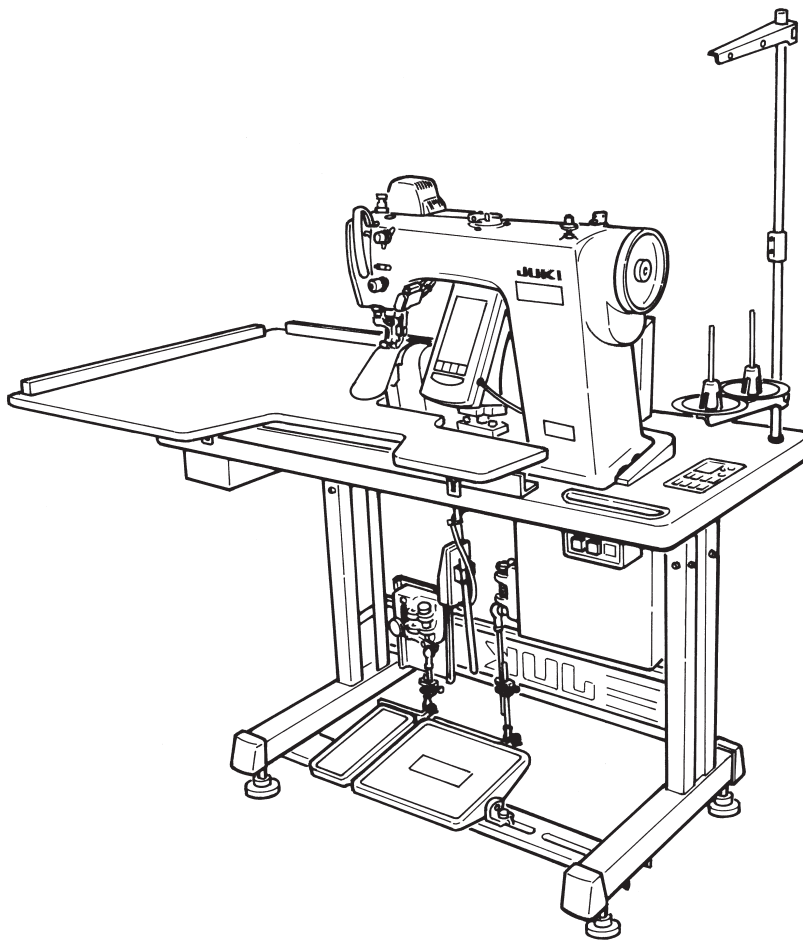


JUKI®

**Computer-controlled Dry-head, Lockstitch,
Sleeve Setting Machine
with Multi-programming Device**

DP-2100

ENGINEER'S MANUAL



40018531
No.E363-00

PREFACE

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

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

In addition, for the motor for the sewing machine with thread trimmer, refer to the separate Instruction Manual or Engineer's Manual for the motor. And for the control panel, refer to the Instruction Manual for the control panel.

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

CONTENTS

1. SPECIFICATIONS	1
2. CONFIGURATION	2
(1) Sewing machine main unit	2
(2) Operation panel	3
3. STANDARD ADJUSTMENT	4
(1) Adjusting the height of the needle bar	4
(2) Adjusting the needle and the hook	4
(3) Removing the main shaft motor and the coupling	6
(4) Adjusting the main shaft belt tension	8
(5) Adjusting the hook shaft belt tension	8
(6) Adjusting the feed belt tension	10
(7) Adjusting the height of the feed foot bar	12
(8) Adjusting the height of the presser foot bar	12
(9) Adjusting the amount of alternate vertical movement	14
(10) Height of the presser screw	16
(11) Assembling the guide plate	16
(12) Adjusting the initial position of the auto-lifter	18
(13) Adjusting the speed of the auto-lifter	18
(14) Adjusting the stroke of the auto-lifter	20
(15) Adjusting the thread trimmer cam	20
(16) Adjusting the initial position of the moving knife	22
(17) Adjusting the initial position of the thread trimmer solenoid	22
(18) Adjusting the position of the moving knife and the counter knife	24
(19) The fixing position of the auxiliary feed motor pulley	24
(20) The fixing position of the main feed motor pulley	26
(21) The fixing position of the thrust collar of AT solenoid	26
(22) The fixing position of the thread tension shaft collar	28
(23) Adjusting the height of the feed foot	28
(24) Adjusting the height of the auxiliary feed foot	30
(25) Adjusting the height of the presser foot	30
(26) Adjusting the feed eccentric cam	32
(27) Adjusting the assembly of the counter knife guard plate	32
(28) Replacing procedure of the top feed belt	34
(29) Replacing procedure of the bottom feed belt	48
4. PARTS TO BE GREASED	50
5. SET-UP MANUAL FOR IP-200	52
(1) Connecting procedure of operation panel with external vehicle	52
(2) Re-setup of operation panel	56
(3) Re-setup of main program	59
(4) Re-setup of servo program	65
(5) When using smart media other than that which has been packed together	71

6. INITIALIZING THE BACKUP DATA	72
7. SEWING DATA LIST	73
8. MEMORY SWITCH DATA LIST	76
9. ERROR CODE LIST	82
10. TROUBLES AND CORRECTIVE MEASURES	87
(1) Mechanical parts	87
(2) Electrical parts.....	93
11. CIRCUIT DIAGRAM	104
(1) Block diagram (1/2)	104
(1) Block diagram (2/2)	105
(2) Head and table/stand circuit diagram.....	106
(3) Main and panel circuit diagram	107
(4) Power source A circuit diagram	108
(5) Power source B circuit diagram	109
(6) Power source C circuit diagram	110
(7) Motor circuit diagram	111
(8) Servo motor circuit diagram	112
12. VARIOUS PRINTED WIRING BOARDS	113
(1) FLT-T p.c.b.	113
(2) FLT-S p.c.b.	113
(3) PWR p.c.b.	114
(4) MAIN p.c.b.	114
(5) PANEL p.c.b.	115
(6) DATA p.c.b.	115
13. DRAWING OF THE TABLE	116
(1) Slant table	116
(2) Work top table	117
(3) Edge Stopper A	118
(4) Edge Stopper B	119

1. SPECIFICATIONS

No.	Item	Specifications	
1	Model	DP-2100	
2	Model name	Computer-controlled dry-head, lockstitch, sleeve setting machine with a multi-program device	
3	Max. sewing speed	3,500 rpm (*1)	
4	Feed system	Intermittent belt feed by direct drive of stepping motor	
5	Stitch length	Both top and bottom 1.5 to 6 mm	
6	Stitch length adjustment system	Panel input	
7	Stitch length adjustment minimum resolution	0.1mm	
8	Needle bar stroke	30.7mm	
9	Needle	DP X 17 #10 to #14	
10	Hook	Full-rotary non-lubrication horizontal-axis hook	
11	Bobbin case	Bobbin case for full-rotary non-lubrication horizontal-axis hook	
12	Bobbin	Standard aluminum bobbin	
13	Presser foot lift	By hand lifter : 5.5 mm, by auto-lifter : 10 mm	
14	Amount of alternate vertical movement of presser foot/feed foot Max.	3.5 mm (0.2 to 0.3 mm at the time of delivery)	
15	Adjustment of amount of alternate vertical movement of presser foot/feed foot	Slot stop position adjustment	
16	Lubrication	Non-lubrication	
17	Number of programs that can be inputted	99 programs	
18	Number of steps that can be inputted (per program)	30 steps	
19	Data mirroring	Provided	
20	Right/left alternate sewing	Possible	
21	Data record	Smart media	
22	Grease	Exclusive grease : 23640204 (500g can) JUKI grease A : 40006323 (tube of 10g)	
23	Weight of complete set	106 Kg (head 65 Kg)	
24	Control box model	MC-650	
25	Power voltage	3-phase 200V/220V/240V	Single phase 220V/230V/240V
26	Frequency	50Hz / 60Hz	
27	Rated current	2.6A/2.4A/2.2A	2.8A/2.6A/2.5A
28	Power/power consumption	560VA	
29	Operating temperature/humidity	0 to 40, Less than 90%	
30	Noise	Workplace-related noise at sewing speed n=3,000 min ⁻¹ : L _{PA} 84dB(A) Noise measurement according to DIN 45635-48-A-1	

- * 1. The maximum sewing speed is limited in accordance with the amount of alternate vertical movement of presser foot and feed foot, and stitch length.
 2. Limitation by the stitch length is automatically limited.
 3. Set the limitation by the amount of alternate vertical movement with the memory switch K02.

Limitation by the amount of alternate vertical movement of presser foot and feed foot

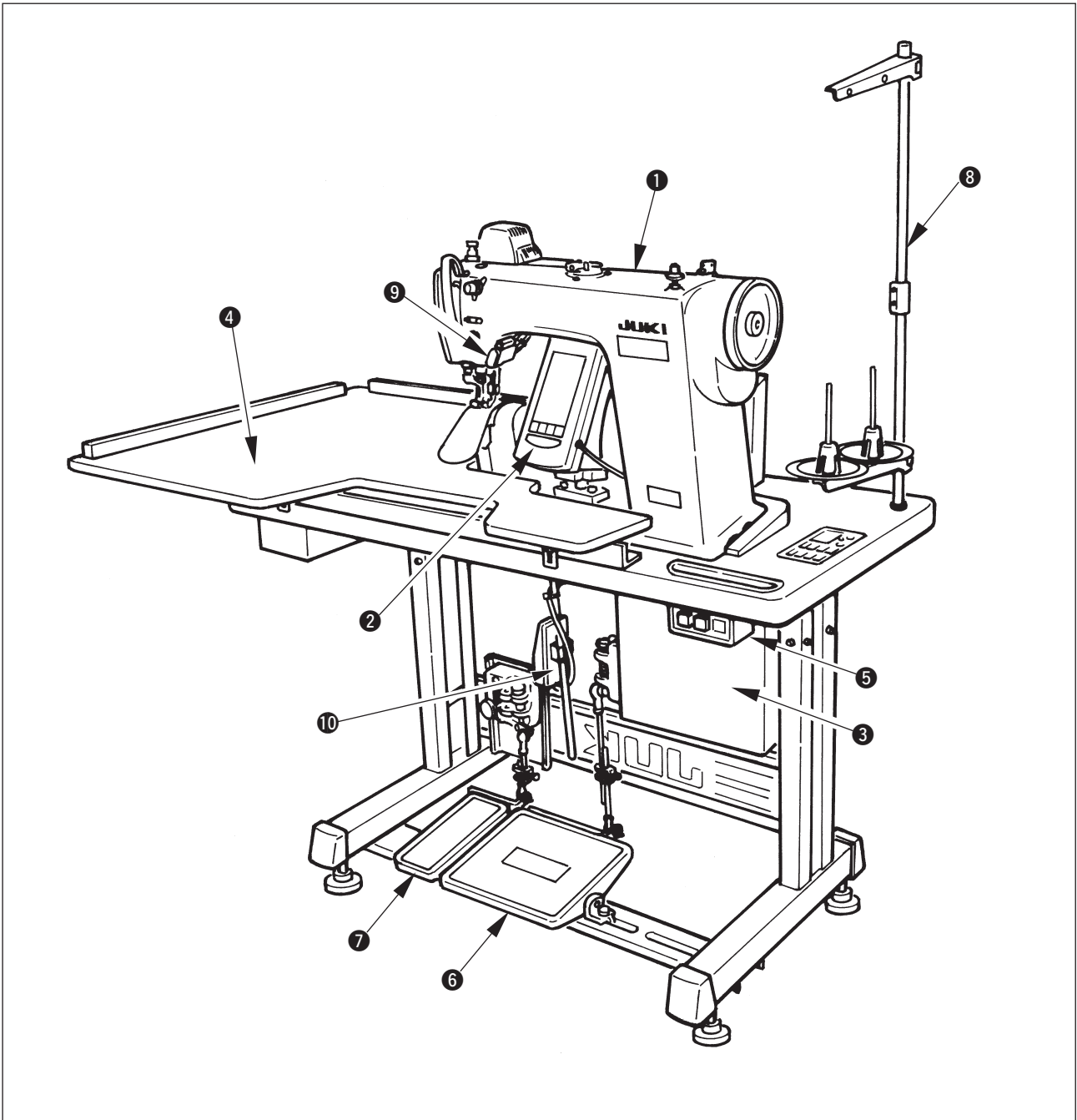
Max. sewing speed (rpm)	Amount of vertical movement of feed foot (mm)	Amount of vertical movement of presser foot (mm)
3,500	Less than 0.3	(2.7)
2,600	Not less than 0.3 to 1.5	(1.5)
2,000	Not less than 1.5 to 2.5	(2.5)
1,600	Not less than 2.5 to 3.5	(3.5)

Limitation by stitch length

Max. sewing speed (rpm)	Stitch length (mm)
3,500	1.5 to 4.0
2,500	4.1 to 6.0

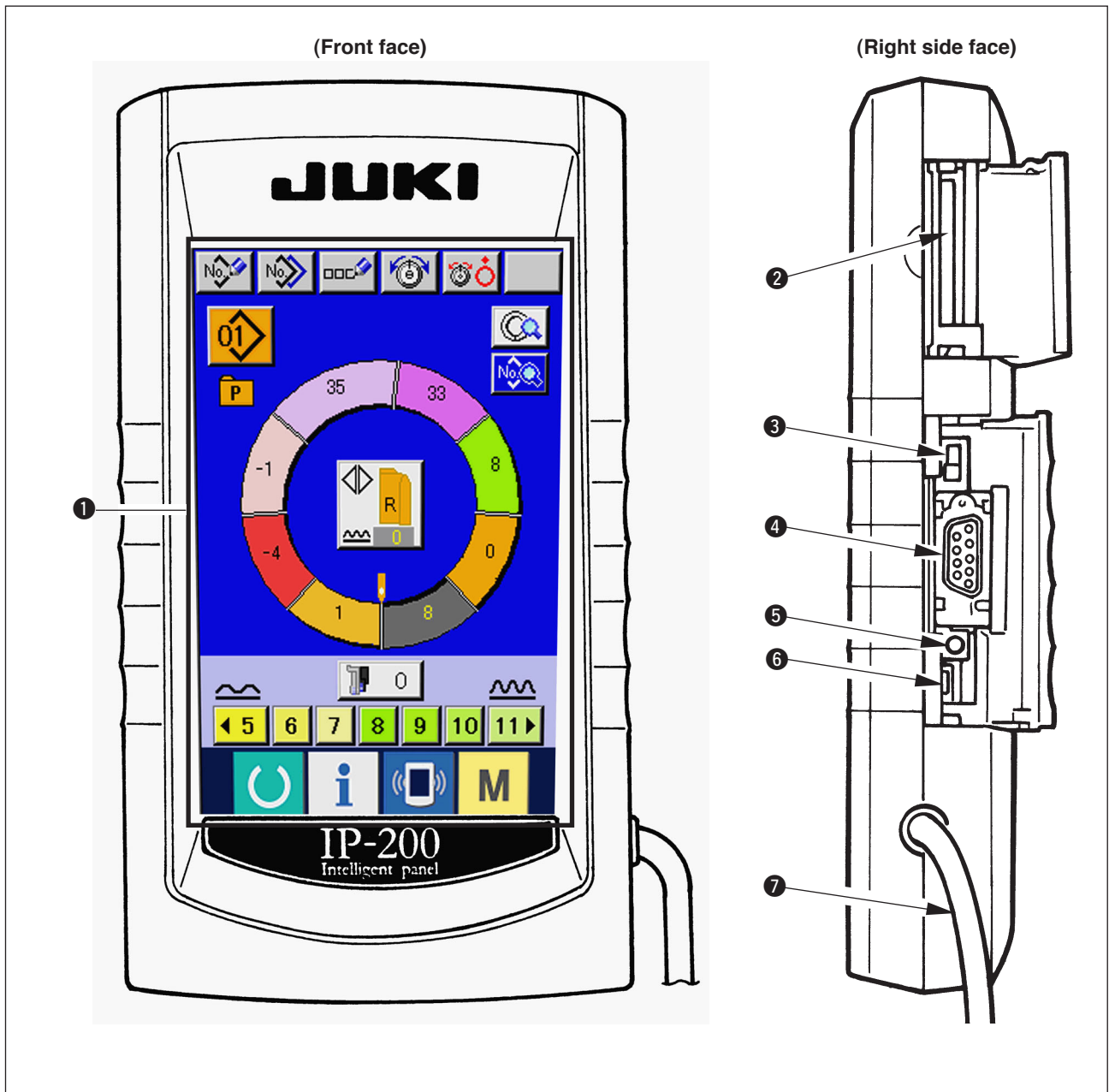
2. CONFIGURATION

(1) Sewing machine main unit



- ① Sewing machine head
- ② Operation panel
- ③ Control box
- ④ Auxiliary table (WORK TOP TABLE)
- ⑤ Power switch
- ⑥ Main pedal
- ⑦ Auxiliary pedal
- ⑧ Thread stand
- ⑨ Shirring release switch
- ⑩ Knee switch for step changeover

(2) Operation panel



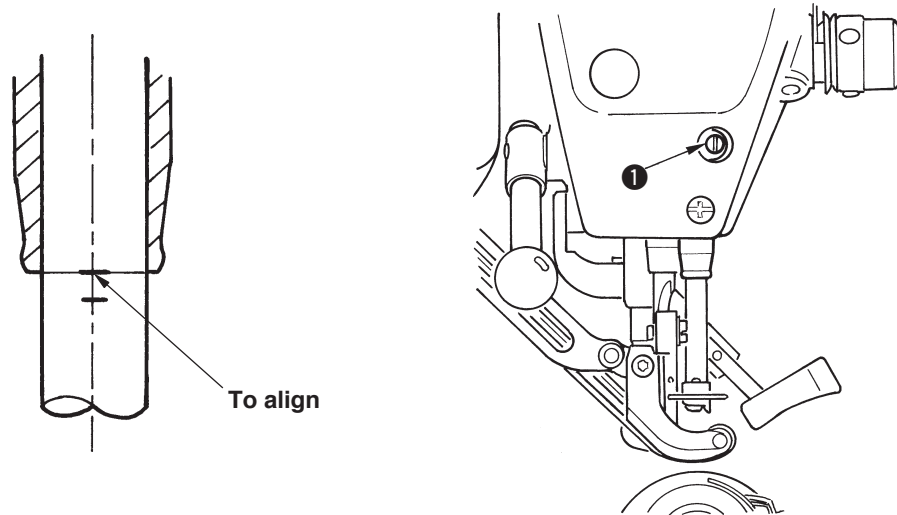
- ① Touch panel, LCD display section
- ② Smart media slot card (Use with the lid closed.)
- ③ Slide switch (Unused · OFF)
- ④ Connector for RS-232C communication
- ⑤ Variable resistor for adjusting color LCD screen contrast
- ⑥ Connector for external input
- ⑦ Cable

3. STANDARD ADJUSTMENT

(1) Adjusting the height of the needle bar

Standard Adjustment

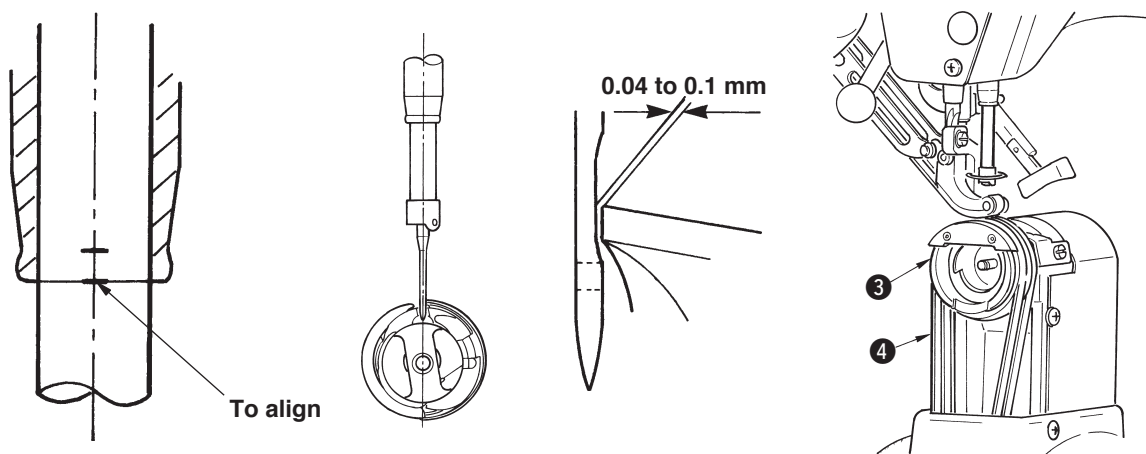
1. Bring the needle bar to its lower dead point, and adjust so that the upper marker line engraved on the needle bar aligns with the bottom end face of the needle bar lower bushing.



(2) Adjusting the needle and the hook

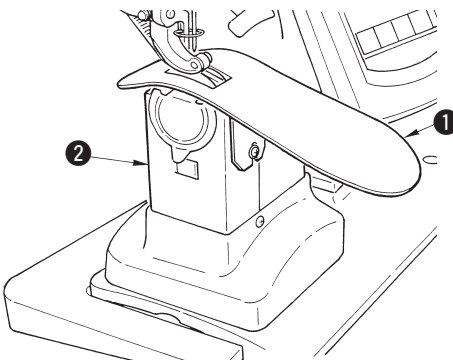
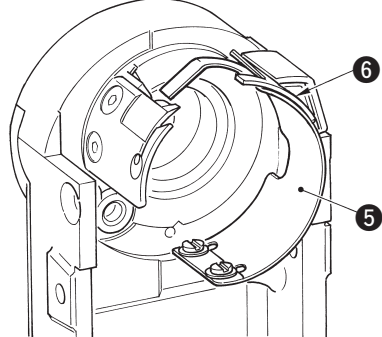
Standard Adjustment

1. Adjust the blade point of hook to the center of needle so that the clearance between the blade point and the needle is 0.04 to 0.1 mm when the lower marker line engraved on the needle bar aligns with the bottom end face of the needle bar lower bushing. Then tighten three setscrews in the hook.



* RP hook (dry hook) rolls thread waste or cloth dust, and there is a possibility of breakdown or sewing trouble. Periodically perform cleaning of the hook.

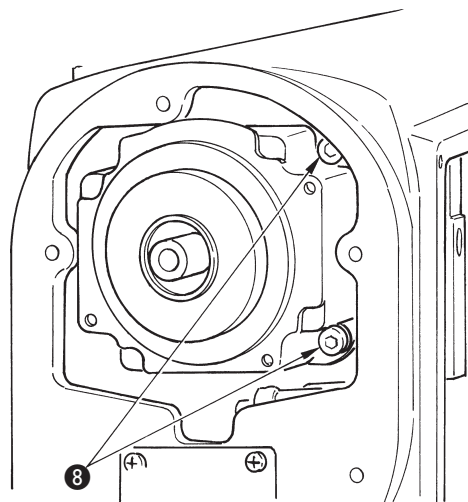
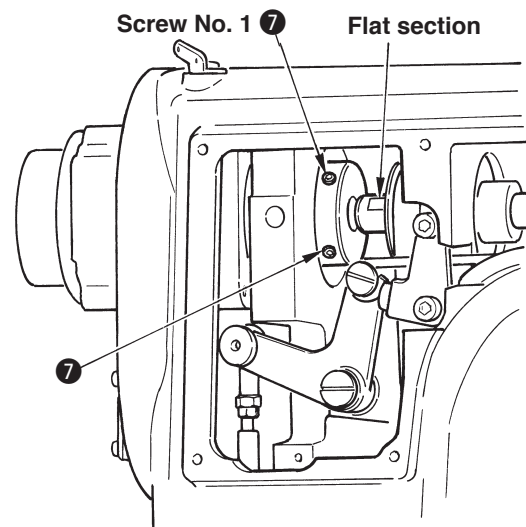
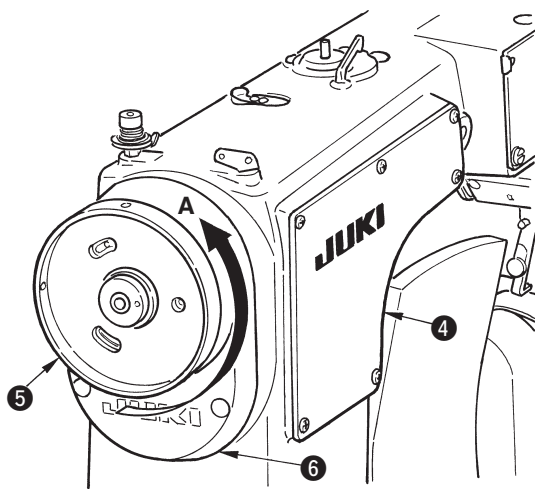
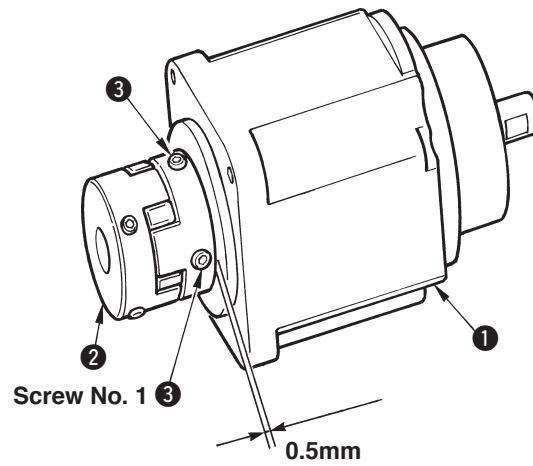
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Turn the handwheel by hand to bring the needle bar to its lower dead point. 2. Remove the plug of the face plate cover. 3. Loosen needle bar connection setscrew ❶ to adjust the height. 4. Tighten needle bar connection setscrew ❶, and attach the plug. 	<ul style="list-style-type: none"> ○ Stich skipping or thread breakage may occur.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Remove throat plate auxiliary plate ❶, hook cover asm. ❷ and hook base ❸. 2. Turn the handwheel and adjust the lower marker line engraved on the needle bar to the bottom end face of the needle bar lower bushing. 3. Loosen three setscrews in the hook, adjust the needle to the blade point, and tighten three setscrews in the hook. 4. Put bottom feed belt ❹ on hook base ❸, and assemble them to the hook shaft base. 5. Assemble throat plate auxiliary plate ❶ and hook cover asm. ❷.  <p>The diagram shows a side view of the hook assembly. Callout 1 points to the throat plate auxiliary plate, callout 2 points to the hook cover assembly, and callout 3 points to the hook base.</p>	<ul style="list-style-type: none"> ○ When the clearance is excessively narrow, the blade point of hook is damaged, and when it is excessively wide, stitch skipping will be caused. ○ Place counter knife guard plate ❺ located inside hook base ❸ to the inside of counter knife ❻ since pull-up trouble will be caused.  <p>The diagram shows a top-down view of the hook assembly. Callout 5 points to the counter knife guard plate, and callout 6 points to the counter knife.</p>

(3) Removing the main shaft motor and the coupling

Standard Adjustment

1. Clearance between main shaft motor ① and coupling ② has to be 0.5 mm.

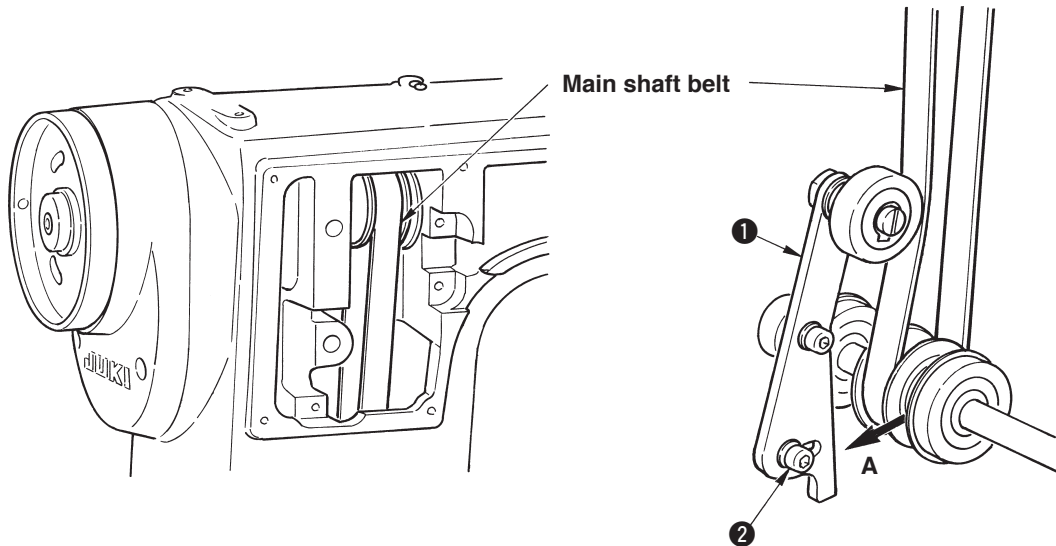


Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen the respective setscrews in side plate ④, pulley ⑤ and pulley cover ⑥, and remove the respective parts. 2. Loosen two setscrews ⑦ in the coupling. 3. Loosen four setscrews ⑧ in the main shaft motor and remove main shaft motor ①. 4. Loosen two setscrews ③ in the coupling. 5. Insert a spacer of 0.5 mm between the end of main shaft motor ① and coupling ②, and tighten setscrews ③ in the coupling. 6. When assembling, assemble in the aforementioned order of 3, 2, and 1 in the reverse order of removing. <p>(Caution) When tightening setscrews ③ and ⑦ in the coupling, assemble so that screw No. 1 in terms of the rotating direction A of the main shaft should come to the flat sections of main shaft motor ① and the main shaft.</p>	<ul style="list-style-type: none"> ○ When setscrews ③ and ⑦ in the coupling are not adjusted to the flat section of main shaft motor ① and that of the main shaft : <ol style="list-style-type: none"> 1. UP-stop position does not come near to 50°. 2. Thread is not cut.

(4) Adjusting the main shaft belt tension

Standard Adjustment

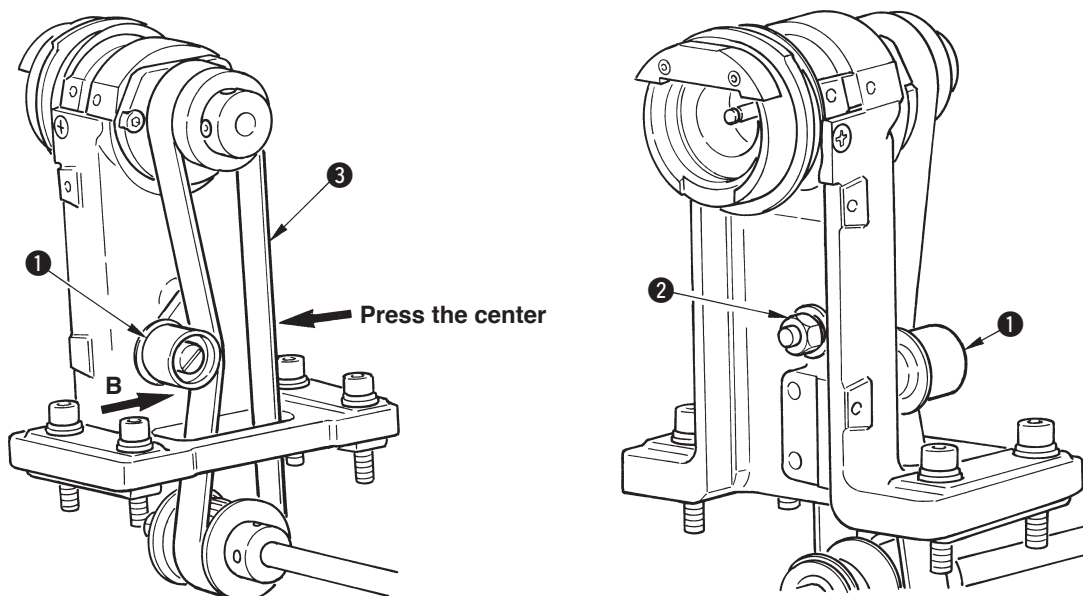
1. Press in the direction of **A** with a load of 19.6 N (2 Kgf), and tighten setscrew **2**.



(5) Adjusting the hook shaft belt tension

Standard Adjustment

1. The hook shaft belt has to sag 3 mm when the center of hook shaft belt **3** is pressed with a load of 1.3N (130gf).



Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrew ② in idler installing plate ①. 2. Press idler installing plate ① in the direction of arrow mark A with a load of 19.6 N (2 Kgf), and tighten setscrew ②. 	<ul style="list-style-type: none"> ○ When belt tension is excessively low, the side where the belt is loosened vibrates and noise occurs. ○ When belt tension is excessively high, the side where the belt is tense vibrates with a sharp noise.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen lock nut ② in belt idler ①. 2. Press belt idler ① in the direction of arrow mark B, and tighten lock nut ②. 	<ul style="list-style-type: none"> ○ When belt tension is excessively low, the side where the belt is loosened vibrates and noise occurs. At the same time, the slip of hook position occurs, resulting in needle breakage or damage of hook. ○ When belt tension is excessively high, the side where the belt is tense vibrates. At the same time, the load to bearing is increased, and the life of machine is shortened.

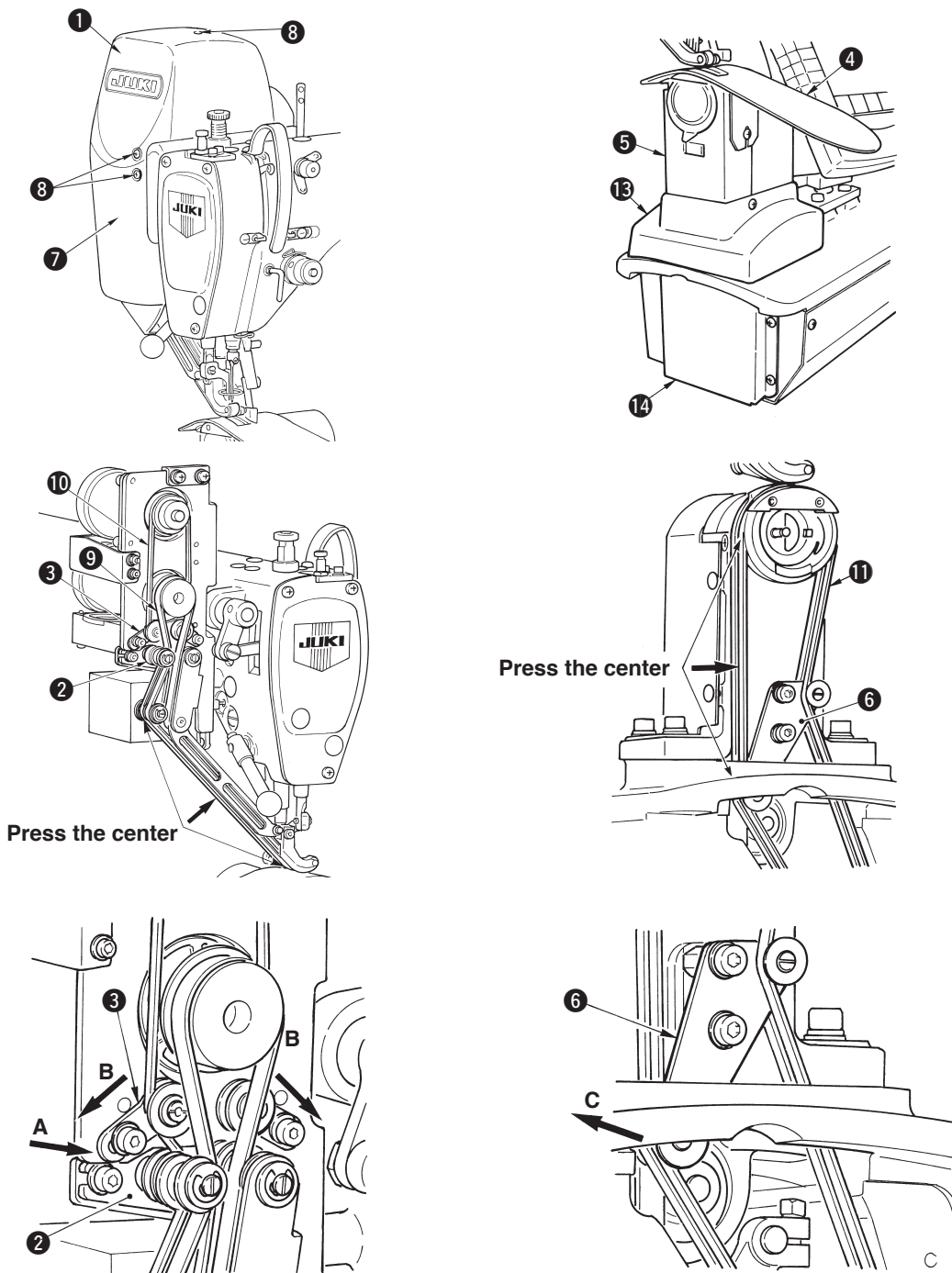
(6) Adjusting the feed belt tension

Standard Adjustment

1. Main feed belt
Adjust so that main feed belt ⑨ sags 3 mm when it is pressed with a finger with a load of 1.3N (130 gf).
2. Auxiliary feed belt
Adjust so that auxiliary feed belt ⑩ sags 3 mm when it is pressed with a finger with a load of 0.4N (40 gf).
3. Bottom feed belt
Adjust so that bottom feed belt ⑪ sags 3 mm when it is pressed with a finger with a load of 1.5N (150 gf).

* The standard of the replacing time of the respective belts is one year although it depends on the frequency of use.

Replace the belt when excessive decrease of feed force or the like is observed.

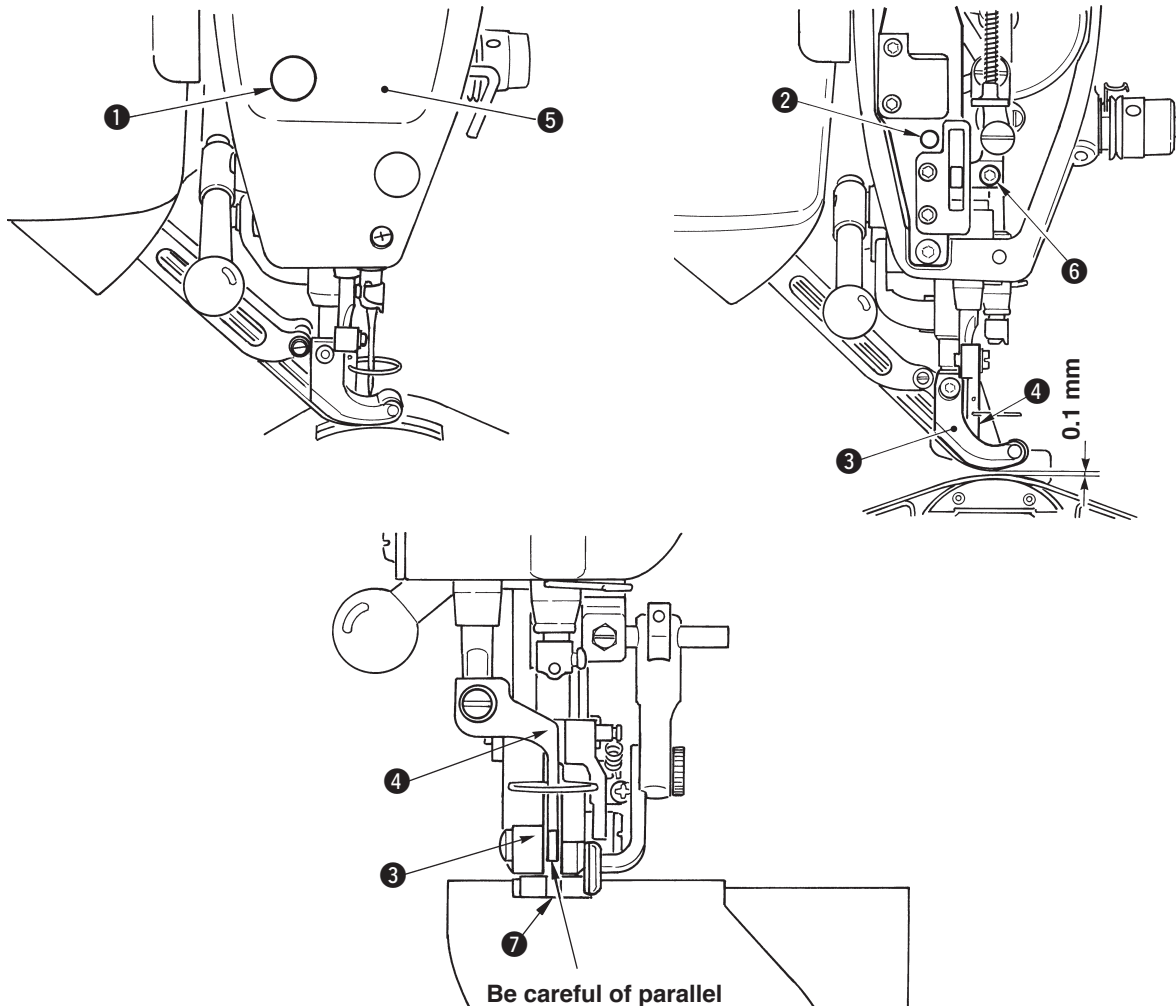


Adjustment Procedures	Results of improper Adjustment
<p>1. Main feed belt</p> <p>(1) Remove 10 setscrews 8 in top feed covers A 1 and B 7.</p> <p>(2) Move tension adjustment plate L 2 to the right and left to adjust the tension. Move to the right (direction A) to increase the tension, and to the left to decrease it.</p> <p>2. Auxiliary feed belt</p> <p>(1) Move tension adjustment plate S 3 to the right and left to adjust the tension. Open both sides (direction B) to increase the tension, and close both sides to decrease it.</p> <p>3. Bottom feed belt</p> <p>(1) Remove throat plate auxiliary plate 4, hook cover asm. 5, frame cover 13 and bottom feed cover 14.</p> <p>(2) Move bottom feed tension plate 6 to the right and left to adjust the tension. The tension is increased in the direction of C.</p>	<p>○ If the tension is not proper, shirring trouble due to feed pitch error will be caused.</p>

(7) Adjusting the height of the feed foot bar

Standard Adjustment

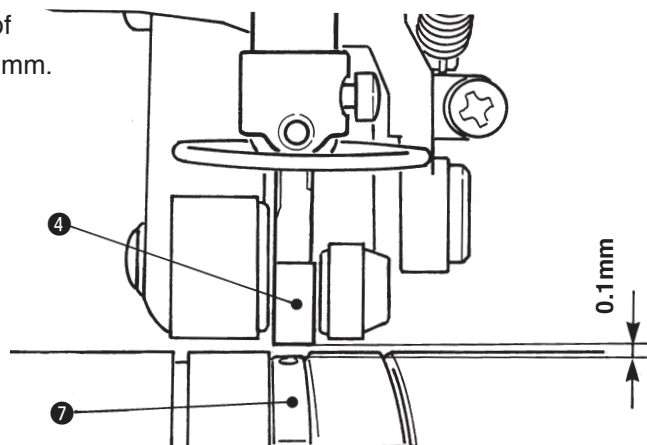
1. Adjust the clearance between top and bottom feed belts to 0.1 mm.



(8) Adjusting the height of the presser foot bar

Standard Adjustment

1. Adjust the clearance between the bottom face of presser foot ④ and needle hole guide ⑦ to 0.1 mm.
[\(Refer to the previous item \(7\) Adjusting the height of the feed foot bar.\)](#)



Adjustment Procedures	Results of improper Adjustment
<p>1. Height of the feed foot bar</p> <ol style="list-style-type: none"> (1) Bring the needle bar to its upper dead point. (2) Remove plug ❶. (3) Loosen feed foot bar connection clamp screw ❷. (4) Move feed foot ❸ up or down and adjust the clearance between top feed belt and bottom feed belt to 0.1 mm. Then tighten feed foot bar connection clamp screw ❷. 	<ul style="list-style-type: none"> ○ When the clearance is larger than 0.1 mm, feed force is deteriorated. ○ Clearance between top and bottom feed belts is 0.1 mm. If the clearance is widened more than the specified value, components interfere with each other. ○ When tightening feed foot bar clamp screw ❷, take care of the parallel between feed foot ❸ and presser foot ❹. Bend of cloth or feed trouble will be caused.

Adjustment Procedures	Results of improper Adjustment
<p>1. Height of the presser foot bar</p> <ol style="list-style-type: none"> (1) Bring the needle bar to its lower dead point. (2) Remove face plate ❺. (3) Loosen presser foot bar connection clamp screw ❻. (4) Adjust the clearance between the bottom face of presser foot ❷ and needle hole guide ❸ to 0.1 mm, and tighten presser foot bar connection clamp screw ❻. <p>(Refer to the previous item (7) Adjusting the height of the feed foot bar.)</p>	<ul style="list-style-type: none"> ○ When the clearance is widened, feed force is deteriorated.

(9) Adjusting the amount of alternate vertical movement

Standard Adjustment

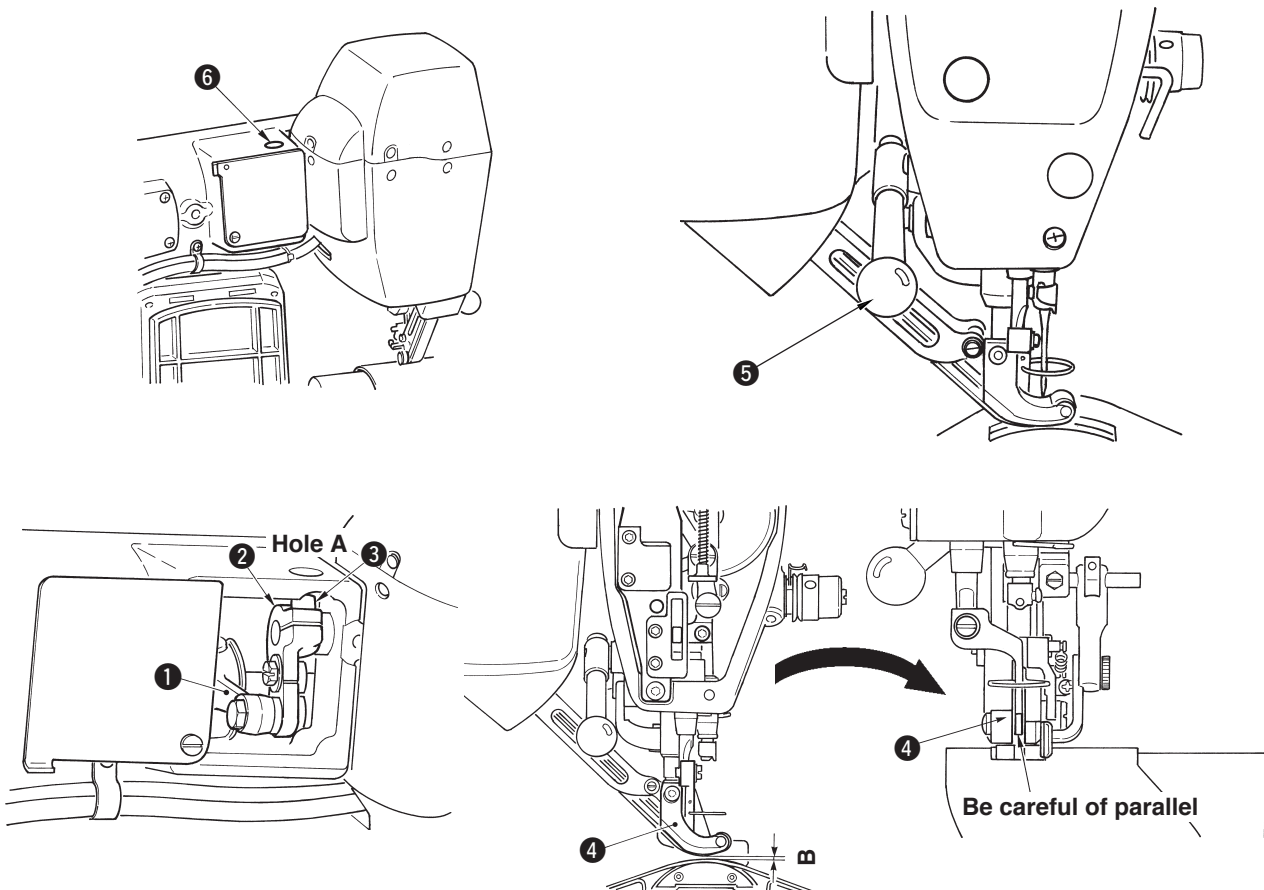
1. State of feed foot and presser foot at the time of delivery

Cam rod position	Top feed arm lowest position
Amount of alternate vertical movement of feed foot	0.2 to 0.3 mm
Clearance at lower dead point of feed foot	0.1mm
Amount of alternate vertical movement of presser foot	Approximately 2.7 mm
Clearance at lower dead point of presser foot	0.1mm

2. Relation between amount of alternate vertical movement and max. sewing speed

	1	2	3	4
Amount of vertical movement of feed foot (mm)	Less than 0.3	Up to 1.5	Up to 2.5	Up to 3.5
Amount of vertical movement of presser foot (mm)	2.7	1.5	2.5	3.5
Max. sewing speed (rpm)	3,500	2,600	2,000	1,600

(Caution) When changing the amount of alternate vertical movement, change max. sewing speed. When it is not changed, components breakage or damage occurs and the life of the machine is excessively shortened.

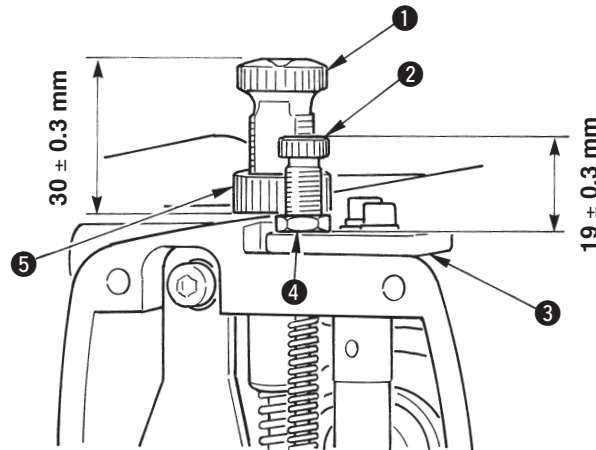


Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Turn the handwheel and bring the needle bar to its lower dead point. 2. Adjust the position of cam rod ❶ to the lowest position of top feed arm ❷. 3. Remove stopper plug ❸, insert a hexagonal wrench key from hole A, and loosen top feed arm clamp screw ❹. <ul style="list-style-type: none"> → Feed foot ❺ moves downward. Adjust so that clearance B between top and bottom belts becomes 0.1 mm. (Range : 0.1 to 1.0 mm) <p>(It is the premise that (7) Adjusting the height of the feed foot bar has been performed.)</p> 4. Turn presser foot lever ❻, raise feed foot ❺, and insert a spacer so that the clearance between top feed belt and bottom feed belt becomes 0.2 to 0.3 mm. 5. Tighten top feed arm clamp screw ❹. 6. Turn presser foot lever ❻ and remove the spacer. 	<ul style="list-style-type: none"> ○ When the clearance is widened, feed force is deteriorated at high speed. ○ When the clearance is widened, noise or vibration is increased at high speed. ○ When the clearance is excessively narrow, efficiency of rotation of material is deteriorated.

(10) Height of the presser screw

Standard Adjustment

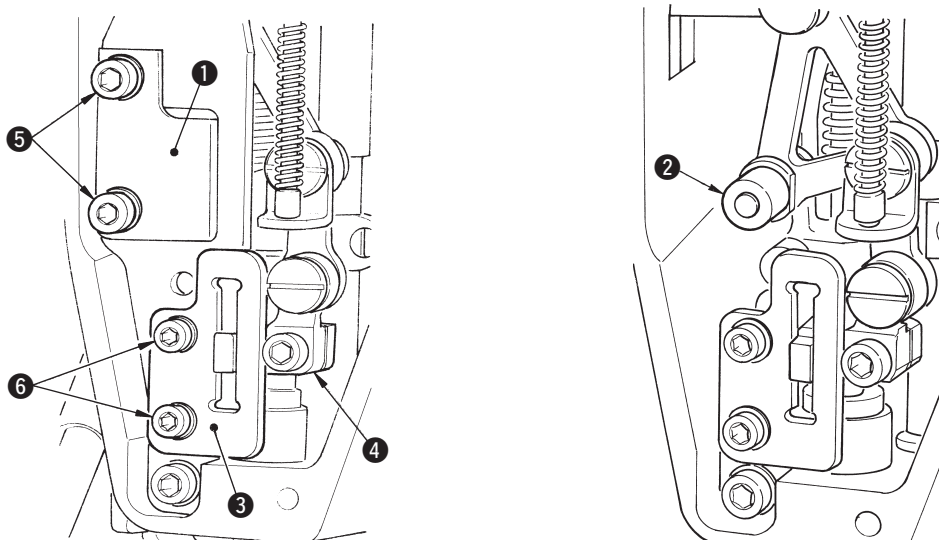
1. Adjust the height of top feed spring adjusting screw **1** to 30 ± 0.3 mm from the machined plane of frame.
2. Adjust the height of presser spring regulator **2** to 19 ± 0.3 mm from the top surface of spring base **3**.



(11) Assembling the guide plate

Standard Adjustment

1. Roller guide **1** has to always receive roller **2** when roller moves **2** up and down.
2. Assemble presser foot guide plate **3** so that presser foot shaft connection **4** smoothly moves up and down.



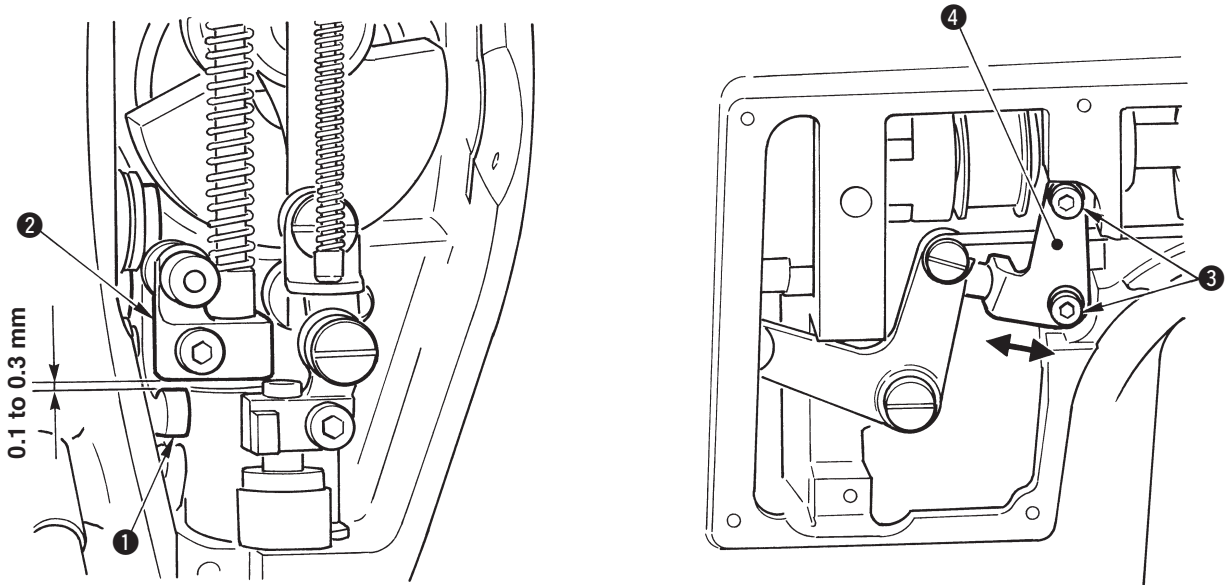
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. For the adjustment of top feed spring adjusting screw ❶, loosen nuts ❷, adjust the height to 30 ± 0.3 mm, and tighten nuts ❷. 2. For the adjustment of presser spring regulator ❸, loosen presser spring regulator nut ❹, adjust the height to 19 ± 0.3 mm, and tighten presser spring regulator nut ❹. 	<ul style="list-style-type: none"> ○ When the height is excessively high, shortage of feed force occurs and jumping at high speed occurs. As a result, damage of components is caused. ○ When the height is excessively low, pressure applied to the belt is increased and belt mark remains on the cloth.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Remove the face plate cover, loosen setscrews ❷ in roller guide ❶, move roller guide ❶ to the right and left, move the auto-lifter up and down, and adjust so that roller ❷ always comes in contact with the inside of roller guide ❶. Then tighten setscrews ❷. 2. Loosen setscrews ❸ in presser foot guide plate ❹, and adjust with the hand lifter or auto-lifter so that the guide section of presser foot shaft connection ❺ smoothly moves up and down the groove section of presser foot guide plate ❹. 	<ul style="list-style-type: none"> ○ Excessive side pressure is applied to the presser bar. As a result, the presser bar will break down. ○ A proper amount of alternate vertical movement cannot be obtained. ○ Lifting amount of auto-lifter cannot be obtained. ○ Bend of feed is increased due to the unevenness of right/left of feed foot. ○ A proper amount of alternate vertical movement cannot be obtained. ○ Groove section of presser foot guide plate ❹ is cut and unevenness of right/left of presser foot is increased.

(12) Adjusting the initial position of the auto-lifter

Standard Adjustment

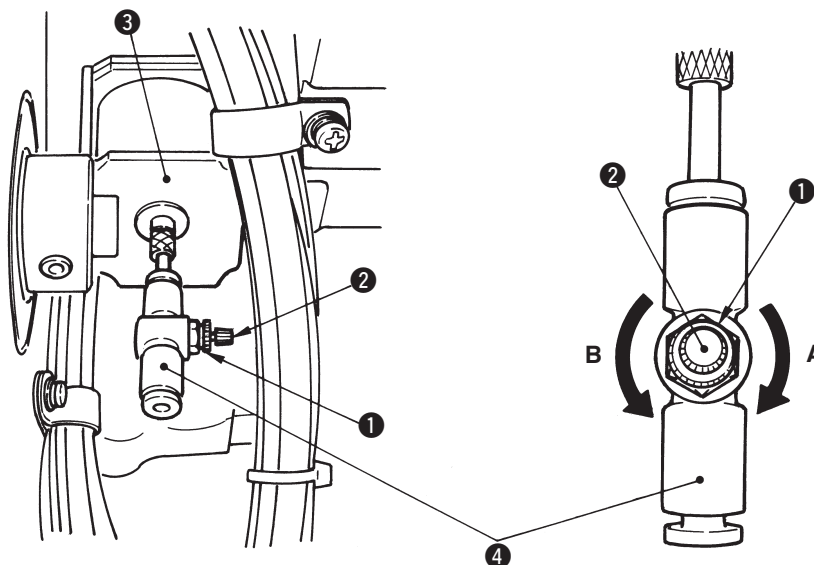
1. Adjust so that the clearance between the top surface of presser lifter link **1** and the bottom face of feed foot bar connection **2** is 0.1 to 0.3 mm at the upper dead point of the needle bar.



(13) Adjusting the speed of the auto-lifter

Standard Adjustment

1. Adjust throttle valve **4** of AK solenoid section **3** to the state that it is turned four times from being fully closed.



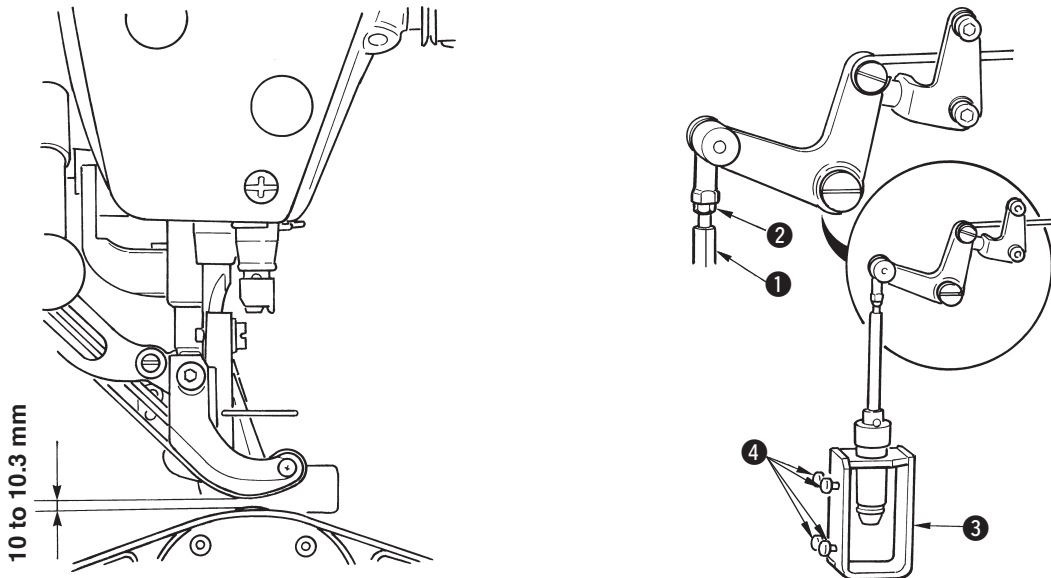
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Remove the side plate, and loosen setscrews ③ in stopper installing plate ④. 2. Move stopper installing plate ④ in the direction of the arrow mark, and adjust the clearance between presser lifter link ① and feed foot bar connection ② to 0.1 to 0.3 mm. Then tighten setscrews ③. 	<ul style="list-style-type: none"> ○ When the clearance is excessively wide, a big noise occurs when the auto-lifter goes up.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen lock nut ①. 2. Turn knob ② until it will turn no further in the direction of A. (Set throttle valve ④ to the state that it is fully closed.) 3. Turn knob ② four times in the direction of B. (Set throttle valve ④ to the state that it is opened four times from the state that it is fully closed.) 4. Tighten lock nut ①. 	<ul style="list-style-type: none"> ○ When the opening amount of the throttle valve is larger than the specified value : <ol style="list-style-type: none"> 1. Feed foot, presser foot, needle hole guide, etc. will break. 2. The life of the respective feed belts is shortened. ○ When the opening amount of the throttle valve is smaller than the specified value : <ol style="list-style-type: none"> 1. The force to feed material is deteriorated immediately after the motion of auto-lifter. 2. The lifting amount of auto-lifter is decreased.

(14) Adjusting the stroke of the auto-lifter

Standard Adjustment

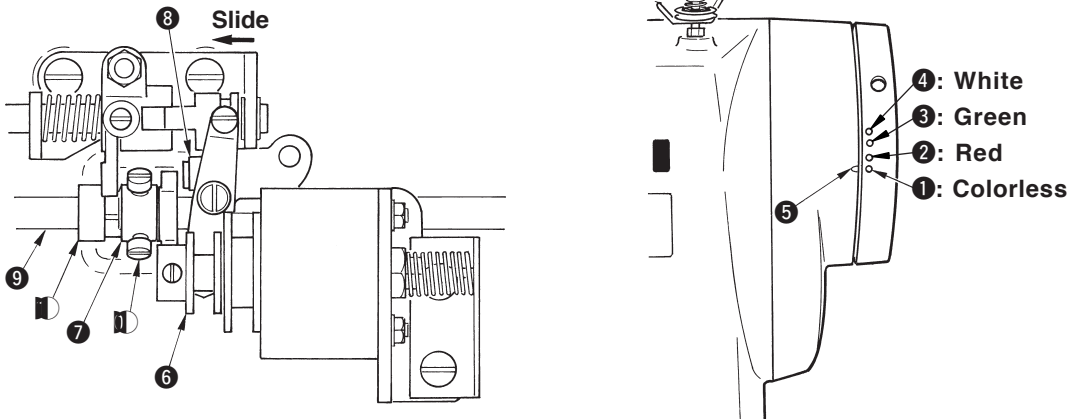
1. Adjust so that the clearance between the bottom face of the top feed belt and the top surface of the bottom feed belt is 10 to 10.3 mm.



(15) Adjusting the thread trimmer cam

Standard Adjustment

1. Turn the handwheel to the position where the thread take-up lever comes a little before it goes up to its upper dead point.
2. Turn ON the thread trimmer solenoid, slide roller ⑧ to thread trimmer cam ⑦ and make them engage with each other using the output signal check I06-09 of the check program (refer to the Instruction Manual).
3. In the state as it is, turn the handwheel in the normal operating direction and in the reverse direction. Then set the handwheel to the position where it does not turn.
4. When marker dot ⑤ engraved on the pulley cover aligns with marker dot ① engraved on the handwheel, the timing is normal.



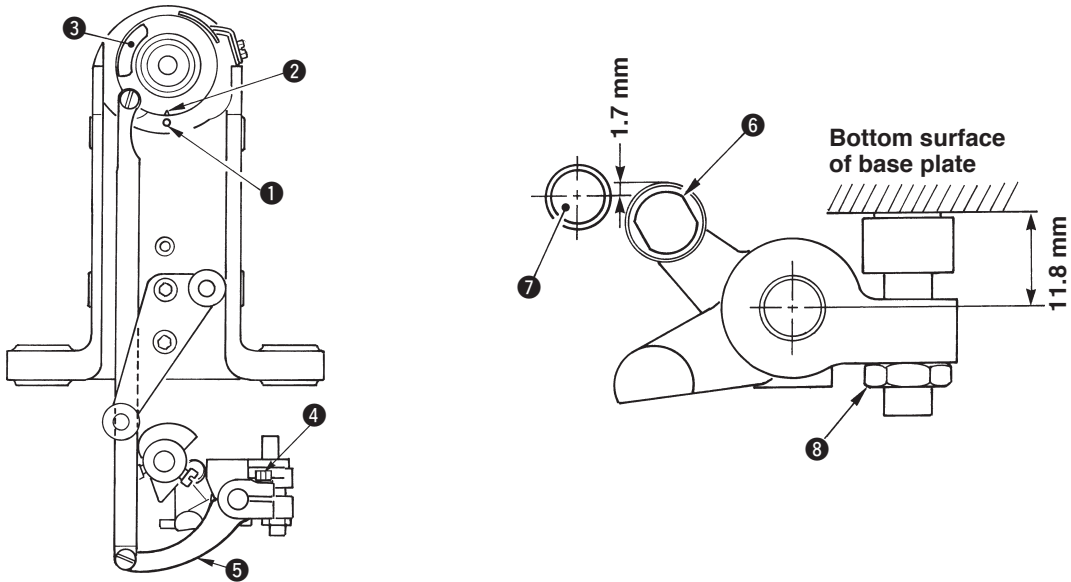
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen nut ② of link ball shaft ① 2. Turn link ball shaft ① and tighten nut ② when the specified value (10 to 10.3 mm) is reached. 3. If the adjustment range is insufficient, loosen setscrews ④ in AK solenoid, and move AK solenoid ③ downward to adjust the stroke. 	<ul style="list-style-type: none"> ○ When the clearance is excessively wide, feed foot comes in contact with the feed foot bar bushing and a noise occurs when the presser lifter goes up.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Remove the bottom cover. 2. Loosen setscrews ⑩ in the thread trimmer cam. 3. When cam collar ⑪ moves, adjust so that thread trimmer cam ⑦ does not engage with roller ⑧ and thread trimmer cam ⑦ and roller ⑧ come to the almost equal position in the range where thread trimmer cam ⑦ enters roller ⑧. Then tighten setscrew ⑪ in the cam collar. 4. Adjust marker dot ① on the handwheel to marker dot ⑤ on the pulley cover. 5. Pressing driving block ⑥ to the right, make thread trimmer cam ⑦ engage with roller ⑧. 6. Turn thread trimmer cam ⑦ only, without turning hook driving shaft ⑨ in the reverse direction against the rotating direction of the hook driving shaft. 7. Press roller ⑧ to thread trimmer cam ⑦ at the position where thread trimmer cam ⑦ does not turn, and press thread trimmer cam ⑦ to cam collar ⑪. Then tighten setscrews ⑩ in the thread trimmer cam. 	<ul style="list-style-type: none"> ○ Length of needle thread remaining on the needle is shortened. ○ Thread trimming motion is not completed at the time of UP-stop position.

(16) Adjusting the initial position of the moving knife

Standard Adjustment

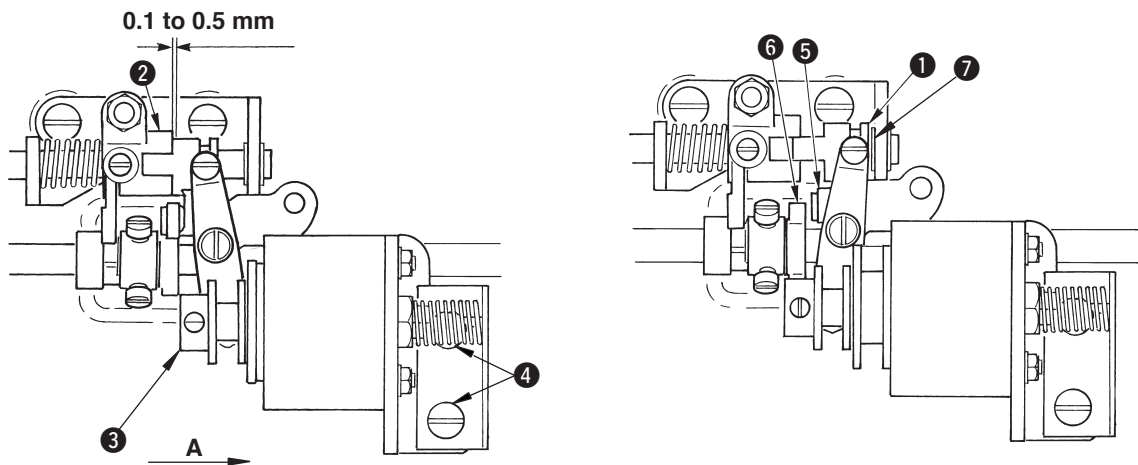
1. The initial position of the moving knife is the position where marker dot **1** engraved on the hook shaft base aligns with V groove **2** on the moving knife base **3**.
At this time, end **6** of the cam roller is higher by 1.7 mm than hook driving shaft center **7**.



(17) Adjusting the initial position of the thread trimmer solenoid

Standard Adjustment

1. Adjust the initial position so that the clearance between slide arm **1** and driving shaft arm **2** is 0.1 to 0.5 mm when the thread trimmer solenoid performs suction.



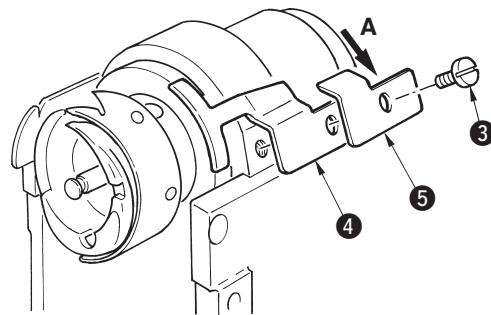
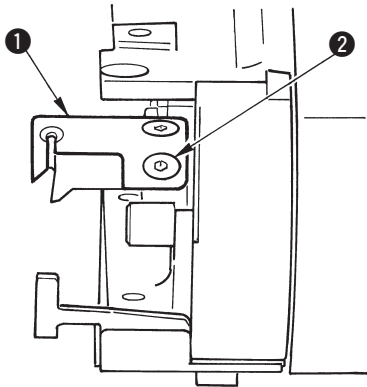
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Adjusting the engraved marker dot <ol style="list-style-type: none"> (1) Loosen clamp screw ④ in knife driving arm ⑤ make engraved marker dot ① align with V groove ② and tighten clamp screw ④ 2. Adjusting the position of the cam roller <ol style="list-style-type: none"> (1) Loosen stopper lock nut ⑧ turn the stopper, and tighten cam roller ⑥ at the proper position (11.8 mm). 	<ul style="list-style-type: none"> ○ Thread handling trouble The blade section of moving knife does not fully pass the blade section of counter knife, and thread trimming failure will occur. ○ When the position of cam roller ⑥ is excessively higher as against hook driving shaft ⑦ the moving knife rocking stroke is decreased and thread trimming failure will be caused. On the contrary, the position is excessively lower, the rocking stroke is increased and the length of remaining needle thread is shortened or the blade point is damaged.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Remove the bottom cover and press driving block ③ by finger in the direction of the arrow mark A. At this time, loosen setscrews ④ and adjust so that the clearance is 0.1 to 0.5 mm. 2. Detach the finger and make sure that there is a clearance between cam roller ⑤ and the edge of thread trimmer cam ⑥ 3. Secure a clearance of approximately 0.5 mm between slide arm ① and E ring ⑦ 	<ul style="list-style-type: none"> ○ When the clearance is excessively large, thread trimming motion trouble may occur. ○ When the clearance is excessively small, the load applied to the respective components is increased, and abnormal worn-out of components may occur.

(18) Adjusting the position of the moving knife and the counter knife

Standard Adjustment

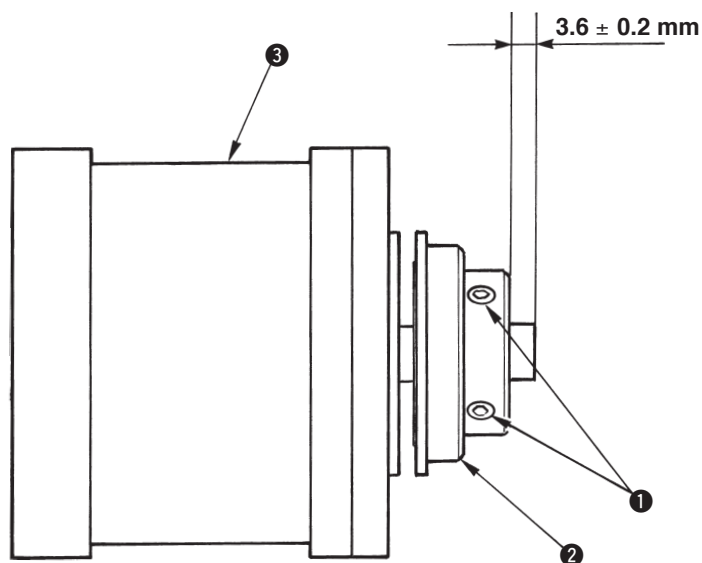
1. Install moving knife ① with setscrews ② in the moving knife by making it come in contact with the moving knife base.
2. Install counter knife ④ together with knife pressure adjustment plate ⑤ with setscrew ③ in the counter knife.



(19) The fixing position of the auxiliary feed motor pulley

Standard Adjustment

1. Adjust the dimension from the end of the shaft of auxiliary feed motor ③ to the end of pulley ② to 3.6 ± 0.2 mm.



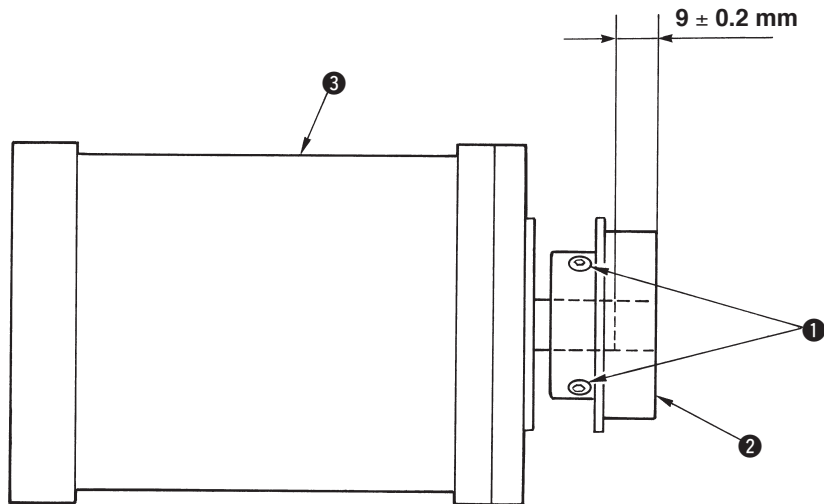
Adjustment Procedures	Results of improper Adjustment
<p>1. Adjust so that the blade section of the eye of moving knife ❶ and the blade section of counter knife ❷ come in contact with each other in parallel, slightly press knife pressure adjustment plate ❸ in the direction of A, and tighten with setscrew ❹ in the counter knife.</p>	<ul style="list-style-type: none"> ○ When the parallel is not obtained, remaining of thread end will be caused. ○ When the knife pressure is excessively low, thread trimming failure will be caused. When it is excessively high, it is related to the damage of the blade section of counter knife ❷

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrews ❶ 2. Adjust the position of pulley ❷ (dimension : 3.6 ± 0.2 mm). 3. Tighten setscrews ❶ 	<ul style="list-style-type: none"> ○ When the dimension is large, timing belt comes off pulley ❷ ○ When the dimension is small, timing belt is abnormally worn out.

(20) The fixing position of the main feed motor pulley

Standard Adjustment

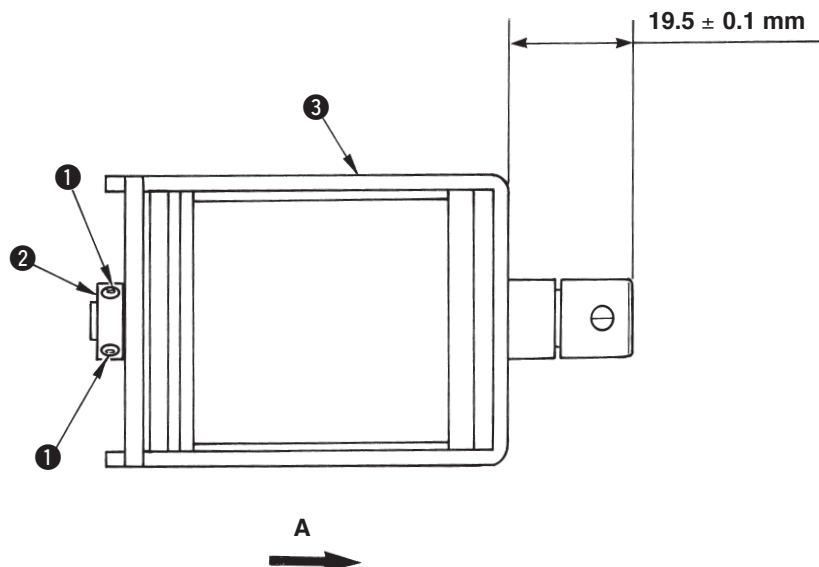
1. Adjust the dimension from the end of the shaft of main feed motor ③ to the end of pulley ② to 9 ± 0.2 mm.



(21) The fixing position of the thrust collar of AT solenoid

Standard Adjustment

1. Adjust so that the dimension from the main body of AT solenoid ③ to the end of the shaft of AT solenoid ③ to 19.5 ± 0.1 mm when thrust collar ② is pressed to the main body of AT solenoid ③ (direction of **A**).



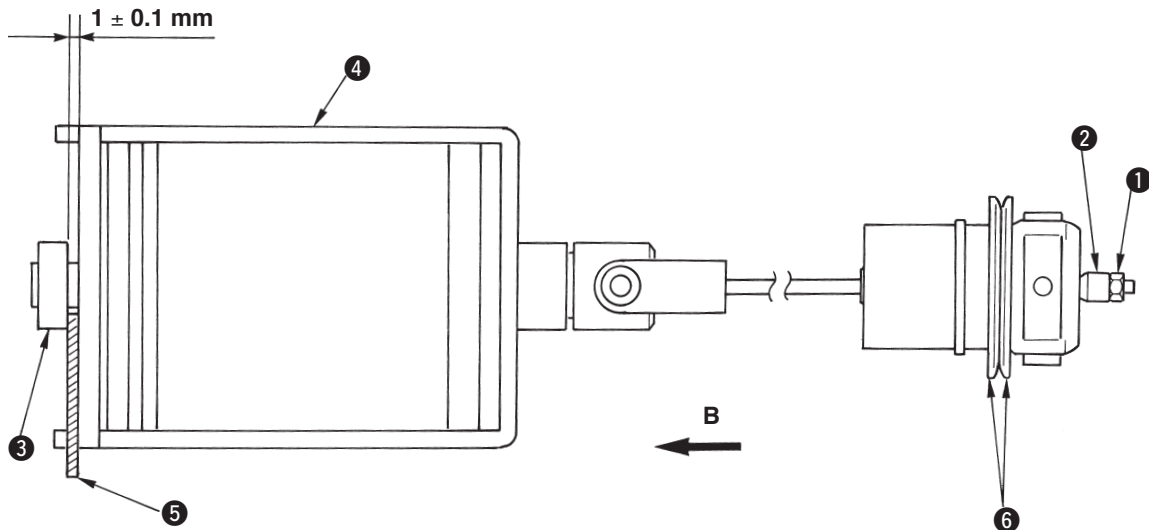
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrews ❶ 2. Adjust the position of pulley ❷ (dimension : 9 ± 0.2 mm). 3. Tighten setscrews ❶ 	<ul style="list-style-type: none"> ○ When the dimension is small, timing belt comes off pulley ❷ ○ When the dimension is large, timing belt is abnormally worn out.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrews ❶ 2. Adjust the position of thrust collar ❷ (dimension : 19.5 ± 0.1 mm). 3. Tighten setscrews ❶ 	<ul style="list-style-type: none"> ○ When the dimension is large, needle thread tension is not stabilized. ○ When the dimension is small, needle thread tension is not stabilized.

(22) The fixing position of the thread tension shaft collar

Standard Adjustment

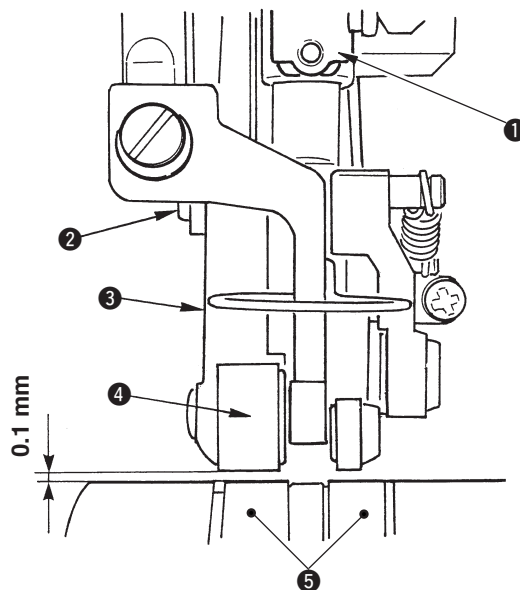
1. Pull thread release pin adjustment collar **2** in the direction of **B**, and adjust so that the dimension from the end of thrust collar **3** to the main body of AT solenoid **4** to 1 ± 0.1 mm when thread tension disks **6** are fully closed.



(23) Adjusting the height of the feed foot

Standard Adjustment

1. Adjust the clearance between the bottom face of main feed belt (4) and the top surface of bottom feed belt (5) to 0.1 mm when needle bar (1) is in the position of its upper dead point.



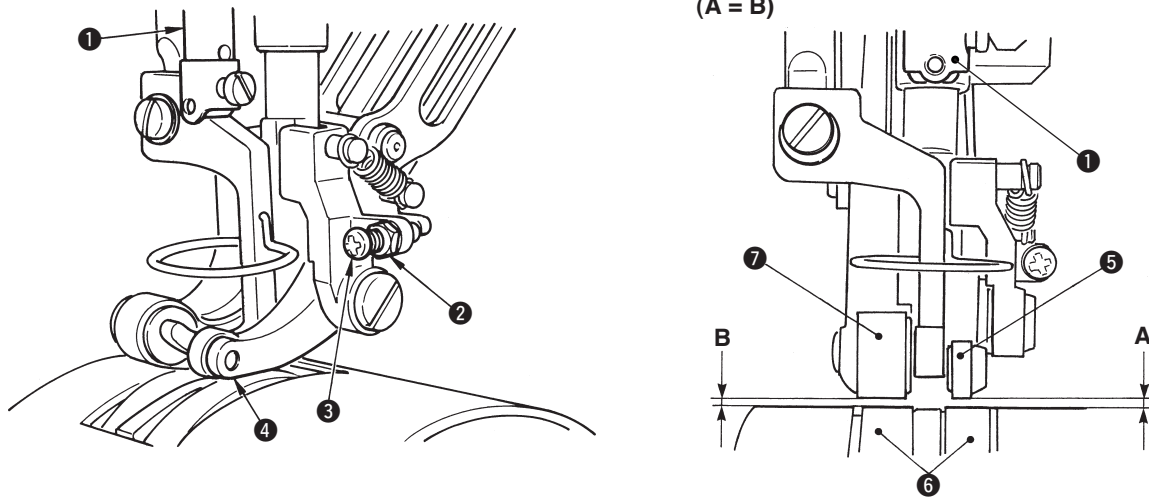
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Loosen nut ❶ 2. Loosen thread release pin adjustment collar ❷ 3. Insert a spacer ❺ of 1 mm between thrust collar ❸ and the main body of AT solenoid ❹ 4. Tighten thread release pin adjustment collar ❷ until thread tension disks ❻ are fully closed. 5. Tighten nut ❶ 6. Remove a spacer ❺ of 1 mm between thrust collar ❸ and the main body of AT solenoid ❹ 	<ul style="list-style-type: none"> ○ When the dimension is large, needle thread tension is not stabilized. ○ When the dimension is small, needle thread tension is not stabilized.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Bring needle bar ❶ to the position of its upper dead point. 2. Loosen screw ❷ 3. Adjust the height of feed foot ❸ to 0.1 mm. 4. Tighten screw ❷ 	<ul style="list-style-type: none"> ○ When dimension is large → 1. Material cannot be fed well. ○ When dimension is small → 1. Worn-out of main feed belt ❹ is accelerated.

(24) Adjusting the height of the auxiliary feed foot

Standard Adjustment

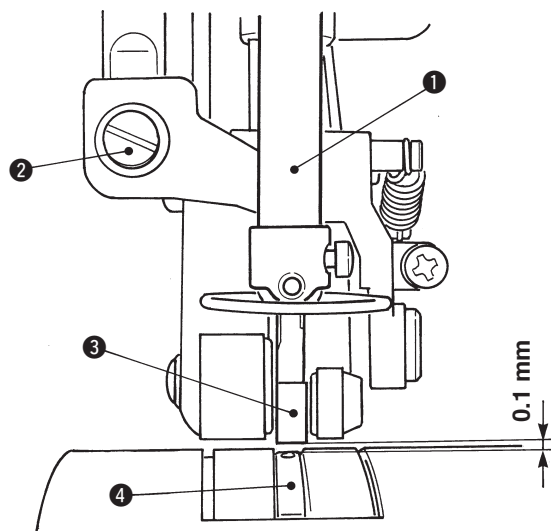
1. Make the clearance **A** between the bottom face of auxiliary feed belt **5** and the top surface of bottom feed belt **6** the same as that **B** between the bottom face of main feed belt **7** and the top surface of bottom feed belt **6** when needle bar **1** is in the position of its upper dead point.



(25) Adjusting the height of the presser foot

Standard Adjustment

1. Adjust the clearance between the bottom face of presser foot **3** and the top surface of needle hole guide **4** to 0.1 mm when needle bar **1** is in the position of its lower dead point.



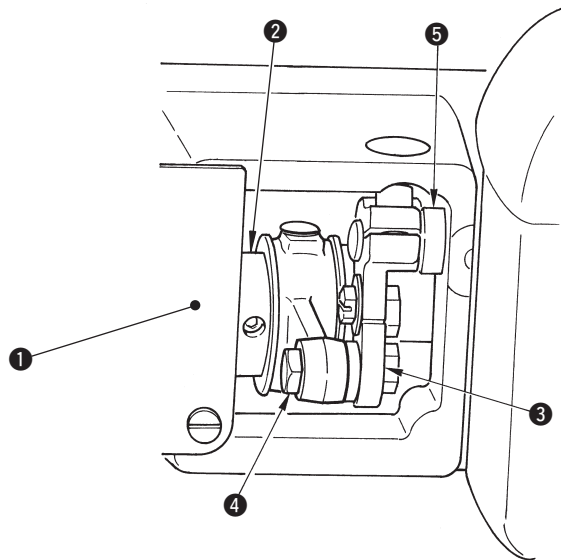
Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Bring needle bar ❶ to the position of its upper dead point. 2. Loosen nut ❷ 3. Turn screw ❸ and adjust the height of auxiliary feed foot ❹ <p>* When screw ❸ is turned clockwise, auxiliary feed foot ❹ goes up.</p> <p>* When screw ❸ is turned counterclockwise, auxiliary feed foot ❹ comes down.</p> <ol style="list-style-type: none"> 4. Tighten nut ❷ 	<ul style="list-style-type: none"> ○ When dimension is large <ul style="list-style-type: none"> → 1. Material cannot be fed straight. 2. Shirring cannot be performed well. ○ When dimension is small <ul style="list-style-type: none"> → 1. Material cannot be fed straight. 2. Shirring cannot be performed well. 3. Worn-out of auxiliary feed belt ❺ is accelerated.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Bring needle bar ❶ to the position of its lower dead point. 2. Loosen setscrew ❷ 3. Adjust the height of presser foot ❸ 4. Tighten setscrew ❷ 	<ul style="list-style-type: none"> ○ When dimension is large <ul style="list-style-type: none"> → 1. Material cannot be pressed. ○ When dimension is small <ul style="list-style-type: none"> → 1. Needle hole guide ❹ is broken. 2. Presser foot ❸ is broken.

(26) Adjusting the feed eccentric cam

Standard Adjustment

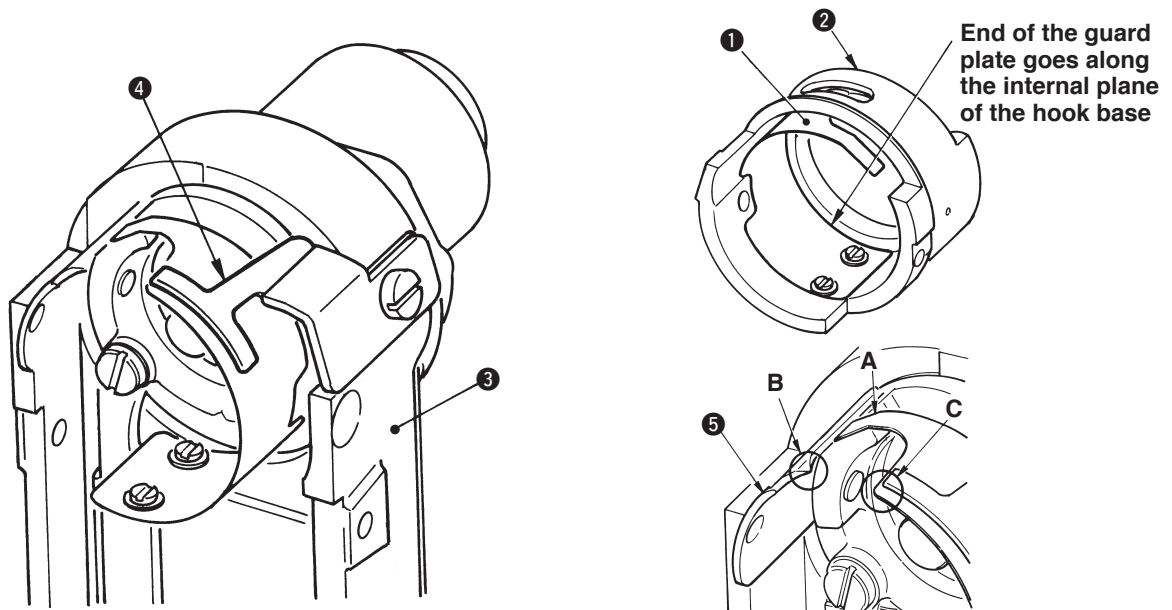
1. Adjust feed eccentric cam **2** so that screw No. 1 faces the center of hinge screw **4** in cam rod at the upper dead point of the needle bar.



(27) Adjusting the assembly of the counter knife guard plate

Standard Adjustment

1. Adjust so that counter knife guard plate **1** does not come in contact with the periphery of hook at the time of sewing, and the top end of counter knife guard plate **1** is pressed down by moving knife **5** and enters the bottom side of moving knife **5** at the time of thread trimming operation.

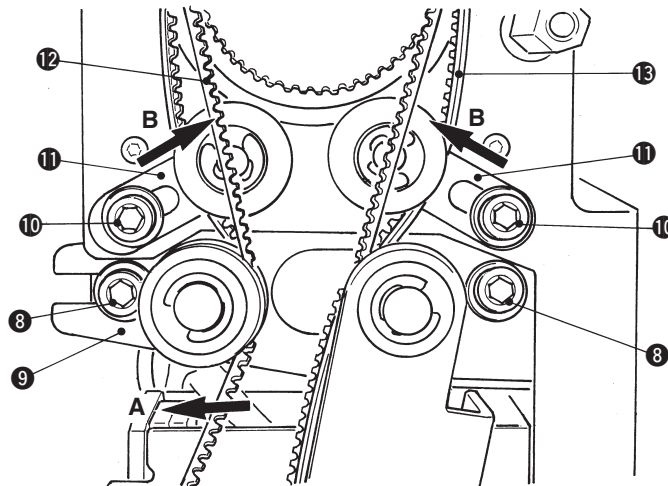
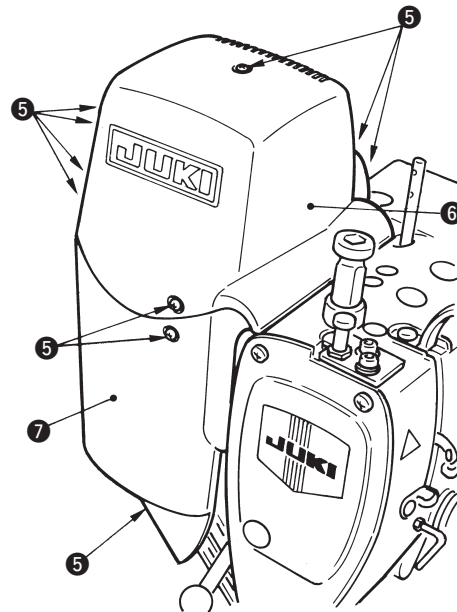
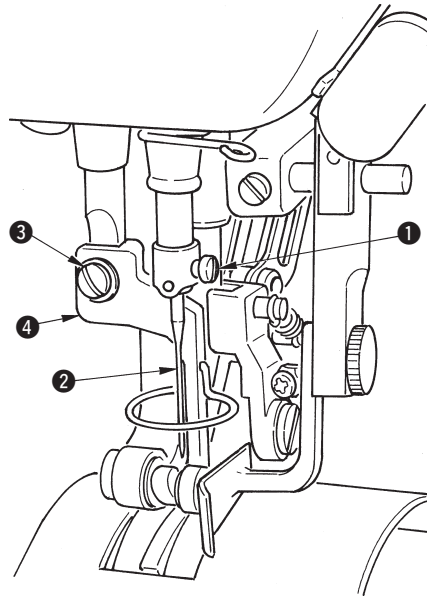


Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Turn top feed arm cover ❶ 2. Turn the handwheel and adjust the main shaft to the upper dead point of the needle bar. 3. Draw top feed arm ❸ to this side. 4. Tighten the screw No. 1 of feed eccentric cam ❷ so that it faces the center of hinge screw ❹ in cam rod. 5. Turn the handwheel to rotate the main shaft, and tighten the screw No. 2. <p>(Caution) Tighten the screws so that there is no clearance between top feed arm ❸ and drive shaft rear bushing ❺</p>	<ul style="list-style-type: none"> ○ When timing is improper, troubles below will be caused. <ol style="list-style-type: none"> 1. Stitch skipping is apt to occur. 2. Material is not fed. 3. Pitch is not obtained.

Adjustment Procedures	Results of improper Adjustment
<ol style="list-style-type: none"> 1. Adjust so that counter knife guard plate ❶ is along the internal plane of hook base ❷, and tighten it with screws. 2. Set hook base ❷ to hook shaft base ❸, and adjust so that the clearance between the top surface of counter knife guard plate ❶ and the bottom face of counter knife ❹ becomes 0.2 to 0.5 mm. 3. Actuate moving knife ❺, press down section A of counter knife guard plate ❶ at the bottom face of moving knife ❺, and adjust so that moving knife ❺ enters between counter knife guard plate ❶ and counter knife ❹. 	<ul style="list-style-type: none"> ○ When the clearance between the top surface of counter knife guard plate ❶ and the bottom face of counter knife ❹ is excessively large, <ol style="list-style-type: none"> 1. The guard plate comes in contact with the hook and thread-stain will occur at the time of sewing. 2. A noise will occur. 3. It is related to the early deterioration of counter knife guard plate ❶. 4. Thread trimming trouble may occur. ○ When the clearance is excessively small, or pressing down at section A is insufficient, <ol style="list-style-type: none"> 1. Section B of moving knife ❺ collides with section C of counter knife guard plate ❶ at the time of thread trimming. As a result, main shaft will be locked.

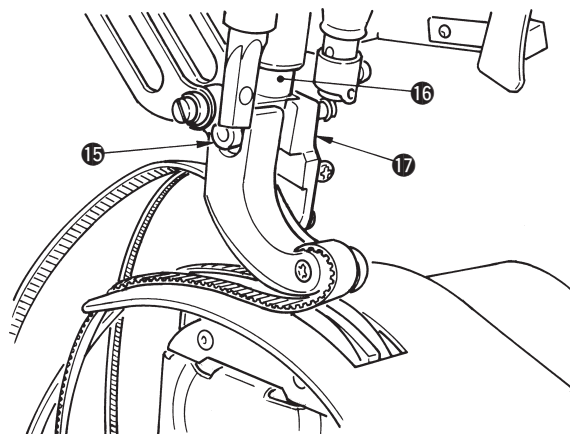
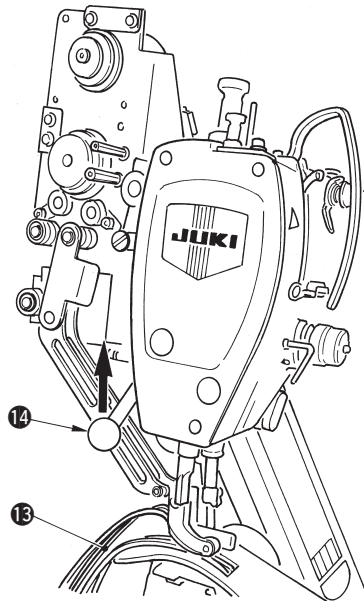
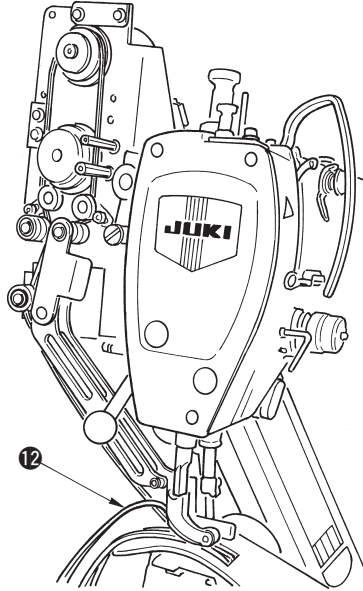
(28) Replacing procedure of the top feed belt (1/7)

Procedures of disassembling / assembling



(28) Replacing procedure of the top feed belt (2/7)

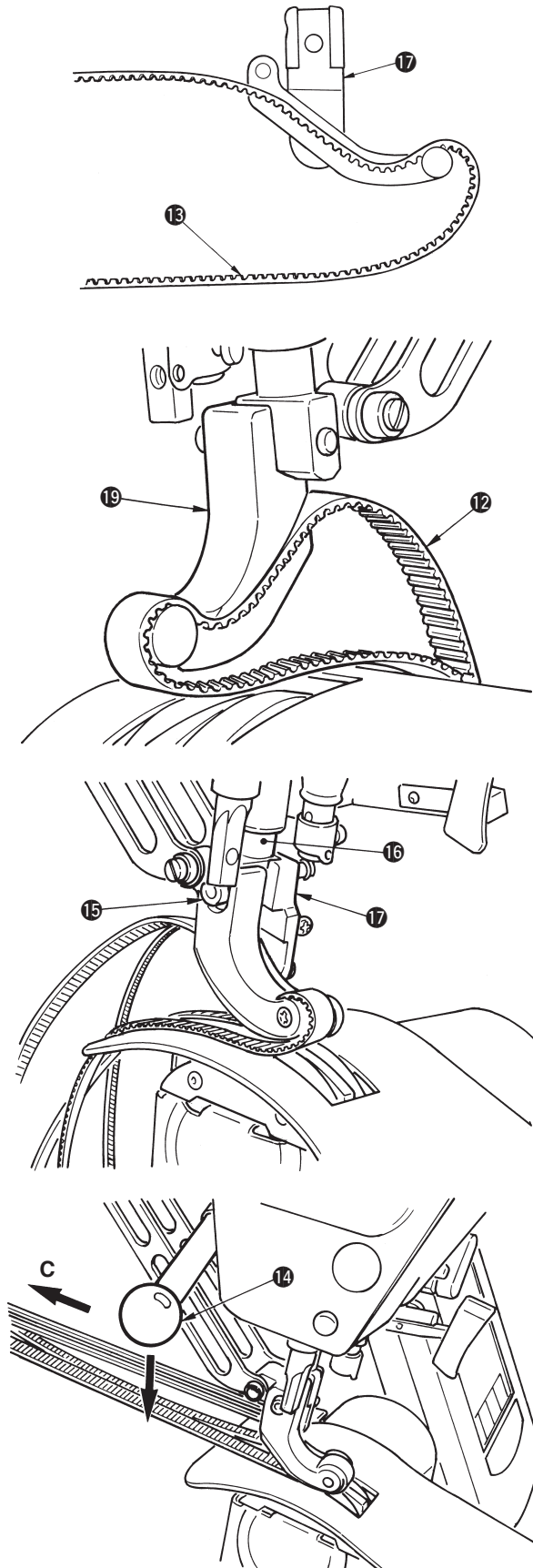
Procedures of disassembling / assembling



Caution in disassembling	Caution in assembling
<p data-bbox="177 365 719 398">6. Remove main feed belt ⑫ from the pulley.</p> <p data-bbox="177 1003 759 1037">7. Remove auxiliary feed belt ⑬ from the pulley.</p> <p data-bbox="177 1081 655 1115">8. Raise manual presser lifting lever ⑭.</p> <p data-bbox="177 1641 935 1709">9. Remove setscrew ⑮, and remove auxiliary feed foot ⑰ from feed foot bar ⑯.</p>	

(28) Replacing procedure of the top feed belt (3/7)

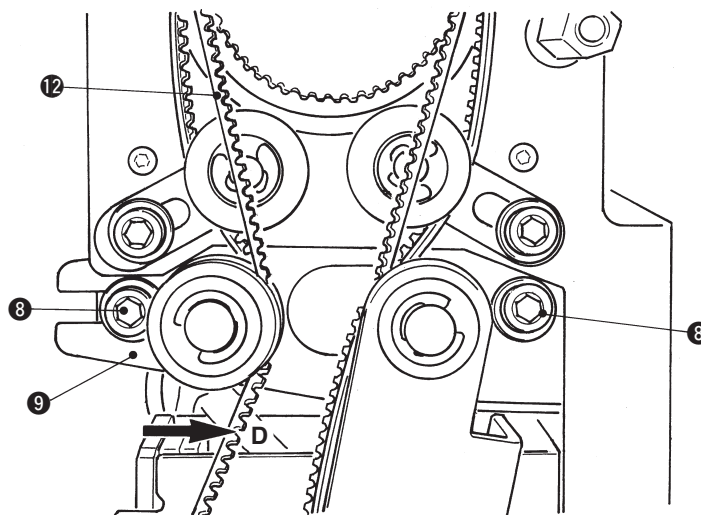
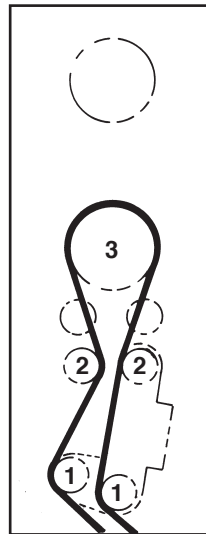
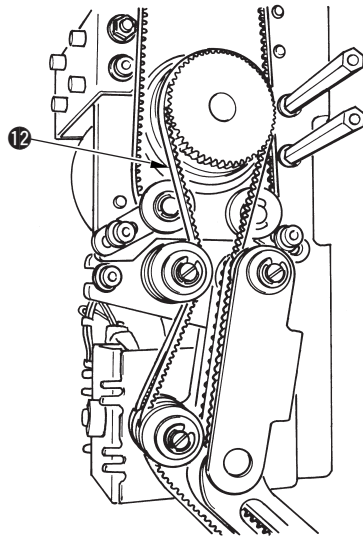
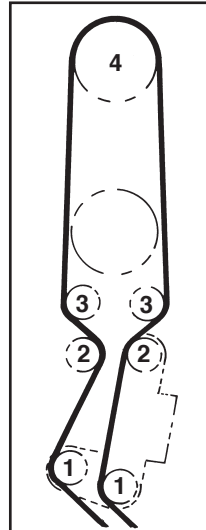
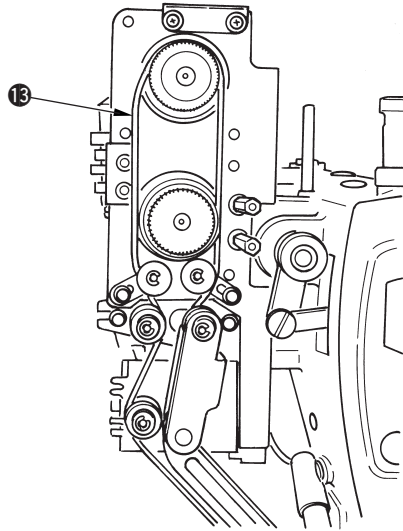
Procedures of disassembling / assembling



Caution in disassembling	Caution in assembling
<p>10. Remove the old auxiliary feed belt 13 of auxiliary feed foot 17, and replace it with the new auxiliary feed belt 13.</p> <p>11. Remove the old main feed belt 12 of feed foot 19, and replace it with the new main feed belt 12.</p> <p>12. Set auxiliary feed foot 17 to auxiliary feed foot bar 16 while taking care so that the belt does not come off, and temporarily tighten it with setscrew 15.</p> <p>13. Lightly drawing the feed belt in the direction of C, lower manual presser lifting lever 14.</p>	<p>* When lowering manual presser lifting lever 14, make sure that the respective belts enter the guide grooves located in the bottom faces of feed foot 19 and auxiliary feed foot 17.</p>

(28) Replacing procedure of the top feed belt (4/7)

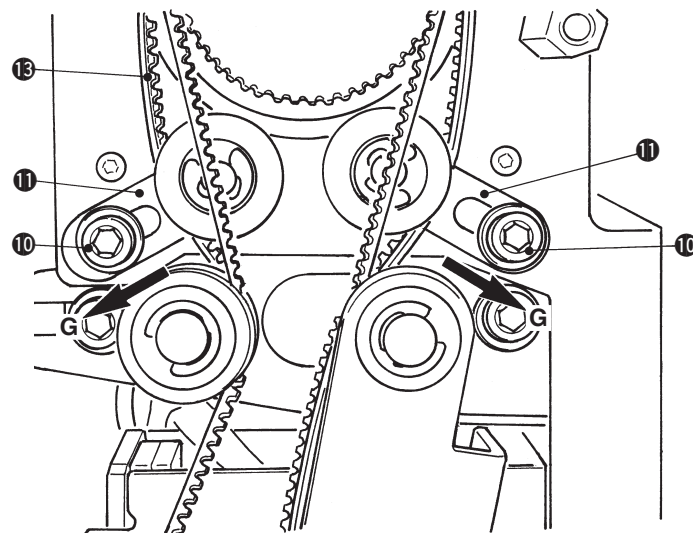
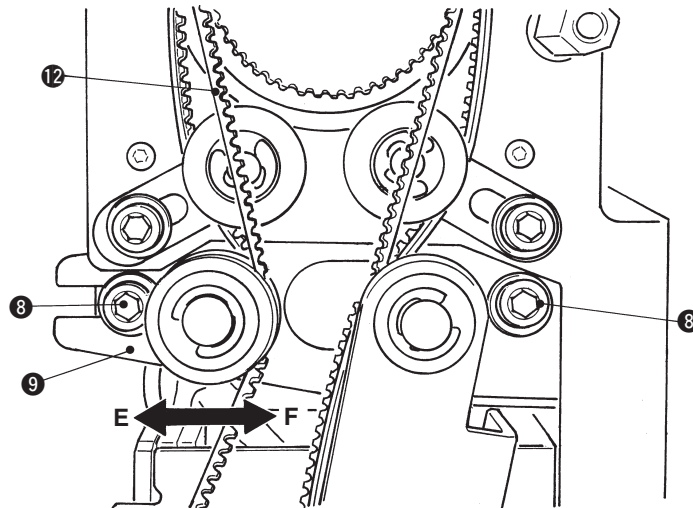
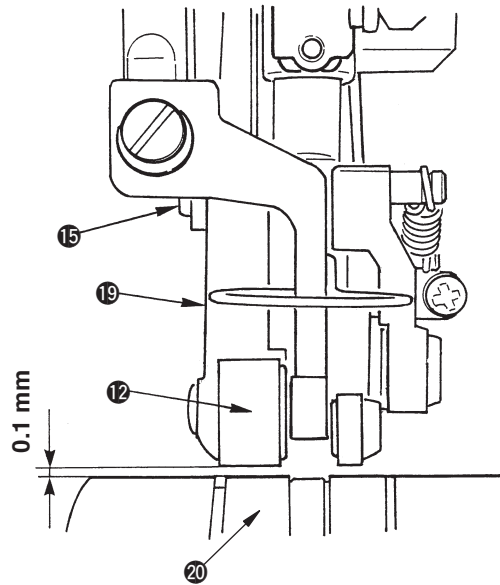
Procedures of disassembling / assembling



Caution in disassembling	Caution in assembling
<p>14. Set auxiliary feed belt 13 to the respective pulleys in order of the numbers in the illustration on the left side.</p>	<p>* When setting auxiliary feed belt 13 to the pulley, do not twist or draw forcibly auxiliary feed belt 13.</p>
<p>15. Set main feed belt 12 to the respective pulleys in the order of the numbers in the illustration on the left side.</p>	<p>* When setting main feed belt 12 to the pulley, do not twist or draw forcibly main feed belt 12.</p>
<p>16. Move tension adjustment plate L 9 in the direction of D to such an extent that the slackness of main feed belt 12 disappears, and temporarily tighten setscrew 8</p>	

(28) Replacing procedure of the top feed belt (5/7)

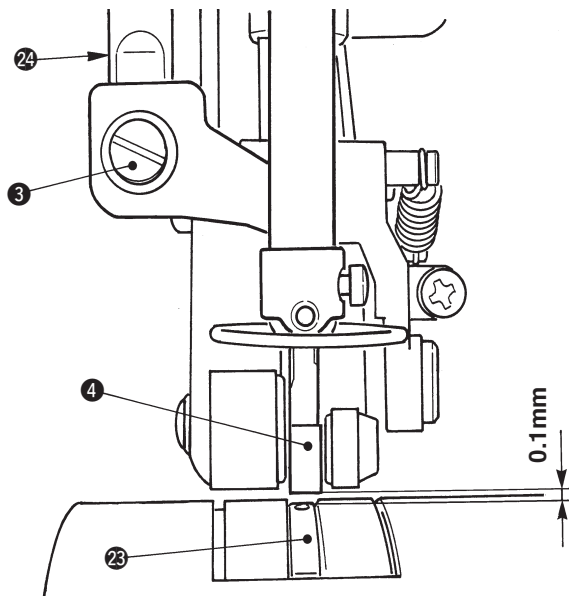
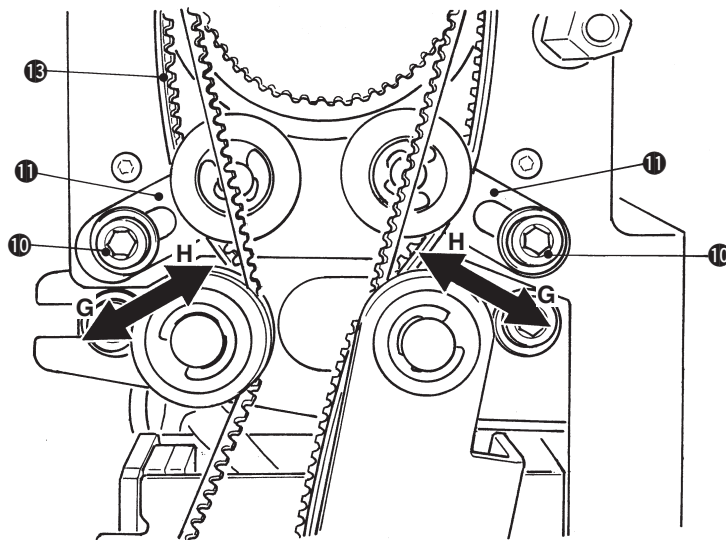
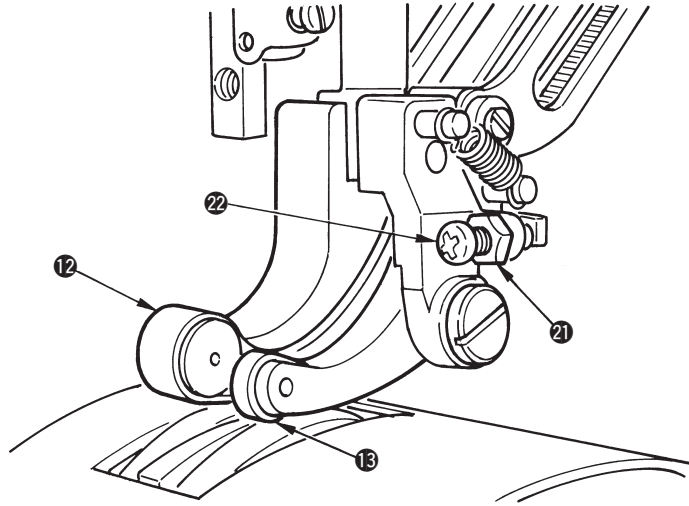
Procedures of disassembling / assembling



Caution in disassembling	Caution in assembling
<p>17. Bring the needle bar to the position of its upper dead point, and tighten screw 15 after adjusting the height of feed foot 19 so that the clearance between main feed belt 12 and bottom feed belt 20 is 0.1 mm.</p> <p>18. Adjust main feed belt 12 to the proper tension by adjusting the lateral position of tension adjustment plate L 9 and tighten setscrew 8</p> <p>* Tension of main feed belt 12 is increased when tension adjustment plate L 9 is moved in the direction of F, and decreased when the plate is moved in the direction of E.</p> <p>19. Move tension adjustment plate S 11 in the direction of G to such an extent that the slackness of auxiliary feed belt 13 disappears, and temporarily tighten setscrew 10.</p>	<p>* For the details of adjusting the height of the feed foot, refer to "(23) Adjusting the height of the feed foot".</p> <p>* For the details of adjusting the belt tension, refer to "(6) Adjusting the feed belt tension".</p>

(28) Replacing procedure of the top feed belt (6/7)

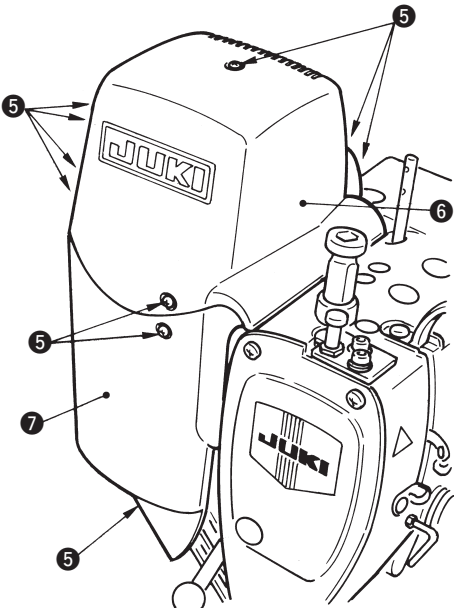
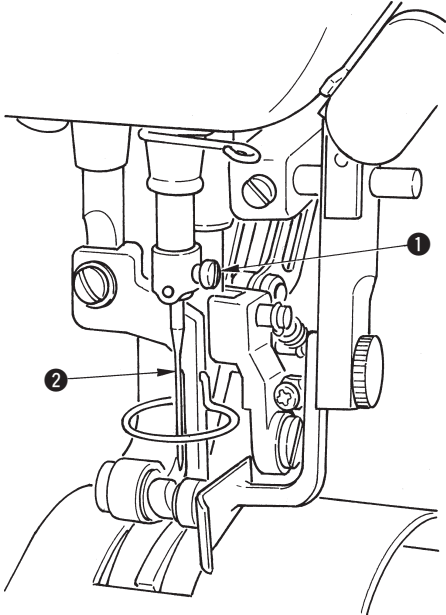
Procedures of disassembling / assembling



Caution in disassembling	Caution in assembling
<p>20. Bring the needle bar to the position of its upper dead point, loosen nut ①, turn screw ②, and adjust so that the bottom face of auxiliary feed belt ⑬ is as high as that of main feed belt ⑫. After the adjustment, tighten nut ①.</p> <p>* The height of the bottom face of auxiliary feed belt ⑬ becomes high when turning screw ② clockwise, and low when turning it counterclockwise.</p>	<p>* For the details of adjusting the height of the auxiliary feed foot, refer to "(24) Adjusting the height of the auxiliary feed foot".</p>
<p>21. Adjust auxiliary feed belt ⑬ to the proper tension by adjusting the position of tension adjustment plate S ⑩, and tighten setscrew ⑪.</p> <p>* The tension of auxiliary feed belt ⑬ becomes high when moving tension adjustment plate S ⑩ in the direction of G, and low when moving it in the direction of H.</p>	<p>* For the details of adjusting the belt tension, refer to "(6) Adjusting the feed belt tension".</p>
<p>22. Bring the needle bar to the position of its lower dead point, and fix presser foot ④ to presser foot bar ②④ with setscrew ③ so that the clearance between the bottom face of presser foot ④ and needle hole guide ②③ is 0.1 mm.</p>	<p>* For the details of adjusting the height of the presser foot, refer to "(25) Adjusting the height of the presser foot".</p>

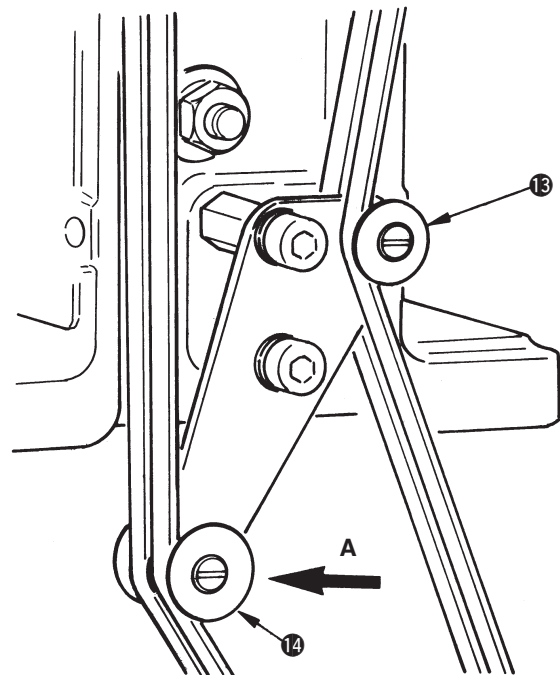
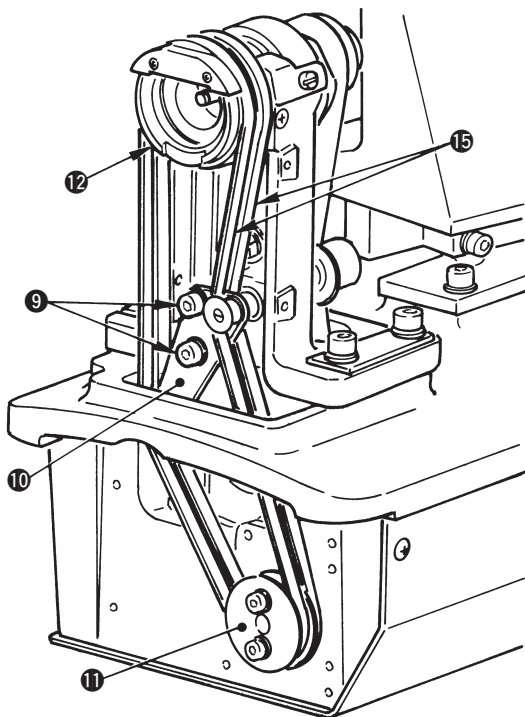
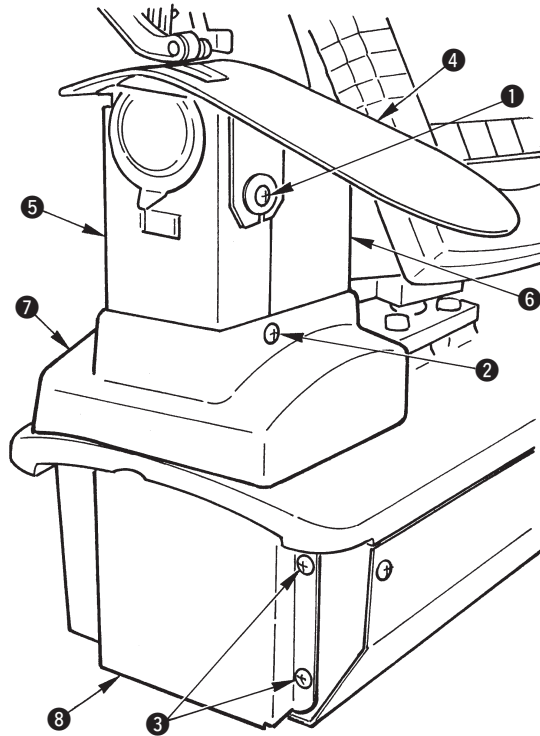
(28) Replacing procedure of the top feed belt (7/7)

Procedures of disassembling / assembling



(29) Replacing procedure of the bottom feed belt

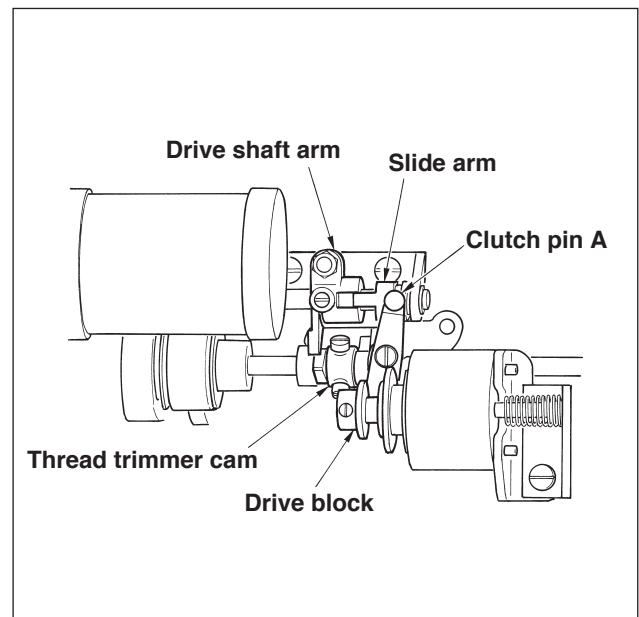
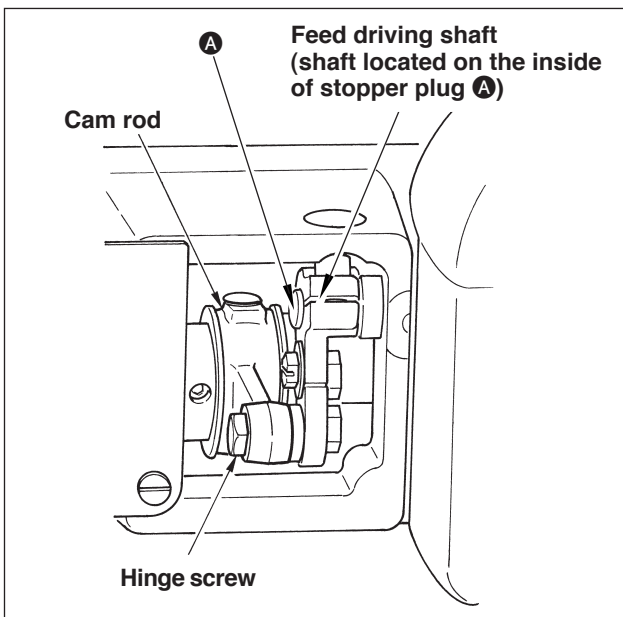
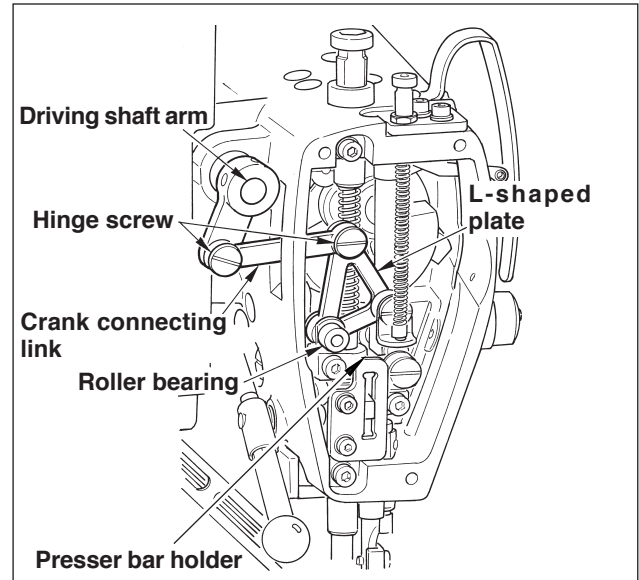
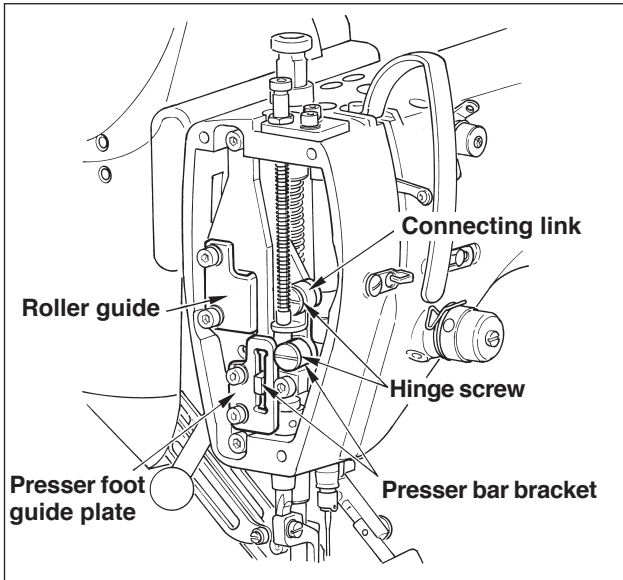
Procedures of disassembling / assembling

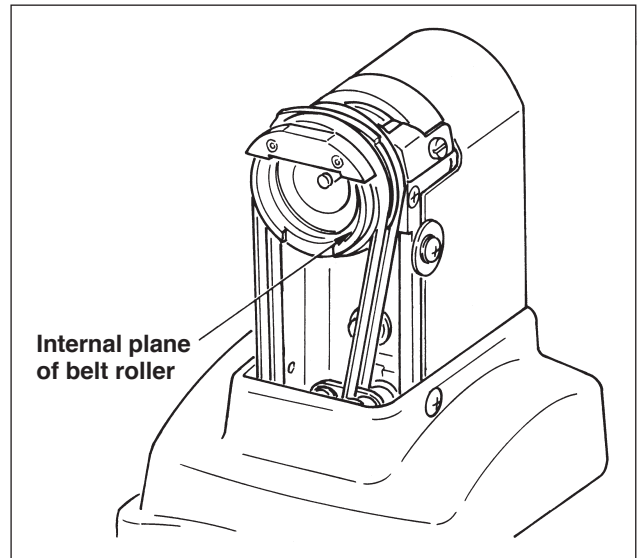
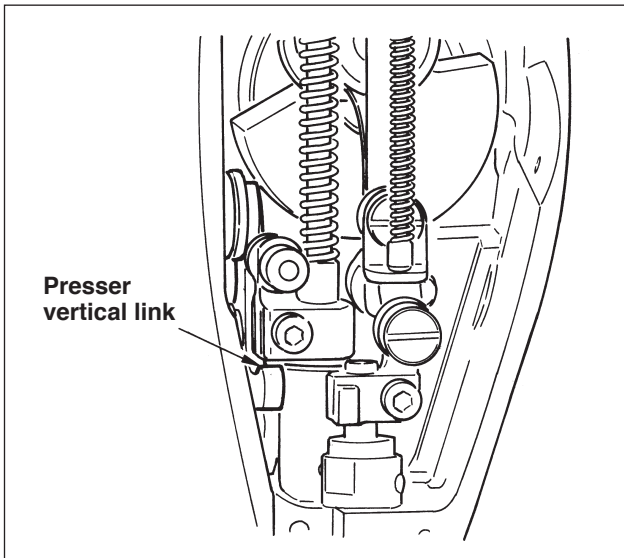


Caution in disassembling	Caution in assembling
<ol style="list-style-type: none"> 1. Loosen cover setscrews ① ② and ③ 2. Remove throat plate auxiliary plate ④ hook cover ⑤ hook belt cover ⑥ frame cover ⑦ and bottom feed cover ⑧ 3. Loosen setscrews ⑨ in the bottom feed tension plate. 4. Remove bottom feed tension plate ⑩. 5. Replace bottom feed belt ⑮ with a new one. 6. Put new bottom feed belt ⑮ to bottom feed pulley ⑪ and belt roller ⑫. 7. Put bottom feed belt ⑮ to idler pulleys ⑬ and ⑭ as illustrated on the left side, and tighten bottom feed tension plate ⑩ with setscrews ⑨ in the bottom feed tension plate. 8. Move bottom feed tension plate ⑩ in the direction of A to apply proper tension to bottom feed belt ⑮. 9. Tighten throat plate auxiliary plate ④ and the respective covers ⑤ ⑥ ⑦ and ⑧ with setscrews ① ② and ③ 	<p>* For the details of adjusting the belt tension, refer to "(6) Adjusting the feed belt tension".</p>

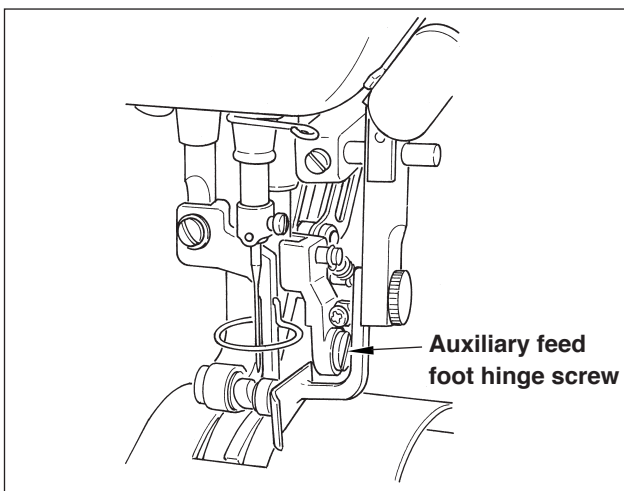
4. PARTS TO BE GREASED

- (1) Periodically perform grease-up to the indicated sections below approximately every six months as a standard.
- (2) Apply the exclusive grease (500g can, Part No. :23640204 or tube containing 10g, Part No. : 40006323) to the sections for which lubrication is necessary excluding the lubricating sections.
- (3) Tighten the respective hinge screws excluding the auxiliary feed foot hinge screw with a tightening torque of $5.88 \pm 0.49 \text{ N} \cdot \text{m}$ ($60 \pm 5 \text{ kgf} \cdot \text{cm}$).





(4) Tighten the auxiliary feed foot hinge screw with a tightening torque of $4.9 \pm 0.49 \text{ N} \cdot \text{m}$ ($50 \pm 5 \text{ kgf} \cdot \text{cm}$).



5. SET-UP MANUAL FOR IP-200

(1) Connecting procedure of operation panel with external vehicle

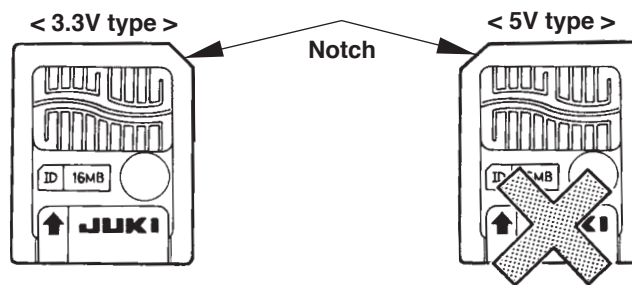
It is possible for this operation panel to perform communication or input of signal with the external vehicle below other than the control box.

1. Smart media card
2. RS-232C
3. Input of signal by means of the connector for external input

1. Smart media card

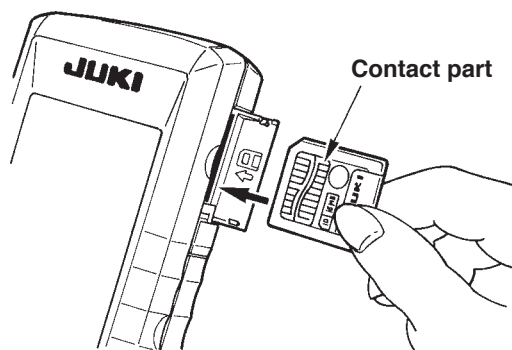
It is possible to give and take data by using the smart media card.

For the smart media card, it is recommended to use SmartMedia of 3.3V voltage type which is prescribed by SSFDC forum. The card is different in the position of notch as shown in the figure below. Judge it by the position of notch.



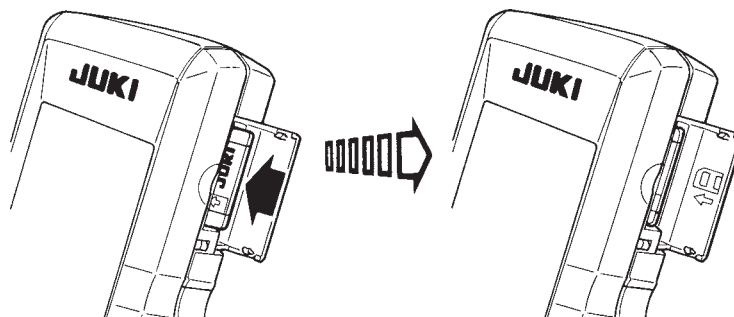
(Caution) When the contact part becomes dirty, contact failure will be caused. Control so that the contact part is not touched by hand, or that dust, oil or other foreign material does not adhere to the contact part. Besides, be very careful of handling the card since the internal data is broken by the static electricity or the like.

(Setting procedure)



- 1) When the upper side cover located on the side of operation panel is opened, there is the inserting opening of the smart media card. Insert the card there while facing the contact part to the front.

- 2) When continuing inserting the smart media card, the card stops once in the state that it protrudes by approximately 10 mm. When some force is applied to it, it is further inserted and goes to the end. When it goes no further, reduce the force and it returns by approximately 1 mm. This work completes the setting of the card.



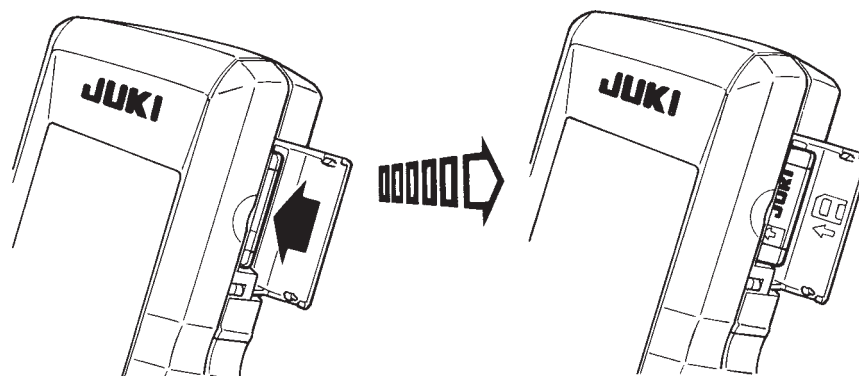
- 3) When the setting of the card is completed, close the smart media card cover. It is not possible to receive or send the data with smart media card with the cover opened. For the operating procedure, refer to “USING COMMUNICATION FUNCTION” of the Instruction Manual.

If the smart media card comes in contact with the cover and the cover is not closed, check the following matters.

- Check that inserting is stopped in the state that the card protrudes by approximately 10 mm.
- Check that the contact part is faced downward and inserted.
- Check that the smart media card other than 3.3V voltage type is used.

(Removing procedure)

- 1) Open the smart media cover, press the card until it goes no further and reduce the force. The card returns by approximately 10 mm by reversing order at the time of setting.
- 2) Then drawing up the card completes removing.

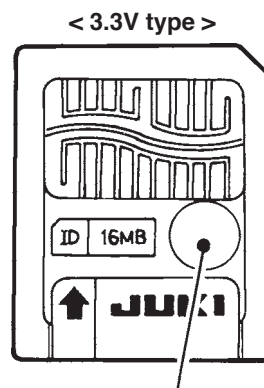


< Handling the smart media card >

- Smart media is a precision instrument. Do not bend or shock it.
- It is recommended to periodically save the data saved in the smart media into the other vehicle for the accident.
- When initializing data, perform it after checking that there is no necessary data in the card. When the data is initialized, the internal data is deleted.
- Avoid using or keeping the card in a high temperature or high humidity place.
- Avoid using the card near heating or combustible articles.
- When the contact part becomes dirty, contact failure will be caused. Control so that the card is not touched by hand, or that dust, oil or other foreign material does not adhere to the card. Besides, be careful of handling the card since the internal data is broken by the static electricity or the like.
- Smart media has the life, and writing and deletion cannot be performed after an extended period of use. In this case, replace the smart media with a new one.

< Prevention of memory error >

- When write protect seal is pasted, the card becomes exclusive for reading and writing cannot be performed.
- Strip off the seal when you desire to record again.
- Do not use again the seal which was pasted once and stripped off. The trouble of the main unit will be caused.



2. Communication by means of RS-232C

Operation panel can give and take the data with the personal computer by using communication by means of RS-232C.

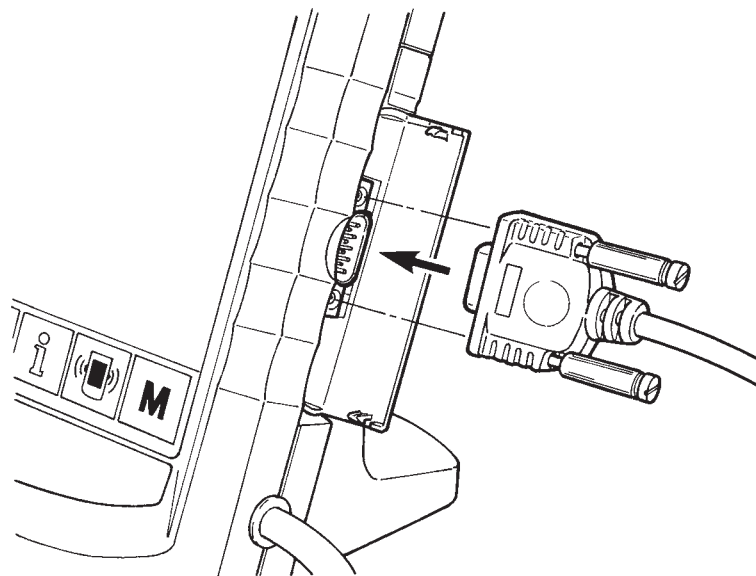
For the cable to be connected, connect the reverse type 9-pin (female) to the operation panel side. Signal names of the operation panel are as follows.

Pin No.	Signal name	Function	Signal direction
1	N.C.	Not connected	
2	RXD	Receive data	To panel
3	TXD	Transmit data	From panel
4	DTR	Data terminal ready	From panel
5	GND	Earth	
6	DSR	Data set ready	To panel
7	RTS	Transmission request	From panel
8	CTS	Transmission approved	To panel
9	N.C.	Not connected	

(Caution) When the contact part becomes dirty, contact failure will be caused. Control so that the contact part is not touched by hand, or that dust, oil or other foreign material does not adhere to the contact part. Besides, be careful of handling the contact part since the internal element is broken by the static electricity or the like.

(Setting procedure)

- 1) When the lower side cover located on the side of operation panel is opened, there is a 9-pin connector for RS-232C. Insert the cable there. When the screw for lock is attached to the connector, tighten the screw to prevent the screw from falling.

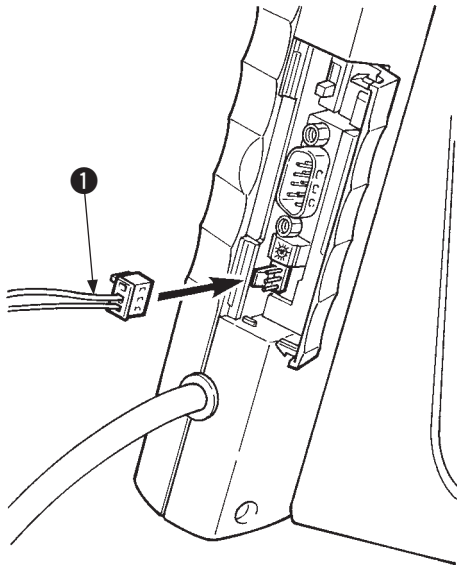


3. Input of signal by means of the connector for external input

It is possible to input the signal from the outside.

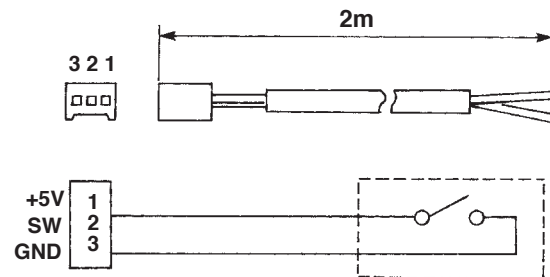
When the switch is connected, it is possible to use as the input of the production control information.

For the details, refer to "Observing the production control information" of the Instruction Manual.



Cable (separately-sold) as shown in the figure below can be connected.

① Relay cable A (asm.) (40008168)



Connector housing : KYOCERA ELCO CO. 60-8263-3038-15-000

Pin contact : KYOCERA ELCO CO. 60-8263-0513-00-808

(Note) The switch main unit is not installed to the relay cable A (asm.).

(Caution) When the contact part becomes dirty, contact failure will be caused. Control so that the contact part is not touched by hand, or that dust, oil or other foreign material does not adhere to the contact part. Besides, be careful of handling the contact part since the internal element is broken by the static electricity or the like.

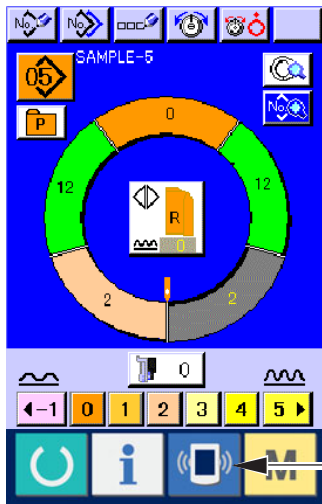
(2) Re-setup of operation panel

When the case is as below, it is necessary to perform re-setup of the program of the operation panel.

- When the operation panel is used as that for other model.
- When version-up of the program is performed.

The way of performing setup of the program from the smart media is shown below. Besides, it is regarded that the program to perform setup has already entered the smart media card.

- 1) First, turn ON the power. Normally, the sewing ready screen is displayed.
- 2) Insert the smart media card into the operation panel.
- 3) Perform operation by the procedure below.





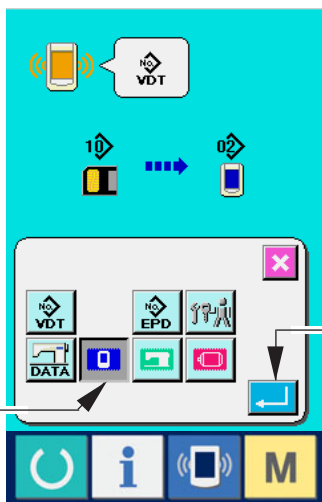
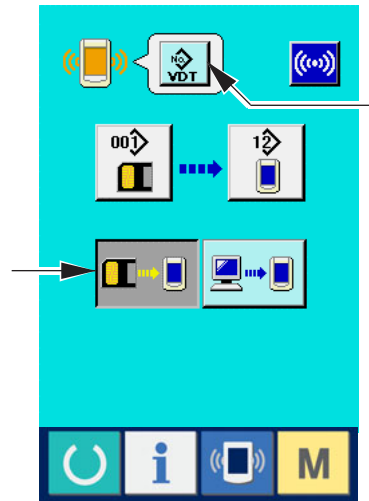
Data edit screen

- 1) Press key  for three seconds.





Communication screen 1

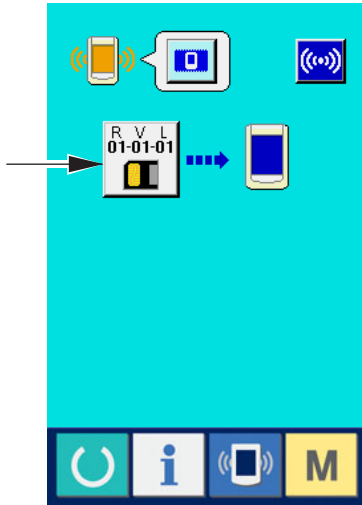
- 2) Press key .
- 3) Press key .




Data selection screen

- 4) Press key .
- 5) Press key .






Communication screen 2

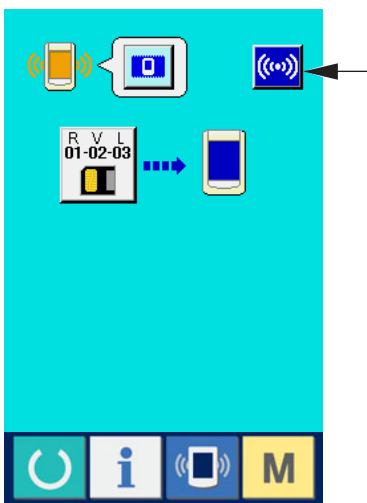
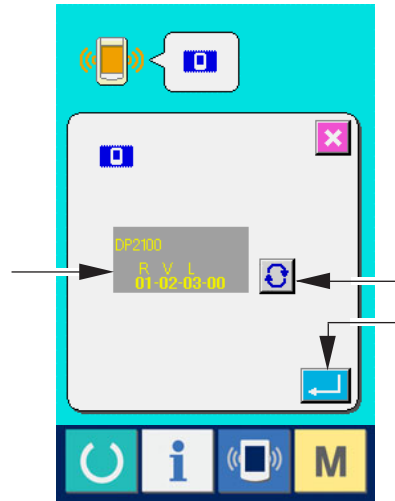
6) Press key  .




File selection screen

7) Press key  and select the download program at display .

8) Press key  .



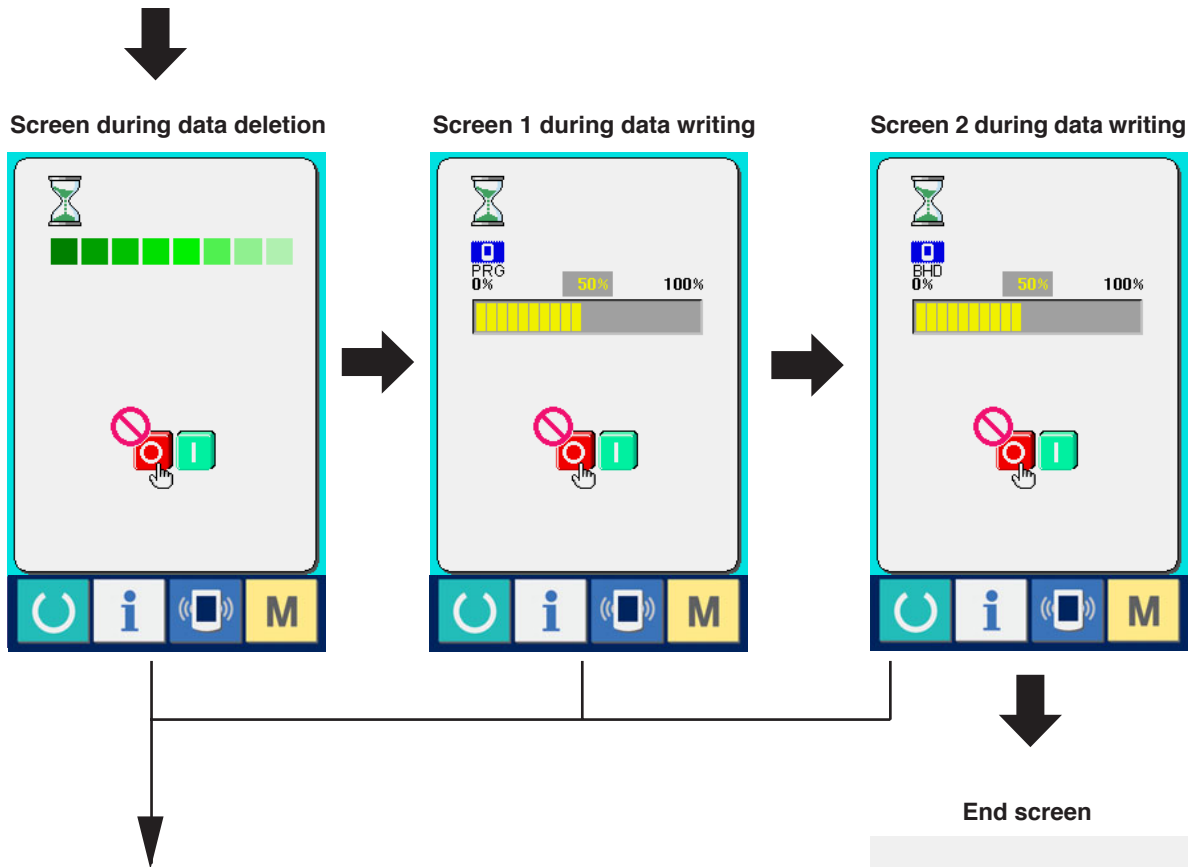
Communication screen 3

9) Press key  .



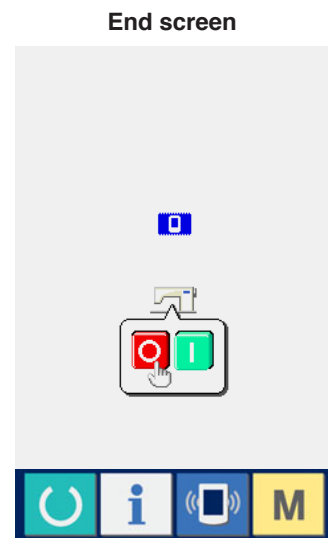
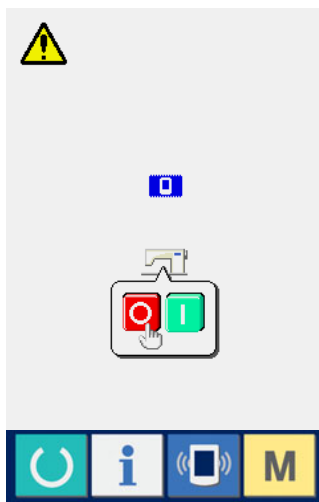
<-<- Start of communication ->>





If the screen below is displayed, quickly turn OFF the power and perform the set-up again after checking [Checking items] below.

Data writing abnormal screen



The procedure above completes the replacing work of application software.

Checking items

- ① Smart media cover is opened during the data communication from the smart media.
- ② Data of the smart media is not correct. Or, there is no data file.
- ③ Contact of the smart media is dirty. Contact is defective.

(Caution) Do not turn OFF the power and close/open the smart media cover during the work. The main unit may be broken.

(3) Re-setup of main program

When you have purchased the single unit of IP-200 operation panel, the smart media card is packed together. You can perform re-setup of the main program of MAIN circuit board on the control box side by using this smart media card.

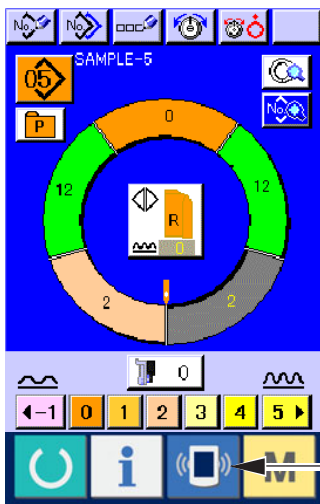
It is necessary that the main program and panel program have to match with each other.

If not, there is a possibility that trouble such as Error "E703 or E704" occurs. Be sure to perform setup by using the smart media card which is packed together.

1. When panel program matches with main program

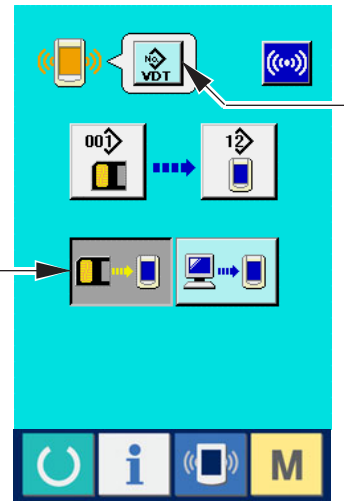
Perform the work by the procedure below when performing version-up of the main program by using the smart media card.

- 1) First, turn ON the power.
- 2) Insert the smart media card into the operation panel.
- 3) Perform operation by the procedure displayed in the screen below.





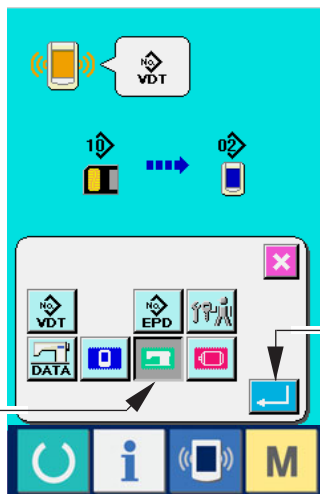
Data edit screen

- 1) Press key  for three seconds.





Communication screen 1

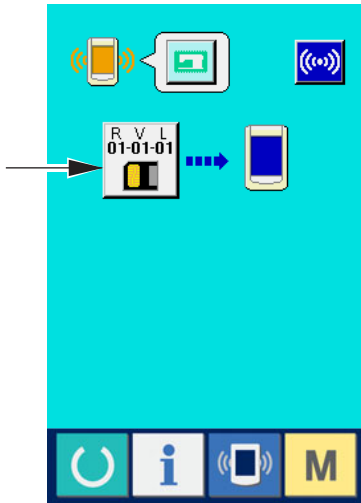
- 2) Press key .
- 3) Press key .




Data selection screen

- 4) Press key .
- 5) Press key .






Communication screen 2

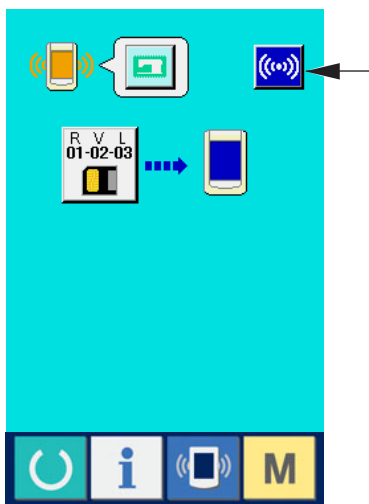
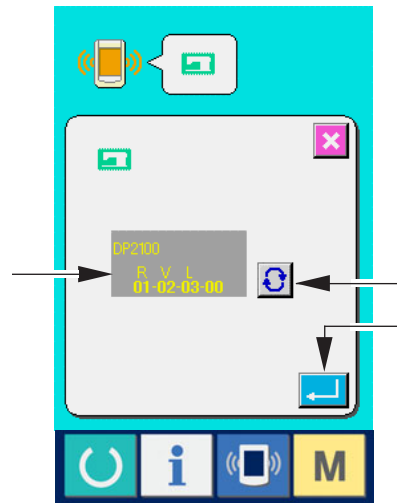
6) Press key .




File selection screen

7) Press key  and select download program at display .

8) Press key .



Communication screen 3

9) Press key .

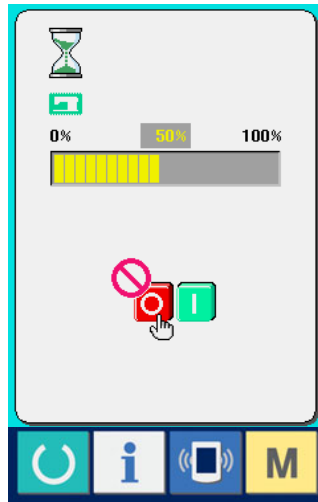


<<- Start of communication ->>

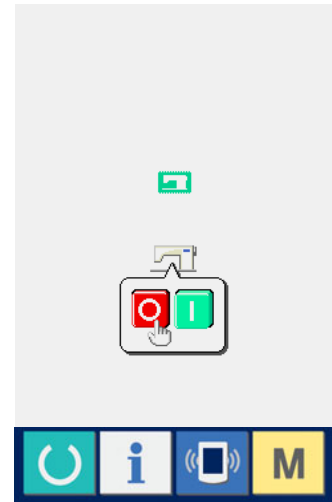




Screen during data writing



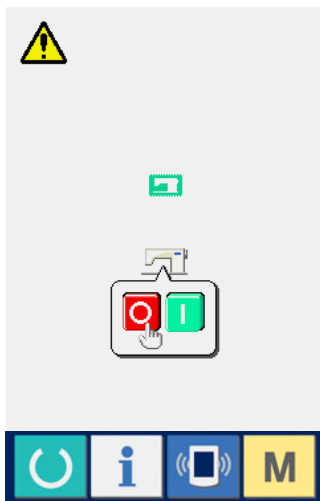
Screen of end of data writing



The procedure above completes the replacing work of application software.

If the screen below is displayed, quickly turn OFF the power and perform the set-up again after checking [Checking items] below.

Data writing abnormal screen



Checking items

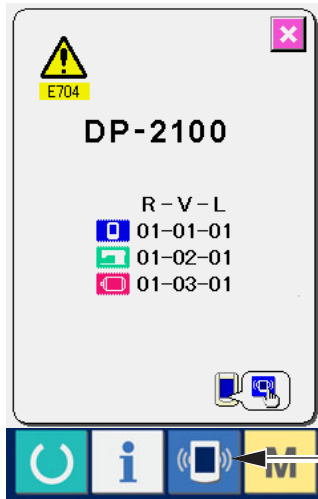
- ① Smart media cover is opened during the data communication from the smart media.
- ② Data of the smart media is not correct. Or, there is no data file.
- ③ Contact of the smart media is dirty. Contact is defective.

(Caution) Do not turn OFF the power and close/open the smart media cover during the work.
The main unit may be broken.


2. When panel program does not match with main program and an error occurs

Perform the work by the procedure below when replacing the main program in case trouble such as Error "E703", "E704", etc. occurs.

- 1) First, turn ON the power. Error screen (E703 or E704) is displayed after turning ON the power.
- 2) Insert the smart media card into the operation panel.
- 3) Perform operation by the procedure displayed in the screen below.

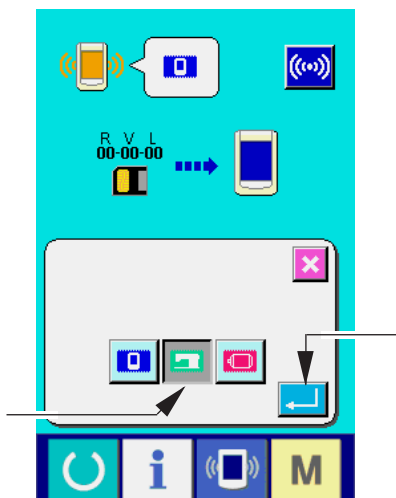
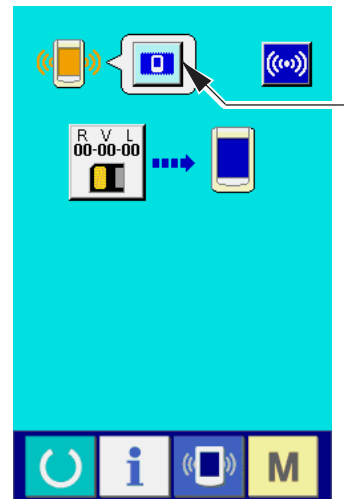


Error screen

1) Press key .


Communication screen 1

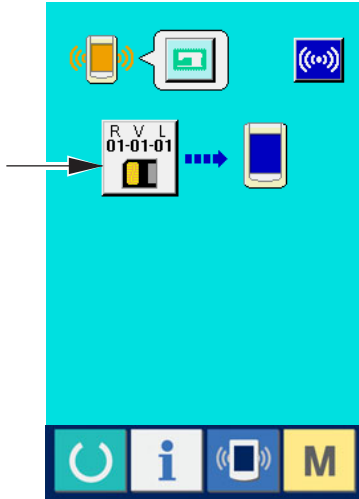
2) Press key .




Data selection screen

3) Press key .

4) Press key .




Communication screen 2

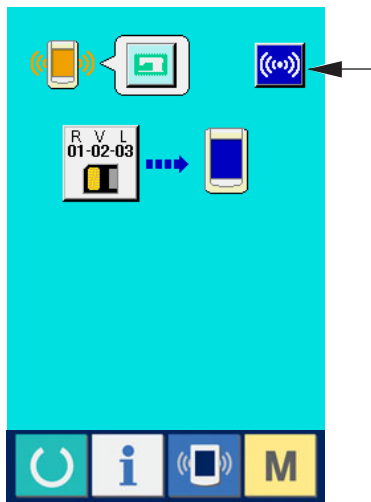
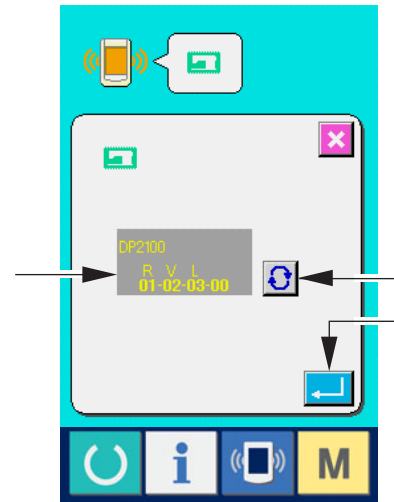
6) Press key .




File selection screen

7) Press key  and select the download program at display .

8) Press key .



Communication screen 3

9) Press key .

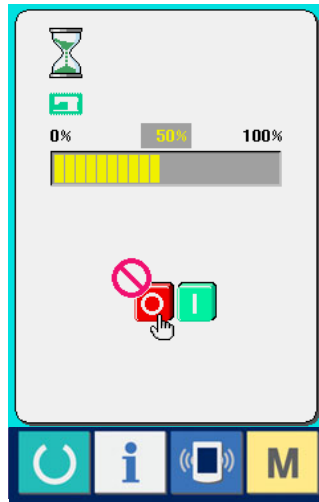


<-<- Start of communication ->>

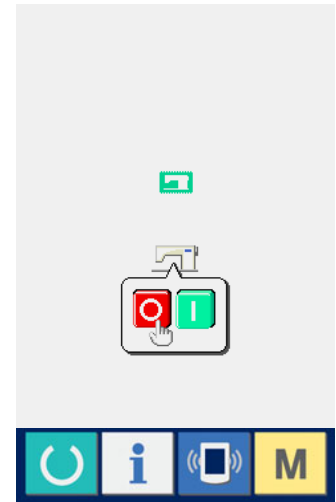




Screen during data writing



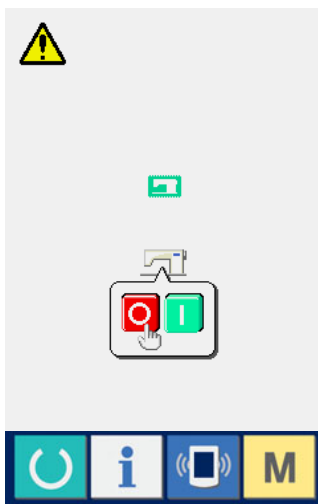
Screen of end of data writing



The procedure above completes the replacing work of application software.

If the screen below is displayed, quickly turn OFF the power and perform the set-up again after checking [Checking items] below.

Data writing abnormal screen



Checking items

- ① Smart media cover is opened during the data communication from the smart media.
- ② Data of the smart media is not correct. Or, there is no data file.
- ③ Contact of the smart media is dirty. Contact is defective.

(Caution) Do not turn OFF the power and close/open the smart media cover during the work.
The main unit may be broken.

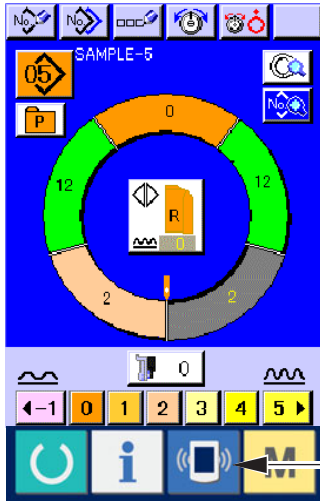
(4) Re-setup of servo program

Perform the work by the procedure below when rewriting the servo program in the same way of “Re-setup of main program”.

1. When main program matches with servo program

Perform the work by the procedure below when making the servo program version-up by using the smart media card.

- 1) First, turn ON the power. Normally, the sewing ready screen is displayed.
- 2) Insert the smart media card into the operation panel.
- 3) Perform operation by the procedure displayed in the screen below.





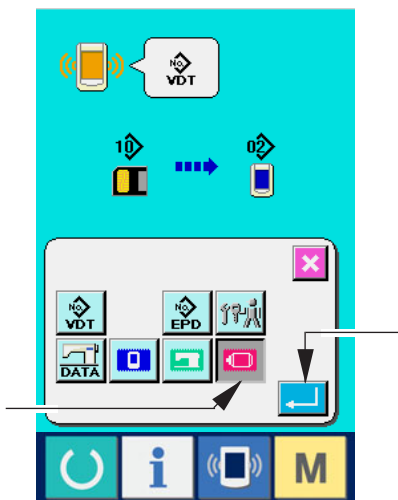
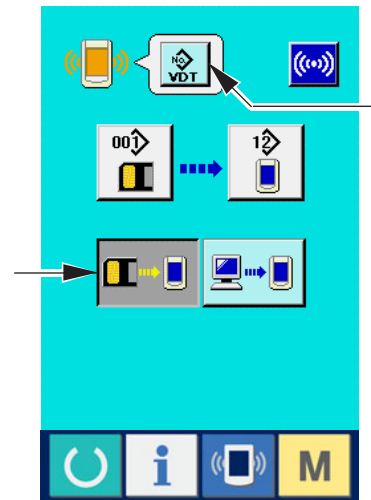
Data edit screen

- 1) Press key  for three seconds.





Communication screen 1

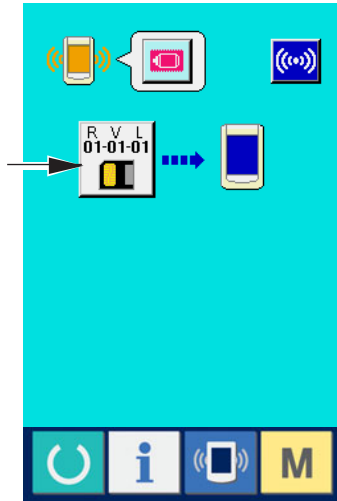
- 2) Press key .
- 3) Press key .




Data selection screen

- 4) Press key .
- 5) Press key .






Communication screen 2

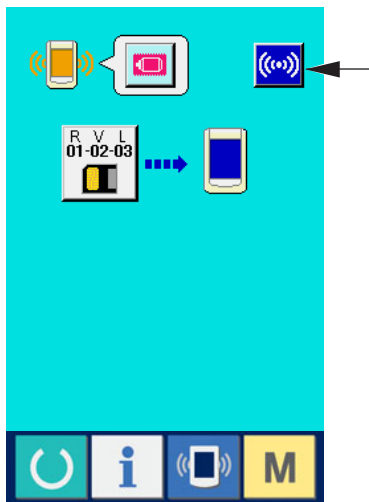
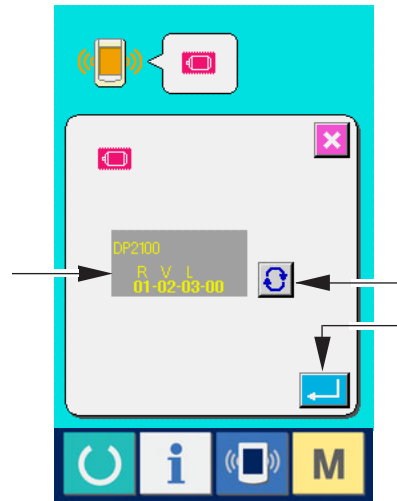
6) Press key .




File selection screen

7) Press key  and select the download program at display .

8) Press key .



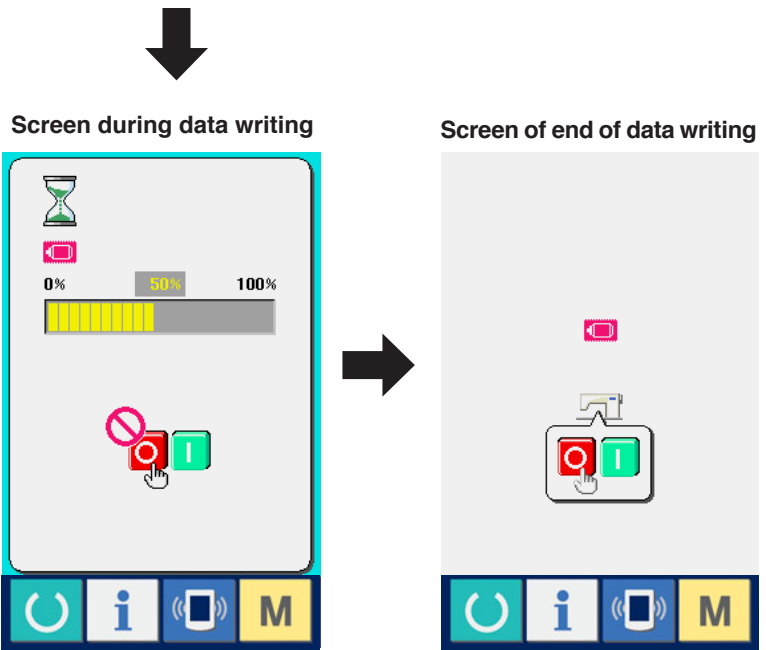
Communication screen 3

9) Press key .



<-<- Start of communication ->>

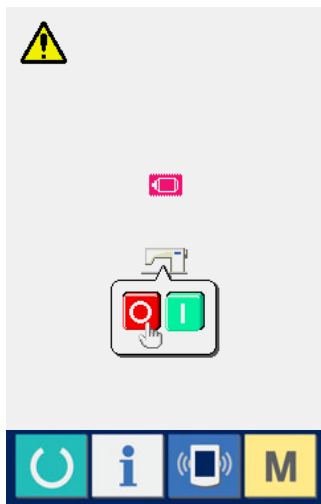




The procedure above completes the replacing work of application software.

If the screen below is displayed, quickly turn OFF the power and perform the set-up again after checking [Checking items] below.

Data writing abnormal screen



Checking items

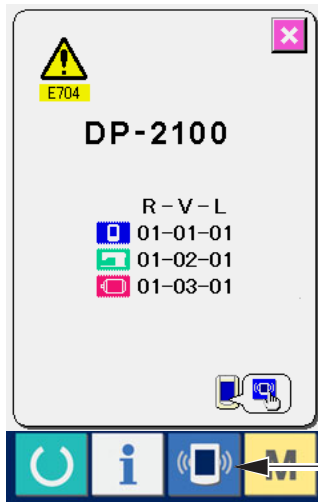
- ① Smart media cover is opened during the data communication from the smart media.
- ② Data of the smart media is not correct. Or, there is no data file.
- ③ Contact of the smart media is dirty. Contact is defective.

(Caution) Do not turn OFF the power and close/open the smart media cover during the work. The main unit may be broken.


2. When panel program does not match with main program and an error occurs

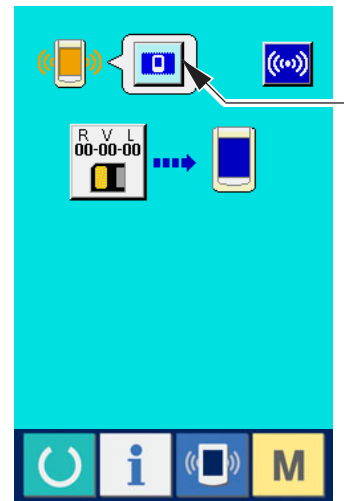
Perform the work by the procedure below when replacing the main program in case trouble such as Error "E703", "E704", etc. occurs.

- 1) First, turn ON the power. Error screen (E703 or E704) is displayed after turning ON the power.
- 2) Insert the smart media card into the operation panel.
- 3) Perform operation by the procedure displayed in the screen below.



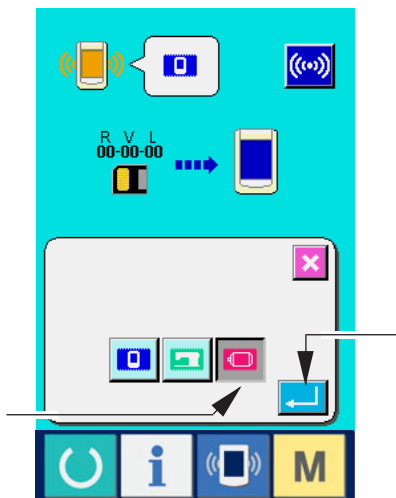
Error screen

1) Press key .





Communication screen 1

2) Press key .

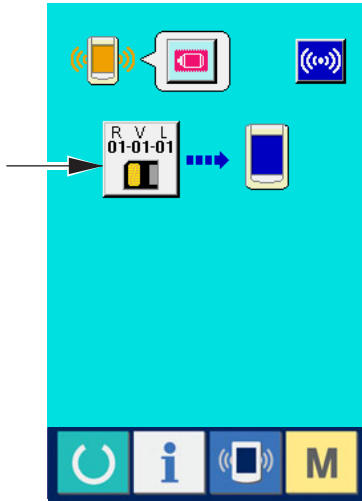


Data selection screen


3) Press key .

4) Press key .






Communication screen 2

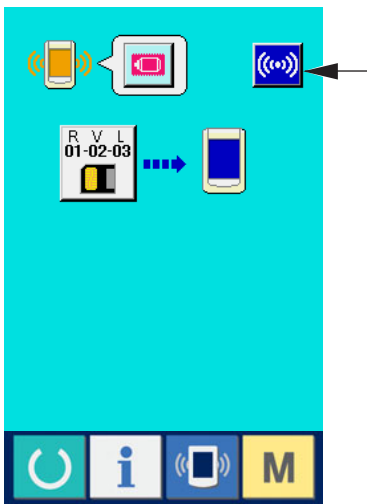
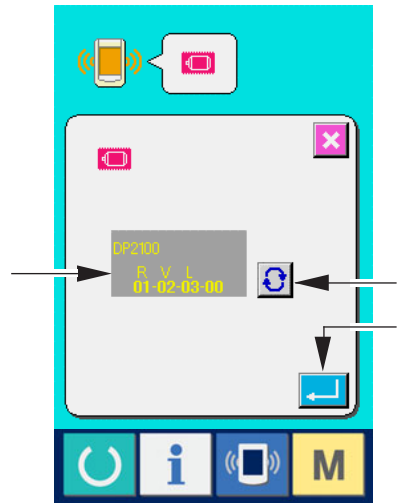
5) Press key .



File selection screen

6) Press key  and select the download program at display .

7) Press key .



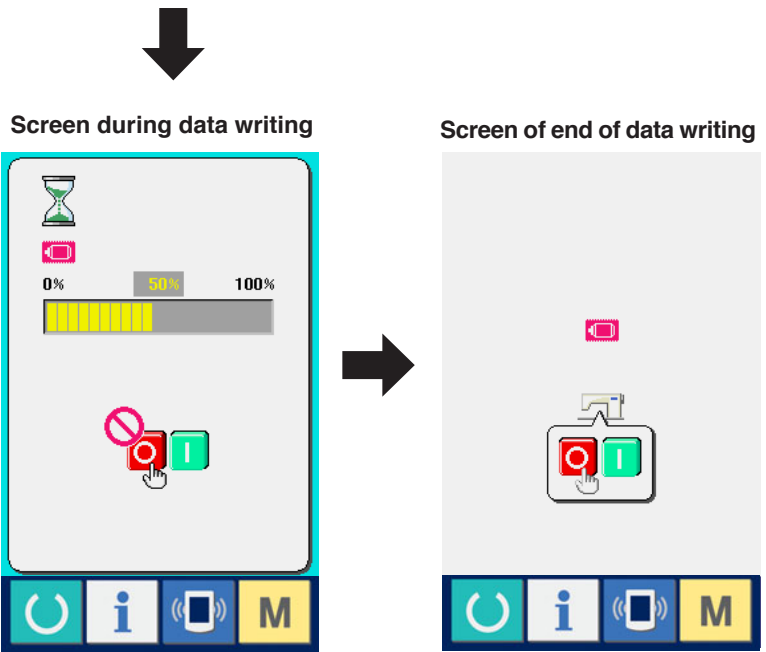
Communication screen 3

8) Press key .



<<- Start of communication ->>

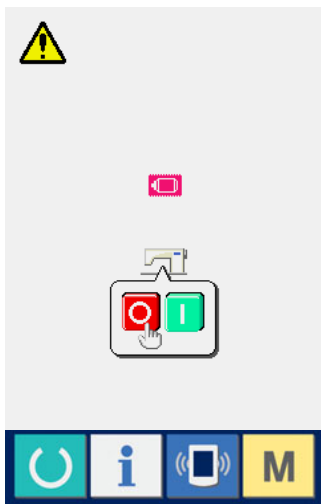




The procedure above completes the replacing work of application software.

If the screen below is displayed, quickly turn OFF the power and perform the set-up again after checking [Checking items] below.

Data writing abnormal screen



Checking items

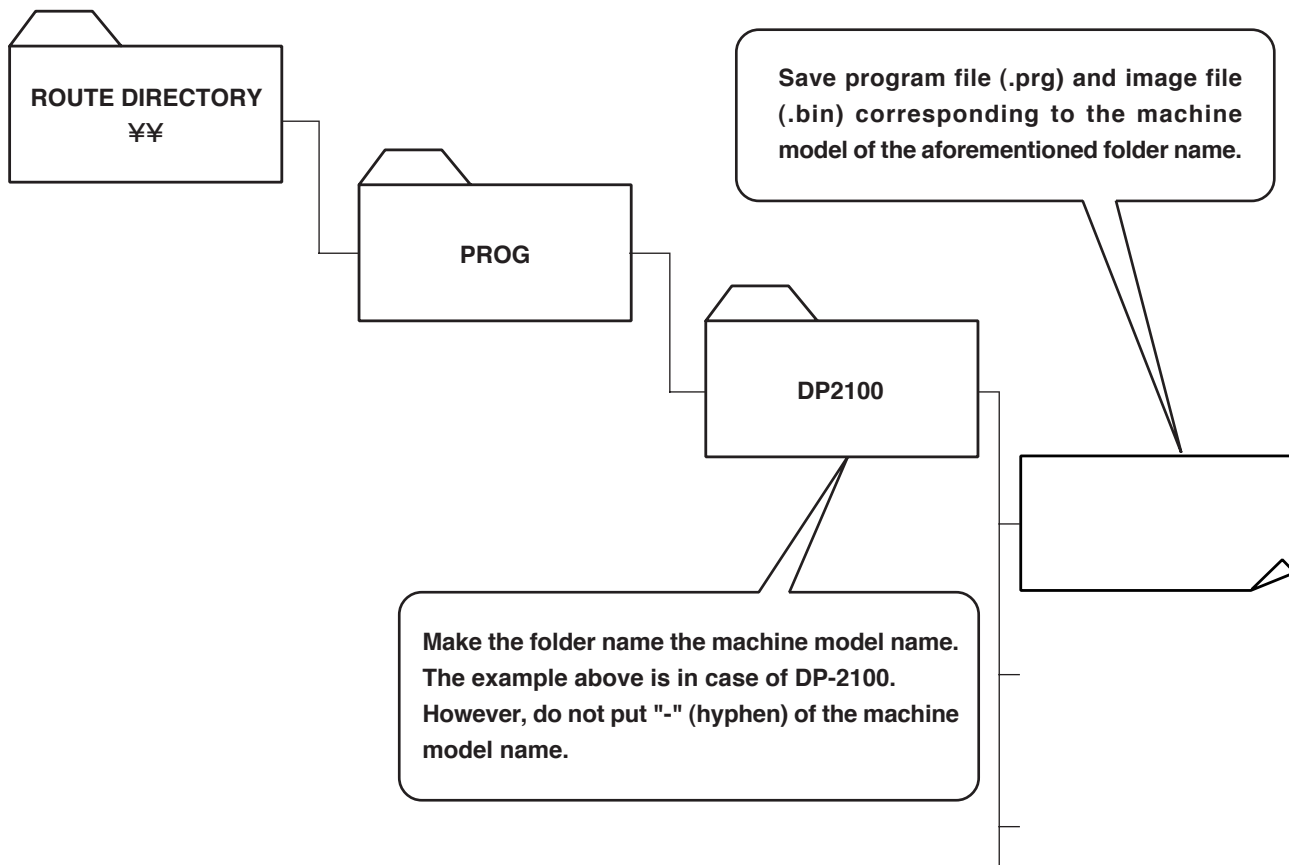
- ① Smart media cover is opened during the data communication from the smart media.
- ② Data of the smart media is not correct. Or, there is no data file.
- ③ Contact of the smart media is dirty. Contact is defective.

(Caution) Do not turn OFF the power and close/open the smart media cover during the work. The main unit may be broken.

(5) When using smart media other than that which has been packed together

When copying the contents of the smart media card which is packed together to the other smart media, create the directory structure mentioned below with the personal computer after formatting the smart media to be the copy destination with IP-200.

For the formatting procedure of the smart media, read "USING COMMUNICATION FUNCTION" of Instruction Manual.



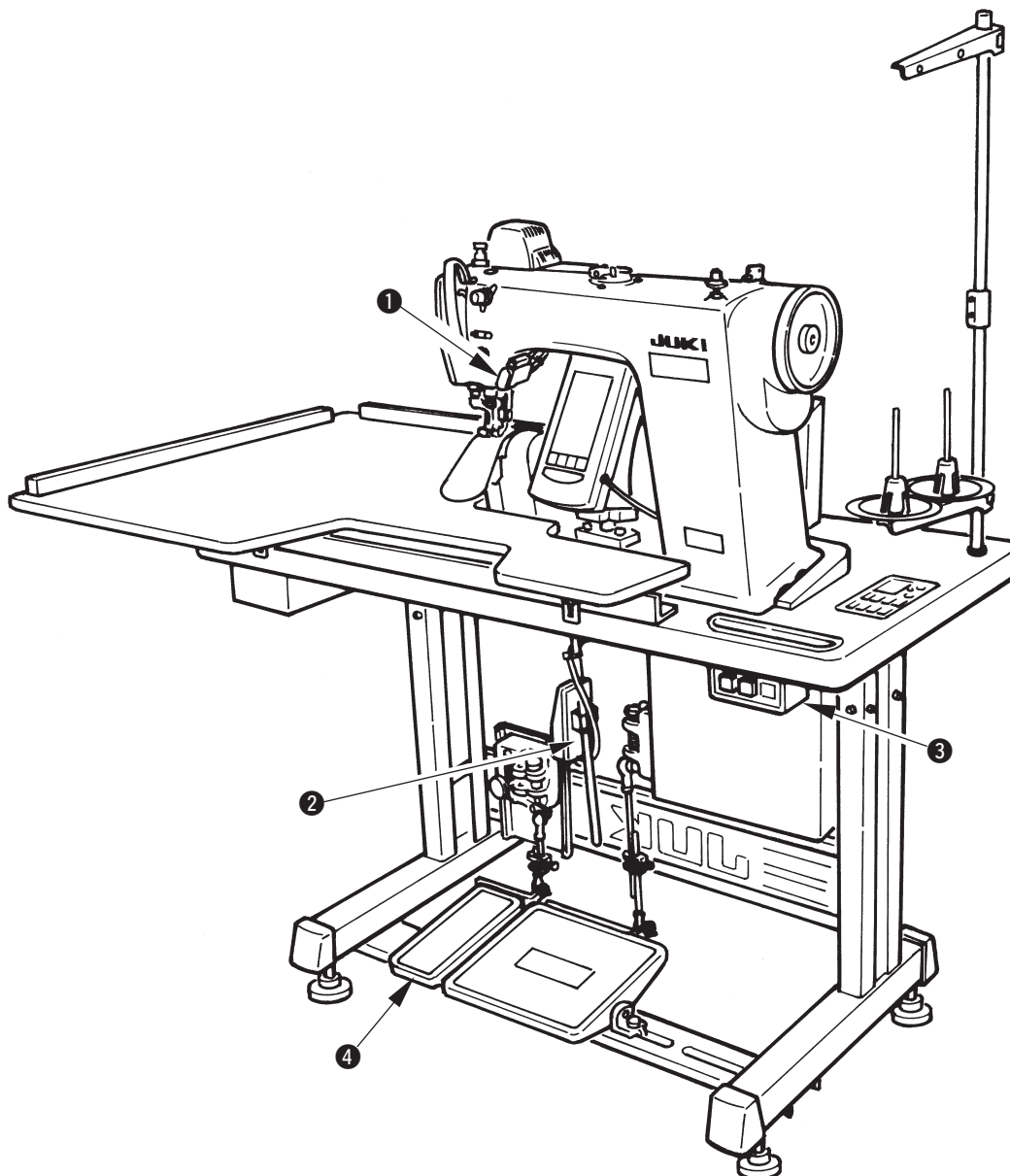
6. INITIALIZING THE BACKUP DATA

Perform the work in the order of the procedures below in order to return the backup data which are memorized in the sewing machine to the status at the time of delivery.

- 1) Press down shirring release switch ①, press down knee switch for step changeover ②, and turn ON power switch ③ with auxiliary pedal ④ depressed.
- 2) In a short time, the buzzer sounds, and release the respective switches ③, ① and ②, and auxiliary pedal ④.
- 3) After a few minutes has passed, E001 "MAIN EEP-ROM initialization contact of MAIN p.c.b." is displayed on the panel.
- 4) Turn OFF power switch ③.
- 5) When power switch ③ is turned ON again, the data which have been set up to now are initialized and returned to the status (sample pattern only) at the time of delivery .

Backup data to be initialized are sewing data, and all data which have been set in the mode screen (memory switch, counter, check program, etc.)

However, thread tension data (tension during operation. tension during waiting and base tension) cannot be initialized.






7. SEWING DATA LIST




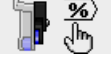
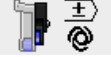
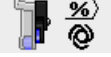




This list is the list of sewing data to set for every pattern.

"Semi-automatic selection and fully-automatic selection"

No.	Item	Setting range	Edit unit	Initial display
S01	Selection of gents and ladies (Fully-automatic only) Select from two kinds of gents and ladies.  : Gents  : Ladies	---	---	Gents
S02	Shirring amount increase/decrease setting Increase/decrease value of the shirring amount of the whole of the pattern is set. 	(Numerical value input) -50 to 50	1	0
		(Ratio input) -95 to 95	5%	0%
S03	Sewing size setting (Fully-automatic only) Sewing size is set. Here, the description is in case of Japanese gents. Size value changes in accordance with the country classes. 	2 to 16	1 size	No. 5 In case of Japanese gents
S04	Sewing pitch setting Pitch at the time of sewing is set. 	1.5 to 6.0	0.1mm	2.0mm
S05	Length between steps setting (Fully-automatic only) Length of each step is set. 	1.0 to 255.0	0.1mm	Without
S06	Grading value setting (Full-automatic only) Offset value at the time of grading is set. 	0 to 255	0.1mm	0mm
S07	Compensation thread tension setting Increase/decrease of thread tension value in terms of the set value of needle thread tension is set. 	-200 to 200	1	0
S08	Compensation pitch setting Increase/decrease value in terms of the sewing pitch set with S04 is set. 	-4.5 to 4.5	0.1mm	0mm
S09	Start position change Start position of the program is changed. 	1 to 15	1	1
S10	Mirroring Mirroring of the program of one sleeve is performed and the program of the other sleeve is created. 	---	---	---

No.	Item	Setting range	Edit unit	Initial display
S11	Compensation shirring amount setting Number of stitches to increase/decrease the shirring amount immediately after changing over the step and the shirring amount are set. 	Number of stitches of compensation 0 to 15	1 stitch	0 stitch
		Compensation shirring amount -30 to 30	1	0
S12	Addition of step A new step is added to the rear of the selected step. 	---	---	---
S13	Deletion of step The selected step is deleted. 	---	---	---




















"Manual selection"


















No.	Item	Setting range	Edit unit	Initial display
S50	<p>Auxiliary pedal motion selection The motion is selected from two kinds of step mode and interlocking mode.</p> <p> : Step mode</p> <p> : Interlocking mode</p>	---	---	Interlocking mode
S51	<p>Auxiliary feed mode selection Motion mode of the auxiliary feed is selected.</p> <p> : Manual numerical value input</p> <p> : Manual ratio input</p> <p> : Interlocking numerical value input</p> <p> : Interlocking ratio input</p>	---	---	Manual numerical value input
S52	<p>Sewing pitch setting Pitch at the time of sewing is set.</p> 	1.5 to 6.0	0.1mm	2.0mm
S53	<p>Auxiliary feed interlocking mode setting Setting of the interlocking mode is performed when the interlocking numerical value input or the interlocking ratio input is selected under S51 Auxiliary feed mode selection.</p> 	---	---	---
S54	<p>Shirring amount range setting The upper limit value and lower limit value of shirring amount is set when the interlocking mode is selected under S50 Auxiliary pedal motion selection.</p> 	-4 to 35	1	Lower limit value -4 Upper limit value 35
S55	<p>Compensation thread tension setting Increase/decrease of tension value in terms of the set value of needle thread tension is set.</p> 	-200 to 200	1	0




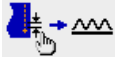



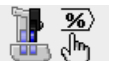


8. MEMORY SWITCH DATA LIST

1) Level 1

Memory switch data (level 1) are the motion data that the sewing machine has in common and the data that operate on all sewing patterns in common.


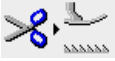

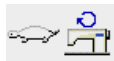

No.	Item	Setting range	Edit unit	Initial display
U01	Reverse stitching at the sewing start selection Select from among three kinds of without, single and double.  : Without  : Single  : Double	---	---	Without
U02	Reverse stitching at the sewing end selection Select from among three kinds of without, single and double.  : Without  : Single  : Double	---	---	Without
U03	Number of stitches of reverse stitching Number of stitches at the sewing start and that at the sewing end are set. 	0 to 19	1 stitch	5 stitches
U04	Reverse stitching speed Speed of the reverse stitching at the sewing start and the sewing end is set. 	200 to 3000	10rpm	800rpm
U05	Needle position at the time of stop Needle position at the time of temporary stop during sewing is selected.  : DOWN  : UP	---	---	DOWN
U06	Number of stitches of soft start setting Number of stitches of soft start at the sewing start is set. 	0 to 9	1 stitch	0 stitch
U07	Soft start speed setting Speed of soft start at the sewing start is set. 	200 to 2000	10rpm	800rpm
U08	Condensation sewing selection Select from among four kinds of without, start only, end only and both start and end.  : Without  : Start  : End  : Both	---	---	Without
U09	Number of stitches of condensation Number of stitches of condensation sewing is set. 	0 to 9	1 stitch	0 stitch
U10	Condensation speed setting Speed of condensation sewing is set. 	200 to 2000	10rpm	800rpm
U11	Base tension in waiting state Base tension in waiting state (except during sewing) is set. 	0 to 200	1	20





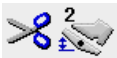






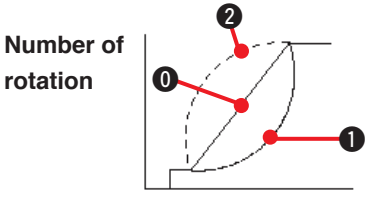


No.	Item	Setting range	Edit unit	Initial display
U12	Compensation tension mode selection Select from among manual (numerical value), manual (level) and automatic.   : Numerical value  : Level   : Automatic For setting procedure of the manual (numerical value), refer to "Explanation of compensation tension (numerical value)" of the Instruction Manual.	---	---	Manual (numerical value)
U13	Compensation tension manual (level) setting This item is displayed when "manual (level)" is selected in U12 Compensation tension mode selection. Compensation tension value for each level is set. → Refer to "Explanation of compensation tension manual (level)" of the Instruction Manual.	- 200 to 200	1	Level 1) 10 Level 2) 20 Level 3) 30
U14	Compensation tension automatic setting This item is displayed when "automatic" is selected in U12 Compensation tension mode selection. Compensation tension value for each shirring amount range is set. → Refer to "Explanation of compensation thread tension automatic" of the Instruction Manual.	Shirring amount - 4 to 35 Compensation tension value - 200 to 200	---	---
U15	Shirring smoothing function setting Use of shirring smoothing function is selected. → Refer to "Explanation of the shirring smoothing function" of the Instruction Manual.  : Unused  : Us	---	---	Unused
	Number of stitches of shirring smoothing function setting Number of stitches of shirring smoothing function is set. 	0 to 99	1 stitch	1 stitch
	Shirring smoothing function shirring amount setting Shirring amount of shirring smoothing function is set. 	1 to 35	1	1
U16	Data storing function at the time of sewing Whether storing data or not when data is changed in the sewing screen is selected.  : No storing  : Storing	---	---	Storing
U17	Sound output at the time of changeover of step selection Whether buzzer sounds or not when step is changed over is selected.  : No sound  : Sound	---	---	No sound
U18	Auxiliary pedal use selection Whether auxiliary pedal is used or not is selected.  : Unused  : Use	---	---	Use
U19	Shirring release switch use selection Whether shirring release switch is used or not is selected.  : Unused  : Use	---	---	Use





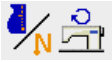






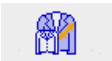


No.	Item	Setting range	Edit unit	Initial display
U20	Knee switch use selection Whether knee switch for step changeover is used or not is selected.  : Unused  : Use	---	---	Use
U21	Shirring amount interlock function at the time of change of pitch selection Whether shirring amount set to each step at the time of change of pitch is corrected or not according to the change amount of pitch is selected.  : Not correct  : Correct	---	---	Not corrected
U22	Screen changeover function at the time of thread trimming on the way selection Whether screen is changed over or not when thread trimming is performed at the step other than the last step is selected.  : No changeover  : Changeover	---	---	No changeover
U23	Auxiliary feed input mode selection Whether auxiliary feed input is performed with offset numerical value or % ratio is selected.  : Numerical value  : Ratio	---	---	Numerical value
U24	Shirring amount increase/decrease input mode S02 Whether Shirring amount increase/decrease value input is performed with offset numerical value or with % ratio is selected.  : Numerical value  : Ratio	---	---	Numerical value








2) Level 2


Memory switch data (level 2) can be edited when pressing MODE switch for as long as 6 seconds.

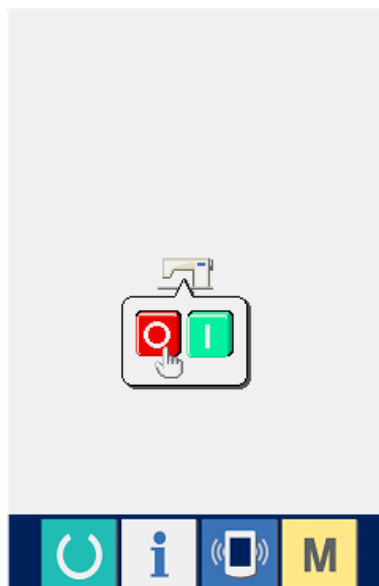
No.	Item	Setting range	Edit unit	Initial display
K01	Presser position after thread trimming selection Position of the presser after thread trimming is set.  : DOWN  : UP	---	---	UP
K02	Max. sewing speed setting Max. sewing speed of the sewing machine is set. 	200 to 3500	10rpm	3500rpm
K03	Sewing speed at low speed setting Min. sewing speed of the sewing machine is set. 	200 to 400	5rpm	200rpm
K04	Sewing speed of thread trimming setting Sewing speed at the time of thread trimming is set. 	100 to 250	5rpm	160rpm

No.	Item	Setting range	Edit unit	Initial display
K05	Flicker reduction function setting This function is set when hand lamp flickers. 0 : Without flicker reduction function 1 : Less effective → 8 : more effective 	0 to 8	1	0
K06	Rotation start pedal stroke setting Stroke from the neutral position of pedal to sewing machine rotation start position is set. 	1.0 to 5.0	0.1mm	3.0mm
K07	Pedal low speed section Section from pedal neutral position to sewing machine acceleration start position is set. 	1.0 to 10.0	0.1mm	6.0mm
K08	Pedal presser lifting start position Section from pedal neutral position to cloth presser lifting start position is set. 	- 1.0 to -6.0	0.1mm	- 2.1mm
K09	Thread trimming start pedal stroke Section from pedal neutral position to thread trimming start position is set. 	- 1.0 to -6.0	0.1mm	- 5.1mm
K10	Pedal max. number of rotation reach stroke Section from pedal neutral position to max. number of rotation reach position is set. 	1.0 to 15.0	0.1mm	15.0mm
K11	Pedal neutral position compensation Compensation value of neutral point of pedal is set. 	- 15 to 15	1	- 1
K12	Auto-lifter lifting holding time Waiting time of lifting the presser lifter is set. 	10 to 600	10sec	60sec
K13	Pedal curve selection function Curve of the number of rotation of the sewing machine in terms of pedal depressing amount is selected.  0 : Straight line  1 : Square  2 : Square root 	---	---	Straight line
K14	Reverse rotation to lift needle after thread trimming function selection Sewing machine is rotated in the reverse direction after thread trimming, and needle bar is lifted near to its upper dead point.  : Ineffective  : Effective	---	---	Ineffective

No.	Item	Setting range	Edit unit	Initial display
K15	Reverse stitching at the sewing start A/M changeover function selection Designation of sewing speed of reverse stitching at the sewing start is selected.  : In accordance with the speed by manual operation of pedal or the like  : In accordance with the speed set by U04 Reverse stitching speed	---	---	Speed by manual operation
K16	Stop function immediately after reverse stitching at the sewing start selection Function to make the sewing machine stop once when reverse stitching at the sewing start is completed.  : Without function  : With function	---	---	Without function
K17	Condensation/EBT changeover speed Initial speed at the time of start of EBT (reverse stitching at the sewing end) is set. 	0 to 250	10rpm	170rpm
K18	Retry function selection Function to make the sewing machine rotate again in the normal direction with max. torque after rotating the machine in the reverse direction once when the sewing machine is locked is selected.  : Without retry function  : With retry function	---	---	Without retry function
K19	Sewing machine start-up curve selection Start-up curve of the sewing machine is selected.  : Normal curve  : More sharp curve	---	---	Normal curve
K20	Presser position at the time of stop of the sewing machine selection Position of the presser foot when the sewing machine temporarily stopped is selected.  : DOWN  : UP	---	---	DOWN
K21	Size class setting Initial value (size country class, gents'/ladies' selection, and basic size) when creating a new pattern is set.  → Refer to "Explanation of the size class". of the Instruction Manual.	---	---	Japan Gentlemen No. 6
K22	Initial pitch setting Initial value of pitch when creating a new pattern is set. 	1.5 to 6.0	0.1mm	2.0mm
K23	Bottom feed amount compensation value setting Compensation value of set value and actual value of bottom feed amount is set. 	-1.0 to 1.0	0.1mm	0mm

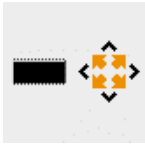
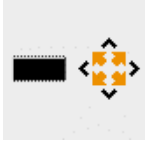
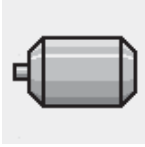
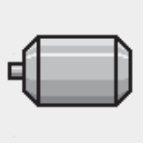
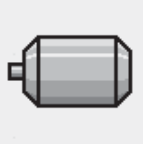
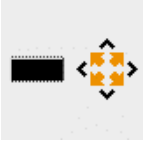
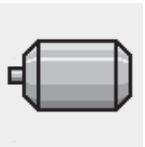
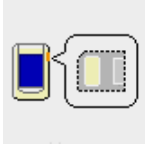
No.	Item	Setting range	Edit unit	Initial display
K24	Top feed amount compensation value setting Compensation value of set value and actual value of top feed amount is set. 	-1.0 to 1.0	0.1mm	0mm
K25	Thread tension curve selection Inclination of thread tension curve is selected.  : Standard  : Gentle (thin materials)	---	---	Standard
K26	Reverse stitching button display selection Display of reverse stitching button in the sewing screen is selected.  : Non-display  : Display	---	---	Non-display
K27	Dish-rise timing setting Disk-rise timing from the start of thread trimming is set. 	0 to 40	1	18
K28	Length of remaining thread setting Length of remaining needle thread at the time of thread trimming is set. When the set value is changed, the disk-close timing from the disk-rise timing changes. 	0 to 40	1	5






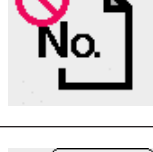
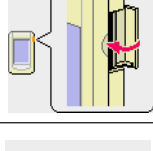
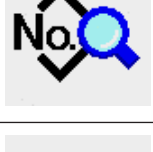

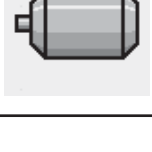
(Caution) When the contents of level 2 have been changed, the screen becomes POWER OFF screen after pressing CLOSE button . Accordingly turn ON the power again after turning OFF the power once.




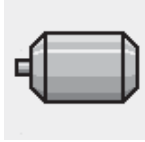
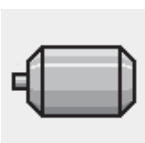
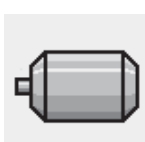

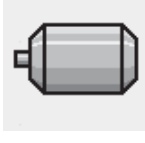



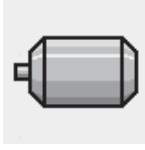
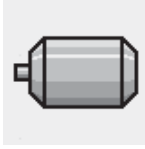



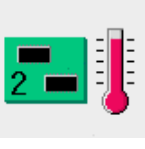

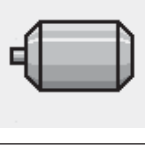

"POWER OFF screen"





9. ERROR CODE LIST

Error code	Pictograph	Description of error	How to recover	Place of recovery
E000		Contact of initialization of main shaft EEP-ROM of MAIN p.c.b. When data is not written in EEP-ROM or data is broken, data is automatically initialized and the initialization is informed.	Turn OFF the power.	
E001		Contact of initialization of main EEP-ROM of MAIN p.c.b. When data is not written in EEP-ROM or data is broken, data is automatically initialized and the initialization is informed.	Turn OFF the power.	
E003		Main shaft motor encoder defectiveness Angle counter of needle UP detection has exceeded the value equivalent to 1.1 turns. Angle counter of needle DOWN detection has exceeded the value equivalent to 1.1 turns.	Turn OFF the power.	
E004		Main shaft motor needle DOWN detection defectiveness Angle counter of needle UP detection has not exceeded the value equivalent to 1.1 turns. Angle counter of needle DOWN detection has exceeded the value equivalent to 1.1 turns.	Turn OFF the power.	
E005		Main shaft motor needle UP detection defectiveness Angle counter of needle UP detection has exceeded the value equivalent to 1.1 turns. Angle counter of needle DOWN detection has exceeded the value equivalent to 1.1 turns.	Turn OFF the power.	
E006		Contact of initialization of machine head EEP-ROM of the circuit board mounted on the machine head When data is not written in EEP-ROM or data is broken, data is automatically initialized and the initialization is informed.	Turn OFF the power.	
E007		Main shaft motor-lock When large needle resistance sewing product is sewn	Turn OFF the power.	
E011		External media not inserted External media is not inserted.	Possible to recover by reset.	Previous screen

Error code	Pictograph	Description of error	How to recover	Place of recovery
E012		Read error Data read from external media cannot be performed.	Possible to recover by reset.	Previous screen
E013		Write error Data write from external media cannot be performed.	Possible to recover by reset.	Previous screen
E014		Write protect External media is in the write prohibition state	Possible to recover by reset.	Previous screen
E015		Format error Format cannot be performed.	Possible to recover by reset.	Previous screen
E016		External media capacity over Capacity of external media is short.	Possible to recover by reset.	Previous screen
E022		File No. error Designated file is not in smart media.	Possible to recover by reset.	Previous screen
E029		Smart media error Lid of smart media slot is open.	Possible to recover by reset.	Previous screen
E062		Sewing data error When sewing data is broken or revision is old.	Turn OFF the power.	
E302		Confirmation of tilt of machine head When tilt of machine head sensor is OFF.	Turn OFF the power.	
E303		Main shaft semilunar plate sensor error Semilunar plate of sewing machine motor is abnormal.	Turn OFF the power.	

Error code	Pictograph	Description of error	How to recover	Place of recovery
E702		Abnormality of control CPU performed processing other than supposed.	Turn OFF the power.	
E703		Panel is connected to the machine other than supposed. (Machine type error) When machine type code of system is improper in case of initial communication.	Possible to rewrite program after pressing down communication switch.	
E704		Nonagreement of system version When version of system software is improper in case of initial communication.	Possible to rewrite program after pressing down communication switch.	Communication screen
E731		Main motor hole sensor defectiveness or position sensor defectiveness When motor hole sensor error signal (UVWE) is detected with the motor locked (2 seconds or more have passed at 20 rpm or less).	Turn OFF the power.	
E733		Reverse rotation of main shaft motor When motor has continued to rotate 40 times or more in the reverse direction as against the control direction at 500 rpm or more during motor running (excluding at the time of holding).	Turn OFF the power.	
E801		Phase-lack of power When 400 ms or more of power phase-lack signal (PHE) is detected after 2 seconds of phase-lack observation invalid time passed from turning ON the power.	Turn OFF the power.	
E802		Power instantaneous cut detection When power instantaneous cut detection signal (PWF) is detected.	Turn OFF the power.	
E810		Solenoid power short-circuit When solenoid power short-circuit signal (PWSH) (CPLD internal signal) is detected while power phase-lack signal (PHE) is not detected after 2 seconds of phase-lack observation invalid time passed from turning ON the power.	Turn OFF the power.	

Error code	Pictograph	Description of error	How to recover	Place of recovery
E811		Overvoltage When power overvoltage signal (OVL) which is output when input power is 280V or more is detected.	Turn OFF the power.	
E813		Low voltage When low voltage signal (LVL) which is output when input power is 150V or less is detected.	Turn OFF the power.	
E903		Abnormality of stepping motor power When stepping motor power abnormality signal (LVPMP) which is output when the stepping motor power, 48V, fluctuates -15% or more when turning ON the power is detected.	Turn OFF the power.	
E915		Abnormality of communication between operation panel and main CPU When abnormality occurs in data communication.	Turn OFF the power.	
E916		Abnormality of communication between main CPU and main shaft CPU When abnormality occurs in data communication.	Turn OFF the power.	
E917		Failure of communication between operation panel and personal computer When abnormality occurs in data communication.	Possible to recover by reset.	
E918		Abnormality of heat sink temperature for MAIN p.c.b. When temperature of heat sink for MAIN p.c.b. is 85°C or more.	Turn OFF the power.	
E920		CPLD writing abnormality When 1 bit each is written in the test port and it does not agree with Verify when turning ON the power.	Turn OFF the power.	
E922		Main shaft motor control impossible When the number of rotation of measuring exceeds 50 ms or more than the upper limit value (3,500 rpm).	Turn OFF the power.	
E924		Main shaft drive trouble When motor driver error signal (GTRE) is detected while motor overcurrent signal (OCL1) is not detected with the motor locked (2 seconds or more have passed at 20 rpm or less).	Turn OFF the power.	

Error code	Pictograph	Description of error	How to recover	Place of recovery
E941		<p>CPLD reading abnormality When input signal from CPLD is read twice and they do not agree with each other even when trying 10 ms or more when turning ON the power.</p>	Turn OFF the power.	
E942		<p>Main shaft EEPROM trouble When data writing to EEPROM cannot be performed.</p>	Turn OFF the power.	
E943		<p>Main EEPROM trouble When data writing to EEPROM cannot be performed.</p>	Turn OFF the power.	
E946		<p>Head EEPROM trouble When data writing to EEPROM cannot be performed.</p>	Turn OFF the power.	

10. TROUBLES AND CORRECTIVE MEASURES

(1) Mechanical parts

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
1. Thread breakage	1-1) Thread path is bad.	1-A) Thread path is not smooth.	Finish the thread path.
		1-B) Thread path has flaws.	Finish the thread path.
		1-C) Thread path has burrs.	Correct the thread path.
	1-2) Needle thread tension is improper.	2-A) Needle thread tension is too high or too low.	Adjust the tension to the proper tension.
	1-3) Adjustment of thread take-up spring is improper.	3-A) Stroke is too large or too small.	Adjust the stroke (standard : 10 to 12 mm).
		3-B) Spring tension is too high or too low.	Adjust the tension.
	1-4) Needle is bad.	4-A) Needle is bent.	Replace the needle.
		4-B) Needle has flaws.	Replace the needle.
		4-C) Needle tip is blunt.	Replace the needle.
		4-D) Installing direction of needle is improper.	Install the needle again.
		4-E) Needle in terms of thread used is too thin or too thick.	Replace the needle.
		4-F) Needle tip is too sharp.	Change the needle to the ball-point needle.
	2. Stitch skipping	1-5) Parts related to the hook are bad.	5-A) Thread path of the hook has flaws.
		5-B) Blade point of the hook is blunt or worn out.	Correct the blade point or replace the hook.
2-1) Needle is bad.		1-A) Needle is bent.	Replace the needle.
		1-B) Installing direction of needle is improper.	Install the needle again.
		1-C) Needle tip is blunt.	Replace the needle.
	1-D) Needle in terms of thread used is too thin or too thick.	Replace the needle.	

To the next page

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
From the previous page	2-2) Parts related to the hook are bad.	2-A) Blade point of the hook is blunt or worn out.	Correct the blade point of hook or replace the hook.
		2-B) Hook timing is improper.	Perform adjustment.
		2-C) Height of the needle bar is improper.	Adjust the needle bar up or down in terms of the blade point of the hook.
		2-D) Clearance between the needle and the blade point of hook is improper.	Make the clearance as small as possible.
	2-3) Needle thread tension is too high.	3-A) Tension is too high.	Decrease the tension.
	2-4) Adjustment of thread take-up spring is improper.	4-A) Stroke is too large.	Decrease the stroke.
		4-B) Tension is too high.	Decrease the tension.
3. Loose stitches	3-1) Thread tension is too low.		Increase the tension.
	3-2) Adjustment of thread take-up spring is improper.	2-A) Stroke is too small.	Increase the stroke.
		2-B) Tension is too low.	Increase the tension.
	3-3) Thread take-up lever stroke is too large.		Move the arm thread guide A to the right and decrease the supply amount of thread by means of the thread take-up lever.
	3-4) Parts related to the hook are bad.	4-A) Hook timing is too fast.	In case of cotton thread and spun thread, adjust the timing to the standard or delay the timing a little.
		4-B) Hook timing is too slow.	In case of synthetic thread, adjust the timing to the standard or advance the timing a little.
		4-C) Hook is bad (scratch).	Replace the hook.
	3-5) Thread path is bad.	5-A) Thread path is not smooth.	Finish the thread path.
		5-B) Thread path has flaws.	Finish the thread path.
		5-C) Thread path has burrs.	Correct the thread path.
	3-6) Bobbin or bobbin case is bad.	6-A) Bobbin thread is caught in bobbin or bobbin case due to improper fitting of bobbin and bobbin case.	Replace the bobbin or the bobbin case.

To the next page

To the next page

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
From the previous page	From the previous page		
	<p>3-7) Thread tension is improper.</p>	<p>6-B) Winding of bobbin thread is improper.</p> <p>6-C) Thread tension spring of the bobbin case is improper.</p> <p>6-D) Bobbin thread in the bobbin case runs idle.</p> <p>7-A) Thread tension disk is risen.</p>	<p>Tension of the bobbin winder is too high or too low.</p> <p>Replace the bobbin case.</p> <p>Increase the spring pressure of the idle-prevention spring.</p> <p>Adjust the thread tension disk to the proper position.</p>
4. Several stitches skip at the start of sewing.	<p>4-1) Needle thread remaining at needle tip after thread trimming is too short.</p>	<p>1-A) Needle thread tension is too high at the time of thread trimming since there is abnormality in the needle thread route.</p> <p>1-B) Thread tension given by the thread tension controller No. 1 is too high.</p> <p>1-C) Rise of the thread tension disk No. 2 at the time of thread trimming is incomplete.</p> <p>1-D) Thread trimming timing is too fast and the moving knife moves while threads are not separated.</p>	<p>Check the needle thread route and correct the position of thread guide of the thread stand.</p> <p>Decrease the tension of thread tension controller No. 1.</p> <p>Perform checking and adjustment of the parts related to the thread rise.</p> <p>Check and adjust the thread trimmer cam timing.</p>
	<p>4-2) Needle thread is not scooped with the blade point of hook.</p>	<p>2-A) Timing between needle and hook is improper.</p>	<p>Check the height of the needle bar and adjust the height to the standard adjustment.</p>
	<p>4-3) Bobbin thread at the start of sewing is too short.</p>	<p>2-B) Tension or momentum of the thread take-up spring is too high or too large.</p> <p>2-C) Blade point of the hook is worn out.</p> <p>2-D) Installation of the needle is improper.</p>	<p>Decrease the tension and decrease the momentum (standard : 10 to 12 mm).</p> <p>Correct the blade point or replace the hook.</p> <p>Adjust the inclination of needle or replace the needle in case it is bent.</p>
	<p>4-4) Needle thread and bobbin thread are difficult to be knotted at the start of sewing.</p>	<p>3-A) End of bobbin thread is drawn in the bobbin case due to the idling of the bobbin.</p> <p>3-B) Bobbin thread is cut short since there are flaws in the hook.</p> <p>4-A) Speed at the start of sewing is too fast and needle thread and bobbin thread are difficult to be interlaced.</p>	<p>Increase the spring pressure of the idle-prevention spring.</p> <p>Increase the bobbin thread tension.</p> <p>Correct the flaw of the hook or replace the hook.</p> <p>Decrease the speed at the start of sewing.</p>

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
5. Thread slips off the needle at the start of sewing.	5-1) Needle thread length remaining at the needle tip after thread trimming is uneven.	1-A) Thread is cut with counter knife only in case sharpening of counter knife is not good (too sharp).	Sharpen again or replace the counter knife.
	5-2) Thread slips off the needle simultaneously with thread trimming.	1-B) There are flaws on the moving knife or the hook.	Correct the flaw or replace the corresponding part.
	5-3) Needle thread and bobbin thread are difficult to be knotted at the start of sewing.	2-A) Thread trimming timing is too fast and even the thread on the needle side is cut.	Adjust the thread trimming timing.
		2-B) Thread rise is not performed.	Check and adjust the parts related to the thread rise.
		3-A) Speed at the start of sewing is too fast, and needle thread and bobbin thread are difficult to be interlaced.	Decrease the speed at the start of sewing.
6. Loose stitches at the start of sewing	6-1) Needle thread tension at the start of sewing is too low.	1-A) Bobbin thread tension at the start of sewing is too low due to idling of the bobbin.	Increase the spring pressure of the idle-prevention spring.
		1-B) Tension of both needle and bobbin threads is too low.	Increase the tension of needle and bobbin threads.
7. Needle thread is not trimmed. (Bobbin thread is trimmed.)	7-1) Stitch skipping at the last stitch	1-A) Installation of the needle is improper.	Check the installation of the needle and make sure of the bend of needle.
		1-B) Momentum of thread take-up spring is too large.	Decrease the momentum (standard : 10 to 12 mm).
		1-C) Hook adjustment is improper.	Check stitch skipping at low speed sewing and perform hook adjustment.
	7-2) A part of the cutting blade section of the knife is not sharp.	2-A) Cutting blade sections of moving knife and counter knife are not closely fit at the time of thread trimming. (Installing angle and position of the counter knife are not fit to the cutting blade section of the moving knife.)	Remove the hook base, and move the moving knife to cut three pieces of spun #50. It is OK when three pieces are cut evenly. If not, sharpen the counter knife or correct the inclination of the top end of counter knife.
	7-3) Thread waste collects on moving knife, counter knife and counter knife guard plate, and thread handling is improper.		Adjust the installing position of counter knife.
	8-1) Thread trimming timing is delayed and the moving knife cannot be handled.		Perform cleaning.
8. Bobbin thread is not trimmed. (Needle thread is trimmed.)			Re-adjust the timing.

To the next page

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
	From the previous page		
	8-2) Thread waste collects on moving knife, counter knife and counter knife guard plate, and thread handling is improper.		Perform cleaning.
9. Moving knife is locked.	9-1) Timing of respective sections is improper.	1-A) Thread trimmer cam timing is improper.	Check and adjust the thread trimmer cam timing.
	9-2) Moving knife comes in contact with the counter knife guard plate.	2-A) Improper adjustment	Correct the bend of the counter knife guard plate.
10. Noise from the face plate section	10-1) Roller guide does not come in contact with the roller.	1-A) Improper adjustment	Adjust so that the roller guide comes in contact with the roller.
	10-2) Amount of the alternate vertical movement is too large.	2-A) Improper adjustment	Adjust to the proper value (standard feed foot : 0.2 to 0.3 mm).
	10-3) Needle and hook interfere with each other due to improper hook adjustment.		Check the hook adjustment.
11. Vibration is large.	11-1) Main shaft motor belt tension is improper.		Adjust the main shaft motor belt tension.
	11-2) Gear back-lash is improper.	2-A) Hook driving shaft gear	Check the back-lash.
	11-3) Looseness of main shaft and hook driving shaft is large.	3-A) Looseness of main shaft thrust	Check the looseness of main shaft thrust.
		3-B) Looseness of hook driving shaft	Check the looseness of hook driving shaft.
12. Needle breakage.	12-1) Presser foot interferes with needle.		Adjust the installing position of presser foot.
	12-2) Contact with the moving knife		Adjust the installing position of moving knife.
	12-3) Interference with the needle hole guide		Adjust the installing position of needle hole guide.
13. Irregular stitches.	13-1) Parts related to the hook are improper.	1-A) Hook is improper (scratch or improper thread path).	Replace the hook or correct the thread path.
	13-2) Bobbin or bobbin case is improper.	2-A) Bobbin thread is caught due to improper fitting of bobbin and bobbin case.	Replace the bobbin or the bobbin case.
		2-B) Winding of bobbin thread is improper.	Tension of the bobbin winder is too high or too low.
		2-C) Thread tension spring of bobbin case is improper.	Replace the bobbin case.
		2-D) Bobbin thread in the bobbin case runs idle.	Increase the spring pressure of the idle-prevention spring.
		2-E) Putting way of bobbin into the bobbin case	Check the putting way.

To the next page

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
From the previous page	13-3) Thread path is improper.	3-A) Thread path is not smooth.	Finish the thread path.
		3-B) There are flaws in the thread path.	Finish the thread path.
		3-C) There are burrs in the thread path.	Correct the thread path.
	13-4) Needle thread tension is improper.	4-A) Needle thread tension is too high or too low.	Adjust the tension to the proper tension.
	13-5) Adjustment of the thread take-up spring is improper.	5-A) Stroke is too large or too small.	Adjust the stroke (standard : 10 to 12 mm).
		5-B) Spring tension is too high or too low.	Adjust the tension.
	13-6) Stroke of the thread take-up lever is too large.		Move the arm thread guide A to the right and decrease the supply amount of thread by means of the thread take-up lever.
14. Material bends.	14-1) Position of the top feed belt is improper.	1-A) Top feed belt is bent.	Adjust the feed foot.
	14-2) Height of the main feed foot and the auxiliary feed foot is improper.	2-A) Height of the main feed foot and the auxiliary feed foot is wrong.	Adjust the height of the main feed foot and the auxiliary feed foot.
	14-3) Auxiliary feed shirring amount set value is improper.	3-A) Auxiliary feed shirring amount set value is wrong.	Set to the optimum set value.
15. Feed pitch is not obtained.	15-1) Feed belt has been worn out.		Replace the belt.
	15-2) Feed foot is excessively raised.		Adjust the height of the feed foot.
	15-3) Belt tension is too low.		Set to the proper tension value.
16. Shirring is not performed.	16-1) Feed belt has been worn out.		Replace the belt.
	16-2) Feed foot is excessively raised.		Adjust the height of the feed foot.
	16-3) Belt tension is too low.		Set to the proper tension value.
	16-4) Set value is too small.		Set to the optimum set value.
17. Shirring is excessively performed.	17-1) Set value is too large.		Set to the optimum set value.

(2) Electrical parts

1) Turning ON the power

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure	
1. Power fails to work.	1-1) Power is not supplied up to the power switch.	1-A) Power plug is disconnected.	Connect the power plug.	
	1-2) Power is not supplied up to the control box.	2-A) Connection of power cord is different.	Check the connection of wiring.	
	2. Panel is not displayed.	2-1) +5V is not supplied to MAIN p.c.b.	1-A) Connector (CN44) of MAIN p.c.b. is disconnected.	Connect CN44.
		2-2) +5V is not supplied to PANEL p.c.b.	2-A) Connector (CN34) of MAIN p.c.b. is disconnected.	Connect CN34.
		2-3) +24V is not supplied to MAIN p.c.b.	2-B) POWER p.c.b. is broken down.	Replace POWER p.c.b.
			3-A) Connector (CN59) of MAIN p.c.b. is disconnected.	Connect CN59.
			3-B) Connector (CN13) of POWER p.c.b. is disconnected.	Connect CN13.
	4-A) Connector (CN34) of MAIN p.c.b. is disconnected.	Connect CN34.		
3. E062 (sewing data error) is displayed.	2-5) Data is not sent to LCD (liquid crystal display device) of the panel.	4-B) POWER p.c.b. is broken down.	Replace POWER p.c.b.	
		5-A) Connector (CN105) of PANEL p.c.b. is disconnected.	Connect CN105.	
	2-6) +24V is not supplied to the back-light of LCD (liquid crystal display device) of the panel.	6-A) Connector (CN108) of PANEL p.c.b. is disconnected.	Connect CN108.	
	2-7) Panel cannot be displayed.	7-A) PANEL p.c.b. id broken down.	Replace the panel.	
	3-1) Sewing data is broken.		Turn ON the power again (the broken sewing data is automatically deleted with this action).	
	4. E302 (head tilt check) is displayed.	4-1) Head tilt check switch is inputted.	1-A) Installation of the head tilt check switch is improper.	Adjust the installation of head tilt check switch.
			1-B) Head tilt check switch is broken.	Replace the switch. (Caution) Switch is the normal open type and error does not occur with disconnection of connector or breaking of wire.
5. E703 (panel is connected to the machine other than supposed one) is displayed.	5-1) Panel which is different in model setting is connected.		Connect the panel of the same model. Press down the communication switch and rewrite the panel to the same program as that of the model code of the sewing machine.	

To the next page

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
From the previous page	5-2) Communication cannot be performed between operation panel and MAIN CPU.	2-A) Contact of connector (CN34) of MAIN p.c.b. is improper.	Check the connection of CN34.
		2-B) Program of MAIN is broken.	Perform rewriting of the program of MAIN.
		2-C) Data on the side of MAIN of MAIN p.c.b. is broken.	Initialize the data on the side of MAIN of MAIN p.c.b.
		2-D) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
		2-E) PANEL is broken down.	Replace PANEL.
6. E704 (disagreement of system version) is displayed.	6-1) R or V of R-V-L of main shaft, MAIN and PANEL is different.	1-A) R or V of main shaft is different.	Press down the communication switch and rewrite the program of main shaft.
		1-B) R or V of MAIN is different.	Press down the communication switch and rewrite the program of MAIN.
		1-C) R or V of PANEL is different.	Press down the communication switch and rewrite the program of PANEL.
	6-2) Communication cannot be performed between operation panel and MAIN CPU.	2-A) Contact of connector (CN34) of MAIN p.c.b. is improper.	Check the connection of CN34.
		2-B) Program of MAIN is broken.	Rewrite the program of MAIN.
		2-C) Data on the side of MAIN of MAIN p.c.b. is broken.	Initialize the data on the side of MAIN of MAIN p.c.b.
		2-D) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
		2-E) PANEL is broken down.	Replace PANEL.
7. E811 (overvoltage) is displayed.	7-1) Input voltage is 280V or higher and power overvoltage signal (OVL) is detected.	1-A) Input power is high.	Check the input power.
		1-B) POWER p.c.b. is broken down.	Replace POWER p.c.b.
8. E813 (low voltage) is displayed.	8-1) Input voltage is 150V or lower and low voltage signal (LVL) is detected.	1-A) Input power is low.	Check the input power.
		1-B) POWER p.c.b. is broken down.	Replace POWER p.c.b.

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
9. E915 (abnormal communication between operation panel and MAIN CPU) is displayed.	9-1) Communication cannot be performed between operation panel and MAIN CPU.	1-A) Contact of connector (CN34) of MAIN p.c.b. is improper.	Check the connection of CN34.
		1-B) Program of MAIN is broken.	Perform rewriting of the program of MAIN.
		1-C) Data on the side of MAIN of MAIN p.c.b. is broken.	Initialize the data on the side of MAIN of MAIN p.c.b.
		1-D) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
10. E916 (abnormal communication between MAIN CPU and main shaft CPU) is displayed.	10-1) Communication cannot be performed between MAIN CPU and main shaft CPU.	1-A) Program of main shaft is broken.	Perform rewriting of the program of main shaft.
		1-B) Data on the side of main shaft of MAIN p.c.b. is broken.	Initialize the data of the side of main shaft of MAIN p.c.b.
		1-C) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
11. E920 (abnormality of CPLD writing) is displayed.	11-1) Writing cannot be performed to CPLD.	1-A) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
12. E941 (abnormality of CPLD reading) is displayed.	12-1) Reading cannot be performed from CPLD.	1-A) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.

2) Panel operation

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
1. E000 (contact of initialization of main shaft EEPROM of MAIN p.c.b.) is displayed.	1-1) Data of main shaft EEPROM is broken.	1-A) MAIN p.c.b. is broken.	Replace MAIN p.c.b.
		1-B) Main shaft EEPROM is broken.	Replace MAIN p.c.b.
2. E001 (contact of initialization of MAIN EEPROM of MAIN p.c.b.) is displayed.	2-1) Data of MAIN EEPROM is broken.	1-A) MAIN p.c.b. is broken.	Replace MAIN p.c.b.
		1-B) MAIN EEPROM is broken.	Replace MAIN p.c.b.
3. E006 (contact of initialization of head EEPROM of p.c.b. mounted on machine head) is displayed.	3-1) Data of head EEPROM is broken.	1-A) P.c.b. mounted on machine head is broken.	Replace p.c.b. mounted on the machine head.
	3-2) P.c.b. mounted on machine head is not connected.	1-B) Head EEPROM is broken.	Replace p.c.b. mounted on the machine head.
4. E011 (external media is not inserted) is displayed.	4-1) Recognition of smart media cannot be performed.	2-A) Connector (CN55) of MAIN p.c.b. is disconnected.	Connect CN55.
		1-A) Smart media is not inserted.	Insert the smart media.
		1-B) Reading section of the smart media is dirty.	Clean the reading section.
		1-C) Inside of the throttle of the smart media is dirty.	Clean the inside of the throttle.
		1-D) Smart media is broken.	Replace the smart media.
5. E012 (read error) is displayed.	5-1) Data cannot be read from the smart media.	1-A) Reading section of the smart media is dirty.	Clean the reading section.
		1-B) Inside of the throttle of the smart media is dirty.	Clean the inside of the throttle.
		1-C) Smart media is broken.	Replace the smart media.
6. E013 (write error) is displayed.	6-1) Data cannot be written to the smart media.	1-A) Reading section of the smart media is dirty.	Clean the reading section.
		1-B) Inside of the throttle of the smart media is dirty.	Clean the inside of the throttle.
		1-C) Smart media is broken.	Replace the smart media.

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
7. E014 (write protect) is displayed.	7-1) Smart media is in the writing prohibited state.	1-A) Write prohibition seal is pasted on the smart media.	Strip off the seal.
		1-B) Reading section of the smart media is dirty.	Clean the reading section.
		1-C) Inside of the throttle of the smart media is dirty.	Clean the inside of the throttle.
		1-D) Smart media is broken.	Replace the smart media.
8. E015 (format error) is displayed.	8-1) Smart media is in the writing prohibited state.	1-A) Write prohibition seal is pasted on the smart media.	Strip off the seal.
		1-B) Reading section of the smart media is dirty.	Clean the reading section.
		1-C) Inside of the throttle of the smart media is dirty.	Clean the inside of the throttle.
		1-D) Smart media is broken.	Replace the smart media.
9. E016 (external media capacity over) is displayed.	9-1) Capacity of the smart media is full.	1-A) Space region is not in the smart media.	Delete the inside data of the smart media and secure the space region.
	9-2) Recognition of the smart media cannot be performed.	2-A) Reading section of the smart media is dirty.	Clean the reading section.
		2-B) Inside of the throttle of the smart media is dirty.	Clean the inside of the throttle.
		2-C) Smart media is broken.	Replace the smart media.
10. E022 (file No. error) is displayed.	10-1) The designated file is not in the smart media.		Designate the existing file.
	10-2) Recognition of the smart media cannot be performed.	2-A) Reading section of the smart media is dirty.	Clean the reading section.
		2-B) Inside of the throttle of the smart media is dirty.	Clean the inside of the throttle.
		2-C) Smart media is broken.	Replace the smart media.
11. E029 (smart media slot error) is displayed.	11-1) Cover of the smart media is open.		Close the cover.
	11-2) Close/open detection switch of the cover is broken.		Replace the close/open switch (SW2).

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
12. E702 (abnormal control) is displayed.	12-1) Program of the panel has run away.	1-A) PANEL p.c.b. is broken.	Replace PANEL p.c.b.
		1-B) Program of the panel is broken.	Rewrite the program of the panel.
		1-C) Writing of the program of the panel is not properly performed.	Rewrite the program of the panel.
13. E917 (failure of communication between operation panel and personal computer) is displayed.	13-1) Communication cannot be performed between operation panel and personal computer.	1-A) Contact of RS232C connector (CN102) of the panel is improper.	Check the connection of CN102.
		1-B) Contact of RS232C connector of personal computer is improper.	Check the connection of RS232C connector of the personal computer.
		1-C) PANEL p.c.b. is broken down.	Replace the panel.
14. Key is not accepted even when pressing the touch panel.	14-1) Signal does not come to PANEL p.c.b.	1-A) Connector (CN109) of PANEL p.c.b. is disconnected.	Connect CN109.
		2-A) PANEL p.c.b. is broken down.	Replace the panel.

3) Sewing

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
1. E003 (failure of main shaft motor encoder) is displayed.	1-1) Angle counter of main shaft motor is abnormal.	1-A) Encoder of main shaft motor is broken.	Replace the main shaft motor.
	1-2) Encoder signal is not inputted.	2-A) Connector (CN21) of POWER p.c.b. is disconnected.	Connect CN21.
		2-B) Connector (CN10) of POWER p.c.b. is disconnected.	Connect CN10.
		2-C) Connector (CN44) of MAIN p.c.b. is disconnected.	Connect CN44.
2. E004 (failure of needle DOWN detection of main shaft motor) is displayed.	2-1) Needle DOWN detection signal of main shaft motor is abnormal.	1-A) Encoder of main shaft motor is broken.	Replace the main shaft motor.
	2-2) Encoder signal is not inputted.	2-A) Connector (CN21) of POWER p.c.b. is disconnected.	Connect CN21.
		2-B) Connector (CN10) of POWER p.c.b. is disconnected.	Connect CN10.
		2-C) Connector (CN44) of MAIN p.c.b. is disconnected.	Connect CN44.
	2-3) Normal/reverse rotation signals are frequently inputted.	3-A) Encoder of main shaft motor is broken.	Replace the main shaft motor.
		3-B) Repeated operations of normal/reverse rotation by hand are quickly performed.	Perform the repeated operations slowly.
3. E005 (failure of needle UP detection of main shaft motor) is displayed.	3-1) Needle UP detection signal of main shaft motor is abnormal.	1-A) Encoder of main shaft motor is broken.	Replace the main shaft motor.
	3-2) Encoder signal is not inputted.	2-A) Connector (CN21) of POWER p.c.b. is disconnected.	Connect CN21.
		2-B) Connector (CN10) of POWER p.c.b. is disconnected.	Connect CN10.
		2-C) Connector (CN44) of MAIN p.c.b. is disconnected.	Connect CN44.
	3-3) Normal/reverse of rotation signals are frequently inputted.	3-A) Encoder of main shaft motor is broken.	Replace the main shaft motor.
		3-B) Repeated operations of normal/reverse rotation by hand are quickly performed.	Perform the repeated operations slowly.

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
4. E007 (main shaft motor lock) is displayed.	4-1) Main shaft motor is locked.		Release the locking.
	4-2) Power is not supplied to motor.	2-A) Connector (CN2) of FLT p.c.b. is disconnected.	Connect CN2.
	4-3) Encoder signal is not inputted.	3-A) Connector (CN21) of POWER p.c.b. is disconnected.	Connect CN21.
		3-B) Connector (CN10) of POWER p.c.b. is disconnected.	Connect CN10.
		3-C) Connector (CN44) of MAIN p.c.b. is disconnected.	Connect CN44.
	4-4) Drive signal is not output to motor.	4-A) Connector (CN38) of POWER p.c.b. is disconnected.	Connect CN38.
5. E303 (main shaft woodruff plate sensor error) is displayed.	5-1) Woodruff plate sensor of main shaft motor is abnormal.	1-A) Encoder of main shaft motor is broken.	Replace the main shaft motor.
	5-2) Encoder signal (woodruff plate) is not inputted.	2-A) Connector (CN21) of POWER p.c.b. is disconnected.	Connect CN21.
		2-B) Connector (CN10) of POWER p.c.b. is disconnected.	Connect CN10.
		2-C) Connector (CN44) of MAIN p.c.b. is disconnected.	Connect CN44.
6. E810 (solenoid power short-circuit) is displayed.	6-1) Solenoid power short-circuit signal (PWSH) is detected.	1-A) Thread trimmer solenoid is broken down.	Replace the thread trimmer solenoid.
		1-B) Presser lifter solenoid is broken down.	Replace the presser lifter solenoid.
		1-C) POWER p.c.b. is broken down.	Replace POWER p.c.b.
7. E918 (abnormal temperature of heat sink for MAIN p.c.b.) is displayed.	7-1) Temperature of heat sink of MAIN p.c.b. is more than 85°C.	1-A) Fan located inside of box is not rotating.	Connect CN23 and CN24 of POWER p.c.b.
		1-B) Air hole of control box is blocked.	Clean the air hole.
		1-C) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
		1-D) Stepping motor is broken down.	Replace the stepping motor.

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
8. E922 (impossible to control main shaft motor) is displayed.	8-1) Number of revolution of measurement exceeds the upper limit (3,500 rpm). 8-2) Encoder signal is not inputted.	1-A) Encoder of main shaft motor is broken. 2-A) Connector (CN21) of POWER p.c.b. is disconnected. 2-B) Connector (CN10) of POWER p.c.b. is disconnected. 2-C) Connector (CN44) of MAIN p.c.b. is disconnected.	Replace the main shaft motor. Connect CN21. Connect CN10. Connect CN44.
9. E924 (failure of main shaft drive) is displayed.	9-1) Motor driver error signal (GTRF) is detected.	1-A) Main shaft motor is broken down. 1-B) POWER p.c.b. is broken down.	Replace the main shaft motor. Replace POWER p.c.b.
10. Shirring amount changes when changing over to sewing screen.	10-1) Setting of auxiliary pedal is improper.		Refer to 21-2 "Performing setting of the auxiliary pedal" in Instruction Manual and set again.
11. Shirring display is not "0" in the manual screen.	11-1) Setting of auxiliary pedal is improper.		Refer to 21-2 "Performing setting of the auxiliary pedal" in Instruction Manual and set again.
12. Thread tension during waiting is high.	12-1) Base tension during waiting is improper.		Set again the base tension during waiting of level 1 [U12] of memory switch data.
13. Compensation thread tension setting button is not displayed even when pressing the step details button.	13-1) Compensation tension mode is selected to the automatic.		Stop the automatic selection of compensation tension mode selection of level 1 [U12] of memory switch data.
14. Data changed in the sewing screen is not stored in memory.	14-1) Sewing is completed at the step other than the last step. 14-2) Not to store is selected in the data storage function selection at the time of sewing.		Complete the sewing at the last step. Set to storing the data storage function selection at the time of sewing of level 1 [U16] of memory switch data.
15. Buzzer does not sound when changing over the step.	15-1) Output of sound when changing over the step is selected to not to sound.		Set to sound the output of sound when changing over the step selection of level 1 [U17] of memory switch data.
16. Auxiliary pedal cannot be used.	16-1) Selection of auxiliary pedal use is set to not to use.		Set to use the auxiliary pedal use selection of level 1 [U18] of memory switch data.
17. Change does not occur even when pressing the shirring release switch.	17-1) Selection of shirring release switch use is set to not to use.		Set to use the shirring release switch use selection of level 1 [U19] of memory switch data.
18. Knee switch fails to work at the time of full auto sewing.	18-1) Selection of knee switch use is set to not to use.		Set to use the knee switch use selection of level 1 [U20] of memory switch data.
19. Shirring amount changes at the time of change of pitch.	19-1) Shirring amount interlocking function is set to use at the time of change of pitch.]		Set to not to use the shirring amount interlocking function selection at the time of change of pitch of level 1 [U21] of memory switch data.
20. Screen changes over even when performing thread trimming on the way of step.	20-1) Selection of screen changeover function at the time of thread trimming on the way is set to use.		Set to not to use the screen changeover function selection at the time of thread trimming on the way of level 1 [U22] of memory switch data.

4) Starting of the sewing machine

Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
1. E731 (failure of main shaft motor hole sensor and the position sensor) is displayed.	1-1) Motor hole sensor error (UVW) is detected.	1-A) Main shaft motor is broken down.	Replace the main shaft motor.
		1-B) POWER p.c.b. is broken down.	Replace POWER p.c.b.
		1-C) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
2. E733 (main shaft motor reverse rotation) is displayed.	2-1) Main shaft motor rotates in the reverse direction.	1-A) Main shaft motor is broken down.	Replace the main shaft motor.
		1-B) POWER p.c.b. is broken down.	Replace POWER p.c.b.
		1-C) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
3. E801 (power phase-lack) is displayed.	3-1) Power phase-lack signal (PHE) is detected.	1-A) POWER p.c.b. is broken down.	Replace POWER p.c.b.
		1-B) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
4. E802 (power instantaneous cut detection) is displayed.	4-1) Power instantaneous cut signal (PWF) is detected.	1-A) POWER p.c.b. is broken down.	Replace POWER p.c.b.
		1-B) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
		1-C) PANEL is broken down.	Replace PANEL.

5) Others

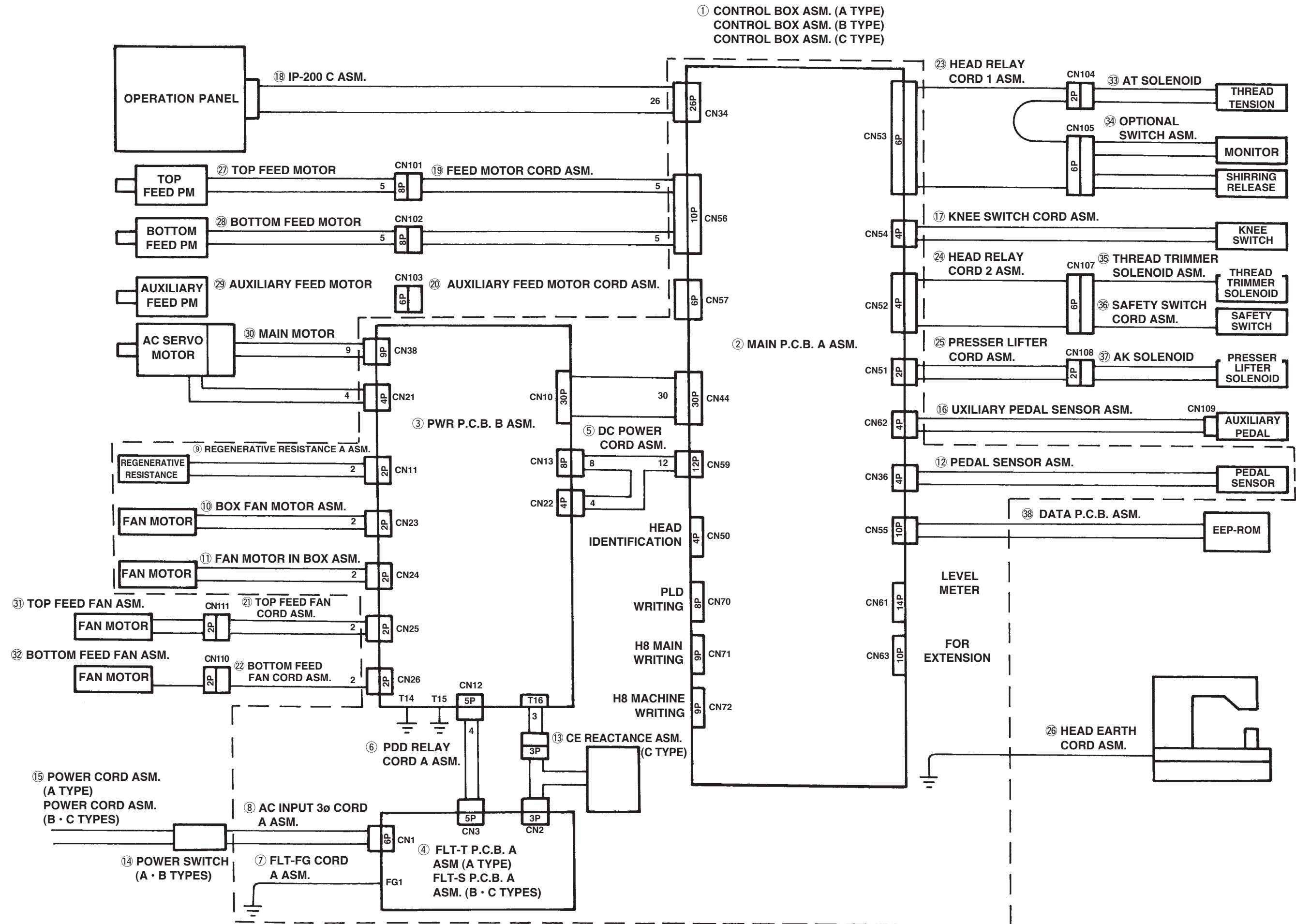
Trouble	Cause (1)	Cause (2)	Inspecting order and adjusting procedure
1. E942 (failure of main shaft EEPROM) is displayed.	1-1) Data of main shaft EEPROM is broken.	1-A) MAIN p.c.b. is broken.	Replace MAIN p.c.b.
		1-B) Main shaft EEPROM is broken.	Replace MAIN p.c.b.
2. E943 (failure of main EEPROM) is displayed.	2-1) Data of main EEPROM is broken.	1-A) MAIN p.c.b. is broken.	Replace MAIN p.c.b.
		1-B) MAIN EEPROM is broken.	Replace MAIN p.c.b.
3. E946 (failure of head EEPROM) is displayed.	3-1) Data of head EEPROM is broken.	1-A) P.c.b. mounted on the machine head is broken.	Replace p.c.b. mounted on the machine head.
		1-B) Head EEPROM is broken.	Replace p.c.b. mounted on the machine head.
4. Buzzer sounds two times at a regular cycle.	4-1) CPU mode check error	1-A) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
5. Buzzer sounds three times at a regular cycle.	5-1) Internal RAM check error	1-A) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
6. Buzzer sounds four times at a regular cycle.	6-1) External RAM check error	1-A) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
7. Buzzer sounds five times at a regular cycle.	7-1) NORTI setting error	1-A) MAIN p.c.b. is broken down.	Replace MAIN p.c.b.
8. Buzzer sounds 7 times at a regular cycle.	8-1) EEPROM writing error	1-A) MAIN EEPROM is broken.	Replace MAIN p.c.b.
9. Buzzer sounds 8 times at a regular cycle.	9-1) Communication error with PANEL	1-A) Contact of connector (CN34) of MAIN p.c.b. is improper.	Check the connection of CN34.
		1-B) Program of MAIN is broken.	Perform rewriting of the program of MAIN.
		1-C) Data on the side of MAIN of MAIN p.c.b. is broken.	Perform initialization of the data on the side of MAIN of MAIN p.c.b.
		1-D) MAIN p.c.b. is broken.	Replace MAIN p.c.b.
10. Buzzer sounds 9 times at a regular cycle.	10-1) Communication error with the main shaft	1-A) MAIN p.c.b. is broken.	Replace MAIN p.c.b.
		1-B) Writing of the program of main shaft is not performed.	Perform writing of the program of main shaft.
		1-C) Initialization of EEPROM of main shaft is not performed.	Perform initialization of EEPROM of main shaft.

11. CIRCUIT DIAGRAM

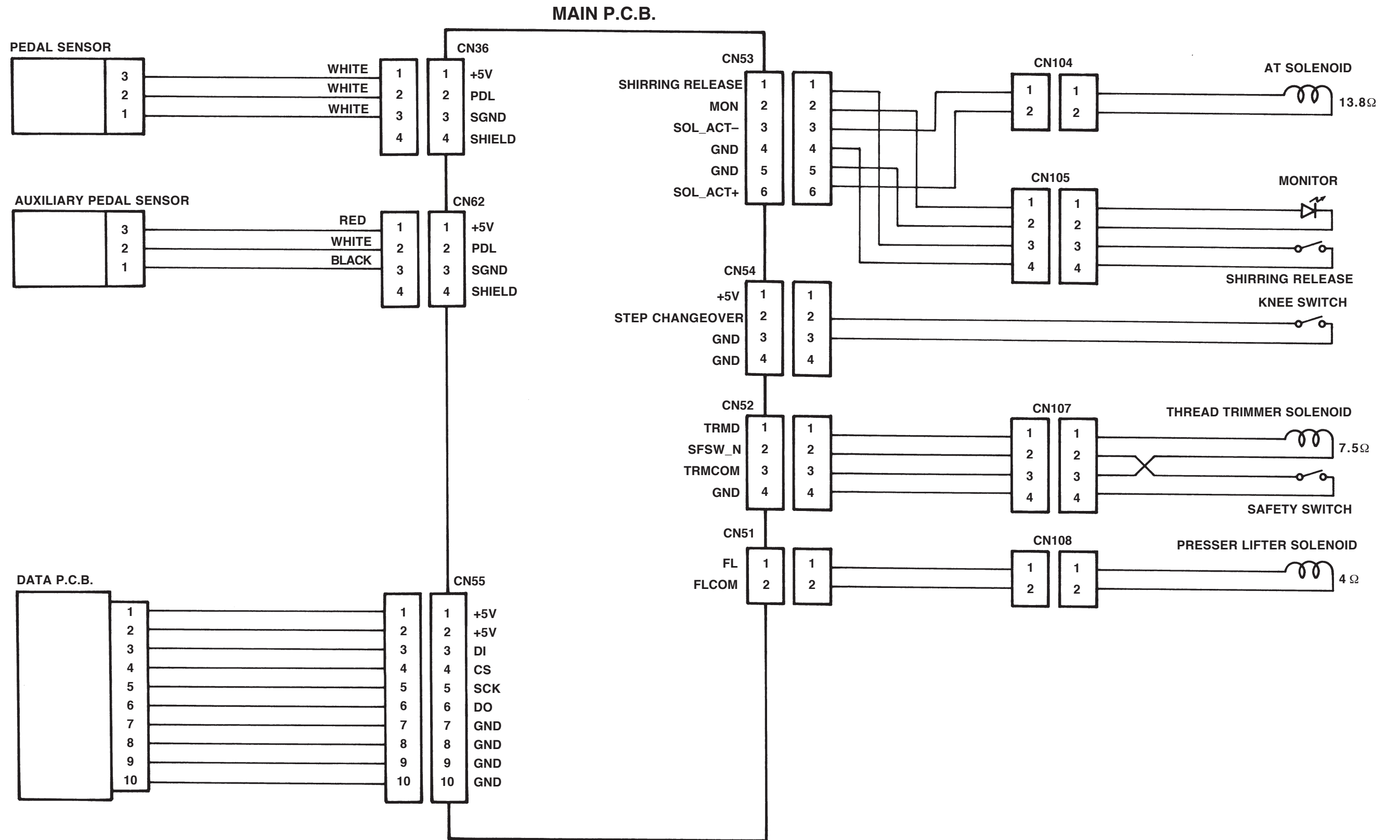
(1) Block diagram (1/2)

No.	PART No.	DESCRIPTION	ASSEMBLED PLACE	REMARKS
①	40008173 40017733 40017734	CONTROL BOX A ASM. CONTROL BOX B ASM. CONTROL BOX C ASM.	CONTROL BOX	A (3-PHASE : JAPAN, JUS) B (SINGLE PHASE : GENERAL EXPORT) C (SINGLE PHASE : CE TYPE)
②	40008187	MAIN P.C.B. A ASM.	CONTROL BOX	EXCLUSIVE
③	40017736	PWR P.C.B. B ASM.	CONTROL BOX	EXCLUSIVE
④	40000056 40000046	FLT-T P.C.B. A ASM. FLT-S P.C.B. A ASM.	CONTROL BOX CONTROL BOX	A (FOR 3-PHASE),MC-601/OTHERS B • C (FOR SINGLE PHASE),MC-601/OTHERS
⑤	40017743	DC POWER CORD ASM.	CONTROL BOX	EXCLUSIVE
⑥	40005987	PDD RELAY CORD A ASM.	CONTROL BOX	SC-915
⑦	40005974	FLT-FG CORD A ASM.	CONTROL BOX	SC-915
⑧	40005975 40005976 40005977	AC INPUT 3 ø CORD A ASM. AC INPUT 1 ø CORD A ASM. AC INPUT 1 ø CORD CE ASM.	CONTROL BOX	SC-915
⑨	40005979	REGENERATIVE RESISTANCE A ASM.	CONTROL BOX	SC-915
⑩	40016435	BOX FAN MOTOR ASM.	CONTROL BOX	SC-916
⑪	40016435	FAN MOTOR IN BOX ASM.	CONTROL BOX	SC-916
⑫	40005980	PEDAL SENSOR ASM.	CONTROL BOX	SC-915
⑬	40016436	CE REACTANCE ASM.	CONTROL BOX	C (CE TYPE ONLY),SC-916
⑭	HA004250000	POWER SWITCH	TABLE/STAND	A • B (EXCLUDING CE TYPE)
⑮	M90175800A0 M90245800A0	POWER CORD ASM.	TABLE/STAND	A (FOR 3-PHASE),MC-580 B • C (FOR SINGLE PHASE),MC-580
⑯	40016702	AUXILIARY PEDAL SENSOR ASM.	TABLE/STAND	EXCLUSIVE
⑰	40017738	KNEE SWITCH CORD ASM.	TABLE/STAND	EXCLUSIVE
⑱	40010034	IP-200C TOTAL ASM.	HEAD	IP-200
⑲	40017737	FEED MOTOR CORD ASM.	HEAD	EXCLUSIVE
⑳	40015794	AUXILIARY FEED MOTOR CORD ASM.	HEAD	EXCLUSIVE
㉑	40015795	TOP FEED FAN CORD ASM.	HEAD	EXCLUSIVE
㉒	40015796	BOTTOM FEED FAN CORD ASM.	HEAD	EXCLUSIVE
㉓	40017740	HEAD RELAY CORD 1 ASM.	HEAD	EXCLUSIVE
㉔	40017741	HEAD RELAY CORD 2 ASM.	HEAD	EXCLUSIVE
㉕	40017739	PRESSER LIFTER CORD ASM.	HEAD	ONE BODY WITH AK SOLENOID
㉖	40017742	HEAD EARTH CORD ASM.	HEAD	EXCLUSIVE
㉗	KM000000350	TOP FEED MOTOR	HEAD	LZ-2290
㉘	KM000000350	BOTTOM FEED MOTOR	HEAD	LZ-2290
㉙	HM001940000	AUXILIARY FEED MOTOR	HEAD	EXCLUSIVE
㉚	KM000000470	MAIN MOTOR	HEAD	EXCLUSIVE
㉛	40005402	TOP FEED FAN ASM.	HEAD	EXCLUSIVE
㉜	40005402	BOTTOM FEED FAN ASM.	HEAD	MC-601(LBH-1790)
㉝	40016908	AT SOLENOID	HEAD	EXCLUSIVE
㉞	40014098	OPTIONAL SWITCH ASM.	HEAD	EXCLUSIVE
㉟	40017612	THREAD TRIMMER SOLENOID ASM.	HEAD	11043106(DDL-5550)
㊱	23638554	SAFETY SWITCH CORD ASM.	HEAD	DDL-9000
㊲	40017823	AK SOLENOID	HEAD	EXCLUSIVE
㊳	40017744	DATA P.C.B. ASM.	HEAD	EXCLUSIVE

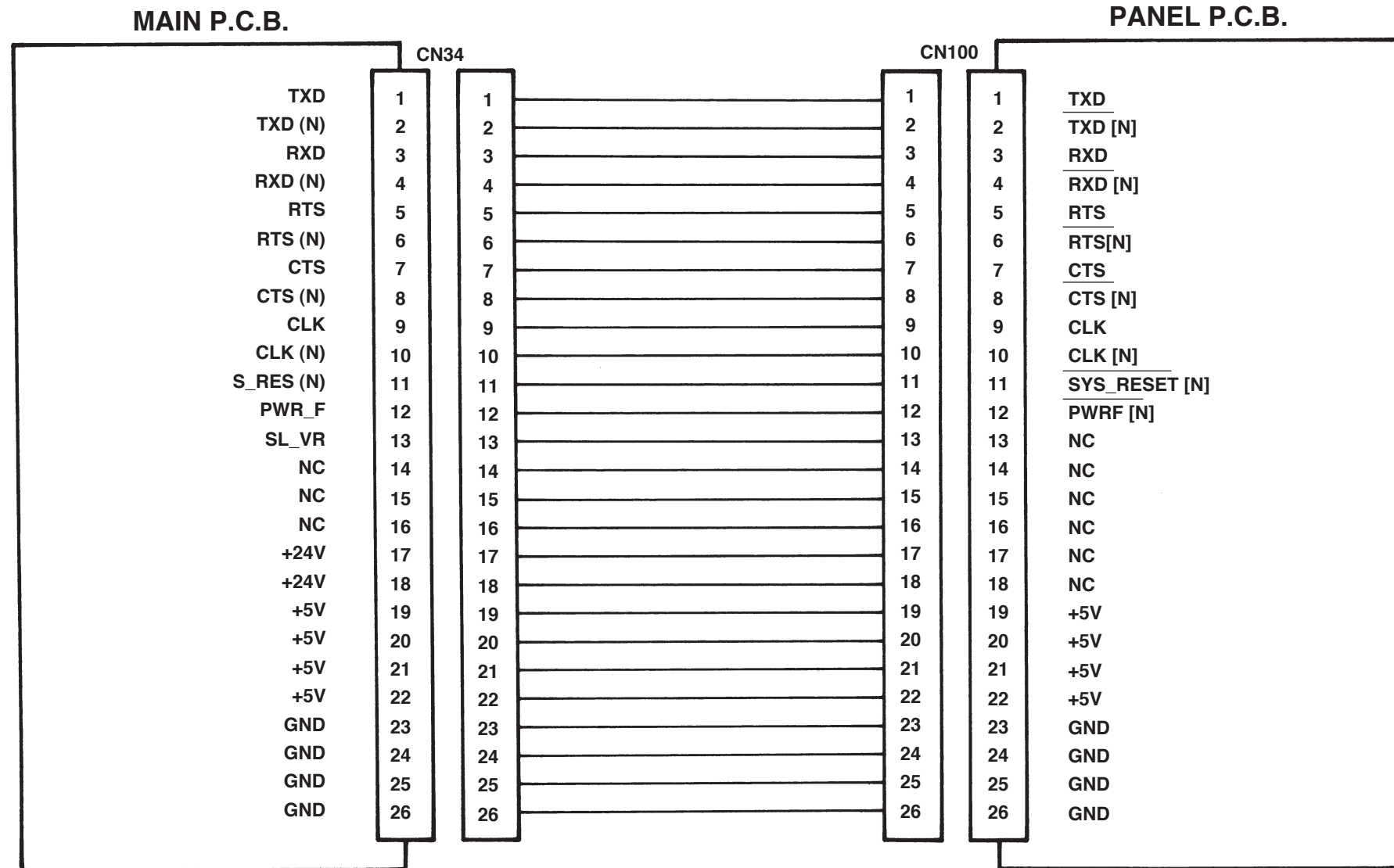
(1) Block diagram (2/2)



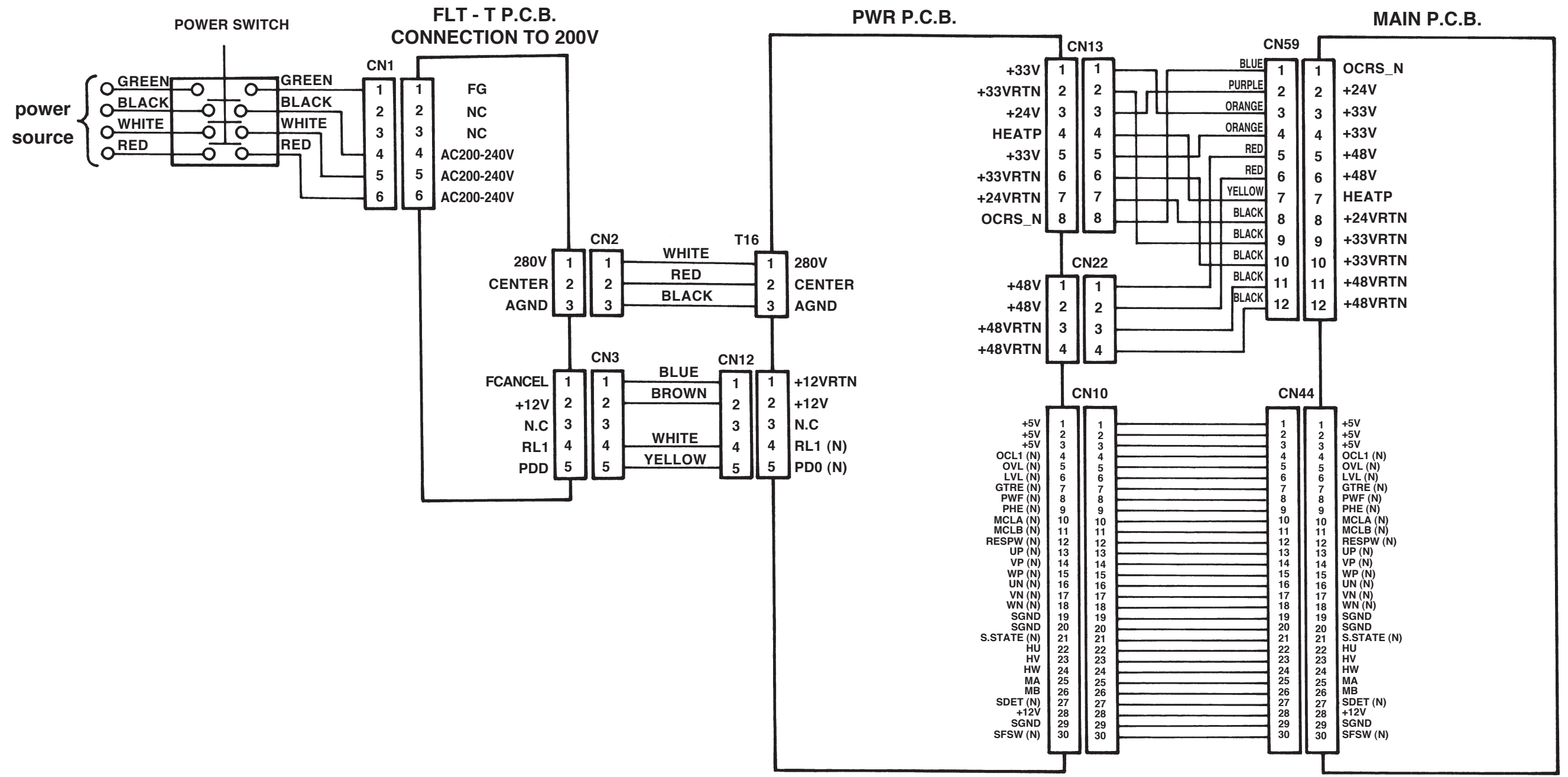
(2) Head and table/stand circuit diagram



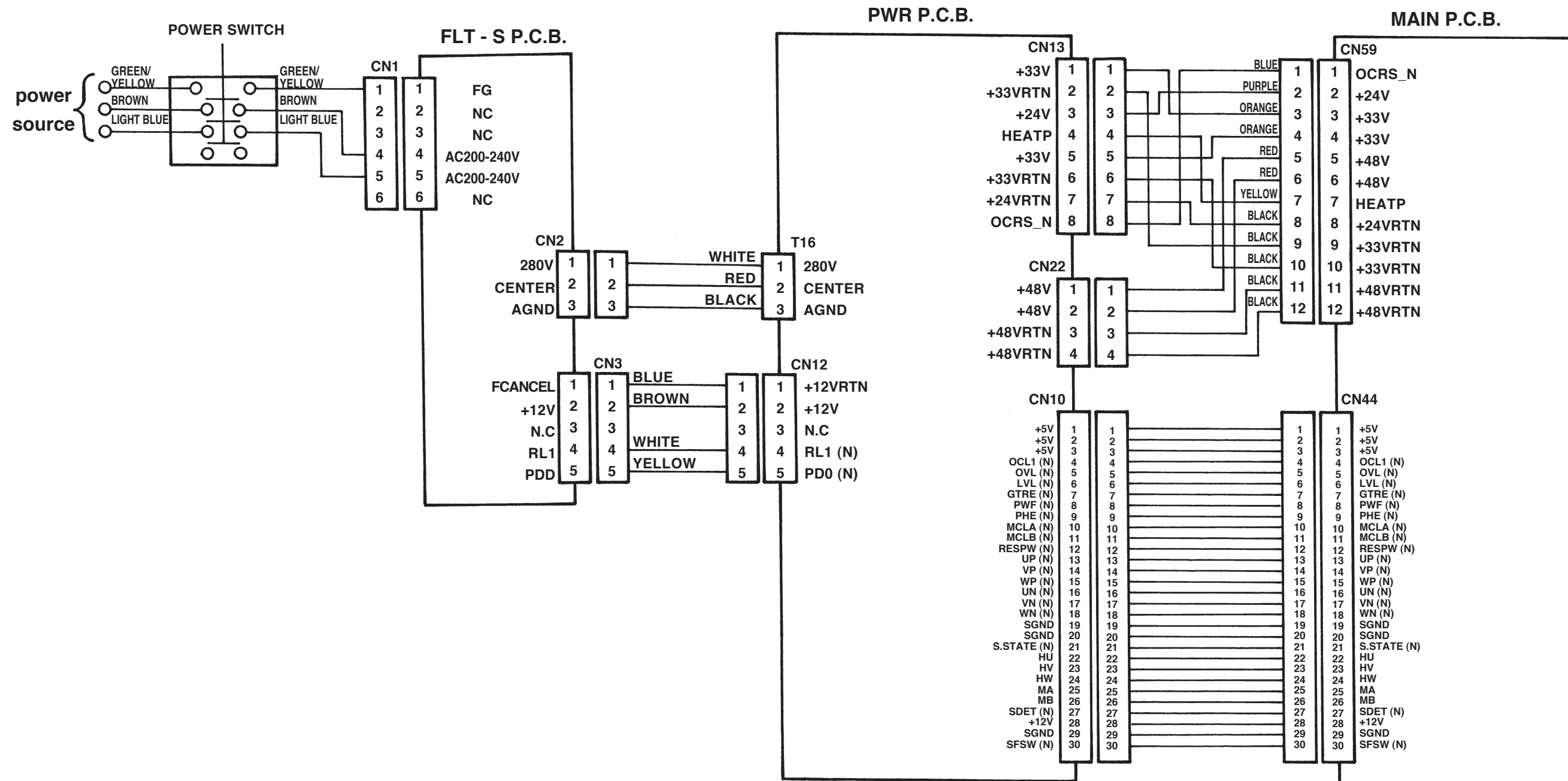
(3) Main and panel circuit diagram



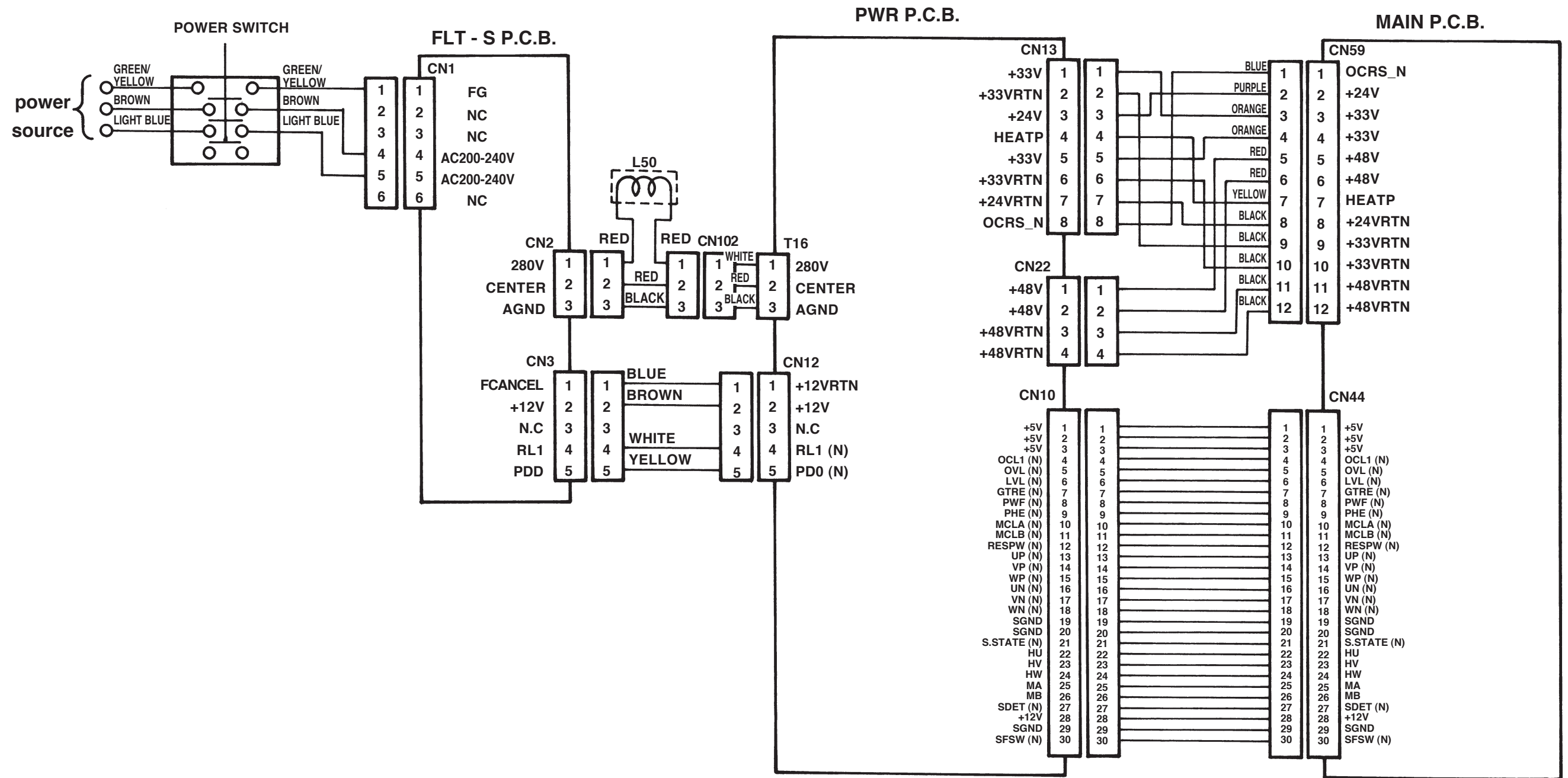
(4) Power source A circuit diagram



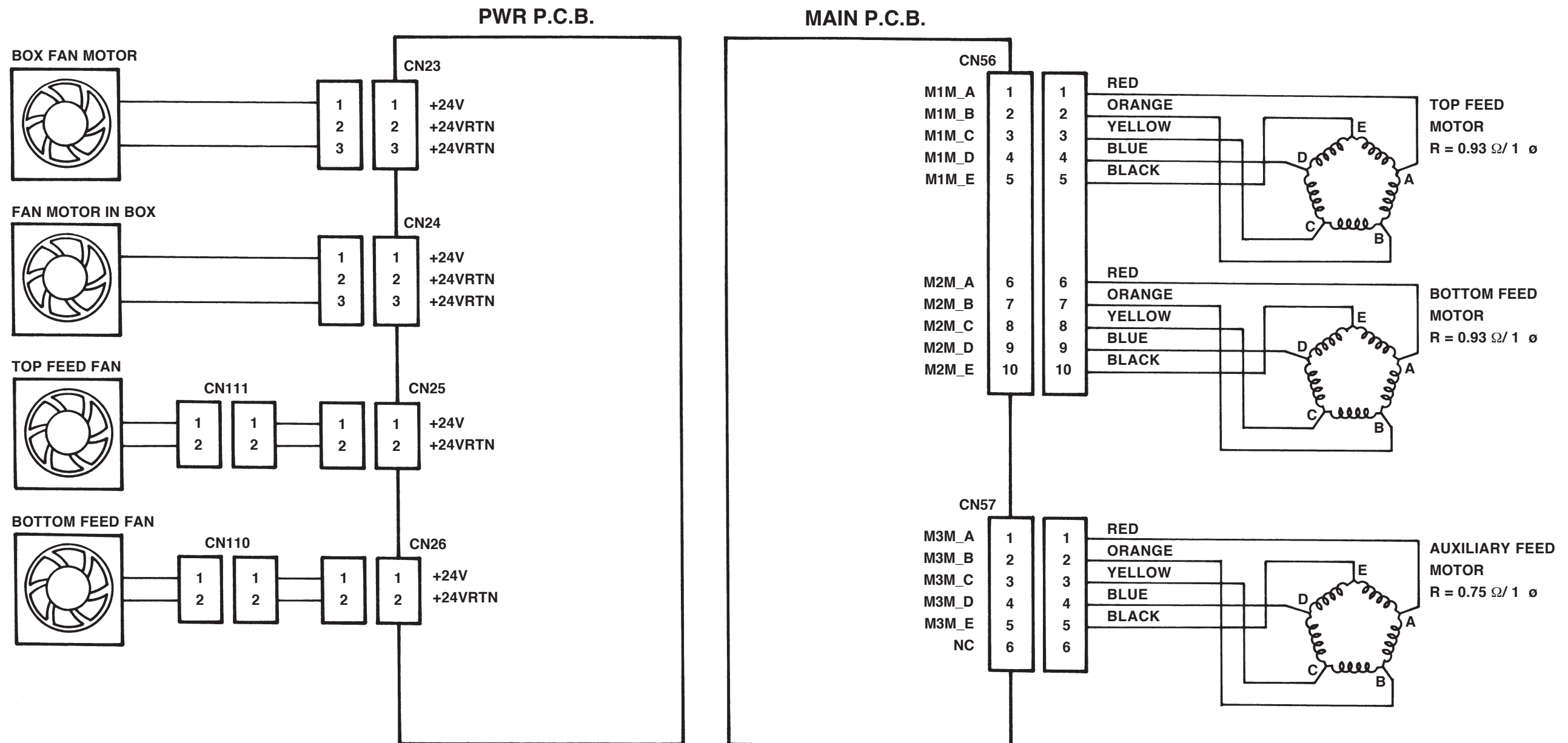
(5) Power source B circuit diagram



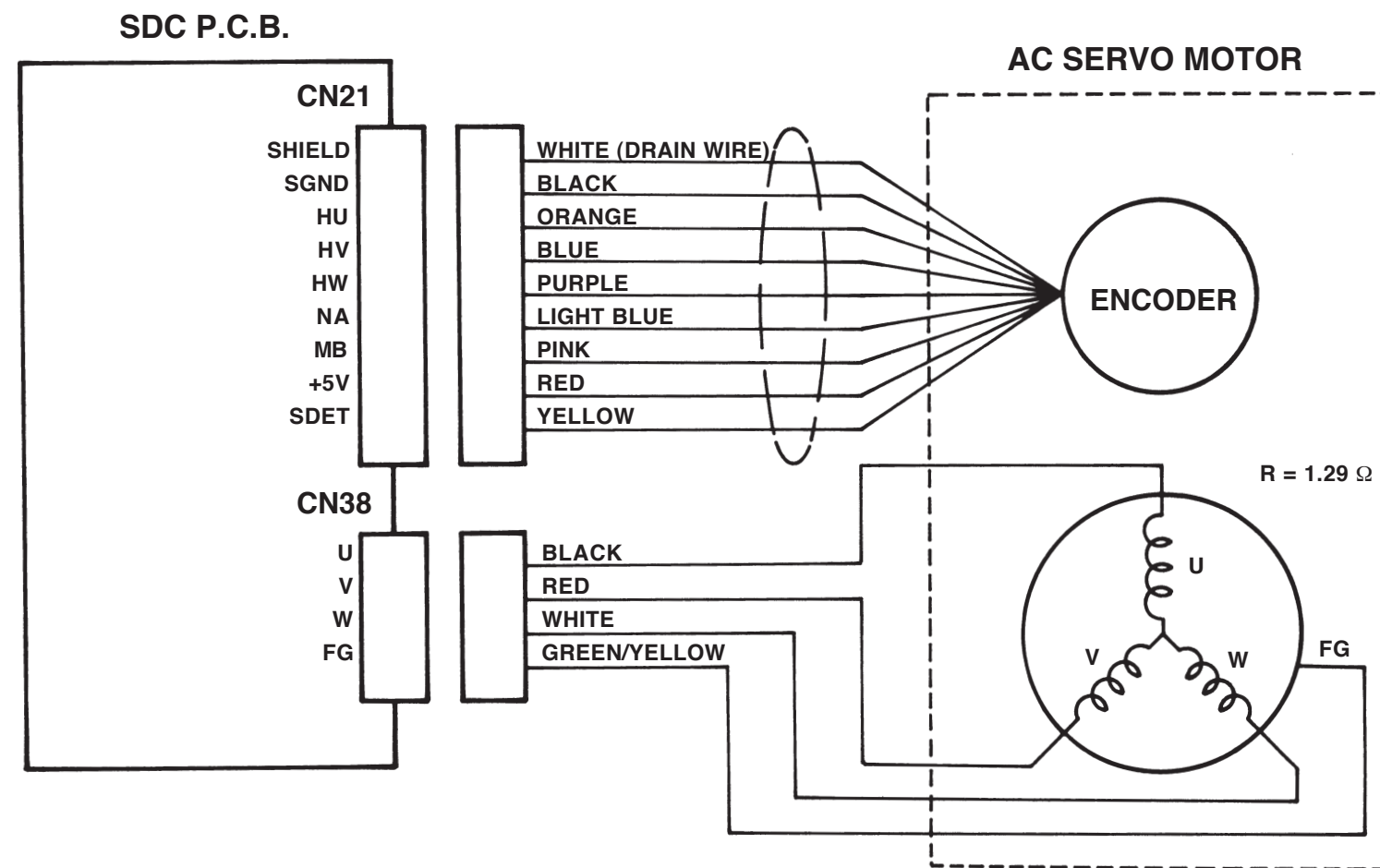
(6) Power source C circuit diagram



(7) Motor circuit diagram



(8) Servo motor circuit diagram

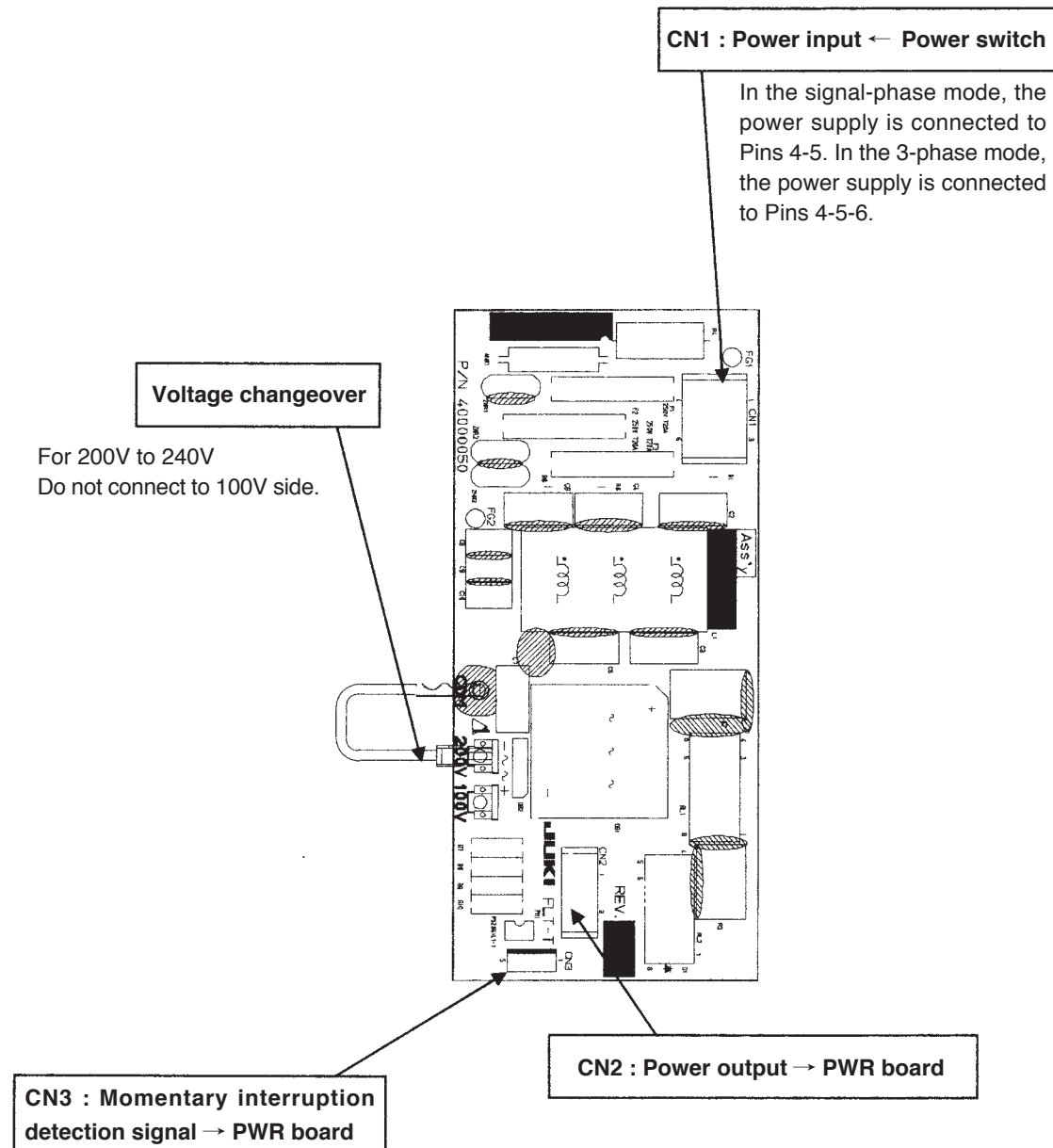


12. VARIOUS PRINTED WIRING BOARDS

(1) FLT-T p.c.b.

3-phase 200V~240V
Single-phase 200V~240V

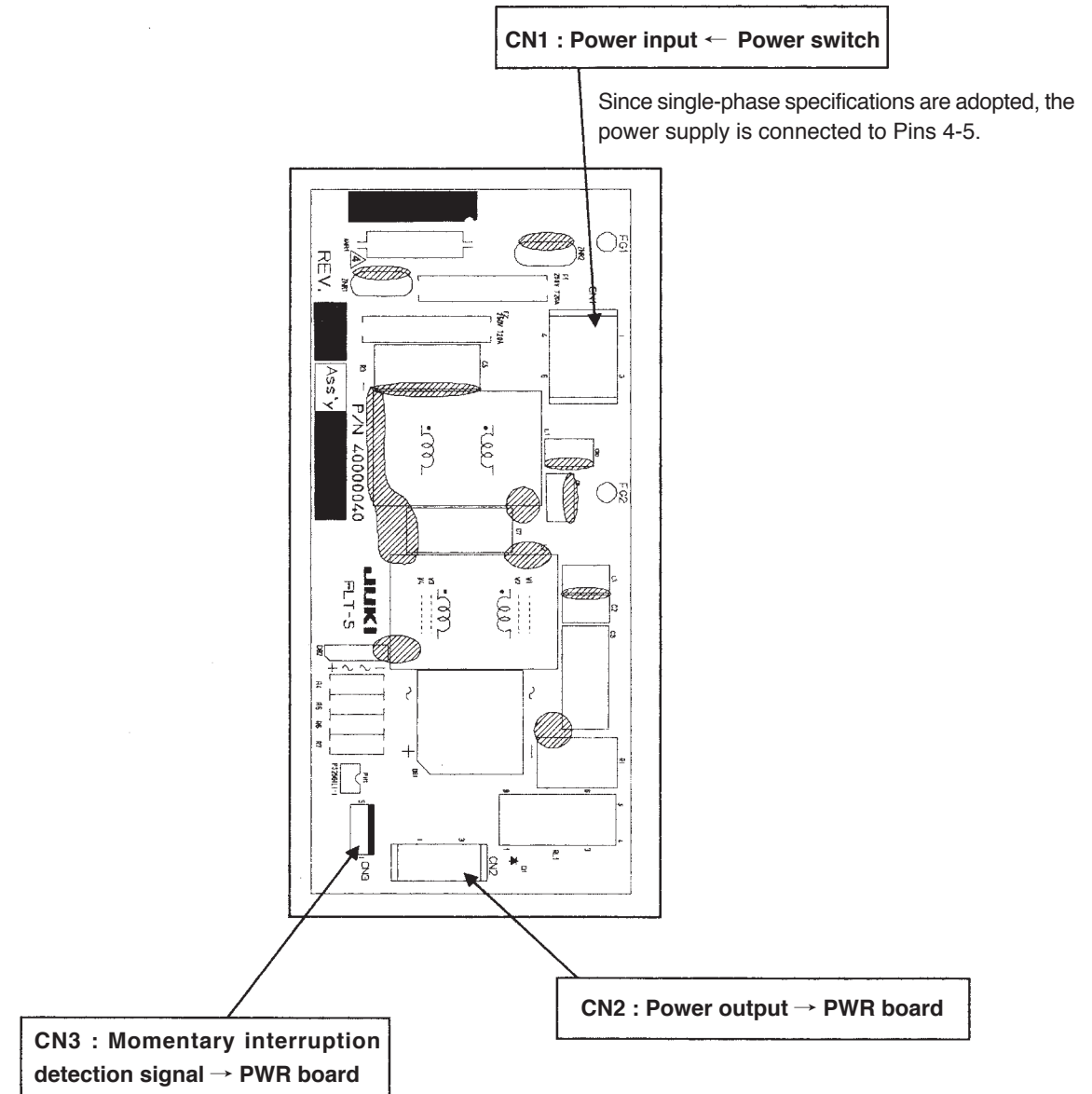
Pulse generation is carried out for the purposes of power supply rectification, noise reduction, and the detection of a momentary interruption



(2) FLT-S p.c.b.

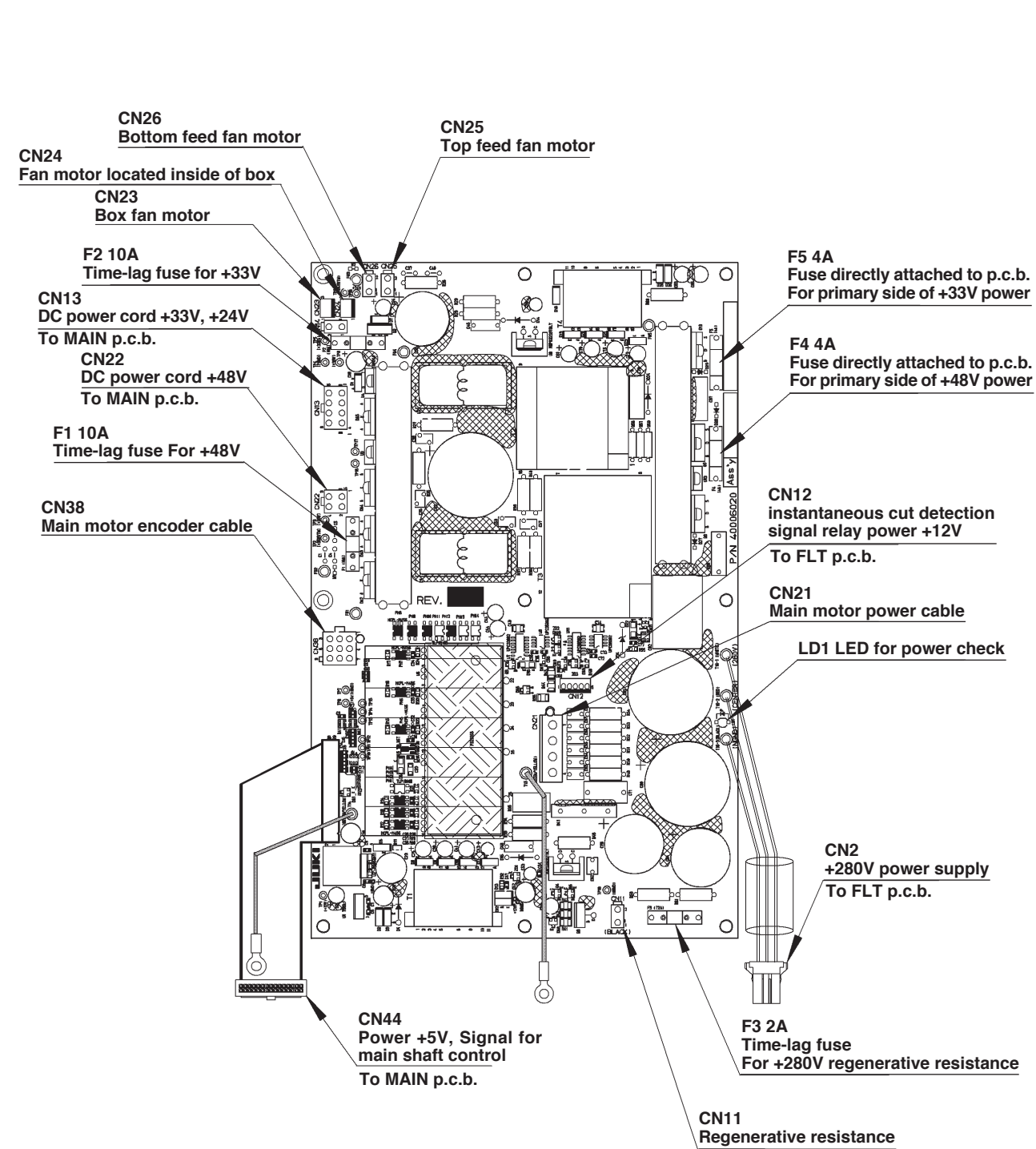
Single-phase 200V~240V

Pulse generation is carried out for the purposes of power supply rectification, noise reduction, and the detection of a momentary interruption



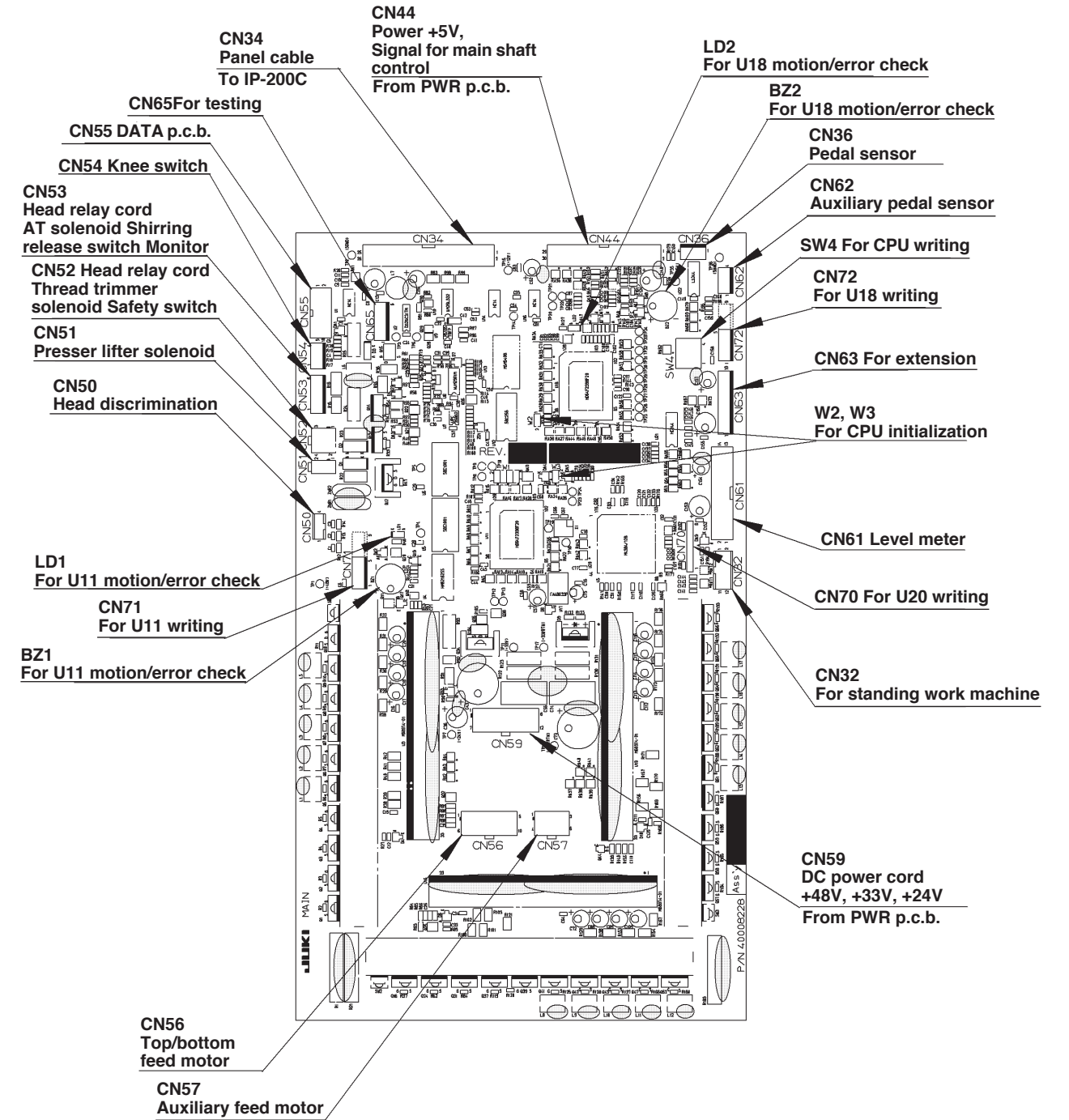
(3) PWR p.c.b.

This p.c.b. performs generation of power, check of power and drive of main motor.



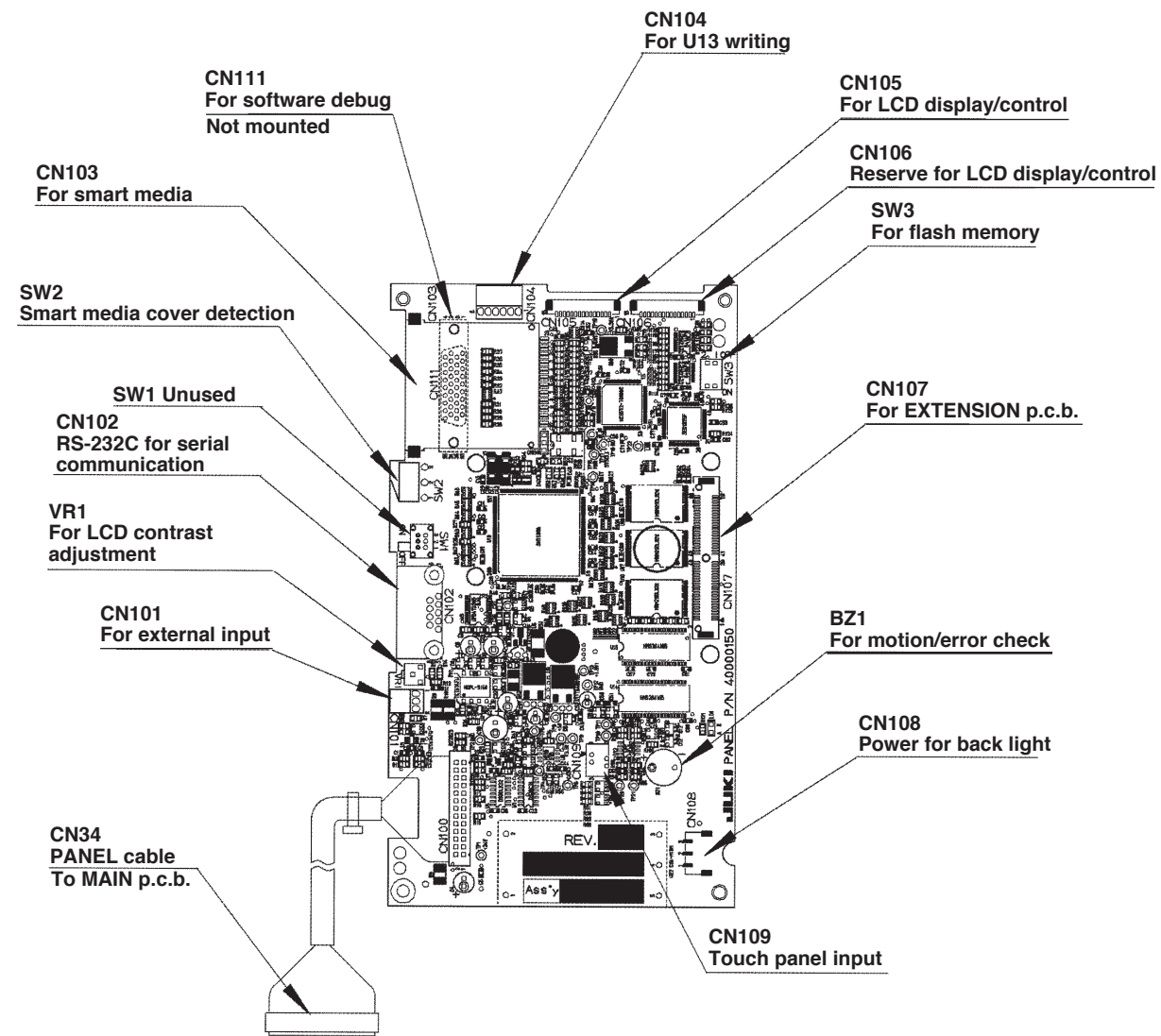
(4) MAIN p.c.b.

This p.c.b. performs the whole control such as control of feed stepping motor, control of main motor, control of active tension, memory switches, etc.



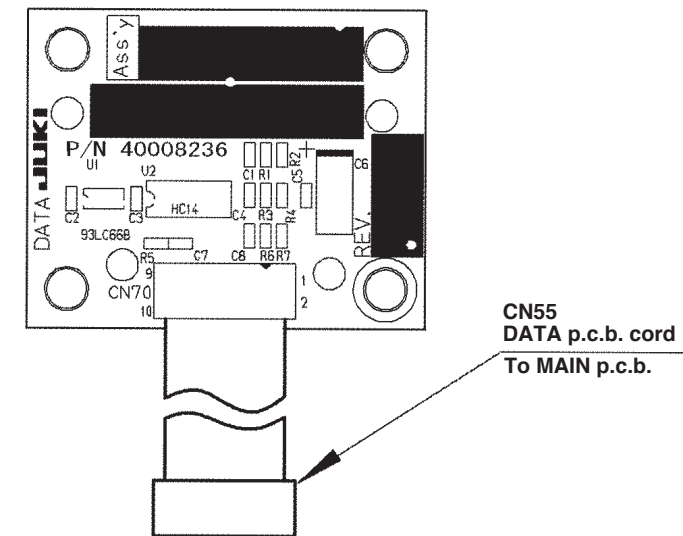
(5) PANEL p.c.b.

This p.c.b. performs input of operation, creation of sewing data, change of various setting of memory switches, storing of various data, writing, communication with external equipment, etc.



(6) DATA p.c.b.

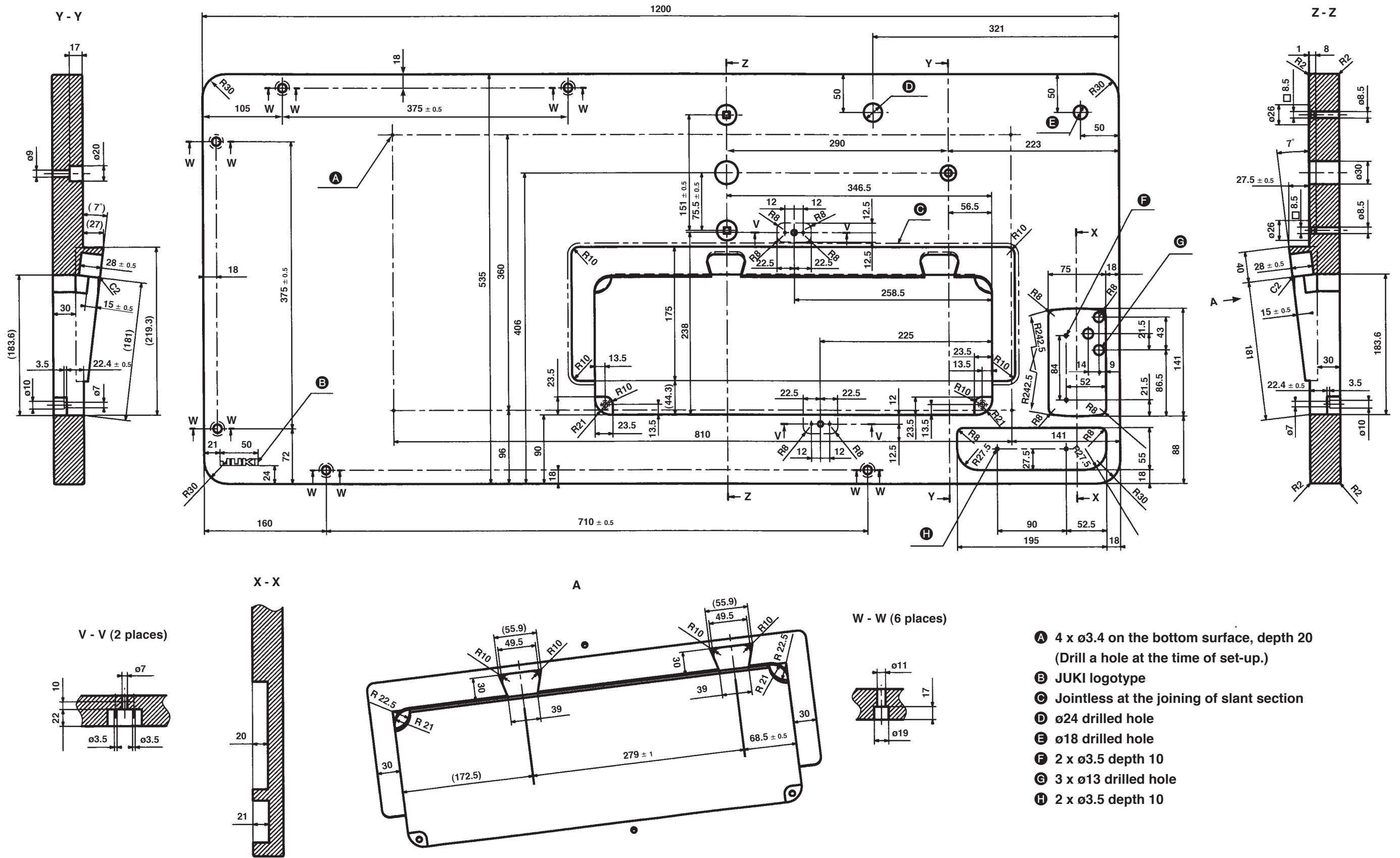
This p.c.b. records the data which are specific to the machine head such as compensation value of active tension and the like.



13. DRAWING OF THE TABLE

Part No. : 40013092

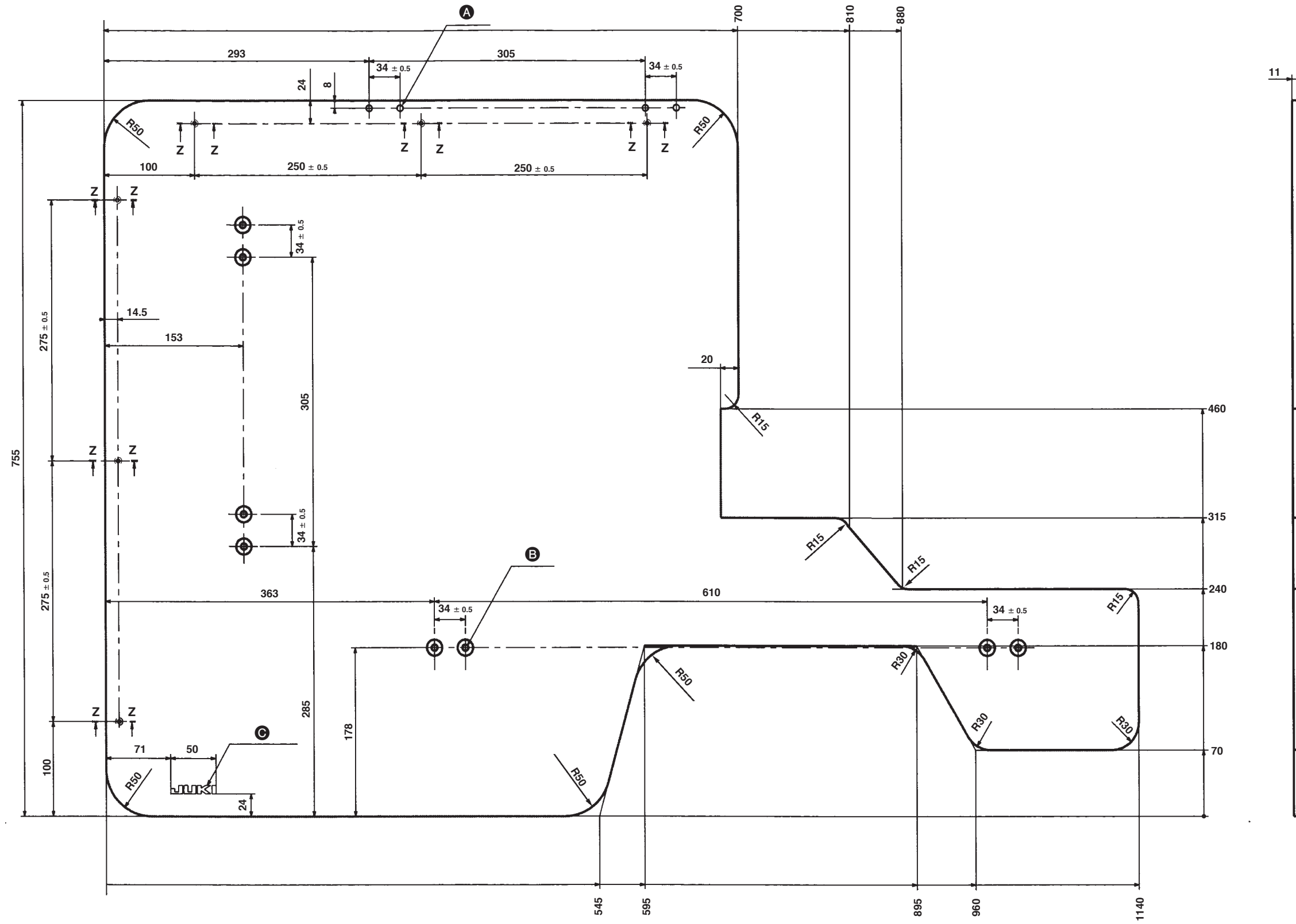
(1) Slant table



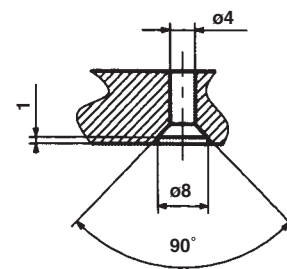
- Ⓐ 4 x $\phi 3.4$ on the bottom surface, depth 20
(Drill a hole at the time of set-up.)
- Ⓑ JUKI logotype
- Ⓒ Jointless at the joining of slant section
- Ⓓ $\phi 24$ drilled hole
- Ⓔ $\phi 18$ drilled hole
- Ⓕ 2 x $\phi 3.5$ depth 10
- Ⓖ 3 x $\phi 13$ drilled hole
- Ⓗ 2 x $\phi 3.5$ depth 10

(2) Work top table

Part No. : 40013086



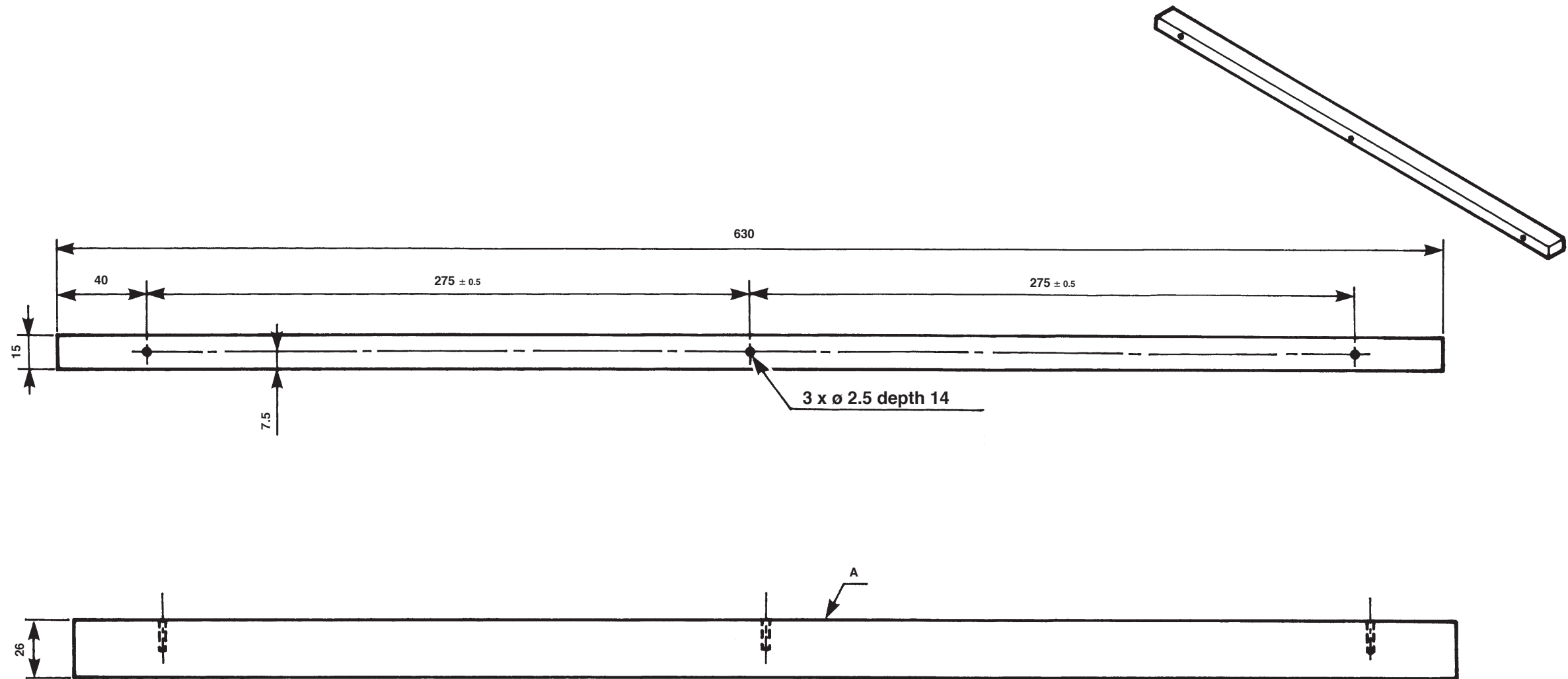
Z - Z (1:1) (6 places)



- Ⓐ 4 x 6.6 drill
- Ⓑ 8 x 6.6 drill, depth 17, spot facing depth 2
- Ⓒ JUKI logotype

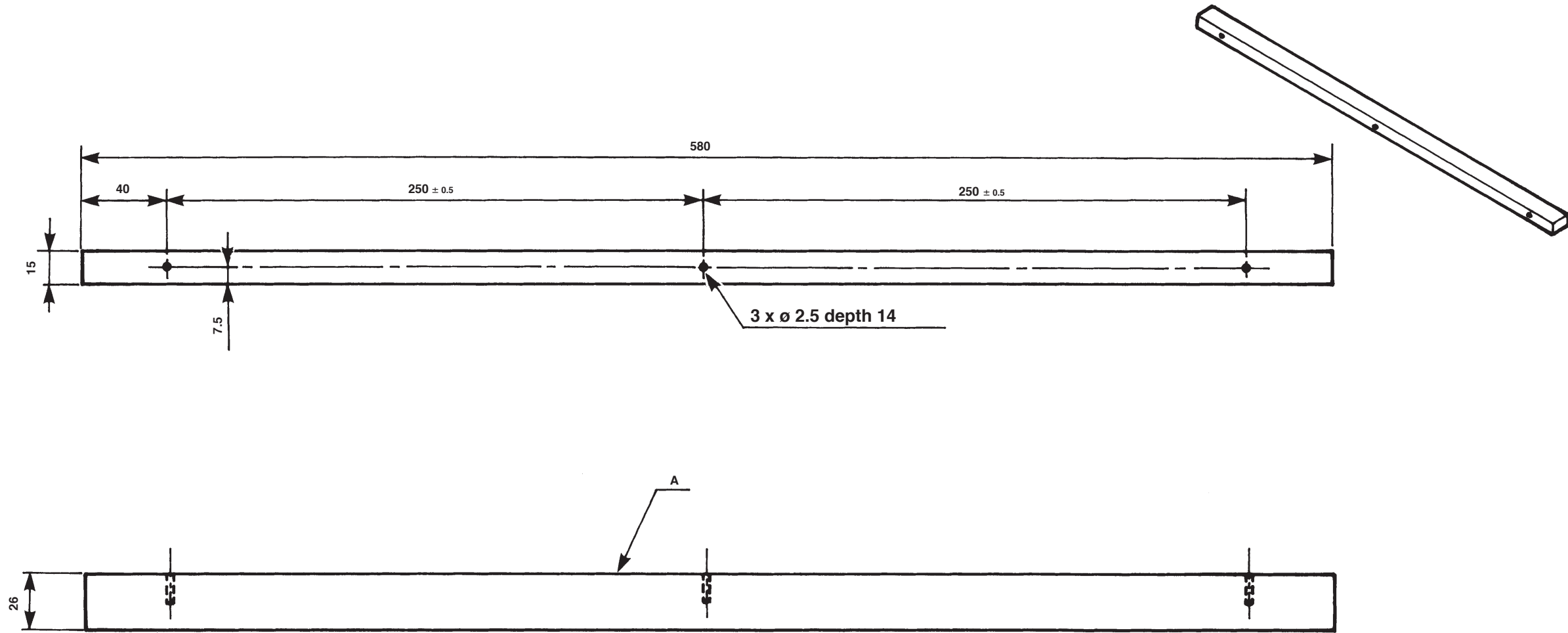
(3) Edge Stopper A

Part No. : 40013087



(4) Edge Stopper B

Part No. : 40013088



JUKI®

JUKI CORPORATION

INTERNATIONAL SALES H.Q.
8-2-1, KOKURYO-CHO,
CHOFU-SHI, TOKYO 182-8655, JAPAN
PHONE : (81)3-3430-4001 to 4005
FAX : (81)3-3430-4909 • 4914 • 4984
TELEX : J22967

Copyright © 2004 JUKI CORPORATION.
All rights reserved throughout the world.



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.**