JUKI®

SC-920

ENGINEER'S MANUAL

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.

It is advisable to use the Instruction Manual and Parts List for CP-180, IP-110F, SC-920 together with this Engineer's Manual when carrying out the maintenance of these machines.

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

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	320VA	320VA	320VA
Mass	3kg	3kg	3kg

2. OUTLINE

(1) Features

1) Voltage changeover function of single phase 100 to 120V/3-phase 200 to 240V is provided.
   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 changing the voltage changeover connector inside the box.
   In addition, it can be used for single phase 200 to 240V.
2) By using IP-110F, CP-180 the sewing management information such as output display, etc. can be used.
3) The conventional JUKI optional devices can be used without any adjustment.
   However, when AE (bobbin thread remaining amount detection device) is used, it is necessary to separately purchase the optional circuit board.
4) By using the flash ROM for CPU, the future version-up can be adapted.
5) The SC-920 control box can be used for the (belt) drive system machine head by connecting the DD (direct-drive) system machine head and the small-sized motor unit (M-92).

3. NAME OF EACH COMPONENT

(1) DDL-9000B/SC-920

❶ Power switch
❷ Operation panel (CP-18, 180 or IP-110F)
❸ Pulley cover
❹ Thread stand
❺ Control box (SC-920)
❻ Operation pedal
❼ One-touch type reverse feed button
❽ Wiper
❾ Bobbin winder unit
❿ Stitch dial

⓫ Knee lifter
⓬ Oil filler port (except for DDL-9000B-DS)
⓭ Feed lever
⓮ Minute adjustable presser lifting screw
⓯ Hand wheel
⓯ Take-up lever cover
⓰ Finger guard
⓱ Under cover
⓳ 1st thread tension
⓴ 2nd thread tension

❶ Power switch
This switch turns on and off the power to the head unit motor, electric components, and operation panel.

❷ Operation panel (CP-18, 180 or IP-110F)
This panel allows users to conduct the settings of automatic reverse stitching, head sewing, sewing speed, and more.

❸ Pulley cover
This cover protects the machine head motor.

❹ Thread stand

❺ Control box (SC-920)
The box contains the circuit that controls the head unit and motor, the output circuit that operates each output (the thread trimming solenoid, back solenoid, wiper solenoid, etc.), the pedal sensor that detects the pedal operation, and the power circuit that performs each function.

❻ Operation pedal
This pedal allows users to conduct machine speed control, thread trimming, presser lifting motion (only for AK-138), and more by depressing the front or back part of the pedal.

❼ One-touch type reverse feed button
This button allows users to conduct reverse stitching.

❽ Wiper
The wiper moves the needle from the sewing material after thread trimming under control of the wiper signal from the control box.

❾ Bobbin winder unit
This unit is integrated into the head unit.

❿ Stitch dial
This dial adjusts the front feeding amount.

⓫ Knee lifter

⓬ Oil filler port (except for DDL-9000B-DS)
This port is used for lubrication to the hook. (except for DDL-9000B-DS)

⓭ Feed lever
This lever allows users to conduct reverse stitching.

⓮ Minute adjustable presser lifting screw

⓯ Hand wheel

⓯ Take-up lever cover
This cover prevents users from touching the take-up lever.

⓰ Finger guard
This guard prevents users (mainly thumb and fingers) from touching the needle.
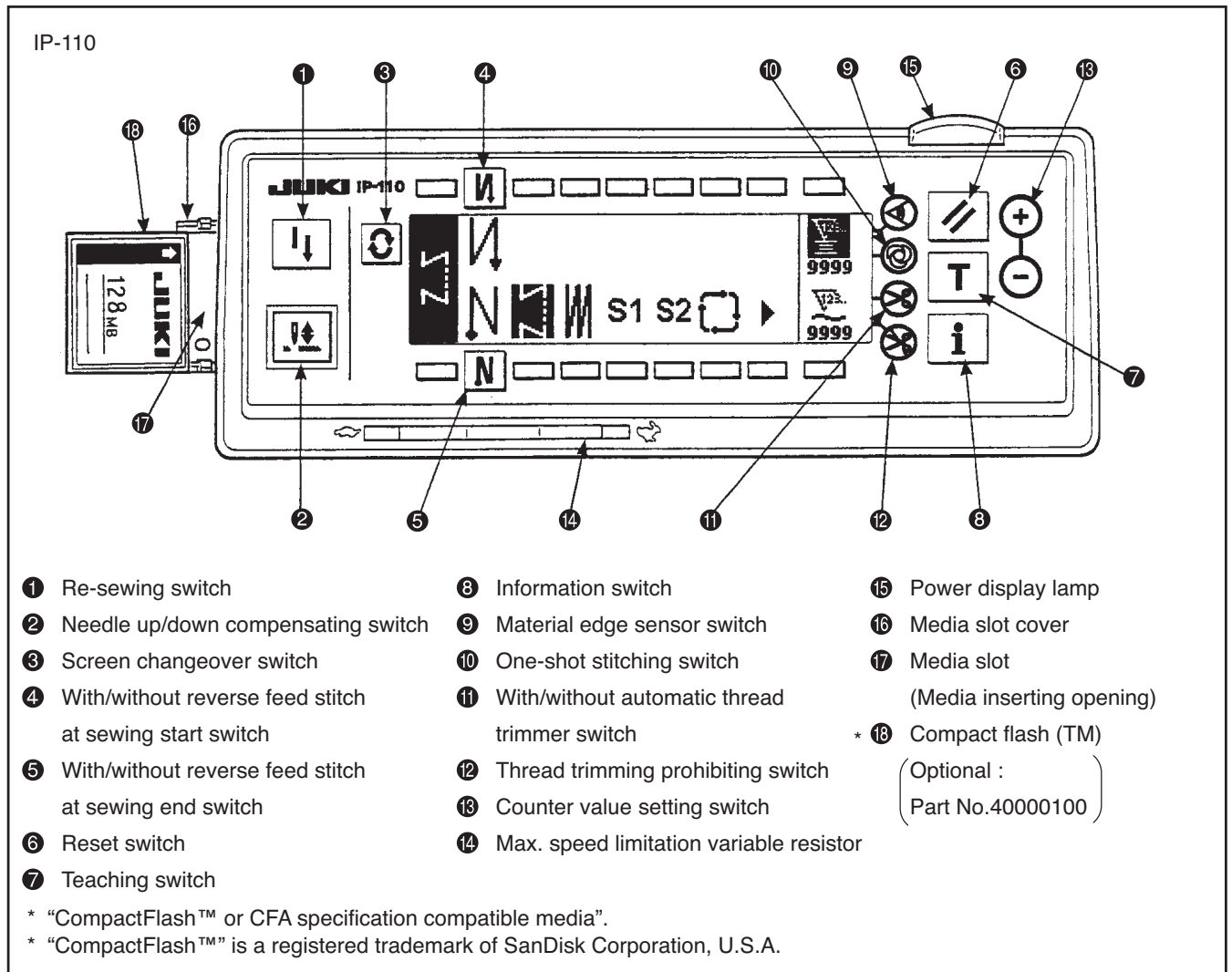
⓱ Under cover

⓳ 1st thread tension

⓴ 2nd thread tension

4. EXPLANATION OF OPERATION PANEL

(1) List of operation panels of CP-180

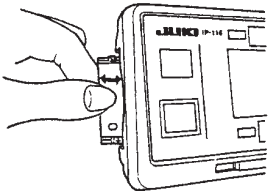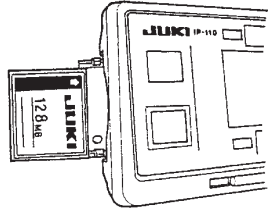| No.	Description
❶	**Power indication LED :** Lights up when the power switch is turned ON.
❷	**Max. speed limit variable resister :** Maximum speed is limited when this resister is moved in the left direction ( ).
❸	**Pattern selector switch :** Used for selecting a pattern from among the four different patterns.
❹	**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.
❺	**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.
❻	**Automatic reverse stitching at the start of sewing switch :** Used for turning ON / OFF the automatic reverse stitching at the start of sewing.
❼	**Automatic reverse stitching at the end of sewing switch :** Used for turning ON / OFF the automatic reverse stitching at the end of sewing.
❽	**Switches for setting the number of stitches :** Used for setting the number of stitches to be sewn in processes A through D.
❾	**Material edge sensor ON / OFF switch :** Rendered effective when the material edge sensor is installed on the machine. Used for setting whether or not the material edge sensor is used during sewing.
❿	**One-shot automatic stitching switch :** Rendered effective when the material edge sensor is installed on the machine or when the sewing machine is operated under the constant-dimension stitching mode. Start the sewing machine with this switch, and the sewing machine will run automatically until the material edge is detected or the end of a constant-dimension stitching is reached.
⓫	**Automatic thread trimming switch :** Rendered effective when the material edge sensor is installed on the machine or when the sewing machine is operated under the constant-dimension stitching mode. Even keep depressing the front part of the pedal, the sensor can detect the material edge, or after the completion of the constant-dimension stitching mode, the machine will automatically perform thread trimming.
⓬	**Bobbin thread counter :** Indicates the amount of bobbin thread while counting it by subtracting from the set value.
⓭	**Bobbin thread counter/thread trimming counter :** Bobbin thread counter/thread trimming counter can be changed over by the function of the control box main body. **Bobbin thread counter :** Indicates the amount detecting device is installed on the machine, the counter indicates the number of times of detecting. **Thread trimming counter :** Every time thread trimming is performed, the counter value is added.
⓮	**Bobbin counter reset switch :** Used for returning the value shown on the bobbin thread counter to the initial value.
⓯	**Bobbin thread amount setting switch :** Used for setting the amount of bobbin thread.
⓰	**Needle bar stop position changeover function to be available when the needle up/down compensating switch/pedal is in neutral state.** **Needle up/down compensating switch :** This switch is used for each needle up/down compensating stitching. **[Changeover selection of needle bar stop position when the pedal is in its neutral position]** Pressing the needle up/down compensation switch, turn ON the power to the machine, and the needle bar stop position when the pedal is in its neutral position is changed over to down position/up position. Confirmation of the stop position can be performed at the front cover of the control box. When up position stop is specified : " nP UP " When down stop position is specified : " nP Lo "
⓱	**Information switch** Used for calling the production support function (by keeping the switch held pressed for one seconds).

(2) List of operation panel of IP-110F

IP-110

❶ Re-sewing switch
❷ Needle up/down compensating switch
❸ Screen changeover switch
❹ With/without reverse feed stitch
   at sewing start switch
❺ With/without reverse feed stitch
   at sewing end switch
❻ Reset switch
❼ Teaching switch

❽ Information switch
❾ Material edge sensor switch
❿ One-shot stitching switch
⓫ With/without automatic thread
   trimmer switch
⓬ Thread trimming prohibiting switch
⓭ Counter value setting switch
⓮ Max. speed limitation variable resistor

⓯ Power display lamp
⓰ Media slot cover
⓱ Media slot
   (Media inserting opening)
* ⓲ Compact flash (TM)
   Optional :
   Part No.40000100

* "CompactFlash™ or CFA specification compatible media".
* "CompactFlash™" is a registered trademark of SanDisk Corporation, U.S.A.

❶ Re-sewing switch		This switch is used to continue sewing from the step on the way after replacing bobbin thread when bobbin thread has run out during program stitching step.
❷ Needle up/down compensating switch		This is the switch to perform needle up/down compensating stitching. (Needle up/down compensating stitching and one stitch compensating stitching can be changed over with function setting No.22.)
❸ Screen changeover switch		This is the switch to change over the screen.
❹ With/without reverse feed stitch at sewing start switch		This is the switch to turn ON/OFF automatic reverse feed stitch at sewing start. * This switch cannot be used with the sewing machine which is not provided with automatic reverse feed stitching device.
❺ With/without reverse feed stitch at sewing end switch		This is the switch to turn ON/OFF automatic reverse feed stitch at sewing end. * This switch cannot be used with the sewing machine which is not provided with automatic reverse feed stitching device.
❻ Reset switch		This is the switch to make the value of bobbin thread counter or sewing counter the set value.

❼	Teaching switch	**T**	This is the switch to set the setting of the number of stitches with the value of number of stitches which has been actually sewn.
❽	Information switch	**i**	This is the switch to perform various function settings.
❾	Material edge sensor switch		Rendered effective when the material edge sensor is installed on the machine. Used for selecting whether or not the material edge sensor is used during sewing.
❿	One-shot stitching switch		When this switch is set to effective at the time of program stitching, the sewing machine automatically operates up to the specified number of stitches.
⓫	With/without automatic thread trimmer switch		When this switch is set to effective at the time of program stitching, the sewing machine automatically performs thread trimming when the specified number of stitches has been completed.
⓬	Thread trimming prohibiting switch		This switch prohibits all thread trimmings. * This switch cannot be used with the sewing machine which is not provided with the automatic thread trimming device.
⓭	Counter value setting switch	**+** **−**	This is the switch to set the value of bobbin thread counter of No. of pcs. counter.
⓮	Max. speed limitation variable resistor		When moving the resistor in the left direction, max. speed is limited.
⓯	Power display lamp		This lamp lights up when the power switch is turned ON.
⓰	Media slot cover		This is the cover for media inserting opening. To open the cover, place your finger on the notch located on the side of the cover as shown in the figure and push the cover in the direction of left slanting rear. * There are some functions that are not able to be operated with the cover opened. Do not close the cover unless compact flash (TM) is completely inserted.
⓱	Media slot (Media inserting opening)		To set compact flash (TM), place the label face of the compact flash (TM) to the front and insert the part that has a small hole (place the notch of the edge to the rear) to the panel. To remove the compact flash (TM), hold it between your fingers and draw it out. *When the inserting direction of the compact flash (TM) is wrong, the panel and the compact flash (TM) may be damaged. Do not insert anything other than the compact flash (TM).

(3) Operation of the connection panel

1) Connecting procedure of CP-18/180 or IP-110F
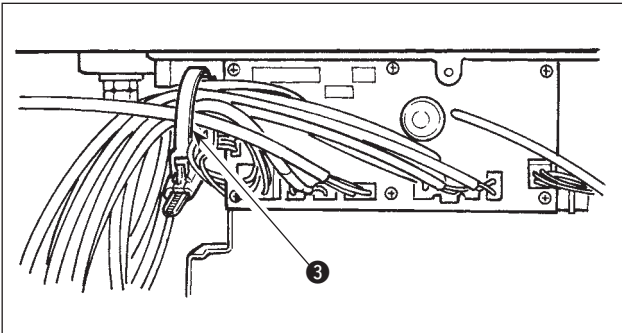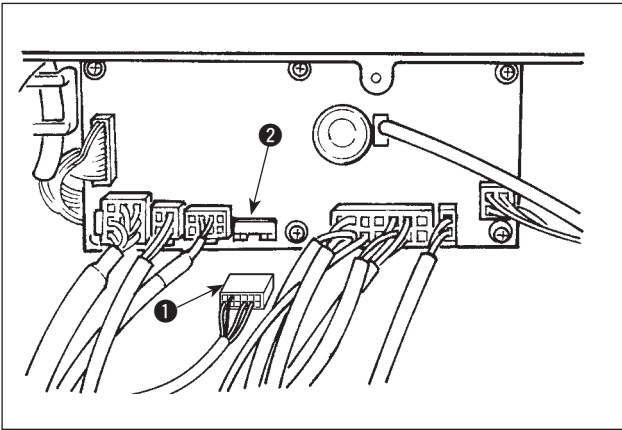
[Connection of the connector for CP, IP panel]

Exclusive connectors are prepared for connection of the connector for CP-18/180, IP-110F.

Paying attention to the orientation of the connector, connect it to connector CN38 ❷ located on the circuit board. After connecting, securely lock the connector.

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

1. After inserting the connector, put all cords together with cable clip band ❸ located on the side of the box.
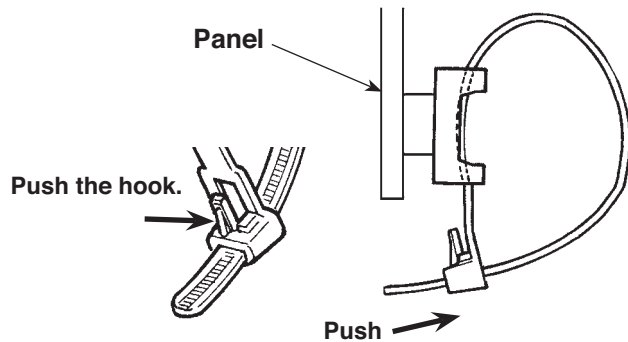
(Caution) 1. **Fix the cord clamp and the cable clip band ❸ following the attaching procedure.**
2. **When removing the connector, remove it from the wire saddle and remove it while pressing the hook of the cable clip band ❸.**
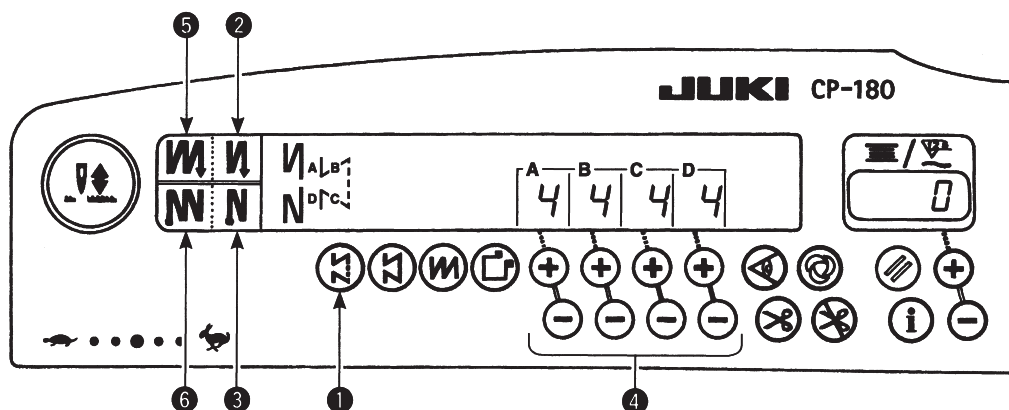
How to fix cable clip band ❸

Panel

Pull
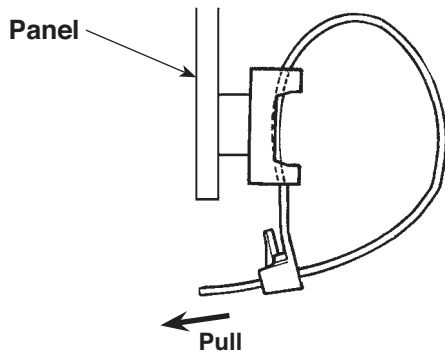
How to remove cable clip band ❸

Panel

Push the hook.

Push

Pushing the hook portion, push the band to remove it.

(4) Explanation of operation panel CP-180

1) Reverse stitching pattern

❷	**Ν**	OFF	ON	OFF	ON
Sewing pattern		↓	A⟍B / ↓	↓	A⟍B / ↓ C⟍D
❸	**N**	OFF	OFF	ON	ON

1. Press reverse stitching pattern switch ❶ to specify the reverse stitching pattern.
2. The reverse stitching pattern is selected, and the number of stitches and data on reverse stitching which have already been specified are shown on the panel.
3. If you want to change the number of stitches, operate the " + " or " - " switch of switches ❹ for setting the number of stitches A through D.
   (The range of the number of stitches that can be changed : 0 to 19 stitches)
4. Four different stitching patterns can be performed by matching the ON and OFF settings of automatic reverse stitching (for start) switch ❷ and automatic reverse stitching (for end) switch ❸.
5. Furthermore, the double reverse stitching can be selected by operating double reverse stitching (for start) switch ❺ and double reverse stitching (for end) switch ❻.

2) Constant-dimension stitching pattern
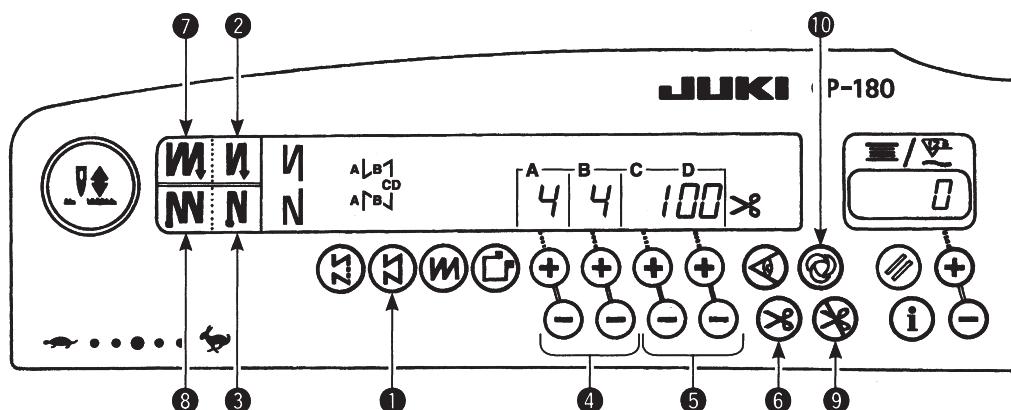
❷	**N↓**	OFF	ON	OFF	ON
Sewing pattern		CD↓	A/B CD↓	CD↓ B/A	A/B CD↓ B/A
❸	**N**	OFF	OFF	ON	ON

1. Press constant-dimension stitching pattern switch ❶ on the control panel to select the constant-dimension stitching pattern.
2. The constant-dimension stitching pattern is selected. Now, the predetermined number of stitches and the state of reverse stitching function are shown on the control panel.
3. To change the number of stitches of the processes in the constant-dimension stitching pattern, change the number of stitches for processes C and D by operating switches ❺ for setting the number of stitches for processes C and D. Select the reverse feed stitching accordingly. To change the number of reverse-feed stitches, operate switches ❹ for setting the number of stitches for processes A and B.

$$\left(\text{Adjusting range :} \quad \begin{array}{l} \text{A, B = 0 to 19 stitches} \\ \text{C, D = 0 to 500 stitches} \end{array} \right)$$

4. Four different kinds of stitching patterns can be performed according to the combination of ON/OFF settings of automatic reverse stitching (for start) switch ❷ and automatic reverse stitching (for end) switch ❹.
5. Furthermore, the double reverse stitching mode can be specified by operating double reverse stitching (for start) switch ❼ and double reverse stitching (for end) switch ❽.
6. If automatic thread trimming switch ❻ is turned ON, the sewing machine will automatically perform thread trimming after it finishes the predetermined number of stitches between C and D. (If the automatic reverse feed stitching (for end) is selected, the sewing machine will automatically perform thread trimming after it finishes the automatic reverse stitching (for end) even when the automatic thread trimming switch is not selected.)
   If automatic thread trimming switch ❻ is turned OFF, operate the touch-back switch after the completion of processes C and D. 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.
7. If thread trimming prohibiting function ❾ is chosen, the machine will stop with the needle up without performing thread trimming.
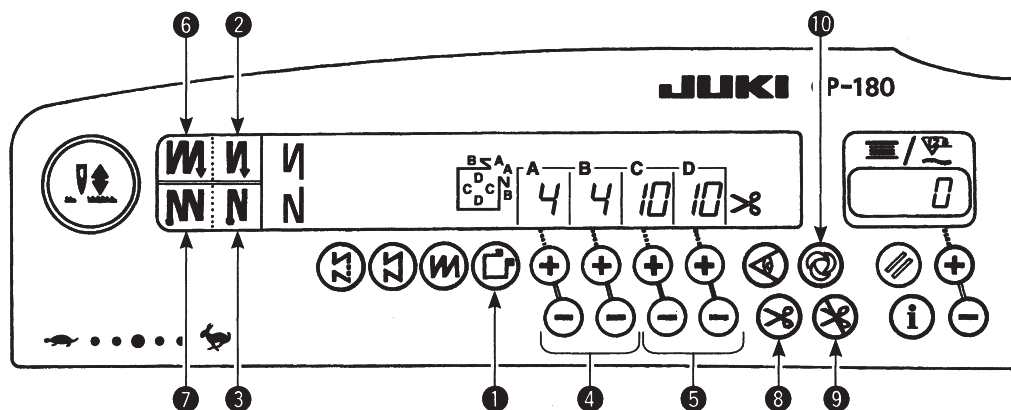8. If one-shot automatic stitching function ❿ is chosen, the machine will automatically perform sewing at a stretch, at the specified speed by depressing the front part of the pedal.
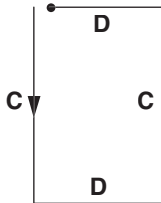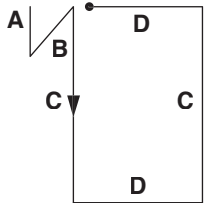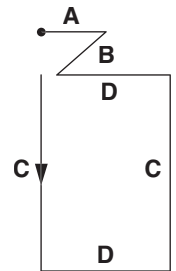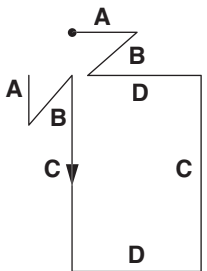
3) Overlapped stitching pattern
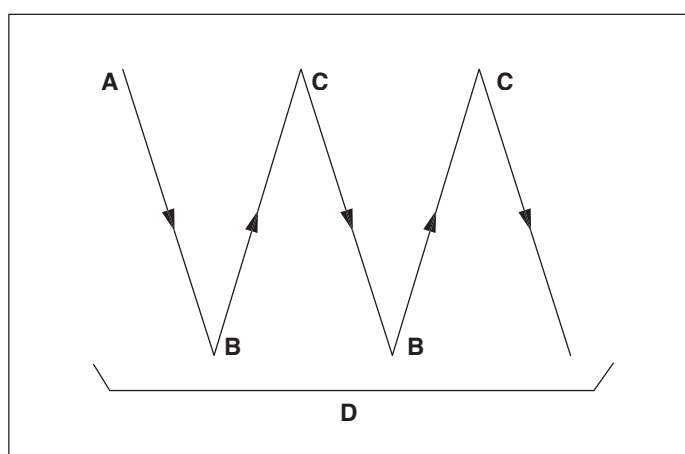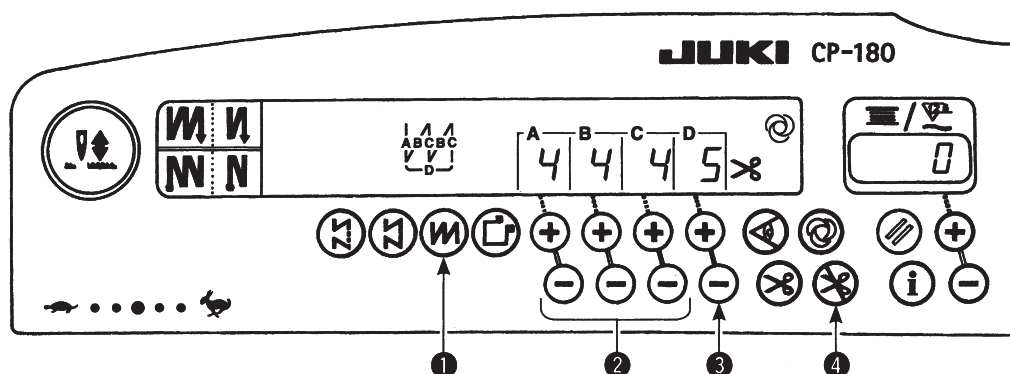
1. Press overlapped stitching pattern switch ❶ to specify the overlapped stitching pattern.
2. The overlapped stitching pattern is selected, and the number of stitches and data on overlapped stitching which have already been specified are shown on the panel.
3. If you want to change the number of stitches, operate number of stitches setting switches ❷ for processes A through C, and to change the number of repeated processes, operate the " + " or " - " switch of switch ❸ for setting the number of processes D.

   The range of the number of stitches A, B and C that can be changed : 0 to 19 stitches.
   The range of the number of processes D that can be changed : 0 to 9 times.

4. Depress the front part of the pedal once, and the sewing machine will repeat the normal stitching and reverse stitching by the predetermined times. Then, the sewing machine will automatically make the thread trimmer actuate and will stop to complete the overlapped stitching procedure. (The one-shot automatic stitching cannot be turned OFF.)
5. If thread trimming prohibiting function ❹ is chosen, the machine will stop with the needle up upon completion of the overlapped stitching procedure without performing thread trimming.

4) Rectangular stitching pattern

② [icon]	OFF	ON	OFF	ON
Sewing pattern				
③ [icon]	OFF	OFF	ON	ON

1. Press rectangular stitching pattern switch ❶ on the control panel to select the rectangular stitching pattern.
2. The rectangular stitching pattern is selected. Now, the predetermined number of stitches and other sewing data are shown on the control panel.
3. To change the number of stitches of the processes in the rectangular stitching pattern, operate switches ❺ (for processes C and D) to change the number of stitches for processes C and D.
   Select the reverse feed stitching accordingly. To change the number of reverse-feed stitches, operate switches ❹ for setting the number of stitches for processes A and B.
   (Adjustable range : A, B = 0 to 19 stitches, C, D = 0 to 99 stitches)
4. Four different kinds of stitching patterns can be performed according to the combination of ON/OFF settings of automatic reverse stitching (for start) switch ❷ and automatic reverse stitching (for end) switch ❸.
5. Furthermore, the double reverse stitching mode can be specified by operating double reverse stitching (for start) switch ❻ and double reverse stitching (for end) switch ❼.
   When the touchback switch is operated at this time, the sewing machine runs at a low speed (compensating stitching). If the automatic thread trimming switch ❽ is not specified, sewing can be continued regardless of the setting of the number of stitches when the pedal is returned to its neutral position and its front part is depressed again after the final step has been automatically stopped.
6. If automatic thread trimming switch ❽ is turned ON, the sewing machine will automatically perform thread trimming after the completion of the last process. (If the automatic reverse stitching (for end) is selected, the sewing machine will automatically perform thread trimming after it finishes the automatic reverse stitching (for end).)
7. If thread trimming prohibiting function ❾ is chosen, the machine will stop with the needle up without performing thread trimming.
8. If one-shot automatic stitching function ❿ is chosen, the machine will automatically perform sewing at a stretch until the number of stitches specified is reached, at the predetermined sewing speed by depressing the pedal while the sewing machine is engaged in the sewing of process C or D. The machine performs thread trimming in the last process of one-shot automatic stitching pattern.
9. For the sewing machine equipped with an auto-lifter, the presser foot will automatically go up after the completion of each sewing process.

(5) Example of application

1) When the CP-180 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 ❸ of the CP-180, turn ON material end sensor ON/OFF switch ⑫ of the CP-160, and turn ON ⊘ mark ⑬ of the automatic one-shot stitching.
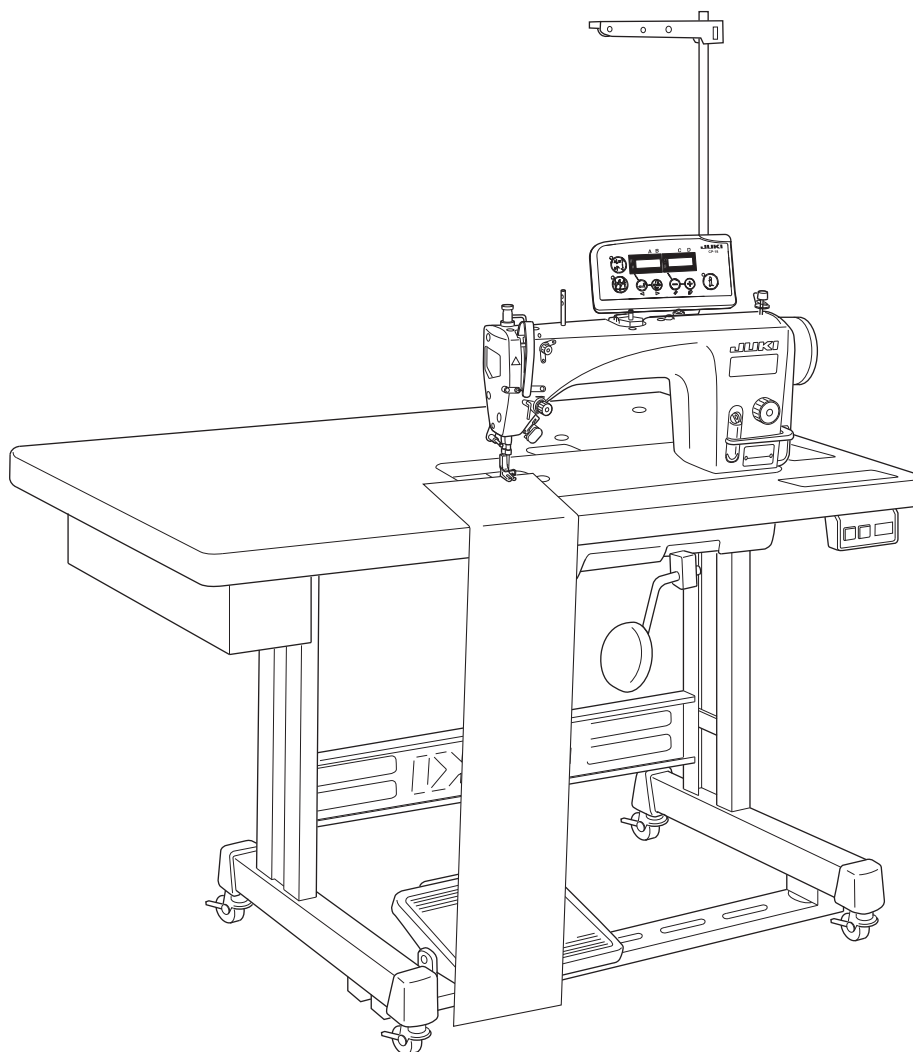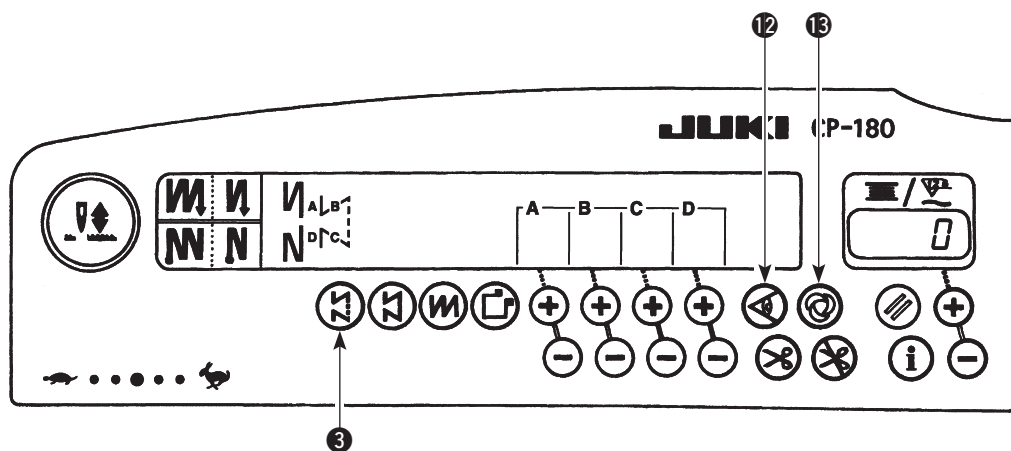
(Caution) Number of rotations of the automatic one-shot stitching can be changed by the function setting (No. 38).

2) Label attaching is performed by the automatic one-shot stitching with the CP-180

(Method) Select ⓗ mark ❺ on the CP-180, and turn ON ⓠ mark ⑬ of the automatic one-shot stitching.
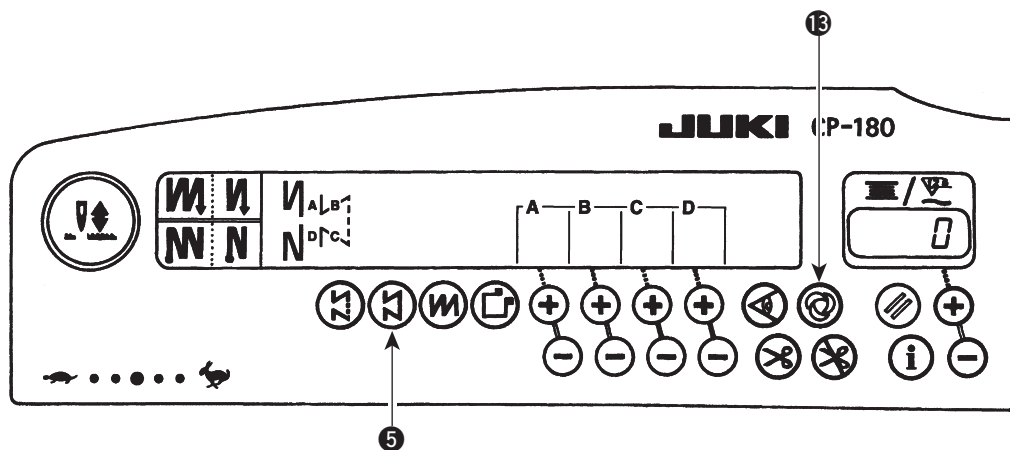

(Explanation) Number of stitches at the section CD can be set up to 500 stitches. If the stitch length is 2 mm, it is possible to sew approximately 1,000 mm (1 m).
This function can perform the automatic one-shot stitching without using the material end sensor (ED : optional). Therefore, the sewing machine 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.
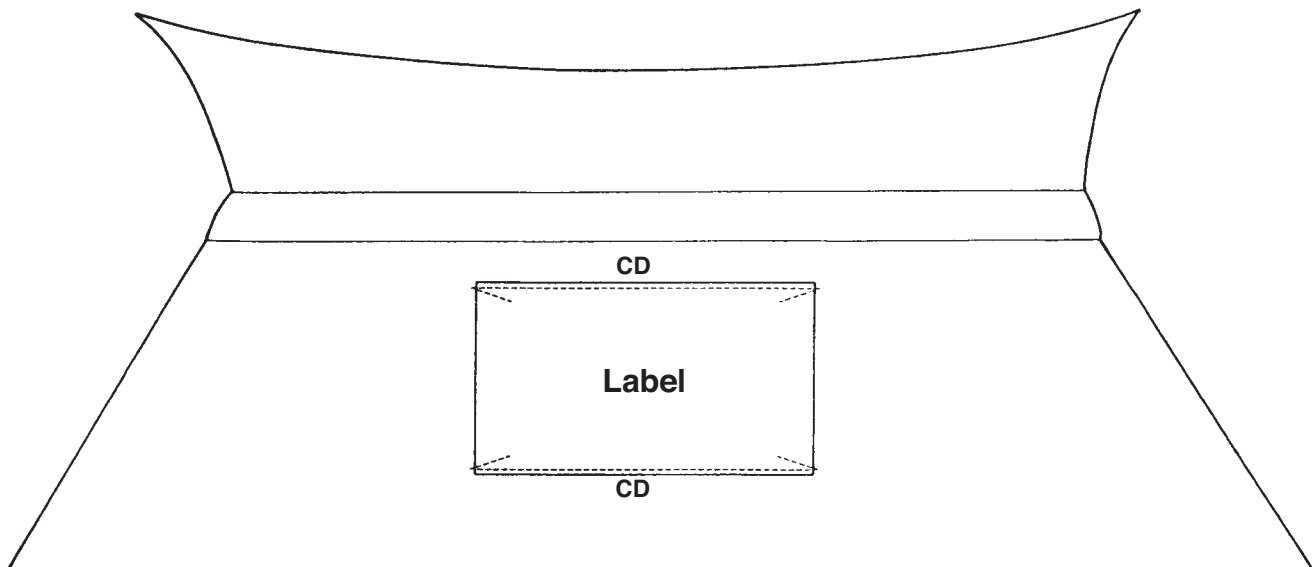
3) Seam joining of the reverse feed stitching at the end of sewing (For thick materials)

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.
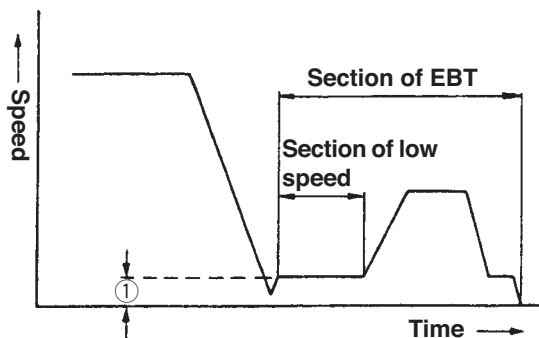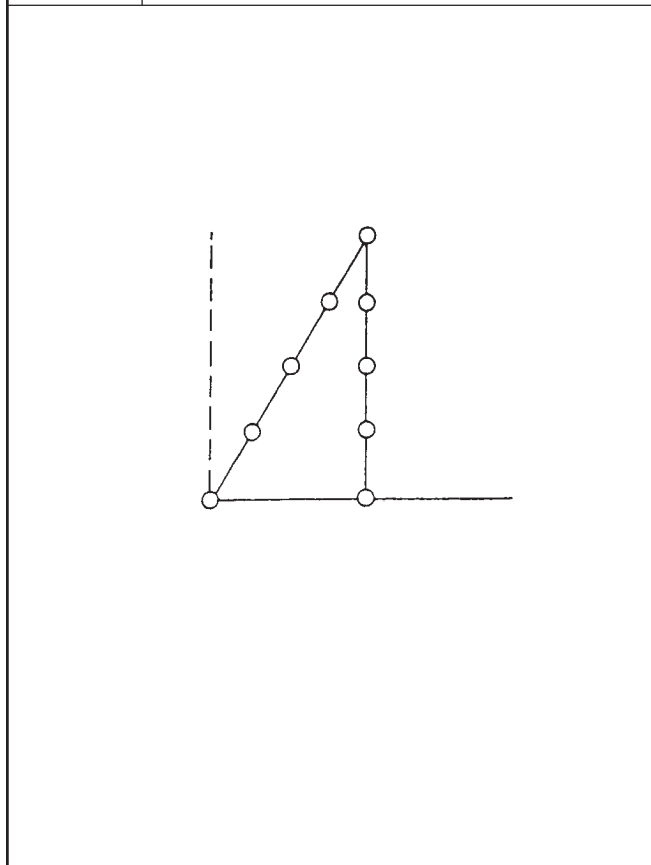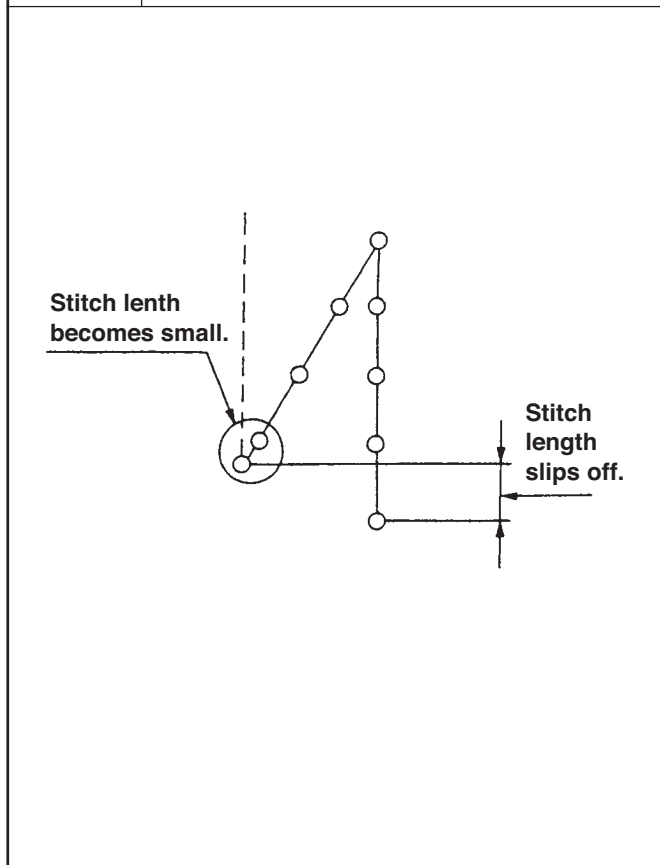

① At the timing to move to the reverse feed stitching action, the rotating speed at the section where the sewing machine is rotated at a low speed can be changed.
SC-920 function setting No. 64

Example) Use for reference.

Standard

Condition	Machine head of DDL-9000B-SH (for thick materials)	
	Stitch length	4 mm
	Number of stitches	4 stitches
	ITEM No. 64	180 sti/min

Stitch lenth becomes small.

Stitch length slips off.

Condition	Machine head of DDL-9000B-SH (for thick materials)	
	Stitch length	4 mm
	Number of stitches	4 stitches
	ITEM No. 64	"0" sti/min

(6) Explanation of operation panel IP-110F

Reverse stitching pattern

�[И] ❷	OFF	ON	OFF	ON
Sewing pattern		A / B		A / B C / D
[N] ❸	OFF	OFF	ON	ON

Press [↻] to display the pattern list screen.
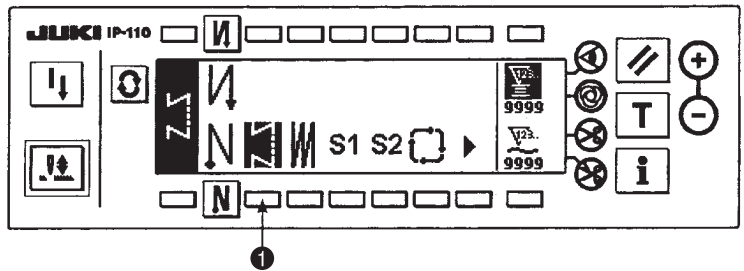
1. Press switch ❶ to select the reverse stitching pattern, and the screen is automatically changed over to the number of stitches reverse stitching setting screen to display the number of stitches which has already been set.
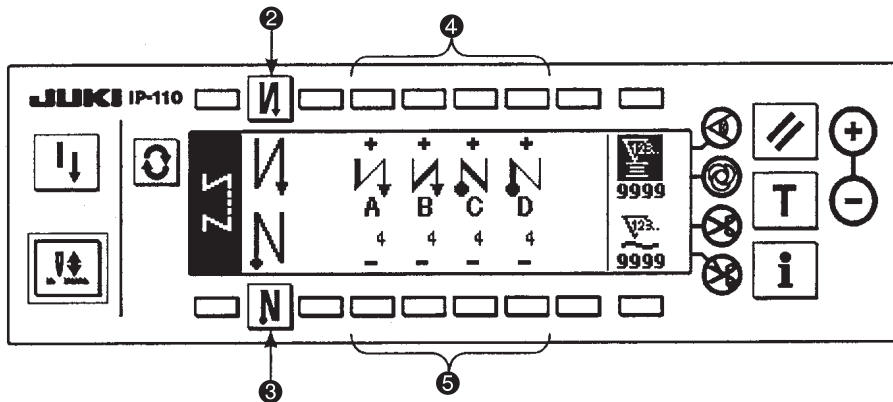
2. When changing the number of stitches, change it with switched ❹ and ❺ for setting the number of stitches A through D.
   (The range of the number of stitches that can be changed : 0 to 99 stitches.)

3. Press switch ❷ to set the reverse stitching at the start of sewing.

No setting   Reverse stitching at the start of sewing   Double reverse stitching at the start of sewing

4. Press switch ❸ to set the reverse stitching at the end of sewing.

No setting   Reverse stitching at the end of sewing   Double reverse stitching at the end of sewing

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Overlapped stitching pattern
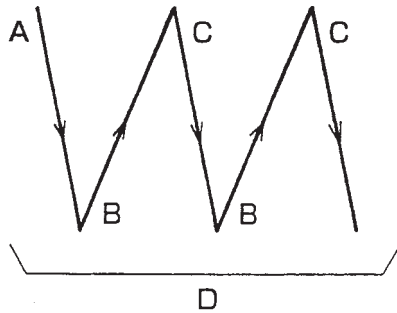
Press [⟳] to display the pattern list screen.
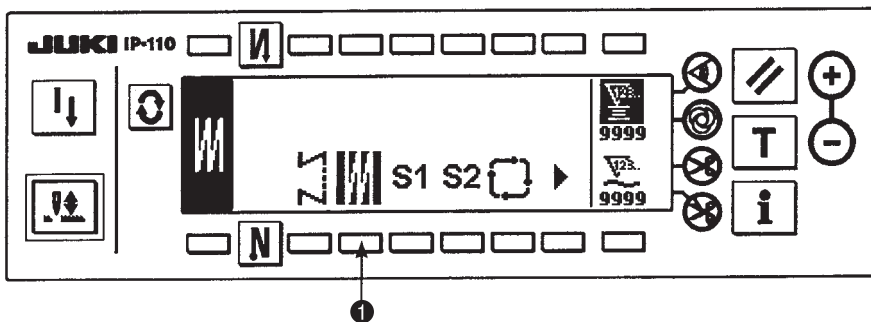
1. Press switch ❶ to select the overlapped stitching pattern, and the screen is automatically changed over to the number of stitches of overlapped stitching setting screen to display the number of stitches which has already been set.
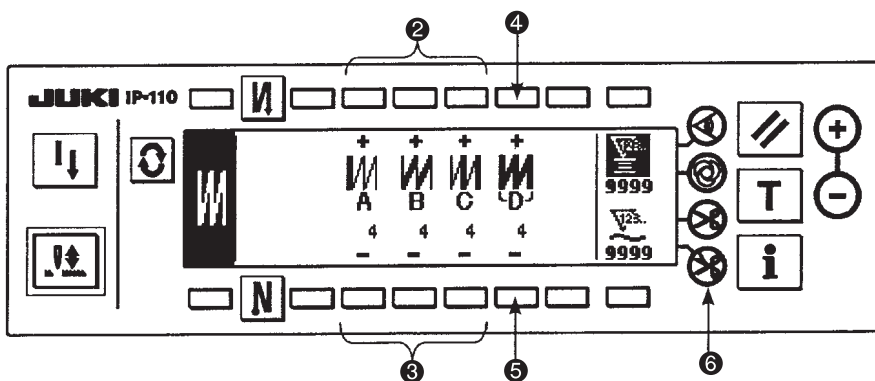
2. When changing the number of stitches, change it with switches ❷ and ❸ for setting the number of stitches for processes A through C. To change the number of times of the whole processes, change it with switches ❹ and ❺ for setting the number of processes D.
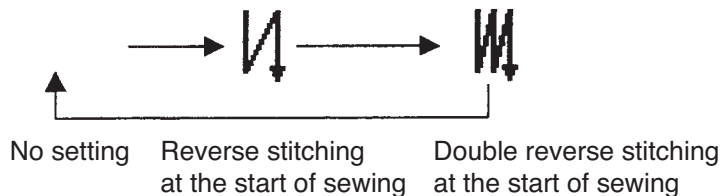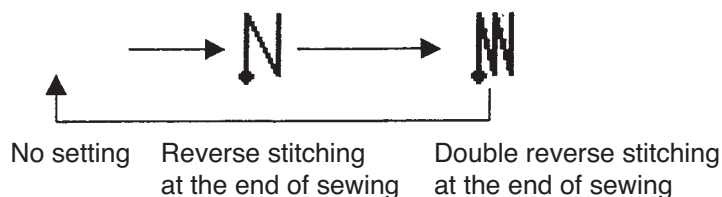   (The range of the number of stitches A, B and C that can be changed : 0 to 19 stitches, The range of the number of processes D that can be changed : 0 to 9 times)

3. Depress the front part of the pedal once, and the sewing machine will repeat the normal stitching and reverse stitching as many as the number of specified times. Then the sewing machine will automatically make the thread trimmer actuate and will stop to complete the overlapped stitching procedure. (The one-shot automatic stitching cannot be turned OFF.)

4. When thread trimming prohibiting function ❻ is selected, the machine will stop with the needle up upon completion of the overlapped stitching procedure without performing thread trimming.

1) Information

Setting and checking of various data can be performed with the information.

For the information, there are the operator level and the maintenance personnel level.
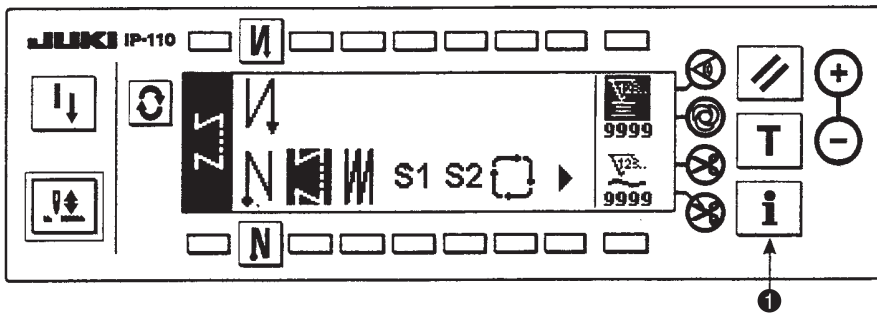
[Operator level]

1. Turn ON the power.
2. Press switch ❶ to display the information screen.

Information screen (operator level)
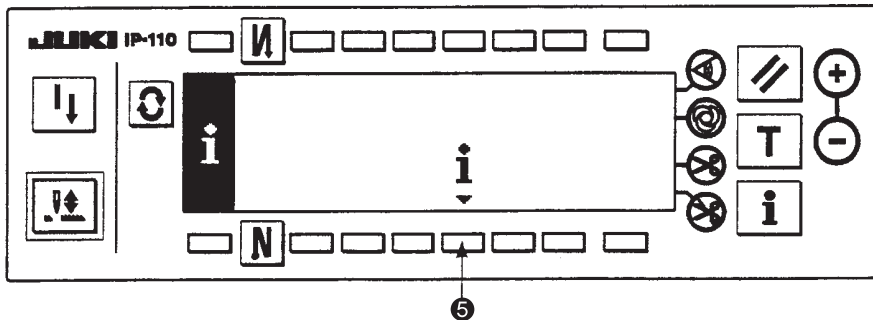
❺ : Sewing management information

1. Sewing management information

For the sewing management information, there are the maintenance management function, production control function and working measurement function.

[Maintenance management function]
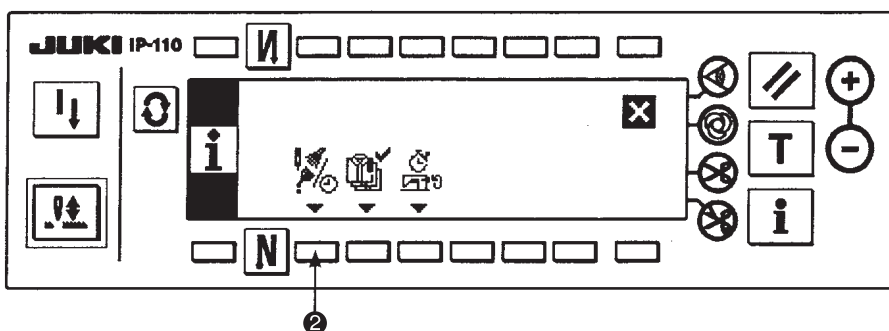
1) Press ❷ to display the maintenance function screen.

[Maintenance personnel level]
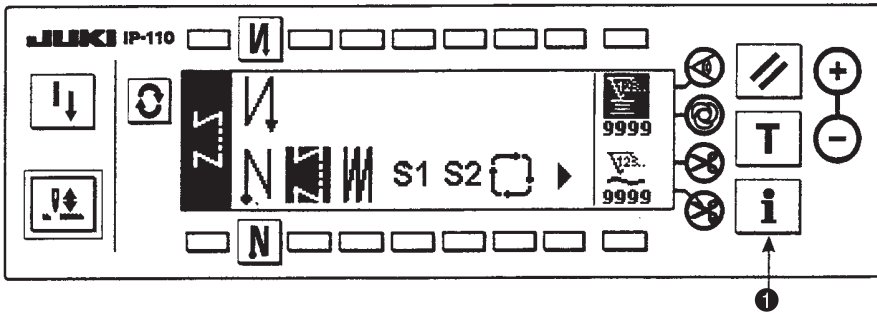
1) Turn ON the power. When the needle bar is not in the UP position, turn the handwheel to bring the needle bar to its UP position.
2) Press switch ❶ for approximately three seconds to display the information screen.
3) Press switches ❸, ❹, ❺, ❻ and ❼ corresponding to the various functions.

Information screen (Maintenance personnel level)
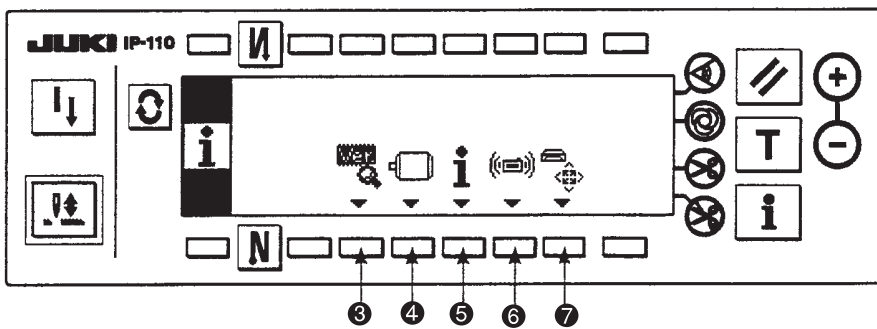
❸ : Ver display
❹ : Function setting
❺ : Sewing management information
❻ : Communication mode
❼ : Compact flash (TM) format

2. Ver display

Software version of each CPU is displayed.

Press switch ❸ in the information screen (maintenance personnel level).

Ver display screen

R V L
01-01-01 00
01-01-01 00

Explanation of display

```
         R    V    L
  [  ]   01-  01   01    00
                          Others

                   Level

              Version

         Revision

  Kind of CPU
```

Panel software

Servo motor software
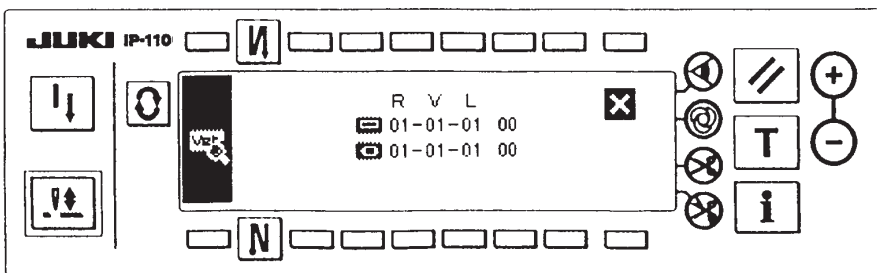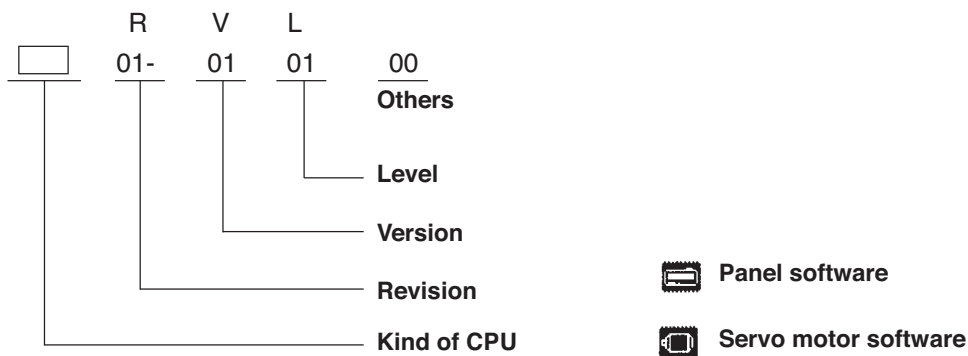
3. Sewing management information

For the sewing management information, there are the operator level and the maintenance personnel level.

[Operator level]

Press switch ❺ **ᵢ** in the information screen. (Previous page)

[Maintenance personnel level]

Press switch ❺ **ᵢ** for approximately three seconds in the information screen. (Previous page)

Pictograph on the left end of the sewing management information is shown in reverse video.

Sewing management information screen (Maintenance personnel level)
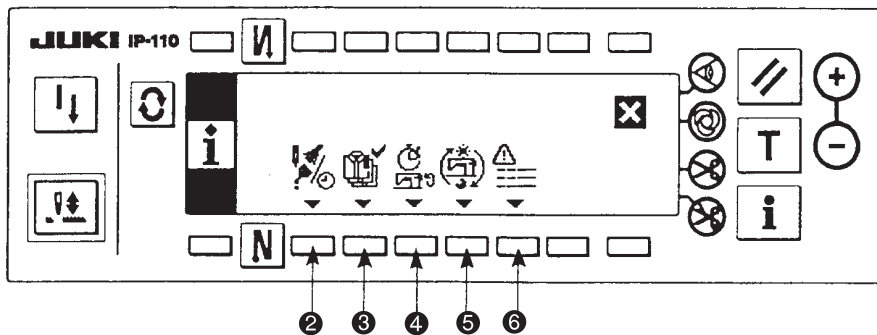
❷ : Maintenance function
❸ : Production control function
❹ : Operation measurement function
❺ : Operation status
❻ : Error record

4. Operation status screen

The total record of the sewing machine is displayed.
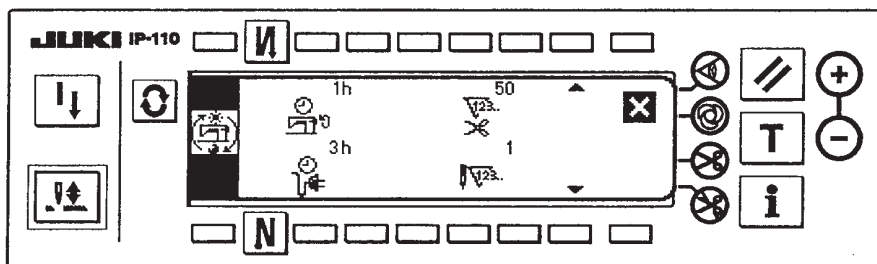
⏲ : Total operation time of the sewing machine (hour)

✂ : Total number of times of thread trimming of the sewing machine (number of times)

⏲ : Total current-carrying time of the sewing machine (hour)

: Total number of stitches of the sewing machine (1,000 stitches)

5. Error record display

Press error record display switch ❻ ⚠ in the sewing management information screen (maintenance personnel level). (Refer to the previous page.)

Error record screen
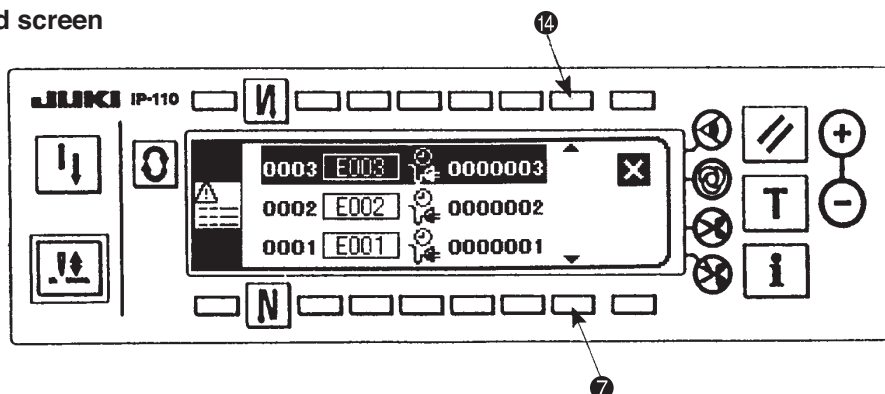
When switch ❼ or ⓮ is pressed, the error record scrolls up or down.

Explanation of display

Record No. Error No. Time occurred (Unit : time)
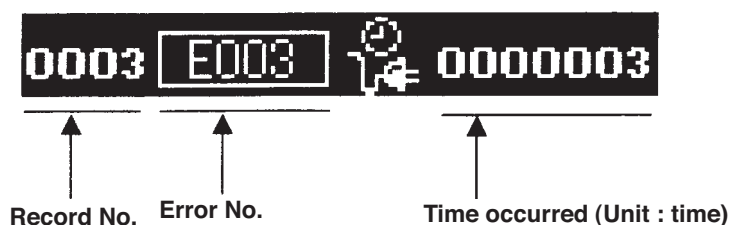
Error record of approximately 100 cases (depending on the memory capacity) can be stored in memory in the order of the latest.

6. Communication mode

Uploading and downloading of various data with the sewing machine server utility (hereinafter called SU- 1) or the compact flash (TM) can be performed in the communication mode.

For the communication mode, there are the operator level and the maintenance personnel level.

The kind of data which can be handled with the operator level is different from that with the maintenance personnel level.

Communication function table

Kind of data	Operation level	Download	Upload	Extension of file	Remarks
DATA All sewing machine data	Maintenance personnel			MSP	
Panel	Maintenance personnel		NG	PRG	
Main					
Servo motor					
Each program data					

⬚ : Panel

⬚ : Compact flash (TM)

🖥 : SU-1

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Operating procedure

[Maintenance personnel level]

Press communication mode switch ((☐)) ❻ for approximately three seconds in the information screen.

Refer to [Information screen (Maintenance personnel level)

Pictograph on the left end of the communication screen is shown in reverse video.

Communication screen (Maintenance personnel level)

Kind of selected data   Data selection ❶

Data communication   Data   Communication   Start of
source ❸   communication   method selection ❼   communication ❽
                          destination ❺
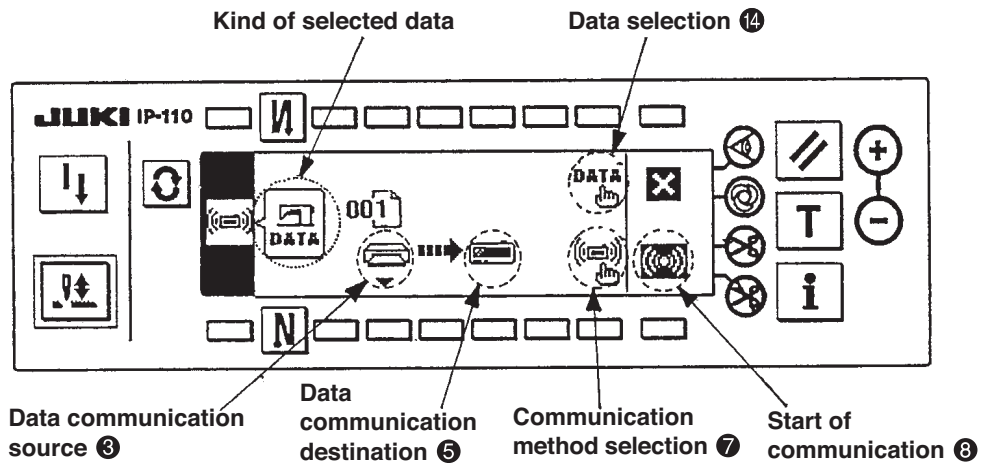
7. Communication setting

① Data selection

Press data selection switch ❶ in the communication screen.

Data selection screen
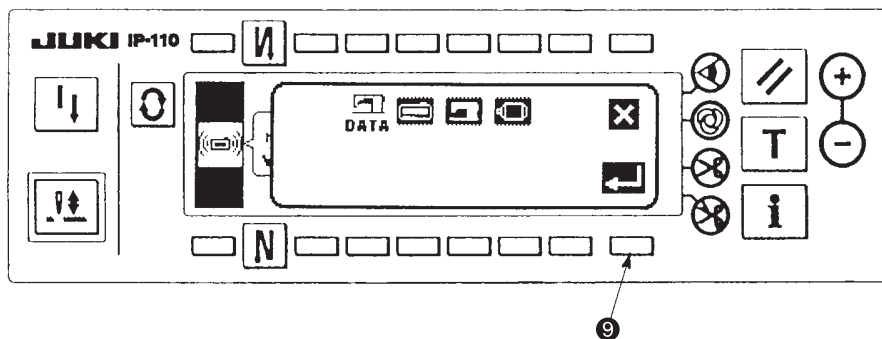
Select the data to perform communication, and press set key switch ❾ [↙] .

② Communication method selection

Press communication method selection switch ❼ in the communication screen.

Communication method selection screen

❿
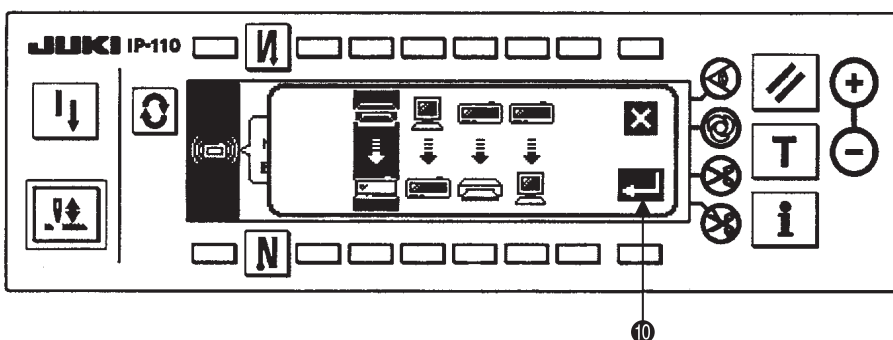
Select the method to perform communication and press set key switch ❿ ⏎ .
Reference : Communication method cannot be selected by downloading of program.

③ Data communication source ❸
④ Data communication destination ❺
Set data communication source ❸ and data communication destination ❺ in the ten key screen, or "+" or "−" key.
(Ten key input, or "+" or "-" key input is changed according to the kind of data.)
⑤ Start of communication
After all settings have been completed, press communication start key switch ❽ 🔊 to start communication. When the screen returns to the communication setting screen after display of the during communication screen, communication is completed.
(Caution) Never turn OFF the power during communication.
Motion in case of OFF cannot be guaranteed.

8. All sewing machine data

  1. Data such as sewing setting data, adjustment data, etc. which are memorized in the sewing machine can be stored in one package.
  2. It is possible to download the all sewing machine data to the other sewing machines to make the same setting.

Communication screen (Download of all sewing machine data)
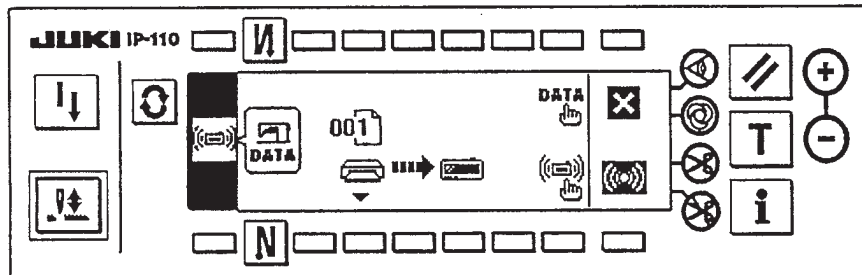
Reference : When downloading the all sewing machine data, it is necessary that the file and the Ver of the sewing machine have to agree with each other. An error occurs when the file of different Ver is downloaded.

(Caution) It is not possible to store and copy the function setting of the servo motor.

Folder structure of all sewing machine data (* .MSP) file in the Compact flash (TM)
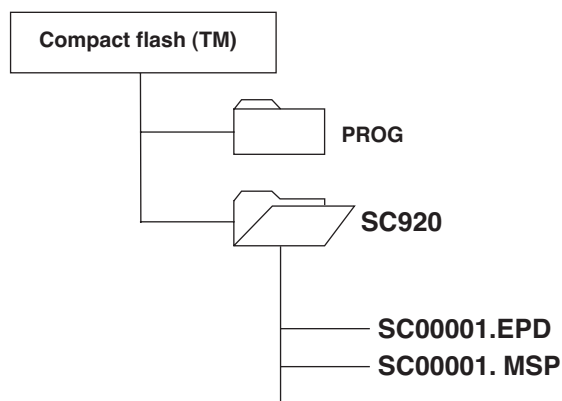
Upload :

Uploading to the compact flash (TM) is written in the folder of "SC-920".

In case there is no folder, the folder of "SC-920" is automatically created.

Download :

Downloading from the compact flash (TM) is read from the folder of "SC-920".

Store the copy from other compact flash (TM) or the like in the folder of "SC-920".

① Create folder "SC-920" in the compact flash (TM).

(It is not necessary to create the folder when it already exists.)

② Copy the file (extension MSP).

9. Program data

1. When the change of software occurs in the future due to Ver-up or the like, rewriting of the program can be performed.Rewriting of the program is performed with each CPU.

Communication screen (Download of IP-110F program data)
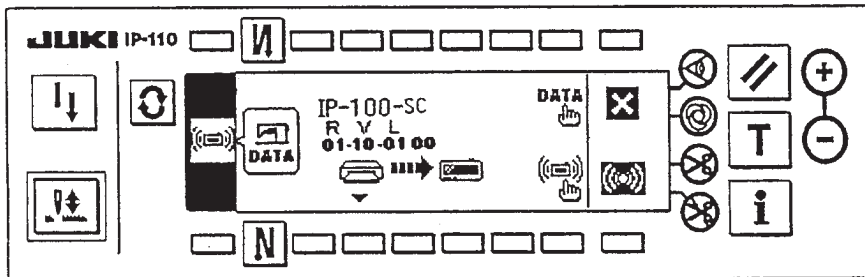
Folder structure of program (* .PRG) file in the compact flash (TM)
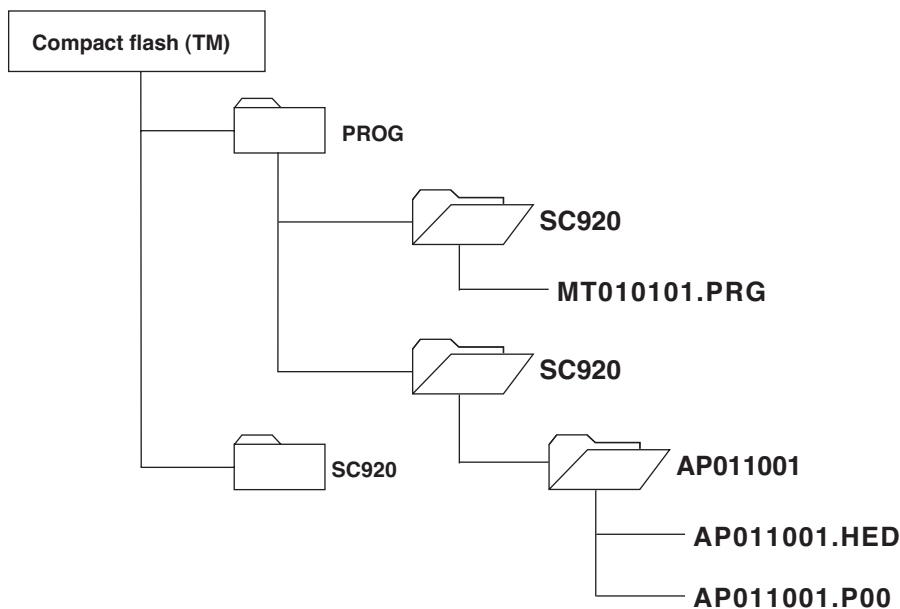
Download :

・ Downloading of SC-920 program data

Downloading from the compact flash (TM) is read from the folder of "PROG¥SC-920".

Store the copy from other media the like in the folder of "PROG¥SC-920".

① Create folder "PROG" in the compact flash (TM).

② Create folder "SC-920" in the PROG folder.

   (It is not necessary to create the folder when it already exists.)

③ Copy the program file (extension PRG).

・ Downloading of IP-110 program data

Downloading from the compact flash (TM) is read from the folder of "PROG¥SC-920".

Store the copy from other media the like in the folder of "PROG¥SC-920".

① Create folder "PROG" in the compact flash (TM).

② Create folder "SC-920" in the PROG folder.

   (It is not necessary to create the folder when it already exists.)

③ Copy the folder "AP011001" where the program file (extensions HED and P00) of IP-110 is stored.

   (The 011001 section can change according to the program version.)

10. Compact flash (TM) format

Perform formating of the compact flash (TM).
The compact flash (TM) formated with the personal computer or the like may not be used.
When using the media with IP-110F, be sure to perform formating with IP-110F.

Press compact flash (TM) format switch 🚙 ❼ in the information screen (maintenance personnel level)

Compact flash (TM) format confirmation screen
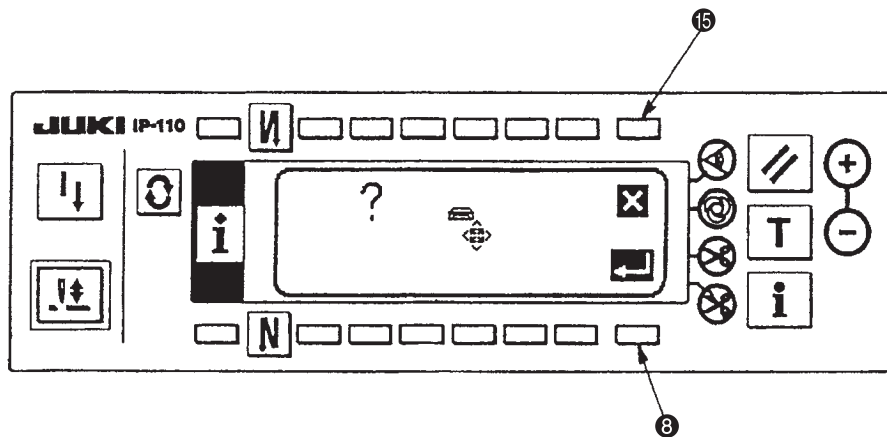
❽ : Formating is performed.
   Confirm again whether formating can be performed before pressing the switch.

⑮ : The screen returns to the information screen.

(Caution) When formating is performed, all data stored in the compact flash (TM) are deleted. Take the backup of necessary data beforehand.

2) Error code list (Error display in panel)
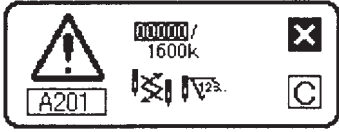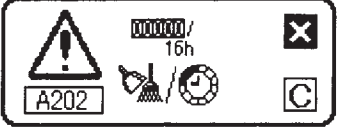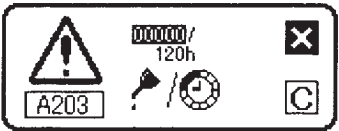
There are the following error codes in this device. These error codes interlock (or limit function) and inform the problem so that the problem is not enlarged when any problem is discovered. When you request our service, please confirm the error codes.

No.	Description of error detected	Cause	Item to be checked or corrective measure
—	UP position detection error when turning ON the power	1. When needle position is not UP position at the time of turning ON the power.	1. Set to UP position by turning handwheel by hand. 2. Connect synchronizer connector.
—	Media cover open	1. Lid of media slot is open.	Close the lid.
E000	Execution of data initialization (Not error)	1. EEPROM initialization is executed. 2. Resistor pack is replaced. 3. When machine head is replaced.	—
E003	Disconnection of synchronizer connector	1. When position detection signal is not inputted from the sewing machine head synchronizer. 2. When the synchronizer has broken.	1. Check the synchronizer connector (CN30) for loose connection and disconnection. 2. Check whether the synchronizer cord has broken since the cord is caught in the machine head or the like.
E004	Synchronizer upper position sensor failure		
E005	Synchronizer upper position sensor failure		
E007	Overload of motor	1. When the machine head is locked. 2. When sewing extra-heavy material beyond the guarantee of the machine head. 3. When the motor does not run. 4. Motor or driver is broken.	1. Check whether the thread has been entangled in the motor pulley. 2. Check the motor output connector (4P) for loose connection and disconnection. 3. Check whether there is any draw when turning motor by hand.
E011	Compact flash (TM) not inserted	Compact flash (TM) is not inserted.	Return after reset operation.
E012	Read error	Data read from compact flash (TM) is not possible.	Return after reset operation.
E013	Write error	Data write to compact flash (TM) is not possible.	Return after reset operation.
E014	Write protect	Compact flash (TM) is in write prohibition state.	Return after reset operation.
E015	Format error	Formatting cannot be performed.	Return after reset operation.
E016	External media capacity over	Media capacity of compact flash (TM) is short.	Return after reset operation.
E019	File size over	File is too big.	Return after reset operation.
E021	Access error	Abnormality of access of file	Return after reset operation.
E032	File compatibility error	There is not file compatibility.	Turn OFF the power.
E053	Execution of panel backup data initialization. (Not error)	When model code of panel does not agree with that of control box. When executing initialization operation when the panel.	Turn OFF the power.
E070	Slip of belt	1. When the machine head is locked. 2. Belt is loose.	1. Check whether there is any holdup when turning the motor by hand. 2. Check the belt tension.
E071	Disconnection of motor output connector	Disconnection of motor connector	Check the motor output connector for loose connection and disconnection.
E072	Overload of motor at the time of thread trimming motion	Same as E007	Same as E007
E220	Grease fill-up time information	When grease fill-up time to the specified place has come.	After turning OFF the power, perform grease fill-up, and set Function No.118 to "1". When grease fill-up cannot be performed during sewing, release of error can be performed with the reset key of the panel.
E221	Grease-up error	LH-41** Machine head greasing alarm (Grease replenishment alarm after the lapse of specified time)	Replenish the specified grease and execute resetting operation.

No.	Description of error detected	Cause	Item to be checked or corrective measure
E302	Fall detection switch failure (When safety switch works)	When fall detection switch is inputted in the state that the power is turned ON.	1. Check whether the machine head is tilted without turning OFF the power switch (sewing machine operation is prohibited for safety sake). 2. Check whether the fall detection switch cord is caught in the sewing machine or the like and has broken. 3. Check whether the fall detection switch lever is caught in something.
E303	Semilunar plate sensor error	The semilunar plate sensor signal cannot be detected.	1. Check whether there is coincidence between machine head and model setup. 2. Check whether the connecting wires of the motor encoder connector are broken.
E343	Bobbin thread remaining amount sensor unit trouble	1. The device is not connected when bobbin thread remaining detection function is ON. 2. Failure of position sensor of the device 3. Failure of position solenoid of the device 4. When the position of detection rod of AE device is out of the home position.	1. Check whether the device is connected. 2. Check whether bobbin thread remaining amount detection connector (CN121 and CN123) is loosened or disconnected. 3. Check whether the detection rod of AE device is returned to the proper position. 4. Check whether function setting No. 57 is wrongly set. 5. Check whether cord of AE device is broken due to pinching of cord or the like by machine head.
E703	Connection of panel which is not supposed	When panel connected to the sewing machine is the kind which is not supposed.	Turn OFF the power Connect the proper panel.
E704	Inconsistency of system versions	When system versions are inconsistent.	Turn OFF the power. Consist system versions with each other.
E730	Motor encoder trouble (AB phase)	When the motor signal is not properly inputted.	1. Check the motor signal connector (CN30) for loose connection and disconnection. 2. Check whether the motor signal cord has broken since the cord is caught in the machine head or the like, broken since the cord is caught in the machine head or the like. 3. Check whether the inserting direction of the motor encoder connector is wrong.
E731	Motor sensor error (UVW phase)		
E733	Reverse rotation of main shaft motor	State that the sewing machine is rotating in the different direction from the normal rotating direction at 500 rpm or more continues 40 times or more while motor is running (excluding holding of needle position).	Turn OFF the power.
E808	Solenoid short-circuited	Normal voltage cannot be secured for the solenoid power supply.	Check whether the machine head cords are pinched by the pulley cover or the like.
E809	Holding operation error	No changeover to solenoid holding operation	Check whether the solenoid is generating heat. (The relating circuit of the CTL board is broken.)
E810	Solenoid short-circuit	When the short-circuited solenoid is desired to be driven.	Check whether the solenoid is short-circuited.
E811	Power-supply voltage is abnormal	1. When voltage upper than guaranteed one is inputted. 2. When 200V is inputted for 100V setting. 3. 220V is applied to JUS : 120V box. 4. 400V is applied to CE : 230V box. 5. When voltage lower than guaranteed one is inputted. 6. When 100V is inputted for 200V setting. 7. 120v is applied to JUS : 220V box. 8. Inner circuits are damaged by the overvoltage applied.	1. Check whether the applied power voltage is higher than the rated voltage + (plus) 10% or more. 2. Check whether 100V/200V changeover connector is set by mistake. In either of the above cases, the power supply board may have been broken. 3. Check whether the source voltage is below -10% of the rated level. 4. Check whether the fuses have blown cut or the regenerative resistance is broken.

No.	Description of error detected	Cause	Item to be checked or corrective measure
E906	Communication error toward the control panel	1. Disconnection of the control panel cords 2. Control panel damaged	1. Check whether the control panel connectors (CN38) are loosened or disconnected. 2. Check whether the control panel cords are broken because of being caught by the machine head or the like.
E920	GA failure	Abnormality of gate array	When return is not performed even after turning OFF the power, the possibility of gate array breakage is large.
E922	Main shaft motor control is impossible.	When main shaft motor cannot be controlled.	Turn OFF the power.
E924	Motor driver failure	Motor driver has broken.	Turn OFF the power.
E930	Encoder failure	When the motor signal is not properly inputted.	Check the motor signal connector (CN30) for loose connection and disconnection. Check whether the motor signal cord has broken since the cord is caught in the machine head or the like.
E931	Motor hole sensor failure		
E941	GA failure	Abnormality of gate array	When return is not performed even after turning OFF the power, the possibility of gate array breakage is large.
E942	EEPROM failure	Writing is not completed even after the lapse of 10 [ms] or more.	Turn OFF the power.
E799	Bird's nest sequence error	Bird's nest prevention sequence is not completed.	Turn OFF the power.

3) Warning list

No.	Contents and display of warning	Corrective measure	Remarks
A201	Replacement of oil warning	• Press ✖ to close warning screen, and perform replacement of needle. Then clear the value in the clear screen. • Press to Ⓒ clear the value, and perform replacement of needle.	Refer to the relevant screen in regard to the maintenance functions of the instruction manual.
A202	Cleaning warning	• Press to ✖ close warning screen, and perform cleaning. Then clear the value in the clear screen. • Press to Ⓒ clear the value, and perform cleaning.	Refer to the relevant screen in regard to the maintenance functions of the instruction manual.
A203	Replacement of needle warning	• Press to ✖ close warning screen, and perform replacement of oil. Then clear the value in the clear screen. • Press to Ⓒ clear the value, and perform replacement of oil.	Refer to the relevant screen in regard to the maintenance functions of the instruction manual.

5. CONTROL BOX (SC-920)

(1) Connecting the cords

> **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 on the front face of SC-920. Connect the connectors coming from the machine head to the corresponding places so as to fit the devices mounted on the machine head.

❶ CN30 Motor signal connector

❷ CN38 Operation panel: Various kinds of sewing can be programmed. (For details of the operation panel other than CP-18, refer to the Instruction Manual for the panel to be used.)

❸ CN33 Synchronizer : It detects the needle bar position.

❹ CN37 Presser foot lifting solenoid (Only for the automatic presser foot lifter type)

❺ CN48 Safety switch (standard) : When tilting the sewing machine without turning the power OFF, the operation of the sewing machine is prohibited so as to protect against danger.
OPTION switch: Input function can be changed by changing over the internal function with this switch.

❻ CN42 Thread trimming safety switch

❼ CN39 Standing machine pedal : JUKI standard PK70, etc. Sewing machine can be controlled with external signals.

❽ CN55 +24 V external power source

❾ CN57 Simplified production control counter input

❿ CN36 Machine head solenoid: Provided with solenoids for thread trimming, reverse feed stitching, one-touch type reverse feed switch.

⓫ CN54 Material end detection sensor ED-5, etc.

(2) Operating procedure of the sewing machine
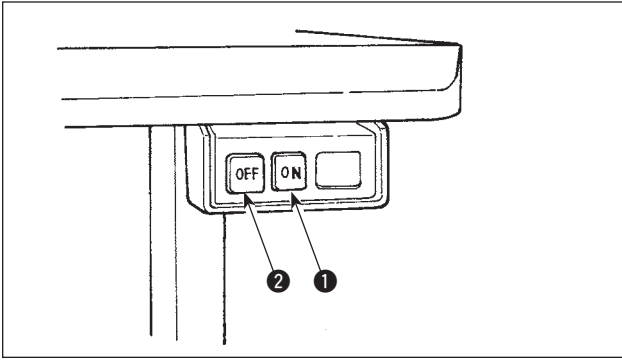
1. Press ON button ❶ of the power switch to turn ON the power.

(Caution) **In case the power indication LED does not lights up even when turning ON the power switch,immediately turn OFF the power and check the voltage.**
In addition, in such a case as this, return ON the power switch when 2 to 3 minutes or more have passed after turning OFF the power switch.

2. When the needle bar is not in UP position, it automatically turns to the UP position.

(Caution) **When turning ON the power for the first time, there is the case where the timing is slightly retarded to perform the initialization work. When turning ON the power, the needle bar moves. Do not put your hands or things under the needle.**
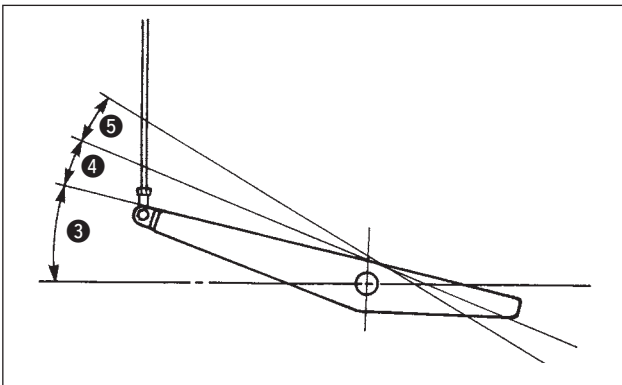
3. When depressing front part ❸ of the pedal, the sewing machine rotates at the number of revolutions in accordance with the depressing amount. When the pedal is returned to the neutral position, the sewing machine stops.

4. When lightly depressing back part ❹ of the pedal, the presser goes up. (PFL type only)

5. When strongly depressing back part ❺ of the pedal, thread trimming is performed.

	PFL	KFL
Presser foot operation by pedal	Enabled	Disabled
Pedal depressing depth for thread trimming	Deep	Shallow
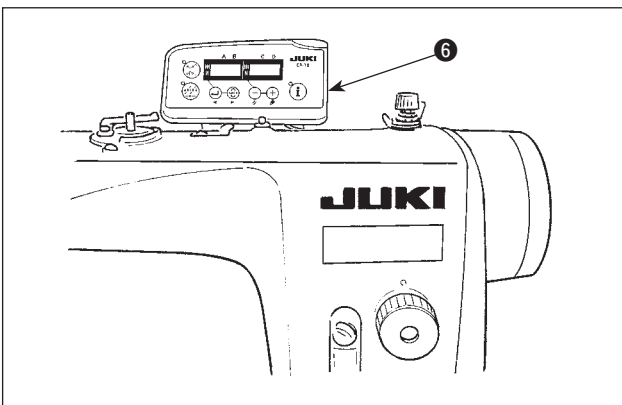
6. It is possible to program various sewing patterns, using the operation panel, such as the reverse feed stitching at sewing start and reverse feed stitching at sewing end. Refer to **"5.-(4) Operating procedure of the sewing patterns"** for details when using CP-18 ❻. For the operation panel other than CP-18 ❻, refer to the Instruction Manual for the operation panel to be used.
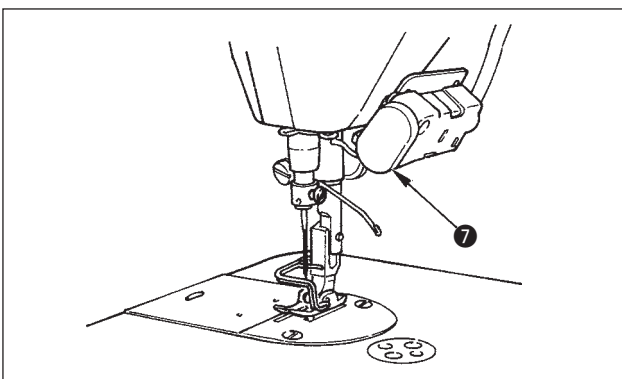
7. When pressing touch-back switch ❼, reverse feed can be performed.
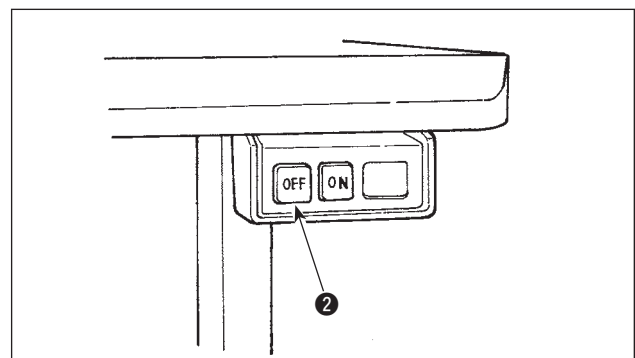
8. When sewing is completed, press OFF button ❷ of the power switch to turn OFF the power switch after confirming that the sewing machine has stopped.

(3) Explanation of the operation panel (CP-18)
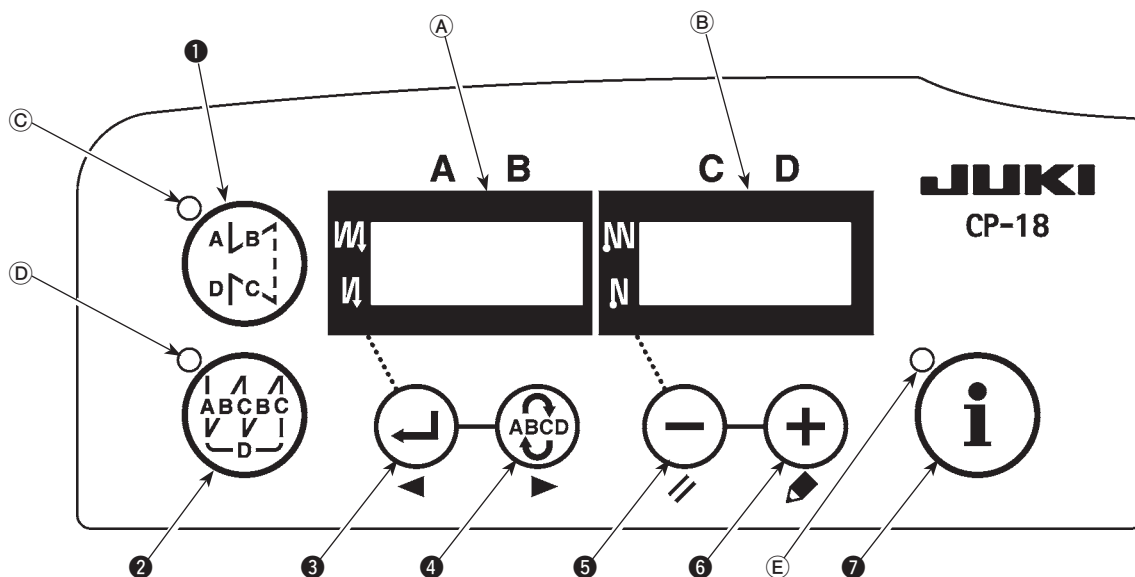
❶ (A↓B, D↑C) switch : Used for changing over effective/ineffective of the reverse feed stitching pattern.

❷ (ABCBC) switch : Used for changing over effective/ineffective of the overlapped stitching pattern.

❸ (↵) switch : Used for confirming the contents of setting and for changing over effective/ineffective of the reverse feed stitching at sewing start.

❹ (ABCD) switch : Used for selecting the process (A, B, C, D) the number of stitches for which is to be changed.
* The selected process flashes on and off.

❺ (−) switch : Used for changing the content of the selected display (flashing section) and for changing over effective/ineffective of the reverse stitch at sewing end.

❻ (+) switch : Used for changing the content of the selected display (flashing section).

❼ (i) switch : Used for calling the production support function (by keeping the switch held pressed for two seconds).

Indicators Ⓐ and Ⓑ : Various pieces of information are displayed.

LED Ⓒ : Lights up when the reverse feed stitching pattern is effective.

LED Ⓓ : Lights up when the overlapped stitching pattern is effective.

LED Ⓔ : Lights up when the production support function is displayed.

(4) Operating procedure of the sewing pattern

(Caution) For the operation panel other than CP-18, refer to the Instruction Manual for the operation panel to be used.

1) Reverse feed stitching pattern

Reverse feed stitching at sewing start and reverse feed stitching at sewing end can be separately programmed.
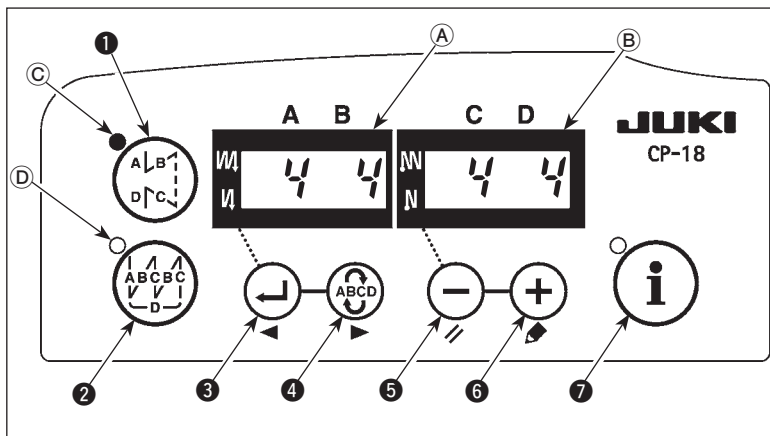
[Setting procedure of the reverse feed stitching]

1. Effective/ineffective of the reverse feed stitching pattern can be changed over by pressing switch ❶.

   When the reverse feed stitching pattern is rendered effective, LED Ⓒ lights up, the number of stitches of the reverse feed stitching at sewing start is displayed on Ⓐ, and the number of stitches of the reverse feed stitching at sewing end is displayed on indicator Ⓑ.

Select a process (A, B, C or D) the number of stitches for which is to be changed by using switch ❹.

The number which is flashing on and off represents the process which is being set.

Change the number of stitches for the selected process by using switch ❺ and switch ❻.

Press switch ❸ to confirm the change you have made. (The number of stitches that can be set is 0 to 15.)

(Caution) The sewing machine cannot perform sewing when the display of the number of stitches for a process is flashing on and off.

| Without reverse stitching | | | | Reverse stitching | | |
| Double reverse stitching | | | | | | |
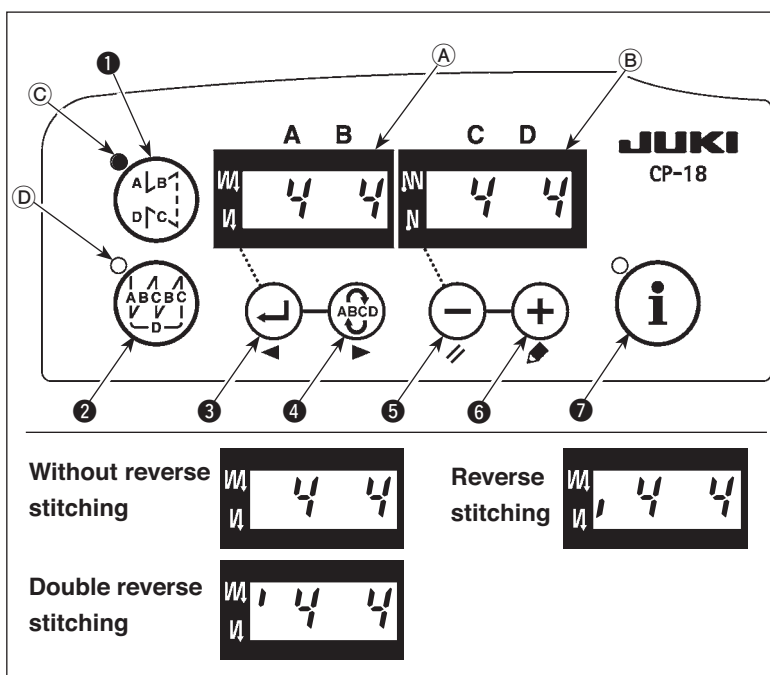
2. When the number of reverse feed stitches display is not flashing on and off, every press on switch ❸ changes over the reverse feed stitching mode from the "reverse feed stitching at sewing start," "double reverse feed stitching at sewing start" and "no reverse feed stitching at sewing start."

   In addition, every time switch ❺ is pressed, the reverse feed stitching feature changes over from the reverse feed stitching at sewing end to the double reverse stitch at sewing end, then to no reverse feed stitching at sewing end, in turn.

(Caution) For some types of the machine head, reverse feed stitching patterns are not available.

2) Overlapped stitching pattern

Overlapped stitching pattern can be programmed.
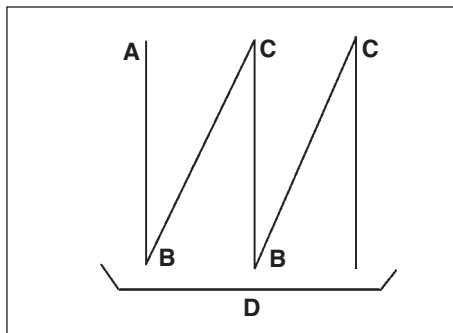
A : Number of stitches of normal stitching setting
　　0 to 15 stitches
B : Number of stitches of reverse stitching setting
　　0 to 15 stitches
C : Number of stitches of normal stitching setting
　　0 to 15 stitches
D : Number of times of repetition
　　0 to 9 times
(Caution) When process D is set to 5 times, the sewing is repeated as A → B → C → B → C.
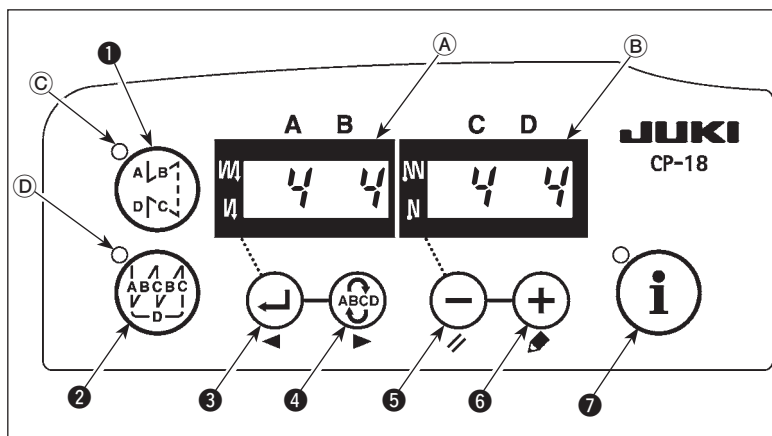
[Setting procedure of the overlapped stitching]

1. Effective/ineffective of the overlapped stitching pattern can be changed over by pressing switch ❷.
   When the overlapped stitching pattern is rendered effective, LED Ⓓ lights up.

2. Select a process (A, B, C or D) the number of stitches for which is to be changed by using switch ❹.
   The number which is flashing on and off represents the process which is being set.

3. Change the number of stitches for the selected process by using (−) switch ❺ and (+) switch ❻.

4. Press (↵) switch ❸ to confirm the change you have made.

   (The sewing machine does not run unless the setting has been confirmed by pressing (↵) switch ❸.)

(Caution) **The overlapped stitching pattern is carried out under automatic operation mode. Once the pedal is depressed, the sewing machine will automatically perform sewing of the number of overlapped stitches.**

(5) One-touch setting

A part of function setting items can be easily changed in the normal sewing state.

(Caution) **For the setting of functions other than those covered in this part, refer to "5.-(6) Setting of functions of SC-920".**

(Caution) **The setting is confirmed by pressing ⓘ switch ❼.**
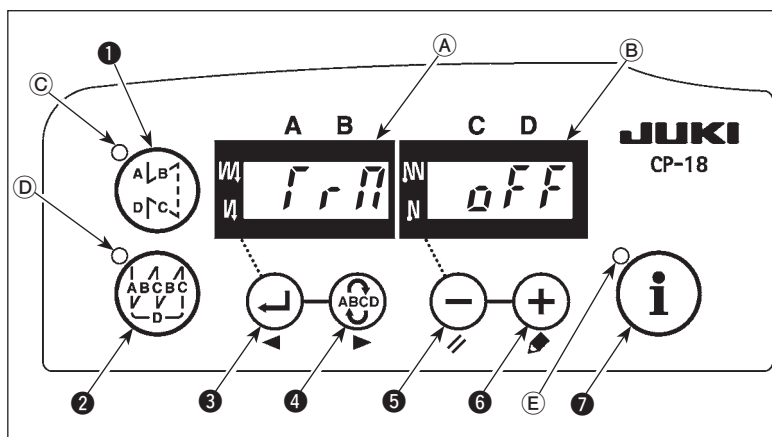
[One-touch setting procedure]

1. Keep ⓘ switch ❼ held pressed for one second to place the panel in the function setting mode.
2. Change over the item to be set by using ↵ switch ❸ or (ABCD) switch ❹. Then, the set value can be changed by using (−) switch ❺ and (+) switch ❻.
3. To return to the normal sewing state, press ⓘ switch ❼.

① Thread trimming function (Γ r Π)

    o F F : Thread trimming operation is not performed (solenoid output prohibition: Thread trimmer, wiper)

    o n   : Thread trimming operation is effective.

② Wiper function (H ı P)

    o F F : Wiper does not operate after thread trimming   o n : Wiper operates after thread trimming

③ One-shot automatic stitching function (5 H o Γ)

    o F F : One-shot automatic stitching function is ineffective.   o n : One-shot automatic stitching is effective.

(Caution) **This function is rendered effective when the material end sensor function is set. It is not possible to prohibit the one-shot operation during overlapped sewing operation. The number of revolution is the value which is set for setting No. 38.**

④ Setting of the max. speed of stitch (5 P d)

The highest speed of stitch of the machine head is set. The upper limit of the set value differs with the type of machine head to which the SC is connected.

      Setting range : 150 - Max. value [sti/min]

⑤ Material end sensor function (E d)

    o F F : Material end sensor function is ineffective.

    o n   : Once the material end is detected, the sewing machine stops running after having sewn the number of stitches set with ⑦ (E d 5 Γ).

 * This function is rendered effective when the optional material end sensor is connected to the sewing machine.

⑥ Thread trimming function by material end sensor (E d Γ r)

This function is rendered effective when the optional material end sensor is connected to sewing machine.

    o F F : Automatic thread trimming function after the detection of material end is ineffective.

    o n   : Once the material end is detected, the sewing machine performs thread trimming after having sewn the number of stitches set with ⑦ (E d 5 Γ).

 * This function is rendered effective when the optional material end sensor is connected to sewing machine.

⑦ Number of stitches for material end sensor (E d 5 Γ)

The number of stitches to be sewn from the detection of material end to the stop of the sewing machine

Number of stitches that can be set: 0 to 19 (stitches)

(Caution) **If the number of stitches specified is inadequate, the sewing machine can fail to stop within the preset number of stitches depending on the number of revolutions of the sewing machine.**

(6) Setting of functions

Functions can be selected and specified.

(Caution) For the function setting procedure of any operation panel other than CP-18, refer to the Instruction Manual for the operation panel to be used.

1. Turn ON the power with i switch ❼ held pressed.
   (The item which has been changed during the previous work is displayed.)

* If the screen display does not change, re-carry out operation described in step 1).

(Caution) Be sure to re-turn ON the power switch when one or more seconds have passed after turning it OFF. If the power switch is re-turned ON immediately after turning it OFF, the sewing machine may fail to operate normally. In such a case, be sure to turn ON the power switch again properly.

2. To move the setting No. forward, press switch ❹. To move the setting No. backward, press switch ❸.

(Caution) If the setting No. is moved forward (or backward), the previous (or subsequent) content of the setting is confirmed. Be careful when the content of a setting is changed (when the − / + switch is touched).

Example) Changing the maximum number of revolutions (setting No. 96)

Press switch ❸ or switch ❹ to call setting No. "96."
The current set value is displayed on indicator Ⓑ.
Press − switch ❺ 10 times to change the set value to "2500."

* The content of setting of the setting No. returns to the initial value by pressing − switch ❺ and + switch ❻ simultaneously.

3. After completion of the changing procedure, press switch ❸ or switch ❹ to confirm the updated value.

(Caution) If the power is turned OFF before carrying out this procedure, the changed content is not updated. When switch ❸ is pressed, the display on the panel changes to the previous setting No. When switch ❹ is pressed, the display on the panel changes to the subsequent setting No. After completion of the operation, the machine is returned to the normal sewing state by turning OFF the power and re-turning it ON.

(7) Setting procedure of the machine head

(Caution) For the operation panel other than CP-18, refer to the Instruction Manual for the operation panel to be used for the setting procedure of the machine head.
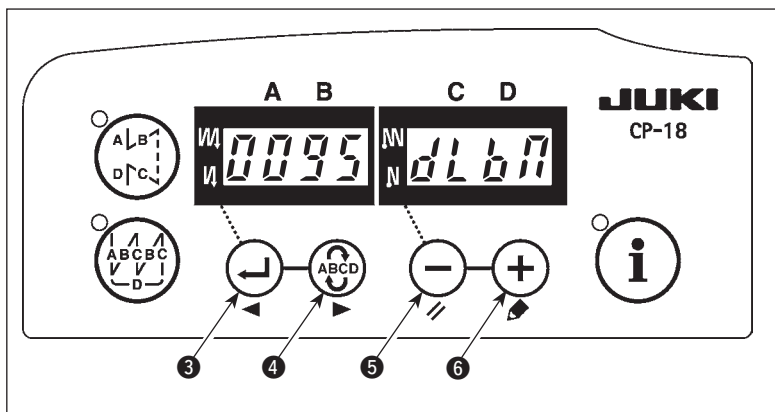
1. Refer to **"IV-(6) Setting for functions of SC-920 Instruction Manual"**, and call the function setting No. 95.
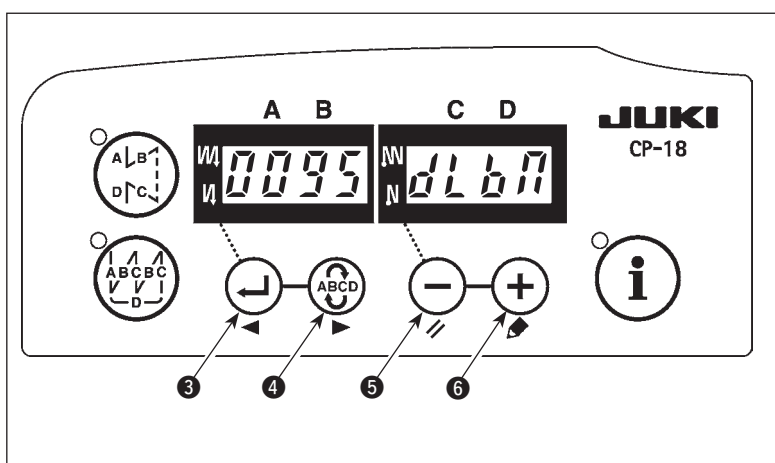
2. The type of machine head can be selected by pressing ⊖ switch ❺ (⊕ switch ❻).

   * Refer to "CAUTIONS WHEN SETTING UP THE SEWING MACHINE" or "Machine head list" on the separate sheet for the types of machine heads.
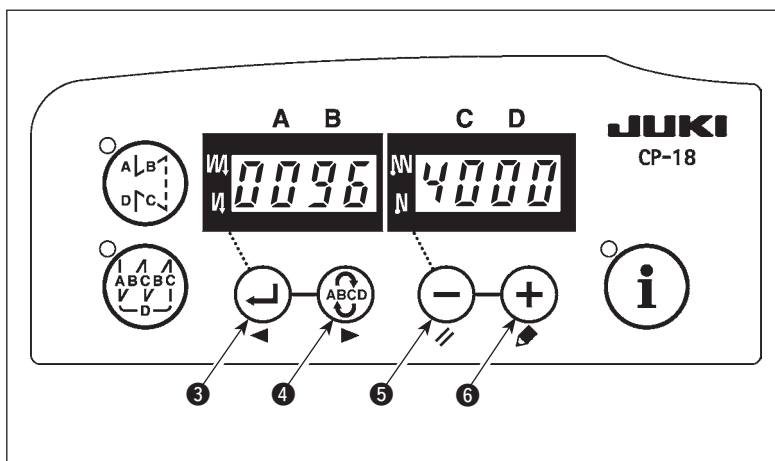
3. After selecting the type of machine head, by pressing ⏎ switch ❸ (⟳ABCD switch ❹), the step proceeds to 96 or 94, and the display automatically changes to the contents of the setting corresponding with the type of machine head.

(8) Machine head list

No.	Machine head	Type	Contents of display	Number of revolutions at the time of delivery (sti/min)	Max. number of revolutions (sti/min)	
1	DDL-9000B MA/MS/SS	dLbM	dLbN	4000	5000	⊖
2	DDL-9000B DS	dLbd	dLbd	4000	4000	
3	DDL-9000B SH	dLbH	dLbH	4000	4500	
4	DDL-9000A MA/MS/SS	dLAM	dLAN	4000	5000	
5	DDL-9000A DS	dLAd	dLAd	4000	4000	
6	DDL-9000A SH	dLAH	dLAH	4000	4500	
7	LH-3528/68A	H35d	H35d	3000	3000	
8	DLN-9010	Ln9S	Ln9S	4000	5000	
9	DDL-8700	dL87	dL87	4000	5000	
10	DDL-5600J	dL6J	dL6J	4000	4000	
11	DDL-5600L,U,R	dL6L	dL6L	3000	3000	
12	DDL-5550	dL50	dL50	4000	5000	
13	DLU-5490	LU90	LU90	4000	4500	
14	DLD-5430	Ld54	Ld54	4000	4500	
15	DLN-5410	Ln54	Ln54	4000	5000	
16	DLM-5400	LM54	LM54	4000	4500	
17	LZ-2280	Z280	Z280	4000	5000	⊕

∗ (marks row 9)

∗Machine head set at the time of delivery

(Caution) 1. When the dry-type machine head is connected, any model other than dry-type one cannot be set.

2. Refer to the machine head list (40088647) for the details of each machine head.

(9) Adjusting the machine head (direct-drive motor type sewing machine only)

(Caution) When the slip between the white marker dot on the handwheel and the concave of the cover is excessive after thread trimming, adjust the angle of the machine head by the operation below.
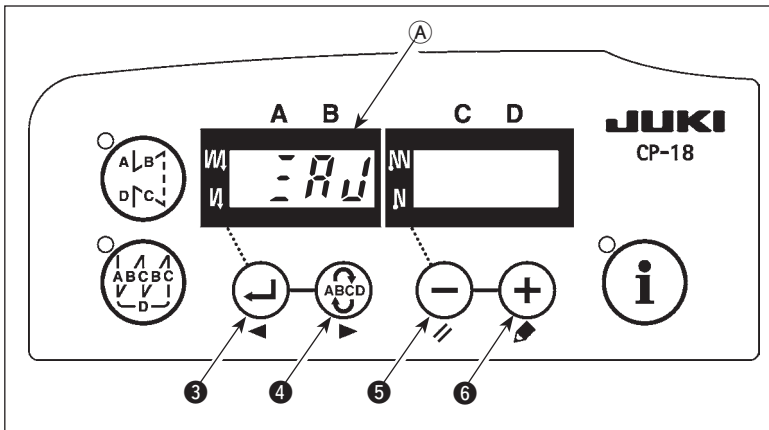
1. Simultaneously pressing (ABCD) switch ❹ and (−) switch ❺, turn ON the power switch.

2. $\Xi R \mathit{J}$ is displayed (Ⓐ) in the indicator and the mode is changed over to the adjustment mode.
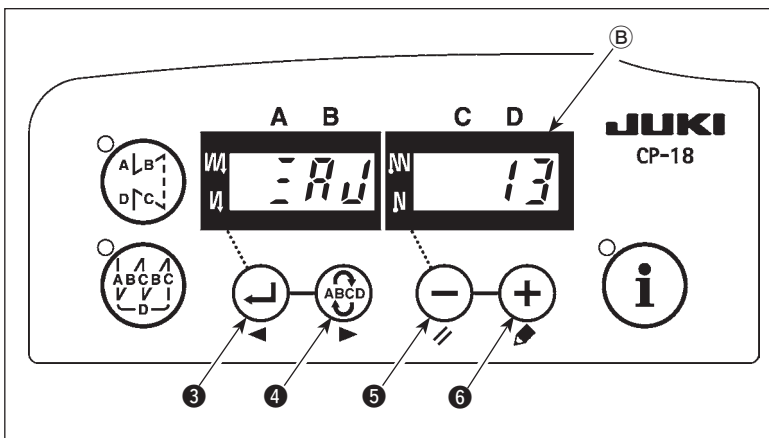
3. Turn the pulley of the machine head by hand until the main-shaft reference signal is detected. At this time, the degree of an angle from the main-shaft reference signal is displayed on the indicator Ⓑ.
(The value is the reference value.)
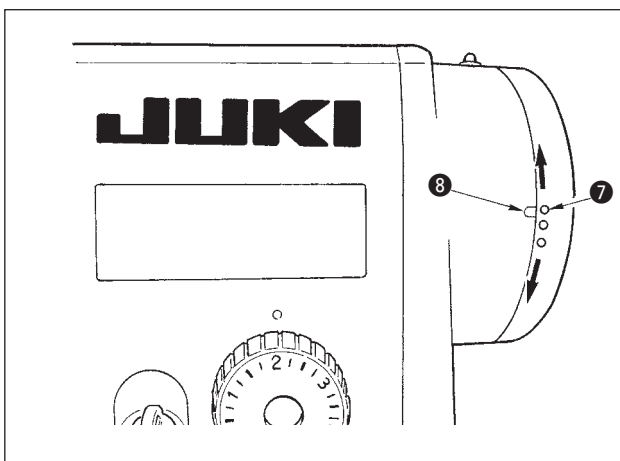
4. In this state, align the white dot ❼ of the handwheel with the concave ❽ of the pulley cover as shown in the figure.
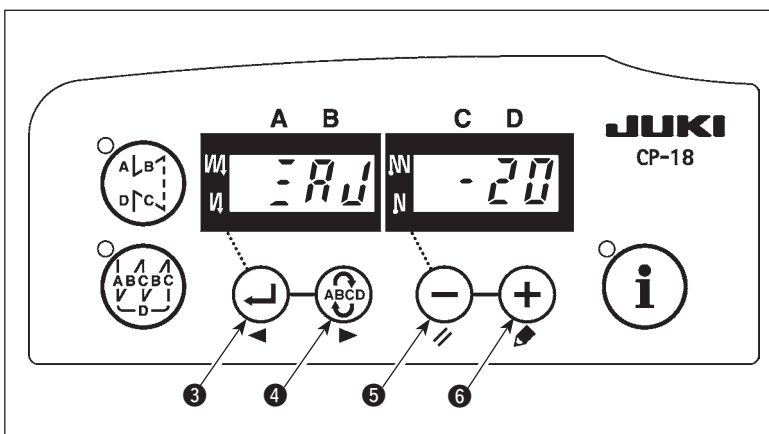
5. Press (+) switch ❻ to finish the adjustment work. (The value is the reference value.)
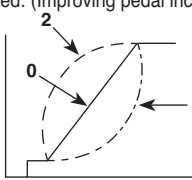
(10) Function setting list

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. 0 : The function is not selected. 1 to 9 : The number of stitches to be sewn under the soft-start mode.	0 to 9 (Stitches)	1 ⬚ 0	44
2	Material end sensor function	Material end sensor function (to be used only with CP-18). 0 : Material end detection function is not operative. 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	44
3	Thread trimming function by material end sensor	Thread trimming function by material end sensor (to be used only with CP-18). 0 : Automatic thread trimming function after detection of material end is not operative. 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	44
4	Number of stitches for material end sensor	Number of stitches for material end sensor (to be used only with CP-18). Number of stitches from detection of material end to stop of the sewing machine.	0 to 19 (Stitches)	4 ⬚ 5	44
5	Flicker reducing function	Flicker reducing function 0 : Flicker reducing function is not operative. 1 : Flicker reducing function is effective	0/1	5 ⬚ 0	44
6	Bobbin thread counting function	Bobbin thread counting function 0 : Bobbin thread counting function is not operative. 1 : Bobbin thread counting function is operative.	0/1	6 ⬚ 1	44,48
* 7	Unit of bobbin thread counting down	Unit of bobbin thread counting down 0 : 1 Count/10 stitches 1 : 1 Count/15 stitches 2 : 1 Count/20 stitches 3 : 1 Count/thread trimming	0 to 3	7 ⬚ 0	
* 8	Number of rotation of reverse feed stitching	Sewing speed of reverse feed stitching	150 to 3,000 (sti/min)	8 1 9 0 0	
9	Thread trimming prohibiting function	Thread trimming prohibiting function (to be used only with CP-18). 0 : Thread trimming prohibiting function is not operative. 1 : Thread trimming is prohibited. (Output of solenoid is prohibited. : Thread trimmer and wiper)	0/1	9 ⬚ 0	44
10	Setting of needle bar stop position when the sewing machine stops.	Position of needle bar is specified when the sewing machine stops. 0 : Predetermined lowest position 1 : Predetermined highest position	0/1	1 0 ⬚ 0	44
11	Operation confirmation sound for operation panel	Operation confirmation sound for operation panel 0 : Operation confirmation sound is not generated 1 : Operation confirmation sound is generated.	0/1	1 1 ⬚ 1	44
12	Optinal switch function selection	Switching of function of optional switch. Refer to **"5.-(11) Detailed explanation of selection of functions"**		1 2 o P T _	45
* 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 0 : When counting is out (-1 or less) Function of prohibiting start of the sewing machine is not operative. 1 : When counting is out (-1 or less) Function of prohibiting start of the sewing machine after thread trimming is operative. 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	1 3 ⬚ 0	
14	Sewing counter	Counting function of sewing (number of completion of process) 0 : Sewing counter function is not operative. 1 : Sewing counter function is operative. (Every time thread trimming is performed) 2 : With the sewing counting switch input function	0 to 2	1 4 ⬚ 1	48
15	Thread wiping function after thread trimming	Thread wiping operation after thread trimming is specified. 0 : Thread wiping is not carried out after thread trimming 1 : Thread wiping is carried out after thread trimming	0/1	1 5 ⬚ 1	
21	Function of neutral presser lifting	Function of lifting presser foot when the pedal is in neutral position. 0 : Function of neutral automatic presser lifting is not operative. 1 : Selection of function of neutral presser lifting.	0/1	2 1 ⬚ 0	48

* Do not change the set values with asterisk (*) mark as they are functions for maintenance. If the standard set value set at the time of delivery is changed, it is in danger of causing the machine to be broken or the performance to be deteriorated.

No	Item	Description	Setting range	Indication of function setting	Ref. page
22	Needle up/down correction switch changeover function	Function of the needle up/down correction switch is changed over. 0 : Needle up/down compensation 1 : One stitch compensation	0/1	2 2　　　0	48
25	Thread trimming operation after turning the handwheel by han	Thread trimming operation after moving the needle away from its upper or lower position by turning the handwheel by hand is specified. 0 : Thread trimming operation is carried out after turning the handwheel by hand 1 : Thread trimming operation is not carried out after turning the handwheel by hand	0/1	2 5　　　1	
29	Initial motion time of back-tack	This function sets the suction time of initial motion of back-tack solenoid. 50 ms to 500 ms	50 to 500 (ms)	2 9　　7 0	48
30	Function of reverse feed stitching on the way	Function of reverse feed stitching on the way 0 : Function of reverse stitching on the way is not operative. 1 : Function of reverse stitching on the way is operative.	0/1	3 0　　　0	49
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	49
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 0 : Function is not operative when the sewing machine stops. 1 : Function is operative when the sewing machine stops.	0/1	3 2　　　0	49
33	Thread trimming function by reverse feed stitching on the way	Thread trimming function by reverse feed stitching on the way 0 : Automatic thread trimming function after completion of reverse feed stitching on the way is not operative. 1 : Automatic thread trimming after completion of reverse feed stitching on the way is performed.	0/1	3 3　　　0	49
* 35	Number of rotation at a low speed	Lowest speed by pedal (The MAX value differs by machine head.)	150 to MAX (sti/min)	3 5　　2 0 0	
* 36	Number of rotation of thread trimming	Thread trimming speed (The MAX value differs by machine head.)	100 to MAX (sti/min)	3 6　　4 2 0	
37	Number of rotation of soft-start	Sewing speed at the start of sewing (soft-start) (The MAX value differs by machine head.)	100 to MAX (sti/min)	3 7　　8 0 0	44
38	One-shot speed	One-shot speed (The max. value depends on the number of rotation of the sewing machine head.)	150 to MAX (sti/min)	3 8　2 5 0 0	49
* 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 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	
* 44	Pedal stroke for reaching the maximum number of rotation	Position where the sewing machine 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	
47	Auto-lifter selecting function	Limitation time of waiting for lifting solenoid type auto-lifter device	10 to 600 (second)	4 7　　6 0	50
* 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	52
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　　− 8	50

* Do not change the set values with asterisk (*) mark as they are functions for maintenance. If the standard set value set at the time of delivery is changed, it is in danger of causing the machine to be broken or the performance to be deteriorated.

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No	Item	Description	Setting range	Indication of function setting	Ref. page
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 0	50
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 5	50
55	Foot lift after thread trimming	Function of lifting presser foot at the time of (after) thread trimming 0 : Not provided with the function of lifting presser foot after thread trimming 1 : Provided with the function of lifting presser foot automatically after thread trimming	0/1	5 5 1	51
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 0 : Not provided with the function of reverse revolution to lift the needle after thread trimming 1 : Provided with the function of reverse revolution to lift the needle after thread trimming	0/1	5 6 0	51
58	Function of holding predetermined upper/lower position of the needle bar	Function of holding predetermined upper/lower position of the needle bar 0 : Not provided with the function of holding predetermined upper/lower position of the needle bar 1 : Provided with the function of holding predetermined upper/lower position of the needle bar (holding force is weak.) 2 : Provided with the function of holding predetermined upper/lower position of the needle bar (holding force is medium.) 3 : Provided with the function of holding predetermined upper/lower position of the needle bar (holding force is strong.)	0 to 3	5 8 0	51
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. 0 : The speed will depend on the manual operation by pedal, etc. 1 : The speed will depend on the specified reverse feed stitching speed (No. 8).	0/1	5 9 1	51
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 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 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	51
64	Change-over speed of condensation stitch or EBT (end back tack)	Initial speed when starting condensation stitch or EBT	0 to 250 (sti/min)	6 4 1 8 0	
70	Function of soft-down of presser foot	Presser foot is slowly lowered. 0 : Presser foot is rapidly lowered. 1 : Presser foot is slowly lowered.	0/1	7 0 0	52
71	Double reverse feed stitching function	Effective/ineffective of double reverse feed stitching is changed over. (to be used only with CP-18) 0 : Ineffective 1 : Effective	0/1	7 1 1	
72	Sewing machine startup selecting function	Current limit at the startup of sewing machine is specified. 0 : Normal (Current limit is applied during startup) 1 : Rapid (Current limit is not applied during startup)	0/1	7 2 0	
73	Retry function	This function is used when needle cannot pierce materials . 0 : Normal 1 : Retry function is provided.	0/1	7 3 1	52
76	One-shot function	One-shot operation up to the material end is specified. (to be used only with CP-18) 0 : One-shot operation is not performed. 1 : One-shot operation is performed.	0/1	7 6 0	44
84 *	Initial motion suction time of presser foot lifting solenoid	Suction motion time of presser foot lifting solenoid	50 to 500 (ms)	8 4 1 4 0	52
87	Function of pedal curve selection	Pedal curve is selected. (Improving pedal inching operation) **Number of rotations** 2 / 0 / 1 **Pedal stroke**	0/1/2	8 7 0	52
90	Initial motion up stop function	Automatic UP stop function is set immediately after turning ON the power. 0 : off 1 : on	0/1	9 0 1	53

* Do not change the set values with asterisk (*) mark as they are functions for maintenance. If the standard set value set at the time of delivery is changed, it is in danger of causing the machine to be broken or the performance to be deteriorated.

No	Item	Description	Setting range	Indication of function setting	Ref. page
91	Function of prohibiting compensation operation after turning handwheel by hand	It is effective in combination with the machine head provided with tension release function. 0 : Tension release function is ineffective. 1 : Tension release function is effective.	0/1	9 1 1	
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. 0 : Speed is not reduced. 1 : Speed is reduced.	0/1	9 2 0	53
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. 0 : Normal (needle up/down compensating stitching only) 1 : One stitch compensating stitching is performed only when aforementioned changeover is made. (Upper stop → upper stop)	0/1	9 3 0	53
94	Continuous + One-shot nonstop function	The function that does not stop the sewing machine by combining continuous stitching with one-shot stitching using the program sewing function which is available in the IP operation panel. 0 : Normal (The sewing machine stops when a step is completed.) 1 : The sewing machine does not stop when a step is completed and proceeds to next step.	0/1	9 4 0	53
95	Head selection function	Machine head to be used is selected. (When the machine head is changed, each setting item is changed to the initial value of the machine head.)		9 5 d L b M	
96	Max. number of rotation setting	Max. number of rotation of the sewing machine head can be set. (The MAX value differs by machine head.)	150 to MAX (sti/min)	9 6 4 0 0 0	53
103	Needle cooler output OFF delay time	Delay time from the stop of sewing machine to the output OFF is specified using the needle cooler output function.	100 to 2000 ms	1 0 3 5 0 0	
120	Main shaft reference angle compensation	Main shaft reference angle is compensated.	–50 to 50	1 2 0 – 2 3	53
121	Up position starting angle compensation	Angle to detect UP position starting is compensated.	–15 to 15	1 2 1 5	53
122	DOWN position starting angle compensation	Angle to detect DOWN position starting is compensated.	–15 to 15	1 2 2 0	53
124	Setting of energy-saving function during standby	Setting to reduce the power consumption while the sewing machine is in standby state 0: Energy-saving mode is ineffective 1: Energy-saving mode is effective	0/1	1 2 4 0	53

* Do not change the set values with asterisk (∗) mark as they are functions for maintenance. If the standard set value set at the time of delivery is changed, it is in danger of causing the machine to be broken or the performance to be deteriorated.

(11) 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)

| | | 3 | 7 | | 8 | 0 | 0 |

Data setting range

100 to MAX sti/min <10 sti/min> (The MAX value differs by machine head.)

② **Material end sensor (ED : optional) function (Function setting No. 2 to 4, 76)**

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) This function is rendered effective only with the CP-18.

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

The function reduces flickering of the hand lamp at the start of sewing.

| | | | 5 | | | | 0 |

0 : Flicker reducing function is ineffective

1 : Flicker reducing function is effective

(Caution) When the flicker reducing function is set at the "Flicker reducing function is effective," the startup speed of the sewing machine decreases.

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

When the control panel 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.

| | | | 6 | | | | 1 |

0 : Bobbin thread counting function is not operative.

1 : Bobbin thread counting function is operative.

(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.

(Caution) This function is rendered effective only with the CP-18.

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.

| | | 1 | 0 | | | | 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 **Panel operating sound (Function setting No. 11)**

Whether the panel operation generates sound or not can be selected.

| | | 1 | 1 | | | | 1 |

0 : off   Operation confirmation sound is not generated

1 : on   Operation confirmation sound is generated.

⑧ **Selection of the optional input/output function (Function setting No. 12)**
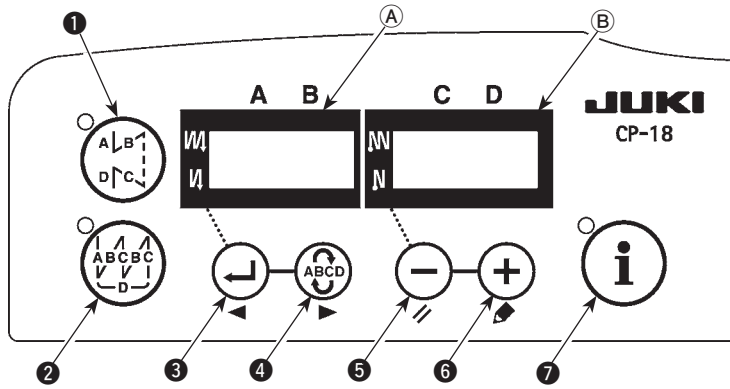
| 1 2 o P T _ | Select function setting No. 12 with the operating procedure of function setting procedures 1) through 3).
Select the items of "End", "in" and "ouT" with keys ❺ and ❻. |

| 9 0 0 _ E n d |
| i n _ _ | **[When "in" is selected]**
The port number is displayed on indicator Ⓐ. Specify the input port with key ❸ or ❹. Or, specify the function of input port using key ❺ or ❻. |
| o u T _ |

| 9 0 1 _ * * * | Function code and abbreviation are displayed alternately on indicator Ⓑ.
(For the relation between signal input No. and connector pin array, refer to the separate list.) |
| ↕ *** Name of option is displayed.** |
| 9 1 2 | **[When "ouT" is selected]**
The port number is displayed on indicator Ⓐ. Specify the output port with key ❸ or ❹. Or, specify the function of output port using key ❺ or ❻. |

| 9 5 1 _ * * * | Function code and abbreviation are displayed alternately on indicator Ⓑ.
(Refer to the separate table for the relation between the signal output numbers and the connector pin configuration.) |
| ↕ *** Name of option is displayed.** |
| 9 5 3 |

---

* Example) Setting the thread trimming function to the optional input port 1

| 1 2 o P T _ | 1. Select function setting No. 12 with the operating procedure of function setting procedures 1) through 3). |

| 9 0 0 i n _ _ | 2. Select the item of "in" with keys ❺ and ❻. |

| 9 0 1 _ n o P | 3. Select the port of 901 with key ❹. |

| 9 0 1 _ T S W | 4. Select the thread trimming function, "TSW" with keys ❺ and ❻. |
| ↕ **Lighting alternately** |
| L _ _ 4 | 5. Determine the thread trimming function, "TSW" with key ❹. |

| 9 0 1 L _ _ 4 | 6. Set ACTIVE of the signal with keys ❺ and ❻.
Set the display to "L" when the signal is "Low" and performing thread trimming, and set the display to "H" when the signal is "High" and performing thread trimming. |
| ↕ |
| H _ _ 4 |

| 9 0 2 _ n o P | 7. Determine the aforementioned function with key ❹. |
| ⋮ |
| 9 0 0 _ _ i n | 8. Finish the optional input with key ❹. |

| E n d | 9. Select the item of "End" with keys ❺ and ❻ to return to the function setting mode. |

Input function list

Function code	Abbreviation	Function item	Remarks
0	noP	No function	(Standard setting)
1	HS	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	bHS	Back compensating stitching	Reverse feed stitching is performed at low speed while the switch is held pressing. (It is effective only when a constant-dimension sewing is selected.)
3	EbT	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	TSW	Thread trimming function	This function is actuated as the thread trimming switch.
5	FL	Presser foot lifting function	This function is actuated as the foot lifter switch.
6	oHS	One stitch compensating stitching	Every time the switch is pressed, one stitch stitching operation is executed.
7	SEbT	Function of cancel of reverse feed stitching at start/end	By operating the optional switch, ineffective/effective can be alternately changed over.
8	PnFL	Presser 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.
9	Ed	Material edge sensor input	This function works as the input signal of material edge sensor.
10	LinH	Function of prohibiting depressing front part of pedal	Rotation by pedal is prohibited.
11	TinH	Function of prohibiting thread trimming output	Output of thread trimming is prohibited.
12	LSSW	Low speed command input	This function works as low speed switch for standing sewing machine.
13	HSSW	High speed command input	This function works as high speed switch for standing sewing machine.
14	USW	Needle lifting function	UP stop motion is performed when switch is pressed during DOWN stop.
15	bT	Reverse feed stitching switch input	Reverse feed stitching is output as long as the switch is held pressed.
16	SoFT	Soft start switch input	The speed of stitch is limited to the predetermined soft-start speed as long as the switch is held pressed.
17	oSSW	One-shot speed command switch input	This function works as one-shot speed command as long as the switch is pressed.
18	bKoS	Backward one-shot speed command switch input	Reverse feed stitching is performed in accordance with the one-shot speed command as long as the switch is held pressed.
19	SFSW	Safety switch input	Rotation is prohibited.
20	MES	Thread trimming safety switch input	It operates as an input signal of the thread trimmer safety switch.
21	AUbT	Automatic reverse feed stitching cancellation/addition switch	Every time the switch is pressed, reverse feed stitching at sewing start or reverse feed stitching at sewing end is cancelled or added.
22	CUnT	Sewing counter input	Every time the switch is pressed, the sewing counter value is increased.

Output function list

Function code	Abbreviation	Function item	Remarks
0	noP	No function	(Standard setting)
1	TrM	Thread trimming output	Output of thread trimming signal
2	WiP	Thread wiper output	Output of thread wiper signal
3	TL	Thread release output	Output of thread release signal
4	FL	Presser lifter output	Output of presser lifting signal
5	bT	Reverse feed stitching output	Output of reverse feed stitching signal
6	EbT	EBT cancel monitor output	State of one time cancel of reverse feed stitching at end function is output.
7	SEbT	Reverse feed stitching at start/end cancel monitor output	State of cancel of reverse feed stitching at start/end is output.
8	AUbT	Sewing start/end cancellation/addition monitor output	State of cancel or addition of automatic reverse feed stitching is output.
9	SSTA	Sewing machine stop state output	Sewing machine stop state is output.
10	CooL	Needle cooler output	Output for needle cooler
11	bUZ	Buzzer output	It is output when the bobbin counter set value has been exceeded, an error has occurred or the bobbin thread remaining amount is detected.
12	LSWo	Revolution command output	Revolution demanding command state is output.

Input function setting connectors

Connector No.	Pin No.	Display No.	Initial value of function setting
CN48	1	901	noP (No function setting)
CN48	2	902	SFSW (Safety switch input)
CN50	12	903	SoFT (Soft-start speed limit input)
CN36	5	904	bT (Reverse feed stitching switch input)
CN50	11	905	LinH (Input of prohibition of depress on front part of pedal)
CN39	7	906	TSW (Thread trimming switch input)
CN39	11	907	LSSW (Low-speed revolution switch input)
CN39	9	908	HSSW (High-speed revolution switch input)
CN39	5	909	FL (Presser foot lifting switch input)
CN57	1	910	CUnT (Sewing counter input)
CN42	2	911	MES (Thread trimming safety switch input)
CN54	3	912	noP (No function setting)

Output function setting connector

Connector No.	Pin No.	Display No.	Initial value of function setting
CN50	7	951	bT (Reverse feed stitching output)
CN50	8	952	TrM (Thread trimming output)
CN50	9	953	LSWo (Revolution request input)

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.

| | | 1 | 4 | | | | 1 |

0 : off   Sewing counting function is inoperative.

1 : on   Sewing counting function is operative. (Every time thread trimming is performed)

2 : on   External sewing counter switch input.

(Caution) The sewing counter can only be operative when the CP-180 is used with the sewing machine.

The counter indication changes as shown below according to the combination of setting No. 6 and setting No. 14.

Setting No. 6	Setting No. 14	Counter
1	1	Bobbin counter
1	0	Bobbin counter
0	1	Sewing counter (only with CP-180)
0	0	Counter function is ineffective.

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 **Needle up/down switch function changeover function (Function setting No. 22)**

The needle up/down switch function can be changed over between the needle up/down compensation and one stitch compensation.

| | | 2 | 2 | | | | 0 |

0 : Needle up / down compensating stitching

1 : One stitch compensating stitching

⑫ **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 | | | 7 | 0 |

Setting range : 50 to 500 ms <10 / ms>

⑬ **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.

Application	Function setting			Output function
	No.30	No.32	No.33	
❶	0	0 or 1	0 or 1	It works as normal touch-back switch.
❷	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.
❸	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.
❹	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.
❺	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.

Actions under each setting state

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

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

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

❹ 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.)

❺ 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.)

⑭ **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. sti/min. <50 / sti/min>

(Caution) The max. number of rotation of one-shot stitching is limited by the model of the sewing machine head.

⑮ **Holding time of lifting presser foot (Function setting No. 47)**

Solenoid type presser foot lifter 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 is selected, the holding time control of lifting presser foot is limitless regardless of the set value.

| | | 4 | 7 | | | 6 | 0 |

Setting range

10 to 600 sec <10 / sec>

⑯ **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.

❶ 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 | | | − | 8 |

Adjusting range

− 36 to 36 <1 / 10˚>

Set value	Compensation angle	Number of stitches of compensation
− 36	− 360 ˚	− 1
− 18	− 180 ˚	− 0.5
0	0 ˚	0
18	180 ˚	0.5
36	360 ˚	1
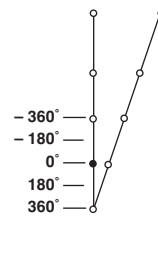
* **When the point before 1 stitch is regarded as 0˚, compensation is possible by 360˚ (1 stitch) in front and in the rear.**

❷ 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 | 0 |

Adjusting range

− 36 to 36 <1 / 10˚>

Set value	Compensation angle	Number of stitches of compensation
− 36	− 360 ˚	− 1
− 18	− 180 ˚	− 0.5
0	0 ˚	0
18	180 ˚	0.5
36	360 ˚	1
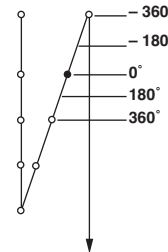
❸ Compensation of off-timing of solenoid for reverse feed stitching at the end of sewing (Function setting No. 53)

Off-timing of solenoid for reverse feed stitching at the start of sewing can be compensated by the unit of angle.

| | | 5 | 3 | | | 1 | 5 |

Adjusting range

− 36 to 36 <1 / 10˚>

Set value	Compensation angle	Number of stitches of compensation
− 36	− 360 ˚	− 1
− 18	− 180 ˚	− 0.5
0	0 ˚	0
18	180 ˚	0.5
36	360 ˚	1
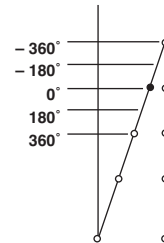
⑰ **Foot lift function after thread trimming (Function setting No. 55)**

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.)

⑱ **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.

⑲ **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   Not provided with the function of holding predetermined upper/lower position of the needle bar
1 : on   Provided with the function of holding predetermined upper/lower position of the needle bar (holding force is weak.)
2 : on   Provided with the function of holding predetermined upper/lower position of the needle bar (holding force is medium.)
3 : on   Provided with the function of holding predetermined upper/lower position of the needle bar (holding force is strong.)

⑳ **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 : Manual   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.

㉑ **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

Stop the sewing machine temporarily to change direction of sewing products.
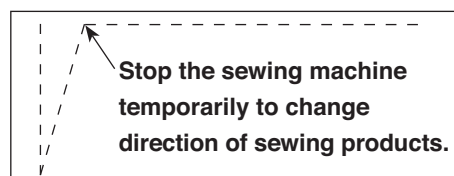
㉒ **Function of soft-down of presser foot (with AK device only) (Function setting Nos. 70 and 49)**
This function can softly lower the presser foot.
This function can be used when it is necessary to decrease contact noise, cloth defect, or slippage of cloth at the time of lowering the presser foot.

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

㉓ **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 accelerated 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.

Temporary stop

Sew without stopping without a break.
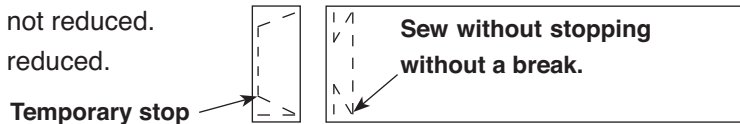
㉔ **Retry function (Function setting No. 73)**
When the retry function is used, if the sewing material is thick and not pierced with needle, this function makes the needle pierce in the material with ease.

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

0 : Normal
1 : Retry function is provided.

㉕ **Presser foot lifting solenoid suction time setting (Function setting No. 84)**
Suction time of presser foot lifting solenoid can be changed. When heating is great, it is effective to lessen the value.

(Caution) When the value is excessively small, malfunction will be caused. So, be careful when changing the value.

| | | 8 | 4 | | 1 | 4 | 0 |

Setting range : 50 to 500ms <10/ms>

㉖ **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.

Number of rotation (sti/min)
Pedal stroke (mm)
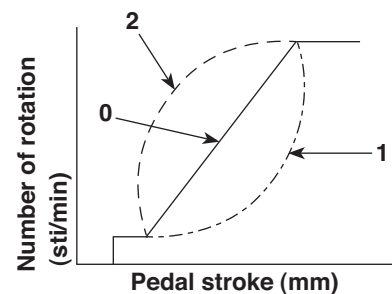
㉗ **Initial motion UP stop position move function (Function setting No. 90)**

Effective/ineffective of automatic return to UP stop position immediately after turning ON the power can be set.

| | | 9 | 0 | | | | 1 |

0 : Ineffective
1 : Effective

㉘ **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 → upper stop) is performed only when aforementioned changeover is made.

㉙ **Continuous stitching + one shot stitching nonstop function (Function setting No. 94)**

This function is used to proceed a step to the next one without stopping the sewing machine at the end of the step when performing sewing with the continuous sewing and one-shot sewing combined using the programming function of the operation panel IP.

| | | 9 | 4 | | | | 0 |

0 : Normal (Stop when a step has completed.)
1 : The sewing machine proceeds to next step without stopping after a step has completed.

㉚ **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. [sti/min] <50 / sti/min>

㉛ **Main shaft reference angle compensation (Function setting No. 120)**

Main shaft reference angle is compensated

| | 1 | 2 | 0 | | – | 2 | 3 |

Setting range
– 50 to 50˚ <1 / ˚>

㉜ **UP position starting angle compensation (Function setting No. 121)**

Angle to detect UP position starting is compensated.

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

Setting range
– 15 to 15˚ <1 / ˚>

㉝ **DOWN position starting angle compensation (Function setting No. 122)**

Angle to detect DOWN position starting is compensated.

| | 1 | 2 | 2 | | | | 0 |

Setting range
– 15 to 15˚ <1 / ˚>

㉞ **Setting of energy saving function during standby (Function setting No. 124)**

It is possible to reduce power consumption while the sewing machine is in standby state. It should be noted that the startup of the sewing machine may delay for a moment if this function is set.

| | 1 | 2 | 4 | | | | 0 |

0 : Energy-saving mode is ineffective.
1 : Energy-saving mode is effective.

6. CONNECTING PROCEDURE OF JUKI OPTIONAL DEVICE

(1) Connection of the material end sensor (ED)
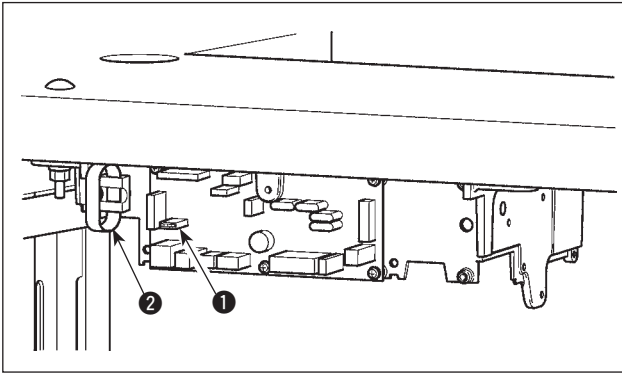
1. Connect the connector of material end sensor (ED) to connector ❶ (CN54 : 4P) of SC-920.
2. Tighten the cord of the material end sensor together with other cords with cable clip band ❷ attached to the side of the box after passing it through the cable clamp.

(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.

(2) Connection of the pedal of standing-work machine (PK)
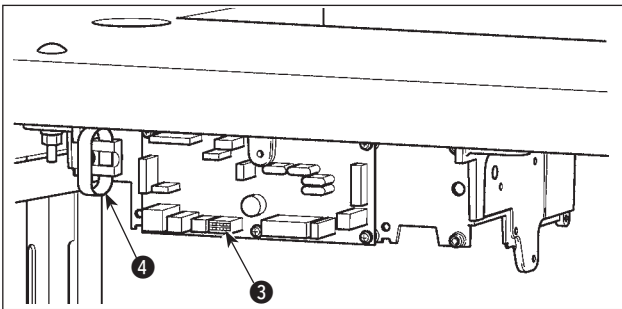
1. Connect the connector of PK70 to connector ❸ (CN39 : 12P) of SC-920.
2. Tighten the cord of PK70 together with other cords with cable clip band ❹ attached to the side of the box after passing it through the cable clamp.

(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.
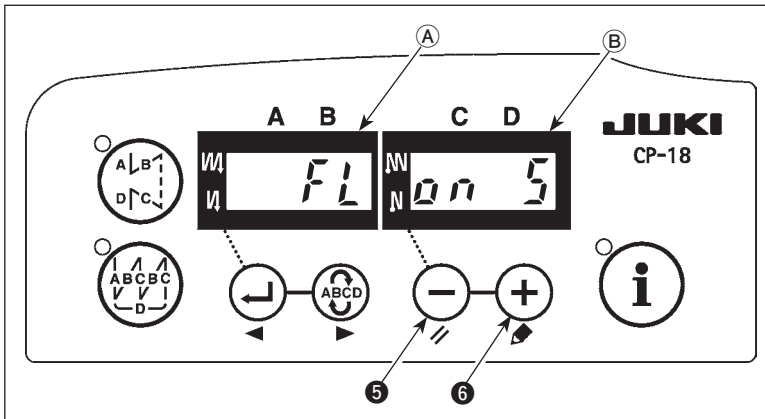
1. Turn ON the power switch with (—) switch ❺ held pressed.
2. "FL ON" is displayed on indicators Ⓐ and Ⓑ with a blip to make the auto lifter function effective.
3. Turn OFF the power switch, and turn ON the power switch again to return to the normal mode.
4. Repeat the operation 1) to 3), and LED display is turned to (FL OFF). Then, the function of auto-lifter does not work.

Solenoid drive display (+33V)

Air drive display (+24V)

FL ON : Auto-lifter device becomes effective. Selection of the auto-lifter device of solenoid drive (+33V) or of air drive (+24V) can be performed with (+) switch ❻.

(Changeover is performed to drive power +33V or +24V of CN37.)

FL OFF : Auto-lifter function does not work. (Similarly, the presser foot is not automatically lifted when programmed stitching is completed.)

⚠ **WARNING :**
When the solenoid is used with the air drive setting, the solenoid may be burned out. So, do not mistake the setting.

(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.

7. EXTERNAL INPUT / OUTPUT CONNECTOR

External input/output connector (CN50) ❶ which can take out the following signals that are convenient when installing counter or the like outside is prepared.

(Caution) **When using the connector, note that the engineer who has the electrical knowledge has to work.**
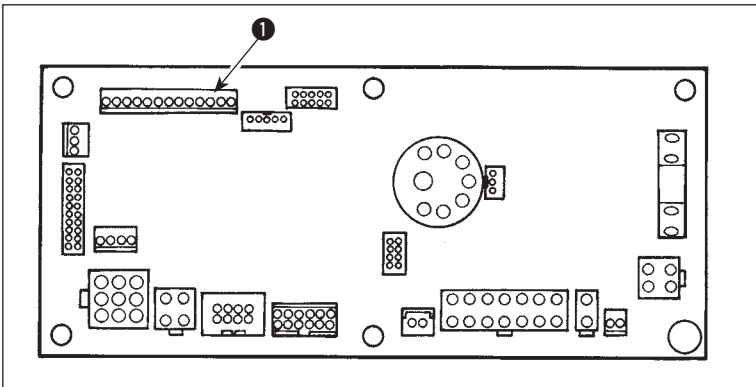
Table of assignment of connector and signal

CN50	Signal name	Input / output	Description	Electric spec.
1	+5V	-	Power source	
2	MA	Output	Rotation signal 360 pulses/rotation	DC5V
3	MB	Output	–	DC5V
4	UDET(N)	Output	"L" is output when needle bar is at LOW position.	DC5V
5	DDET(N)	Output	"L" is output when needle bar is at UP position.	DC5V
6	HS(N)	Output	Rotation signal 45 pulses/rotation	DC5V
7	BTD(N)	Output	"L" is output when the back-tack solenoid works.	DC5V
8	TRMD(N)	Output	"L" is output when the thread trimmer solenoid works.	DC5V
9	LSWO(P)	Output	Rotation request (pedal or the like) monitor signal	DC5V
10	S.STATE(N)	Output	"L" is output when the sewing machine is in the stop state.	DC5V
11	LSWINH(N)	Input	Rotation by pedal is prohibited while "L" signal is being inputted.	DC5V, –5mA
12	SOFT	Input	Rotation speed is limited to the soft-speed while "L" signal is being inputted.	DC5V, –5mA
13	SGND	-	0V	

JUKI genuine part No.   Connector : Part No. HK016510130
                            Pin contact : Part No. HK016540000

8. INITIALIZATION OF THE SETTING DATA

All contents of function setting of SC-920 can be returned to the standard set values.
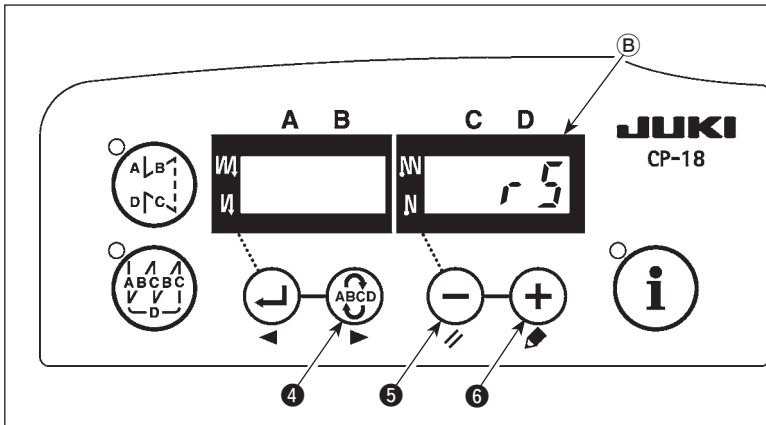
1. Turn ON the POWER switch with all of switch 🔘 ❹, switch ⊖ ❺ and ⊕ switch ❻ held pressed.

2. "rS" is displayed on indicator Ⓑ with a blip to start initialization.

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 after closing the front cover. The machine returns to the normal motion.

(Caution) 1. **When you carry out the aforementioned operation, the neutral position correction value for the pedal sensor is also initialized. It is therefore necessary to carry out automatic correction of the pedal sensor neutral position before using the sewing machine. (Refer "Instruction Manual Automatic compensation of neutral point of the pedal sensor")**
2. **When you carry out the aforementioned operation, the machine-head adjustment values are also initialized. It is therefore necessary to carry out adjustment of the machine head before using the sewing machine. (Refer "5.-(9) Adjusting the machine head")**
3. **Even when this operation is performed, the sewing data set by the operation panel cannot be initialized.**

9. CONNECTOR CONNECTION DIAGRAM

(1) Solenoid for machine head

| 8 | 9 | 10 | 11 | 12 | 13 | 14 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

DDL-9000B-DS
CN36

TRMD	1	TRM (Thread trimming) Approx 7.5 Ω
TRM COM	8	
BTD	6	BT (Touch back) Approx 6.5 Ω
BT COM	13	
WPD	2	WP (Wiper) Approx 8.5 Ω
WP COM	9	
TL SUB	7	
TL SUB COM	14	
CON	4	
CON COM	11	
BTSW	5	BT SW Touch back switch
BT RTN	12	DS
HADE SEL (DDL-9000B-DS)	3	
FG	10	
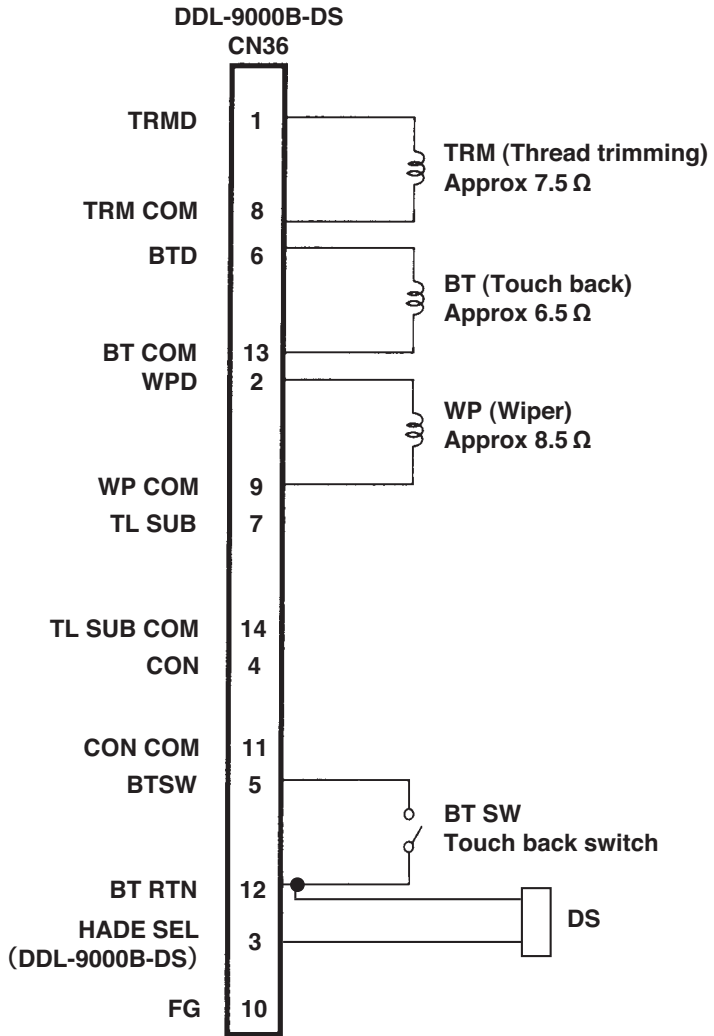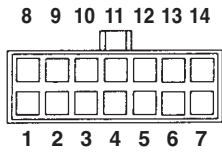
(2) Solenoid for lifting presser foot

1	
2	

CN37

FLD	1	FL (Presser foot lifter) Approx 5.4Ω
FLCOM	2	
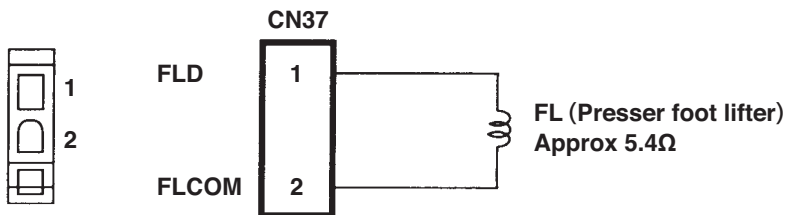
10. OPTIONAL CORD

(1) Relay cord A asm. for the standing sewing machine (Part No. M9701351AA0)

Approx. 1.5m
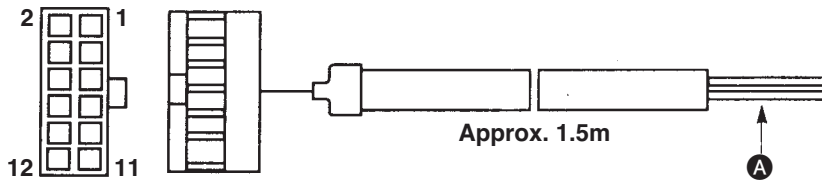
1) Wiring diagram of variable pedal PK-70 and -71

CN39

5V	1	Brown
	2	
Variable resistor for speed	3	Orange
S GND	4	Yellow
Switch for lifting presser foot	5	Green
S GND	6	Blue
Switch for thread trimming	7	Purple
S GND	8	Gray
Switch for high-speed	9	White
S GND	10	Light blue
Switch for low-speed	11	Pink
S GND	12	Black

VR (1kΩ)

Used by variable voltage between 1 to 2V (Increasing / decreasing speed)
Neutral position is 1V ± 0.05V (Between 3 to 4)
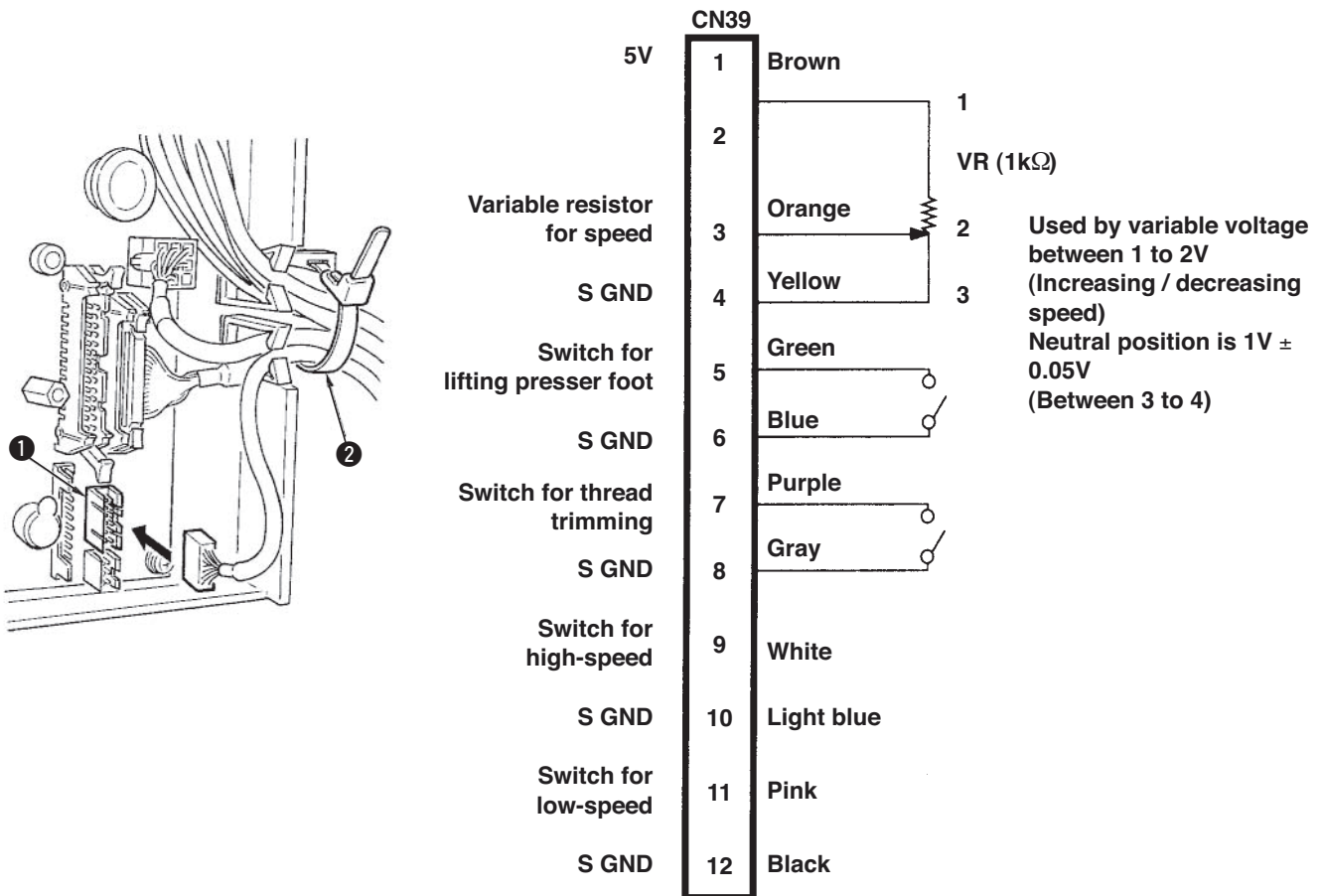
o Power section ❶ which is separated by respective signals with different colors comes out from the relay cord A asm. for the standing sewing machine. Connect switches and variable resistor for speed in accordance with the wiring diagram.

o Insert to the connector ❶ (CN39 : 12P) of standing sewing machine pedal in the PSC box and use it.

o Tighten the cord of the PK70 together with other cords with cable clip band ❷ 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.

2) Wiring diagram of fixing max. speed

CN39

5V	1	Brown	
	2		
Variable resistor for speed	3	Orange	
S GND	4	Yellow	
Switch for lifting presser foot	5	Green	
S GND	6	Blue	
Switch for thread trimming	7	Perple	
S GND	8	Gray	
Switch for high-speed	9	White	
S GND	10	Light blue	
Switch for low-speed	11	Pink	
S GND	12	Black	
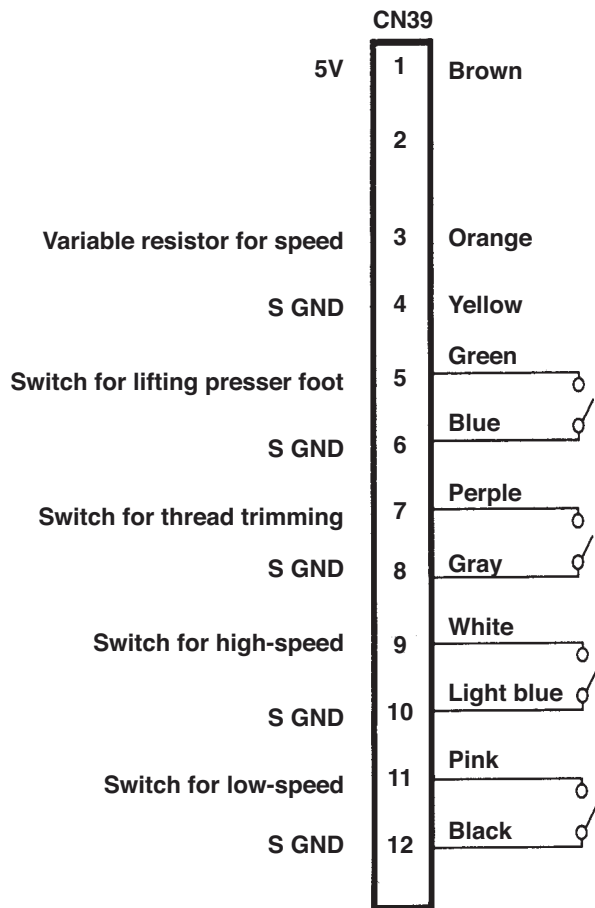
o   Insert to the connector (connector ❶ CN39) of standing sewing machine pedal in the PSC box and use it.

(Caution) In case of decreasing the speed of switch for high-speed, use the variable resistor for max. speed limit mounted on the control panel.

11. MAINTENANCE

(1) Replacing the fuse

(Caution) The illustration below shows the PWR-T PCB. The type of PCB differs by destination.
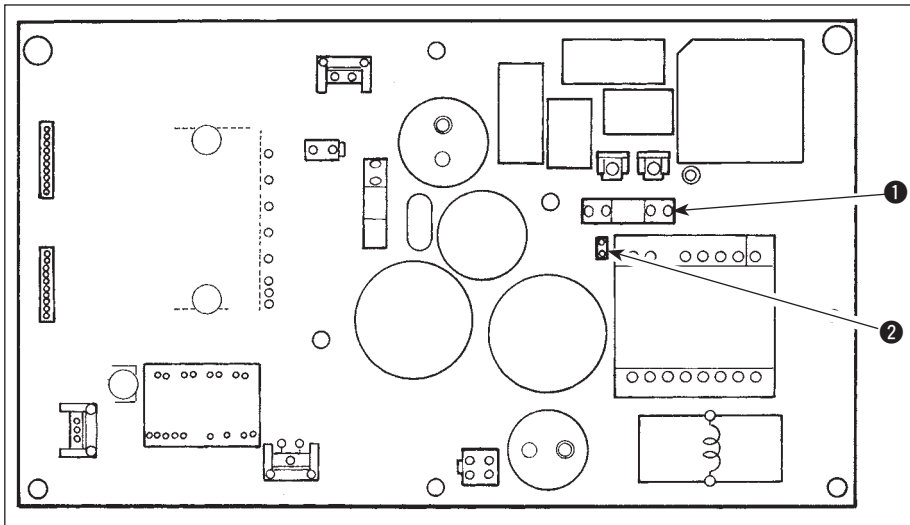
1. Remove all the cables which are connected to the control box.
2. Remove the connecting rod.
3. Remove the control box from the table stand.
4. Holding the glass section of fuse ❶, remove the fuse.

(Caution) **There is a risk of electrical shock when removing the fuse. Be sure to remove the fuse after LED ❷ has totally gone out.**

5. Be sure to use a fuse with the designated capacity.

   ❶ : 3.15 A/250 V Time-lag fuse

   (Power circuit protective fuse)

   Part number: KF000000080

6. Install the control box on the table stand. (Refer to **"Ⅱ-1. Installing to the table"**.)
7. Connect all the cables to the control box. (Refer to **"5.-(1) Connecting the cords"**.)
8. Fit the connecting rod back in place. (Refer to **"Ⅱ-3. Attaching the connecting rod"**.)

(2) Method of voltage changeover

[Changing over the voltage between 100 V and 200 V]

> **WARNING :**
> To prevent personal injuries caused by electric shock hazards or 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 accidents caused by unaccustomed work or electric shock, request the electric expert or engineer of our dealers when adjusting the electrical components.

* The illustration below shows the PWR-T PCB. The type of PCB differs by destination.

A

100V 200V COM

Wiring for the single-phase 100 V
Be sure to connect the wire between 1 and 2.
If it is connected between 1-3 or 2-3, the sewing machine will be inoperative.

(Box side) (Plug side)
WHITE — 1 WHITE
BLACK — 2 BLACK
RED
GREEN/YELLOW   GREEN/YELLOW

B

100V 200V COM

Wiring for the 3-phase 200 V
(Box side) (Plug side)
WHITE — 1 WHITE
BLACK — 2 BLACK
RED — 3 RED
GREEN/YELLOW   GREEN/YELLOW

C

100V 200V COM

Wiring for the single-phase 200 V
Be sure to connect the wire between 1 and 2.
If it is connected between 1-3 or 2-3, the sewing machine will be inoperative.

(Box side) (Plug side)
WHITE — 1 WHITE
BLACK — 2 BLACK
RED
GREEN/YELLOW   GREEN/YELLOW

The supply voltage can be changed over from the single-phase 100 - 120 V to the single-phase 200 - 240 V or to the 3-phase 200 - 240 V through the following two steps:

① Replacement of the power cords
② Changing-round of connector ❶ on the PWR PCB

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) Loosen the screws which are used to secure the rear cover of the control box. Carefully open the rear cover.
4) Changing procedure of the power voltage

(Caution) If the supply power changing is carried out in a wrong manner, the control box can break. Be extremely careful when taking the supply voltage changing procedure.

A. To change over the supply voltage from 200 - 240 V to 100 - 120 V
● Change the power cord with the JUKI genuine cord with the part number (M90355800A0). Change the earth cord with the one with the part number (M90345800A0).
● Change over supply voltage changeover connector ❶ mounted on the PWR PCB with the connector for 100 V.
● Connect the crimp style terminal of AC input cord to the power plug as shown in the figure A.
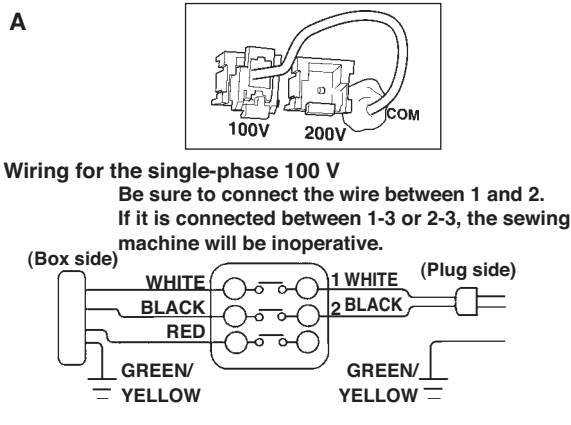
B,C. To change over the supply voltage from 100 - 120 V to 200 - 240 V
● Change the power cord with the JUKI genuine cord with the part number（M90175800A0）.
● Change over supply voltage changeover connector ❶ mounted on the PWR PCB with the connector for 200 V.
● Connect the crimp contact of the AC input cord to the power plug as illustrated in Fig. B for the 3-phase power supply or as illustrated in Fig. C for the single-phase one.
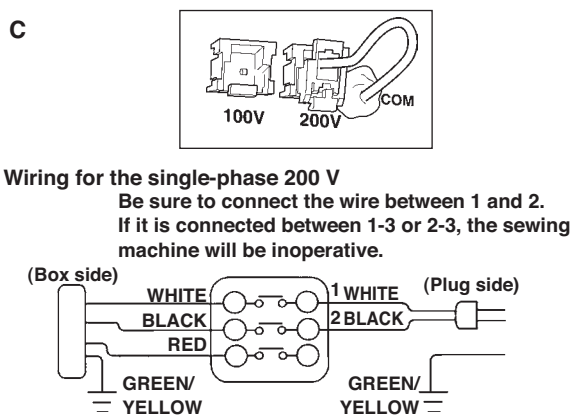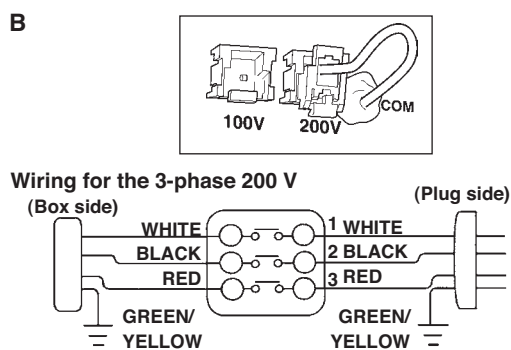
5) Be sure to ascertain again that the relevant parts have been correctly changed before closing the rear cover.
6) Close the rear cover while pressing it, taking care not to allow the wiring to be caught between the rear cover and the main body of the control box. Then, secure the rear cover with the screws.

(Caution) Be sure to remove the connector while holding its locking section with your fingers. Be extremely careful not to pull the connector forcibly.

Locking section

12. REGARDING ERROR DISPLAY (SC-920)

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

No.	Phenomenon	Cause	Corrective measure
1	When tilting the sewing machine, the buzzer beeps and the sewing machine cannot be operated. Solenoids for thread trimming	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.
2	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.
3	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.
4	The sewing machine does not stop even when the pedal is returned to its neutral position.		
5	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.
6	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.
7	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.
8	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 under cover. Bundle the cables by routing them according to the normal routing method as described in the Instruction Manual.
9	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.
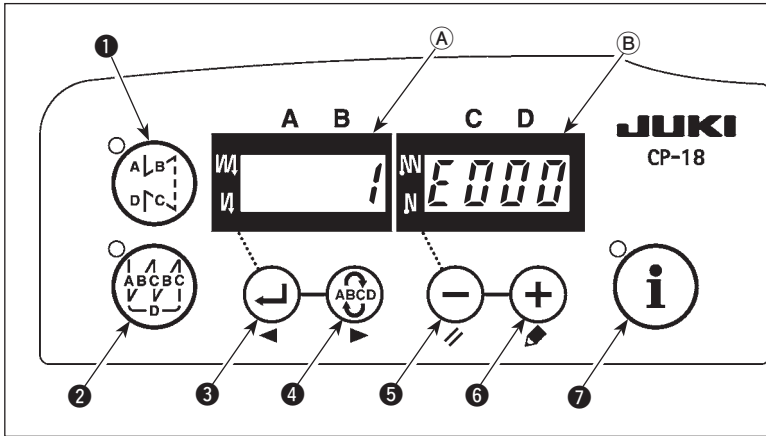
[Checking procedure of the error code]

1) Turn ON the power switch with ⏎ switch ❸ held pressed.

2) The latest error number is displayed on indicator Ⓑ with a blip.

3) Contents of previous errors can be checked by pressing ⏎ switch ❸ or ABCD switch ❹.

(When the confirmation of the contents of previous error advanced to the last, the warning sound peeps in single tone two times.)

(Caution) **When ⏎ switch ❸ is pressed, the previous error code of the currently displayed one is displayed. When ABCD switch ❹ is pressed, the next error code of the currently displayed one is displayed.**

(1) Error code list (SC-920)

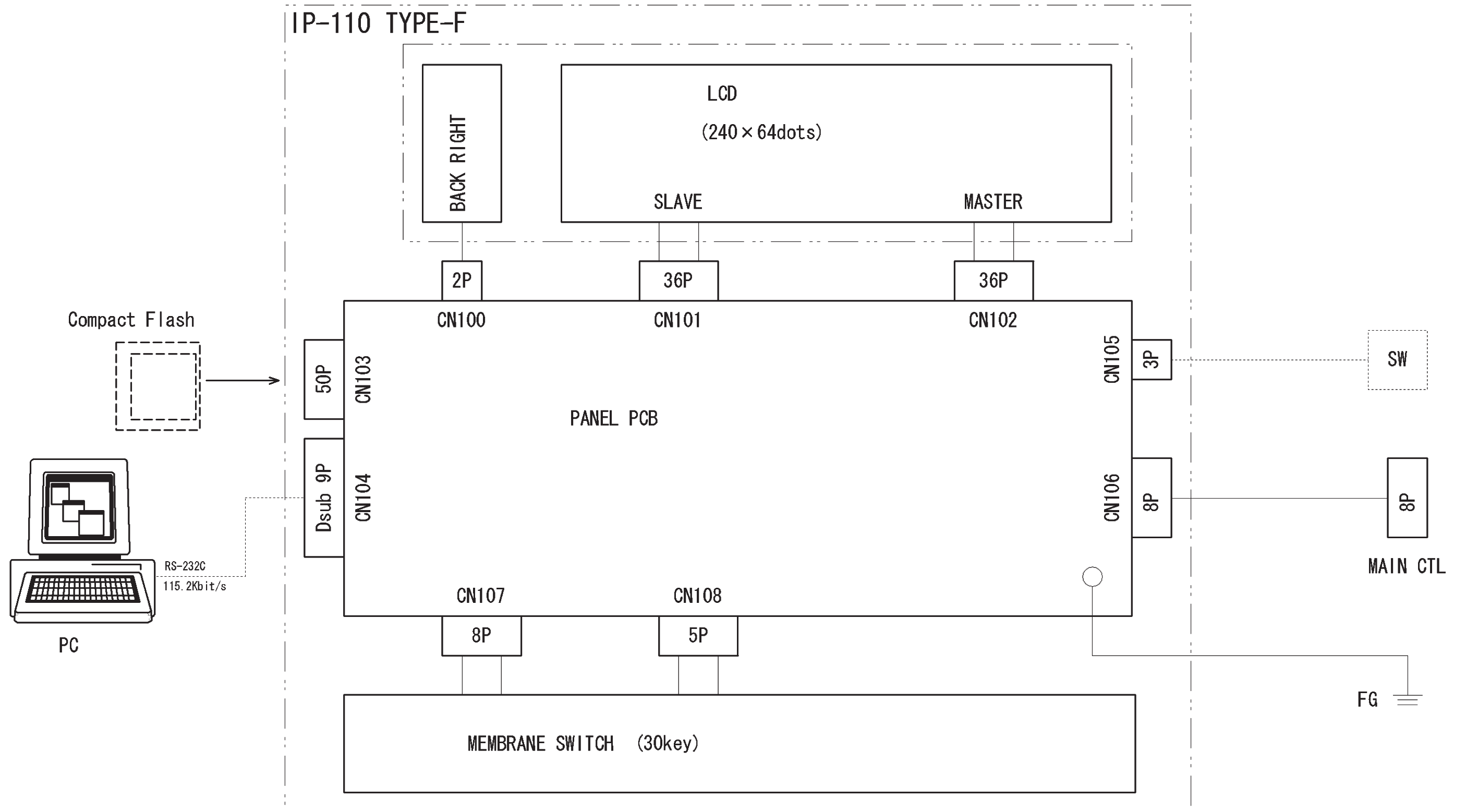| No.	Description of error detected	Cause of occurrence expected	Items to be checked
E000	Execution of data initialization (This is not the error.)	• When the machine head is changed. • When the initialization operation is executed	
E003	Disconnection of synchronizer connector	• When position detection signal is not input from the sewing machine head synchronizer.	• Check the synchronizer connector (CN33) for loose connection and disconnection.
E004	Synchronizer lower position sensor failure	• When the synchronizer has broken.	• Check whether the synchronizer cord has broken since the cord is caught in the machine head.
E005	Synchronizer upper position sensor failure	• Belt is loose. • Machine head is not proper. • Motor pulley is not proper.	• Check the belt tension. • Check the setting of the machine head. • Check the setting of the motor pulley.
E007	Overload of motor	• When the machine head is locked. • When sewing extra-heavy material beyond the guarantee of the machine head. • When the motor does not run. • Motor or driver is broken.	• Check whether the thread has been entangled in the motor pulley. • Check the motor output connector (4P) for loose connection and disconnection. • Check whether there is any holdup when turning the motor by hand.
E070	Slip of belt	• When the machine head is locked. • Belt is loose.	• Check whether there is any holdup when turning the motor by hand. • Check the belt tension.
E071	Disconnection of motor output connector	• Disconnection of motor connector	• Check the motor output connector for loose connection and disconnection.
E072	Overload of motor at the time of thread trimming motion	• Same as E007	• Same as E007
E220	Grease-up warning	• When the predetermined number of stitches has been reached.	• Replenish the specified places with grease and reset. (For the details, refer to the data of the machine head.)
E221	Grease-up error	• When the predetermined number of stitches has been reached and the sewing is not possible.	• Replenish the specified places with grease and reset. (For the details, refer to the data of the machine head.)

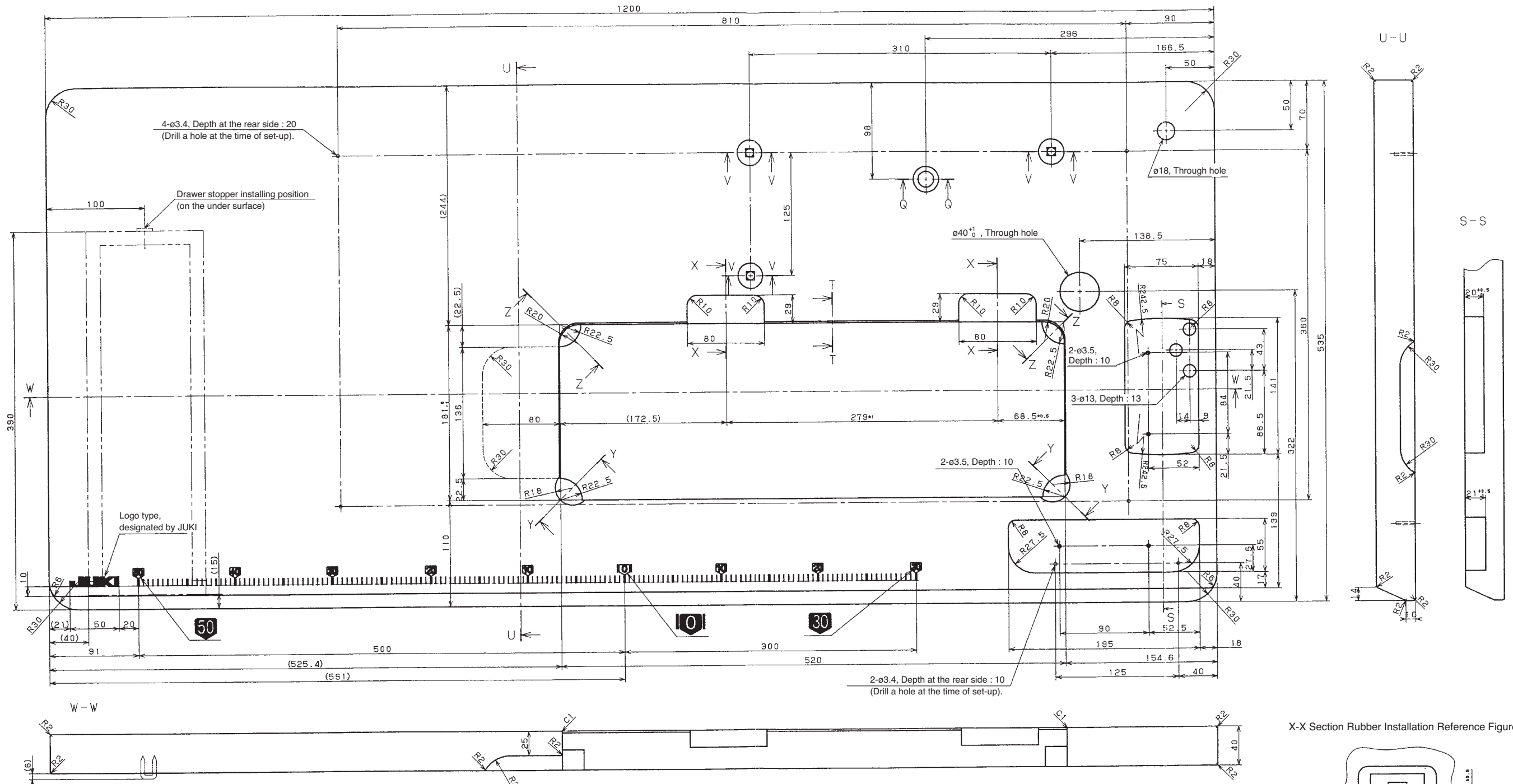| No.	Description of error detected	Cause of occurrence expected	Items to be checked
E302	Fall detection switch failure (When the safety switch works)	• When fall detection switch is input in the state that the power is turned ON.	• Check whether the machine head is tilted without turning OFF the power switch (sewing machine operation is prohibited for safety sake). • Check whether the fall detection switch cord is caught in the sewing machine or the like. • Check whether the fall detection switch lever is caught in something. • Check whether the contact of the tilt detection switch lever with the machine table is inadequate. (The table has a dent or the mounting location of the bed strut is too far)
E303	Semicircular plate sensor error	• Semicircular plate sensor signal cannot be detected.	• Check whether the machine head corresponds with the machine type setting. • Check whether the motor encoder connector is disconnected.
E730	Encoder failure	• When the motor signal is not properly inputted.	• Check the motor signal connector (CN30) for loose connection and disconnection. • Check whether the motor signal cord has broken since the cord is caught in the machine head. • Check whether the inserting direction of the motor encoder connector is wrong.
E731	Motor hole sensor failure		
E733	Inverse rotation of motor	• This error occurs when the motor is running at 500 sti/min or more in the opposite direction of that of rotation indication during motor is running.	• Connection of the encoder of main shaft motor is wrong. • Connection for the electric power of main shaft motor is wrong.
E808	Solenoid short circuit	• Solenoid power does not become normal voltage.	• Check whether the machine head cord is caught in the pulley cover or the like.
E809	Holding motion failure	• Solenoid is not changed over to holding motion.	• Check whether the solenoid is abnormally heated. (CTL circuit board asm. Circuit is broken.
E810	Solenoid current abnormality	• Solenoid rare short-circuit.	• Solenoid resistance
E811	Abnormal voltage	• When voltage higher than guaranteed one is inputted. • 200V has been inputted to SC-920 of 100V specifications. • JUS : 220V is applied to 120V box. • CE : 400V is applied to 230V box. • When voltage lower than guaranteed one is inputted. • 100V has been inputted to SC-920 of 200V specifications. • JUS : 120V is applied to 220V box • Inner circuit is broken by the applied overvoltage	• Check whether the applied power voltage is higher than the rated voltage + (plus) 10% or more. • Check whether 100V/200V changeover connector is improperly set. In the aforementioned cases, POWER p.c.b is broken. • Check whether the voltage is lower than the rated voltage - (minus) 10% or less. • Check whether 100V/200V changeover connector is improperly set. • Check whether fuse or regenerative resistance is broken.
E906	Operation panel transmission failure	• Disconnection of operation panel cord • Operation panel has broken.	• Check the operation panel connector (CN38) for loose connection and disconnection. • Check whether the operation panel cord has broken since the cord is caught in the machine head.
E924	Motor driver failure	• Motor driver has broken.	
E942	Faulty EEPROM	• Data cannot be written on the EEPROM.	• Turn the power OFF.

13. BLOCK DIAGRAM

(1) SC-920 block diagram

40087155
PEDAL SENSOR A ASSY — 3P

3P CN34 PEDAL SENSOR (JST:PH)

CN42 THREAD TRIMMER SAFETY SW (ELCO:8263) — 3P

※OP : STANDING-WORK PEDAL

3-PEDALS ASSIM GPK700010A0 PK-70 — 12P

CN33 HEAD SYNCHRONIZED (TECHNICAL ELECTRON:D7-733N-10) — 7P

2-PEDALS ASSIM GPK710010A0 PK-71 — 12P

12P CN39 STANDING-WORK PEDAL (FCI:69168-212)

CN48 SAFETY SWITCH (molex:5566) — 4P — 4P

13P CN50 OPTION I/F (ELCO:8263)

CN36 HEAD MAGNET DRIVE (molex:5566) — 14P — 14P

4P CN54 OPTION INPUT (ELCO:8263)

40087119 CTL PCB ASSY

CN37 AK SOLENOID (molex:5566) — 2P — 2P

2P CN57 PRODUCTION MANAGEMENT CONTROL INPUT (JST:XA)

CN52 PROGRAMING WRITING (JST:PH) — 5P

2P CN55 LAMP POWER SUPPLY (ELCO:8263)

CN30 ENCODER (AMP:770182-2) — 9P — 9P

※OP : PANEL SELECTION SPECIFICATION

OPTION CP-18 PANEL (SINPLE PANEL) — 40088342 PANEL CORD ASSY — 8P

8P CN38 PANEL I/F (JST:XAD)

CN31 PWR SUBSTRATE I/F (JST:PHD)

CN35 DC POWER SUPPLY (molex:5566)

OPTION CP-180 PANEL — 40088342 PANEL CORD ASSY — 8P

20P / 20P — 40087150 PWR-CTL I/F CORD ASSY

4P / 4P — 40087153 DC POWER SUPPLY CORD ASSY

10P CN14 (JST:SAN) / 10P CN15 (JST:SAN) (+5V, EACH CONTROL SIGNAL)

CN13 DC POWER SUPPLY (molex:5566)

40087152 MOTOR CORD ASSY
T15-1, T15-2, T15-3 (MOTOR DRIVE) — 4P — 4P

※TYPE: A: 40089241 PWR-CE PCB ASSY
B,C: 40087129 PWR-S PCB ASSY
D,E,F: 40087147 PWR-T PCB ASSY

*B,C: 40051434 AC POWER SUPPLY CORD A — 4P

CN11 REGENERATIVE RESISTANCE (molex:5566) — 2P — 2P — 40087154 RESISTANCE A ASSY

ONLY B,C TYPE — 4P — T16-1, T16-2

*D:LOCAL SELECTION(40089414 AC POWER SUPPLY CORD D)
*E:40089567 AC POWER SUPPLY CORD E — 4P

ONLY A TYPE — 2P / 2P — CN3 (AMP:D-3200)

ONLY D,E,F TYPE — 3P / 3P — CN1 (AMP:D-3200)

*D:LOCAL SELECTION(40089567 AC POWER SUPPLY CORD E) — 4P

ONLY D,E TYPE — 4P — T3-1, T3-2, T3-3

※TYPE:
A: 40087107 PSC UNIT 1PHASE 200-240V CE PFL
B,C: 40087114 PSC UNIT 1PHASE 200-240V PFL
D,E,F: 40087115 PSC UNIT 3PHASE 200-240V PFL

*A:M6102461DAA AC INPUT CABLE ASM. (CE)

*A:40088052 AC INPUT CORD ASSY CE — 4P — 4P — T3-1, T3-2

※TYPE: A: 40085811 FLT-CE PCB ASSY
D,E,F: 40087139 FLT-T PCB ASSY
B,C: NON

*F:LOCAL PROCUREMENT SECTION PARTS

*F:40089575 AC INPUT CORD ASSY LA — 4P — 4P — T3-1, T3-2, T3-3

"*THE SIGN" IN FIGURE SHOWS THE INDUCING GROUND SELECTION PARTS.
A NO SIGN IS USED FOR ALL INDUCING GROUND AND 「*OP:」OPTIONAL SELECTION PARTS.

SIGN	INDUCING GROUND	ELECTRICAL EQUIPMENT FINAL PRODUCT NAME	FINAL PRODUCT No.
A	CE	SC-920 1PHASE 200-240V CE PFL NO-OPT	
B	UN1	SC-920 1PHASE 200-240V PFL NO-OPT	
C	CN	SC-920 1PHASE 200-240V CN PFL NO-OPT	
D	JP	SC-920 3PHASE 200V PFL NO-OPT JP	
E	US	SC-920 3PHASE 200-240V PFL NO-OPT JA	
F	LA	SC-920 1PHASE 100-120V PFL NO-OPT LA	
G			

(2) IP-110F operation panel block diagram

IP-110 TYPE-F

LCD
(240×64dots)

BACK RIGHT

SLAVE   MASTER

2P   36P   36P
CN100   CN101   CN102

Compact Flash

50P
CN103   CN105   3P ········ SW

PANEL PCB

Dsub 9P
CN104   CN106   8P ──── 8P

RS-232C
115.2Kbit/s   MAIN CTL

PC

CN107   CN108

8P   5P   FG

MEMBRANE SWITCH   (30key)

14. DRAWING OF THE TABEL (For DDL-9000B)

Part No. : 23642200

MEMO
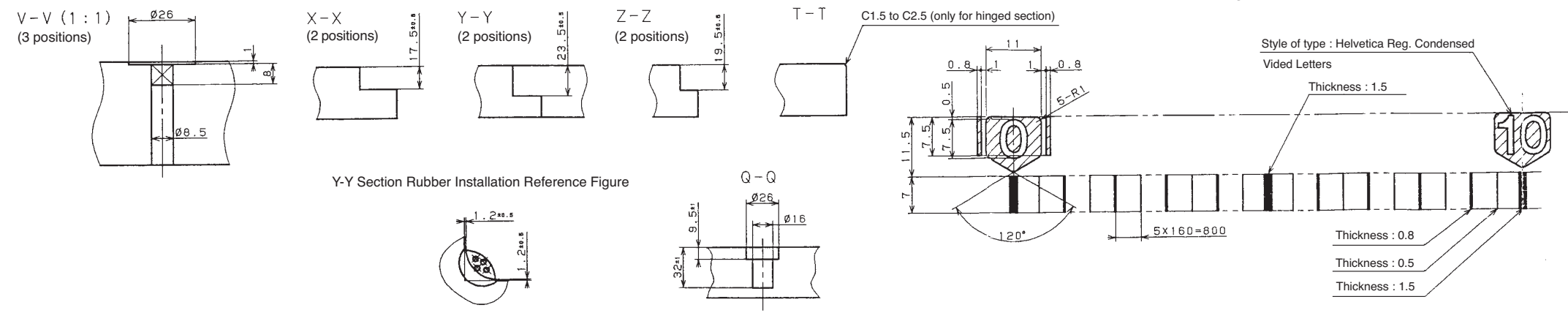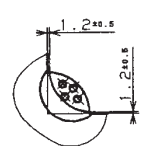
<REFERENCE> TABLE OF DIGITAL DISPLAY

Table of digital display

Numeral	0	1	2	3	4	5	6	7	8	9
Digital display	0	1	2	3	4	5	6	7	8	9
Numeral	A	B	C	D	E	F	G	H	I	J
Digital display	A	b	C	d	E	F	G	H	i	J
Numeral	K	L	M	N	O	P	Q	R	S	T
Digital display	t	L	M	n	o	P	q	r	S	r
Numeral	U	V	W	X	Y	Z
Digital display	U	u	H	II	H	E

ISO14001 : 2004
REG.NO.JSAE389

JAB
CM001

089

This manual uses environment-friendly soyink.

JUKI CORPORATION

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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.

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