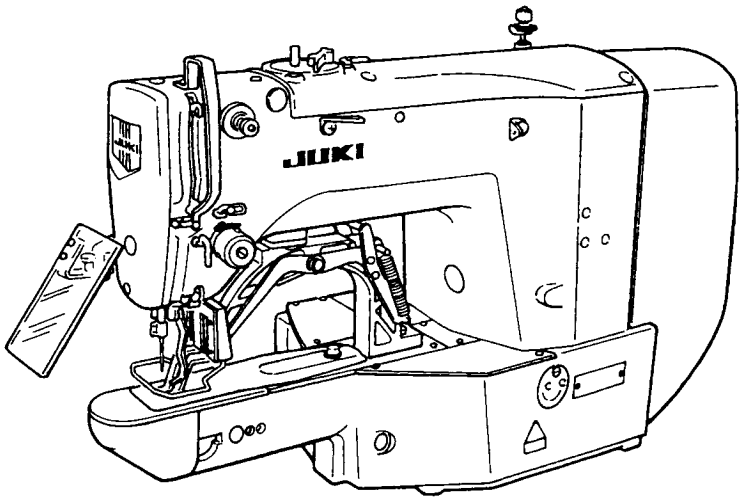
JUKI®

Computer-controlled High Speed
Bar Tacking Industrial Sewing Machine

LK-1900A Series

ENGINEER'S MANUAL



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PREFACE

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

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

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

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

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1. Specifications

No.	Model name / Item	Application			
		LK-1900A	LK-1901A	LK-1902A	LK-1903A
1	Application	Bartacking	Eyelet buttonhole bartacking	Belt-loop attaching	Lock stitch button sewing
2	Sewing area	X-Direction (right, left) 40mm; Y-Direction (forward, backward) 30mm			———
3	Button size	———			Type: Round-shaped, flat button ø 8 to ø32mm, Standard (ø8 to ø20mm)
4	Max. sewing speed	* 3000rpm max. (*2700rpm fo the 2-fold semi-rotary hook)	* 3000rpm max. (When sewing pitches are less than 5mm in X-direction and 3.5mm in Y-direction)		* 2700rpm max.
5	Stitch length	0.1mm to 10.0mm (adjustable in 0.1mm step)			
6	Feed motion of work clamp foot	intermittent feed (2-shaft drive by stepping motor)			
7	Meddle bar stroke	41.2mm			45.7mm
8	Needle	DPX5 #14			DPX17 #14
		DPX5#11 (F, M) (DPX17#21 heavy-weight material)		(DPX17#21 heavy-weight material)	
9	Work clamp lifting system	Pulse motor			
10	Lifting (lift) amount of work-clamp foot	Standard 14mm, Max.17mm (In the reverse-rotation needle-up function)			Max. 13mm
11	Number of standard patterns	50 patterns	3 patterns	6 patterns	50 patterns
12	Wiper system	Interlockly with work clamp foot lifter by pulse motor			
13	Needle thread clamp device	Standard: General 0			Standard: Disable 1 **(Caution) 1.**
14	Needle thread tension	Active tension (electronic thread tension control mechanism)			
15	Hook	Standard semi-rotary hook (2-fold semi-rotary hook)	Standard semi-rotary hook		
16	Lubrication	Hook : minute-quantity lubrication			
17	Lubricating oil	JUKI NEW Defrix oil (equivalent to ISO VG32) (Lubrication system)			
18	Grease	1. Penetration No. 2 lithium grease, 2. Templex N2, 3. Juki Grease A, 4. Juki Grease B **(Caution)2.**			
19	Memory medium	EEP-ROM (128Kbyte) EP-ROM (32Kbyte)			
20	Number of stitches that can be stored in memory	Max. 20,000 stitches			
21	Enlarging/Reducing facility	X-Direction, Y-Direction: 20 ~ 200% each (1% step)			
22	Enlarging/Reducing method	Pattern enlargement/reduction can be done by increasing/decreasing the stitch length			
23	Sewing speed limits	450 ~ 3000rpm (100rpm step) (2700rpm max. for the 2-fold semi-rotary hook)			400 ~ 2700rpm (100rpm step)
24	Material clrawing amount	———	Max. 3mm	———	
25	Pattern selector facility	Pattern No. designation system (1 ~ 200)			
26	Bobbin thread counter	Up/Down method (0~9999)			
27	Sewing machine motor	450W compact AC servomotor (direct-drive system)			
28	External dimensions	W: 1200mm, L: 660mm, H: 1100mm (standard table stand applied)			
29	Weight	Machine head (include motor): 42kg, Control box: 16.5kg			
30	Power consumption	320W			
31	Working temperature range	5°C~35°C			
32	Working humidity range	35% ~ 85% (no dew condensation permissible)			

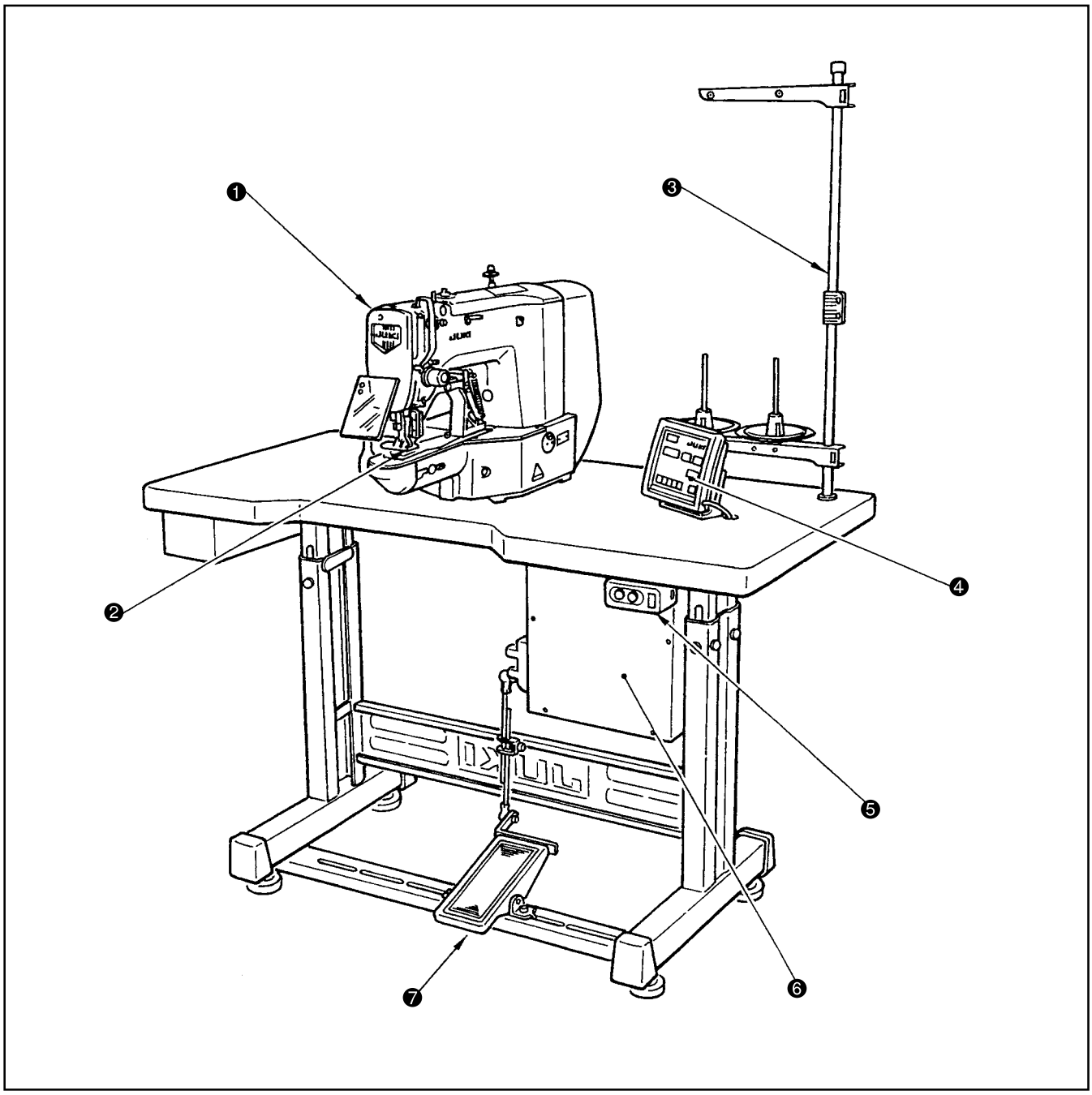
* Maximum sewing speed should be reduced according to the sewing conditions.

(Caution) 1. LK-1903A is set to needle thread clamp prohibited (no motion) with memory switch No. 35 at the time of standard delivery.

2. Grease type, refer to (3) Greasing parts of [9] Maintenance.

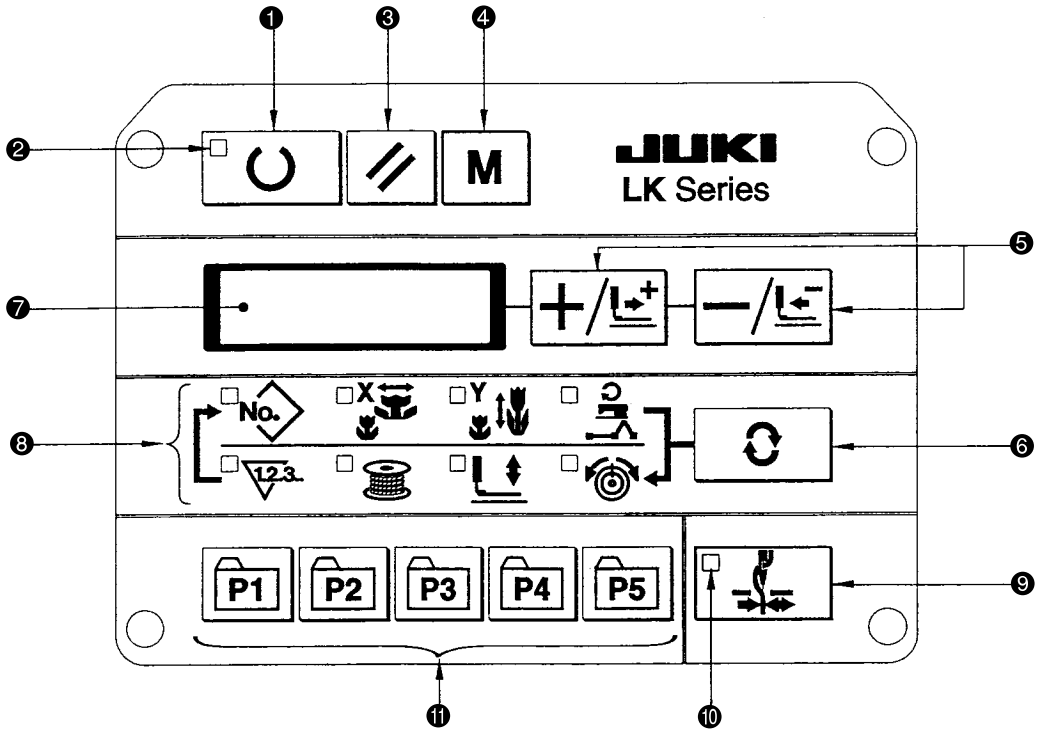
2. Configuration

(1) Names of main unit



❶ Sewing machine head
❷ Work clamp foot
❸ Thread stand
❹ Operation panel
❺ Power switch
❻ Control box
❼ Pedal switch

(2) Names and explanation of switches on the operation panel



❶ **"Ready" key**
This key changes over the setting state from the panel to the sewing state where the sewing machine actually operates.

❷ **Sewing LED**
This LED goes off at the time of setting state and lights up at the time of sewing state. Changeover can be performed with "Ready" key.

❸ **"Reset" key**
This key is used for canceling error or returning the set value to the initial value.

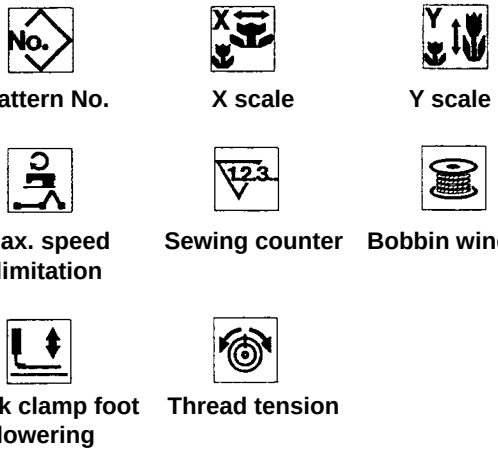
❹ **"Mode" key**
This key makes the setting mode of the memory switch.

❺ **"+ / Feed forward" key, and "- / Feed backward" key**
This key is used for changing pattern No. and X/Y scale, and feed forward/feed backward.

❻ **"Selection" key**
This key selects the item to be set. Item selection LED of the selected item and the set value are displayed.

❼ **Data indication LED**
This LED indicates the set values of the selected items such as pattern No., X/Y scale, etc.

❽ **Item selection LED**
LEDs of the selected items light up.



Pattern No. **X scale** **Y scale**

Max. speed limitation **Sewing counter** **Bobbin winder**

Work clamp foot lowering **Thread tension**

❾ **Needle thread clamp ON/OFF key**
This key selects effective/ineffective of needle thread clamp. When it is effective, needle thread clamp disply LED lights up. **(Note) 1.**

❿ **Needle thread clamp display LED**
When this LED lights up, needle threas clamp operaters.

⓫ **Pattern registration key**
This key registers the pattern. When this key is pressed, the pattern registered here can sew immediately.
X/Y scale, sewing position, ets. can be changed and registered.

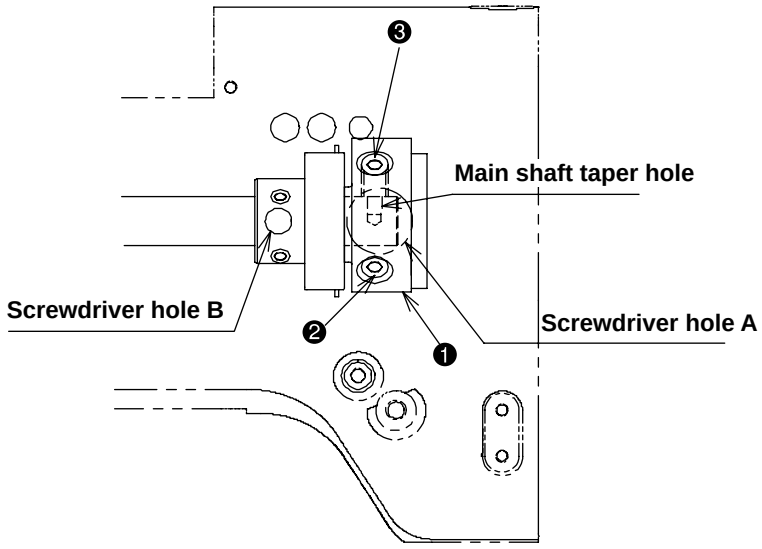
(Note) 1. LK-1903A is set to needle thread clamp prohibited (no motion) with memory switch No. 35 at the time of standard delivery.

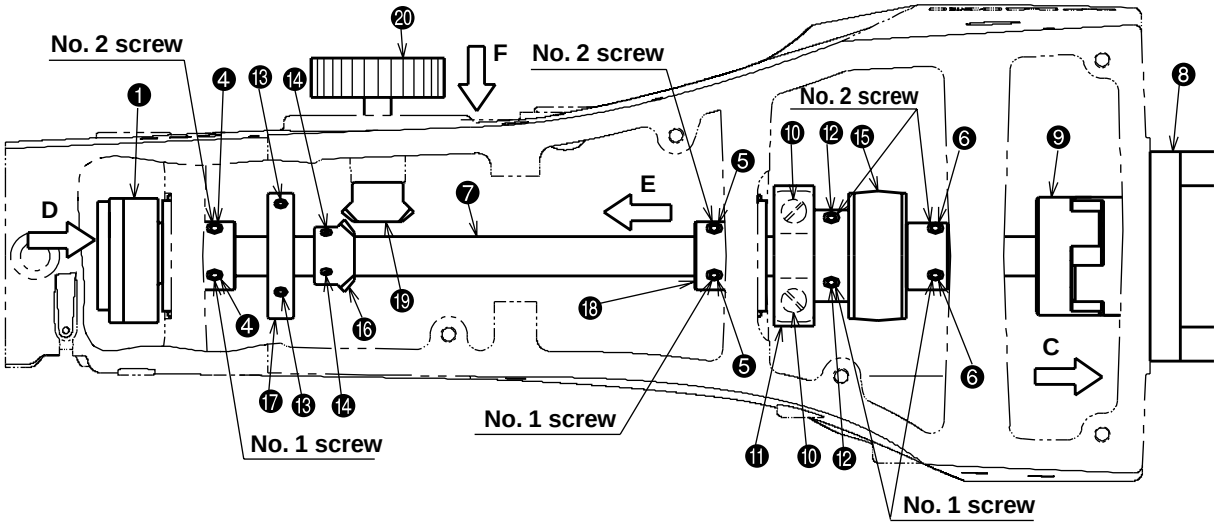
3. Standard adjustment

(1) Main shaft connection/disconnection

Procedures of disassembling

1. Loosen the set screw ❷ of the main shaft counterbalance ❶ through the screwdriver hole A, then remove the taper screw ❸.
2. Loosen the two set screws ❹ (through the screwdriver hole B), and also the two each of ❺ and ❻.
   At that time, loosen the second set screw first. The first set screw should be removed completely from the flat part of the main shaft ❼.
3. Remove the main shaft motor ❽.
   Refer to "(2) Removal of the main shaft motor and coupling."
4. Loosen the two set screws ❿.
   Pay attention to possible injury at that time because the balancer ⓫ begins to turn when the set screw ❿ is loosened.
5. Loosen the two set screws ⓬.
   At that time, the first set screw of the set screw ⓬ should be removed completely from the flat part of the main shaft ❼.
6. Loosen the two set screws ⓭ and the two set screws ⓮.
7. Draw out the main shaft ❼ in the direction of the Arrow C.





Procedures of assembling

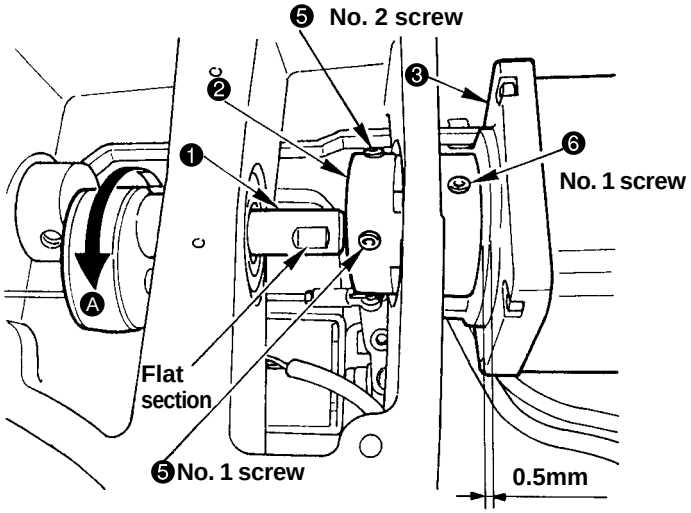
1. Insert the crank rod ⓯, balancer ⓫, hand pulley gear A ⓰, bobbin winder driver wheel ⓱, and the main shaft counterbalance ❶ in the main shaft ❼ in this order, and mount the assembly on the frame.
2. Insert the taper screw ❸ in the taper hole of the main shaft, and tighten it. Then, tighten the set screw ❷ to fix the main shaft counterbalance ❶.
3. Lightly press the main shaft counterbalance ❶ in the direction of the arrow D and also the middle metal ⓲ in the direction of the arrow E. Then, tighten the two set screws ❺.
   (Tighten the first screw so that it touches flatly on the main shaft ❼. Then, tighten the second one. Same procedures followed hereafter.)
4. Tighten the two each set screws ❹ and ❻, respectively. (Make sure that the first screw touches flatly on the main shaft ❼.)
5. Push the hand pulley ⓴ in the direction of the arrow F so that the hand pulley gear A ⓰ is meshed with that the hand pulley gear B ⓳. In this state, fix the pulley with the two set screws ⓮.
6. Mount the main shaft motor ❽ and the coupling ❾.
   Refer to [(2) Removal of the main shaft motor and coupling].
7. Fix the crank rod ⓯ with the two set screws ⓬. Refer to [(3) Crank connecting rod connection/disconnection].
8. Fix the balancer ⓫ with the two set screws (⓾. Refer to [(4) Crank balancer positioning].
9. Fix the bobbin winder driver wheel ⓱ with the two set screws ⓲. Refer to [(29) Adjustment of the bobbin winder driving wheel position].
   * Try to turn the main shaft and confirm that there is no torque.

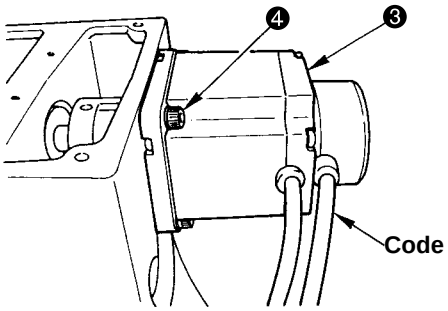
(2) Removal of the main shaft motor and coupling

Procedures of disassembling

1. Removal of the main shaft motor together with coupling
   Loosen the two set screws ❺ on the main shaft side of the coupling ❷. Then, remove the four motor set screws ❹.
2. To remove the coupling ❷ from the main shaft motor ❸, loosen the two set screws ❻ on the main shaft side.

(Caution) Turn the main shaft ❶ in the direction of forward rotation Ⓐ. The screw (hole) that can be seen first is the No. 1 screw. Loosen the screws, starting with the No. 2 screw. Tightening should be done, starting with the No. 1 screw.





Procedures of assembling

1. Mounting of the main shaft motor together with the coupling
1) Tighten the four motor set screws ❹. Then, tighten the two set screws ❺ on the main shaft side of the coupling ❷.
2) The cords of the main shaft motor ❸ should be positioned in the sidewise direction.

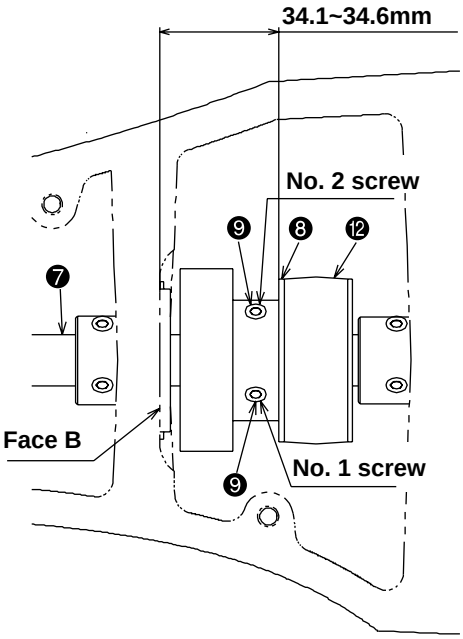
2. Incorporation of the coupling in the main shaft motor
1) Provide a clearance of 0.5mm between the coupling ❷ and the main shaft motor ❸.
2) Apply the No. 1 screw ❺ of the coupling ❷ to the shaft flat section of the main shaft motor ❸, and fix it.

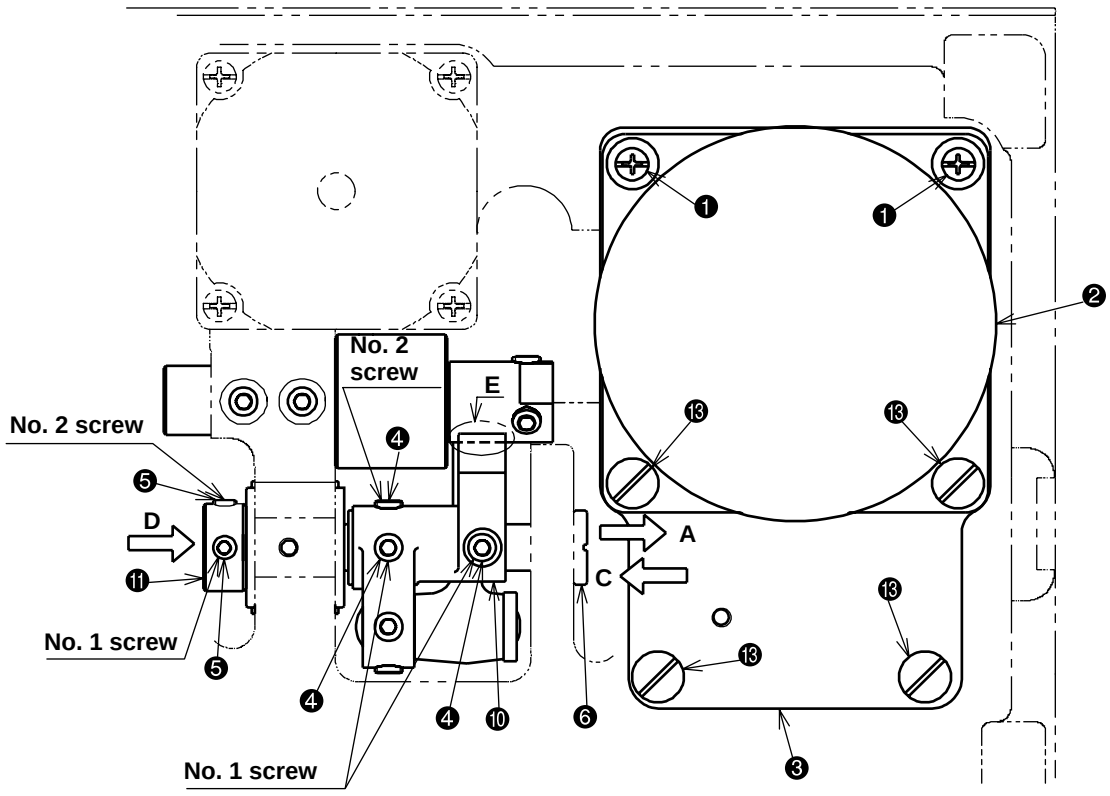
3. Meshing of the coupling
1) Apply the set screw ❻ (No. 1 screw) of the main shaft motor side to the section between the two set screws ❺ of the main shaft, and get them meshed.

(3) Crank connecting rod connection / disconnection

Procedures of disassembling

1. Remove the two set screws ❶ and four set screws ⓭. Then take out the lengthwise feed motor ❷ and the crosswise feed motor mounting plate ❸.
2. Loosen the three set screws ❹ and the two set screws ❺. At that time, the second screws should be loosened first for the set screws ❹ and ❺. The first screws of the set screws ❹ and ❺ should be arranged so that they can come completely off the flat section of the oscillator shaft ❻.
3. Pull out the oscillator shaft ❻ in the direction of the arrow A.
4. Remove the main shaft ❼ according to [(1) Main shaft connection/ disconnection]. Then, take out the crank rod unit ⓬.





Procedures of assembling

1. Mount the main shaft ❼ according to [(1) Main shaft connection/ disconnection]. Assemble the crank rod unit ⓬.
2. Adjust the clearance to 34.1 ~ 34.6mm between the under-cam ❽ of the crank rod unit ⓬ and Plane B (middle metal bearing mounting plane) of the frame. Fix the cam with the set screw ❾.
   (Tighten the first screw so that it touches flatly on the main shaft ❼. Then, tighten the second one. Same procedures followed hereafter.)
3. Mount the frame while the oscillator ❿ is passed through the oscillator shaft ❻.
4. Pass the thrust collar ⓫ through the oscillator shaft ❻. Lightly push the oscillator shaft ❻ in the direction of the arrow C and the thrust collar ⓫ in the direction of the arrow D. Tighten the two set screws ❺. (Make sure that the first screw touches flatly on the oscillator shaft ❻.)
5. Fix the large pendulum ❿ according to [(6) Oscillator gear positioning].
6. Mount the lengthwise feed motor ❷ and the crosswise feed motor mounting plate ❸, using the two set screws ❶ and four set screws ⓭.
   Refer to [(26) Adjusting the position of the X feed motor and the Y feed motor (Adjusting the backlash of the driving gear)].

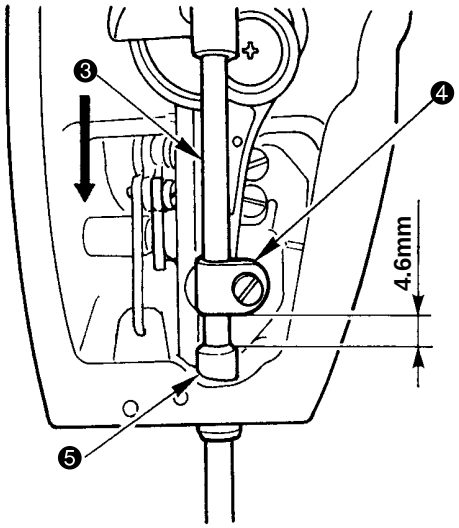
(Cautions) 1. Try to turn the main shaft and confirm that there is no torque.
2. In the case of connection/disconnection or positioning of the crank rod unit ⓬ or positioning of the oscillator ❿, grease-up treatment is always needed for the specified places (2 positions) and the gear area E of the oscillator ❿.
3. After the completion of positioning of the crank rod unit ⓬ (under-cam ❽), actions must be taken, without fail, according to [(6) Oscillator gear positioning]. Inadequate positioning of the under-cam ❽ and the oscillator ❿ can cause of the frictional wear or lock-up.

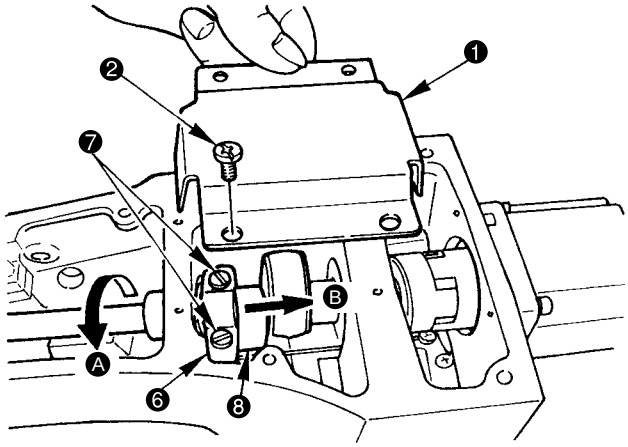
(4) Crank balancer positioning

Standard Adjustment

[Rotating direction]
When the needle bar ❸ lowers and the clearance between the needle bar connecting ❹ and the needle bar bushing, lower ❺ is 4.6mm, the two set screws ❼ of the crank balancer ❻ assume the horizontal condition.

[Axial direction]
Keep the close contact with the main shaft eccentric cam ❽ and the crank balancer ❻.

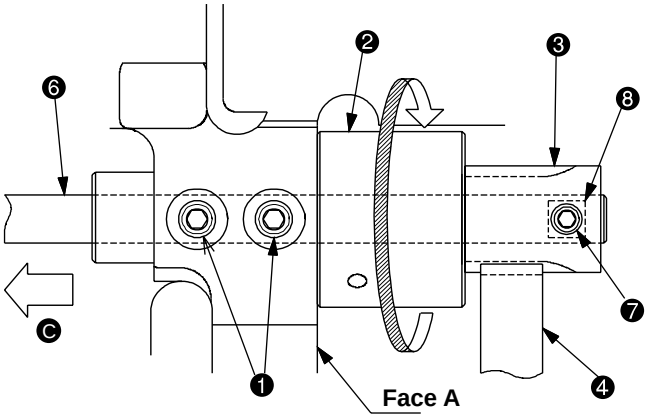


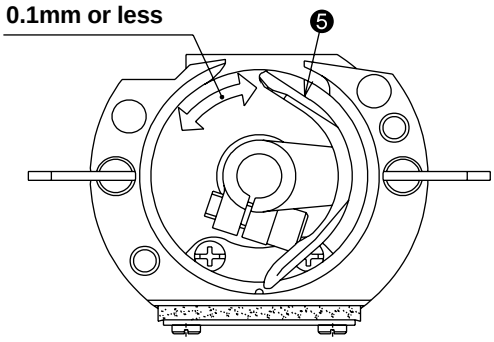


(5) Lower shaft backlash adjustment and connection/disconnection

Standard Adjustment

1. Size of lower shaft backlash is 0.1mm at the tip of the driver ❺. The shaft is required to rotate smoothly.
2. Define the stop position of the lower shaft ❻ so that the set screw ❼ settles almost in the center of the flat section ❽ of the lower shaft ❻.





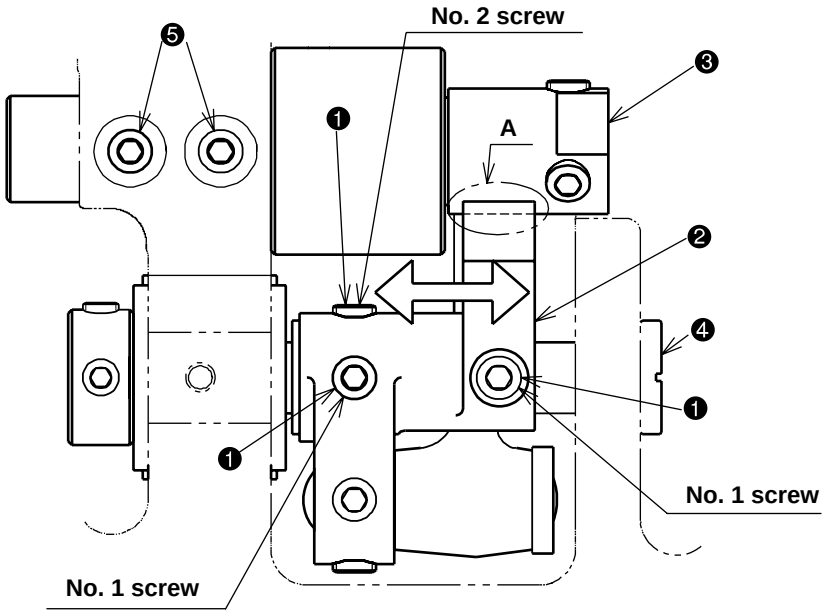
Adjustment Procedures	Results of Improper Adjustment
If the main shaft eccentric cam❽ is not fixed, this adjustment should be carried out after defining its position and fixing it. 1. Loosen the two set screws ❼ of the crank balancer ❻. 2. Using the four set screws ❷, remove the crank rod cover ❶. 3. Turn the main shaft in the direction of forward rotation Ⓐ so that the needle bar ❸ lowers and the clearance between the needle bar connecting ❹ and the needle bar bushing, lower ❺ is 4.6mm. 4. In the state that the two set screws ❼ of the crank balancer ❻ assume the horizontal condition and they are moved in the direction of the arrow mark Ⓑ, keep the close contact with the main shaft eccentric cam ❽ and tighten the two set screws ❼. When tightening these two set screws ❼, the screws should be tightened reciprocally.	o If the angle for fixing the crank balancer ❻ is inadequate, vibration of sewing machine operation will be intensified. o If the sewing machine is used for a long time while the fixing position is inadequate, the operational life of the main shaft bearing may be shortened. o If the crank balancer ❻ is not moved in the direction of the arrow mark Ⓑ, there may be interference with the sewing machine frame.

Adjustment Procedures	Results of Improper Adjustment
1. Lower shaft backlash 1) Loosen the two set screws ❶. 2) Turn the lower shaft rear metal ❷ in the direction of the arrow and adjust the backlash, keeping the metal to contact closely with Face A. Size of backlash is 0.1mm at the tip of the driver ❺. The shaft is required to rotate smoothly. 3) Tighten the two set screws ❶. **(Caution) When eliminate the backlash, the direction of rotation should always be kept in the direction of the arrow.** 2. Lower shaft connection/disconnection 1) Loosen the two set screws ❼. 2) The lower shaft ❻ can be taken out if it is pulled in the direction Ⓒ of the arrow. 3) When mounting the lower shaft ❻, insert it in the lower shaft rear metal ❷ and the lower shaft gear ❸. Apply one of the set screws ❼ to the flat section ❽ of the lower shaft ❻ and tighten it approximately in the center. Tighten the remaining set screw ❼. * Connection and disconnection of the lower shaft ❻ become easy if the above-mentioned backlash has been relieved in advance. In this case, backlash adjustment must be done after the lower shaft ❻ has been installed.	o If the backlash is excessive, the hook noise will be increased. o If backlash is too small, the lower shaft gear ❸ or the oscillator ❹ will give rise to frictional wear. In addition, this can be a cause of crank rod lock-up. o If the front or rear position of the lower shaft rear metal ❷ is displaced at the time of backlash adjustment, this can also be a cause of the lock-up of oscilator or the crank rod.

(6) Oscillator gear positioning

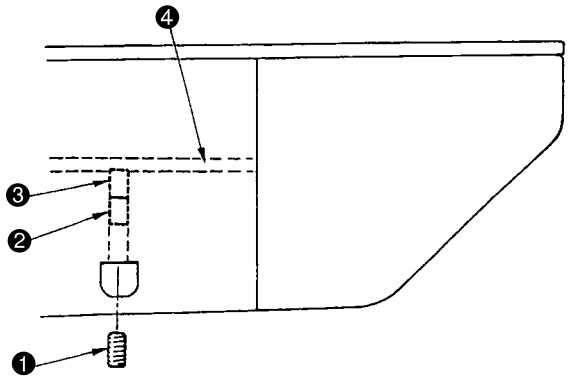
Standard Adjustment

1. When the oscillator is lightly swung by a finger in the direction of the arrow, the oscillator ❷ is fixed in the center position of swinging.



(7) Adjustment of hook oil amount

Standard Adjustment



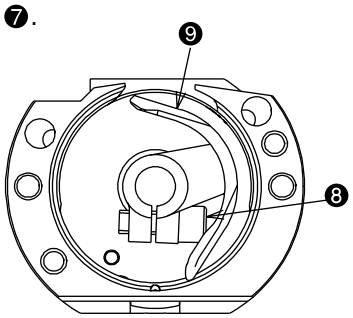
Adjustment Procedures	Results of Improper Adjustment
1. Loosen the two set screws ❺ and increase the backlash of the lower shaft gear ❸. **(Caution) 1. If the lower shaft gear ❸ has insufficient backlash, the oscillator ❷ does not swing correctly. In such a case, refer to [(5) Lower shaft backlash adjustment and connection/disconnection] and provide a sufficient backlash.** 2. The three set screws ❶ should have been loosened in advance. In this case, the second screw of the set screws ❶ should be loosened first. Then, the first one can be loosened. 3. Lightly swing the whole body of the oscillator ❷ with a finger in the direction of the arrow. Decide the positioning of the oscillator ❷ so that it stays in the center of swinging. 4. Loosen the three set screws ❶ and then fix them so that the oscillator ❷ is not displaced from the center of swinging. (Tighten the first screw first so that it comes in contact flatly with the oscillator shaft ❹. Then, tighten the second one.) 5. Make backlash adjustment for the lower shaft gear ❸, according to [(5) Lower shaft backlash adjustment and connection/ disconnection]. **(Cautions) 1. In the case of disassembly and adjustment, grease-up treatment is always needed for the specified places (2 positions) and the gear area A of the oscillator ❷.** **2. When the crank rod (under-cam) is removed, actions for under-cam positioning must be taken, without fail. Refer to [(3) Crank connecting rod connection/ disconnection].**	o If the position for fixing the oscillator ❷ is inadequate, this can also be a cause of the frictional wear or lock-up of the oscillator pin, crank rod lid, under-cam, and the crank rod.

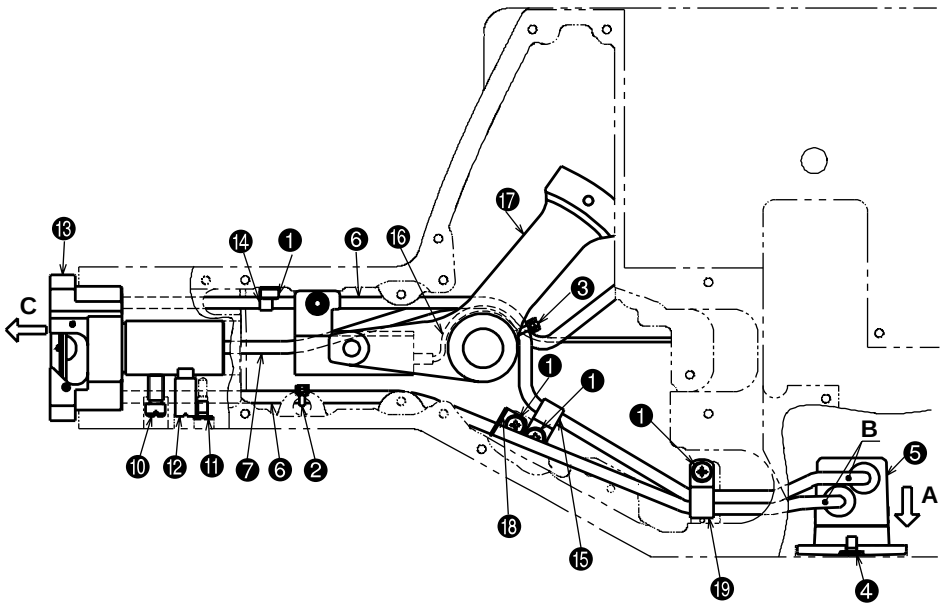
Adjustment Procedures	Results of Improper Adjustment
1. Loosen the set screw ❶ and remove it. 2. When the adjusting screw ❷ is tightened, the quantity of oil can be regulated for the lubrication pipe left ❹. 3. After adjustments, tighten the set screw ❶ to fix it. **(Cautions) 1. In the state of standard shipping, the hook lubrication reducer ❸ is positioned so that it is lightly tightened and then return-loosened by 4 turns.** **2. When reducing the oil amount, the screw should not be tightened up fully. Tighten the hook lubrication reducer ❸ and then return it by two turns. In this position, wait for half a day to see how it goes. Too much reduction can be a cause of hook wear.**	o If the amount of hook lubricant is reduced too much, this can be a cause of frictional wear of the hook race plane or lock-up.

(8) Large hook connection / disconnection and oil wick piping

Procedures of disassembling

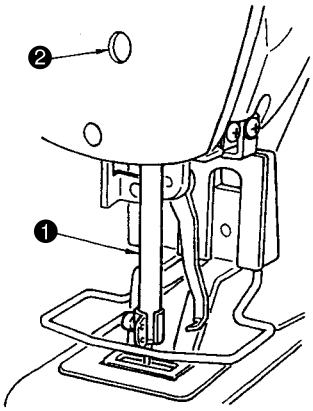
1. Loosen the four set screws ❶.
2. Cut the harness bands ❷ and ❸.
3. Remove the set screw ❹ and pull the oil tank ❺ in the direction of the arrow A.
4. Pull Part B upwards of the two lubrication pipes ❻. Take them out of the oil tank ❺.
5. Release the cord clamp from the rear side of the bed of the oil drain pipe ❼.
6. Loosen the set screw ❽ and take out the driver ❾.
7. Loosen the set screw ❿.
8. Remove the set screw ⓫ and pull out the shuttle race adjust shaft ⓬.
9. Pull the shuttle ⓭ in the direction of the arrow C and take it out.

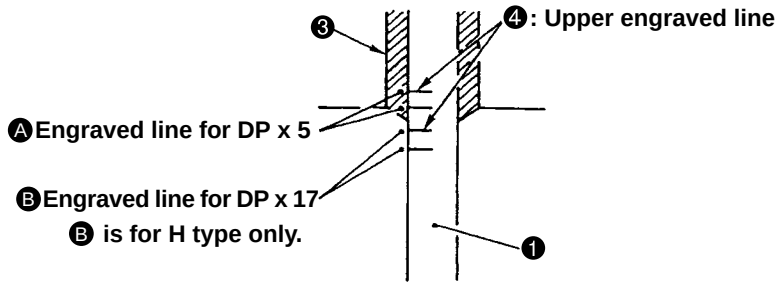




(9) Adjusting the height of the needle bar

Standard Adjustment





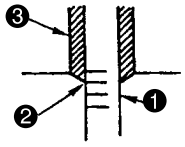
Procedures of assembling
1. Pass the two lubrication pipes ❻ and the oil drain pipe ❼ through the frame, and mount the shuttle ⓭. 2. Hold the lubrication pipe ❻ with the lubrication pipe holder plate ⓮ and fix it with the set screw ❶. At that time, make sure not to let the lubrication pipe ❻ come in contact with the thread cutter connector rod. 3. Pass the lubrication pipe ❻ through the cord clamp ⓯ and fix it with the set screw ❶ At that time, the needle thread clamp sensor cord ⓰ should be passed beneath the lubrication pipe ❻ and the oil drain pipe ❼. If the needle thread clamp sensor cord ⓰ is located above them, this can be a cause of abrasion or cable breakage in the crosswise feed main ⓱. 4. Using the harness band ❷ and the lubrication pipe holder ⓲, stretch and fix the lubrication pipe ❻ along the wall side of the frame. At that time, make sure not to permit the lubrication pipe ❻ to touch the needle thread clamp connector link. 5. Bundle the needle thread clamp sensor cord ⓰, the lubrication pipe ❻, and the oil drain pipe ❼ with the harness band ❸. 6. Pass the two oil drain pipes ❻ through the cord clamp ⓳ and fix them with the set screw ❶. 7. Insert the two oil drain pipes ❻ (part B) in the oil tank ❺. Fix the oil tank ❺ to the frame with the set screw ❹. 8. Fix the oil drain pipe ❼ to the rear side by means of the cord clamp. 9. Fix the shuttle ⓭ and mount the driver ❾. Refer to [(10) Hook adjustment]. * Harness bands ❷ and ❸ : Part No. EA9500B0100

Adjustment Procedures	Results of Improper Adjustment
Bring needle bar ❶ to the lowest position of its storoke. Loosen needle bar connection screw ❷ and adjust so that upper marker line ❹ engraved on the needle bar aligns with the bottom end of needle bar bushing lower ❸. **(Caution) After the adjustment, make sure that there is no uneven torque.** * When stitch skipping occurs in accordance with the sewing conditions, adjust the height of the needle bar so as to lower it by 0.5 to 1mm from the neddle bar engraved line ❹.	

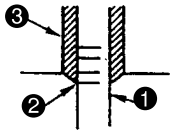
(10) Hook adjustment

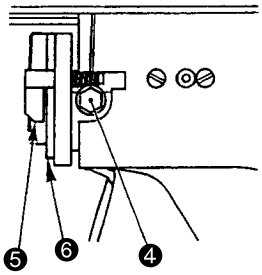
Standard Adjustment

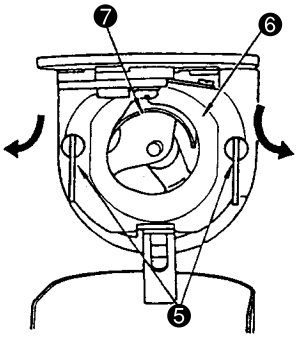
For DPX5

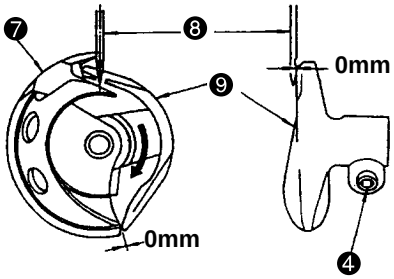


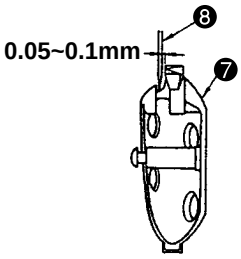
For DPX17

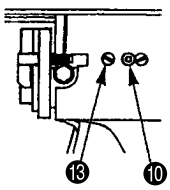


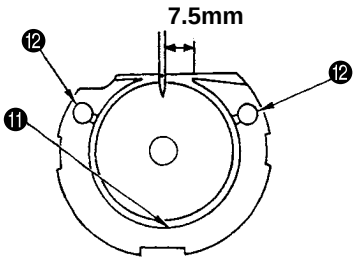










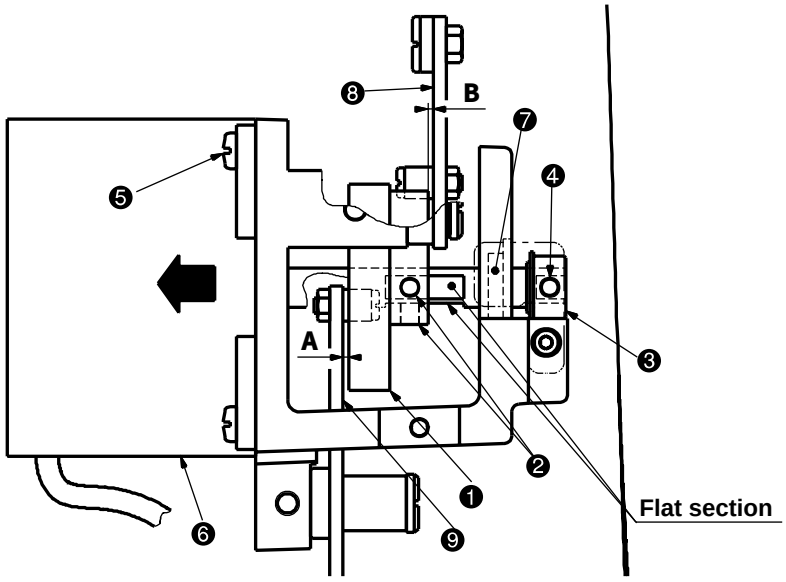


Adjustment Procedures	Results of Improper Adjustment
1. Turn the handwheel by hand. When needle bar ❶ has gone up, adjust so that lower marker line ❷ engraved on the needle bar aligns with the bottom end of the needle bar bushing ❸, lower. 2. Loosen setscrew ❹ in the driver ❾. Open inner hook pressers ❺ to the right and left, and remove inner hook presser ❻. **(Caution) At this time be careful not to let inner hook ❼ come off and fall.** 3. Adjust so that the blade point of inner hook ❼ aligns with the center of needle ❽, and that a clearance of 0 mm is provided between the front end of the driver ❾ and the needle as the front end face of driver ❾ receives the needle ❽ to prevent the needle from being bent. Then tighten setscrew ❹ of the driver ❾. 4. Loosen setscrew ⓭ of the shuttle, and adjust the longitudinal position of the shuttle. To do this adjustment, turn shuttle race adjusting shaft ❿ clockwise or counterclockwise to provide a 0.05 to 0.1 mm clearance between needle ❽ and the blade point of inner hook ❼. 5. After adjusting the longitudinal position of the shuttle, further adjust to provide a 7.5 mm clearance between the needle ❽ and the shuttle by adjusting the rotating direction. Then tighten setscrew ⓭ of the shuttle. **(Caution) Apply a small amount of oil to race section ⓫ and oil wick ⓬, and use the sewing machine after an extended period of disuse or cleaning the periphery of hook portion.**	

(11) Thread trimmer cam position adjustment and connection / disconnection

Procedures of disassembling

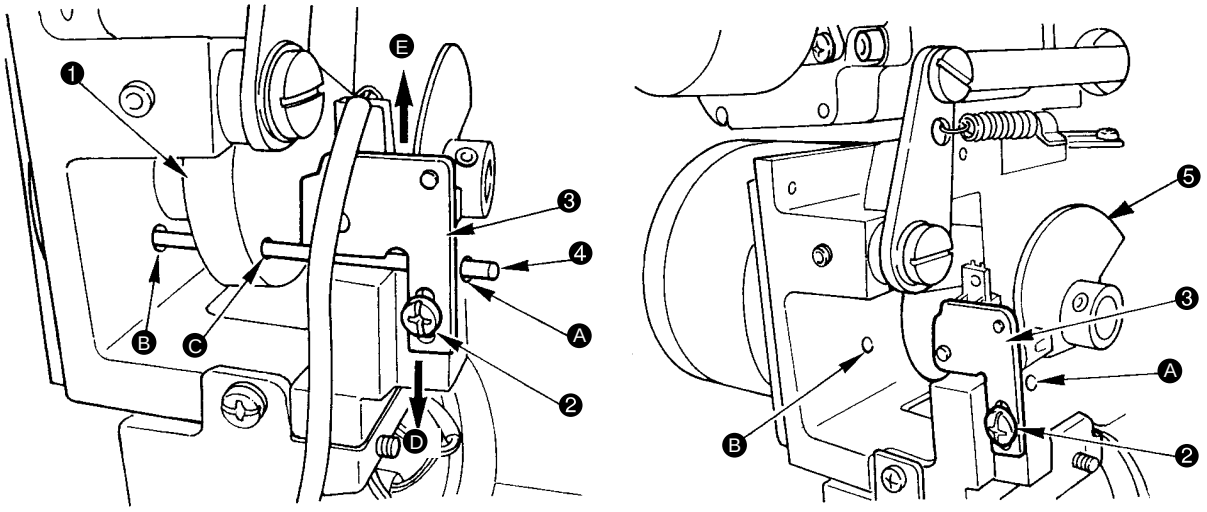
1. Loosen the two set screws ❷ of the thread trimmer cam (cam hereafter)❶.
2. Loosen the two set screws ❹ and remove the sensor slit ❸.
3. Remove the four set screws ❺ and take out the presser lifting motor ❻ in the direction of the arrow. In some cases, the bearing ❼ and the motor shaft seem to be tightly coupled. Pull out the motor shaft in the direction of the arrow straightforward in order not to hurt the bearing ❼.
   At that time, the cam ❶ may come down. Handle it with care, not to damage it.



(12) Thread trimmer and presser foot origin sensor adjustment

Standard Adjustment

In the state of origin retrieval (Start Switch ON) in the test mode CP-6, the standard holes Ⓐ and Ⓑ of the sewing machine frame come to coincide with the standard hole Ⓒ of the thread trimmer and presser bar lifter cam ❶.

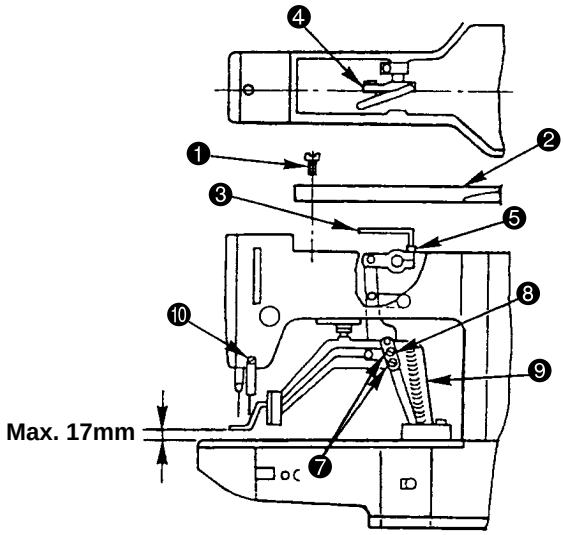


Procedures of assembling
1. Apply a proper amount of grease (Juki Grease A) to the grooved cam block of the cam ❶, the peripheral cam block, and the rollers of the presser bar lifter link ❽ and the thread trimmer link ❾. Refer to “9.-(4) Parts to which grease is applied.” 2. While the cam ❶ is being inserted in the shaft of the presser lifting motor ❻, mount the assembly on the sewing machine frame and tighten the four set screws ❺. The insertion of the cam should be done gently in order not to hurt the bearing ❼. 3. Clearance B toward the presser bar lifter link ❽ and Clearance A toward the thread trimmer link ❾ should be equally distributed. For this purpose, adjust the position of the cam ❶ and fix it with the use of the two set screws ❷. (Apply the screws to the flat section at both ends of the shaft.) * If it is difficult to examine Clearance B, Clearance A should be adjusted to 0.5mm ~ 0.7mm during assembly. 4. Mount the sensor slit ❸ with the two set screws ❹ so that the end plane of the motor shaft can approximately coincide with that of the sensor slit ❸. (Join the flat section for installation.) * Confirm that the slit plate of the sensor slit ❸ does not interfere with the presser bar lifter sensor. 5. Refer to “(12) Thread trimmer and presser foot origin sensor adjustment” and make sensor adjustments.

Adjustment Procedures	Results of Improper Adjustment
1. Start the test mode CP-6. 2. Tread on the pedal for the retrieval of the thread trimmer and presser bar lifter (cam) origin. 3. Using a bar ❹ or the like, confirm that the standard holes Ⓐ and Ⓑ of the sewing machine frame coincide with the standard hole Ⓒ of the thread trimmer and presser bar lifter cam ❶. 4. If the standard hole Ⓒ of the thread trimmer and presser bar lifter cam ❶ stays in the upper Ⓔ direction, loosen the set screw ❷ to move the sensor mounting plate ❸ in the lower Ⓓ direction and then fix it. If the standard hole Ⓒ of the thread trimmer and presser bar lifter cam ❶ stays in the lower Ⓓ direction, loosen the set screw ❷ to move the sensor mounting plate ❸ in the upper Ⓔ direction and then fix it. After the sensor mounting plate ❸ has been fixed, tread on the pedal for the retrieval of the thread trimmer and presser bar lifter (cam) origin to confirm whether the standard holes coincide with each other. 5. Repeat the above steps 2 to 4 until the coincidence is confirmed. **(Caution) Confirm that there is no mutual interference between the sensor slit plate ❺ and the sensor before tightening the set screw ❷.**	o If there is no coincidence of the standard holes, such a condition is regarded as a thread cutting timing error. This can be a cause of trouble in thread breakage or unthreading at the beginning of sewing.

(13) Adjusting the lift of the work clamp foot

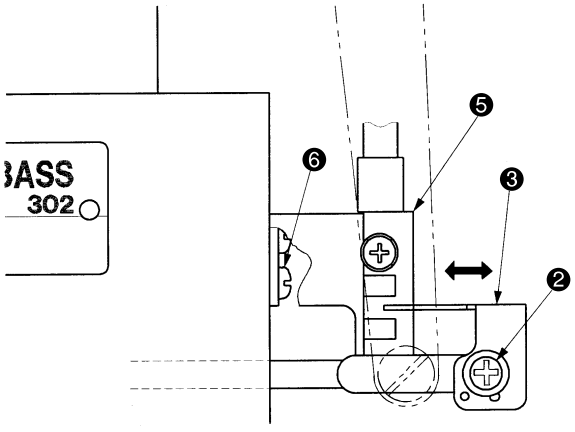
Standard Adjustment

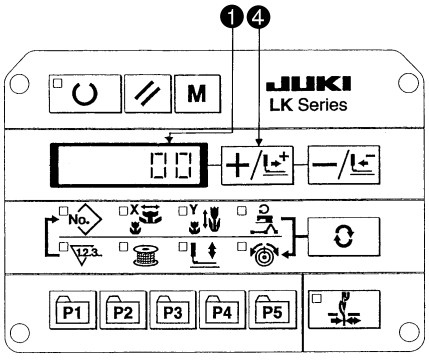


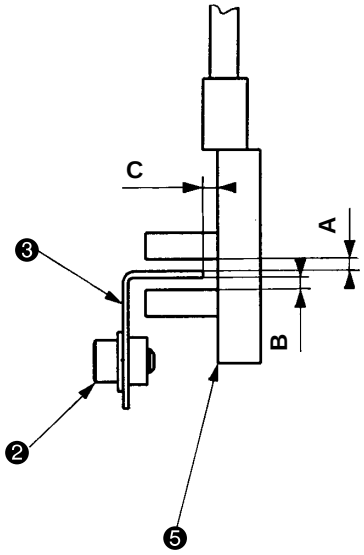
(14) Adjusting the thread trimmer sensor

Standard Adjustment

After the completion of origin retrieval in the test mode CP-6 (Start Switch ON), try to press the + key ❹ 6 to 8 times. At that time, the thread trimmer sensor is turned ON. (The digit display ❶ at the operation panel: [10] → [00])







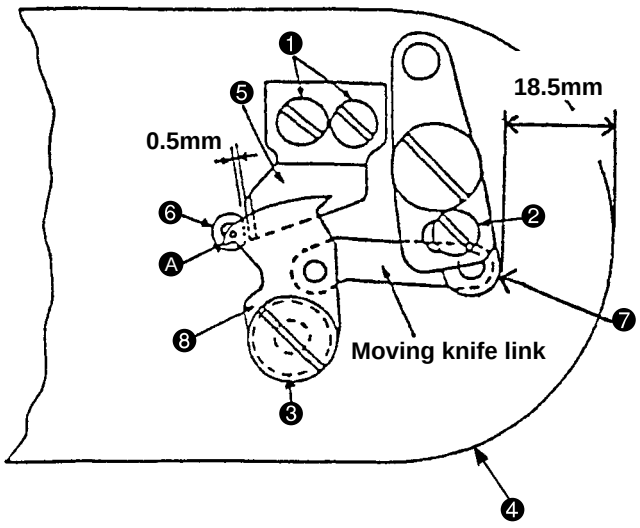
Adjustment Procedures	Results of Improper Adjustment
1. With the machine in stop mode, remove six setscrews ❶ of the top cover, and take off top cover ❷. 2. Apply L-shaped wrench ❸ to socket bolt ❺ of clamp ❹, and loosen the socket bolt. 3. Push down L-shaped wrench ❸ to increase the lift of the work clamp hoot, or pull it up to decrease the lift. 4. After the adjustment, securely tighten socket bolt ❺. 5. If the right and left work clamp feet are not levelled, loosen fixing screw ❼ and adjust the position of the work clamp foot lever support plate ❽ to level them. **(Caution) At this time, be careful not to cause work clamp foot lever support plate ❽ to interfere with feed bracket ❾. If the work clamp foot levers support plate interferes with the wiper, readjust the height of the wiper using setscrew ❿ in the wiper installing base.**	

Adjustment Procedures	Results of Improper Adjustment
1. Start the test mode CP-6. 2. Tread on the pedal to perform origin retrieval for the thread trimmer cam. (Confirm that the origin is in the correct position. Then, proceed to the procedures shown below. Refer to "(12) Thread trimmer and presser foot origin sensor adjustment.") 3. Press the] key ❹. Confirm that the display ❶ of the operation panel is changed over from [10] → [00] when the key is pressed within the range of 6 to 8 times. 4. If the display changeover occurs deviating from the range of 6 times to 8 times, or if the display changeover does not occur at all, loosen the set screw ❷ and make fine adjustments of the sensor slit ❸ in the directions of the arrow. 5. After the sensor slit ❸ has been fixed, tread on the pedal and make origin retrieval for the thread trimmer cam. Examine the sensor changeover position in the steps 3 and 4 above. 6. Repeat the steps 2 ~ 5 above until the coincidence is secured. **(Caution) During adjustments, check the clearances A, B, and C of the sensor slit ❸ and the sensor ❺. If the clearances seem to be insufficient, use the set screws ❷ and ❻ to correct the gradient. While taking this action, continue to work on the steps above.**	o If the thread trimmer sensor changeover takes place outside the range, the moving knife may interfere with the needle. This will be a cause of injury or the breakage of parts. o If the thread trimmer sensor changeover does not take place, Error 305 occurs and the sewing machine fails to start operating. o If the sensor slit ❸ has no clearance against the sensor ❺, this can be a cause of destruction in the sensor slit ❸ or the sensor ❺.

(15) Adjustment of the moving knife and counter knife position

Standard Adjustment

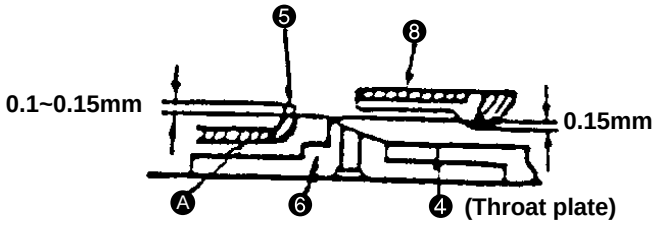
Counter knife position : The clearance between the counter knife ❺ and the needle hole guide ❻ is 0.5mm.
Moving knife position : Before thread trimmer operation (standby state), the distance from the throat plate ❹ front end to the tip of the thread cutter lever (small) ❼ is 18.5mm.



(16) Adjusting the height of the moving knife and counter knife

Standard Adjustment

Moving knife ❽ : The amount of mesh of the needle hole guide ❻ with the moving knife ❽ is 0.15mm.
Counter knife ❺ : The height between the needle hole guide ❻ and the blade of the counter knife ❺ is 0.1 ~ 0.15mm.



Adjustment Procedures	Results of Improper Adjustment
1. Counter knife position Loosen the counter knife set screw ❶ to adjust the position. 2. Moving knife position Loosen the screw ❷ to adjust the position. **(Cautions) 1. In normal operation, the moving knife ❽ passes inside the needle hole guide ❻, as illustrated in Ⓐ.** **2. The throat plate ❹ is the appropriate item for the LK-1900A Series (40006721).**	o If the clearance is less than 0.5mm, thread may be cut by the counter knife ❺ blade when the thread is pulled with the moving knife ❽. In this case, upper and lower threads are cut into short pieces. o If the clearance is more than 0.5mm, the residual thread length after thread cutting operation becomes longer beneath the work.

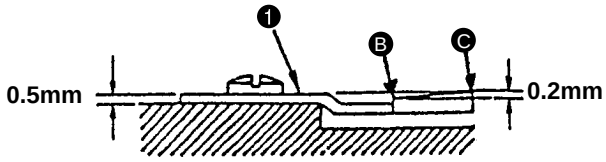
Adjustment Procedures	Results of Improper Adjustment
1) Adjusting the height of the moving knife Adjustments should be based on the plate thickness of the washer ❸ in the above illustration. If the height seems to be inadequate, select and use the parts as specified below. 2) Adjusting the height of the counter knife Adjust the height by prying Part Ⓐ with a screwdriver or the like.	o If the step is too small (0.25 ~ 0.3mm) between the moving ❽ and counter ❺ knives, trouble in thread cutting may occur. o If the step is too large (0.1 ~ 0.15mm) between the needle hole guide ❻ and the counter knife ❺, thread may be cut by the counter knife ❺ blade when the thread is pulled with the moving knife ❽. In this case, upper and lower threads are cut into short pieces.

Part No.	Name of part	Thickness
B242328000A	Moving knife washer	0.4mm
B242328000B	Moving knife washer	0.5mm
B242328000C	Moving knife washer	0.6mm
B242328000D	Moving knife washer	0.7mm
B242328000E	Moving knife washer	0.8mm

(17) Inclination of the blade point of the counter knife

Standard Adjustment

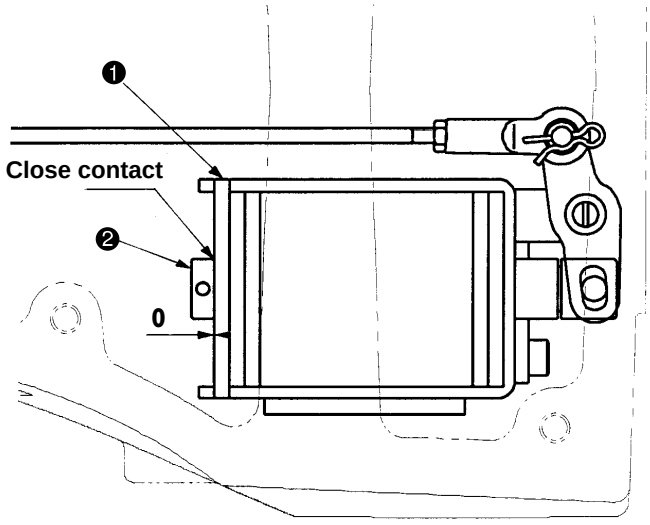
To cut the two threads (needle thread and, bobbin thread) uniformly, the blade face of the counter knife ❶ is made to have an inclination of 0.2mm.

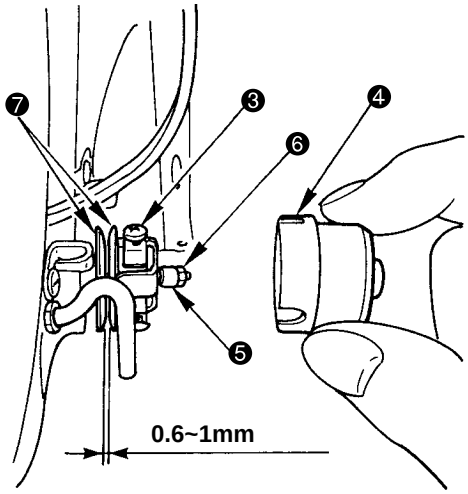


(18) Floating amount of the thread tension disk

Standard Adjustment

When the sewing machine power supply is turned off (AT solenoid ❶ is OFF), the gap between AT thread tension discs is 0.6 ~ 1mm.





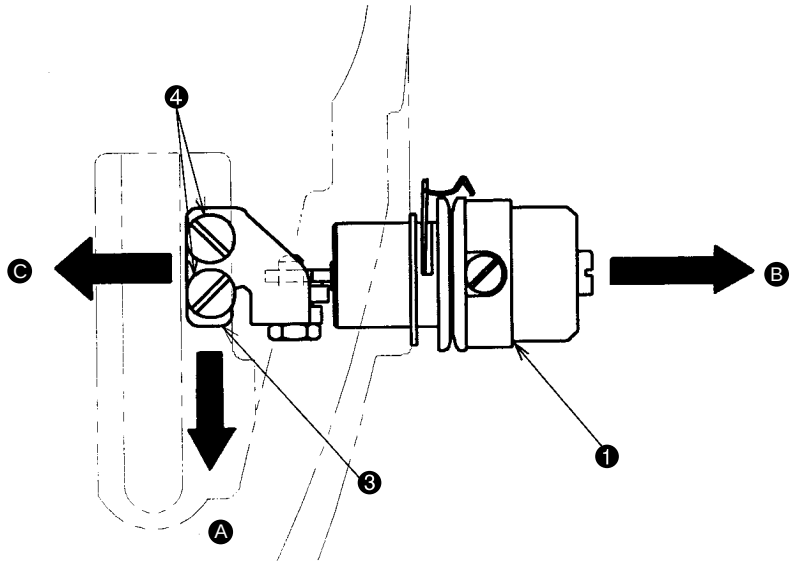
Adjustment Procedures	Results of Improper Adjustment
1. If the thread on Side Ⓑ cannot be cut, grind Side Ⓒ. If the thread on Side Ⓒ cannot be cut, grind Side Ⓑ. **(Caution) When grinding the side, make the angle more acuter than 90 degrees.**  **Secure an acute angle.**	o When less than 0.2mm Thread on Side Ⓒ cannot be cut. o When more than 0.2mm Thread on Side Ⓑ cannot be cut.

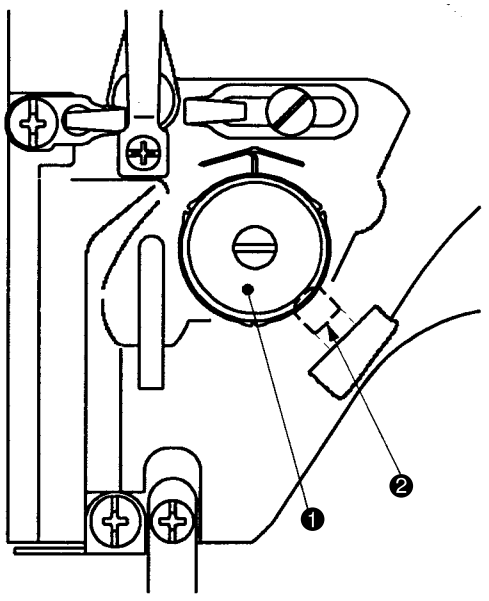
Adjustment Procedures	Results of Improper Adjustment
1. Turn off the power supply and look for any close contact between the AT solenoid ❶ and the thrust collar ❷. 2. Loosen the three set screws ❸ and remove the thread tension cap ❹. 3. Hold the tension releasing pin adjust collar ❺ not to let it rotate, and loosen the nut ❻. 4. Turn the tension releasing pin adjust collar ❺ and adjust the gap between the thread tension discs ❼. (Adjustment of thread tension disc floating) 5. Hold the tension releasing pin adjust collar ❺ and tighten the nut ❻. Mount the thread tension cap ❹ by means of the set screw ❸. 6. Turn on the power supply and set up the thread tension. Confirm that the thread tension discs ❼ are closed.	o If the amount of disc floating is too less, the residual thread length can be changed or shortened when the thread is thick. o If the amount of disc floating is too much, the tension discs cannot close completely and normal thread tension may fail to be chosen. This can be a cause of imperfect sewing.

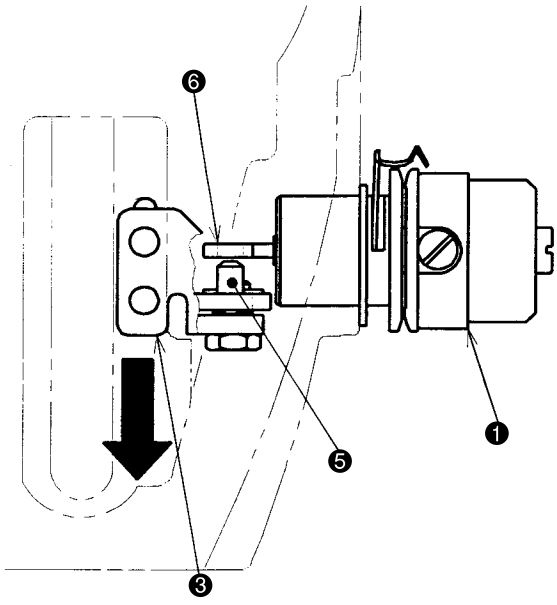
(19) Second thread tension connection / disconnection

Procedures of disassembling /assembling

1. Loosen the set screw ❷.
2. Remove the two set screw ❹.
3. Move the AT link unit (front) ❸ downwards (in the direction of the Arrow Ⓐ), and pull out the pin block ❺ from the hole of the thread tension releasing pin ❻ of the second thread tension ❶.
4. Pull out the second thread tension ❶ to remove it. (Arrow Ⓑ)
5. For reassembly, follow the steps of 4) to 1) above.







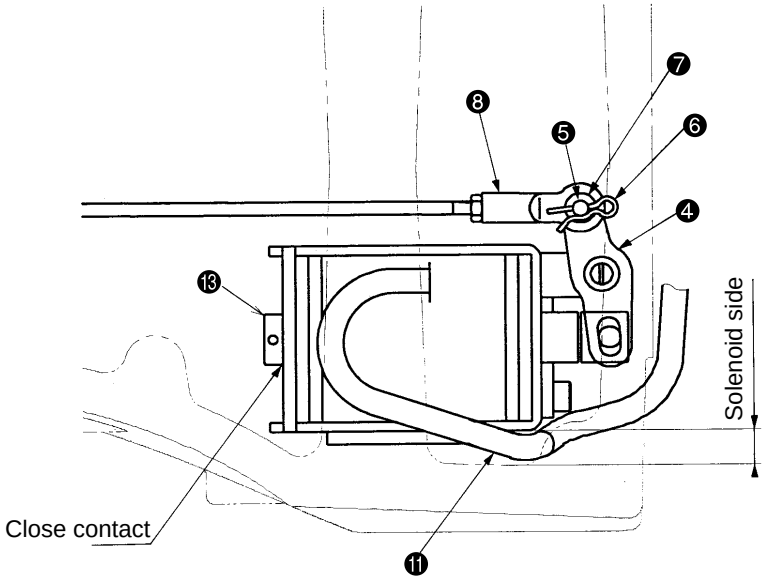
Cautions for disassembly and reassembly

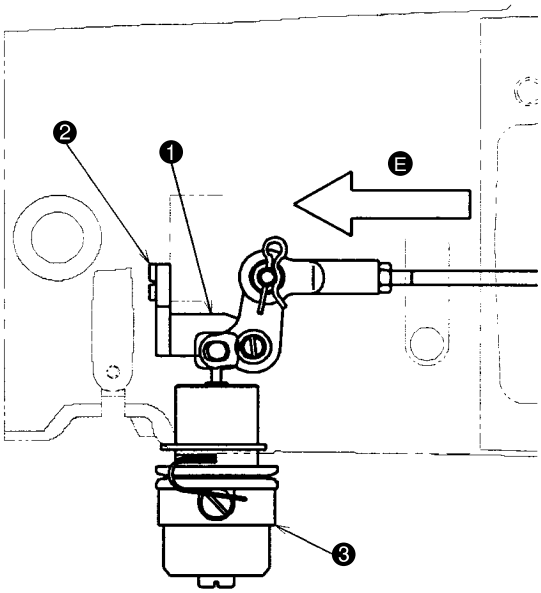
1. When pulling out the second thread tension ❶, confirm that the pin block ❺ of the AT link unit (front) ❸ has been displaced from the hole of the thread tension releasing pin ❻. If this action is taken forcedly with the pin block ❺ left connected, this can be a cause of breaking the second thread tension ❶.
2. When tightening the set screw ❹, this fixing action should be taken after the AT link unit (front) ❸ has been moved to the left side (in the direction of the arrow Ⓒ). If it is not moved to the left side (in the direction of the arrow Ⓒ), the amount of tension disc floating may fail to be adjusted normally.
3. After reassembly, follow the steps for the adjustment of thread tension disc floating and thread take-up spring stroke. (Refer to the instruction manual.)

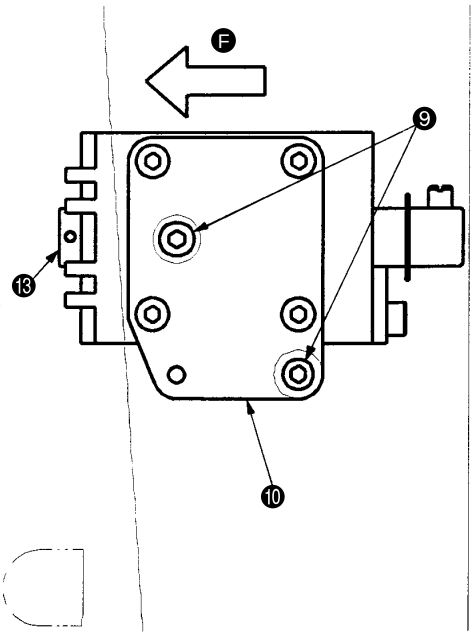
(20) AT unit connection / disconnection

Procedures of disassembling /assembling

1. Remove the set screw ❷ of the AT link unit (front) ❶ and take out the second thread tension ❸. ((19) Refer to “Second thread tension connection / disconnection.”)
2. Draw out the cotter pin ❻ from the pin block ❺ of the AT link unit (rear) ❹. Be careful not to drop the washer ❼ at that time.
   * Work becomes easier if the main shaft motor is removed.
3. Lift the joint block ❽ of the AT unit upwards and take it off the pin block ❺ of the AT link unit (rear) ❹.
4. Draw out the AT link unit (front) ❶ from the plane side (in the direction of the arrow Ⓔ) and remove it.
5. Remove the two set screws ❾ and take out the AT solenoid unit ❿.
6. For reassembly, follow the steps of 5. to 1. above.

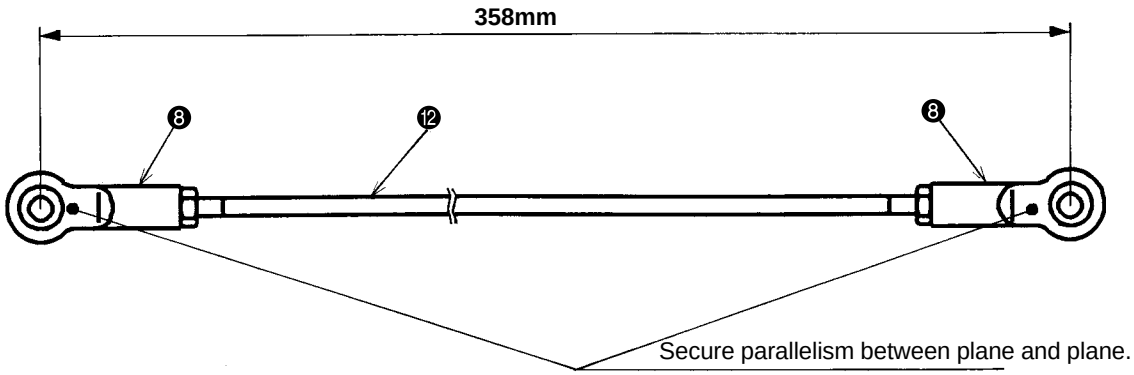






Cautions for disassembly and reassembly

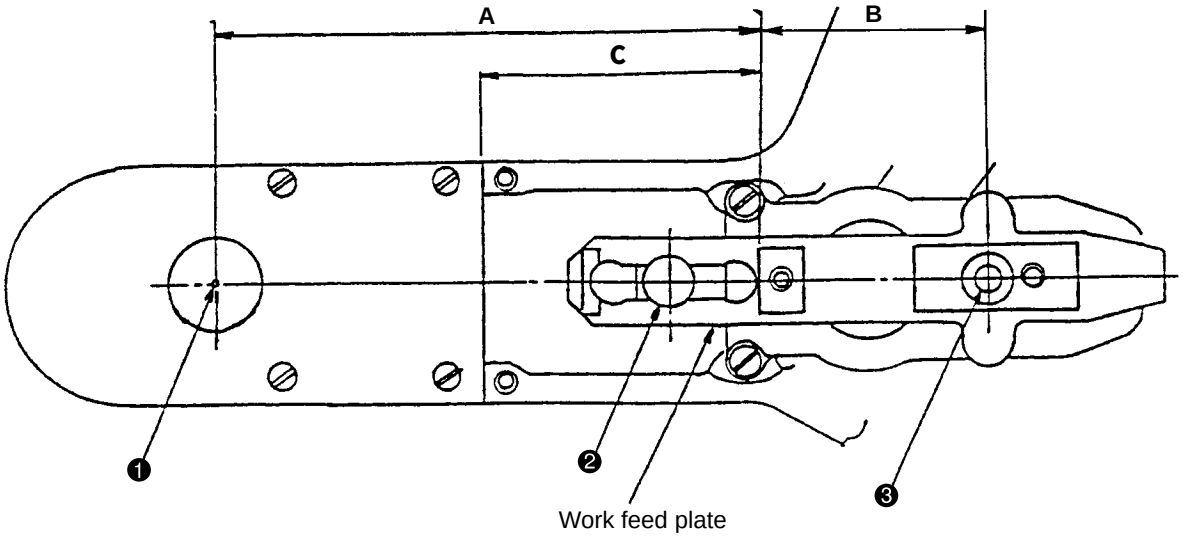
1. When incorporating the AT solenoid unit ⑩, the solenoid cable ⑪ should be laid beside the AT solenoid. If this solenoid cable ⑪ is positioned in the vicinity of the AT link unit (rear) ④, this will be a cause of AT solenoid malfunction.
2. The center-to-center distance is 358mm between the AT joints ⑧ of the AT connector rod ⑫.
   In cases of disassembly and reassembly of the AT joints ⑧, the center-to-center distance must be secured correctly. In addition, the parallelism of the two front and rear joints ⑧ must also be secured, without fail. If the correct distance and parallelism are lost, this can be a cause of AT malfunction and normal sewing tension cannot be obtained.
3. Upon the completion of all reassembly work, confirm that there is a close contact between the thrust collar ⑬ and the AT solenoid unit ⑩. If any clearance is perceived, loosen the two set screws ⑨ and assemble the AT solenoid unit ⑩ after it has been moved to the left side (in the direction of the arrow Ⓕ).
   * If the above-mentioned center-to-center distance is great between the AT joints ⑧, the clearance will be opened wider.



(21) Position of the mechanical origin

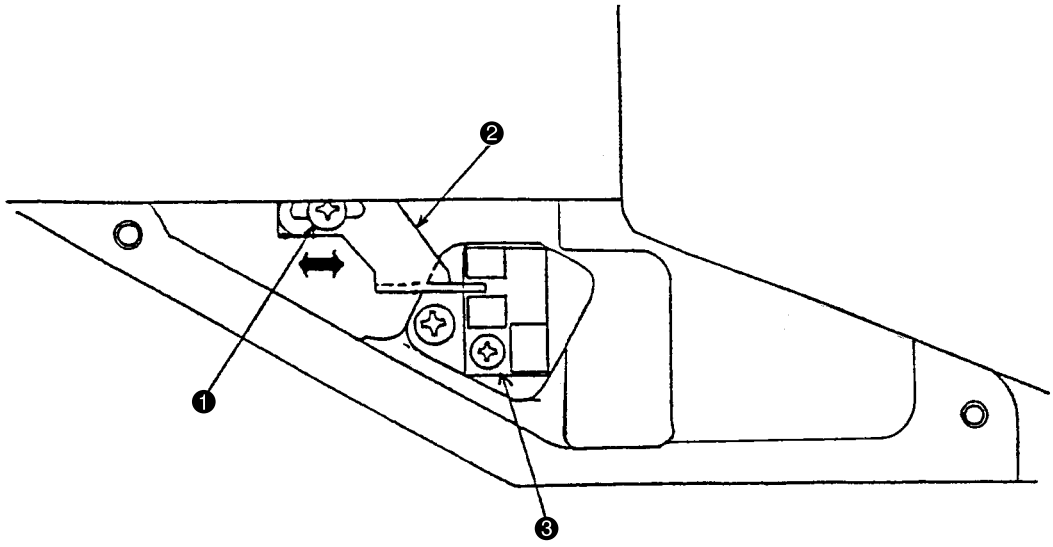
Standard Adjustment

A : 147mm (LK-1900A, 1902A)
: 146mm (LK-1901A, 1903A)
B : 61mm (LK-1900A, 1902A)
: 62mm (LK-1901A, 1903A)
C : 74mm (LK-1900A, 1902A)
: 73mm (LK-1901A, 1903A)



(22) Adjusting the Y origin sensor

Standard Adjustment

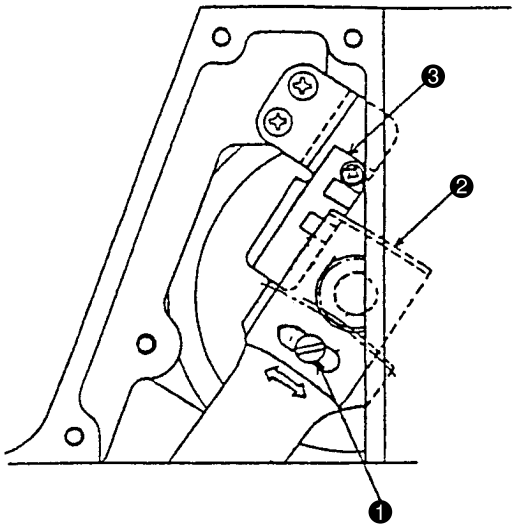


Adjustment Procedures	Results of Improper Adjustment
1. The position of the mechanical origin is shown in the illustration at left. 2. In the horizontal direction, the needle hole center ❶ <center of the horizontal feed fulcrum shaft ❷> and the center of the vertical feed fulcrum shaft ❸ are aligned on a straight line. 3. Adjustments should be carried out according to 1) (22) Adjusting the Y origine sensor and (23) Adjusting the X origin sensor.	o The maximum area cannot be secured.

Adjustment Procedures	Results of Improper Adjustment
1. Select the test mode No. 2 (CP-2) origin retrieval. 2. Origin retrieval is conducted each time the pedal is trodden on. Loosen the sensor slit set screw ❶ and shift the position of the sensor slit plate ❷. Apply the work feed plate to the origin position. Refer to " (21) Position of the mechanical origin." **(Caution) After adjustments, confirm that the sensor slit plate ❷ does not interfere with the sensor ❸.**	

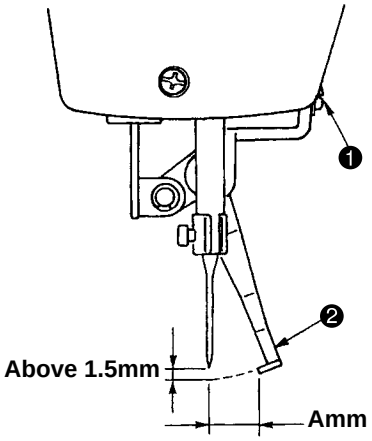
(23) Adjusting the X origin sensor

Standard Adjustment



(24) Adjusting the wiper position

Standard Adjustment

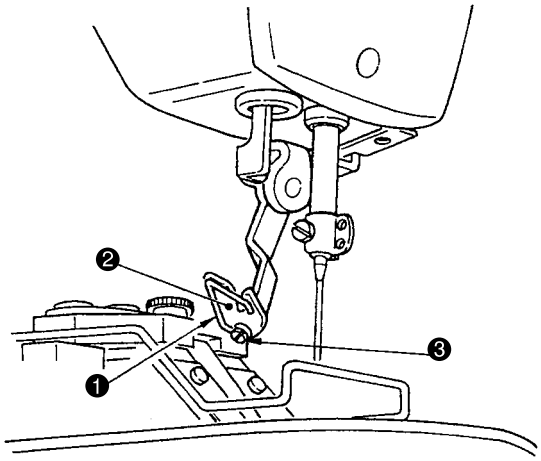


Adjustment Procedures	Results of Improper Adjustment
1. Select the test mode No. 2 (CP-2) origin retrieval. 2. Origin retrieval is conducted each time the pedal is trodden on. Loosen the sensor slit set screw ❶ and shift the position of the sensor slit plate ❷. Apply the work feed plate to the origin position. Refer to " (21) Position of the mechanical origin." **(Caution) After adjustments, confirm that the sensor slit plate ❷ does not interfere with the sensor ❸.**	

Adjustment Procedures	Results of Improper Adjustment
1. Loosen the screw ❶ to adjust the clearance between the wiper ❷ and the needle so that this clearance attains 1.5mm or more. Loosen 2. Loosen the screw ❶ to adjust Distance A between the wiper ❷ end plane and the needle center until this distance attains the values specified below. After adjustments, tighten the screw ❶ firmly. Distance A between the needle center and the wiper ❷ end plane (Amm) Other than LK-1903A : 23mm to 25mm LK-1903A only : 15mm to 17mm * The needle stays in the position of the end of sewing and stop.	o If Distance A is too small, the presser bar may tread on the needle thread when the presser bar is lowered. At that time, the needle thread may be caught by the wiper ❷ and the needle may be broken. In particular, this must be taken into consideration when a thin needle (#11 or less) is used.

(25) Adjusting the wiper spring (LK-1903A only)

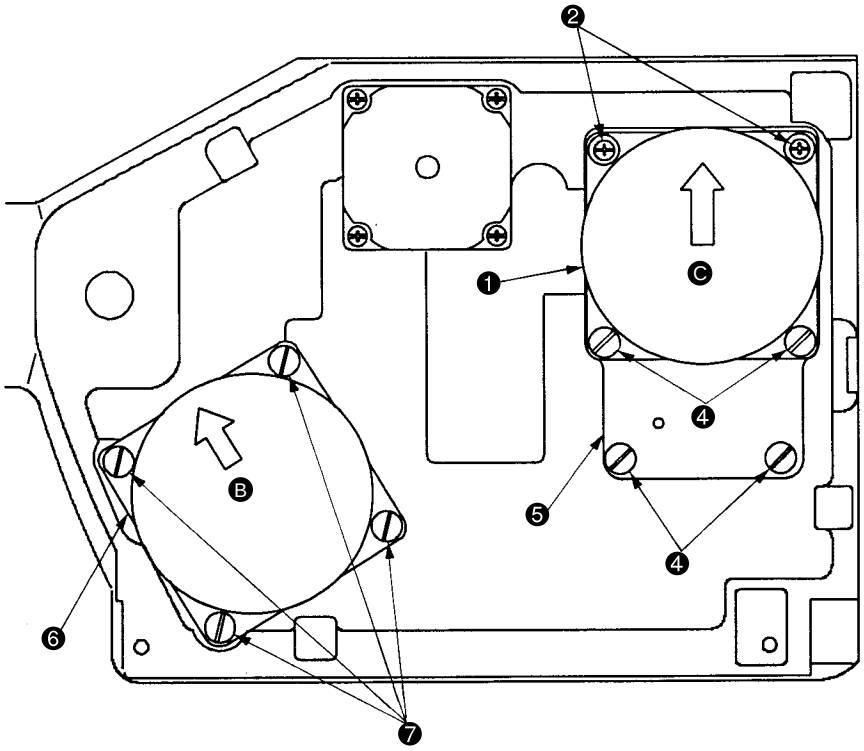
Standard Adjustment



(26) Adjusting the position of the X feed motor and the Y feed motor (Adjusting the back-lash of the driving gear)

Standard Adjustment

1. Fix the Y feed motor ❶ by pressing it in the direction of the arrow Ⓒ.
2. Fix the X feed motor ❻ by pressing it in the direction of the arrow Ⓑ.

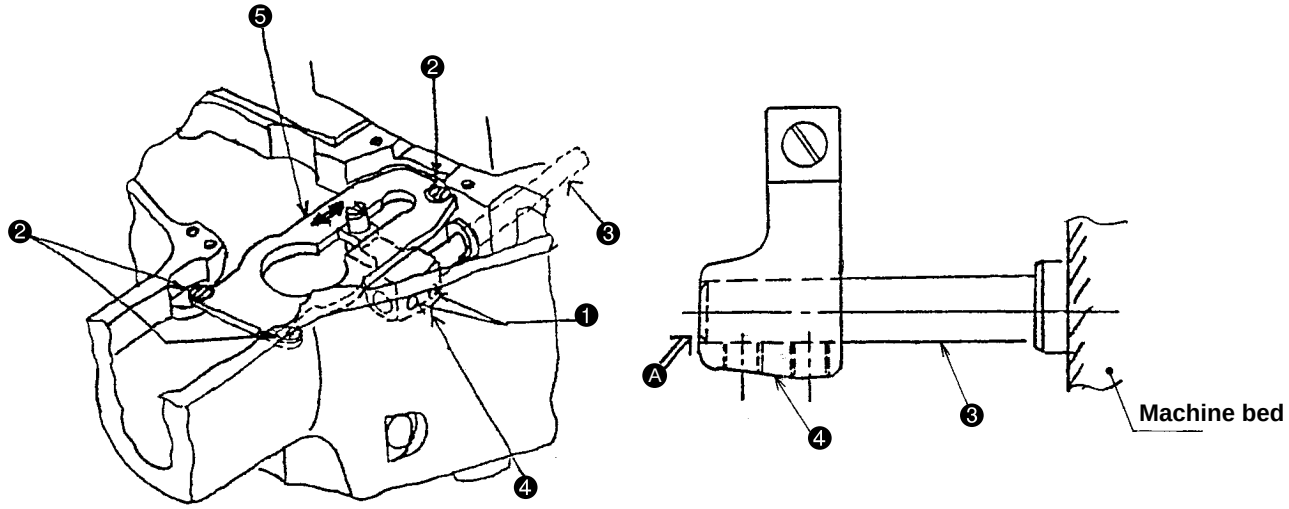


Adjustment Procedures	Results of Improper Adjustment
After thread cutting, the wiper spring ❶ is used to hold the needle thread with the aid of the wiper ❷. Adjust the wiper spring ❶ and fix it with the set screw ❸ so that the intensity of the spring force becomes 30g (somewhat stronger than that of the bobbin thread that is protruded from the bobbin case). 1. Remove the set screw ❸ and take out the wiper spring ❶ from the wiper ❷. 2. Adjust the wiper spring ❶ and mount it on the wiper ❷ again by means of the screw ❸. **(Caution) 1. If the holding force is too strong, the thread may be protruded above the button.** **2. If the holding force is insufficient, needle thread cast-off may occur.** **3. If the wiper spring ❶ position is inadequate, the needle thread cannot be held correctly and this can be a cause of needle breakage.**	

Adjustment Procedures	Results of Improper Adjustment
1. Loosen the two set screws ❷ and four set screws ❹ of the Y feed motor ❶ and the two set screws ❹ of the X feed motor mounting plate ❺. 2. Pressing it in the direction of the arrow Ⓒ, tighten the two upper set screws ❷ in the first place. Then, tighten the two remaining set screws ❷and another two set screws ❹, X feed motor mounting plate ❺. 3. Loosen the four set screws ❼ of the X feed motor ❻. Pressing it in the direction of the arrow Ⓑ, tighten the set screw ❼.	o If the pressing force is insufficient, feed gear backlash becomes too much and needle location accuracy may be decreased. This can also be a cause of feed error, needle breakage, etc.

(27) Installing the feed plate support plate

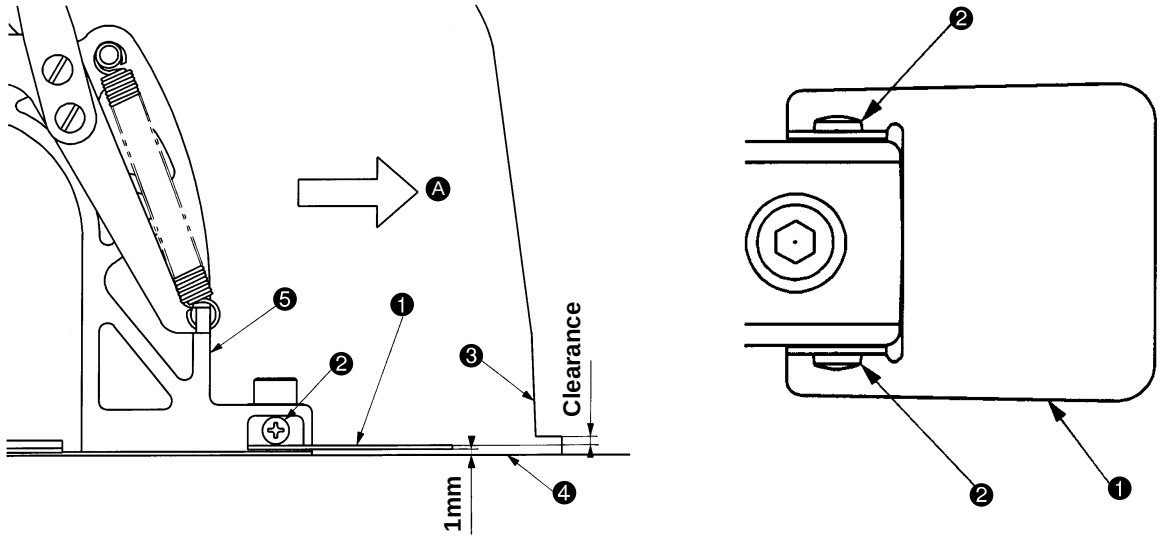
Standard Adjustment



(28) Installation of the feeder bar rear cover

Standard Adjustment

The clearance between the feeder bar rear cover ❶ and the upper surface of the work feed presser bar ❹ is about 1mm.
When the feeder bar ❺ is moved in the direction of the arrow Ⓐ, there must be a clearance at the notch part of the sewing machine frame ❸.



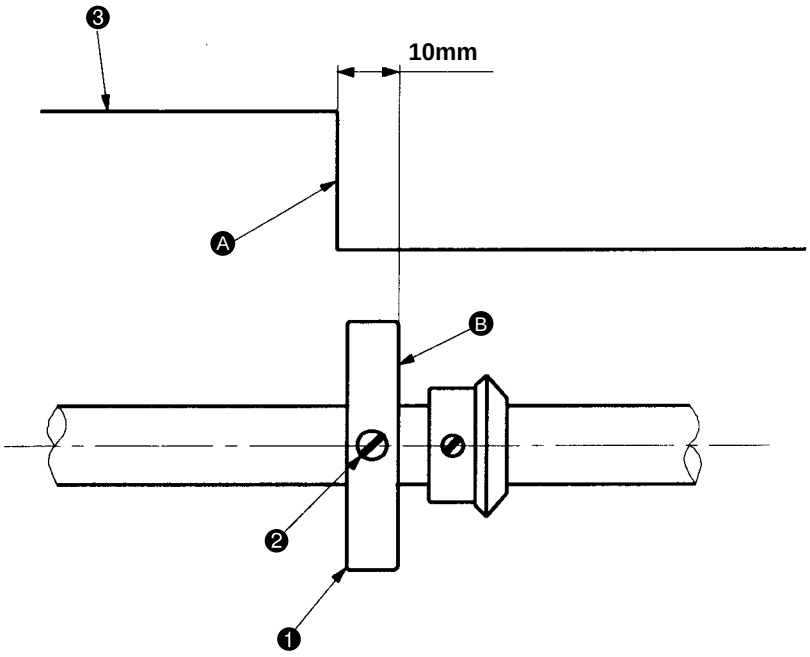
Adjustment Procedures	Results of Improper Adjustment
1. Loosen the Y feed arm ❹ set screw ❶. 2. Push the Y feed shaft ❸ in the direction of the arrow Ⓐ ⇒. 3. Loosen the setscrews ❷ (3 pcs.) of the work feed acceptor plate. Moving the Y feed arm ❹ in the direction of the arrow ◀▶, fix the Y feed shaft ❸ to the guide and also fix the work feed acceptor plate ❺ in the position where no torque is generated. 4. Let the end planes Ⓐ of the Y feed shaft ❸ and the Y feed arm ❹ coincide with each other. Fix the Y feed arm ❹ set screw ❶.	o The feeding load becomes too much and this can be a cause of feed error.

Adjustment Procedures	Results of Improper Adjustment
1. Loosen the two set screws ❷. 2. Make vertical adjustments of the feeder bar rear cover ❶ and secure a clearance of about 1mm toward the upper plane of the work feed presser bar ❹. Then, tighten the two set screws ❷. 3. Move the feeder bar ❺ in the direction of the arrow Ⓐ and confirm that there is a clearance at the notch part of the sewing machine frame ❸. If there is no clearance and there is interference with the sewing machine frame ❸, the steps of 1. ~ 2. above should be repeated again. **(Caution) 1. When tightening the set screws ❷, the feeder bar rear cover ❶ may be moved vertically. Hold the feeder bar rear cover ❶ firmly while the set screws ❷ are tightened.**	o If the clearance is too small between the feeder bar rear cover ❶ and the upper plane of the work feed presser bar ❹, the feeder bar rear cover ❶ will come in contact with the work feed presser bar ❹ due to the effect of vibration during sewing operation. This will cause noise and abrasion. o If there is no clearance between the feeder bar rear cover ❶ and the notch part of the sewing machine frame ❸, the feeder bar rear cover ❶ will come in contact with the sewing machine frame ❸, causing feed error during sewing operation.

(29) Adjustment of the bobbin winder driving wheel position

Standard Adjustment

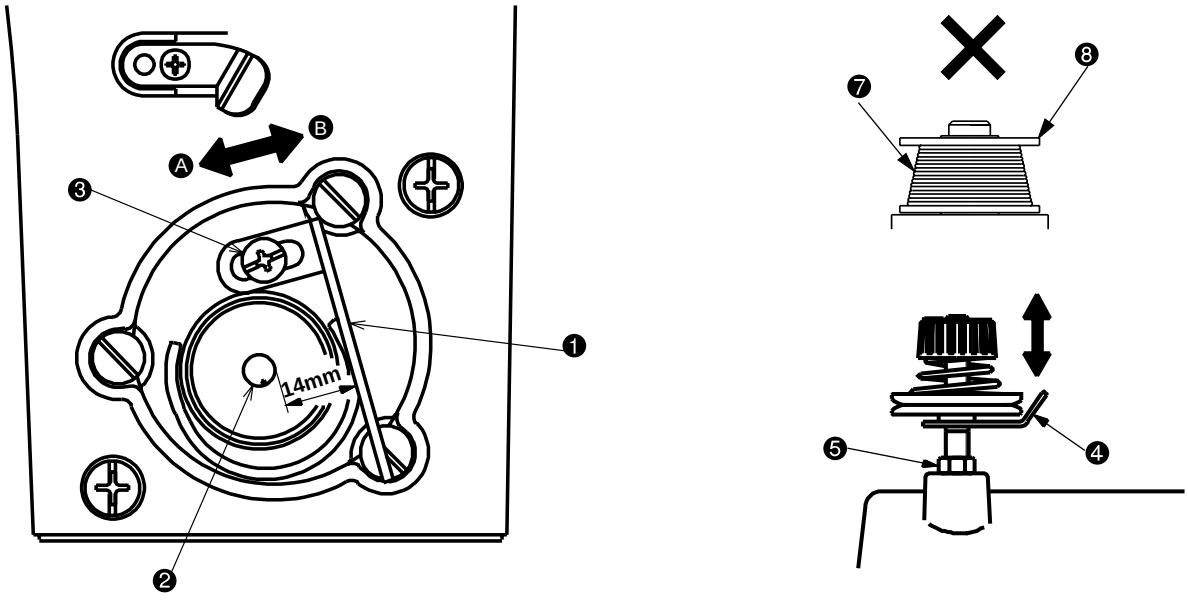
The distance is 10mm between the measuring plane ❽ of the bobbin winder driving wheel ❶ and the cover mounting plane Ⓐ of the sewing machine frame ❸.



(30) Adjusting the bobbin winder amount

Standard Adjustment

The position of the bobbin winder lever ❶ is based on the standard that it is 14mm apart from the bobbin winder shaft ❷. Try to perform bobbin winding actually and make fine adjustments in the directions of the arrows Ⓐ and Ⓑ so that the amount of thread winding becomes adequate (recommended value: 80 ~ 90% of the bobbin).



Adjustment Procedures	Results of Improper Adjustment
1. Adjust the position of the bobbin winder driving wheel ❶ and fix it with two set screws ❷.	o If the distance of 10mm is insufficient, rubber ring wear may occur in the bobbin winder unit. In addition, the bearing life may be reduced in the bobbin winder unit. o If the distance of 10mm is excessive, normal thread winding may fail. In addition, this will also cause rubber ring slippage in the bobbin winder unit and give rise to wear.

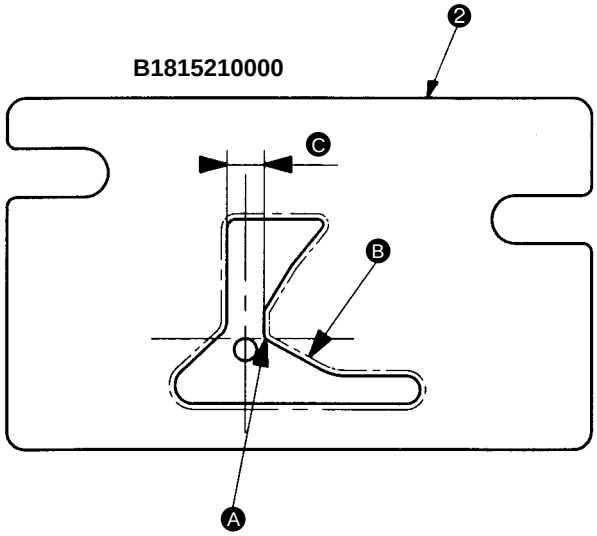
Adjustment Procedures	Results of Improper Adjustment
1. Loosen the set screw ❸ of the bobbin winder lever and adjust the distance to 14mm between the bobbin winder lever ❶ and the bobbin winder shaft ❷. After that, tighten the set screw ❸ of the bobbin winder lever. 2. Start the sewing machine and wind the thread at the bobbin winder. Confirm the amount of winding. 1) If the amount of winding seems to be too much, adjust the bobbin winder lever ❶ in the direction of the arrow Ⓐ. 2) If the amount of winding seems to be too less, adjust the bobbin winder lever ❶ in the direction of the arrow Ⓑ. 3. If the winding state of the thread ❼ around the bobbin winder ❽ seems to be uneven, loosen the nut ❺ and adjust the height of the thread tension control ❹. (Example) If the amount of the wound thread is less on the upper side of the bobbin winder ❽ as illustrated, adjust the thread tension control ❹ upwards.	o If too much thread is wound (thread protruded from the bobbin ❽), the thread ❼ will come in contact with the inside of the bobbin case and this can be a cause of sewing deficiency. o If the amount of thread winding is uneven at top and bottom of the bobbin winder ❽, stitch perforation may become irregular.

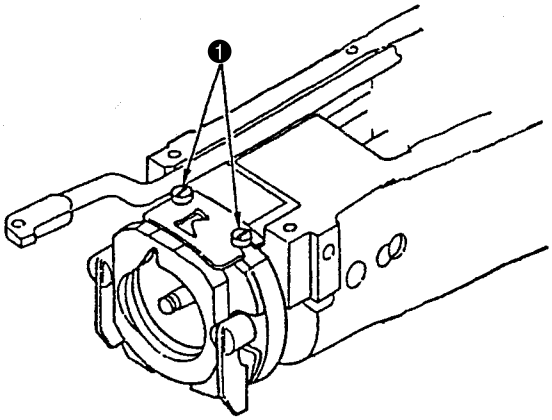
(31) Adjustment of the hook upper spring position

Standard Adjustment

For the right and left positions, the needle center is made to coincide with the center of the groove width Ⓒ. For the front and rear positions, the needle rear end is made to coincide with the corner part Ⓐ.

(Caution) If Part Ⓑ is damaged, this is the cause of thread breakage, hangnail of thread, stain on thread, etc. Therefore, this part should be polished by the use of a buff or the like. In particular, the rear side should be handled with care.

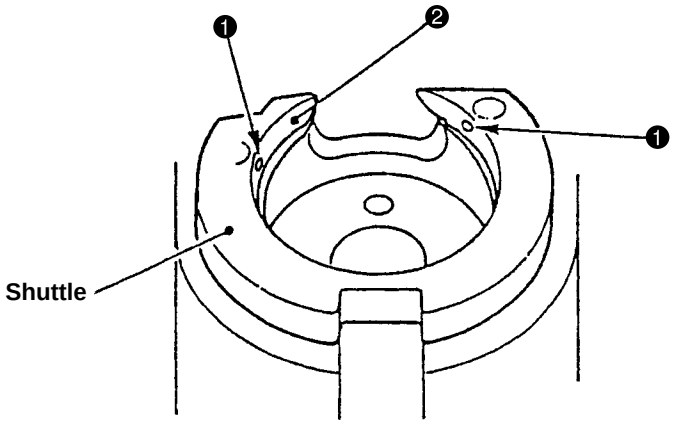




(32) Shuttle felt

Standard Adjustment

Two pieces of the shuttle felt ❶ are inserted in the holes of the shuttle race ❷. Confirm that the shuttle felts ❶ are not overloaded when the inner hook is set and turned along the shuttle race ❷.



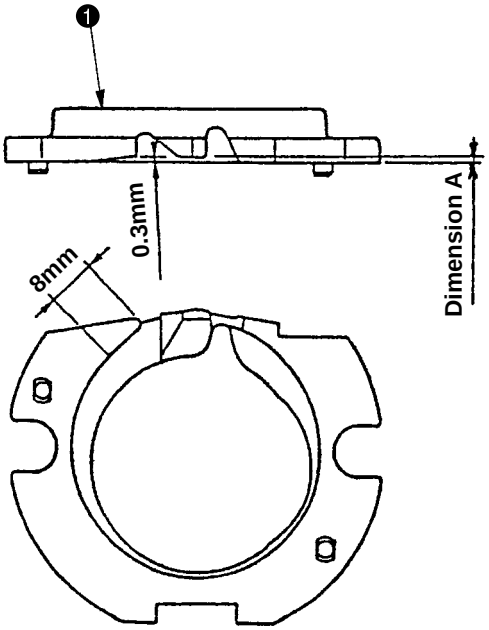
Adjustment Procedures	Results of Improper Adjustment
1. Remove the work feed bar, feed plate, and the throat plate. Make adjustments with the screw ❶. **(Caution) The right and left positions can also change during (10) hook adjustments. Position adjustment for the large hook upper spring ❷ should be done after the completion of standard hook adjustment, without fail.**	o If there is a front and rear displacement or a right and left displacement, needle thread biting may occur into the hook. Too much motion to the rear side will cause the moving knife to fail to hook the needle thread. o Too much motion to the rear side will cause the moving knife to fail to hook the needle thread. o Too much motion to the left side will cause the moving knife to fail to hook the bobbin thread.

Adjustment Procedures	Results of Improper Adjustment
1. If the shuttle felt ❶ seems to be protruded or it has been replaced with a new one, push it in by means of tweezers or the like. **(Caution) Do not push it in excessively. Align the height and the plane of the shuttle race ❷.**	o If the shuttle felt ❶ is protruded, this will be turned into a rotary load of the inner hook, causing a sewing error. o If the shuttle felt ❶ is missing or pushed in too much, this will result in hook lubrication deficiency, causing hook overheating and wear.

(33) Shape of the shuttle race ring

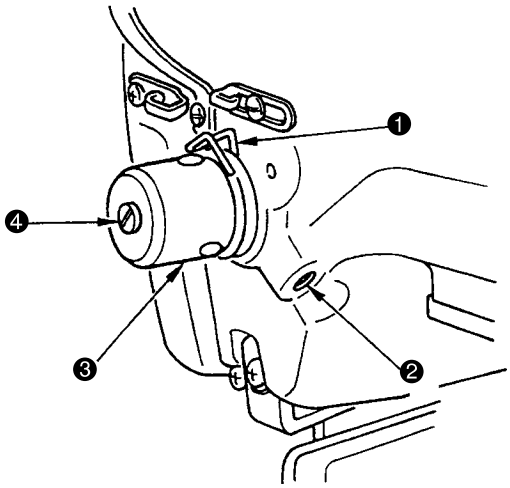
Standard Adjustment

If wear seems to be too much around the pointed tip of the inner hook, release the shuttle race ring ❶ and confirm that the dimensions of the hatched area on the rear side are 0.3 x 8mm.



(34) Adjustment of the thread take-up spring

Standard Adjustment



Adjustment Procedures	Results of Improper Adjustment
1. If the dimensions of 0.3 x 8mm are not secured, retouching is required with the aid of an oil stone.	

Dimension A (mm)	Part No.	Name of part	Remarks
0.8	14103253	Shuttle race ring A	Conforming to Specifications F and M as standard
1.3	14103352	Shuttle race ring B	Conforming to Specifications S as standard
1.7	14103659	Shuttle race ring C	Conforming to Specifications H as standard
1.9	B1817210DAD	Shuttle race ring D	Optional

Adjustment Procedures	Results of Improper Adjustment
The standard stroke of thread take-up spring ❶ is 8 to 10mm, and the pressure at the start is 0.1 to 0.3N. 1) Adjusting the stroke Loosen setscrew ❷, and turn thread tension asm. ❸. Turning it clockwise will increase the moving amount and the thread drawing amount will increase. 2) Adjusting the pressure To change the pressure of the thread take-up spring ❶, insert a thin screwdriver into the slot of thread tension post ❹ while screw ❷ is tightened, and turn it. Turning it clockwise will increase the pressure of the thread take-up spring ❶. Turning it counterclockwise will decrease the pressure.	

Example of the thread tension

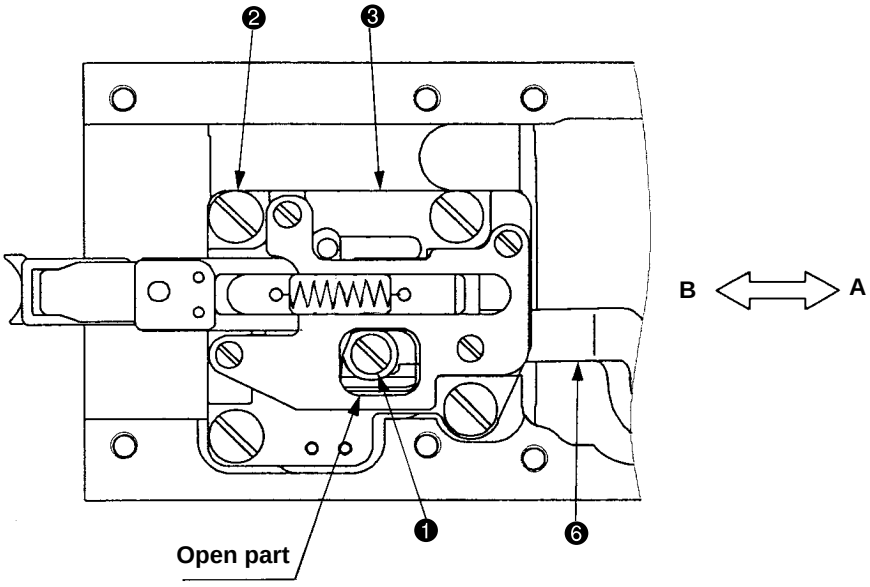
When using the sewing machine for the first time, adjust the thread tension referring to the table below.

Thread	Material	Needle thread tension setting	Thread take-up spring moving amount [Thread drawing amount]	Strength
Tetoron thread #50	Wool	30 to 35	10mm [13mm]	0.1N
Spun thread #50	Wool	50 to 55	10mm [13mm]	0.2N
Spun thread #60 (Thread clamp OFF)	T/C broad	30 to 35	8 to 10mm [11 to 13mm]	0.1N
Cotton thread #50	Denim	35 to 45	10mm [13mm]	0.1N
Cotton thread #20	Denim	35 to 45	8 to 10mm [11 to 13mm]	0.1N

(35) Needle thread clamp device connection/disconnection

Procedures of disassembling

1. Remove the hinge screw ❶.
   * If the hinge screw ❶ cannot be seen from the open part of the needle thread clamp device ❸, try to move the needle thread clamp connector link ❻ by hand in the direction of A or B.
2. Remove the four set screws ❷ of the needle thread clamp base and take out the needle thread clamp device ❸.

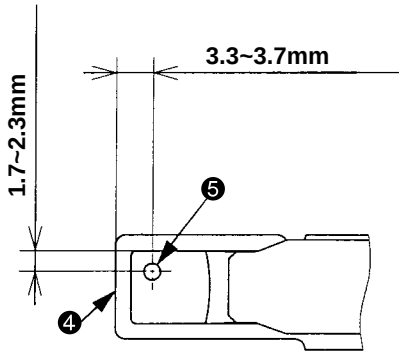


Procedures of assembling and adjustment procedures

1. Push the needle thread clamp device ❸ in the direction of A and fix it with the four set screws ❷. Tighten the hinge screw ❶.
2. Turn on the power supply and press the [ ] key twice so that the needle thread clamp support plate complete ❹ is positioned at the far advanced end.
   Confirm that the distance between the needle thread clamp support plate complete ❹ and the needle ❺ is 3.3 ~ 3.7mm and 1.7 ~ 2.3mm, respectively.
3. If the distance seems to be inadequate, loosen the four set screws ❷ and move the needle thread clamp device ❸ for adjustment.

(Caution) For the prevention of injury, the distance should be checked only if the sewing LED is unlit.
(Press the [ ] key twice after the power supply has been turned on.)

4. After the completion of the above-mentioned reassembly, make adjustments according to "(36) Adjusting the needle thread clamp sensor."

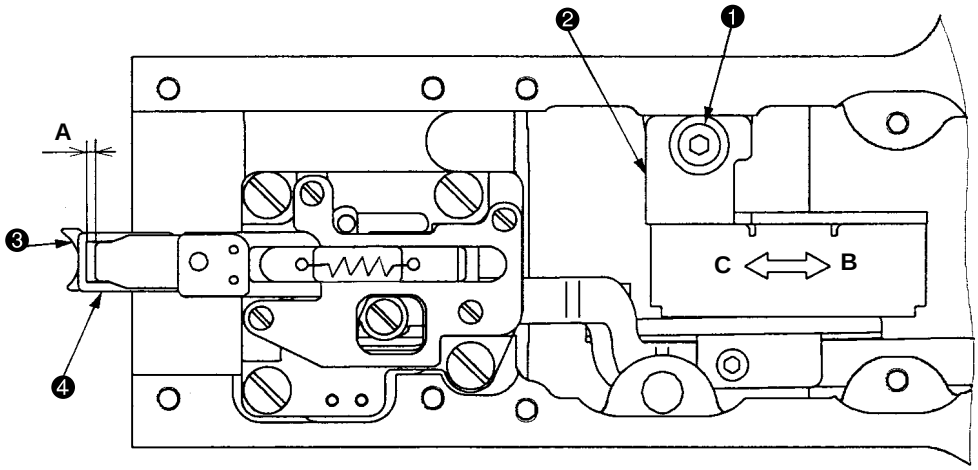


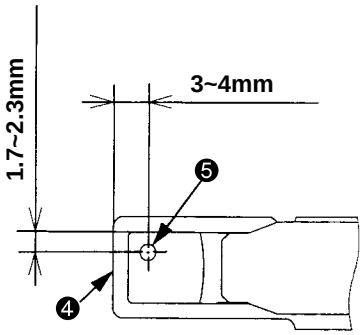
(36) Adjusting the needle thread clamp sensor

Standard Adjustment

When the needle thread clamp support plate complete ❹ is withdrawn by 3 to 4 pulses from the needle thread clamp position **(Caution) 1**., the clearance A toward the needle thread clamp device ❸ becomes 0.

(Caution) 1. The needle thread clamp position is known to be the one that is one step returned from the most advanced position when the [ ] key is pressed in the test mode CP-7.





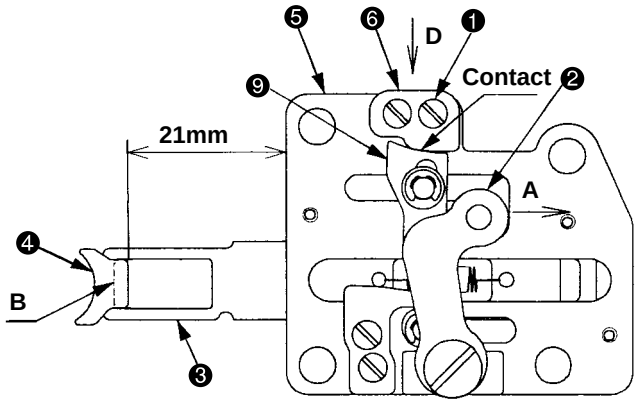
Adjustment Procedures	Results of Improper Adjustment
1. Start the test mode CP-7. 2. Tread on the pedal for needle thread clamp device ❸ origin retrieval. 3. Press the [↻] key twice and set the needle thread clamp support plate complete ❹ in the needle thread clamp position. 4. Confirm that the clearance A becomes 0 between the needle thread clamp device ❸ and the needle thread clamp support plate complete ❹ when the [–] key is pressed 3 to 4 times (for 3 to 4 pulses), and that both the needle thread clamp device ❸ and the needle thread clamp support plate complete ❹ move together when the [–] key is pressed again. 5. If the clearance A becomes 0 with 5 or more pulses, loosen the set screw ❶ and fix the sensor mounting plate ❷ after moving it in the direction B. 6. If the clearance A becomes 0 with less than 3 pulses, loosen the set screw ❶ and fix the sensor mounting plate ❷ after moving it in the direction C. 7. After the sensor mounting plate ❷ has been fixed, check the above-mentioned steps 2. to 4. 8. Using 3 to 4 pulses, repeat the steps 2. to 6. above until the clearance A becomes 0. 9. Tread on the pedal for needle thread clamp device ❸ origin retrieval and define the most advanced position by pressing the [↻] key once. 10. Confirm that the distances between the needle thread clamp support plate complete ❹ and the needle ❺ are kept at 3 ~ 4mm and 1.7 ~ 2.3mm, respectively. 11. If the distance is found to be inadequate, adjust the position toward the needle ❺ according to (35) Needle thread clamp device connection/disconnection. Since then, make the above-mentioned sensor adjustments again.	o If there are too many pulses used until the clearance A becomes 0, this can be a cause of unthreading at the beginning of sewing. o If the number of pulses is too small until the clearance A becomes 0, the resistance toward the needle thread becomes large and this can be a cause of thread breakage at the beginning of sewing. o If the distance is improper between the needle thread clamp support plate complete ❹ and the needle ❺, this will give rise to interference between the needle thread clamp device ❸ and the needle ❺.

(37) Adjusting the needle thread clamp notch

Standard Adjustment

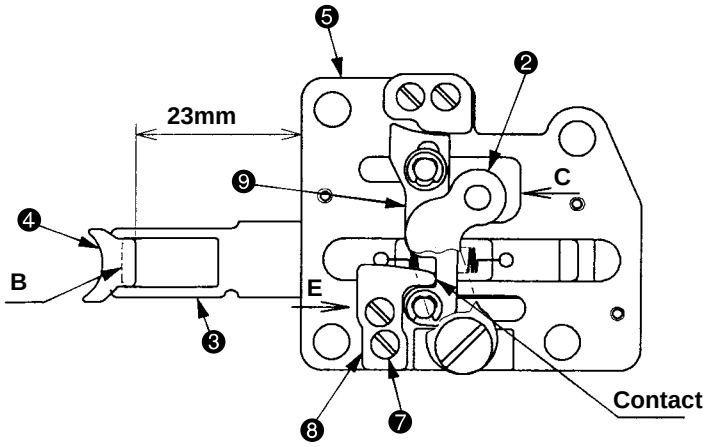
1. Needle thread clamp notch R position

   1) When the needle thread clamp link complete ❷ is pushed in Direction A and Part B of the needle thread clamp support plate complete ❸ and the needle thread clamp device ❹ begins to open, the distance between the needle thread clamp device ❹ and the needle thread clamp base ❺ becomes 21mm.



2. Needle thread clamp notch F position

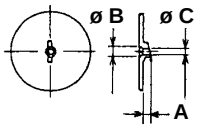
   1) When the needle thread clamp link complete ❷ is pushed in Direction C and Part B of the needle thread calmp support plate complete ❸ and the needle thread clamp device ❹ begins to open, the distance between the needle thread clamp device ❹ and the needle thread clamp base ❺ becomes 23mm.



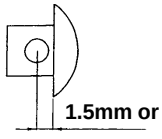
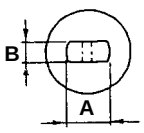
Adjustment Procedures	Results of Improper Adjustment
1. Needle thread clamp notch R adjustment 1) Loosen the two set screws ❶. 2) Push the needle thread clamp link complete ❷ in Direction A so that the distance between the needle thread clamp device ❹ and the needle thread clamp base ❺ becomes 21mm. Move the needle thread clamp notch R ❻ in Direction D, lightly push it toward the needle thread clamp cam plate ❾, and tighten the two set screws ❶.	o If the distance between the needle thread clamp device ❹ and needle thread clamp base ❺ comes to leager than 21mm, release timing turns so early that unthreading at the beginning of sewing is caused. o If the distance between the needle thread clamp device ❹ and needle thread base ❺ comes to smaller than 21mm, release timing turns so slowly that needle thread remains on the back side of the material is caused.
2. Needle thread clamp notch F adjustment 1) Loosen the two set screws ❼. 2) Push the needle thread clamp link complete ❷ in Direction C so that the distance between the needle thread clamp device ❹ and the needle thread clamp base ❺ becomes 23mm. Move the needle thread clamp notch F ❽ in Direction E, lightly push it toward the needle thread clamp cam plate ❾, and tighten the two set screws ❼.	o If the distance between the needle thread clamp device ❹ and needle thread clamp base ❺ comes to larger than 23mm, clamp timing turns so early that needle thread remains on the back side of the material or jamming of needle thread in to the needle thraed clamp device ❹ is caused. o If the distance between the needle thraed clamp device ❹ and needle thread clamp base ❺ comes to smaller than 23mm, clamp timing turns so slowly that needle thread clamp error is caused.

4. Sub-class information

(1) Models classified by button sizes (LK-1903A)

Model name			LK-1903A-301						LK-1903A-302		Optional	
Button size classification			For Extra-small button			For small buttons (accessories)			For medium-sized buttons		For large buttons	
Outside diameter that can be adjusted (mm)			ø8~ø9	ø9~ø10	ø10~ø15	ø10~ø20			ø10~ø20		ø15~ø32	
Sewing size (mm)	Lengthwise (Y)		0~2.5	0~3.0	0~3.5	0~3.5			0~4.5		0~6.5	
	Crosswise (X)		0~2.5	0~3.0	0~3.5	0~3.5			0~4.5		0~6.5	
Button clamp jaw lever (combination)	Thickness (mm)		1.7 (2.2)		Engraving	1.7 (2.2) (2.7) *(0.9)		Engraving	2.0 (2.2) (2.7)	Engraving	2.7 (3.2)	Engraving
	Part No.	Right	MAZ158070BB		G	14148852		K	14149058	L	MAZ157070BB	D
			(MAZ158070BA)		F	(MAZ155070B0)		B	(MAZ155070B0)	B	(MAZ157070BA)	E
			—		—	(MAZ156070B0)		C	(MAZ156070B0)	C	—	—
			—		—	*(B25553720A0)		—	—	—	—	—
		Left	MAZ158080BB		G	14148951		K	14149157	L	MAZ157080BB	D
			(MAZ158080BA)		F	(MAZ155080B0)		B	(MAZ155080B0)	B	(MAZ157080BA)	E
			—		—	(MAZ156080B0)		C	(MAZ156080B0)	C	—	—
			—		—	*(B25573720A0)		—	—	—	—	—
Needle hole guide (mm) 	A		1.6 (1.8)			1.6 (1.8) *(1.1)			1.6		1.4	
	B		ø2.8			(ø3.5)			ø3.5		ø3.5	
	C		ø1.6			(ø1.6)			ø2.0		ø2.0	
	Part No.		MAZ15801000			(MAZ15501000)			MAZ15601000		MAZ15701000	
			(14149900)			(14149603)						
			—			*(D2426284Y00)						
Feed plate			MAZ15502000(□8.5)			←			MAZ15602000(□10)		MAZ15702000(□12.5)	

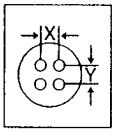
● Items in ( ) are optional. ● * For common use

Model name	Option (LK-1903A-305)	
Button type	For shank buttons	
Max. Sewing speed	1, 500rpm	
Button configuration	Outside diameter	ø8~ø20
	Diameter of hole in button	ø1.5 or more
	Position of hole in button	 **1.5mm or more**
Configuration of shank		B (mm) / A (mm) Min. / Max.: 1 — 4 — 9; 3 — 3 — 8; 5 — — — 7
Sewing pattern number	18, 19, 20, 21, 22	

Optional parts for shank button	
Part No.	Names of part
14146054	Pick-up device complate
D1401M1YC0A	Needle bar (for TQ-1)
MAZ160170A0	Wiper (asm.)
40015434	Moving plate link A
14148209	Bushing
SL6030892TN (2 pcs.)	Screw
MAZ16015000	Button support link
SD0640321TP	Hinge screw
40010103	Connecting link
SL6040892TN (2 pcs.)	Screw
MAZ16021000	Needle hole guide
MTQ300B1400	Needle TQx3 #14

(2) Table of Standard Patterns (LK-1903A)

The number of stitches and the standard sewing lengths X and Y are as specified in the table below.



Pattern No.	Stitch sape	Sewing thread (pcs.)	Standard length X (mm)	Standard length Y (mm)	Pattern No.	Stitch Sape	Sewing thread (pcs.)	Standard length X (mm)	Standard length Y (mm)
1•34		6-6			18•44		6		
2•35		8-8			19•45		8		
3		10-10			20		10	3.4	0
4		12-12			21		12		
5•36		6-6			22		16		
6•37		8-8			23•46		6		
7		10-10			24		10	0	3.4
8		12-12			25		12		
9•38		6-6			26•47		6-6		
10•39		8-8	3.4	3.4	27		10-10	3.4	3.4
11		10-10			28•48		6-6		
12•40		6-6			29		10-10		
13•41		8-8			30•49		5-5-5		
14		10-10			31		8-8-8	3.0	2.5
15•42		6-6			32•50		5-5-5		
16•43		8-8			33		8-8-8		
17		10-10							

* Standard sewing lenghts X and Y given above are given assvming that the scale is 100.
Use the patterns No. 34~50 with hole diameter ø1.5mm or less.

5. Memory switches

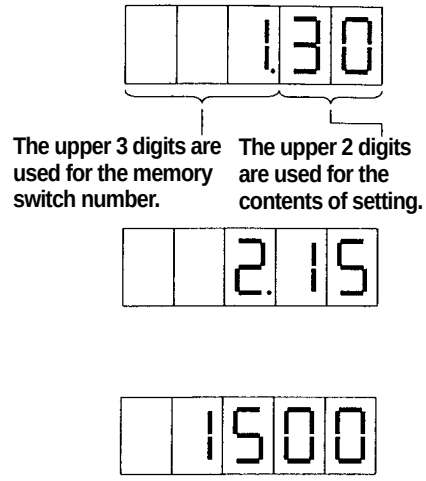
The sewing machine operation can be changed by changing the setting of the memory switch.

(1) Memory switch start and change

1. When the [M] key is pressed in the state that the sewing LED is turn off, the user level setting mode is assumed for the memory switches. When the [M] key is continuously pressed for 6 seconds, the service level setting mode is assumed for the memory switches.

   (Caution) In the case of continued pressing, the buzzer sounds after 3 seconds and 6 seconds, respectively. The buzzer sound after 3 seconds indicates that the test mode has become effective.

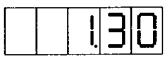
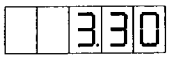
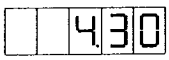
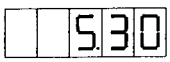
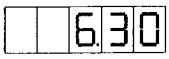
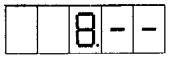
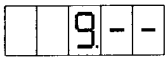
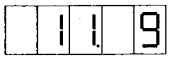
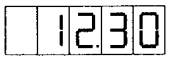
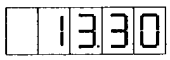
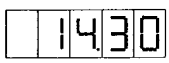
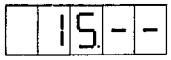
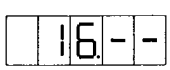
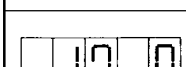
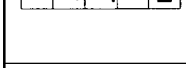
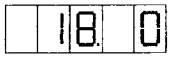
2. The memory switch number can be modified with the [+/□] and [−/□] keys.
3. Select a required number of memory switch by pressing the [+/□] [−/□] key, then fix the number by pressing [↻] key to turn on the LED.
4. Change the contents of the memory switch with the [+/□] and [−/□] keys.
5. The factory shipment values can be recovered with the [//] key.
6. The contents of modification can be registered by pressing the [↻] key. In this case, the sewing LED is turn off and the select condition of the memory switch number is recovered.
7. When the [M] key is pressed, the memory switch setting mode is finished and normal operating conditions are recovered.

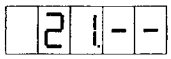
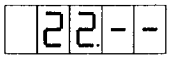
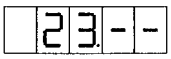
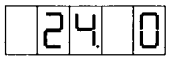
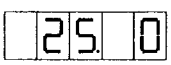
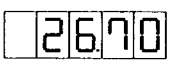
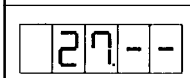
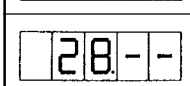
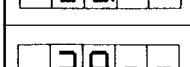
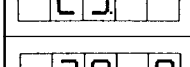
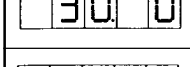
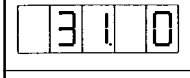
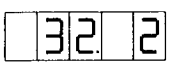
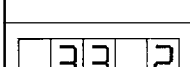
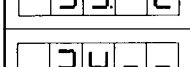
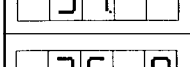
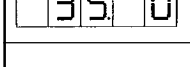
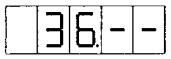
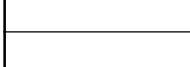
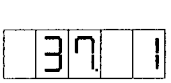


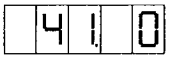
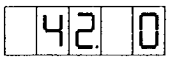
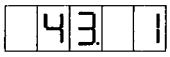
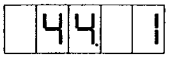
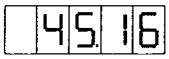
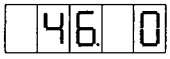
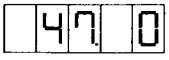
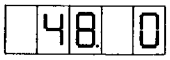
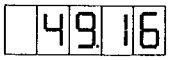
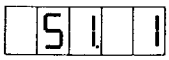
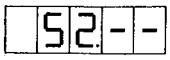
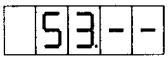
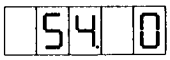
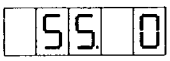
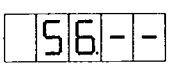
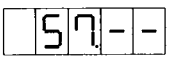
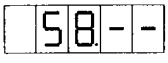
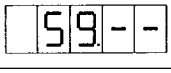
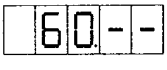
(2) Table of memory switch functions

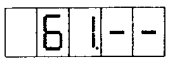
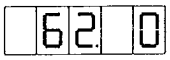
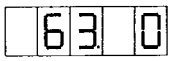
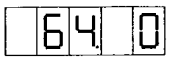
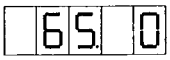
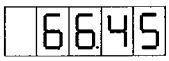
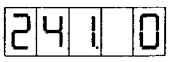
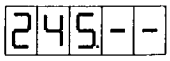
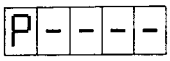
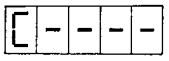
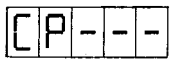
Some initial values for shipment may change according to models.

The contents are divided into two categories of user level (U) and service level (S).

Indication	Level	Functions	Setting range	State when delivered	Remarks
	U	Max sewing speed (Setting possible in the unit of 100rpm)	400~3000rpm	3000	To be set at 2700 for the LK-1900AW and LK-1903A.
	U	Sewing speed for the first stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~1500rpm	1500	
	U	Sewing speed for the second stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	3000	
	U	Sewing speed for the third stitchj (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	3000	
	U	Sewing speed for the 4th stitchj (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	3000	
	U	Sewing speed for the 5th stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	3000	
	U	Thread tension for the first stitch (with needle thread clamp)	0~200	200	
	U	Thread tension at the time of thread trimming	0~200	0	
	U	Changeover timing of thread tension at the time of thread trimming	–6~4 (~–1:32°, 0:28°, 1:24°~)	0	When the setting value isincreased, operation becomes faster in the unit of 4°.
	U	Sewing speed for the first stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~1500rpm	400	
	U	Sewing speed for the second stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	900	
	U	Sewing speed for the third stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	3000	
	U	Sewing speed for the 4th stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	3000	
	U	Sewing speed for the 5th stitch (with needle thread clamp) (Setting possible in the unit of 100rpm)	400~3000rpm	3000	
	U	Thread tension for the first stitch (with needle thread clamp)	0~200	0	
	U	Changeover timing of thread tension at the sewing start (with needle thread clamp)	–5~2 (~ –1: 64°, 0: 60°, 1: 56°~)	0	When the setting value is increased, operation becomes faster in the unit of 4°.
	U	Display of Pattern No., XY enlargement/ reduction scale rate, and max. speed limits; change enabled/disabled	0: Operative 1: Inoperative	0	In case of setting 1, use of M key is prohibited as well. When changing memory switch, pressing M key, turn ON the power switch. (Standard operation panel)
	U	Counter operation	0: Production counter (addition) 1: Bobbin thread counter (subtraction)	0	(Standard operation panel)
	U	Selection of pedal	0: Standard pedal 1: Standard pedal (2-step stroke) 2: Optional pedal 3: Optional pedal (2-step stroke)	0	
	U	Selection of pedal	0: Standard pedal 1: Optional pedal	0	

Indication	Level	Functions	Setting range	State when delivered	Remarks
	S	Standard pedal, clamp switch position	50~200	70	When the setting value is increased, the amount of pedal tread becomes larger.
	S	Standard pedal, 2-step stroke switch position	50~200	120	When the setting value is increased, the amount of pedal tread becomes larger.
	S	Standard pedal, start switch position	50~200	185	When the setting value is increased, the amount of pedal tread becomes larger.
	U	Optional pedal 1 operated	0: OFF when trodden again 1: OFF when released	0	
	U	Optional pedal 2 operated	0: OFF when trodden again 1: OFF when released	0	
	U	Height of work clamp foot at the time of 2-step stroke	50~90	70	Height is lowered when the set value is increased.
	S	Clamp lowering speed during pedal operation (Setting possible in the unit of 10pps)	100~4000pps	4000	
	S	Clamp rising speed during pedal operation (Setting possible in the unit of 10pps)	100~4000pps	1500	Too much rise in the setting level may result in malfunction.
	S	Thread trimmer clamp rising spped at the end of sewing (Setting possible in the unit of 10pps)	100~4000pps	3000	Too much rise in the setting level may result in malfunction.
	U	Pattern's enlargement / reduction reference point	0: Origin 1: Sewing start point	0	The enlargement / reduction point in the pattern data is effective only for 0 setting.
	U	It is possible to stop sewing machine operation with panel's reset key.	0: Disabled 1: Panel's reset key 2: External switch	0	
	U	Buzzer sound can be prohibited.	0: No buzzer sound 1: Panel's operation sound 2: Panel's operation sound + Error sound	2	
	U	No. of stitches for needle thread clamp release	1 ~ 7 stitches	2	
	U	Clamping timing of needle thread clamp	–10~0 (~–1:84°, 0:80°)	0	Delayed in negative direction in the unit of 4°.
	U	Needle thread clamp control disabled	0: Normal 1: Disabled	0	Set at 1 for LK1903A.
	U	Selection of feed operation timing. Set in negative direction when the tightness of stitches is adverse.	–8~16 (~11:64°, 12:60°, 13:56°~)	12	Delayed in negative direction in the unit of 4°. If set at extreme negative, there is danger of needle breakage. Significant when handling heavy materials.
	U	State of work clamp foot after completion of sewing can be selected	0: Work clamp foot goes up after moving at the sewing start. 1: Work clamp foot goes up immediately after the end of sewing 2: Work clamp foot goes up by pedal operation after moving attne sewing start. LK1903A	1	LK-1903A/BR-35 to be set at 0
	S	Sewing is possible only with the start switch, without raising the work clamp foot.	0: Normal 1: Work clamp foot rise disabled.	0	
	U	Each time sewing is finished, origin retrieval is possible. (Except for the cycle sewing)	0: No origin retrieval 1: Origin retrieval enabled	0	
	U	Origin retrieval setting is possible after cycle sewing.	0: No origin retrieval 1: Origin retrieval after the end of one pattern. 2: Origin retrieval after the end of one cycle.	0	

Indication	Level	Functions	Setting range	State when deivered	Remarks
	U	State of work clamp foot when machine stopped by temporary stop command can be selected.	0: Work clamp foot goes up. 1: Work clamp foot goes up with work clamp foot switch. 2: Lift of work clamp foot is prohibited.	0	
	U	Needle bar stop position is set.	0: Up position (53°) 1: Upper dead point (22°)	0	Needle bar rotates the reverse direction after the UP position stop and stops when upper dead point stop is set.
	S	Selection of sewing machine rpm during thread trimming	0:400rpm 1:800rpm	1	This is the sewing machine rpm of the thread spreading by moving knife. When the sewing machine has stopped, thread trimmer is function.
	S	Selection of whether the thread is moved in the direction of easy trimming.	0: Feeding disabled. 1: Feeding enabled.	1	
	S	Needle hole guide diameter when feeding is moved for thread cutting. (Setting possible in the unit of 0.2mm)	16~40 (1.6mm~4.0mm)	16 (1.6mm)	When the setting value is increased, the amount of feeding becomes larger.
	U	Thread trimming can be disabled at the end of sewing.	0: Normal 1: Thread trimming disabled	0	After tentative stoppage, thread trimming is not disabled.
	S	Thread trimming can be disabled.	0: Normal 1: Thread trimming disabled	0	All thread trimming operation is disabled.
	U	The origin reset route can be selected with the reset key.	0: Linear reset 1: Pattern returning	0	
	U	Bobbin winding speed can be set (Setting possible in the unit of 100rpm)	800~2000rpm	1600	
	U	Operation timing of material closing is selected. (LK1901A only)	0: Output prohibited 1: Operation when work clamp foot comes down. 2: Operation at the time of start	2	For the machines other than LK-1901A, this function is not indicated.
	U	Wiper operation method can be selected.	0: Without wiper at the time of thread trimming on the way 1: With wiper at the time of thread trimming on the way ① 2: With wiper at the time of th-read trimming on the way ② 3: Magnet wiper	1	① Without return of the last wiper ② With return of the last wiper (When the setting No. 37:1 of the memory switch, wiper operation method can not be used.)
	S	Magnet wipe-out time (Setting possible in the unit of 10ms)	10~500ms	50	Effective only if the magnet wiper has been selected.
	S	Magnet wipe-in time (Setting possible in the unit of 10ms)	10~500ms	100	
	S	Wipe-out timing at the time of upper dead point stop	0: Sewing machine returned and upper dead point stop after wiper operation in up position. 1: Wiper operation after upper dead point stop	0	Effective only if upper dead point stop is selected.
	U	The stitching at the start of sewing of the pattern for button sewing can be prohibited. For LK-1903A only	0: The stitching effective 1: Tie stitching ineffective	0	For the machines other than LK-1903A, thus function is not indicated.
	S	Moving limit range in +X direction (right side)	–20~20mm	20	In the state of shipment, no clamp configuration is considered.
	S	Moving limit range in –X direction (left side)	–20~20mm	–20	In the state of shipment, no clamp configuration is considered.
	S	Moving limit range in +Y direction (back side)	–20~10mm	10	In the state of shipment, no clamp configuration is considered.
	S	Moving limit range in –Y direction (front side)	–20~10mm	–20	In the state of shipment, no clamp configuration is considered.
	S	Jump feed speed of XY (Setting possible in the unit of 10pps)	100~4000pps	2000	

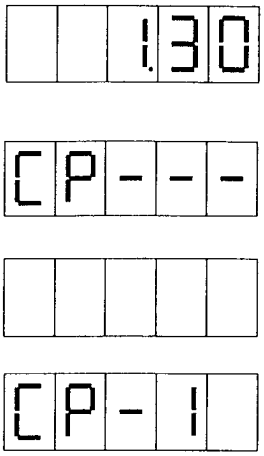
Indication	Level	Functions	Setting range	State when delivered	Remarks
	S	XY feed forward / back speed (Setting possible in the unit of 10pps)	100~4000pps	500	
	S	When the power supply is turned on, oautomatic preparation is possible without pressing the READY key.	0: Normal 1: Automatic preparation is operated when the power supply is ON.	0	
	S	While the needle stays in an upper position, a current is maintained in the main motor to make the needle hard to down.	0: Holding disabled 1: Holding enabled	0	
	U	Method of XY enlargement/reduction scale rate setting (IP200 only)	0: % setting 1: Size setting	0	Displayed only for the IP200 operation panel.
	U	The origin is moved toward the front by 5mm.	0: Standard 1: 5mm closer to the front	0	This setting is needed when using the LK1904 presser foot and patterns.
	S	No. of pulses for work clamp foot interlock wiper operation	30~60	45	
	S	The head falling detector switch can be disabled.	0: Normal 1: Head falling detector switch disabled	0	
	U	This function sets whether or not the calling of the pattern data is operative.	0: Calling inoperative 1: Calling operative	Setting dep-ends on the model used.	Standard pattern Nos. 1 to 64 can be individually set (Standard operation panel)
	S	Initialization of model's specifications is executed.	0:LK1900ASS 1:LK1900AHS 2:LK1900AFS 3:LK1900AMS 4:LK1901ASS 5:LK1902ASS 6:LK1902AHS 7:LK1903ASS-301 8:LK1903ASS-302 9:LK1903ASS-311/BR35 10:LK1903ASS-312/BR35 11:LK1900AWS	Setting values are specified at left according to models.	Contents of the memory switches are initialized to the state when delivered. The thread tension of each standard pattern is initialized to the state when delivered. All the registrations patterns and cycles are deleted.
	U	Grease-up error	The number of stitches is counted based on drive, sewing machine.		Only clearing possible with the RESET key. Clearing should be done after the completion of grease-up action.
	U	Pattern registration is carried out.			
	U	Cycle sewing registration is carried out.			
	S	Test mode is assumed.			

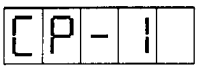
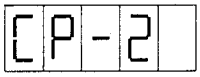
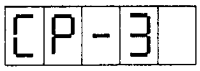
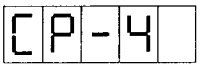
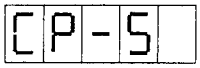
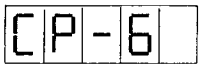
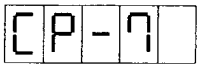
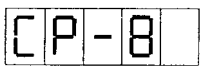
6. Test mode

When the test mode is started, it is possible to carry out maintenance and inspection.

(1) Test mode start

1. When the [M] key is continuously pressed for 3 seconds in the state that the sewing LED is turn off, the buzzer sounds and test mode start can be selected, with the user level setting mode of the memory switch kept effective.
   (Caution) The test mode cannot be selected unless the [M] key is pressed for more than 3 seconds.
2. Change the memory switch No. with the [+/▲] , [−/▼] keys to select the test mode.
3. Press the [↺] key. The selected test mode is assumed and a display output test can be started. In regard to the contents of the display output test, refer to (2) Display output test.
4. Press the [↺] key. The display output test is finished and operation moves to the selection of another test feature.
5. Select the test program No. by the use of the [+/▲] , [−/▼] keys.

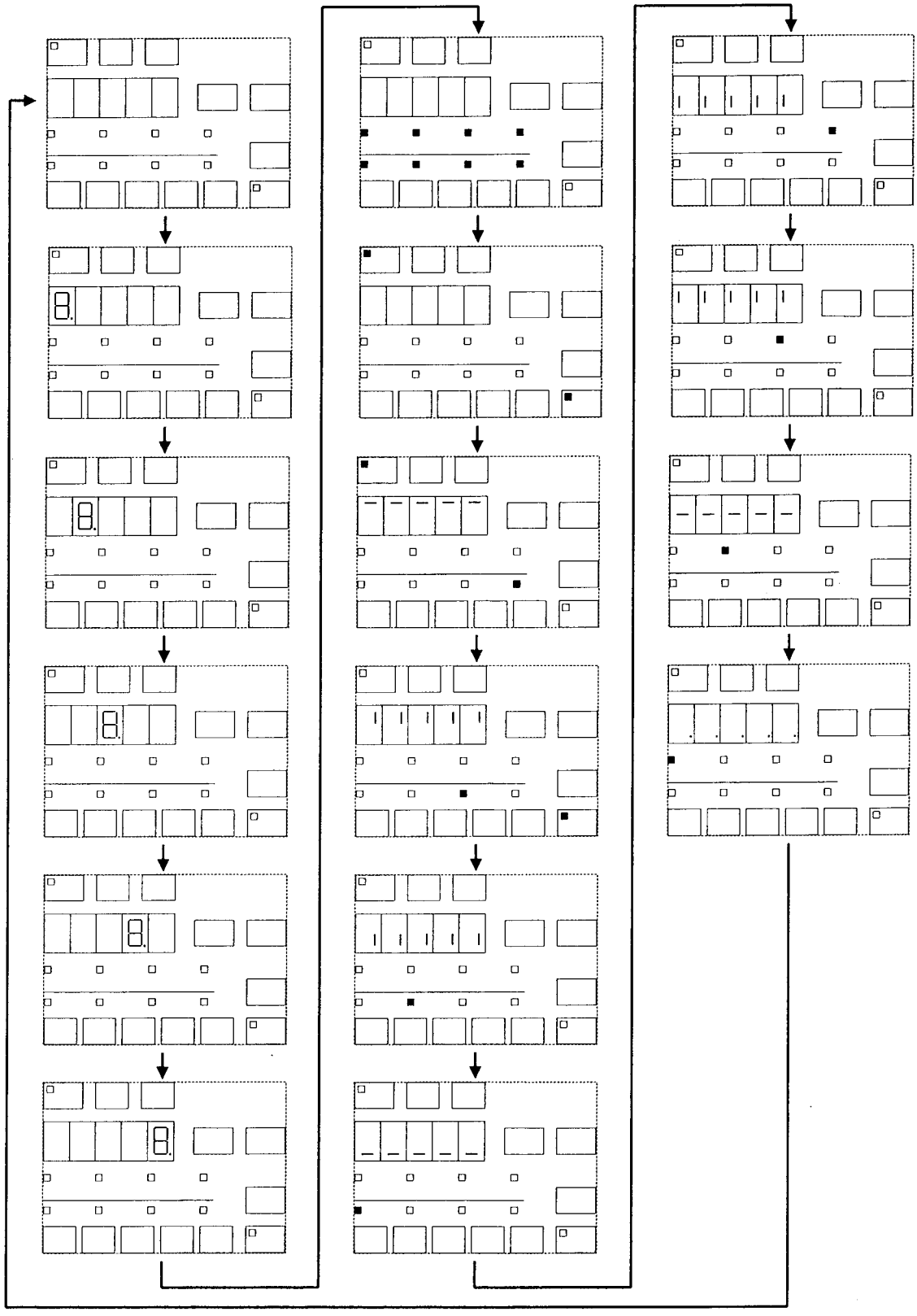


Test program No.	Test program	Descriptions
	Input signal check	The conditions of switches and sensor inputs are displayed at the LED.
	XY motor / origin sensor check	Inching operation of the X/Y motor, operation of origin retrieval, and the status of X/Y origin sensors are displayed.
	Continuous operation	After the setting of continuous operational conditions, the continuous operation mode is assumed.
	Main motor rpm check	The sewing machine is started based on the preset rpm, and the measured rpm number is displayed.
	Output check	Output is maintained for the LK1901A material drawing magnet.
	Presser foot and thread trimmer motor and origin sensor check	Inching operation of the presser foot and thread trimmer motor, operation of origin retrieval, and the status of presser origin and presser sensors are displayed.
	Needle thread clamp motor and origin sensor check	Inching operation of the needle thread clamp motor, operation of origin retrieval, and the status of needle thread clamp origin and needle thread clamp sensors are displayed.
	Software version display	The software versions of the MAIN and SDC boards are displayed.

6. Press the [↺] key and define the test program number.
7. For each program, the test program can be closed when the [M] key is pressed. The condition of 5. recovered.
   However, the continuous operation mode cannot be canceled if it is once assumed. To close this mode, it is necessary to turn off the power supply.

(2) Display output test

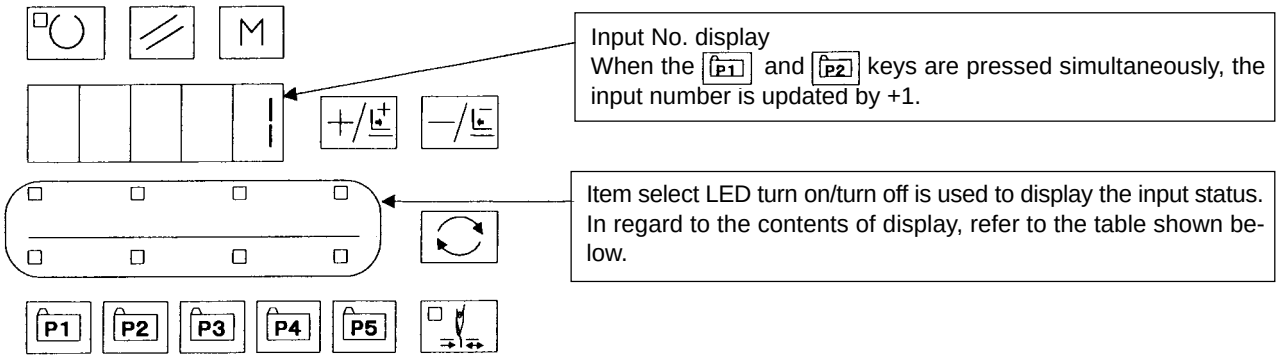
After moving to the test mode, the display output test is started.
At the intervals of one second, the LEDs shown below are turn on.



(3) Method of confirmation according to each test program No.

1) CP-1 (Input signal check)

It is possible to check the input conditions of the respective operation panel keys, pedal switches, and various sensors.



Contents of display for each input No.

Input No.	Pattern LED	X enlarge LED	Y enlarge LED	Speed LED	Counter LED	Bobbin winder LED	Threading LED	Tension LED
1			key	key	key	key	key	key
2			(key)	key	key	key	key	key
3	DIPSW2-4	DIPSW2-3	DIPSW2-2	DIPSW2-1	(Pedal SW)	Optional Clamp 2 SW	Optional› Start SW	Optional Clamp SW
4	Pedal SW ⑧	Pedal SW ⑦	Pedal SW ⑥	Pedal SW ⑤	Pedal SW ④	Pedal SW ③	Pedal SW ②	Pedal SW ①
5	Presser motor origin sensor	Y motor origin sensor	X motor origin sensor	Needle thread clamp motor origin sensor	Thread trimmer sensor	Needle thread clamp sensor		
6		Upper needle dead point (5~30°)	Lower needle dead point (185~215°)		Lower needle position (80~123°)	Upper needle position (40~62°)	TG (45 times/ revolution)	Feeding standard (125~155°)
7	Main motor Phase Z (0~180°)							
8	(Temporary stop)					Head fall SW	(Thermal sensor)	Turn on

DIPSW2 denotes a dipswitch on the MAIN board.
Pedal SW ① ~ ⑧ are lit up in the direction of ① to ⑧ according to the amount of treading-on.
[Pedal position = 128 x ⑧ + 64 x ⑦ + 32 x ⑥ + 16 x ⑤ + 8 x ④ + 4 x ③ + 2 x ② + 1 x ①]

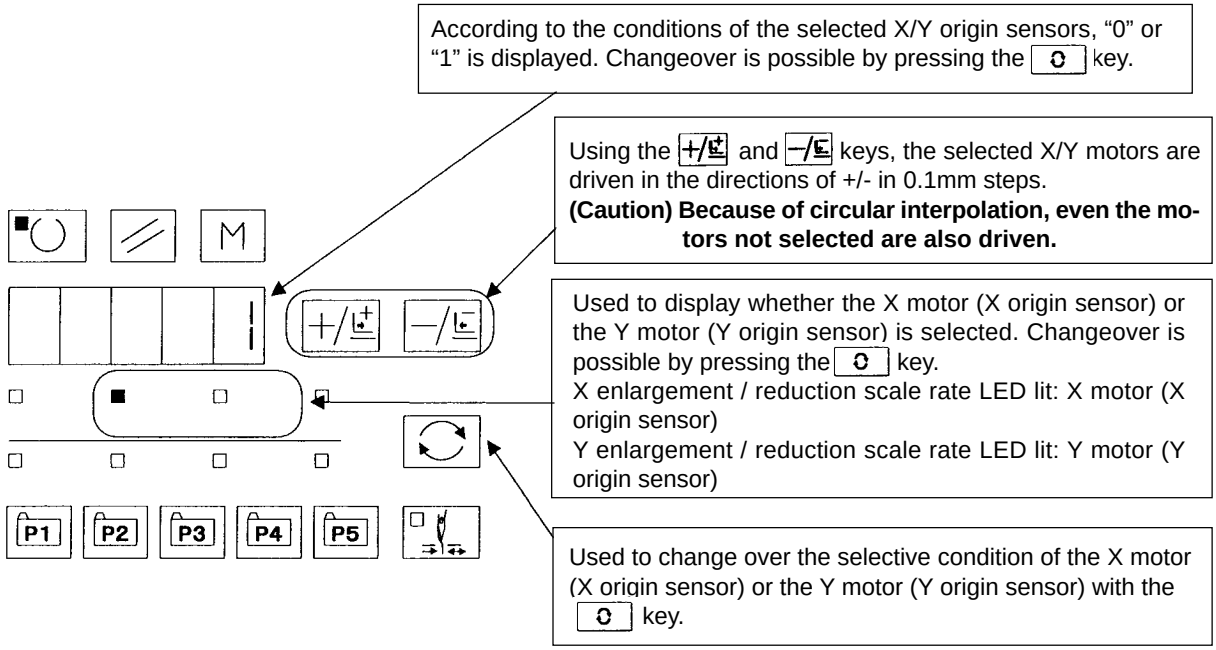
2) CP-2 (XY motor / origin sensor check)

Inching operation of the X/Y motor, operation of origin retrieval, and the status of X/Y origin sensors are displayed.

1. Preparation

   At first, press the [ ] key to start origin retrieval for needle thread clamp and work clamp foot/thread trimmer motors. The presser foot assumes the lowering condition. After the completion of preparation, the sewing LED is turn on.

2. Operation

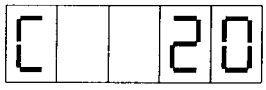


Using the Start SW, origin retrieval of X/Y motors is effected for both shafts.

3) CP-3 (Continuous operation)

After the setting of continuous operation, the condition moves to the continuous operation mode.
Turn off the power supply to close the continuous operation mode.

1. Rest time setting
   Press the [+/E+] and [−/E−] keys to set up the rest time.
   Setting is possible within the range of 0 ~ 9900ms in the unit of 100ms. (Initial value: 2000ms)
   After the completion of setting, press the [ ] key.



2. Origin retrieval enable/disable setting at the end of sewing
   Press the [+/E+] and [−/E−] keys to set up whether origin retrieval is enabled or disabled at the end of sewing.
   - A0: Disable (Initial value)
   - A1: Every 100 sewing cycles
   - A2: Every sewing cycle

   After the completion of setting, press the [ ] key to recover ordinary display.

3. Continuous operation
   After the completion of setting, set up the pattern numbers, etc., in the same manner as that for ordinary operation.
   After the completion of sewing, origin retrieval of the X/Y/work clamp foot/thread trimmer/needle thread clamp motors is conducted if “origin retrieval enabled” has been set as per 2. above. In this case, automatic sewing operation is restarted after the lapse of the rest time specified as per 1. above.
   To stop continuous operation, press ON the Start SW during the rest time. [E 50] is displayed and operation is suspended.

4) CP-4 (Main motor rpm check)

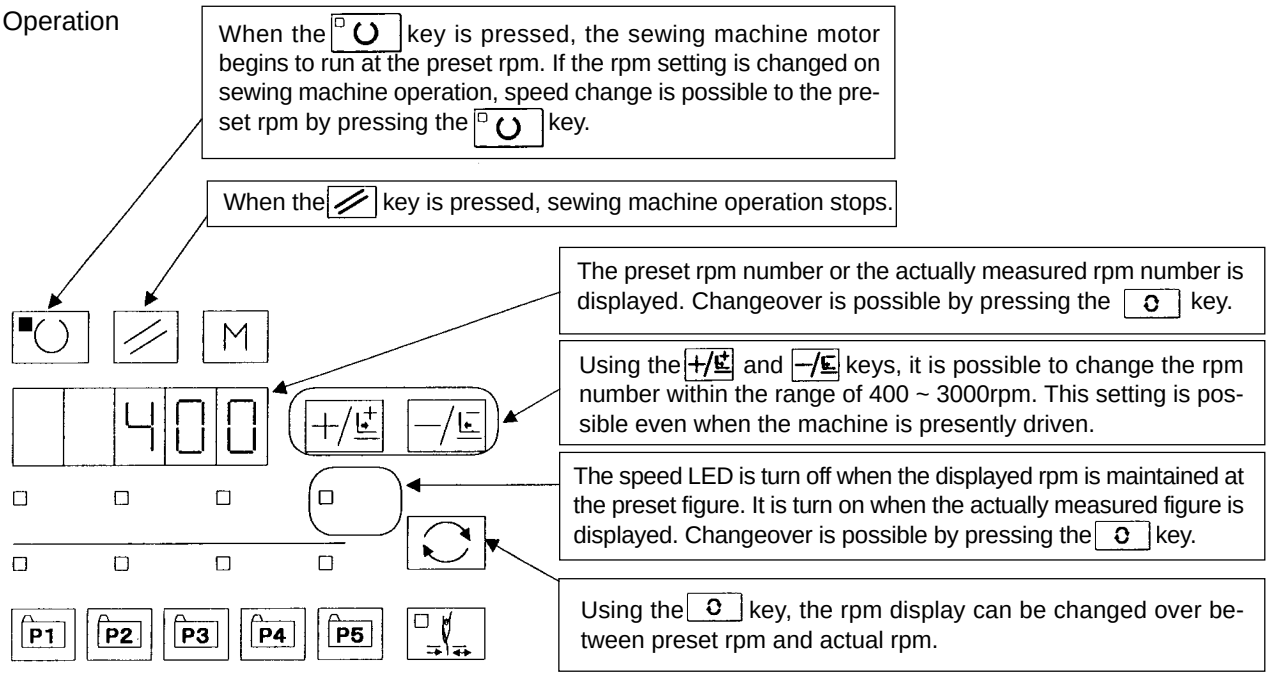
Used to set up the sewing machine rpm. Only the main motor is driven at the preset rpm and the actually measured rpm number is displayed.

1. Preparation

   At first, press the key to start origin retrieval for needle thread clamp and work clamp foot/thread trimmer motors.

   After the completion of preparation, the sewing LED is turn on.

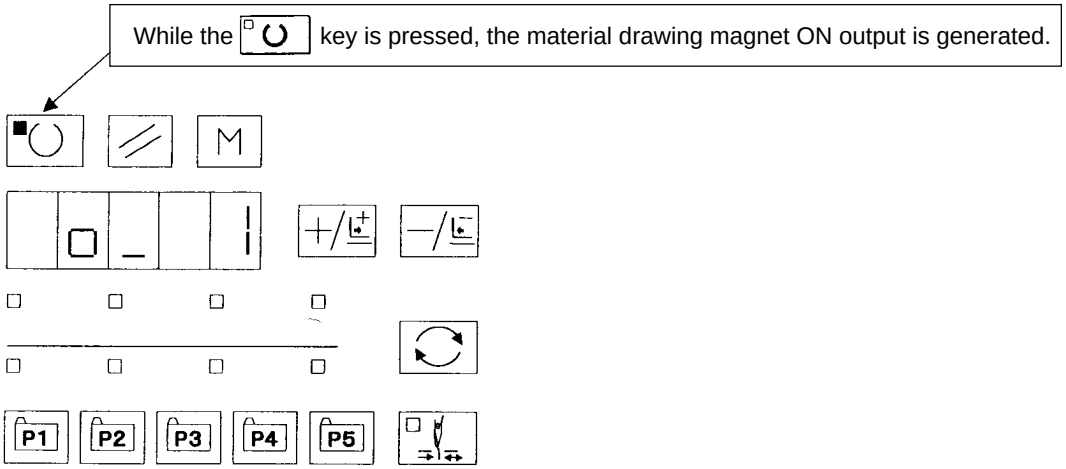
2. Operation



5) CP-5 (Output check)

Output check is carried out for the material drawing magnet of the LK1901A.

1. Operation

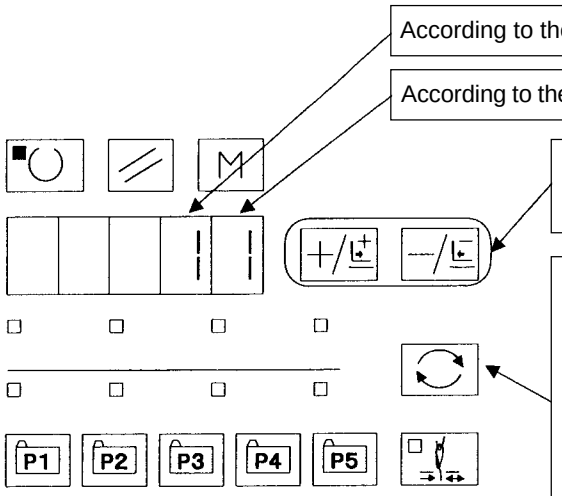


6) CP-6 (work clamp foot/thread trimmer motor/origin sensor check)

Inching operation of the work clamp foot/thread trimmer motors, operation of origin retrieval, and the status of origin and thread trimmer sensors are displayed.

1. Preparation
   In the first place, the [ ] key is pressed to carry out origin retrieval of needle thread clamp.
   After operation for preparation, the sewing LED is turn on.

2. Operation



According to the status of the thread trimmer sensor, “0” or “1” is displayed.

According to the status of the work clamp foot origin sensor, “0” or “1” is displayed.

Using the [+/L+] and [−/L−] keys, the work clamp foot/thread trimmer motors are driven in the directions of +/- for each pulse.

Using the [ ] key, the work clamp foot/thread trimmer motor is driven to each specified position.
① Work clamp foot rising position
② Work clamp foot lowering position (lowering position during pedal operation)
③ Thread trimmer position
④ Work clamp foot lowering position (lowering position after thread trimming)
⑤ Wipe-out position
Driving in reverse rotation is conducted when the [ ] key is pressed with the [P5] key kept pressed.

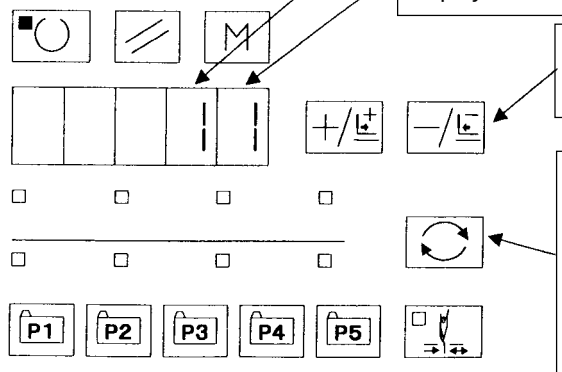
(Caution) This feature is available after the completion of origin retrieval of the work clamp foot/thread trimmer motors with the Start SW.

Origin retrieval of the work clamp foot/thread trimmer motors is carried out by the use of the Start SW.

7) CP-7 (Needle thread clamp motor / origin sensor check)

Inching operation of the needle thread clamp motor, operation of origin retrieval, and the status of needle thread clamp origin sensor and needle thread clamp sensor are displayed.

1. Operation



According to the status of the needle thread clamp sensor, “0” or “1” is displayed.

According to the status of the needle thread clamp origin sensor, “0” or “1” is displayed.

Using the [+/L+] and [−/L−] keys, the needle thread clamp motor is driven in the directions of +/- for each pulse.

Using the [ ] key, the needle thread clamp motor is driven to each specified position.
① Standby position (front side)
② Needle thread bending position
③ Needle thread clamp position
④ Refuge position (rear side)

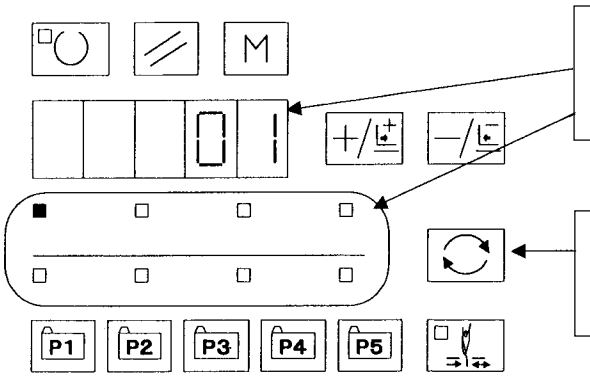
(Caution) This feature is available after the completion of origin retrieval of the needle thread clamp motor with the Start SW.

Origin retrieval of the needle thread clamp motor is carried out by the use of the Start SW.

8) CP-8 (Software version display)

The software versions of the MAIN and SDC boards are displayed.
Each version comes in the type description of RR-VV-LL-xx. “xx” is used for the specifications of special ordering. It is not displayed usually.
(Example: 01-01-01, 01-01-02, 01-02-01)

1. Operation



According to the item selection LED, RR-VV-LL-xx of the MAIN and SDC boards is respectively displayed. Changeover is possible by pressing the [ ] key. Contents of the display are shown in the table below.

Display changeover is possible with the [ ] key in the order of RR → VV → LL → (xx) → for the MAIN board and RR → VV →LL → (xx) → for the SDC board.

RR-VV-LL-xx display for the MAIN and SDC boards for each item selection LED

Pattern LED	X enlarge LED	Y enlarge LED	Speed LED	Counter LED	Bobbin winder LED	Threading LED	Tension LED
MAIN board RR	MAIN board VV	MAIN board LL	MAIN board xx	SDC board RR	SDC board VV	SDC board LL	SDC board xx

7. Miscellaneous

(1) Various printed wiring boards

1) FLT-T board Single-phase 100V~120V
3-phase 200V~240V
Single-phase 200V~240V

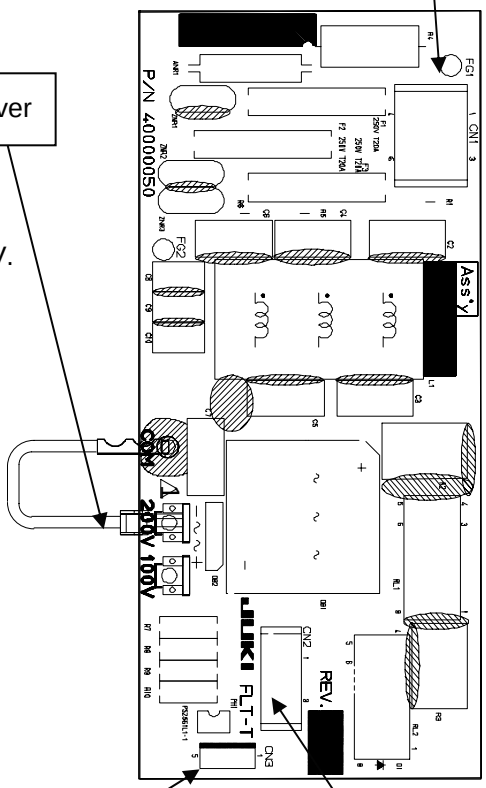
Pulse generation is carried out for the purposes of power supply rectification, noise reduction, and the detection of a momentary interruption

CN1 : Power input ← Power switch

In the signal-phase mode, the power supply is connected to Pins 4-5. In the 3-phase mode, the power supply is connected to Pins 4-5-6.

Voltage changeover

Connected to 100V side for 100V~120V or to 200V side for 200V~240V.

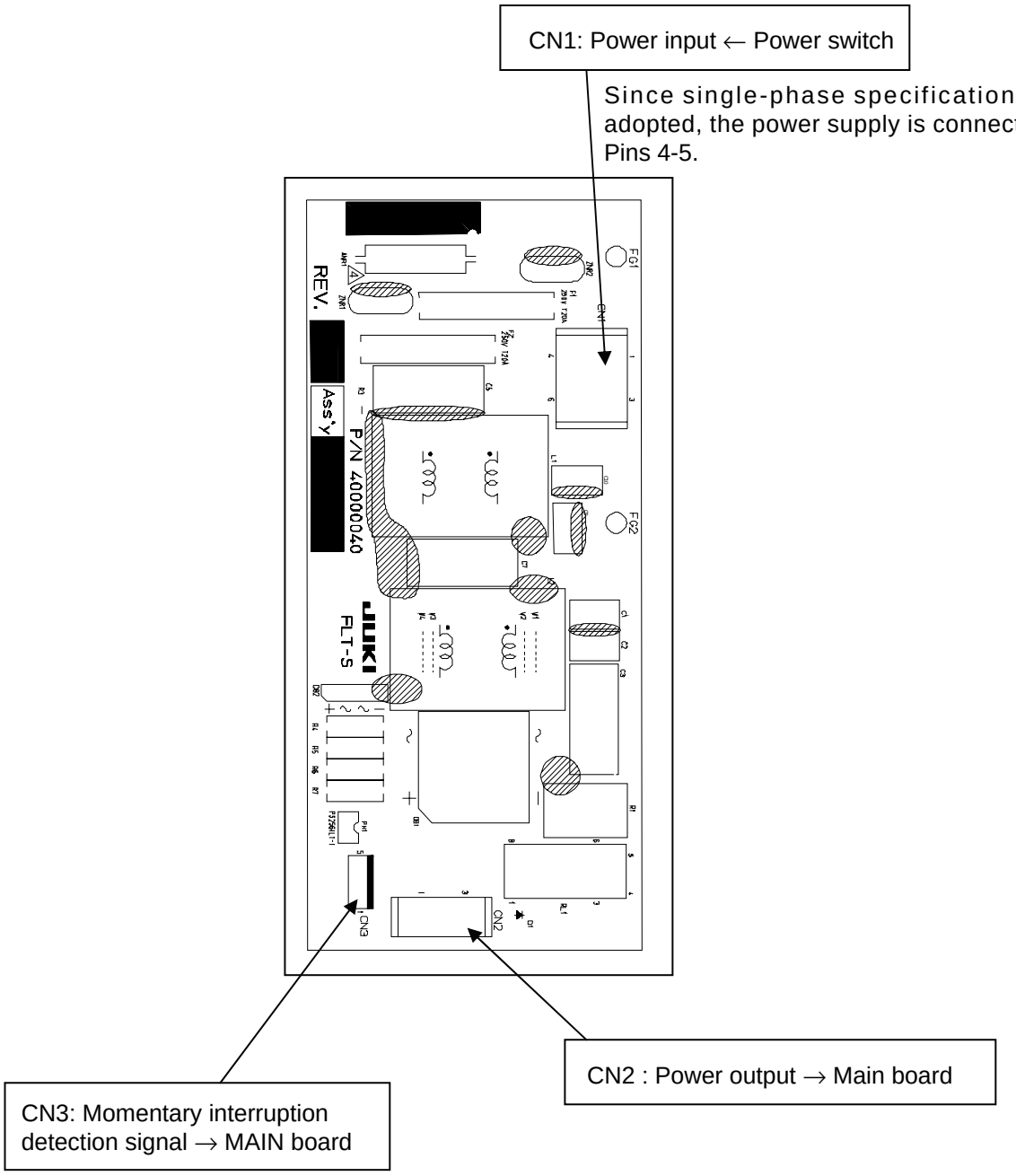


CN2 : Power output → MAIN board

CN3: Momentary interruption detection signal → MAIN board

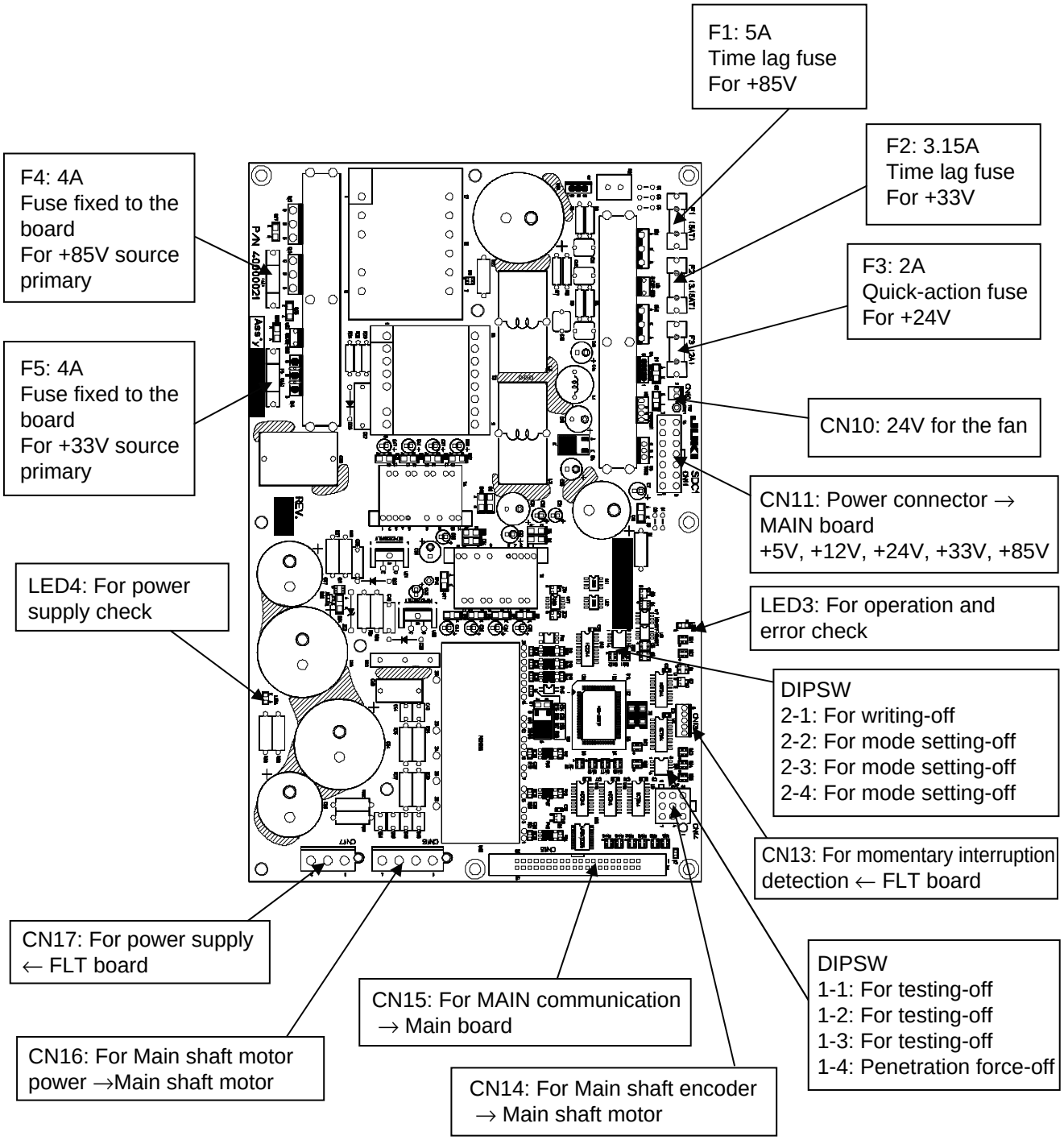
2) FLT-S board Single-phase 200V~240V

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



3) SDC board

The power supply is generated and error check is carried out. Main shaft control is effected, receiving the commands from the MAIN board.

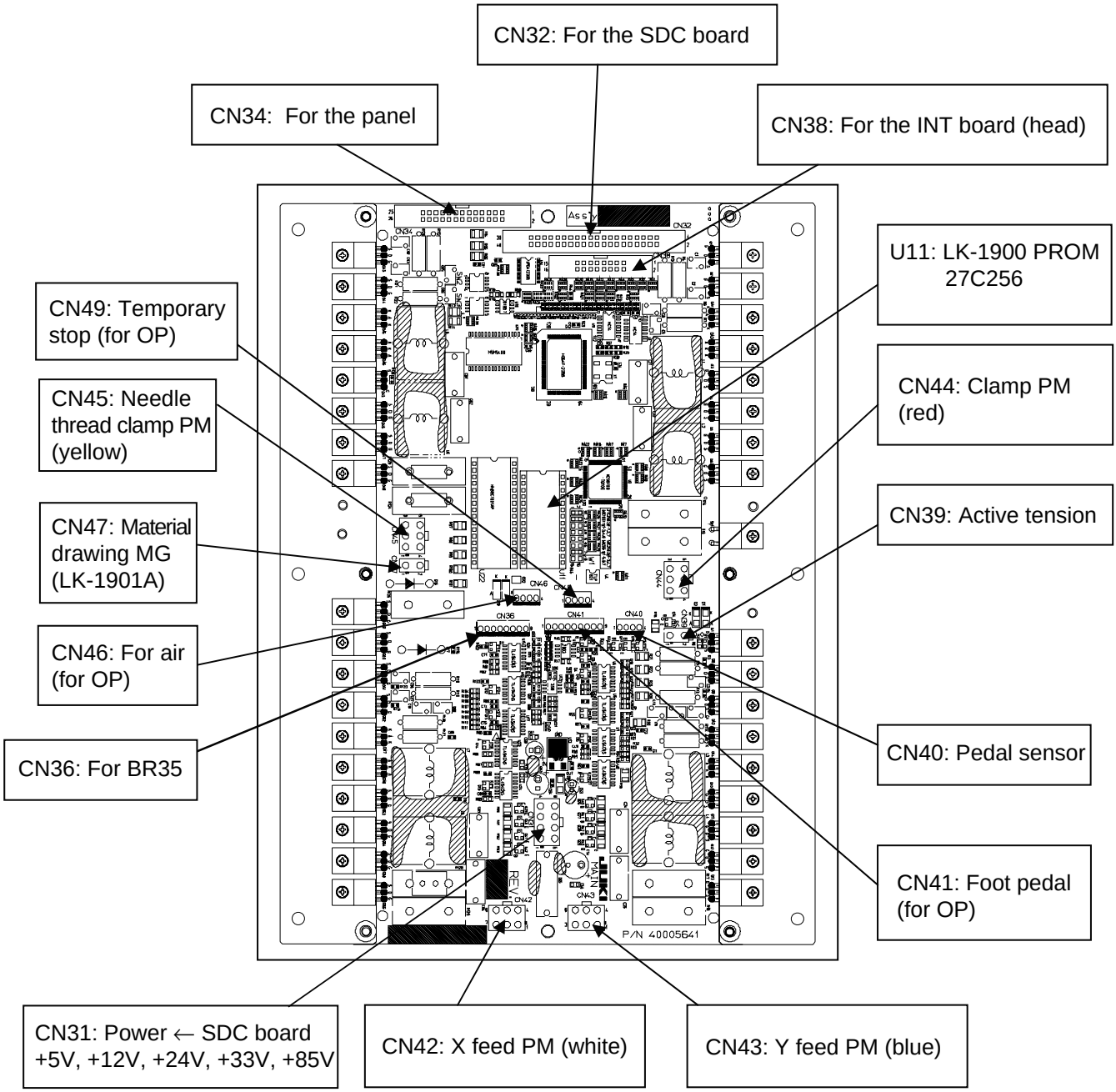


4) LED3 for SDC board error check

No. of LED3 flashes	Error description	Display of operation panel	Remarks
Turn on	Nil		Dimly turn on in ordinary state
1	Main shaft motor lock	E007	Failure in revolving for 2 seconds
2	Error in phase Z	E303	Failure in phase Z detection
3	Error in phases A and B	E730	Failure in phases A and B detection
4	Motor position sensor error	E731	Logical error in U, V, W
5	IPM error	E901	Error output generation from IPM
6	Undervoltage	E813	Source voltage -20% or more
7	Motor reverse rotation	E733	Irregular motor revolutions
8	Overvoltage	E811	Source voltage +20% or more
9	Power interruption	Display disabled	Power interruption of 40ms or more
10	Not used		
11	+85V power system error	E903	SDC board fuse F1 blow-off
12	+33V power system error	E904	SDC board fuse F2 blow-off
13	Overheasting	E905	Radiator panel of SDC boaed heated at 85°C or higher
14	Not used		
15	Communication erroe	E916	Failure in comminication with the MAIN board

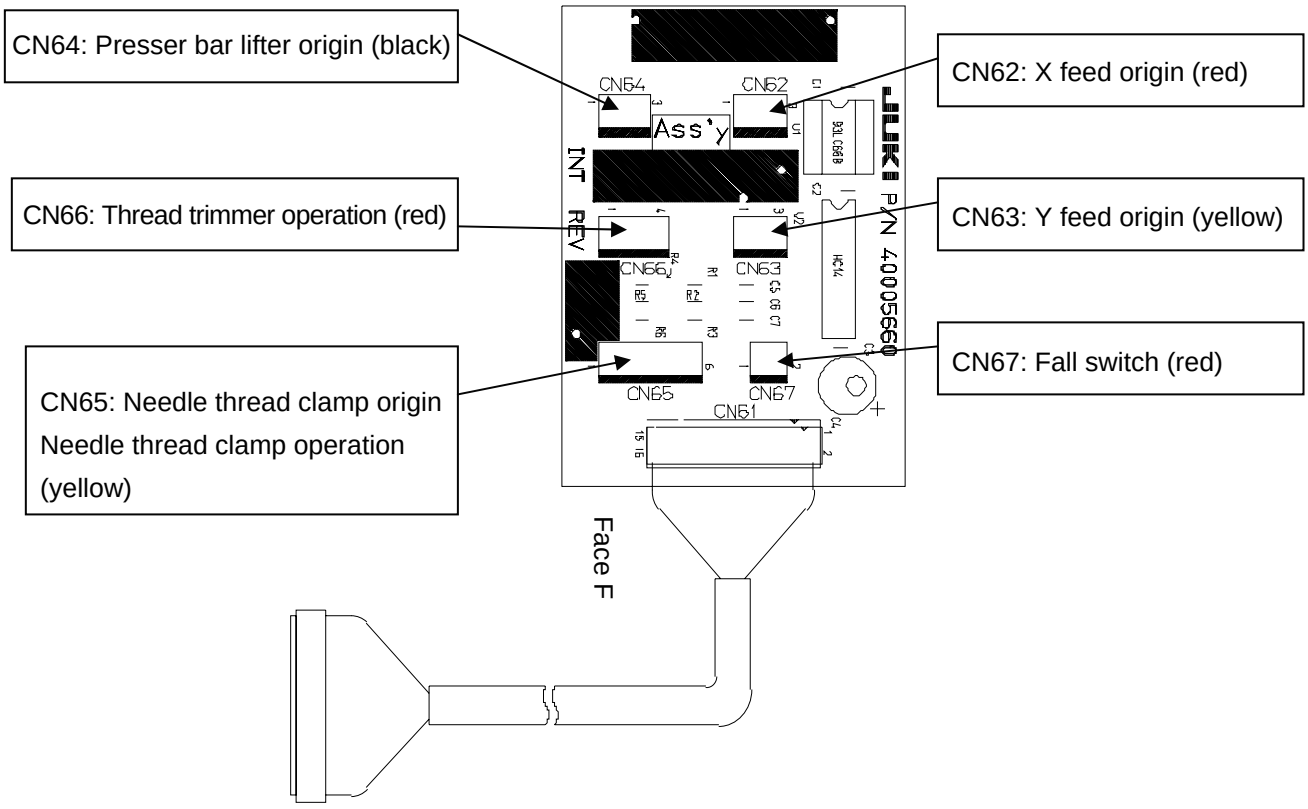
5) MAIN board

Overall controls are carried out, such as pulse motor driving for shafts, control of active tension, etc., memory switch control, etc.



6) INT board

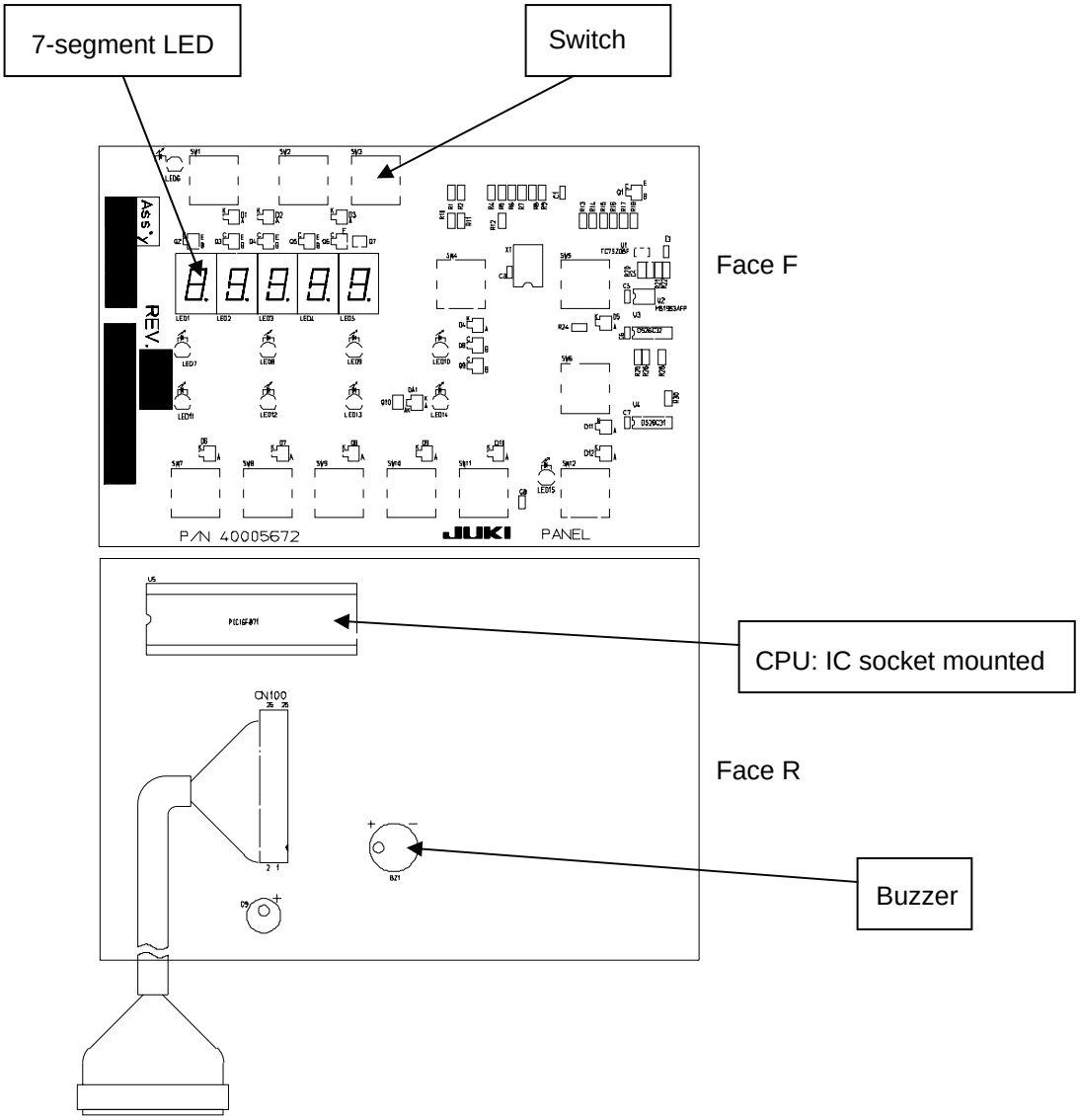
The INT board repeats the head sensor signals and transfers the head model data to the MAIN board.



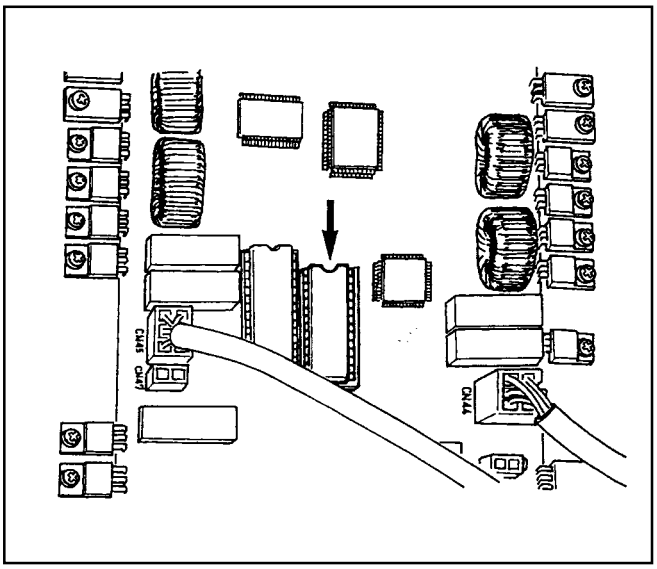
The head model type (Memory switch No. 241), corrected value of the active tension, the number of stitches for grease-up (Memory switch No. 245), etc. are stored.

7) PANEL board

The PANEL board accommodates the display LEDs, switches, buzzer, etc. together with the control CPU.



(2) LK1900 data ROM



The data ROM for the LK-1900 is used by inserting it in the IC socket that is located on the MAIN board.

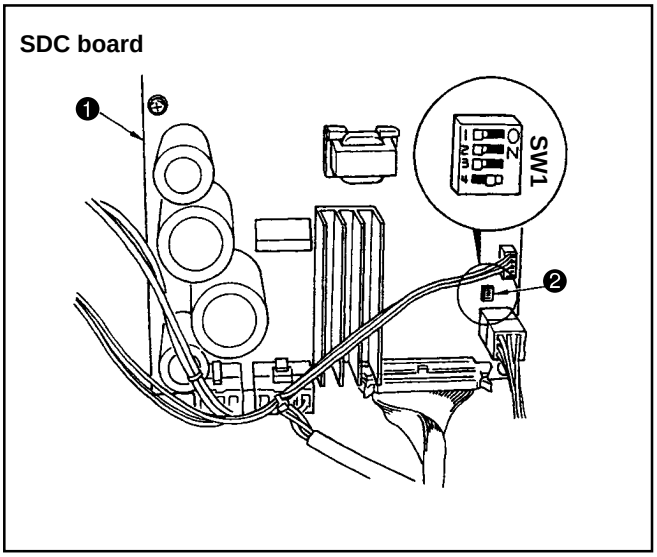
(Cautions) 1. Pay attention to the direction of insertion.
2. EEPROM cannot be used.
3. If the pattern number is the same as that of the standard pattern, the pattern in the data ROM is in higher preference.

Available ROM
27C256 EPROM

JUKI part No.: HL008423000

(3) Dipswitch setting

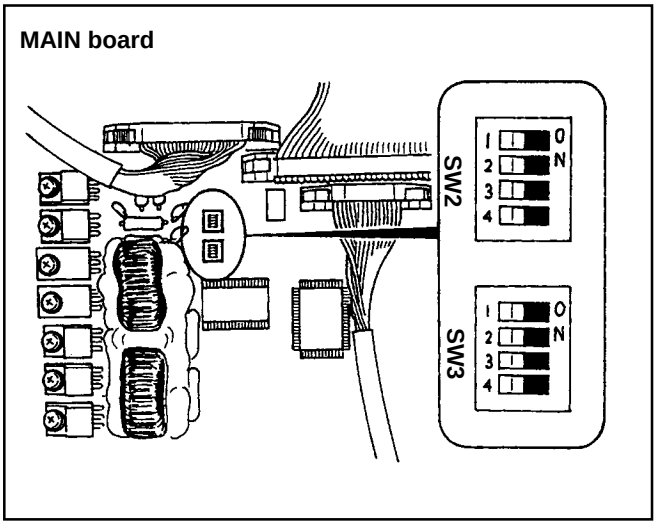
SDC board



1. The penetration force is increased when “4” of Dipswitch SW1 ❷ is turned ON on the SDC board ❶.
2. If the penetration force is insufficient for thick materials, this switch should be turned ON.
3. All other dipswitches should be turned OFF.

(Caution) Dipswitch changeover should be done after the power supply has been turned off.

MAIN board



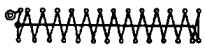
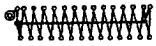
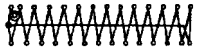
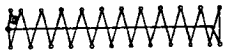
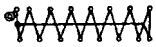
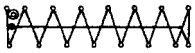
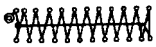
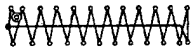
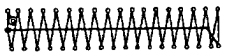
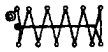
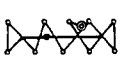
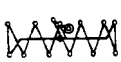
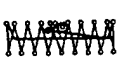
4. All dipswitches on the MAIN board are turned OFF.

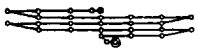
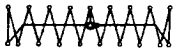
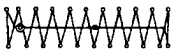
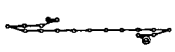
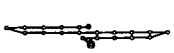
(4) Table of standard pattern specifications

					1900A		1901A	1902A
NO	Lengthwise	Crosswise	Number of stitches	Pattern	S, F, H, W	M	S	S, H
1 (51)	2.0	16	42	Large size bartacking	*			
2	2.0	10	42	Large size bartacking	*			
3	2.5	16	42	Large size bartacking	*			
4	3.0	24	42	Large size bartacking				
5	2.0	10	28	Large size bartacking	*			
6	2.5	16	28	Large size bartacking	*			
7	2.0	10	36	Large size bartacking	*			
8	2.5	16	36	Large size bartacking	*			
9	3.0	24	56	Large size bartacking				
10	3.0	24	64	Large size bartacking				
11	2.5	6	21	Small size bartacking (eyelet)	*		*	
12	2.5	6	28	Small size bartacking (eyelet)	*		*	
13	2.5	6	36	Small size bartacking (eyelet)	*		*	
14	2.0	8	14	Knit goods bartacking	*	*		
15	2.0	8	21	Knit goods bartacking	*	*		
16	2.0	8	28	Knit goods bartacking	*	*		
17	0	10	21	Straight line bartacking	*			*
18	0	10	28	Straight line bartacking	*			*
19	0	25	28	Straight line bartacking				
20	0	25	36	Straight line bartacking				
21	0	25	41	Straight line bartacking				
22	0	35	44	Straight line bartacking				
23	20	4.0	28	Lengthwise bartacking				
24	20	4.0	36	Lengthwise bartacking				
25	20	4.0	42	Lengthwise bartacking				
26	20	4.0	56	Lengthwise bartacking				
27	20	0	18	Lengthwise straight line bartacking				
28	10	0	21	Lengthwise straight line bartacking				
29	20	0	21	Lengthwise straight line bartacking				
30	20	0	28	Lengthwise straight line bartacking				
38	2.0	8	28	Knit goods bartacking	*	*		

In the condition of delivery from the factory, the pattern sewing with * marks can be made.
When using the standard patterns other than the patterns with * marks, refer to “Setting whether the calling of the pattern data is operative or not” described in the item of the how to use the memory switch.

(5) Table of standard patterns

	No	Stitch diagram	Number of stitches	Sewing size (mm) Length-wise	Sewing size (mm) Cross-wise	(Note) 2 No. of work clamp foot
Large size bartacking	1 (51)		42	2.0	16	1 / 2
	2			2.0	10	1 / 2
	3 *			2.5	16	1 / 4
	4 *			3.0	24	6 / 7
	5		28	2.0	10	1 / 2
	6 *			2.5	16	1 / 4
	7		36	2.0	10	1 / 2
	8 *			2.5	16	1 / 4
	9 *		56	3.0	24	6 / 7
	10 *		64	3.0	24	6 / 7
Small size bartacking	11		21	2.5	6	8
	12		28	2.5	6	
	13		36	2.5	6	
Knit goods bartacking	14		14	2.0	8	5
	15		21	2.0	8	
	16		28	2.0	8	

	No	Stitch diagram	Number of stitches	Sewing size (mm) Length-wise	Sewing size (mm) Cross-wise	(Note) 2 No. of work clamp foot
Straight line bartacking	17		21	0	10	1 / 2
	18		28	0	10	1 / 2
	19			0	25	6 / 7
	20		36	0	25	6 / 7
	21		41	0	25	6 / 7
	22		44	0	35	(Note) 3
Lengthwise bartacking	23	(other side)  (This side)	28	20	4.0	9
	24	(other side)  (This side)	36	20	4.0	
	25	(other side)  (This side)	42	20	4.0	
	26	(other side)  (Tis side)	56	20	4.0	
Lengthwise linear bartacking	27	(other side)  (This side)	18	20	0	11
	28	(other side)  (This side)	21	10	0	
	29	(other side)  (This side)		20	0	
	30	(other side)  (This side)	28	20	0	

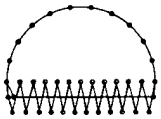
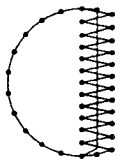
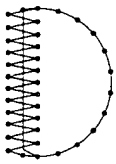
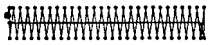
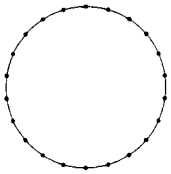
(Note) 1. Sewing size shows the dimensions when the scale rate is 100%.

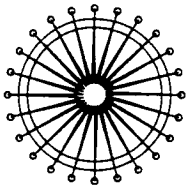
2. Refer to the work-clamp type table indicated in the figure 8.-(3) in the separate sheet hereto.

3. For No. 22, process the work clamp foot blank for use.

4. Use the patterns with *marks for sewing denim.

5. No. 51 is for the machine used without thread clamp device.

	No	Stitch diagram	Number of stitches	Sewing size (mm)	
				Length-wise	Cross-wise
Semilunar bartacking	31		52	7	10
	32		63	7	12
	33		24	6	10
	34		31	6	12
	35		48	10	7
	36		48	10	7
Large size bartacking	37		90	3	24
Knit goods bartacking	38		28	2	8
Round bartacking	39		28	ø12	
	40		48		

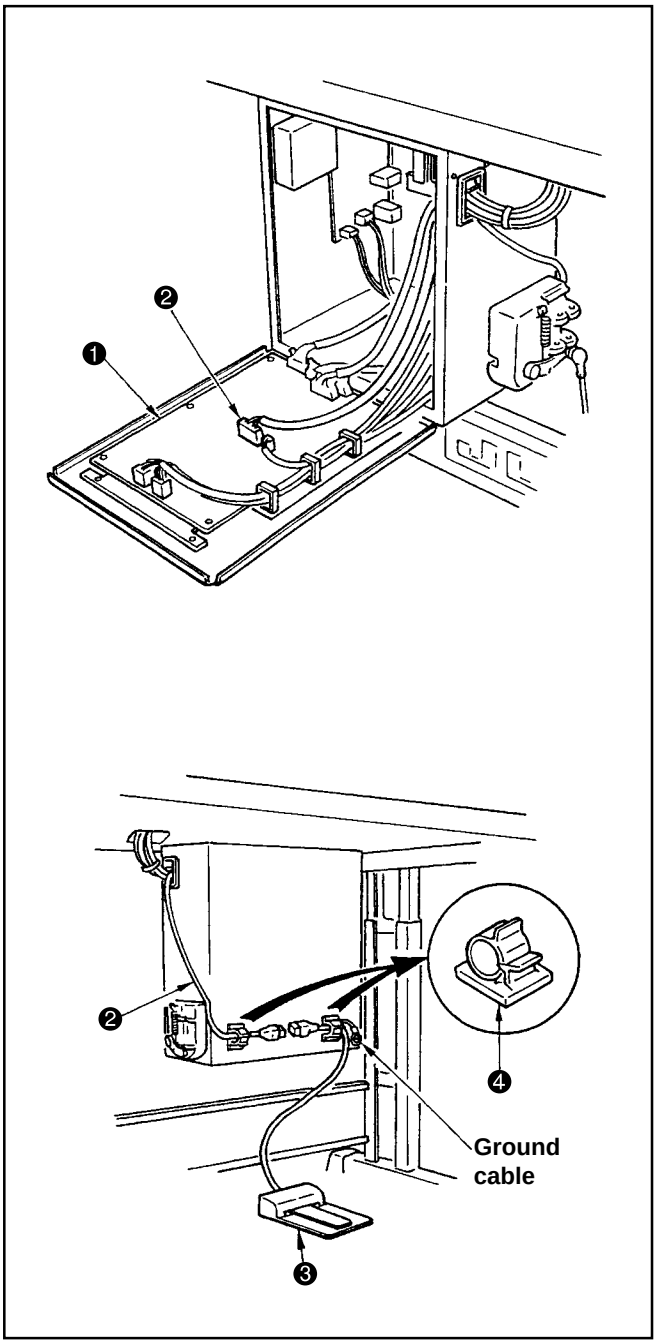
	No	Stitch diagram	Number of stitches	Sewing size (mm)	
				Length-wise	Cross-wise
Lengthwise bartacking	41		29	20	2.5
	42		39	25	2.5
	43		45	25	2.5
	44		58	30	2.5
	45		75	30	2.5
	46		42	30	2.5
Radial bartacking	47		91	ø8	
	48		99		
	49		148		
	50		164		

(Note) 1. Patterns Nos. 41 to 46 are arranged for the optional presser bar (No. 12).

2. The origin is different by 5mm from that of the lengthwise bartacking patterns Nos. 23 to 26.

8. Optional features

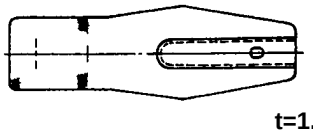
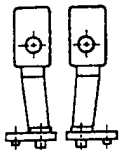
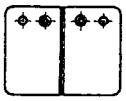
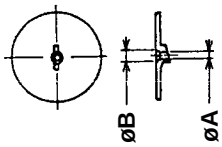
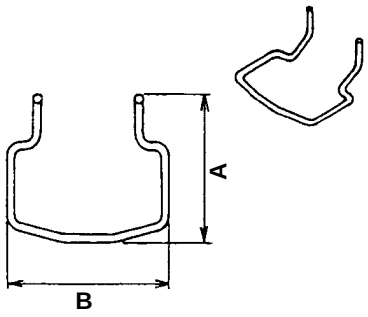
(1) Connection of PK-57

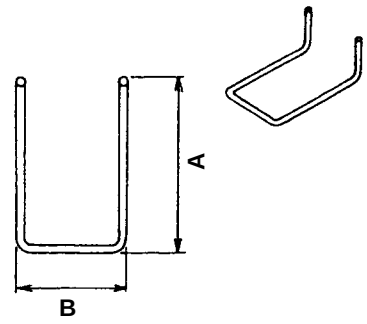
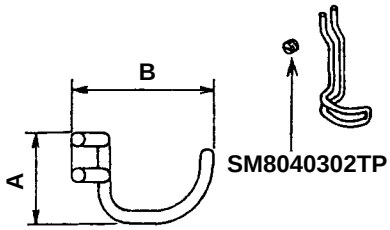


1. Connect PK-57 change cable ❷ with CN41 of MAIN circuit board ❶.
2. Connect the cord of PK-57 ❸ with the PK-57 change cable at the rear face of the control box.
   Then clamp two places with adhesive clamp ❹.
   In addition, tighten with a screw the PK-57 ground cable as illustrated in the figure.
   ❷ PK-57 change cable : Part No. M90135900A0
   ❸ PK-57 : Part No. GPK570010B0
   ❹ Adhesive clamp : Part No. E9607603000
3. Set the memory switches as follows.

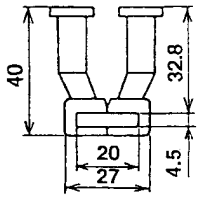
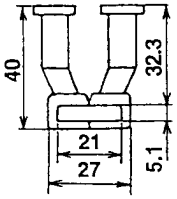
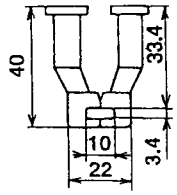
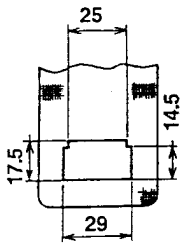
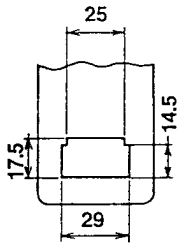
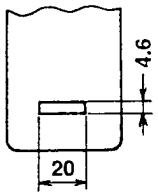
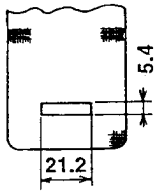
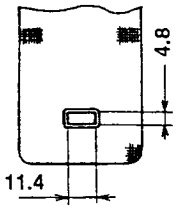
Memory Switch No.	Set value
19	2
20	1
24	1

(2) Table of optional parts

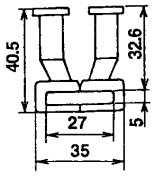
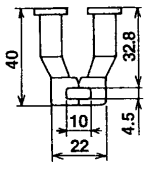
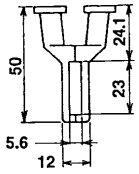
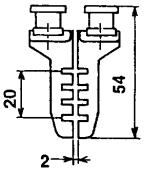
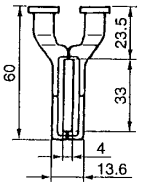
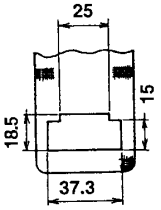
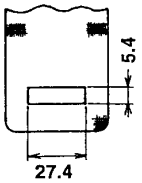
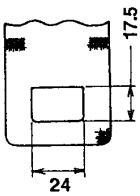
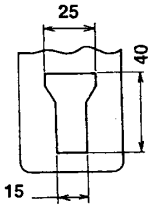
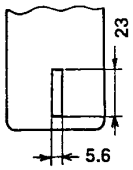
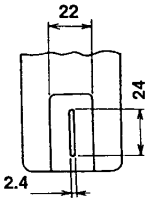
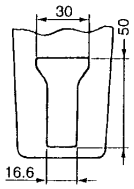
Name of parts	Type	Part No.	Remarks
Feed plate blank  t=1.2	Without knurl/Processed	14120109	For the stitich size 30 x 20
	With knurl/Processed	14120307	For the stitich size 30 x 20
	Without knurl/stainless steel	14120505	t=0.8 For the stitich size 30 x 20
Work calmp foot face plate (asm.) 		14121263	Face plate for presser blank
Presser blank  t=3.2	With knurl/processed (right)	14121701	For the stitich size 30 x 20
	With knurl/processed (left)	14121800	For the stitich size 30 x 20
Needle hole guide 	A=1.6 B=2.6 With relief slit	B2426280000	Standard type
	A=1.6 B=2.0 Without relief slit	D2426282C00	F and M types
	A=2.3 B=4.0 Without relief slit	14109607	For heavy-weight material
	A=2.7 B=3.7 Without relief slit	D2426MMCK00	For extraheavy-weight material
Finger guard (1) 	A=56.5 B=64	13533104	
	A=59 B=74	13548300	For large size bartacking

Name of parts	Type	Part No.	Remarks
Finger guard (2) 	A=66.5 B=43	14135305	For lengthwise bartacking
Finger guard (3) 	A=21.5 B=35.5	14120000	For specially ordered work clamp

(3) Table of the work clamp foot

No. of the work clamp foot	1	2	3	4	5
Work clamp foot	13518659 (asm.)			13548557 (asm.)	13542964 (asm.)
					
Feed plate	14116107	14116404	14116800	14116305	14116206
		(Without knurl)	(Without knurl)		
					
Sewing specification	S	F	F	H	M
* Finger guard	13533104				
Remarks	Standard accessory for S (standard) type machine head.	Optional	Spplied with F (foundation) type machine head. (Depends on the destination)	Optional	Standard accessory for M (knit goods) type machine head.

* Install a finger guard suitable for each work clamp foot when replacing the work clamp foot.

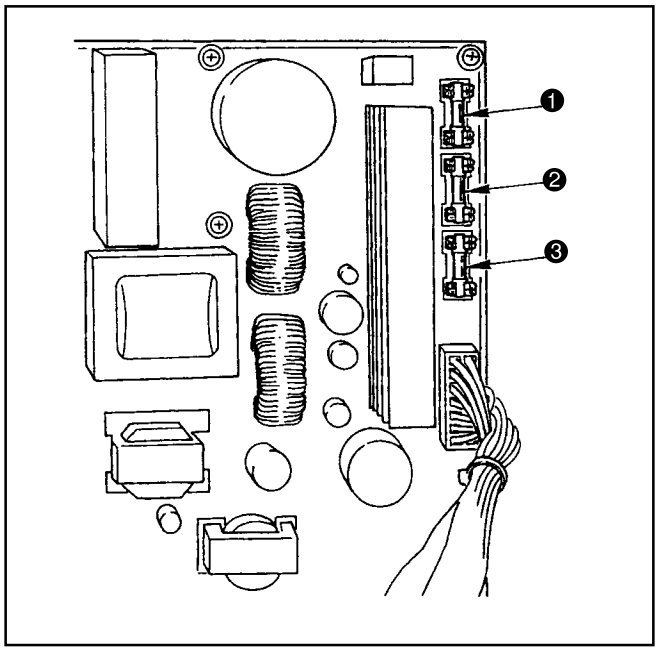
No. of the work clamp foot	6	7	8	9	10	11	12*
Work clamp foot	13548151 (asm.)		13542451 (asm.)	13571955 (asm.)		13561360 (asm.)	14137509 (Right) 14137608 (Left)
							
Feed plate	13548003	13554803	14116602	14116503	14116909	14116701	14137707
				(Without knurl)	(Without knurl)	(Without knurl)	(Without knurl)
							
Sewing specification	S	H	S	F	F	F	F
* Finger guard	13548300		13533104	14135305			
Remarks	Optional	Standard accessory for H (heavy-weight material) type machine head.	Optional	Optional	Standard accessory for F (foundation) type machine head.	Optional	Optional

* Install a finger guard suitable for each work clamp foot when replacing the work clamp foot.

* The presser bar No. 12 (optional) should be used for the standard patterns Nos. 41 to 46 (lengthwise bartacking).

9. Maintenance

(1) Replacing the fuse

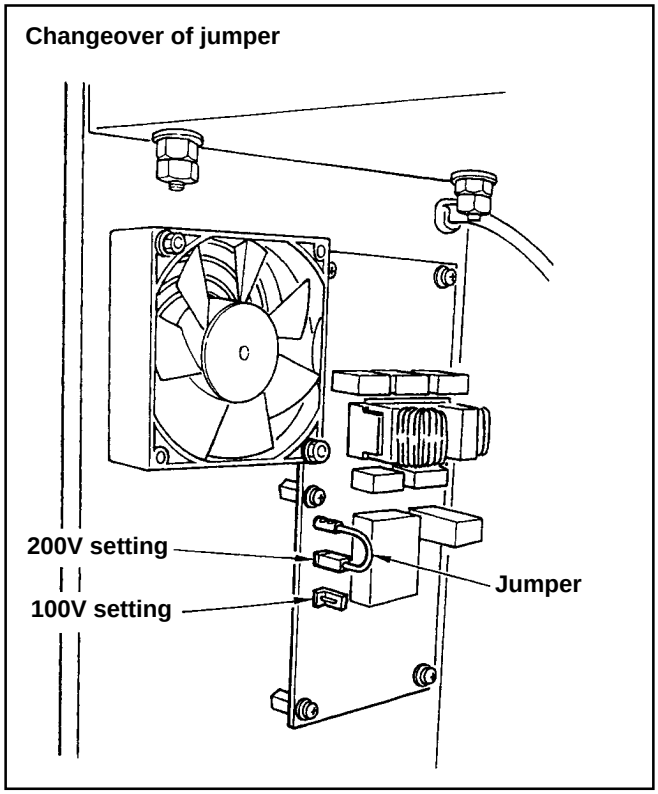


The machine uses the following three fuses:

- ❶ For pulse motor power supply protection
  5A (time-lag fuse)
- ❷ For solenoid and pulse motor power supply protection
  3.15A (time-lag fuse)
- ❸ For control power supply protection
  2A (fast-blow type fuse)

(2) 100V ↔ 200V voltage specification changeover

3-phase 200/220/240V type and single-phase 100/110/120V type can be changed over by changing the power source cable and changing over of the jumper.



Change over the jumper in accordance with the voltage used.

For the change of the connection of power source cable, refer to the item (Instruction manual (2)) of “Connecting the power source cord”.

(Caution) When a wrong connection such as putting 200V type voltage at the time of setting 100V type or the like is performed, the printed circuit board is broken. Perform the change of connection after checking the voltage used.

(3) Greasing parts

(1) When the parts for greasing and grease sealing-in are disassembled and the operational frequency seems to be higher than usual around these parts, grease should be replenished once every two years.

(2) Recommendable grease
This sewing machine uses four types of grease as specified below. The recommendable brands of grease are listed in (4) Parts to which grease is applied. According to this information, replenish the most applicable grease to these parts.
* Use ① Lithium Type Consistency No. 2 for the parts where “Grease” is simply specified in (4) Parts to which grease is applied.

① Penetration No. 2 lithium grease
This type of grease is used in general sliding parts.

Maker name	Brand name
Esso:	Listan 2, Beacon 2
Shell:	Albania
Nippon Oil Co., Ltd.:	Multinok 2, Epinok 2
Kyodo Oil Co., Ltd.:	Lisonix 2
Idemitsu Petrochemical Co., Ltd.:	Coronex 2

② Templex N2 --- Used for the feeding gear block.

10g tube JUKI Part No.: 13525506

③ Juki Grease A --- Used for high-speed sliding parts and their peripheral parts.

10g tube JUKI Part No.: 40006323

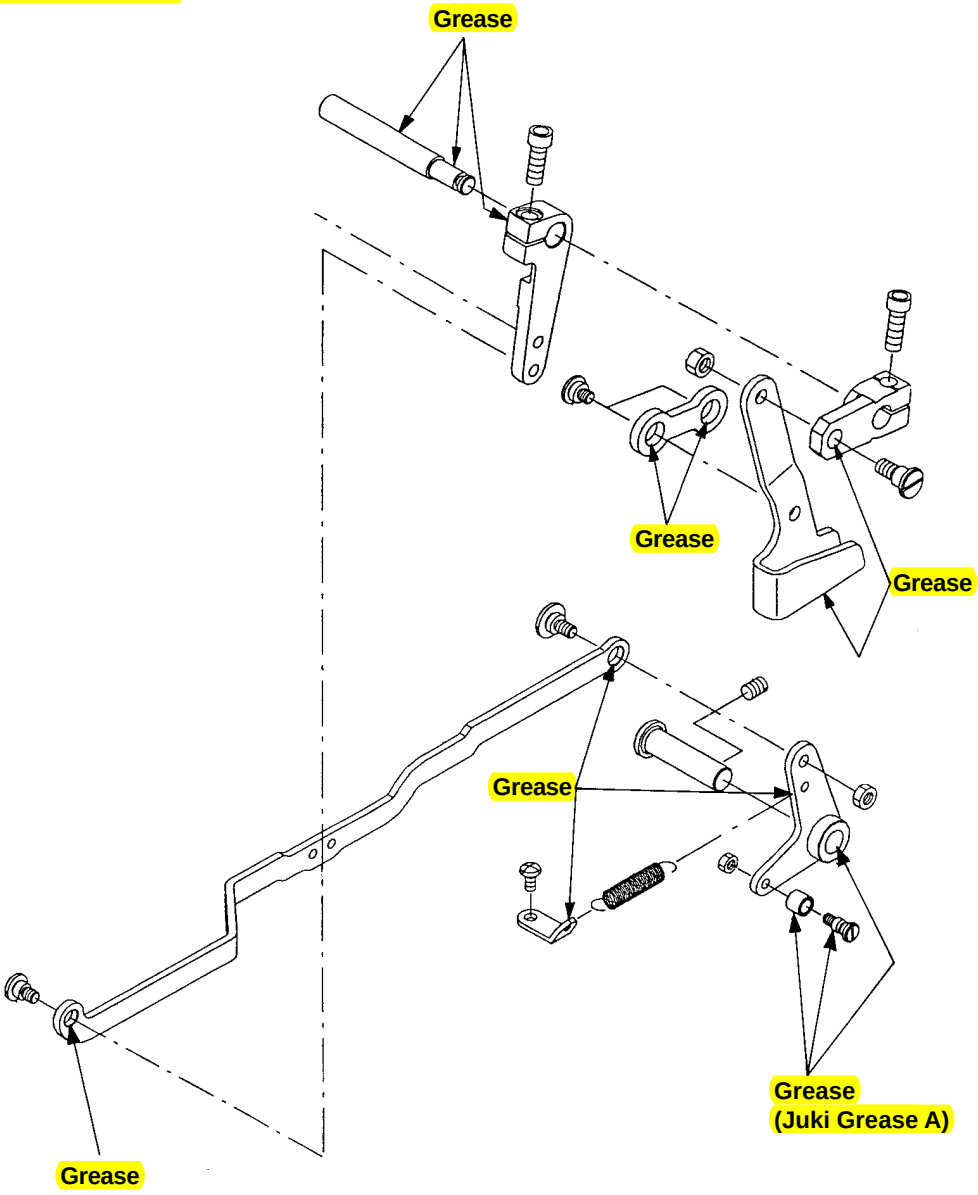
④ Juki Grease B --- Used, in particular, for the specific areas with highly loaded parts. Important: this grease must be replenished at the specified intervals of period, according to “(5) Grease-up procedures for the specified position.”

10g tube JUKI Part No.: 40013640

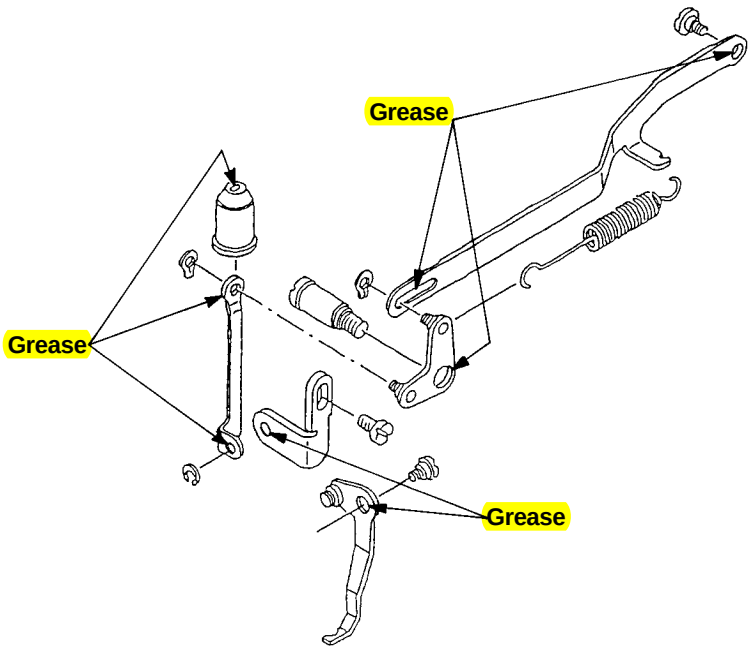
(3) Method of greasing
If no grease pump is available, fill a plastic oilcan with grease. Otherwise, an injector without a needle can be conveniently used.

(4) Parts to which grease is applied

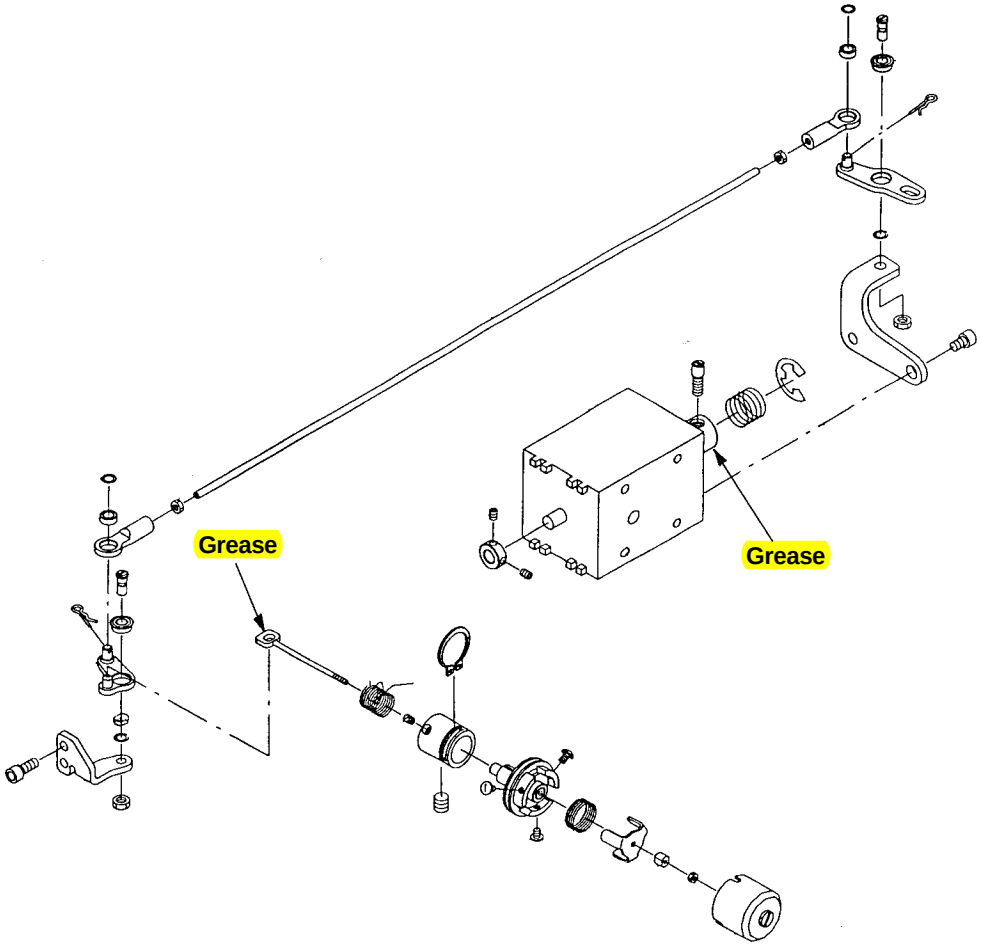
1) Presser bar lifter area



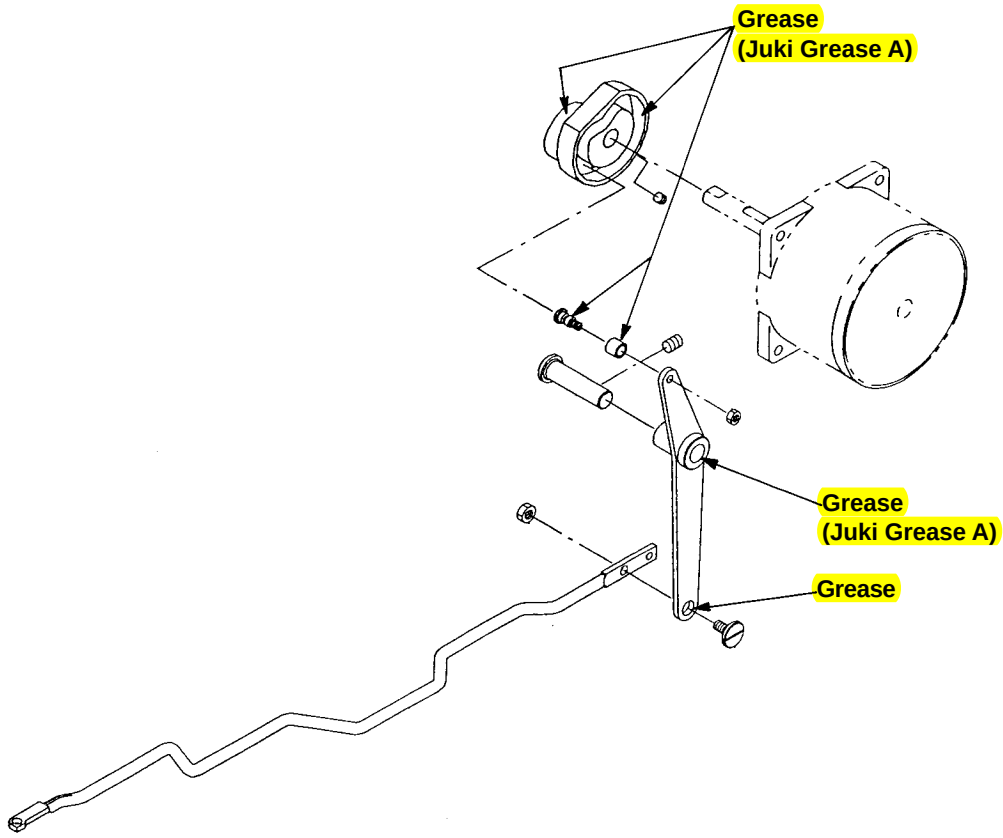
2) Wiper area



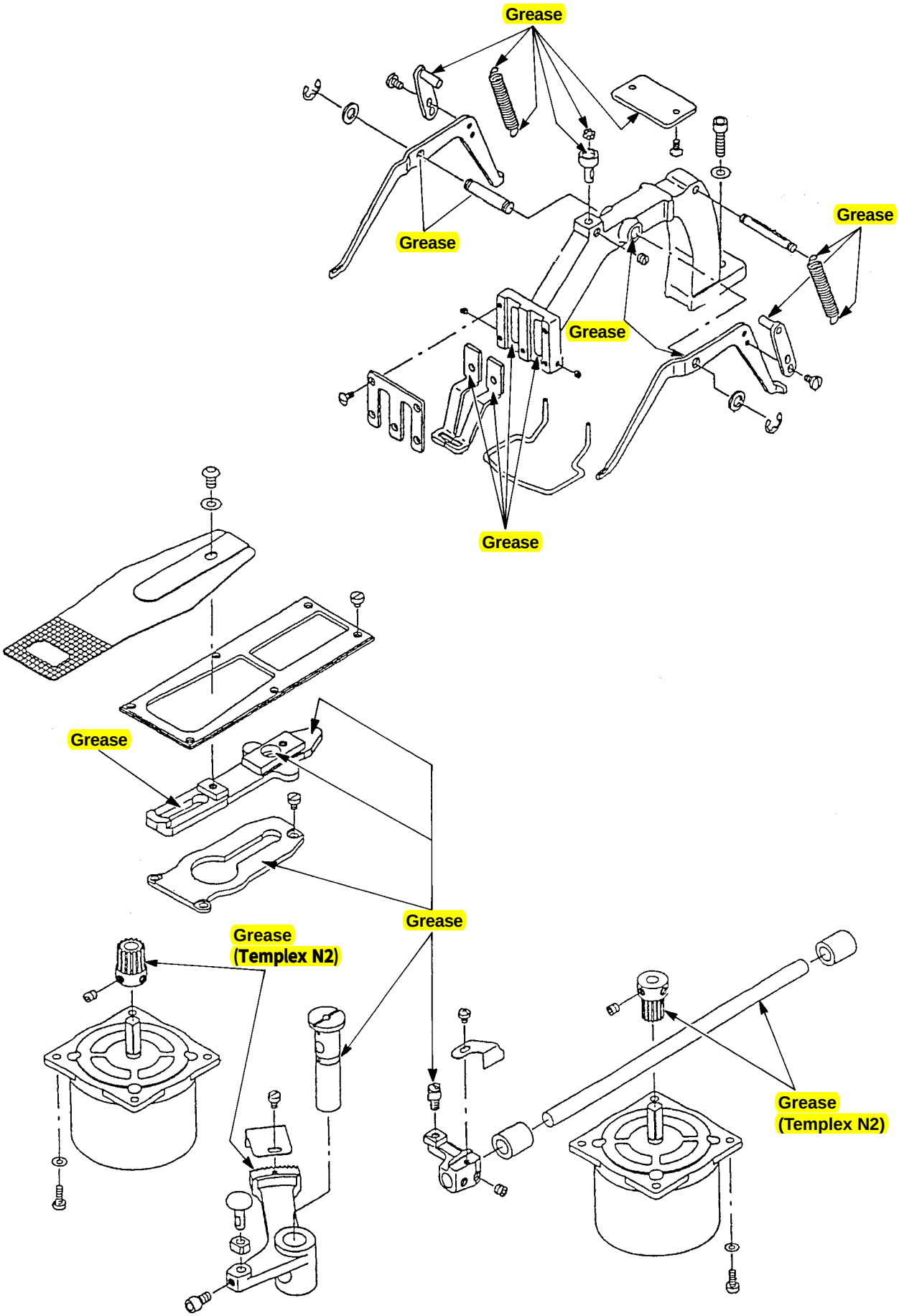
3) Thread tension area



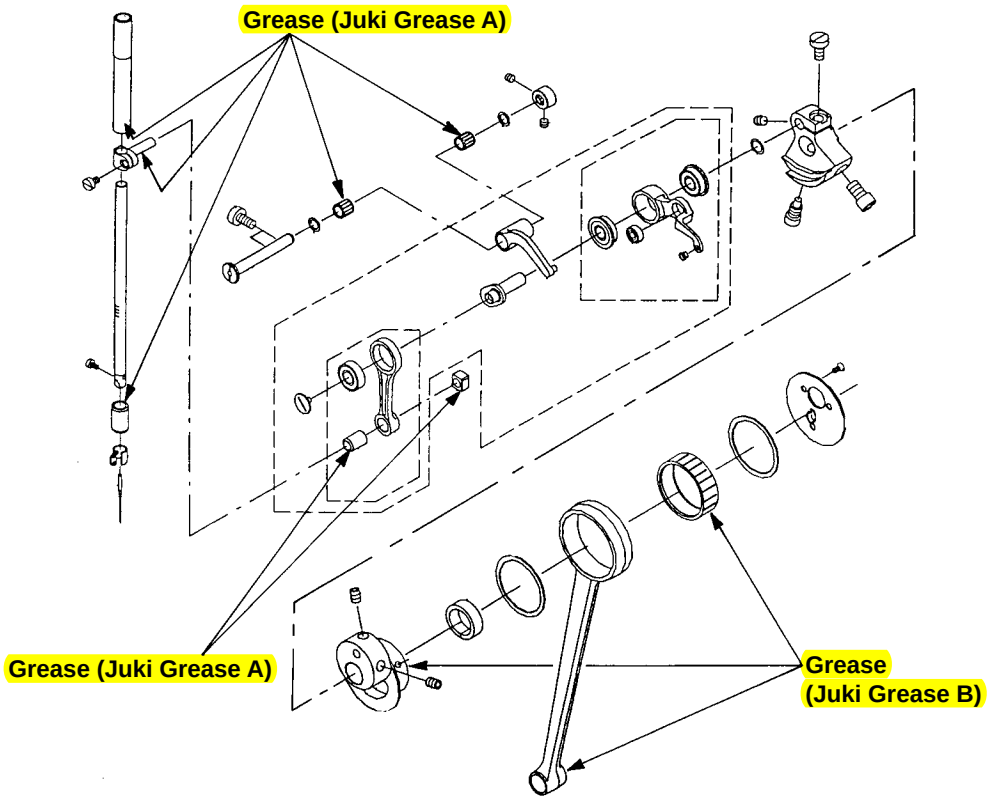
4) Thread trimmer area



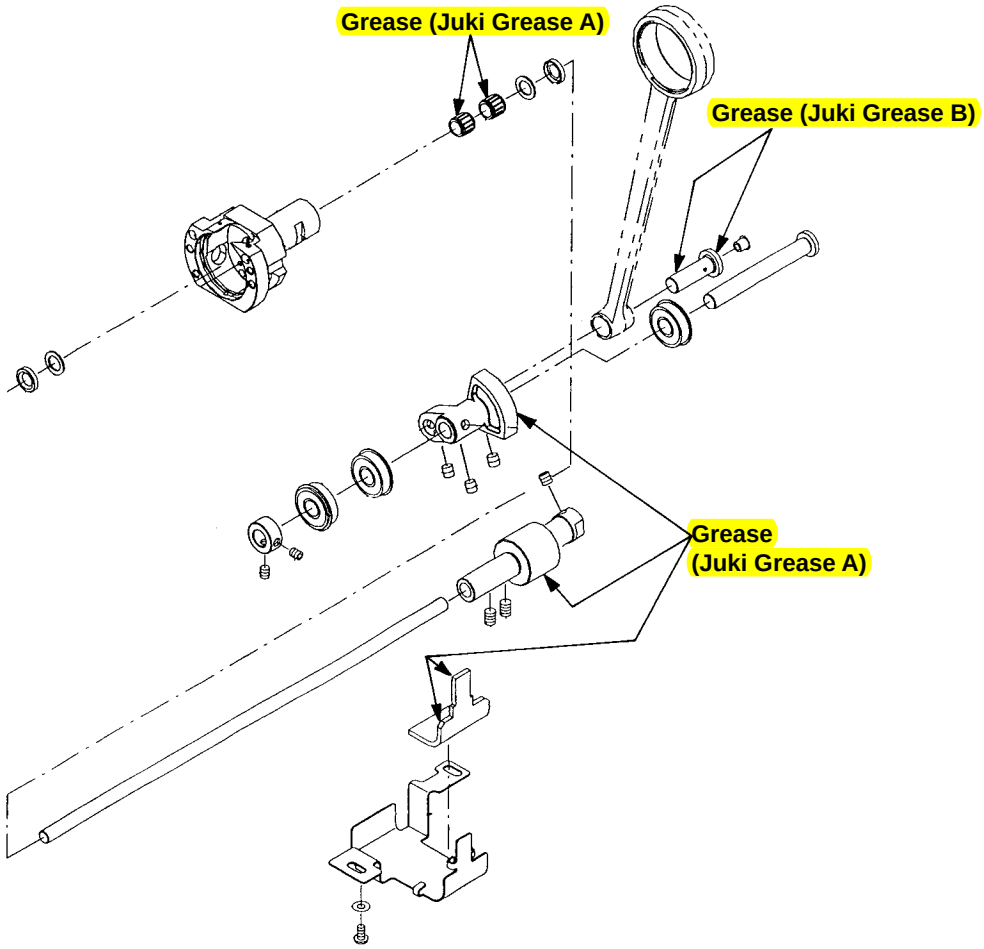
5) Feed area


Grease
Grease
Grease
Grease
Grease
Grease
Grease
(Templex N2)
Grease
(Templex N2)

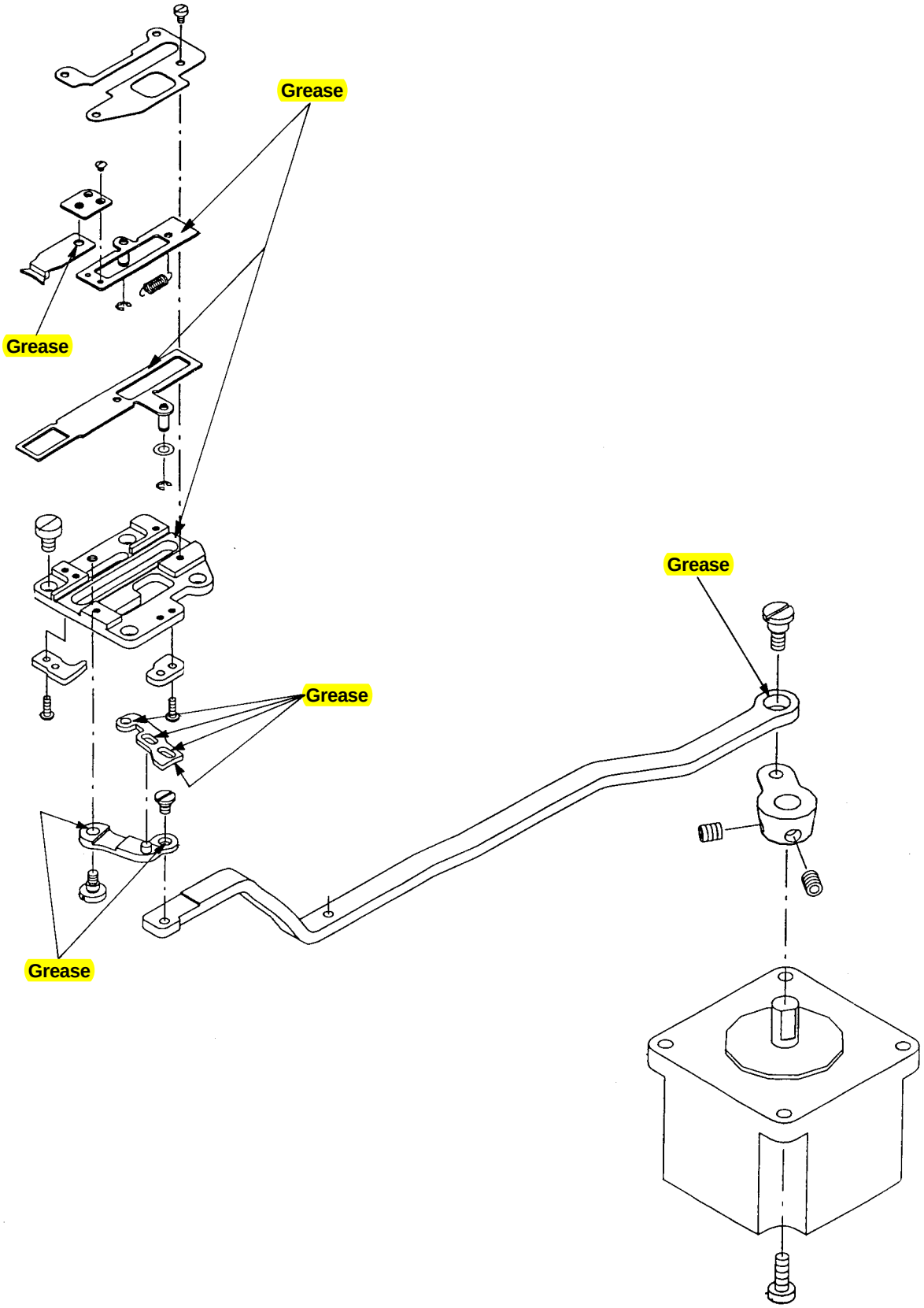
6) Needle bar and main shaft area



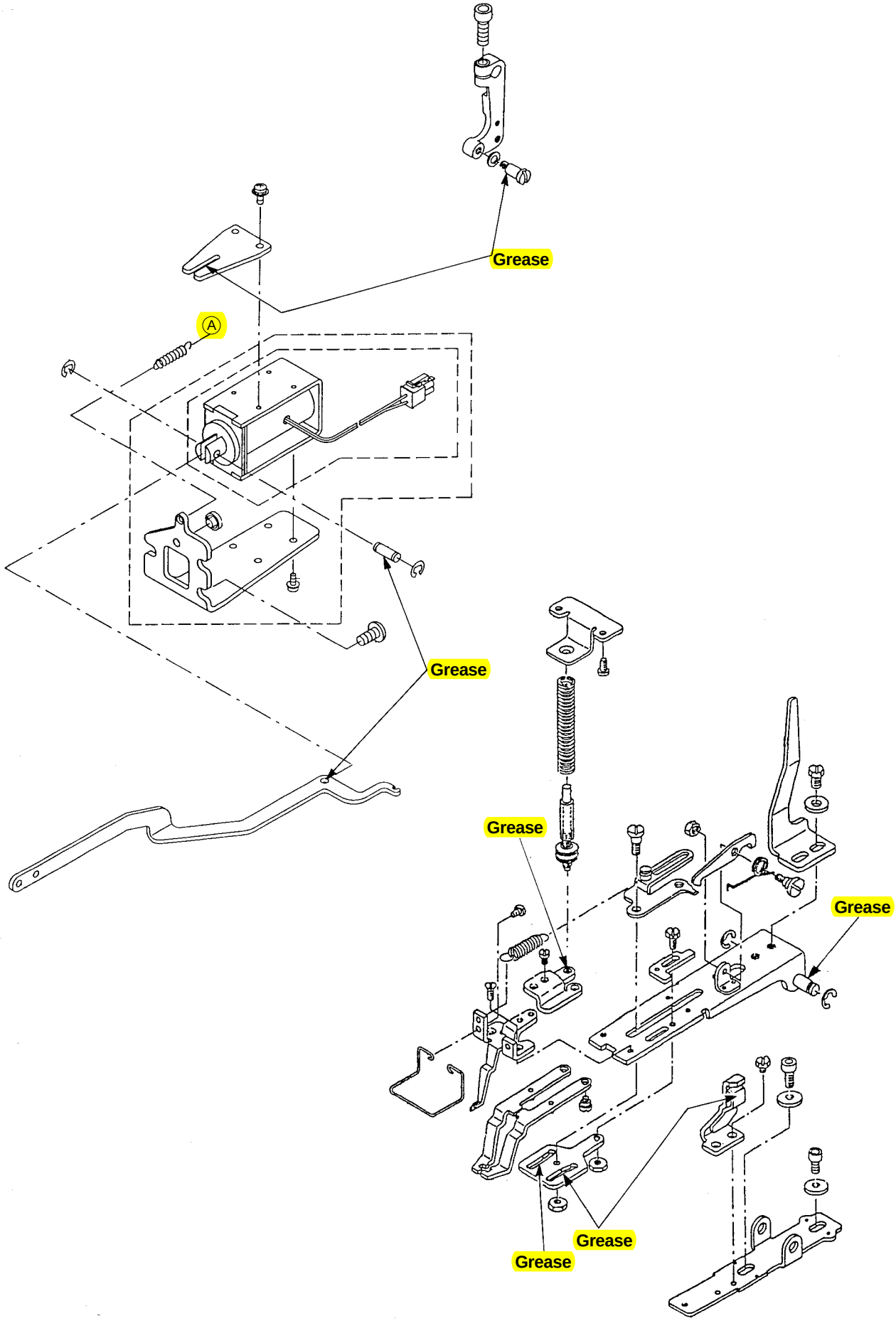
7) Lower shaft area



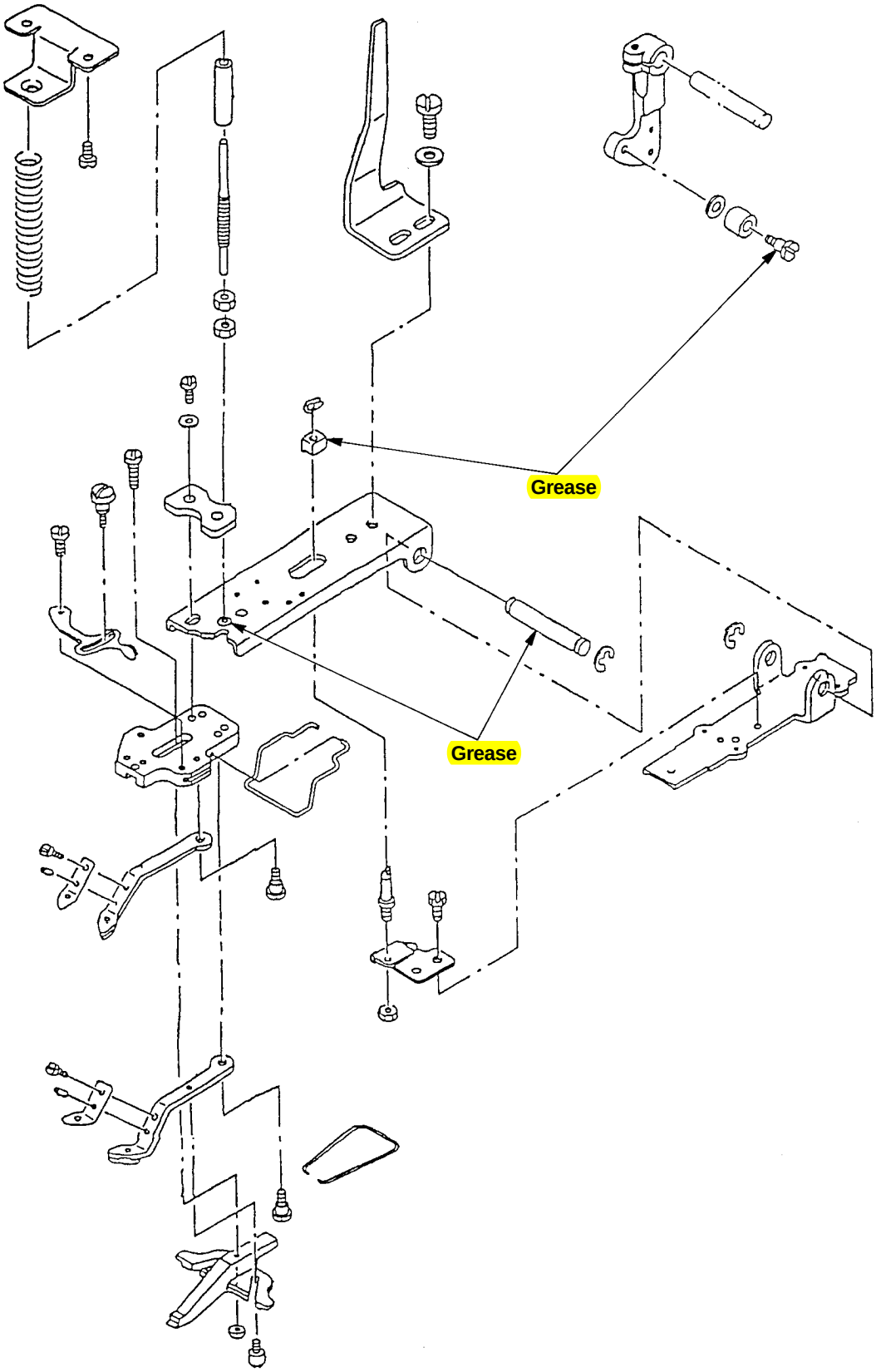
8) Needle thread clamp mechanism area



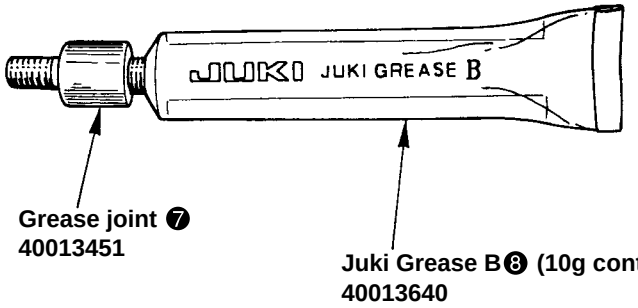
9) LK-1901A relations



10) LK-1903A relations



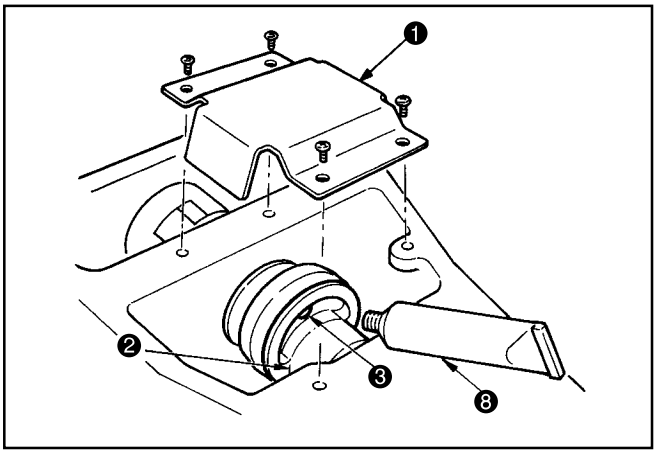
(5) Grease-up procedures for the specified position



When sewing operation is repeated for a certain time period, Error Code No. E220 is displayed at the operation panel when the power supply is turned ON. This error code is used for the indication of the grease replenishing time for the specified parts. When you see this error code, replenish the grease specified below, without fail. After greasing, call the memory switch No. 245 and set up “0” with the reset key.
Even after the display of Error Code No. E220, this error code can be canceled by pressing the reset key and the machine can be used continuously. Since then, however, this Error Code No. E220 is displayed each time the power supply is turned on.
When the sewing machine is used further for the specified time period after the display of Error Code No. E220, Error Code No. E221 is then displayed. In this case, this error code cannot be canceled even though the reset key is pressed, and the sewing machine cannot work anymore.
Therefore, when this Error Code No. E221 is displayed, replenish the grease, without fail, to the parts specified below. Start the memory switch and set up the Memory switch No. 245 at “0” with the reset key.

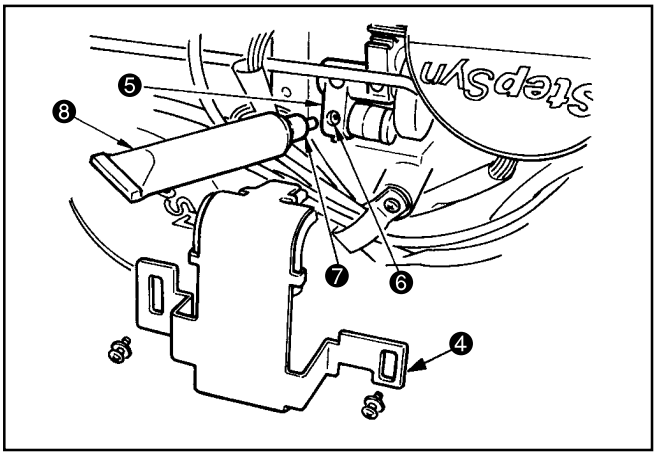
Cautions: 1. If the memory switch No. 245 is not reset at “0” after the replenishment of grease, Error No. E220 or No. E221 will be displayed again.
2. For the replenishment of grease to the parts specified below, use the attached Juki Grease B ❽ (Part No. 40013640). If any grease other than the specified item is replenished, this can be a cause of destruction of parts.

1) Greasing to the eccentric cam area



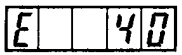
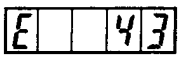
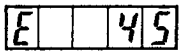
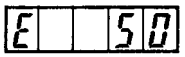
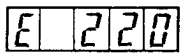
1. Open the upper cover and take out the grease cover ❶.
2. Remove the rubber cap ❸ that is located beside the eccentric cam ❷. Feed the specified grease (Juki Grease B ❽).

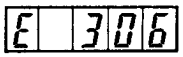
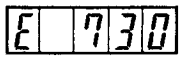
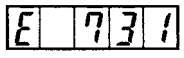
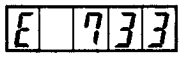
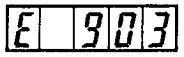
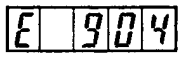
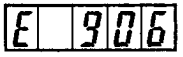
2) Greasing to the oscillator pin area

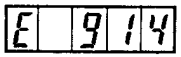
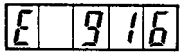
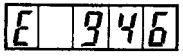


1. Lay down the sewing machine body and remove the grease cover ❹.
2. Remove the set screw ❻ of the oscillator gear ❺ and screw in the Juki Grease B ❽ into the threaded hole. This grease tube is attached with an accessory grease joint ❼. Then, the grease can be replenished. (The amount of grease to be replenished is 0.74 grams.)
3. After the grease has been replenished, firmly fasten the set screw ❻ that has been removed.

10. Table of errors

Indication	Name of error	Description of error	Corrective measure	Remarks
	Machine lock error	The main shaft of the sewing machine does not rotate due to some troubles.	Turn OFF the power switch and remove the cause of troubles.	
	Pattern No. error	Back-up pattern No. has not been registered in the data ROM, or it is set to readout inoperative. Pattern No. is set at “0”.	Press the reset switch and check the pattern No. Check the contents of memory switch No. 201.	
	Needle bar UP position error	Needle bar is out of the needle UP position.	Turn the hand pulley to return the needle bar to its UP position.	
	Sewing area over	The sewing area is beyond the limit.	Press the reset switch and check the pattern and X/Y scale rate.	This error is output when max. sewing area, 30 x 40 is over. Interference of the work clamp foot with needle is not protected
	Enlargement error	The sewing pitch is beyond 10mm.	Press the reset switch and check the pattern and X/Y scale rate.	
	Pattern data error	The pattern data cannot be adopted.	Turn OFF the power switch and check the data ROM.	
	Temporary stop	Temporary stop by operating the reset switch while the sewing machnine is running. (Refer to memory switch No. 31.)	Re-start or return-to-origin after thread trimming by means of the reset switch (For the details, refer to the item “Using the temporary stop function”, P.29.)	
	Notice for the grease replacement time	Indicates that it is the time to replenish grease to the specified parts.	Replenish the grease to the specified part and set the memory switch No. 245 at [0] with the reset key. If the grease cannot be fed soon in the middle of sewing work, the error can be canceled by means of the reset key.	9. Refer to Maintenance (5) “Replenishment of grease-up procedures for the specified position.”
	Grease replenishment alarm error	The sewing machine stopped due to the expiration of grease replenishment time to the specified parts.	Replenish the grease immediately and set the memory switch No. 245 at [0] with the reset key.	9. Refer to Maintenance (5) “Replenishment of grease-up procedures for the specified position.”
	Head tilt error	Head tilt detection switch is turned ON.	The sewing machine cannot be operated withe the head tilted. Return the sewing machine head to its proper position.	

Indication	Name of error	Description of error	Corrective measure	Remarks
	Z phase detection error	Detection of the upper dead point of the sewing machine cannot be performed.	Turn OFF the power switch and check whether CN14 of SDC circuit board is disconnected or loose.	
	Presser foot and thread trimmer position error	Presser foot and the thread trimmer is not in the proper position.	Turn OFF the power switch and check whether CN66 of INT circuit board is discoonected or loose.	
	Needle tread clamp position error	The needle thread clamp device is not in the proper position.	Turn OFF the power switch and check whether CN65 of INT circuit board is disconnected or loose.	
	Encoder trouble A	Encoder A or B phase cannot be detected.	Turn OFF the power switch and check whether Cn14 is loose or disconnected.	
	Encoder trouble B	Encoder U, V or W phase connot be detected.	Turn OFF the power switch and check whether CN14 is loose or disconnected.	
	Reverse rotation motor	The motor is reversing.	Turn OFF the power switch and check whether coupling of the main motor is loose.	
	Overvoltage error	Power source voltage is beyond the specified value.	Check the power source voltage.	
	Low voltage error	Power source voltage is short.	Check the power source voltage.	
	Motor driver trouble	Error from the motor driver is detected.	Turn OFF the power switch and turn ON the power switch again after some time..	
	Stepping motor power source trouble	Power source of the stepping motor is not output.	Turn OFF the power switch and check F1 fuse of SDC circuit board.	Check the cause of blown-out of the fuse.
	Solenoid power source trouble	Power source of the solenoid is not output.	Turn OFF the power switch and check F2 fuse of SDC circuit board.	Check the cause of blown-out of the fuse.
	SDC circuit board overheat	Overheat of SDC circuit board	Turn OFF the power switch and turn ON the power switch again after some time.	
	MAIN circuit board overheat	Overheat of MAIN circuit board	Turn OFF the power switch and turn ON the power switch again after some time.	
	X origin retrieval error	X origin sensor does not change.	Turn OFF the power switch and check whether CN62 of INT circuit board or CN42 of MAIN circuit board is disconnected or loose.	

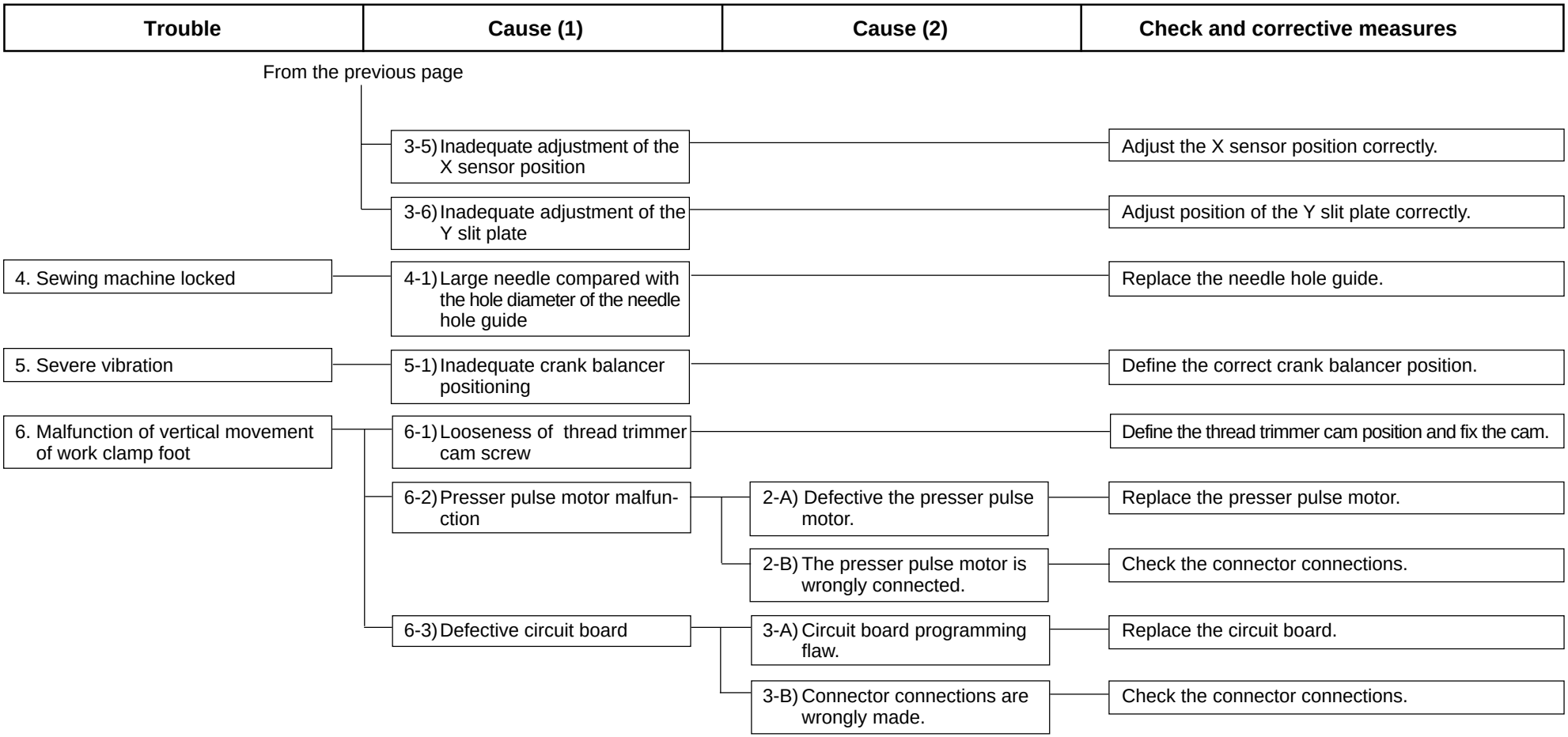
Indication	Name of error	Description of error	Corrective measure	Remarks
	Y origin retrieval error	Y origin sensor does not change.	Turn OFF the power switch and check whether CN63 of INT circuit board or CN43 of MAIN circuit board is discoonected or loose.	
	Work clamp foot origin retrieval error	Work clamp foot origin sensor does not change.	Turn OFF the power switch and check whether CN64 of INT circuit board or CN44 of MAIN circuit board is discoonected or loose.	
	Needle thread clamp origin retrieval error	Needle thread clamp origin sensor does not change.	Turn OFF the power switch and check whether CN65 of INT circuit board or CN45 of MAIN circuit board is discoonected or loose.	
	Feed trouble error	Timing lag between feed and main shaft has occurred.	Turn OFF the power switch and check whether coupling of the main motor is loose.	
	Communication error between panel and MAIN	Comminication between the panel and MAIN cannot be performed.	Turn OFF the power switch and check whether CN34 of MAIN circuit board is loose.	
	Communication error between panel and SDC	Comminication between MAIN and SDC cannot be performed.	Turn OFF the power switch and check whether CN32 of MAIN circuit board or CN15 of SDC circuit board is disconnected or loose.	
	MAIN memory write-in trouble	Memory write-in of MAIN circuit board cannot be performed.	Turn OFF the power switch and check the ins-rtion of ROM of U22 of MAIN circuit board.	
	INT memory write-in trouble	Memory write-in of the head circuit board cannot be performed.	Turn OFF the power switch and check whether CN38 of MAIN circuit board is disconnected or loose	
(No display) 	Abnormal power source Disconnection of connector	Power source voltage type is different. The connector is disconnected.	Turn OFF the power switch and check the power source voltage and check whether CN3 of FLT circuit board or CN13 of SDC circuit board is disconnected or loose.	

11. Troubles and corrective measures

(1) Troubles and corrective measures (Mechanical parts)

Trouble	Cause (1)	Cause (2)	Check and corrective measures
1. Wiper cannot spread a thread	1-1) Interference between wiper and needle	1-A) Wiper mounting position is inadequate.	Adjust the wiper position.
	1-2) Displacement of front-rear wiper position	2-A) Wiper mounting position is inadequate.	Adjust the wiper position.
	1-3) Thread holding before wiper action	3-A) The right left wiper mounting position is inadequate. (insufficient distance to the needle).	Adjust the wiper position
2. Abnormal noise	2-1) Backlash between the oscillator and the shuttle driver shaft is large.		Check oscillator gear positioning and adjust the lower shaft gear backlash.
	2-2) Too much clearance between shuttle and shuttle driver		Adjust the clearance between the shuttle and the shuttle driver.
3. Deformation in sewn patterns	3-1) Too much backlash in the Y feed gear	1-A) Backlash is too much in the Y feed arm and the motor base.	Adjust backlash of motor base.
		1-B) Backlash is too much in the Y feed pulse motor and the motor base.	Adjust backlash of Y feed pulse motor.
	3-2) Too much backlash in the X feed gear		Adjust backlash of the X feed gear.
	3-3) Travelling torque in X direction is excessive.	3-A) The motor is pressed against the X feed arm too strongly.	Adjust backlash of the motor.
		3-B) The feed plate or the work clamp foot is caught by the needle hole guide.	Tighten the set screw further for the needle hole guide.
	3-4) Travelling torque in Y direction is excessive.	4-A) The pulse motor is pressed against the Y feed shaft too strongly.	Adjust backlash of the feed motor gear.
		4-B) Friction is excessive between the Y feed arm and the cloth feed support plate.	Install the cloth feed support plate.
		4-C) The feed plate or the work clamp foot is caught by the needle hole guide.	Tighten the set screw further for the needle hole guide.

To the next page


Trouble
Cause (1)
Cause (2)
Check and corrective measures
From the previous page
3-5) Inadequate adjustment of the X sensor position
Adjust the X sensor position correctly.
3-6) Inadequate adjustment of the Y slit plate
Adjust position of the Y slit plate correctly.
4. Sewing machine locked
4-1) Large needle compared with the hole diameter of the needle hole guide
Replace the needle hole guide.
5. Severe vibration
5-1) Inadequate crank balancer positioning
Define the correct crank balancer position.
6. Malfunction of vertical movement of work clamp foot
6-1) Looseness of thread trimmer cam screw
Define the thread trimmer cam position and fix the cam.
6-2) Presser pulse motor malfunction
2-A) Defective the presser pulse motor.
Replace the presser pulse motor.
2-B) The presser pulse motor is wrongly connected.
Check the connector connections.
6-3) Defective circuit board
3-A) Circuit board programming flaw.
Replace the circuit board.
3-B) Connector connections are wrongly made.
Check the connector connections.

(2) Troubles and corrective measures (Sewing conditions)

Trouble	Cause (1)	Cause (2)	Check and corrective measures
1. Thread comes off at the start of sewing	1-1) Stitch skipping at the 1st stitch		Decrease the sewing speed at the start of sewing.
		1-A) Penetration registance of the thread against the cloth is small.	Use a thinner needle. (Lower the needle count to be used.)
	1-2) Length of thread remaining at the needle is not sufficient.	2-A) Tension controller No. 1 provides an excessive tension.	Properly adjust the tension controller No. 1.
		2-B) Floating of the AT thread tension disc is insufficient.	Adjust the amount of AT thread tension floating.
		2-C) Stroke of the thread take-up spring is excessive.	Adjust the stroke of the thread take-up spring.
		2-D) The thread take-up spring tension is insufficient.	Adjust the thread take-up spring tension.
		2-E) Level difference between the needle hole guide and the counter knife is excessively high.	Adjust the height of the counter knife.
		2-F) Needle thread tension is high and the thread is excessively stretched.	Adjust the needle thread tension.
		2-G) Thread spreading section of the moving knife has scratches.	Polish the thread spreading section of the moving knife with buff or replace the knife.
	1-3) Length of bobbin thread remaining is not sufficient.	3-A) Level difference between the needle hole guide and the counter knife is excessively high.	Adjust the height of the counter knife. (Otherwise, widen the gap.)
		3-B) Lower face of the needle hole guide has scratches.	Polish the needle hole guide with a buff or replace it.
		3-C) Thread spreading section of the moving knife has scratches.	Polish the thread spreading section of the moving knife with buff or replace the knife.
		3-D) Shuttle upper spring has scratches.	Polish the shuttle upper race with a buff or replace it.
		3-E) The bobbin thread tension is excessive.	Adjust the bobbin thread tension.
		3-F) The bobbin or bobbin case has scratches.	Polish it with a buff or replace it.

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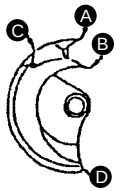
Trouble	Cause (1)	Cause (2)	Check and corrective measures
	From the previous page		
	1-4) Material to be sewn is not properly stretched.		Remove the slack of the material to be sewn.
	1-5) Unstable needle thread clamp	5-A) Thread tends to be extended or sliding efficiency is worse.	Increase the needle thread clamp needle number to 3~4 stitches.
			Lower the speed of the first stitch. (600 ~ 1000rpm)
		5-B) Pitch of the first stitch is too small.	Lower the needle thread tension of the first stitch.
			Increase the pitch of the first stitch.
	1-6) Threading the needle bar thread guide is wrong.		Refer to the item “Threading the needle bar thread Guide”.
	1-7) Bobbin runs idle and the bobbin thread is drawn out.		Use a stronger idling prevention spring.
		7-A) Initial positioning of the moving knife is inadequate.	Adjust the initial position of the moving knife.
2. Needle breakage	2-1) Inadequate clearance between the shuttle driver and the needle		Adjust the clearance between needle and shuttle driver.
	2-2) Inadequate clearance between the needle and the inner hook.		Adjust the clearance between the needle and the inner hook.
	2-3) Feed timing is defective	3-A) Feed timing is slow in regard to the work pressure.	Change the feed timing by the use of the memory switch.
	2-4) Needle coming in contact with the moving knife		Adjust the moving knife position.
			Adjust the work clamp foot (feed bracket) position.
	2-5) Needle coming in contact with the wiper		Adjust the wiper position.
	2-6) Needle is bent	6-A) The needle thread tension is too high.	Adjust the tension to a proper level.
		6-B) The presser bar treads on the needle thread at the beginning of sewing and the wiper is caught.	Increase the crosswise clearance between the wiper and the needle. 23 ~ 25mm
	2-7) Needle is too thin.		Change the needle No. to the suitable one to the material.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
3. Stitch Skipping	3-1) Too much clearance between the needle and the inner hook.		Adjust the clearance between needle and inner hook.
	3-2) Inadequate timing adjustment for the needle and the inner hook.		Adjust timing for the needle and the inner hook.
	3-3) Inadequate clearance between the shuttle driver and the needle		Adjust the clearance between needle and shuttle driver.
	3-4) Material to be sewn is not properly stretched.	4-A) Too much clearance between the work clamp foot and sewing object	Adjust the work clamp foot height.
			Remove the slackness of the sewing object.
	3-5) Needle is bent or blunt.		Replace the needle.
	3-6) Loop of the needle thread falls down.		Attach the needle with the long groove orienting slightly to the right. (Approximately 20°)
		6-A) Feed timing is too fast.	Change the feed timing by the use of the memory switch.
4. Thread breakage	4-1) Stratches on the inner hook 	1-A) Scratches on section Ⓐ (Contact of the inner hook with the needle)	After polishing the blade point of the inner hook with oilstone, polish it with polishing powder. Properly adjust the clearance between the needle and the inner hook.
		1-B) Scratches on section Ⓑ (Scratches occur when the needle is bent or broken.)	After polishing the blade point of the inner hook, polish it with polishing powder.
		1-C) Scratches on section Ⓒ (Needle scratches the inner hook when removing the inner hook.)	After polishing the blade point of the inner hook, polish it with polishing powder.
		1-D) Scratches on section Ⓓ	After polishing the blade point of the inner hook, polish it with polishing powder.
	4-2) Thread enters into the shuttle.	2-A) Position of the shuttle upper spring is wrong.	Properly adjust the position of the shuttle upper spring.
		2-B) Blade point section Ⓐ of the shuttle is round. 	Replace the inner hook.
		2-C) Position of the shuttle is wrong.	Properly adjust the position od the shuttle.
		2-D) Needle thread tension is too low.	Properly adjust the needle thread tension.

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Trouble	Cause (1)	Cause (2)	Check and corrective measures
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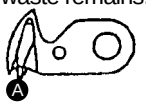
		2-E) Thread take-up spring tension is too low.	Adjust the thread take-up spring.
		2-F) Length of the remaining needle thread is too long.	Properly adjust the tension controller No. 1.
		2-G) The specified inner hook and shuttle driver are not used.	Use the specified parts.
	4-3) Scratches on the shuttle driver.		Remove the scratches and polish with buff, or replace the shuttle driver.
	4-4) Clearance between the shuttle driver and the inner hook is too small.		Properly adjust the clearance between the shuttle driver and the inner hook.
	4-5) Scratches on the needle hole guide.		Remove the scratches and polish with buff, or replace the needle hole guide.
	4-6) Finish of the needle hole is rough.		Replace the needle.
	4-7) Thread take-up spring is maladjusted.	7-A) Stroke of the thread take-up spring is too large.	Properly adjust the thread take-up spring.
		7-B) Thread take-up spring tension is too high.	Properly adjust the thread take-up spring.
	4-8) Rotation of the inner hook is defective.	8-A) Race face of the shuttle is clogged with thread waste.	Remove the inner hook and remove the thread waste.
		8-B) Oil amount is insufficient.	Supply oil to the shuttle components.
	4-9) Needle thread clamp device OFF	9-A) Needle thread length is inadequate.	Adjust the needle thread length and turn the needle thread clamp device ON.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
5. Thread breakage at the time of thread trimming.	5-1) Thread release timing is defective.	1-A) Floating amount of the thread tension disk No. 2 is small.	Adjust the amount of thread tension No. 2 floating.
	5-2) Thread spreading section of the moving knife has scratches.		Paying attention to the blade section, polish with polishing powder.
	5-3) Shuttle upper spring has scratches.		Remove the scratches.
	5-4) Level difference between the needle hole guide and the counter knife is too high.	4-A) Thread is cut before trimming with the blade section of the moving knife.	Properly adjust the position of counter knife.
	5-5) Clearance between the needle hole guide and the counter knife is too small.	5-A) Thread is cut before trimming with the blade section of the moving knife.	Properly adjust the position of counter knife.
	5-6) Lower face of the needle hole guide has scratches.	6-A) Thread is cut with the needle hole guide.	Remove the scratches and polish with buff, or replace the needle hole guide.
	5-7) Thread spreading timing of the moving knife is defective.		Adjust initial positions of the presser origin sensor, thread trimmer, and the moving knife.
	5-8) Thread take-up spring tension is too low.		Adjust the thread take-up spring.
6. Defective thread trimming	6-1) Sharpness of the knife is difective	1-A) Worn-out of the moving and counter knives.	Replace the moving and counter knives.
		1-B) Engagement of the moving and counter knives is defective.	Properly adjust the heigh and position of the moving and counter knives.
		1-C) Parallel of the blade section of counter knife is defective.	Properly adjust the parallel of the blade section of counter knife.
		1-D) Attaching position of the counter knife is defective.	Properly adjust the attaching position of counter knife.
	6-2) Double cutting for the needle thread. (Thread waste remains inside the cylinder arm cap.)	2-A) There is a burr on thread spreading section Ⓐ of the moving knife. The shape of the thread trimmed becomes ⟶ and thread waste remains. 	Paying attention to the blade section, polish with polishing power, or replace the moving knife.
		2-B) Shuttle upper spring has scratches. (The shape of the thread trimmed becomes ⟶ and thread waste remains.)	Remove the scratches.

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Trouble	Cause (1)	Cause (2)	Check and corrective measures
	6-3) Moving knife does not spread threads.	3-A) Initial position of the moving knife is maladjusted.	Adjust the initial position of the moving knife.
		3-B) Thread trimmer cam position is inadequate.	Adjust the thread trimmer cam position.
		3-C) Position of the shuttle upper spring is defective.	Adjust the position of shuttle upper spring .
	6-4) Stitch skipping at the final stitch	4-A) Timing of the needle to the inner hook and the clearance between them are defective.	Adjust the timing and the clearance.
		4-B) Work clamp foot big.	Let the biginning of stitch come closer to the presser by moving the pattern.
		4-C) Loop of the needle thread falls down.	Attach the needle with the long groove orienting slightly to the right (approximately 20°)
	6-5) Bobbin thread cannot be cut.	5-A) Bobbin thread tension is low.	Streng then the bobbin thread tension.
		5-B) Needle hole size of the needle hole guide is large.	Replace the needle hole guide with a new one having a smaller hole diameter.
7. Poorly tense stitches	7-1) Tension controller No. 2 is maladjusted.	1-A) Tension of the tension controller No. 2 is low.	Properly adjust the tension of tension controller No. 2.
	7-2) Tension controller No. 2 is floating.		Adjust the thread tension releasing mechanism.
	7-3) Thread take-up spring is maladjusted.		Adjust thread take-up spring tension and stroke.
	7-4) Clearance between the inner hook and the shuttle driver is defective.	4-A) The clearance between the inner hook and the shuttle driver is too small.	Properly adjust the clearance of inner hook and shuttle driver.
	7-5) Selection of the needle to be used is improper.	5-A) Needle to be used is thin.	Replace the needle with a thicker one.
	7-6) Selection of the needle hole guide is improper.	6-A) Hole diameter of the needle hole guide to the needle to be used and thread is small.	Replace the needle hole guide with a new one having a larger needle hole.

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Trouble	Cause (1)	Cause (2)	Check and corrective measures
From the previous page			
8. Defective stitches with the synthetic thread	7-7) Shape of the feed plate is defective.	7-A) Material to be sewn is stiff and closely contacted with the throat plate, and there is no clearance between them to pass the thread.	Raise the material to be sewn by means of the feed plate.
		7-B) Material to be sewn is highly elastic and closely contacted with the throat plate, and there is no clearance between them to pass the thread.	Raise the material to be sewn by means of the feed plate.
	7-8) Feed timing is defective	8-A) Feed timing is too fast.	Use the memory switch to change the feed timing.
	8-1) Thread breakage due to heat	1-A) The sewing speed is too fast.	Slow down the maximum speed.
		1-B) The needle used is too thick.	Use a thin needle or a super needle for the synthetic thread.
			Use silicon.
			Use a needle cooler.
	8-2) Thread makes burrs.	2-A) Thread path is defective.	Polish the thread path of each component with polishing powder.
		2-B) Finish of the needle hole is defective.	Replace the needle.
		2-C) Loop of the needle thread falls down.	Move the thread guide A to the left.
	8-3) Thread floating occurs at the sewing start.	3-A) Penetration registance of the thread against the cloth is too small.	Use a thinner needle. (Lower the number of needle to be used.)
			Needle thread clamp device ON.
	8-4) Stitch skipping due to the heat.	4-A) Sewing speed is too fast.	Change the maximum speed (electrical components.)
		4-B) Needle is too thin.	Use a thicker needle. (Raise the number of needle to be used.)
		4-C) Loop of the needle thread falls down.	Attach the needle with the long groove orienting slightly to the right (approximately 20°).
			Use a needle cooler.
	8-5) Uneven stitch tightness due to the stretch of thread.	5-A) Sewing speed is too fast.	Reduce the speed by means of the speed variable resistor.
		5-B) Tension of the tension controller No. 2 is excessive.	Decrease the tension of tension controller No. 2.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
9. Thread chips generated in the shuttle	9-1) Long needle thread at the beginning of stitches	1-A) The thread trimmer is used for cutting.	Needle thread clamp device OFF
			Adjust the needle thread length to 32 ~ 36mm
			Increase the sewing length to more than 10mm.
10. Roll-in malfunction of remaining thread at underside material.	10-1) Protrusion of needle thread	1-A) Material does not keep close contact with the throat plate.	Change the feed plate.
		1-B) Stitch size is short.	Increase the sewing size to more than 10mm.
		1-C) The needle thread is long.	Adjust the needle thread length to 32 ~ 36mm.

(3) Troubles and corrective measures (Electrical components) (Refer to “Block diagram A”)

Trouble	Cause (1)	Cause (2)	Check and corrective measures
1. No display at the operation panel	1-1) No supply of DC power.	1-A) AC power is not supplied.	Examine if a power supply is available at the power switch.
		1-B) The FLT board has no power supply.	Check whether an AC voltage is available between Pins 4-5 of CN1 in the FLT board. If no voltage is found, check the connections around the power switch.
		1-C) The SDC board has no power supply.	Check whether DC 280V is available between Pins 1-3 of CN17 in the SDC board. If no voltage is found, check the connections toward the FLT board. If there is no problem in connections, replace the FLT board.
		1-D) The MAIN board has no power supply.	Check whether DC 5V is available between Pins4-8 of CN31 in the MAIN board. Check the power supply for the SDC board unit and examine if there is short-circuiting in the 5V power system.
		1-E) The operation panel has no power supply.	Confirm that the cable from the operation panel is connected to CN34 of the MAIN board. If there is no problem in connections, replace the MAIN or PANEL board.
	1-2) Detection of a momentary interruption in the SDC board Led 3 on SDC board: Flashing 9 times	2-A) There is no connection between CN3 of the FLT board and CN13 of the SDC board.	Check the connection between CN3 of the FLT board and CN13 of the SDC board.
		2-B) No AC voltage is available between Pins 4-5 of CN1 in the FLT board.	When a sewing machine for 3-phase specifications is used in a 1-phase system, connect the power supply to red and white of the power cord led from the box.
	1-3) Difference in source voltage	3-A) High input voltage	Check the 100/200V selector cord in the FLT board.
			Check the source voltage.
2. Key malfunction on the operation panel	2-1) No signal transmission	1-A) Input circuit is out of order.	Replace the PANEL board.
3. Error E007 Machine lock error LED3 on SDC board: Flashing once	3-1) The main shaft motor of the sewing machine cannot rotate.	1-A) The motor connector is disconnected or broken.	Check CN16 of the SDC board to see if there is any disconnection.
		1-B) The mechanism is locked.	Check the mechanism and look for the section that is particularly overloaded or whether screws are loose.
		1-C) The driver circuit is out of order.	Replace the SDC board.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
4. Error E030 Needle bar up position displacement	4-1) Displacement of the up position	1-A) The stop position is inadequate.	Try to turn the main shaft by hand. Check if there is any particular heavy load.
			Disconnect CN16 and check the resistance value among pins. Replace the motor, as required.
5. Error E302 Head tilt error	5-1) Detector switch contact open	1-A) Connector CN67 of the INT board is disconnected.	Check CN67 of the INT board.
		1-B) The switch cord is broken.	
		1-C) The safety switch is broken.	Check whether the terminal leads are broken or the switch turns ON/OFF correctly.
		1-D) The switch does not function.	Confirm the mounting condition of the switch.
6. Error E303 Main shaft motor Phase Z sensor error LED3 on SDC board: Flashing twice	6-1) Phase Z signal (main shaft motor) does not enter.	1-A) The encoder cord is broken or out of order.	Confirm whether each signal is delivered to CN14 of the SDC board. In the case of encoder error, replace the motor as a whole. [See the Servo Motor Circuit Diagram.]
		1-B) The detector circuit is out of order.	Replace the SDC board.
7. Error E305 Thread trimmer sensor error	7-1) Irregular motor revolutions	1-A) There are irregularities in the mechanism, such as over-loading, etc.	Check the presser bar and thread trimmer mechanisms and look for the section that is particularly overloaded or whether screws are loose.
		1-B) Motor leads are broken. The motor is out of order.	Disconnect CN44 (red) of the MAIN board and check the motor resistance. [See the Pulse Motor/ Solenoid Circuit Diagram.] Replace the motor.
		1-C) The driver circuit is out of order.	Replace the MAIN board.
	7-2) No sensor signal entry Use of Test Mode CP-1 or CP-2	2-A) The sensor is out of order or broken.	Check whether the sensor lamp is turned ON/OFF when a metallic plate is moved closer to or separated from the sensor plane. In the case of no lamp ON/OFF, the sensor is broken or the connector block is disconnected.
		2-B) The INT board connector is disconnected.	Check the connection of CN66 (red) of the INT board.
		2-C) Sensor mounting position is inadequate.	Check and correct the sensor mounting position.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
8. Error E306 Needle thread clamp sensor error	8-1) Irregular motor rotations	1-A) There are irregularities in the mechanism, such as overloading, etc.	Check the mechanism and look for the section that is particularly overloaded or whether screws are loose.
		1-B) Motor leads are broken. The motor is out of order.	Disconnect CN45 (yellow) of the MAIN board and check the motor resistance. [See the Pulse Motor/ Solenoid Circuit Diagram.] Replace the motor.
	8-2) No sensor signal entry Use of Test Mode CP-1 or CP-2	2-A) The sensor is out of order or broken.	Check whether the sensor lamp is turned ON/OFF when a metallic plate is moved closer to or separated from the sensor plane. In the case of no lamp ON/ OFF, the sensor is broken or the connector block is disconnected.
		2-B) The INT board connector is disconnected.	Check the connection of CN65 (yellow) of the INT board
		2-C) Sensor mounting position is inadequate.	Check and correct the sensor mounting position.
9. Error E730 Main shaft motor encoder error A LED3 on SDC board: Flashing 3 times	9-1) Phase A and Phase B signals (main shaft motor) do not enter.	1-A) The encoder cord is broken or out of order.	Confirm whether each signal is delivered to CN14 of the SDC board. In the case of encoder error, replace the motor as a whole. [See the Servo Motor Circuit Diagram.]
		1-C) There is internal disconnection in the SDC board.	Replace the SDC board.
10. Error E731 Main shaft motor encoder error B LED3 on SDC board: Flashing 4 times	10-1)Position signals U, V, W (main shaft motor) do not enter.	1-A) The encoder cord is broken or out of order.	Confirm whether each signal is delivered to CN14 of the SDC board. In the case of encoder error, replace the motor as a whole. [See the Servo Motor Circuit Diagram.]
		1-B) There is internal disconnection in the SDC board.	Replace the SDC board.
11. Error E733 Reverse rotation of the main shaft motor LED 3 on SDC Board: Flashing 7 times	11-1)Irregular motor rotations	1-A) Motor connections are inadequate or broken.	Check whether the connections are correct or broken around CN16 of the SDC board. [See the Servo Motor Circuit Diagram.]
	11-2)Incorrect encoder signal transmission	2-A) The encoder cord is broken or out of order.	Confirm whether each signal is delivered to CN14 of the SDC board. In the case of encoder error, replace the motor as a whole. [See the Servo Motor Circuit Diagram.]
		2-B) The driver circuit is out of order.	Replace the SDC board.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
12. Error E811 Overvoltage error LED3 on SDC board: Flashing 8 times	12-1) Excessive AC input voltage (More than 280V)	1-A) There are variations or unusual rise in the AC input power line.	Check the AC input power line.
		1-B) The detector circuit is out of order.	Replace the SDC board.
13. Error E813 Low voltage error LED3 on SDC board: Flashing 6 times	13-1) Insufficient AC input voltage (Less than 160V)	1-A) There are variations or unusual drop in the AC input power line.	Check the AC input power line.
		1-B) 100V is used despite the 200V setting. (FLT board for 3-phase specifications)	Check the voltage setting (100V or 200V) in the FLT board.
		1-C) The detector circuit is out of order.	If everything is OK after the above checks, the SDC board is out of order.
14. Error E901 Main shaft motor IPM error LED3 on SDC board: Flashing 5 times	14-1) The main shaft motor driving IPM in the SDC board generates an error output	1-A) IPM heat generation is excessive.	Check whether electric box cooling is effective. Look for clogging around air suction holes and check the fan, etc.
		1-B) The main shaft motor is out of order.	Disconnect CN16 of the SDC board and check the resistance among pins. [See the Servo Motor Circuit Diagram.]
		1-C) The driver circuit is out of order.	Replace the SDC board.
15. Error E903 Pulse motor source error LED3 on SDC board: Flashing 11 times	15-1) No +85V power output of the SDC board available	1-A) Fuse F1 of the SDC board is broken.	Check for the presence of short-circuiting in the +85V system of the MAIN board. Eliminate the cause and replace the fuse.
		1-B) Fuse F4 of the SDC board is broken.	Replace the SDC board.
	15-2) There is a deviation of more than ±15% in the +85V source of the SDC board.	2-A) The power circuit is out of order.	Replace the SDC board.
16. Error E904 Solenoid power source error LED3 on SDC board: Flashing 12 times	16-1) No +33V power output of the SDC board available	1-A) Fuse F2 of the SDC board is broken.	Check for the presence of short-circuiting in the +33V system of the MAIN board. Eliminate the cause and replace the fuse.
		1-B) Fuse F5 of the SDC board is broken.	
	16-2) There is a deviation of more than ±15% in the +33V source of the SDC board.	2-A) The power circuit is out of order.	Replace the SDC board.

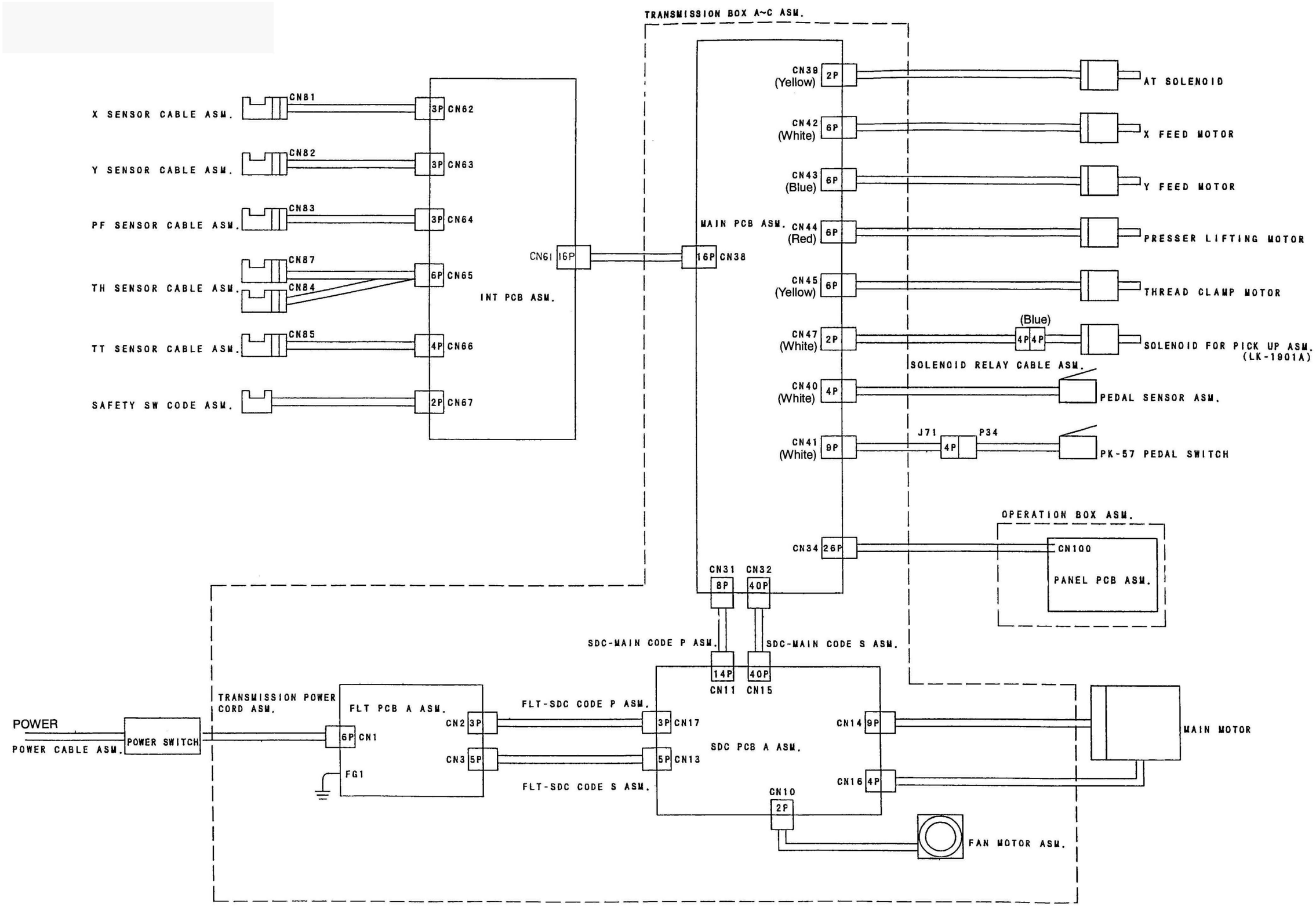
Trouble	Cause (1)	Cause (2)	Check and corrective measures
17. Error E905 Thermal error in SDC board LED3 on SDC board: Flashing 13 times	17-1) Heat sink temperature of the SDC board has exceeded 85°C.	1-A) Failing in cooling.	Check whether electric box cooling is effective. Look for clogging around air suction holes and check the fan, etc.
		1-B) The SDC board is out of order.	Replace the SDC board.
18. Error E907 X origin retrieval error	18-1)Irregular motor rotations	1-A) There are irregularities in the mechanism, such as overloading, etc.	Check the mechanism and look for the section that is particularly overloaded or whether screws are loose.
		1-B) Motor leads are broken. The motor is out of order.	Disconnect CN42 (white) of the MAIN board and check the motor resistance. [See the Motor/ Solenoid Circuit Diagram.] Replace the motor.
		1-C) The MAIN board is out of order.	Replace the MAIN board.
	18-2)No sensor signal entry Use of Test Mode CP-1 or CP-2	2-A) The sensor is out of order or broken.	Check whether the sensor lamp is turned ON/OFF when a metallic plate is moved closer to or separated from the sensor plane. In the case of no lamp ON/ OFF, the sensor is broken or the connector block is disconnected.
		2-B) The INT board connector is disconnected.	Check the connection of CN62 (red) of the INT board.
		2-C) Sensor mounting position is inadequate.	Check and correct the sensor mounting position.
19. Error E908 Y origin retrieval error	19-1) Irregular motor rotations	1-A) There are irregularities in the mechanism, such as overloading, etc.	Check the mechanism and look for the section that is particularly overloaded or whether screws are loose.
		1-B) Motor leads are broken. The motor is out of order.	Disconnect CN43 (blue) of the MAIN board and check the motor resistance. [See the Motor / Solenoid Circuit Diagram.] Replace the motor.
		1-C) The MAIN board is out of order.	Replace the MAIN board.
	19-2)No sensor signal entry Use of Test Mode CP-1 or CP-2	2-A) The sensor is out of order or broken.	Check whether the sensor lamp is turned ON/OFF when a metallic plate is moved closer to or separated from the sensor plane. In the case of no lamp ON/ OFF, the sensor is broken or the connector block is disconnected.
		2-B) The INT board connector is disconnected.	Check the connection of CN63 (yellow) of the INT board.
		2-C) Sensor mounting position is inadequate.	Check and correct the sensor mounting position.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
20. Error E910 Work clamp foot origin retrieval error	20-1) Irregular motor rotations	1-A) There are irregularities in the mechanism, such as overloading, etc.	Check the mechanism and look for the section that is particularly overloaded or whether screws are loose.
		1-B) Motor leads are broken. The motor is out of order.	Disconnect CN44 (red) of the MAIN board and check the motor resistance. [See the Motor / Solenoid Circuit Diagram.] Replace the motor.
		1-C) The MAIN board is out of order.	Replace the MAIN board.
	20-2)No sensor signal entry Use of Test Mode CP-1 or CP-2	2-A) The sensor is out of order or broken.	Check whether the sensor lamp is turned ON/OFF when a metallic plate is moved closer to or separated from the sensor plane. In the case of no lamp ON/OFF, the sensor is broken or the connector block is disconnected.
		2-B) The INT board connector is disconnected.	Check the connection of CN64 (black) of the INT board
		2-C) Sensor mounting position is inadequate.	Check and correct the sensor mounting position.
21. Error E913 Needle thread clamp origin retrieval error	21-1) Irregular motor rotations	1-A) There are irregularities in the mechanism, such as overloading, etc.	Check the mechanism and look for the section that is particularly overloaded or whether screws are loose.
		1-B) Motor leads are broken. The motor is out of order.	Disconnect CN45 (yellow) of the MAIN board and check the motor resistance. [See the Motor/ Solenoid Circuit Diagram.] Replace the motor.
		1-C) The driver circuit has no power supply. (24V)	Check F3 of the SDC board. After confirming the presence of short-circuiting in the 24V system, replace the fuse.
	21-2)No sensor signal entry Use of Test Mode CP-1 or CP-2	2-A) The sensor is out of order or broken.	Check whether the sensor lamp is turned ON/OFF when a metallic plate is moved closer to or separated from the sensor plane. In the case of no lamp ON/OFF, the sensor is broken or the connector block is disconnected.
		2-B) The INT board connector is disconnected.	Check the connection of CN65 (yellow) of the INT board
		2-C) Sensor mounting position is inadequate.	Check and correct the sensor mounting position.

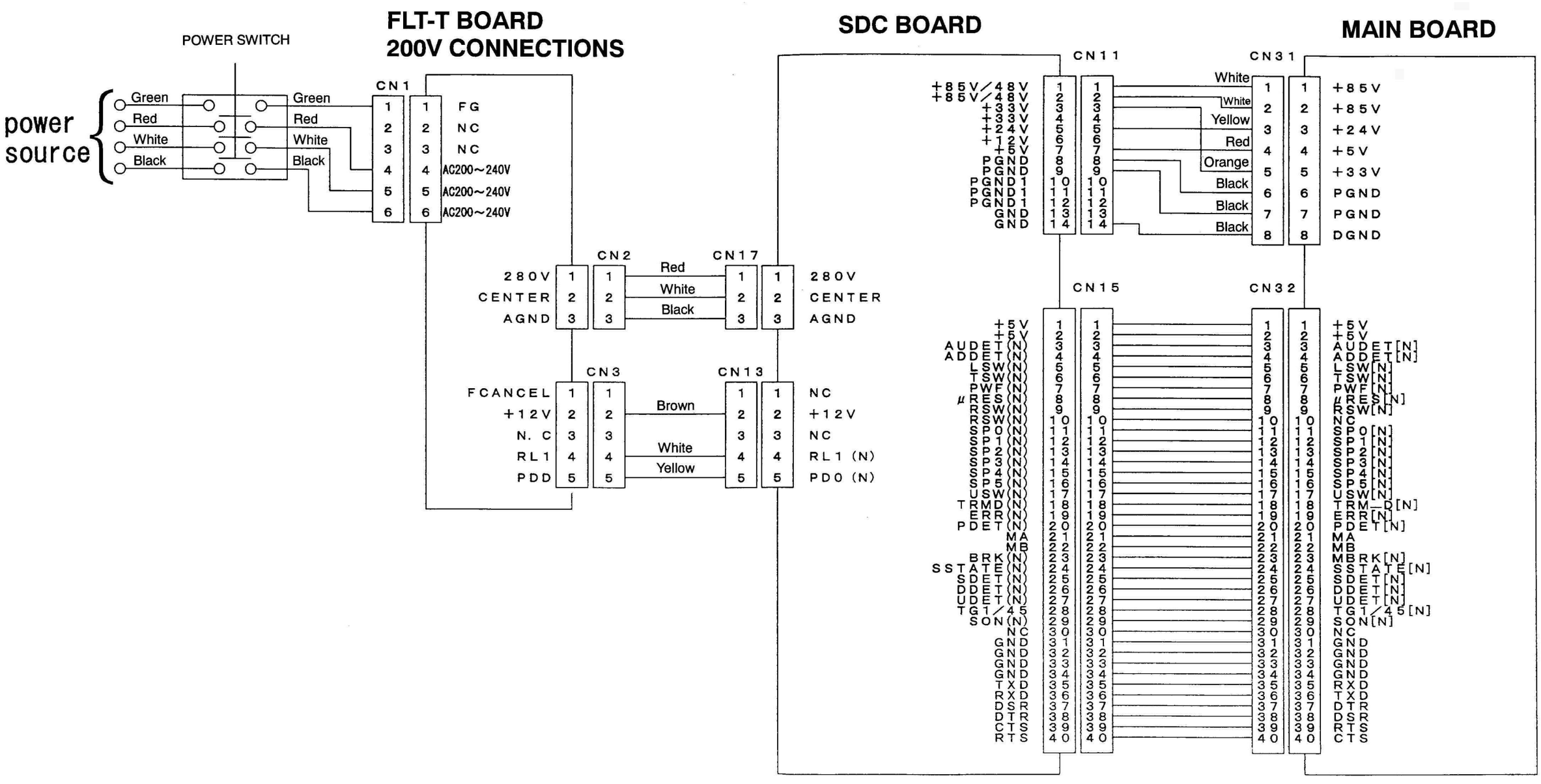
Trouble	Cause (1)	Cause (2)	Check and corrective measures
22. Error E914 Feed error	22-1) Main shaft motor failing in normal rotations	1-A) There are irregularities in the mechanism, such as overloading, etc.	Check the mechanism and look for the section that is particularly overloaded or whether screws are loose.
		1-B) The main shaft motor is out of order.	Disconnect CN16 of the SDC board and check the resistance among pins. [See the Servo Motor Circuit Diagram.]
		1-C) The SDC board is out of order.	Replace the SDC board.
23. Error E915 Panel – MAIN communication error	23-1) Communication error between the Panel and MAIN boards	1-A) MAIN board setting is inadequate.	All the dipswitches on the MAIN board must be OFF.
		1-B) The MAIN board or the operation panel is out of order.	Try to replace the operation panel or the MAIN board.
24. Error E916 MAIN – SDC communication error LED3 on SDC board: Flashing 15 times	24-1) Communication error between the MAIN and SDC boards	1-A) The SDC – MAIN cord connector is disconnected.	Check the connections in the SDC – MAIN cord set and check if any disconnection is present. CN15 of the SDC board and CN32 of the MAIN board.
		1-B) MAIN and SDC board setting is inadequate.	All the dipswitches on the MAIN and SDC boards must be OFF.
		1-C) The MAIN or SDC board is out of order.	Try to replace the MAIN or SDC board.
25. Error E943 MAIN board EEPROM writing error	25-1) MAIN board EEPROM failing in writing	1-A) MAIN board EEPROM is disconnected.	Check whether EEPROM is correctly mounted.
		1-B) The MAIN board is out of order.	Replace the MAIN board.
26. Error E946 INT board EEPROM writing error	26-1) INT board EEPROM failing in writing	1-A) INT board connector CN38 is disconnected.	Check CN38 of the MAIN board to see whether it is disconnected or broken.
		1-B) The MAIN or INT board is	Replace the MAIN or INT board.

12. Circuit diagrams

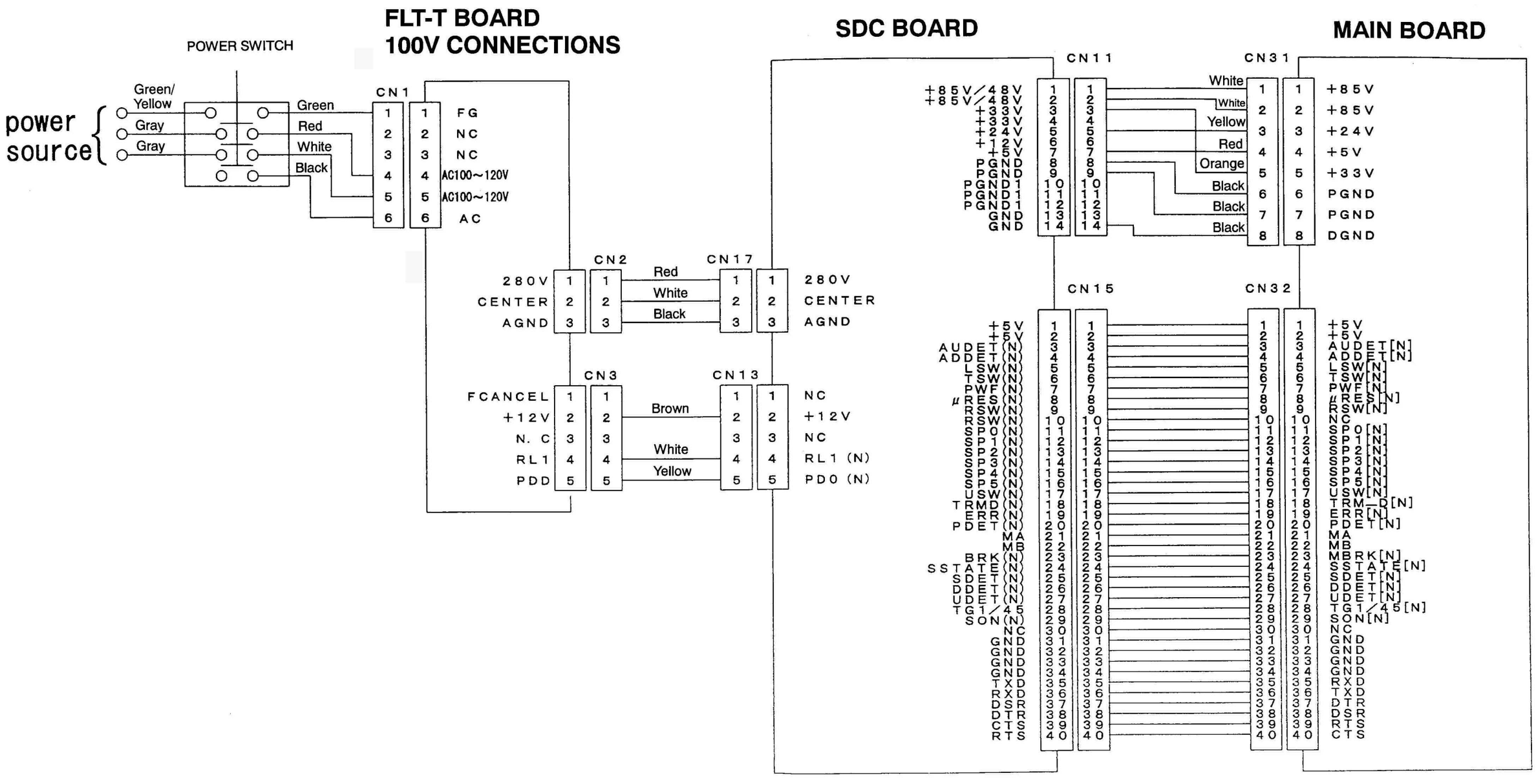
(1) Block diagram A



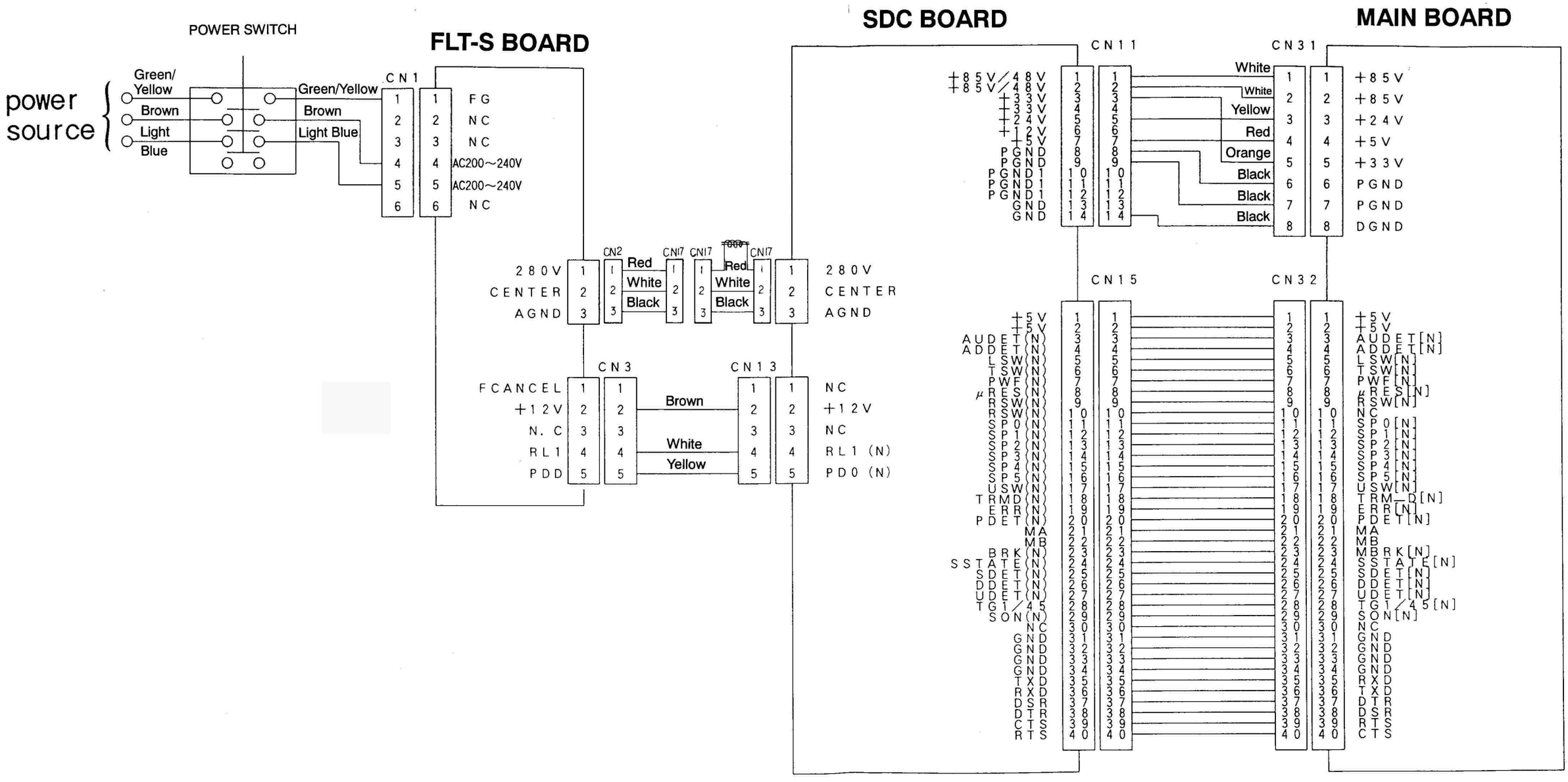
(2) Power supply circuit diagram A



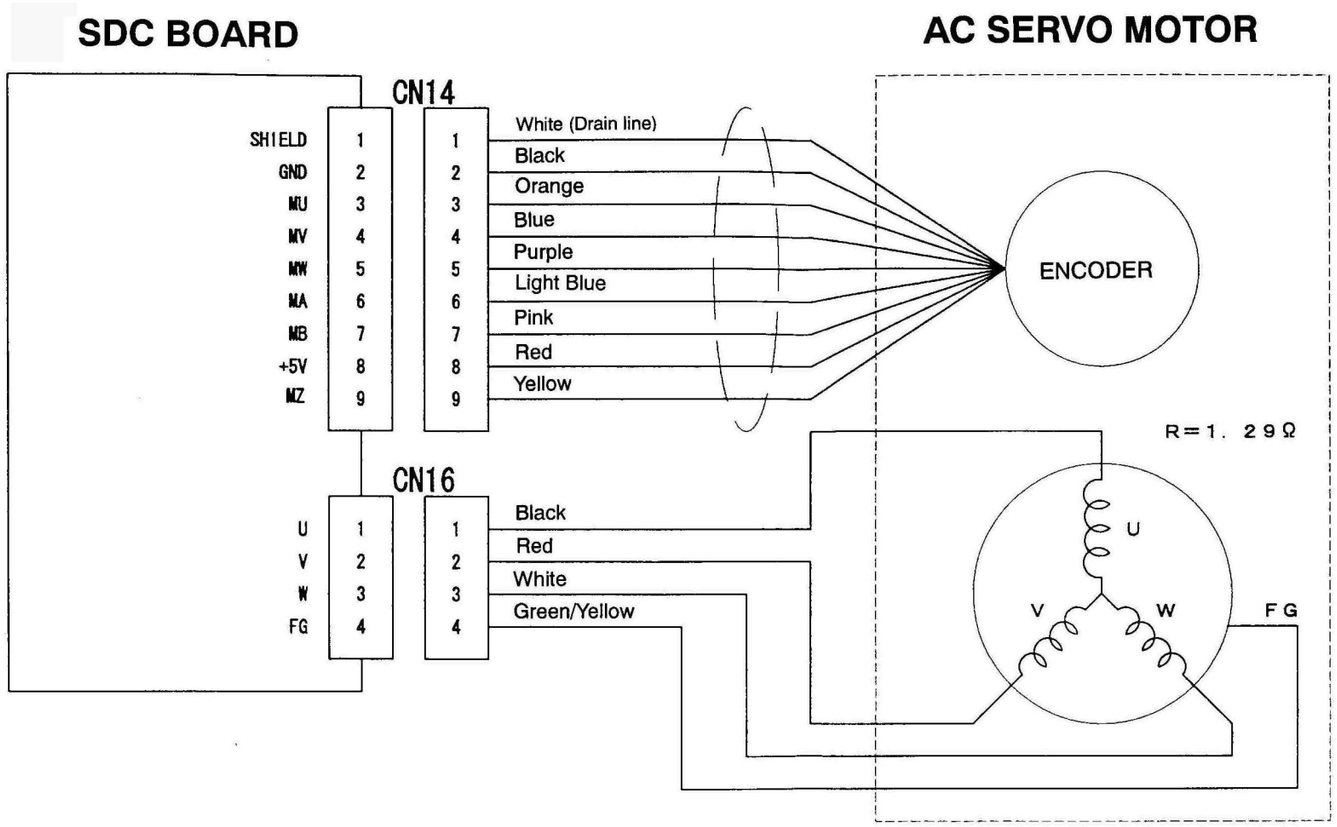
(3) Power supply circuit diagram B



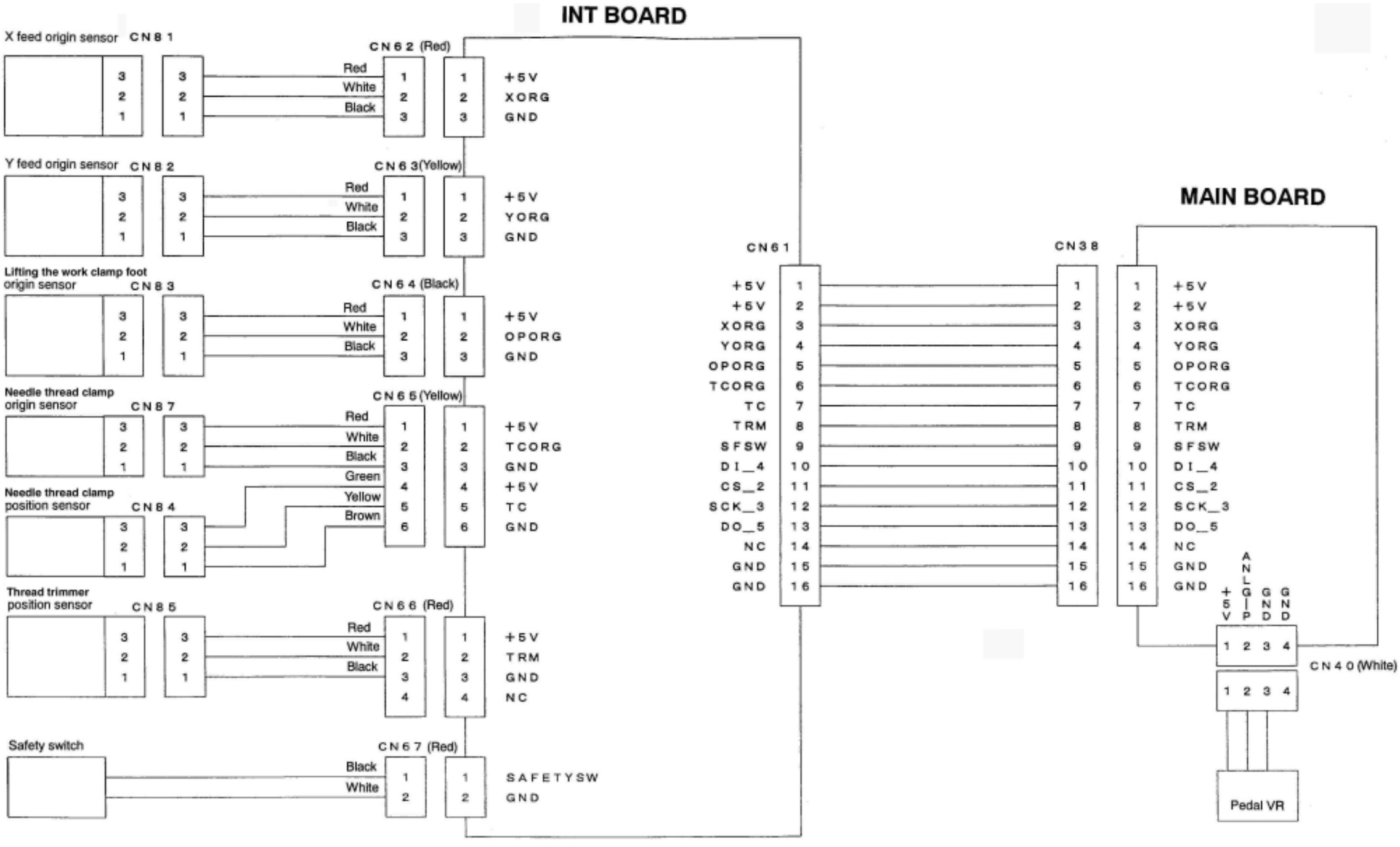
(4) Power supply circuit diagram C



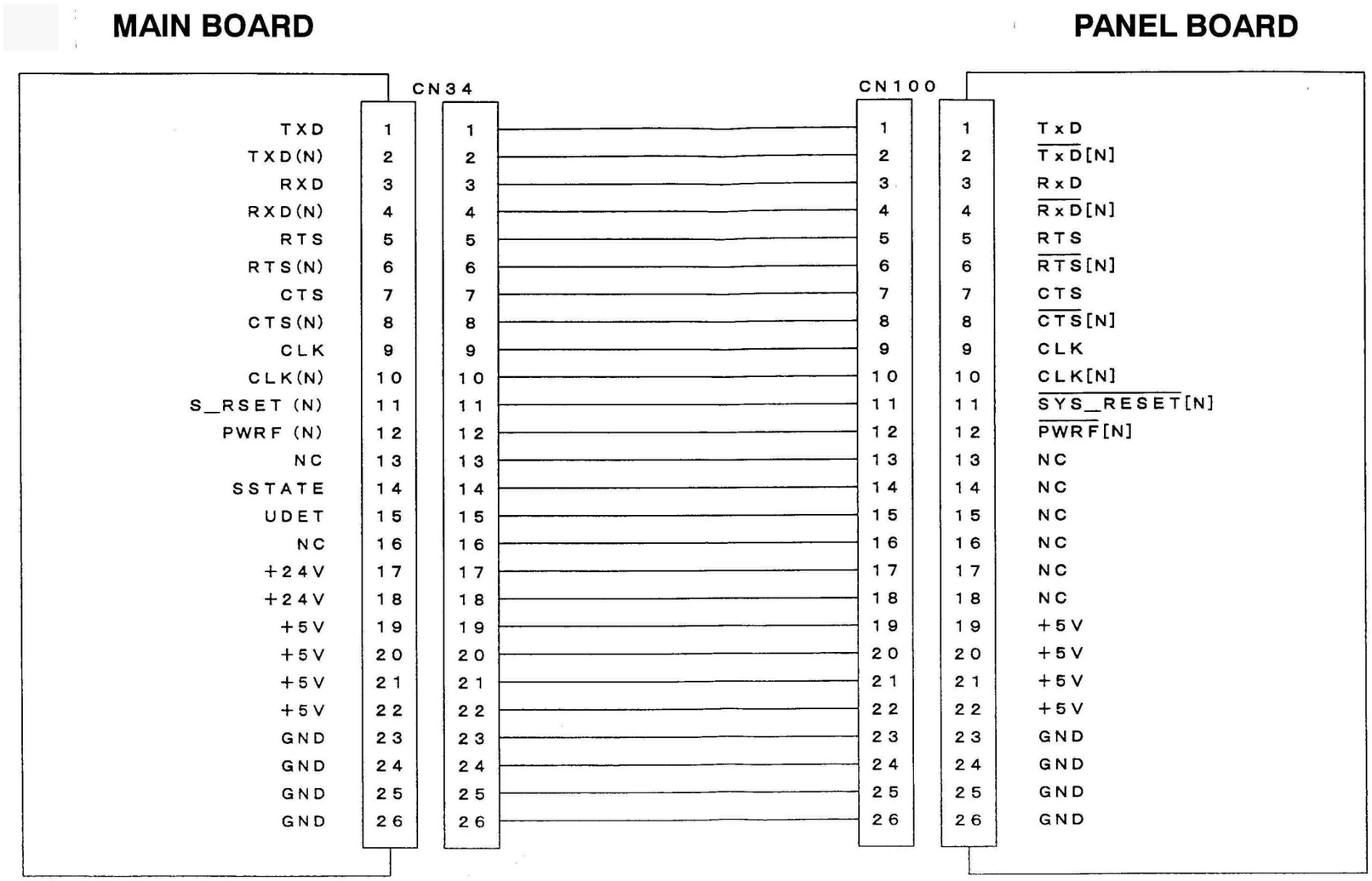
(5) Servo motor circuit diagram



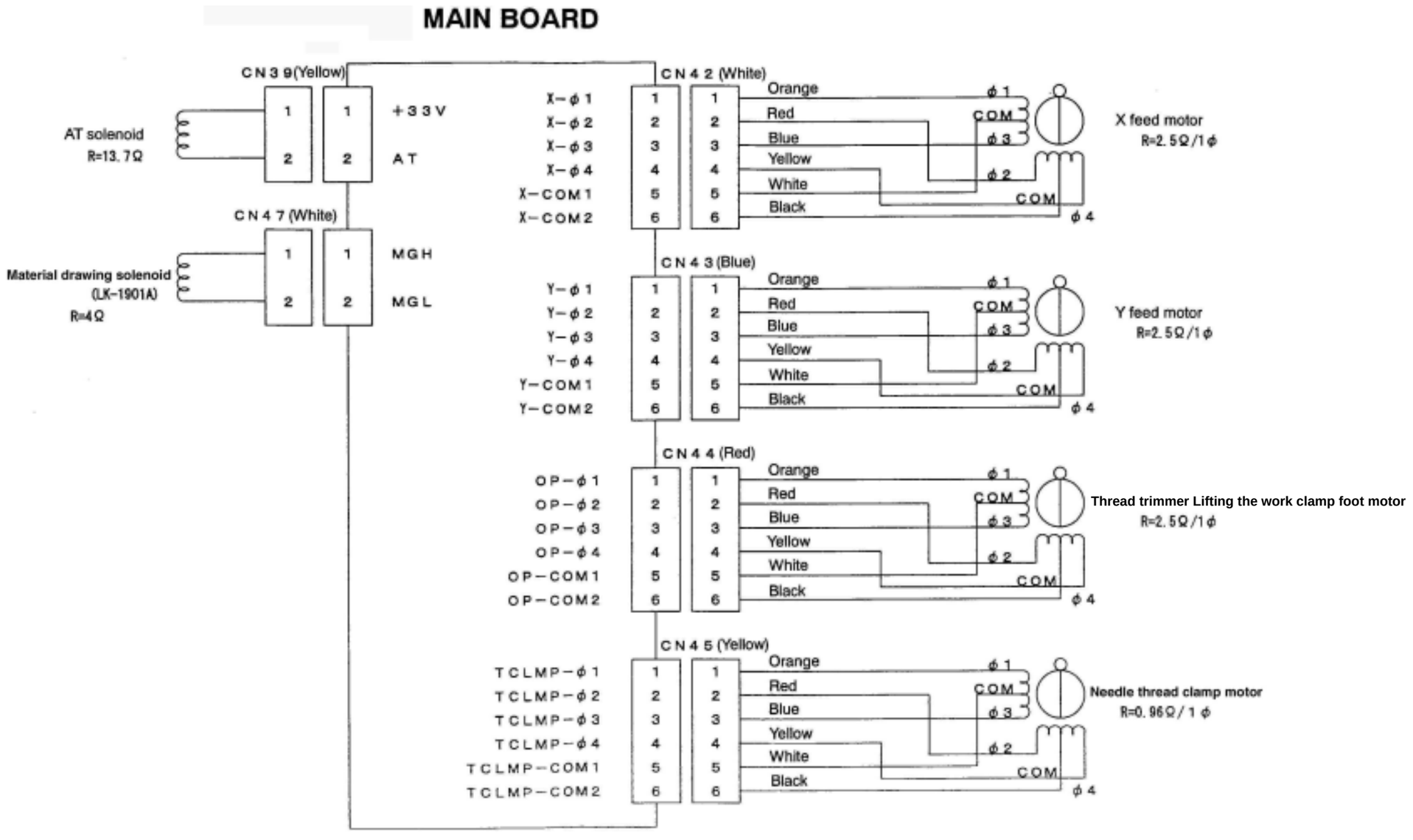
(6) Sensor – pedal VR circuit diagram



(7) MAIN • PANEL board circuit diagram

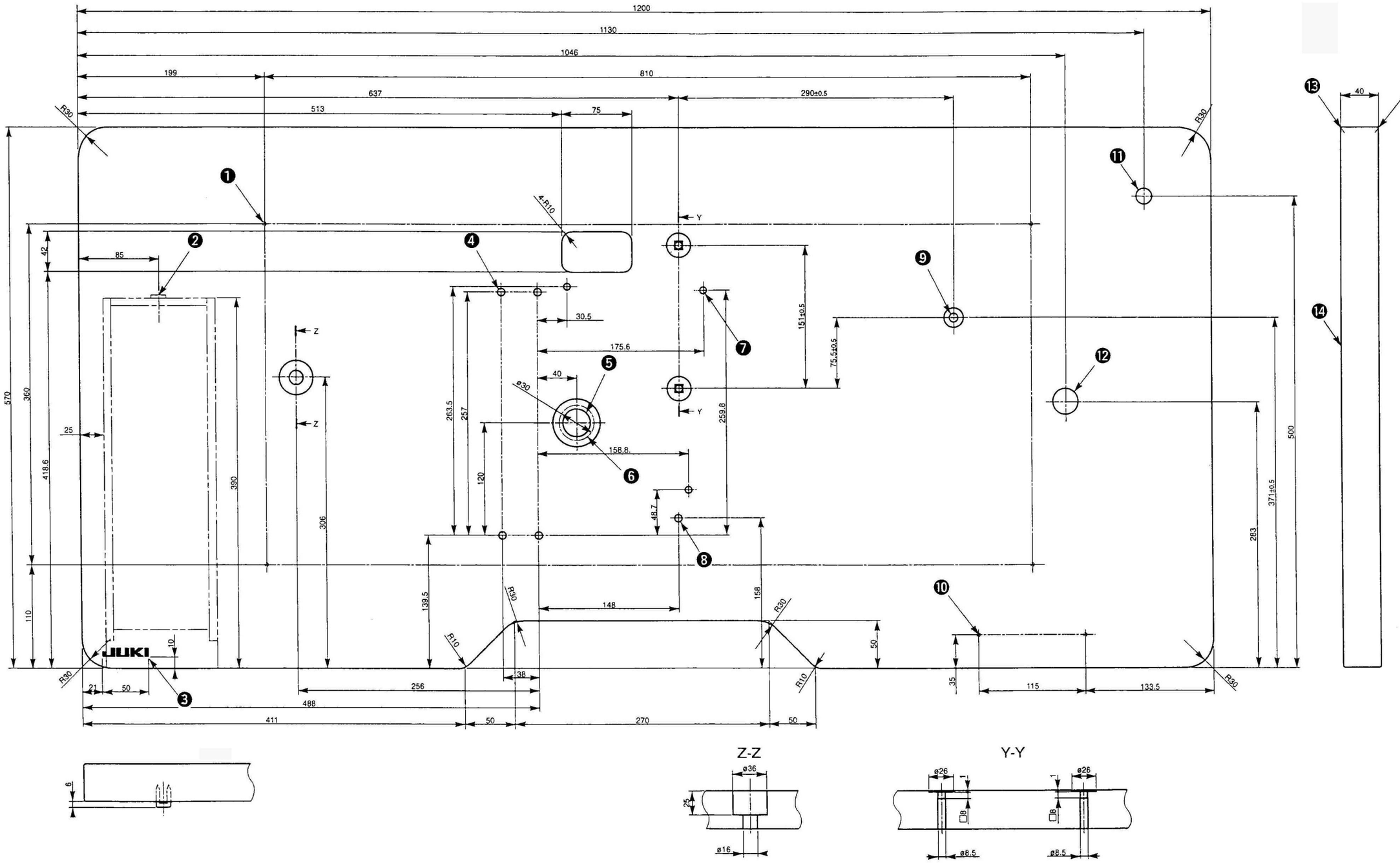


(8) Motor • solenoid circuit diagram



13. Table drawings

(1) Table type for longitudinal Installation



❶ 4x2 drill depth 10 rear side (Table stand mounting holes)
❷ Drawer stopper mounting position (1 position on rear side)
❸ JUKI logotype
❹ 4x8 drill
❺ 30 drill 51 depth Counterbore depth 16
❻ Oil drain funnel mounting hole
❼ 3x7 drill, depth 6
❽ 8 drill
❾ 9 drill x20 depth Counterbore depth 17
❿ 2x2 drill depth 10 rear side (Power switch mounting holes)
⓫ 17 drill
⓬ 28 drill
⓭ R2 (all periphery)
⓮ Top of a table

For LK-1900A
For LK-1901A
For LK-1903A
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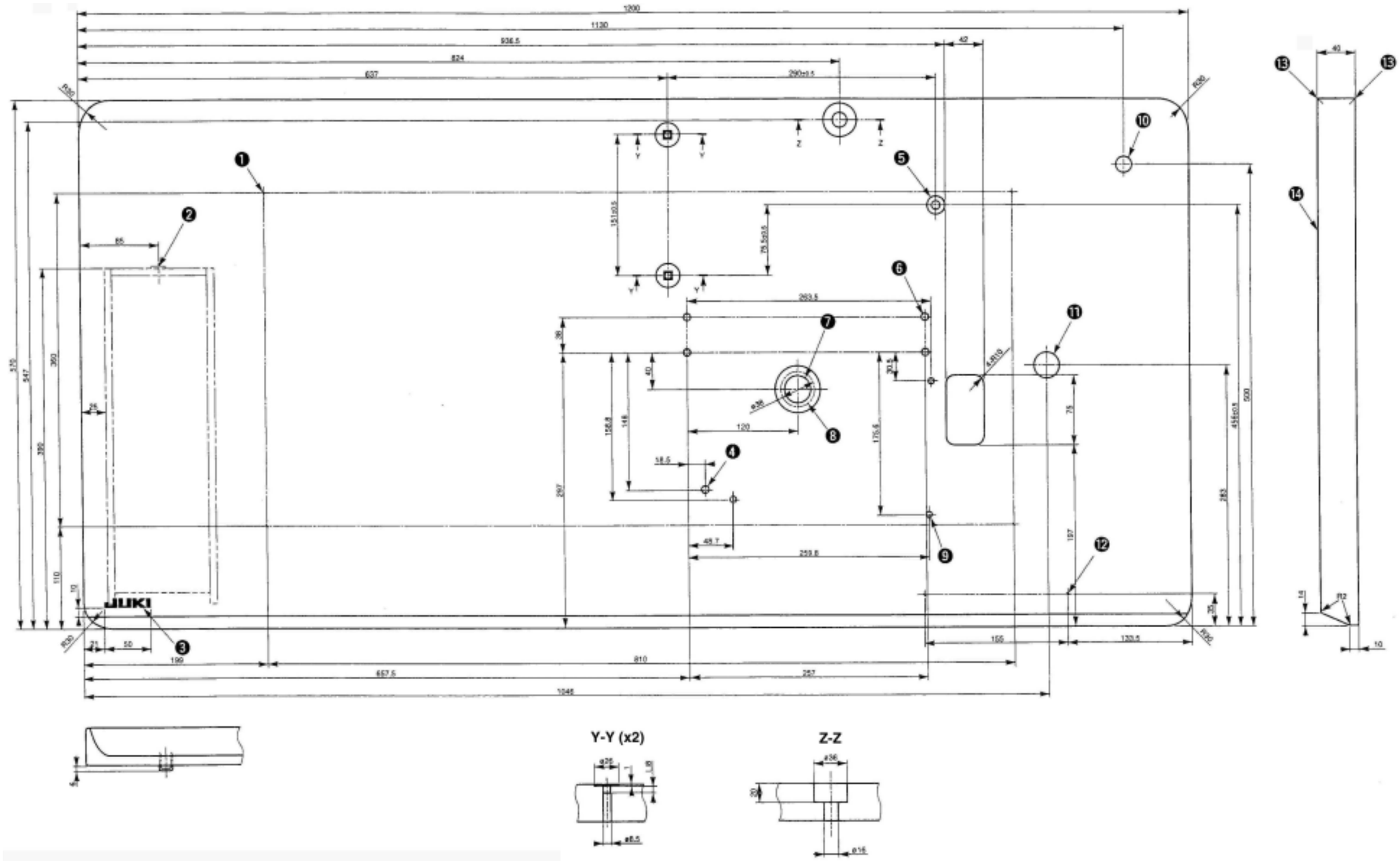
(2) Table type for lateral Installation



❶ 4x2 drill depth 10 rear side (Table stand mounting holes)
❷ Drawer stopper mounting position (1 position on rear side)
❸ JUKI logotype
❹ 8 drill
❺ 9 drill x20 depth Counterbore depth 17
❻ 4x8 drill
❼ 30 drill 51 depth Counterbore depth 16
❽ Oil drain funnel mounting hole
❾ 3x7 drill, depth 6
❿ 17 drill
⓫ 28 drill
⓬ 2x2 drill depth 10 rear side (Power switch mounting holes)
⓭ R2 (all periphery)
⓮ Top of a table

For LK-1902A
Part No.: 40006887

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

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