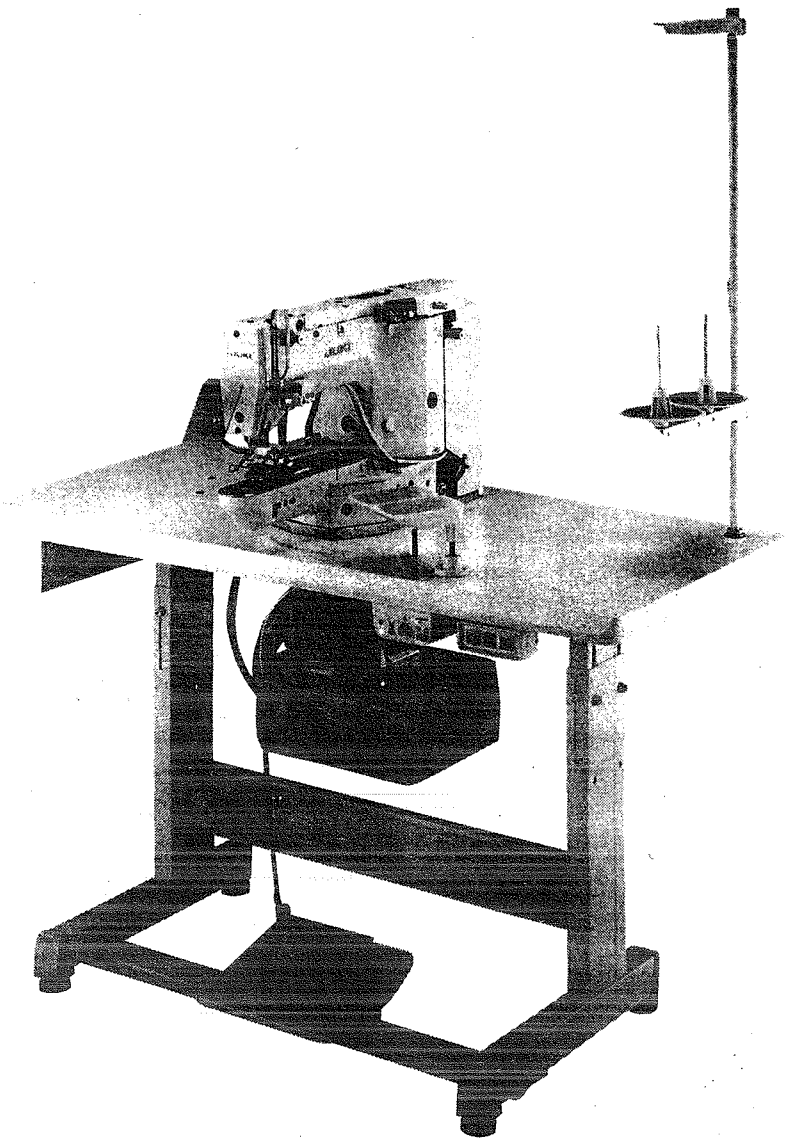
JUKI

SC-5(CP-10)for LK-1850C
SC-6(CP-11)for LK-1851C/555

ENGINEER'S MANUAL



No. I-48
1994. 1

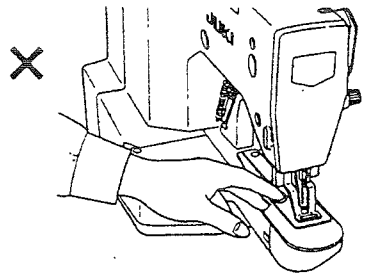
PREFACE

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

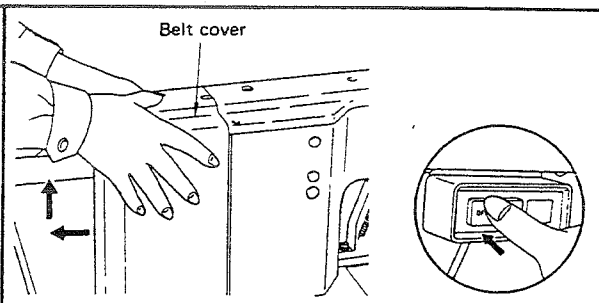
The Instruction Manual for the machine intended for the maintenance personnel and operators at a garment factory contains detailed operating instructions. This manual describes "Standard Adjustment", "How to Adjust", "Effects of Adjustment", and various other information which is not covered by the Instruction Manual.

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

CAUTION



1. **Do not place your fingers near the work clamp foot while the machine is in operation.**

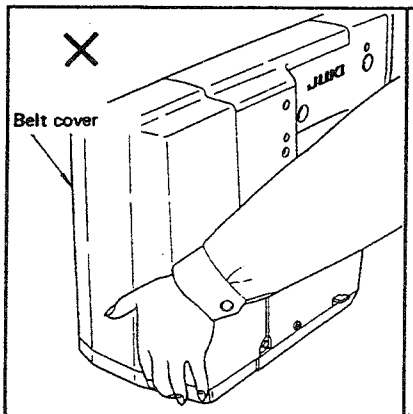


2. **Make sure to turn off the power switch before removing the belt cover.**

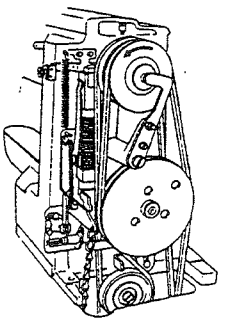
3. **Never bring your fingers or hair close to, or place anything on the handwheel, V-belt, bobbin winder wheel or motor during operation. It may lead to serious personal injuries.**

4. **If your machine is provided with a belt cover, finger guard and eye guard, never operate your machine with any of them removed.**

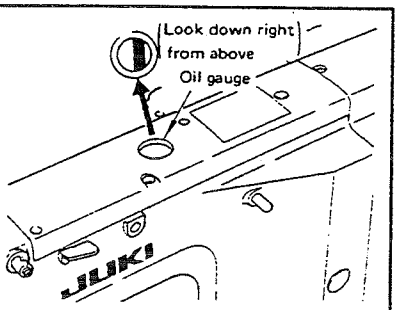
CAUTIONS BEFORE OPERATION



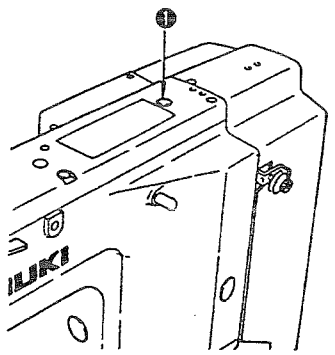
1. **Do not hold the belt cover when carrying the sewing machine.**

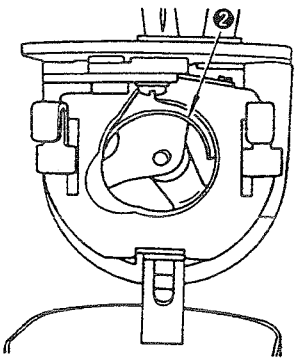


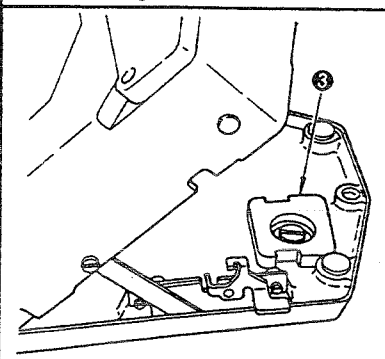
2. **The sewing machine should run in the arrowed direction. Never allow the machine to run in the reverse direction.**



3. **If the red color is observed in the oil gauge when looking down from just above the oil gauge, supply the lubricating oil .**







4. **Before starting a machine which has been newly set up or has not been used for a long period of time, apply a few drops of the lubricating oil to main shaft components through hole ❶, one drop to the racing surface ❷ of the shuttle race, and infiltrate sufficient amount of the lubricating oil to the machine bed oil felt ❸.**

5. **Confirm that the voltage and phase (single- or 3-phase)are correct by checking them against the ratings shown on the PSC box nameplate located under the motor.**

6. **Be sure to connect the power supply earth wire to assure either for a single-phase or 3-phase version.**

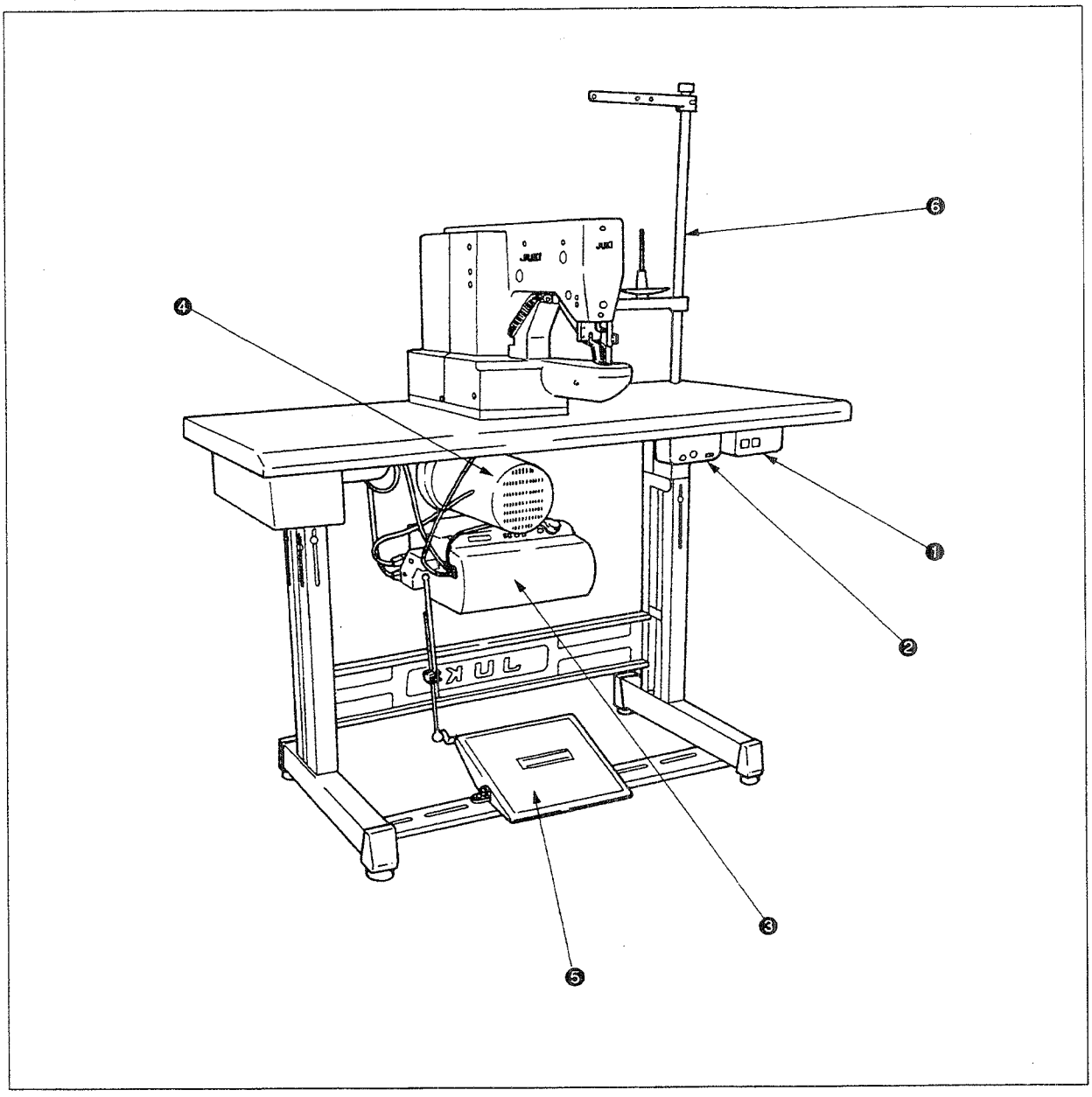
CONTENTS

1. GENERAL

(1) Features

1) The max. sewing speed control variable resistor is mounted on the control box, thereby facilitating operation.
2) The motor is no longer equipped with a mechanical brake.
3) Thanks to the high-speed upper stop control mechanism, the machine time is almost as same as the sewing machine with a general-purpose motor.
4) The machine comes with a pedal that can be easily operated with a light pressure. One-pedal unit and 2-pedal unit are prepared.
5) The control box (CP-11) is provided with an electric change-over function to select the half-divided number of stitches for button sewing.
6) The machine comes with various safety mechanisms to protect the machine in case of a sensor failure and to detect the work clamp foot in the lowest position.

2. CONFIGURATION



❶ Power switch
❷ Operation box
❸ PSC box
❹ Motor
❺ Operation pedal
❻ L-shaped thread stand

❶ Power switch
Power switch for the motor, PSC and control box.

❷ Operation box
Used to control the sewing speed of the sewing machine and lift/lower the work clamp foot.

❸ PSC box
Comprises a circuitry to control the sewing machine and motor, input and output circuitries to control inputs and outputs and a power circuit to actuate the functions.

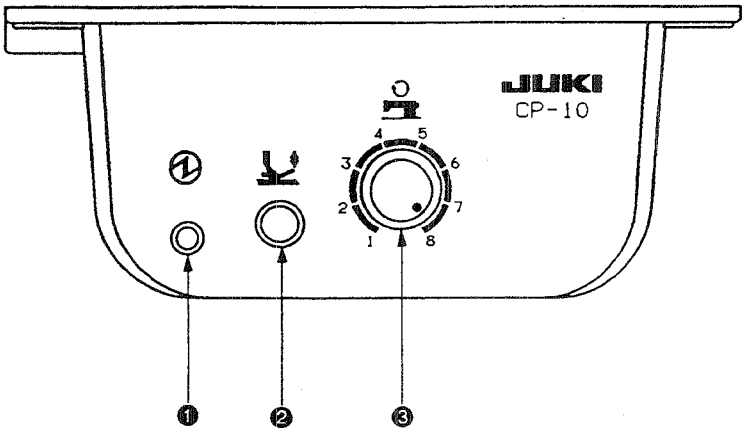
❹ Motor
Operates the sewing machine at high speed, medium speed or low speed responding to a signal output from the PSC box.

❺ Operation pedal
Work clamp foot is raised/lowered or the sewing machine is started by depressing the front part of the pedal.

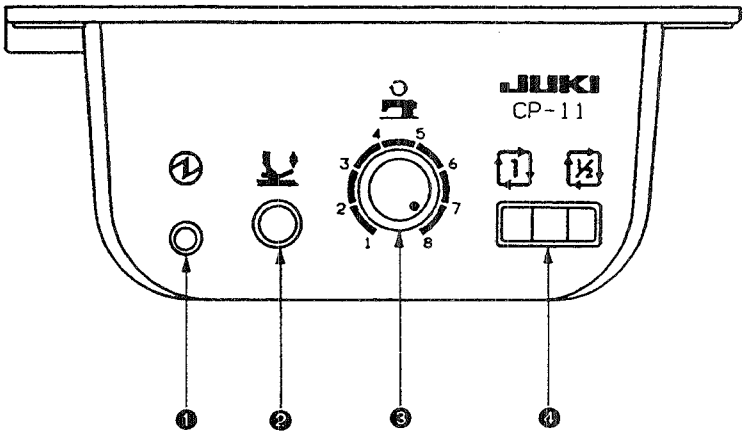
❻ L-shaped thread stand

3. EXPLANATION OF THE CONTROL BOX

(1) CP-10



(2) CP-11



❶ Power indicator lamp (LED)
Lights up when the power switch is turned ON.

❷ Manual work clamp operation switch
Every time the switch is pressed, the work clamp foot goes up and comes down alternately.
(The switch does not operate unless the needle bar is in the highest position of its stroke.)

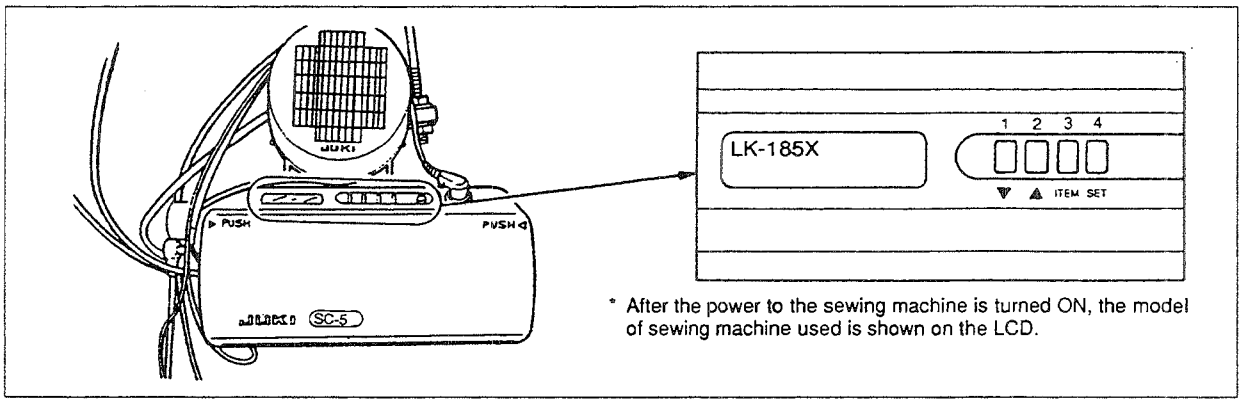
❸ Max. speed limitation variable resistor
This is a variable resistor used to control the sewing speed of the sewing machine.
(1 (low speed) ..... 8 (high speed))

❹ Half-division switch (CP-11)
Used to change over the sewing mode of the button sewing machine.
Refer to the Instruction Manual for LK-1851C-555/SC-6 for how to change over the sewing modes.

4. EXPLANATION OF THE PSC BOX

(1) How to set for functions

Various functions can be selected and specified using the four setting switches and liquid crystal display mounted on the front face of the PSC box.



* After the power to the sewing machine is turned ON, the model of sewing machine used is shown on the LCD.

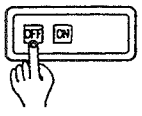
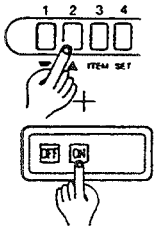
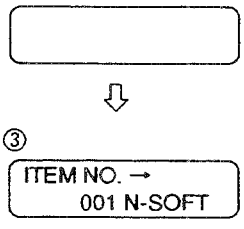
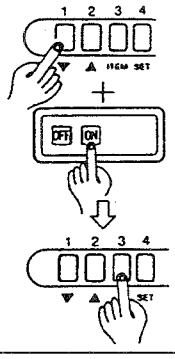
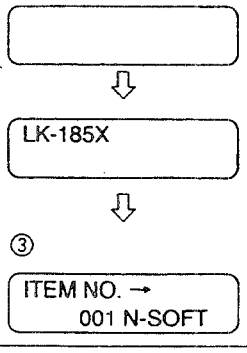
(Caution) Never operate the switches in any way other than the procedure described below.

1) Setting for functions

Functions can be set in two different levels, i.e., user level and service level. In the service level, the number of function items that can be specified is larger than that in the user level. Set for functions in either level according to sewing conditions.

User level (ITEM No. 001 to 003, 108)

Service level (ITEM No. 030 to 049, 075, 100 to 103, 105 and 107 in addition to the items accepted under the user level)

	Switch operation	LCD
① Turn OFF the power to the machine once.		
② Call the user level or service Level for the setting of functions. **< How to call the user level >** Pressing the 2 [▲] switch, turn ON the power to the machine. **< How to call the service level >** Pressing the 1 [▼] switch, turn ON the power to the machine. Then, press the 3 [ITEM] switch.	Calling the user level 	 ③ ITEM NO. → 001 N-SOFT
③ Indication shown in the illustration on the right will be given on the LCD. (If the indication does not appear on the LCD, re-perform the procedure from step ①.)	Calling the service level 	 ③ ITEM NO. → 001 N-SOFT

④ Then, select the item No. corresponding to the function you want to specify by pressing the 1 [▼] switch or 2 [▲] switch.
(Refer to the function setting table for the description of items.)

⑤ Once the item No. corresponding to the function desired has been selected, press the 4 [SET] switch.

Example)
Function for changing the number of stitches for the soft-start function (2 to 5)

* For example, the number of stitches for the soft-start function is changed to five.

⑥ The indication shown on the LCD will change as illustrated in the figure on the right. Now, the set value can be changed.

⑦ Press the 2 [▲] switch three times to change the number of stitches for the start to five.
(To decrease the number of stitches, press the 1 [▼] switch.)

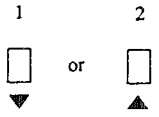
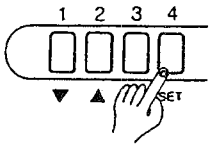
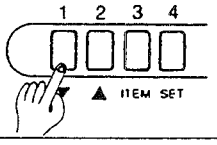
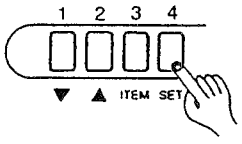
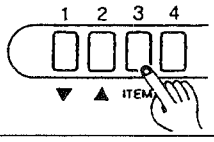
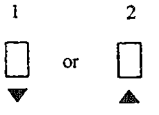
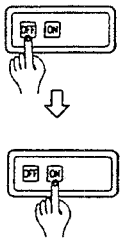
⑧ After the completion of data changing procedure, press the 4 [SET] switch to enter the modified value.

(Caution) If you omit this procedure, the modified value will not be entered.

⑨ The indication given on the LCD will change to show that data on the subsequent function item No. can be modified.

⑩ To put forward or put back the item No., press first the 3 [ITEM] switch to return the indication on the LCD to the function setting, and call the item No. desired by pressing the 1 [▼] switch or 2 [▲] switch.

⑪ After the completion of operation described in step ⑧, turn OFF the power to the machine, then turn it ON. This will return the machine to the normal operation mode.

	Switch operation	Indication on the LCD
④		Selected item No. is indicated.
⑤	Example) Changing the number of stitches for the soft-start function 	ITEM NO. → 001 N-SOFT ⇩ ⑥ 001 N-SOFT → 2 (N)
⑦		001 N-SOFT → 5 (N)
⑧		001 N-SOFT → 5 (N) ⇩ ⑨ 002 T-Acc → 2 3
⑩		ITEM NO. → 002 T-Acc
		Selected item No. is indicated.
⑪		⇩ LK-185X

(2) PSC function setting table (Refer to the pages for reference for details.)

- → shows the set value.

Number of stitches for the soft-start function (Refer to page 10.)

△ 001 N-SOFT → 2 [N]

Flicker reducing function (Refer to page 10.)

△ 002 T-Acc → 2 3

Number of revolutions for soft start function (Refer to page 10.)

△ 003 S-SOFT → 900 [spm]

Number of revolutions at low speed (Refer to page 10.)

030 S-Pos → 200 [spm]

Click (Refer to page 10.)

031 Sound → 1 : on 0 : off

The number of stitches for cycle sewing (Refer to page 10.)

032 N-Cye → 42 [N]

Teaching function (Refer to page 11.)

033 TEACH → 0 : off 1 : on

Work clamp lifting solenoid drive timing (Refer to page 11.)

□ 034 A-FLS → 345

Work clamp lifting cylinder drive timing (Refer to page 11.)

□ 035 A-FLC → 360

Length of time during which the work clamp foot is held lowered (Refer to page 11.)

□ 036 T-FLD → 200 [msec]

Work clamp foot lowest position detection (Refer to page 12.)

037 PRD-Se → 1 : on 0 : off

Length of time during which the machine waits for start at the 2nd origin (Refer to page 12.)

✻ □ 038 HC-w → 100 [msec]

Timing of the thread tension releasing solenoid (Refer to page 12.)

□ 039 A-DFon → 10

Effective diameter of motor pulley (Refer to page 12.)

040 PCDMP → 85.0 [mm]

Motor stop retaining function (Refer to page 12.)

041 M-HOLD → 0 : off 1 : on

Function to automatically lower the work clamp lifting solenoid/cylinder (Refer to page 13.)

042 FL-AD → 0 : off 1 : on

Retaining time until the work clamp foot automatically lowers (Refer to page 13.)

□ 043 T-FLH → 180 [sec]

Optional pedal (Refer to page 13.)

044 PEDAL → 0 : off 1 : on

Wiper drive time (Refer to page 14.)

□ 045 T-OWip → 100 [msec]

Waiting time after the wiper drives (Refer to page 14.)

□ 046 T-WWip → 80 [msec]

Thread trimmer 1 off timing (Refer to page 14.)

□ 047 T-Tof 1 → 20 [msec]

Thread trimmer 2 off timing (Refer to page 14.)

□ 048 T-Tof 2 → 20 [msec]

Thread tension releasing timing (Refer to page 14.)

□ 049 T-Dish → 20 [msec]

Direction of rotation of the motor (Refer to page 14.)

075 DM → CCW CW

Accumulated length of time during which the sewing machine is energized (Refer to page 14.)

100 STO → 0 [min]

E² PROM reset (Refer to page 14.)

ITEM NO. → ■ 101 ResEEP

Monitor of the state of input signal for ITEM No. 102 (Refer to page 14.)

[PO✻] 7 – – – – – – 0 → 1 1 1 1 1 1 1 1

Registered troubles of ITEM No. 103 (Refer to page 14.)

→ EO 0 EXIT

Receiving mode of E² PROM reset (Refer to page 14.)

ITEM NO. → ■ 105 RxCopy

Transmission mode of E² PROM reset (Refer to page 14.)

ITEM NO. → ■ 107 TxData

Version management No. of ITEM No. 108 (Refer to page 15.)

Version
* * – * * – * * – * * *

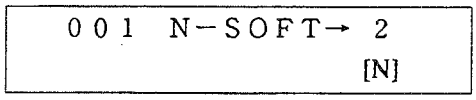
△ : User level
* : Used only for the machine head for button sewing (SC-6)
□ : This function cannot be specified in accordance with the destination of the sewing machine.

(Caution) The function setting table is prepared for the LK-1850(42) model of sewing machine.

(3) Explanation of the functions

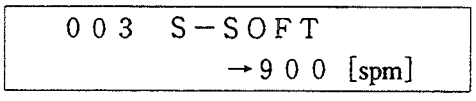
1) Soft-start function (Function setting No. 001, 003)

① Number of stitches for the soft-start function (Function setting No. 001)
The needle thread may fail to interlace with the bobbin thread at the start of sewing when a smaller stitch length or a thicker needle is used. To solve such problem, this function is used to limit the sewing speed at the sewing start, thereby ensuring successful formation of the starting stitches.



1 to 9 : The number of stitches to which the soft-function works.

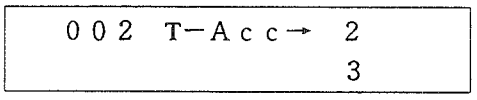
② The number of revolutions for the soft-start (Function setting No. 003)
The limit of sewing speed while the soft-start function works is also changed.



Data setting range
130 to 1000 [spm] <10/s.p.m.>

2) Flicker reducing function (Function setting No. 002)

This function is used to prevent the hand lamp from flickering at the start-up of the sewing machine. The larger the value is set, more effective the function will work.

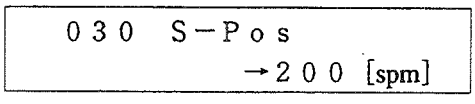


Data setting range
0 to 8
0 : Flicker reducing function does not work.
〈
8 : Flicker reducing function works most effectively.

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

3) Number of revolutions at low speed (Function setting No. 030)

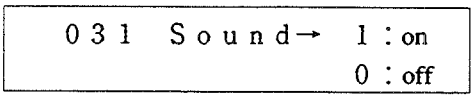
The lowest speed when the sewing machine starts running can be adjusted.



Adjustable range
130 to 250 [spm] <5/s.p.m.>

4) Click of the key switches on the PSC (Function setting No. 031)

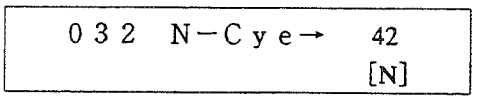
Specifies whether the four key switches mounted on the PSC box click.



1 : on Switches click.
0 : off Switches do not click.

5) Function of setting the number of stitches for cycle sewing (Function setting No. 032)

The number of stitches for cycle sewing of the machine head used can be specified.



Data setting range
12 to 128 [stitches] <1/stitch>

6) Teaching function (Function setting No. 033)

When the number of stitches for cycle sewing is changed after the machine head used has been changed or the worm has been replaced, the number of stitches for cycle sewing can be automatically specified by using the teaching function.

033 TEACH→ 0 : off 1 : on	0 : off The teaching function is rendered ineffective. 1 : on The teaching function is rendered effective.

Set the teaching function to the effective state. Turn OFF the power to the machine once, then re-turn it ON. This will made thev sewing machine enter the teaching mode. Under the teaching mode, the sewing machine runs at low speed, stops at the origin of the cycle sewing and the work clamp foot goes up. After the number of stitches for cycle sewing has been determined, the machine restores the normal high-speed operation.

(Caution) **1. When the machine head for button sewing is used, the teaching function is rendered ineffective.**
2. The teaching mode fails to work normally unless the origin detecting sensor of the machine head has been properly adjusted. Be sure to check how the origin detecting sensor of the sewing machine has been adjusted before starting your sewing machine.
(Refer to the Engineer's Manual for the LK-1850C.)

7) Function of adjusting the timing to drive the work clamp lifter (Function setting No. 034, 035)

The timing to raise the work clamp foot after the completion of a sewing cycle can be adjusted.
For the machine with a solenoid type work clamp lifting mechanism, adjust the timing to lift the work clamp foot using the "Work clamp solenoid drive timing" (function setting No. 034). For the sewing machine with an air cylinder type work clamp lifting mechanism, adjust it using the "work clamp lifting cylinder drive timing" (function setting No. 035).

Increase the set value to retard the timing to lift the work clamp foot after the sewing machine stops.
Decrease the set value to advance it.

(Caution) **If the set value is excessively decreased, the work clamp foot will go up before the sewing machine stops. In this case, the length of needle thread remaining after thread trimming will vary or the work clamp foot may come in contact with the thread trimming mechanism of the machine head. So, be careful.**

① Timing to drive the work clamp lifting solenoid

034 A−FLS → 345	Adjustable range 0 to 370° <5/°>

② Timing to drive the work clamp lifting cylinder

035 A−FLC → 360	Adjustable range 0 to 370° <5/°>

8) Length of time during which the work clamp foot is held lowered (function setting No. 036)

The length of time during which the sewing machine rotation is prohibited after the work clamp foot has come down can be adjusted.

036 T−FLD → 200 [msec]	Adjustable range 0 to 200 [msec.] <10/msec.>

(Caution) **If the aforementioned length of time is excessively short, the sewing machine will start to rotate before the work clamp foot comes down to the lowest position of its stroke, resulting in needle breakage or slip-off of thread.**

9) Selection of the work clamp foot lowest position detection (Function setting No. 037)

The LK-1850C Series model of sewing machine is equipped as standard with the function to detect the lowest position of the work clamp foot. However, the function can be rendered in effective in case of the machine head that does not come with it.

```
037  PRD-Se→1 : on
                0 : off
```

1 : on Work clamp foot lowest position detecting function is effective.
2 : off Work clamp foot lowest position detecting function is ineffective.

(Caution)
1. **If "1 : on Work clamp foot lowest position detecting function is effective" is selected for the machine head that is not provided with the function to detect the lowest position of the work clamp foot, "E35" (work clamp lifting failure) will occur making the sewing machine fail to start.**
2. **If "E35" (work clamp lifting failure) occurs because of failed work clamp foot lowest position detecting switch mounted on the machine head, it is possible to temporarily operate the sewing machine by selecting "0 : off Work clamp foot lowest position detecting function is ineffective."**

10) Length of time during which the machine waits for start at the 2nd origin (Function setting No. 038)

When operating the machine head for button sewing under the "4-holed button sewing without cross-over stitches" mode, the length of time required to re-start the sewing machine after the wiper solenoid has driven at the 2nd origin.

```
038  HC-w.
        →  100 [msec]
```

Adjustable range
0 to 200 [msec.] <10/msec.>

(Caution) If the length of time is too short, the wiper will interfere with the needle.

11) Timing to drive the thread tension releasing solenoid (Function No. 039)

The timing to drive the thread tension releasing solenoid when the thread trimmer actuates can be adjusted.

Decrease the set value to advance the timing to release the thread tension when the thread trimmer actuates.
Increase the set value to retard the timing to release the thread tension when the thread trimmer actuates.

```
039  A-DFon
        →  10
```

Adjustable range
0 to 25 [°] <5/°>

(Caution) If the aforementioned timing is not properly adjusted, the length of thread remaining after thread trimming will vary.

12) Effective diameter of the motor pulley (Function setting No. 040)

The size (effective diameter) of motor pulley used is specified.

```
040  PCDMP
        →  85.0 [mm]
```

Adjustable range
40.0 to 200.0 [mm] <0.5/mm>

(Caution) In principle, do not change the size of the pulley. If the size of the pulley is changed, the machine may fail to make the most out of the functions and performance of the sewing machine.

13) Motor stop retaining function (Function setting No. 041)

The main shaft of the sewing machine is retained by slightly applying the brake to the motor while the sewing machine is in the stop state (with its needle up).

```
041  M-HOLD→0 : off
                1 : on
```

0 : off Motor stop retaining function is inoperative.
1 : on Motor stop retaining function is effective.

(Caution)
1. **When the aforementioned retaining function is used, the motor whirs. This is not a failure of the motor.**
2. **When the aforementioned retaining function is used, the pulley cannot be turned by hand while the power to the machine is in the ON state.**

14) Function to automatically lower the work clamp lifting solenoid/cylinder (Function setting No. 042, 043)

This function is used to automatically lower the work clamp foot after the work clamp foot has ascended for a predetermined length of time.
The length time required to make the work clamp foot automatically descend can be adjusted using function setting No. 043.

① Function to automatically lower the work clamp lifting solenoid/cylinder (function setting No. 042)

```
042  FL−AD→0 : off
                1 : on
```

0 : off Function to automatically lower the work clamp lifting solenoid/cylinder is ineffective.
1 : on Function to automatically lower the work clamp lifting solenoid/cylinder is effective.

② Length of time during which the work clamp foot is held raised (function setting No. 043)

```
043  T−FLH
       →  180 [sec]
```

Adjustable range
60 to 600 [sec.] <10/sec.>

(Caution) If the work clamp lifting solenoid for the H or J type machine, heating value of the solenoid will be increased. So, be sure to set the function setting No. 042 to "1 : on Function to automatically lower the work clamp lifting solenoid/cylinder is effective."

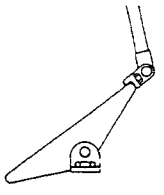
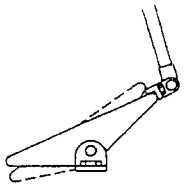
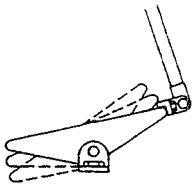
15) Optional pedal (Function setting No. 044)

The LK pedal that is equipped as standard for the PSC box can be replaced with the commercially-available pedal for standing work or the like.

```
044  PEDAL→0 : off
                1 : on
```

0 : off LK pedal is used
1 : on Optional pedal is used

To use the standard LK pedal for the PSC box, specify "0 : off LK pedal is used."
If the circuit structure of the work clamp operating switch of the optional pedal to be used is as illustrated in ② of the figure shown below, specify "1 : on Optional pedal is used."

		In the neutral position	Depressed to the first step	Depressed to the second step
				
①	LK pedal	Work clamp operating switch: on Start switch: off	Work clamp operating switch: off Start switch: off	Work clamp operating switch: off Start switch: on
②	Optional pedal	Work clamp operating switch: off Start switch: off	Work clamp operating switch: on Start switch: off	Work clamp operating switch: on Start switch: on

Confirm the circuit structure of the pedal to be used, then select the appropriate setting of function.

(Caution) The optional pedal can replace only the 1-pedal unit. It cannot be used instead of the 2-pedal unit.

16) Wiper drive time, etc. (Function setting Nos. 045, 046, 047, 048 and 049)

Functions corresponding to the aforementioned function setting Nos. are not used at present. (Any selection mode for the respective functions are ineffective.)

```
045  T-OWip
        → 100 [msec]
```

```
046  T-WWip
        →  80 [msec]
```

```
047  T-Tof1
        →  20 [msec]
```

```
048  T-Tof2
        →  20 [msec]
```

```
049  T-Dish
        →  20 [msec]
```

17) Direction of rotation of the motor (Function setting No. 075)

Specifies the direction of rotation of the motor.

```
075   DM   → CCW
             CW
```

CCW : Counterclockwise
CW : Clockwise

18) Accumulated length of time during which the sewing machine is energized (Function setting No. 100)

Indicates the accumulated length of time during which the sewing machine is energized in the unit of minutes.

```
100   STO
      → *** [min]
```

19) E^2 PROM reset (Function setting No. 101)

Specified data on the function can be returned to the factory-specified data at the time of delivery.
(Modified data on the function return to the factory-set state at the time of delivery.)

```
ITEM No.  → ▨
      101 ReSEEP
```

When the item No. 101 is shown on the LCD panel, execute the function by simultaneously pressing the 3 [ITEM] switch and 4 [SET] switch.
(While the function is being executed, the section on the right of the → blinks.)

20) Monitor of the state of input signal (Function setting No. 102)

Gives the real-time indication of the state of input signals (0/1).

21) Hysteresis of troubles (Function setting No. 103)

If a trouble occurs, the description of the trouble and the time (minute) when it occurs will be stored in the hysteresis of troubles.

```
→ E**      ***
  EXIT
```

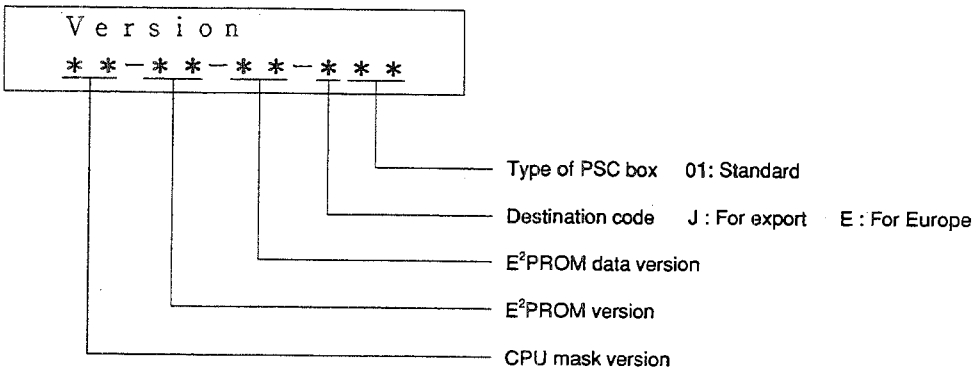
E ** Description of trouble
*** Time of occurrence

22) Communication facility (Function setting Nos. 105, 107)

Receives/transmits data stored in the PSC box.

23) PSC box version management (Function setting No. 108)

Be sure to contact our office after checking the version No. of your PSC box.



24) Indication with respect to the machine head used (Function setting No. 095)

The following table shows the machine heads corresponding to those indicated on the PSC box. The numeral shown in parentheses indicates the number of stitches for cycle sewing.

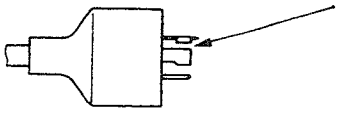
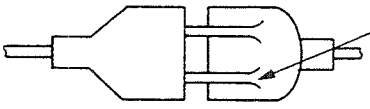
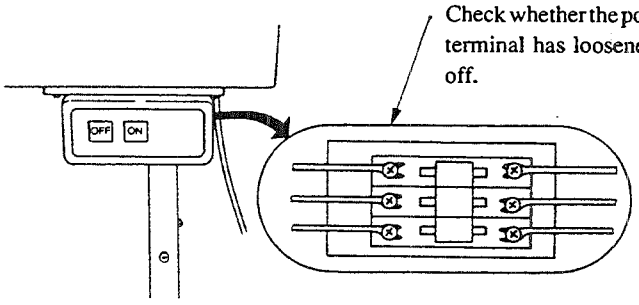
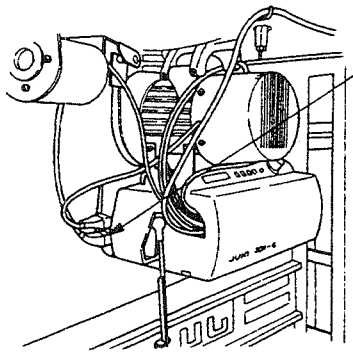
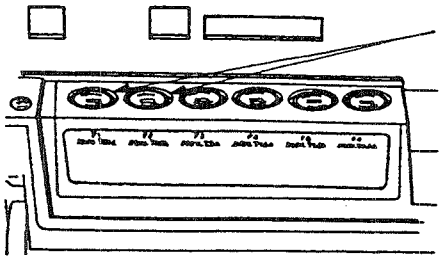
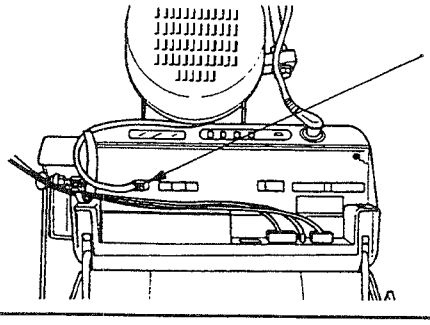
Indication of machine head used shown on the PSC box	Corresponding machine head	
LK-185X	LK-1850C Series that is adaptable to modified worms (excluding H and J types)	(Caution 1)
LK-1850(42)	LK-1850C Series for 42 stitches (excluding H and J types)	
LK-1852(28)	LK-1850C Series for 28 stitches (excluding H and J types)	
LK-1852(14)	LK-1850C Series for 14 stitches (excluding H and J types)	
LK-1853(36)	LK-1850C Series for 36 stitches (excluding H and J types)	
LK-1853(18)	LK-1850C Series for 18 stitches (excluding H and J types)	
LK-1854(21)	LK-1850C Series for 21 stitches (excluding H and J types)	
LK-185XH	H and J types of LK-1850C Series that is adaptable to modified worms	(Caution 1)
LK-1850H(42)	H and J types of LK-1850C Series for 42 stitches	(Caution 3)
LK-1852H(28)	H and J types of LK-1850C Series for 28 stitches	
LK-1852H(14)	H and J types of LK-1850C Series for 14 stitches	
LK-1853H(36)	H and J types of LK-1850C Series for 36 stitches	
LK-1853H(18)	H and J types of LK-1850C Series for 18 stitches	
LK-1854H(21)	H and J types of LK-1850C Series for 21 stitches	
LK-1851B(18)	LK-1851C-555, -558 for button sewing for 18 stitches	(Caution 2)
LK-1851B(16)	LK-1851C-556 for button sewing for 16 stitches	(Caution 2)
LK-1852B(22)	LK-1852C-557 for button sewing for 22 stitches	(Caution 2)
LK-1853B(30)	LK-1853C-559 for button sewing for 30 stitches	(Caution 2)
MOL(28)	Cannot be used at present	
MOL(36)	Cannot be used at present	
MOL(42)	Cannot be used at present	

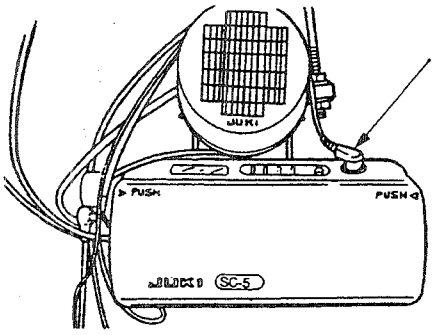
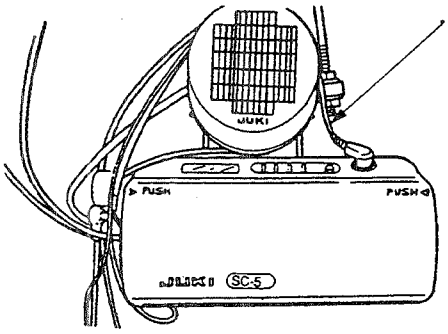
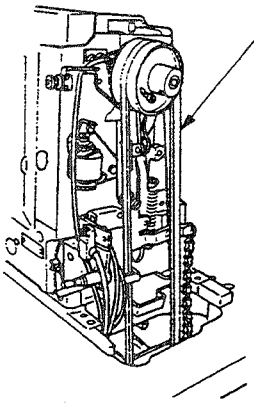
(Caution) 1) **If LK-185X or LK-185XH is selected, the machine automatically will automatically enter the teaching mode (see page 11) after the power to the machine is turned ON for the first time.**

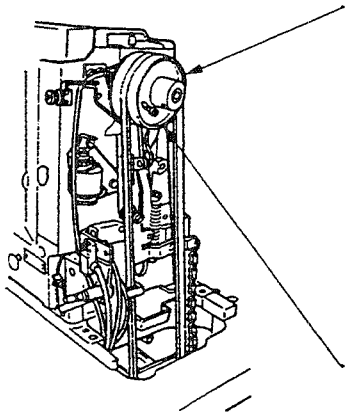
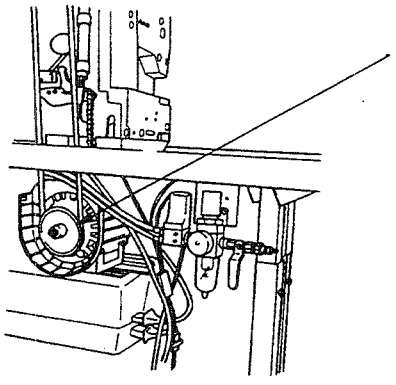
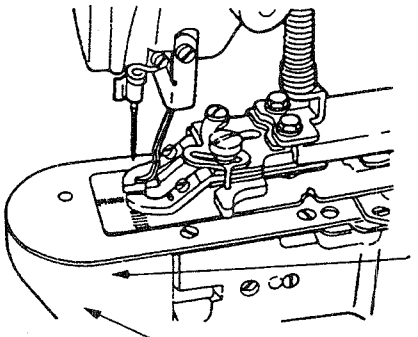
2) **The machine head for button sewing can be used only with the SC-6. It cannot be used with the SC-5.**

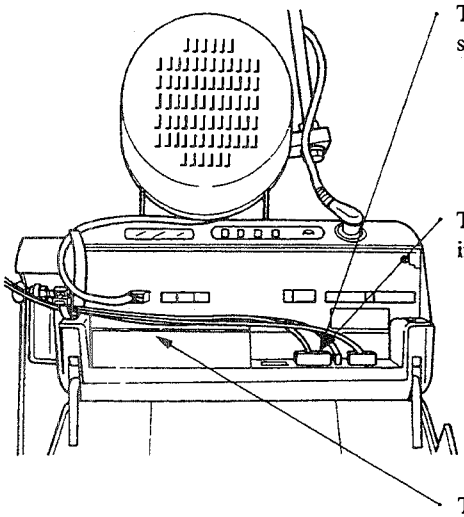
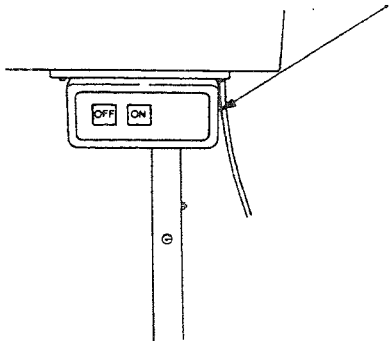
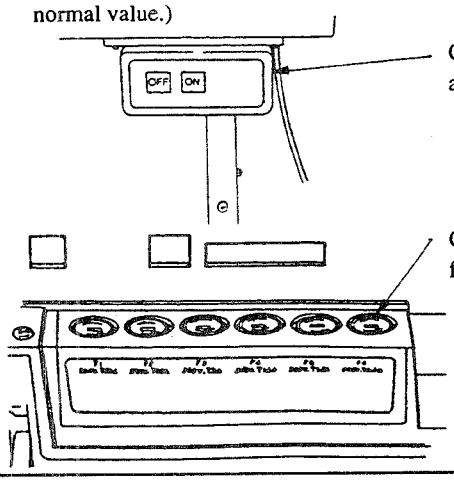
3) **If LK-1854C1-24 is used, confirm that "LK-1850H (42)" has been selected on the PSC box.**

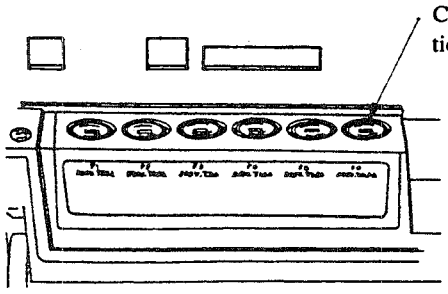
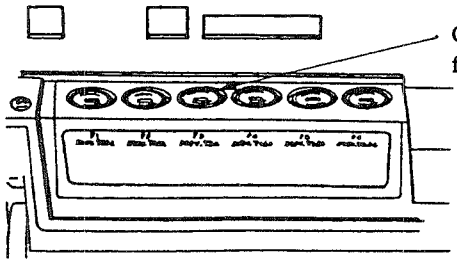
5. EXPLANATION OF ERRORS AND CORRECTIVE MEASURES

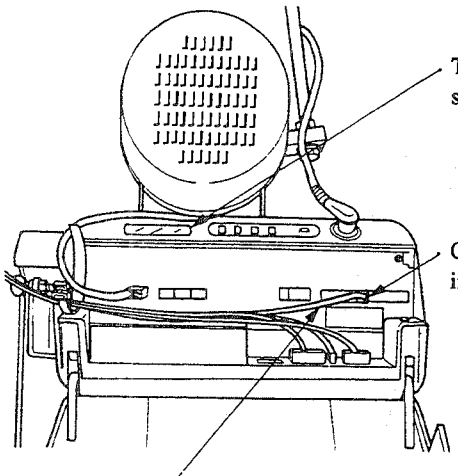
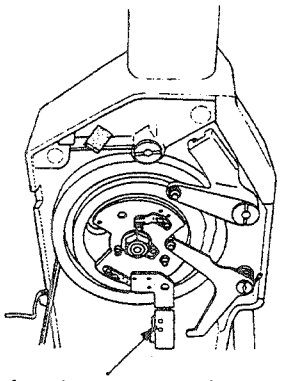
No.	Description and components to be checked	Corrective measures
E0	• Initialization of data on E^2PROM	
E1	• Failed input power supply (open phase of power supply)	
	 Check whether the power plug and receptacle have loosened or come off.	• Tighten the screw mounted in the plug. • Re-connect the plug to the receptacle.
	 Check the power plug for failed contact.	• Correct the receptacle.
	 Check whether the power switch terminal has loosened or come off.	• Tighten the screw inside the power switch.
	 Check whether the power connector pin has loosened or come off.	• Re-connect the connector.
	 Check whether the power fuse has blown.	• Check the fuses F1 and F2 for blow-out. Then, replace a blown out fuse, if any, with a new one.
E2	• Motor connector has come off. (The motor connection signal has not been input in the normal value.)	
	 Check whether the motor signal connector pin has loosened or come off.	• Re-connect the connector. **(Caution) The error is not stored in memory of the hysteresis of troubles.**

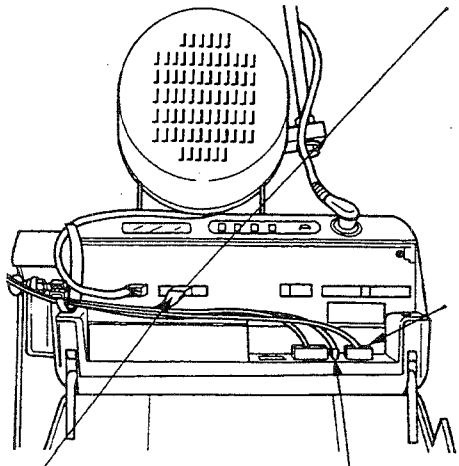
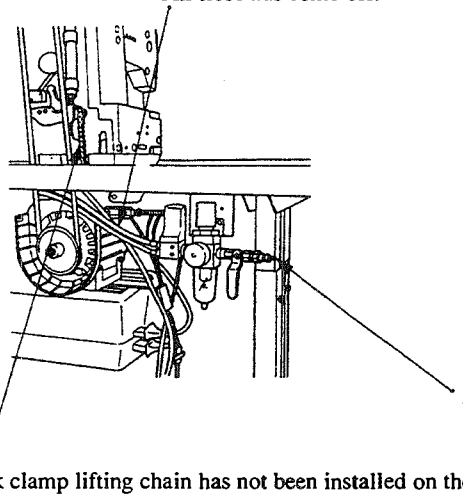
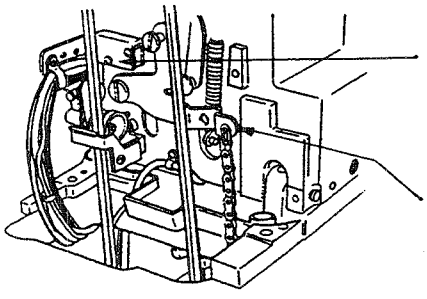
No.	Description and components to be checked	Corrective measures
E3	• V belt slips or comes off. Synchronizer connector comes off. (The motor rotates, but an upper detection signal is not input.)	
	 Check whether the synchronizer connector has loosened or come off.	• Re-connect the synchronizer.
	 Check the synchronizer for disconnection.	• Replace the synchronizer with a new one.
	 Check whether the V belt has come off, loosened or slipped.	• Check the V belt. (Belt tension: 6 mm/500g)
		(Caution) **The trouble is not stored in memory of the hysteresis of troubles.**
	LK 980 Servo check magnet on synchronizer. Red line inside Top of magnet At 3 o'clock position	

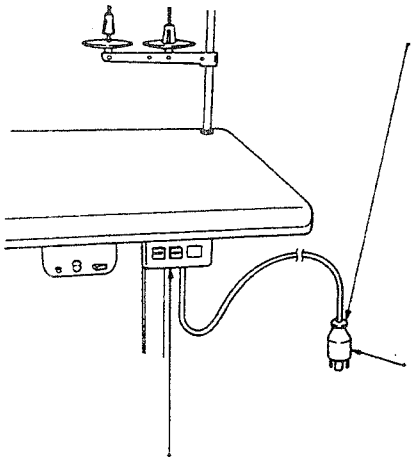
No.	Description and components to be checked	Corrective measures
E7	• The motor has locked. (The motor has been started by depressing the front part of the pedal, but the sewing machine fails to rotate.)	
	 Check whether the sewing machine head has locked. (Confirm that the pulley lightly rotates when the power to the machine is turned OFF.)	• Correct the seizure of the machine head.
	Check whether the thread has been tangled in the pulley of the sewing machine.	• Remove the thread from the pulley.
	 Check whether the thread has been tangled in the motor pulley shaft.	• Remove the pulley and eliminate the thread from the pulley.
	 Check whether the thread has been caught in the hook.	• Check the hook.
	Check whether the proper amount of oil is supplied to the hook.	• Properly adjust the amount of oil supplied to the hook.

No.	Description and components to be checked	Corrective measures
E10	• The solenoid has short-circuited. (Short-circuit signal has been detected when actuating the solenoid.)  The machine head solenoid has short-circuited. The solenoid connector has been improperly wired. The transformer fuse has blown.	• Check the resistance of the solenoid. • Check the wiring. • Check the fuse F3.
E11	• Overvoltage of the power supply (The source voltage exceeds the normal value.)  Check whether the source voltage is correct.	• Measure the voltage.
E12	• Overcurrent of the power supply (The source current exceeds the normal value.)	• Motor has short-circuited.
E13	• Low voltage of the power supply (The source voltage is lower than the normal value.)  Check whether the source voltage is correct. Check whether the regenerative fuse has blown.	• Measure the voltage. • Check the fuse F6.

No.	Description and components to be checked	Corrective measures
E14	• Power supply detecting circuit has failed. (Overvoltage and low voltage of the power supply are simultaneously input.)  	• Check the fuse F6.
E20	• Circuit board inside the PSC box has failed. (Failure has been found during the performance checking procedure taken after turning ON the power to the machine.)	
E22	• Failed control of the motor rotation (The number of revolutions of the motor is larger than that controlled by the motor control circuit board by a specified value or more.)	
E23	• Solenoid transistor is defective. (Short-circuit signal of the solenoid transistor has been detected when turning ON the power to the machine.)	
E24	• Motor DRv element has failed. (Error signal from the DRv element has been input.)	
E25	• Defective power supply of the solenoid (When the output voltage of the power supply of the solenoid has been changed at the time of turning ON the power to the machine to find that the voltage is defective against the indicated value.)  	• Check the fuse F3.
E26	• Failed +24 V power supply (The +24 V power supply has short-circuited.) Refer to E25.	Refer to E25.
E30	• Open phase of the motor encoder (Motor encoder provides pulses below the specified value.)	
E31	• Open phase of the motor pole sensor (A signal other than the acceptable input signals of the pole sensor has been input.)	
E33	• Failed reverse rotation of the motor (The motor has rotated in the direction other than the one controlled.)	

No.	Description and components to be checked	Corrective measures
E34	• Failed detection of origin  The number of stitches for cycle sewing is improperly set. Connector of the origin detecting sensor has come off. Disconnection of the cord of origin detecting sensor  Origin detecting sensor has failed. (Does the sensor emit light?) Origin detecting sensor has not been properly adjusted.	• Check the set value of the number of stitches for the control box and that for the machine head. (See page 15.) • Securely connect the origin detecting sensor connector. • Re-adjust the origin detecting sensor. (Refer to the Engineer's Manual for the LK-1850C.) • Replace the origin detecting sensor unit with a new one.

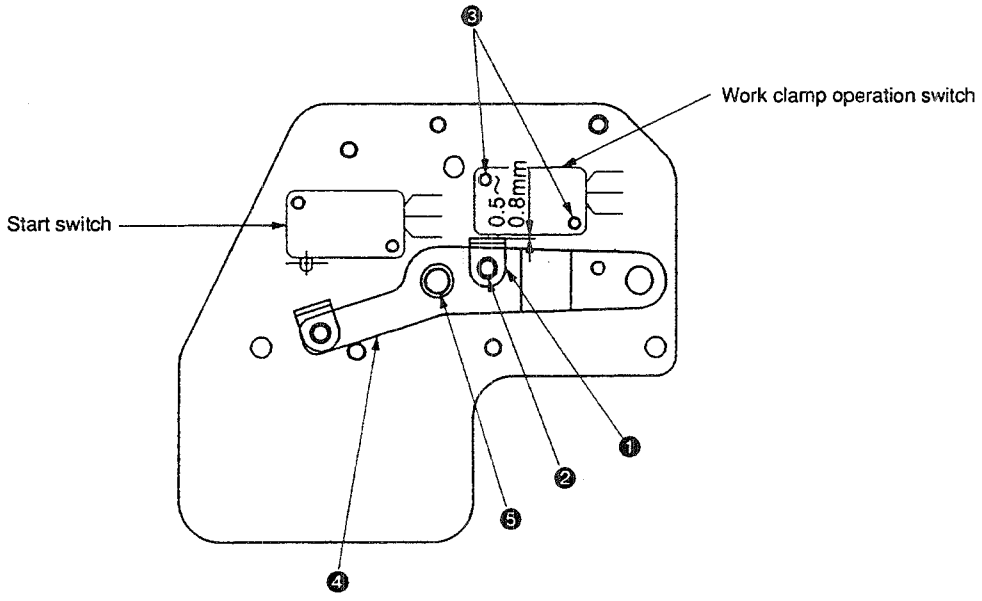
No.	Description and components to be checked	Corrective measures
E35	• Work clamp lifting failure  Connector of the work clamp lowest position detector has come off.	• Securely connect the connector of the work clamp lowest position detector.
	Connector of the work clamp lifting cylinder has come off.	• Securely connect the connector of the work clamp lifting cylinder.
	Cord of the work clamp lowest position detecting sensor has disconnected. Connector of the work clamp lifting solenoid has come off.	• Securely connect the connector of the work clamp lifting solenoid.
	Air hose has come off.  Air leakage	• Securely connect the air hose. **(Caution) This trouble is not stored in memory of trouble hysteresis.**
	Work clamp lifting chain has not been installed on the machine.	• Check the operating air pressure. • Attach the chain to the machine.
	 Work clamp lowest position detecting switch has failed. Work clamp lowest position detecting switch has not been properly adjusted. Presser bar lifting lever has locked. (The lever will not move even when you press it by hand.)	• Properly adjust the presser bar lifting lever. (Refer to the Engineer's Manual for the LK-1850C.) • Properly adjust the work clamp lowest position detecting switch. (Refer to the Engineer's Manual for the LK-1850C.) • Replace the work clamp lowest position detecting switch unit with a new one. (In this case, the machine can be temporarily operated by setting ITEM No. 037 to the off position.)

No.	Description and components to be checked	Corrective measures
E36	• Power failure (The power has given out while the sewing machine is in operation.)  Failed contact of the power plug Power plug or receptacle has loosened or has come off. Did you turn OFF the power to the machine while the sewing machine was in operation? • Did the power supply stop while the sewing machine was in operation?	Plug • Re-connect the plug to the receptacle. • Re-turn ON the power switch. **(Caution) This trouble is not stored in memory of trouble hysteresis.**
E41	• Micro-computer has failed. (The micro-computer has failed to control the peripheral components.)	
E42	• E^2PROM (Failed access to the memory)	

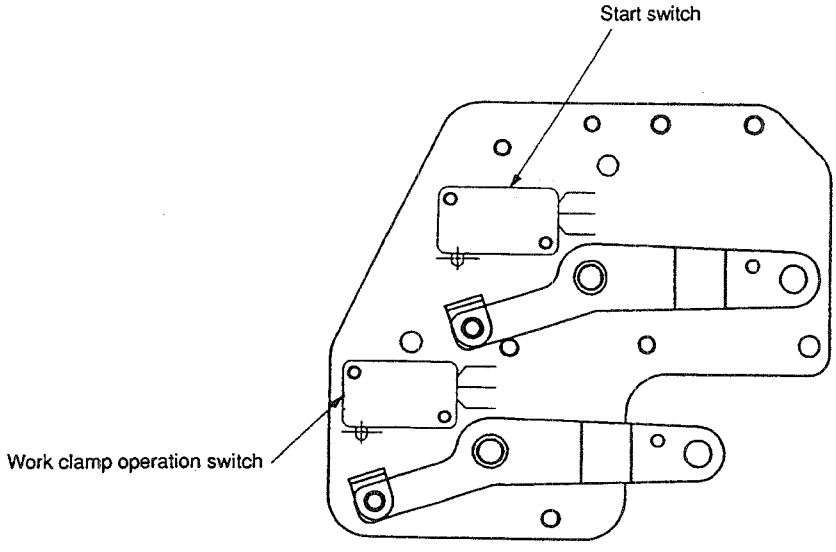
6. ADJUSTING THE LK PEDAL

The LK pedal that is equipped for the PSC box as standard comes in two different types, 1-pedal unit and 2-pedal unit. Either pedal is provided with a work clamp operation switch and a start switch.
If the work clamp foot cannot be raised/lowered by depressing the pedal, check the switches for continuity.
When the switch is turned ON, a clearance of 0.5 to 0.8 mm should be provided between switch presser plate ❶ and the switch.
Adjust the clearance to the aforementioned value using screw ❷ in the presser plate and screw ❸ in the switch.
If the shaft of pedal lever ❹ creaks, apply grease to shaft ❺.

(1-pedal unit)



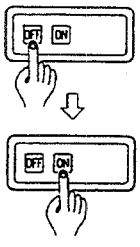
(2-pedal unit)



7. HOW TO CHANGE THE SET VALUE WHEN REPLACING THE WORM IN THE MACHINE HEAD

If the number of stitches for cycle sewing needs to be changed when replacing the worm in the machine head, re-specify the number of stitches for cycle sewing for the control box.

1) Setting the number of stitches for cycle sewing using the teaching function (for the SC-5)

	Switch operation	Indication on LCD
①	Call the service level.	ITEM NO. → 001 N-SOFT
②	1 ▼ or 2 ▲	ITEM NO. → 033 TEACH
③	4 SET	033 TEACH→ 0: off 1: on
④	1 ▼ or 2 ▲	033 TEACH→ 1: on 0: off
⑤	4 SET	034 A-FLS → 345
⑥		⇩ LK-1850 (42)

① Call the service level. (Refer to page 6.)

② Press 1 [▼] switch or 2 [▲] switch to select ITEM No. 033.

③ Press the 4 [SET] switch. Then the indication as illustrated in the figure on the right will appear on the display. Now, you can set the number of stitches for cycle sewing.

④ Press the 1 [▼] switch or 2 [▲] switch to select "1 : on."

⑤ Press the 4 [SET] switch, and the specified value will be entered. Then the ITEM No. next to No. 033 will appear on the display.

⑥ Turn OFF the power to the machine, then re-turn it ON. This will make the sewing machine enter the teaching mode.

Under the teaching mode, the sewing machine runs at low speed when the front part of the pedal is depressed and stops at the origin of the cycle sewing. Once the number of stitches for cycle sewing is determined, the machine will restore the normal high-speed operation.

(Caution) **1. When the machine head for button sewing is used, the teaching function is rendered ineffective. So, be sure to change the setting of "ITEM No. 032 Setting the number of stitches for cycle sewing."**

2. The teaching mode fails to work normally unless the origin detecting sensor of the machine head has been properly adjusted. Be sure to check how the origin detecting sensor of the sewing machine has been adjusted before starting your sewing machine. (Refer to the Engineer's Manual for the LK-1850C.)

2) Manual setting of the number of stitches for cycle sewing (for the SC-6)

The number of stitches for cycle sewing can be directly input using "ITEM No. 032 Function to set the number of stitches for cycle sewing."
Refer to the function setting procedure described on page 6 and beyond for how to input data.

8. ADJUSTING THE NEEDLE-UP POSITION DETECTING MAGNET

Adjust the needle-up position detecting magnet in the sewing machine pulley of the machine head using "ITEM No. 102 Input signal monitor."

① Call the service level. (See page 6.)

② Press the 1 [▼] switch or the 2 [▲] switch to select ITEM No. 102.

③ Press the 4 [SET] switch. Then the indication as illustrated in the figure on the right will appear on the display.

④ Press the 1 [▼] switch or 2 [▲] switch to select "P2*."

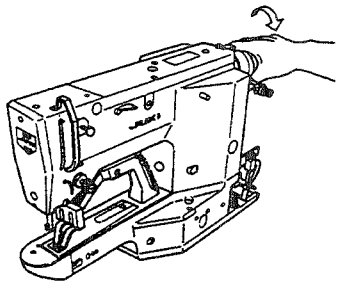
⑤ Holding the sewing machine pulley by hand, turn it slowly in the normal direction of rotation from the highest dead point of the needle bar.

⑥ Turn the pulley while observing the third indication on the display, as counted form the rightmost one, which corresponds to the needle-up detecting signal. The display shows the start of input of a needle-up signal by changing the numeral from "0" to "1."

⑦ The adjustment value at the start of input of a needle-up detecting signal varies with the type of machine head used. So, adjust the value referring to the Engineer's Manual for the machine head used.

⑧ After the completion of the adjustment, turn OFF the power to the machine.

	Switch operation	Indication on LCD
①	Call the service level.	ITEM NO. → 001 N-SOFT
②	1 ▼ or 2 ▲	ITEM NO. → 102 ISMon
③	4 SET	7------0 [P0*]→11111111
④	1 ▼ or 2 ▲	7------0 [P2*]→00000101



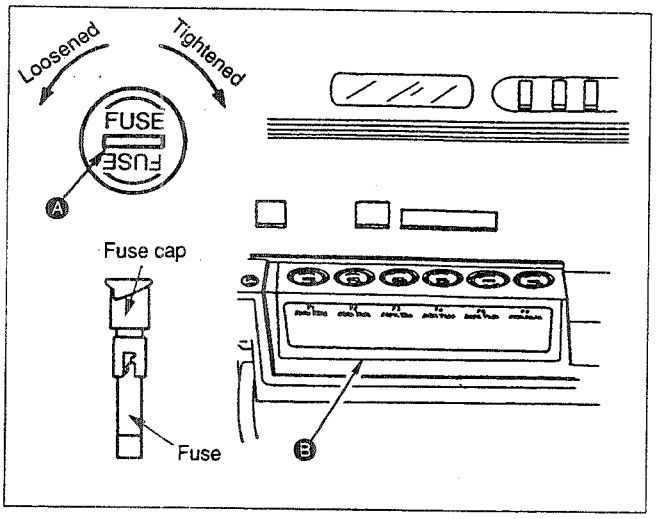
7-------0
[P2*] → 00000101

Needle-up detecting signal

Concentrate on This Third digit To change From 1 to 0 will change From 0 to 1 when 1 appears measure distance of 18mm or 20mm according to LK1851555C or LK1850C

9. EXPLANATION OF FUSES

(1) Replacing the fuses



Open the front cover. Fit a screwdriver onto slit Ⓐ on the fuse cap. Turn the cap in the direction of the arrow using the screwdriver while lightly pressing the screwdriver against the slit until the cap comes off.
Use a fuse with a capacity indicated on a label attached on section Ⓑ of the connector panel.

(Caution) Be sure to replace the fuse with the power to the machine turned OFF.

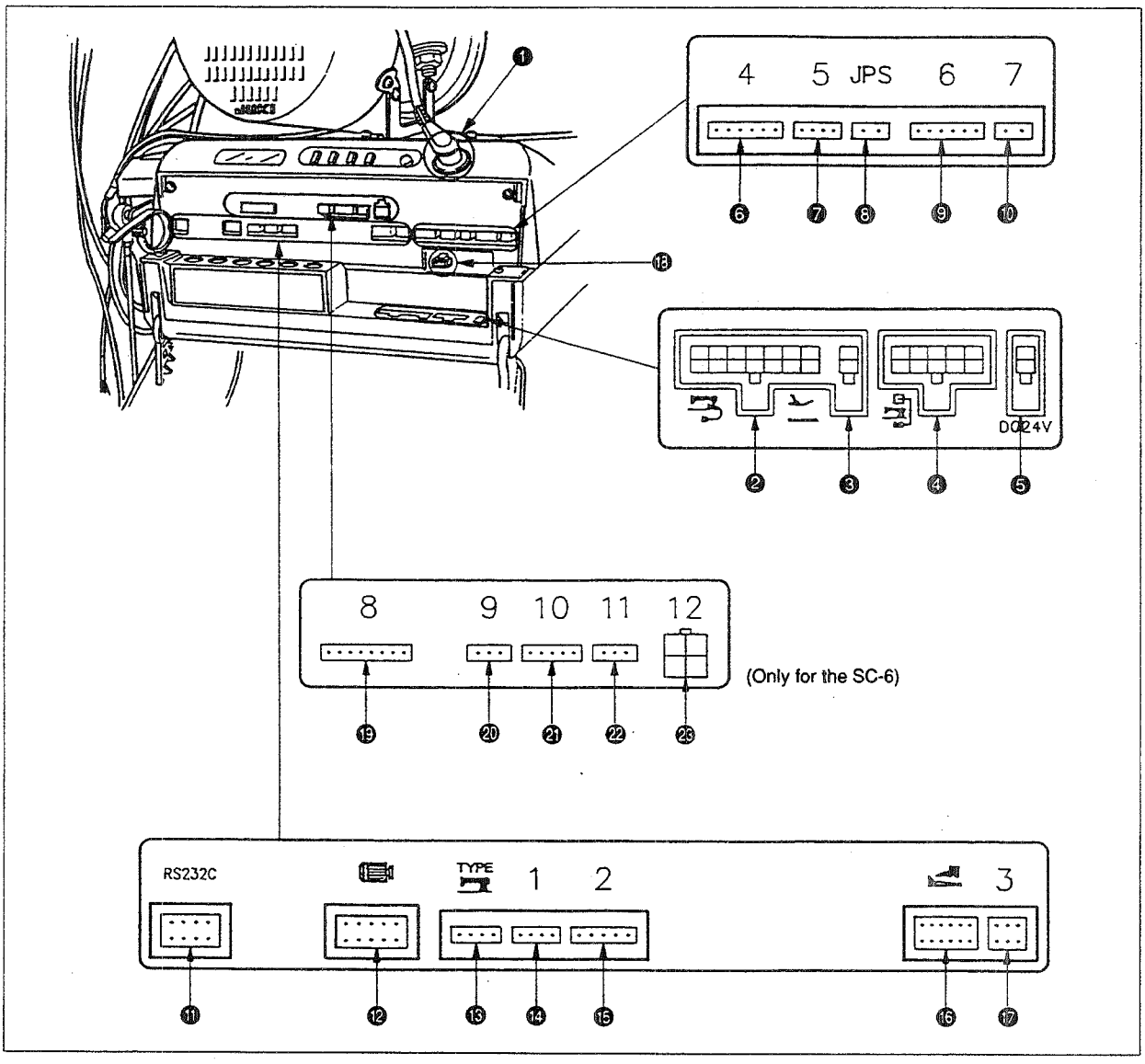
Enlarged view of section Ⓑ (The figure illustrates the fuse for the machine of ø3 and 220 V for general export.)

F1	F2	F3	F4	F5	F6
250V. 12A	250V. 12A	250V. 12A	250V. T1.6A	250V. T1.6A	250V. T0.5A

* Fuse table

	3ø 220 V	Phenomenon caused by blown out fuse	1ø 220 V	1ø 120 V	Phenomenon caused by blown out fuse	JE type of ø1 and 220 V	Phenomenon caused by blown out fuse
F1	250 V 12 A Main	E1 is indicated on the display.	250 VT 20 A Main	250 VT 20 A Main	The machine cannot be energized.	— —	— —
F2	250 V 12 A Main	E1 is indicated on the display.	250 VT 20 A Main	250 VT 20 A Main	The machine cannot be energized.	— —	—
F3	250 V 12 A Main	E1 is indicated on the display.	— —	— —	— —	— —	— —
F4	250 VT 1.6 A Transformer	E25 is first indicated on the display, then E26 replaces it.	250 VT 1.6 A Transformer	250 VT 3.0 A Transformer	E25 is first indicated on the display, then E26 replaces it.	250 VT 1.6A Transformer	E25 is first indicated on the display, then E26 replaces it.
F5	250 VT 1.6 A Rush-current prevention	The machine cannot be energized.	250 VT 1.6 A Rush-current prevention	250 VT 1.6 A Rush-current prevention	The machine cannot be energized.	250 VT 1.6A Rush-current prevention	The machine cannot be energized.
F6	250 VT 0.5 A Regeneration absorption	E13 is indicated on the display.	250 VT 0.5A Regeneration absorption	250 VT 0.5A Regeneration absorption	E13 is indicated on the display.	250 VT 0.5A Regeneration absorption	E13 is indicated on the display.

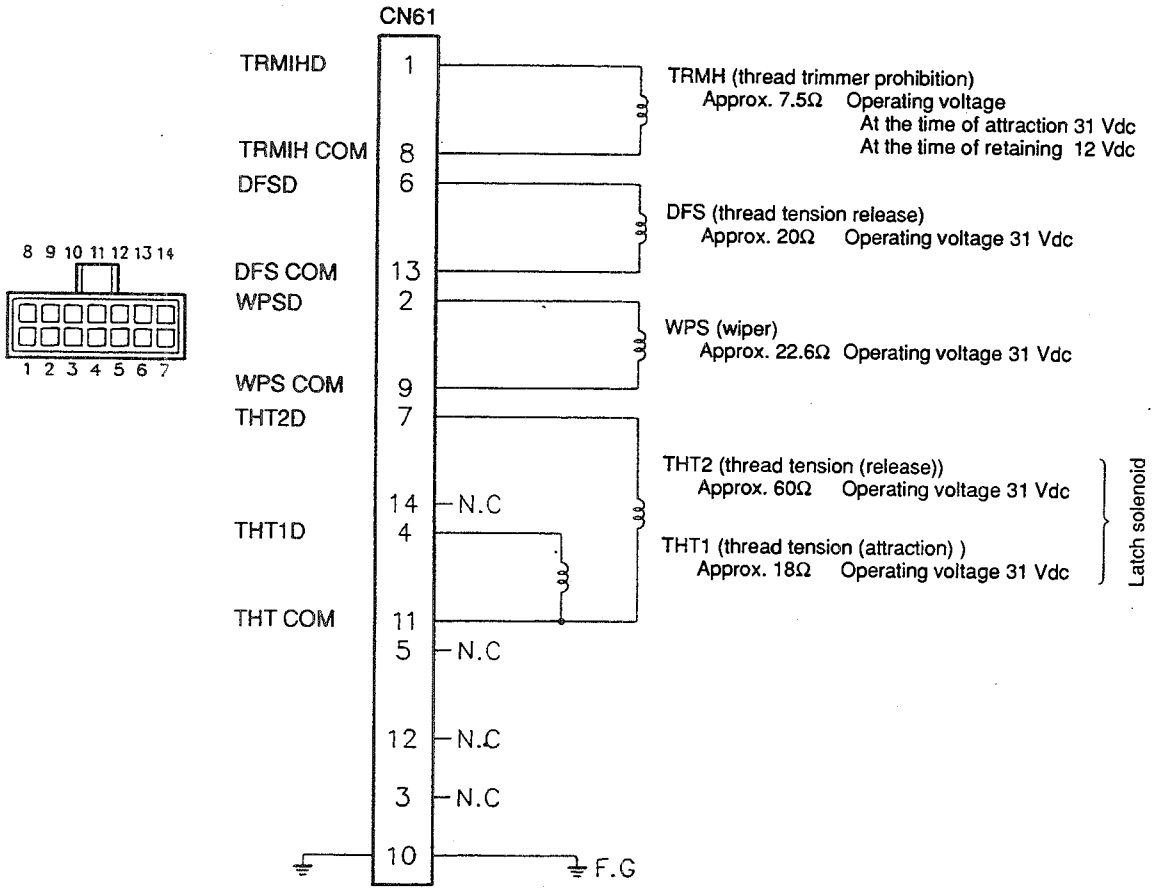
10. CONNECTOR CONNECTION DIAGRAM



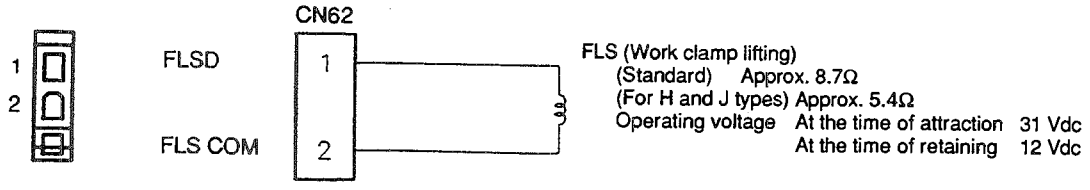
①	CN32	7P	Synchronizer
②	CN61	14P	Machine head solenoid
③	CN62	2P	Presser foot lifting solenoid (Flyback resistor asm. is not required.)
④	CN63	10P	Work clamp lifting cylinder
⑤	CN64	2P	24 V external output
⑥	CN10	6P	Origin detection
⑦	CN11	4P	Not used
⑧	CN12	2P	JPS, production control system (optional)
⑨	CN13	6P	Operation box 1
⑩	CN14	2P	Emergency stop (not used at present)
⑪	CN1	8P	RS232C
⑫	CN3	10P	Motor
⑬	CN4	4P	Resistor pack
⑭	CN5	4P	Work clamp lowest position detection
⑮	CN6	5P	Optional
⑯	CN8	12P	LK pedal
⑰	CN9	6P	Operation box 2
⑱	CN93	2P	Lamp fuse holder
⑲	CN131	8P	Not used
⑳	CN132	3P	Not used
㉑	CN133	5P	2-4 hole detection
㉒	CN134	3P	Not used
㉓	CN135	4P	Not used

⑲–㉓: Only for the SC-6

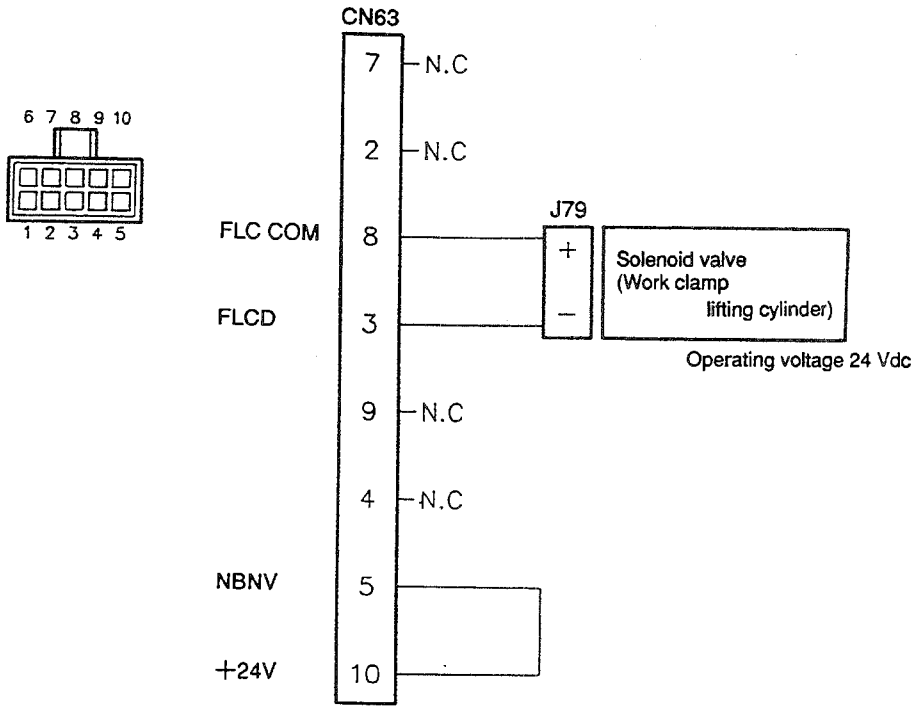
Machine head solenoid



Presser foot lifting solenoid

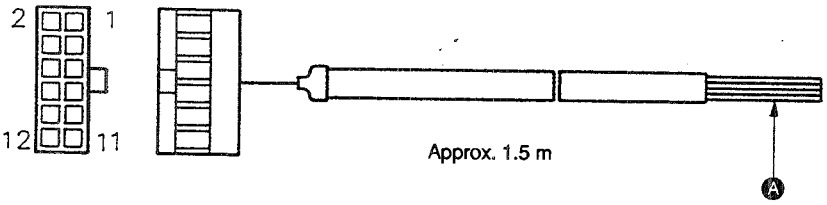


Work clamp lifting cylinder

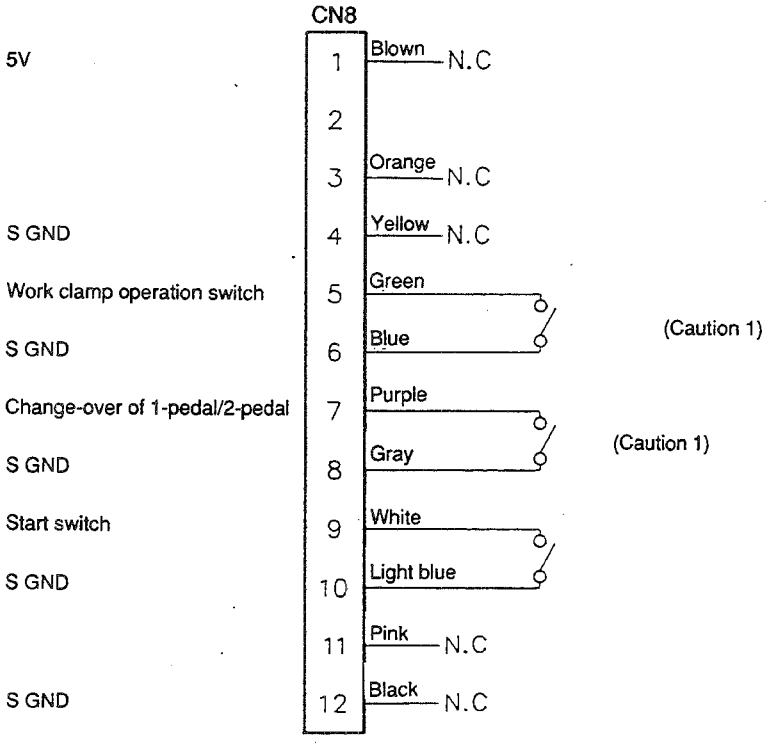


11. OPTIONAL CORDS

(1) Junction code A asm. for sewing machine for standing work (Part No. M9701351AA0)



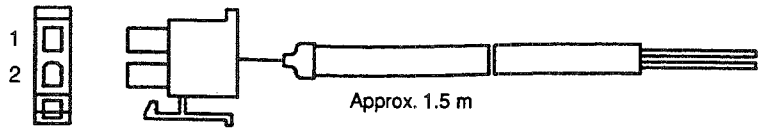
Wiring diagram



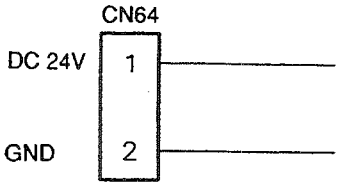
- Junction cord A asm. for the sewing machine for standing work has power connectors (A) which are colored in accordance with signals. Connect the switches as shown in the wiring diagram.
- Connect the cord to the connector (10. Connector connection diagram (16) CN8 12P) of the LK pedal on the PSC box.

(Caution) 1. Do not connect the cord to the LK pedal connector if a 1-pedal unit is used.
2. If a 2-pedal unit is used, connect the cord to the LK pedal connector.

(2) Junction cord A asm. for 24 Vdc (Part No. M9703351AA0)



Wiring diagram

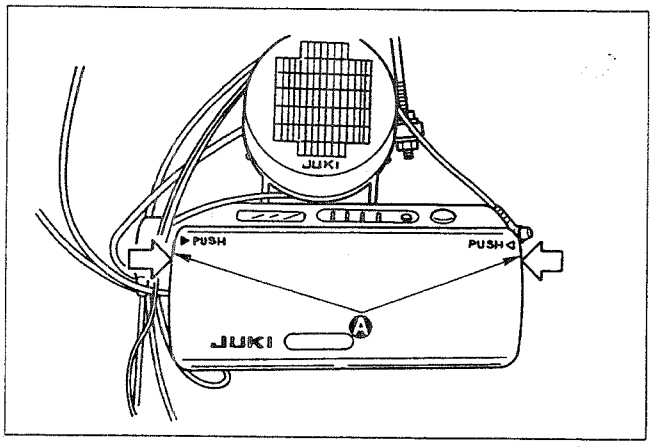


* Use the cord with a solenoid, for reference. (Up to 100 mA)

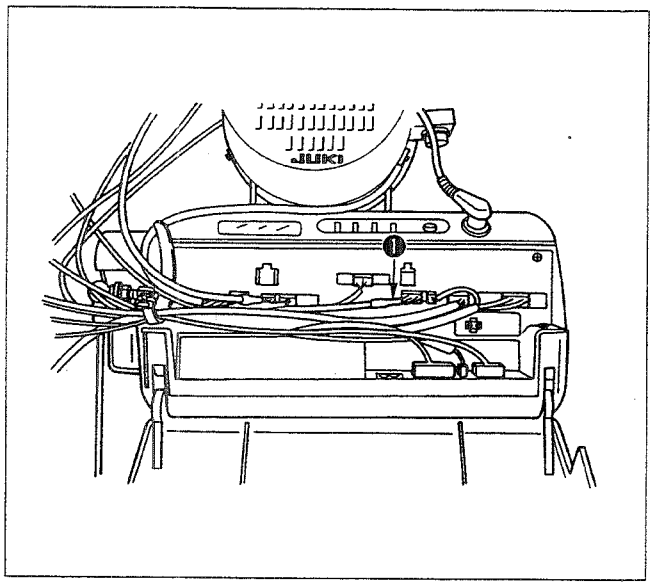
○ Use the cord with connected to the yellow connector (❺ CN64 2P on "10. Connector connection diagram") of 24 Vdc on the PSC box.

12. HOW TO REPLACE THE CIRCUIT BOARDS

(1) Replacing the LK pedal [M4001355AA0, M4001355BA0]

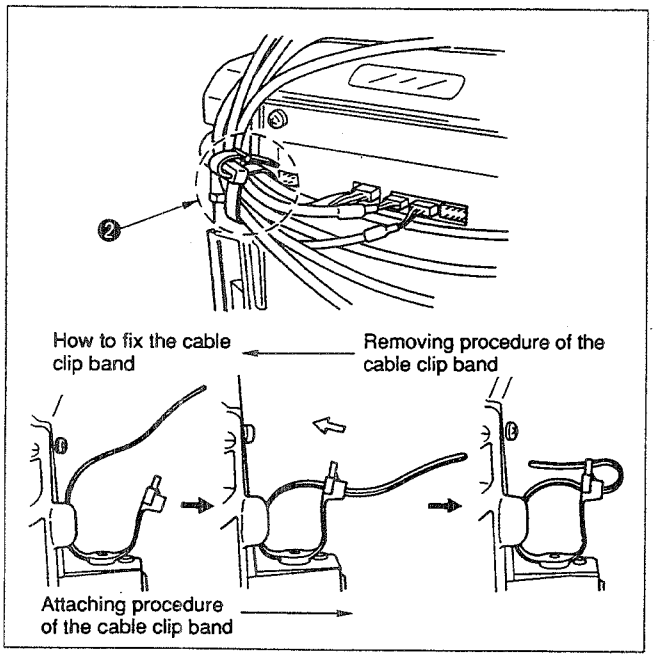


1. Push two points Ⓐ on both sides of the front cover to open the front cover.



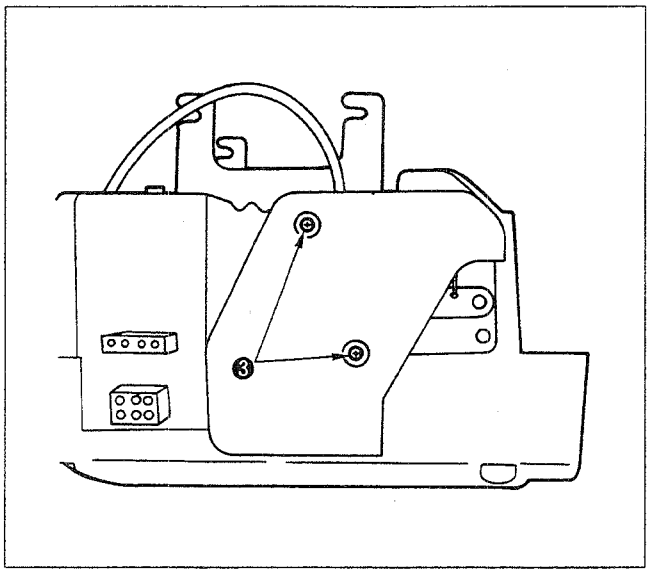
2. Remove LK pedal connector ❶ "  ."

(Caution) Be sure to remove the pedal connector while holding the connector section. (Removing the connector while holding the cord will cause imperfect contact.)

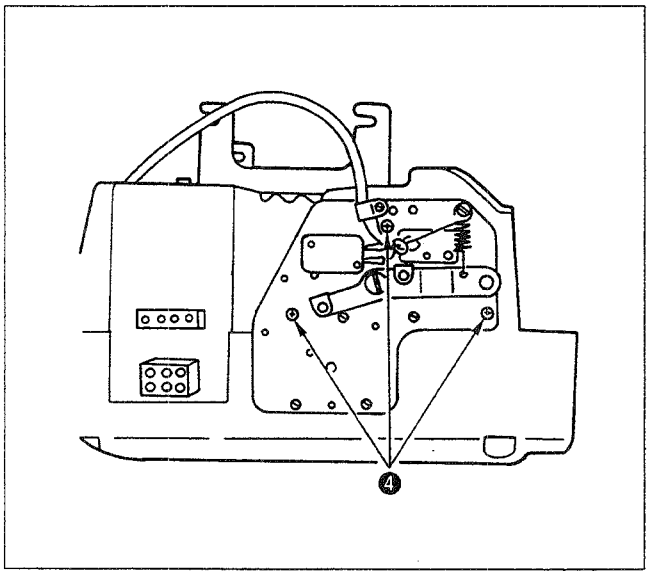


3. Remove cable clip band ❷ following the procedure described on the left to unbind the cords.

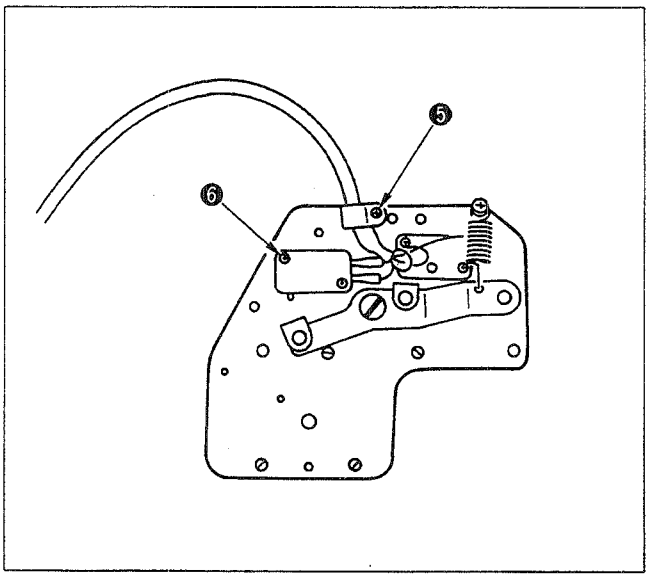
(Caution) The cable clip band is used repeatedly. So, do not cut it off with a pair of nippers or the like.



4. Remove two screws [M4, L=26] ❸ from the pedal cover using a screwdriver. Then remove the pedal cover.

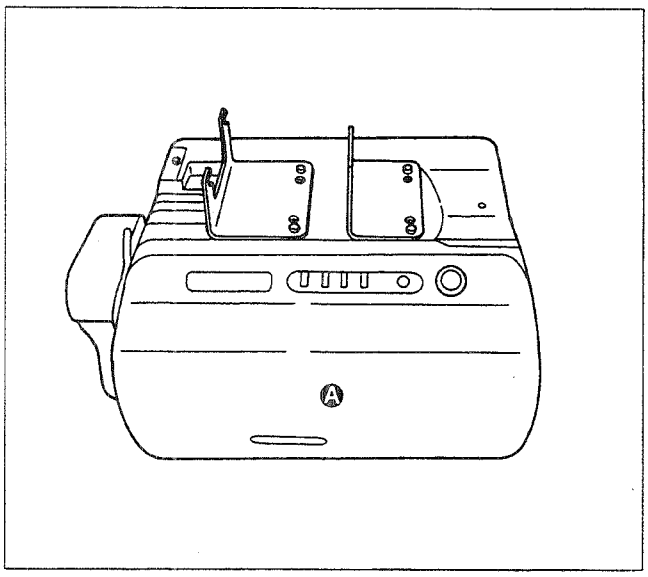


5. Remove three screws [M4, L=10] ❹ in the pedal asm. Remove the pedal unit from the PSC box.

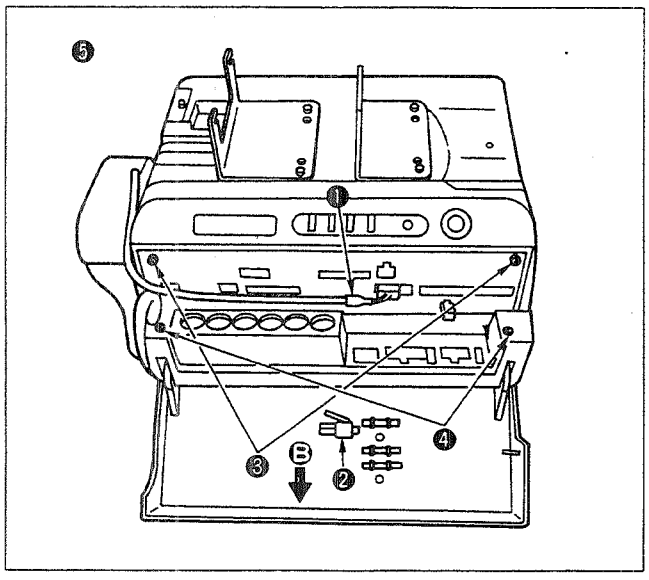


6. To replace the 1-pedal cord asm., remove screw [M4, L=8] ❺ from the cord clamp and four screws [M3, L=16] ❻ from the switch.
   After the replacement, adjust the LK pedal installed in accordance with "6. Adjusting the LK pedal."

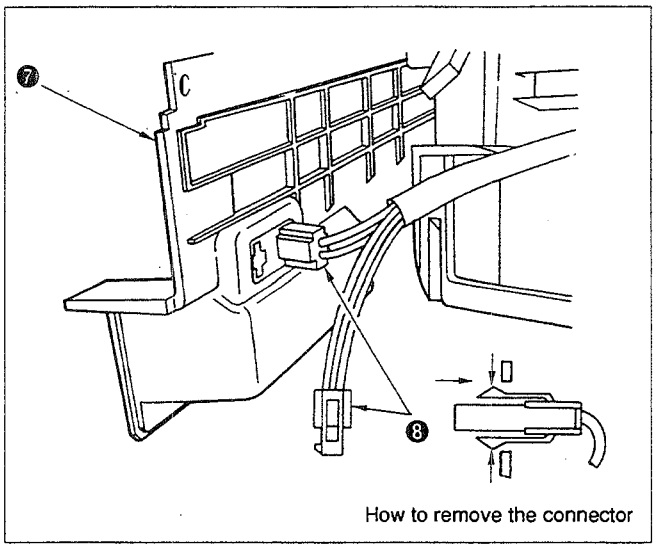
(2) How to replace the circuit boards on the PSC box



1. Open the front cover by pressing two points Ⓐ on both sides of the front cover.

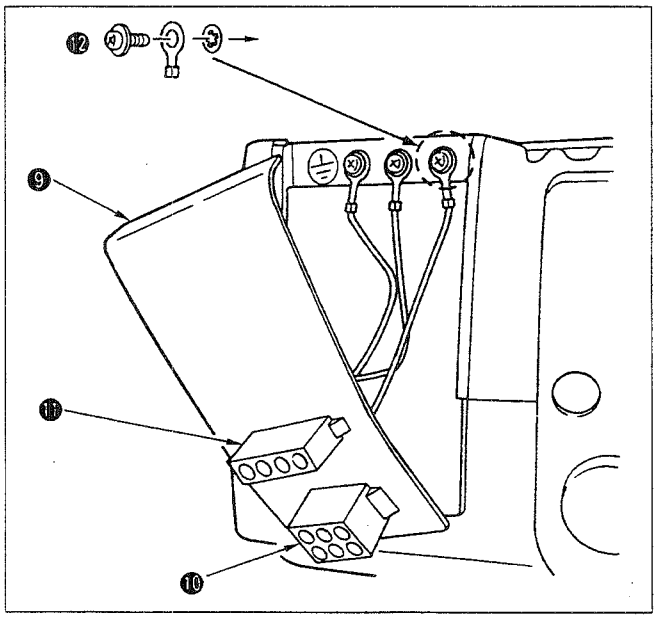


2. (1) Remove LK pedal connector ❶.
   (2) Press the front cover in direction Ⓑ (downward) until it comes off.
   (3) Holding the lock tab, remove transformer input change-over cord A asm. ❷.
   (4) Remove screws A ❸ and B ❹ which are used to install the connector panel.
   (5) Remove screw ❺ from the connector installing plate.



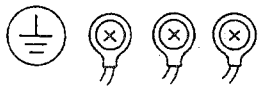
How to remove the connector

4. 1) Draw connector panel ⑦ toward you until it comes off. Press lamp power connector ⑧, while pinching the lock tab with your fingers, away from you until it comes off. (Refer to figure.)

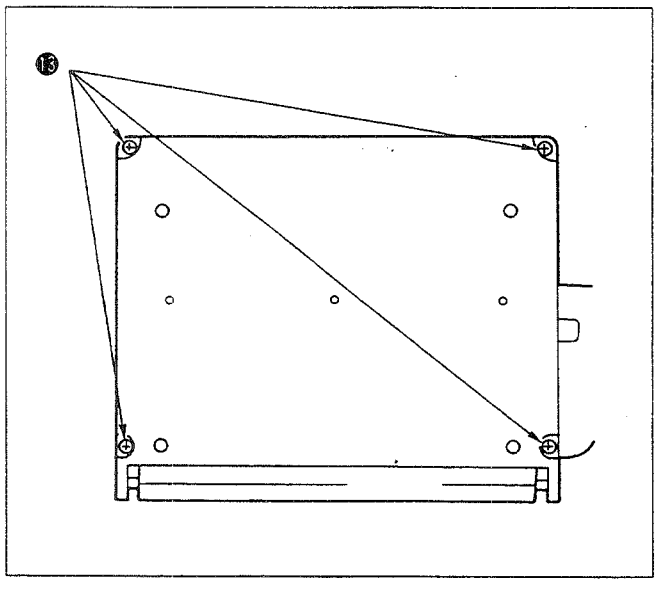


5. 1) Draw out AC input connector ⑩ (6P) and motor output connector ⑪ (4P) from connector installing plate ⑨.
   2) Loosen screw ⑫ which is used to retain the FG using a screwdriver and remove the FG.

(Caution) 1. The FGs have been factory-installed in the order as illustrated below at the time of delivery.

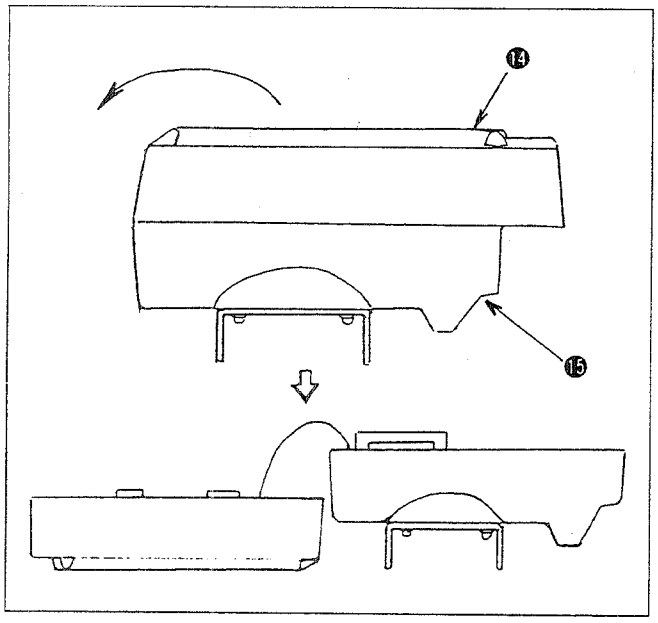


2. When removing the FG, take care not to drop the toothed washer.

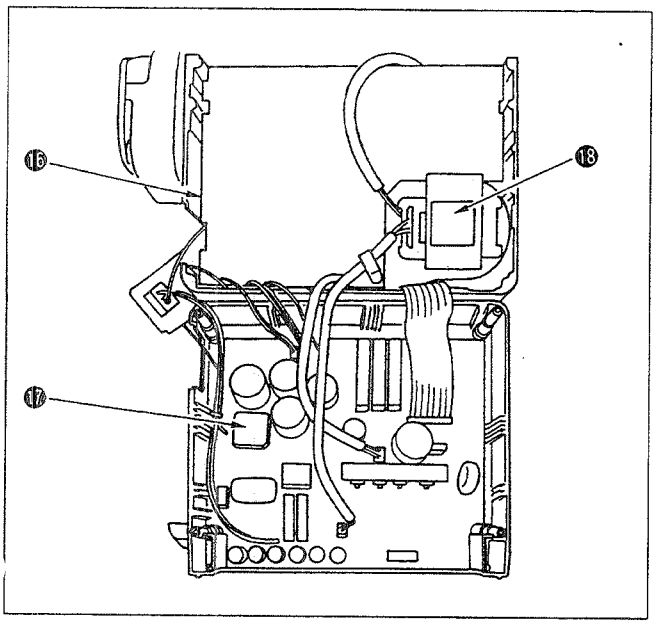


6. 1) Turn over the SC-5/-6 and loosen four screws ⑬ in the bottom cover using a screwdriver.

(Caution) 1. The screws for the bottom cover have been designed so that they hardly come off.

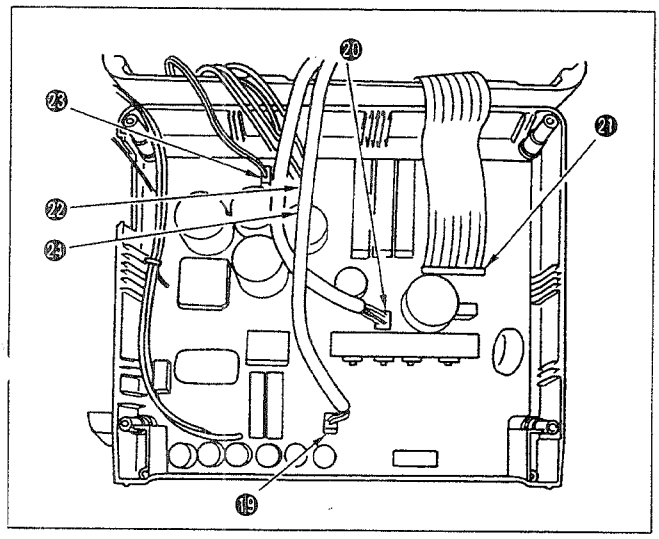


7. 1) Tilt bottom cover ⑭ in the direction of the arrow (⌒). Then detach bottom cover ⑭ from top cover ⑮.

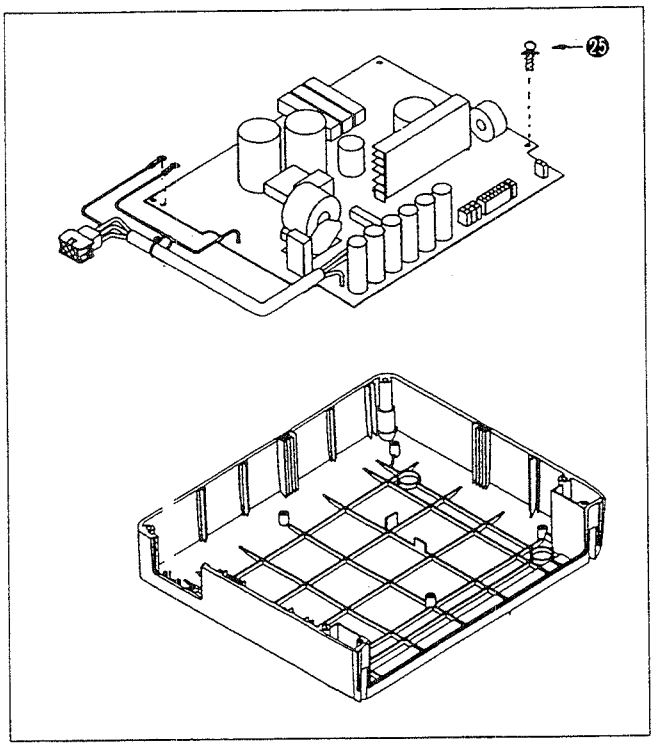


8. 1) When the the bottom cover and the top cover are separated from each other, you can observe CTL circuit board ** asm. ⑯, power circuit board ** asm. ⑰ and power transformer * asm. ⑱.

(Caution) The asterisk (*) mark of the assemblies indicate the type of circuit board and the destination.

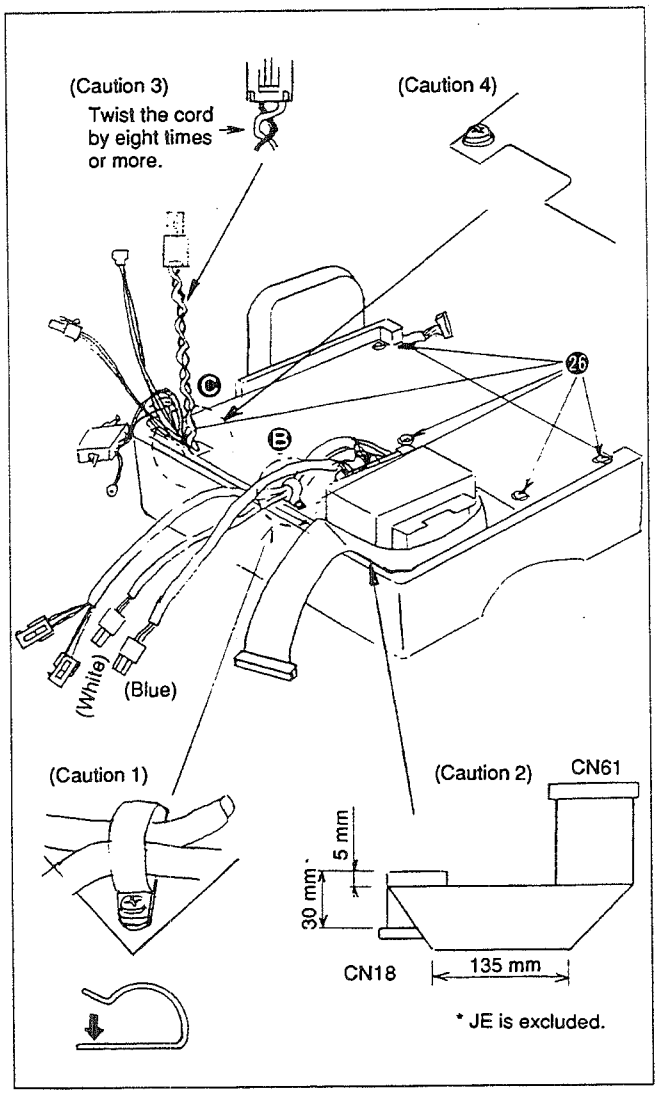


9. Power circuit board ** asm. [M860*351*A*]
   1) Remove transformer input connector (6P blue) ⑲ from CN57, and output connector (4P white) ⑳ from CN56.
   2) Remove I/F connector (34P) ㉑, which connects the power circuit board with the CTL circuit board, from the CN54, power connector (2P) ㉒ for RCC from the CN53, and power connector (2P) ㉓ for +15 V power supply from the CN51.
   3) Remove driver power connector (2P) ㉔ coming from the DRV circuit board from the CN52.



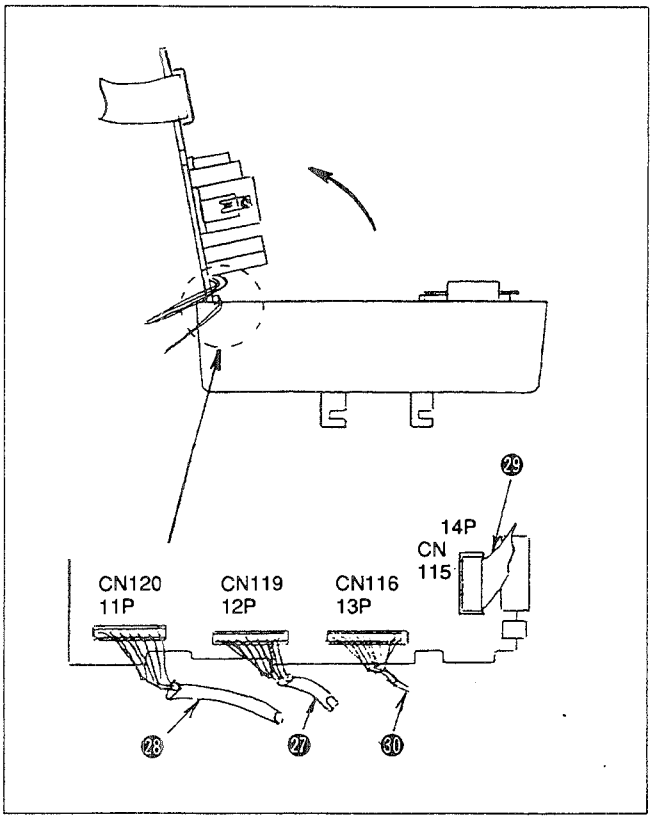
4) Remove six screws ㉕ from the power circuit board. Then, remove the power circuit board from the bottom cover.

(Caution) 1. Some connectors are equipped with a lock. Carefully connect/remove such a connector.



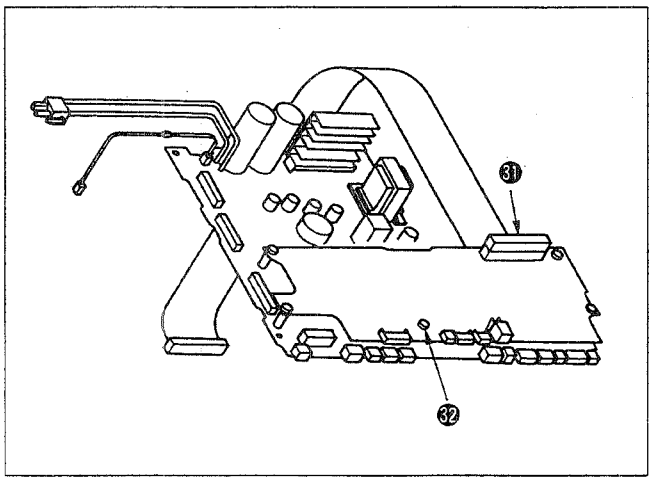
10. CTL circuit board ** asm. [M8601351*A*]
    1) Remove six screws ㉖ from the CTL circuit board. Then separate the CTL circuit board ** asm. from the top cover.

(Caution) 1. One of the six screws that is located in section Ⓑ is also used to fix the cable clamp. So, clamp the transfer cords, except the lamp output cord, with the cable clamp.
2. Bend the I/F cable which connects the CTL circuit board to the PWR circuit board as illustrated in the figure to allow it to bypass the transformer.
3. Twist the driver power cord by eight times of more.
4. Draw out the cords coming from the CTL circuit board and DRV circuit board which are to be connected to the other circuit boards through section Ⓒ of the CTL circuit board.



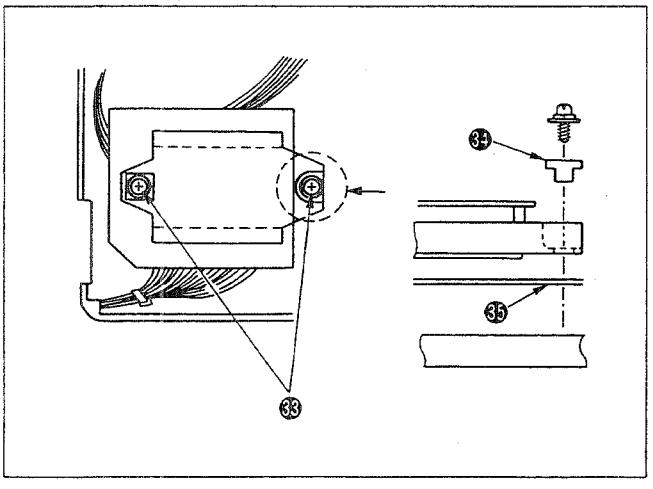
2) Raise the CTL circuit board as illustrated in the figure on the left. Remove DRV circuit board signal connector ㉗ from the CN119, and predriver power connector ㉘ from the CN120.
3) Remove junction connector ㉙ which is used to connect the CTL circuit board with the LCD circuit board from the CN115. Then remove junction connector ㉚ which is used to connect the CTL circuit board with the SW circuit board from the CN116.

(Caution) 1. Special attention must be attached not to erroneously connect the CN120, CN119 and CN116.



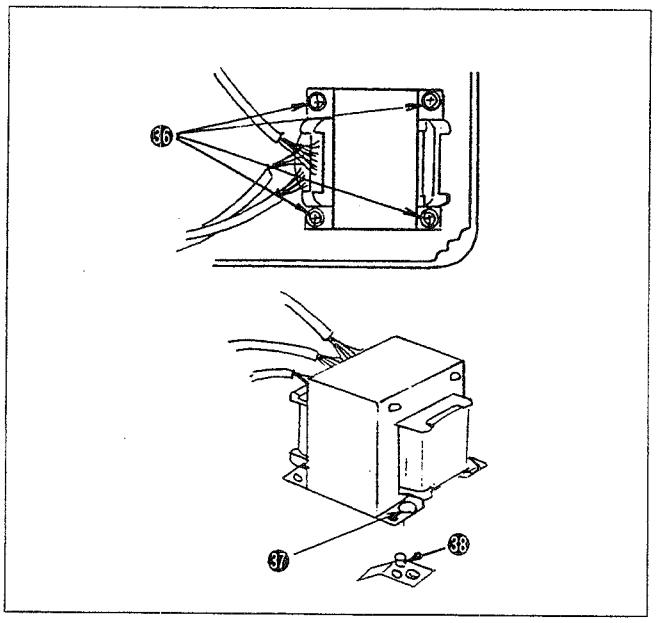
(For the SC-6)

4) Detach CTL junction cord connector ㉛ and remove five screws ㉜. in the LK SUB circuit board. Then, remove the LK SUB circuit board.



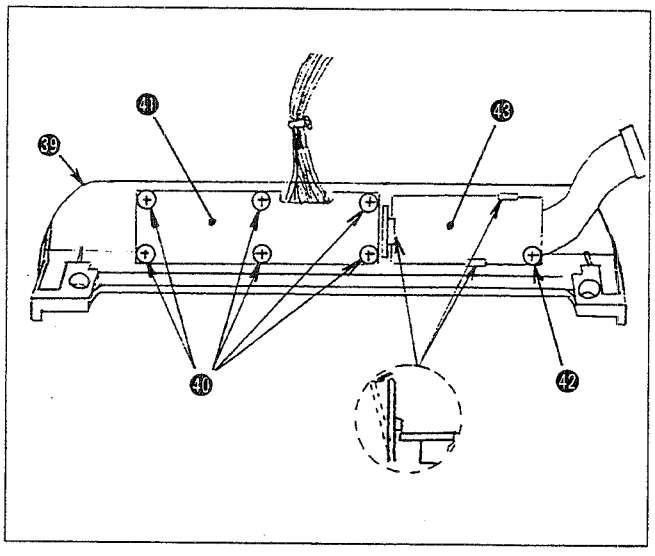
11. DRV circuit board ** asm. [M8602351AA*]
1) Remove screws ㉝ from the DRV circuit board using a screwdriver.

(Caution) 1. When assembling, be careful to attach spacer ㉞ and sheet ㉟, together with the screw, to the circuit board.



12. Power transformer asm. [M8502351*A0]
    1) Remove screws ㊱ from the power transformer with a screwdriver.

(Caution) 1. When assembling, be sure to align transformer positioning guide hole ㊲ with projection ㊳ on the top cover.



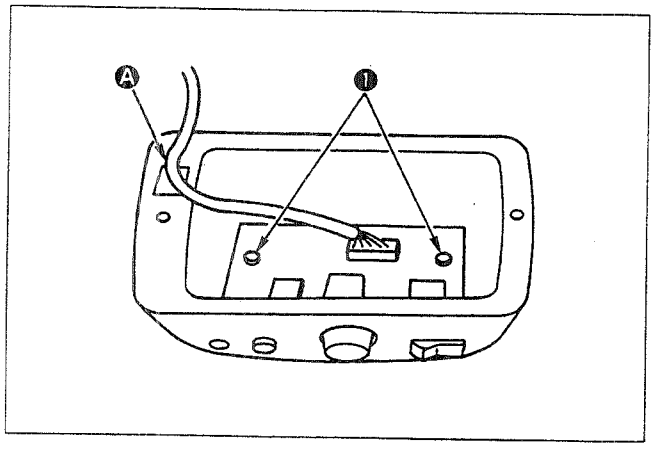
13. SW circuit board A* asm. [M8607351AA*]
    1) Remove screws ㊵ for the SW circuit board, using a screwdriver, from display setting device * asm. ㊴ . Then, remove SW circuit board * asm. ㊶ .

14. LCD unit A asm. [M8503351AA0]
    1) Remove screw ㊷ from the LCD unit with a screwdriver.
    2) Open the three circuit holders in the direction of the arrow (⇐), then remove LCD unit A asm. ㊸ .

(Caution) 1. Carefully opening the circuit board holder in the direction of the arrow (⇐), since they may break if you open them roughly.
2. Be careful not to excessively tighten the screws for the SW circuit board and LCD unit, since they are tapping screws.

When assembling the circuit boards after the replacement, follow the procedure for disassembling them in the reverse order.

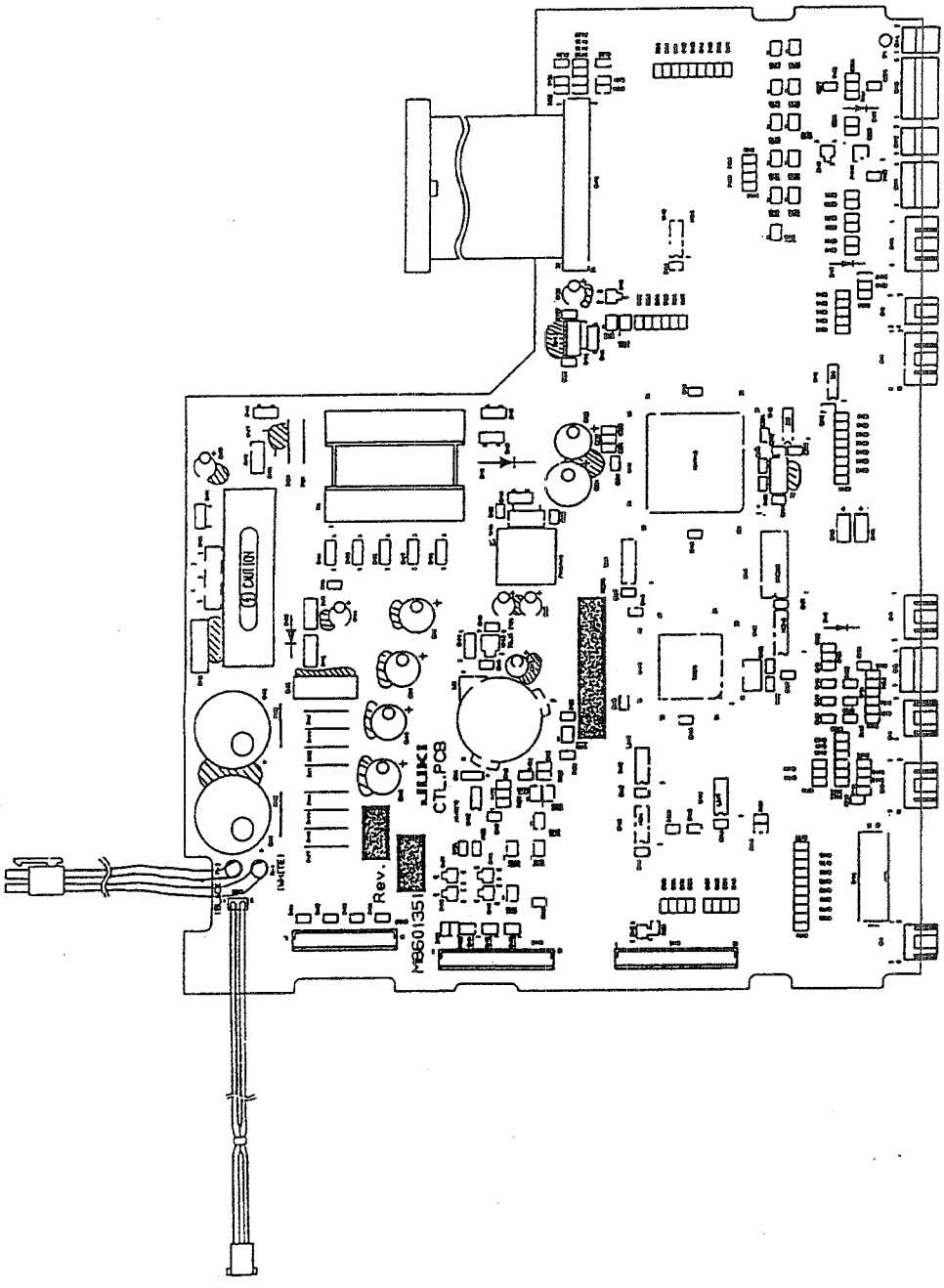
(3) OPR circuit board * asm. [M8601380*A0]



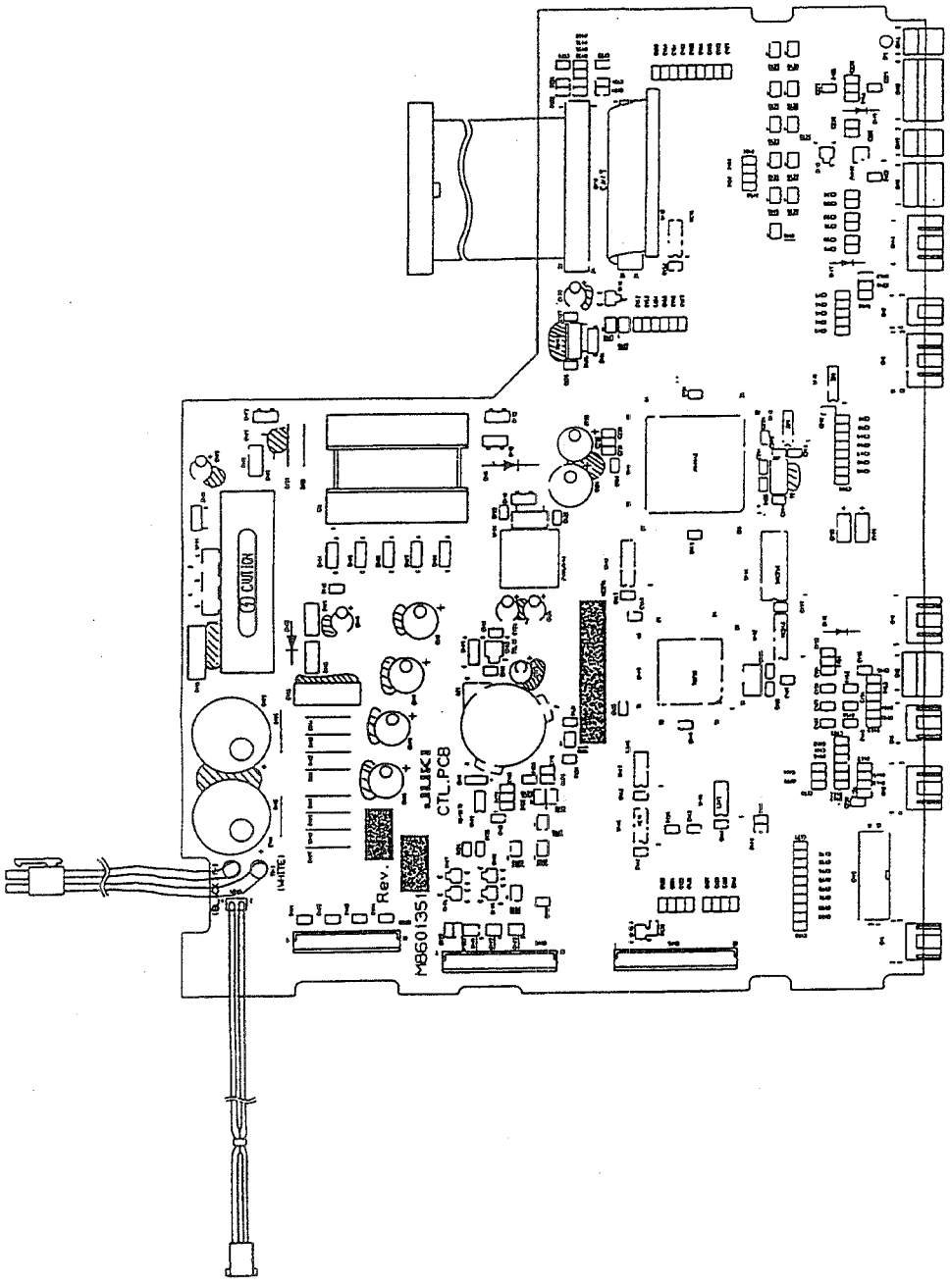
1. Remove screws ❶ from the OPR circuit board through the opening in the CP-10 or CP-11. Then, remove the cord from cord clamp Ⓐ.

13. CIRCUIT BOARD MOUNTING DIAGRAM

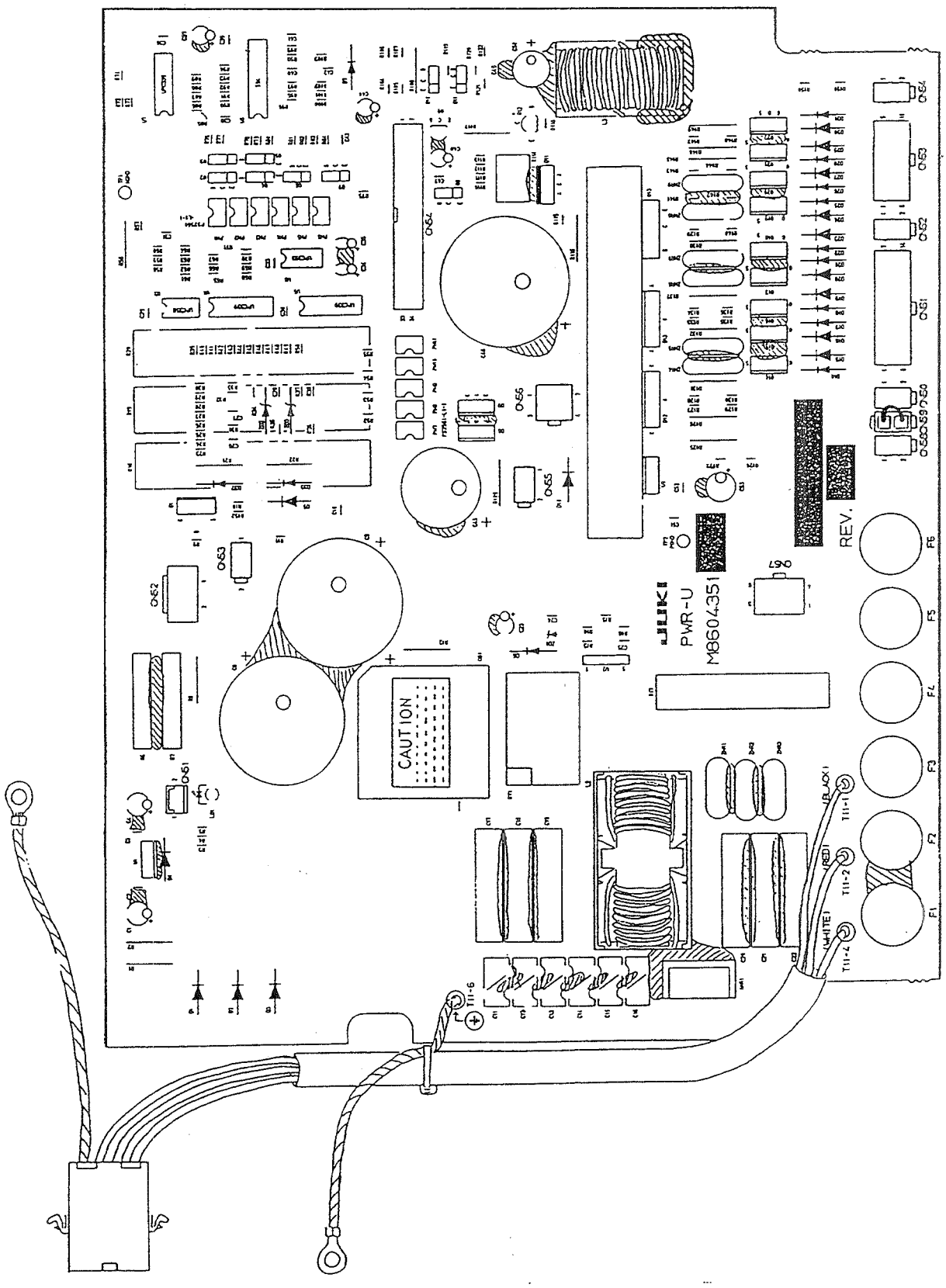
1) CTL circuit board EA asm. [M8601351EAA] : Excluding JE
   CTL circuit board EB asm. [M8601351EAB] : JE
   } SC-5



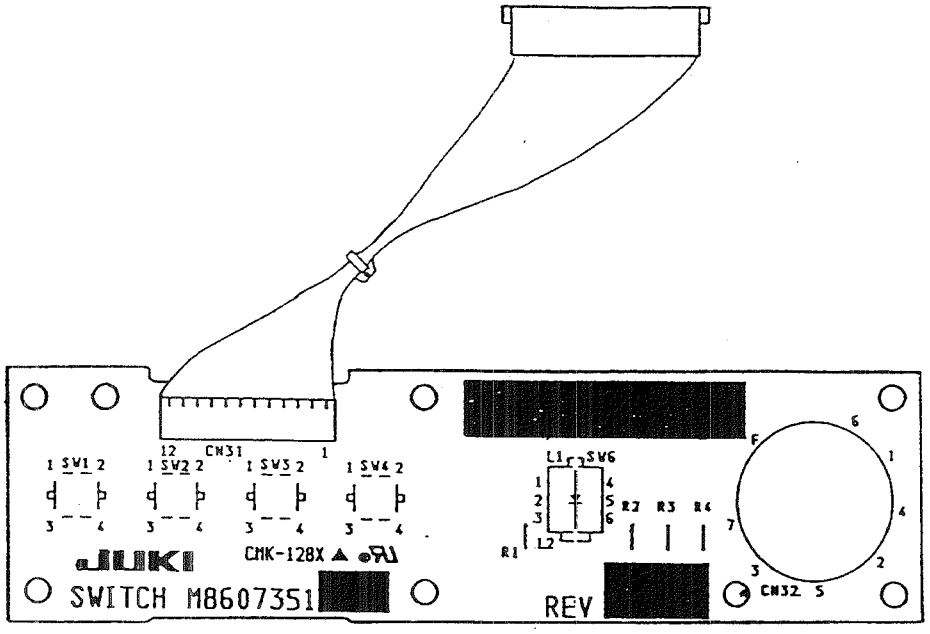
2) CTL circuit board GA asm. [M8601351GAA] : Excluding JE
CTL circuit board GB asm. [M8601351GAB] : JE } SC-6



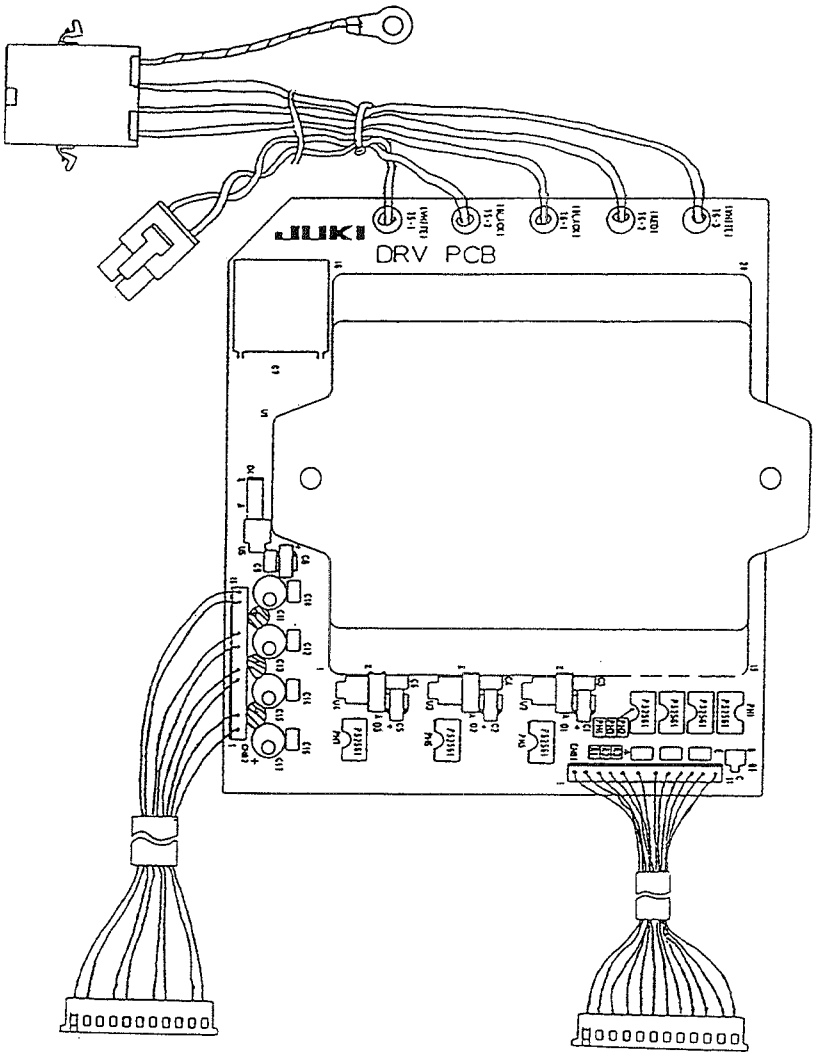
3) **Power circuit board B asm. [M8604351BA*] : General export ø3 200 to 240 V**
Power circuit board C asm. [M8605351CA*] : General export ø1 200 to 240 V
Power circuit board E asm. [M8604351EA*] : JA ø3 200 to 240 V
Power circuit board F asm. [M8605351FA*] : JA ø1 100 to 120 V
Power circuit board G asm. [M8605351GA*] : JE ø1 200 to 240 V
Power circuit board H asm. [M8605351HA*] : General export ø1 100 to 120 V



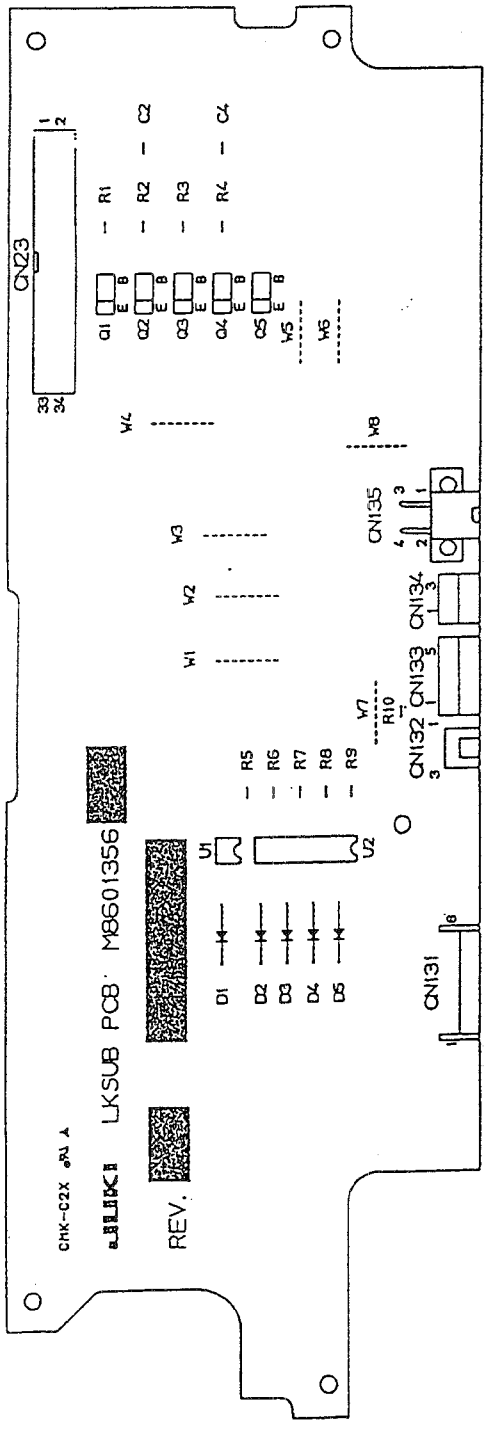
4) SW circuit board AA asm. [M8607351AAA] : Excluding JE
SW circuit board AB asm. [M8607351AAB] : JE



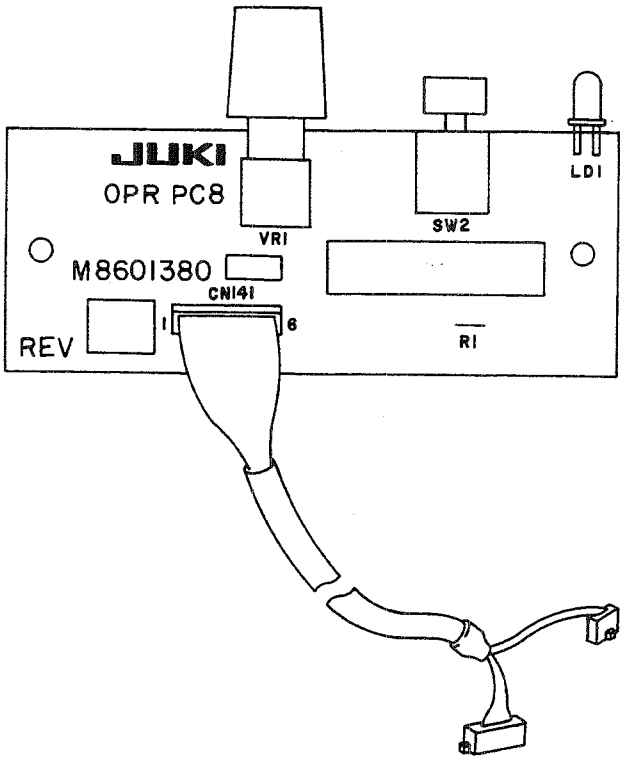
5) DRV circuit board AA asm. [M8602351AAA] : General export
DRV circuit board AB asm. [M8602351AAB] : JE
DRV circuit board AC asm. [M8602351AAC] : JA



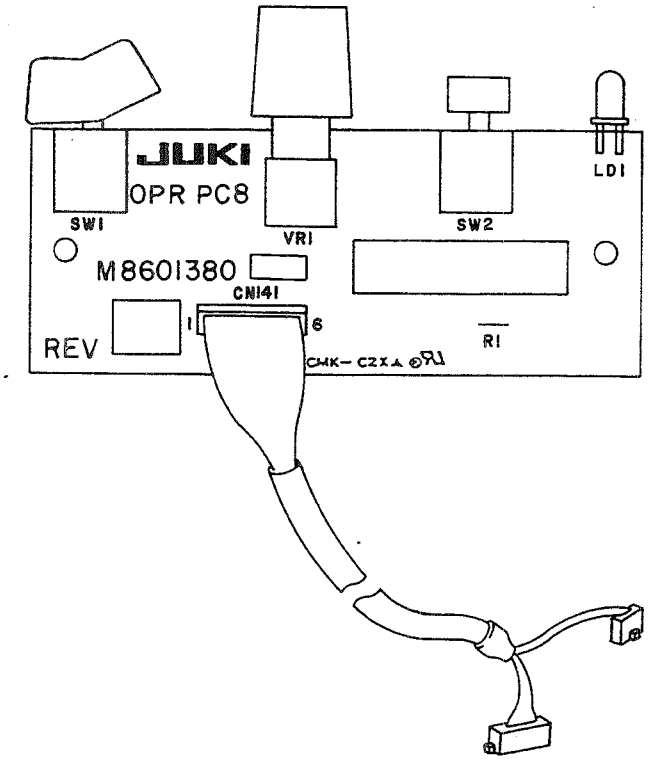
6) LK SUB circuit board A asm. [M8601356AA0] (SC-6)



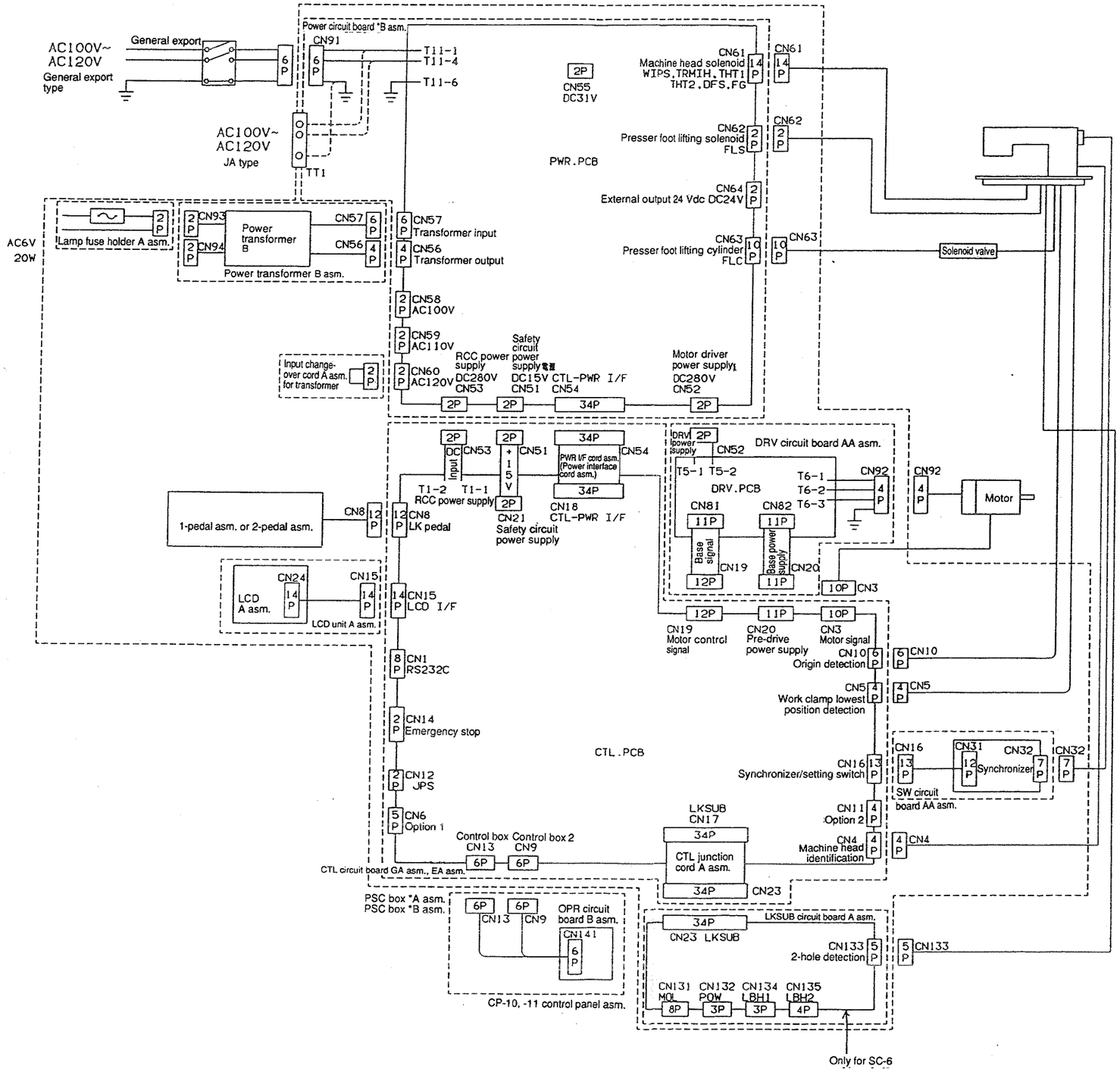
7) OPR circuit board A asm. [M8601380AA0] (CP-10)



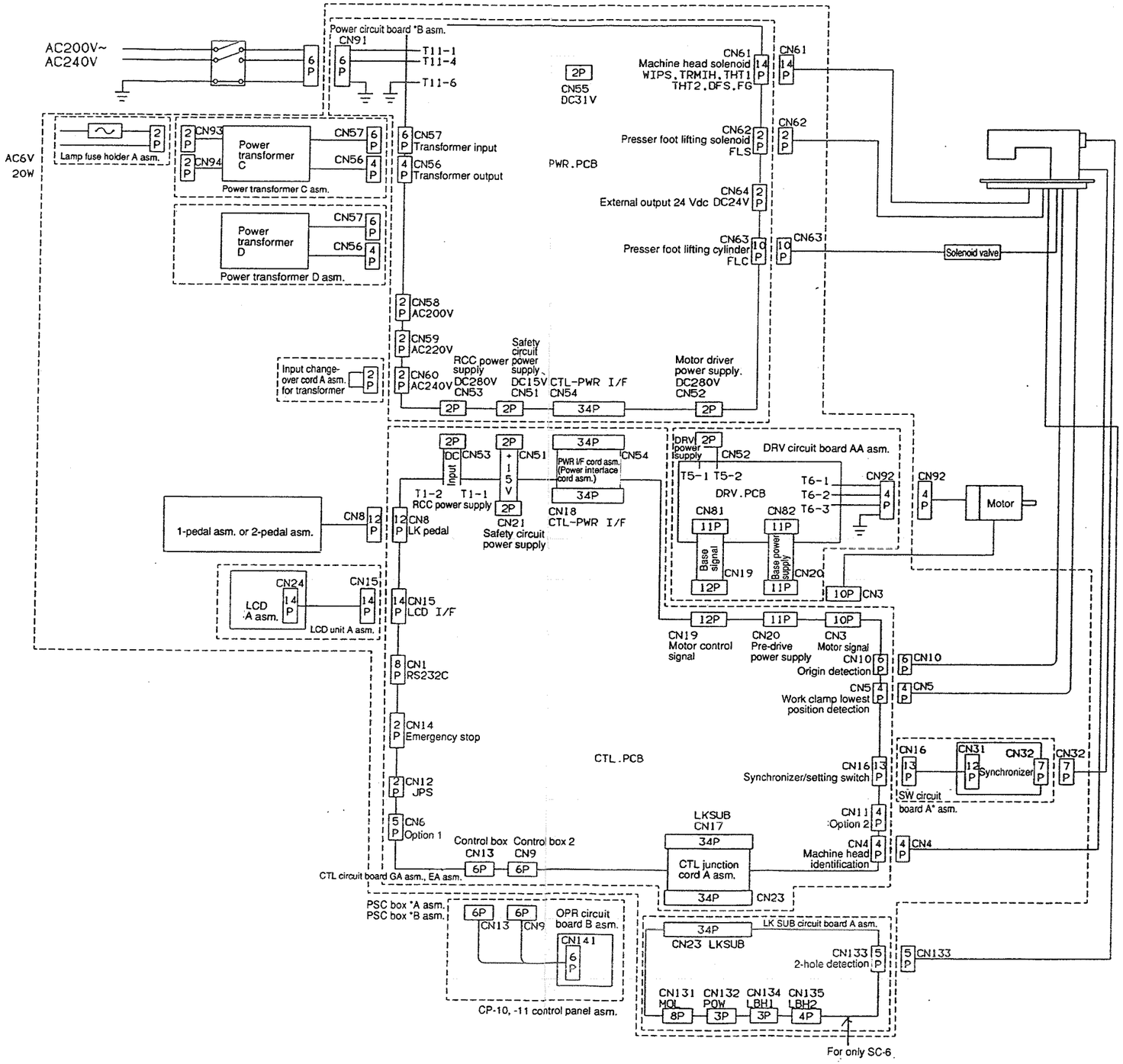
8) OPR circuit board B asm. [M8601380BA0] (CP-11)



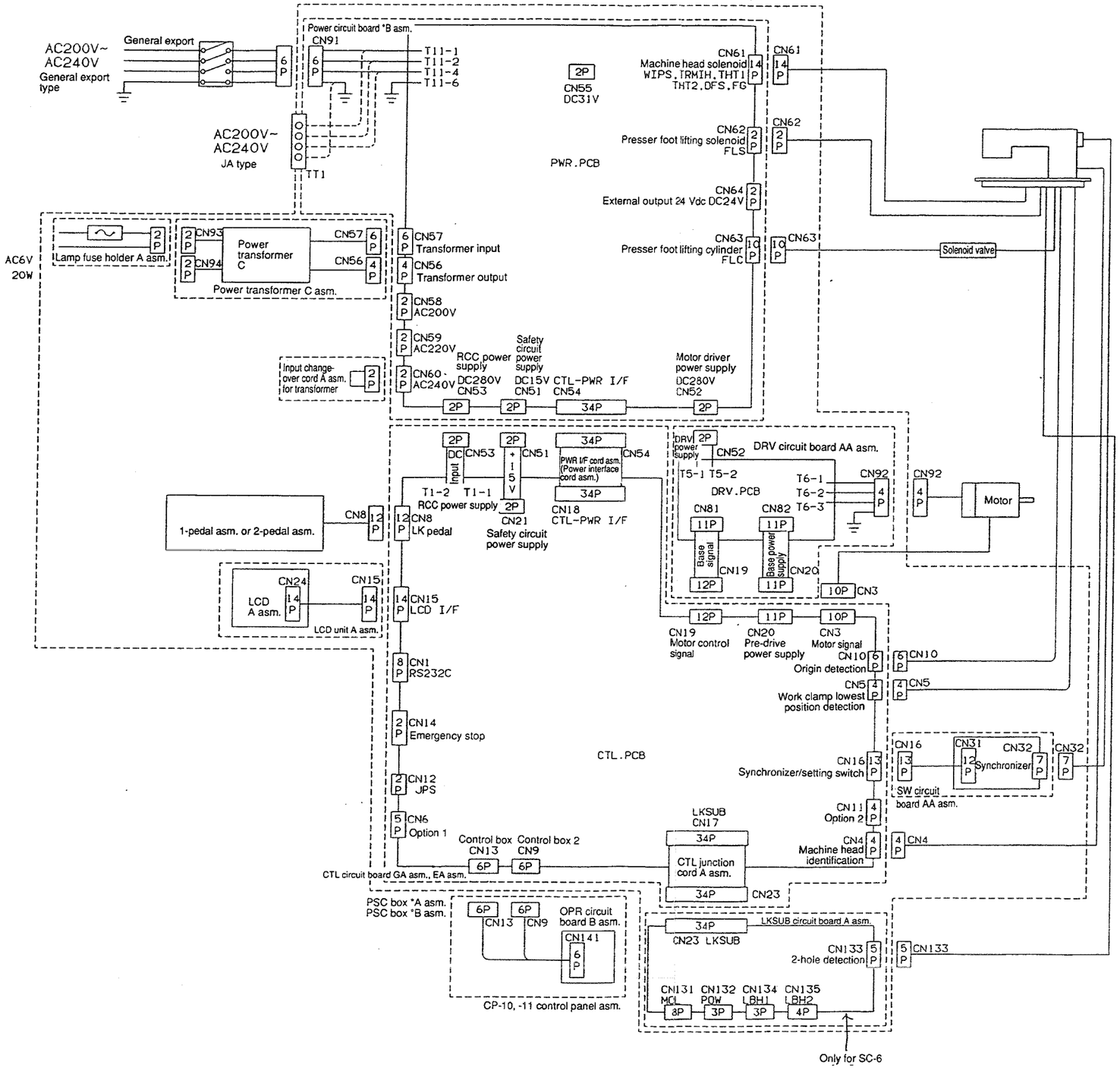
5. BLOCK DIAGRAM (3-PHASE AC100 ~ 120V)



15. BLOCK DIAGRAM (SINGLE-PHASE AC200 ~ 240V)



14. BLOCK DIAGRAM (SINGLE-PHASE AC200 ~ 240V)



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