lifting. | 0/1 | 21 0 | 20 |

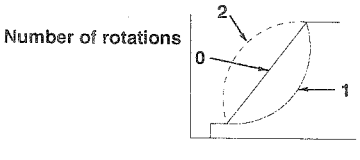
*** Functions with * (asterisk) are those for maintenance. Be very careful of changing the set value.**

| | No. | Item | Description | Setting range | Indication of function setting | Ref. page |
|---|---|---|---|---|---|---|
| | 22 | Function of changeover of compensating switch on the operation panel function | Function of needle up/down compensating switch on the operation panel can be changed.<br>0 : Needle up/down compensation<br>1 : One stitch compensation | 0/1 | 2 2 _ _ _ 0 | 21 |
| * | 24 | Function of fine adjustment of number of rotation | Number of rotation can be compensated.<br>Be sure to normally use this function with "0". | −1.5% to 1.5% (0.1 %) | 2 4 _ _ _ 0 | |
| | 25 | Thread trimming motion condition | This function sets the thread trimming motion after DOWN position has been off by turning handwheel by hand.<br>0 : Thread trimming after turning handwheel by hand is permitted.<br>1 : Thread trimming after turning handwheel by hand is prohibited. | 0/1 | 2 5 _ _ _ 1 | 21 |
| * | 26 | Function of setting the holding force after stop | This function prevents the sewing machine from the reverse rotation after it has stopped.<br>0 : Initial value<br>1 : Less effective → 9 : Highly effective | 0 to 9 | 2 6 _ _ _ 0 | 21 |
| | 27 | Function of setting the reaction force at the time of retry | This function sets the magnitude of return force of the needle bar before the retry motion.<br>1 : Less return force → 15 : High return force | 0 to 15 | 2 7 _ _ _ 3 | 21 |
| | 29 | Suction time of the first start of the back solenoid | This function sets the suction motion time of the back-tack solenoid.<br>50 ms to 300 ms | 50 to 300 (ms) | 2 9 _ 2 5 0 | 21 |
| | 30 | Function of reverse feed stitching on the way | Function of reverse feed stitching on the way<br>0 : Function of reverse stitching on the way is not operative.<br>1 : Function of reverse feed stitching on the way is operative. | 0/1 | 3 0 _ _ _ 0 | 22 |
| | 31 | Number of stitches of reverse feed stitching on the way | Number of stitches of reverse feed stitching on the way. | 0 to 19 (Stitches) | 3 1 _ _ _ 4 | 22 |
| | 32 | Effective condition of reverse feed stitching on the way when the sewing machine is stopping. | Effective condition of reverse feed stitching on the way<br>0 : Function is not operative when the sewing machine stops.<br>1 : Function is operative when the sewing machine stops. | 0/1 | 3 2 _ _ _ 0 | 22 |
| | 33 | Thread trimming function by reverse feed stitching on the way | Thread trimming function by reverse feed stitching on the way<br>0 : Automatic thread trimming function after completion of reverse feed stitching on the way is not operative.<br>1 : Automatic thread trimming after completion of reverse feed stitching on the way is performed. | 0/1 | 3 3 _ _ _ 0 | 22 |
| * | 35 | Number of rotation at a low speed | Lowest speed by pedal | 150 to 250 (r.p.m.) | 3 5 _ 2 0 0 | |
| | 37 | Number of rotation of soft-start | Sewing speed at the start of sewing (soft-start)(The max. value depends on the number of rotation of the sewing machine head.) | 150 to MAX (r.p.m.) | 3 7 _ 8 0 0 | 19 |
| | 38 | One-shot speed | One-shot speed (The max. value depends on the number of rotation of the sewing machine head.) | 150 to MAX (r.p.m.) | 3 8 2 5 0 0 | 23 |
| * | 39 | Pedal stroke at the start of rotation | Position where the sewing machine starts rotating from pedal neutral position (Pedal stroke) | 10 to 50 (0.1 mm) | 3 9 _ _ 3 0 | |
| * | 40 | Low speed section of pedal | Position where the sewing machine starts accelerating from pedal neutral position (Pedal stroke) | 10 to 100 (0.1 mm) | 4 0 _ _ 6 0 | |
| * | 41 | Starting position of lifting presser foot by pedal | Position where the cloth presser starts lifting from pedal neutral position (Pedal stroke) | −60 to −10 (0.1mm) | 4 1 − _ 2 1 | |
| * | 42 | Starting position of lowering presser foot | Starting position of lowering presser foot<br>Stroke from the neutral position | 8 to 50 (0.1 mm) | 4 2 _ _ 1 0 | |
| * | 43 | Pedal stroke 2 for starting thread trimming | Position 2 where the thread trimming starts from pedal neutral position (When the function of lifting presser foot by pedal is provided.) (Pedal stroke) | −60 to −10 (0.1 mm) | 4 3 − _ 5 1 | |

*** Functions with * (asterisk) are those for maintenance. Be very careful of changing the set value.**

| No. | Item | Description | Setting range | Indication of function setting | Ref. page |
|---|---|---|---|---|---|
| * 44 | Pedal stroke for reaching the maximum number of rotation | Position where the sewing machin reaches its highest sewing speed from pedal neutral position (Pedal stroke) | 10 to 150 (0.1 mm) | 4 4 □ 1 5 0 | |
| * 45 | Compensation of neutral point of the pedal | Compensation value of the pedal sensor | −15 to 15 | 4 5 □ □ □ 0 | |
| * 46 | Auto-lifter selecting function | Auto-lifter selection<br>0 : Solenoid drive system<br>1 : Pneumatic drive system | 0/1 | 4 6 □ □ □ 0 | |
| 47 | Holding time of lifting auto-lifter | Limitation time of waiting for lifting solenoid type auto-lifter device | 10 to 600 (second) | 4 7 □ □ 6 0 | 23 |
| * 48 | Pedal stroke 1 for starting thread trimming | Position where thread trimming starts from pedal neutral position (Standard pedal) (Pedal stroke) | −60 to −10 (0.1 mm) | 4 8 □ □ 3 5 | |
| 49 | Lowering time of presser foot | Lowering time of presser foot after the pedal has been depressed. (Start of rotation of the sewing machine is delayed during this time.) | 0 to 250 (10 ms) | 4 9 □ 1 4 0 | 25 |
| 51 | Compensation of solenoid-on timing of reverse feed stitching at the start of sewing | Compensation of starting the solenoid for reverse feed stitching when reverse feed stitching at the start of sewing is performed. | −36 to 36 (10°) | 5 1 □ □ 1 0 | 23 |
| 52 | Compensation of solenoid-off timing of reverse feed stitching at the start of sewing | Compensation of releasing the solenoid for reverse feed stitching when reverse feed stitching at the start of sewing is performed. | −36 to 36 (10°) | 5 2 □ □ 1 6 | 23 |
| 53 | Compensation of solenoid-off timing of reverse feed stitching at the end of sewing | Compensation of releasing the solenoid for reverse feed stitching when reverse feed stitching at the end of sewing is performed. | −36 to 36 (10°) | 5 3 □ □ 1 8 | 23 |
| 55 | Foot lift after thread trimming | Function of lifting presser foot at the time of (after) thread trimming<br>0 : Not provided with the function of lifting presser foot after thread trimming<br>1 : Provided with the function of lifting presser foot automatically after thread trimming | 0/1 | 5 5 □ □ □ 1 | 24 |
| 56 | Reverse revolution to lift the needle after thread trimming | Function of reverse revolution to lift the needle at the time of (after) thread trimming<br>0 : Not provided with the function of reverse revolution to lift the needle after thread trimming<br>1 : Provided with the function of reverse revolution to lift the needle after thread trimming | 0/1 | 5 6 □ □ □ 0 | 24 |
| 57 | Bobbin thread remaining amount detection function | Function of detecting bobbin thread remaining amount at the time of (after) thread trimming<br>0 : Not provided with the function of detecting bobbin thread remaining amount<br>1 : Provided with the function of detecting bobbin thread remaining amount | 0/1 | 5 7 □ □ □ 0 | 24 |
| 58 | Function of holding predetermined upper/lower position of the needle bar | Function of holding predetermined upper/lower position of the needle bar<br>0 : Not provided with the function of holding predetermined upper/lower position of the needle bar<br>1 : Provided with the function of holding predetermined upper/lower position of the needle bar | 0/1 | 5 8 □ □ □ 0 | 24 |
| 59 | Function of Auto/Manual change-over of reverse feed stitching at the start of sewing | This function can specify the sewing speed of reverse feed stitching at the start of sewing.<br>0 : The speed will depend on the manual operation by pedal, etc.<br>1 : The speed will depend on the specified reverse feed stitching speed (No. 8). | 0/1 | 5 9 □ □ □ 1 | 24 |
| 60 | Function of stop immediately after reverse feed stitching at the start of sewing | Function at the time of completion of reverse feed stitching at the start of sewing<br>0 : Not provided with the function of temporary stop of the sewing machine at the time of completion of reverse feed stitching at the start of sewing<br>1 : Provided with the function of temporary stop of the sewing machine at the time of completion of reverse feed stitching at the start of sewing. | 0/1 | 6 0 □ □ □ 0 | 25 |
| 61 | Function of starting prohibition of the sewing machine by detection of bobbin thread remaining amount | Function of starting prohibition of the sewing machine by detection of bobbin thread remaining amount<br>0 : This function does not stop the sewing machine when counting is out (-1 or less).<br>1 : This function stops the sewing machine when counting is out (-1 or less). | 0/1 | 6 1 □ □ □ 1 | 24 |

*** Functions with * (asterisk) are those for maintenance. Be very careful of changing the set value.**

| No. | Item | Description | Setting range | Indication of function setting | Ref. page |
|---|---|---|---|---|---|
| 64 | Change-over speed of EBT (end back tack) | Initial speed when starting reverse feed stitching at the sewing end | 0 to 250 (r.p.m.) | 64 1800 | |
| 70 | Function of soft-down of presser foot | Presser foot is slowly lowered.<br>0 : Presser foot is rapidly lowered.<br>1 : Presser foot is slowly lowered. | 0/1 | 70 0000 | 25 |
| 71 | Function of limitation of re-acceleration from reduction of speed | Speed limitation is performed at the time of re-acceleration on the way of reducing speed of the sewing machine.<br>It is effective when operating inching sewing. | 0 to 5 | 71 0000 | 25 |
| 72 | Function of limitation of acceleration at the start of rotation | Speed limitation is performed at the time of start-up of the sewing machine (excluding the start of sewing).<br>It is effective when operating inching sewing. | 0 to 5 | 72 0000 | 25 |
| 73 | Retry function | This function is used when needle cannot pierce materials .<br>0 : Normal<br>1 : Retry function is provided. | 0/1 | 73 0001 | 26 |
| * 75 | Rotating direction of motor | Normal rotating direction of motor<br>0 : Clockwise<br>1 : Counterclockwise | 0/1 | 75 0001 | |
| 76 | One-shot function up to end of material | One-shot automatic stitching up to end of material is performed. (Used in case of without panel)<br>0 : Without one-shot function<br>1 : With one-shot function | 0/1 | 76 0000 | 26 |
| * 84 | Presser lifter solenoid initial motion suction time | Suction motion time of presser lifter solenoid<br>50 to 300 ms | 50 to 300 (ms) | 84 0250 | |
| 87 | Function of pedal curve selection | Pedal curve is selected. (Improving pedal inching operation)<br>  <br> | 0/1/2 | 87 0000 | 26 |
| * 89 | Tension release function | It is effective in combination with the machine head provided with tension release function.<br>0 : Tension release function is ineffective.<br>1 : Tension release function is effective. | 0/1 | 89 0000 | |
| * 91 | Function of prohibiting compensation operation after turning handwheel by hand | Function of compensating stitching when turning handwheel by hand at the time of completion of constant-dimension stitching<br>0 : Function of compensating stitching is effective.<br>1 : Function of compensating stitching is prohibited. | 0/1 | 91 0001 | |
| 92 | Function of reducing speed of reverse feed stitching at the start of sewing | Function to reduce speed at the time of completion of reverse feed stitching at the start of sewing.<br>0 : Speed is not reduced.<br>1 : Speed is reduced. | 0/1 | 92 0000 | 25 |
| 93 | Function added to needle up/down compensating switch | Operation of needle up/down compensating switch is changed after turning ON the power or thread trimming.<br>0 : Normal (needle up/down compensating stitching only)<br>1 : One stitch compensating stitching is performed only when aforementioned changeover is made. (Upper stop ⇒ upper stop) | 0/1 | 93 0000 | 26 |
| * 94 | Manufacturer's function | Do not change the set value. | 0/1 | 94 0000 | |
| 96 | Max. number of rotation setting | Max. number of rotation of the sewing machine head can be set.<br>* Setting varies in accordance with resistance pack to be connected. | 150 to MAX (rpm) | 96 4000 | 26 |

*** Functions with * (asterisk) are those for maintenance. Be very careful of changing the set value.**

## (5) Detailed explanation of selection of functions

① **Selection of the soft-start function (Function setting No. 1)**

The needle thread may fail to interlace with the bobbin thread at the start of sewing when the stitching pitch (stitch length) is small or a thick needle is used. To solve such problem, this function (called "soft-start") is used to limit the sewing speed, thereby assuring successful formation of the starting stitches.

□1□□□0

0 : The function is not selected.
1 to 9 : The number of stitches to be sewn under the soft-start mode.

The sewing speed limited by the soft-start function can be changed. (Function setting No. 37)

37□800

Data setting range
150 to MAX rpm <50 rpm>

② **Material end sensor (ED : optional) function (Function setting No. 2 to 4)**

This function is possible when the material end sensor (ED) is attached.
As for the details, refer to the instruction manual for the material end sensor.

(Caution) **Setting will be invalid when the material end sensor is not attached, or CP-160 is connected.**

③ **Flicker reducing function (Function setting No. 5)**

The function reduces flickering of the hand lamp at the start of sewing. The higher the set value increases, the more effective the function will work.

Setting range
0 to 8

□5□□□0

0 : Flicker reducing function does not work.
to
8 : Flickering is effectively reduced.

(Caution) **The more effective the flicker reducing function works (the more the set value is made), the lower the start-up speed of the sewing machine will become.**

④ **Bobbin thread counting function (Function setting No. 6)**

When the control panel (CP-160) is used, the function subtracts from the predetermined value and indicates the used amount of bobbin thread.
For the details, refer to the instruction manual for the control panel.

(Caution) **If "0" is set, the LCD indication on the control panel will go out and the bobbin thread counting function will be invalid.**

⑤ **Thread trimming prohibiting function (Function setting No. 9)**

This function turns OFF thread trimming solenoid output and wiper solenoid output when thread trimming is actuated. [If the control panel (CP-160) is used with the sewing machine, this function will work in accordance with the function setting on the control panel.]
By this function, separate sewing material can be spliced and sewn without trimming thread.

□9□□□0

0 : off Thread trimming is operative. (thread can be trimmed).
1 : on Thread trimming is inoperative. (thread can not be trimmed).

⑥ **Setting of the needle bar stop position when the sewing machine stops (Function setting No. 10)**

The position of the needle bar when the pedal is in its neutral position is specified.

10□□□0

0 : Down The needle bar stops in the lowest position of its stroke.
1 : Up The needle bar stops in the highest position of its stroke.

(Caution) **If the stop position of the needle bar is set to the highest position, the thread trimming action will be taken after the needle bar comes down once to the lowest position.**

⑦ **Sound of click of the key switch mounted on the PSC box (Function setting No. 11)**

This function selects whether the sound is effective or ineffective when operating the four key switches mounted on the PSC box.

1 1 □ □ □ 1

0 : off The sound of click is ineffective.

1 : on The sound of click is effective.

⑧ **Optional switch function selection (Function setting No. 12) : It is used only when it is combined with the machine head provided with the optional switch.**

Functions to be assigned to the optional switch can be selected from the following functions.

1 2 □ □ □ 0

0 : No function (Standard setting)

1 : Needle up / down compensating stitching : Every time the switch is pressed, normal feed stitching by half stitch is performed. (Same operation as that of up / down compensating stitching switch on the panel.)

2 : Back compensating stitching : Reverse feed stitching is performed at low speed while the switch is held pressing. (It is effective only when constant dimension sewing pattern is selected with the CP-160.)

3 : Function of canceling once reverse feed stitching at the end of sewing : By depressing the back part of the pedal after pressing the switch, operation of reverse feed stitching is canceled once.

4 : Thread trimming function : This function is actuated as the thread trimming switch.

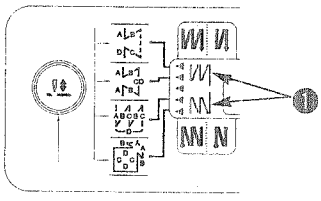
5 : Presser foot lifting function : This function is actuated as the foot lifter switch.

6 : One stitch compensating stitching : Every time the switch is pressed, one stitch stitching operation is executed.

7 : Function of simultaneously canceling reverse feed stitching at the start and end of sewing : By operating the optional switch, ineffective/effective can be alternately changed over.

8 : Presser foot lifting function when pedal is neutral : Every time the switch is pressed, the function whether automatically lifting the presser foot when the pedal is neutral or not can be selected.

**(Note) Indication ❶ of reverse feed stitching at the start and end of sewing on the operation panel is the same even when the function is canceled. So, be careful.**



⑨ **Sewing counting function (Function setting No. 14)**

The function counts up every time thread trimming is completed and counts the number of completion of the sewing process.

This can be realized together with the CP-160 control panel. Refer to the explanation of the control panel.

1 4 □ □ □ 1

1 : on Sewing counting function is operative.

0 : off Sewing counting function is inoperative.

(Indication on the CP-160 contorl panel will go out as well.)

**(Caution) Setting will be invalid when the material end sensor is not attached, or CP-160 control panel is connected.**

⑩ **Neutral automatic presser lifting function (with AK device only) (Functionsetting No. 21)**

This function can automatically lift the presser foot when the pedal is in the neutral position.

Automatic lifting time of the pedal depends on the automatic lifting time after thread trimming and when the presser foot is automatically lowered, it is automatically lifted at the second neutral position after it has come off the neutral position once.

2 1 □ □ □ 0

0 : off Function of neutral automatic presser lifting is not operative.

1 : on Selection of function of neutral automatic presser lifting

⑪ **Function of changeover of compensating switch on the operation panel function (Function setting No. 22)**

Function of compensation switch on the operation panel of CP-160 can be changed over to needle up / down compensating stitching or one stitch compensating stitching.

| 2 | 2 | | | | 0 |
|---|---|---|---|---|---|

0 : Needle up / down compensating stitching
1 : One stitch compensating stitching

⑫ **Thread trimming motion condition (Function setting No. 25)**

This function makes the thread trimming motion ineffective when depressing the back part of the pedal after DOWN detection position has been off by turning handwheel by hand or the like.

| 2 | 5 | | | | 1 |
|---|---|---|---|---|---|

0 : Thread trimming motion is effective.
1 : Thread trimming motion is prohibited.

⑬ **Function of setting the holding force after stop (Function setting No. 26)**

Function to prevent the increased amount of reverse rotation after stop when the machine has been used for a long time and the machine head torque has become light. When the set value is increased, the prevention effect becomes large. However, when the set value is excessively increased, on the contrary, there is a danger that the machine normally rotates. Adjust the function while checking the motion of the needle bar.

| 2 | 6 | | | | 0 |
|---|---|---|---|---|---|

Setting range : 0 to 9

⑭ **Function of setting the reaction force at the time of retry (Function setting No. 27)**

This function changes the magnitude of the reversing force before moving to the retry motion.

| 2 | 7 | | | | 3 |
|---|---|---|---|---|---|

Setting range : 1 to 15
1 : Less reversing force to 15 : More reversing force

⑮ **Setting of the suction time of the back-tack solenoid (Function setting No. 29)**

This function can change the suction time of the back-tack solenoid.
It is effective to decrease the value when the heat is high.
**(Caution) When the value is excessively decreased, failure of motion or defective pitch will follow. Be careful when changing the value.**

| 2 | 9 | | 2 | 5 | 0 |
|---|---|---|---|---|---|

Setting range : 50 to 300 ms <10 / ms>

⑯ **Function of reverse feed stitching on the way (Function setting Nos. 30 to 33)**

Functions of the limit of number of stitches and thread trimming command can be added to the touch back switch on the sewing machine head.

Function setting No. 30

3 0 □ □ □ 0

Function of reverse feed stitching on the way is selected.

0 : off Normal back-tack function

1 : on Function of reverse feed stitching on the way

Function setting No. 31

3 1 □ □ □ 4

Number of stitches performing reverse feed stitching is set.

Setting range

0 to 19 stitches

Function setting No. 32

3 2 □ □ □ 0

Effective condition of reverse feed stitching on the way

0 : off Inoperative when the sewing machine stops.
(Reverse feed stitching on the way functions only when the sewing machine is running.)

1 : on Operative when the sewing machine stops.
(Reverse feed stitching on the way functions both when the sewing machine is running and stops.)

**(Caution) Either condition is operative when the sewing machine is running.**

Function setting No. 33

3 3 □ □ □ 0

Thread trimming is performed when reverse feed stitching on the way is completed.

0 : off Without thread trimming

1 : on Thread trimming is executed.

**Actions under each setting state**

| Application | Function setting | | | Output function |
|---|---|---|---|---|
| | No.30 | No.32 | No.33 | |
| ① | 0 | 0 or 1 | 0 or 1 | It works as normal touch-back switch. |
| ② | 1 | 0 | 0 | When operating touch-back switch at the time of depressing front part of the pedal, reverse feed stitching as many as the number of stitches specified by the function setting No. 31 can be performed. |
| ③ | 1 | 1 | 0 | When operating touch-back switch at the time of either stop of the sewing machine or depressing front part of the pedal, reverse feed stitching as many as the number of stitches specified by the function setting No. 31 can be performed. |
| ④ | 1 | 0 | 1 | When operating touch-back switch at the time of depressing front part of the pedal, automatic thread trimming is performed after reverse feed stitching as many as the number of stitches specified by the function setting No. 31 has been performed. |
| ⑤ | 1 | 1 | 1 | When operating touch-back switch at the time of either stop of the sewing machine or depressing front part of the pedal, automatic thread trimming is performed after reverse feed stitching as many as the number of stitches specified by the function setting No. 31 has been performed. |

① Used as the normal reverse feed stitching touch-back switch.

② Used for reinforcing seam (press sewing) of the pleats. (It works only when the sewing machine is running.)

③ Used for reinforcing seam (press sewing) of the pleats.
(It works either when the sewing machine stops or when the sewing machine is running.)

④ Used as starting switch for reverse feed stitching at the sewing end.
(Used as the substitute for thread trimming by depressing back part of the pedal. It works only when the sewing machine is running. It is especially effective when the sewing machine is used as the standing-work machine.)

⑤ Used as starting switch for reverse feed stitching at the sewing end.
(Used as the substitute for thread trimming by depressing back part of the pedal. It works either when the sewing machine stops or when the sewing machine is running. It is especially effective when the sewing machine is used as the standing-work machine.)

⑰ **Number of rotation of one-shot stitching (Function setting No. 38)**

This function can set, by the pedal operation of one time, the sewing speed of one-shot stitching when the sewing machine continues stitching until completing the number of stitches specified or detecting the material end.

[3][8] [2][5][0][0] Setting range
150 to MAX. rpm. <50 / rpm>

(Caution) **1. Setting of one-shot stitching is made by the operation panel of the CP-160, or the function setting No. 76.**
**2. The max. number of rotation of one-shot stitching is limited by the model of the sewing machine head.**

⑱ **Holding time of lifting presser foot (Function setting No. 47)**

Solenoid type presser foot lifter (No. 46 0) can adjust the holding time control of lifting presser foot.
This function automatically lowers the presser foot when the time set with the setting No. 47 has passed after lifting the presser foot.
When the pneumatic type presser foot lifter (No. 46 1) is selected, the holding time control of lifting presser foot is limitless regradless of the set value.

[4][7] [ ][ ][6][0] Setting range
10 to 600 sec <10 / sec>

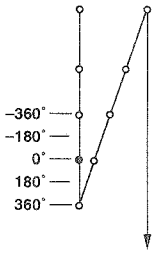
⑲ **Compensation of timing of the solenoid for reverse feed stitching (Function setting No. 51 to 53)**

When the normal and reverse feed stitches are not uniform under the automatic reverse feed stitching action, this function can change the ON / OFF timing of the solenoid for back tack and compensate the timing.

① Compensation of on-timing of solenoid for reverse feed stitching at the start of sewing (Function setting No. 51)
On-timing of solenoid for reverse feed stitching at the start of sewing can be compensated by the unit of angle.

[5][1] [ ][ ][1][0] Adjusting range
– 36 to 36 <1 / 10°>

| Set value | Compensation angle | Number of sitches of compensation |
|---|---|---|
| – 36 | – 360° | – 1 |
| – 18 | – 180° | – 0.5 |
| 0 | 0° | 0 |
| 18 | 180° | 0.5 |
| 36 | 360° | 1 |

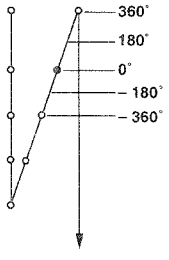



*** When the point before 1 stitch is regarded as 0°, compensation is possible by 360° (1 stitch) in front and in the rear.**

② Compensation of off-timing of solenoid for reverse feed stitching at the start of sewing (Function setting No. 52)
Off-timing of solenoid for reverse feed stitching at the start of sewing can be compensated by the unit of angle.

[5][2] [ ][ ][1][6] Adjusting range
– 36 to 36 <1 / 10°>

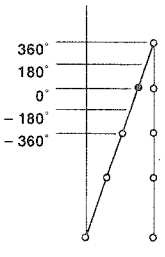
| Set value | Compensation angle | Number of sitches of compensation |
|---|---|---|
| – 36 | – 360° | – 1 |
| – 18 | – 180° | – 0.5 |
| 0 | 0° | 0 |
| 18 | 180° | 0.5 |
| 36 | 360° | 1 |




③ Compensation of off-timing of solenoid for reverse feed stitching at the end of sewing (Function setting No. 53)
Off-timing of solenoid for reverse feed stitching at the start of sewing can be compensated by the unit of angle.

[5][3] [ ][ ][1][8] Adjusting range
– 36 to 36 <1 / 10°>

| Set value | Compensation angle | Number of sitches of compensation |
|---|---|---|
| – 36 | – 360° | – 1 |
| – 18 | – 180° | – 0.5 |
| 0 | 0° | 0 |
| 18 | 180° | 0.5 |
| 36 | 360° | 1 |



⑳ **Foot lift function after thread trimming (Function setting No. 55)**

This function can automatically lift the presser foot after thread trimming.This function is effective only when it is used in combination with the AK device.

5 5 □□□ 1

0 : off Function of automatically lifting the presser foot is not provided.
(Presser foot does not automatically go up after thread trimming.)

1 : on Function of automatically lifting the presser foot is provided.
(Presser foot automatically goes up after thread trimming.)

㉑ **Reverse revolution to lift the needle after thread trimming (Function setting No. 56)**

This function is used to make the sewing machine rotate in the reverse direction after thread trimming to lift the needle bar almost to highest position. Use this function when the needle appears under the presser foot and it is likely to make scratches on the sewing products of heavy-weight material or the like.

5 6 □□□ 0

0 : off Function of making the sewing machine rotate in the reverse direction to lift the needle after thread trimming is not provided.

1 : on Function of making the sewing machine rotate in the reverse direction to lift the needle after thread trimming is provided.

**(Caution) The needle bar is raised, by rotating the machine in the reverse direction, almost to the highest dead point. This may result in slip-off of the needle thread. It is therefore necessary to adjust the length of thread remaining after thread trimming properly.**

㉒ **Bobbin thread remaining amount detection function (Function setting No. 57 and No. 61)**

This function detects the amount of the bobbin thread used and informs of the time of replacement of the bobbin.

This function is used when the bobbin thread remaining amount detection device (AE) is attached.

As for the details, refer to the instruction manual for the bobbin thread remaining amount detection device.

5 7 □□□ 0

**(Caution) Be sure to set the setting No. 57 to ineffective ("0") when the AE device is not attached. ("E43" is displayed, and the sewing machine is not actuated.)**

㉓ **Function of holding predetermined upper / lower position of the needle bar (Function setting No. 58)**

When the needle bar is in the upper position or in the lower position, this function holds the needle bar by applying a brake slightly.

5 8 □□□ 0

0 : off Function of holding predetermined upper/lower position of the needle bar is ineffective.

1 : on Function of holding predetermined upper/lower position of the needle bar is effective.

㉔ **Change-over function of AUTO / Pedal for sewing speed of the reverse feed stitching at the start of sewing (Function setting No. 59)**

This function selects whether the reverse feed stitching at the start of sewing is performed without a break at the speed set by the function setting No. 8 or the stitching is performed at the speed by the pedal operation.

5 9 □□□ 1

0 : Manu The speed is indicated by the pedal operation.

1 : Auto Automatic stitching at the specified speed

**(Caution) 1. The max. sewing speed of the reverse feed stitching at the start of sewing is limited to the speed set by the function setting No. 8 regardless of the pedal.**

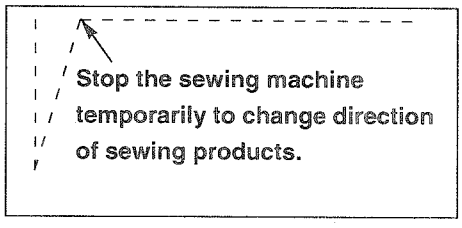
**2. When "0" is selected, stitches of reverse feed stitching may not match those of normal feed stitching.**

### ㉕ Function of stop immediately after the reverse feed stitching at the start of sewing (Function setting No. 60)

This function temporarily stops the sewing machine even when keeping depressing the front part of the pedal at the time of completion of process of reverse feed stitching at the start of sewing.
It is used when sewing a short length by reverse feed stitching at the start of sewing.

[6][0][ ][ ][ ][0]

0 : Not provided with the function of temporary stop of the sewing machine immediately after the reverse feed stitching at the start of sewing
1 : Provided with the function of temporary stop of the sewing machine immediately after the reverse feed stitching at the start of sewing




### ㉖ Function of soft-down of presser foot (with AK device only) (Function setting Nos. 70 and 49)

This function can softly lower the presser foot.
This function can be used when it is necessary to decrease contact noise, cloth defect, or slippage of cloth at the time of lowering the presser foot.

**Note : Change the time of function setting No. 49 together at the time of selecting the function of soft-down since the sufficient effect cannot be obtained unless the time of function setting No. 49 is set longer when lowering the presser foot by depressing the pedal.**

[4][9][ ][1][4][0]

0 to 250 ms
10 ms/Step

[7][0][ ][ ][ ][0]

0 : Function of soft-down of presser foot is not operative. (Presser foot is rapidly lowered.)
1 : Selection of function of soft-down of presser foot

### ㉗ Function of improving inching operation (Function setting Nos. 71 and 72)

This function improves operability of one-stitch sewing by operating the high-speed switch for the pedal or sewing machine for standing work.
The more the set value becomes, the more the speed limitation at the start of rotation is remarkably added and operability of one-stitch sewing is improved.
Function setting No. 71 limits the speed at the time of re-acceleration on the way of reducing speed.
Function setting No. 72 limits acceleration from the stop state.

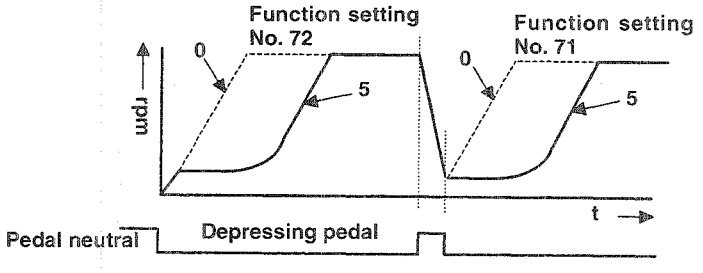
**Note : This function fails to work when turning ON the power or starting sewing immediately after thread trimming.**

[7][1][ ][ ][ ][0]

0 to 5

[7][2][ ][ ][ ][0]

0 to 5

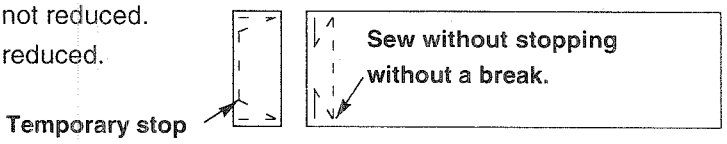



### ㉘ Function of reducing speed of reverse feed stitching at the start of sewing (Function setting No. 92)

Function to reduce speed at the time of completion of reverse feed stitching at the start of sewing : Normal use depending on the pedal condition (Speed is acceralated to the highest without a break.)
This function is used when temporary stop is used properly. (Cuff and cuff attaching)

[9][2][ ][ ][ ][0]

0 : Speed is not reduced.
1 : Speed is reduced.



㉙ **Retry function (Function setting No. 73)**

When the retry function is used, if the sewing material is thick and not piereced with needle, this function makes the needle pierce in the material with ease.

| 7 | 3 | | | | 1 |
|---|---|---|---|---|---|

0 : Normal
1 : Retry function is provided.

㉚ **One-shot function up to material end (Function setting No. 76)**

This function can perform the one-shot automatic stitching up to the end of material in combination with the material end sensor when the operation panel is not connected.

| 7 | 6 | | | | 0 |
|---|---|---|---|---|---|

0 : Without one-shot function
1 : With one-shot function

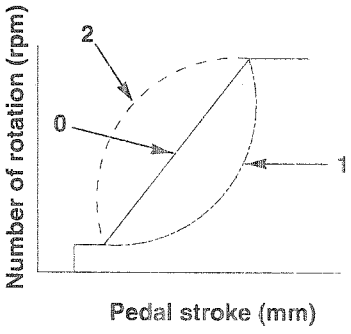
㉛ **Function of pedal curve selection (Function setting No. 87)**

This function can perform the selection of the curve of number of rotation of the sewing machine against the depressing amount of the pedal.

Change to this function when you feel that inching operation is hard or that pedal response is slow.

| 8 | 7 | | | | 0 |
|---|---|---|---|---|---|

0 : Number of rotation of the sewing machine in terms of the depressing amount of the pedal increases linearly.
1 : Reaction to intermediate speed in terms of the depressing amount of the pedal is delayed.
2 : Reaction to intermediate speed in terms of the depressing amount of the pedal is advanced.




㉜ **Function added to the needle up / down compensating switch (Function setting No. 93)**

One stitch operation can be performed only when the needle up / down compensating switch is pressed at the time of upper stop immediately after turning ON the power switch or upper stop immediately after thread trimming.

| 9 | 3 | | | | 0 |
|---|---|---|---|---|---|

0 : Normal (Only needle up / down compensating stitching operation)
1 : One stitch compensating stitching operation (upper stop if upper stop) is performed only when aforementioned changeover is made.

㉝ **Setting of max. number of rotation of the sewing machine head (Function setting No. 96)**

This function can set the max. number of rotation of the sewing machine head you desire to use.

Upper limit of the set value varies in accordance with the sewing machine head to be connected.

| 9 | 6 | 4 | 0 | 0 | 0 |
|---|---|---|---|---|---|

150 to Max. [rpm] <50 / rpm>

㉞ **Function of prohibiting start of the sewing machine by bobbin thread counter (Function setting No. 13)**

When operation panel (CP-160 or higher class model) is used, and when thread trimming is executed after the predetermined value has been subtracted until the counter value is reached "-"1, this function prohibits start of sewing machine afterward.

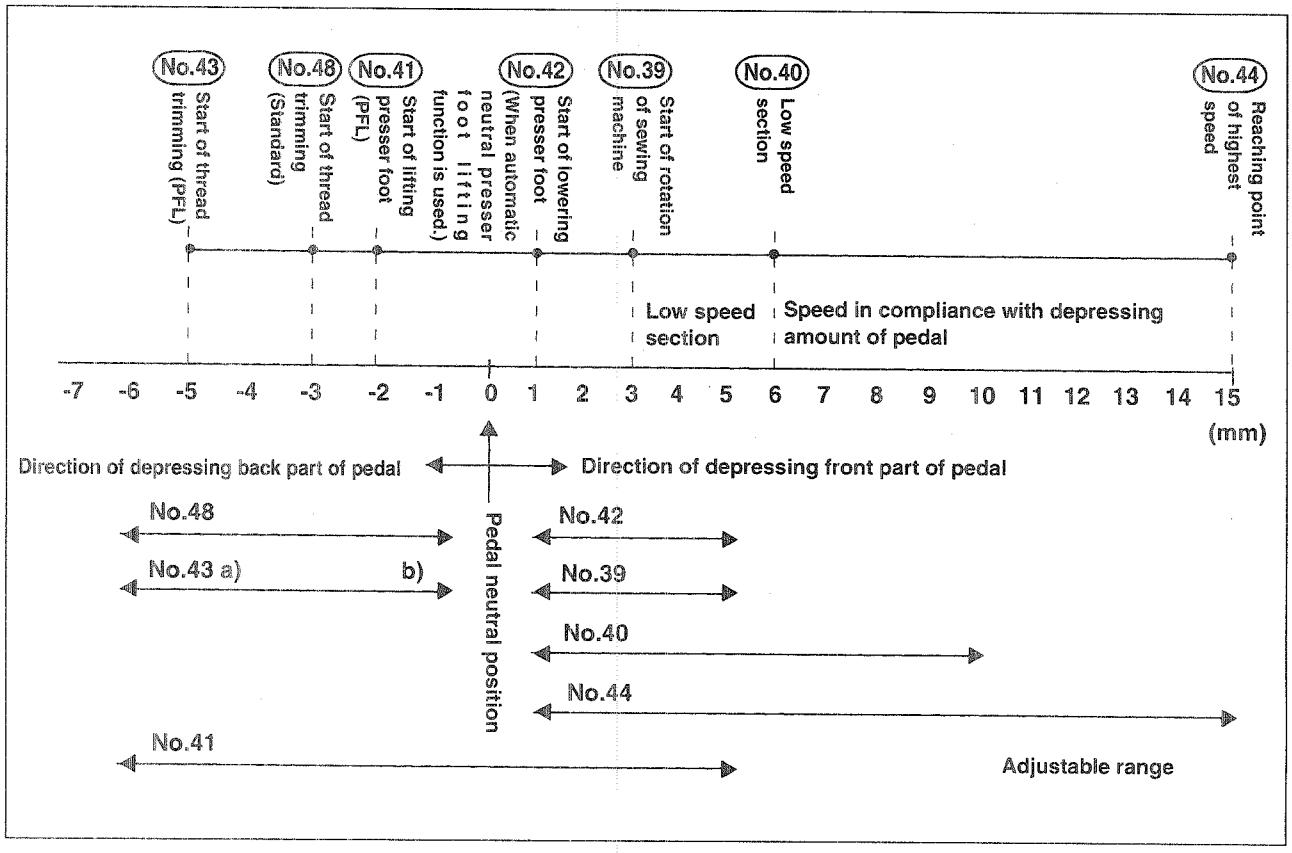
Set this function when there is a possibility of failing to hear the buzzer sound only and making a mistake of the time of replacement.

**(Caution) Reset the bobbin thread counter value when releasing the prohibition operation.**

| 1 | 3 | | | | 0 |
|---|---|---|---|---|---|

0 : Bobbin thread counter (in csse of -1 or less)
Without function of prohibiting start of sewing machine
1 : Bobbin thread counter (in case of -1 or less)
With function of prohibiting start of sewing machine
2 : Bobbin thread counter (-1 or less)
With function of forcibly prohibiting start of sewing machine

## ㉟ Adjustment of the pedal stroke (Function setting Nos. 39 to 44 and 48)




### 1. Pedal stroke at the start of rotation (Function setting No. 39)

Stroke between the pedal in its neutral position and starting position of rotation of the sewing machine can be adjusted.

[3][9][ ][ ][3][0] Adjusting range
1.0 to 5.0 [mm] <0.1 / mm>

### 2. Low speed section of the pedal (Function setting No. 40)

Stroke of the low speed section can be adjusted by operating the pedal.

[4][0][ ][ ][6][0] Adjusting range
1.0 to 10.0 [mm] <0.1 / mm>

### 3. Starting position of lifting presser foot by pedal (Function setting No. 41)

Stroke between the pedal in its neutral position and starting position of lifting presser foot can be adjusted. (When lifting presser foot by pedal is applied.)

[4][1][-][ ][2][1] Adjusting range
- 6.0 to 5.0 [mm] <0.1 / mm>

### 4. Setting of starting position of lowering presser foot (Function setting No. 42)

Stroke between the pedal in its neutral position and starting position of lowering presser foot can be adjusted.(When the automatic neutral presser foot lifting function is used.)

[4][2][ ][ ][1][0] Adjusting range
0.8 to 5.0 [mm] <0.1 / mm>

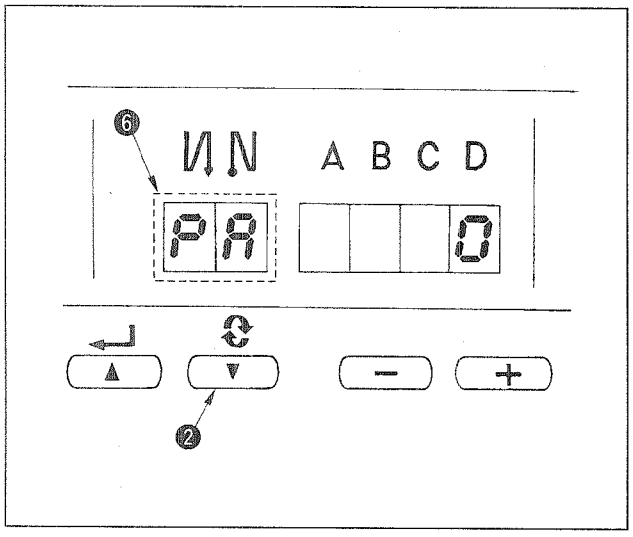
### 5. Pedal stroke 2 for starting thread trimming (Function setting No. 43)

Stroke between the pedal in its neutral position and starting position of thread trimming can be adjusted. (When the function of lifting presser foot by pedal is provided.)

[4][3][-][ ][5][1] Adjusting range
-6.0 to -1.0 [mm] <0.1 / mm>

## (6) Automatic compensation of neutral point of the pedal sensor

Whenever the pedal sensor, spring, etc. are replaced, be sure to perform following operation :



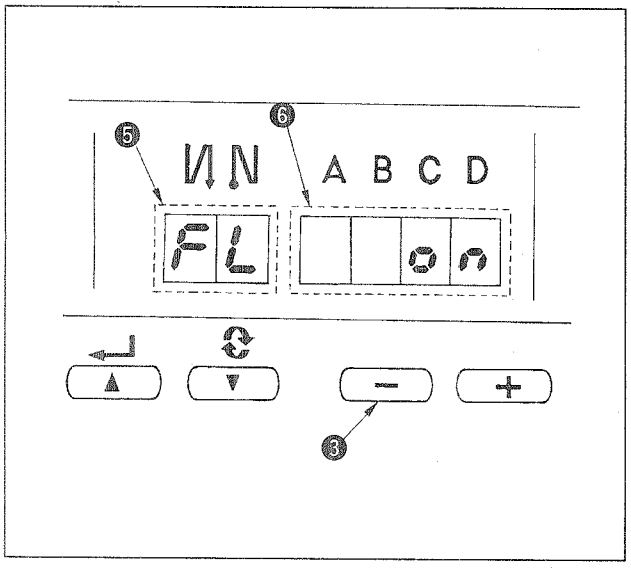

(1) Pressing switch ❷, turn ON the power switch.

(2) Indication on the screen will be as illustrated in ❻. At this time, the value indicated in the 7 segments of four figures is the compensation value.

**(Caution) At this time, the pedal sensor does not work properly if the pedal is depressed. Do not place the foot or any object on the pedal. Warning sound "peeps" and the compensation value is not displayed.**

(3) Turn OFF the power switch, and turn ON the power switch again to return to the normal mode.

## (7) Setting of the auto lifter function




When the auto-lifter device (AK) is attached, this function makes the function of auto-lifter work.

(1) Turn ON the power switch while pressing switch ❸ inside the control box.

(2) LED display is turned to ❺, ❻ (FL ON) with "beep", and the function of auto-lifter becomes effective.

(3) Turn OFF the power switch, and turn ON the power switch again to return to the normal mode.

(4) Repeat the operation 1) to 3), and LED display is turned to (FL OFF). Then, the function of auto-lifter does not work.

FL ON : Auto-lifter device becomes effective.

FL OFF : Auto-lifter function does not work. (Standard at the time of delivery)

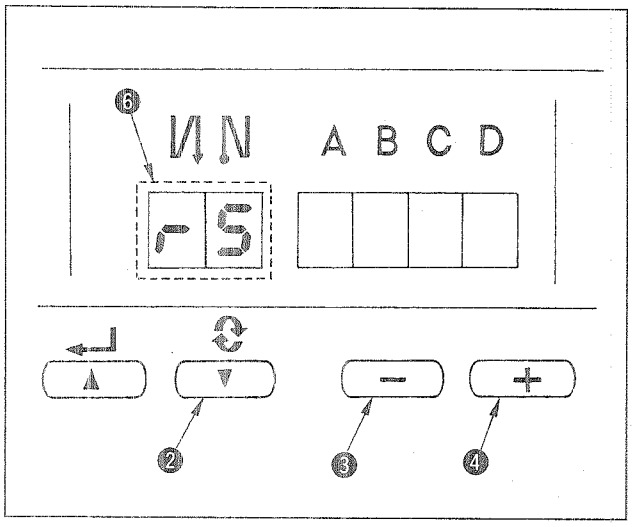
(Similarly, the presser foot is not automatically lifted when programmed stitching is completed.)

(Caution) **1. To perform re-turning ON of the power, be sure to perform after the time of one second or more has passed.**
**(If ON / OFF operation of the power is performed quickly, setting may be not changed over well.)**

**2. Auto-lifter is not actuated unless this function is properly selected.**

**3. When "FL ON" is selected without installing the auto-lifter device, starting is momentarily delayed at the start of sewing. In addition, be sure to select "FL OFF" when the auto-lifter is not installed since the touch-back switch may not work.**

## (8) Initialization of the setting data




All contents of function setting of SC-500 can be returned to the standard set values.

(1) Pressing all switches ❷, ❸ and ❹, turn ON the power switch.

(2) LED displays indication ❻ with the sound "peep", and initialization starts.

(3) The buzzer sounds after approximately one second (single sound three times, "peep", "peep", and "peep"), and the setting data returns to the standard setting value.

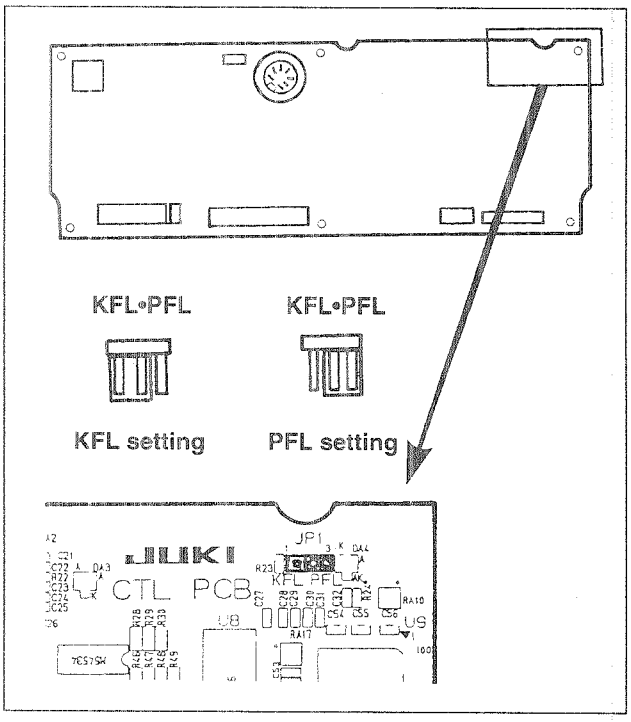
**(Caution) Do not turn OFF the power on the way of initializing operation. Program of the main unit may be broken.**

(4) Turn OFF the power switch, and turn ON the power switch again to return to the normal mode.

(Caution)

1. **When this operation is performed, the neutral compensation value of the pedal sensor becomes "0". Accordingly, be sure to execute the operation of automatic pedal sensor neutral compensation before using the sewing machine. (Refer to page 32.)**
2. **Even when this operation is performed, the sewing data set by the operation panel cannot be initialized.**

# 7. CHANGING PROCEDURE OF THE PEDAL TYPE



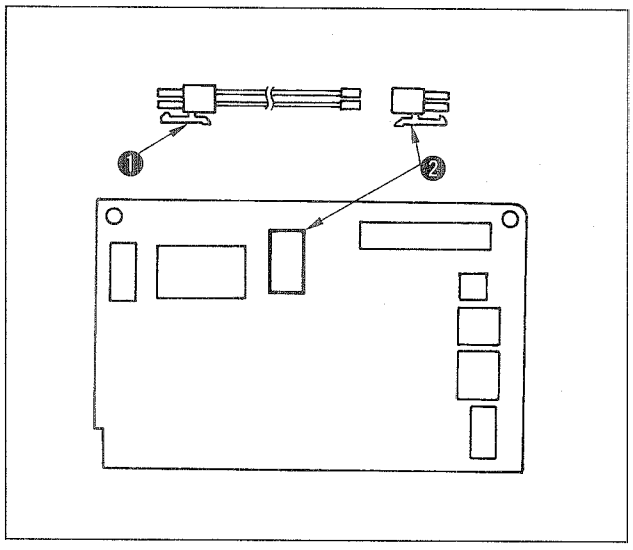

1. PFL type is the standard for the pedal type for SC-500
2. When PFL type is in the standard state, there is a section of auto-lifter and the amount of depressing the back part of foot pedal to actuate thread trimmer becomes larger (thread trimmer motion position is deep).
3. For this reason, when you feel the work difficult, it is recommended to change over the jumper switch to KFL type.
   By setting to KFL type, when depressing the back part of foot pedal, thread trimmer motion is performed at the shallow position.
4. Select the pedal sensor type changeover jumper pin in accordance with the type.

**(Caution)**

1. **When changing over the jumper, be sure to perform the work with the power OFF.**
2. **Setting does not change even when changing over the jumper while the power is ON. However, there is a danger of damaging the main unit.**

# 8. CONNECTING PROCEDURE WITH JUKI OPTIONAL DEVICES

## (1) Bobbin thread remaining amount detection device, AE

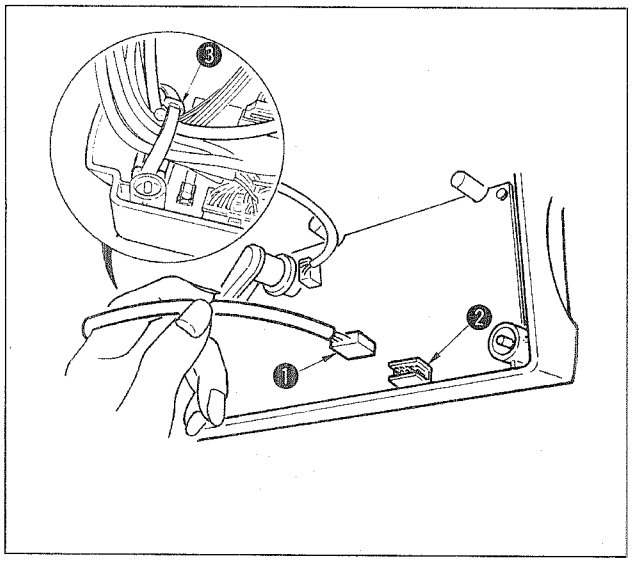



When using the AE device, the optional IO p.c.b. is necessary.

Connect solenoid cord ❶ attached to the side of the AE device to 2P plug (red) ❷ attached to the IO p.c.b. for use.

**(Caution) Even when connecting to 14P plug from the machine head, the device does not work. So, be careful.**

## (2) Connection of the pedal of standing-work machine

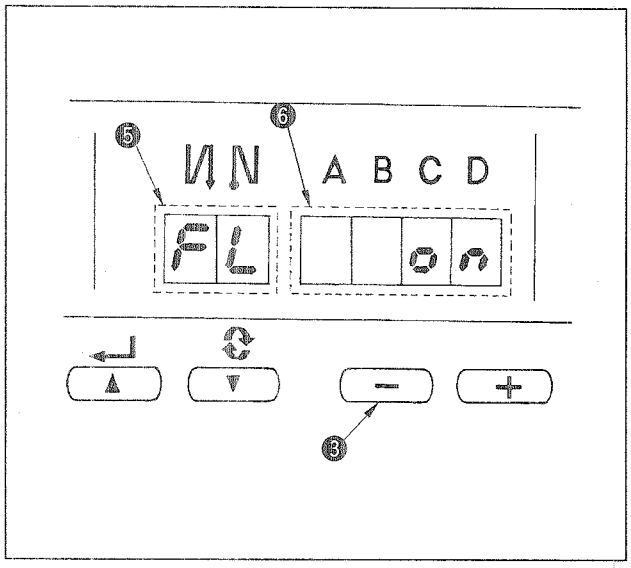



(1) Connect the connector of PK70 ❶ to connector ❷ (CN39 : 12P) of SC-500.

(2) Tighten the cord of PK70 together with other cords with cable clip band ❸ attached to the side of the box after passing it through the cable clamp.

**(Caution) Be sure to turn OFF the power before connecting the connector.**

## (3) Setting of the auto lifter function




When the auto-lifter device (AK) is attached, this function makes the function of auto-lifter work.

(1) Turn ON the power switch while pressing switch ❸ inside the control box.

(2) LED display is turned to ❺, ❻ (FL ON) with "beep", and the function of auto-lifter becomes effective.

(3) Turn OFF the power switch, and turn ON the power switch again to return to the normal mode.

(4) Repeat the operation 1) to 3), and LED display is turned to (FL OFF). Then, the function of auto-lifter does not work.

FL ON : Auto-lifter device becomes effective.

FL OFF : Auto-lifter function does not work. (Standard at the time of delivery)

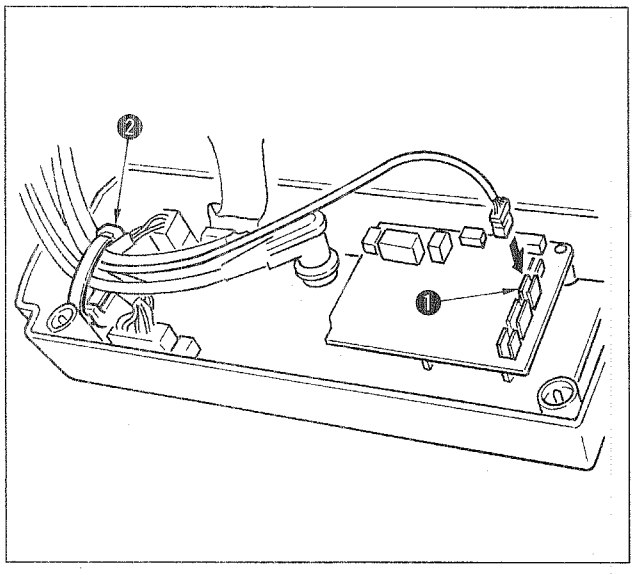
(Similarly, the presser foot is not automatically lifted when programmed stitching is completed.)

(Caution) **1. To perform re-turning ON of the power, be sure to perform after the time of one second or more has passed.**
**(If ON / OFF operation of the power is performed quickly, setting may be not changed over well.)**

**2. Auto-lifter is not actuated unless this function is properly selected.**

**3. When "FL ON" is selected without installing the auto-lifter device, starting is momentarily delayed at the start of sewing. In addition, be sure to select "FL OFF" when the auto-lifter is not installed since the touch-back switch may not work.**

## (4) Connection of the material end sensor (ED)




(1) Connect the connector of material end sensor (ED) to connector ❶(CN55 : 6P) of SC-500.

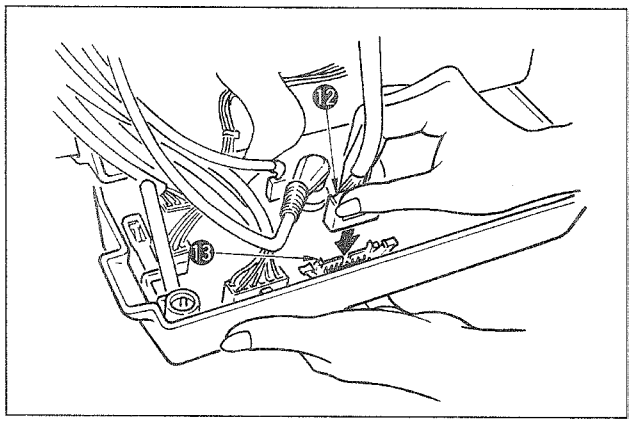
(2) Tighten the cord of the material end sensor together with other cords with cable clip band ❷ attached to the side of the box after passing it through the cable clamp.

**(Caution)**

**1. Be sure to turn OFF the power before connecting the connector.**

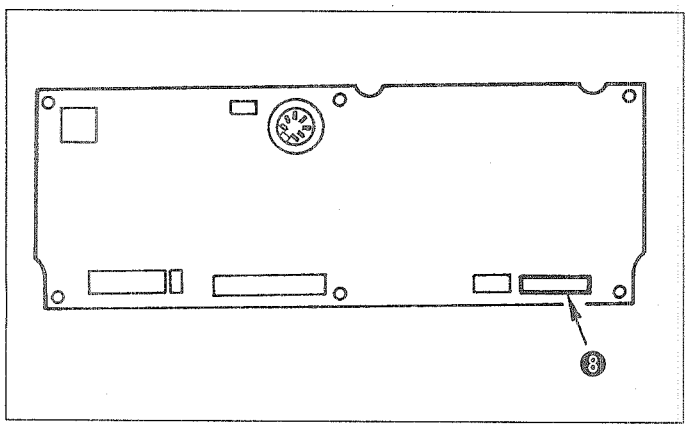
**2. For the use of the material end sensor, refer to the Instruction Manual attached to the material end sensor.**

## (5) Connecting procedure of CP-160




1) Exclusive connectors are prepared for connection of the connector for CP-160.
2) aying attention to the orientation of the connector ⑫, connect it to connector ⑬ (CN38) located on the circuit board. After connecting, securely lock the connector.

# 9. EXTERNAL INPUT/OUTPUT CONNECTOR (SIGNAL CONNECTOR FOR EXTENSION)




For external input/output connector ⑧, following signals which are convenient when installing counter or the like outside are prepared.

**(Caution) When using the connector, consult technicians who have electrical knowledge.**

**Table of layout of connector and signal**

| CN40 Pin No. | Name of signal | Input/ output | Description | Electricity spec. |
|---|---|---|---|---|
| 1 | +5V | - | | |
| 2 | LSWINH(N) | Input | Revolution by pedal is prohibited while "Low" signal is being inputted. | DC5V,-5mA |
| 3 | SOFT(N) | Input | Speed of rotation is limited to soft-speed while "Low" signal is being inputted. | DC5V,-5mA |
| 4 | DDET(N) | Output | "Low" is output when needle bar is in its DOWN position. | DC5V |
| 5 | UDET(N) | Output | "Low" is output when needle bar is in its UP position. | DC5V |
| 6 | S.STATE3(N) | Output | "Low" is output when sewing machine is in STOP state. | DC5V |
| 7 | SGND(N) | - | OV (Ground) | |
| 8 | HS(N) | Output | Rotation signal 45 pulses/revolution | DC5V |
| 9 | SUBPSW(N) | Input | Input signal of optional sub-panel switch. Motion depends on setting of function setting No. 12. | DC5V,-5mA |
| 10 | SGND(N) | - | OV (Ground) | DC5V,-5mA |
| 11 | SUBSWL(N) | Output | Monitor LED output of SUBPSW | DC5V,5mA |

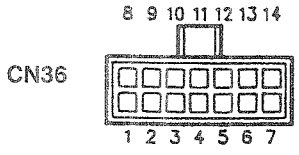
# 10. CONNECTOR CONNECTION DIAGRAM

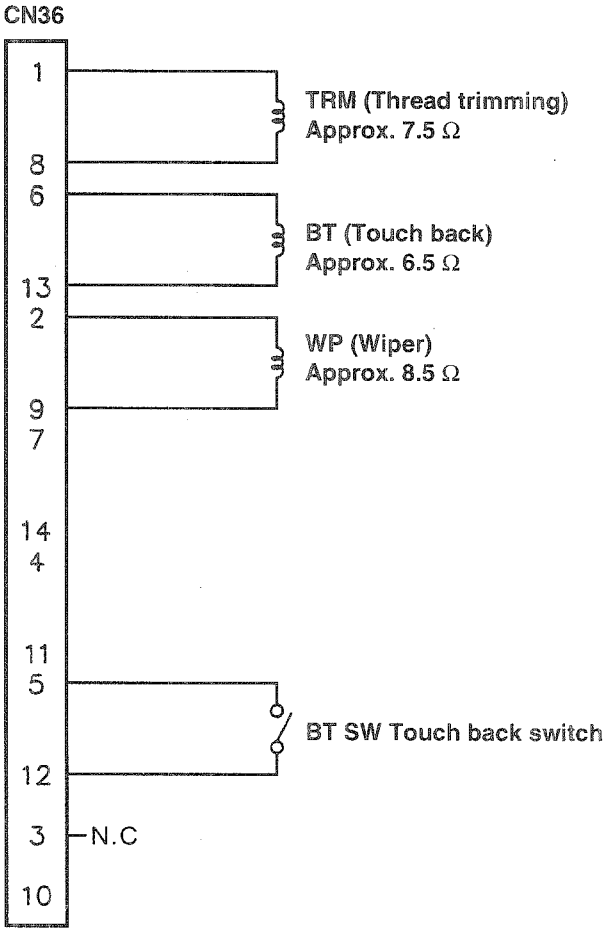
## (1) Solenoid for machine head

Layout of the signals of machine head solenoid connectors CN36 and CN37 varies in accordance with the function revision of CONTROL circuit board (CTL circuit board).
However, there is interchangeability for the specifications on the machine head side, and the signals can be used without change.

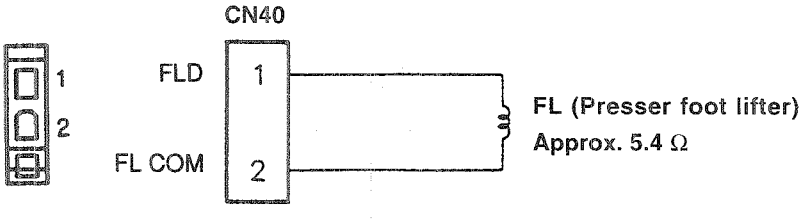
**Layout of CN36 pins by classified function Rev.**

| Name of signal | | Pin No. |
|---|---|---|
| Function Rev. 01 | Function Rev. 02 | |
| TRMD | TRM COM | 1 |
| TRM COM | TRMD | 8 |
| BTD | BTD COM | 6 |
| BT COM | BTD | 13 |
| WPD | WP COM | 2 |
| WP COM | WPD | 9 |
| SUB BTD | SUB BT COM | 7 |
| SUB BT COM | SUB BTD | 14 |
| UTSD | UTS COM | 4 |
| UTS COM | UTSD | 11 |
| BTSW | BTSW RTN | 7 |
| BTSW RTN | BTSW | 14 |
| N.C | FG | 4 |
| FG | FG | 11 |

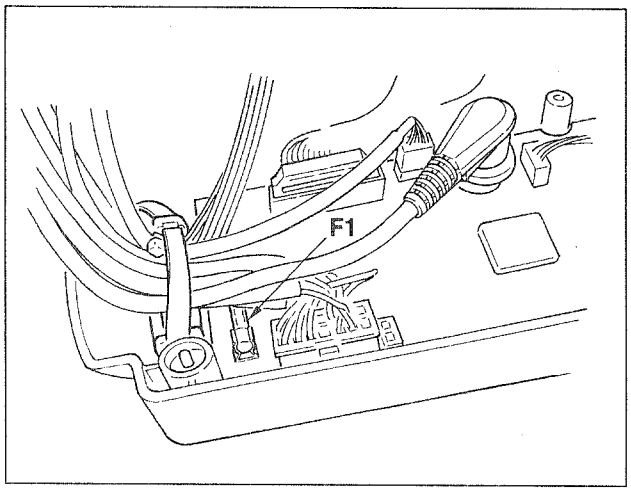



## (2) Solenoid for lifting presser foot

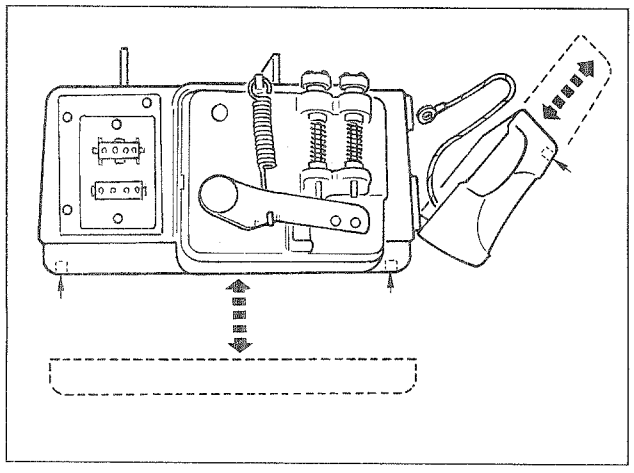


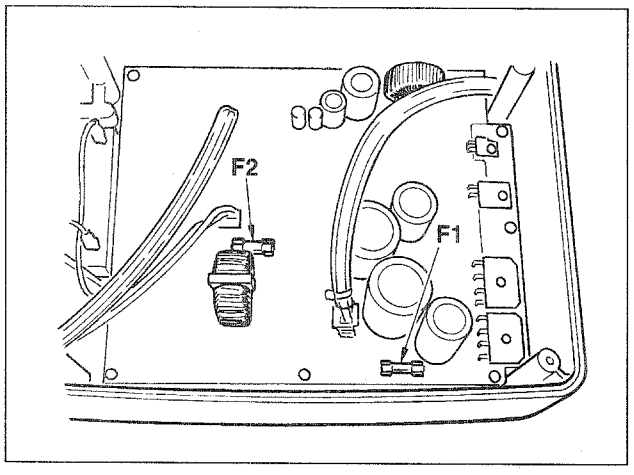
**[ Replacing F1 fuse on CTL circuit board (solenoid protection fuse) ]**




1) Loosen two setscrews in the front cover and open the cover after checking that the power has been turned OFF.
2) Replace 5A F1 fuse on CTL circuit board with a fuse of the same capacity supplied as accessories.
3) Close the front cover as before and fix it with the setscrews while paying attention to pinching of the cords.

**[ Replacing F1 fuse on PWR circuit board (power circuit protection fuse) ]**
**[ Replacing F2 fuse on PWR circuit board (regenerative resistance protection fuse) ]**



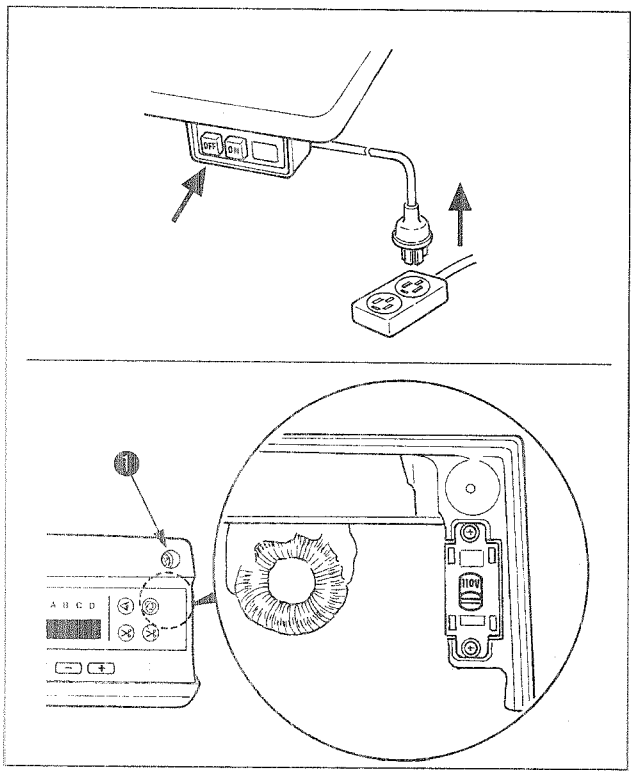



1) Loosen two setscrews in the front cover and open the cover after checking that the power has been turned OFF.
2) Remove connectors CN30, CN32, CN33, CN36, CN37 and CN38 and remove the setscrew attached to the ground wire of CTL circuit board. (Connector Nos. depend on the specifications.)
3) Draw up the front cover obliquely at the position where the front cover is obliquely tilted by approximately 45 degrees, and remove the cover.
   Remove the control box from the motor.
4) Remove four setscrews in the bottom cover and remove the bottom cover.
5) Replace 3.15A F1 fuse or 2A F2 fuse on PWR circuit board with a fuse of the same capacity supplied as accessories.
6) Fix the bottom cover as before with the setscrews, and press the front cover to the bottom cover from the position where the front cover is obliquely tilted by approximately 45 degrees for assembling.
7) Attach the connectors and the ground wire which have been removed.
8) Close the front cover as before and fix it with the setscrews while paying attention to pinching of the cords.

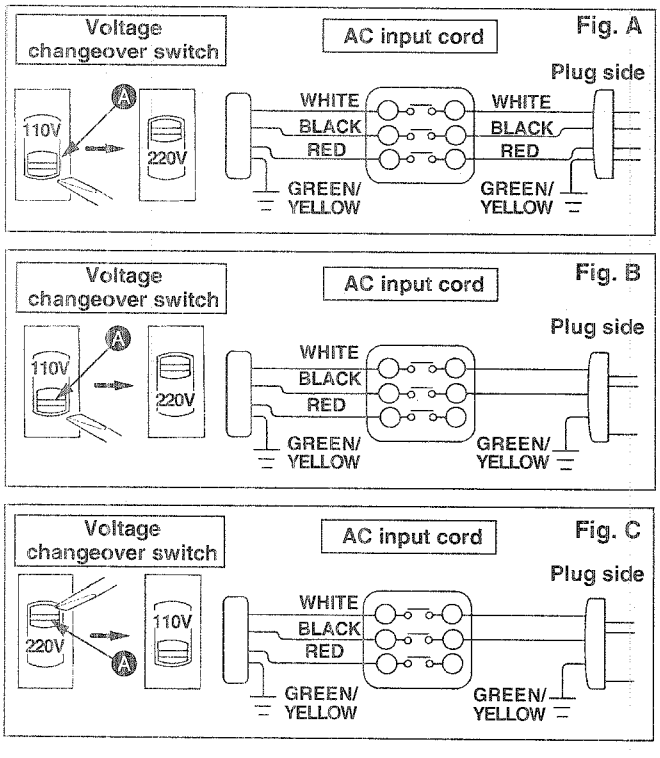
## (2) Changing procedure between 100V to 120V and 200V to 240V
### (Possible only for the voltage changeover type)

Voltage can be changed between single phase 100 to 120V and single phase/3-phase 200 to 240V by changing over the voltage changeover switch.

(Caution) **The voltage changeover switch is on the inside of the control box. When changing the setting, be sure to open the front cover after turning OFF the power switch and a lapse of 5 minutes or more. In addition, if the changing procedure is mistaken, the control box is damaged. So, be very careful.**



(1) Turn OFF the power with the power switch after checking that the sewing machine has stopped.
(2) Draw out the power cord from the power receptacle after checking that the power switch has been turned OFF. Then wait for 5 minutes or more.
(3) Remove two screws ❶ fixing the front cover and slowly open the front cover.




(4) hanging procedure of the power voltage

**(Caution) When the voltage of the power changeover switch and that of the AC input cord are wrong, the control box is damaged. Be sure to check the indication of the changeover switch and the input power voltage for use.**

1) When using with 3-phase 200 to 240V
- Put a screwdriver or the like to the slit section Ⓐ of the changeover switch and push up the switch.
  (Indication of the voltage of switch is 220V.)
- Connect the crimp style terminal of AC input cord to the power plug as shown in the figure A.

2) When using with single phase 200 to 240V
- Put a screwdriver or the like to the slit section Ⓐ of the changeover switch and push up the switch.
  (Indication of the voltage of switch is 220V.)
- Connect the crimp style terminal of AC input cord to the power plug as shown in the figure B.

3) When using with single phase 100 to 120V
- Put a screwdriver or the like to the slit section Ⓐ of the changeover switch and push down the switch.
  (Indication of the voltage of switch is 110V.)
- Connect the crimp style terminal of AC input cord to the power plug as shown in the figure C.

**(Caution) Be very careful that the components are not damaged by the top end of the screwdriver.**

(5) Check again that the change has been performed without fail before closing the front cover.
(6) Close the front cover and tighten two screws while being very careful that the cord is not caught by the cover.

## (3) Control voltage check terminal of CTL circuit board

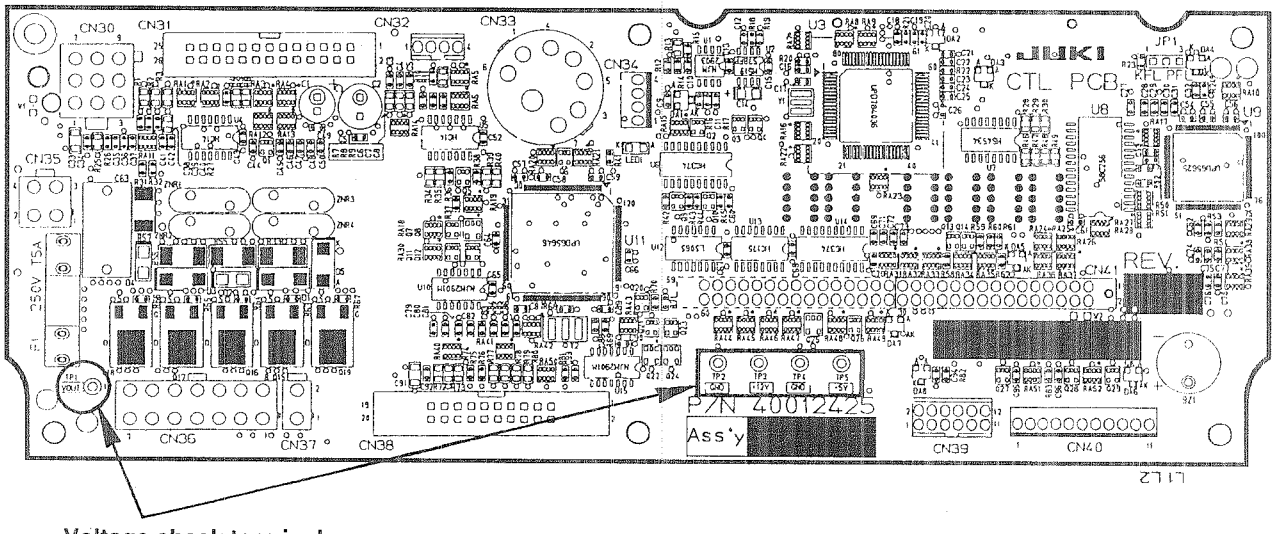
Appearance of CTL circuit board assembled inside the front panel of SC-500 is as below.
Control voltage check terminals are set up and the check whether or not the respective voltages are abnormal can be performed.

**[DANGER] There is a danger of electric shock since the work is performed with the power ON. Do not perform the work by any person other than technicians who have electrical knowledge.**

| Check terminal | Power main use | Nominal voltage | Remarks |
|---|---|---|---|
| TP1 | Solenoid drive (VOUT) | +33V/+24V/+12V | Voltage varies in accordance with control state. |
| TP2 | Ground (GND) | 0V | |
| TP3 | CP panel control (+12V) | +12V | |
| TP4 | Ground (GND) | 0V | |
| TP5 | Circuit control (+5V) | +5V | |

**(Caution) All nominal voltages are those from GND reference. There is a slight error between the actual value and the indication value.**

### Appearance of CTL circuit board



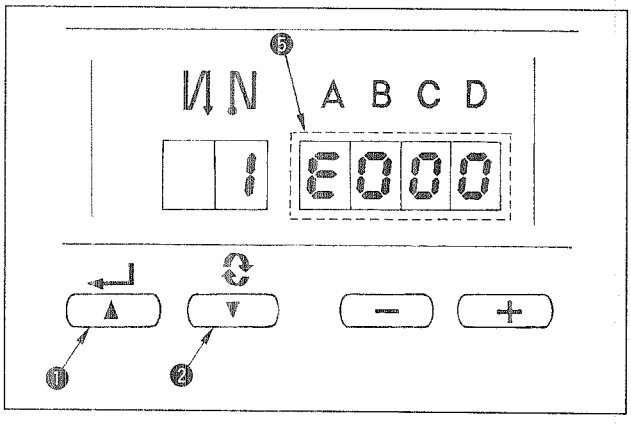

Voltage check terminal

# 12. ERROR CODES

In case of the following, check again before you judge the case as trouble.

| Phenomenon | Cause | Corrective measure |
|---|---|---|
| When tilting the sewing machine, the buzzer beeps and the sewing machine cannot be operated. | When tilting the sewing machine without turning OFF the power switch, Action given on the left side is taken for safety sake. | Tilt the sewing machine after turning OFF the power. |
| Solenoids for thread trimming, reverse feed, wiper, etc. fail to work. Hand lamp does not light up. | When the fuse for solenoid power protection has blown out. | Check the fuse for solenoid power protection. |
| Even when depressing the pedal immediately after turning ON the power, the sewing machine does not run. When depressing the pedal after depressing the back part of pedal once, the sewing machine runs. | Neutral position of the pedal has varied. (Neutral position may be shifted when changing spring pressure of the pedal or the like.) | Execute the automatic neutral correction function of the pedal sensor. |
| The sewing machine does not stop even when the pedal is returned to its neutral position. | | |
| Stop position of the sewing machine varies (irregular). | When tightening the screw in the handwheel is forgotten at the time of adjustment of needle stop position. | Securely tighten the screw in the handwheel. |
| Presser foot does not go up even when auto-lifter device is attached. | Auto-lifter function is OFF. | Select "FL ON" by auto-lifter function selection. |
| | Pedal system is set to KFL system. | Change the jumper to PFL setting to lift the presser foot by depressing the back part of the pedal. |
| | Cord of auto-lifter device is not connected to connector (CN37). | Connect the cord properly. |
| Touch-back switch fails to work. | Presser foot is going up by auto-liter device. | Operate the switch after the presser foot lowered. |
| | Auto-lifter device is not attached. However, auto-lifter function is ON. | Select "FL OFF" when auto-lifter device is not attached. |
| UP position move fails to work when all lamps on the panel light up. | The mode is in the function setting mode. The switch on the CTL p.c.b. is pressed by the bound cords and the aforementioned mode resulted. | Remove the front cover, and arrange the cords by the regular binding procedure described in the Instruction Manual. |
| Sewing machine fails to run. | Motor output cord (4P) is disconnected. | Connect the cord properly. |
| | Connector (CN30) of motor signal cord is disconnected. | Connect the cord properly. |

In addition, there are the following error codes in this device. These error codes interlock (or limit function) and inform the problem so that the problem is not enlarged when any problem is discovered. When you request our service, please confirm the error codes.




**Checking procedure of the error code**

1) Pressing switch ❶ in the control box, turn ON the power switch.
2) LED becomes display ❺ with the sound of "peep" and the latest error code is displayed.
3) Confirmation of the contents of previous error can be performed by operating switches ❶ or ❷.

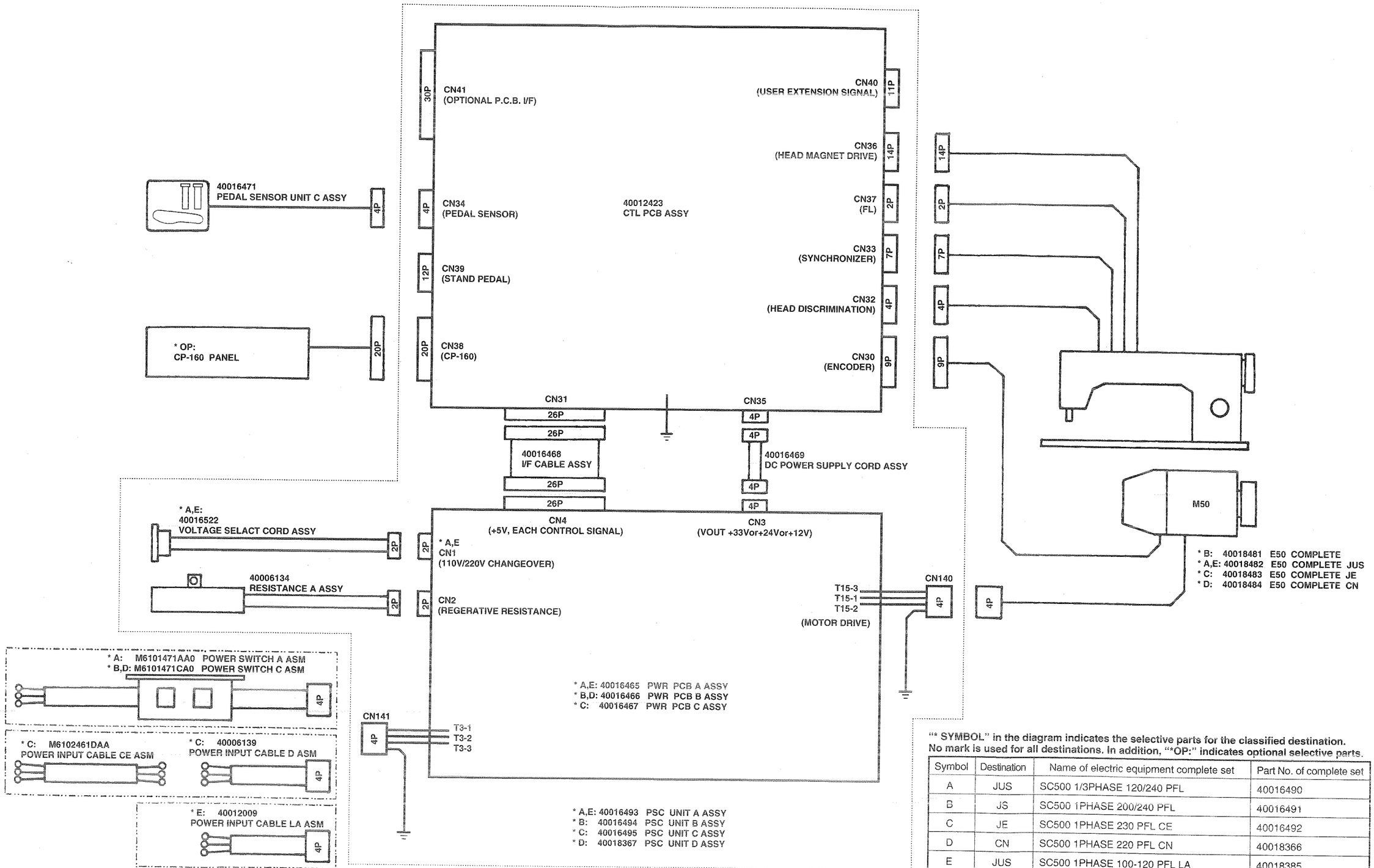
**(Caution) When operating switch ❶, one before the existing error code is displayed.**

**When operating switch ❷, one after the existing error code is displayed.**

## (1) Error code list

| No. | Description of error detected | Cause of occurrence expected | Items to be checked |
|---|---|---|---|
| E000 | Execution of data initialization (This is not the error.) | • When the machine head is changed.<br>• When the initialization operation is executed | |
| E003 | Disconnection of synchronizer connector | • When position detection signal is not input from the sewing machine head synchronizer.<br>• When the synchronizer has broken. | • Check the synchronizer connector (CN33) for loose connection and disconnection.<br>• Check whether the synchronizer cord has broken since the cord is caught in the machine head. |
| E004 | Synchronizer lower position sensor failure | | |
| E005 | Synchronizer upper position sensor failure | | |
| E906 | Operation panel transmission failure | • Disconnection of operation panel cord<br>• Operation panel has broken. | • Check the operation panel connector (CN38) for loose connection and disconnection.<br>• Check whether the operation panel cord has broken since the cord is caught in the machine head. |
| E007 | Overload of motor | • When the machine head is locked.<br>• When sewing extra-heavy material beyond the guarantee of the machine head.<br>• When the motor does not run.<br>• Motor or driver is broken. | • Check whether the thread has been entangled in the motor pulley.<br>• Check the motor output connector (4P) for loose connection and disconnection.<br>• Check whether there is any holdup when turning the motor by hand. |
| E008 | Machine head connector failure(Resistance pack) | • When the machine head connector is not properly read. | • Check the machine head connector (CN32) for loose connection and disconnection. |
| E811 | Overvoltage | • When voltage higher than guaranteed one is inputted.<br>• 220V has been inputted to SC-500 of 110V specifications.<br>• 400V is applied to the box of 220V (230V). | • Check whether the applied power voltage is higher than the rated voltage + (plus) 10% or more.<br>• Check whether 110V/220V changeover switch is improperly set.<br>In the aforementioned cases, POWER p.c.b is broken. |
| E813 | Low voltage | • When voltage lower than guaranteed one is inputted.<br>• 110V has been inputted to SC-500 of 220V specifications.<br>• 110V is applied to the box of 220V.<br>• Inner circuit is broken by the applied overvoltage | • Check whether the voltage is lower than the rated voltage – (minus) 10% or less.<br>• Check whether 110V/220V changeover switch is improperly set.<br>• Check whether fuse or regenerative resistance is broken. |
| E924 | Motor driver failure | • Motor driver has broken. | |
| E730 | Encoder failure | • When the motor signal is not properly inputted. | • Check the motor signal connector (CN30) for loose connection and disconnection.<br>• Check whether the motor signal cord has broken since the cord is caught in the machine head. |
| E731 | Motor hole sensor failure | | |
| E343 | Bobbin thread remaining amount sensor unit failure | • When the position of the detection bar of the AE device is shifted from the home position. | • Check whether the detection bar of the AE device has returned to the correct position.<br>• Check whether the function setting No. 57 has been mistakenly set.<br>• Check the AE device connectors (CN121, CN123) for loose connection and disconnection.<br>• Check whether the AE device cord has broken since the cord is caught in the machine head. |

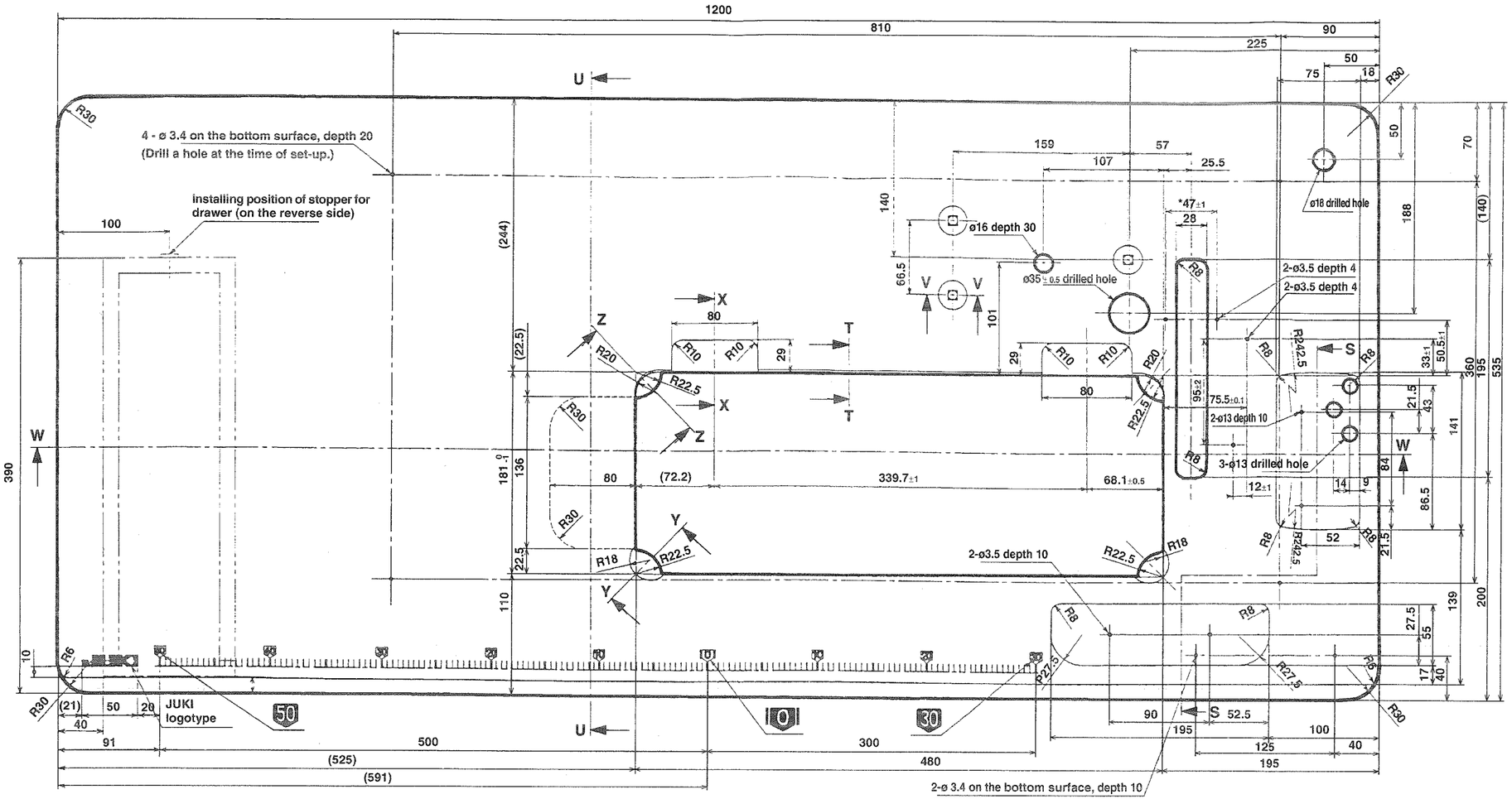
# 13. BLOCK DIAGRAM



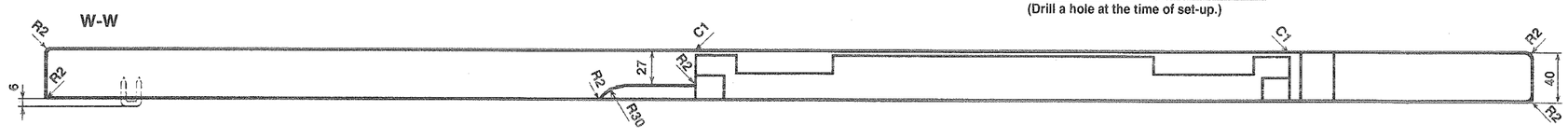

"* SYMBOL" in the diagram indicates the selective parts for the classified destination.
No mark is used for all destinations. In addition, "*OP:" indicates optional selective parts.

| Symbol | Destination | Name of electric equipment complete set | Part No. of complete set |
|---|---|---|---|
| A | JUS | SC500 1/3PHASE 120/240 PFL | 40016490 |
| B | JS | SC500 1PHASE 200/240 PFL | 40016491 |
| C | JE | SC500 1PHASE 230 PFL CE | 40016492 |
| D | CN | SC500 1PHASE 220 PFL CN | 40018366 |
| E | JUS | SC500 1PHASE 100-120 PFL LA | 40018385 |

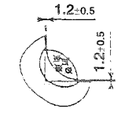
# 14. DRAWING OF THE TABLE (For DDL-8700)



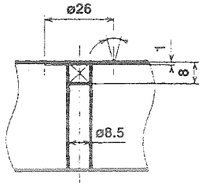

W-W



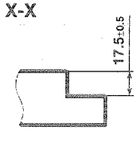

Y - Y
rubber cushion installing drawing for reference



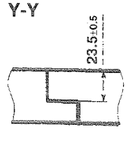

V-V (1:1)



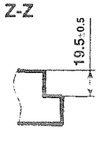

X-X



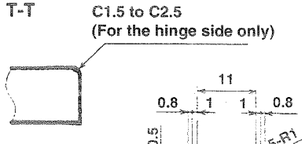

Y-Y



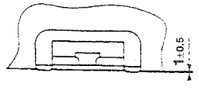

Z-Z



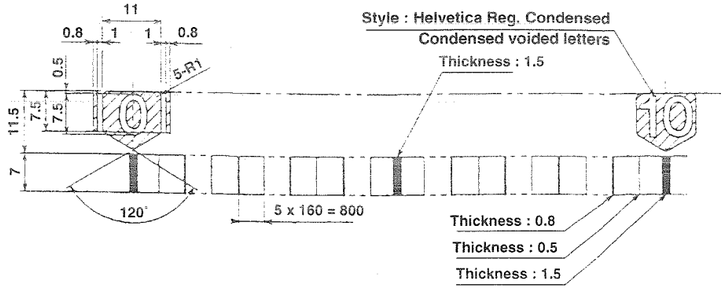

T-T




X - X
rubber cushion installing drawing for reference




Measure detailed drawing (2 : 1)




**Part No. : 11155603**

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Please do not hesitate to contact our distributors or agents in your area for further information when necessary.

*** The description covered in this engineer's manual is subject to change for improvement of the commodity without notice.**

03 · 11 Printed in Japan (E)