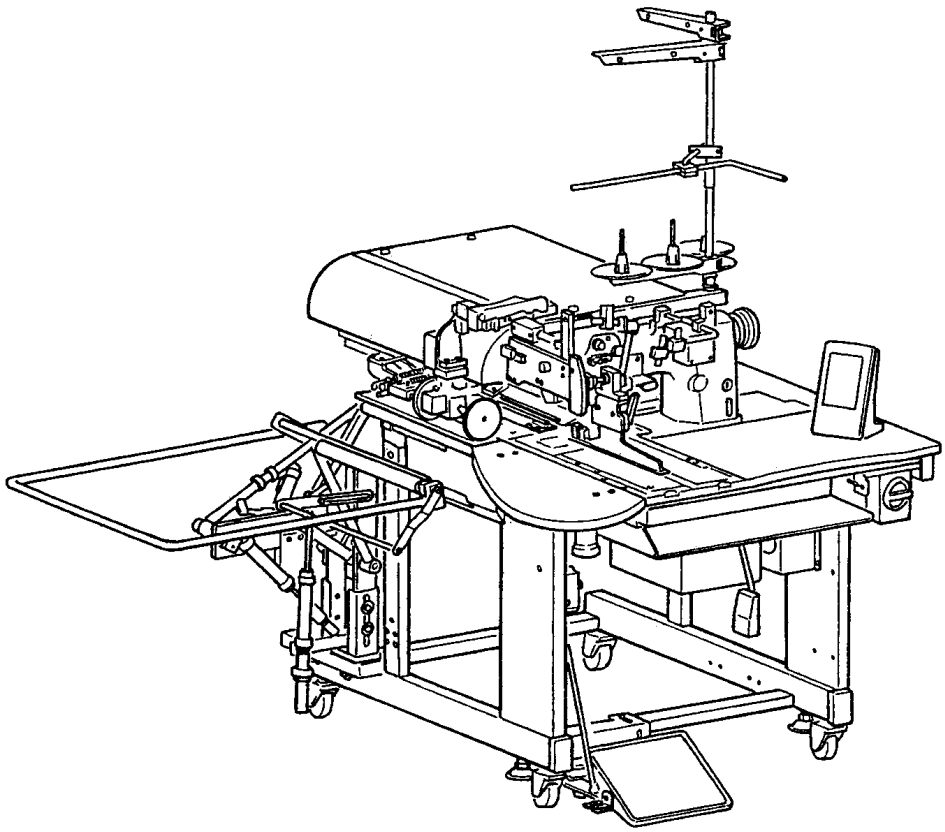
JUKI®

Lockstitch, Automatic Welting Machine

APW-895 (Parallel Pocket with Flap Sewing)

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 instruction in derail. 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 Input Instruction Manual, relevant Instruction Manual and Parts List together with this Engineer’s Manual when carrying out the maintenance of these machines.
In addition, for the motor for the sewing machine with thread trimmer, refer to the separate Instruction Manual or This manual gives the “Standard Adjustment” on the former page under which the most basic adjustment value is described, and on the latter page “Results if Improper Adjustment” under which stitching errors and troubles arising from mechanical failures and “Hoe to adjust” are described.

CONTENTS

1. Specifications

(1) Machinical specifications

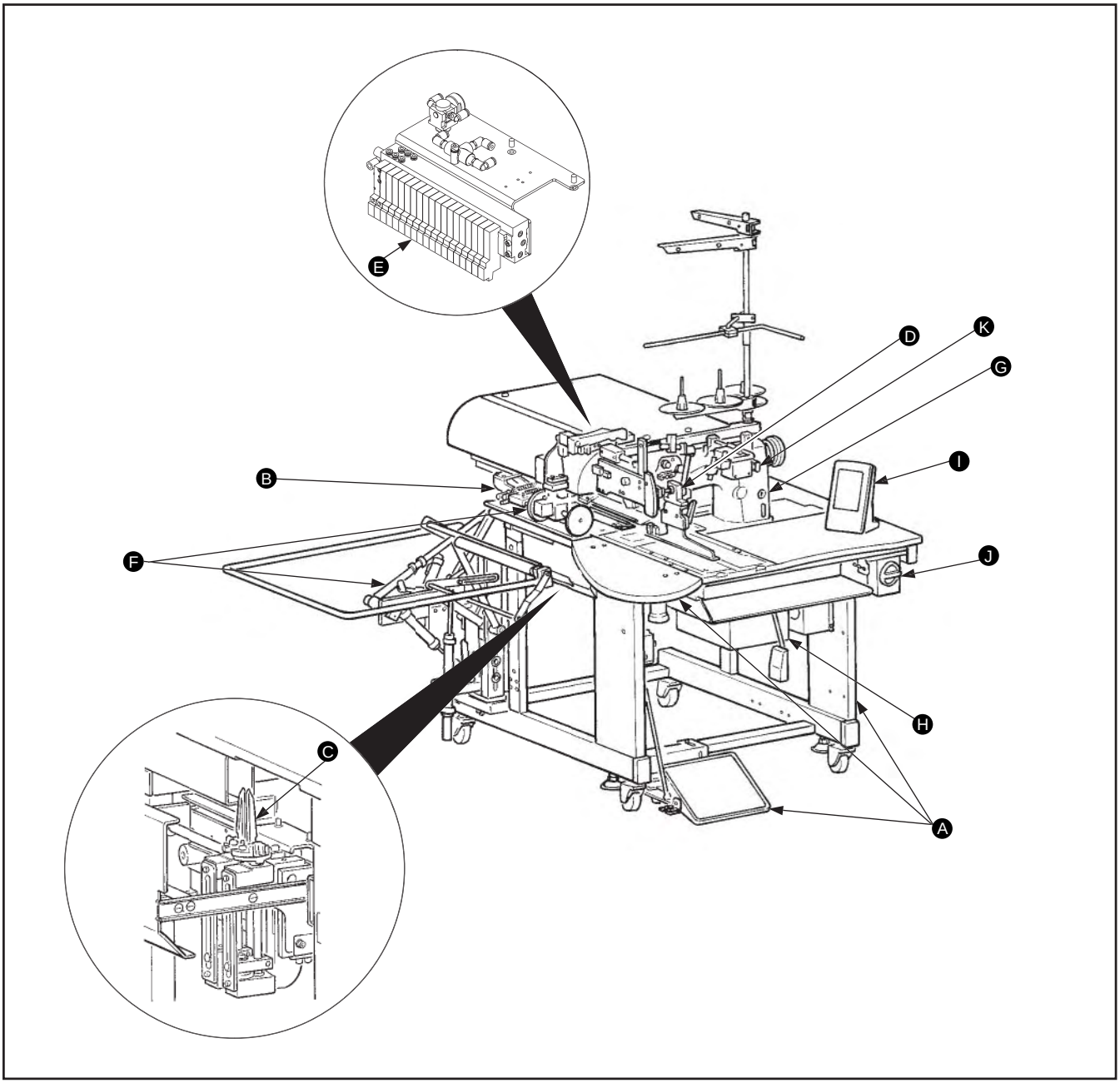
No.	Model name / Item	Application
		APW-895
1	Sewing machine	LH-895 model of 2-needle, lockstitch machine with a center knife
2	Sewing speed	Max: 3,000 rpm
3	Stitch length	Lockstitch : 2.0 to 3.4mm (standard :2.5mm) Condensation stitch : 0.5 to 1.5mm (standard : 1.0mm) Back tuck stitch : 0.5 to 3.0mm (standard : 2.0mm) Condensation/Back tuck stitch selectable
4	Types of welt	Parallel duble welt, parallel single welt Each with flap or without flap
5	Pocket lip length (Welt length)	Possible to set in increments of 0.1mm ithin the range of 18mm (min.) to 220mm (max.) (Needle gage: 8 to 20mm) Note that the pocket length is 35mm at the minimum when using the corner knife (50mm in case of 14mm gauge or more and 21mm by adding a solenoid valve) For the longer type (optonal), the maxmimum sewing length will be 250mm (Needle gage: 22 to 32mm) (Possible up to 300mm wihiout entering corner knife)
6	Welting width (Needle gauge)	8, 10, 12, 14, 16, 18 and 20mm (Optional : 22, 24, 26, 28, 30 and 32mm)
7	Needles	ORGAN DP X 17 #14 to #18 (standard #16), SCHMETZ 190R #100 to #110 (standard #100)
8	Thread	Spun thread #60 (Recommended)
9	Hook	Vertical-axis 1.7-fold capacity hook
10	Thread take-up lever	Slide thread tak-up lever
11	Needle bar stroke	33.3mm
12	Cloth feed mechanism	Driver by stepping motor
13	Control	By a micro-computer
14	Safety mechanism	Machine operation is automatically stopped if the cloth feed mechanism error detector, the needle thread breakage detector or anu of the various safety devices is actuated.
15	Lubricating oil	JUKI New Defrix Oil No. 1 (equivalent to ISO VG7)
16	Grease	1. JUKI Grease A. 2. JUKI Grease B
17	Operating air pressure	Standard : 0.5MPa
18	Air consumption	40dm^3/min(ANR)
19	Dimensions of machine	Width: 1,095 mm Length: 1,500 mm Height: 1,200 mm (Width: 1,580 mm, including stacker) (Height: 1,800 mm, including thread stand)
20	Weight	238.5kg
21	Working temperature/ humidity	Temperature: 5°C to 35°C, Humidity: 35 to 85% (no condensation)

(2) Electric specifications

Once setting has been made, data can be retained (for 100 hours) by the built-in battery cell even after Power OFF unless this setting is canceled, thanks to the function of the built-in microcomputer.

No.	Model name / Item	Application
		APW-895
1	No. of patterns for stored single sewing	99 (1 to 99)
2	No. of patterns for stored alternate sewing	20 (1 to 20)
3	No. of stored cycles	20 (1 to 20)
4	Input voltage/frequency	Single phase/3-phase 200 V, 220 V, 230 V, 240 V (option 380 V) 50/60 Hz Power voltage fluctuation Rated voltage ±10% or less
5	Power consumption	200VA

2. Configuration of the machine



The APW-895 consists mainly of the following units.

- Ⓐ Frame and structural components (Frame sewing table, covers, foot switch, etc.)
- Ⓑ Clamp foot unit and feed mechanism
- Ⓒ Corner knife unit
- Ⓓ Binder unit (Binder components and its driving components)
- Ⓔ Pneumatic control unit (Pneumatic control devices and pipings)
- Ⓕ Stacker unit (Optional)
- Ⓖ Sewing machine head
- Ⓗ Electric control unit (Control panel)
- Ⓘ Operation panel
- Ⓙ Power switch
- Ⓚ Temporary stop switch

With this machine consisting of the aforementioned 11 units, you can do desired welting work simply by setting materials (garment body, interlining piece, welting patch, etc.) in place and operating the switches on the operation panel.

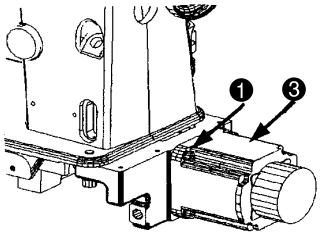
In addition, when temporary stop switch Ⓚ is pressed during operation of the device, tthe device stops.

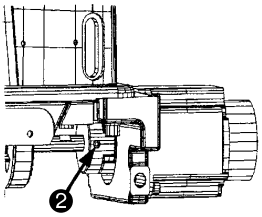
3. Standard Adjustment

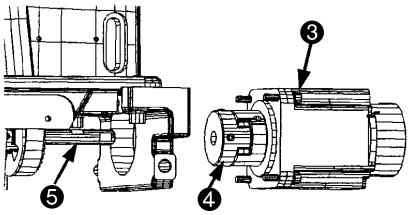
(1) Machine head

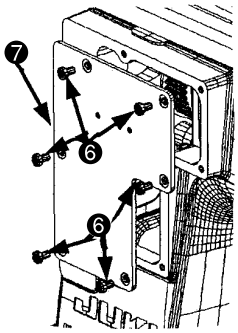
1) How to change the timing belt

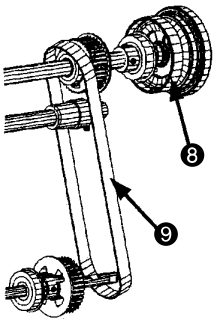
Standard Adjustment

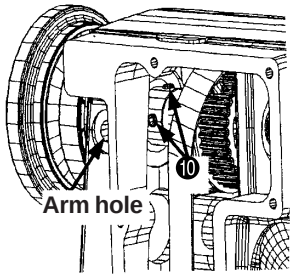


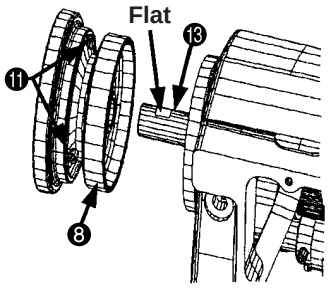


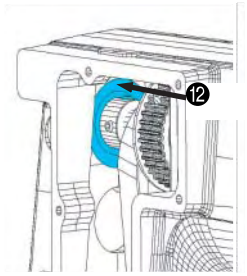


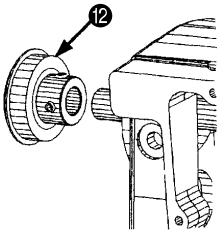


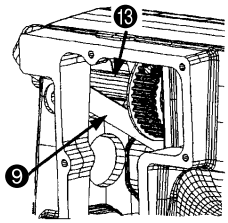


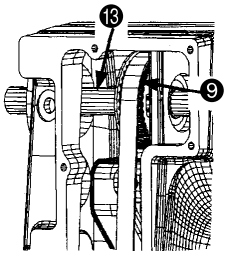


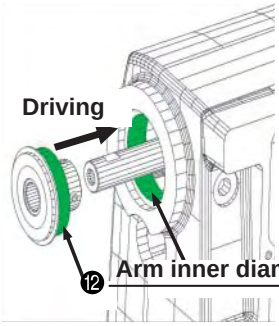




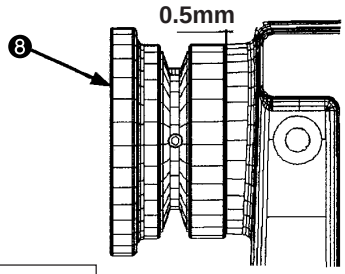


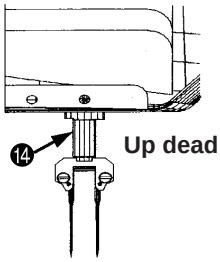


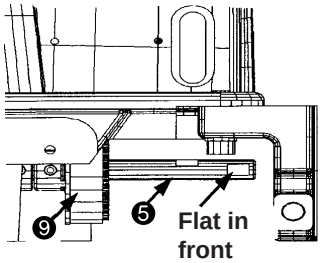


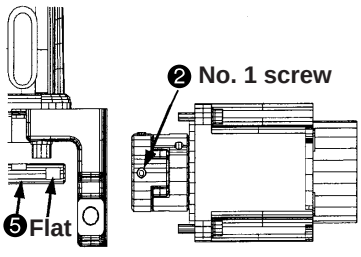


Parts no. : 40029049





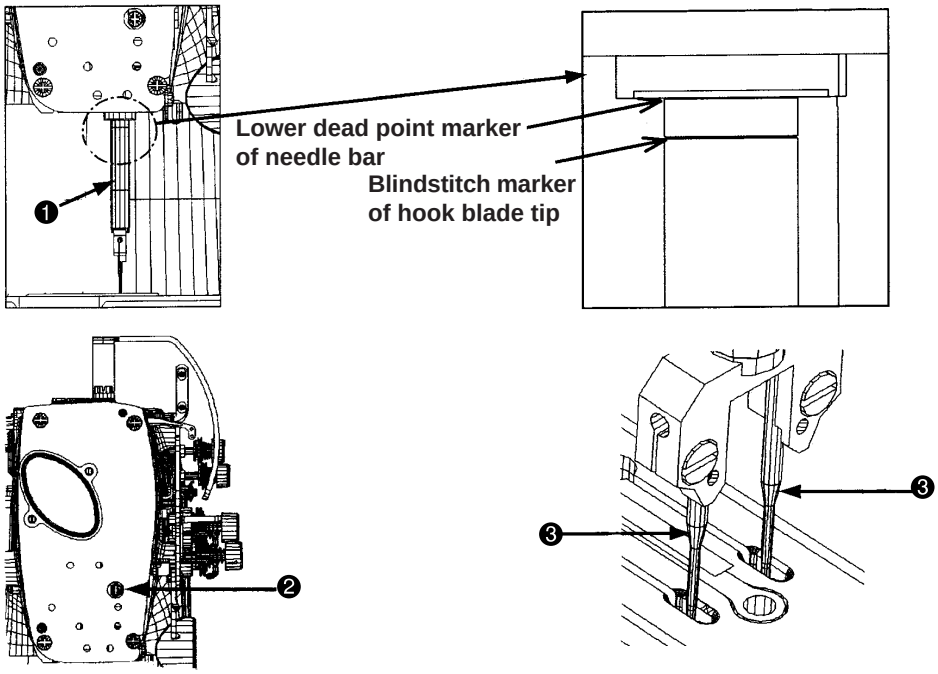




Adjustment Procedures	Results of Improper Adjustment
1. Remove the four set screws ❶ of the motor. 2. Loosen the two set screws ❷ of the coupling. 3. Remove the motor ❸ and coupling ❹ from the lower shaft ❺. 4. Remove the six set screws ❻, and remove the window plate ❼. 5. Remove the timing belt ❾ from the pulley ❽. 6. Loosen the two setscrews ❿ from arm hole. 7. Loosen the two setscrews ⓫ of the pulley ❽, and remove the pulley ❽. 8. Tap the rear bearing ⓬ from inside and pull out this rear bearing ⓬. 9. Pass the timing belt ❾ through the bearing hole of the arm and remove (pull out) the timing belt ❾ via the main shaft ⓭. 10. Install a new timing belt ❾. 11. Degrease the outer diameter of the rear bearing ⓬ and the inner diameter of the arm, apply a sealant of medium or higher strength, and drive the rear bearing ⓬ until it stops in the interior. 12. Tighten two setscrews ❿ from the armhole. (There is no flat section.) 13. Join the flat section of the main shaft ⓭ with the first screw ⓫ of the pulley ❽, and mount the pulley ❽. At that time, the clearance should be about 0.5mm between the pulley ❽ and the arm. 14. Turn the pulley ❽ and let the needle bar ⓮ stay in the UP dead position. At that time, the timing belt ❾ is hung in the position where the flat section of the lower shaft ❺ faces the front. 15. Join the flat section of the lower shaft ❺ with the first screw ❷ of the coupling, and tighten two setscrews❷. 16. Tighten four motor setscrews ❶ to fix the motor ❸. 17. Fix the window plate ❼ with six setscrews ❻.	

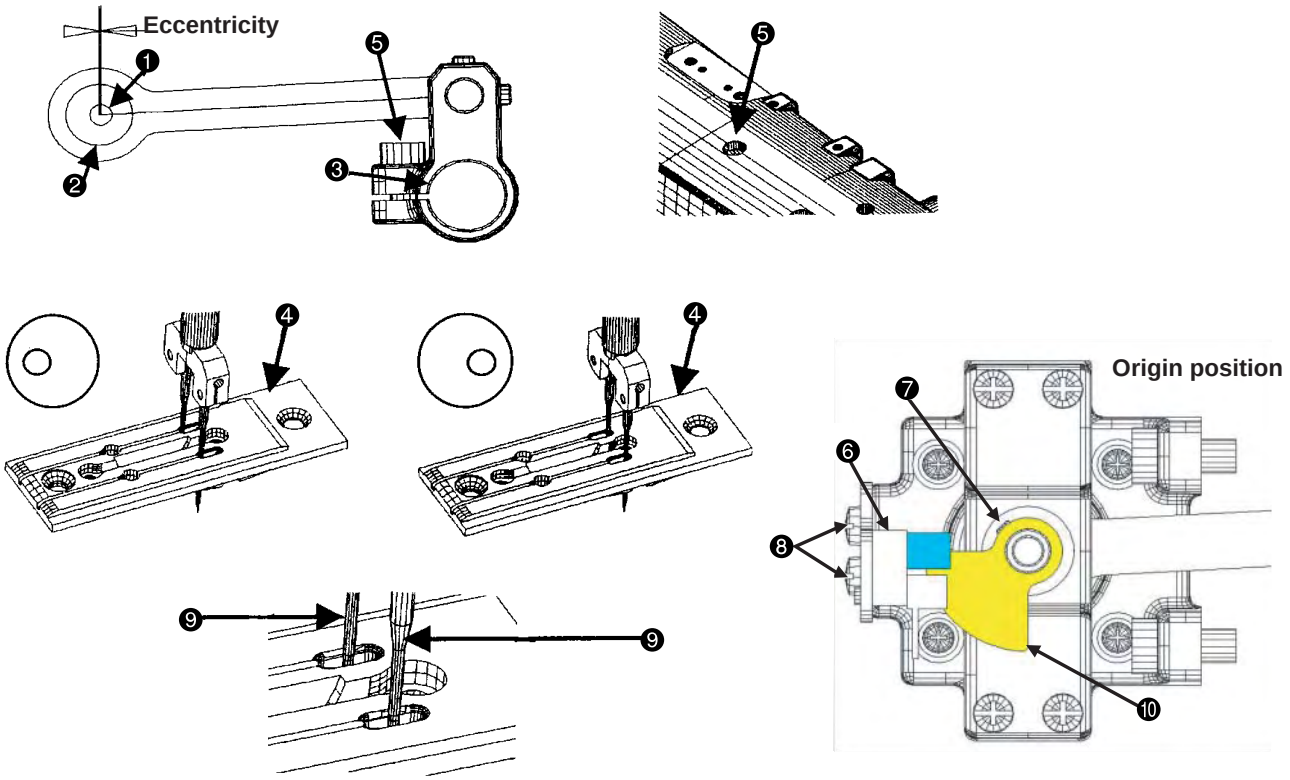
2) Adjustment of needle bar height

Standard Adjustment



3) Front or rear adjustment of needle bar rocking base

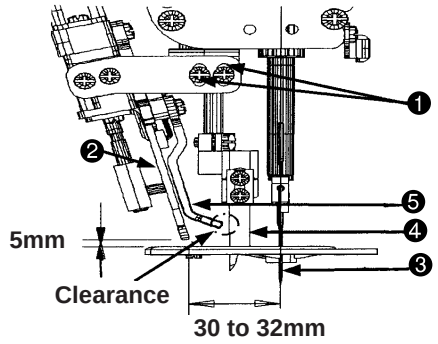
Standard Adjustment



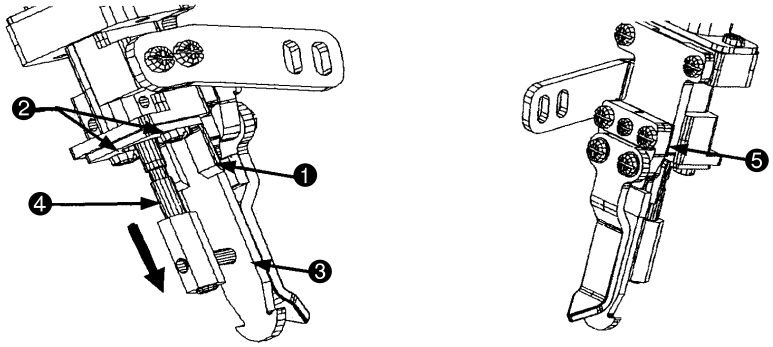
Adjustment Procedures	Results of Improper Adjustment
1. Turn the pulley until the needle bar ❶ comes to the lower dead point. 2. Loosen the needle bar connection screw ❷. 3. Based on the upper engraved marker line of the needle bar lower dead point, tighten the needle bar connection screw ❷. 4. The needle ❸ shall be positioned in the center of the throat plate hole.	

Adjustment Procedures	Results of Improper Adjustment
1. When the motor shaft ❶ is rotated, the needle bar rocking link ❸ makes a rocking motion by the effect of the eccentric cam ❷. 2. Turn the power OFF, rotate the motor shaft ❶, and confirm that the needle makes a uniform rocking motion in the oblong hole of the throat plate ❹. 3. If the needle motion is not uniform, insert a tool from the hole on the top surface of machine arm and loosen the needle bar rocking arm setscrew ❺ for adjustments. 4. In the case of eccentricity to the left, confirm whether the sensor slit ❿ is located in the edge position of the sensor ❻. 5. In the case of deflection, loosen the sensor slit setscrew ❼ or the sensor setscrew ❽ for adjustments. * For fine adjustments, use of the sensor setscrew ❽ is adequate. 6. After the power is ON, the needle ❾ comes in the center of the throat plate hole. To make sure, examine [(11) Needle and Hook Timing Adjustments and (12) Needle and Hook Clearance Adjustments] (Hook Adjustment).	

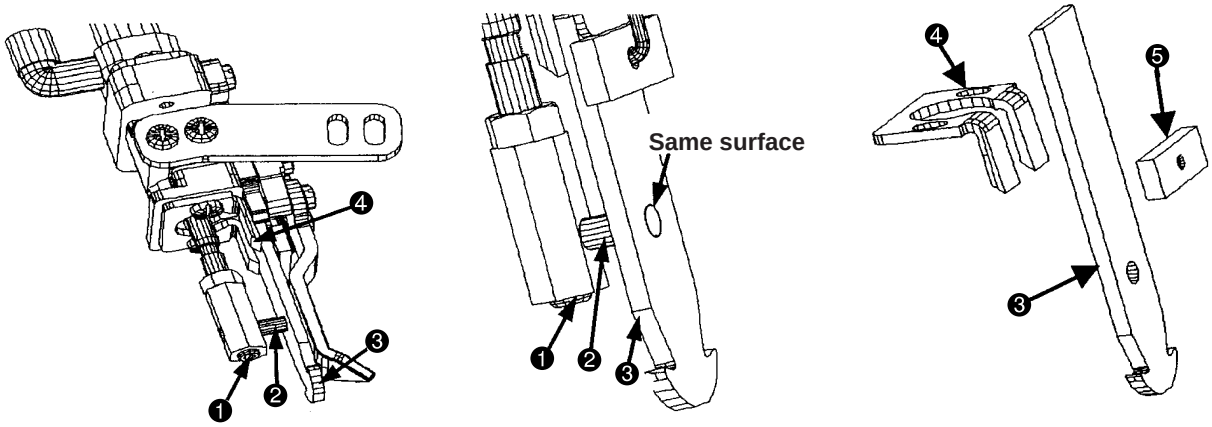
4) Adjustment of mounting position for needle thread trimming unit

Standard Adjustment


5) Adjustment of needle thread trimmer sharpness

Standard Adjustment


6) Replacement of needle thread knife

Standard Adjustment


Adjustment Procedures	Results of Improper Adjustment
☆ The knife is driven by the air cylinder. Therefore, relieve the air pressure before adjustments. 1. Loosen two setscrews ❶ and maintain the clearance toward the throat plate at 5mm in the state that the moving knife ❷ is advanced to the extreme front. Adjust the distance toward the needle ❸ to 30 to 32 mm and tighten the two setscrews ❶. In this case, confirm that a proper clearance is secured between the center knife ❹ and the spreader ❺.	

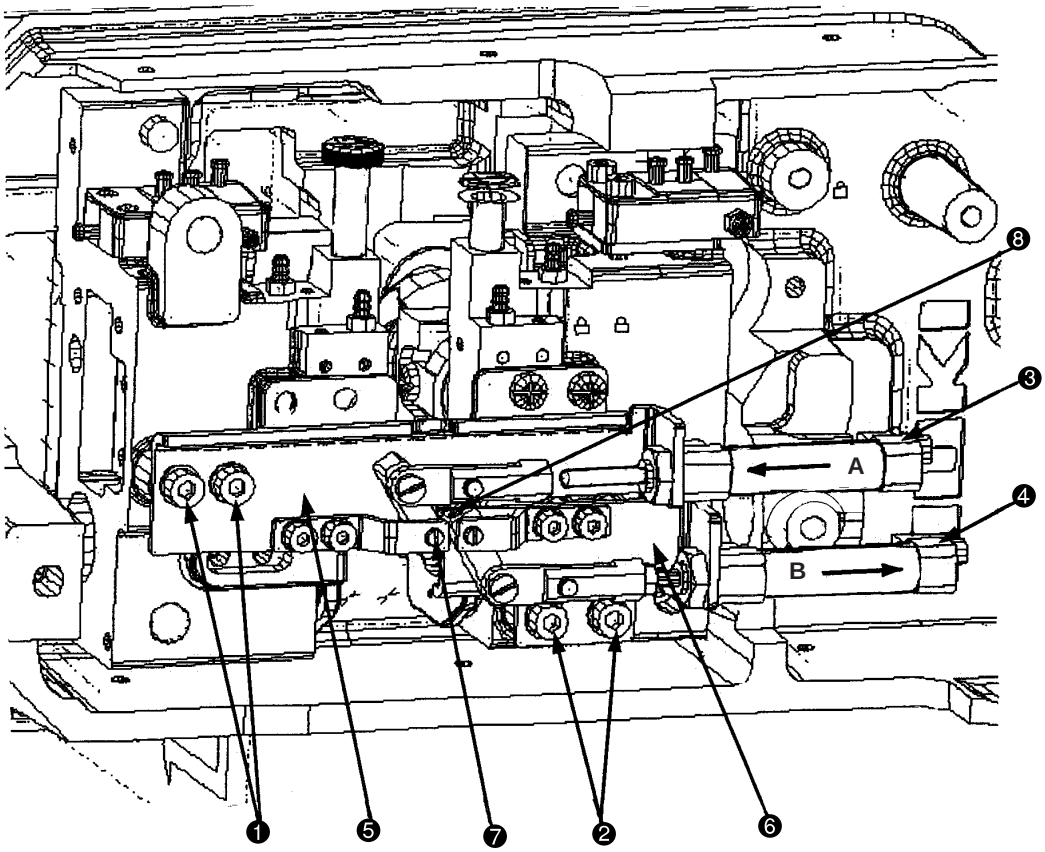
Adjustment Procedures	Results of Improper Adjustment
1. Loosen two setscrews ❷ of the counter knife ❶ and push both right and left blades of the counter knife ❶ uniformly against the moving knife ❸. Then tighten the two setscrews ❷ again. 2. Check the motion of the cylinder shaft ❹. Confirm that it can work to accomplish cutting assuredly at 17.6N (1.8kgf) or less. 3. After thread cutting, the holding force for needle thread clamp is more than 2.9N (300g) both right and left. In the case when this force is not secured, select an adequate spacer ❺. [The spacer ❺ has four types of thickness: 0.2mm, 0.4mm, 0.6mm, and 0.8mm]	

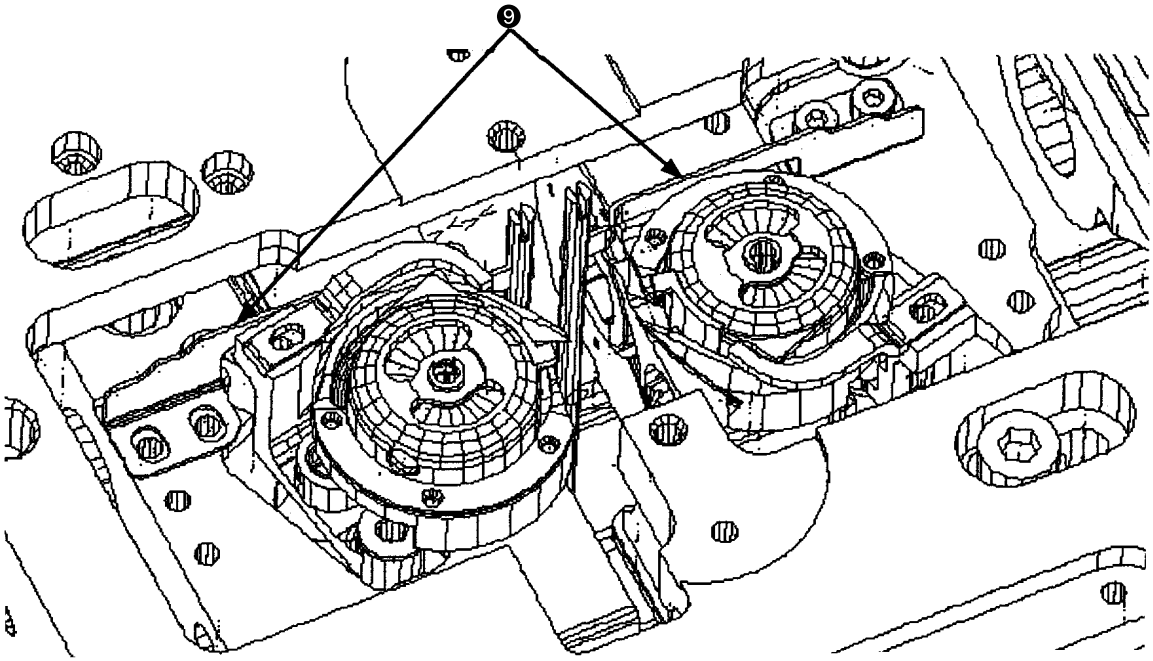
Adjustment Procedures	Results of Improper Adjustment
1. Loosen the setscrew ❶ and remove the pin ❷. Then, the moving knife ❸ can be pulled off downwards. 2. Install a new moving knife ❸ and insert the pin ❷. At that time, the pin ❷ should be held almost in the same plane of the moving knife ❸. Tighten the setscrew ❶. * The needle thread trimming unit has some mounting parts that can change with the gauge size. Refer to the table below for details.	

No.	Size / Name of parts	8mm	10mm	12mm	14mm	16mm	18mm	20mm	22mm	24mm	26mm	28mm	30mm	32mm
1	Counter knife❹	16409906					16411308				40039788			
2	Moving knife❸	40033814	40023020		40033809		40033810		40033811		40033812		40033813	
3	Clamp plate❺	40033815					16411407				40039783			

7) Adjusting the bobbin thread trimming knife

Standard Adjustment

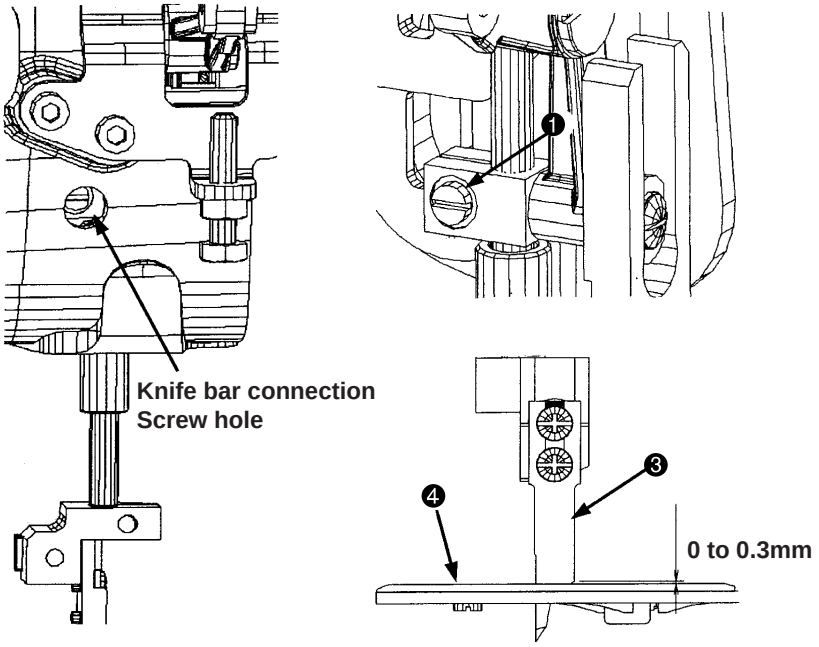




Adjustment Procedures	Results of Improper Adjustment
1. How to join the throat plate and the bobbin thread trimming knife (1) Hold the bobbin thread trimming knife perpendicular to the throat plate. Install it to avoid any twisting motion during operation. (2) Loosen the setscrew ❶ of the left bobbin thread trimmer and actuate the bobbin thread trimmer knife cylinder ❸. (3) Loosen the setscrew ❷ of the right bobbin thread trimmer and actuate the bobbin thread trimmer knife cylinder ❹. (4) Set the left bobbin thread trimmer base ❺ where the bobbin thread trimming knife does not cause twisting motion, and fix the setscrew ❶. (5) Set the right bobbin thread trimmer base ❻ where the bobbin thread trimming knife does not cause twisting motion, and fix the setscrew ❷. **2. Adjustment of bobbin thread trimming knife position and height** (1) Join the upper surfaces of both right and left bobbin thread trimming knives with the upper surface of the throat plate in the same plane. Make adjustments so that the groove of throat plate meets in parallel to that of the bobbin thread trimming knife when the bobbin thread trimmer is actuated. (2) Loosen the setscrew ❼ of the left bobbin thread trimmer and make adjustments so that the upper surfaces of the throat plate and the bobbin thread trimming knife are joined in the same plane. (3) Loosen the setscrew ❽ of the right bobbin thread trimmer and make adjustments so that the upper surfaces of the throat plate and the bobbin thread trimming knife are joined in the same plane. **(Caution) Be aware that the bobbin thread trimming knife should be below the top surface of the throat plate.** (4) Push the bobbin thread trimming knife cylinder ❸ of the left bobbin thread trimmer in Direction A and adjust its position so that the groove of the bobbin thread trimming knife meets in parallel to that of the throat plate. (5) Push the bobbin thread trimming knife cylinder ❹ of the right bobbin thread trimmer in Direction B and adjust its position so that the groove of the bobbin thread trimming knife meets in parallel to that of the throat plate. (6) Tighten the right and left setscrews ❼ and ❽. **3. Replacement of the bobbin thread trimming knife** (1) When the setscrews ❼ and ❽ are loosened, the right and left bobbin thread trimming knives can be pulled off downwards. **4. Adjustment of bobbin thread trimming knife sharpness** (1) Adequately push the thread clamp pushing spring ❾ against the bobbin thread trimming knife to adjust its sharpness. (2) The pushing force should be kept as light as possible, to a degree the thread can be cut assuredly. Then, the	

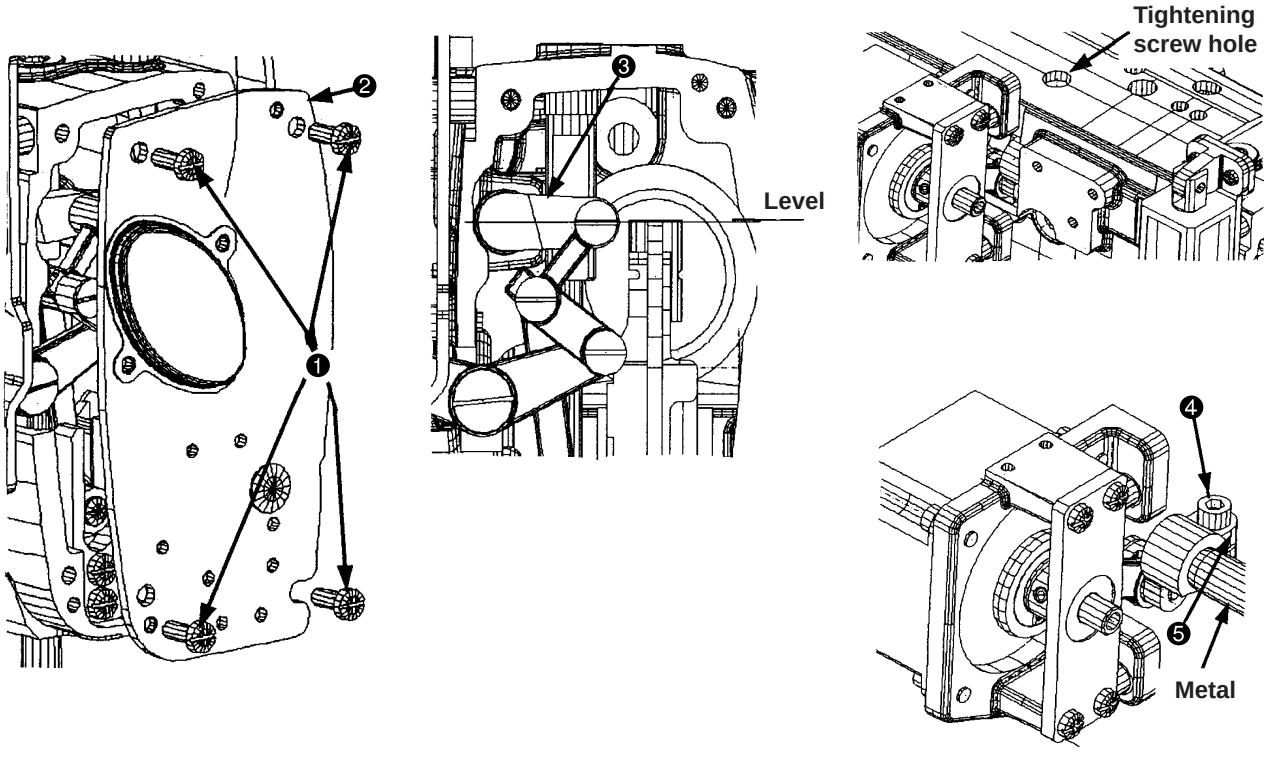
8) Height adjustment of center knife

Standard Adjustment



9) Adjustment of center knife link

Standard Adjustment

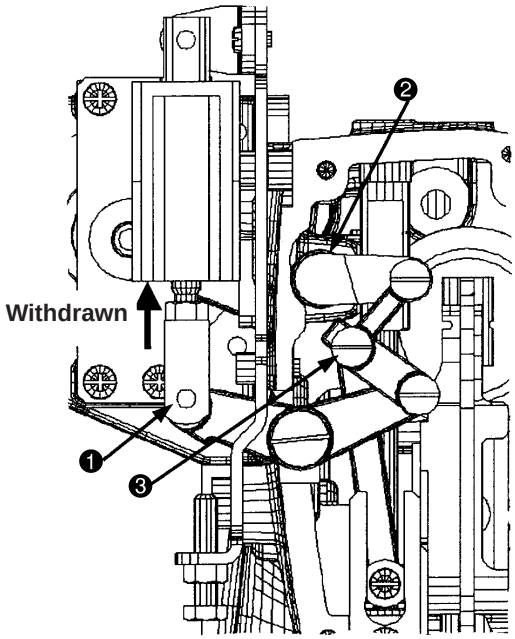


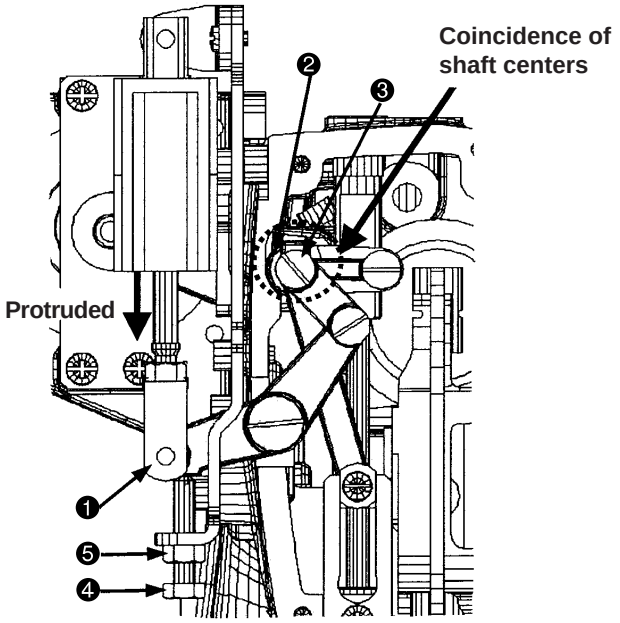
Adjustment Procedures	Results of Improper Adjustment
☆ Relieve the air pressure during adjustment. 1. Insert a tool from the hole of the knife bar connecting screw and loosen the knife bar connecting setscrew ❶. 2. Turn the motor shaft ❷ to move the center knife ❸ to the lower dead point. At that time, tighten the knife bar connecting setscrew ❶ where the throat plate ❹ and the center knife ❸ assume a condition of 0 to 0.3mm as illustrated.	

Adjustment Procedures	Results of Improper Adjustment
1. Remove the four set screws ❶, and remove the face plate ❷. 2. Confirm that Link A ❸ is maintained level at the lower dead point of the center knife. 3. If the horizontality of Link A ❸ is not secured, insert a tool from the tightening screw hole and loosen the driving arm tightening screw ❹. Where Link A ❸ is maintained level, tighten the driving arm tightening screw ❹ again. At that time, the driving arm ❺ should have been moved to the metal side during screw tightening.	

10) Adjustment of center knife motion stop

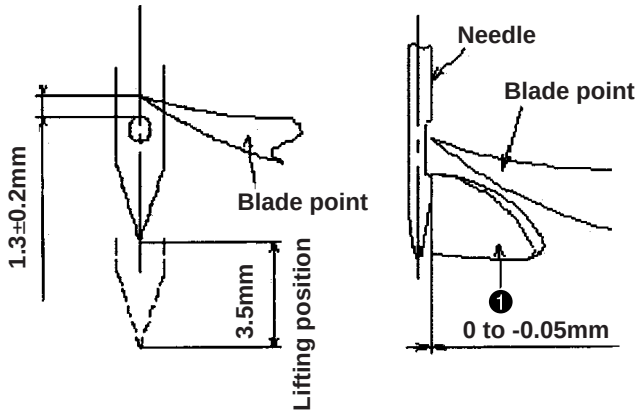
Standard Adjustment

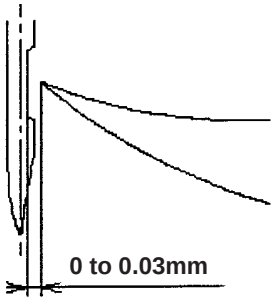


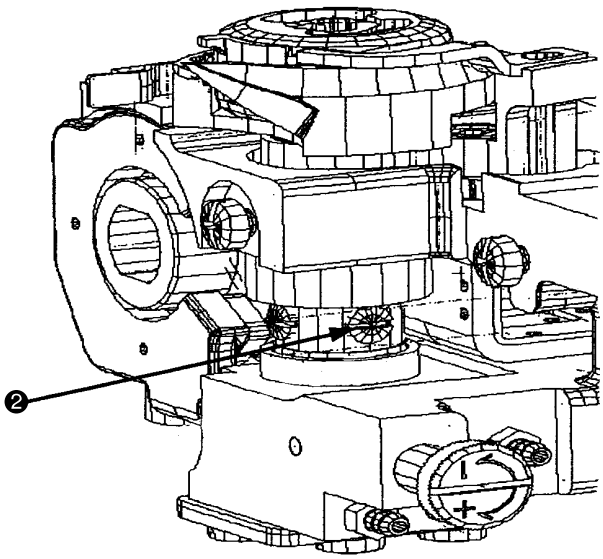


11) Timing adjustment of needle and hook

Standard Adjustment







Adjustment Procedures	Results of Improper Adjustment
1. While the cylinder ❶ is withdrawn, the knife bar is in the state of motion. While it is protruded, the knife bar remains in the state of stop. 2. While this cylinder ❶ is protruded, confirm that the shaft center of Link A ❷ coincides with that of Screw A ❸. 3. If no coincidence is perceived, loosen the nut ❺ of the adjusting screw ❹ and adjust the adjusting screw ❹ to the position where the shaft centers coincide with each other. When coincidence is secured, fix the nut ❺.	

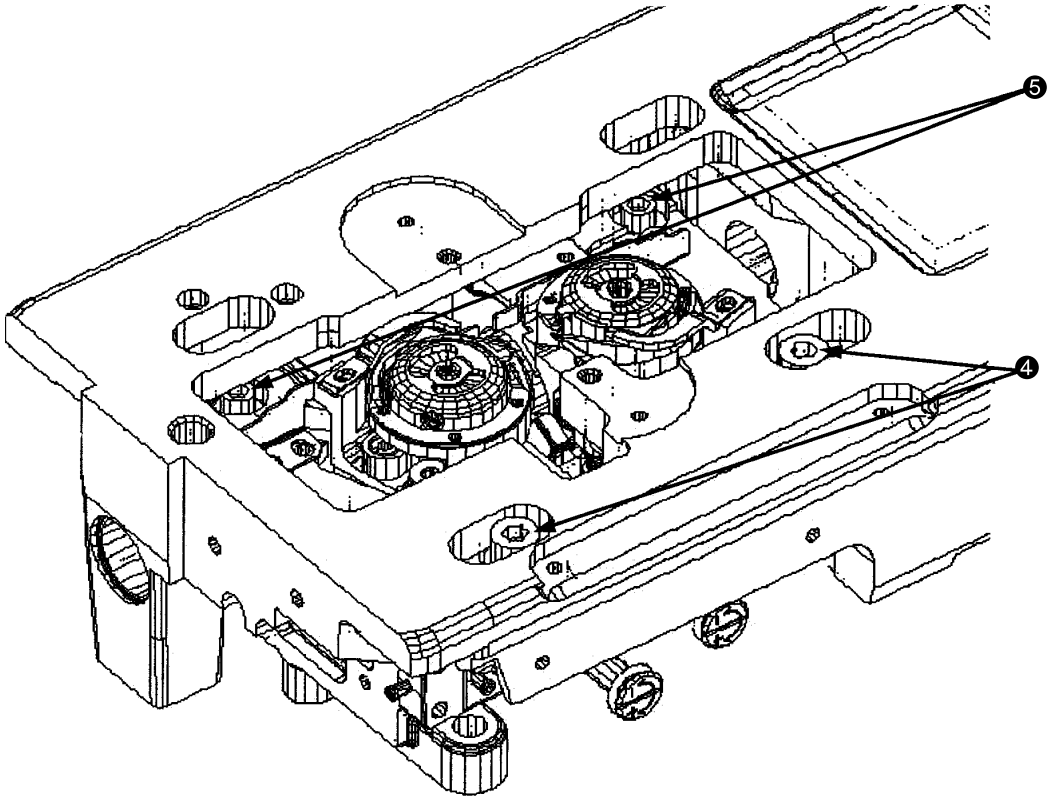
Adjustment Procedures	Results of Improper Adjustment
1. Timing adjustment of the needle and hook (1) Remove the throat plate. When the needle is raised by 3.5mm from the lowermost point (needle bar engraved line alignment), let the blade points of the right and left hooks coincide with the needle centers. At that time, the clearance between the needle side surface and the hook holder ❶ shall be 0 to -0.05mm, the clearance between the needle side surface and the blade point shall be 0 to 0.03mm, and the distance between the upper end of the needle hole and the blade point shall be 1.3±0.2mm. 2. Adjustment of hook timing (1) Loosen three setscrews ❷ of small gears located on the hook shaft and turn the hook. When the needle center coincides with the blade point, tighten the setscrews ❷. In this case, the three setscrews ❷ should be tightened in the specified order. To avoid the occurrence of vertical rattling in the hook shaft, try to tighten the setscrews ❷ while the hook is pushed down and the small gears are somewhat raised. (2) Check whether the main shaft torque is applied after adjustment of the hook timing.	

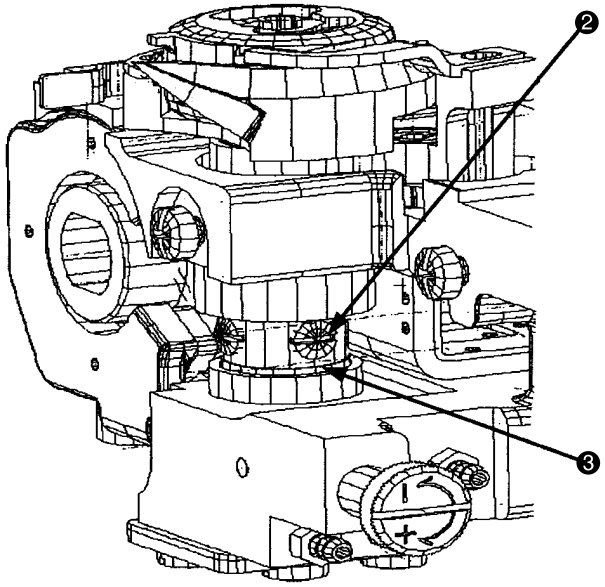
12) Adjustment of clearance between needle and hook

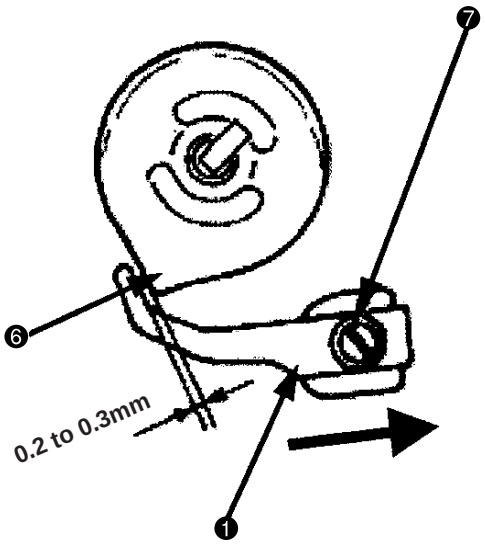
13) Installing and removing of hook

14) Opener adjustment

Standard Adjustment



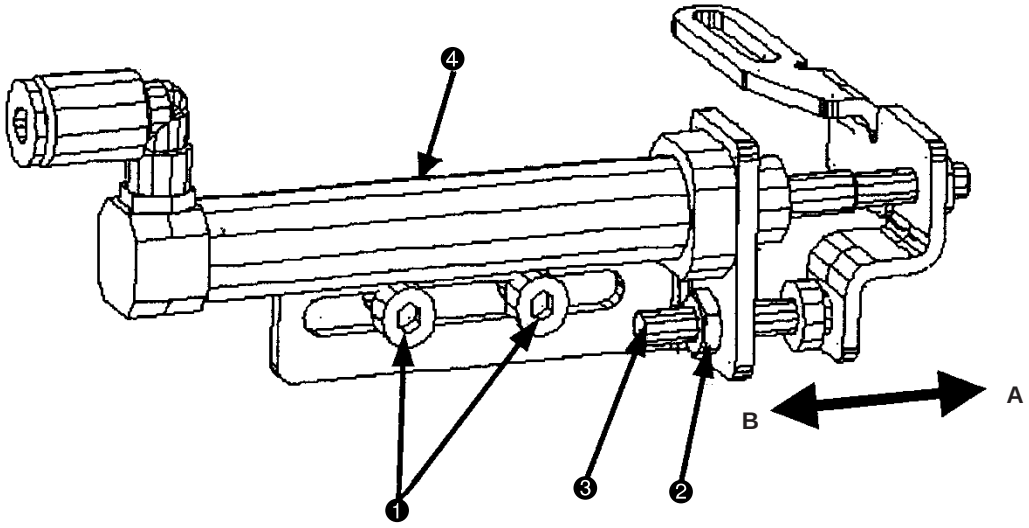


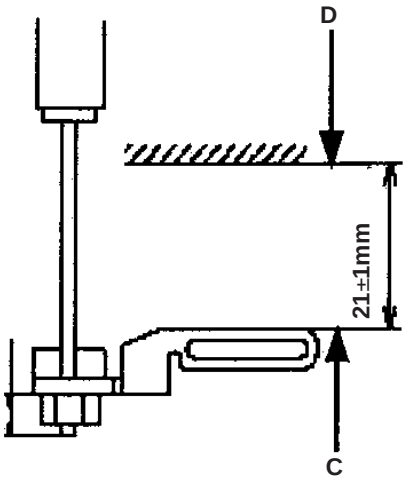


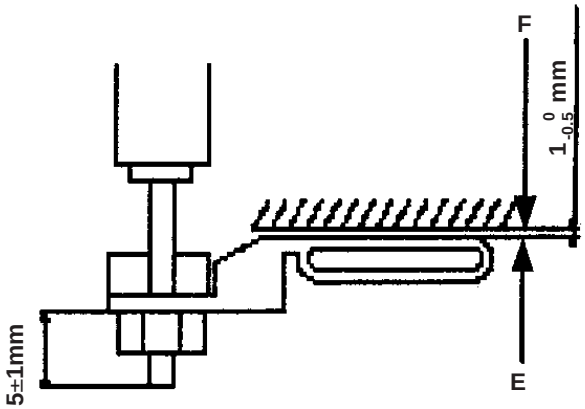
Adjustment Procedures	Results of Improper Adjustment
Adjustment of clearance between needle and hook's blade point 1. Loosen the setscrews ❹ and ❺ of the hook shaft base on the adjusting side. 2. Move the hook shaft base to the right and left and adjust the clearance between the needle and hook's blade point to 0 to 0.03mm. Then tighten the setscrews ❹ and ❺. At that time, the setscrew ❹ should be tightened rigidly while the setscrew ❺ is tightened properly. **(Caution) The setscrew ❺ is tightened with the lower shaft connected. It must be noted that the rotary torque of the lower shaft may be increased if the setscrew is tightened too much.** Removing the hook 1. Remove the throat plate. 2. Remove the opener. 3. Loosen the three setscrews ❷ of the hook shaft small gear. 4. Turn the hand wheel so that the needle bar comes to the highest position. Since then, remove the hook. Installing of the hook 1. Reassembly can be carried out in the reverse order for disassembly. **(Caution) 1. When the hook is installed, confirm that the washer ❸ is inserted in between the hook shaft lower metal and the hook shaft small gear.** **2. When mounting the throat plate, turn the inner hook by hand so that its embossed part is entered in the groove of the throat plate. Since then, mount the throat plate.** Opener adjustment 1. Turn the hand wheel in regular direction and loosen the setscrew ❼ of the inner hook guide ❶ for adjustments so that the clearance between the inner hook guide ❶ and the embossed part ❻ of the bobbin case is adjusted to 0.2 to 0.3mm when the inner hook guide ❶ is moved to the farthest retreat position in the direction of the arrow. **(Caution) Clearance checks and adjustments should be done after the final retreat positions of the right and left inner hook guides ❶ have been confirmed.**	

15) Wiper adjustment

Standard Adjustment





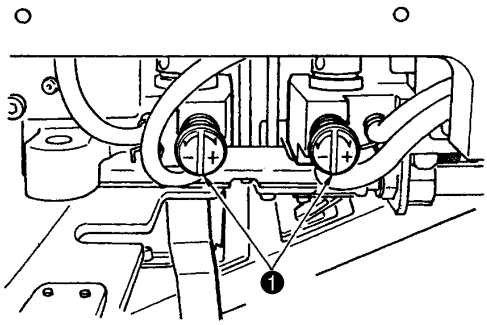


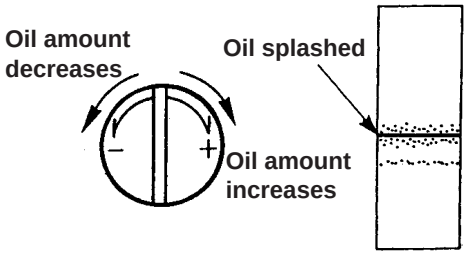
Adjustment Procedures	Results of Improper Adjustment
1. Positioning adjustment of wiper unit (1) Loosen the wiper unit setscrew ❶ to adjust the unit overall so that the clearance between wiper's lower end surface C and the head section D attains 21 ± 1mm when the wiper cylinder ❹ is actuated. 2. Adjustment of wiper stroke (1) Loosen the fixing nut ❷ of the wiper stopper and move the wiper stopper ❸ in Directions A and B. o Direction A → Wiper stroke is decreased. o Direction B → Wiper stroke is increased. (2) After wiper stroke adjustments, tighten the fixing nut ❷ of the wiper stopper and fix the wiper stopper ❸. **(Caution) If the stroke is changed, the clearance is also changed between wiper's lower end surface C and the head section D when the wiper cylinder ❹ is returned. Therefore, loosen the wiper unit setscrew ❶ to adjust the unit overall so that the clearance between wiper's lower end surface E and the head section F attains $1^{\ 0}_{-0.5}$ mm.**	o If the amount of wiper motion is small, unthreading will be caused at the sewing start. o If the amount of wiper motion is large, poorly tense stitches may occur at the sewing start.

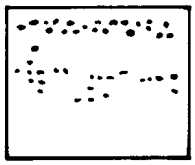
16) Hook oil amount

Standard Adjustment

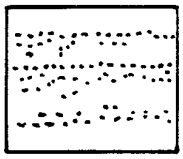
(1) Adjustment of hook oil amount





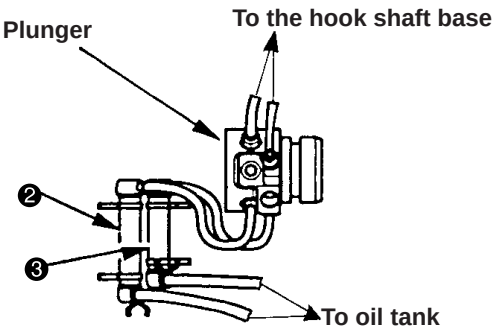


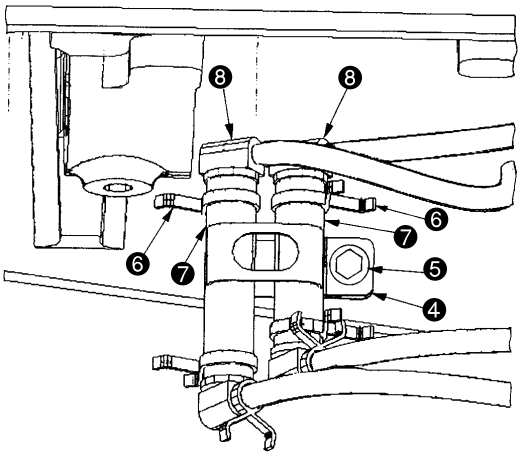
Minimum



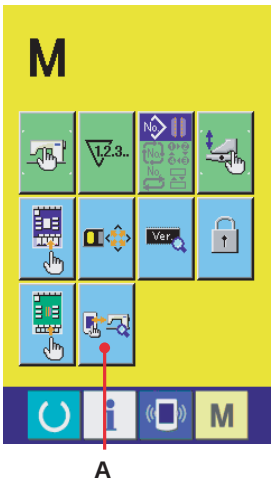
Maximum

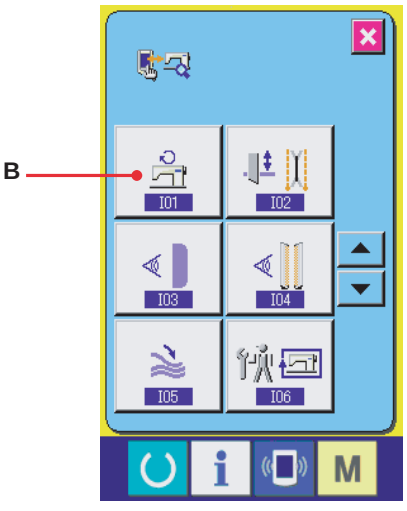
(2) Cleaning of the filter section

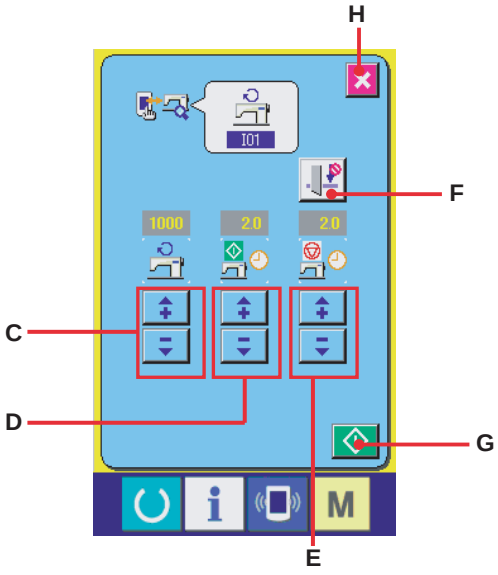




(3) Setting for hook oil amount check







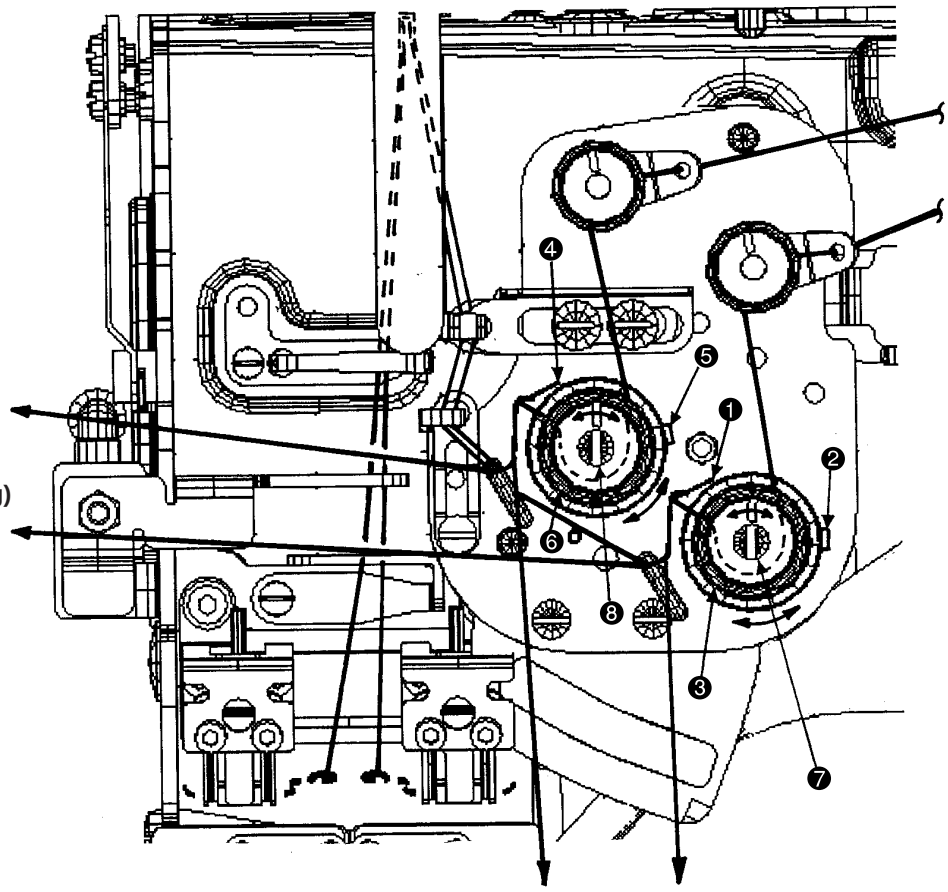
Adjustment Procedures	Results of Improper Adjustment
(1) Adjustment of hook oil amount 1. Adjust the oil amount by means of the oil amount adjusting screw ❶ that is attached to the hook shaft base. 2. When the oil amount adjusting screw ❶ is turned clockwise, the oil amount increases. When it is turned counterclockwise, the oil amount decreases. 3. Measure the oil amount in 5 seconds. If the oil amount is too less, this can be a cause of malfunction. For oil amount check, be sure to observe the oil amount in the hook race section. 4. Adjust the oil amount so that it is not lower than the minimum level (as illustrated). [For reference] When adjustment of hook's oil amount is intended, it is necessary to raise the sewing machine first of all. In regard to the method of raising the sewing machine, refer to the Instruction Manual "VII-5 How to lay down the sewing machine". Be sure to perform the measurement after putting the sewing machine in the storage position. (2) Cleaning of the filter section Periodically (approximately once every 3 months), clean the filter sections ❷ and ❸ (2 positions). 1. Loosen the setscrew ❺ of the lubrication tube holder ❹ for removal from the bed. 2. Loosen the pipe stopper ❻ to take out the tube ❼ and the joint ❽. 3. After the removal of dust attached to the net area of the joint ❽, recover the initial state. (3) Setting for hook oil amount check 1. Display the check program menu screen. When the M key is kept pressed for 3 seconds, a check program button (A) is displayed in the screen. When this button is pressed, the check program menu screen is displayed. 2. IO1 head aging mode Press the head aging button (B) in the check program menu screen to display the head aging screen. C : Used to set up the number of head revolutions. Set 2500 revolutions. D : Used to set up the revolving time. Set 5 seconds. E : Used to set up the stop time. The stop time can be set up arbitrarily. Set up any stop time as you like. F : Used to select whether the center knife is driven in interlinkage with the sewing machine. It is very dangerous if the center knife is driven in the middle of hook oil amount check. This check shall be done in the state of power OFF, without fail. G : Used to start the revolution of the machine head. The revolution stops when it is pressed again. H : Used to return to the menu. (Effective only in the middle of revolution stop)	o If the oil amount lowers below the minimum level, this can be a cause of problems such as hook abrasion, seizure, and so on.

17) Adjustment of thread take-up spring

Standard Adjustment

1.When changing the amount of motion for the thread take-up spring
Stroke : 14±2mm

2.When changing the strength of the thread take-up spring
Thread take-up spring tension: 1mm → 0.25N (25g)

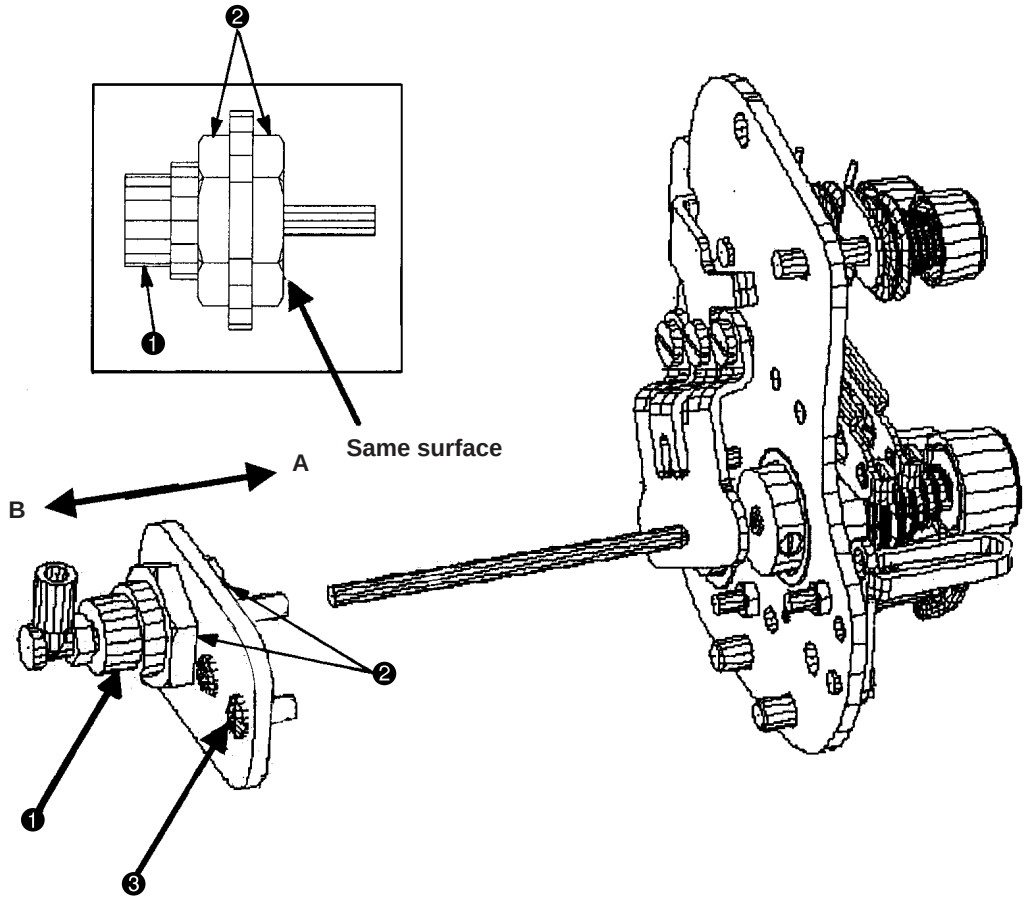


Stroke : 14±2mm

Adjustment Procedures	Results of Improper Adjustment
1. When changing the amount of motion for the thread take-up spring (1) To adjust the right thread take-up spring ❶, loosen the second thread tension setscrew ❷ and turn the second thread tension (asm.) ❸ to the right and left. (2) To adjust the left thread take-up spring ❹, loosen the second thread tension setscrew ❺ and turn the second thread tension (asm.) ❻ to the right and left. (3) When the second thread tensions (asm.) ❸ and ❻ are turned to the right, the thread take-up amount (stroke) is increased. When it is turned to the left, the thread take-up amount becomes small. (4) Make sure that the strokes of the thread take-up springs ❶ and ❹ are 14 ± 2 mm when the thread is pulled downward. **(Caution) When the second thread tension setscrews ❷ (left) and ❺ (right) are loosened, the amount of disk floating may become change. Check "18) Adjustment of floating amount of the thread tension disk" again.** 2. When changing the strength of the thread take-up spring (1) When changing the strength of the right thread take-up spring ❶, turning the spring shaft ❼ to the right causes the strength to increase and turning it to the left causes the strength to decrease. (2) When changing the strength of the left thread take-up spring ❹, turning the spring shaft ❽ to the right causes the strength to increase and turning it to the left causes the strength to decrease. Standard adjusting values (3) Make sure that the tensions of the thread take-up springs ❶ and ❹ are 0.25 N (25g) when the thread is pulled 1 mm sideward and slightly upward.	

18) Adjustment of floating amount of the thread tension disk

Standard Adjustment

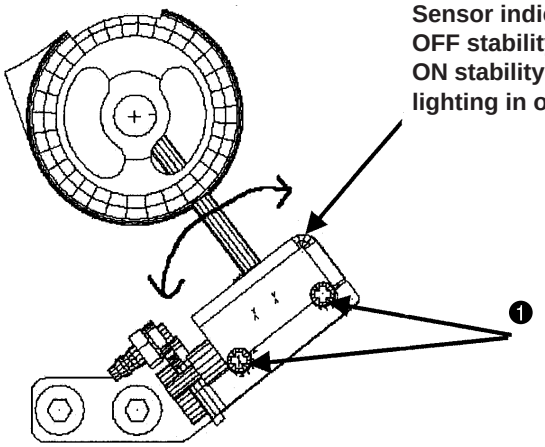


Adjustment Procedures	Results of Improper Adjustment
1. Standard adjustment is to obtain the same plane where the end surface of the disk floating cylinder ❶ and disk floating cylinder fixing nut ❷ are included. 2. The amount of thread tension disk floating is 1.0 to 1.5mm. (1) Remove the fixing plate setscrew ❸ of the disk floating cylinder and take out the disk floating unit. (2) Loosen the fixing nut ❷ of the disk floating cylinder and move the disk floating cylinder ❶ in the direction of the arrow. Adjustment of the disk floating cylinder ❶: o Moving it in Direction A causes the amount of disk floating to increase. o Moving it in Direction B causes the amount of disk floating to decrease. Reassembly can be carried out in the reverse order for disassembly.	

19) Adjustment of the bobbin thread remaining amount detection

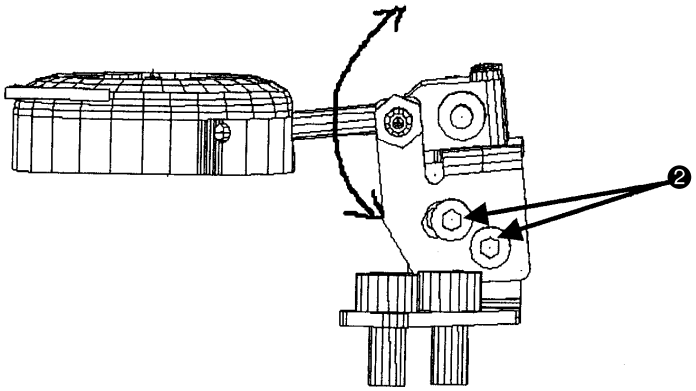
Standard Adjustment

1.Sensor lateral direction

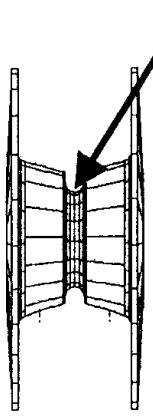


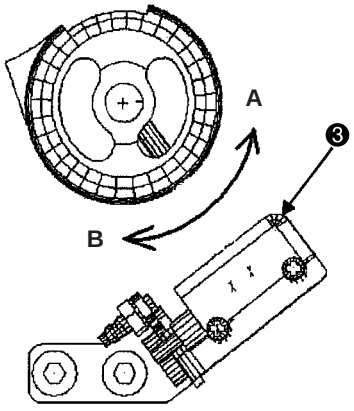
Sensor indicator: ❸
OFF stability display: Lit in green (Orange unlit)
ON stability display: Lit in green and orange (Both unlit or lighting in orange only indicates an unstable condition.)

2.Adjustment of the sensor lateral direction



3.Method of sensor check



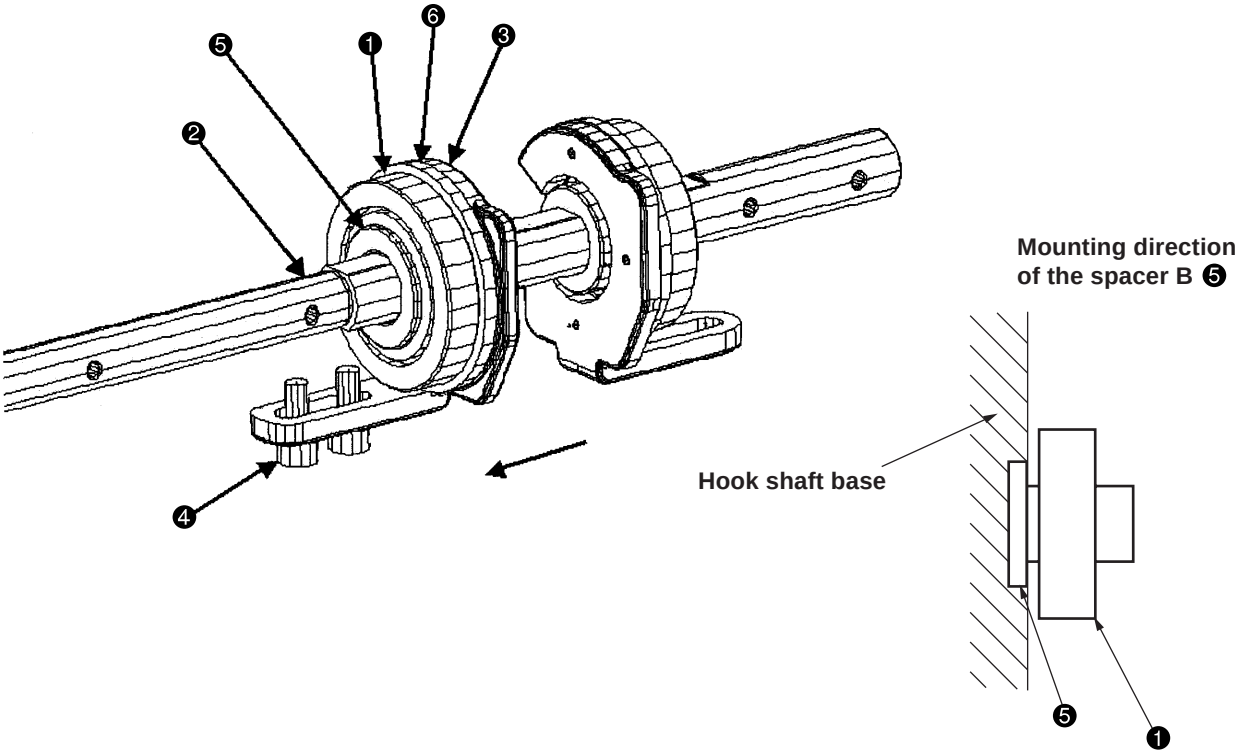


Adjustment Procedures	Results of Improper Adjustment
1. Sensor lateral direction (1) Loosen the sensor setscrew ❶, and adjust the lateral direction to the direction of arrow mark. 2. Adjustment of the sensor lateral direction (1) Loosen the setscrew ❷ of the mounting plate B, and adjust the sensor lateral direction. * Sensor adjustments are the same for both right and left. 3. Method of sensor check (1) Wind a small amount of thread around the bobbin (to a degree bobbin's groove section is covered) and set the bobbin in the bobbin case. (Pass the thread through the bobbin case as making ordinary stitches.) (2) Turn the hand wheel of the sewing machine to assume the needle bar stop position (upper dead point of the needle bar thread take-up lever). (3) Set a bobbin case in the inner hook and slowly pull out the thread until the bobbin reflector seal taps the sensor's optical axis section. When the sensor is actuated at that time and the sensor indicator light ❸ is lit in orange, this is the sign for the completion of adjustments. (4) To confirm whether the sensor performs detection assuredly even when the bobbin case is moved to the right and left at that time, try to turn the bobbin once to assume that the sensor indicator light ❸ is lit in green only and push the bobbin case with a finger in Direction A so that the bobbin reflector seal coincides with the sensor's optical axis section. Check the status of the sensor indicator light ❸ in this manner. Turn the bobbin again and push it in Direction B further in order to examine the status of the sensor indicator light ❸.	

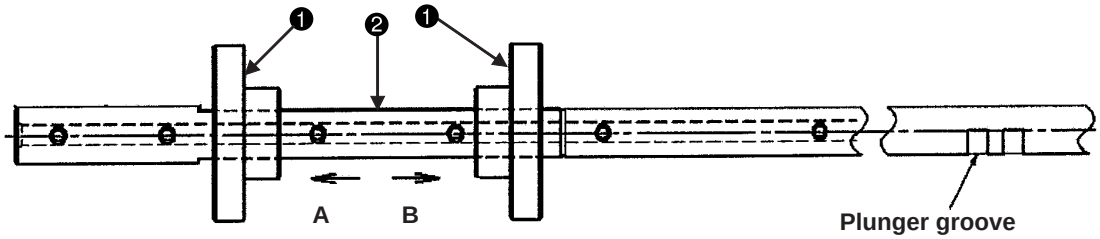
20) Lower shaft area

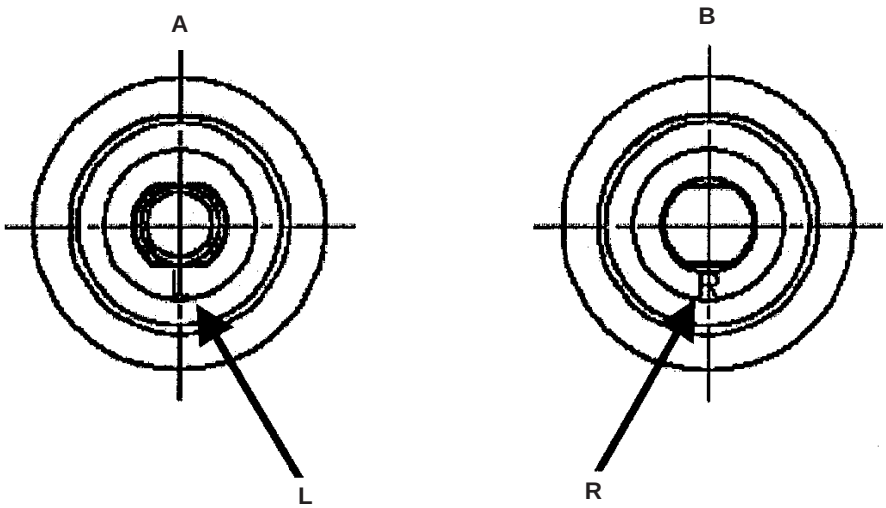
Standard Adjustment

1.Adjustment of the lower shaft gear



2.Replacement of the lower shaft





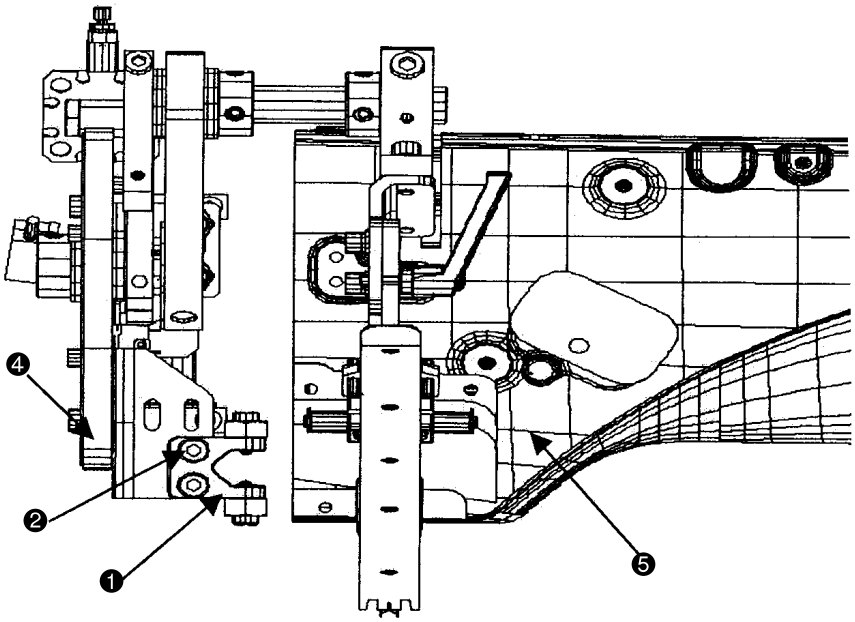
Adjustment Procedures	Results of Improper Adjustment
1. Adjustment of the lower shaft gear (1) Pinch the lower shaft gear ❶ between Spacer A ❷ and Spacer B ❺. Press the gear holder ❸ in the direction of the arrow (hook shaft base side). Make rattle adjustments in thrust direction. **(Caution) Rattles in thrust direction may be adjusted to zero. However, too much pressing may result in very much sound or heat generation around the lower shaft.** (2) After adjustments, fix the lower shaft fixing screw ❹. (3) Make similar adjustments for gears on opposite side. 2. Replacement of the lower shaft (1) Since the right and left lower shaft gears ❶ of the lower shaft ❷ are manufactured in a set, the lower shaft ❷ should be replaced, as required, together with the lower shaft gears ❶ in a set. (Set part No.: 40044641) (2) The lower shaft face and the gear face have their appropriate directions of assembly. Conform to the assembly diagram. * When plunger groove is positioned downwards o the engraved marking L of the left-side lower shaft gear ❶ comes to lower side as the lower shaft gear ❶ is seen from Direction A. o the engraved marking R of the right-side lower shaft gear ❶ comes to lower side as the lower shaft gear ❶ is seen from Direction B. **(Caution) The spacer B ❺ comes in the shape of the step washer. For assembly, the wider side of the washer face should be positioned on the hook shaft base side.**	If there is any rattling in thrust direction, the following difficulties may arise: o Rattles may increase in the direction of hook rotation. This can be a cause of sewing deficiency. o Noise and heat generation may be increased.

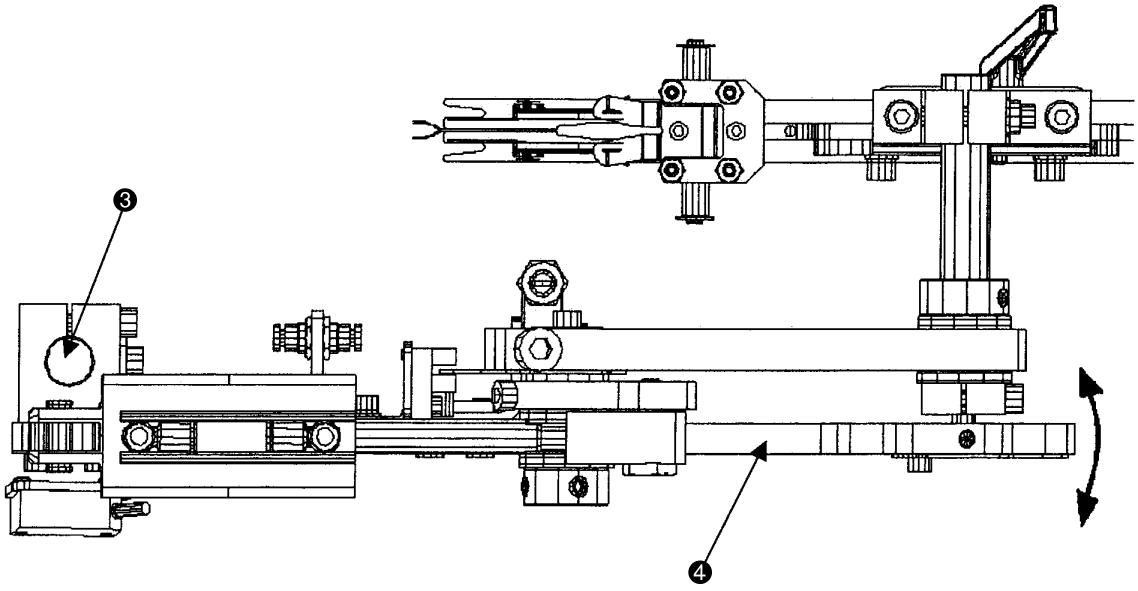
(2) Unit and related sections

1) Binder adjustments

Standard Adjustment

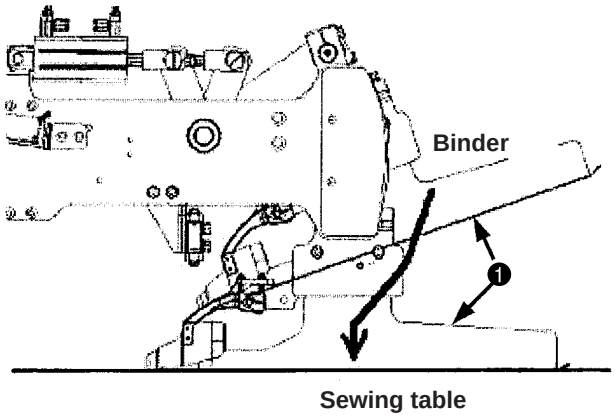
When the pedal switch is trodden on to the third grade, the air cylinder begins to be driven and the binder lowers to the section between the right and left clamp foot.
After the completion of sewing and corner knife actuation, the binder is raised at the end of backward return by the return action of the air cylinder until its original position is recovered.



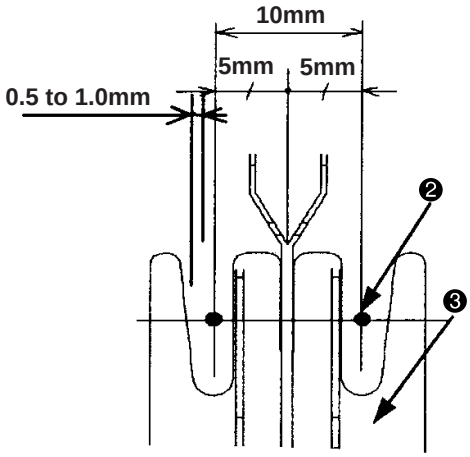


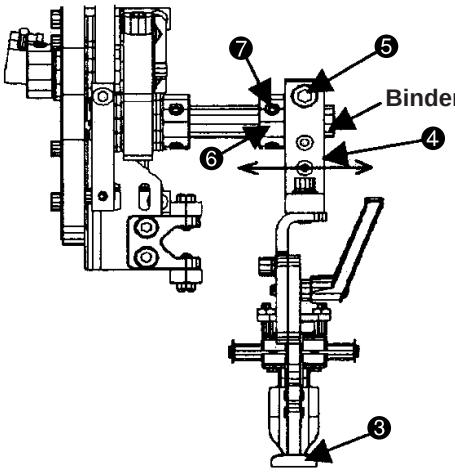
Adjustment Procedures	Results of Improper Adjustment
1. Adjustment of parallelism between slide base side face and machine head side face (1) In the first place, loosen the fixing screw ❷ of the lock base ❶. Since then, deflect the entire slide base ❹ in the direction of the arrow, around the center of the pivot shaft ❸, in order to secure the parallelism between side face of the slide base ❹ and that of the machine head ❺. After parallelism adjustments, tighten the fixing screw ❷ assuredly.	

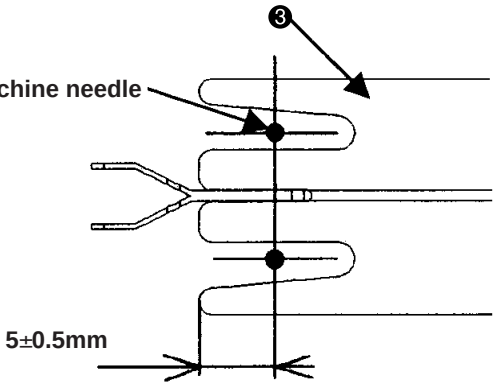
2. Adjustment of binder fall position

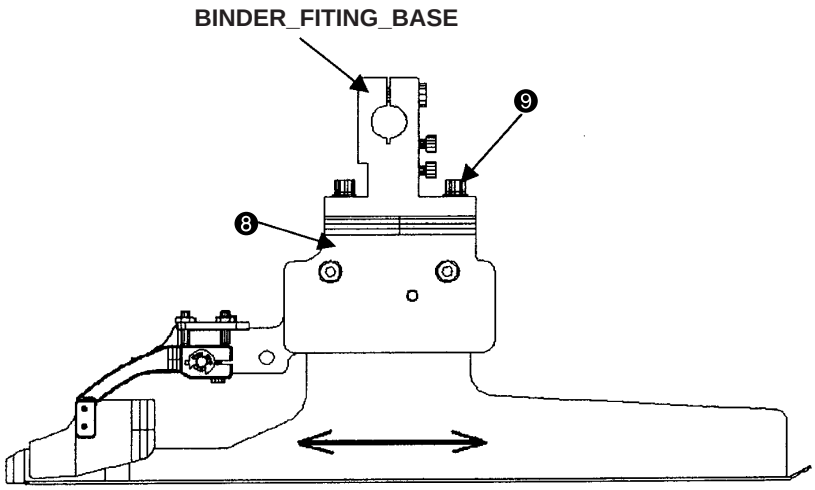


When the stitch width is 10mm





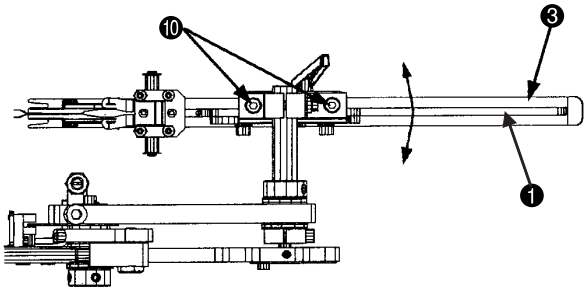




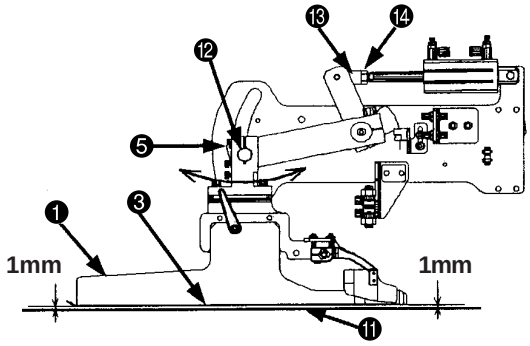
Adjustment Procedures	Results of Improper Adjustment
2. Adjustment of binder fall position (1)Turn off the power supply. Push the binder ❶ by hand in the direction of the arrow to lower the binder ❶. (2) The sewing machine needle ❷ shall be regarded as a standard. The condition is regarded as normal if the binder ❶ lowers to the symmetrical position of right and left where the welting patch scale ❸ does not come in contact with the sewing machine needle ❷. (3) If the welting patch scale ❸ is not symmetrically balanced with reference to the needle fall line, loosen the setscrew ❺ securing the binder mounting base ❹ and the screw ❼ securing the thrust collar ❻ and adjust the position of the binder ❶ in the right-left direction. After adjustments, let the thrust collar ❻ contact the binder mounting base ❹ and tighten the respective screws ❺ and ❼. (4) The dimension from the needle settle position to the rear end of the welting patch scale ❸ shall be approximately 5 ± 0.5mm. (5) If the above-mentioned dimension is not secured, loosen the fixing screw ❾ of the BINDER_FITTING_BASE_B ❽. Move the BINDER_FITTING_BASE_B ❽ in the direction of the arrow for adjustments. After adjustments, tighten the fixing screw ❾ assuredly.	

Standard Adjustment

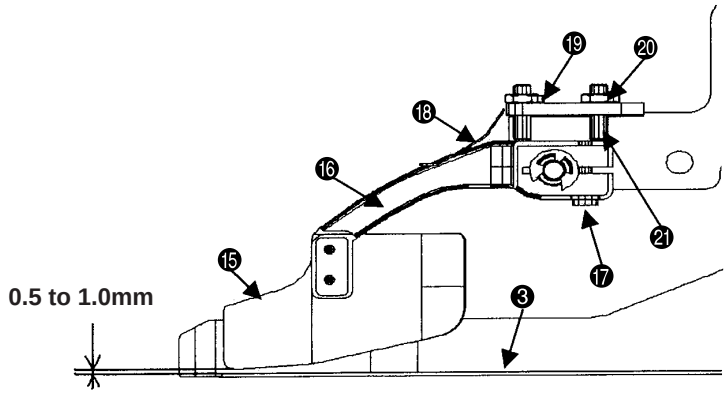
3. Adjustment of concentricity between pocket bag scale and needle center

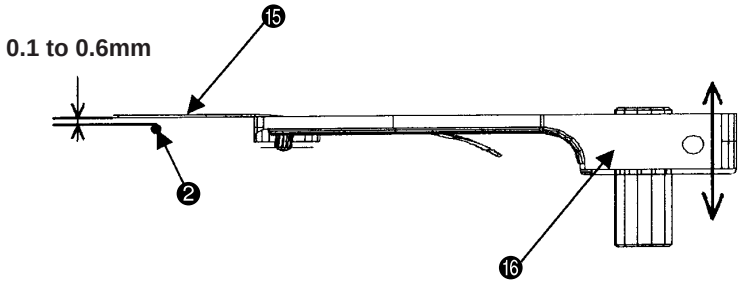


4. Adjustment of binder levelness



5. Adjustment of materials guide

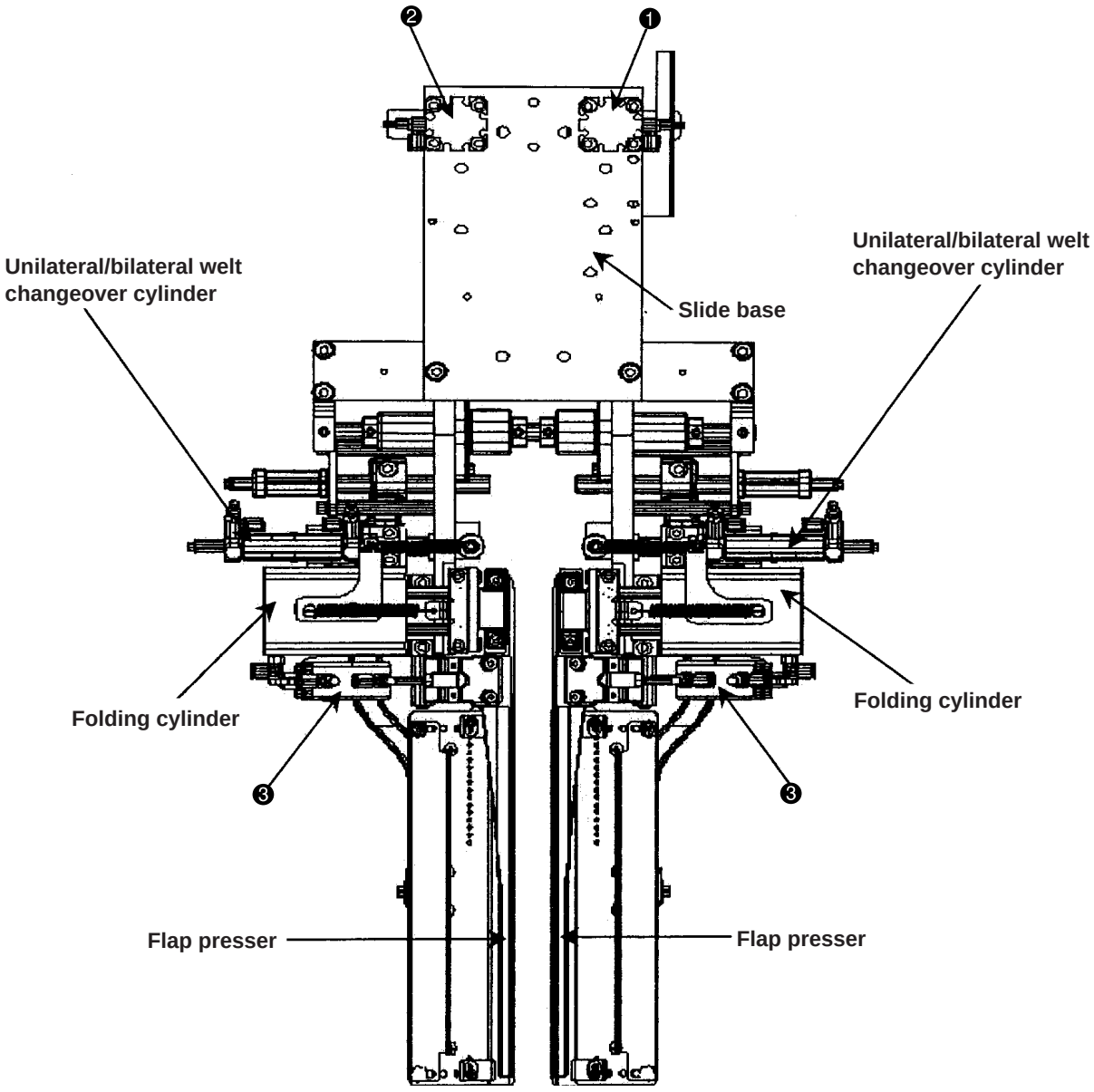




Adjustment Procedures	Results of Improper Adjustment
3. Adjustment of concentricity between welting patch scale and needle center (1) After the fixing screw ⑩ has been loosened, let the entire binder ❶ deflect in the direction of the arrow to secure the concentricity of the needle center. After concentricity adjustments, tighten the fixing screw ⑩ assuredly. **(Caution) This adjustment is also needed when the parallelism is adjusted between the welting patch scale ❸ and the clamp feet.** 4. Adjustment of binder levelness Similarly as for adjustments of fall position and concentricity, adjust and confirm the horizontality (also horizontality of the welting patch scale ❸ and the sewing table ⑪). (1) Similarly as for the adjustment of the fall position, manually lower the binder ❶. (2) Assume the conditions such that the distance becomes 1mm between the lower face of the welting patch scale ❸ and the upper face of the sewing table ⑪ at the bottom end, and that horizontality can be secured. (However, the difference between front and rear ends of the welting patch scale ❸ shall be 0.3mm or less.) (3) For horizontality adjustment, loosen the fixing screw ❺ of the binder mounting base and deflect the entire binding ❶ in the direction of the arrow, around the center of the binder pivot shaft ⑫, in order to secure the horizontality. After the adjustment of horizontality, tighten the fixing screw ❺ securely. (4) For the adjustment of clearance (1mm) between the lower face of the welting patch scale ❸ and the upper face of the sewing table ⑪, try to turn the cylinder sahft ⑬ as illustrated. Loosen the lock nut ⑭ and turn the cylinder shaft ⑬ in the direction of tightening the shaft onto the cylinder joint to let the welting patch scale ❸ rise or in the direction of loosening the shaft to let the scale ❸ fall. When a clearance of 1mm has been secured, tighten the lock nut ⑭ assuredly. 5. Adjustment of materials guide The material guide ⑮ allows a welting patch to become stable at the edge of the needle during sewing. When the stitch size is changed, readjustments are always needed. (1) Loosen the fixing screw ⑰ of the material guide arm ⑯ and move the arm to the side of the needle. The clearance between the side face of the needle shank section ❷ and that of the material guide ⑮ shall be 0.1 to 0.6mm. (2) At that time, the material guide spring ⑱ shall be effective such that the material guide arm ⑯ is lightly pressed and there is no unreasonable resistance at the time of material passing. The pressing pressure of the material guide spring ⑱ can be adjusted by the screw ⑲. (3) The clearance between the material guide ⑮ and the welting patch scale ❸ shall be kept around 0.5 to 1.0mm (welt cloth thickness). It can be adjusted by means of the screw ㉑ after loosening the lock nut ⑳. After adjustments, tighten the lock nut ⑳ securely.	

2) Clamp foot operation

Standard Adjustment



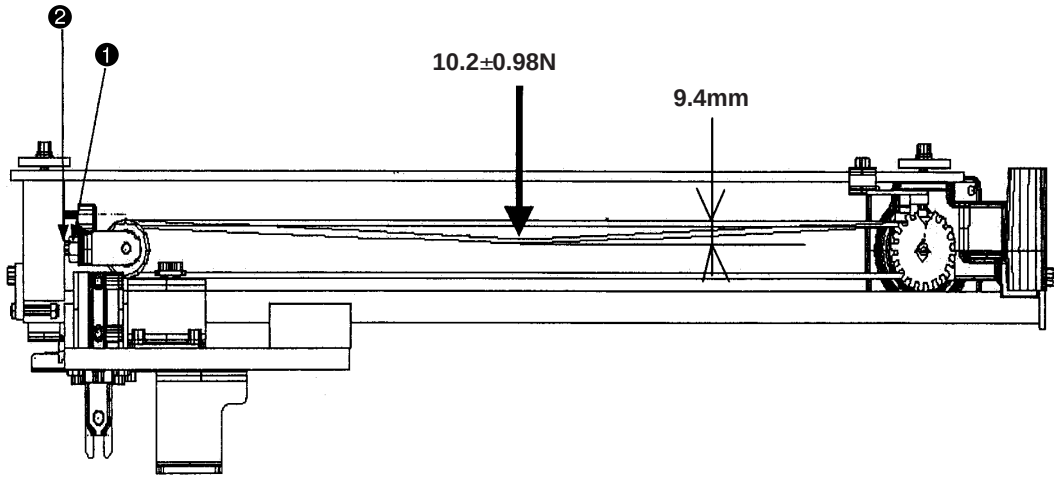
Adjustment Procedures	Results of Improper Adjustment
1. By the action of the right-side clamp foot cylinder ❶ caused by pedal switch tread-on operation, the right-side clamp foot lowers. When the left-side clamp foot cylinder ❷ is actuated, the left-side clamp foot lowers to complete the garment body clamp. 2. In the case of flap sewing, set the right or left flap material and tread on the pedal switch. Then, the flap presser cylinder ❸ is actuated to clamp the flap in the specified position.	

3) Tension adjustment of clamp foot feed belt

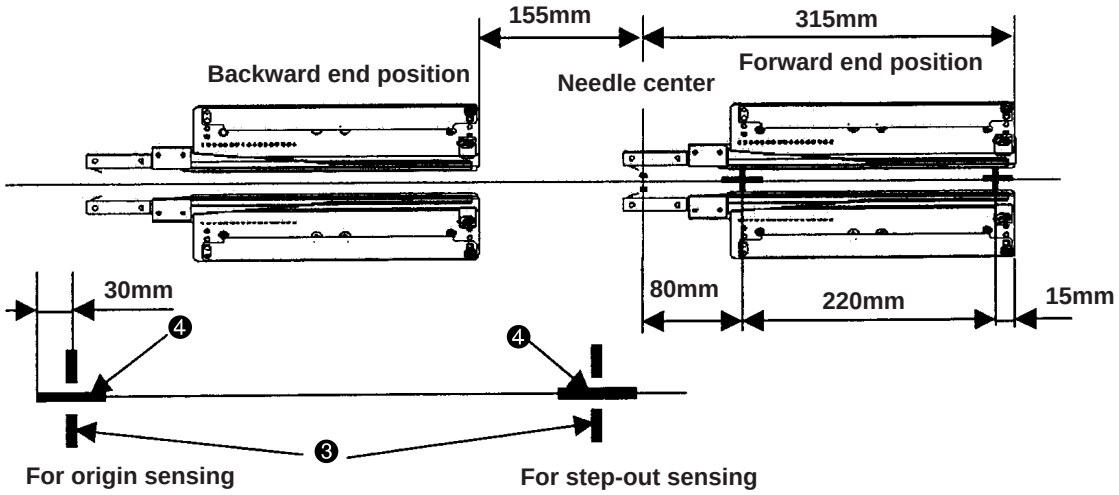
4) Stop position adjustment for forward end or backward end of clamp foot feed

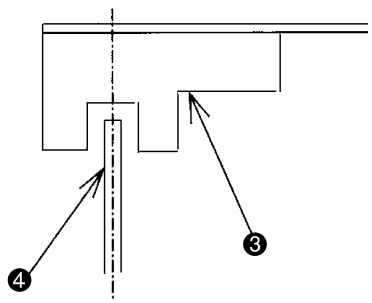
Standard Adjustment

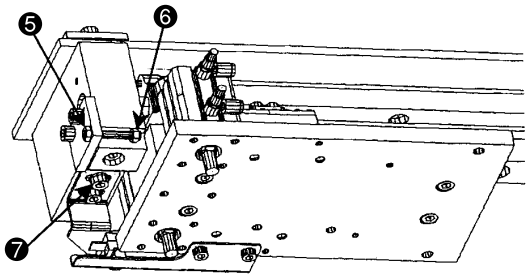
3) Tension adjustment of clamp foot feed belt



4) Stop position adjustment for forward end or backward end of clamp foot feed







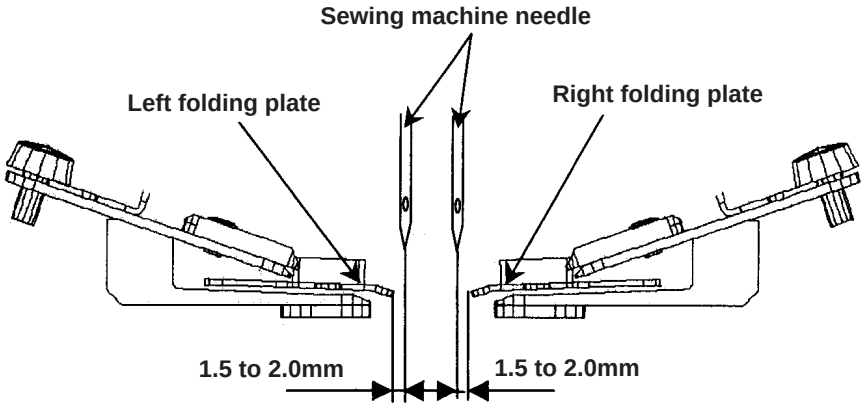
Adjustment Procedures	Results of Improper Adjustment
3) Tension adjustment of clamp foot feed belt 1. Loosen the lock nut ❶, and adjust the tension with the tension screw ❷. 2. When a pressing force of 10.2± 0.98N is applied to the center of the pulley, exert a tension to a degree where a deflection of 9.4mm is caused. 3. After adjustments, tighten the lock nut ❶ firmly. **4) Stop position adjustment for forward end or backward end of clamp foot feed** 1. Stop position of forward end or backward end (1) Decision is based on the position of the photo sensor ❸ as illustrated. Based on the reference dimension of the position of the photo sensor ❸, determine the clamp foot stop position as illustrated. o For the clamp foot forward end, the garment body clamp tip shall be positioned 315mm from the needle center. o For the clamp foot forward end, the garment body clamp tip shall be positioned 155mm from the needle center. (2) When the origin detection sensor is ON, the clamp foot advances by 30mm and then stops. (3) If the dimensions are not as shown in the figure, loosen the lock nut ❺, and turn the stopper screw ❻ to adjust the dimensions. In addition, loosen the setscrew ❼, adjust the position of the photo sensor ❸. 2. Position adjustment of the photo sensor (1) There shall be no interference in the clearance between the clamp foot proximity switch (photo sensor ❸) and the detector plate ❹, and around the clamp foot proximity switch (photo sensor ❸) and the detector plate ❹.	

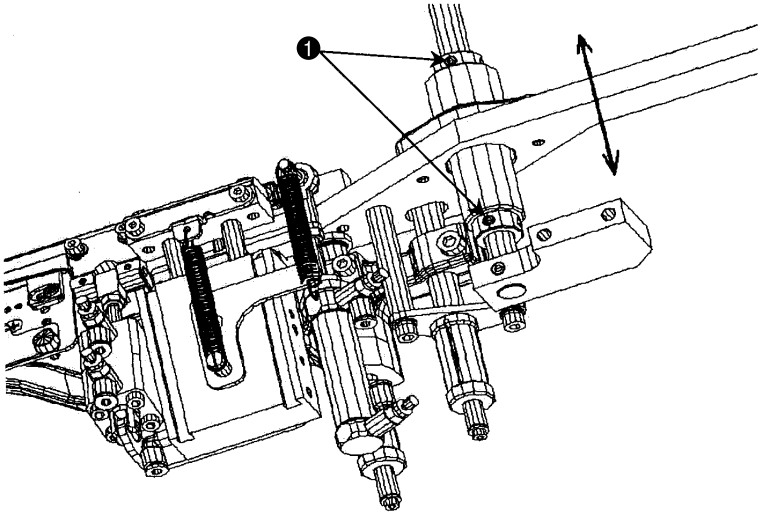
5) Positioning adjustment of welting patch folding plate

6) Adjustment of parallelism of welting patch folding

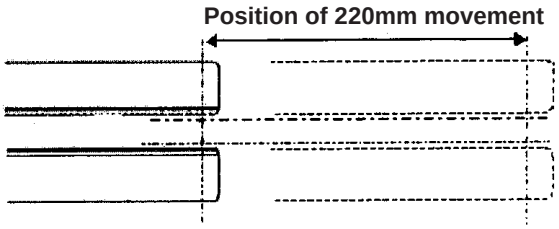
Standard Adjustment

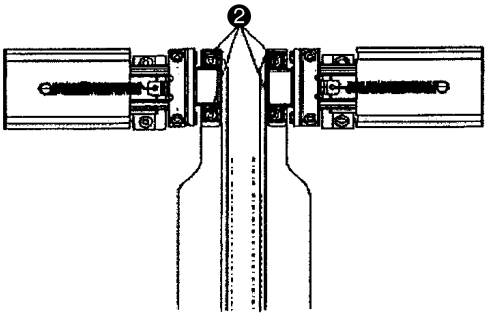
5) Positioning adjustment of welting patch folding plate





6) Adjustment of the parallelism of welting patch folding





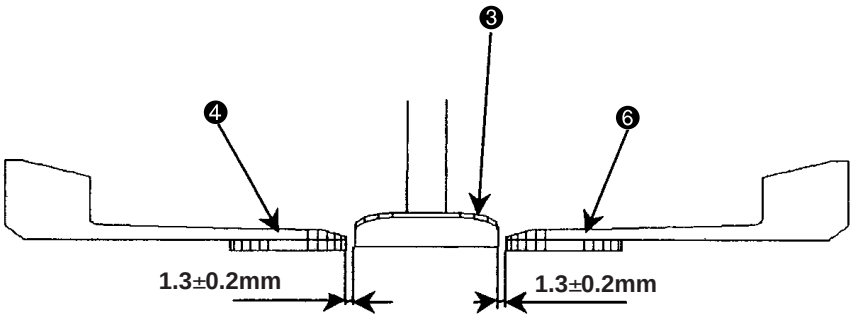
Adjustment Procedures	Results of Improper Adjustment
5) Positioning adjustment of welting patch folding plate 1. If the dimension is inadequate as illustrated, loosen the setscrew ❶ and move it in the direction of the arrow for adjustments. **6) Adjustment of the parallelism of welting patch folding** **1**. When it is moved by 220mm from the clamp foot forward end, the difference between the needle center and the folding end face shall be 0.15mm or less. 2. If the parallelism is not secured, loosen the setscrew ❷ for adjustments.	

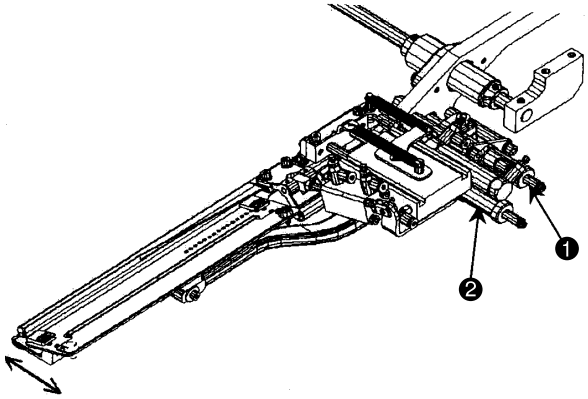
7) Positioning adjustment of right and left garment body clamp

8) Adjustment of parallelism of right and left garment body clamp and welting patch scale

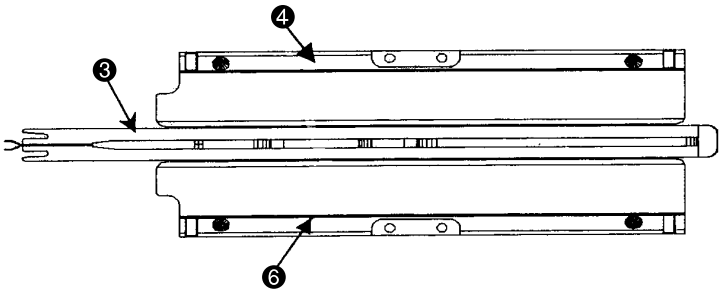
Standard Adjustment

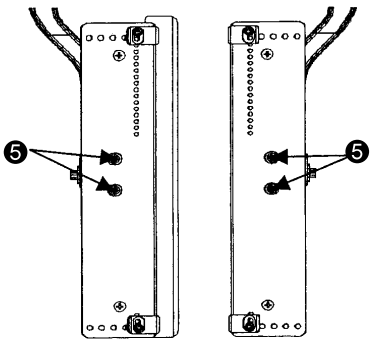
7) Positioning adjustment of right and left garment body clamp





8) Adjustment of parallelism of right and left garment body clamp and welting patch scale



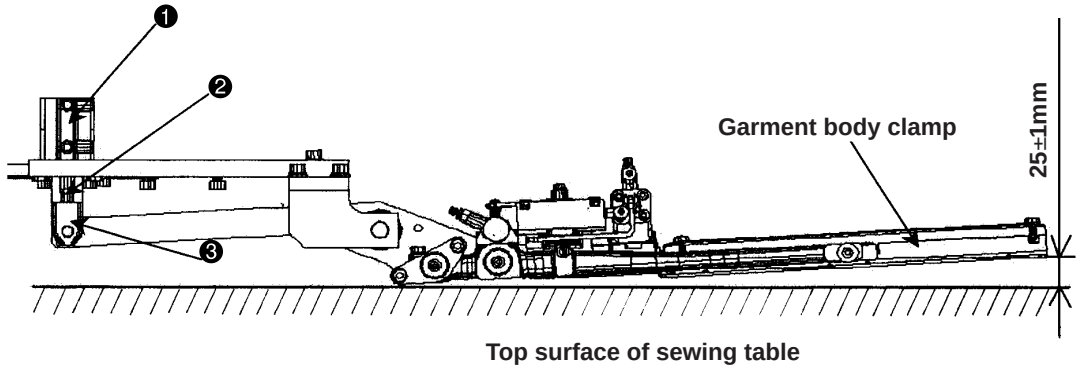


Adjustment Procedures	Results of Improper Adjustment
7) Positioning adjustment of right and left garment body clamp If the dimensions as specified in the illustration are not secured: o For bilateral type, adjust it by turning the ratchet knob ❶. o For unilateral type, adjust it by turning the ratchet knob ❷. **8) Adjustment of parallelism of right and left garment body clamp and welting patch scale** 1. When it is moved by 220mm from the clamp foot forward end, the difference between the welting patch scale ❸ and the end face of the left garment body clamp ❹ and right garment body clamp ❻ shall be 0.15mm or less. 2. If the parallelism is not secured, loosen the fixing screw ❺ for adjustment by lowering the serge back clamp ❹.	

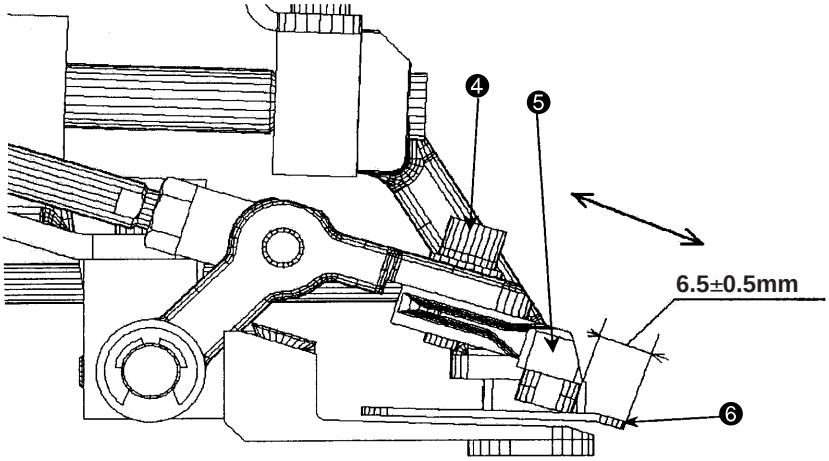
9) Adjustment of released presser height
10) Positioning adjustment of the flap presser
11) Positioning adjustment of flap scale and flap stopper

Standard Adjustment

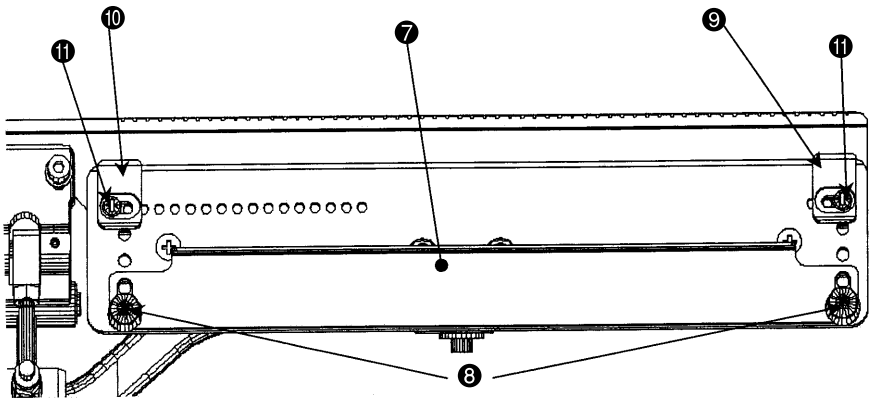
9) Adjustment of released presser height



10) Positioning adjustment of the flap presser



11) Positioning adjustment of flap scale and flap stopper



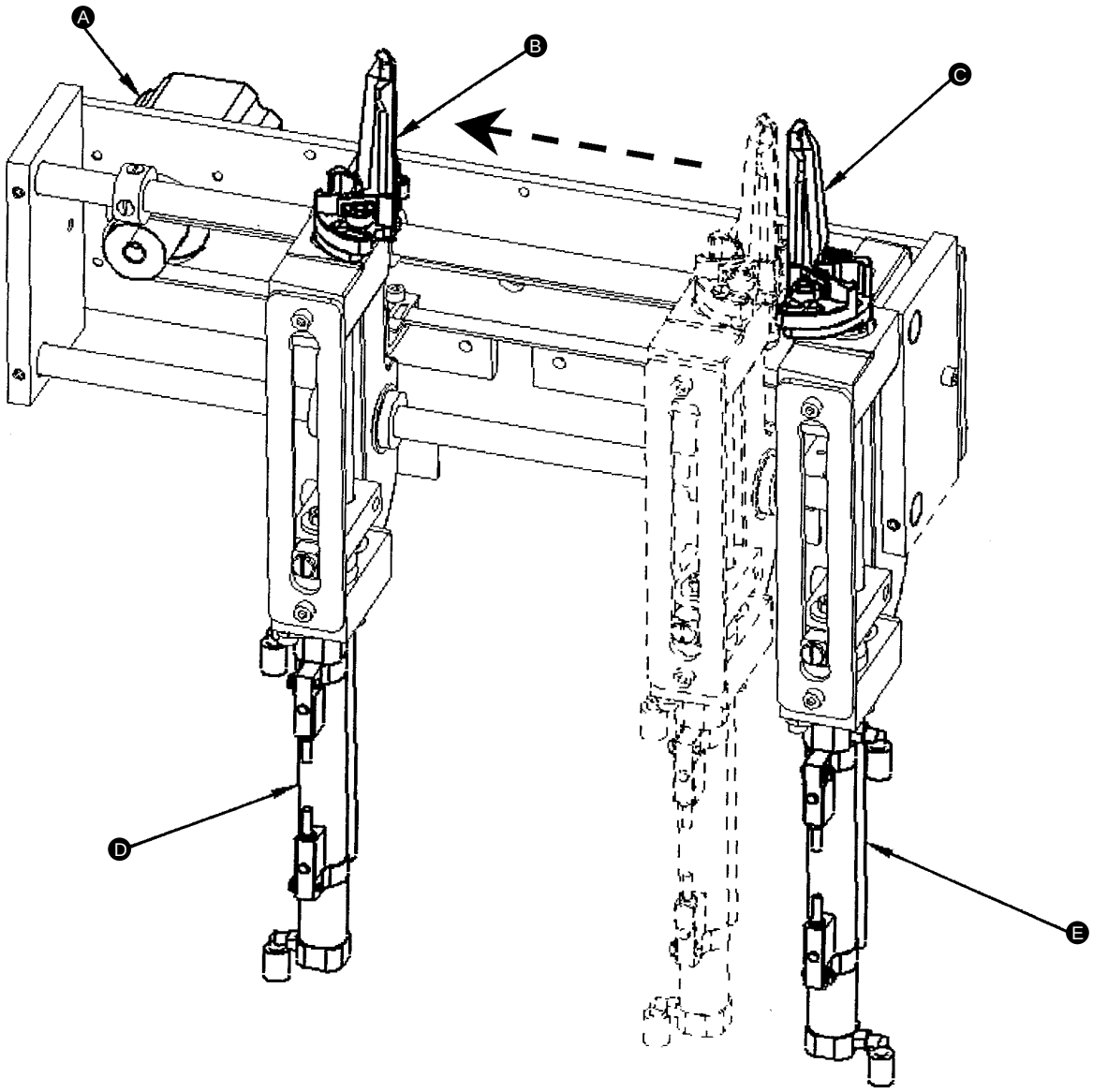
Adjustment Procedures	Results of Improper Adjustment
9) Adjustment of released presser height 1. If the dimensions is not 25 ± 1 mm unlike the drawing, loosen the nut ❷ securing the clamp foot cylinder ❶ and adjust the screwing amount into the elevating block ❸. **10) Positioning adjustment of the flap presser** 1. If the dimensions is not 6.5 ± 0.5 mm unlike the drawing, loosen the setscrew ❹ and adjust the position of the flap presserr ❺. For this adjustment, however, never fail to adjust the parallelism for the folding plate ❻ and the flap presser ❺. **11) Positioning adjustment of flap scale and flap stopper** 1. In conjunction with the flap length, loosen the setscrew ❽ of the flap scale ❼ for adjustment 2. The flap stoppers (A) ❾ and (B) ❿ used to set up the flap materials shall be mainly adjusted by loosening the setscrew ⓫ according to the condition of pattern arrangement for the serge back materials and flap materials.	

12) Corner knife mechanism

Standard Adjustment

[Corner knife operation]

1. When the corner knife moving motor Ⓐ is turned ON, the moving-side corner knife Ⓑ (position of sewing start) moves to the position that is proportionate to the preset sewing length.
2. At the end of movement, the moving-side corner knife Ⓑ and the fixed-side corner knife Ⓒ (position of sewing end) begin to be raised by the respective elevator air cylinders Ⓓ and Ⓔ to cut the material.

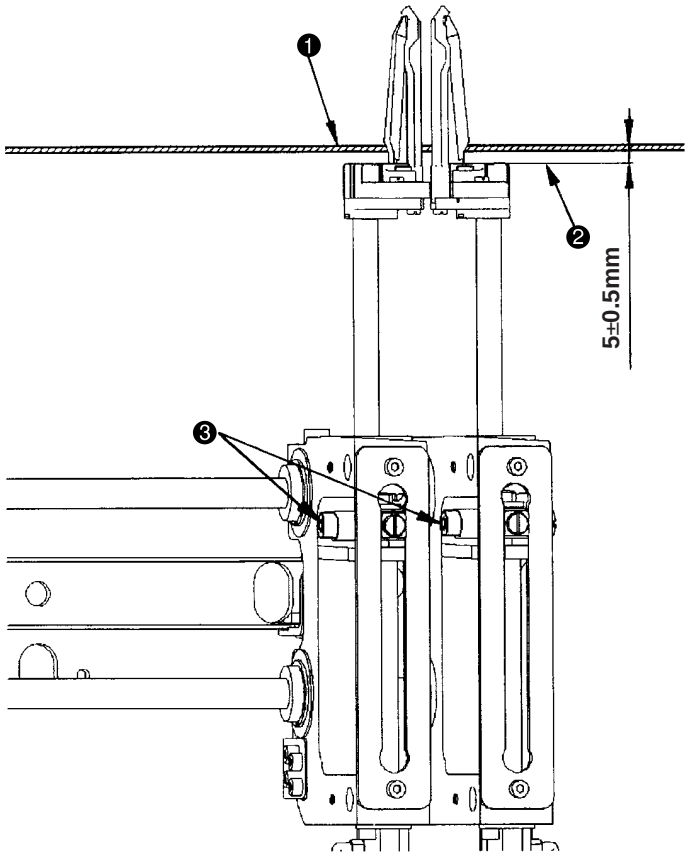


Adjustment Procedures	Results of Improper Adjustment
1. In the case of corner knife replacement and adjustment, draw out the corner knife unit before adjustments. 2. After completion of the adjustment, be sure to conduct the tests sufficiently to ensure that no defective cutting occurs before regular operation.	

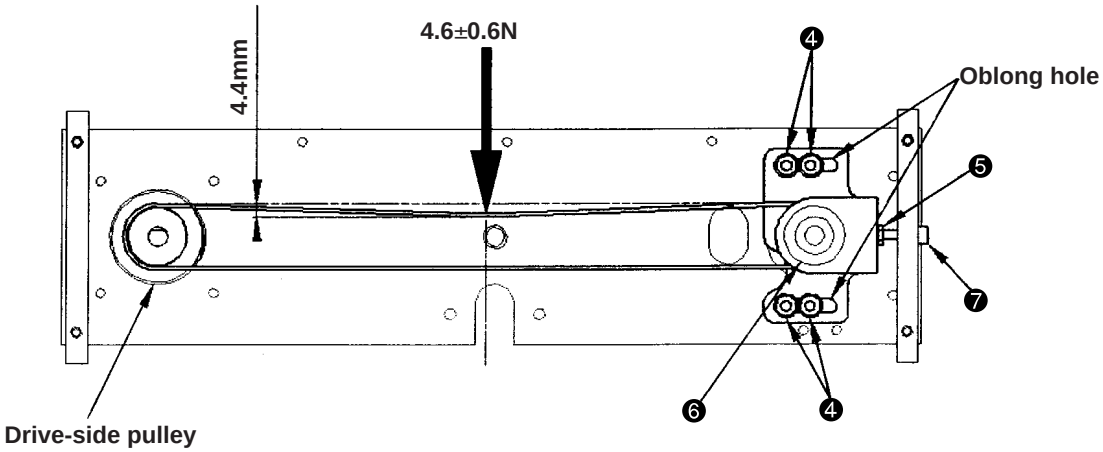
13) Height adjustment of corner knife
14) Tension adjustment of corner knife feeding belt

Standard Adjustment

13) Height adjustment of corner knife



14) Tension adjustment of corner knife feeding belt

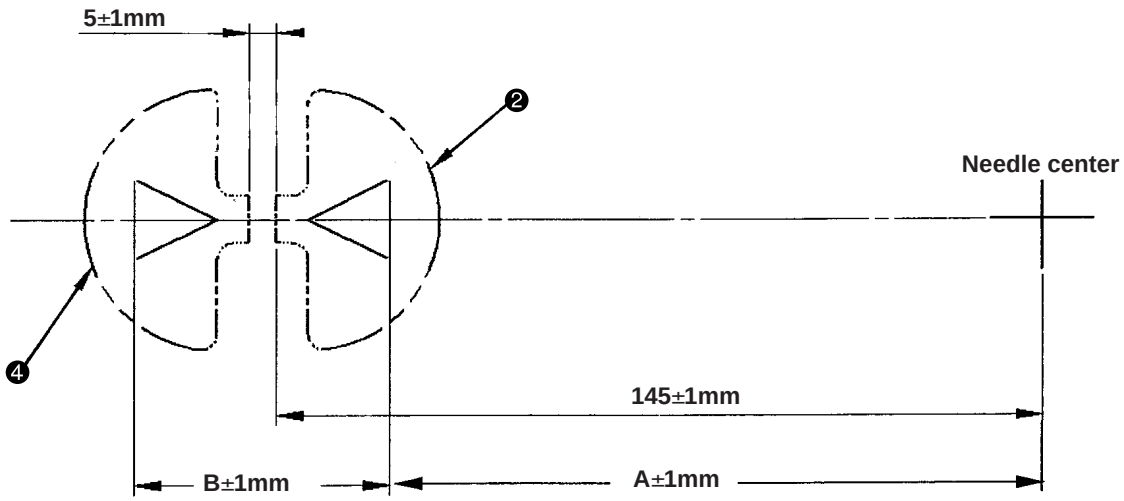


Adjustment Procedures	Results of Improper Adjustment
13) Height adjustment of corner knife 1. Make adjustments by loosening the fixing screw ❸ so that the tips of both moving and fixed corner knifes are positioned about 4.5 to 5.5mm from the table upper face ❶ to the knife holder upper face ❷ at the rising end of the corner knife elevator cylinder, as illustrated.	
14) Tension adjustment of corner knife feeding belt 1. Loosen the fixing screw ❹ and the lock nut ❺ and move the follower side pulley ❻ along the oblong hole of the base. (By moving the adjusting screw ❼ forward and backward, the follower side pulley ❻can be moved.) 2. When a pressing force of 4.6± 0.6N is applied to the center of the pulley, exert a tension to a degree where a deflection of 4.4mm is caused. 3. After adjustments, tighten the fixing screw ❹ and the lock nut ❺ assuredly.	o If the tension is too weak, the sewing and knife positions may give rise to deviation.

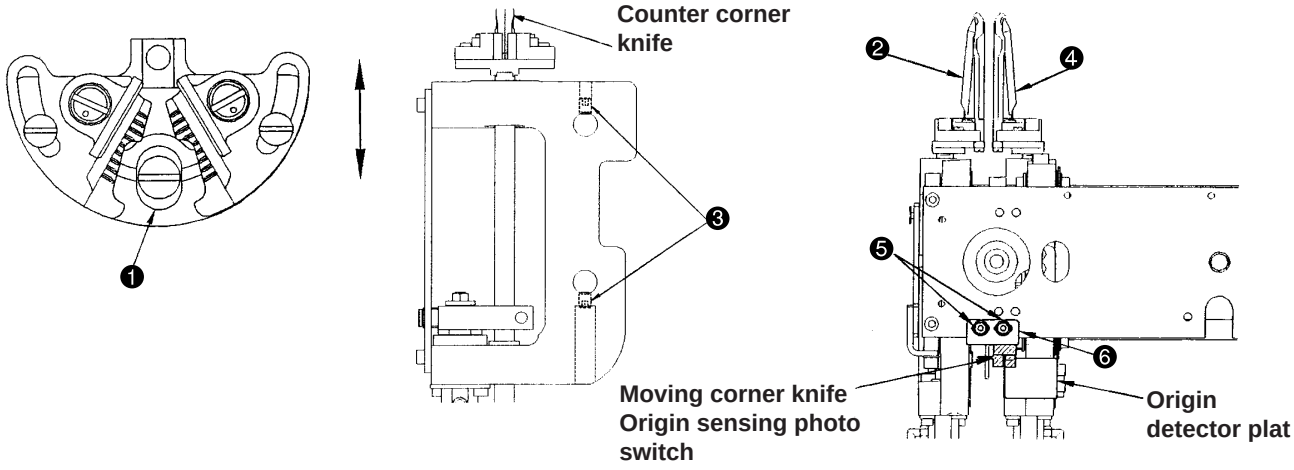
15) Adjustment of origin position of corner knife

Standard Adjustment

[Origin position of the moving and counter corner knife]



G	Gauge size (mm)	8	10	12	14	16	18	20
A	Assemblying dimensions (mm)	131.5	130	130	126.9	125.3	123.8	122.4
B	Assemblying dimensions (mm)	31.9	35	35	41.2	44.3	47.4	50



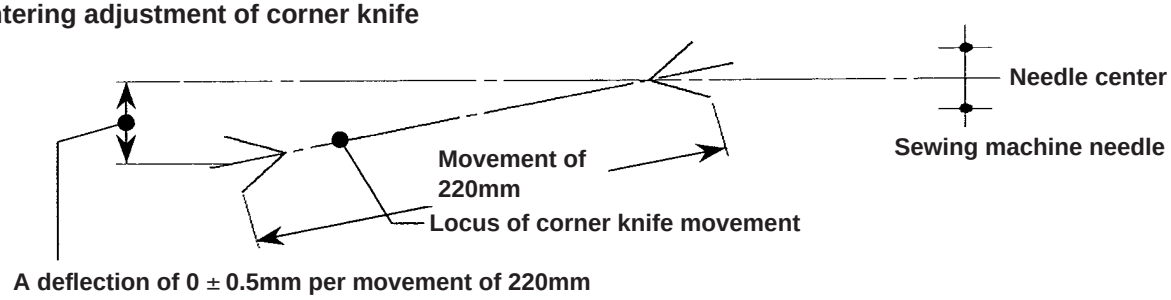
Adjustment Procedures	Results of Improper Adjustment
1. If the dimensions as specified in the illustration are not secured, loosen the setscrew ❶ for adjustment. 2. If the dimension of the fixed corner knife ❷ cannot be secured even after the adjustment by loosening the setscrew ❶, try to loosen the setscrew ❸ for another adjustment. 3. If the dimension of the moving corner knife ❹ cannot be secured even after the adjustment by loosening the setscrew ❶, try to loosen the fixing screw ❺ and shift the switch mounting bracket ❻ for adjustment.	

16) Centering adjustment of corner knife

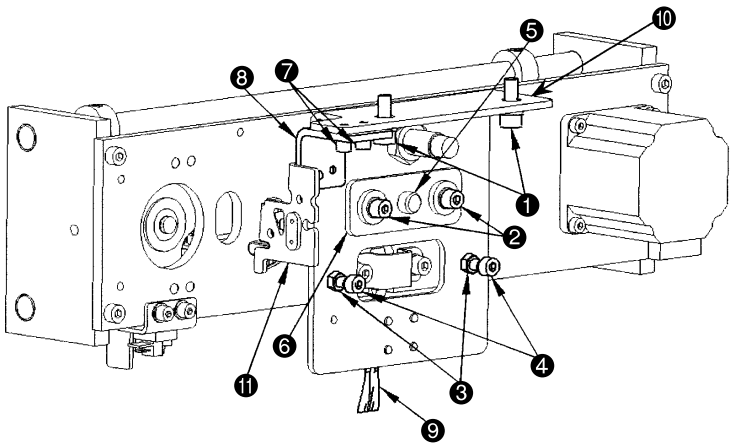
17) Adjustment of corner knife right and left bends

Standard Adjustment

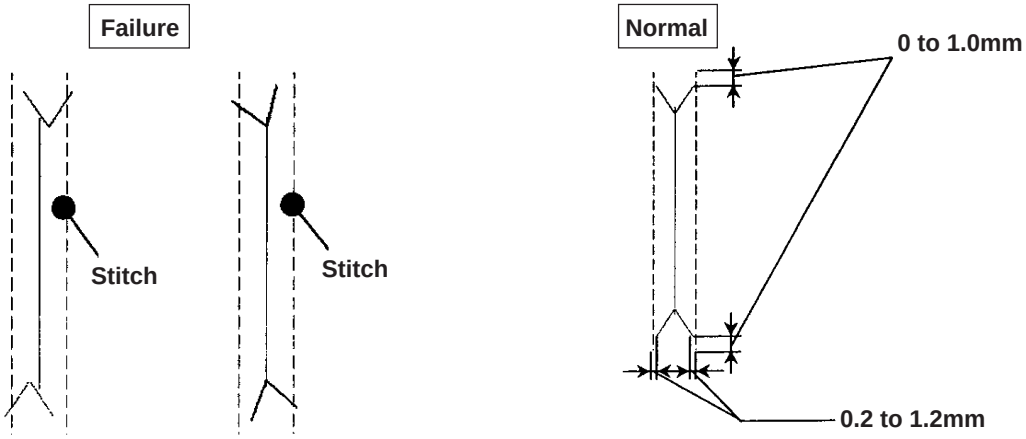
16) Centering adjustment of corner knife



A deflection of 0 ± 0.5mm per movement of 220mm



17) Adjustment of corner knife right and left bends

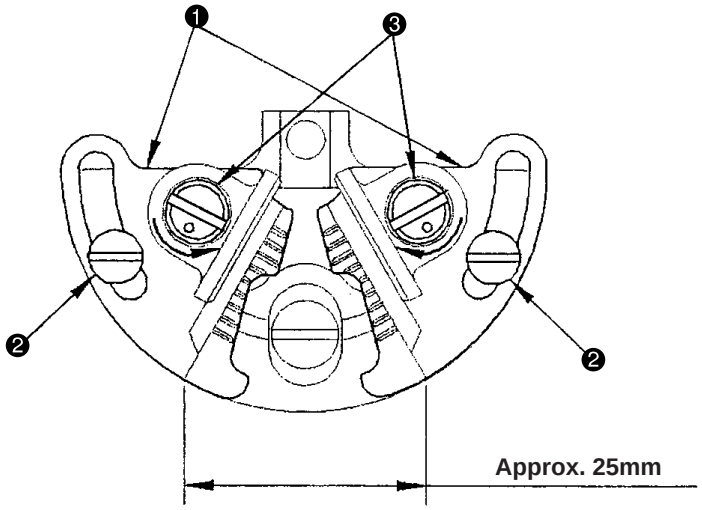


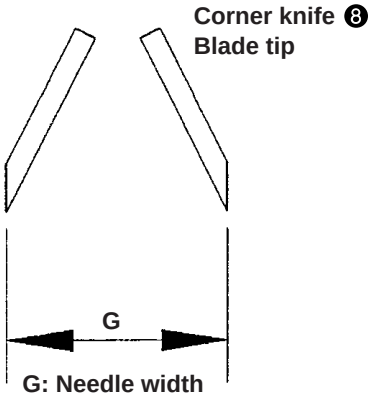
Adjustment Procedures	Results of Improper Adjustment
16) Centering adjustment of corner knife 1. The center of corner knife movement is required to coincide with the needle center. 2. This adjustment has been already finished at the time of shipment from the factory. However, in such a case when the corner knife unit is moved for reasons of external shocks or others, some adjustments are needed in the steps described below so that deviation from the needle center can be kept within 0 ± 0.5mm even when the moving corner knife is moved by about 220mm. (1) Loosen the fixing screws ❶ and ❷, fix the corner knife unit with the toggle clamp ❾, and adjust the frame bracket ❿ so that the center of corner knife movement is maintained in parallel to the needle center. (Fine adjustments can be made by loosening the lock nut ❸ and shifting the adjusting screw ❹ forward and backward.) (2) Shift the guide plate ❻ to make the positioning pin ❺ enter the hole and tighten the fixing screw ❷. (3) Loosen the fixing screw ❼ and make adjustments by shifting the switch bracket ❽ so that the corner knife unit opening sensor switch ⓫ can detect the presence of opening.	
17) Adjustment of corner knife right and left bends 1. The corner knife shall be adjusted so that it cuts the center of the sewing line and that the thread is not cut off. If "16) Centering adjustment of corner knife" has been duly finished, the corner knife may be mounted to make fine adjustments.	o If the corner knife is deflected to the right or left, or fastened in a bent posture, malfunction as illustrated may occur.

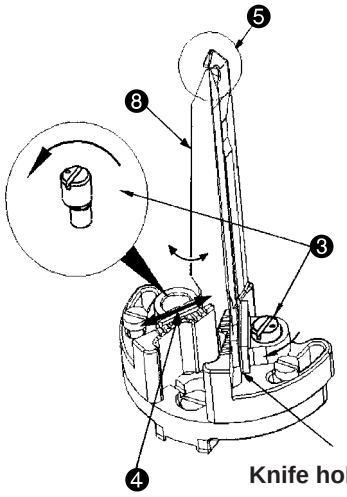
18) Adjustment of parallel sewin
19) Fine adjustments for stitches

Standard Adjustment

18) Adjustment of parallel sewin

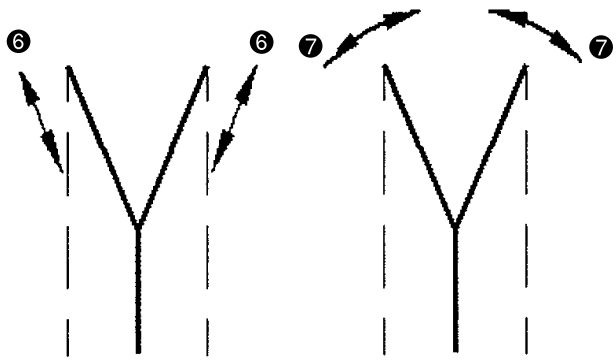






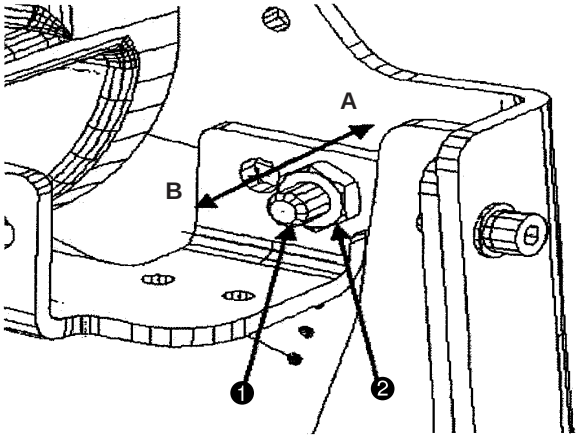
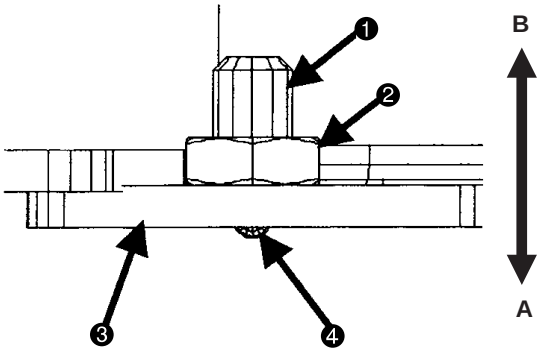
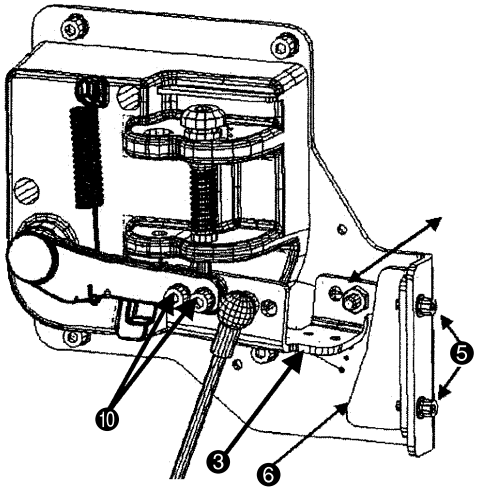
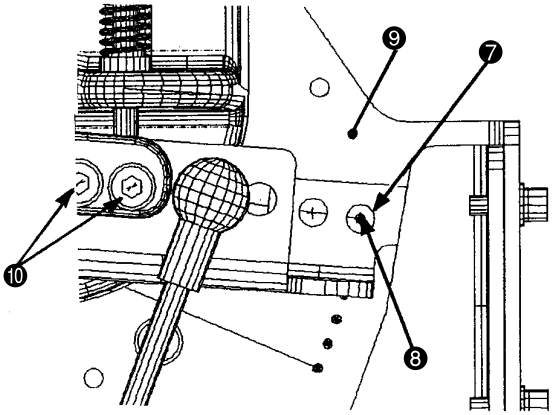
Knife holder groove section

19) Fine adjustments for stitches



Adjustment Procedures	Results of Improper Adjustment
18) Adjustment of parallel sewin 1. ecure the corner knife holder ❶ with setscrew ❷ cso that the opening amount of the holder is set to approx. 25 mm. 2. Insert the corner knife ❽ in the groove section of the corner knife holder and secure the blade position where the width of the blade tip attains an approximate needle size G. In this position, turn the eccentric pin ❸ in the direction of the arrow and fix it. After completion of the setting described above, perform trial sewing with use of sewing material. **19) Fine adjustments for stitches** 1. To adjust the cut section length ❻, loosen the eccentric pin ❸ and move the corner knife ❽ in the direction of the arrow ❹. **(Caution) During the above-mentioned moving adjustments, the blade tip section ❺ should be positioned where it is covered.** 2. For the adjustment of the cut section angle ❼, loosen the setscrew ❷ and adjust the amount of opening of the corner knife holder ❶.	

20) Pedal and related sections

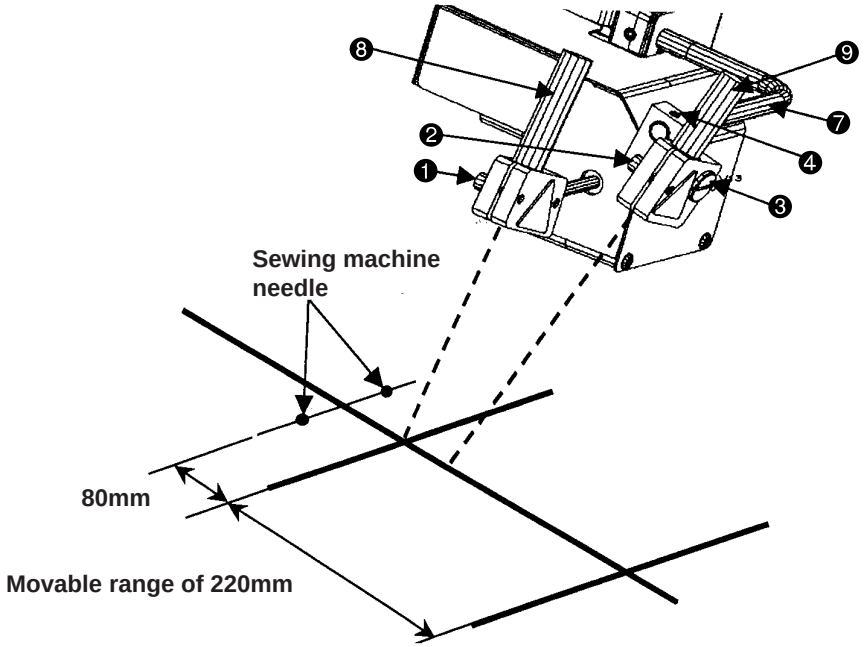
Standard Adjustment
   

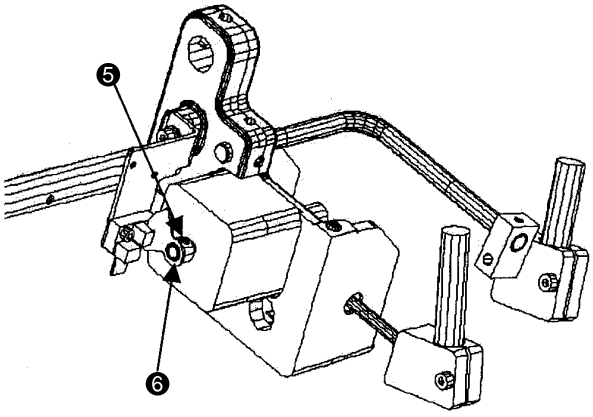
Adjustment Procedures	Results of Improper Adjustment
1. Adjustment of pedal ball plunger (1) Loosen the pedal ball plunger fixing nut ❷ and adjust the position of the pedal ball plunger ❶ in the arrow direction (A or B). o The pedal click is strengthened when the pedal ball plunger ❶ is moved in Direction A. o The pedal click is weakened when the pedal ball plunger ❶ is moved in Direction B. (2) Use the pedal ball plunger fixing nut ❷ for fixing. **(Caution) 1. The pedal ball plunger ❶ is made of plastics. Be aware that tightening the plunger fixing nut ❷ excessively may damage the plunger.** **2. Adjust the main body of the pedal ball plunger ❶ so that it is not protruded from the end face of the pedal lever ❸.** **3. The plunger ball ❹ only is allowed to be protruded from the end face of the pedal lever ❸.** 2. Adjustment of the pedal lever support plate (1) To prevent the pedal lever ❸ from rattling in the direction of the arrow, loosen the pedal lever support plate setscrew ❺ and move the pedal lever support plate ❻ in the direction of the arrow for adjustment. **(Caution) 1. A pedal return error may occur if the pedal lever ❸ does not move smoothly throughout the stroke range.** **2. The pedal click is weakened if the pedal lever ❸ has a rattling problem in the arrow direction (A or B).** 3. Adjustment of ball plunger hole position (1) Loosen the pedal lever fixing screw ❿ and align the mounting tap ❼ of the pedal ball plunger ❶ of the pedal lever ❸ with the plunger hole ❽ of the pedal base ❾.	

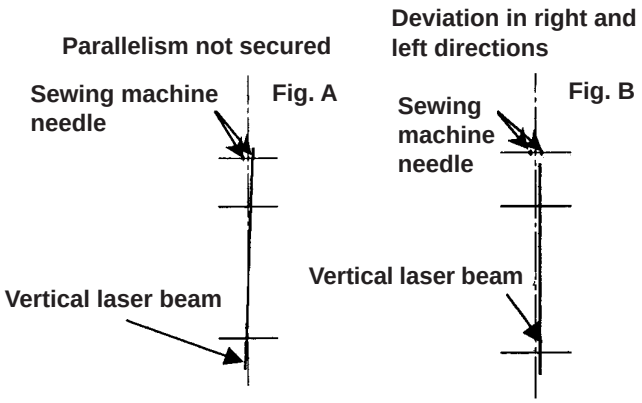
21) Marking light and related sections

Standard Adjustment

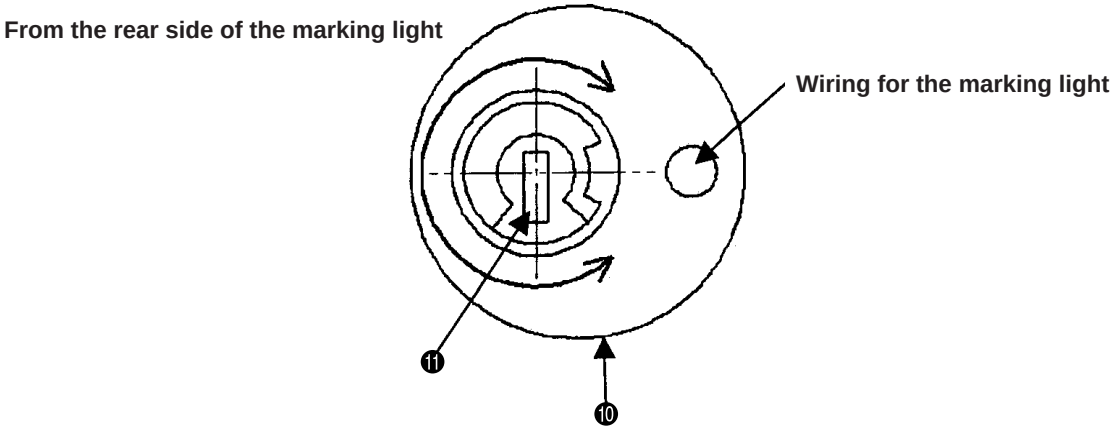
1. Adjustment of laser beam parallelism of the marking light







2. Adjustment of the light value of the marking light



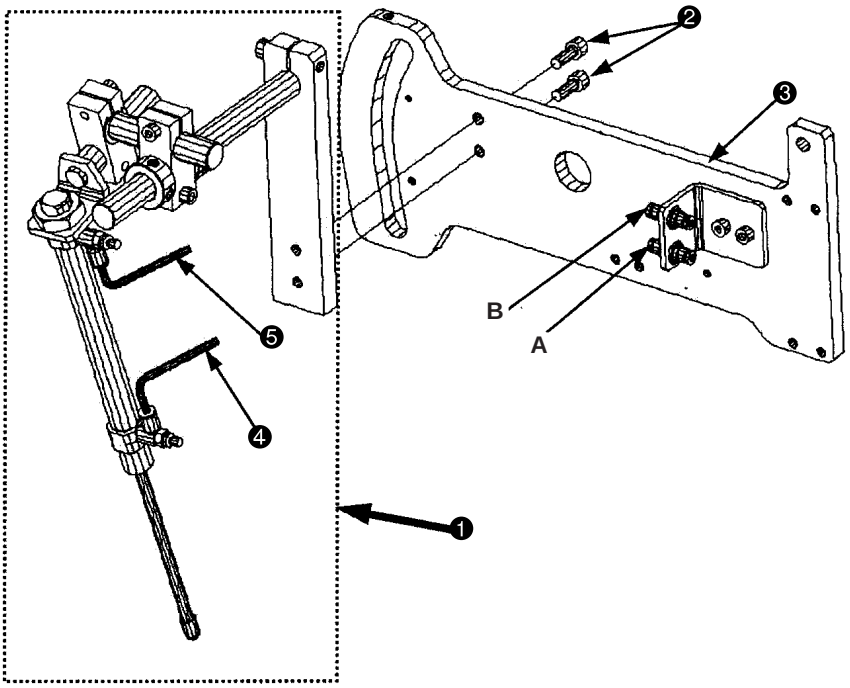
Adjustment Procedures	Results of Improper Adjustment
1. Adjustment of laser beam parallelism of the marking light (1) Adjustment of the horizontal line o If parallelism of the laser beam is not secured, loosen the setscrew ❶ and turn the marking light A ❽ for adjustment. o In the case of adjustments at the panel beyond the range of origin correction (±25mm), dislodge the marking light cover and loosen the setscrew ❺ of the rear sensor plate. In this state, turn the sensor plate ❻ for adjustment. (2) Adjustment of vertical line position o If parallelism of the vertical laser beam is not secured (See Fig. A), loosen the setscrew ❷ and turn the marking light B ❾ for adjustment. o If the vertical laser beam has deviated in the right or left direction (See Fig. B), loosen the hinge screw ❸ and adjust the marking light B ❾ by turning it around the center of the hinge screw ❸. o If the radiation range (300mm from the needle center) of the vertical laser beam is not secured, loosen the setscrew ❹ and turn the marking light B ❾ for adjustment around the center of the fixed shaft ❼. 2. Adjustment of the light value of the marking light (1) The light value of the marking light is adjusted with the volume control ⓫ located on the rear side of the marking light ❿. o The laser beam is lightened when the volume control ⓫ is turned to the right. o The laser beam is darkened when the volume control ⓫ is turned to the left.	

(3) Optional sections

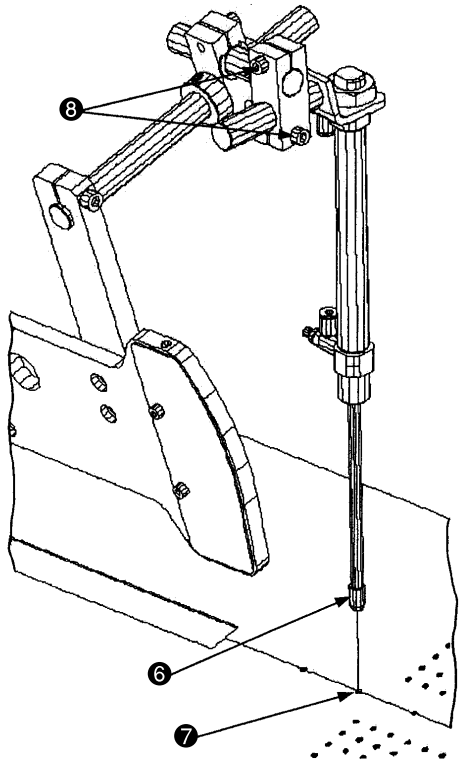
1) SA-117 (dart stretcher unit)

Standard Adjustment

1. Installation



2. Adjustment

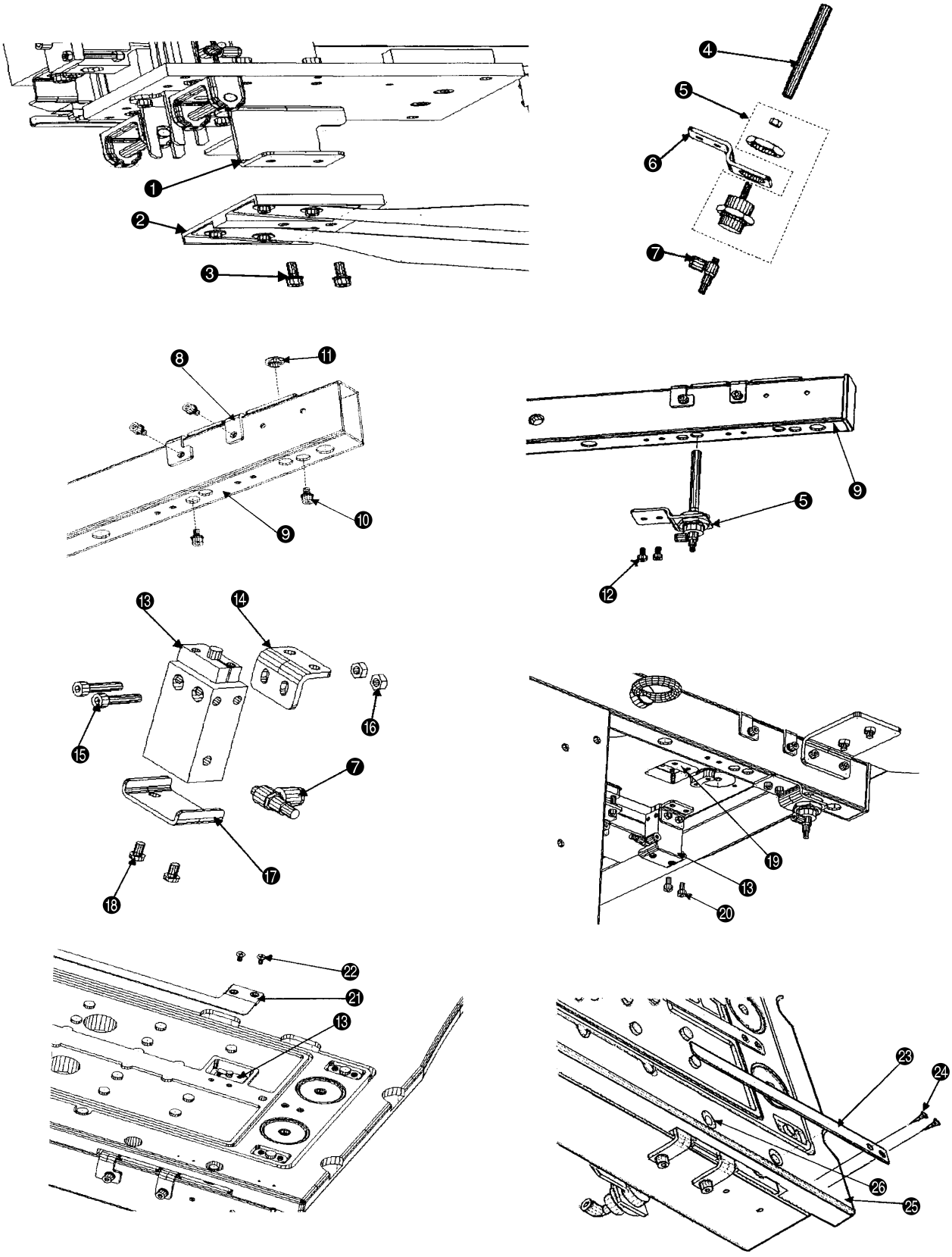


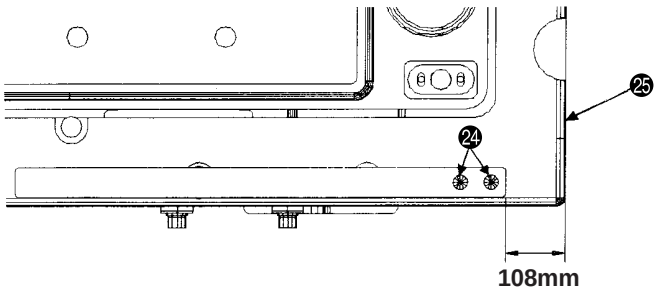
Adjustment Procedures	Results of Improper Adjustment
1. Installation (1) Install the darts stretcher unit ❶ on the base ❸ by means of two setscrews ❷. (2) Insert the tube ❹ in Joint A and the tube ❺ in Joint B. 2. Adjustment (1) Loosen and adjust the adjusting screw ❽ until the darts holding rubber ❻ fits the sewing table hole ❼.	

2) SA-118 (shim unit)

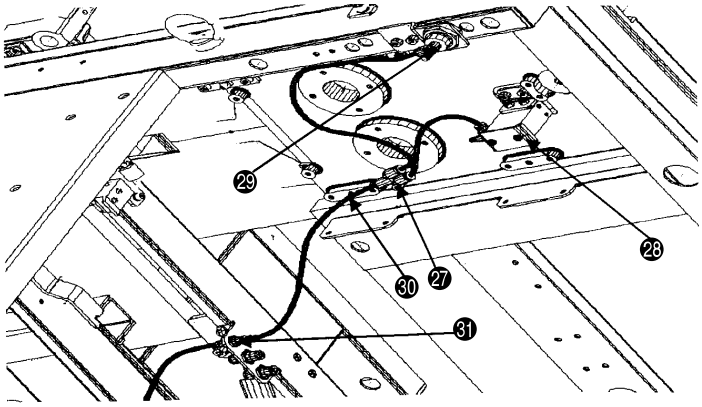
Standard Adjustment

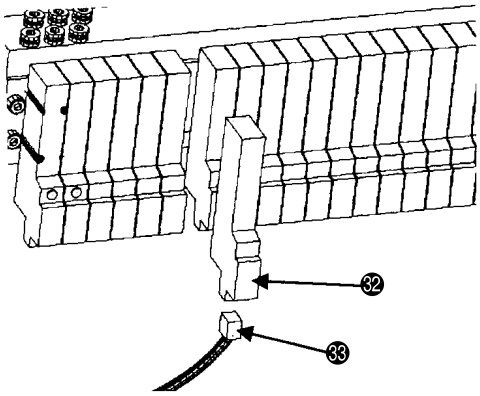
1. Installation of the shim bracket

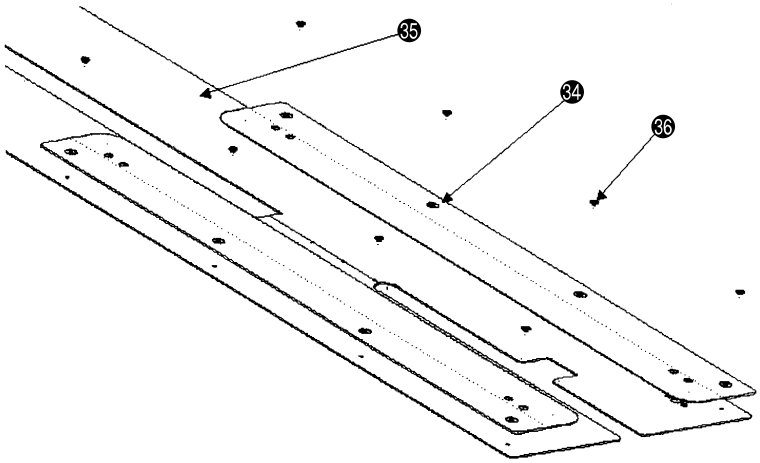


Adjustment Procedures	Results of Improper Adjustment
1. Secure the shim bracket (40028198) ❷ to the shim base (40026610) ❶ with the 2 screws (SL6051692TN) ❸. 2. Secure the cylinder (PA1500505A0) ❺ to the pocket bag clamp cylinder bracket (40034466) ❻ with a screw and tighten the pocket bag clamp cylinder rod (40034467) ❹ onto the cylinder shaft. Mount the speed controller (PC010507000) ❼ on the cylinder ❺. 3. Secure the pocket bag clamp guide plate (40034469) ❽ to the frame ❾ with the 4 screws ❿ (SL6051692TN) . Press the pocket bag clamp cylinder bushing (40034468) ⓫ into the pocket bag clamp guide plate ❽. 4. Secure the cylinder ❺ to the frame ❾ with the 2 screws ⓬. 5. Secure the cylinder (PA160152900) ⓭ to the interlining clamp cylinder bracket (40034471) ⓮ with the screw ⓯ and nut ⓰. Secure the cylinder cover ⓱ to the cylinder ⓭ with the 2 screws ⓲. Mount the speed controller ❼ on the cylinder ⓭. 6. Secure the cylinder ⓭ to the suction base ⓳ with the 2 screws ⓴. 7. Secure the interlining clamp ㉑ to the cylinder ⓭ with the screw ㉒. 8. Lock the pocket bag clamp ㉓ at 108 mm distance from the table ㉕ with the 2 screws ㉔ and position the push rod ㉖ at the center of the pocket bag clamp ㉓.  	

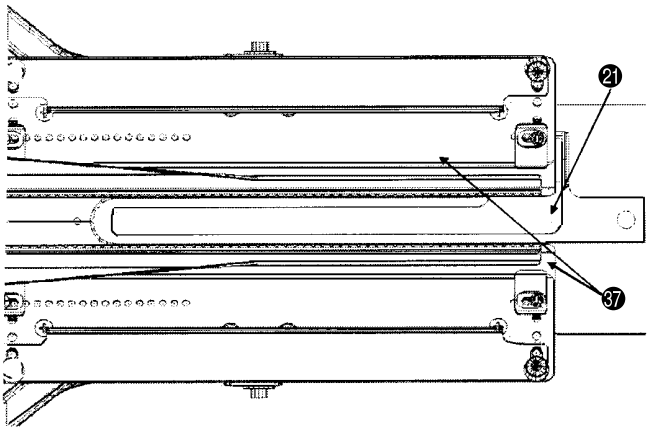
Standard Adjustment

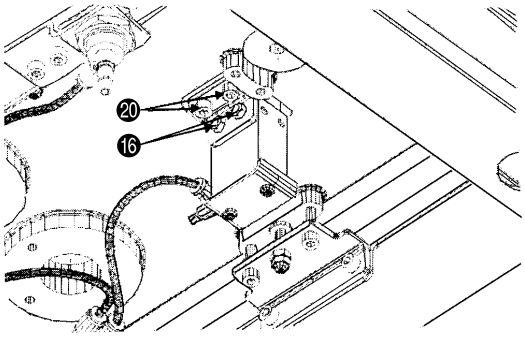






Adjustment of interlining clamp parallelism

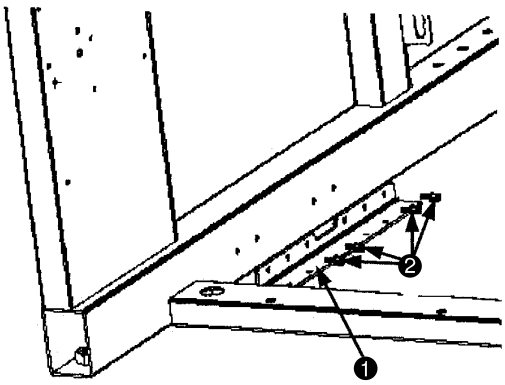


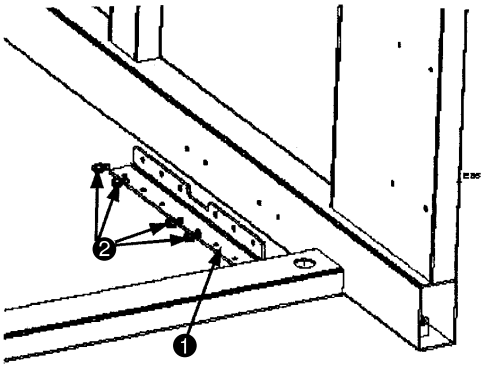


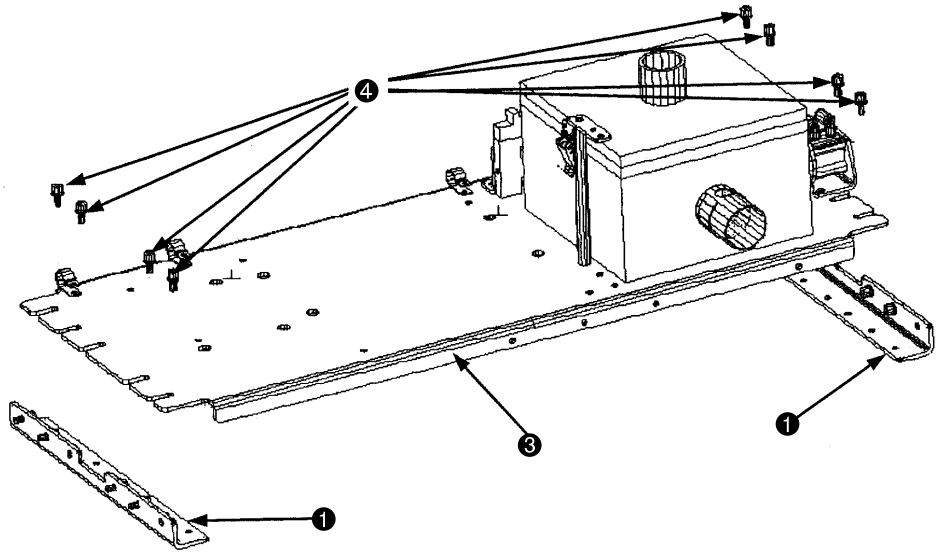
Adjustment Procedures	Results of Improper Adjustment
9. Divide the piping from the one-touch joint (PJ308040002) ㉗ into two piping systems: one goes to the cylinder B system ㉘ and the other goes to the cylinder A system ㉙. Connect the tube ㉚ of the one-touch joint ㉗ to the union ㉛. 10. Remove the 7th plug cap from the left end of the manifold, mount the solenoid valve ㉜, and connect the cable ㉝. 11. Secure the shim guide (40034442) ㉞ to the sewing table (shim-specific type) ㉟ with the 8 screws (SS5090210SP) ㊱. **Adjustment of interlining clamp parallelism** 1. If the parallelism between the interlining clamp ㉑ and clamp foot ㊲ is not established, loosen the screw ⑳ and adjust the parallelism. 2. If the parallelism between the interlining clamp ㉑ and the top surface of the table is not established, loosen the screw ⑯ and adjust the parallelism.	

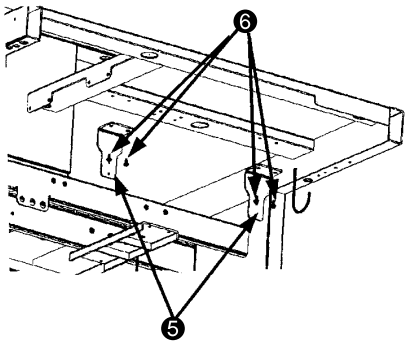
3) SA-119 (suction unit)

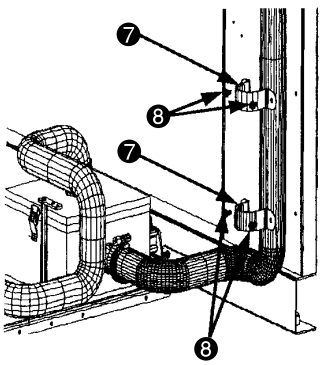
Standard Adjustment

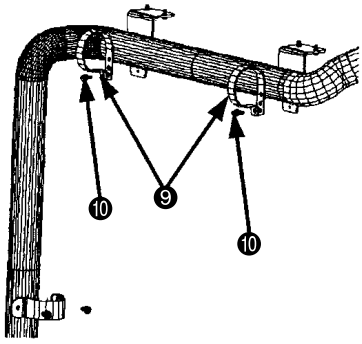






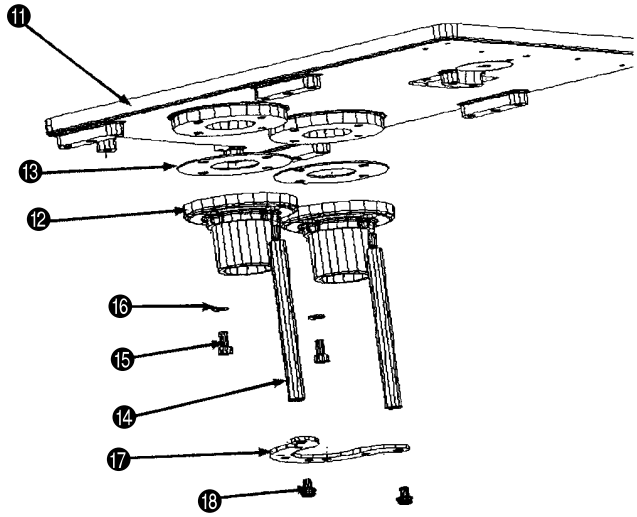


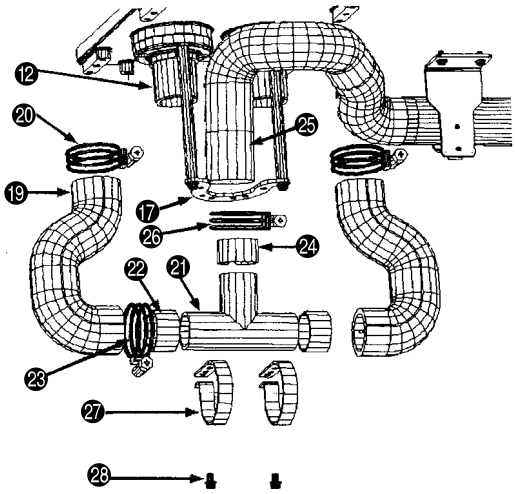


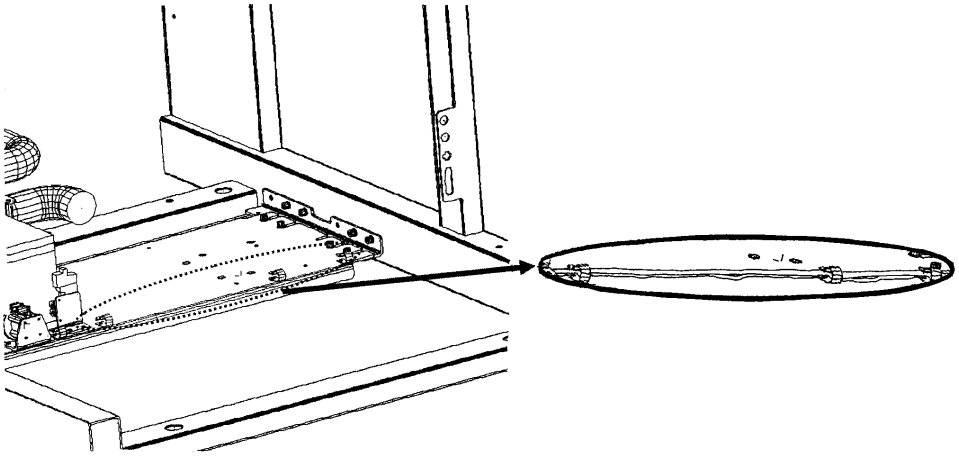


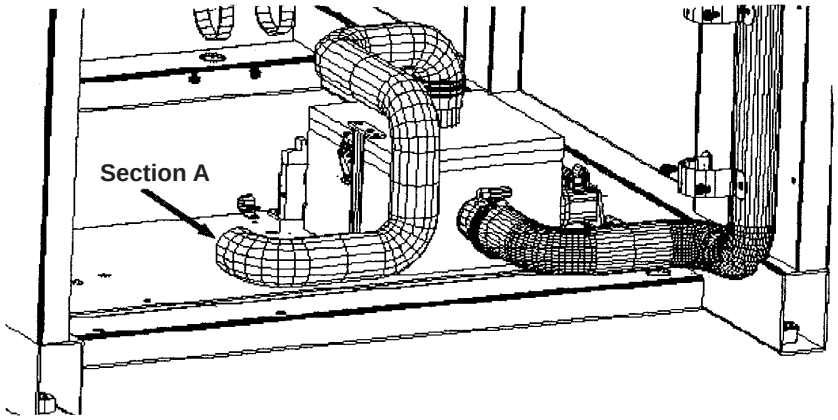
Adjustment Procedures	Results of Improper Adjustment
Suction unit and related sections (setup) 1. Fasten the suction base mounting plate B ❶ to the main body frame by means of the setscrews ❷ (8 pcs.) on the right and left of the frame. 2. Put the vacuum unit ❸ on the suction base mounting plate B ❶ and fasten it with the setscrews ❹ (8 pcs.). 3. Fasten the hose mounting plates ❺ (2 pcs.) to the main body frame by means of the setscrews ❻ (4 pcs.). 4. Pinch the hose by means of the hose holders ❼ (2 pcs.) and fix it to the main body frame with the setscrews ❽ (4 pcs.). 5. Enter the hose in the cable clamps ❾ (2 pcs.) and fasten it to the hose mounting plates ❺ (2 pcs.), mounted in the step 3. above, using the setscrews ❿ (2 pcs.).	

Standard Adjustment



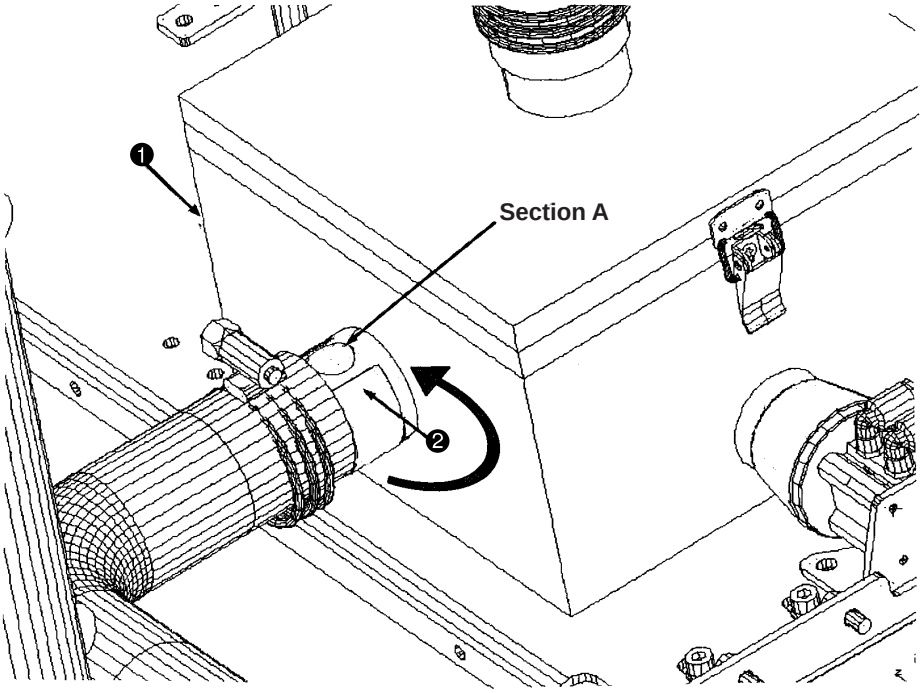


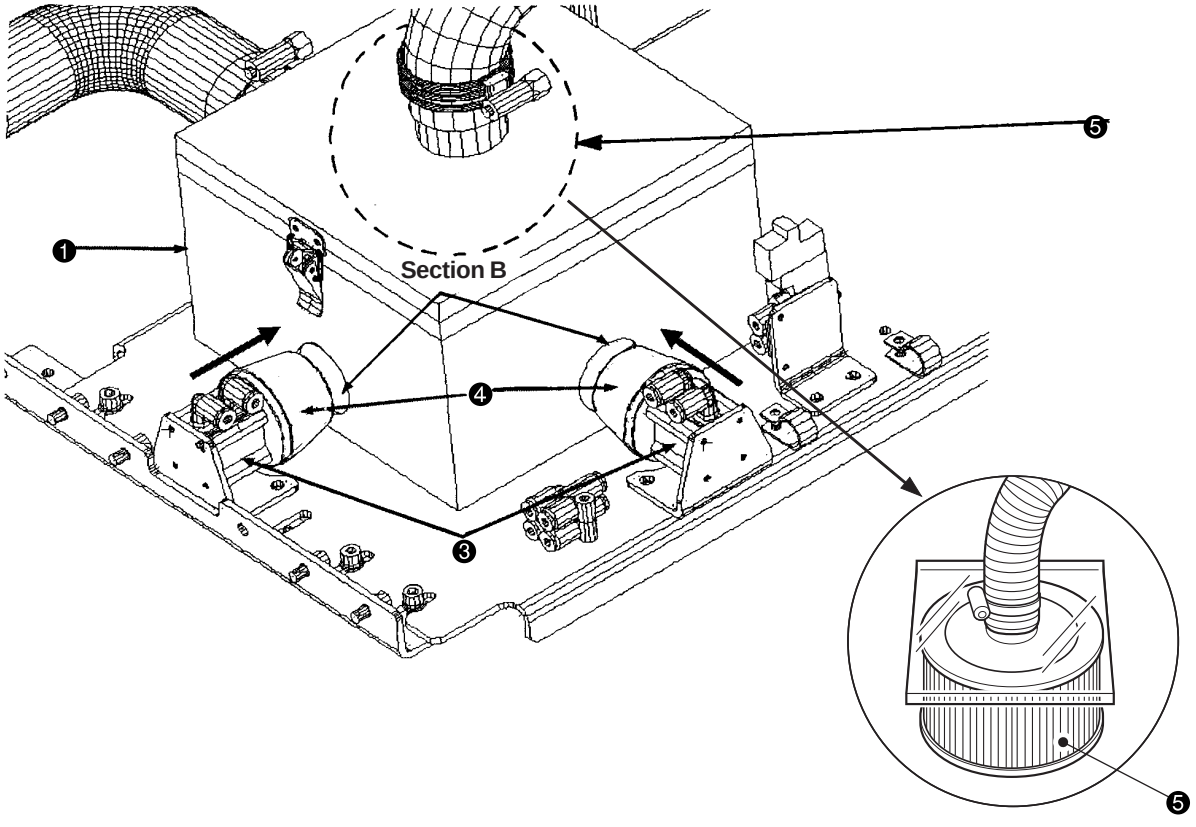




Adjustment Procedures	Results of Improper Adjustment
6. Fix the gasket ⓭ and the hose base ⓬ to the suction base ⓫ by means of the setscrew ⓯ and the washer ⓰. The worker side should be fixed with the stud ⓮. This work shall be done both on the right and left. 7. Fix the stud connector plate ⓱ to the stud ⓮ by means of the setscrew ⓲. 8. Fix the hose ⓳ to the hose base ⓬ by means of the hose band ⓴. 9. Insert the pipe spacer ㉒ in the T-shaped joint ㉑ and fasten the hose ⓳ by means of the hose band ㉓. 10. This work shall be done both on the right and left. 11. Insert the pipe spacer ㉔ in the T-shaped joint ㉑ and fasten the hose ㉕ by means of the hose band ㉖. 12. Pinch the T-shaped joint ㉑ by means of the clamp㉗ and fasten it to the stud connector plate ⓱ by means of the setscrew ㉘. 13. Install the solenoid valve connectors and the air piping. Refer also to SA-119 of the parts list. 14. Connect Section A to the suction motor (SA-127).	

Standard Adjustment



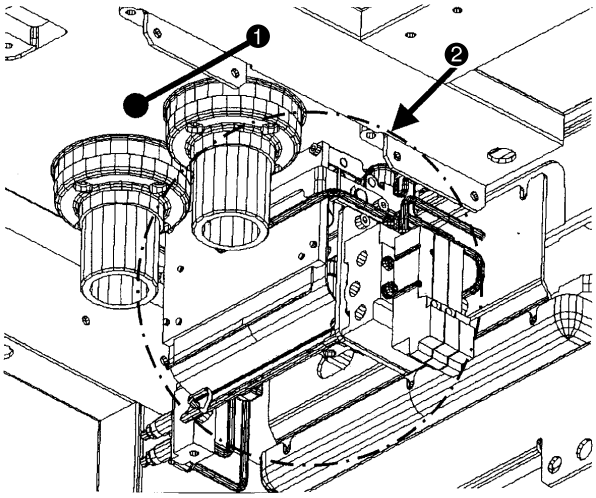


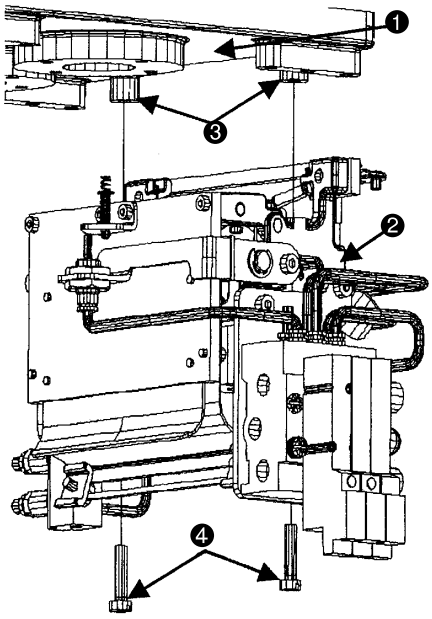
Adjustment Procedures	Results of Improper Adjustment
Adjustment of suction force 1. The suction force is controlled in conjunction with the amount of opening at Section A of the hole of the filter box ❶. 2. Manually adjust the suction control plate ❷ in the direction of the arrow. o The suction force is strengthened when the hole section A is reduced. o The suction force is weakened when the hole section A is opened. **Suction changeover** 1. Suction changeover is carried out by reducing the hole section B of the filter box ❶. 2. Confirm that the hole section B of the filter box ❶ is exactly closed when the stopper rubber ❹ of the changeover cylinder ❸ is moved in the direction of the arrow. 3. The suction force is weakened if the hole section B of the filter box ❶ is not closed completely. **Filter cleaning** Periodically clean the filter ❺ that is located inside the filter box ❶.	o In the case of clogging in the filter ❺, the suction force may be weakened.

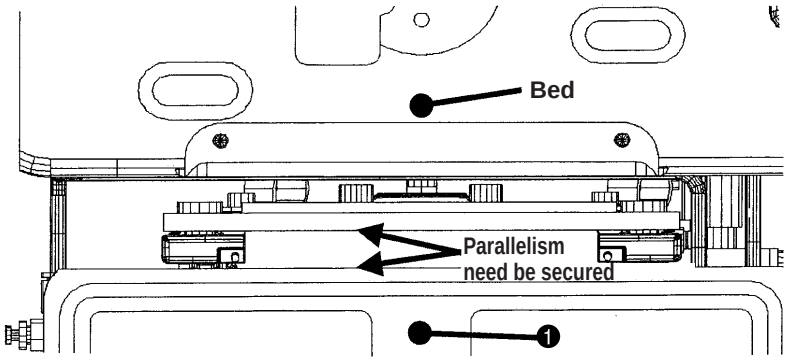
4) SA-120 (automatic interlining feeder unit)

Standard Adjustment

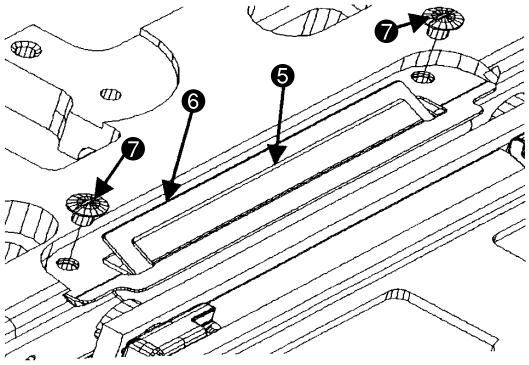
1. Installation of the automatic interlining feeder unit

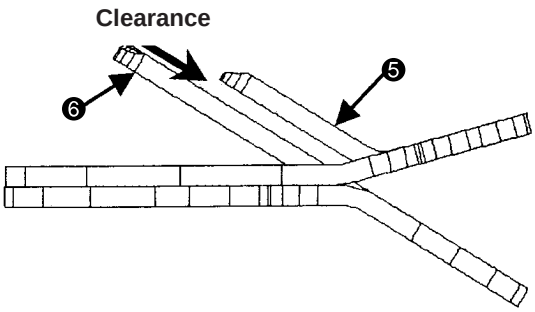






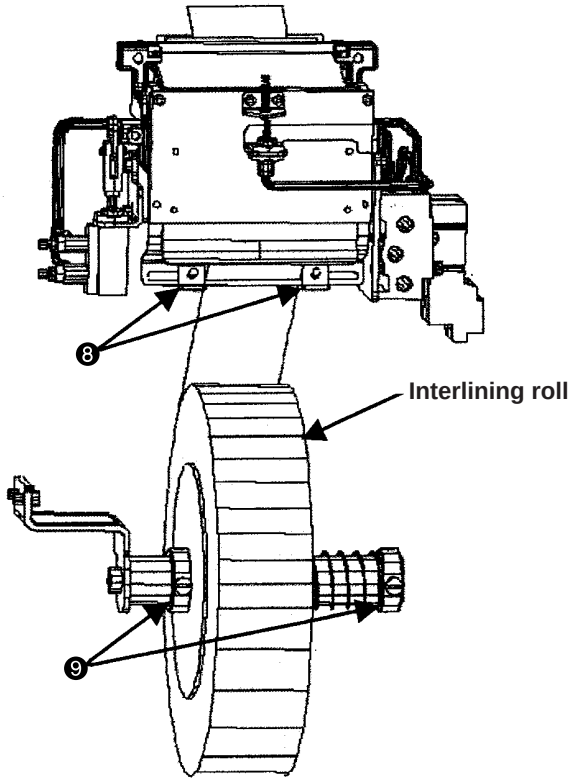
2. Installation of the guide plate



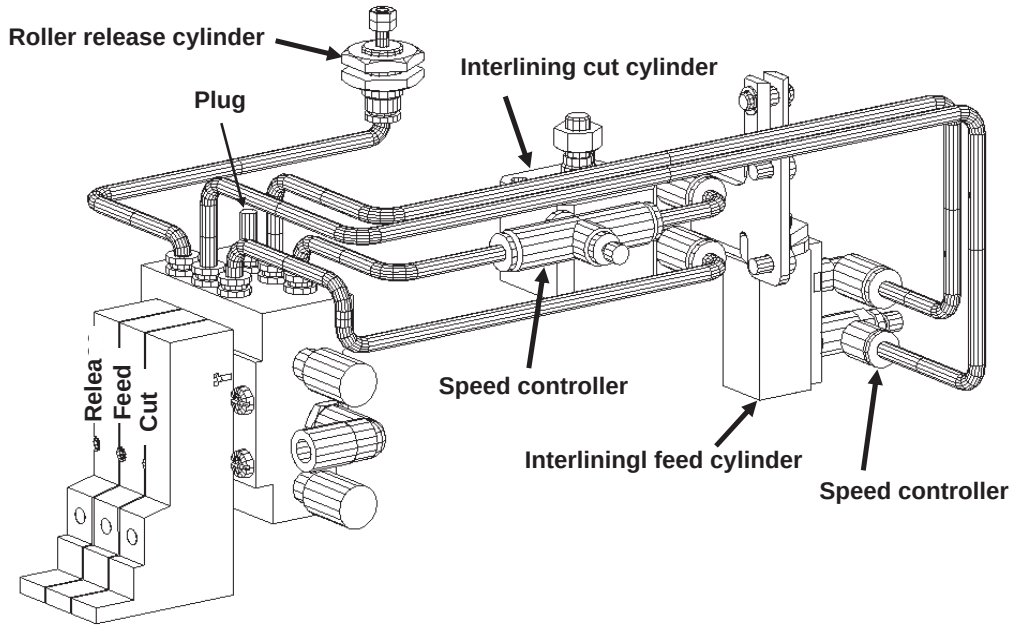


Adjustment Procedures	Results of Improper Adjustment
1. Installation of the automatic interlining feeder unit (1) Install the automatic interlining feeder unit ❷ on the suction base ❶. (2) Fix the automatic interlining feeder unit ❷ to the tap of the boss ❸ of the suction base ❶ by means of two setscrews ❹. (3) At the time of installation, the automatic interlining feeder unit ❷ shall be installed in parallel to the suction base ❶. 2. Installation of the guide plate (1) Fix the material guides A ❺ and B ❻ by means of two setscrews ❼. (2) The clearance between the material guides A ❺ and B ❻ shall be arranged so that it permits the passage of material cloth.	

3. Installation of the interlining roll guide



4. Air tube piping

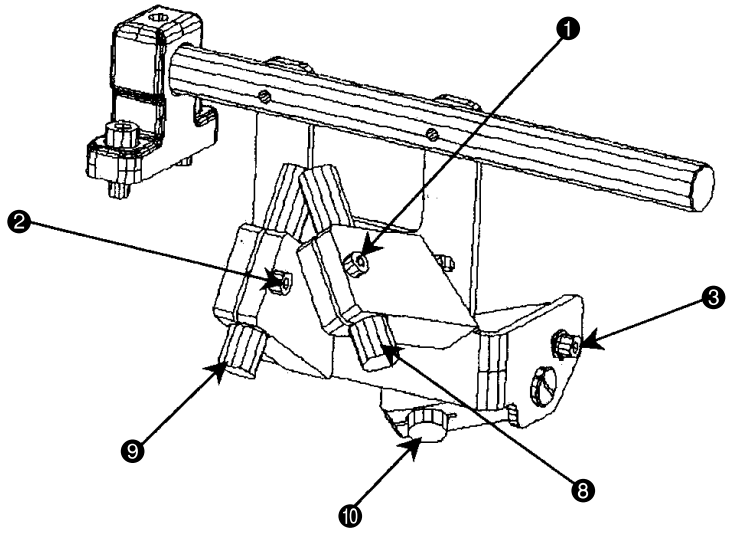


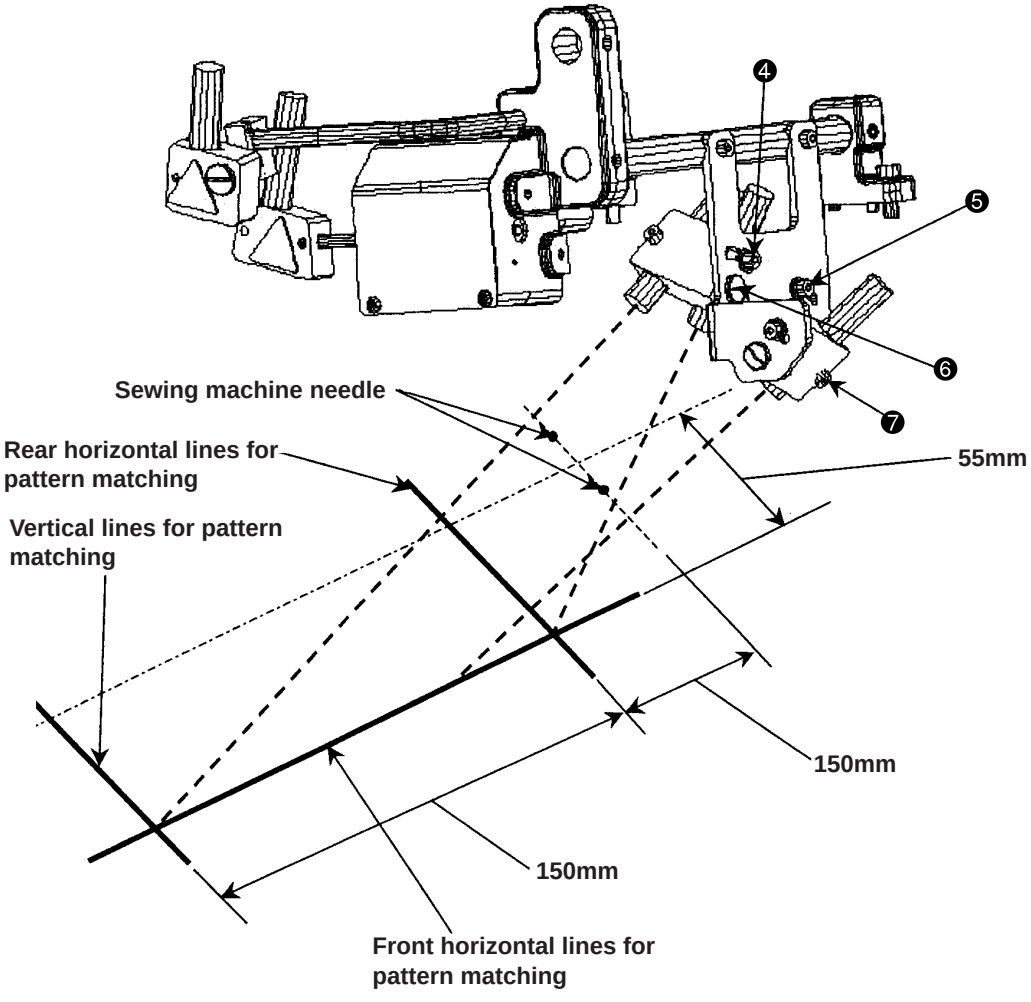
Adjustment Procedures	Results of Improper Adjustment
3. Installation of the interlining roll guide (1) Adjust the interlining guide ❽ and the thrust collar ❾ so that the interlining (interlining roll) can be pulled out straightforward. 4. Air tube piping (1) Make air tube wiring as illustrated.	

5) SA-121 (pattern matching marking light unit)

Standard Adjustment

1. Adjustment of pattern matching marking light position



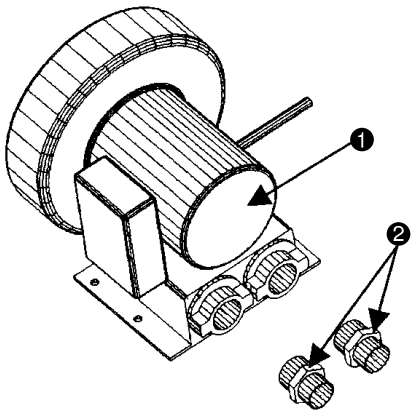


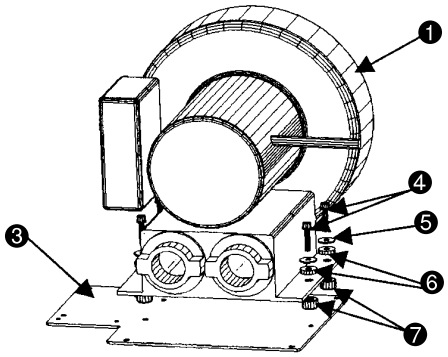
Adjustment Procedures	Results of Improper Adjustment
1. Adjustment of the horizontal line o When horizontality of horizontal lines is not secured (1) For front horizontal lines, loosen the setscrew ❶ and turn the marking light A ❽ for adjustment. (2) For rear horizontal lines, loosen the setscrew ❷ and turn the marking light B ❾ for adjustment. o Adjustment of horizontal line lighting position (1) For front horizontal lines, loosen the setscrew ❹ and turn the marking light A ❽ around the center of the hinge screw ❻ for adjustment. (2) For rear horizontal lines, loosen the setscrew ❺ and turn the marking light B ❾ for adjustment. 2. Adjustment of vertical lines (1) For vertical lines and sewing machine center parallelism, loosen the setscrew ❼ and turn the marking light C ❿ for adjustment. (2) To adjust the vertical line lighting position, loosen the setscrew ❸ and turn the marking light C ❿ for adjustment. **(Caution) The light value of the marking light can be adjusted according to 3.-(2)-21) Marking light and related sections.**	

6) SA-127 (suction motor unit)

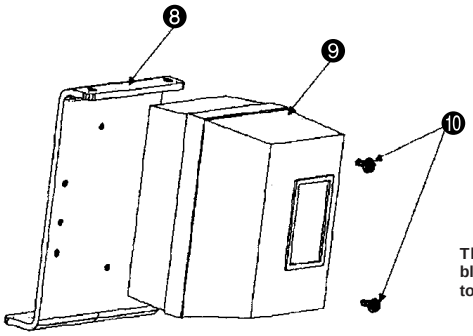
Standard Adjustment

1. Installation of suction motor unit

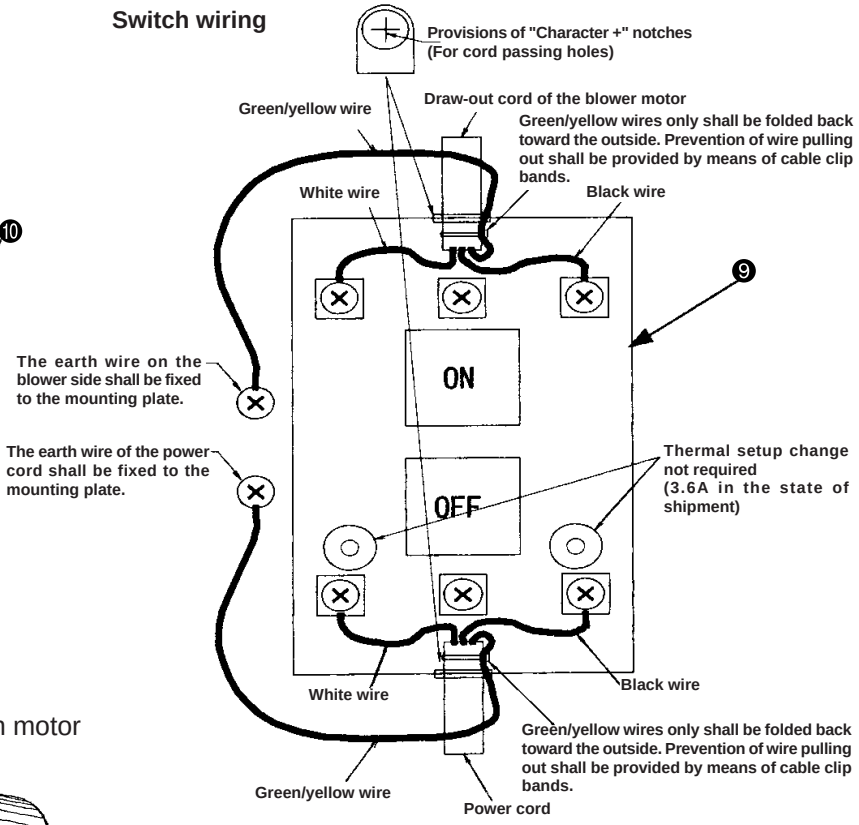




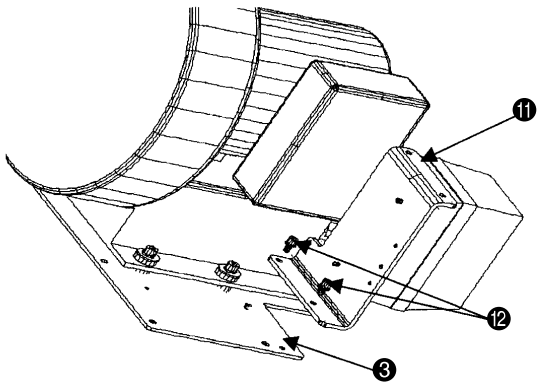
2. Suction switch mounting



Switch wiring



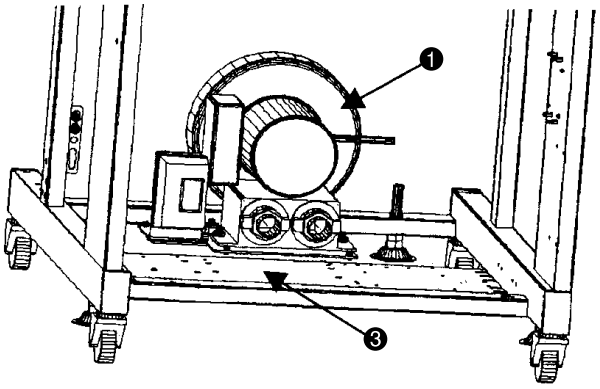
Installation of the switch on the suction motor

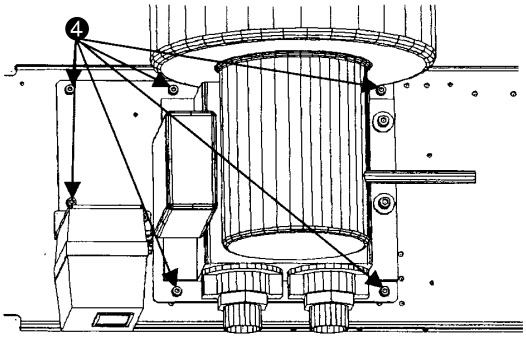


Adjustment Procedures	Results of Improper Adjustment
1. Installation of suction motor unit (1) Install the blower joint ❷ on the suction motor ❶. (2) Install the suction motor ❶ on the suction motor mounting plate ❸ by means of the setscrews ❹, washers ❺, cushions ❻, and rubber ❼. (4 positions) 2. Installation of the suction switch (1) Fix the power switch ❾ to the switch mounting plate ❽ by means of the setscrew ❿. Switch wiring (1) Provide wiring inside the power switch ❾ according to the instructions in the illustration. Installation of the switch on the suction motor (1) Install the suction switch set ⓫ on the suction motor mounting plate ❸ by means of the setscrew ⓬.	

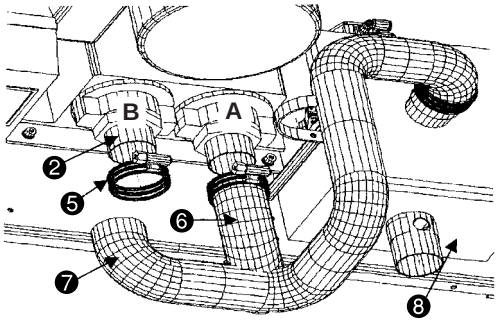
Standard Adjustment

3. Installation of the suction motor

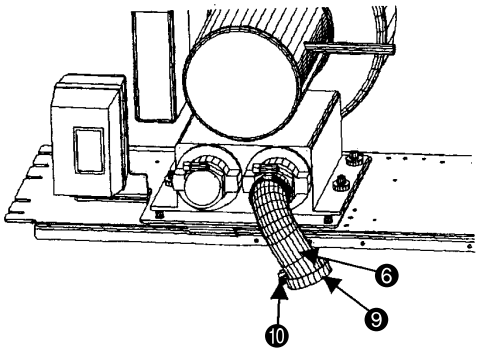




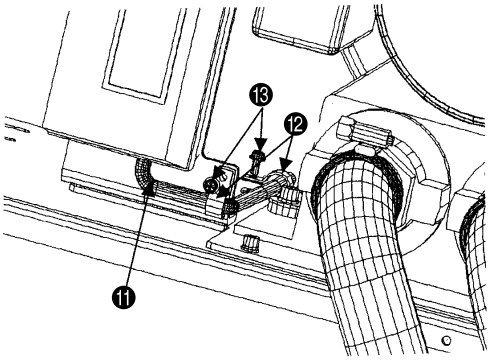
4. Installation of the suction pipe



5. Suction pipe fixing



6. Suction wiring

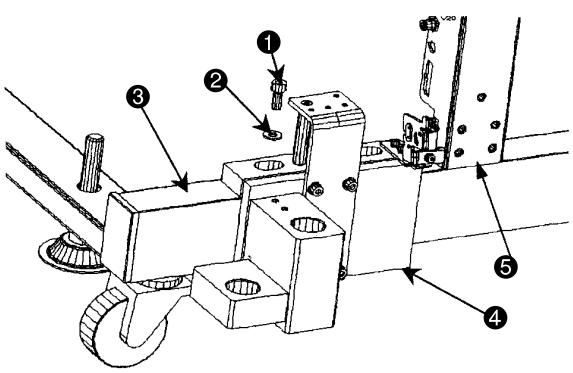


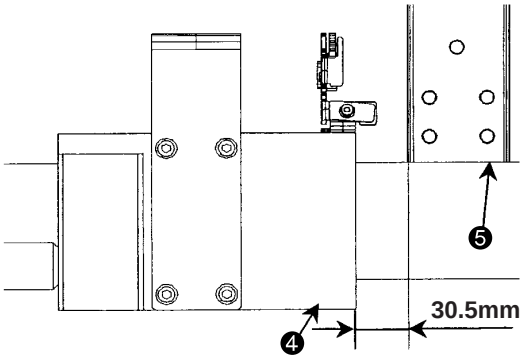
Adjustment Procedures	Results of Improper Adjustment
3. Installation of the suction motor (1) Fix the suction motor ❶ to the suction unit mounting plate ❸ by means of the setscrews ❹ (6 positions). (Refer to the illustration for the setscrew ❹ position.) 4. Installation of the suction pipe (1) Install the suction pipe ❻ on the blower joint ❷ A section by means of the hose bands ❺. (2) The suction pipe ❼ is connected to the filter box ❽. Install this pipe on the blower joint ❷ B section by means of the hose bands ❺. 5. Suction pipe fixing (1) Pinch the suction pipe ❻ with the cable clip bands ❾ and fix it by means of the setscrew ❿. 6. Suction wiring (1) Fix the switch wiring ⓫ by means of cable clips ⓬ and the setscrews ⓭ as illustrated.	

7) SP-46 (clamp bar stacker unit)

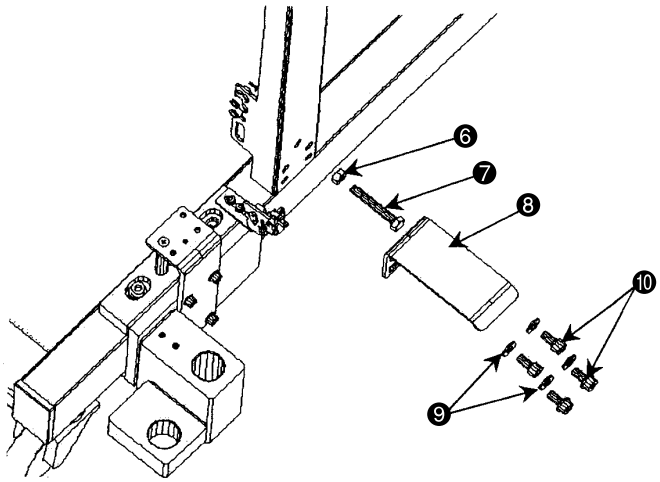
Standard Adjustment

1. Installation of the clamp bar stacker

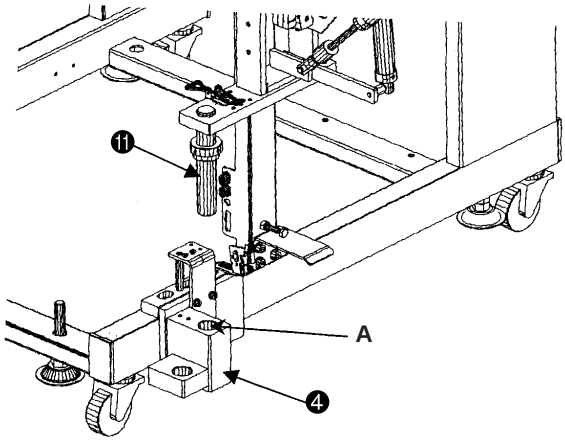




2. Stacker support plate and stacker positioning bolt positions

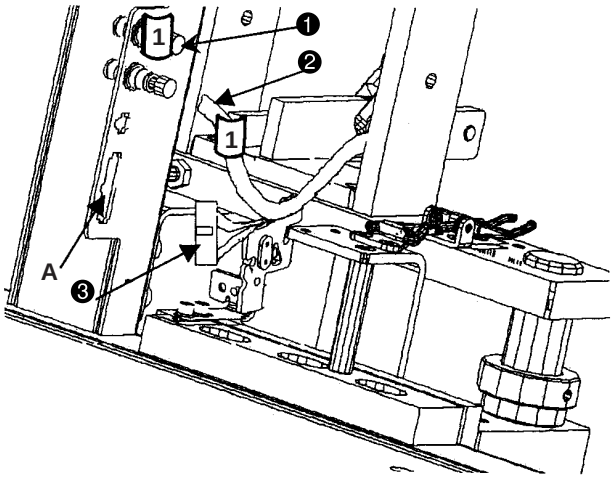


3. Stacker unit assembly

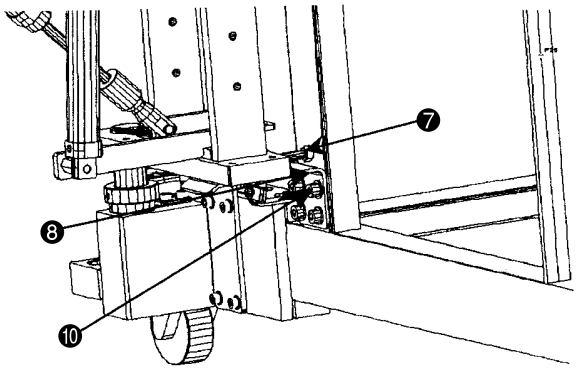


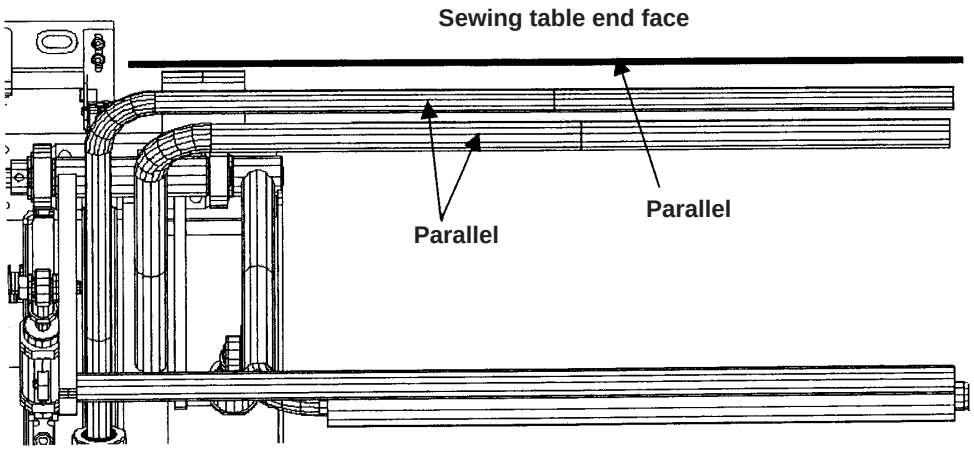
Adjustment Procedures	Results of Improper Adjustment
1. Installation of the clamp bar stacker (1) Let the stacker base ❹ fit the frame ❸ and fix it with the setscrews ❶ and the washers ❷ (in 3 positions). (2) Determine the fixing size so that the end face of frame's vertical strut ❺ and that of the stacker base ❹ are separated by 30.5mm, as illustrated. 2. Stacker support plate and stacker positioning bolt positions (1) Temporarily fasten the stacker positioning bolt ❼ with the frame nut ❻. (2) Temporarily fasten the stacker support plate ❽ with the setscrews ❿ and the washers ❾ (in 4 positions). 3. Stacker unit assembly (1) Insert the stacker unit ⓫ in the mounting hole A of the stacker base ❹.	

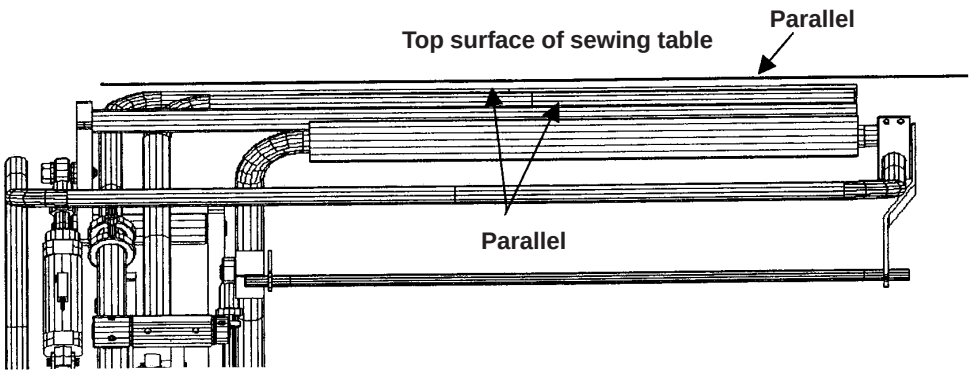
4. Installation of the air pipe and the cable



5. Adjustment of parallelism between wipe-out bar and sewing table end face



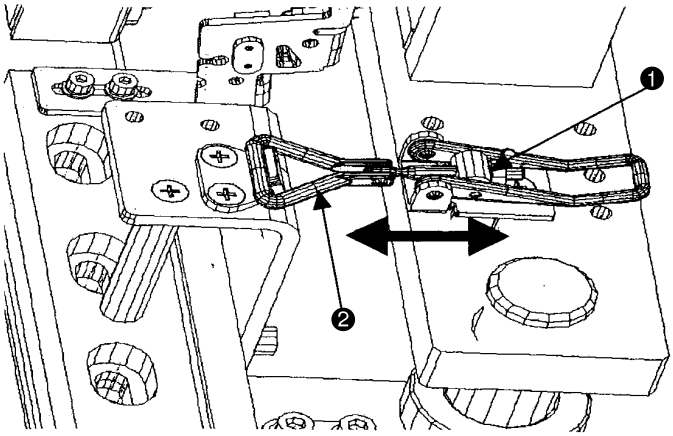




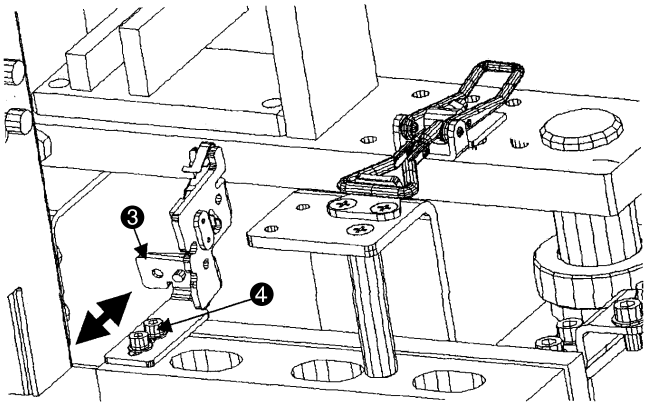
Adjustment Procedures	Results of Improper Adjustment
4. Installation of the air pipe and the cable (1) Remove the air pipe stop plug ❶ and insert the air pipe ❷. (Air pipe No. 1) (2) Insert the stacker cable ❸ in Section A. 5. Adjustment of parallelism between wipe-out bar and sewing table end face (1) If no parallelism is secured from above, loosen the stacker positioning bolt ❼ for adjustment. (2) If no parallelism is secured from the side, loosen the setscrew ❿ to move the stacker support plate ❽ for adjustment.	

Standard Adjustment

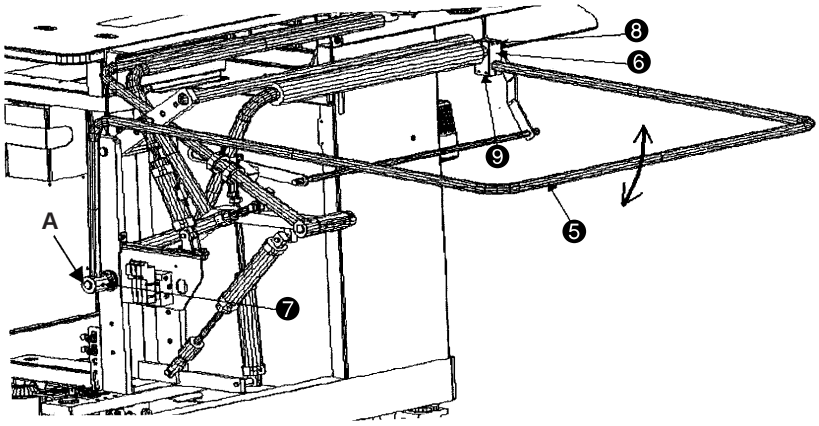
6. Adjustment of stacker hinge length



7. Adjustment of stacker close/open sensor position



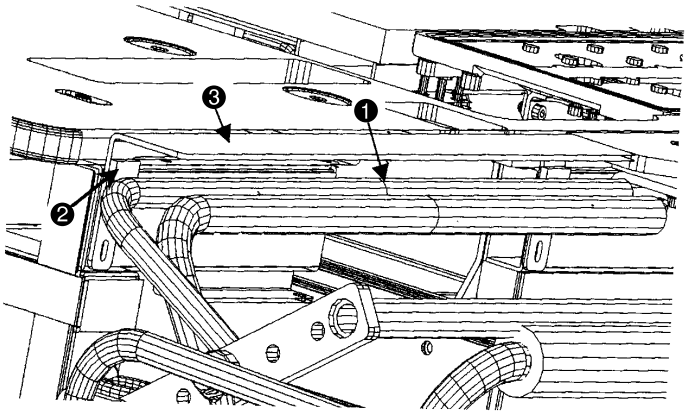
8. Installation of the safety bar

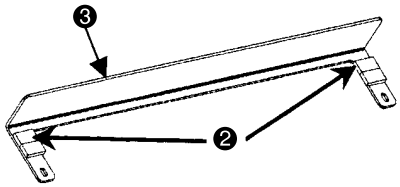


Adjustment Procedures	Results of Improper Adjustment
6. Adjustment of stacker hinge length (1) Adjust the hook section ❷ of the stacker fixing hinge so that the stacker unit is firmly fixed by the stacker fixing hinge in the state that it is keeping contact with the stacker positioning bolt. (2) Loosen the nut ❶ that is used to fix the hook section ❷ and move it in the direction of the arrow for adjustment. 7. Adjustment of stacker close/open sensor position (1) Adjust the stacker close/open sensor ❸ so that it is exactly turned ON when it comes in contact with the stacker positioning bolt. (2) Loosen the setscrew ❹ that is used to fix the stacker close/open sensor ❸ and move it in the direction of the arrow for adjustment. 8. Installation of the safety bar (1) Insert the safety bar ❺in the safety bar clamp ❻ and insert the rotary shaft from Section A. (2) Loosen the setscrew ❽ of the safety bar clamp ❻ to adjust the safety bar ❺ so that it is positioned almost in parallel to the floor surface. (3) Fix the safety bar ❺ by means of the safety bar fixing screws ❼ and ❾.	

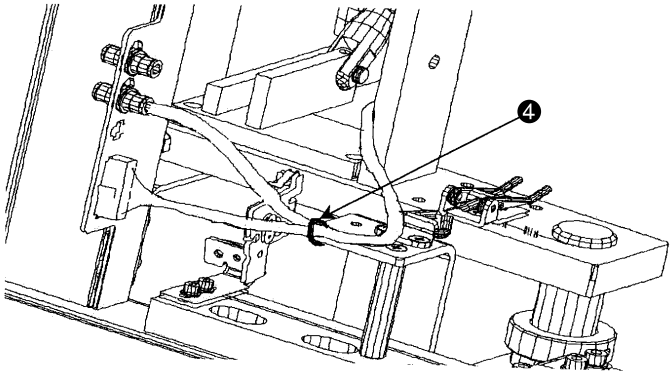
Standard Adjustment

9. Auxiliary table and cushion assembly and position adjustments

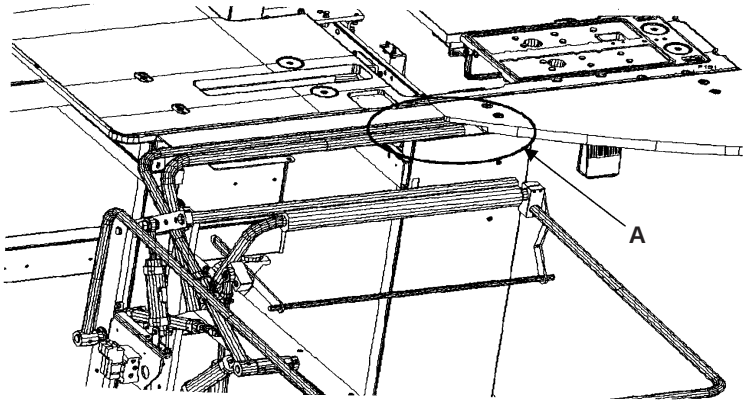




10. Clamp bar cord fixing



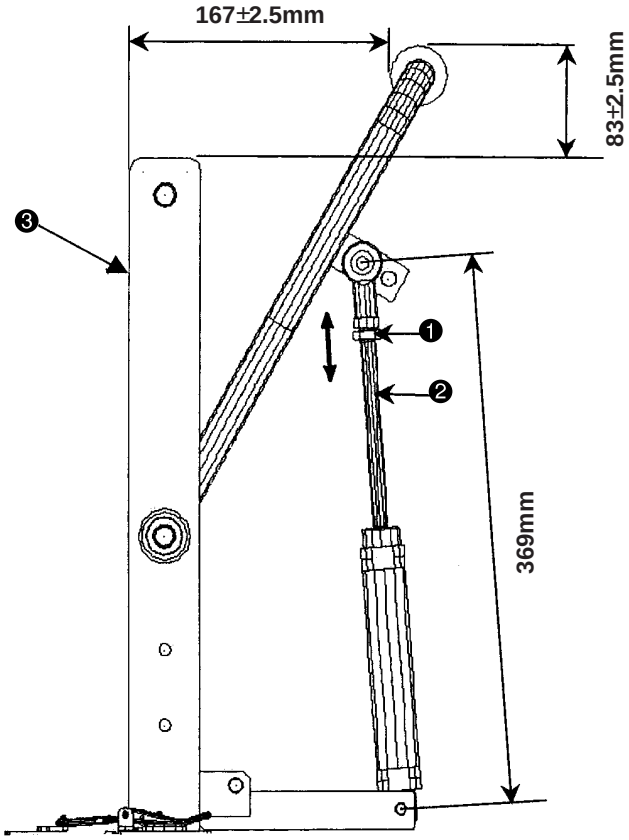
11. Overall stacker position check



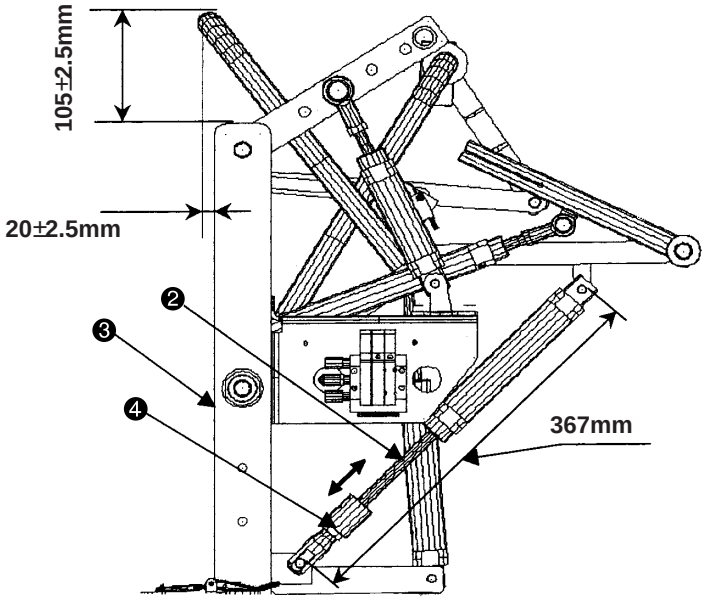
Adjustment Procedures	Results of Improper Adjustment
9. Auxiliary table and cushion assembly and position adjustments (1) If the frame ❸ interferes with the right and left ends of the material wipe-out bar ❶, attach an accessory cushion ❷ to the section of interference. 10. Clamp bar cord fixing (1) Use the cable clip bands ❹ for fixing so that the stacker cords and air pipes are not pinched when the stacker as a whole is swiveled. 11. Overall stacker position check (1) Confirm that no interference is present at each part and Section A when the stacker is actuated or the stacker unit is swiveled.	

Standard Adjustment

12.Adjustment of clamp base position



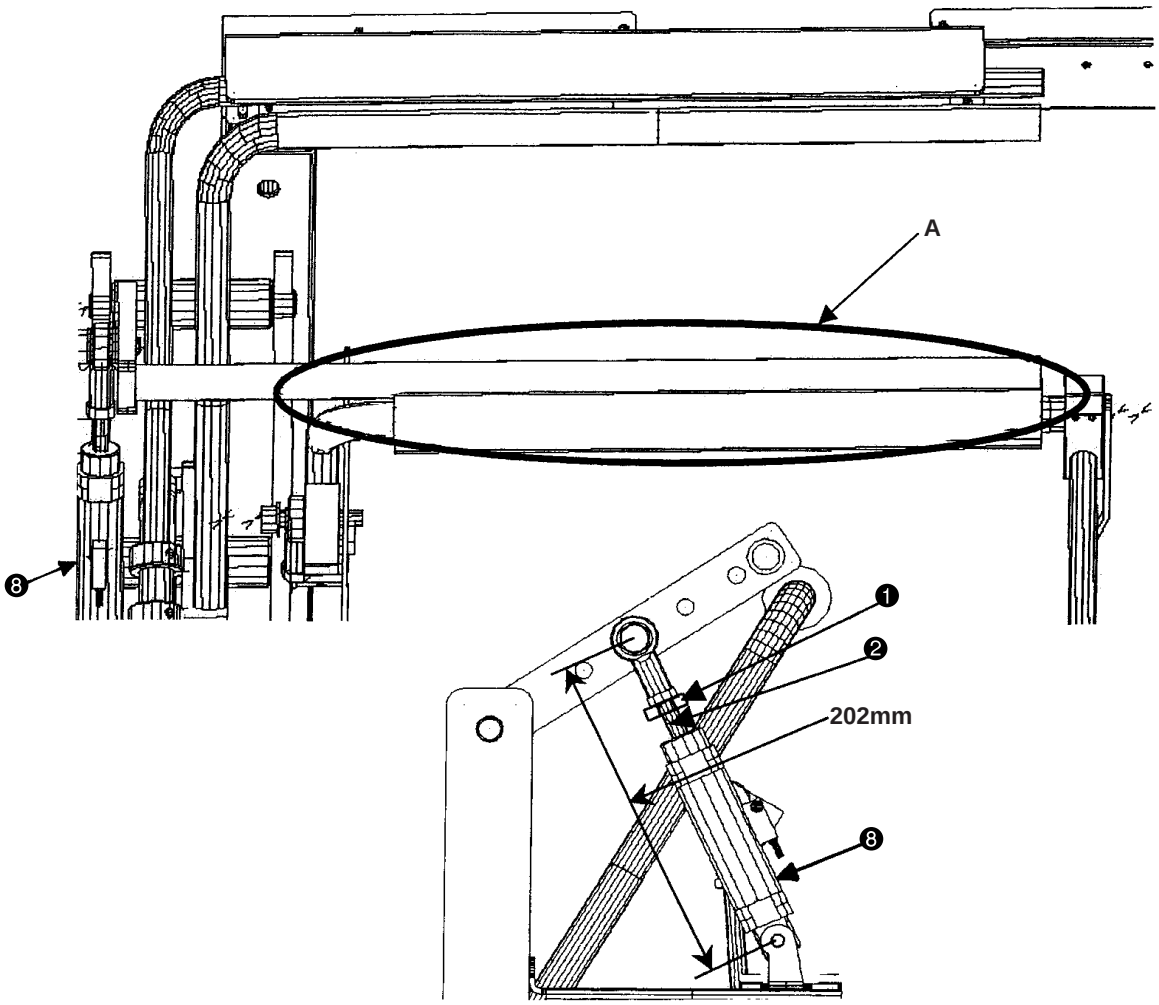
13.Adjustment of second clamp bar position



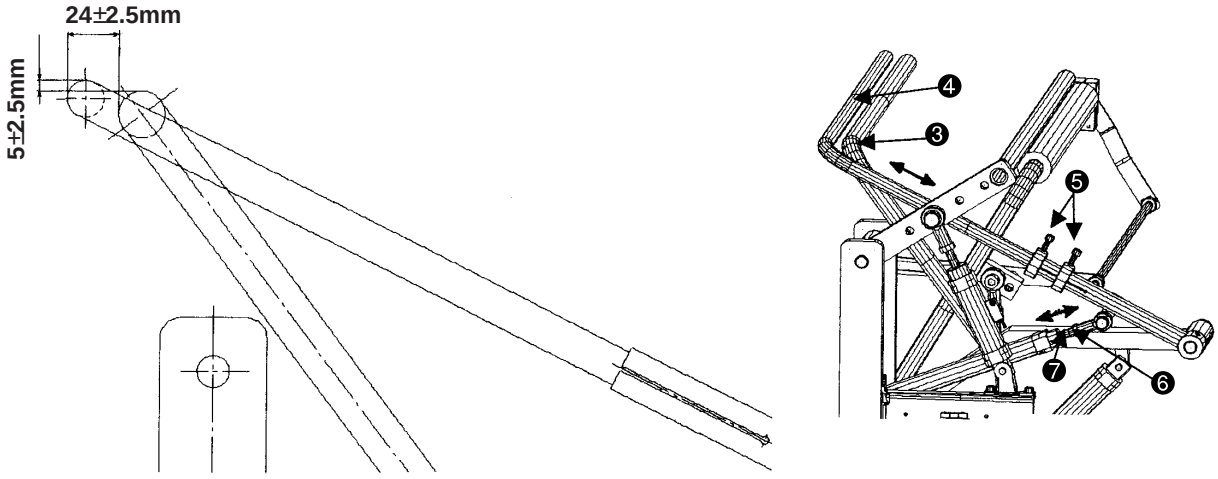
Adjustment Procedures	Results of Improper Adjustment
12. Adjustment of clamp base position (1) Adjust the clamp base position to set the distance between the clamp base and stacker base E ❸ to 83 ± 2.5 mm and 167 ± 2.5mm. (2) Loosen the cylinder rod fixing nut ❶, rotate the 2nd clamp bar drive cylinder rod ❷, and move the rod in the arrow direction to make adjustment. * The goal dimension is 369mm in the state that the cylinder rod ❷ is protruded. 13. Adjustment of second clamp bar position (1) Adjust the 2nd clamp bar position to set the distance between the clamp bar and stacker base E ❸ to 105 ± 2.5 mm in the Y-axis and 20 ± 2.5 mm in the X-axis. (2) Loosen the 2nd clamp bar drive cylinder rod fixing nut ❹, rotate the 2nd clamp bar drive cylinder rod ❷, and move the rod in the arrow direction to make adjustment. * The goal dimension is 367mm in the state that the cylinder rod ❷ is protruded.	

Standard Adjustment

14.Adjustment of first clamp bar position



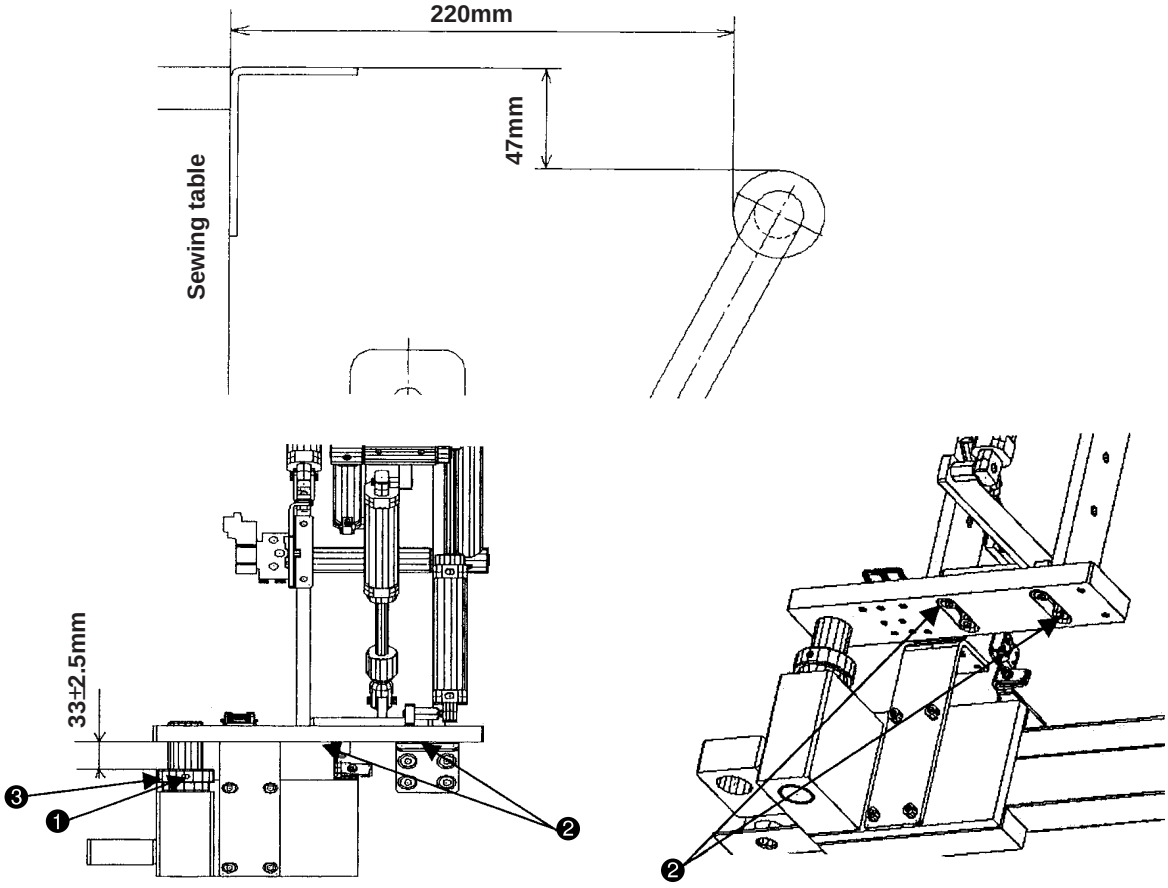
15.Adjustment of material wipe-out bar position



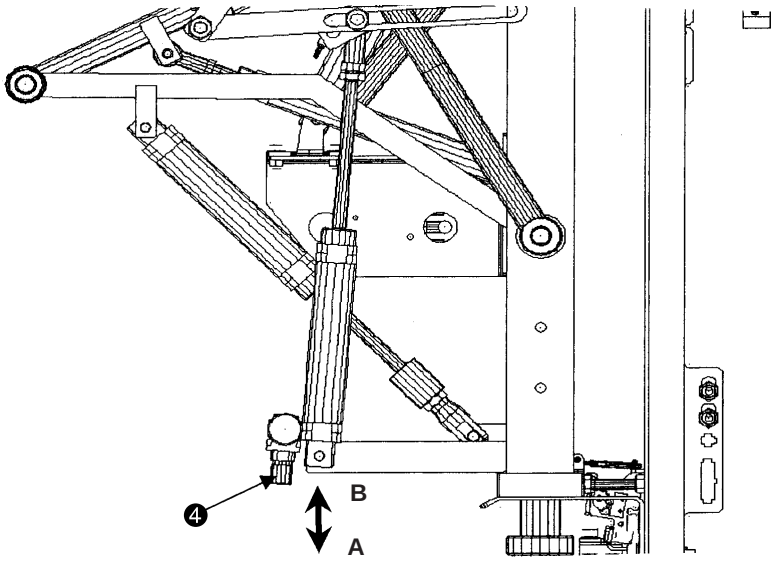
Adjustment Procedures	Results of Improper Adjustment
14. Adjustment of first clamp bar position (1) The first clamp bar shall be capable of clamping a piece of cloth (at Section A) when the first clamp bar drive cylinder ❽ is withdrawn and it keeps contact with the clamp base cushion in parallel to it. (2) Turn and adjust the first clamp bar cylinder rod ❷ by loosening the first clamp bar drive cylinder tip rod fixing nut ❶. * The goal dimension is 202mm in the state that the cylinder is withdrawn. 15. Adjustment of material wipe-out bar position (1) djust the material wipe-out bar ❹ by loosening the setscrew ❺ to secure the illustrated dimension and move the material wipe-out bar ❹ in the direction of the arrow so that the second clamp bar ❸ and the material wipe-out bar ❹ are positioned in parallel to each other. In addition, loosen the material wipe-out bar drive cylinder tip rod fixing nut ❻ and turn the material wipe-out bar cylinder rod ❼ for adjustment.	

Standard Adjustment

16.Adjustment of clamp stacker unit position



17.Adjustment of clamp base cylinder air pressure

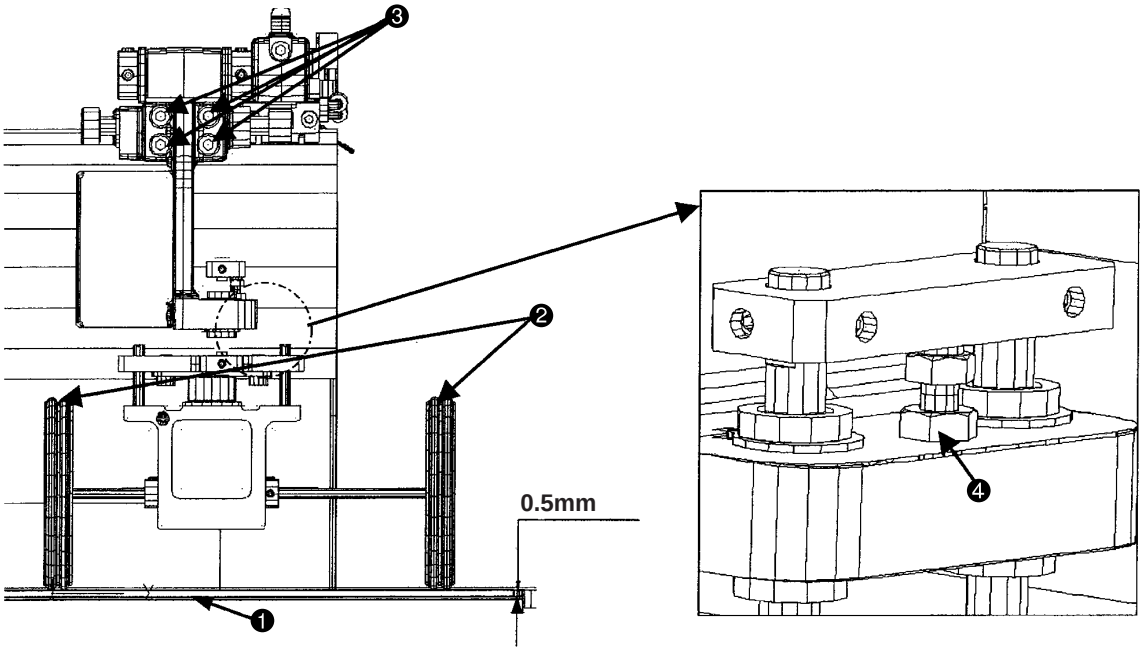


Adjustment Procedures	Results of Improper Adjustment
16. Adjustment of clamp stacker unit position (1) For stacker unit adjustments, vertically move and adjust the base collar ❸ by loosening the setscrew ❶ so that a dimension of 47mm can be secured between the upper face of the sewing table and that of the clamp base cushion. (2) Adjust the stacker unit by loosening the stacker unit fixing screw ❷ so that a dimension of 220mm can be secured between the end face of the sewing table and that of the clamp base cushion. 17. Adjustment of clamp base cylinder air pressure (1) Lower the regulator knob ❹ in the direction of Section A and turn it for adjustment until a clamp base cylinder air pressure of 0.4MPa can be secured. After the completion of adjustment, raise the regulator knob ❹ in the direction of the B section and secure the knob.	

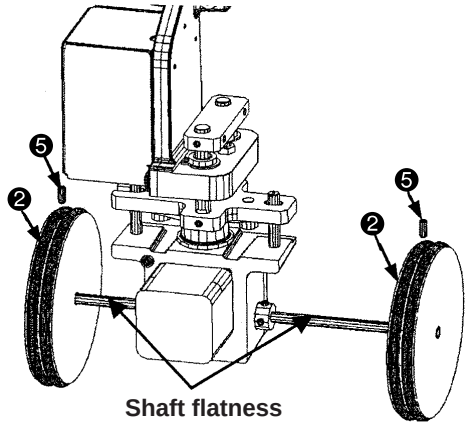
8) SP-47 (roller stacker unit)

Standard Adjustment

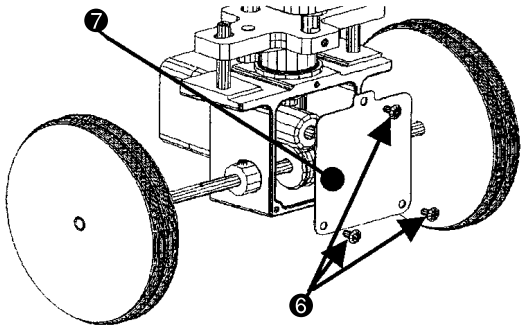
1. Adjustment of roller stacker setup

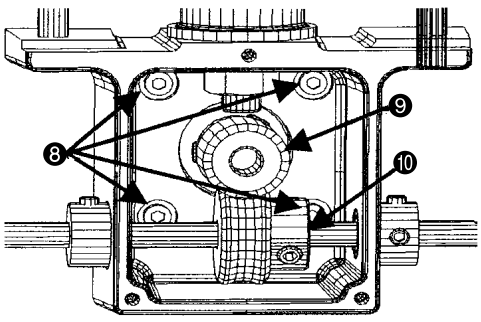


2. Right/left adjustment of the rubber roller



3. Adjustment of backlash



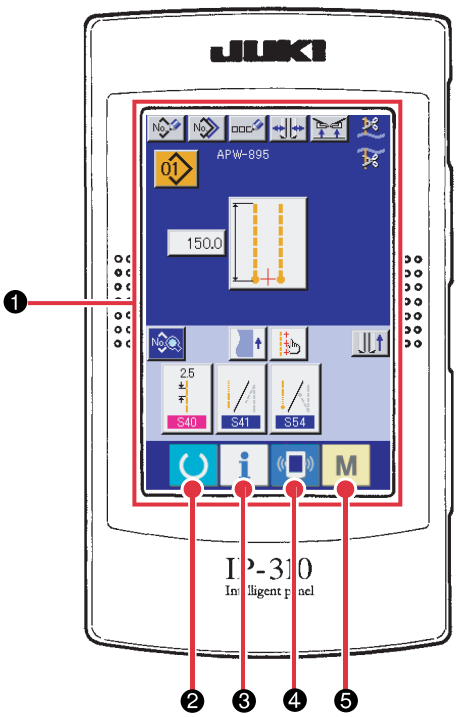


Adjustment Procedures	Results of Improper Adjustment
1. Adjustment of roller stacker setup (1) Parallelism check Confirm that the stacker table ❶ and the rubber roller ❷ are mounted in parallel to each other. If the parallelism is not secured, adjust it by loosening four setscrews ❸. (2) Clearance check Confirm that a clearance of about 0.5mm is secured between the stacker table ❶ and the rubber roller ❷. If this clearance of 0.5mm is not secured, adjust it by loosening the nut ❹. * According to the thickness of materials, make fine adjustments of this clearance. 2. Right/left adjustment of the rubber roller (1) There is a screw ❺ in the flat part of the shaft inside the rubber roller ❷. When this screw is loosened, the rubber roller ❷ can be moved to the right and left. (2) According to the material length, move the rubber roller ❷ and tighten the screw ❺. 3. Adjustment of backlash (1) Loosen three setscrews ❻ and take out the gearbox lid ❼. (2) The worm gear ❾ is directly coupled with the motor shaft. When four motor setscrews ❽ are loosened, the worm gear can be freely moved by moving the motor. (3) Adjust backlash by making the worm gear ❾ mesh with the worm wheel ❿. (4) Since then, install the motor with the setscrew ❽ and the gearbox lid ❼ with the setscrew ❻.	

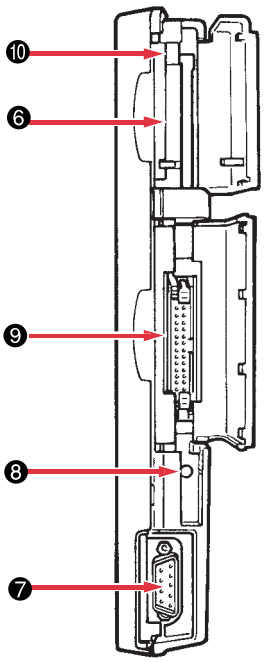
4. Operation panel and related parts

(1)Configuration of IP-310

(Front)



(Right side)

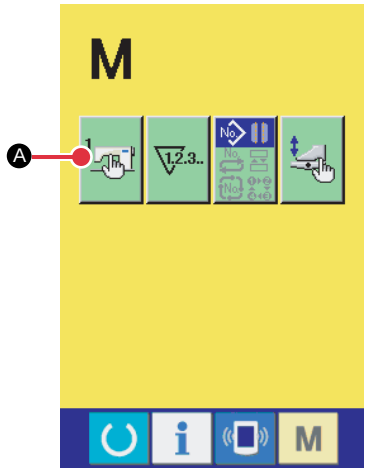


Symbol	Name	Description
❶	TOUCH PANEL,LCD display section	
❷	READY key	Changeover of the data input screen and the sewing screen can be performed.
❸	INFORMATION key	Changeover of the data input screen and the information screen can be performed.
❹	COMMUNICATION key	Changeover of the data input screen and the communi-cation screen can be performed.
❺	MODE CHANGEOVER key	Changeover of the data input screen and the mode changeover screen which performs various detail settings can be performed.
❻	Media card slot	Close the cover for use
❼	Connector for RS-232C communication	
❽	Variable resistor for adjusting contrast of colored LCD screen	Contrasr of the screen can be adjusted. Adjust it as you like.
❾	Connector for external input	
❿	Media removing lever	

(Caution) When READY key is pressed first after turning ON the power, origin retrieval of the clamp foot is performed. At this time, the clamp foot moves. So, be careful.

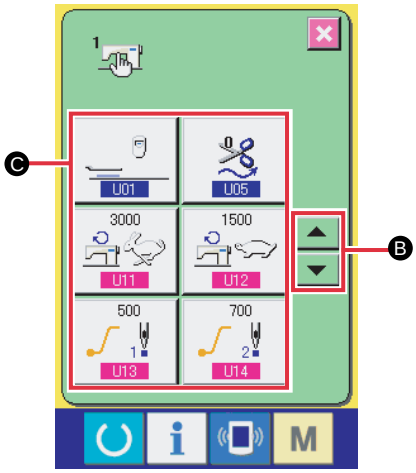
(2) Memory switch

1. Changing procedure of the memory switch data



(1) Display the memory switch data list screen

Press MODE CHANGE-OVER key M and the memory switch button Ⓐ is displayed. When this button is pressed, the memory switch data list (screen A) is displayed.



Memory switch data list screen
(Screen A)

(2) Select the memory switch button you desire to change

Press UP/DOWN SCROLL button ▲ or ▼ Ⓑ and select DATA ITEM button Ⓒ you desire to change.

(3) Memory switch data list

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

No.	Item	Setting range / Edit unit	Initial value
U01	**Change-over of the position of clamp foot after sewing end** Position of clamp foot after sewing end is selected from Stop at front end/ Return to medium/Clamp return/Stop at rear end.  Stop at front end  Return to medium  Clamp return  Stop at rear end	- - -	
U02	**Front end motion start waiting time** Waiting time up to the start of front end motion of clamp foot is set. * It is possible to set only when U01 is set to the stop at front end. 	0.00 to 9.99 / 0.01 sec.	3.00 sec.
U03	**Number of times of feeding of automatic interlining supplying at sewing start** Number of times of feeding of automatic interlining supplying device at sewing start is set. * It is possible to set only when SA120 automatic interlining supplying option is used. 	2 to 9 / 1	3
U04	**Feeding length of automatic interlining supplying at sewing end** Feeding length of automatic interlining supplying device at sewing end is set. * It is possible to set only when SA120 automatic interlining supplying device is used. 	0 to 99.9 / 0.1mm	0mm
U05	**Thread trimming timing** Thread trimming timing after sewing is selected from Standard/ Medium/ Longest and length of thread at sewing end is adjusted  Standard 0  Medium 1  Longest 2 * When SA124 and SA125 zipper device are mounted setting is “0”, needle thread may not be trimmed.	- - -	
U07	**Stacker timer 2** Waiting time from the start of clamp motion to hold material on the stacker base to release the material presser is set. * It is possible to set only when SP-46 clamp bar stacker option is used.	0.00 to 9.99 / 0.01 sec.	0.70 sec.

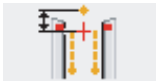
..... Item that is not displayed due to other setting start.

No.	Item	Setting range / Edit unit	Initial value
U08	**Stacker timer 3** Motion time of material sweeping bar is set. * It is possible to set only when SP-46 clamp bar stacker option is used.	0.00 to 9.99 / 0.01 sec.	0.70 sec.
U09	**Stacker timer 4** Time to advance timing to release the sewing product by lifting clamp foot is set. When clamping a short sewing product, the amount to drop by tare is adjusted. * It is possible to set only when SP-46 clamp bar stacker option is used.	0.00 to 9.99 / 0.01 sec.	0.00 sec.
U11	**Sewing speed under the high-speed mode** Number of revolutions of lockstitch section is set. * It is possible to set only when K59 sewing speed setting selection is set to memory switch	1000 to 3000 / 100rpm	2500rpm
U12	**Sewing speed under the low-speed mode** Number of revolutions of condensation and back tuck sewing sections is set. * It is limited by U11 sewing speed under the high-speed mode. * It is possible to set only when K59 sewing speed setting selection is set to memory switch.	1000 to 2500 / 100rpm	1500rpm
U13	**Soft start, 1st stitch** Number of revolutions of first stitch at sewing start is limited.	500 to 2500 / 100rpm	500rpm
U14	**Soft start, second stitch** Number of revolutions of second stitch at sewing start is limited.	500 to 2500 / 100rpm	700rpm
U15	**Soft start, third stitch** Number of revolutions of third stitch at sewing start is limited.	500 to 2500 / 100rpm	1000rpm
U16	**Return speed of clamp foot** Return speed of clamp foot i set.	3 to 7 / 1	7

..... Item that is not displayed due to other setting start.

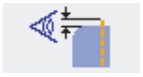
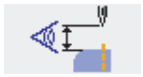
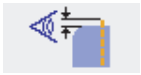
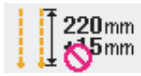
No.	Item	Setting range / Edit unit	Initial value
U17	**Thread breakage detection** With/without thread breakage detection is selected.  With thread breakage detection  Without thread breakage detection	- - -	
U18	**Flap presser motion mode** Motion order of flap presser is selected.  From right  From left  Right/Left at the same time  Side where flap is put * When right and left are simultaneously actuated with customizing of pedal setting, this parameter is neglected and the right and left are simultaneously actuated.	- - -	
U19	**Clamp foot down order change-over** Lowering order of clamp foot is selected.  From right  From left  Right/left at the same time * When right and left are simultaneously actuated with customizing of pedal setting, this parameter is neglected and the right and left are simultaneously actuated.	- - -	
U20	**Folding plate motion mode** “Return/No return” of folding plate when corner knife projects is selected.  Return  No return	- - -	
U21	**Prohibition of binder reduced pressure rise** Binder reduced pressure rise [Yes/No] is set up at the time of vacant feed.  Yes  No	- - -	
U22	**Standing pedal continuous depressing timer effective/ineffective change-over** Effective/ineffective of U23 standing pedal continuous depressing timer is selected. * It i possible to set only when K54 one-shot pedal is set.  Ineffective  Effective	- - -	
U23	**Standing pedal continuous depressing timer** When performing sewing product setting work with the standing pedal depressed, the time interval when the respective devices operate in order is set. * It is possible to set only when K54 on-shot pedal is set. 	0.1 to 2.0 / 0.1 sec.	0.5 se.

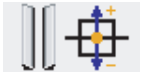
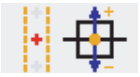
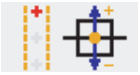
..... Item that is not displayed due to other setting start.

No.	Item	Setting range / Edit unit	Initial value
U24	**Condensation/back tuck detailed setting** Detailed setting “Perform/Not perform” of pitch of condensation/back tack section is selected.  Perform  Not perform	- - -	
U25	**Flap stopper position** In case of flap sewing start irradiation position of marking light (distance from needle) is set * Setting is only the irradiation position of marking light. Actual sewing position is the flap end position detected by the flap sensor. 	80.0 to 280.0 / 0.1mm	80.0mm
U245	**Number of stitches of grease-up** Number of stitches of sewing machine motion after replenishing grease is indicated. * When pressing CLEAR button, number, of stitches is cleared to “0”. Be sure to clear after replenishing grease. 	- - -	- - -
U500	**Language selection** Language to be indicated in panel is selected.  English  English  Japanese  Chinese	- - -	No selection

- **Level 2**
  Memory switch data (level 2) are the motion data that the sewing machine has in common and the data that operate on all sewing patterns in common. The data are for the maintenance personnel and possible to edit by pressing the mode switch as long as 6 seconds.

No.	Item	Setting range / Edit unit	Initial value
K51	**Marking light mounting** Mounting/Non-mounting of marking light is selected. When “Non mounting” is selected, marking light does not work.  Non mounting  Mounting	- - -	
K52	**Sewing position selection** Mode that surely ends sewing at rear reference position, mode that surely starts sewing from front reference position or the conventional motion mode that changes sewing position according to the setting of S05 is selected. * Front reference position: 80mm from needle Rear reference position : 300mm from needle (Long type : 330mm)  Conventional motion mode  Sewing position fixed mode (Rear reference)  Sewing position fixed mode (Front reference)	- - -	
K53	**Setting of solenoid valve for corner knife separate drive** Mounting/non mounting of solenoid valve corner knife separate drive is set.  Non mounting  Mounting		
K54	**Pedal operation mode change-over** Mode to be used for foot pedal is set.  7-step pedal mode  1-shot pedal mode	- - -	
K55	**Excess rate of center knife cutting** Excess rate in terms of the speed of revolution of center knife can be set. 	300 to 500 / 1%	350%
K56	**Setting on intermittent feed prohibition** Perform/not perform intermittent feed sewing is selected. * When performing intermittent sewing, the max. sewing speed of sewing machine is limited 1, 500 rpm.  Perform intermittent feed sewing  Not perform intermittent feed sewing	- - -	

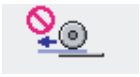
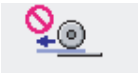
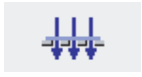
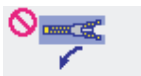
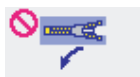
No.	Item	Setting range / Edit unit	Initial value
K57	**Change-over of flap concealed stitching data edit reference** Making the flap concealed stitching data that is set from panel the compensation value from the flap detecting end or the distance from detecting sensor to sewing start is selected.  Flap detecting end compensation  Sensor compensation	- - -	
K58	**L size data range enlargement** Enlarging/not enlarging L size data range to max. 220mm + 15mm is set. In case of SA123 long type vamp foot selection, the size is enlarged to 20mm + 50mm. * When performing sewing longer that 250mm with long type clamp foot, corner knife does not work.  Not enlarging  Enlarging  	- - -	
K59	**Selection of sewing speed of sewing machine setting** It is selected that either memory switch or pattern data performs setting of speed of sewing machine.  Memory switch  Pattern data	- - -	
K60	**Selection of reflecting tape check mode** ON/OFF of reflecting tape check mode is set. * When On is set, the clap foot is automatically comes lowered with the first clamp foot advance motion after turning ON the power and deterioration check of reflecting tape is performed. Clamp foot is automatically lowered. Be sure to use this function only in case of shim type.  OFF  ON	- - -	
K61	**Selection of back tuck return at sewing end compensation setting** It is selected that either memory switch of pattern data performs setting of back tuck return at sewing end compensation.  Memory switch  Pattern data	- - -	
K62	**Back tuck return at sewing end compensation** Back tuck return at sewing end compensation is set. * It is possible to set only when K61 is set to the memory switch selection. 	-2.0 to 2.0 / 0.1mm	0.0mm

No.	Item	Setting range / Edit unit	Initial value
K63	**Selection of mode change-over button display in the pattern list screen** Mode change-over button is displayed in the pattern list screen and data of different mode can be selected.  Non-display  Display	- - -	
K65	**Feeding length after sewing endless zipper** Adjust the length so as to easily perform zipper cut. * It is possible to set only when SA124 endless zipper device is mounted. 	0 to 100 / 1mm	50mm
K80	**Clamp foot motor origin compensation** Origin of clap foot motor is compensated. 	-10.0 to 10.0 / 0.1mm	0.0mm
K81	**Corner knife motor origin compensation** Origin of corner knife motor is compensated. 	-5.0 to 5.0 / 0.1mm	0.0mm
K82	**Marking light origin compensation (just under)** Origin of marking light motor is compensated. Origin is in the sate that it irradiates light just under and located at the position of 230mm from needle. 	-500 to 500 / 1pulse	0pulse
K83	**Marking light origin compensation (needle side)** Position of needle side from origin of marking light motor is compensated. Light irradiation position 80mm from needle. 	-500 to 500 / 1pulse	0pulse
K84	**Marking light origin compensation (operator side)** Position of operator side from origin of marking light motor is compensated. Light irradiation position is 380mm from needle 	-500 to 500 / 1pulse	0pulse
K85	**Back tuck motor origin compensation** Origin of back tuck motor is compensated. 	-30 to 30 / 1pulse	0pulse

..... Item that is not displayed due to other setting start.

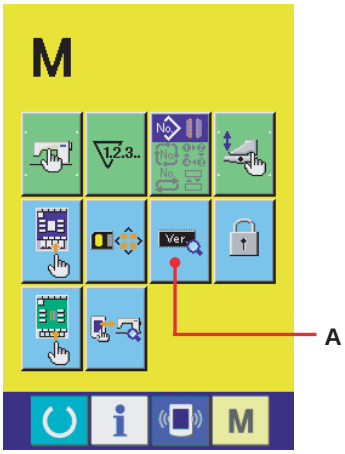
(4) Optional setting list

By setting the optional mounted state, it is possible to perform the respective optional operations.

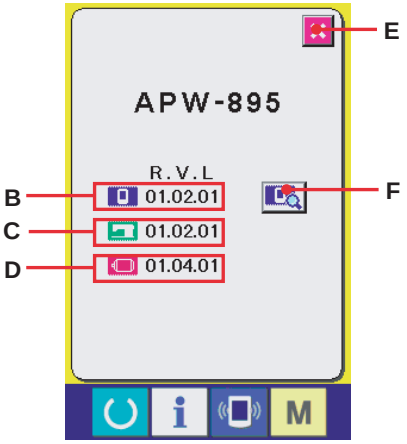
No.	Item	Setting range / Edit unit	Initial value
SP-46	**Clamp bar stacker mounting/not mounting is set**  Not mounting  Mounting	- - -	 Not mounting
SP-47	**Roller stacker mounting/not mounting is set.**  Not mounting  Mounting	- - -	 Not mounting
SA117	**Data stretcher mounting/not mounting is set.** * When using SA123 long type clamp foot dart stretcher does not eork.  Not mounting  Mounting	- - -	 Not mounting
SA119	**Vacuum device mounting/not mounting is set.**  Not mounting  Mounting	- - -	 Not mounting
SA120	**Automatic interlining supplying device mounting/not mounting is set.** * When using SA123 long type clamp foot, automatic interlining supplying device does not work.  Not mounting  Mounting	- - -	 Not mounting
SA123	**Long type selection** It is set when using long type clamp foot.  Standard : Standard clamp mounting, Sewing size 220mm  Long : Long clamp mounting, Sewing size 250mm	- - -	
SA124	**Endiless zipper device mounting/not mounting is set.** * When using SA123 ong type clamp foot, endless zipper device does not work.  Not mounting  Mounting	- - -	 Not mounting
SA125	**Ready-made zipper device mounting/not mouting is set.** * When using SA123 long type clamp foot, ready-made zipper device does not work.  Not mounting  Mounting	- - -	 Not mounting

5. Supplemental remarks of each function number and explanation of each function

(1) Version display



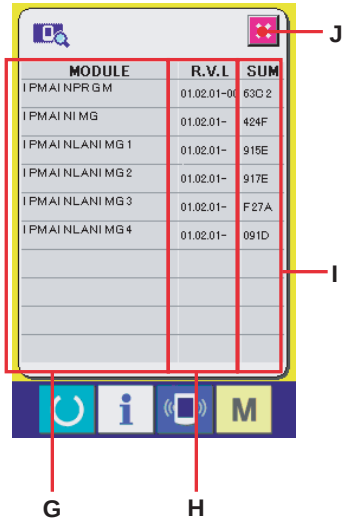
1. To display the version information screen:
Hold down the M key for 3 seconds to call up the version information button, A on the screen. Press this button to display the version information screen.



The version information screen shows the version information of your sewing machine.

B: Panel program version
C: Main program version
D: Main shaft program version

Pressing the cancel button, E closes the version information screen and calls up the mode screen.

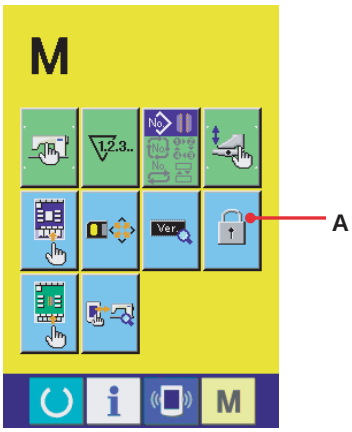


2. To display the detail screen:
Press the detail screen button, F to call up the panel program detail screen.

G : Module
H : RVL
I : Checksum

Pressing the cancel button, J closes the detail screen and calls up the version information screen. Pressing the M key closes the detail screen and calls up the data input screen which you have selected.

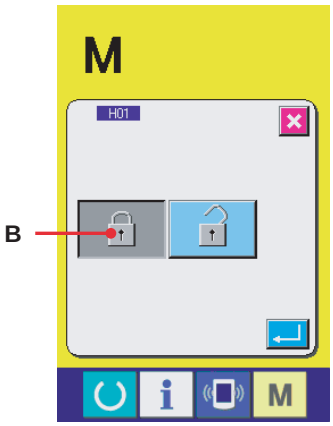
(2) Keylock setup



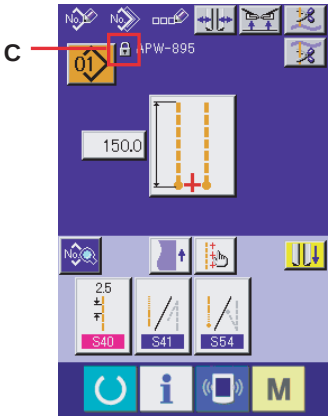
1. **To call up the keylock screen:**
   Hold down the M key for 3 seconds to call up the keylock button, A on the screen. Press this button to display the keylock setting screen.
   The current status appears on the keylock button.

   : Keylock is inactivated.

   : Keylock is activated.



2. **To select keylock and activate it:**
   Select the keylock activation button, B on the keylock setting screen and press . Then, the keylock setting screen closes and keylock becomes activated.



3. **After closing the mode screen and calling up the data input screen:**
   After closing the mode screen and calling up the data input screen, PICT C indicating that keylock is activated appears on the right of the pattern number.
   Only available buttons appear when keylock is activated.

(3) Communication screens of the maintenance personnel level

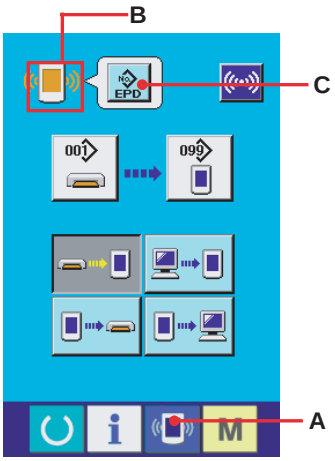
The data types allowed to be handled in the communication screens can differ according to the ordinarily used levels and the specific levels that are used by the maintenance personnel.

1. Types of data that can be handled

In addition to the four ordinary data types, the five more data types can be used for the maintenance personnel level. Each data type is as specified below.

Data name	Pict	Extension	Contents of data
Adjustment data		Model name +00XXX.MSW Example) APW00001.MSW	Data of the memory switches 1 and 2
All sewing machine data		Model name +00XXX.MSP Example) APW00001.MSP	All data maintained by the sewing machine
Panel program data		AP + RVL (6 digits).HED AP + RVL (6 digits).PXX AM + RVL (6 digits).IXX	Program data and display data of the panel
Main program data		MA + RVL (6 digits).PRG	Main program data
Servo program data		MT + RVL (6 digits).PRG	Servo program data

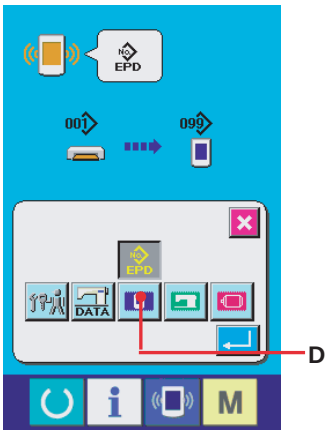
XXX: File No.



2. Reading/Writing of adjustment data and all sewing machine data

(1) Display of the communication screen of the maintenance personnel level

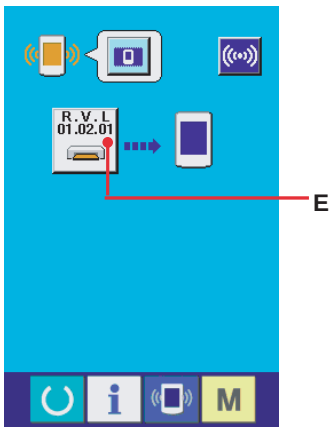
When the key A is continuously pressed for 3 seconds, the top left image is turned into the orange color (B) and a communication screen of the maintenance personnel level is displayed.



3. Program rewriting

(1) Selection of the data type

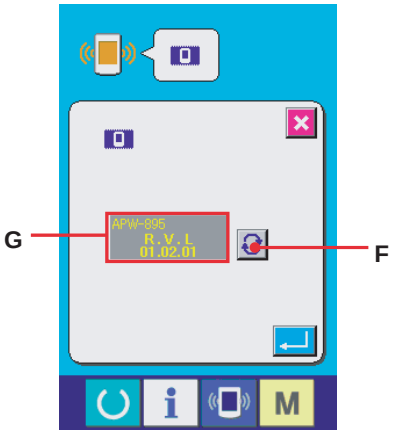
When the data classification button C is pressed in a communication screen of the maintenance personnel level, the data selection screen is displayed. In this state, select the panel program data D.

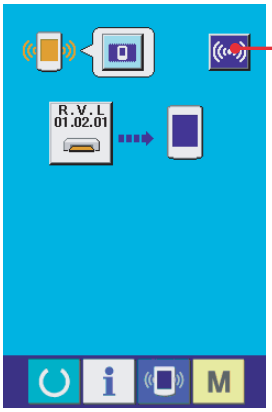


(2) Selection of a file

When the file selection button E is pressed in a communication screen, the file selection screen is displayed.

Press the file retrieval button F to select the download program G, and press the button.



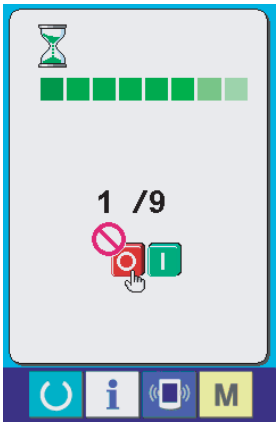


(3) Program rewrite start

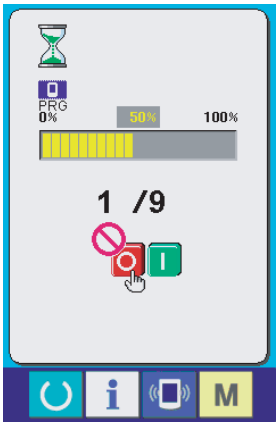
When the start of communication button H is pressed, program rewriting is started.

(Caution) Never turn off the power or open/shut the media cover during the work. Otherwise, the main body can be destroyed.

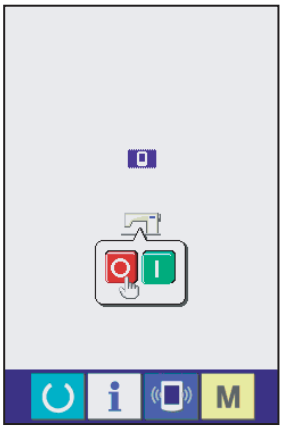
Data deleting screen



Data writing screen

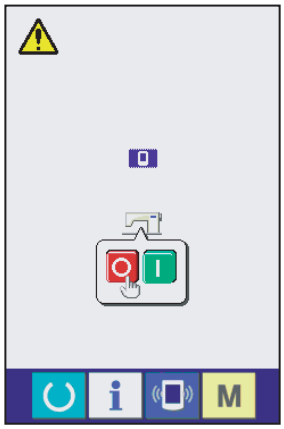


Ending screen



When the ending screen is displayed, the replacement work for the application software has been completed.

Data writing error screen



If any data writing error screen should be displayed, immediately turn off the power supply and check the [checking items] specified below. Then, take the setup actions again.

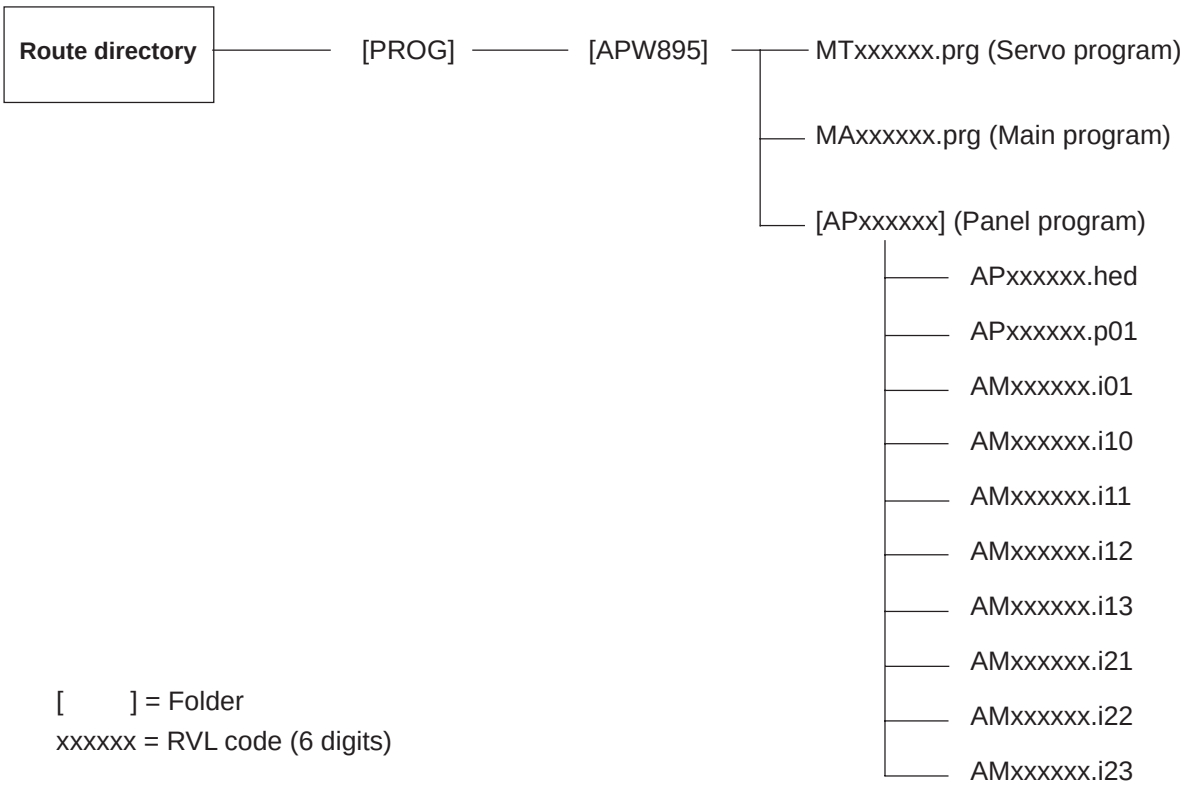
[Checking items]

1) Did you open the media cover in the middle of data communication from the media card.
2) Data of the media card are incorrect, or there is no data file.
3) The contact point of the media card is contaminated, or suffering from poor contact.

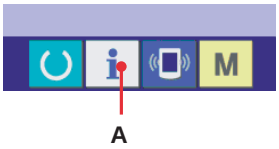
4. Use of media other than those packed together

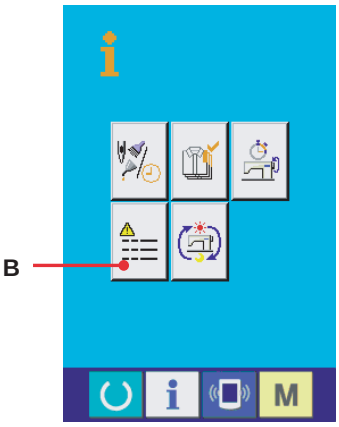
When the contents of the media card packed together are going to be copied on another media card, the media card of the copying destination should be formatted with IP310. Since then, the following directory configuration should be established with a personal computer.

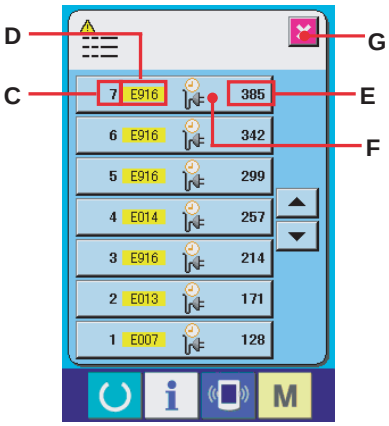
Information about the method of media card formatting is obtainable from the Instruction Manual, [VI-15. How to Use the Communication Functions].

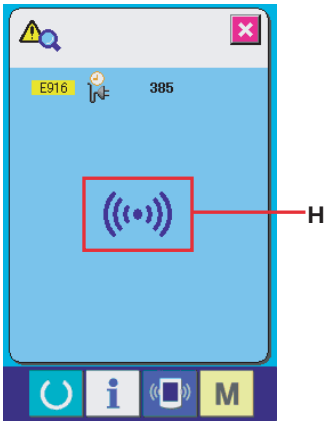


(4) Information screen at the maintenance personnel level









1. Error history

(1) To display the information screen at the maintenance personnel level:

Hold down the information key,  A for approx. 3 seconds in the switch sheet section on the data input screen to call up the information screen at the maintenance personnel level. On the information screen at the maintenance personnel level, the color of PICT at the upper left changes from blue to orange, and there are 5 buttons.

(2) To call up the error history screen:

Press the error history button,  B on the information screen to call up the error history screen.

The error history screen shows the error history of your sewing machine.

C: Chronological recording number
D: Error code
E: Cumulative energizing time during error (hour)

Pressing the cancel button,  G closes the error history screen and calls up the information screen.

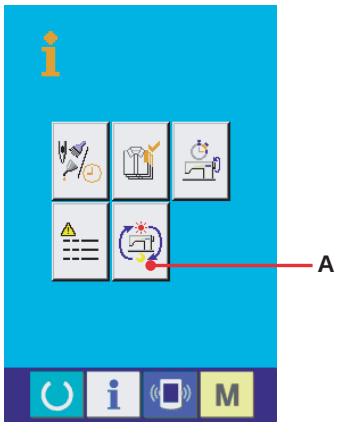
(3) To display details:

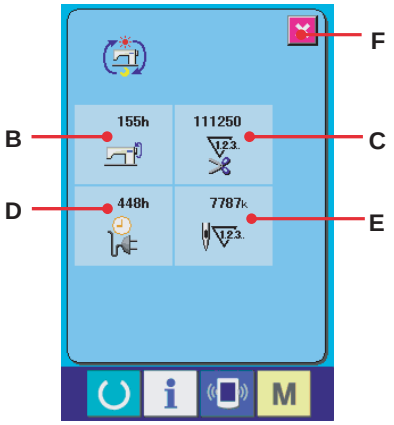
For detailed information about errors, press the error button, 

F that you would like to see to call up the error detail screen.

PICT (H) in response to error codes appears on the error detail screen.

→ In regard to the “9. ERROR CODE LIST” refer to the Service Manual.





2. Cumulative operating information

(1) To call up the information screen at the maintenance personnel level:

Hold down the information key , for approx. 3 seconds in the switch sheet section on the data input screen to call up the information screen at the maintenance personnel level. On the information screen at the maintenance personnel level, the color of PICT at the upper left changes from blue to orange, and there are 5 buttons.

(2) To display cumulative operating information:

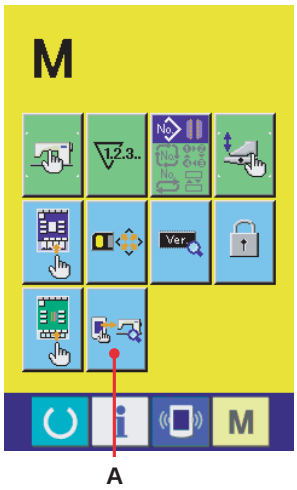
Press the cumulative operating information button, A on the information screen to call up the cumulative operating information screen.

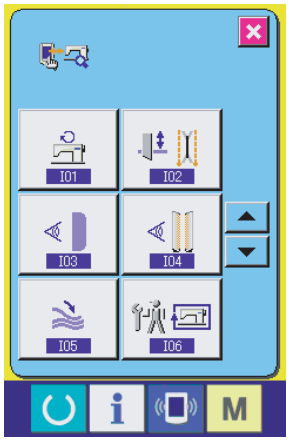
The following 4 items are indicated on the cumulative operating information screen.

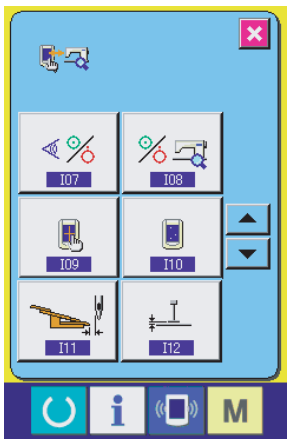
B: Cumulative operating time (hour)
C: Cumulative thread trimming count
D: Cumulative energizing time (hour)
E: Cumulative stitch count (x1000 stitches)

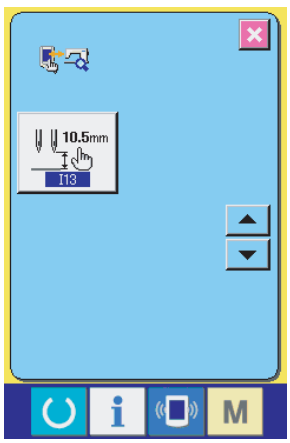
Pressing the cancel button, F closes the cumulative operating information screen and calls up the information screen.

(5) Check program



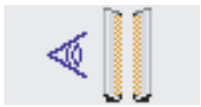
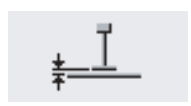


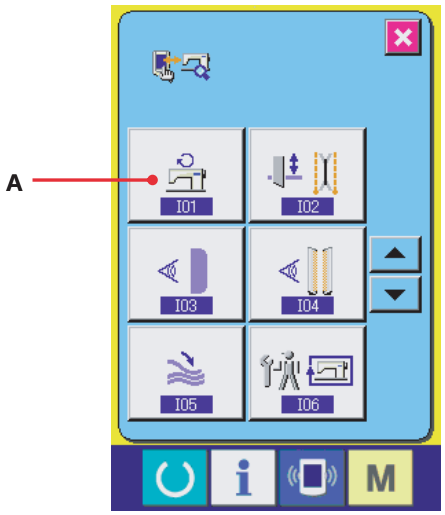




1. Display the check program menu screen.
   When the M key is kept pressed for 3 seconds, the check program button A is displayed on the screen. When this button is pressed, the check program menu screen is displayed.

The check program offers 13 functions as specified below.

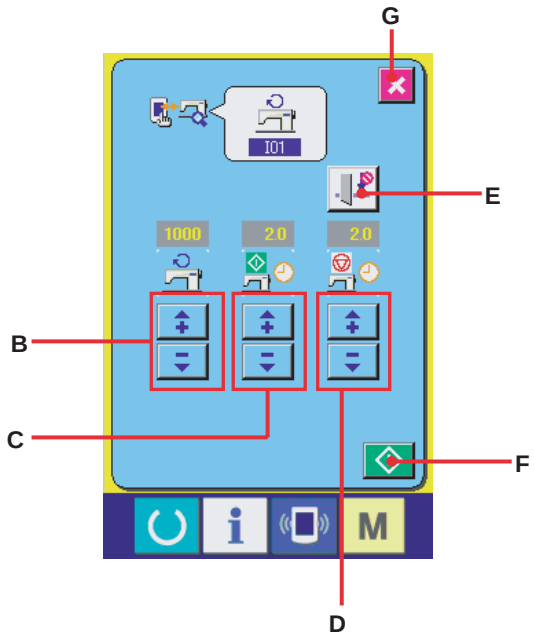
No.	Pictograph	Description
I01		**Independent head operation** Carry out independent head operation. Used to check shuttle oil amount and others.
I02		**Center knife check** Check the independent motion of the center knife motor and the elevating conditions of the center knife.
I03		**Flap sensor adjustments** Adjust and correct the flap sensor mounting position.
I04		**Detection of reflection seal deterioration** Check deterioration (if any) in the reflection seal for flap detection, which is stuck to the folding plate.
I05		**Stacker adjustments** Perate only the stacker independently.
I06		**Unit aging** Repeat sewing operation.
I07		**Input check** Check the sensor input state.
I08		**Output check** Check the solenoid valve output.
I09		**Touch panel correction** Correct the touch panel and button display positions.
I10		**LCD check** LCD dot defect check
I11		**Confirmation of needle entry position** Adjust the clearance between Garment body clamp and folding plate and the needle.
I12		**Adjustment of binder height** Adjust the binder height.
I13		**Head stop angle adjustment** Adjust the upper needle stop angle.



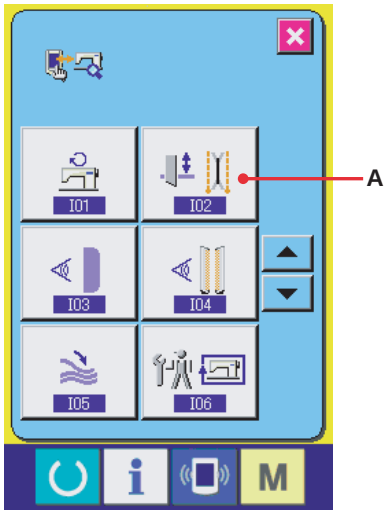
1. How to use the check program

(1) IO1 head aging mode

Press the head aging button A of the check program menu screen and display the head aging screen.

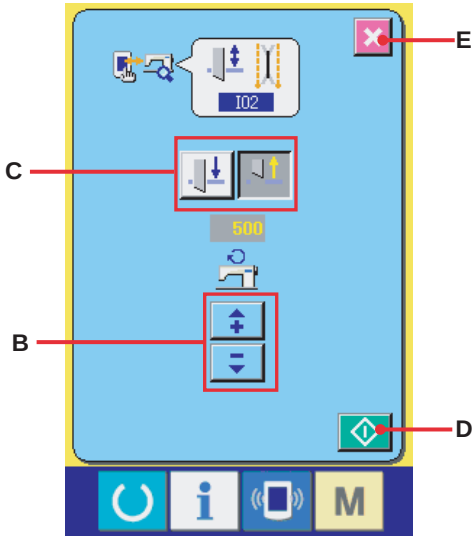


B : Set up the head rpm value.
C : Set up the revolving time.
D : Set up the stop time.
E : In interlinkage with the sewing machine, select whether the center knife can be driven.
F : Set up the head run/stop operation.
G : Returned to the menu. (Effective only in the middle of stoppage)

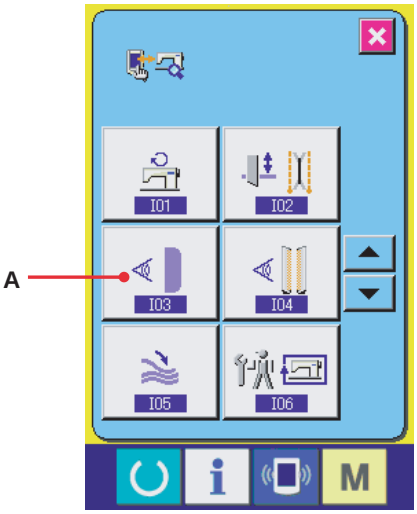


(2) IO2 center knife check mode

Press the center knife check button A of the check program menu screen and display the center knife check screen.



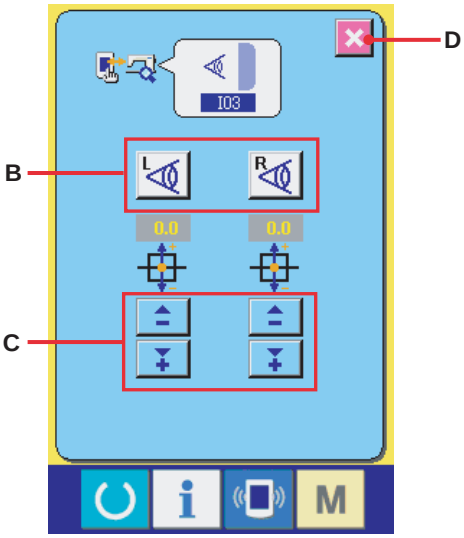
B : Set up the rpm value of the center knife motor.
C : Make center knife rise/lower changeover.
D : Start the revolution of the center knife motor.
E : Returned to the check program menu. (Effective only in the middle of stoppage)



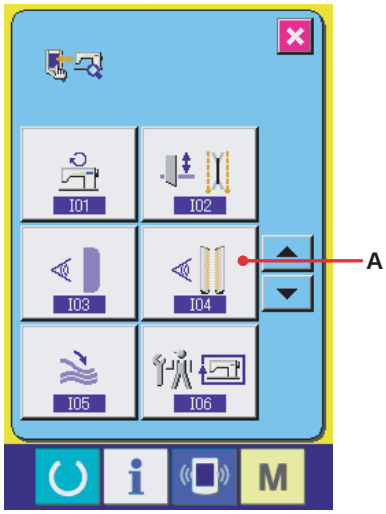
(3) IO3 flap sensor adjusting mode

Press the flap sensor adjusting button  A of the check program menu screen and display the flap sensor adjusting screen.

(Caution) First of all, adjustment of the origin is needed for the marking light.

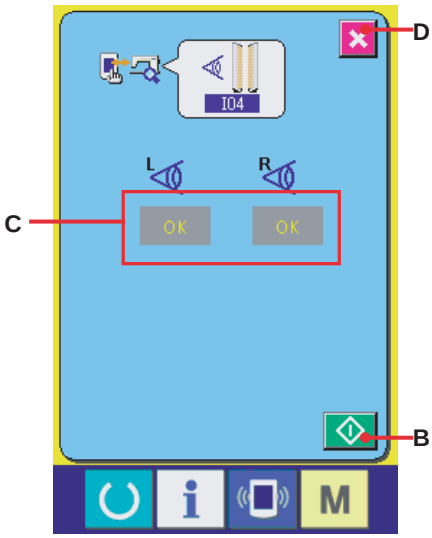


1) When the flap sensor adjusting screen is opened, the marking light moves to the flap sensor adjusting position. Adjust the flap sensor spot so that it coincides with the marking light radiating position.
2) Select the right and left sensors with B when fine adjustments are needed for the flap sensor position. Move the marking light with C and adjust the flap sensor spot so that it coincides with the marking light radiating position. Adjust the flap sensor spot so that it coincides with the marking light radiating position.
3) Finish adjustments with D and recover the check program menu screen.

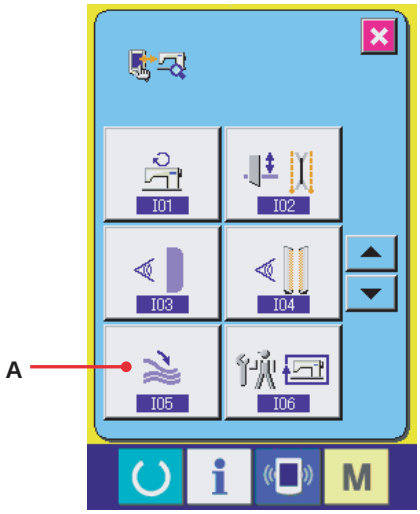


(4) IO4 reflection seal deterioration detection mode

Press the reflection seal deterioration detection button A of the check program menu screen and display the reflection seal deterioration detection screen.

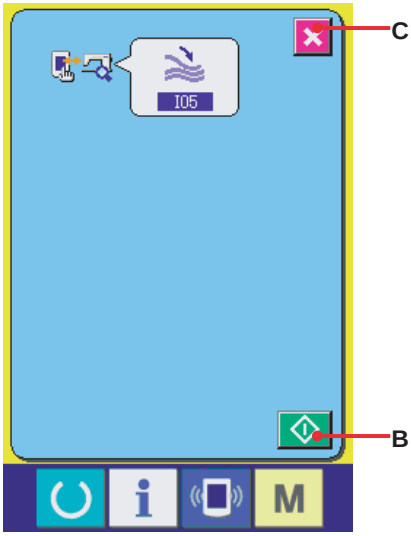


When B is pressed, the large presser begins to advance at a low speed.
In this phase, detect reflection of the reflection seal by means of the flap sensor.
Display the result of detection at C.
If no deterioration is detected, an OK sign is indicated.
If any deterioration is detected, an NG sign is indicated.
In the case of NG, pressing the C causes the large presser to move to the place of deterioration.
With D, the check program menu screen is recovered.

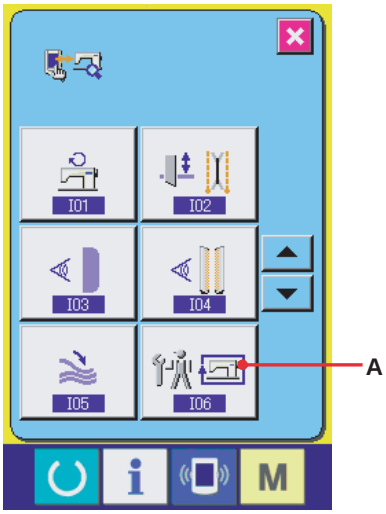


(5) IO5 stacker adjustments

Press the stacker adjustment button A of the check program menu screen and display the stacker adjustment screen.

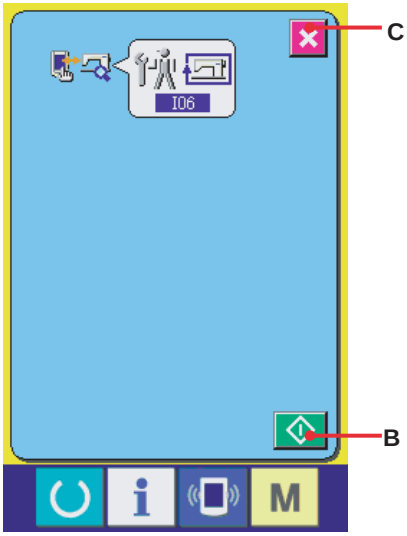


When the B is pressed, the stacker preset by optional setup is actuated.
Use Stacker Timer 1 for the pattern that is selected at present.
With C, the check program menu screen is recovered.



(6) IO6 unit aging

Press the unit aging button  A of the check program menu screen and display the unit aging screen.

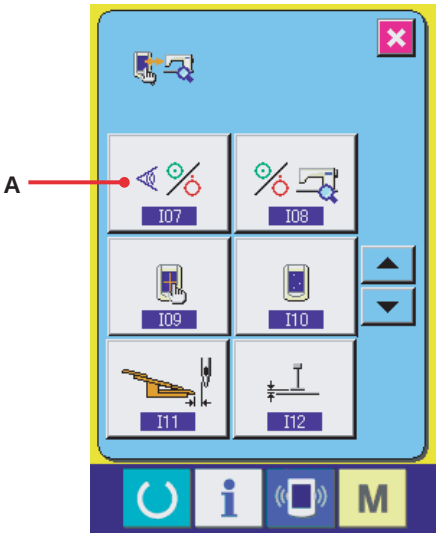


When the B is pressed, the repeated sewing operation is performed for the pattern that is selected at present.

When the C is pressed, no unit aging is carried out, but the check program menu screen is recovered.

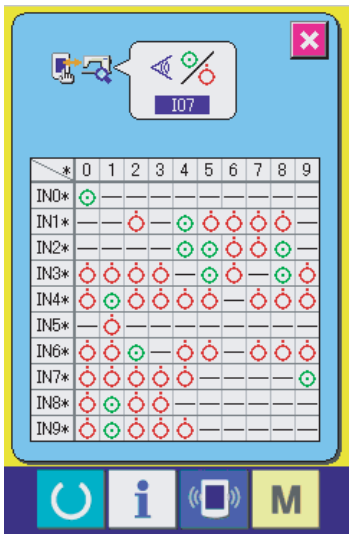
(Caution) 1. Be careful that pressing the B results in automatic sewing operation.

2. To stop the aging operation, press the temporary stop SW.

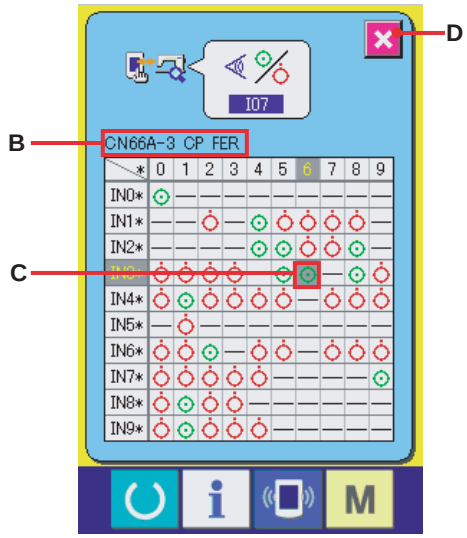


(7) IO7 input check

Press the input check button A of the check program menu screen and display the input check screen.



The present input status is displayed.



If there is any change in the input status, the panel buzzer sounds and the screen simultaneously changes as illustrated at left.

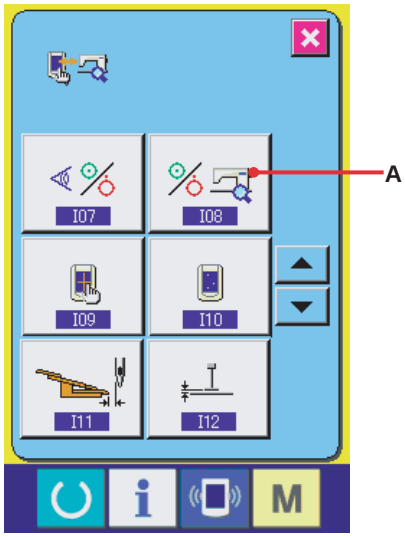
The connector name and the input name are displayed at B.

C: A color change takes place where there has been a change.

To finish input check, press the D to move to the check program menu screen.

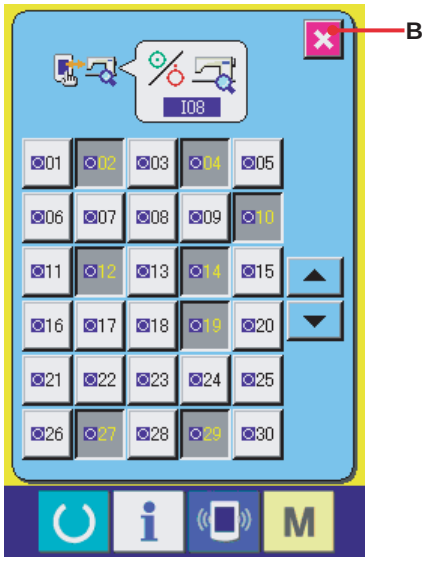
No.	Name	Descriptions
IN00	CN30-2 AIR SW	Air detection
IN12	CN39-24 STOP STATE	Sewing machine operation signal
IN14	CN39-27 UDET	UDET
IN15	CN39-26 DDET	DDET
IN16	CN39-20 PDET	PDET
IN17	CN39-3 AUDET	AUDET
IN18	CN39-23 BRK	BRK
IN24	CN52-13 OP MOTOR	Detection of option motor connection
IN25	CN44-29 TENTION SW	Tension SW with a zipper
IN26	CN44-30 ORG PM10	Welting patch cutting, origin
IN27	CN44-31 ORG-PM11	Pocket bag flap sensor origin
IN28	CN37-6 ORG CNKN	Corner knife opening direction, origin
IN29	CN37-7 ORG MKLT 1	Fine adjustment of marking light origin
IN30	CN60A-2 WLT DET	Monitoring of welting patch
IN31	CN61A-2 FNFP SNS	Pocket bag flap sensor
IN32	CN62A-2 TRD SNS L	Thread breakage detection, left
IN33	CN63A-2 TRD SNS R	Thread breakage detection, right
IN35	CN65A-3 CLOTH SNS	Material sensor
IN36	CN66A-3 CP FER	Step-out detection of clamp foot
IN38	CN68A-1 B OPN SNS	Binder opening detection
IN39	CN69A-1 WELT SW	Changeover SW of welting patch specifications
IN40	CN70A-1 W CP GEND	Bottom end detection of welting patch clamp
IN41	CN71A-3 B DSNS	Binder upper detection
IN42	CN72A-3 B USNS	Binder lower detection
IN43	CN73A-3 B SSNS	Binder swing end detection
IN44	CN74A-3 B SPLYSNS	Binder supply end detection
IN45	CN75A-2 ORG MKLT 2	Marking light origin
IN47	CN77A-2 ORG CLMP	Clamp foot origin (backward end)
IN48	CN78A-2 B MSNS	Forward/reverse movement end of binder
IN49	CN79A-1 CTR KN USNS	Upper detection of center knife
IN51	CN81A-1 DARET USNS	Upper detection of darts extension
IN60	CN60B-2 FSNS L	Flap sensor, left
IN61	CN61B-2 FSNS R	Flap sensor, right

No.	Name	Descriptions
IN62	C62B-2 CN KN DRWSW	Corner knife drawer detection
IN64	CN64B-2 BREM L	Bobbin thread remaining amount detection, left
IN65	CN65B-3 START SW	Start switch
IN67	CN67B-1 TC PEDAL SW	Touch pedal switch
IN68	CN68B-1 FLP CLP PDL	Flap clamp pedal SW
IN69	CN69B-1 STOP SW	Pause switch
IN70	CN70B-1 BGCT CP SW	Pocket bag clamp switch
IN71	CN71B-3 FPSPLY UDET L	Upper detection of flap supply, left
IN72	CN72B-3 FPSPLY UDET R	Upper detection of flap supply, right
IN73	CN73B-3 FPSPLY SDET L	Swing detection (left) of flap supply
IN74	CN74B-3 FPSPLY SDET R	Swing detection (right) of flap supply
IN79	CN79B-1 CN KN SDSENS	Lower detection of fixed-side corner knife
IN80	CN80B-1 CN KN SDUENS	Upper detection of fixed-side corner knife
IN81	CN81B-1 CN KN MDSENS	Lower detection of moving-side corner knife
IN82	CN82B-1 CN KN MDUENS	Upper detection of moving-side corner knife
IN83	CN83B-13 STK OSNS	Stacker opening detection
IN90	CN83B-15 ORG STK	Stacker origin detection
IN91	CN83A-19 ROLL USNS	Roller lifting detection
IN92	CN83B-19 STKCLMPUSNS	Lifting detection of stacker material presser
IN93	CN64B-5 BREM R	Bobbin thread remaining amount detection, right
IN94	CN38-6 BTORG	Back-tack motor origin



(8) IO8 output check

Press the output check button A of the check program menu screen and display the output check screen.

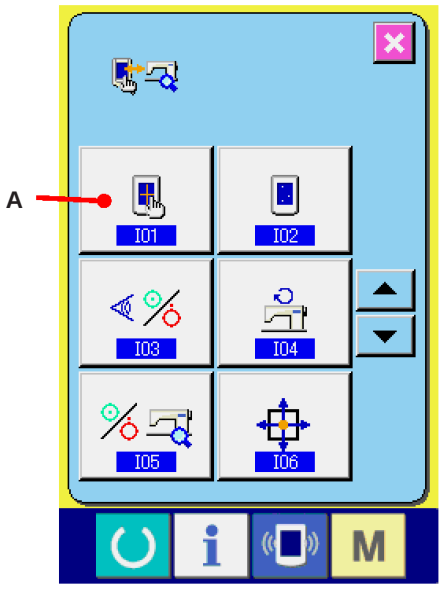


With the B button, output check is finished and the check program menu screen is recovered.
When the button is pressed, the output status ON/OFF can be changed.

(Caution) Be careful that the knife and others may operate according to the output type.

(For reference) Maintain the output state until the check program is finished. In the case of sensor check, etc., you can use IO7 input check immediately.

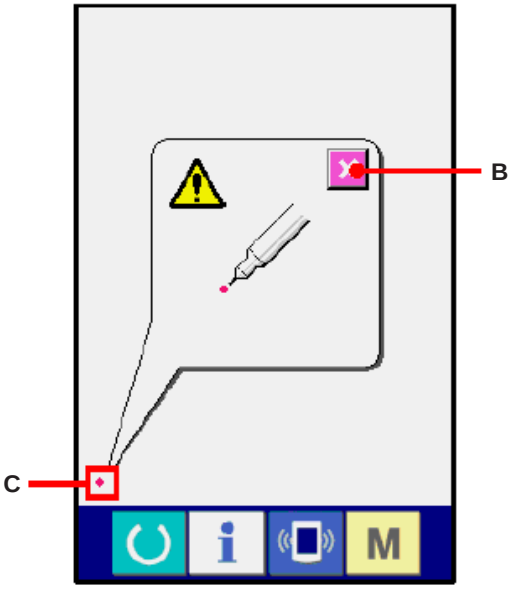
No.	Descriptions
1	Right clamp foot, fall
2	Right clamp foot, rise
3	Left clamp foot, fall
4	Left clamp foot, rise
5	Folding plate, right
6	Folding plate, left
7	Flap presser, right
8	Flap presser, left
9	Garment body clamp, right
10	Garment body clamp, right
11	Garment body clamp, left
12	Garment body clamp, left
13	Binder, fall
14	Binder, rise
15	Rise in binder’s reduced pressure
16	Interlining presser
17	Darts stretcher
18	Thread release
19	Disk rise
20	Vacuum
21	Bobbin thread detection blow
22	Needle thread trimmer
23	Bobbin thread trimme
24	Center knife
25	Fixed-side corner knife elevator
26	Moving-side corner knife elevator
27	Marking light turn off
28	Roller rise
29	Interlining feeder release
30	Interlining feeder feed
31	Interlining feeder cut
32	Stacker material presse
33	Stacker material clamp
34	Stacker material wiper



(9) Touch panel correction

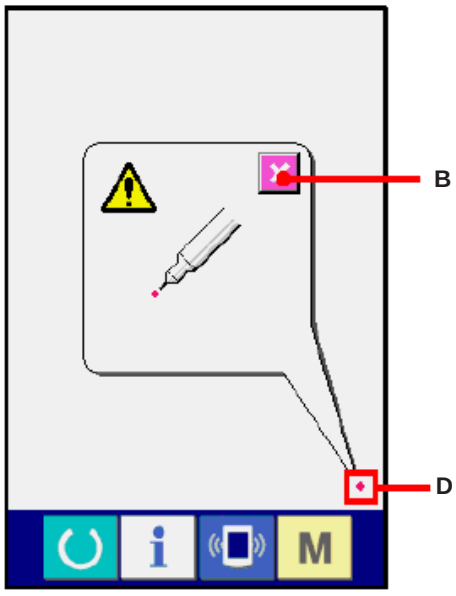
1. Display of the touch panel correction screen

When the touch panel correction button A of the check program screen is pressed, the touch panel correction screen is displayed.



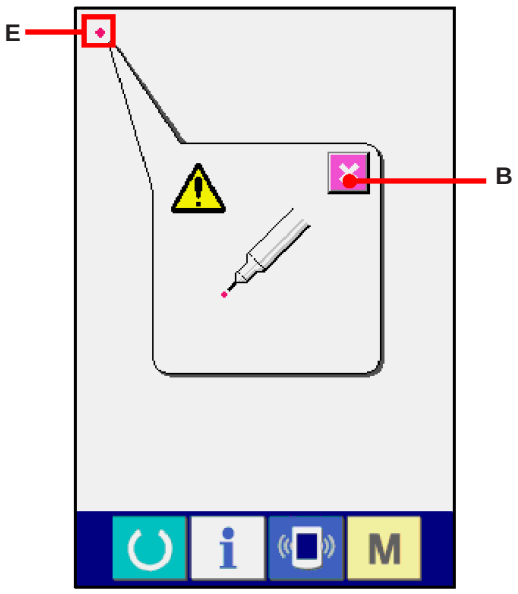
2. Pressing the bottom left position

Press the red circle C located at the bottom left of the screen. To complete correction, press the cancel button B.



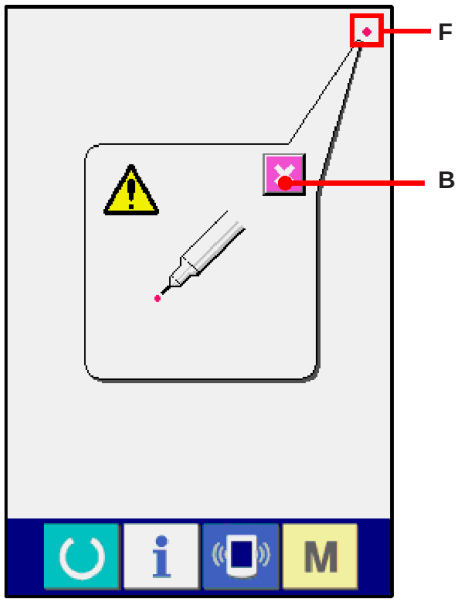
3. Pressing the bottom right position

Press the red circle D located at the bottom right of the screen. To complete correction, press the cancel button B.



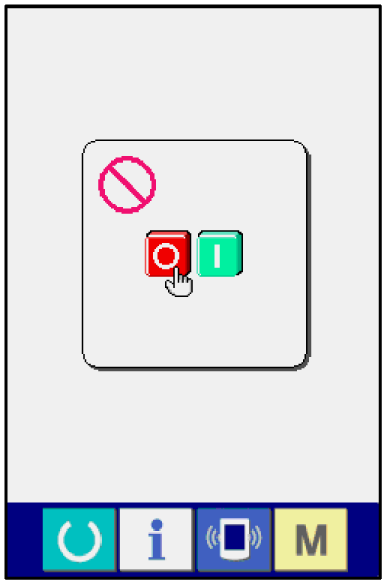
4. Pressing the top left position

Press the red circle E located at the top left of the screen. To complete correction, press the cancel button B.



5. Pressing the top right position

Press the red circle F located at the top left of the screen. To complete correction, press the cancel button B.



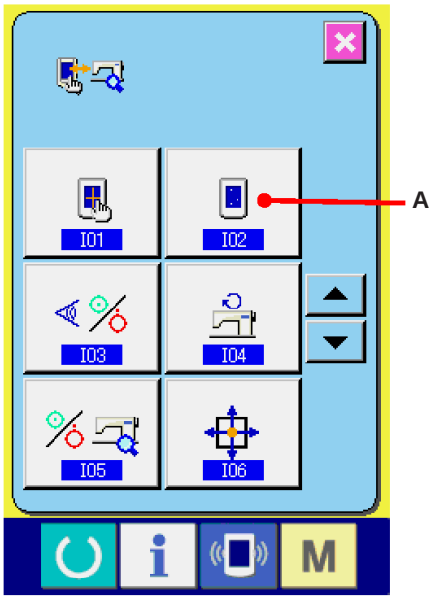
6. Data saving

When all the four points have been pressed, the correction data are saved. At that time, the Power OFF Prohibition screen is displayed.

The power supply must not be turned off while the above-mentioned screen is displayed.

If the power supply is carelessly turned off, no correction data are saved.

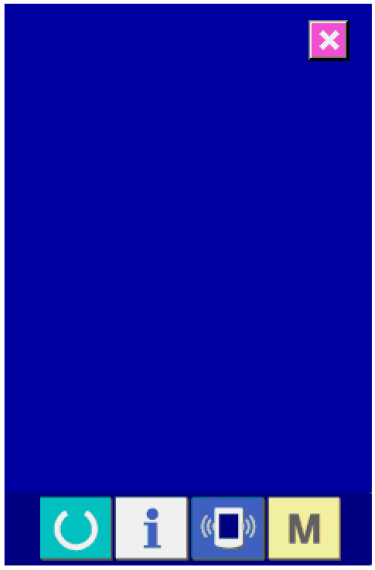
After data saving, the check program screen is automatically displayed.



(10) LCD check

1. Display of the LCD check screen

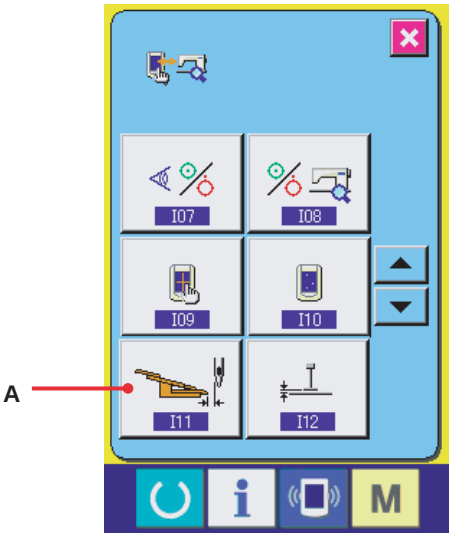
When the LCD check button  A is pressed on the check program screen, the LCD check screen is displayed.



2. Confirmation of LCD dot missing

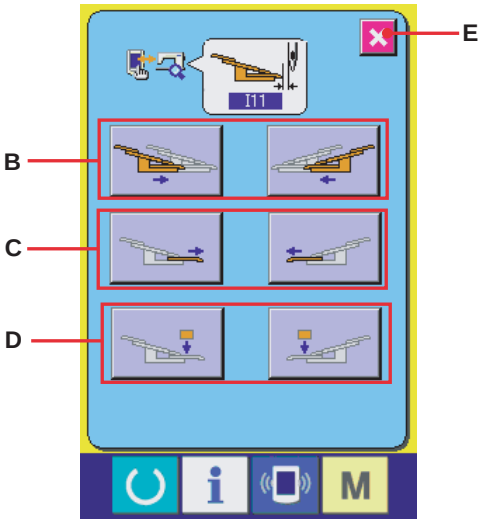
The LCD check screen is displayed only in one color. In this state, the LCD should be checked to freedom from dot missing.

After this confirmation, press a proper position on the screen. The LCD check screen is closed and the check program screen is displayed.

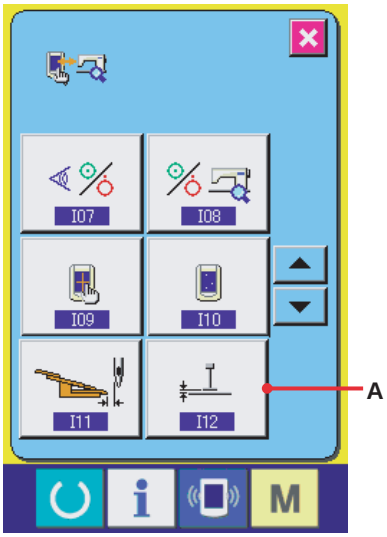


(11) I11 needle entry position check

Press the needle entry position check button  A of the check program menu screen and display the needle entry position check screen.

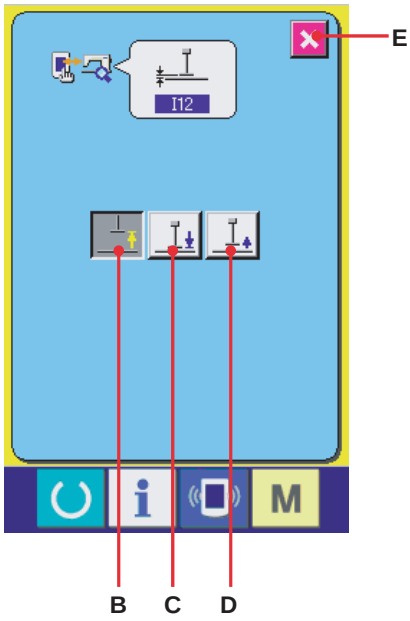


With the B button, output check is finished and the swing clamp position is moved.
With the C button, folding plate operation setup is carried out.
With the D button, flap holding operation setup is carried out.
With the E button, a menu is recovered.
Similarly as for the welt type setup screen, the large presser advances when the pedal is trodden on in this screen and ordinary set operation becomes possible. At that time, however, the binder does not rise and lower.
The large presser retreats when you perform the starting operation that is preset by pedal operation setup.
Use it for the confirmation of a clearance between the needle and the garment body clamp or folding plate.

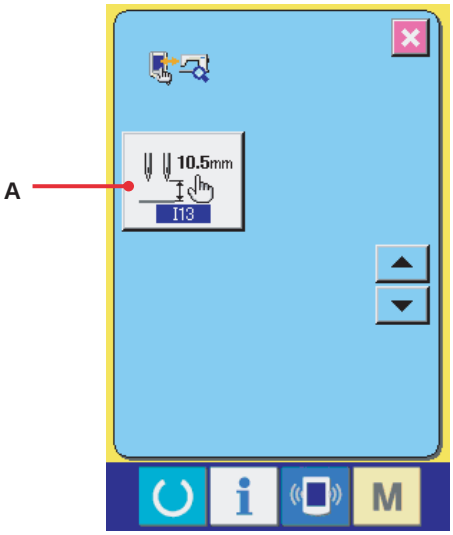


(12) I12 binder elevation

Press the binder elevation button  A of the check program menu screen and display the binder elevation screen.

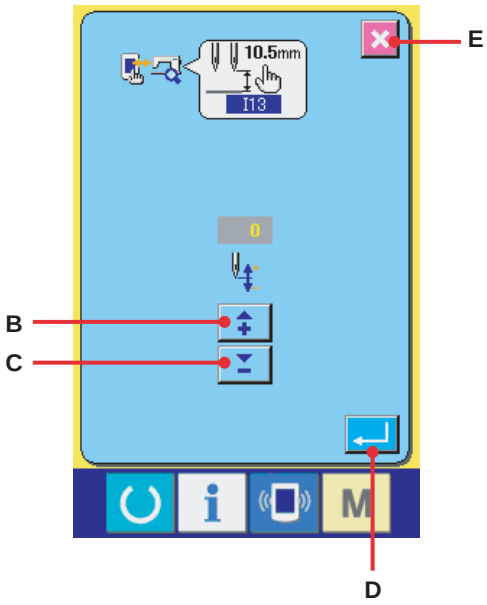


With the B button, the binder is raised.
With the C button, the binder is lowered.
With the D button, the binder's reduced pressure is raised.
With the E button, a menu is recovered.

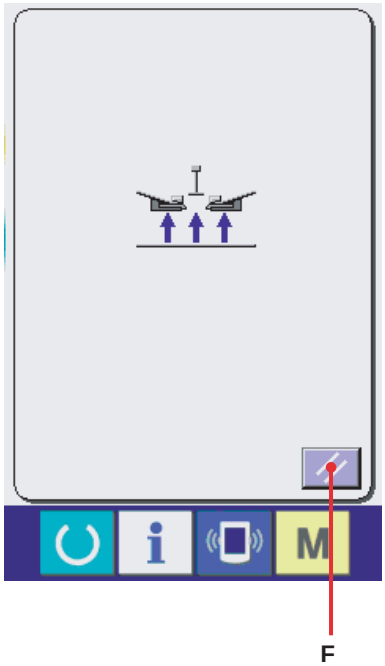


(13) I13 head stop angle adjustment

Press the head stop angle adjustment button  A of the check program menu screen and display the head stop angle adjustment screen.

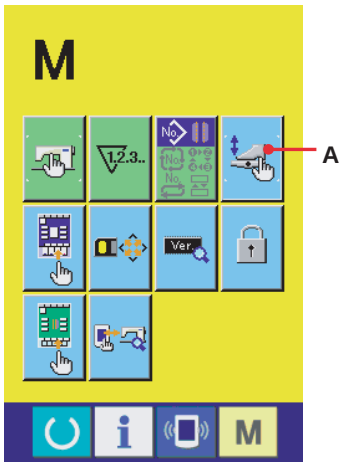


With the B button, the upper stop angle is increased by one degree. (10 degrees max.)
With the C button, the upper stop angle is decreased by one degree. (-10 degrees minimum.)
With the D button, a menu is recovered.
With the E button, setting is canceled and a menu is recovered.



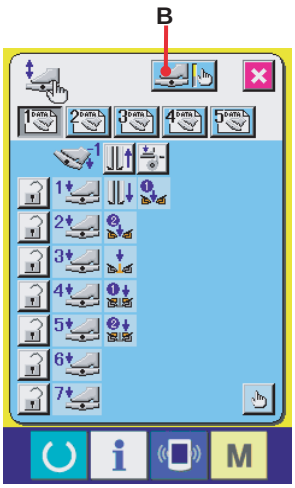
After the parameters have been set up, turn OFF the power supply once and turn it ON again.
When the reset button F is pressed in the screen at left, it moves above the needle. In this state, measure the needle bar height.

(6) Pedal volume adjustments

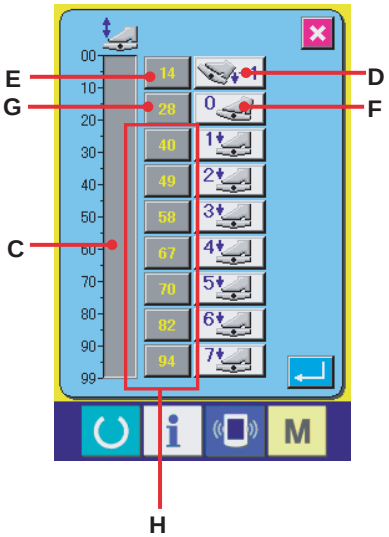


1. 7-step pedal adjustments

(1) Display the pedal customize screen.
When the M mode changeover key is kept pressed for 3 seconds, the pedal customize button A displayed on the screen changes color from green to light blue. When this button is pressed, the pedal customize screen of the maintenance personnel level is displayed.



(2) When the foot pedal adjustment button B is pressed, the foot pedal adjustment screen is displayed. Set up the number of steps corresponding to the pedal tread-on amount.

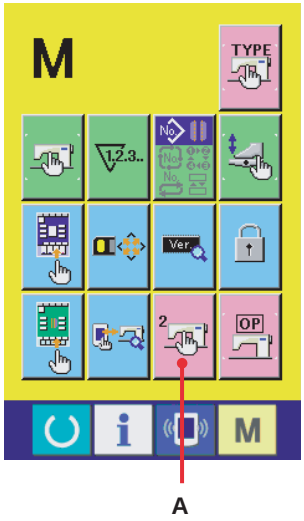


(3) The volume bar display C indicates the voltage value of the pedal sensor in the present state of pedal treading-on within the data range of 0 to 99.
In the first place, in the state that the pedal is reversely trodden on, press the reverse tread-on input button D. The voltage value at that time is then entered in E. Then, press the free input button F in the pedal free state. The voltage value at that time is then entered in G. In the similar manner, make the settings of pedal's first step to 7th step and enter the voltage inputs of the respective pedal positions in the buttons of E, G, and H.

(Reference) As the number of steps is increased in the reference pedal, setting should be made to increase the voltage value.
When the E, G, H buttons are pressed directly, a ten-key input screen is displayed. Then direct numerical input entry becomes possible.

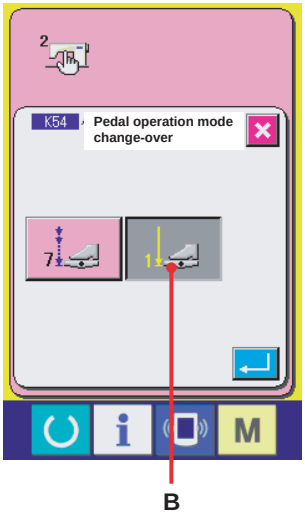
2. One-shot pedal adjustments

One-shot pedal means that each time the pedal is trodden on, the pedal step is advanced. Unlike the 7-step pedal, the status is retained even when the foot is separated from the pedal. To return the step, reverse foot action is taken.

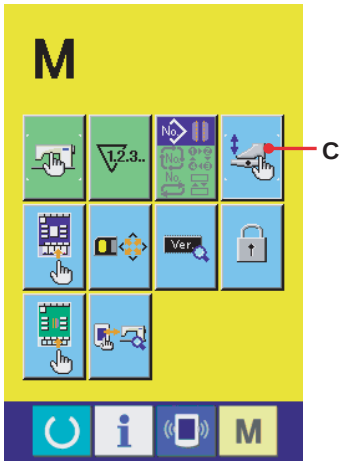


(1) Selection of one-shot pedal

Press the M mode changeover key for 6 seconds and select the A memory SWLv2.

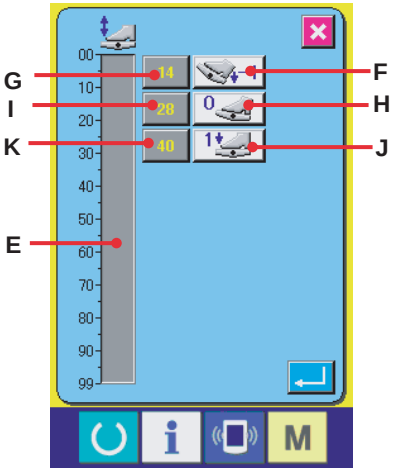


Select the B one-shot pedal with K54.



(2) Display the pedal customize screen.
When the M mode changeover key is kept pressed for 3 seconds, the pedal customize button C displayed on the screen changes color from green to light blue. When this button is pressed, the pedal customize screen of the maintenance personnel level is displayed.

(3) When the foot pedal adjustment button D is pressed, the foot pedal adjustment screen is displayed. Set up the number of steps corresponding to the pedal tread-on amount.



(4) The volume bar display E indicates the voltage value of the pedal sensor in the present state of pedal treading-on within the data range of 0 to 99.
In the first place, in the state that the pedal is reversely trodden on, press the reverse tread-on input button F. The voltage value at that time is then entered in G. Then, press the free input button H in the pedal free state. The voltage value at that time is then entered in I. In the similar manner, make the setting of step J for step advancement.

(Reference) 1. When the F, G, H buttons are pressed directly, a ten-key input screen is displayed. Then direct numerical input entry becomes possible.

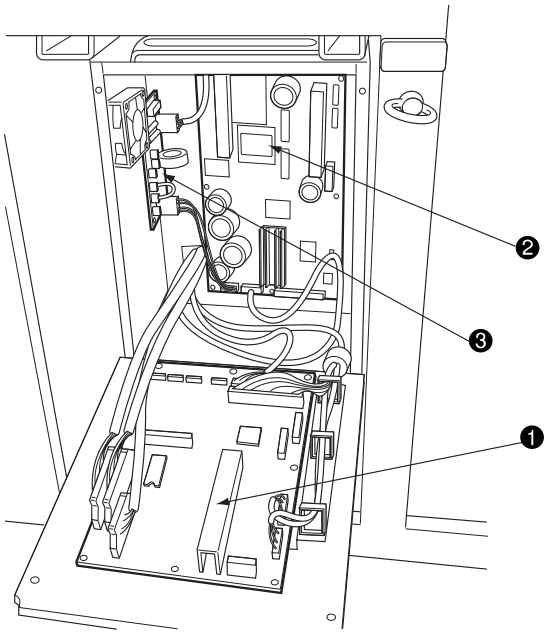
2. Only in the case of reference one-shot pedal, reverse pedal treading-on may be performed to set up H. Then, the pedal is trodden on to set up D. In this manner, the steps can be advanced by depressing the back part of the pedal. This setting is convenient for the work in standing posture.

6. Control box

(1) Description of each constitutive part

1) Function of boards in the control box and installation position

This machine is equipped with a control box on the bottom right side of the table.
Major functions of each board in the control box and the installation position are as described below.
MAIN board asm. ❶: This board is used for the main control of this machine.
There is EEPROM that stores data singular to the machine and also panel setup data.
At the time of board replacement, this EEPROM may be replaced by a new board to make it possible to perform data transfer.
SDC board asm. ❷: Machine's main shaft servomotor is controlled. DC source voltage is also generated.
Fuses for control power supply protection are installed.
FLT board asm. ❸: AC input source rectification and noise elimination are carried out.
This board comes in two types, single-phase specification and single-phase/ three-phase specification.



2) Function of boards in the operation panel (IP-310) and installation position

1. This machine is equipped with the operation panel IP-310 on the top right side of the table.
2. This is an operation panel intended to set up and check the operational specifications.
3. The built-in boards are used for LC display control and touch panel control.

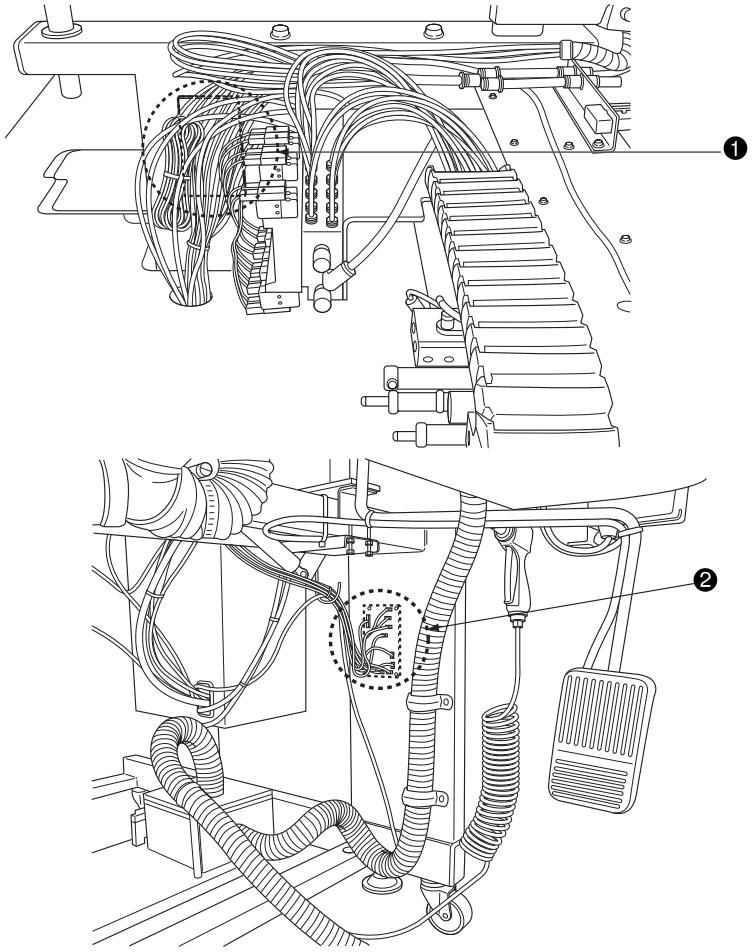
3) Function of INT board (relay board) and installation position

The INT board is installed inside the large presser cover on the upper side of the table and also inside the cover on leg side under the table.

This is a relay board that branches the signal line coming from the MAIN board in the control box and connects the branched line to each I/O equipment unit.

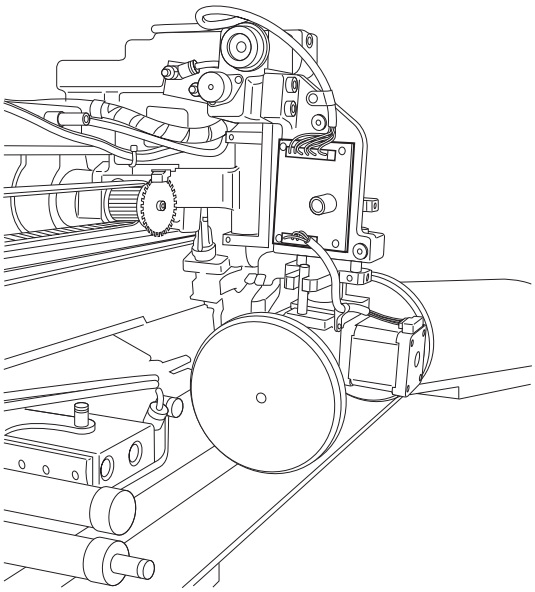
INT board A asm. (upper side) ❶: Used to relay the I/O signals of the switches and sensors installed mainly on the tabletop.

INT board B asm. (lower side) ❷: Used to relay the I/O signals of the switches and sensors installed mainly on the table bottom as well as the parts related to the machine head.



4) Function of PMDC board (optional component) and installation position

1. Installed inside the rear cover of the roller stacker unit (SP47).
2. This board is used to control the roller revolutions of the roller stacker.



(2) Replacement of parts

1) Replacement of fuses

The SDC board is provided with two replaceable fuses for power source protection.

o F1 fuse 10AT : DC +50V power source protection fuse for large presser motor driving

o F2 fuse 5AT : DC +24V power source protection fuse for small pulse motor driving and solenoid valve driving

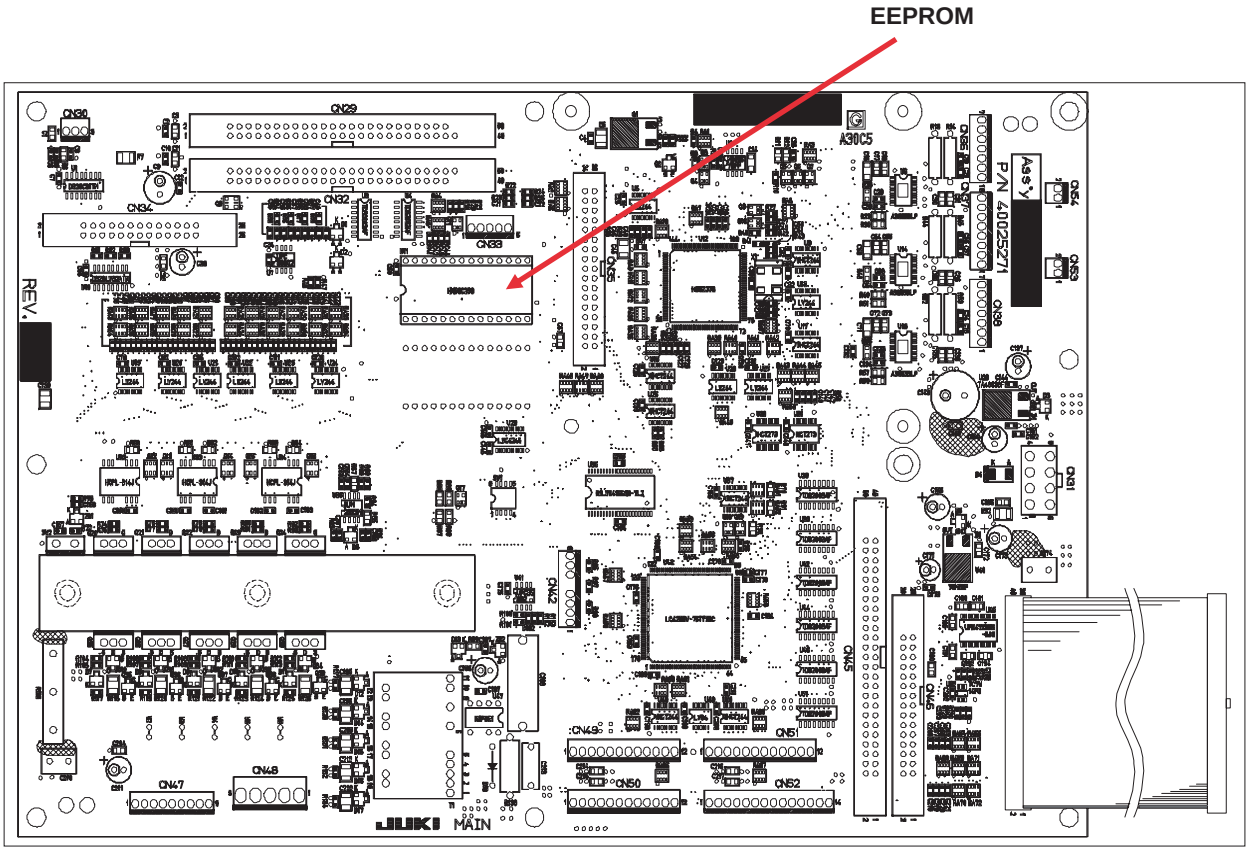
In regard to the fuse mounting position, refer to 2)-2. Replacement of SDC board.

2) Replace the board

1. Replacement of MAIN board

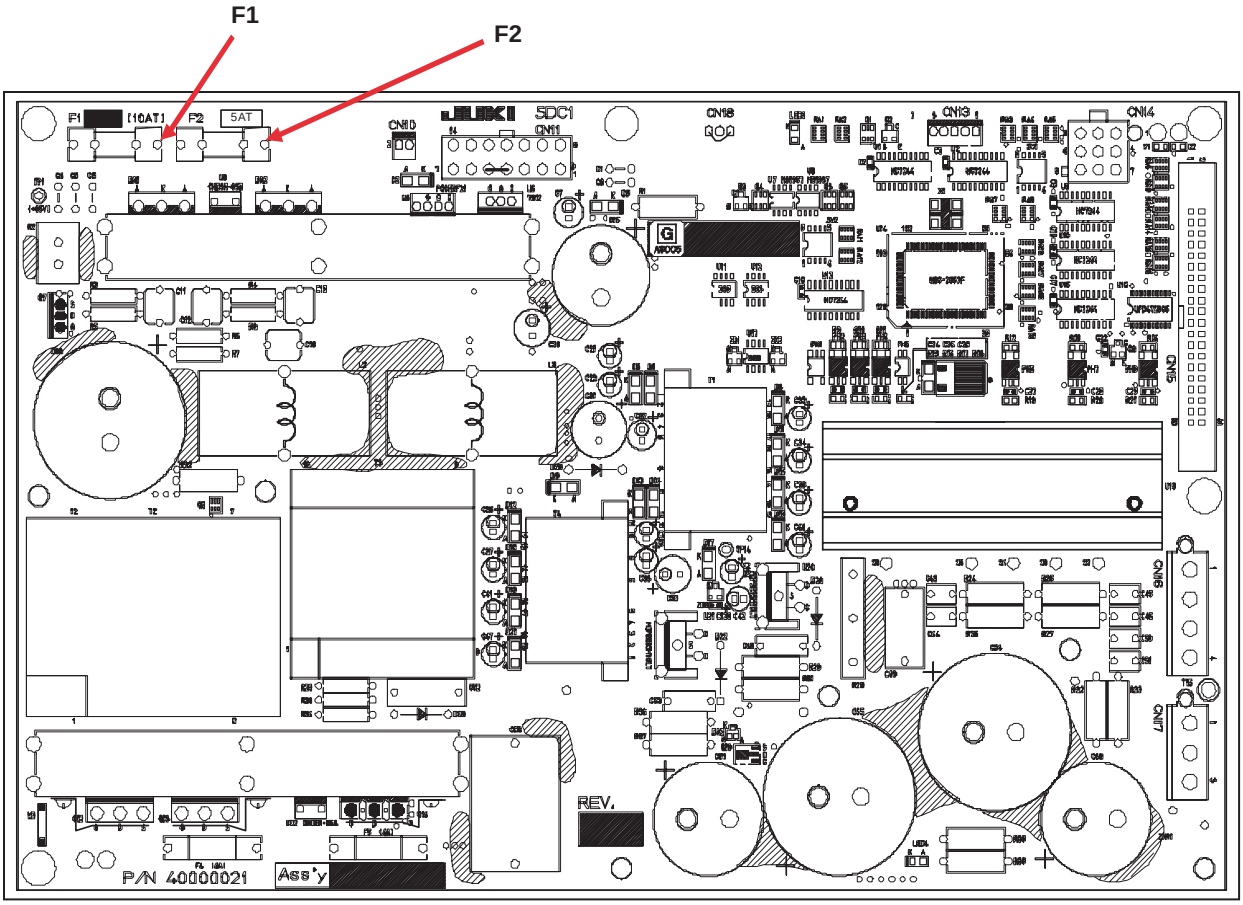
This board is provided with a memory device (EEPROM) that stores the adjusting data singular to the machine and also the operation setup data. This memory device can be out of order due to a problem in the board. However, since precious data are stored there, it is recommended to transfer this memory device to a new board after replacement.

According to the diagram shown below, replace the MAIN board carefully, not to damage the EEPROM terminals.



2. Replacement of SDC board

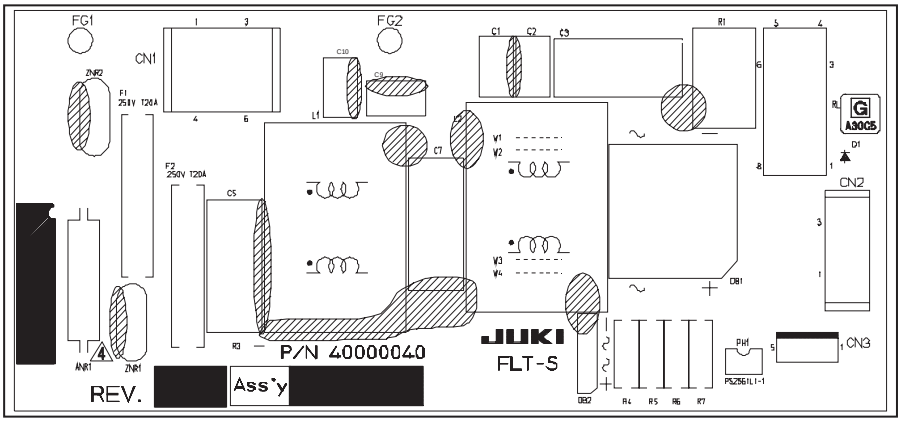
If this board is out of order, errors will occur mainly in the control source voltage and the main shaft motor of the sewing machine. Two replaceable fuses are installed for power source protection. When replacing the fuses, refer to (2) Replacement of parts, 1) Replacement of fuses.



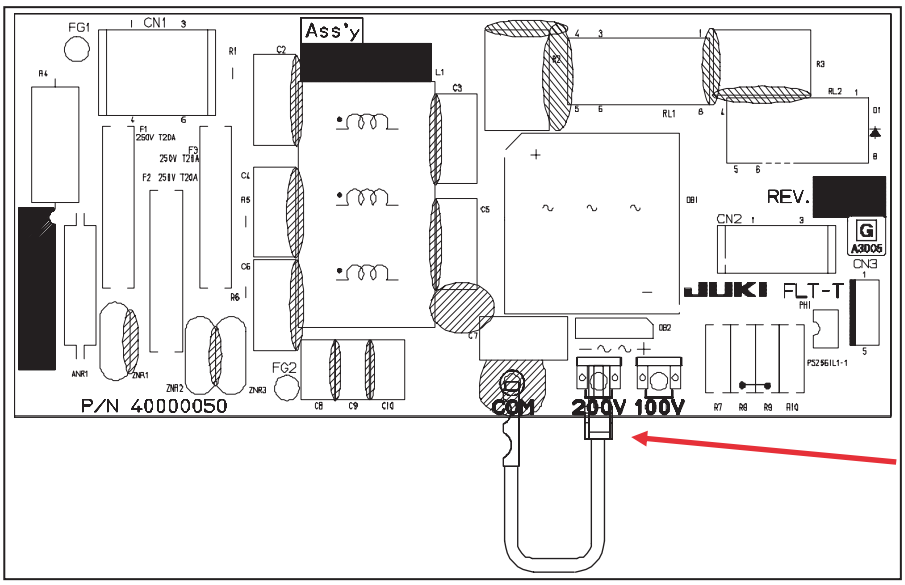
3. Replacement of FLT board

If this board is out of order, possible errors will occur in the AC input power supply.
In another case, both the SDC board and the MAIN board can be defective at the same time.
Note that there are two types of boards according to the power specifications.

40000046 : Single-phase 200V FLT board asm.

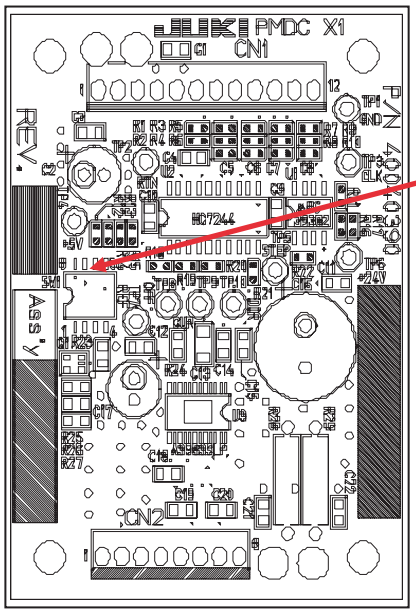


40000056 : Single-phase 100V/3-phase 200V FLT board asm.



(Caution)
The setup procedures shall conform to the input source voltage specifications for 100V/200V source changeover terminals.

4. Replacement of PMDC board (for roller stacker)
   If this board is out of order, roller stacker revolutions will become abnormal or there will be lack of torque.
   Make all settings again because all the dip switches are set at OFF if the replacing board is a newly purchased item.
   Dip switch setting should conform to (3) Dip switches, 4) Dip switches of the PMDC board.



Make the resetting of the dip switches.
SW1-1 only is set at OFF and SW1-2 to 4 are at ON.

(3) Description of dip switches

1) MAIN board dip switch

The dip switch on the MAIN board is used as a functional changeover switch for production.
No modification shall be carried out after shipment because all adjustments and other settings are definite and unnecessary to be modified.

(Caution) All setup values at the time of shipment are based on the OFF condition.

2) SDC board dip switch

The two dip switches on the SDC board are used as the functional changeover switches for production.
No modification shall be carried out after shipment because all adjustments and other settings are definite and unnecessary to be modified.

(Caution) All setup values at the time of shipment are based on the OFF condition.

3) PANEL board dip switch

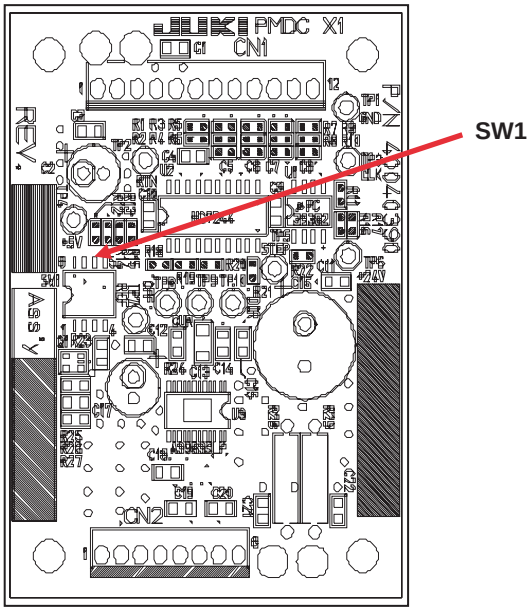
The dip switch on the PANEL board is used as a functional changeover switch for production.
No modification shall be carried out after shipment because all adjustments and other settings are definite and unnecessary to be modified.

(Caution) The setup values at the time of shipment are based on the ON condition for 1 and 2, and OFF condition for 3 and 4.

4) PMDC board dip switch (For roller stacker)

The dip switch on the PMDC board is used as a functional changeover switch.
No modification shall be carried out after shipment because all adjustments and other settings are definite and unnecessary to be modified.
The setup values at the time of shipment are based on the OFF condition for SW1-1 only, and ON condition for SW1-2, -3, -4.

(Caution) Make all settings again because all the switches are set at OFF if the replacing PMDC board is a newly purchased item.



SW	Setup conditions	Function
SW1-1	OFF	Motor driving system selection 1 : OFF•2 : OFF=1/8step 1 : ON •2 : OFF=1/4step 1 : OFF•2 : ON =half step 1 : ON •2 : ON =full step
SW1-2	ON	
SW1-3	ON	Selection of driving current OFF=Standard ON=High current
SW1-4	ON	Input selection OFF=Standard ON=Board detection

(Caution) Stabilized operation is assured only for the definite combinations of the setup conditions.
Those other than the above-mentioned combinations shall not be used for the roller stacker.

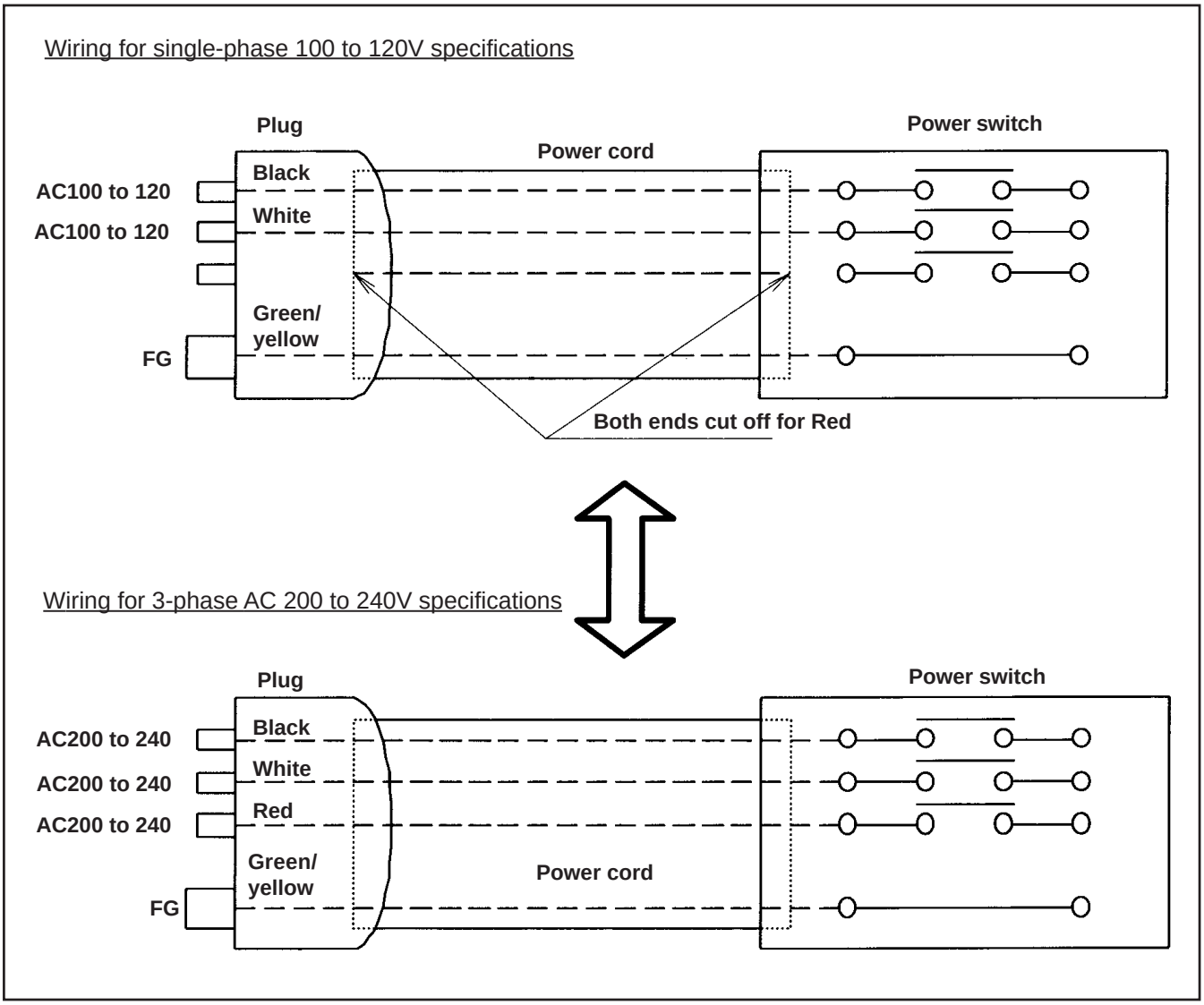
(4) Modification of the source voltage specifications

A changeover setting can be made only for the control box conforming to the specifications of single-phase 100 to120V / 3-phase 200 to 240V.

For the source voltage changeover setting, change the changeover terminal connections according to 2) Replacement of boards 3. FTL board asm.
Power cord connections are made as described below.

When a single-phase 100 to 120V power supply is used, make power code plug connections such that the wires of Black and White are connected to the AC power and the wire of green/yellow is connected to the earth system.
In single-phase operation, the wire of Red need not be connected. Both ends should be cut off at the root of the cord.

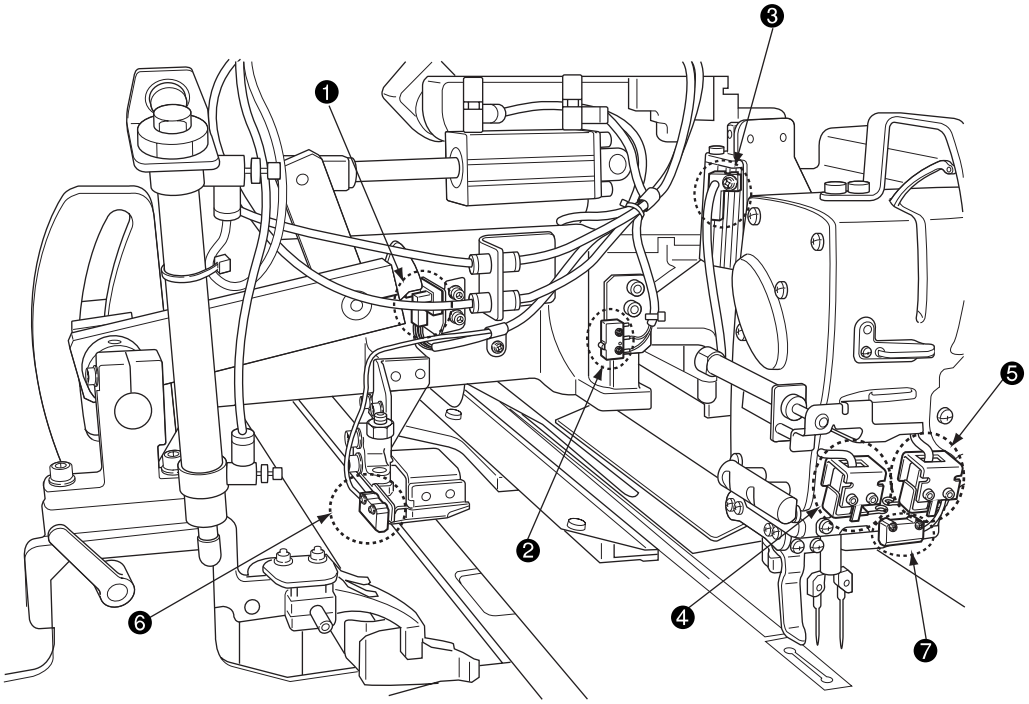
When a 3-phase AC 200 ~ 240V power supply is used, make power code plug connections such that the wires of Black, White, and Red are connected to the AC power and the wire of green/yellow is connected to the earth system.



7. Names of switches and switch sensors and installation places

Installation places for the respective switches and sensors are as specified below.

No.	Name	Connector No.	Input No.	Remarks
❶	Photo sensor for binder upper detection	INT CN71A	IN-41	
❷	Micro switch for binder opening detection	INT CN68A	IN-38	
❸	Cylinder sensor for center knife lifting detection	INT CN79A	IN-49	
❹	Proximity sensor for needle thread trimming detection (left)	INT CN62A	IN-32	
❺	Proximity sensor for needle thread trimming detection (right)	INT CN63A	IN-33	
❻	Reflex optical sensor (left) for flap material end detection	INT CN60B	IN-60	
❼	Reflex optical sensor (right) for flap material end detection	INT CN61B	IN-61	
❽	Pause SW	INT CN69B	IN-69	
❾	Pedal hole pot sensor	INT CN75B	—	
❿	Knee start switch	INT CN65B	IN-65	
⓫	Air pressure detecting switch	MAIN CN30	IN-00	
⓬	Photo sensor for back-tack motor origin	MAIN CN38	IN-94	
⓭	Photo sensor for marking light motor origin	MAIN CN36	IN-29	
⓮	Photo sensor for marking light 2nd origin	INT CN75A	IN-45	
⓯	Air cylinder sensor for clamp origin	INT CN83B	IN-92	
⓰	Air cylinder sensor for material wiper origin	INT CN83B	IN-90	
⓱	Micro switch for stacker opening detection	INT CN83B	IN-83	
⓲	Reflex optical sensor (left) for bobbin thread remaining amount detection	INT CN64B	IN-64	
⓳	Reflex optical sensor (right) for bobbin thread remaining amount detection	INT CN64B	IN-93	
⓴	Photo sensor for clamp foot origin detection	INT CN77A	IN-47	
㉑	Sensor for clamp foot step-out detection	INT CN66A	IN-36	
㉒	Reflex optical sensor for stacker material detection	INT CN65A	IN-35	
㉓	Cylinder sensor for roller stacker lifting detection	MAIN CN49	IN-91	
㉔	Photo sensor for corner knife opening motor origin	MAIN CN37	IN-28	
㉕	Cylinder sensor for upper detection of fixed-side corner knife	INT CN80B	IN-80	
㉖	Cylinder sensor for lower detection of fixed-side corner knife	INT CN79B	IN-79	
㉗	Cylinder sensor for upper detection of moving-side corner knife	INT CN82B	IN-82	
㉘	Cylinder sensor for lower detection of moving-side corner knife	INT CN81B	IN-81	
㉙	Micro switch for corner knife drawer detection	INT CN62B	IN-62	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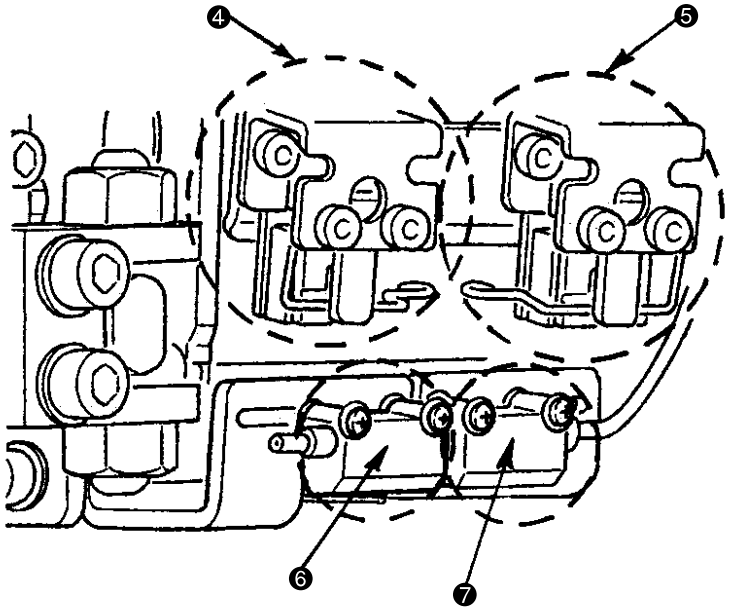
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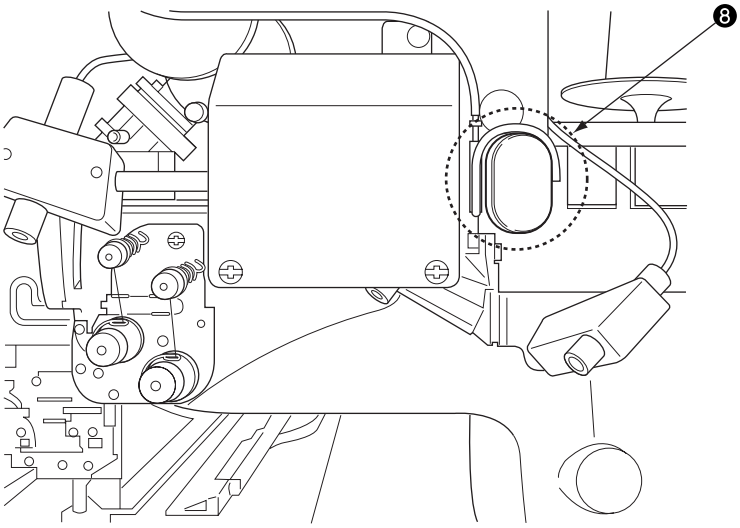
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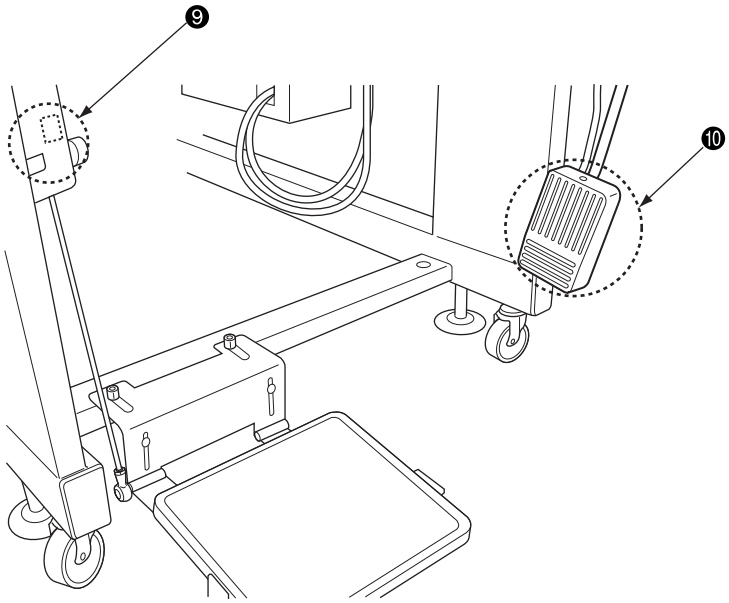
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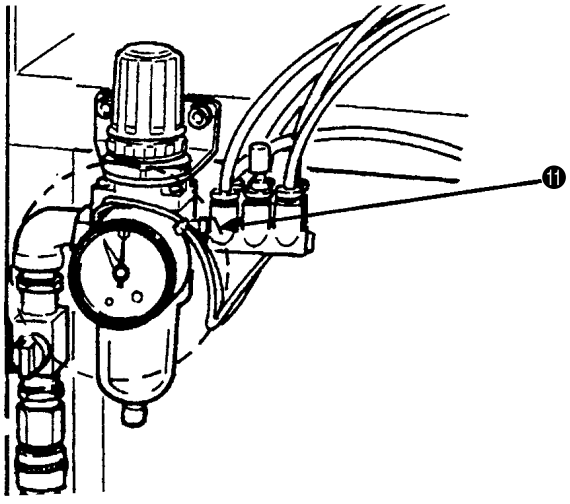
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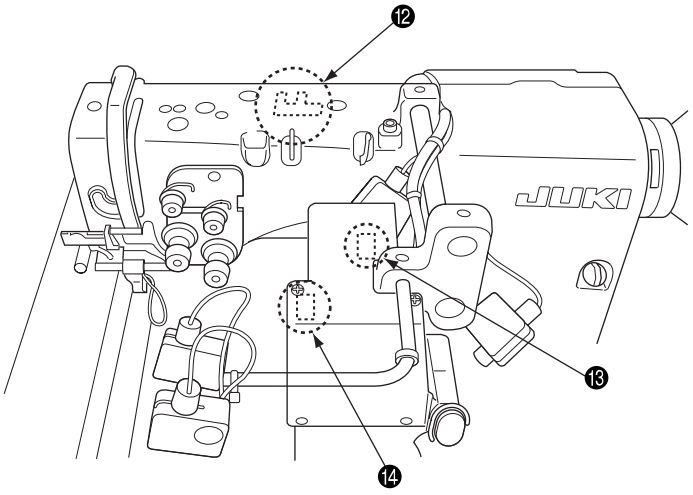
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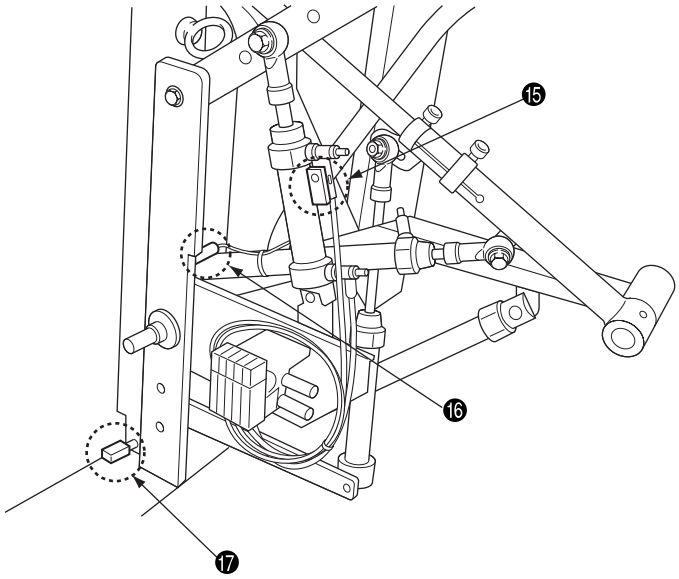
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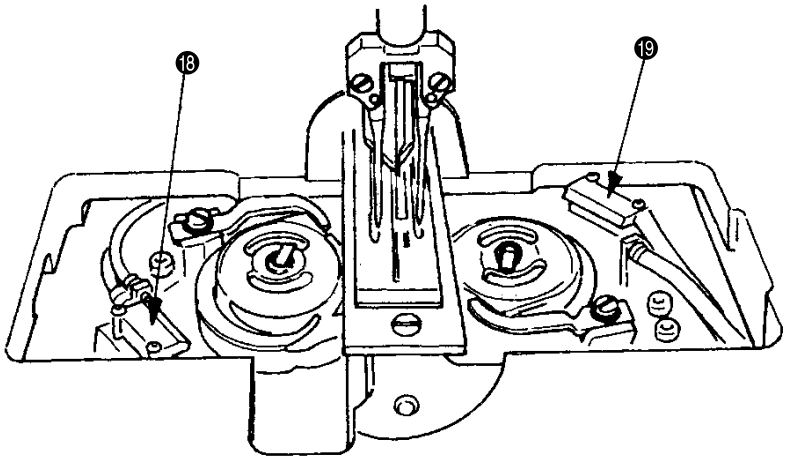
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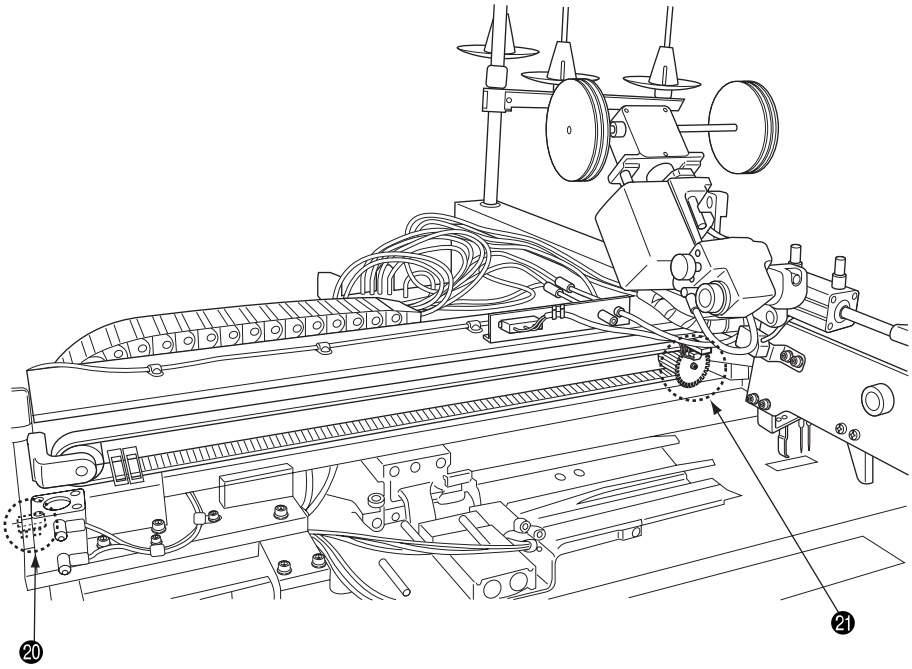
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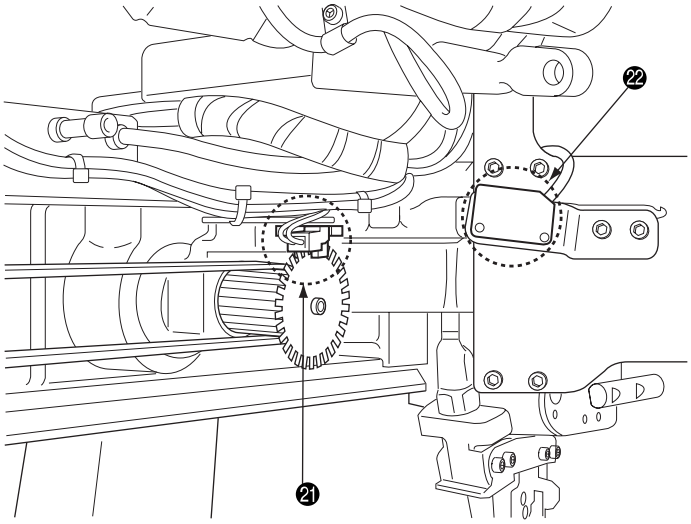
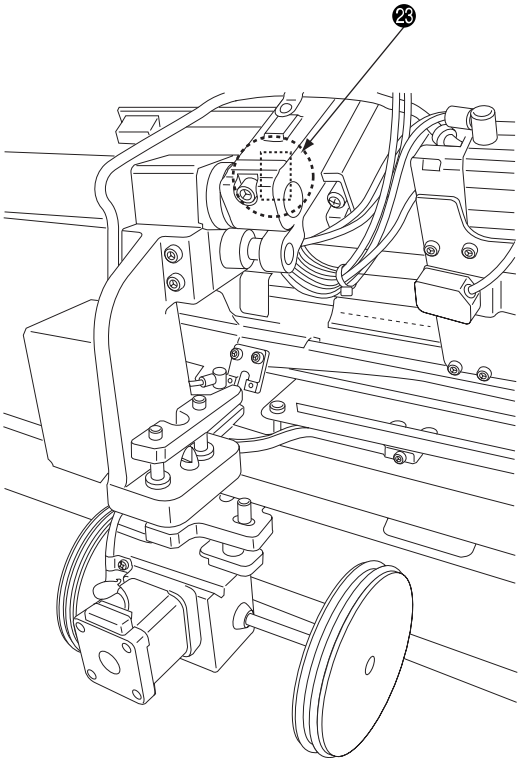
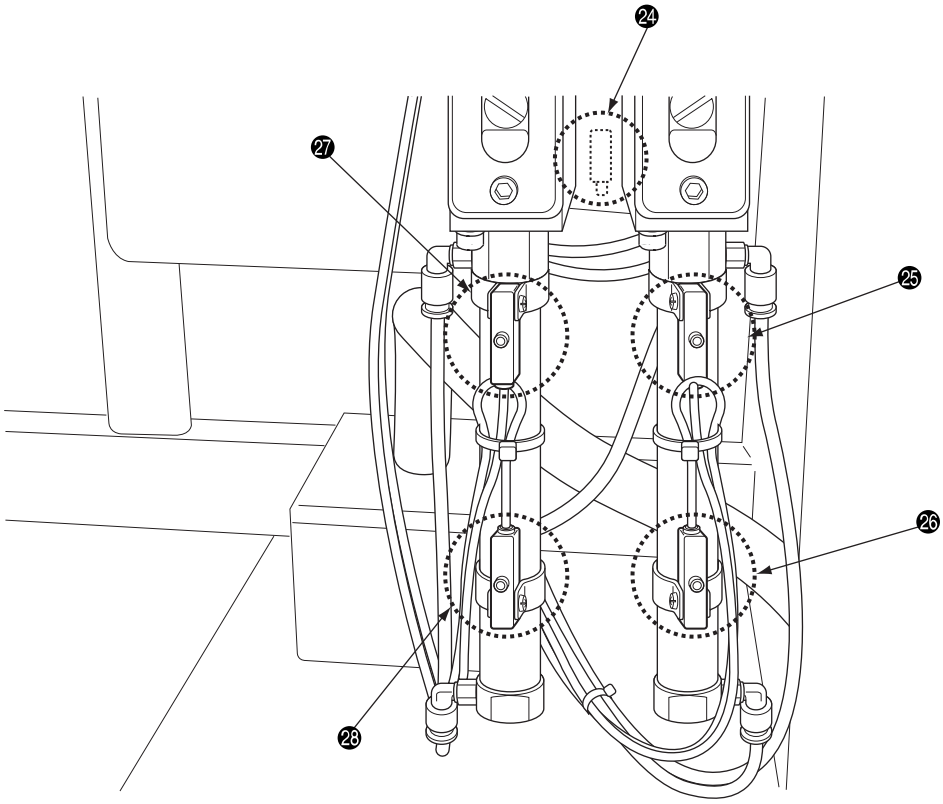

22
21


23


24
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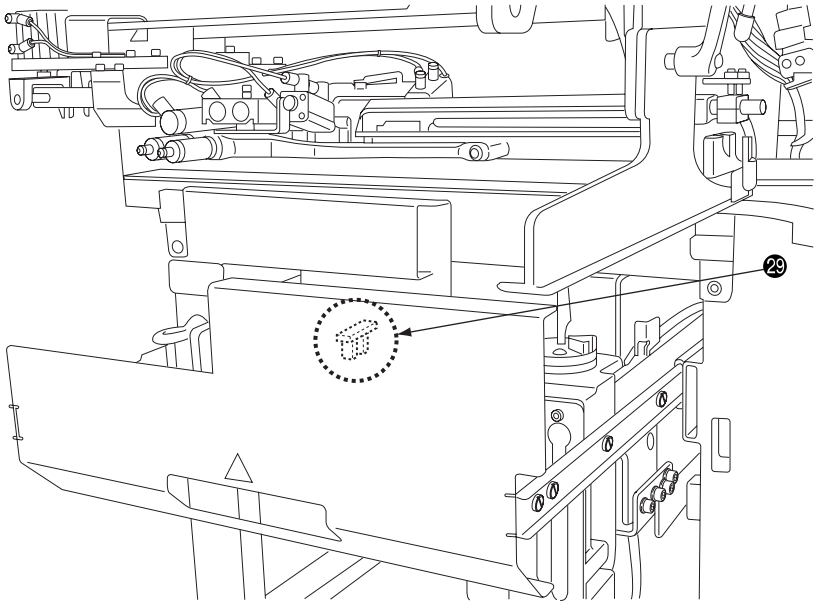
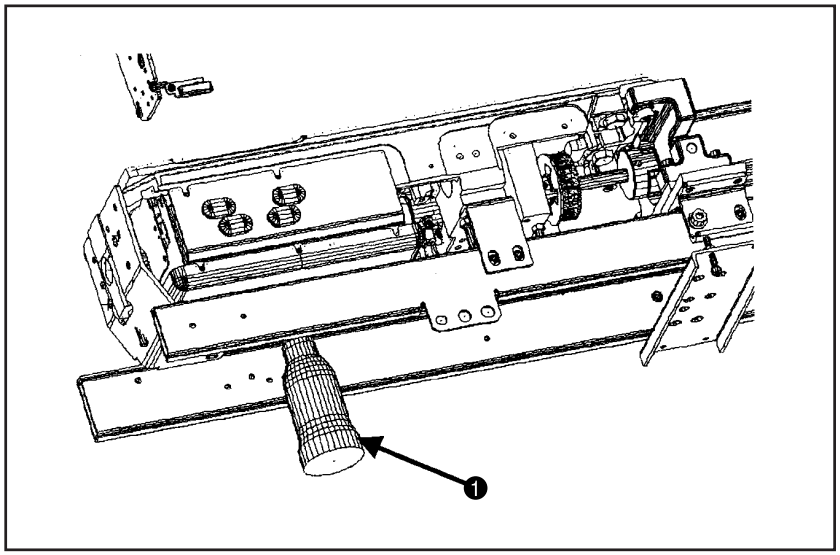

29

8. Maintenance

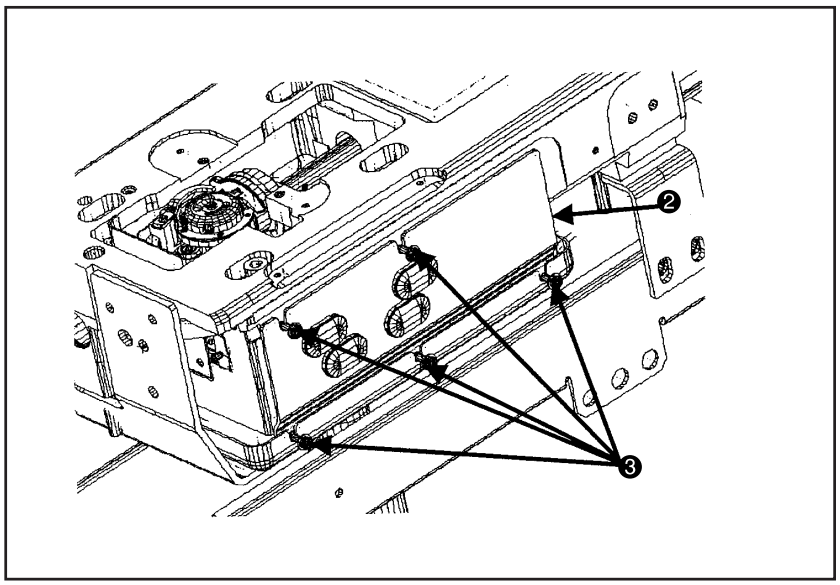
(1) Machine head maintenance-related matters

1. Waste hook oil



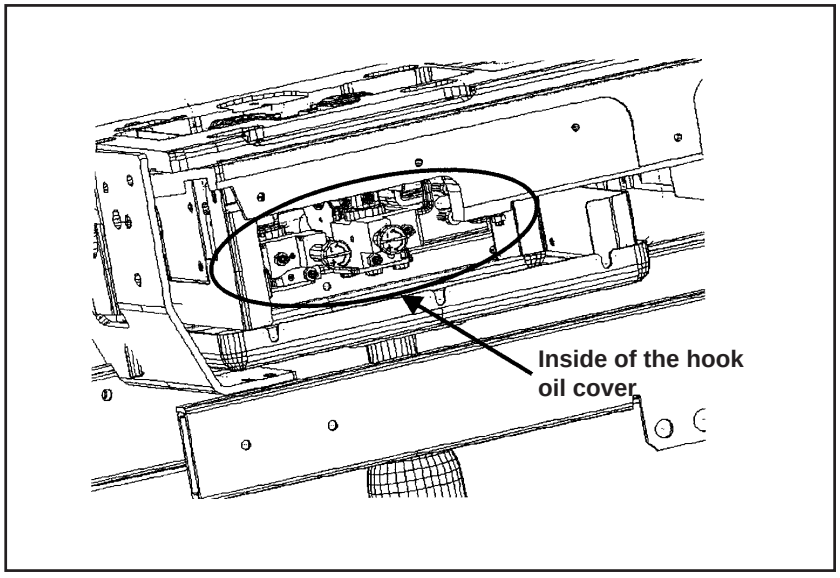
(1) When half a volume of oil is collected in the oil can ❶ located in the machine bed cover, turn the oil can ❶ and discharge the collected waste oil.

2. Cleaning of the hook shaft base



(1) Periodically remove cloth chips and dust accumulated inside the hook oil cover.

o Raise the sewing machine and loosen the setscrews ❸ (5 positions) to take out the oil cover ❷.



o Clean inside of the hook oil cover.

(2) Application of grease and Locktight

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 one years.
2. Recommendable grease
   This sewing machine uses two types of grease as specified below. The recommendable brands of grease are listed in (2) Parts to which grease•Locktight is applied.
   A : JUKI GREASE A (IE-22)
   B : JUKI GREASE B (MaruTemp SB-M)

   ① JUKI Grease A •••• Used for high-speed sliding parts and their peripheral parts.

   10g tube JUKI Part No.: 40006323
   500g (IE-22) JUKI Part No.: 23640204

   ② 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 “(4) Grease-up procedures for the specified position.”
   10g tube JUKI Part No.: 40013640

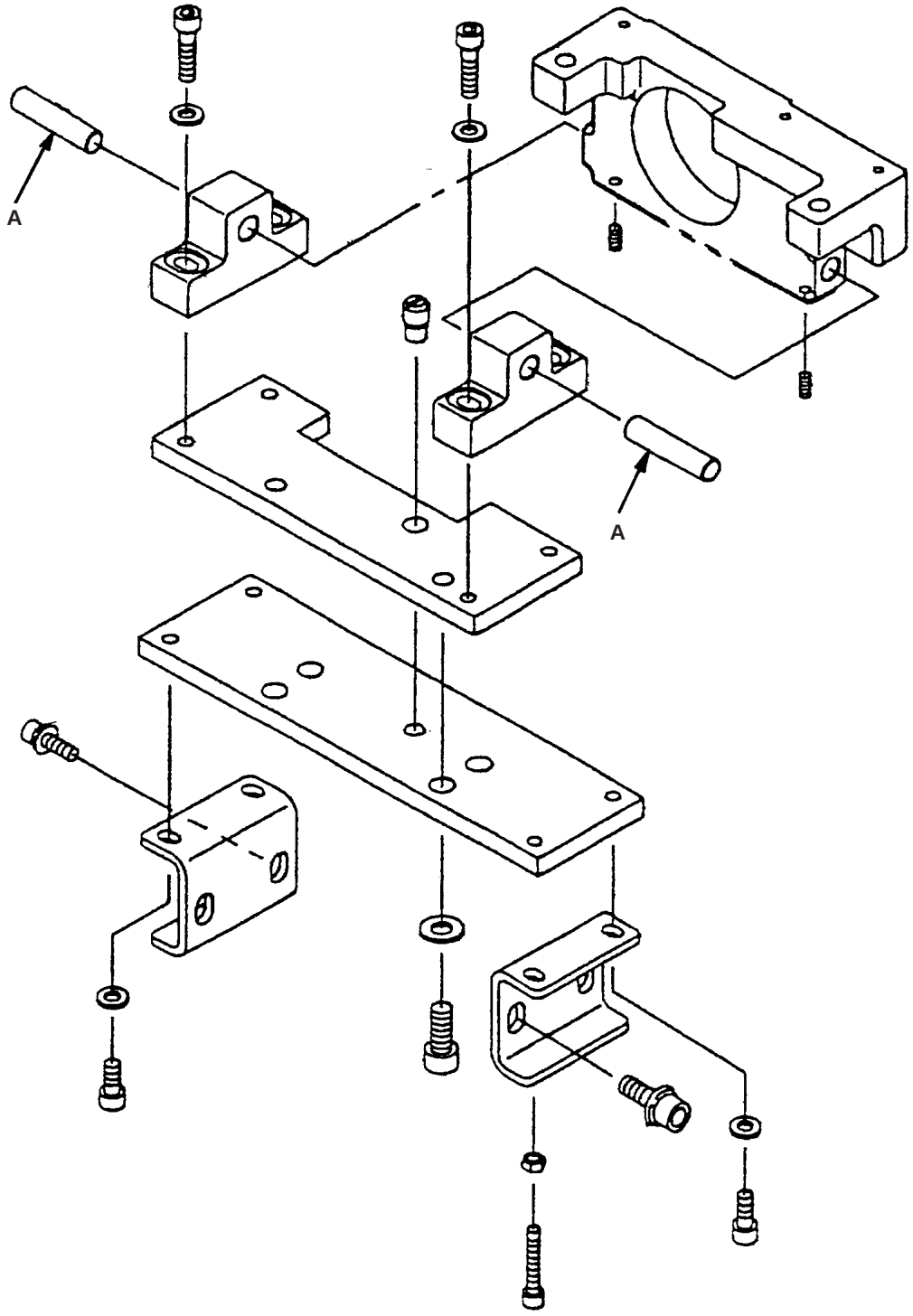
3. Method of greasing
   If no grease pump is available, fill a plastic oiler with grease. Otherwise, an injector without a needle can be conveniently used.

4. Miscellaneous
   An injector to be used exclusively for application / JUKI Part No. : GDS01007000

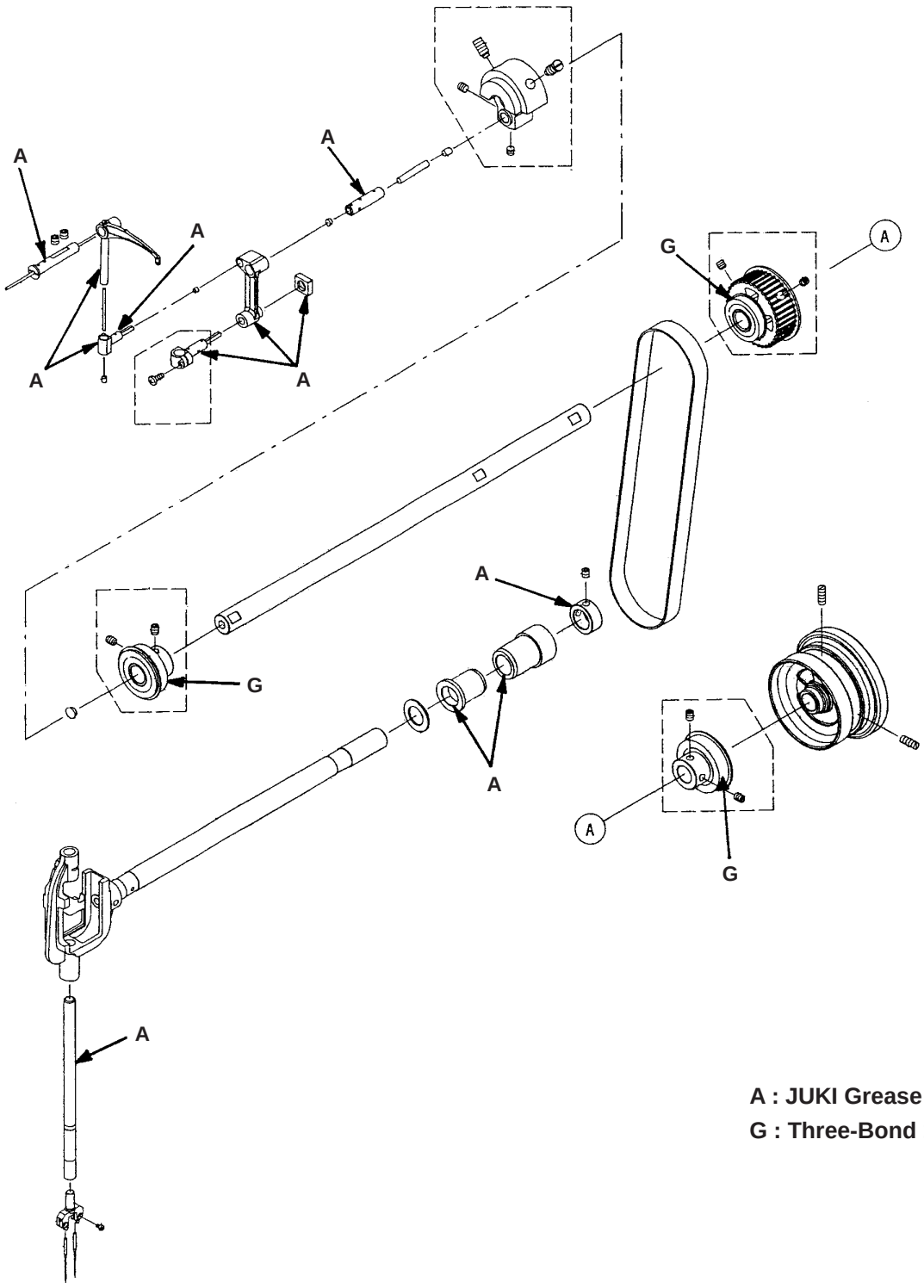
5. Adhesive agent
   Furnish the specified places with the adhesive agents shown below.
   C : Locktight 242
   D : Locktight 243
   E : Locktight 277
   F : Locktight 641
   G : Three-Bond 1373N
   H : Cemedyne Super X Clear

(3) Spots where grease • adhesive agents are used

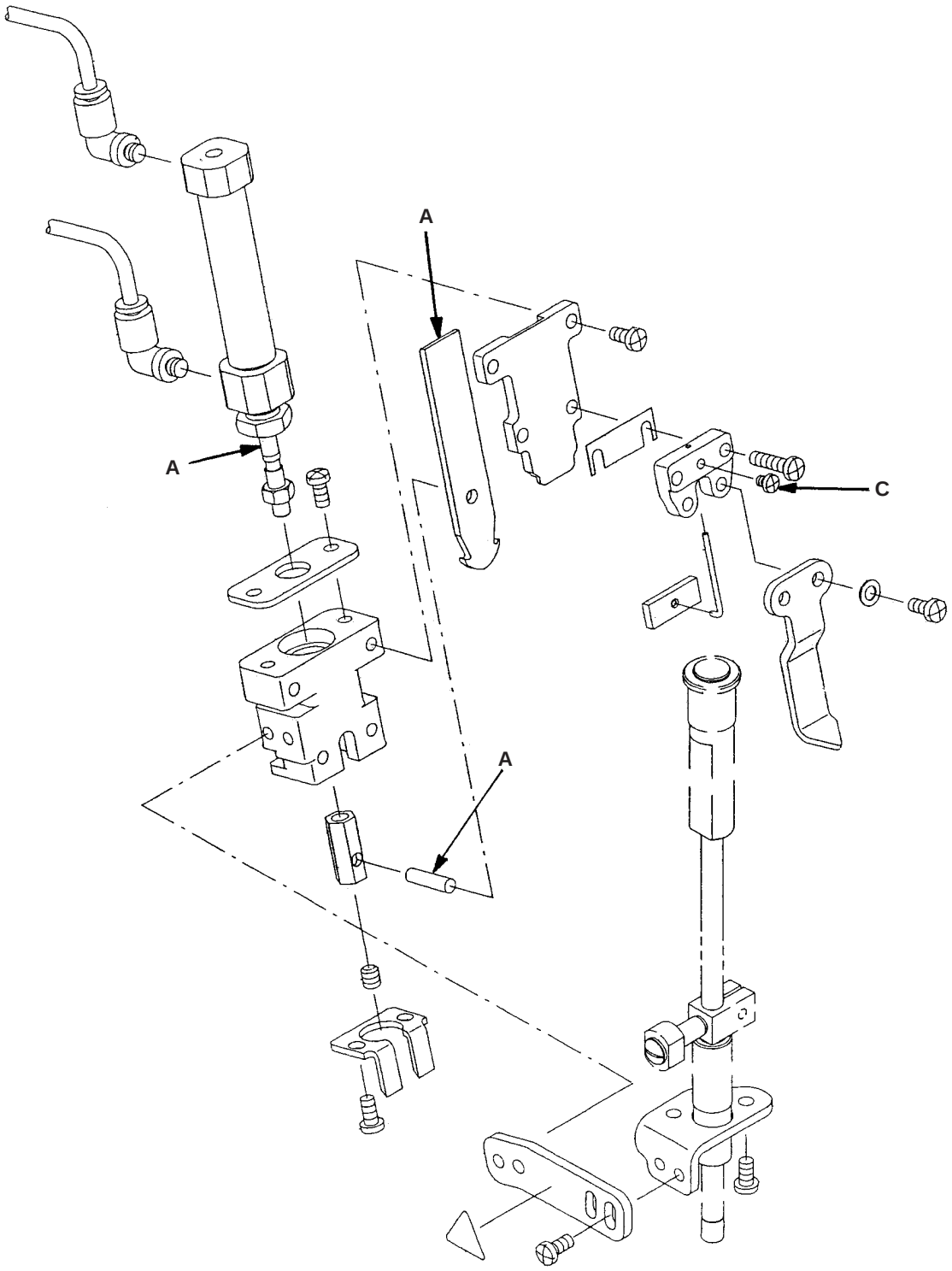
EXTERIORS



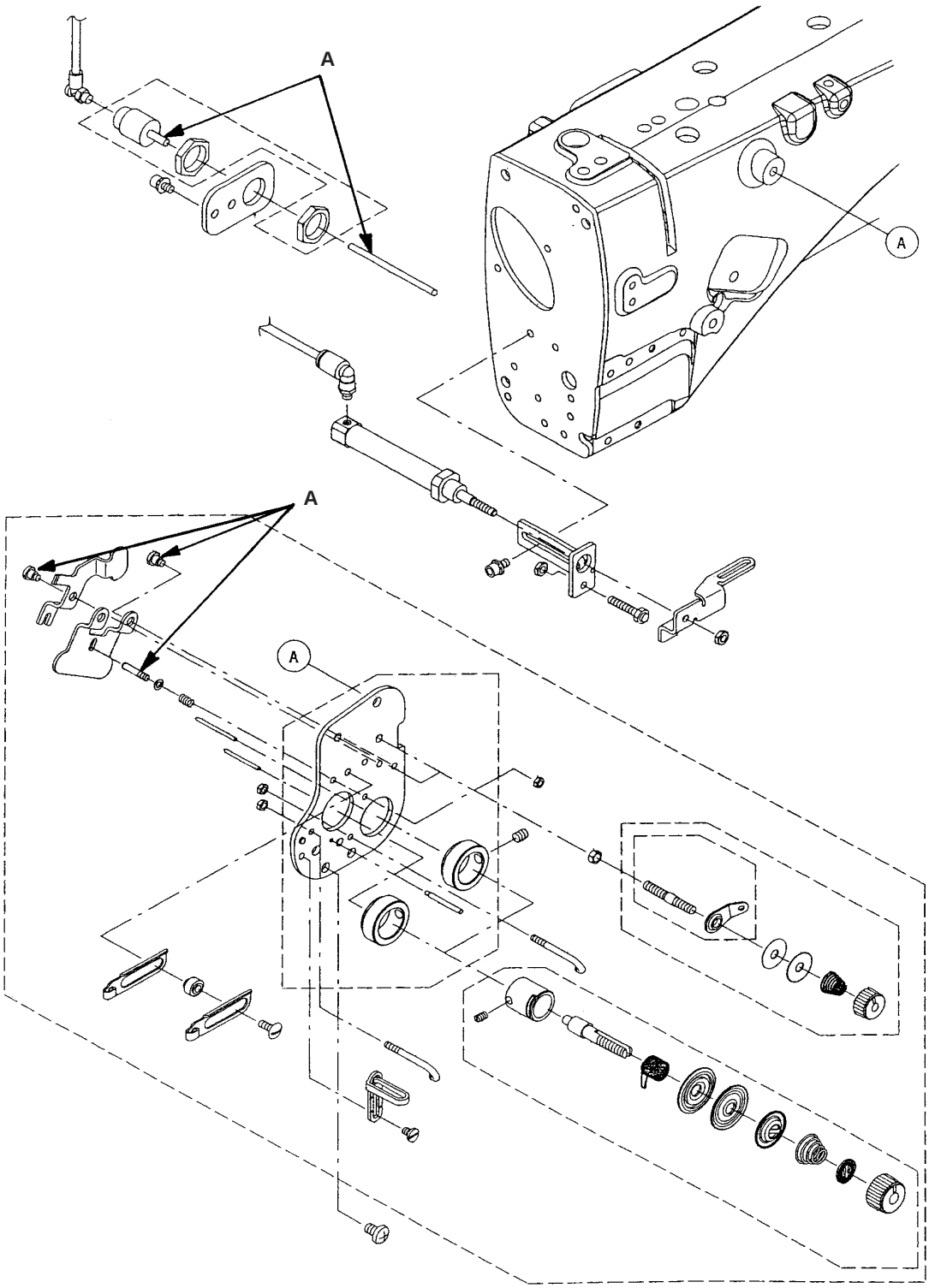
A : JUKI Grease A



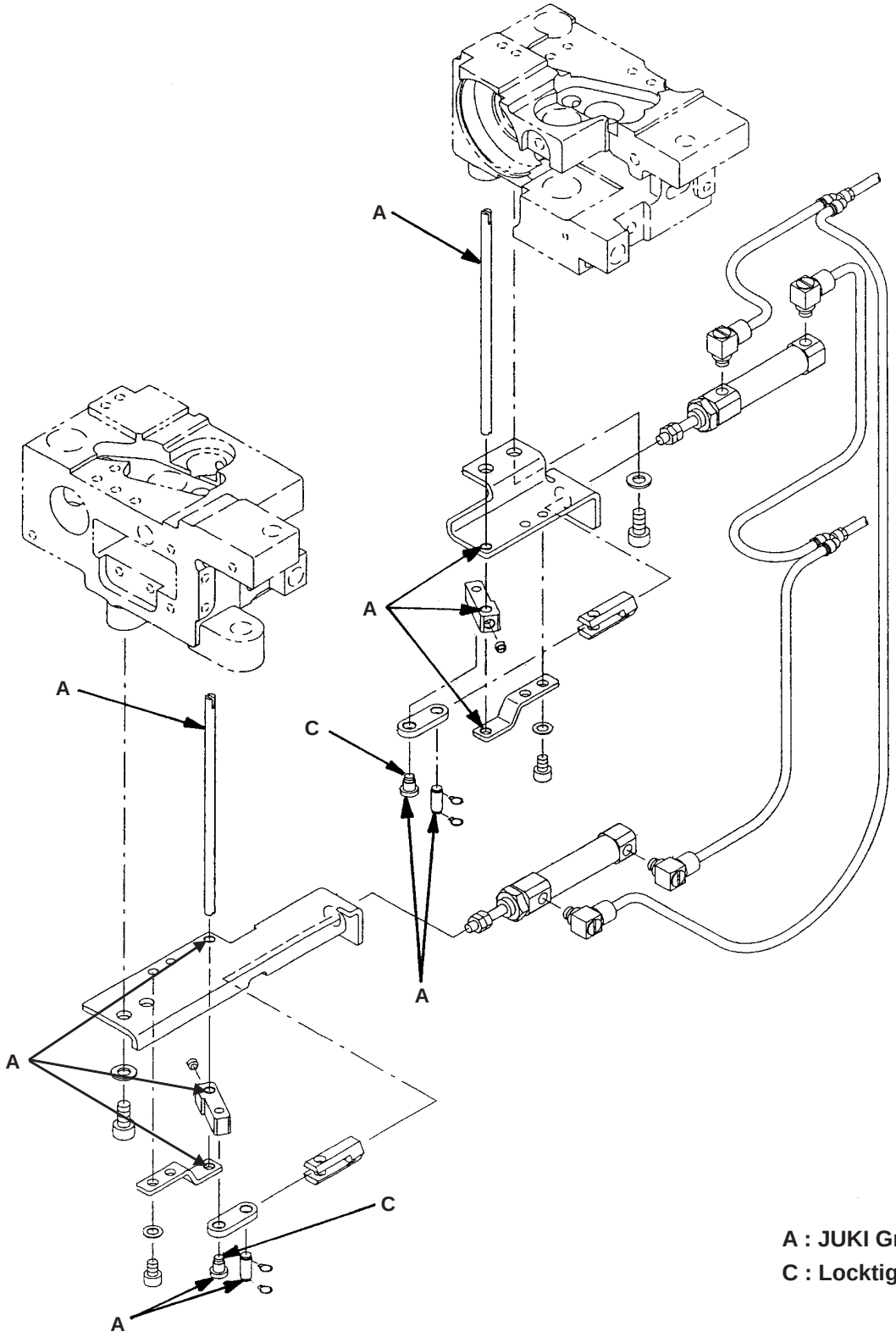
A : JUKI Grease A
G : Three-Bond 1373N



A : JUKI Grease A
C : Locktight 242

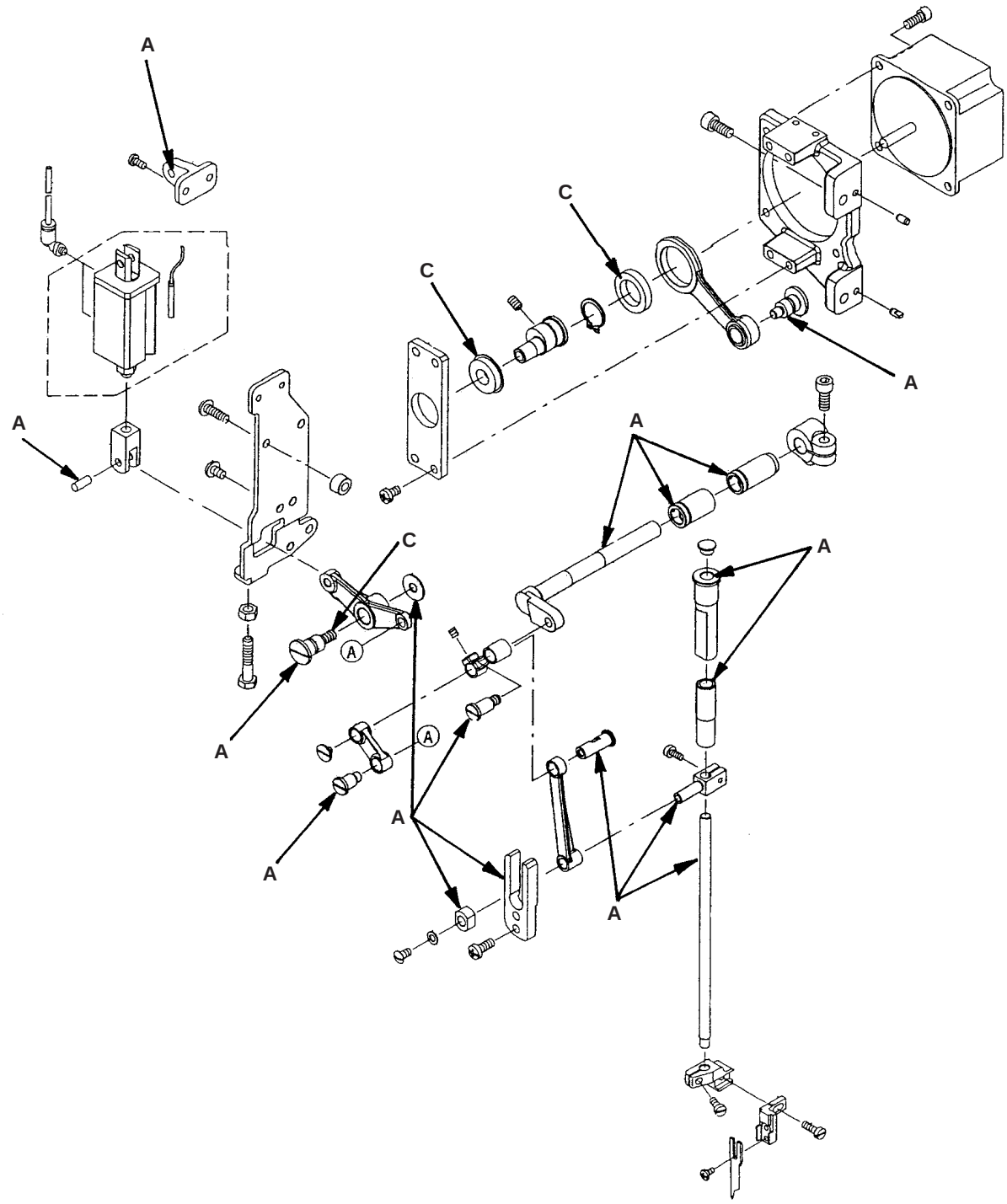


A : JUKI Grease A



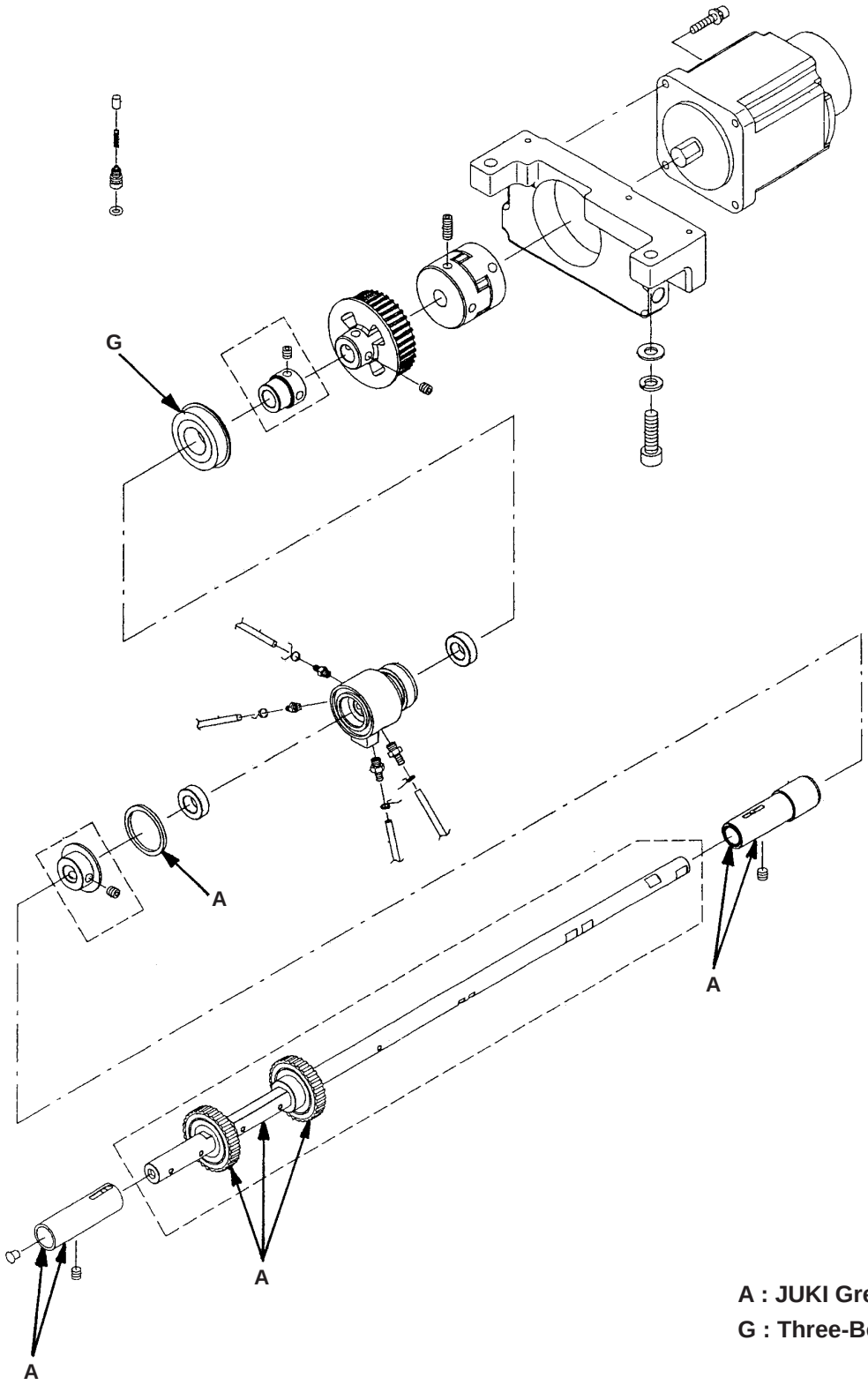
A : JUKI Grease A
C : Locktight 242

CENTER KNIFE COMPONENTS



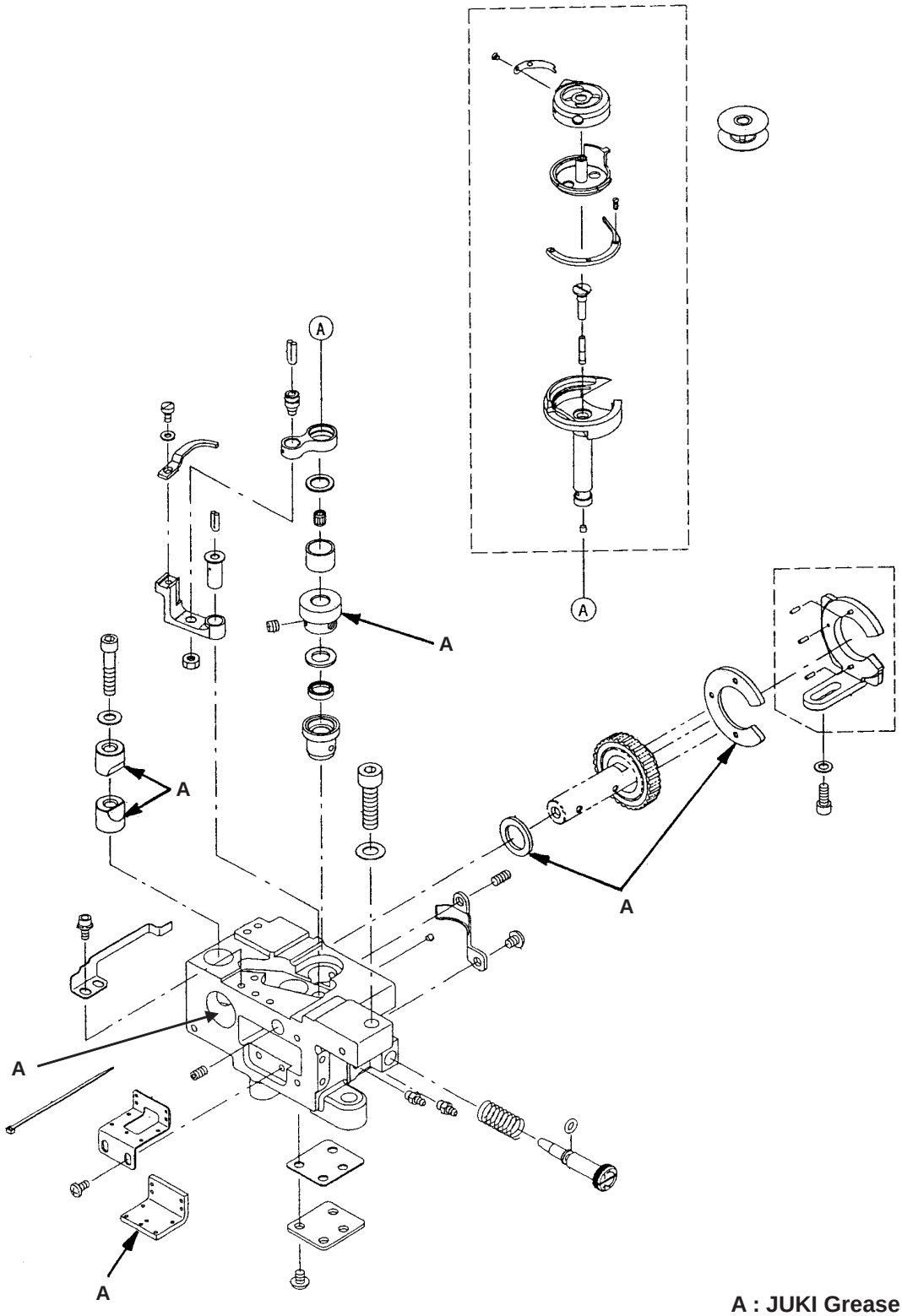
A : JUKI Grease A
C : Locktight 242

LOWER SHAFT COMPONENTS



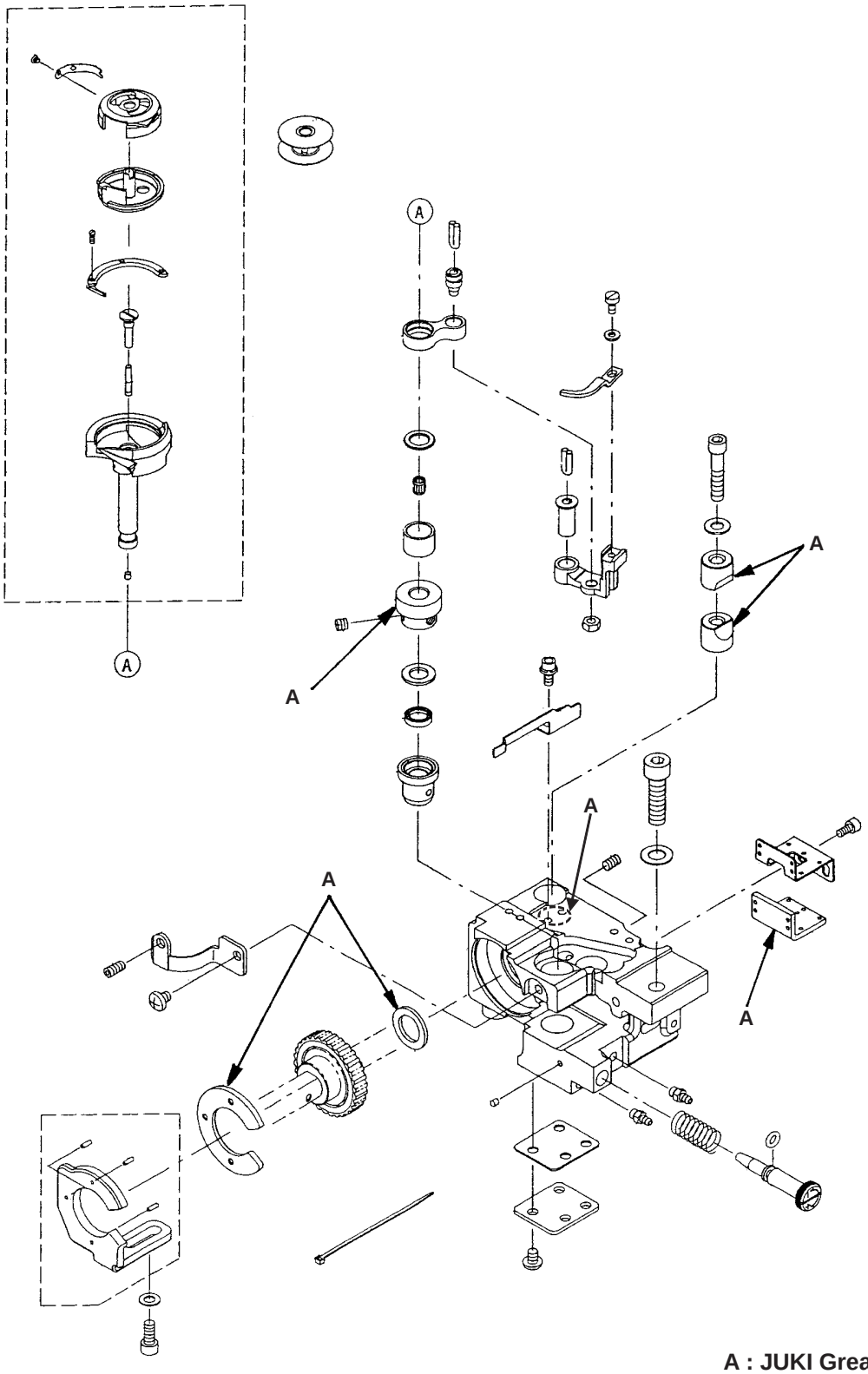
A : JUKI Grease A
G : Three-Bond 1373N

HOOK DRIVING SHAFT LEFT COMPONENTS



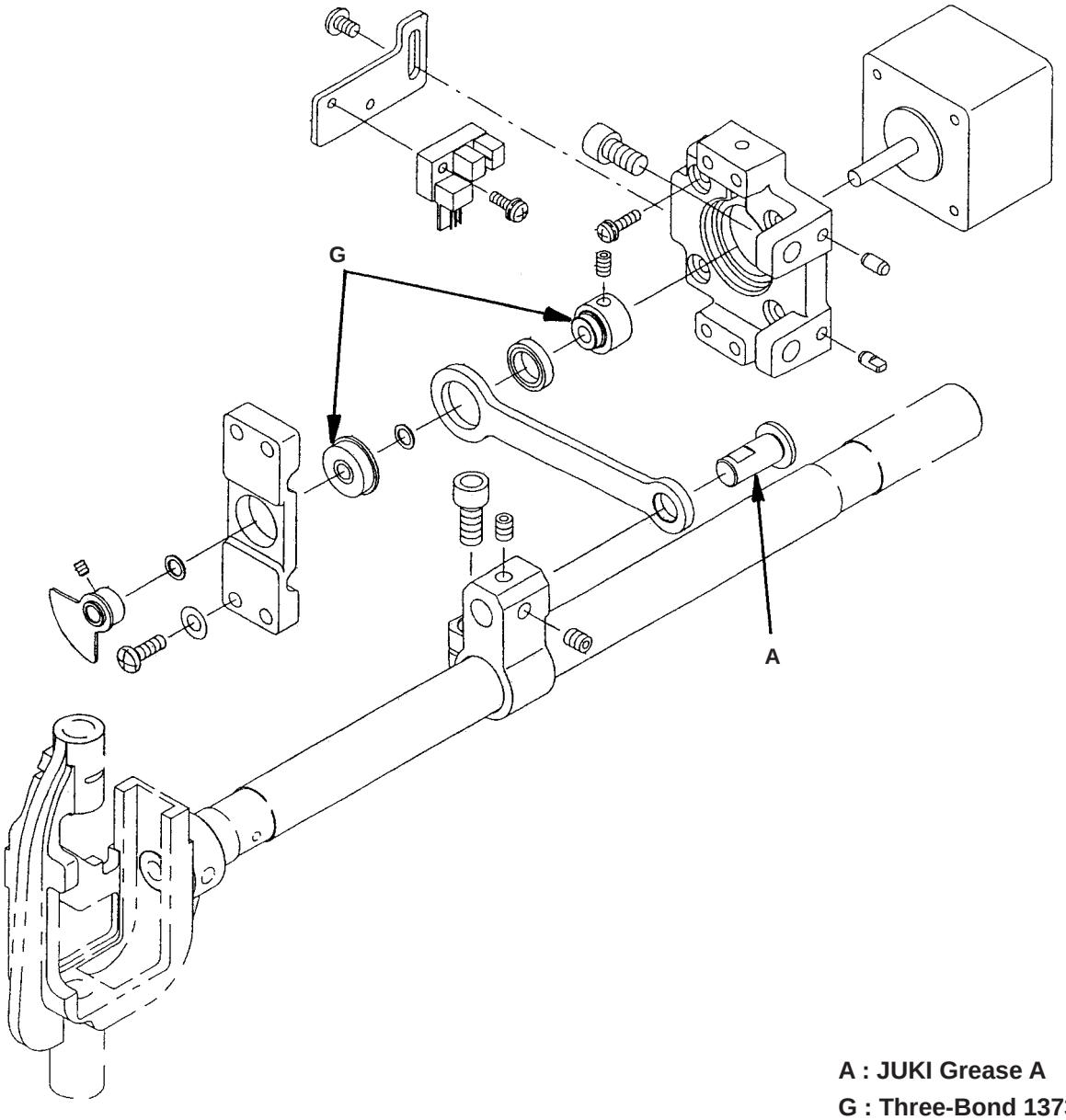
A : JUKI Grease A

HOOK DRIVING SHAFT RIGHT COMPONENTS



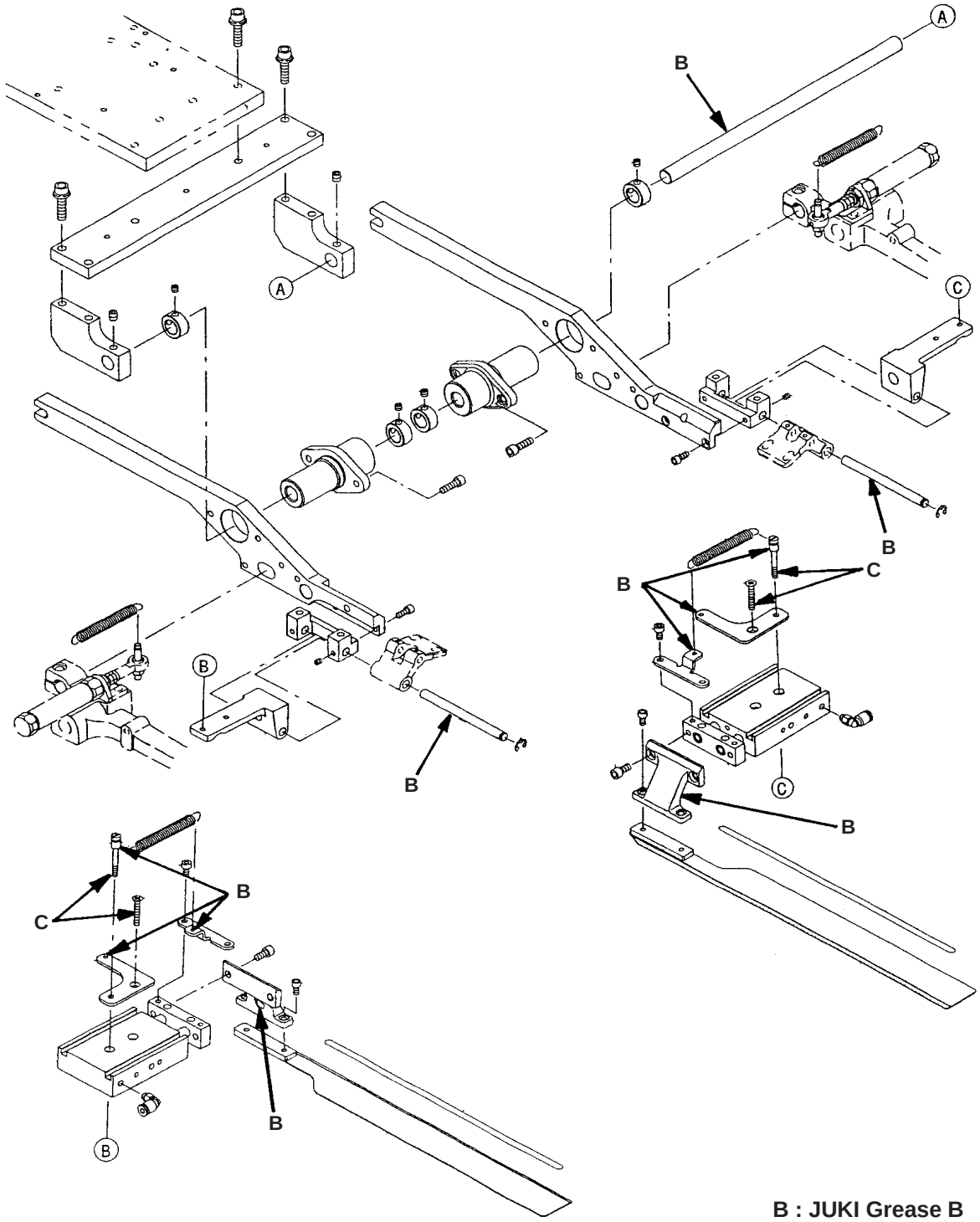
A : JUKI Grease A

BACK TUCK COMPONENTS



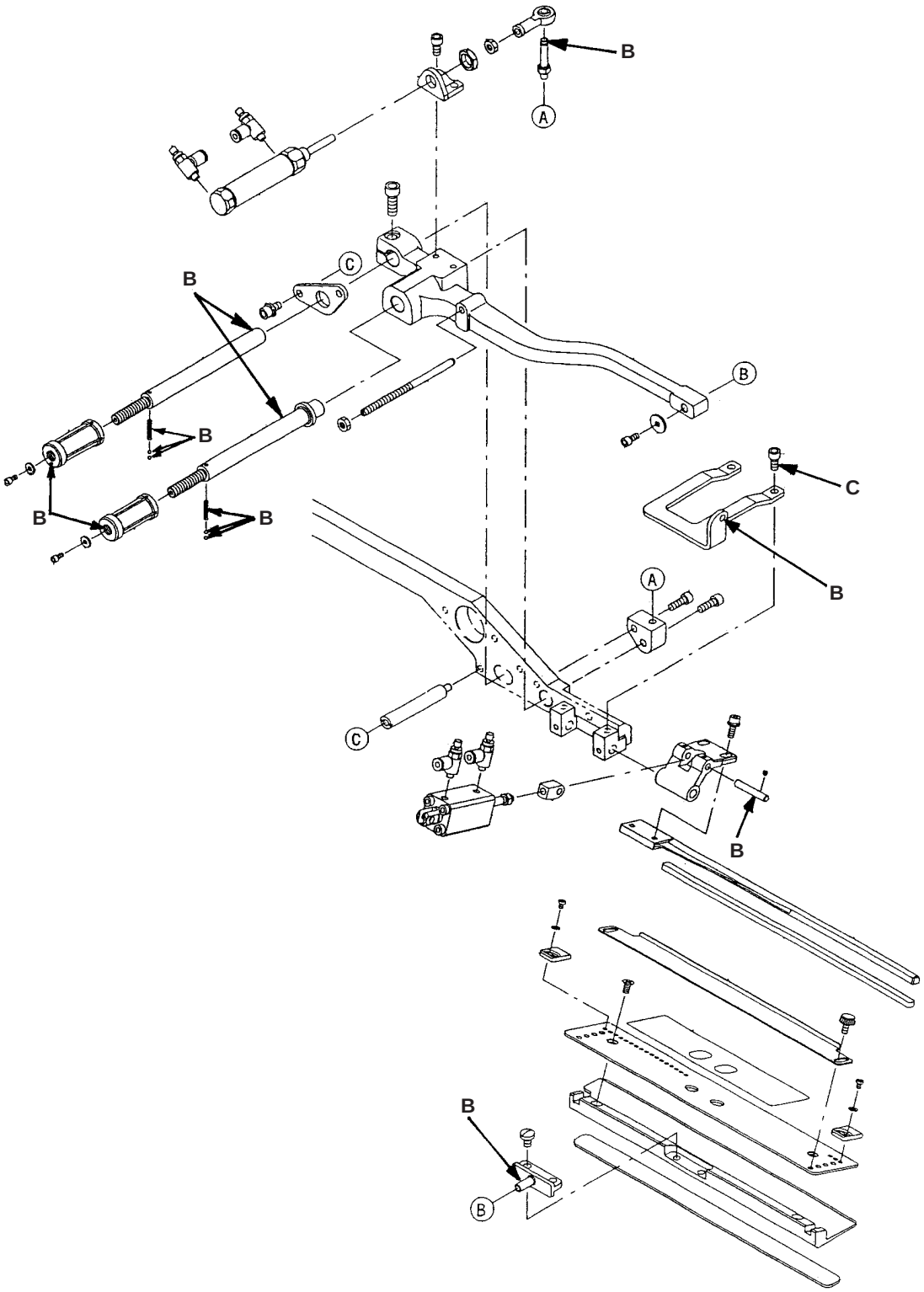
A : JUKI Grease A
G : Three-Bond 1373N

CLAMP FOOT UNIT 1



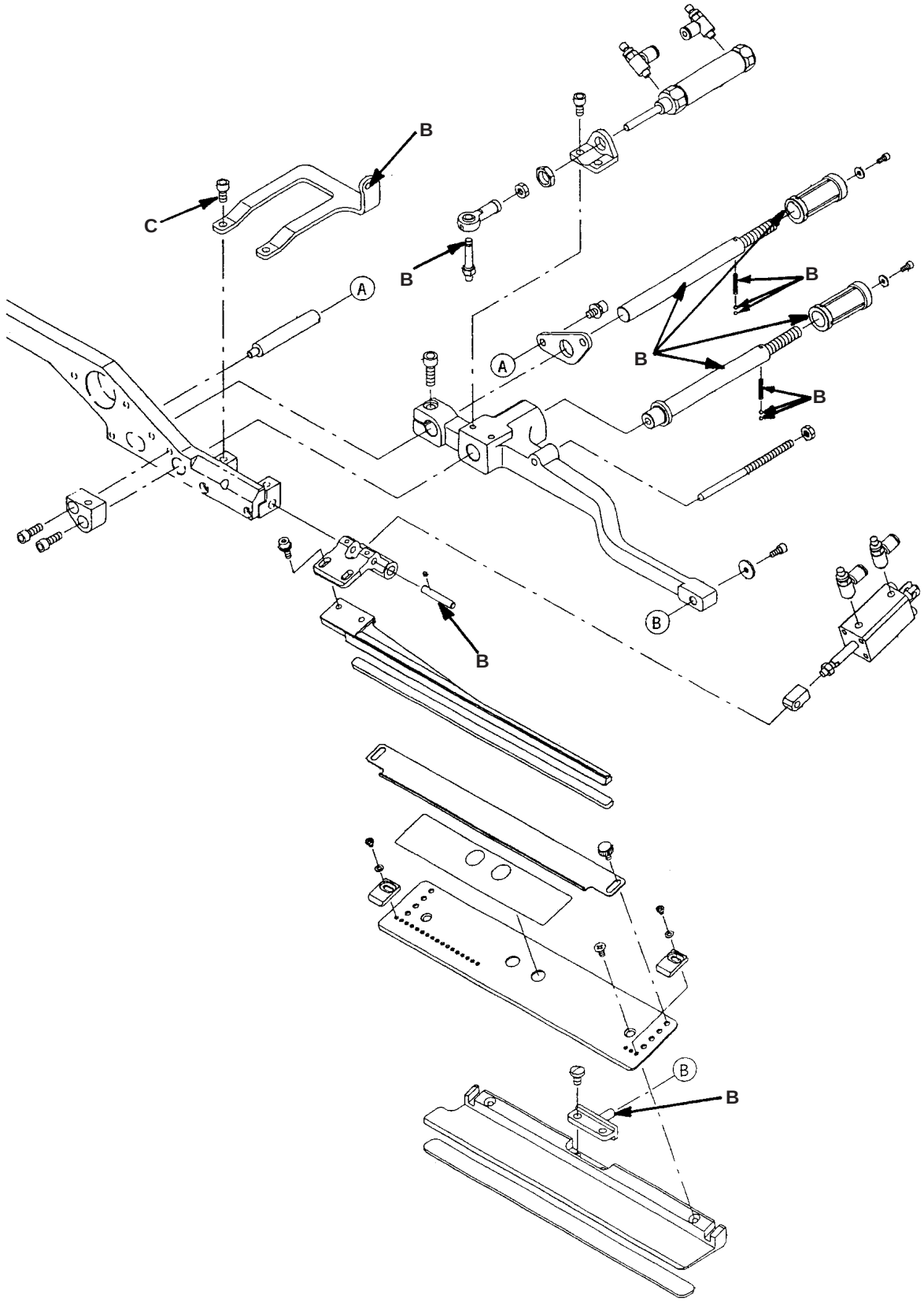
B : JUKI Grease B
C : Locktight 242

CLAMP FOOT UNIT 2

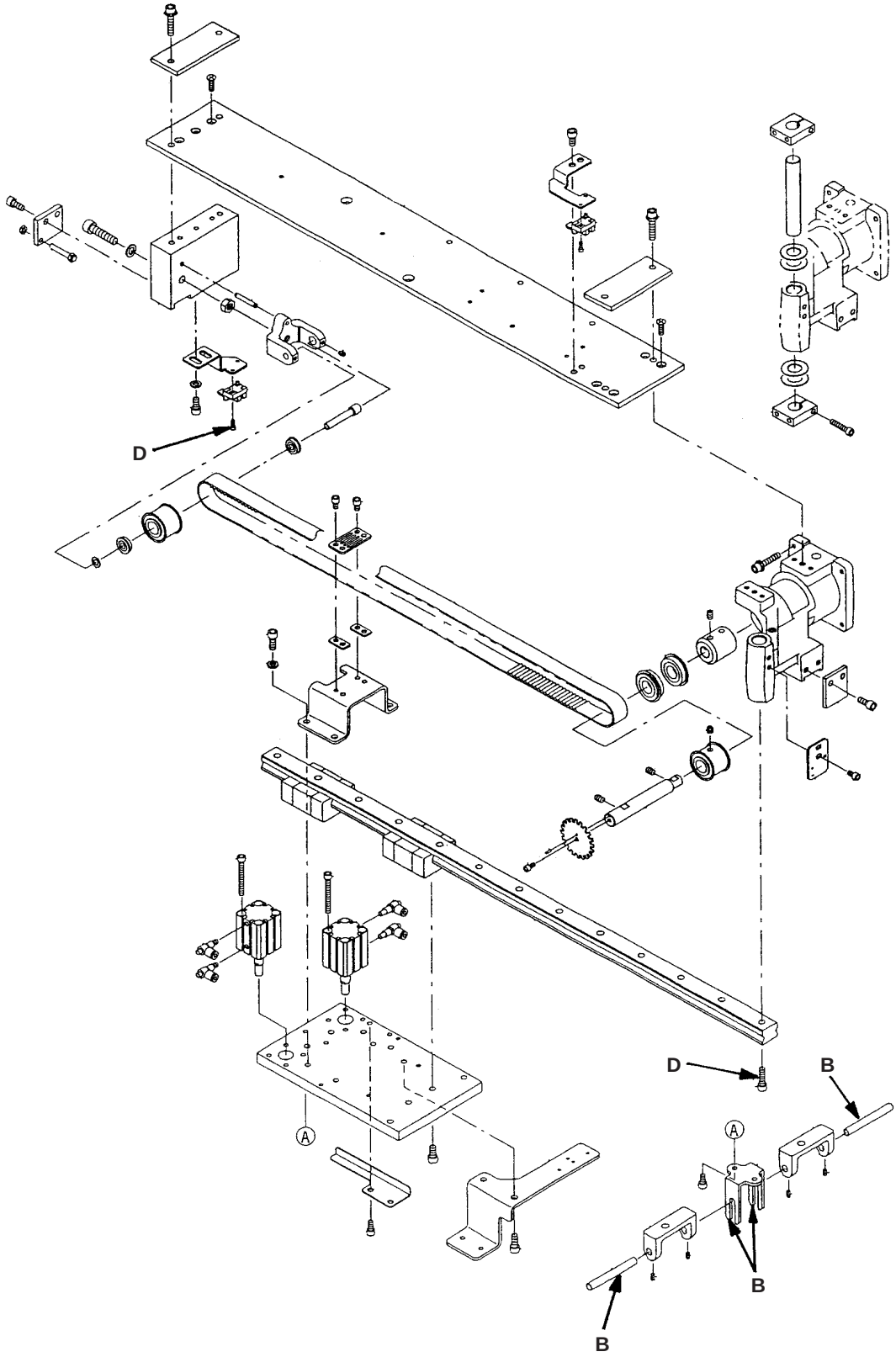


B : JUKI Grease B
C : Locktight 242

CLAMP FOOT UNIT 3

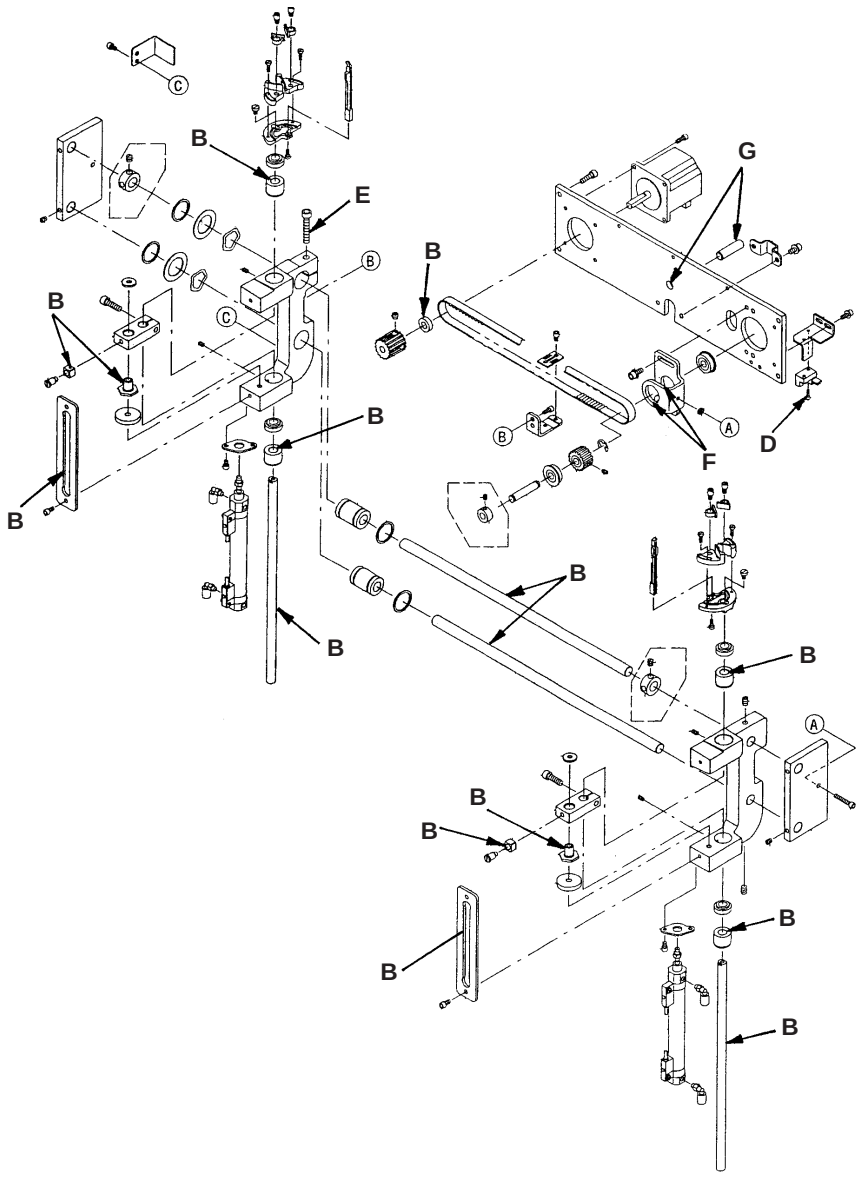


B : JUKI Grease B
C : Locktight 242



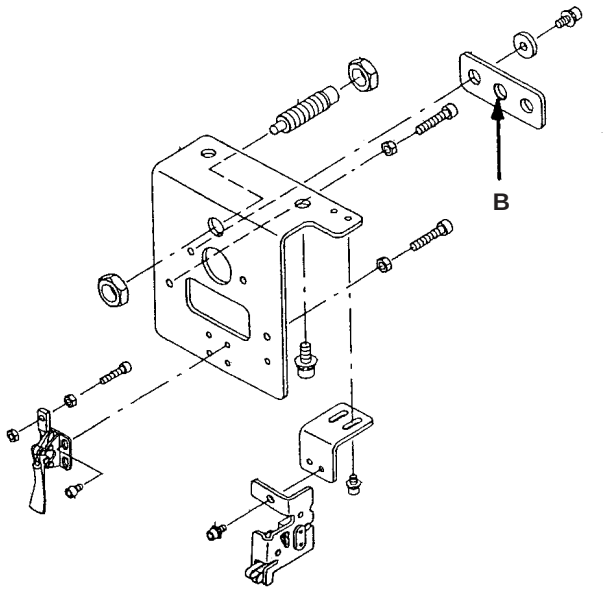
B : JUKI Grease B
D : Locktight 243

CONER KNIF UNIT

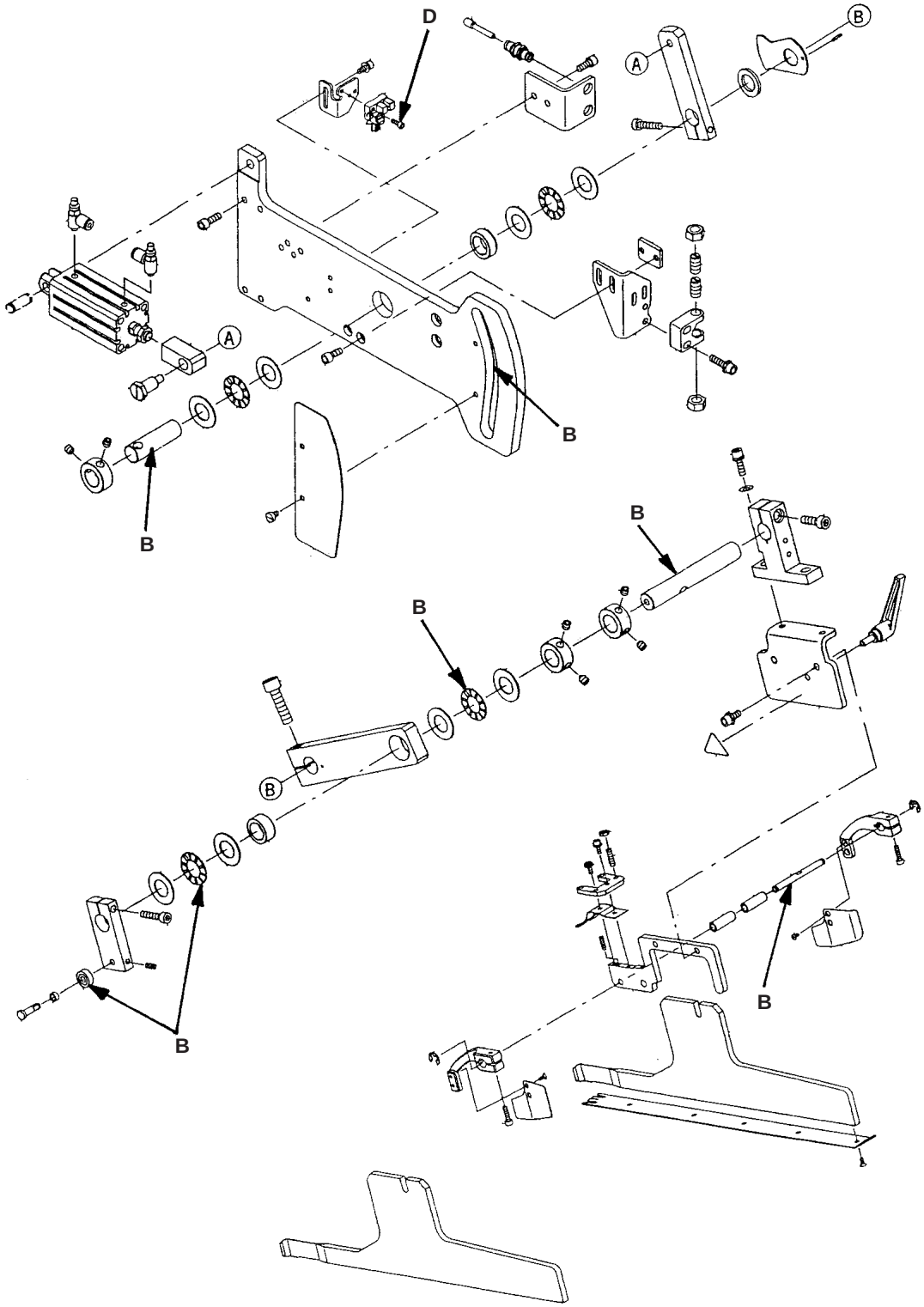


B : JUKI Grease B
D : Locktight 243
E : Locktight 277
F : Locktight 641
G : Three-Bond 1373N

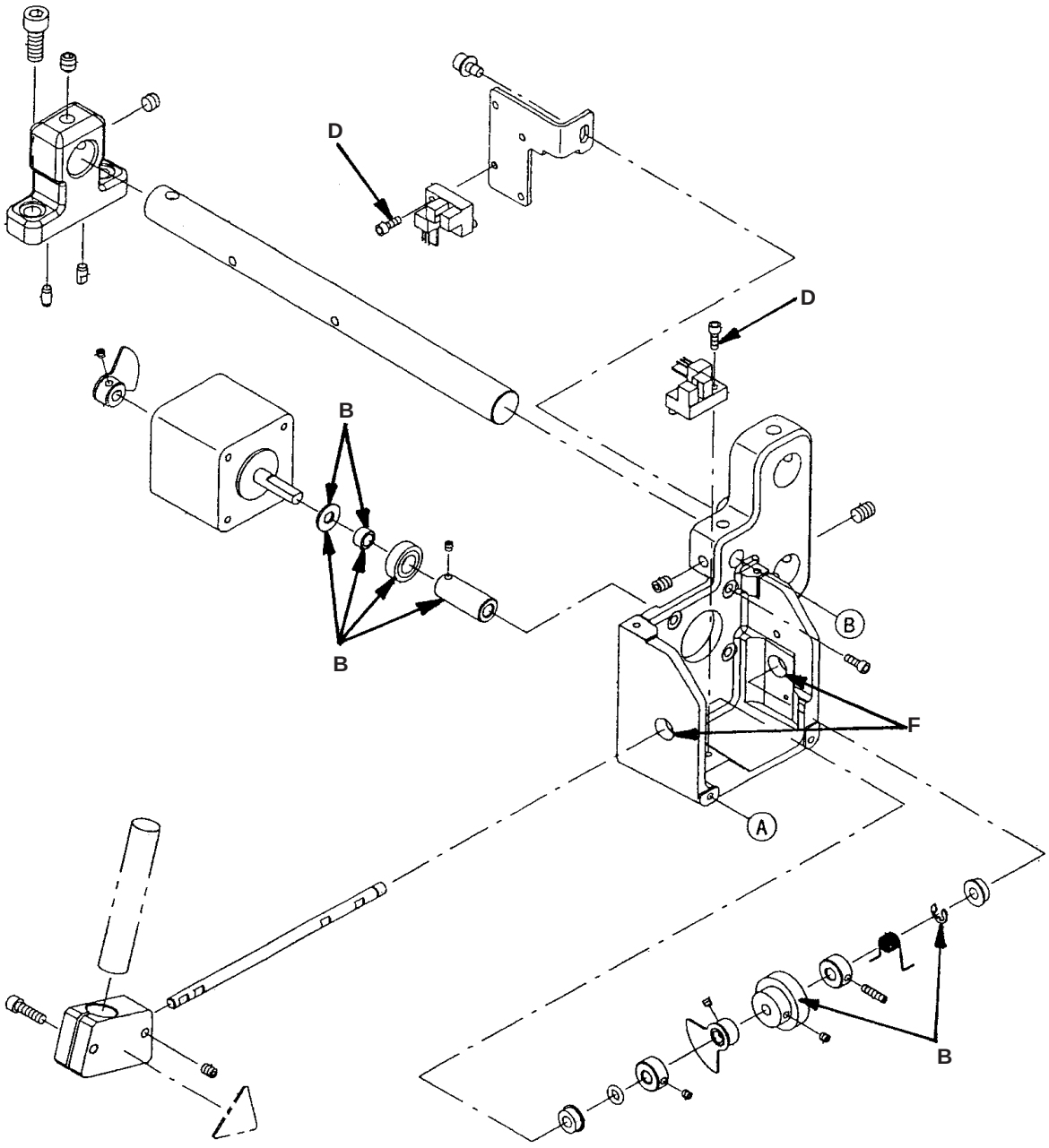
CORNER KNIF COMPONENTS



B : JUKI Grease B

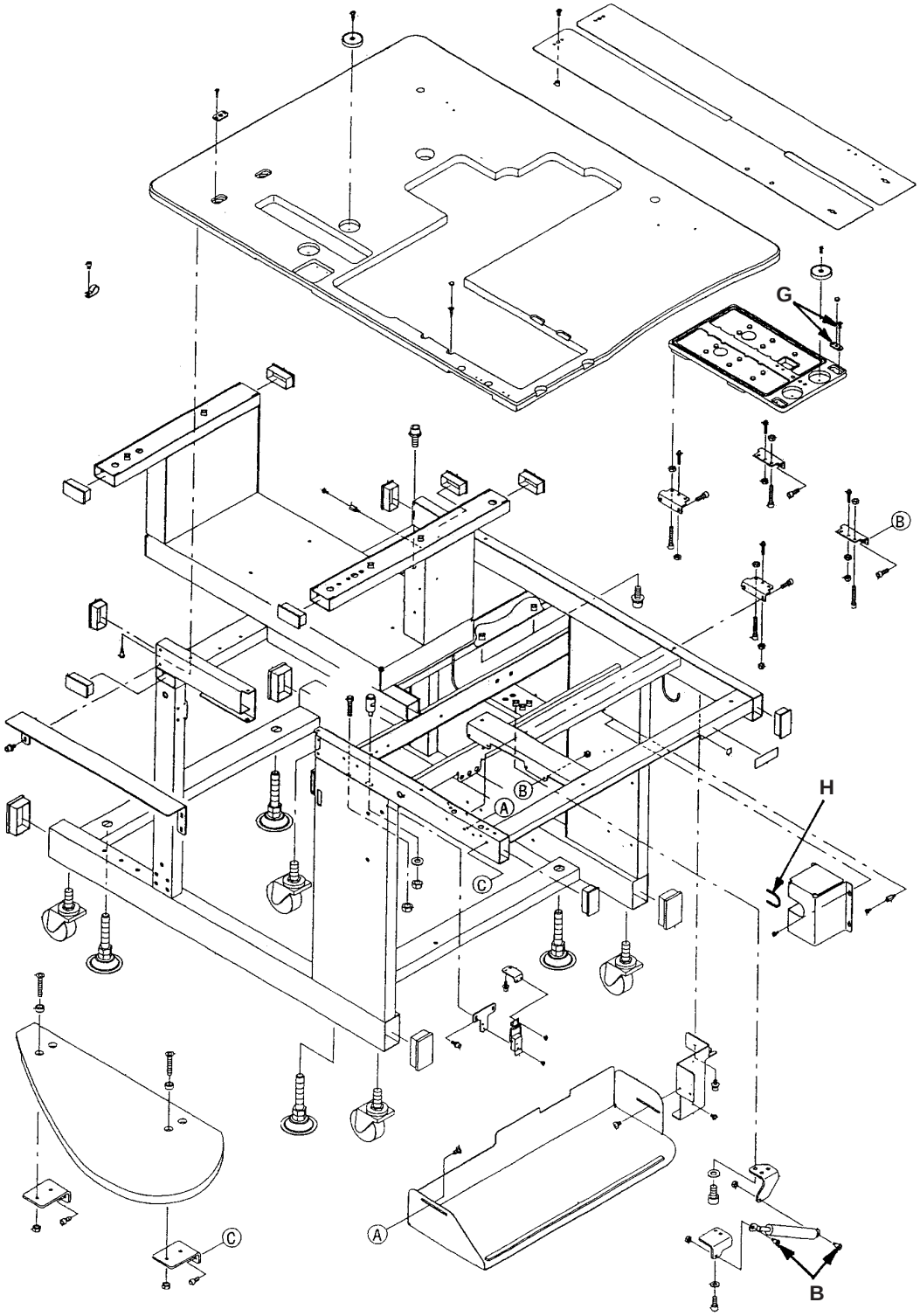


B : JUKI Grease B
D : Locktight 243



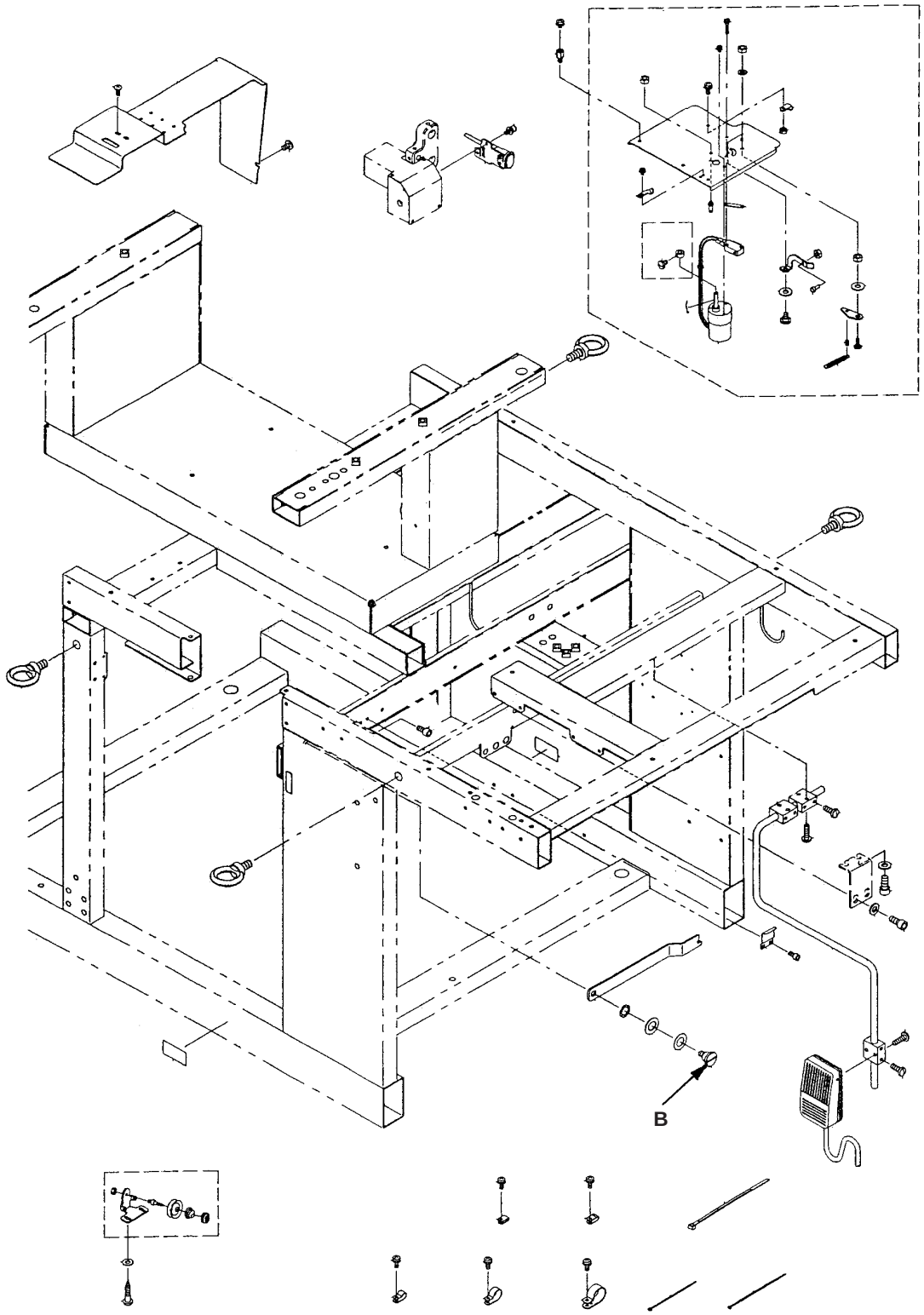
B : JUKI Grease B
D : Locktight 243
F : Locktight 641

FRAME AND COVER COMPONENTS (1)



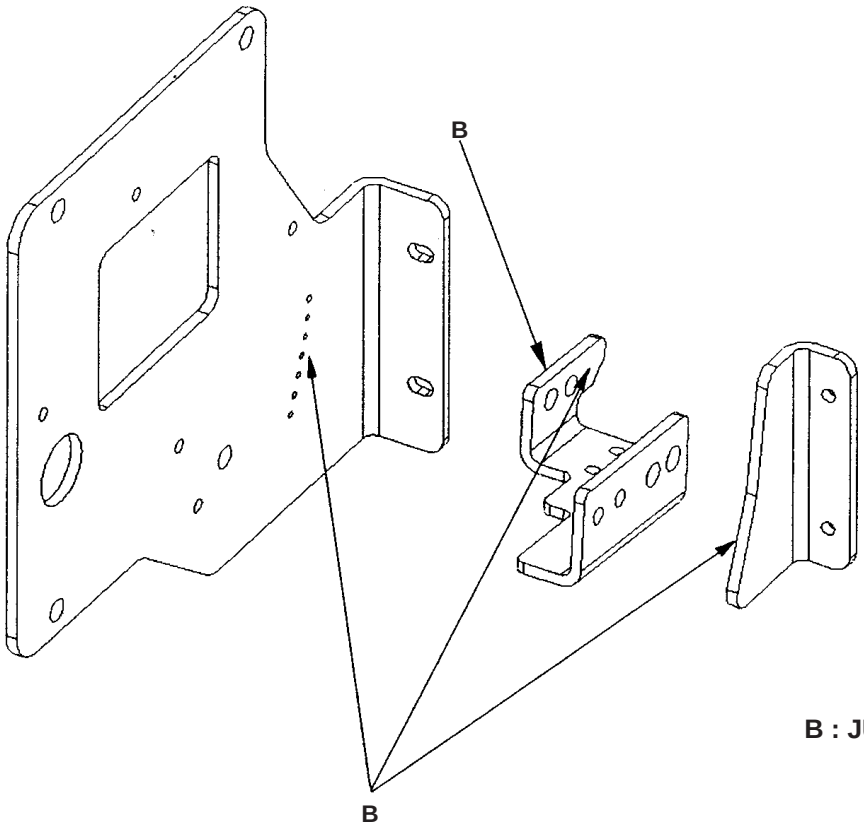
B : JUKI Grease B
G : Three-Bond 1373N
H : Cemedyne Super X Clear

FRAME AND COVER COMPONENTS (2)



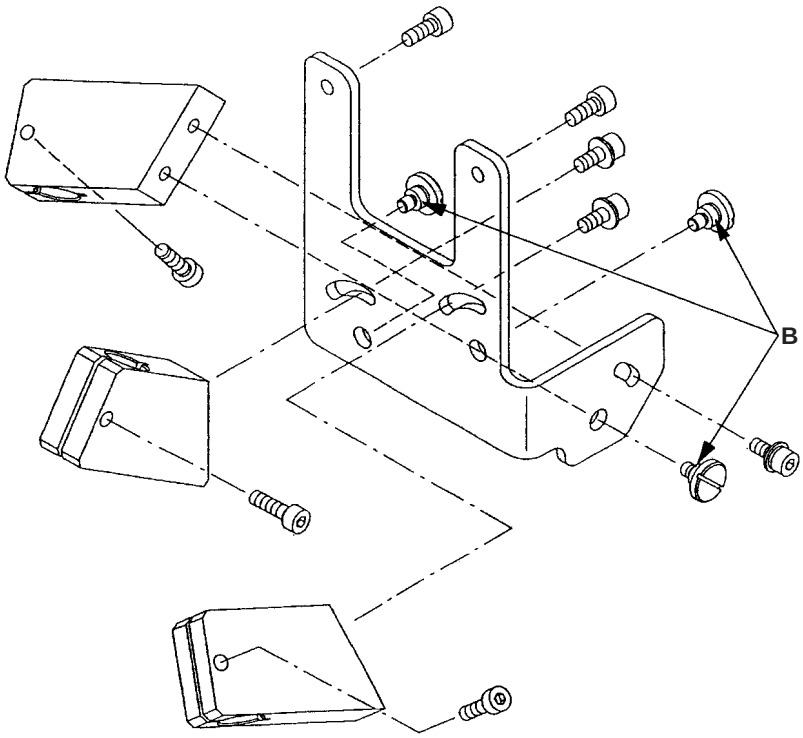
B : JUKI Grease B

PEDAL SWITCH COMPONENTS



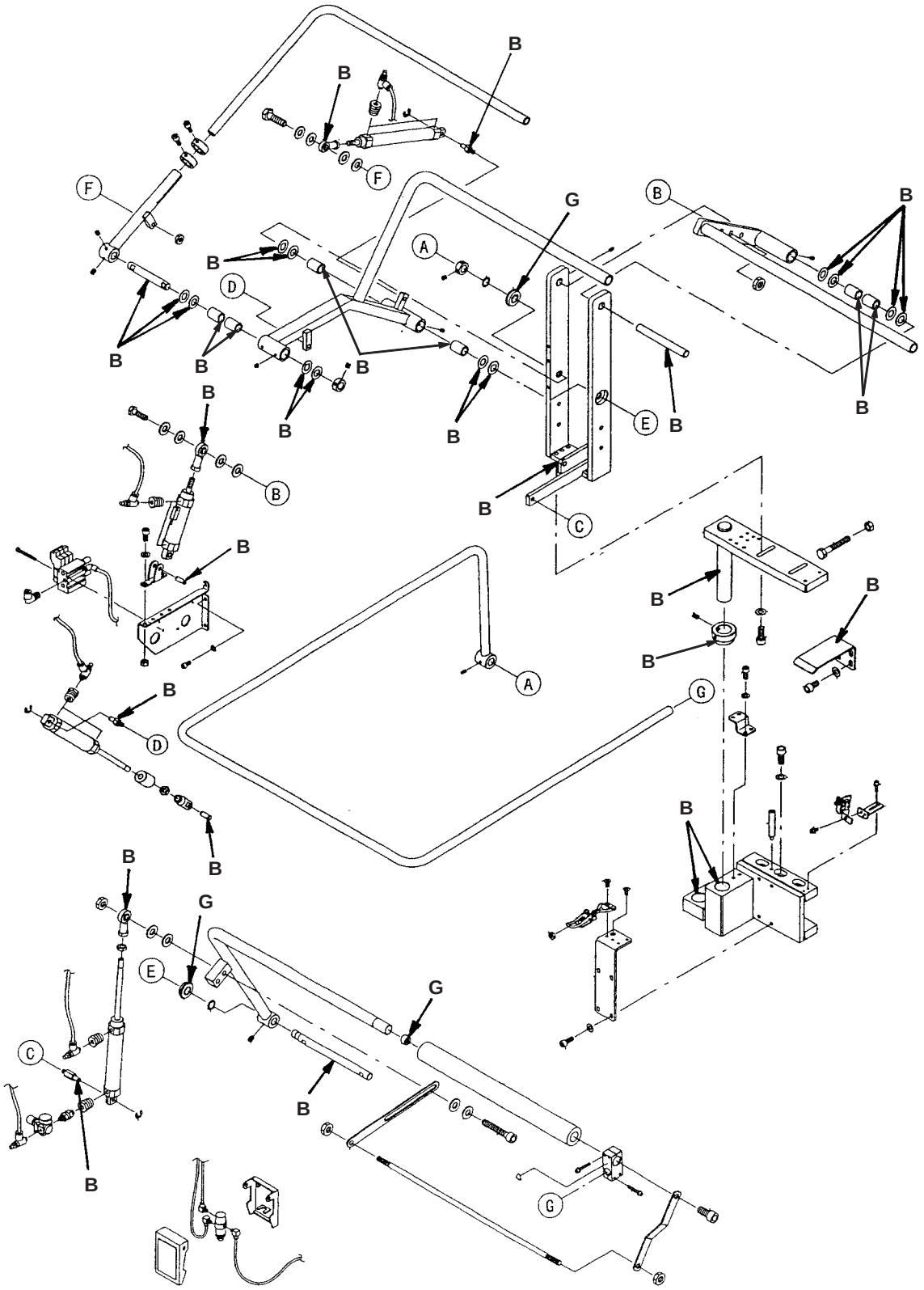
B : JUKI Grease B

FLAP PATTERN MATCHING MARKING LIGHT UNIT (SA-121)

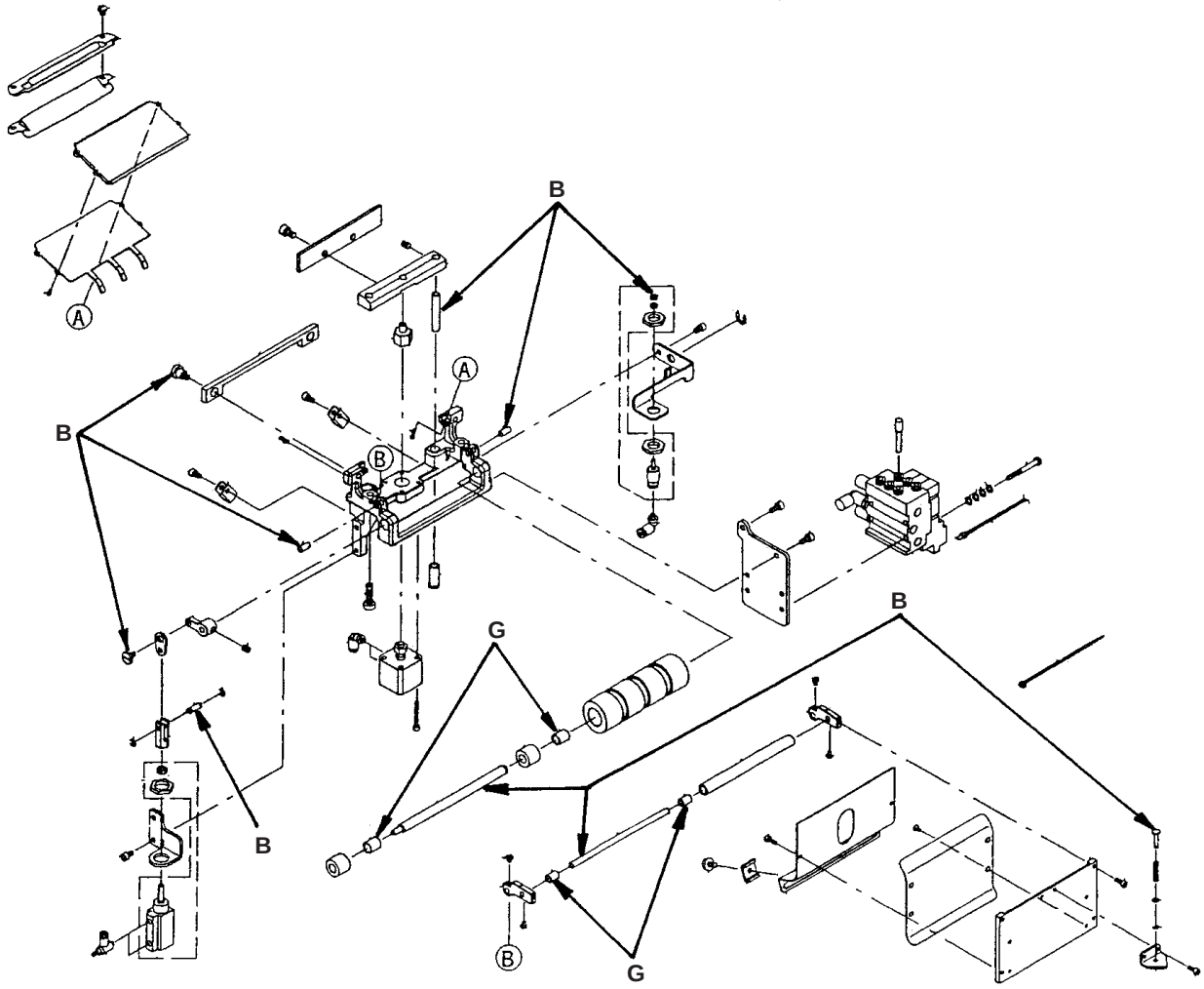


B : JUKI GreaseB

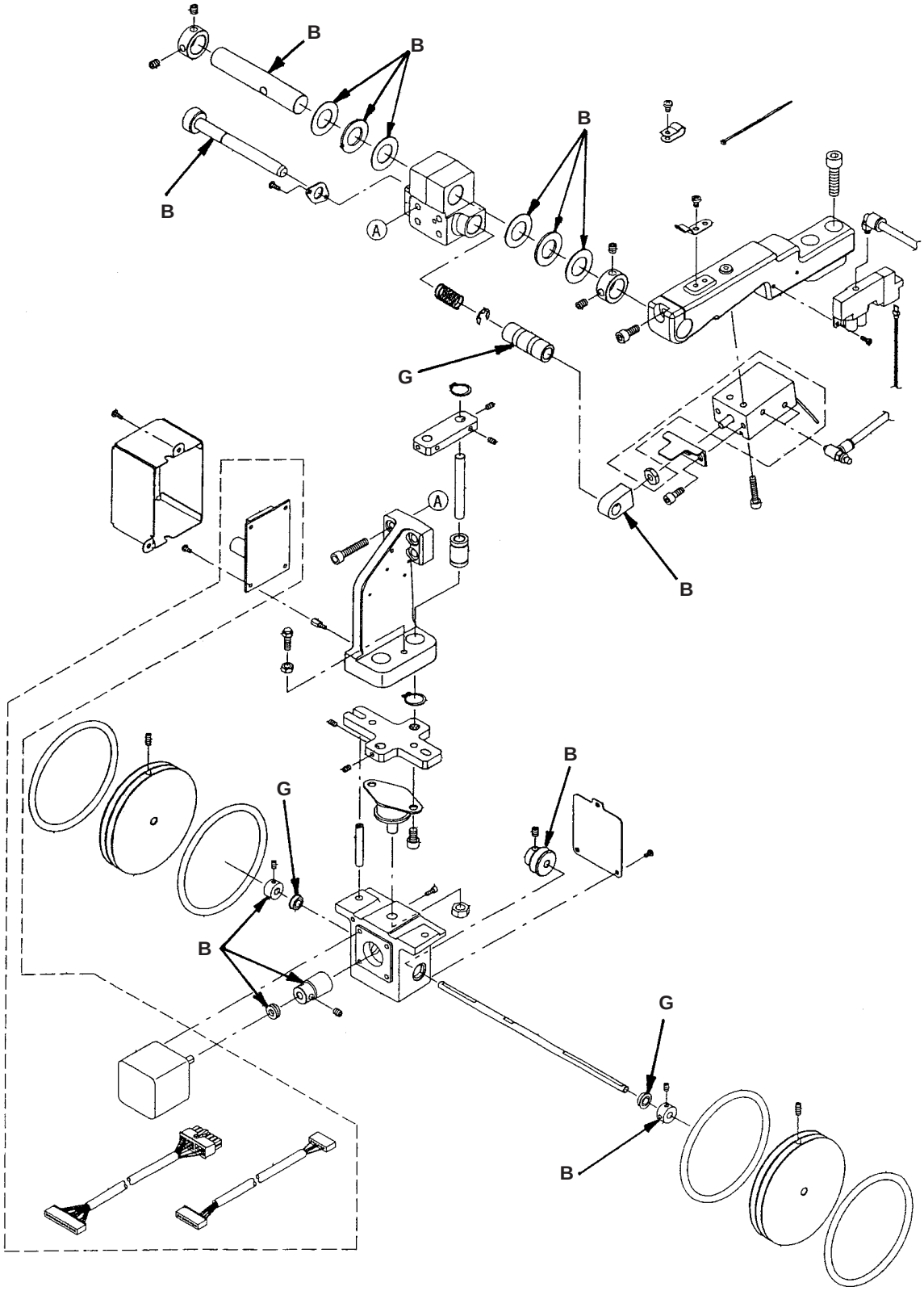
CLAMP BAR STACKER UNIT (SP-46)



B : JUKI Grease B
G : Three-Bond 1373N



B : JUKI Grease B
G : Three-Bond 1373N



B : JUKI Grease B
G : Three-Bond 1373N

(4) Replenishing grease to the designated place

* When “Grease-up warning E220” or “Grease-up error E221” is displayed, or when the machine has been used for one year, be sure to perform replenishing of grease.

When turning ON the power after the sewing machine has operated up to 40 million stitches, “grease-up warning E220” informing of the time of grease replenishment is displayed on the panel. When pressing RESET button to leave the error screen, the screen can continue operating. However, the error is not released and the error is displayed every time the power is turned ON. After performing replenishment of grease which is explained later, call "Memory switch U245" and set the number of stitches of operation to "0" with CLEAR button C .

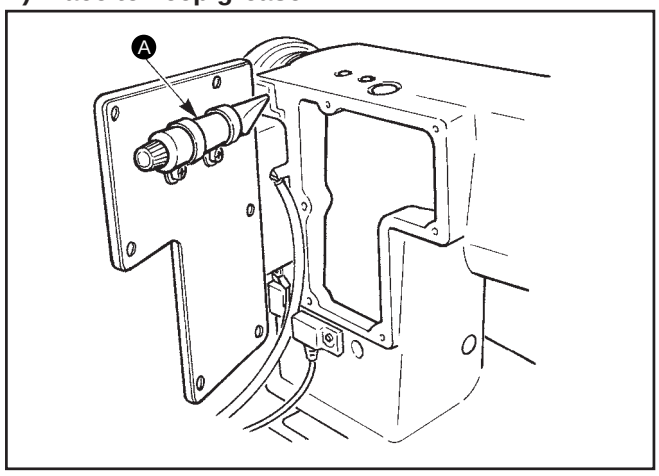
When the machine has been continuously used up to 48 million stitches, “grease-up error E221” is displayed on the panel. In this case, even when RESET button is pressed and the error screen is released, the sewing after that cannot be performed. Be sure to call “Memory switch U245” and set the number of stitches of to “0” with CLEAR button C after performing replen shment of grease whih is explained later.

(Caution) 1. “Grease-up warning E220” and “Grease-up error E221” are displayed again unless memory switch U245 is cleared to “0” after replenishing grease.

2. In regard to the replenishment of grease to the specified spots to be described later, use the accessory grease tube (Juki Grease B) (Part No. 40013640), without fail.

CAUTION :
To prevent accidents caused by abrupt start of the sewing machine, start the work after turning OFF the power.

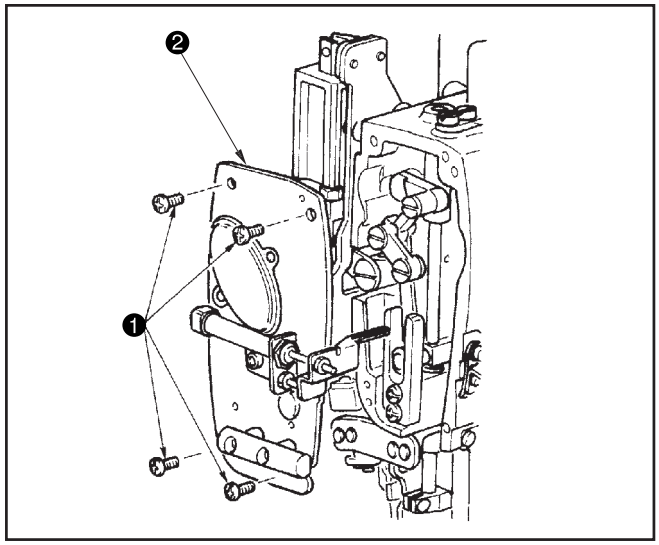
1) Place to keep grease



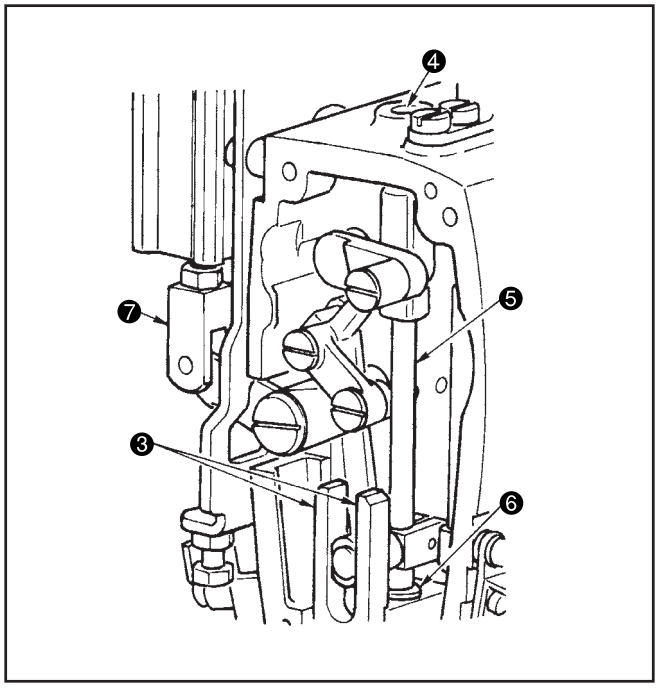
1. Grease tube s attached to the inside of rear plate Ⓐ.

(Caution) The grease tube after use (Juki Grease A) (Part No. 40006323) shall not be returned to the former place. Keep it carefully.

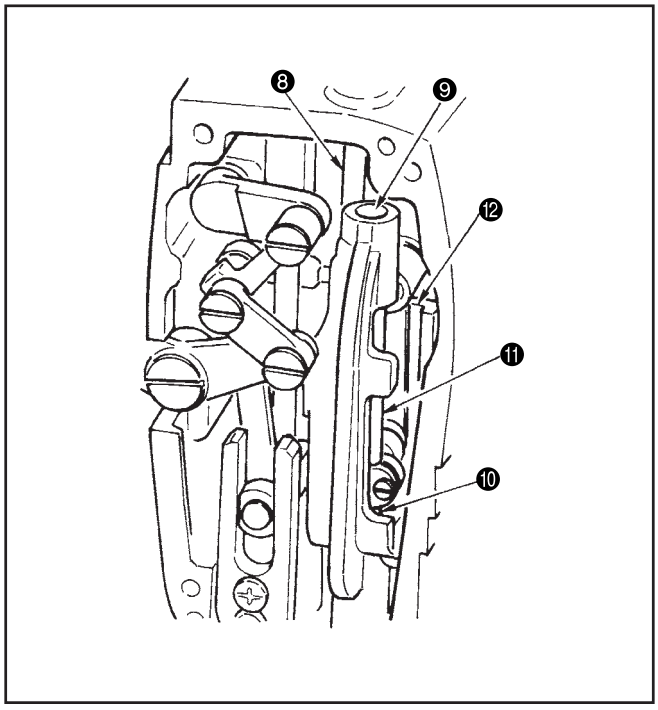
2) Grease-up procedure



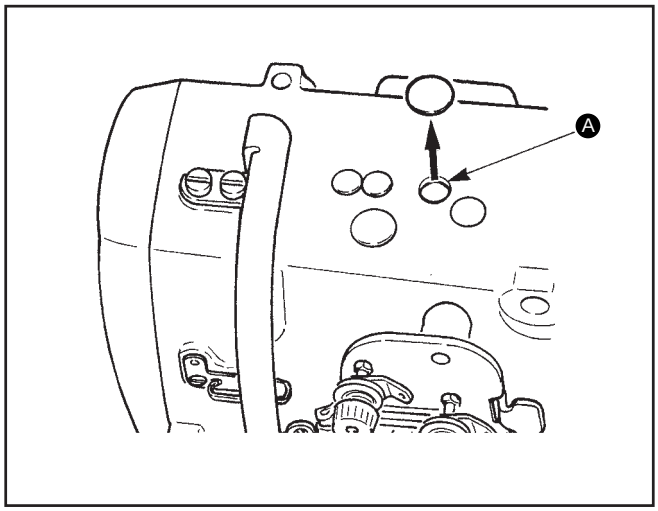
1. Remove four setscrews ❶ and take out face plate ❷.



2. Replenishment of grease to the center knife section
(1) Apply Juki Grease A to both guide faces ❸, knife bar metal top ❹, and knife bar metal bottom ❻.
(2) Knife bar ❺ moves up and down by moving cylinder joint ❼ up and down in the state that air is not supplied. Apply grease to the metal so as to infiltrate the inside.

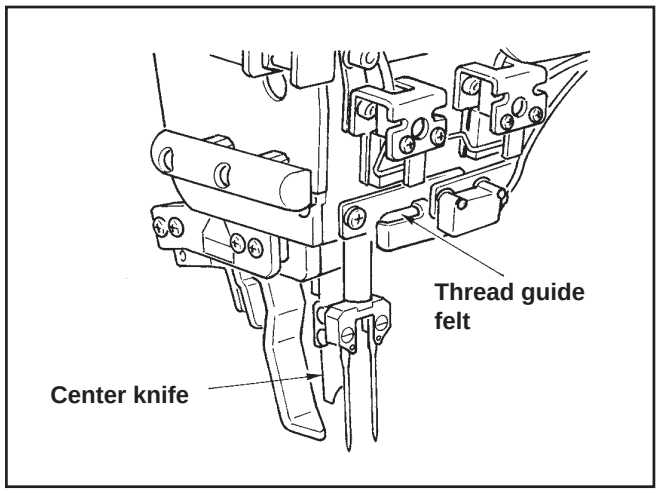


3. Replenishment of grease to the needle bar section
Apply Juki Grease A to the thread take-up lever ❽, needle bar upper section ❾, needle bar lower section ❿, needle bar ⓫ and needle bar ⓬.



4. Remove the rubber cap and apply new grease to the inside of the hole after removing old grease adhered to the inside of hole Ⓐ. Then cover the hole with the rubber cap.

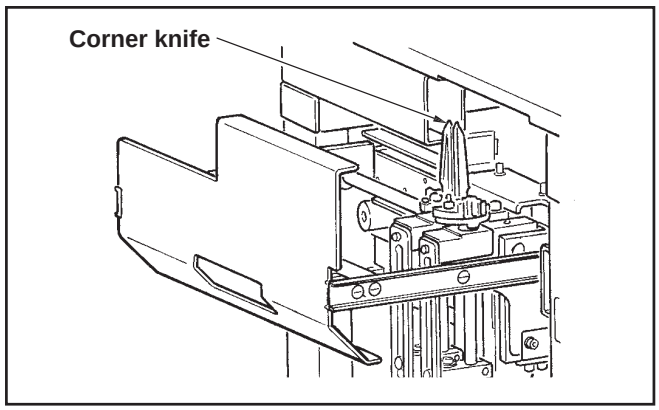
(5) Consumable replacement components

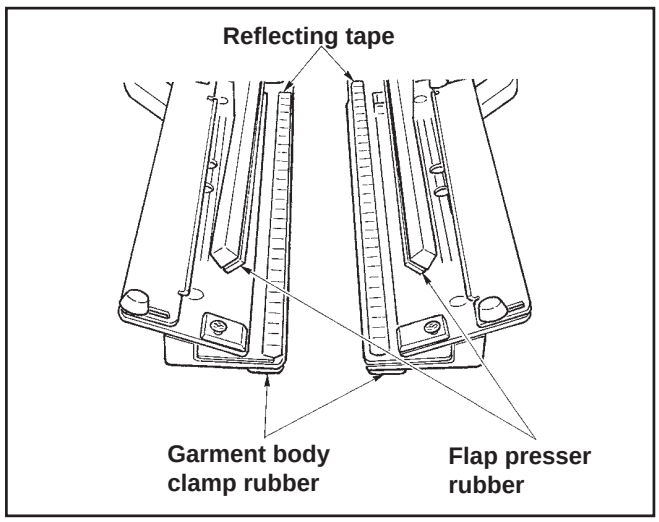


The components below are the consumable ones. Periodically replace them.

o Thread guide felt (Part No. : 40034444)
The part where thread presses is worn out and rough motion of thtead is apt to occur unless it is periodicallt replaced.

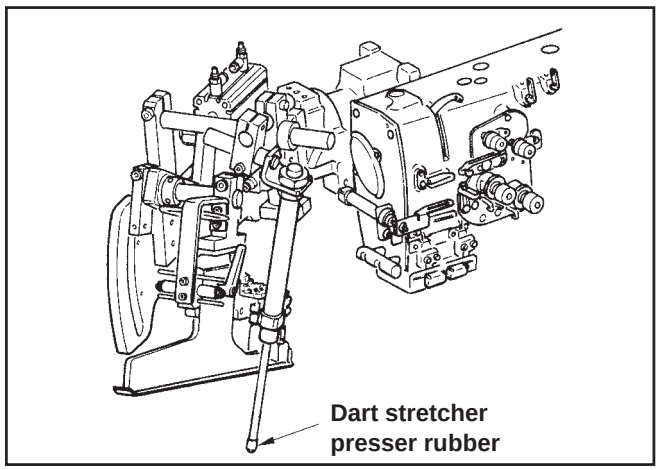
o Center knife (Part No. : 40026155)
o Corner knife (Part Nos. : 16607301 and 16607400)
Sharpness s deter orated and sewing quality s influenced unless it is periodically replaced.





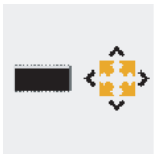
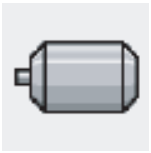
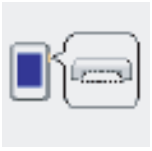
o Reflecting tape (Part No. : 40039942)
Accuracy of detection of flap is deteriorated and sewing quality is influenced unless it is periodically replaced.

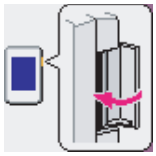
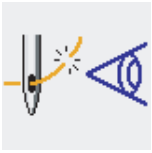
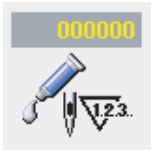
o Garment body clamp rubber (Part No. : 40034825)
o Flap presser rubber (Part No. : 40034826)
Pressing of material is deteriorated and sewing quality is influenced unless it is periodically replaced.

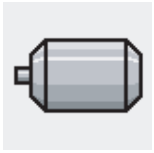
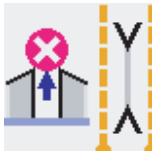


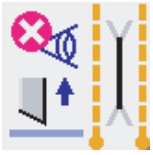
o Dart stretcher presser rubber (Part No. : 40034733)
Pressing of material is deteriorated and sewing quality is influenced unless it is periodically replaced.

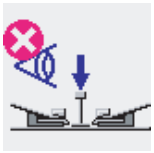
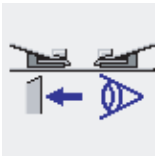
9. Error code list

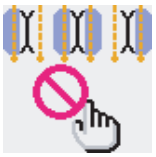
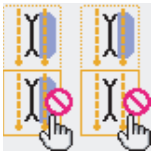
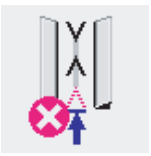
Error code	Pict	Description of error	How to recover
E001		**Initialization of EEPROM of MAIN CPU**	Turn OFF the power
E007		**Machine-lock** Main shaft of the sewing machine does not rotate due to some trouble.	Turn OFF the power
E010		**Pattern No. error** Pattern No. designated with ten-key is not registered when pattern No. is selected	Possible to re-start after reset.
E011		**External media not inserted** Media is not inserted.	Possible to re-start after reset.
E012		**Read error** Data read from media cannot be performed.	Possible to re-start after reset.
E013		**Write error** Data write from media cannot be performed.	Possible to re-start after reset.
E015		**Format error** Formatting of media cannot be performed.	Possible to re-start after reset.
E016		**External media capacity over** Capacity of media is short.	Possible to re-start after reset.
E022		**File No. error** Designated file is not in server or media.	Possible to re-start after reset.
E027		**Read error** Data read from server cannot be performed.	Possible to re-start after reset.

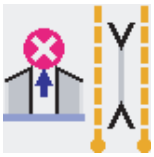
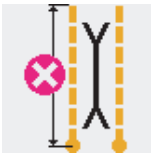
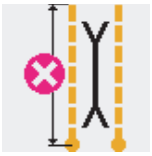
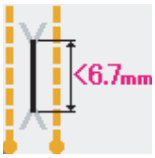
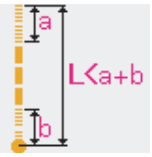
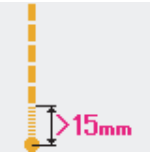
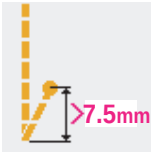
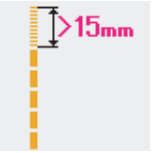
Error code	Pict	Description of error	How to recover
E028		**Write error** Data write from server cannot be performed.	Possible to re-start after reset.
E029		**Lid media slot is open.**	Possible to re-start after reset.
E030		**Needle bar upper position failure** Needle bar is out of needle up position.	Turn the hand pulley to bring the needle bar to its specified position.
E031		**Air presser drop** Air presser is low.	Possible to re-start after reset.
E050		**Stop switch** When stop switch is pressed.	Possible to re-start after reset.
E052		**Thread breakage detection error** When thread breakage is detected.	Possible to re-start after reset.
A201		**Needle replacing time warning** When number of stitches of operation is reached to number of stitches of needle replacement that is set from the panel.	Possible to re-start after reset.
A202		**Cleaning time warning** When operation time of the sewing machine is reached to the cleaning time that is set from the panel.	Possible to re-start after reset.
A203		**Oil replacement time warning** When operation time of the sewing machine is reached to the oil replacement time that is set from the panel.	Possible to re-start after reset.
E220		**Grease-up warning** When the number of stitches has reached 40 million.	Possible to re-start after reset.

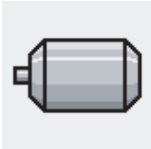
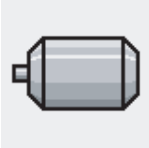
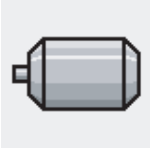
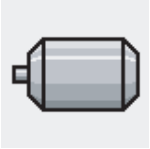
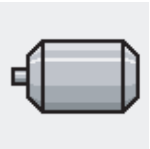
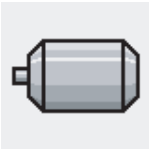
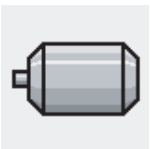
Error code	Pict	Description of error	How to recover
E221		**Grease-up error** When number of stitches of operation is reached to 48 million stitches, sewing impossible start occurs. * After applying grease, it is possible to release when cleaning memory switch U245 Number of stitches of grease-up.	Possible to re-start after reset.
E303		**Semilunar plate sensor error** Detection of upper dead point of the sewing machine cannot be performed.	Turn OFF the power
E366		**Center knife does not lower.**	Possible to re-start after reset.
E367		**Corner knife cannot be entered.**	Possible to re-start after reset.
E368		**Zipper has run out.**	Possible to re-start after reset.
E369		**Roller stacker lower does not detect.**	Possible to re-start after reset.
E370		**Roller stacker upper sensor is gone past.**	Possible to re-start after reset.
E371		**Clamp bar stacker material presser sensor is gone past.**	Possible to re-start after reset.
E372		**Clamp bar stacker material sweeper origin sensor is gone past.**	Possible to re-start after reset.
E373		**Reflecting tape on right-hand side is deteriorated.**	Possible to re-start after reset.

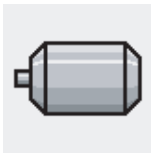
Error code	Pict	Description of error	How to recover
E374		**Reflecting tape on left-hand side is deteriorated.**	Possible to re-start after reset.
E376		**Pedal continuous depressing error**	Possible to re-start after reset.
E377		**Center knife upper detection sensor cannot detect.**	Possible to re-start after reset.
E378		**Clamp bar stacker open detection**	Possible to re-start after reset.
E379		**Roller stacker lift sensor cannot detect.**	Possible to re-start after reset.
E380		**Flap sensor cannot receive light**	Possible to re-start after reset.
E381		**Flap rear end cannot be detected (forced stop).** Error is displayed after end of sewing.	Possible to re-start after reset.
E382		**Flap dust detection error**	Possible to re-start after reset.
E383		**Flap front end cannot be detected.**	Possible to re-start after reset.
E386		**Corner knife fixing side bottom detection error**	Possible to re-start after reset.

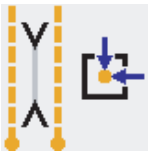
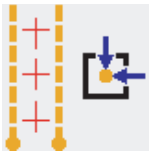
Error code	Pict	Description of error	How to recover
E387		**Corner knife fixing side top detection error**	Possible to re-start after reset.
E388		**Corner knife moving side bottom detection error**	Possible to re-start after reset.
E389		**Corner knife moving side top detection error**	Possible to re-start after reset.
E390		**Material sensor error** Material remains after end of stacker operation.	Automatic recovery by sensor input.
E391		**ST material presser lift detection error**	Automatic recovery by sensor input.
E392		**ST material sweeper origin detection error**	Automatic recovery by sensor input.
E393		**Binder bottom detection error**	Automatic recovery by sensor input.
E394		**Binder top detection error**	Automatic recovery by sensor input.
E398		**Corner knife drawer detection error**	Possible to re-start after reset.
E399		**Binder open detection error**	Possible to re-start after reset.

Error code	Pict	Description of error	How to recover
E401		**Copy disapproved** When trying to perform overwriting copy on the pattern No. which has been already registered	Possible to recover with CANCEL button.
E402		**Erasing disapproved** When trying to delete the pattern used in the cycle sewing	Possible to recover with CANCEL button.
E403		**New creation disapproved** When the registered pattern is selected to the new creation pattern No.	Possible to recover with CANCEL button.
E404		**Data of designated No. does not exist.** When data of designated No. Does not exist in medai or server	Possible to recover with CANCEL button.
E435	– – –	**Out of input range error** When numeral that is set with ten-key exceeds the setting range	Possible to re-start after reset.
E484		**Zipper attaching data cannot be sewn.**	Possible to re-start after reset.
E485		**Data other than zipper attaching data cannot be sewn.**	Possible to re-start after reset.
E486		**Flap sewing data can not be sewn.**	Possible to re-start after reset.
E489		**Combination data other than right/left flap sewing is set at the time of flap priority setting of alternate sewing mode.**	Possible to re-start after reset.
E490		**It is not possible to feed pup to corner knife position.** When flap is put on this side in case of the ling type	Possible to re-start after reset.

Error code	Pict	Description of error	How to recover
E491		**Corner knife length is too short.** When knife cannot be entered since the interval of corner knife is short.	Possible to re-start after reset.
E492		**L size length is too short.** When sewing cannot be performed since the inputted L size length is too short	Possible to re-start after reset.
E493		**L size length is too long.** When sewing cannot be performed since the inputted L size length is too long.	Possible to re-start after reset.
E494		**Center knife length error** When center knife length is smaller than knife size of 6.7mm	Possible to re-start after reset.
E495		**Length at sewing start/sewing end over** When sewing length is shorter than the total of length os each condensation (back tuck) at sewing start and sewing end	Possible to re-start after reset.
E496		**Condensation at sewing end length over** When condensation pitch X number of stitches exceeds 15.0mm	Possible to re-start after reset.
E497		**Back tuck at sewing end length over** When back tuck pitch X number of stitches exceeds 7.5mm	Possible to re-start after reset.
E498		**Condensation at sewing start length over** When condensation pitch X number of stitches exceeds 15.0mm	Possible to re-start after reset.
E499		**Back tuck at sewing start length over** When back tuck pitch X number of stitch exceeds 7.5mm	Possible to re-start after reset.
E702		**CPU runaway detection** When program abnormally has occurred in CPU	Turn OFF the power

Error code	Pict	Description of error	How to recover
E703		**Panel is connected to the sewing machine which is not supposed (Machine type error)** When the machine type between panel and sewing machine is different in the initial communication	Possible to re-start after reset.
E704		**Inconsistency of system version** When system software version is inconsistent in the initial communication	Turn OFF the power
E730		**Main shaft motor is defective or lacking for phases.** When encoder of sewing machine motor is abnormal	Turn OFF the power
E731		**Main motor hole sensor is defective or position sensor is defective.** When hole sensor of sewing machine motor position sensor is defective.	Turn OFF the power
E733		**Reverse rotation of main shaft motor** When the sewing machine motor rotates in the reverse direction	Turn OFF the power
E802		**Power momentary cut detection** When input power is momentarily cut	Turn OFF the power
E811		**Over voltage of power error** When input power is more than the specified value	Turn OFF the power
E813		**Low voltage of power error** When input power is less than the specified value	Turn OFF the power
E901		**Main shaft motor IPM abnormality** When SERVO CONTROL circuit board is abnormal	Turn OFF the power
E903		**Stepping motor power abnormality** When stepping motor power of SERVO CONTROL circuit board fluctuates more than ± 15%	Turn OFF the power

Error code	Pict	Description of error	How to recover
E904		**Solenoid power (24V) abnormality** When solenoid power of SERVO CONTROL circuit board fluctuates more than ± 15%	Turn OFF the power
E905		**Heat sink temperature for SERVO CONTROL circuit board abnormality** Turn On the power again after taking time.	Turn OFF the power
E915		**Communication abnormality between operation panel and MAIN CPU** When abnormality occurs in data communication	Turn OFF the power
E916		**Communication abnormality between MAIN CPU and main shaft CPU** When abnormality occurs in data communication	Turn OFF the power
E917		**Communication abnormality between operation panel and personal computer** When abnormality occurs in data communication	Possible to re-start after reset.
E918		**MAIN circuit board heat sink temperature abnormality** Turn ON the power again after taking time.	Turn OFF the power
E943		**Defective EEP-ROM of MAIN CPU** When data writing to EEP-ROM cannot be performed	Turn OFF the power
E984		**Center knife motor abnormality**	Turn OFF the power
E985		**Clamp foot motor step-out error**	Possible to re-start after reset.
E986		**Clamp foot stepping motor origin retrieval error**	Possible to re-start after reset.

Error code	Pict	Description of error	How to recover
E987		**Back tuck motor origin retrieval error**	Possible to re-start after reset.
E998		**Corner knife stepping motor origin retrieval error**	Possible to re-start after reset.
E999		**Marking light motor origin retrieval error**	Possible to re-start after reset.

10. Troubles and corrective measures

(1) Machine head

Trouble	Cause (1)	Cause (2)	Check and corrective measures
1. Thread breakage (needle thread)	1-1) Scratches on the needle thread path		Removal of scratches from the thread path (use of fine sandpaper or buff)
	1-2) The needle thread overloaded	2-A) Excessive tension of the thread tension disk	Reduce the tension. (Refer to the description of the thread tension disk.)
		2-B) Excessive tension of the thread take-up spring	Reduce the tension. (Refer to the description of the thread take-up spring.)
		2-C) Excessive or deficient stroke of the thread take-up spring	Adjust the stroke. (Refer to the description of the thread take-up spring.)
	1-3) Inappropriate clearance between the inner hook guide and inner hook		Adjust the clearance to 0.2 to 0.3 mm. (Refer to the description of opener adjustment.)
	1-4) Inadequate hook mounting	4-A) Interference between the needle and the blade point of the hook	Adjust the clearance between the needle and the blade point of the hook.(Refer to adjustment of the hook nd needle.)
		4-B) Inappropriate timing for the needle and hook	Adjust the timing between the needle and the blade point of the hook.(Refer to adjustment of the hook and needle.)
		4-C) Blunt blade point of the hook	Sharpen the blade point of the hook.
	1-5) Insufficient hook oil		Add hook oil to the appropriate level. (Refer to adjustment of hook oil.)
2. Thread breakage (bobbin thread)	2-1) The bobbin thread overloaded	1-A) Excessive tension of the bobbin thread	Reduce the tension of the bobbin thread.
		1-B) Thread caught between the bobbin and inner hook	Remove thread chips.
		1-C) Deformed bobbin resulting in non-smooth movement	Replace the bobbin with new one.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
3. Stitch skipping	3-1) Inadequate hook mounting	1-A) Excessive clearance between the needle and the blade point of the hook	Adjust the clearance between the needle and the blade point of the hook. (Refer to adjustment of the hook and needle.)
		1-B) Inappropriate timing for the needle and hook	Adjust the timing between the needle and the blade point of the hook. (Refer to adjustment of the hook and needle.)
		1-C) Blunt blade point of the hook	Sharpen the blade point of the hook.
	3-2) Maladjustment of needle guide	2-A) Excessive clearance between the needle and needle guide	Adjust the clearance between the needle and needle holder. (Refer to adjustment of the timing between the needle and hook.)
		2-B) Excessive contact between the needle and needle guide	Adjust the clearance between the needle and needle holder. (Refer to adjustment of the timing between the needle and hook.)
	3-3) Misalignment of the needle bar rocking base in the front-rear direction		Adjust the position of the needle bar rocking base in the front-rear direction. (Refer to alignment of the needle bar rocking base in the front-rear direction.)
	3-4) Defective needle	4-A) Bent or blunt needle	Replace the needle with new one.
		4-B) Wrong needle size selected	Select an appropriate needle size.
	3-5) Inappropriate clearance between the sewing table and binder		Adjust the binder lowering position. (Refer to adjustment of the binder mechanism.)
	3-6) Defective garment clamp with the clamp foot	6-A) Inappropriate clamp pressure	Set the pressure to 0.5 MPa.
	3-7) Inappropriate lock stitch sewing speed		Adjust the stitch length to 2.0 mm.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
4. Defective thread tension	4-1) Deficient tension of the needle thread		Increase the needle thread tension. (Refer to the description of thread tension.)
	4-2) Maladjustment of thread take-up spring	2-A) The tension of the thread take-up spring is deficient.	Increase the tension of the thread take-up spring. (Refer to the description of thread tension.)
		2-B) Deficient stroke of the thread take-up spring	Adjust the stroke of the thread take-up spring to the appropriate level. (Refer to the description of thread tension.)
	4-3) Inappropriate clearance between the opener and inner hook		Adjust the clearance to 0.2 to 0.3 mm. (Refer to the description of opener adjustment.)
	4-4) Excessive clearance between the sewing table and binder		Adjust the binder lowering position. (Refer to adjustment of the binder levelness.)
5.Needle breakage	5-1) Interference between the needle and the blade point of the hook		Adjust the clearance between the needle and the blade point of the hook. (Refer to adjustment of the hook and needle.)
	5-2) Excessive contact between the needle and needle guide		Adjust the timing between the needle and hook. (Refer to adjustment of the hook and needle.)
	5-3) Interference between the needle and the throat plate or needle hole		Adjust the position of the needle bar rocking base. (Refer to alignment of the needle bar rocking base in the front-rear direction.)
	5-4) Interference between the needle and each device	4-A) Interference with the binder	Adjust the binder position. (Refer to adjustment of the binder mechanism.)
		4-B) Interference with the folding plate	Adjust the position of the folding plate. (Refer to adjustment of the clamp foot mechanism.)
	5-5) Inappropriate lock stitch sewing speed		Adjust the stitch length to 2.0 mm.
	5-6) Too thin needle for the material		Use a 1-count thicker needle.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
6. Uneven sewing	6-1) Threading error	1-A) Wrong needle thread path	Refer to how to thread the needle thread
		1-B) Wrong bobbin thread path	Refer to how to thread the bobbin case
	6-2) Inappropriate tension of the needle/bobbin thread		Readjust the tension of the needle/bobbin thread.
	6-3) Inappropriate tension and/or stroke of the thread take-up spring		Readjust the thread take-up spring.
	6-4) Excessive winding tension of the bobbin thread		Adjust the winding tension.
	6-5) Uneven feeding tension of the bobbin thread	5-A) Thread chips caught between the bobbin and inner hook	Remove thread chips.
		5-B) Deformed bobbin resulting in non-smooth movement	Replace the bobbin with new one.
7. Excessive puckering	7-1) Excessive tension of the needle/bobbin thread		Reduce the tension of the needle/bobbin thread
	7-2) Too thick needle for the material		Use a 1-count thinner needle.
	7-3) Inappropriate clearance between the pocket bag scale and sewing table		Adjust the clearance in accordance with the material thickness.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
8. Thread cast-off from the needle at the sewing start	8-1) Wrong wiper position		Adjust the wiper position. (Refer to wiper adjustment.)
	8-2) Defective needle thread clamp		Position adjustment of the needle thread trimming unit (Refer to adjustment of the needle thread trimming unit.)
	8-3) Defective bobbin thread clamp		Position adjustment of the bobbin thread trimming unit (Refer to adjustment of thr bobbin thread trimming unit
9. Stitch skipping at the sewing start	9-1) Deficient bobbin thread	1-A) Bobbin idling	Increase the bobbin thread tension. Put a cloth under the bobbin to prevent it from idling.
		1-B) Wrong wiper position	Adjust the wiper position. (Refer to wiper adjustment.)
10.Broken material in the garment body or welting patch (entirely)	10-1)Dull center knife	1-A) Defective center knife	Replace the center knife with new one.
		1-B) Defective installation of center knife	Install the center knife properly, (Refer to adjustment of the center knife.)
	10-2)Too thick needle, or blunt tip of the needle		Use a thinner needle. Replace the needle with new one.
11. Needle thread untrimmed	11-1)Malfunction of the needle thread trimmer	1-A) Defective installation of the needle thread trimmer	Install the needle thread trimmer properly. (Refer to adjustment of the needle thread trimmer unit.)
		1-B) Malfunction of the thread trimming cylinder	Reduce the air pressure of the cylinder to approx. 1.8 kg and check the cylinder operation. If the cylinder does not operate well, replace the cylinder with new one.
12. Bobbin thread untrimmed	12-1)Defective bobbin thread trimmer	1-A) Deficient pressure of the bobbin thread trimmer spring	Increase the spring pressure.
		1-B) Dull bobbin thread trimmer	Replace the trimmer with new one.
	12-2)Malfunction of the bobbin thread trimming cylinder		Check the drain in the cylinder or replace the cylinder with new one.

(2) Equipment and related matters

Trouble	Cause (1)	Cause (2)	Check and corrective measures
1. Different welting widths between right and left	1-1) Maladjustment of the clearance between the binder and garment clamp		Adjust the clearance. (Refer to adjustment of the binder mechanism.)
	1-2) Maladjustment of the clearance between the needle and folding plate		Adjust the clearance. (Refer to adjustment of the binder mechanism.)
	1-3) Wrong binder position in the lateral direction	3-A) Wrong front binder position in the lateral direction with respect to the needle	Adjust the binder position in the lateral direction. (Refer to adjustment of the binder mechanism.)
2. Different welting widths between front and rear	2-1) Defective clearance between the binder and garment body clamp		Adjust the clearance. (Refer to adjustment of the binder mechanism.)
	2-2) Uneven presser movement with respect to the binder		Adjust the position. (Refer to adjustment of the binder mechanism.)
3. Displacement of welting patch material	3-1) Defective positions of the front and rear binders	1-A) Different heights of the front and rear binders at jumping	Adjust the position. (Refer to adjustment of the binder mechanism.)
		1-B) Defective positions of the front and rear binders in the lateral direction	Adjust the position. (Refer to adjustment of the binder mechanism.)
		1-C) Maladjustment of the clearance between the front and rear binders	Adjust the position. (Refer to adjustment of the binder mechanism.)

Trouble	Cause (1)	Cause (2)	Check and corrective measures
4. Curved flap stitches	4-1) Insufficient pressure of the flap presser		Adjust the position. (Refer to adjustment of the clamp foot mechanism.)
	4-2) Maladjustment of the material guide	2-A) Insufficient clearance between the material guide and needle	Adjust the position. (Refer to adjustment of the binder mechanism.)
		2-B) Insufficient clearance between the material guide and welting patch scale	Adjust the position. (Refer to adjustment of the binder mechanism.)
	4-3) Adjust the position of the needle thread trimming knife.	3-A) Wrong position of the needle thread trimming knife in the lateral direction	Adjust the position. (Refer to adjustment of the needle thread trimming unit.)
		3-B) Defective height of the needle thread trimming knife at lowering	Adjust the position. (Refer to adjustment of the needle thread trimming unit.)
5. Slack flap lining	5-1) Defective pressure of the flap presser	1-A) Insufficient pressure of the flap presser	Adjust the position. (Refer to adjustment of the clamp foot mechanism.)
6. No core material feeder from the interlining feed unit	6-1) Defective clearance of the guide	1-A) Excessive clearance	Adjust the position of the automatic interlining feed unit. (Refer to adjustment of the automatic interlining feeder unit.)
		1-B) Insufficient clearance	Adjust the position of the automatic interlining feed unit. (Refer to adjustment of the automatic interlining feeder unit.)
	6-2) Wrong guide position	2-A) Wrong positions of the counter knife and guide	Adjust the guide position. (Refer to adjustment of the automatic interlining feeder unit.)
	6-3) Wrong positions of the guide roller and core material		Adjust the automatic interlining feed unit. (Refer to adjustment of the automatic interlining feeder unit.)

(3) Electrical matters

Error code	Trouble	Checking item	Measures
E001	Initialization of the EEPROM on the main CPU	Check whether U11_EEPROM is correctly mounted.	Replace the U11_EEPROM.
E007	Sewing machine lock	Check whether the motor signal cable and power cable are connected appropriately. Check the connectors, CN14 and CN16, of the SDC board.	Replace the main shaft motor. Part No.: 40028015 AC servo motor
E011	External media not inserted	Check whether the media is not broken. Perform an operation check with use of regular media.	Replace the media. Replace the IP-310 operation panel. Part No.:40052016
E012	Read error		
E013	Write error		
E015	Format error		
E029	Media slot cover opened	Check whether the cover fully closes.	Replace the IP-310 operation panel. Part No.:40052016
E030	Needle bar upper position displacement	Check whether the head section of the motor is appropriately positioned.	Replace the main shaft motor. Part No.: 40028015 AC servo motor
E031	Air pressure drop	Check the air source and valve. Check whether the pressure setting pointer (green) of the air pressure gauge reads a appropriate value. Check the connector, CN30, of the MAIN board. Check whether the IN00 signal is transmitted and the sensor appropriately functions.	Reset the air pressure gauge. Replace the air pressure gauge. Part No.: G56042540A0 Filter regulator assembly
E050	Pause switch	Check whether the IN69 signal is transmitted and the sensor appropriately functions. Check whether or not the switch is kept in the pressed state.	Replace the stop switch. Part No.: 32002354 Pause switch
E052	Thread breakage detection error	Check the needle thread path. Check the connectors, CN62 and CN63, of the lower INT board. Check whether the IN32 and IN33 signals are transmitted and the sensor appropriately functions.	Replace the needle thread breakage detection sensor. Part No.: 40043997 Sensor assembly L Part No.: 40043996 Sensor assembly R
E303	Semilunar plate sensor error	Check the main shaft motor because the semilunar pate is integrated into the motor.	Replace the main shaft motor. Part No.: 40028015 AC servo motor
E366	Center knife not lowered	Check the connector, CN79, of the upper INT board. Check whether the IN49 signal is transmitted and the sensor appropriately functions.	Replace the center knife upper detection sensor. Part No.: 40044626 Sensor Part No.: PA1602012A0 Cylinder
E367	The corner knife cannot be inserted	Check the cylinder on the fixed side. Check the connectors, CN79 and CN80, of the lower INT board. Check whether the IN79 and IN80 signals are transmitted and the sensor appropriately functions.	Replace the cylinder sensor. Part No.: 40044627, 40044628 Sensor Part No.: 40023214 Cylinder
		Check the cylinder on the moving side. Check the connectors, CN81 and CN82, of the lower INT board. Check whether the IN81 and IN82 signals are transmitted and the sensor appropriately functions.	Replace the cylinder sensor. Part No.: 40044629, 40044630 Sensor Part No.: 40033799 Cylinder

Error code	Trouble	Checking item	Measures
E369	Undetected by the roller stacker owering end detection sensor	Check the connector, CN83, of the upper INT board. Check whether the IN91 signal is transmitted and the sensor appropriately functions.	Replace the roller stacker lifting detection cylinder sensor. Part No.: 40044632 Sensor Replace the cylinder. Part No.: 40033805 Cylinder
E373	Deterioration of right reflecting tape	Check whether the reflecting tape is attached appropriately so that the flap sensor aims at the center of the reflecting tape.	Replace the reflecting tape. Part No.: 40039942
E374	Deterioration of left reflecting tape		
E376	Continuous pedaling error	Check the connector, CN75, of the lower INT board. Check whether the pedal setting is appropriately implemented. Check whether the pedal returns to the neutral position.	Replace the pedal sensor. Part No.: 40006136 Sensor
E377	Undetected by the center knife upper detection sensor	Check the connector, CN79, of the upper INT board. Check whether the IN49 signal is transmitted and the sensor appropriately functions.	Replace the center measuring cylinder sensor. Part No.: 40044626 Sensor
E378	Undetected by the clamp bar stacker opening detection sensor	Check the connector, CN68, of the upper INT board. Check whether the IN83 signal is transmitted and the sensor appropriately functions.	Replace the binder opening detection micro switch. Part No.: 40044001 Switch
E379	Undetected by the roller stacker lifting detection sensor	Check the connector, CN83, of the upper INT board. Check whether the IN91 signal is transmitted and the sensor appropriately functions.	Replace the roller stacker lifting detection cylinder sensor. Part No.: 40044632 Sensor
E380	Unreceived by the flap sensor	Check whether or not the light-receiving surface of the sensor is clean. Check whether or not the reflecting tape is clean. Check whether the flap sensor is mounted appropriately. Check whether or not the LED of the sensor lights well. (The LED lights green and orange at the sensor ON, and lights only green at the sensor OFF.) Check the connectors, CN60 and CN61, of the lower INT board. Check whether the IN60 and IN61 signals are transmitted and the sensor appropriately functions.	Replace the reflecting tape. Part No.: 40039942 Reflecting tape Replace the flap sensor. Part No.: 40043999 Sensor assembly L Part No.: 40044000 Sensor assembly R
E381	Flap rear end undetected		
E382	Flap dust detection error		
E383	Flap front end undetected		
E386	Corner knife fixed side lower detection error	Check the connector, CN79, of the lower INT board. Check whether the IN79 signal is transmitted and the sensor appropriately functions.	Replace the cylinder sensor. Part No.: 40044627 Sensor Part No.: 40023214 Cylinder
E387	Corner knife fixed side upper detection error	Check the connector, CN80, of the lower INT board. Check whether the IN80 signal is transmitted and the sensor appropriately functions.	Replace the cylinder sensor. Part No.: 40044628 Sensor Part No.: 40023214 Cylinder
E388	Corner knife moving side lower detection error	Check the connector, CN81, of the lower INT board. Check whether the IN81 signal is transmitted and the sensor appropriately functions.	Replace the cylinder sensor. Part No.: 40044629 Sensor Part No.: 40033799 Cylinder
E389	Corner knife moving side upper detection error	Check the connector, CN82, of the lower INT board. Check whether the IN82 signal is transmitted and the sensor appropriately functions.	Replace the cylinder sensor. Part No.: 40044630 Sensor Part No.: 40033799 Cylinder

Error code	Trouble	Checking item	Measures
E390	Material sensor error	Check whether or not the light-receiving surface of the sensor is clean. Check whether or not the reflecting plate is clean. Check the sensor volume. Check the connector, CN65, of the upper INT board. Check whether the IN35 signal is transmitted and the sensor appropriately functions	Replace the reflecting plate. Replace the stacker material detection reflecting photosensor. Part No.: 40044002 Sensor
E391	ST presser lifting detection error	Check the connector, CN83, of the lower INT board. Check whether the IN92 signal is transmitted and the sensor appropriately functions.	Replace the clamp origin air cylinder sensor. Part No.: 40044631 Sensor Part No.: 40035148 Cylinder
E392	ST material wiping origin detection error	Check the connector, CN83, of the lower INT board. Check whether the IN90 signal is transmitted and the sensor appropriately functions.	Replace the material wiping origin air cylinder sensor. Part No.: 40044631 Sensor Part No.: 40035150 Cylinder
E393	Binder lower detection error	Check the connector, CN71, of the upper INT board. Check whether the IN41 signal is transmitted and the sensor appropriately functions.	Replace the binder upper detection photosensor. Part No.: HD00057000A Sensor
E394	Binder upper detection error		
E398	Corner knife drawing detection error	Check the connector, CN62, of the lower INT board. Check whether the IN62 signal is transmitted and the switch appropriately functions	Replace the corner knife drawing detection micro switch. Part No.: M8598610AA0 Switch
E399	Binder opening detection error	Check the connector, CN68, of the upper INT board. Check whether the IN83 signal is transmitted and the switch appropriately functions.	Replace the binder opening detection micro switch Part No.: 40044001 Switch
E702	CPU haywire detection	Replace the MAIN board if this occurs frequently.	Replace the MAIN board. Part No.: 40025270 MAIN board
E703	Connection of the panel to the machine other than supposed	Check the version with reference to the system revision chart.	Replace the IP-310 operation panel. Part No.: 40052016
E704	Nonagreement of system version		
E730	Main shaft motor encoder defectiveness or phase-out	Check the main shaft motor because the encoder and sensors are integrated into the motor. Check the connector, CN14, of the SDC board.	Replace the main shaft motor. Part No.: 40028015 AC servo motor
E731	Main motor hole sensor defectiveness or position sensor defectiveness		
E733	Reverse rotation of main shaft motor	Check the motor. Check the cable.	Replace the main shaft motor. Part No.: 40028015 AC servo motor
E802	Power short break detection	Check the power cable. Check whether the electrical plug is inserted into the outlet appropriately and the screws are tightened properly.	If no error is detected at the power supply side: Replace the SDC board. Part No.: 40032977 SDC board
E811	Power supply overvoltage error	Check the specifications of input power supply. Check the power cable.	
E813	Power supply low voltage error		
E901	Main shaft motor IPM error	Check whether the SDC board functions appropriately.	Replace the SDC board. Part No.: 40032977 SDC board

Error code	Trouble	Checking item	Measures
E903	Pulse motor power error	Check the SDC board. Check whether the fuse, F1, blew. Check whether DC power is short-circuited.	Replace the fuse. (F1: time lag fuse, 10 A) Replace the SDC board. Part No.: 40032977 SDC board
E904	Solenoid power source (24 V) error	Check the SDC board. Check whether the fuse, F2, blew. Check whether DC+24 V is short-circuited.	Replace the fuse. (F2: time lag fuse, 5 A) Replace the SDC board. Part No.: 40032977 SDC board
E905	Temperature error of heat sink for servo control board	Check whether the ventilating hole of BOX is blocked by dust. Check whether the fan motor operates appropriately. Check the SDC board wiring. If the wiring is in a disorder state, make it neat.	Replace the SDC board. Part No.: 40032977 SDC board
E915	Communication disabled between the operation panel and main CPU	Check the connector, CN26, of the MAIN board.	Replace the IP-310 operation panel. Part No.: 40052016
E916	Communication disabled between the main CPU and main shaft CPU	Check the connectors, CN34 and CN14, of the MAIN board and SDC board, respectively.	Replace the SDC board. Part No.: 40032977 SDC board
E917	Communication disabled between the operation panel and personal computer	Check the RS-232 cable. Check the PC setting.	Replace the IP-310 operation panel. Part No.: 40052016
E918	Temperature error of heat sink for the main board	Check whether the ventilating hole of BOX is blocked by dust. Check whether the fan motor operates appropriately. Check the MAIN board wiring. If the wiring is in a disorder state, make it neat.	Replace the MAIN board. Part No.: 40025270 MAIN board
E943	Error of EEP-ROM on the main CPU	Check whether U11_EEPROM is correctly mounted.	Replace the U11_EEPROM.
E984	Center knife motor error	Check the center knife motor.	Replace the motor. Part No.: HM002130000 Motor
E985	Clamp foot motor step-out error	Check whether the clamp foot moves smoothly without an abnormal load at power-off. Check the connector, CN66, of the upper INT board. Check whether the IN36 signal is transmitted and the sensor appropriately functions.	Replace the clamp foot step-out detection sensor. Part No.: HD00057000A Sensor
E986	Clamp foot pulse motor origin retrieval error	Check whether dust is stacked between the sensors. Check the connector, CN77, of the upper INT board. Check whether the IN47 signal is transmitted and the sensor appropriately functions.	Replace the clamp foot origin photosensor. Part No.: HD00057000A Sensor
E987	Back tuck motor origin retrieval error	Check whether dust is stacked between the sensors. Check the connector, CN38, of the MAIN board. Check whether the IN94 signal is transmitted and the sensor appropriately functions.	Back tuck motor origin photosensor. Part No.: HD00057000A Sensor
E998	Corner knife pulse motor origin retrieval error	Check whether dust is stacked between the sensors. Check the connector, CN37, of the MAIN board. Check whether the IN28 signal is transmitted and the sensor appropriately functions.	Replace the corner knife opening origin photosensor. Part No.: HD00057000A Sensor

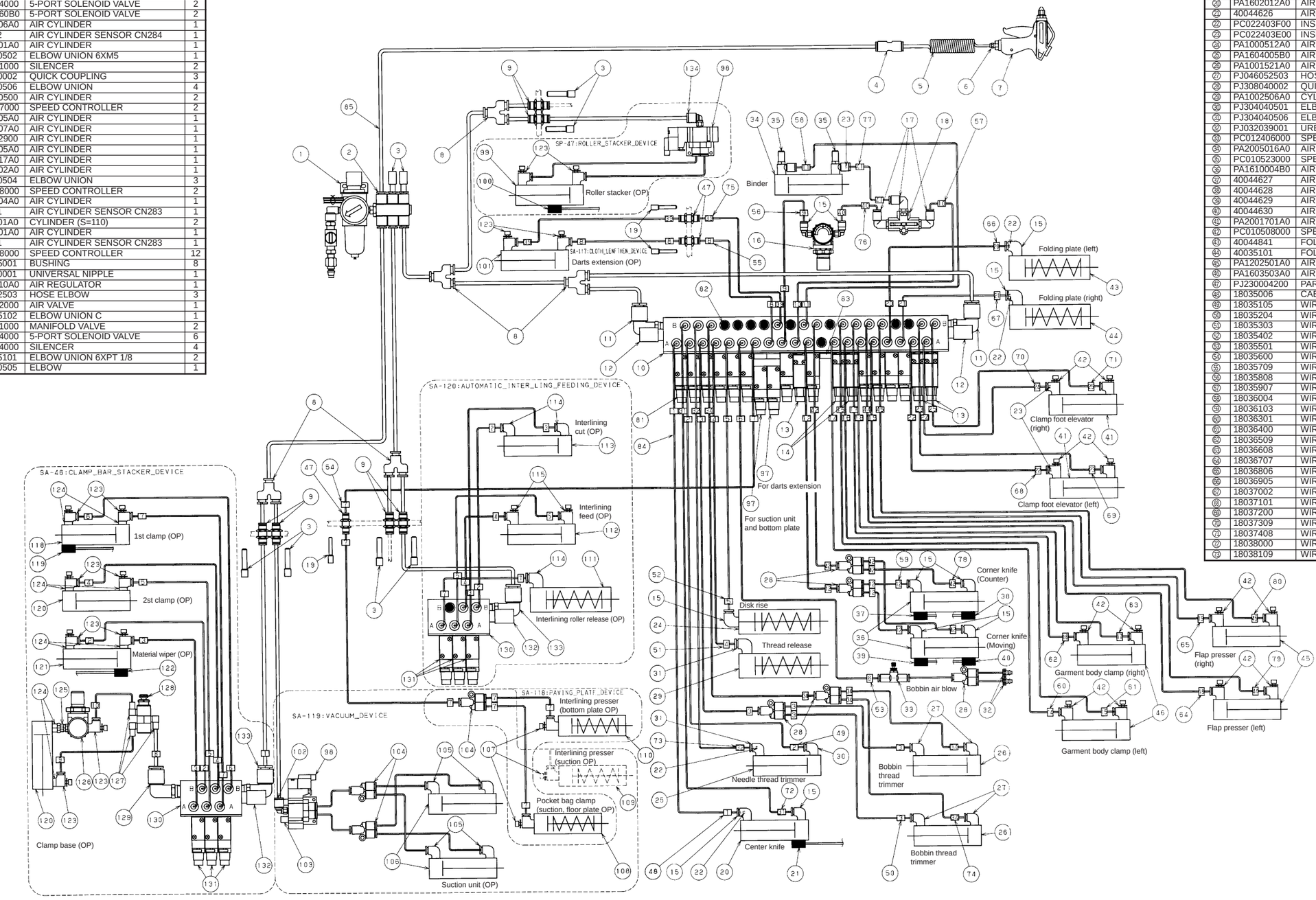
Error code	Trouble	Checking item	Measures
E999	Marking light motor origin retrieval error	Check whether dust is stacked between the sensors. Check the connector, CN36, of the MAIN board. Check the connector, CN75, of the upper INT board. Check whether the IN29 and IN45 signals are transmitted and the sensor appropriately functions.	Replace the marking light origin photosensors (2 pieces). Part No.: HD00057000A Sensor

No.	Other troubles	Checking item	Measures
1	Low level of the marking light	Check whether the luminance adjustment volume is appropriately set.	Perform fine adjustment by rotating the volume clockwise. **(Caution) The volume adjustment range is less than 360 degrees.**
2	Marking light invisible (light shutoff)	This indicates that an error occurred.	The light is turned off because of an error. The machine functions normally.
		No error is displayed on the IP panel.	Check the connectors, CN85A and CN85B, of the INT boards, A and B, respectively.
3	Excessively bright marking light	Check whether the luminance adjustment volume is appropriately set.	Turn the knob counterclockwise slightly to decrease the luminance. **(Caution) The volume adjustment range is less than 360 degrees.**
4	Too thick marking light ray	Check whether the luminance adjustment volume is appropriately set.	Turn the knob counterclockwise slightly to decrease the luminance. **(Caution) The volume adjustment range is less than 360 degrees.**
5	Sewing pattern data deleted	For the case of replacing the MAIN board	Demount the EEPROM (U11) from the former MAIN board and mount it on the new MAIN board.
		For the case of upgrading the software	Initialization is performed because the post-upgrading software is incompatible with the pre-upgrading software. Reenter the sewing pattern data.
		For the cases other than board replacement and software upgrading	Replace the MAIN board. Part No.: 40025270 MAIN board
6	Bobbin thread winding unit disabled	Check the connector, CN54, of the MAIN board.	Replace the bobbin thread winding unit.
7	The key switches of the IP panel disabled	The key switches do not function regardless of the presence of operation sound. Or a different switch responds.	Perform touch panel correction in the check program.
		Key operation sound is not generated.	Replace the IP-310 operation panel. Part No.:40052016
8	Nothing displayed on the IP panel	Check whether the cable is connected appropriately between the IP panel and MAIN board	Replace the IP-310 operation panel. Part No.:40052016
9	The power switch of the vacuum system automatically turned off	Check the power supply voltage of the motor drive. Check whether the motor is heated.	Replace the vacuum motor. Part No.: G6951172CA0 Adjust the thermal level (3.6 A) of the power switch.

MEMO

11. Air circuit diagram

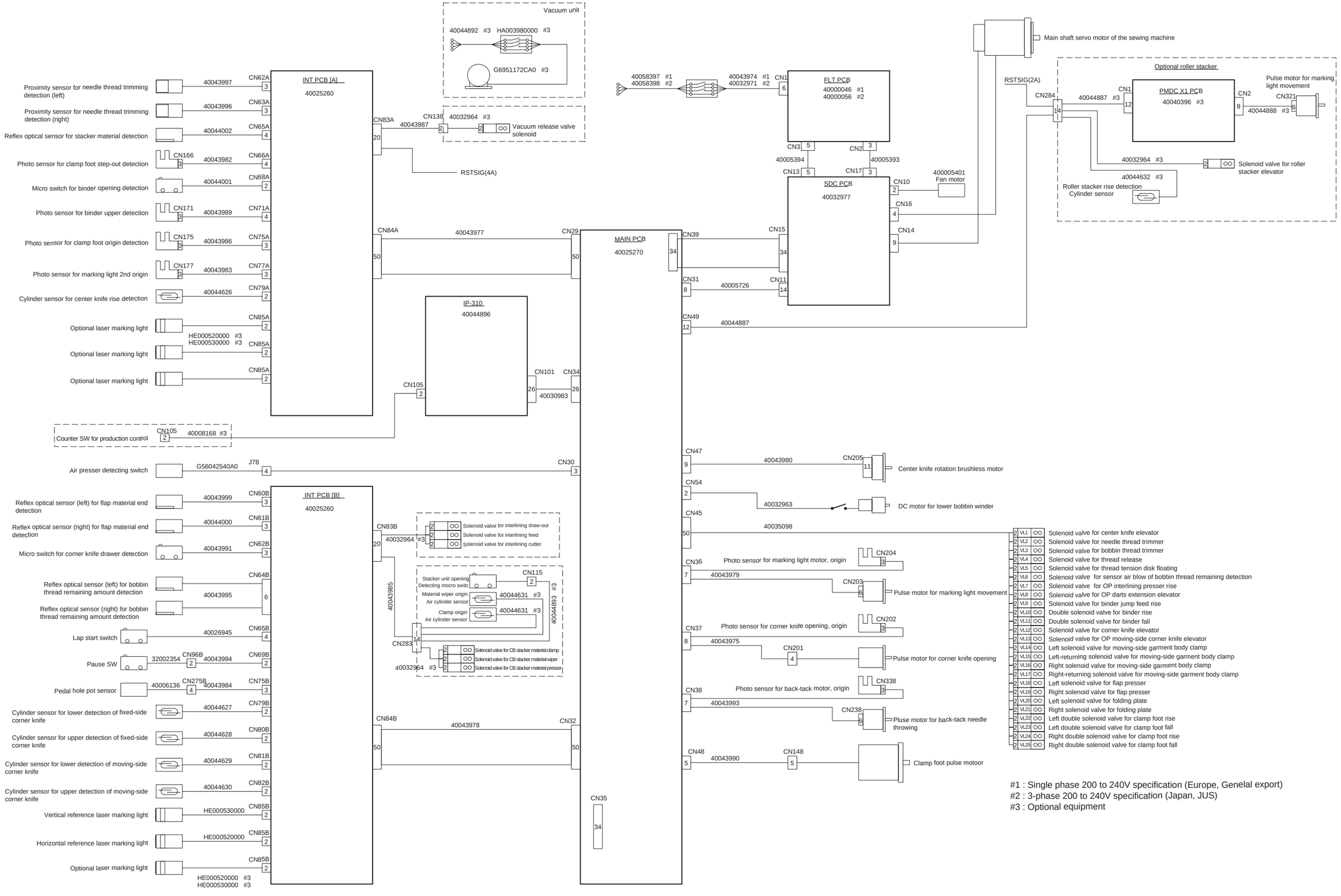
No.	Part No.	Part Name	Q'ty
⑦④	18038307	WIRE MARK (34)	6
⑦⑤	18038802	WIRE MARK (39)	2
⑦⑥	18038901	WIRE MARK (40)	2
⑦⑦	18039008	WIRE MARK (41)	2
⑦⑧	18039107	WIRE MARK (42)	6
⑦⑨	18039305	WIRE MARK (44)	2
⑧⑥	18039404	WIRE MARK (45)	2
⑧①	PV150104000	5-PORT SOKENOID VALVE	12
⑧②	40044631	PLUG 4	9
⑧③	PV920004000	BLANKING PLATE ASSY	3
⑧④	BT0400251EB	URETHANE HUSE, BLACK	
⑧⑤	BT0600400EC	TUBE HOSE, BLUE	
Option			
⑨⑦	PV150104000	5-PORT SOLENOID VALVE	2
⑨⑧	PV1502060B0	5-PORT SOLENOID VALVE	2
⑨⑨	PA2001006A0	AIR CYLINDER	1
⑩⑩	40044632	AIR CYLINDER SENSOR CN284	1
⑩①	PA1609501A0	AIR CYLINDER	1
⑩②	PJ304060502	ELBOW UNION 6XM5	1
⑩③	PX050501000	SILENCER	2
⑩④	PJ308040002	QUICK COUPLING	3
⑩⑤	PJ304040506	ELBOW UNION	4
⑩⑥	PA160100500	AIR CYLINDER	2
⑩⑦	PC010507000	SPEED CONTROLLER	2
⑩⑧	PA1500505A0	AIR CYLINDER	1
⑩⑨	PA1501007A0	AIR CYLINDER	1
⑪⑩	PA160152900	AIR CYLINDER	1
⑪①	PA0600505A0	AIR CYLINDER	1
⑪②	PA1001017A0	AIR CYLINDER	1
⑪③	PA1600802A0	AIR CYLINDER	1
⑪④	PJ304040504	ELBOW UNION	3
⑪⑤	PC010508000	SPEED CONTROLLER	2
⑪⑥	PA2505004A0	AIR CYLINDER	1
⑪⑨	40044631	AIR CYLINDER SENSOR CN283	1
⑫⑩	PA2511001A0	CYLINDER (S=110)	2
⑫①	PA2016001A0	AIR CYLINDER	1
⑫②	40044631	AIR CYLINDER SENSOR CN283	1
⑫③	PC015108000	SPEED CONTROLLER	12
⑫④	PJ015105001	BUSHING	8
⑫⑤	PJ030050001	UNIVERSAL NIPPLE	1
⑫⑥	PF0205010A0	AIR REGULATOR	1
⑫⑦	PJ046052503	HOSE ELBOW	3
⑫⑧	PV010502000	AIR VALVE	1
⑫⑨	PJ304045102	ELBOW UNION C	1
⑬⑩	PV035161000	MANIFOLD VALVE	2
⑬①	PV150104000	5-PORT SOLENOID VALVE	6
⑬②	PX055104000	SILENCER	4
⑬③	PJ304065101	ELBOW UNION 6XPT 1/8	2
⑬④	PJ304040505	ELBOW	1



No.	Part No.	Part Name	Q'ty
①	G56042540A0	FILTER REGULATER ASM	1
②	PJ309065201	TRIPLE_BRANCH_UNIVERSAL_ELBOW	1
③	PX950001000	PLUG	8
④	PJ303060001	STARAIGHT_UNION	1
⑤	G5458116000	CURLED_TUBE	1
⑥	PJ301065201	HALF UNION 6XPT1/4	1
⑦	40044823	AIR_GUN	1
⑧	PJ308060003	Y_UNION	5
⑨	PJ230006200	UNION	6
⑩	40035097	MANIFOLD_VALVE_ASSY	1
⑪	PJ304065101	ELBOW UNION 6XPT1/8	2
⑫	PX055104000	SILENCER	4
⑬	PV150106000	5-PORT SOLENOID VALVE	3
⑭	PV150105000	5-PORT SOLENOID VALVE	2
⑮	PJ304040504	UNION	11
⑯	PF0205010C0	AIR REGULATOR	1
⑰	PJ304045102	ELBOW UNION C	3
⑱	PV205101000	SHUTTLE VALVE	1
⑲	PX500014000	PLUG 4	3
⑳	PA1602012A0	AIR CYKUBDER	1
㉑	40044626	AIRCYLINDER SENSOR CN79A	1
㉒	PC022403F00	INSERT RING 0.6	4
㉓	PC022403E00	INSERT RING 0.5	3
㉔	PA1000512A0	AIR CYLINDER	1
㉕	PA1604005B0	AIR CYLINDER	1
㉖	PA1001521A0	AIR CYLINDER	2
㉗	PJ046052503	HOSE ELBOW	4
㉘	PJ308040002	QUICK JOINT	5
㉙	PA1002506A0	CYLINDER	1
㉚	PJ304040501	ELBOW UNION 4XM5	1
㉛	PJ304040506	ELBOW UNION 4XM5 (0.8)	2
㉜	PJ032039001	URETHANE BARBED JOINT	2
㉝	PC012406000	SPEED CONTROLLER	1
㉞	PA2005016A0	AIR CYLINDER	1
㉟	PC010523000	SPEED CONTROLLER	2
㊱	PA1610004B0	AIR CYLINDER	2
㊲	40044627	AIR CYLINDER SENSOR CN79B	1
㊳	40044628	AIR CYLINDER SENSOR CN80B	1
㊴	40044629	AIR CYLINDER SENSOR CN81B	1
㊵	40044630	AIR CYLINDER SENSOR CN82B	1
㊶	PA2001701A0	AIR CLINDER	2
㊷	PC010508000	SPEED CONTROLLER	12
㊸	40044841	FOLDING_PLATE_CYLINDER_L	1
㊹	40035101	FOLDING_PLATE_CYLINDER_R	1
㊺	PA1202501A0	AIR CYLINDER	2
㊻	PA1603503A0	AIR CYLINDER	2
㊼	PJ230004200	PARTITION UNION	3
㊽	18035006	CABLE MARK NO. 1	2
㊾	18035105	WIRE MARK (2)	2
㊿	18035204	WIRE MARK (3)	6
(51)	18035303	WIRE MARK (4)	2
(52)	18035402	WIRE MARK (5)	2
(53)	18035501	WIRE MARK (6)	2
(54)	18035600	WIRE MARK (7)	4
(55)	18035709	WIRE MARK (8)	2
(56)	18035808	WIRE MARK (9)	2
(57)	18035907	WIRE MARK (10)	2
(58)	18036004	WIRE MARK (11)	2
(59)	18036103	WIRE MARK (12)	6
(60)	18036301	WIRE MARK (14)	2
(61)	18036400	WIRE MARK (15)	2
(62)	18036509	WIRE MARK (16)	2
(63)	18036608	WIRE MARK (17)	2
(64)	18036707	WIRE MARK (18)	2
(65)	18036806	WIRE MARK (19)	2
(66)	18036905	WIRE MARK (20)	2
(67)	18037002	WIRE MARK (21)	2
(68)	18037101	WIRE MARK (22)	2
(69)	18037200	WIRE MARK (23)	2
(70)	18037309	WIRE MARK (24)	2
(71)	18037408	WIRE MARK (25)	2
(72)	18038000	WIRE MARK (31)	2
(73)	18038109	WIRE MARK (32)	2

12. Circuit diagrams

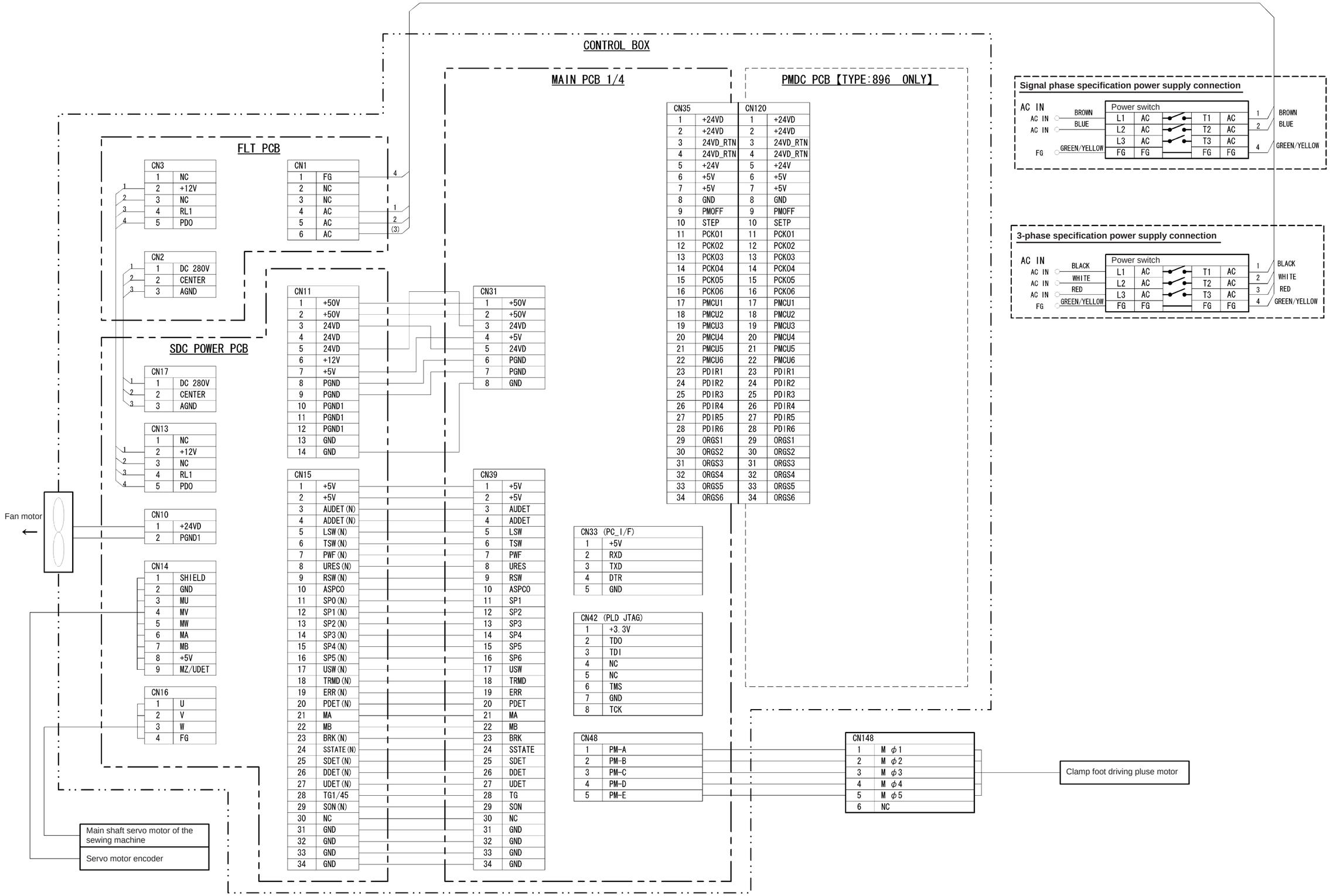
(1) Block diagram



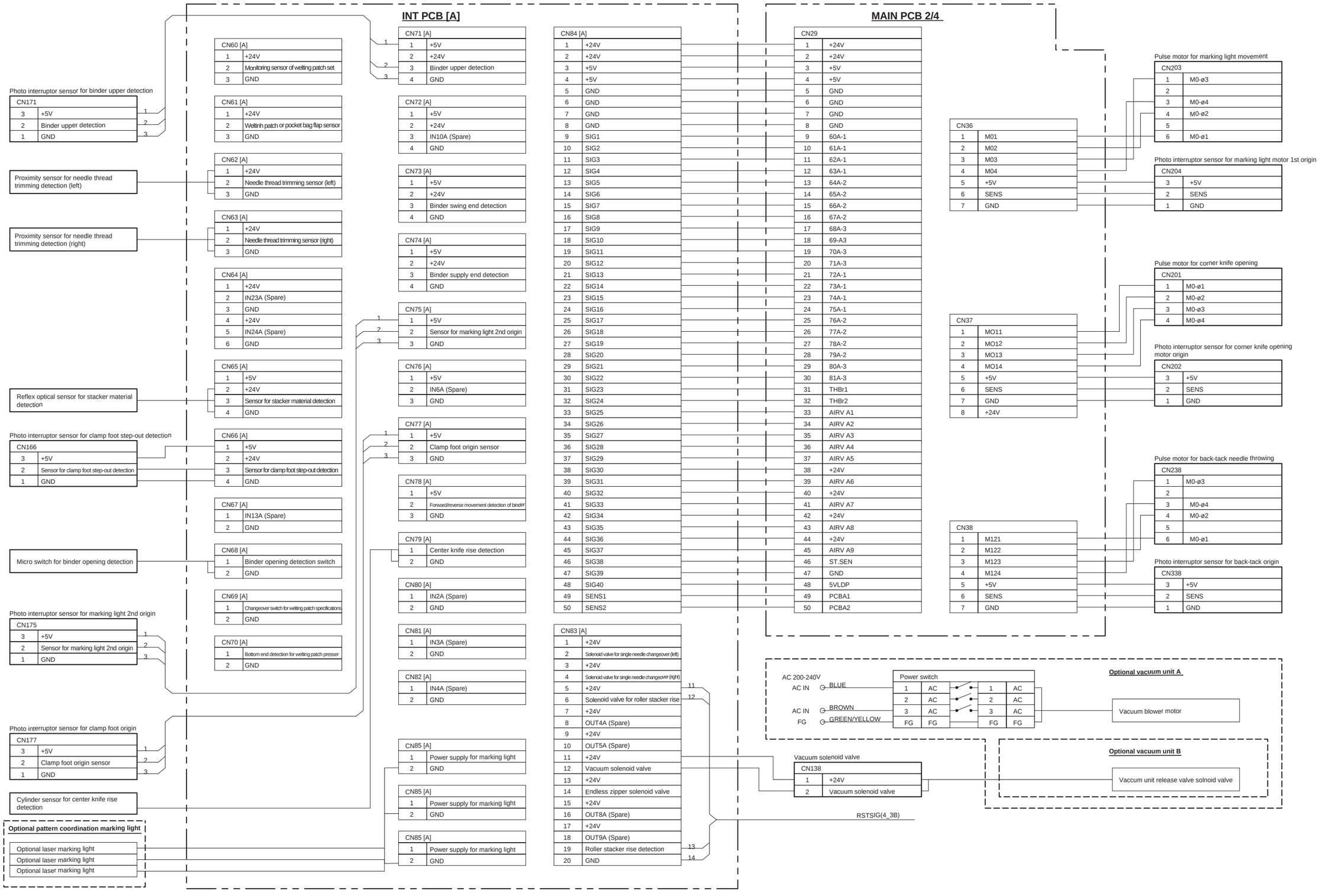
#1 : Single phase 200 to 240V specification (Europe, Genelal export)
#2 : 3-phase 200 to 240V specification (Japan, JUS)
#3 : Optional equipment

(2) Connection diagram

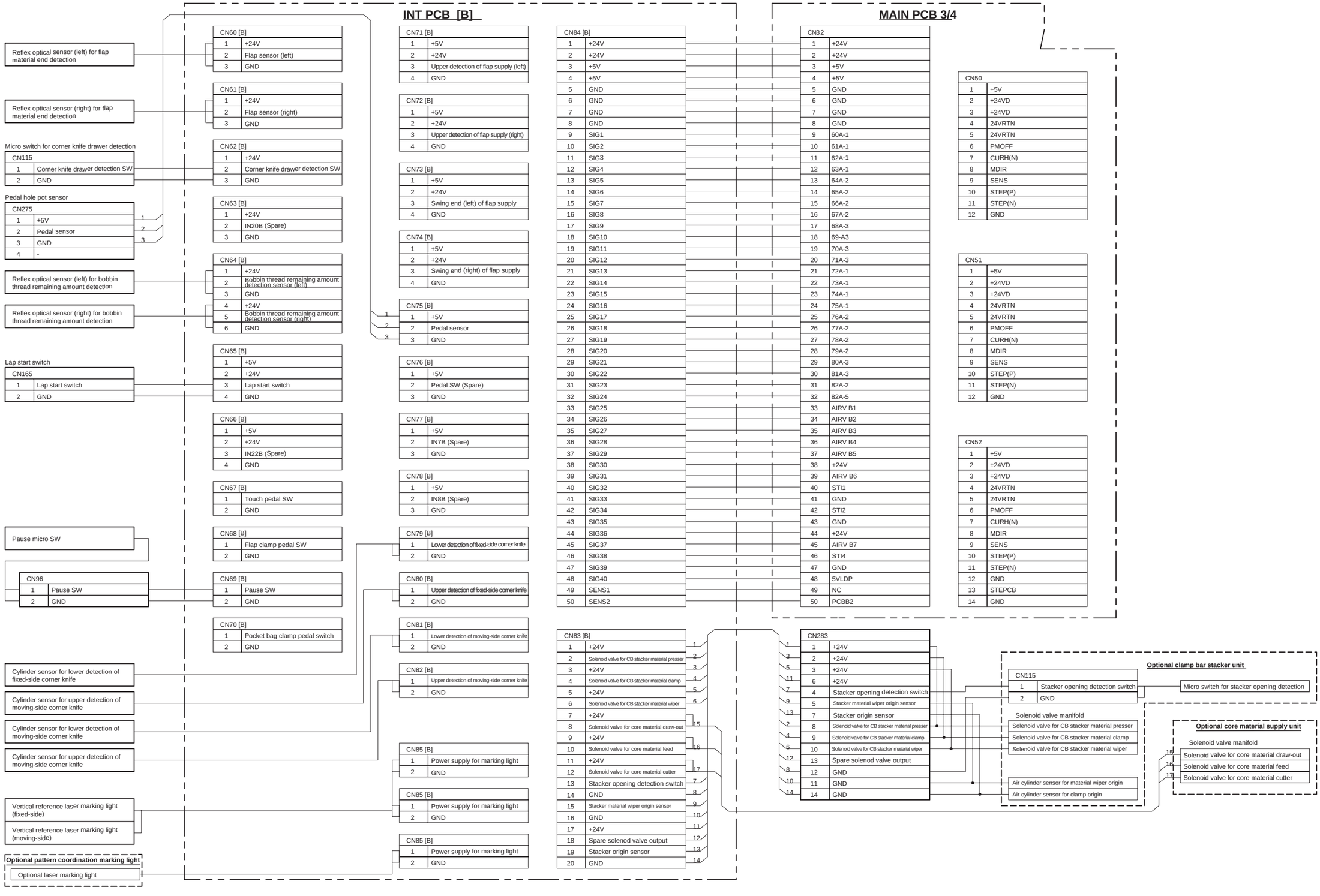
1) Diagram 1



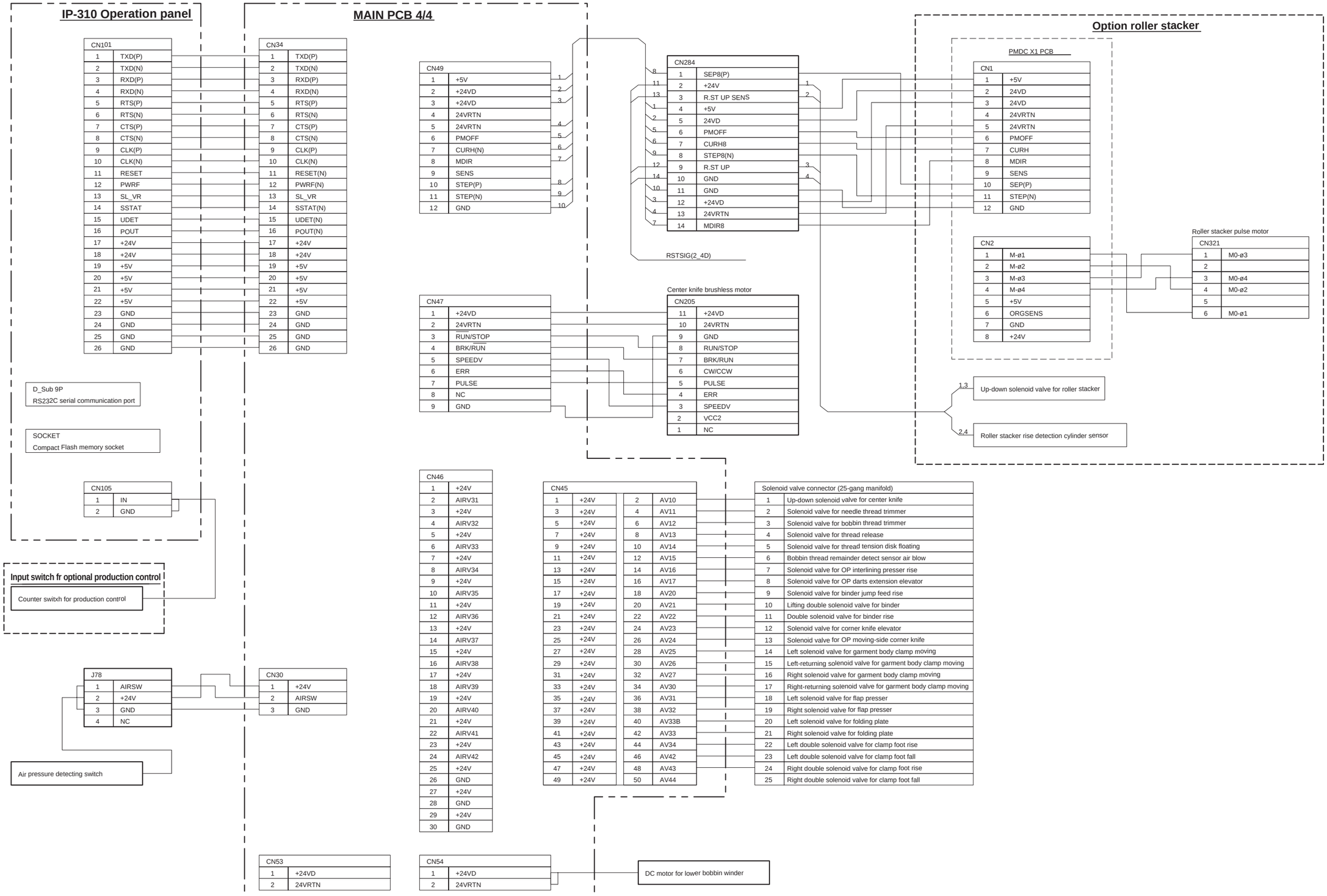
2) Diagram 2


INT PCB [A]
MAIN PCB 2/4
Photo interruptor sensor for binder upper detection
CN171
3 +5V
2 Binder upper detection
1 GND
Proximity sensor for needle thread trimming detection (left)
Proximity sensor for needle thread trimming detection (right)
Reflex optical sensor for stacker material detection
Photo interruptor sensor for clamp foot step-out detection
CN166
3 +5V
2 Sensor for clamp foot step-out detection
1 GND
Micro switch for binder opening detection
Photo interruptor sensor for marking light 2nd origin
CN175
3 +5V
2 Sensor for marking light 2nd origin
1 GND
Photo interruptor sensor for clamp foot origin
CN177
3 +5V
2 Clamp foot origin sensor
1 GND
Cylinder sensor for center knife rise detection
Optional pattern coordination marking light
Optional laser marking light
Optional laser marking light
Optional laser marking light
CN60 [A]
1 +24V
2 Monitoring sensor of welting patch set
3 GND
CN61 [A]
1 +24V
2 Weltinh patch or pocket bag flap sensor
3 GND
CN62 [A]
1 +24V
2 Needle thread trimming sensor (left)
3 GND
CN63 [A]
1 +24V
2 Needle thread trimming sensor (right)
3 GND
CN64 [A]
1 +24V
2 IN23A (Spare)
3 GND
4 +24V
5 IN24A (Spare)
6 GND
CN65 [A]
1 +5V
2 +24V
3 Sensor for stacker material detection
4 GND
CN66 [A]
1 +5V
2 +24V
3 Sensor for clamp foot step-out detection
4 GND
CN67 [A]
1 IN13A (Spare)
2 GND
CN68 [A]
1 Binder opening detection switch
2 GND
CN69 [A]
1 Changeover switch for welting patch specifications
2 GND
CN70 [A]
1 Bottom end detection for welting patch presser
2 GND
CN71 [A]
1 +5V
2 +24V
3 Binder upper detection
4 GND
CN72 [A]
1 +5V
2 +24V
3 IN10A (Spare)
4 GND
CN73 [A]
1 +5V
2 +24V
3 Binder swing end detection
4 GND
CN74 [A]
1 +5V
2 +24V
3 Binder supply end detection
4 GND
CN75 [A]
1 +5V
2 Sensor for marking light 2nd origin
3 GND
CN76 [A]
1 +5V
2 IN6A (Spare)
3 GND
CN77 [A]
1 +5V
2 Clamp foot origin sensor
3 GND
CN78 [A]
1 +5V
2 Forward/reverse movement detection of binder
3 GND
CN79 [A]
1 Center knife rise detection
2 GND
CN80 [A]
1 IN2A (Spare)
2 GND
CN81 [A]
1 IN3A (Spare)
2 GND
CN82 [A]
1 IN4A (Spare)
2 GND
CN85 [A]
1 Power supply for marking light
2 GND
CN85 [A]
1 Power supply for marking light
2 GND
CN85 [A]
1 Power supply for marking light
2 GND
CN84 [A]
1 +24V
2 +24V
3 +5V
4 +5V
5 GND
6 GND
7 GND
8 GND
9 SIG1
10 SIG2
11 SIG3
12 SIG4
13 SIG5
14 SIG6
15 SIG7
16 SIG8
17 SIG9
18 SIG10
19 SIG11
20 SIG12
21 SIG13
22 SIG14
23 SIG15
24 SIG16
25 SIG17
26 SIG18
27 SIG19
28 SIG20
29 SIG21
30 SIG22
31 SIG23
32 SIG24
33 SIG25
34 SIG26
35 SIG27
36 SIG28
37 SIG29
38 SIG30
39 SIG31
40 SIG32
41 SIG33
42 SIG34
43 SIG35
44 SIG36
45 SIG37
46 SIG38
47 SIG39
48 SIG40
49 SENS1
50 SENS2
CN83 [A]
1 +24V
2 Solenoid valve for single needle changeover (left)
3 +24V
4 Solenoid valve for single needle changeover (right)
5 +24V
6 Solenoid valve for roller stacker rise
7 +24V
8 OUT4A (Spare)
9 +24V
10 OUT5A (Spare)
11 +24V
12 Vacuum solenoid valve
13 +24V
14 Endless zipper solenoid valve
15 +24V
16 OUT8A (Spare)
17 +24V
18 OUT9A (Spare)
19 Roller stacker rise detection
20 GND
CN29
1 +24V
2 +24V
3 +5V
4 +5V
5 GND
6 GND
7 GND
8 GND
9 60A-1
10 61A-1
11 62A-1
12 63A-1
13 64A-2
14 65A-2
15 66A-2
16 67A-2
17 68A-3
18 69-A3
19 70A-3
20 71A-3
21 72A-1
22 73A-1
23 74A-1
24 75A-1
25 76A-2
26 77A-2
27 78A-2
28 79A-2
29 80A-3
30 81A-3
31 THBr1
32 THBr2
33 AIRV A1
34 AIRV A2
35 AIRV A3
36 AIRV A4
37 AIRV A5
38 +24V
39 AIRV A6
40 +24V
41 AIRV A7
42 +24V
43 AIRV A8
44 +24V
45 AIRV A9
46 ST.SEN
47 GND
48 5VLDP
49 PCBA1
50 PCBA2
CN36
1 M01
2 M02
3 M03
4 M04
5 +5V
6 SENS
7 GND
CN37
1 MO11
2 MO12
3 MO13
4 MO14
5 +5V
6 SENS
7 GND
8 +24V
CN38
1 M121
2 M122
3 M123
4 M124
5 +5V
6 SENS
7 GND
Pulse motor for marking light movement
CN203
1 M0-ø3
2
3 M0-ø4
4 M0-ø2
5
6 M0-ø1
Photo interruptor sensor for marking light motor 1st origin
CN204
3 +5V
2 SENS
1 GND
Pulse motor for corner knife opening
CN201
1 M0-ø1
2 M0-ø2
3 M0-ø3
4 M0-ø4
Photo interruptor sensor for corner knife opening motor origin
CN202
3 +5V
2 SENS
1 GND
Pulse motor for back-tack needle throwing
CN238
1 M0-ø3
2
3 M0-ø4
4 M0-ø2
5
6 M0-ø1
Photo interruptor sensor for back-tack origin
CN338
3 +5V
2 SENS
1 GND
AC 200-240V
AC IN BLUE
AC IN BROWN
FG GREEN/YELLOW
Power switch
Optional vacuum unit A
Vacuum blower motor
Optional vacuum unit B
Vaccum unit release valve solnoid valve
Vacuum solenoid valve
CN138
1 +24V
2 Vacuum solenoid valve
RSTSIG(4_3B)

3) Diagram 3


INT PCB [B]
MAIN PCB 3/4
Reflex optical sensor (left) for flap material end detection
Reflex optical sensor (right) for flap material end detection
Micro switch for corner knife drawer detection
Pedal hole pot sensor
Reflex optical sensor (left) for bobbin thread remaining amount detection
Reflex optical sensor (right) for bobbin thread remaining amount detection
Lap start switch
Pause micro SW
Cylinder sensor for lower detection of fixed-side corner knife
Cylinder sensor for upper detection of moving-side corner knife
Cylinder sensor for lower detection of moving-side corner knife
Cylinder sensor for upper detection of moving-side corner knife
Vertical reference laser marking light (fixed-side)
Vertical reference laser marking light (moving-side)
Optional pattern coordination marking light
Optional laser marking light
Optional clamp bar stacker unit
Micro switch for stacker opening detection
Stacker opening detection switch
Solenoid valve manifold
Solenoid valve for CB stacker material presser
Solenoid valve for CB stacker material clamp
Solenoid valve for CB stacker material wiper
Air cylinder sensor for material wiper origin
Air cylinder sensor for clamp origin
Optional core material supply unit
Solenoid valve manifold
Solenoid valve for core material draw-out
Solenoid valve for core material feed
Solenoid valve for core material cutter

4) Diagram 4



CN101	
1	TXD(P)
2	TXD(N)
3	RXD(P)
4	RXD(N)
5	RTS(P)
6	RTS(N)
7	CTS(P)
8	CTS(N)
9	CLK(P)
10	CLK(N)
11	RESET
12	PWRF
13	SL_VR
14	SSTAT
15	UDET
16	POUT
17	+24V
18	+24V
19	+5V
20	+5V
21	+5V
22	+5V
23	GND
24	GND
25	GND
26	GND

CN34	
1	TXD(P)
2	TXD(N)
3	RXD(P)
4	RXD(N)
5	RTS(P)
6	RTS(N)
7	CTS(P)
8	CTS(N)
9	CLK(P)
10	CLK(N)
11	RESET(N)
12	PWRF(N)
13	SL_VR
14	SSTAT(N)
15	UDET(N)
16	POUT(N)
17	+24V
18	+24V
19	+5V
20	+5V
21	+5V
22	+5V
23	GND
24	GND
25	GND
26	GND

CN49	
1	+5V
2	+24VD
3	+24VD
4	24VRTN
5	24VRTN
6	PMOFF
7	CURH(N)
8	MDIR
9	SENS
10	STEP(P)
11	STEP(N)
12	GND

CN284	
1	SEP8(P)
2	+24V
3	R.ST UP SENS
4	+5V
5	24VD
6	PMOFF
7	CURH8
8	STEP8(N)
9	R.ST UP
10	GND
11	GND
12	+24VD
13	24VRTN
14	MDIR8

CN1	
1	+5V
2	24VD
3	24VD
4	24VRTN
5	24VRTN
6	PMOFF
7	CURH
8	MDIR
9	SENS
10	SEP(P)
11	STEP(N)
12	GND

CN2	
1	M-ø1
2	M-ø2
3	M-ø3
4	M-ø4
5	+5V
6	ORGSENS
7	GND
8	+24V

CN321	
1	M0-ø3
2	
3	M0-ø4
4	M0-ø2
5	
6	M0-ø1

CN47	
1	+24VD
2	24VRTN
3	RUN/STOP
4	BRK/RUN
5	SPEEDV
6	ERR
7	PULSE
8	NC
9	GND

CN205	
11	+24VD
10	24VRTN
9	GND
8	RUN/STOP
7	BRK/RUN
6	CW/CCW
5	PULSE
4	ERR
3	SPEEDV
2	VCC2
1	NC

CN46	
1	+24V
2	AIRV31
3	+24V
4	AIRV32
5	+24V
6	AIRV33
7	+24V
8	AIRV34
9	+24V
10	AIRV35
11	+24V
12	AIRV36
13	+24V
14	AIRV37
15	+24V
16	AIRV38
17	+24V
18	AIRV39
19	+24V
20	AIRV40
21	+24V
22	AIRV41
23	+24V
24	AIRV42
25	+24V
26	GND
27	+24V
28	GND
29	+24V
30	GND

CN45			
1	+24V	2	AV10
3	+24V	4	AV11
5	+24V	6	AV12
7	+24V	8	AV13
9	+24V	10	AV14
11	+24V	12	AV15
13	+24V	14	AV16
15	+24V	16	AV17
17	+24V	18	AV20
19	+24V	20	AV21
21	+24V	22	AV22
23	+24V	24	AV23
25	+24V	26	AV24
27	+24V	28	AV25
29	+24V	30	AV26
31	+24V	32	AV27
33	+24V	34	AV30
35	+24V	36	AV31
37	+24V	38	AV32
39	+24V	40	AV33B
41	+24V	42	AV33
43	+24V	44	AV34
45	+24V	46	AV42
47	+24V	48	AV43
49	+24V	50	AV44

Solenoid valve connector (25-gang manifold)	
1	Up-down solenoid valve for center knife
2	Solenoid valve for needle thread trimmer
3	Solenoid valve for bobbin thread trimmer
4	Solenoid valve for thread release
5	Solenoid valve for thread tension disk floating
6	Bobbin thread remainder detect sensor air blow
7	Solenoid valve for OP interlining presser rise
8	Solenoid valve for OP darts extension elevator
9	Solenoid valve for binder jump feed rise
10	Lifting double solenoid valve for binder
11	Double solenoid valve for binder rise
12	Solenoid valve for corner knife elevator
13	Solenoid valve for OP moving-side corner knife
14	Left solenoid valve for garment body clamp moving
15	Left-returning solenoid valve for garment body clamp moving
16	Right solenoid valve for garment body clamp moving
17	Right-returning solenoid valve for garment body clamp moving
18	Left solenoid valve for flap presser
19	Right solenoid valve for flap presser
20	Left solenoid valve for folding plate
21	Right solenoid valve for folding plate
22	Left double solenoid valve for clamp foot rise
23	Left double solenoid valve for clamp foot fall
24	Right double solenoid valve for clamp foot rise
25	Right double solenoid valve for clamp foot fall

CN105	
1	IN
2	GND

J78	
1	AIRSW
2	+24V
3	GND
4	NC

CN30	
1	+24V
2	AIRSW
3	GND

CN53	
1	+24VD
2	24VRTN

CN54	
1	+24VD
2	24VRTN

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The environmental management system to promote and conduct
①the technological and technical research, the development and design of the products in which the environmental impact is considered,
②the conservation of the energy and resources, and the recycling, in the research, development, design, distribution, sale and maintenance service of the industrial sewing machines, household sewing machines and industrial-use robots, etc. and in the sale and maintenance service of data entry system and in the purchase, distribution and sale of the household commodities including the healthcare products.

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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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