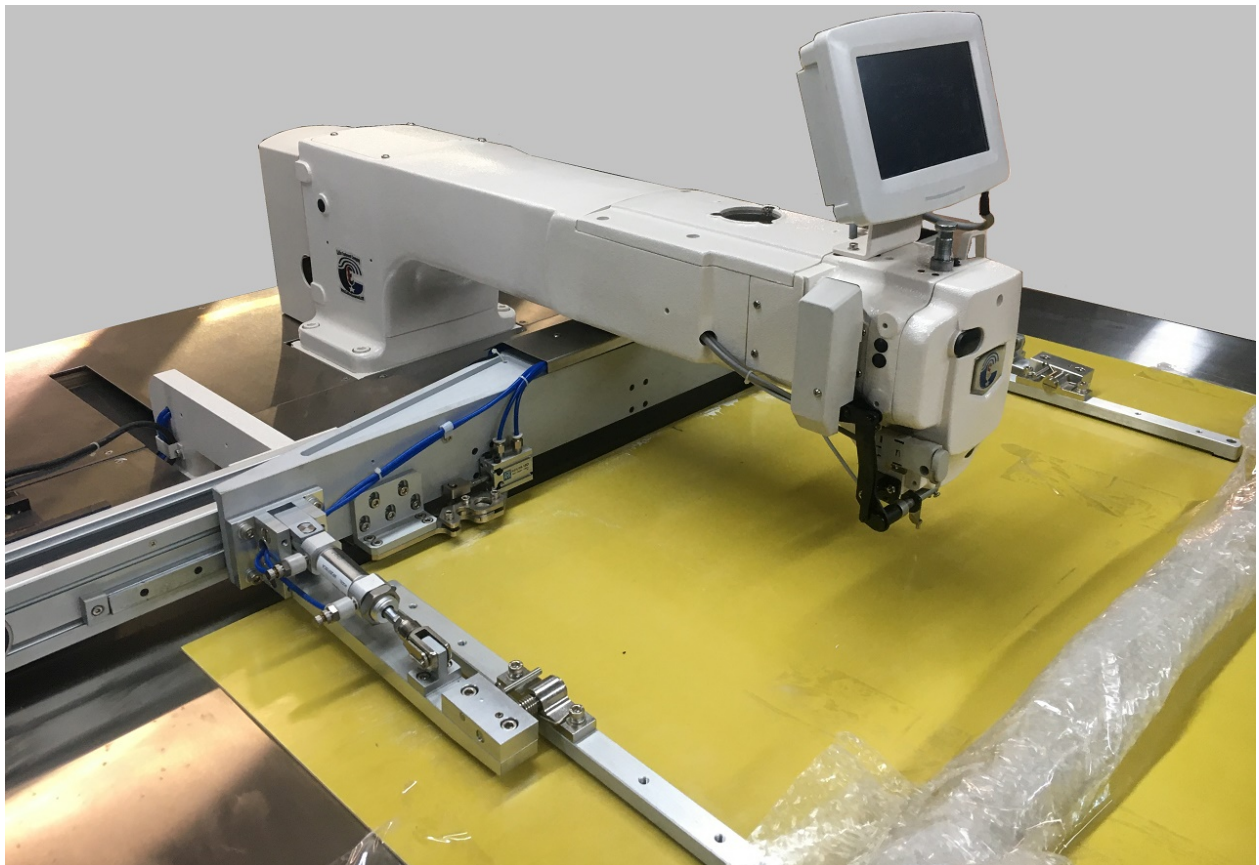


CEDAR *Special*

Computer-controlled, Cycle Machine
With Input Function

CS-6040 Series

ENGINEER'S MANUAL



Collier Equipment

The home of **CEDAR** *Special* &
CEDAR Systems Automated Sewing Devices

100 Mill Creek Circle/Po Box 175
Lexington, Alabama 35648 USA
Phone: (256)229-6595 Fax: (256)229-6779

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 detail. And this manual describes "Standard Adjustment", "Adjustment Procedures", "Results of Improper Adjustment", and other important information which are not covered in the Instruction Manual.

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

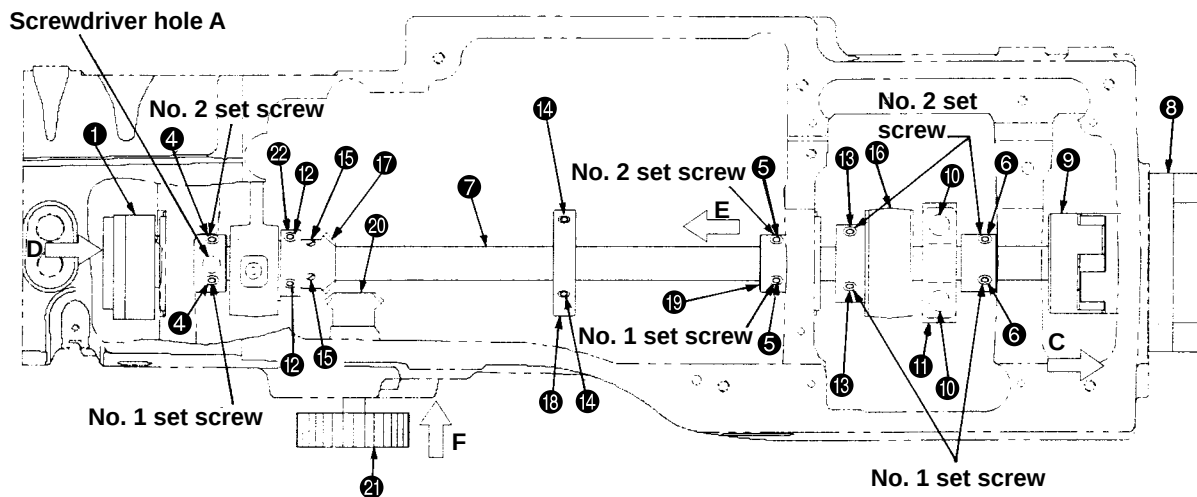
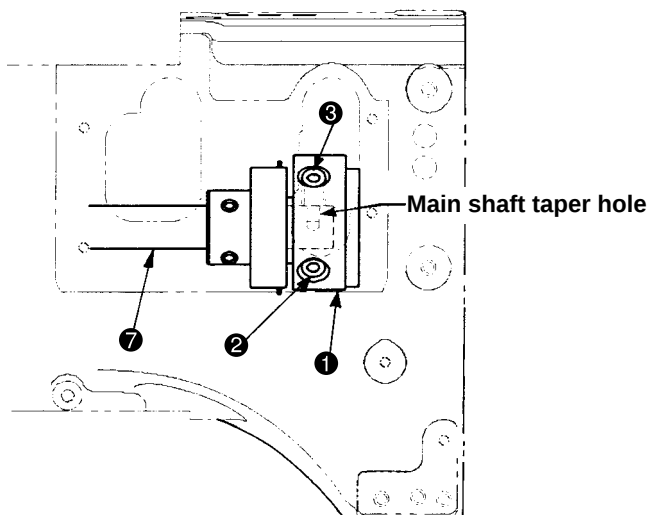
In addition, for the motor for the sewing machine with thread trimmer, refer to the separate Instruction Manual or This manual gives the "Standard Adjustment" on the former page under which the most basic adjustment value is described, and on the latter page "Results if Improper Adjustment" under which stitching errors and troubles arising from mechanical failures and "How to adjust" are described.

3. Standard adjustment

(1) Main shaft connection/disconnection

Procedures of disassembling

1. Loosen the set screw ② securing the main shaft counterbalance ①, and remove the taper screw ③.
2. Loosen 2 set screws ④ (through the screwdriver hole A), 2 set screws ⑤, and 2 set screws ⑥.
On this occasion, loosen No. 2 set screw first, and completely remove No. 1 set screw from the flat part of the main shaft ⑦.
3. Remove the main shaft motor ⑧.
Refer to "3.-(2) Removal of the main shaft motor and coupling".
4. Loosen 2 set screws ⑩.
On this occasion, be aware that the balancer ⑪ may rotate due to loosened set screws ⑩.
5. Loosen 2 set screws ⑫.
6. Loosen 2 set screws ⑬.
On this occasion, completely remove No. 1 set screw of the set screws ⑬ from the flat part of the main shaft ⑦.
7. Loosen 2 set screws ⑭ and 2 set screws ⑮.
8. Pull out the main shaft ⑦ in the direction of Arrow C.



Procedures of assembling

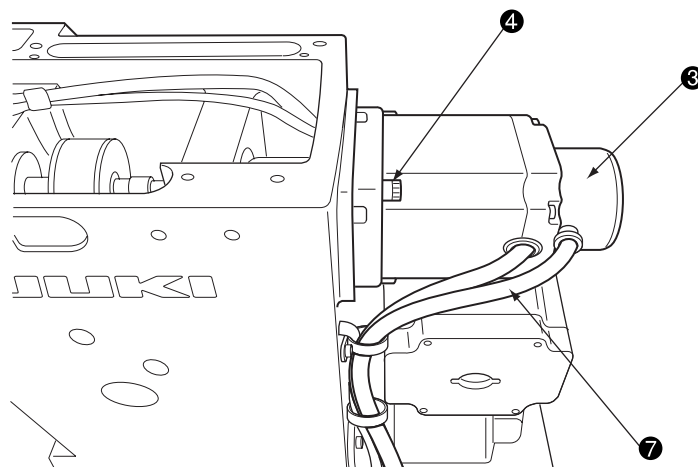
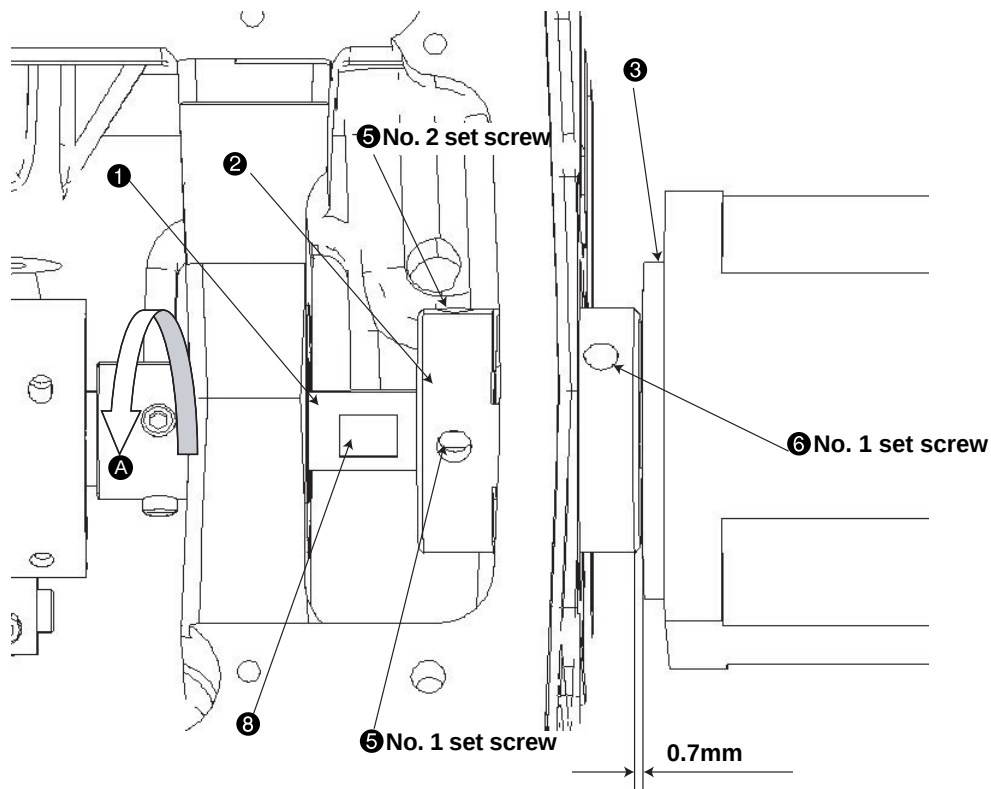
1. Insert the main shaft ⑦ into the crank rod ⑩, balancer ⑪, hand pulley gear A ⑰, bobbin winding drive wheel ⑱, and main shaft counterbalance ① in this order, and mount this assembly on the frame.
2. Tighten the taper screw ③ into the taper hole of the main shaft ⑦, and tighten the set screw ② to secure the main shaft counterbalance ①.
3. Lightly press the main shaft counterbalance ① in the direction of Arrow D and the middle metal ⑲ in the direction of Arrow E, and tighten 2 set screws ⑤.
(Tighten No. 1 set screw so that it touches the flat part of the main shaft ⑦. Then, tighten No. 2 set screw. Same procedure hereafter)
4. Tighten 2 set screws ④ and 2 set screws ⑥. (Make sure that No. 1 set screw touches the flat part of the main shaft ⑦.)
5. Press the hand pulley ⑳ in the direction of Arrow F to engage the hand pulley gear A ⑰ with the hand pulley gear B ㉑, and secure them with 2 set screws ⑮.
6. Mount the main shaft motor ⑧ and coupling ⑨.
Refer to "3.-(2) Removal of main shaft motor and coupling".
7. Secure the eccentric cam of the intermediate presser ㉒ with 2 set screws ⑫. Refer to "3.-(5) Adjustment of intermediate presser cam".
8. Secure the crank rod ⑩ with 2 set screws ⑬. Refer to "3.-(3) Crank rod connection/disconnection".
9. Secure the balancer ⑪ with 2 set screws ⑩. Refer to "3.-(4) Crank balancer positioning".
10. Secure the bobbin winding drive wheel ⑱ with 2 set screws ⑭. Refer to "3.-(34) Adjustment of the bobbin winder driving wheel position".
* Make sure that no torque is applied by rotating the main shaft ⑦.

(2) Removal of main shaft motor and coupling

Procedures of disassembling

1. For removal of the main shaft with the coupling,
Loosen 2 set screws **⑤** on the main shaft side of the coupling **②**, and remove 4 set screws **④** securing the motor.
2. For removal of the coupling **②** from the main shaft motor **③**, loosen 2 set screws **⑥** on the main shaft motor side.

(Caution) The screw (hole) that can be seen first is No. 1 set screw **⑥** when the main shaft **①** is turned in the forward direction **A**. For loosening, loosen No. 2 set screw first, and for tightening, tighten No. 1 set screw **⑥** first.



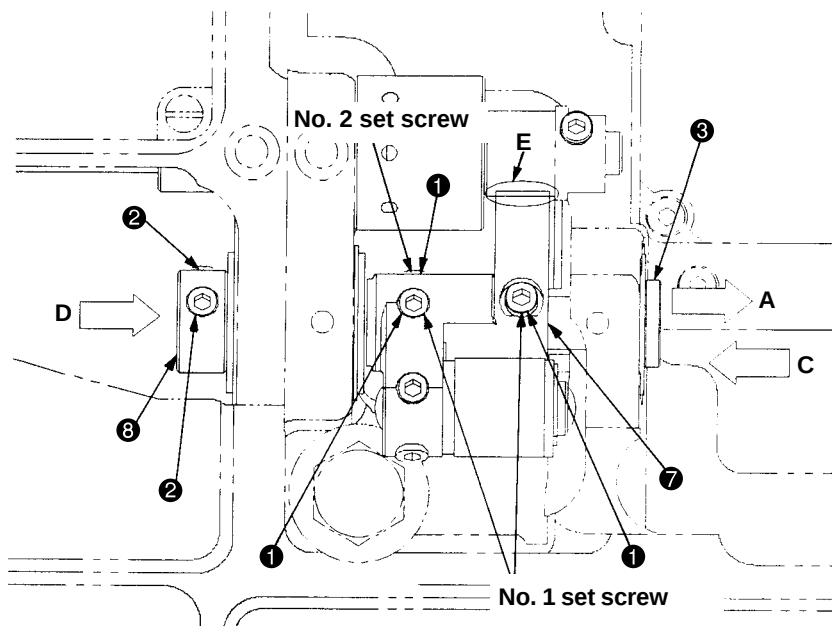
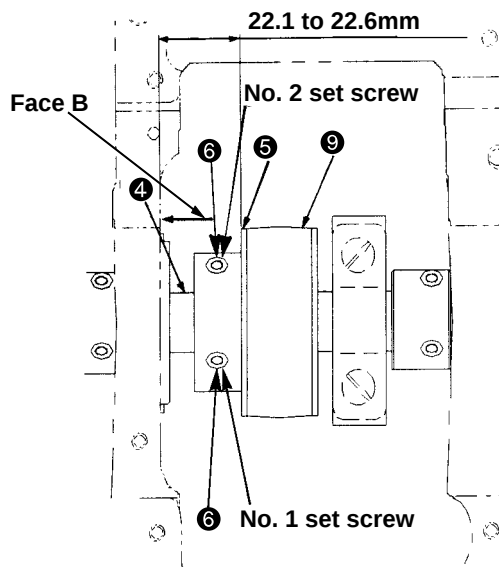
Procedures of assembling

1. For mounting the main shaft motor with the coupling,
 - (1) Tighten 4 set screws ④ that securing the motor, and tighten 2 set screws ⑤ on the main shaft side of the coupling ②.
 - (2) The cords ⑦ of the main shaft motor ③ should be positioned in the lateral direction.
2. For connecting the coupling to the main shaft motor,
 - (1) Provide a clearance of 0.7 mm between the coupling ② and main shaft motor ③.
 - (2) Apply No. 1 set screw ⑥ of the coupling ② to the flat section ⑧ of the main shaft motor ③, the main shaft ① and secure it.
3. For engaging the coupling,
 - (1) Position the set screw ⑥ (No. 1 set screw) on the main shaft motor side between 2 set screws ⑤ on the main shaft side, and engage the coupling.

(3) Crank rod connection/disconnection

Procedures of disassembling

1. Loosen 3 set screws ❶ and 2 set screws ❷. On this occasion, loosen No. 2 set screws first, and completely disengage No. 1 set screws from the flat section of the oscillator shaft ❸.
2. Pull out the oscillator shaft ❸ in the direction of Arrow A.
3. Remove the main shaft ❹ according to "3.-(1) Main shaft connection/disconnection", and remove the crank rod unit ❹.



Procedures of assembling

1. Mount the main shaft ④ according to “3.-(1) Main shaft connection/disconnection”, and mount the crank rod unit ⑨.
2. Adjust the clearance to 22.1 to 22.6 mm between the under cam ⑤ of the crank rod unit ⑨ and Face B (middle metal bearing mounting face) of the frame, and secure the cam with the set screw ⑥.
(Apply No. 1 set screw to the flat section of the main shaft ④ and tighten it first, then tighten No. 2 set screw. Same procedure hereafter)
3. Pass the oscillator ⑦ through the oscillator shaft ③, and mount them on the frame.
4. Pass the thrust collar ⑧ through the oscillator shaft ③. Lightly press the oscillator shaft ③ in the direction of arrow C and the thrust collar ⑧ in the direction of Arrow D, and tighten 2 set screws ②. Make sure that No. 1 set screw touches the flat section of the oscillator shaft ③.)
5. Secure the oscillator ⑦ according to “3.-(11) Oscillator gear positioning”.

(Caution) 1. Make sure that no torque is applied by rotating the main shaft ④.

2. **When the crank rod unit ⑨ is connected, disconnected, or positioned, or the oscillator ⑦ is positioned, be sure to grease two specified positions and the gear section (E) of the oscillator ⑦.**
3. **After positioning the crank rod unit ⑨ (under cam ⑤), be sure to perform “3.-(11) Oscillator gear positioning”. Wrong positioning of the under cam ⑤ or oscillator ⑦ may cause frictional wear or lock-up.**

(4) Crank balancer positioning

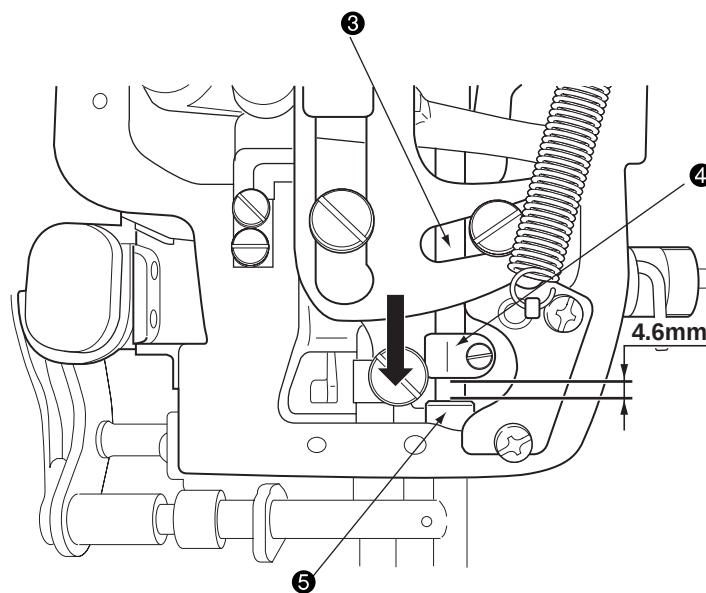
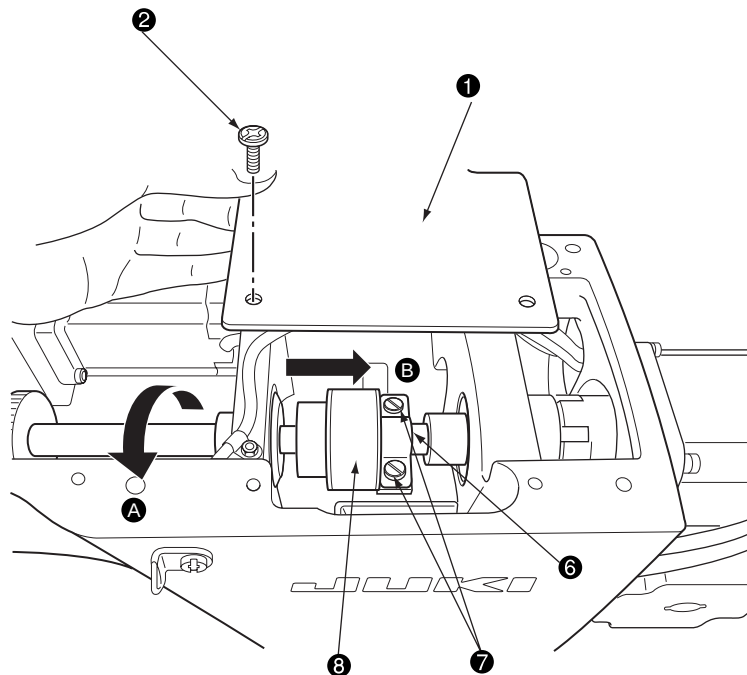
Standard Adjustment

[Rotating direction]

When the needle bar ③ lowers and the clearance between the needle bar connecting ④ and needle bar lower bushing ⑤ is 4.6 mm, 2 set screws ⑦ of the crank balancer ⑥ becomes horizontal position.

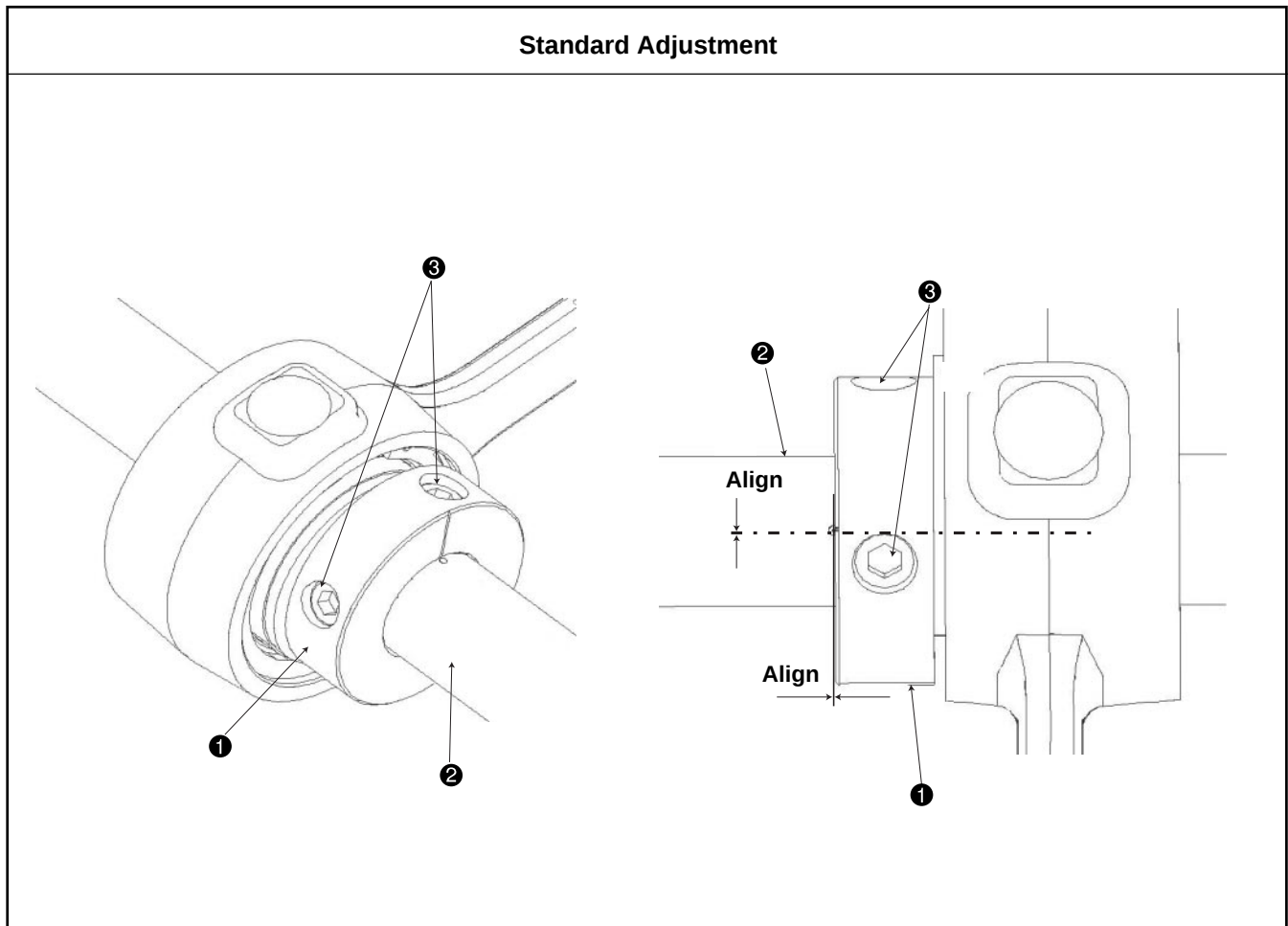
[Axial direction]

Bring the main shaft eccentric cam ⑧ into contact with the crank balancer ⑥.

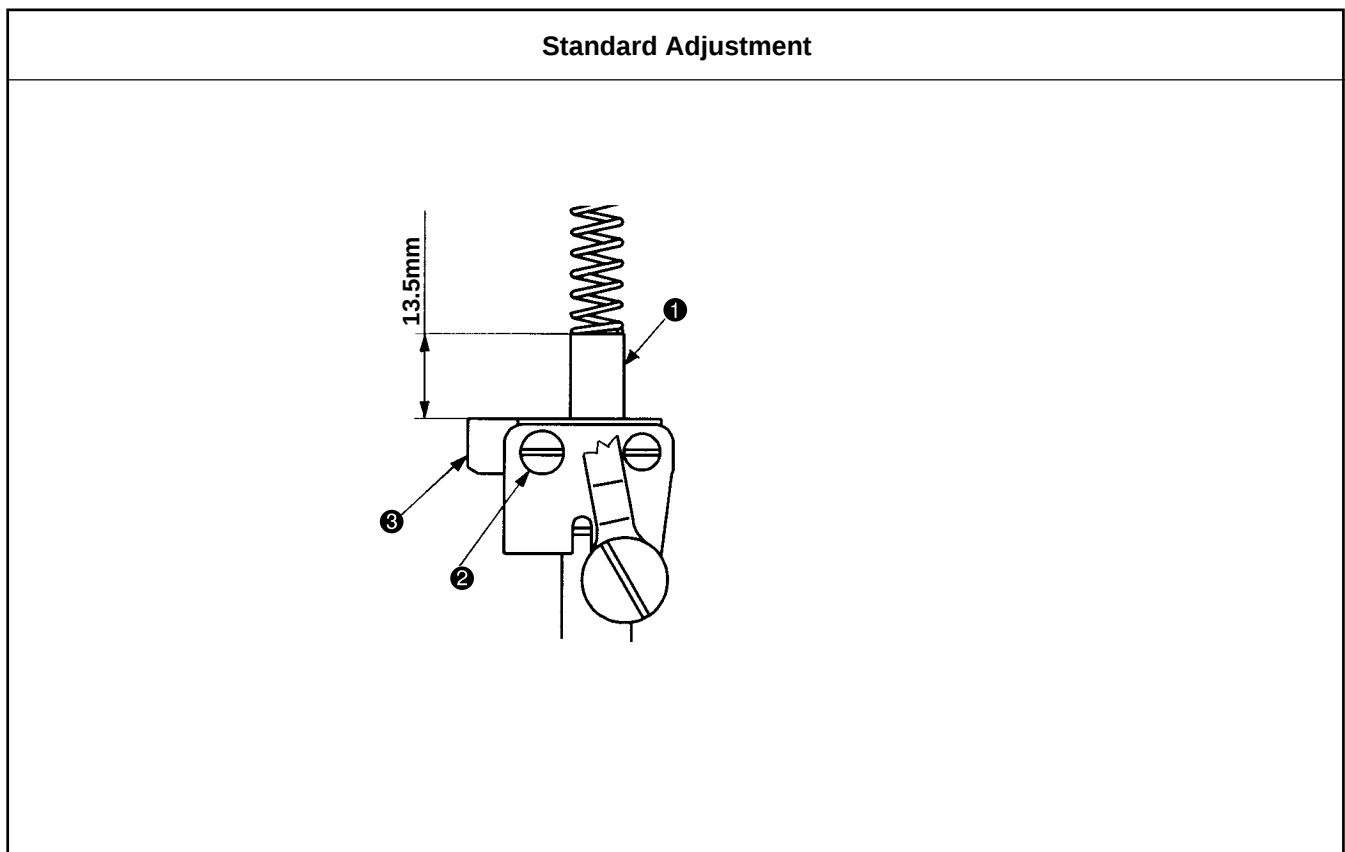


Adjustment Procedures	Results of Improper Adjustment
If the main shaft eccentric cam ⑧ is not secured, the main shaft eccentric cam ⑧ should be positioned first. 1. Loosen 2 set screws ⑦ securing the crank balancer ⑥. 2. Remove 4 set screws ②, then remove the crank rod cover ①. 3. Turn the main shaft in the forward direction ① so that the needle bar ③ lowers and the clearance between the needle bar connecting ④ and needle bar lower bushing ⑤ is 4.6 mm. 4. Secure the crank balancer ⑥ with 2 set screws ⑦ under the conditions that 2 set screws ⑦ securing the balancer ⑥ are horizontally positioned and the balancer ⑥ is moved in the direction of Arrow ② to make it into contact with the main shaft eccentric cam ⑧. For tightening 2 set screws ⑦, tighten them alternately.	- o If the mounting angle of the crank balancer ⑥ is wrong, vibration during sewing will be intensified. - o If the sewing machine is used for a long time under the condition of wrong securing position, the life of main shaft bearing may be shortened. - o If the crank balancer ⑥ is not moved in the direction of Arrow ②, it may interfere with the sewing machine frame.

(5) Adjustment of intermediate presser cam



(6) Adjustment of intermediate presser bar



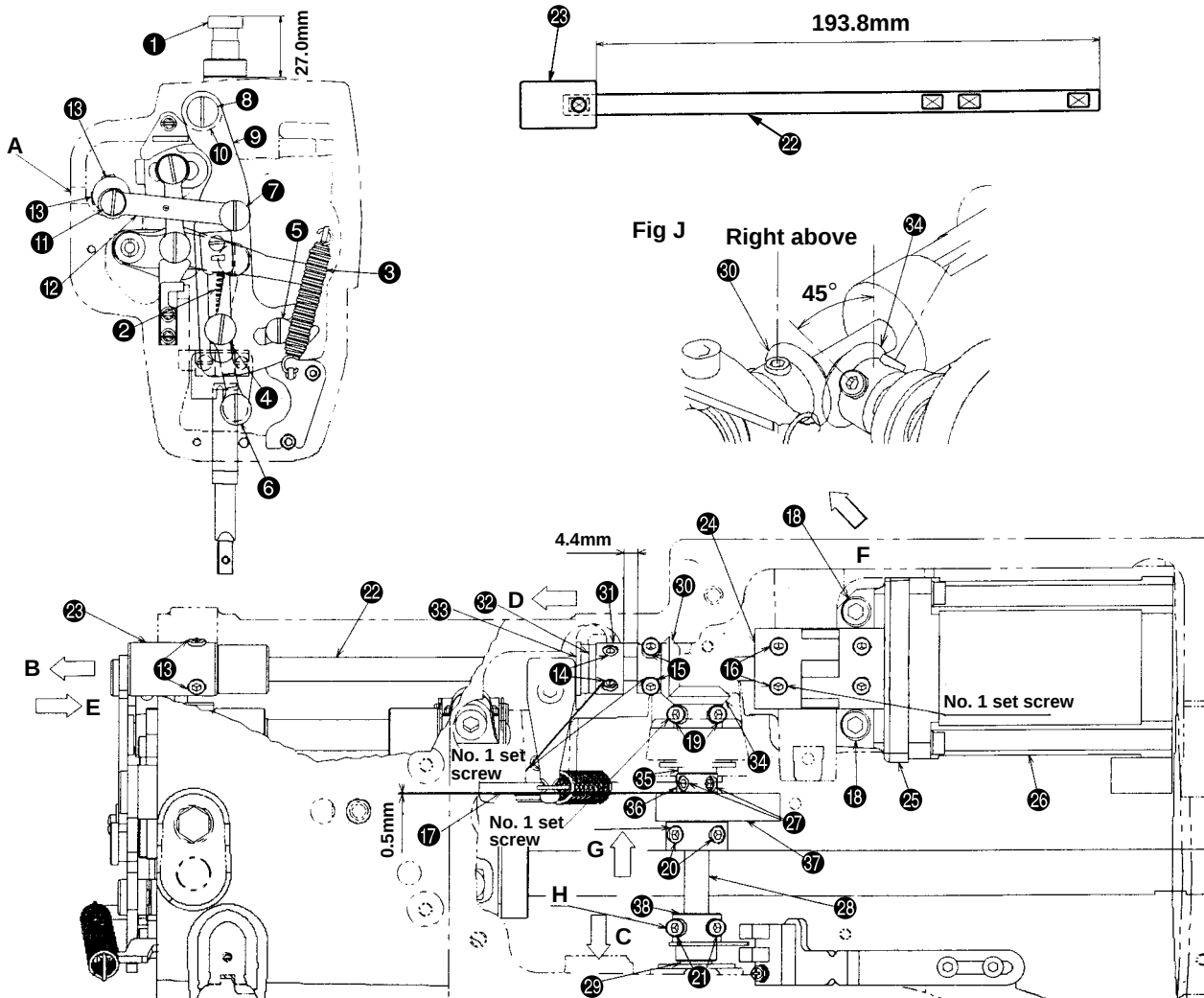
Adjustment Procedures	Results of Improper Adjustment
1. Align the edge of the intermediate presser cam ❶ with the center of the engraved point on the main shaft ❷, align the engraved line on the intermediate presser cam ❶ with the engraved point on the main shaft ❷, and tighten the set screw ❸.	o Stitch skipping and poor tense stitch may occur.

Adjustment Procedures	Results of Improper Adjustment
1. Adjust the thrusting distance of the intermediate presser bar ❶ to 13.5 mm, and tighten the set screw ❷ after ensuring that the needle passes through the center of the intermediate pressure. (Caution) Be aware that the tightening pressure of the set screw ❷ should be from 2.16 to 2.75 N•m (22 to 28 kgf•cm).	o An excessive thrusting distance of the intermediate presser bar ❶ may damage the intermediate presser spring or cause poor presser lifting. o Excessive tightening pressure may deform the intermediate pressure bar ❶ or intermediate presser bar connecting ❸ resulting in malfunction.

(7) Intermediate presser variable connection/disconnection

Procedures of disassembling

1. Remove the presser adjusting screw ①. Then, remove the intermediate presser spring ② and the guide shaft.
2. Remove the intermediate presser auxiliary spring ③.
3. Remove the step screws ④, ⑤, and ⑥.
4. Remove the step screw ⑦.
5. Remove the step screw ⑧, and then the intermediate presser variable plate ⑨ and the variable plate spacer ⑩.
6. Remove the step screw ⑪, and then the intermediate presser variable link ⑫.
- (At that time, insert a hexagonal wrench through the arm screw hole A and apply it to the setscrew ⑬ as a means of turn stop for the intermediate presser variable arm ⑬.)
7. Loosen two each of the setscrews ⑭, ⑮, and ⑯.
- At that time, the second screw should be loosened first. The first screw of the setscrew should be removed, completely separate from the flat part of the intermediate presser variable shaft ⑳.
8. After the intermediate presser variable arm ⑬ and the intermediate presser variable shaft ㉑ have been pulled out in the direction of the Arrow B, loosen the setscrew ⑬ and pull out the intermediate presser variable shaft ㉑ from the intermediate presser variable arm ⑬.
- At that time, both of the setscrews ⑬ should be separated completely from the flat parts (2 positions) of the intermediate presser variable shaft ㉑.
9. Loosen the two setscrews ⑰ and remove the intermediate presser coupling ㉒, the intermediate presser motor mounting plate ㉓, and the intermediate presser motor ㉔.
10. Loosen two each of the setscrews ⑲, ⑳, ㉑ and ㉒.
- At that time, the second screws of the setscrews ⑲ and ㉑ should be loosened first. The first screw of the setscrew should be removed, completely separate from the flat part of the intermediate presser lifting shaft ㉓.
11. Remove the E ring ㉔ and pull out the intermediate presser lifting shaft ㉓ in the direction of the Arrow C.



Procedures of assembling

1. Fix the intermediate presser variable shaft ②② to the intermediate presser variable arm ②③ by means of the two setscrews ①③ so that the length of the shaft section becomes 193.8mm.
(Both setscrews ①③ should be adjusted level to the intermediate presser variable shaft ②②.)
2. Insert the washer ③③, thrust bearing ③②, thrust collar ③①, and the drive bevel gear ③④ in the intermediate presser variable shaft ②② in this order, and mount this assembly on the frame.
3. Pressing the intermediate presser variable arm ②③ in the direction of the Arrow E, secure a proper thrust by pressing the thrust collar ③① in the direction of the Arrow D and tighten the two setscrews ①④. (Tighten the first screw first so that it is fixed level to the intermediate presser variable shaft ②②. Then, tighten the second screw. To be done in the same manner hereafter.)

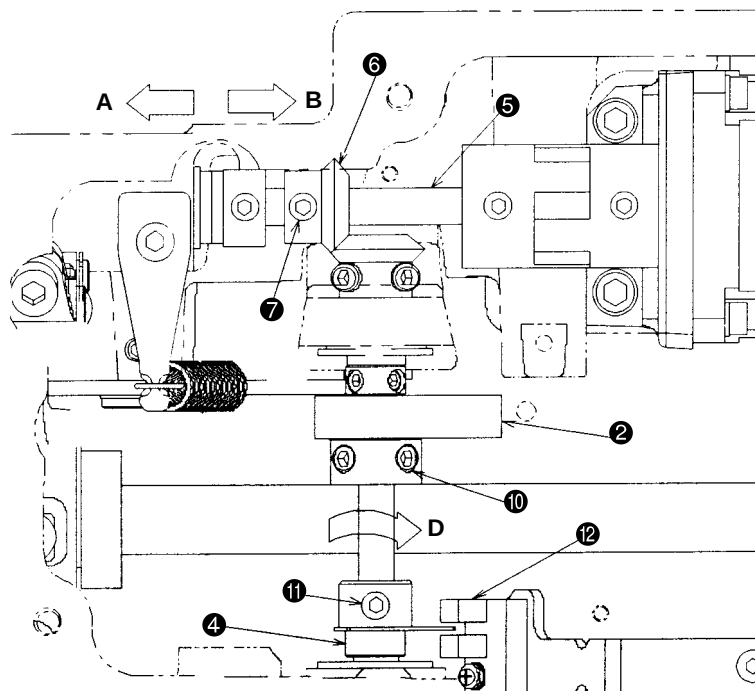
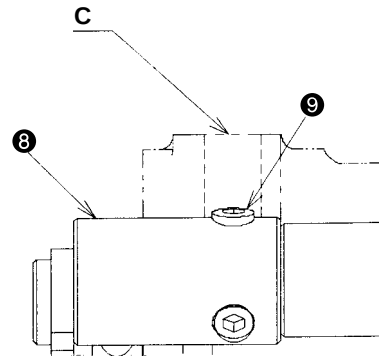
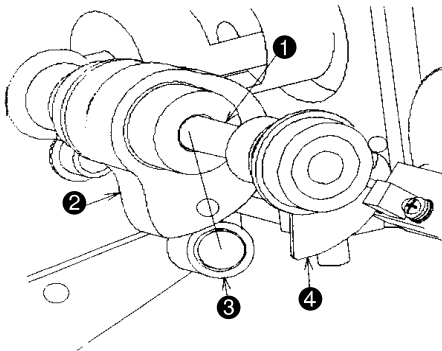
(Caution) If there is rattle in the variable shaft of the intermediate presser ②② in the forward and backward directions, this can be a cause of intermediate presser step-out. Be careful when you try to fix the thrust collar ③①.

4. Adjust the distance to 4.4mm between the thrust collar ③① and the drive bevel gear ③④. Tighten the first screw of the setscrew ①⑤.
(Tentatively tightened till the completion of intermediate presser sensor adjustments)
5. Fix the intermediate presser motor ②⑥ to the intermediate presser motor mounting plate ②⑤ and mount the intermediate presser coupling ②④ on the motor shaft. Since then, press the intermediate presser motor assembly in the direction of the Arrow F and tentatively fix it to the frame by means of the two setscrews ①③. Adjust the positioning of the intermediate presser motor assembly where the intermediate presser coupling ②④ can be turned without any resistance, and tighten the two setscrews ①③.
6. Insert the sensor slit ③③, intermediate presser lifting cam ②⑦, thrust collar ③⑥, and the wave washer ③⑤ in the intermediate presser lifting shaft ②③ in this order, and pass this assembly through the frame. Mount the E ring ②③ on the intermediate presser lifting shaft ②③.
7. Pressing the intermediate presser lifting shaft ②③ in the direction of the Arrow C, press the thrust collar ③⑥ in the direction of the Arrow G and tighten the two setscrews ②⑦.
8. Fix the intermediate presser lifting cam ②⑦ by means of the two setscrews ②⑩ so that the clearance becomes 0.5mm between both end planes of the intermediate presser lifting cam ②⑦ and the intermediate presser lifting link ①⑦.
9. Turn the intermediate presser variable shaft ②② and the intermediate presser lifting shaft ②③ so that the trailing bevel gear ③④ and the drive bevel gear ③④ are positioned as shown in Fig. J. Since then, fix them by means of the two setscrews ①⑨ while the trailing bevel gear ③④ is pressed in the direction of the Arrow G (in order to reduce the backlash to zero).
10. Press the sensor slit ③③ in the direction of the Arrow C and turn the setscrew ②① so that its H comes in the section toward the setscrew ②⑩ of the intermediate presser lifting cam ②⑦. Then, fix H of the setscrew ②① tentatively.
11. According to adjustments of intermediate presser variable as described in 3-(8), make adjustments of intermediate presser variable and fasten the setscrews of the drive bevel gear ③④ and the sensor slit ③③.
12. Using the step screw ①①, mount the intermediate presser variable link ①② on the intermediate presser variable arm ②③.
13. Using the step screw ⑧, mount the intermediate presser variable plate ⑨ and the variable plate spacer ⑩.
14. Mount the step screws ④, ⑤, and ⑥.
15. Using the step screw ⑦, mount the intermediate presser variable link ①② on the intermediate presser variable plate ⑨.
16. Mount the intermediate presser auxiliary spring ③.
17. Mount the intermediate presser spring ② and the guide shaft from above the frame. Then, mount the presser adjusting screw ①.
(27.0mm from the upper plane of the arm to that of the presser adjusting screw ①)

(8) Intermediate presser variable adjustments

Standard Adjustment

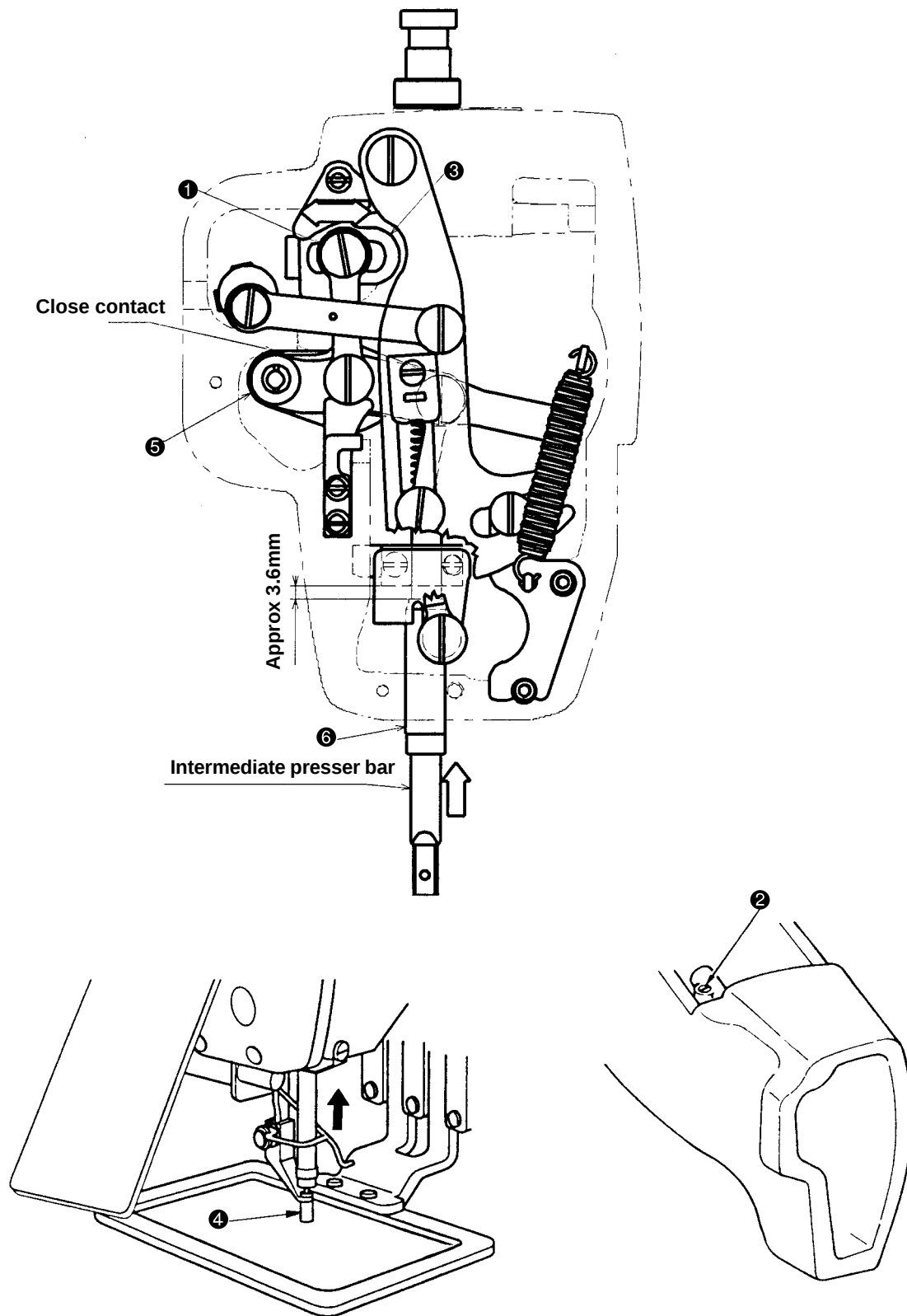
Start the Test Mode I10 (IP-400) or CP-8 (CP-20) and press  twice after the completion of origin retrieval. At that time, there shall be coincidence between the center of the arm's left-side hole C and the second screw ⑨ of the intermediate presser variable arm ⑧.



Adjustment Procedures	Results of Improper Adjustment
1. Start the Test Mode I10 (IP-400) or CP-8 (CP-20). 2. Tread on the start pedal for origin retrieval, and make adjustments by turning the sensor slit ④ so that the lines combining the center of the intermediate presser lifting shaft ①, the standard hole of the intermediate presser lifting cam ②, and the center of the cam follower ③ become almost a straight line. 3. Press  of the panel three times. Loosen the first screw ⑦ of the drive bevel gear ⑥ of the intermediate presser variable shaft ⑤. Take out the drive bevel gear ⑥ from the flat part of the intermediate presser variable shaft ⑤ and move it in the direction of the Arrow A. 4. Using the [+] key or the [-] key, turn the intermediate presser variable shaft ⑤ until the second screw ⑨ of the intermediate presser variable arm ⑧ settles in the center of the arm's left-side hole C. (Insert a hexagonal wrench to adjust positioning so that the arm comes in the center of backlash deflection.) 5. Turn the intermediate presser lifting shaft ① so that the second screw ⑩ of the intermediate presser lifting cam ② comes just above. Press the drive bevel gear ⑥ of the intermediate presser variable shaft ⑤ in the direction of the Arrow B to fix it. 6. After the completion of second origin retrieval, press  of the panel twice to secure the [timing adjustment position]. In this case, confirm that the second screw ⑨ of the intermediate presser variable arm ⑧ is positioned in the center of the arm's left-side hole C or below it. (If the screw seems to have been positioned above the center, return to Step 4 and repeat the above-mentioned adjustments.) 7. If the second screw ⑨ of the intermediate presser variable arm ⑧ is not positioned in the center (or lower), loosen the setscrew ⑪ of the sensor slit ④ and turn this sensor slit ④ in the direction of the Arrow A for fine adjustments. 8. Make origin retrieval and confirm that the the cam follower ③ is located in the parallel section of the intermediate presser lifting cam ②. When the condition has been found normal, fasten the setscrew ⑦ of the drive bevel gear ⑥ and the setscrew ⑪ of the sensor slit ④ regularly. (Caution) For the prevention of the sensor ⑫ from destruction, make origin retrieval after confirming that the slit of the sensor slit ④ is positioned in the center of the sensor ⑫.	- o There will be a displacement between the variable value of the intermediate presser lower position and the panel setup value. - o If there is no cam follower ③ in the parallel section of the intermediate presser lifting cam ② at the time of origin retrieval, stepping out may occur in the intermediate presser motor, thus causing defective stitches, generation of sound from the face plate section, and destruction of parts. - o If adjustments of backlash are insufficient for the drive bevel gear ⑥, stepping out may occur in the intermediate presser motor, thus causing defective stitches, generation of sound from the face plate section, and destruction of parts. .

(9) Intermediate presser drive arm**Standard Adjustment**

* Refer to Instruction Manual, 4-7. Intermediate presser height.

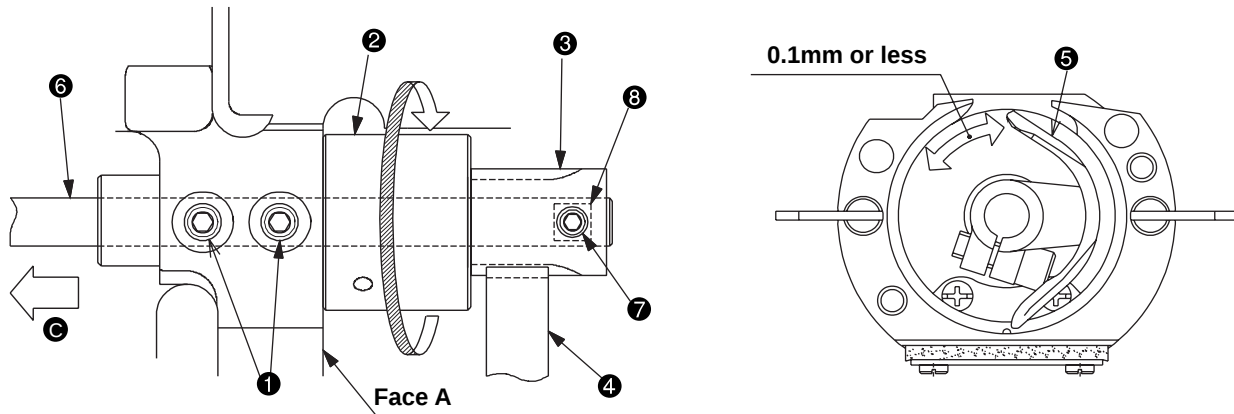


Adjustment Procedures	Results of Improper Adjustment
1. Turn ON the power supply and set the height of the intermediate presser ④ to 0mm. Turn OFF the power supply in the state that the intermediate presser ④ has been lowered. 2. Loosen the intermediate presser stroke adjusting screw ①. 3. Turn the pulley and move the needle bar to the lower dead point. When the intermediate presser ④ is lifted and the intermediate presser stroke adjusting screw ① is moved to the right or left, confirm that the intermediate presser adjusting arm ③ is positioned not to move vertically and that the intermediate presser positioning link ⑤ keeps a close contact with the arm. In this state, tighten the setscrew ② of the intermediate presser drive arm. (The clearance is approximately 3.6mm between the intermediate presser needle bar connection and the intermediate presser bar metal ⑥.) 4. After the setscrew ② has been tightened, confirm that there is no backlash in the intermediate presser adjusting arm ③ in the forward and backward directions. 5. Finally, make adjustments of the intermediate presser stroke. (Refer to Instruction Manual III. MAINTENANCE OF SAWING MACHINE, 1-4. Adjusting the vertical stroke of the intermediate presser.)	- o If there is no clearance, there will be interference between the intermediate presser bar metal ⑥ and the intermediate presser needle bar connection during sewing machine operation, and this will generate abnormal sound as a result. - o If there is too much clearance, there will be interference between the intermediate presser adjusting arm ③ and the arm during sewing machine operation, thus generating abnormal sound as a result. - o If there is too much or too less clearance, the lower dead-point height of the intermediate presser ④ may be changed as a result of intermediate presser stroke adjustments.

(10) Lower shaft backlash adjustment and connection/disconnection

Standard Adjustment

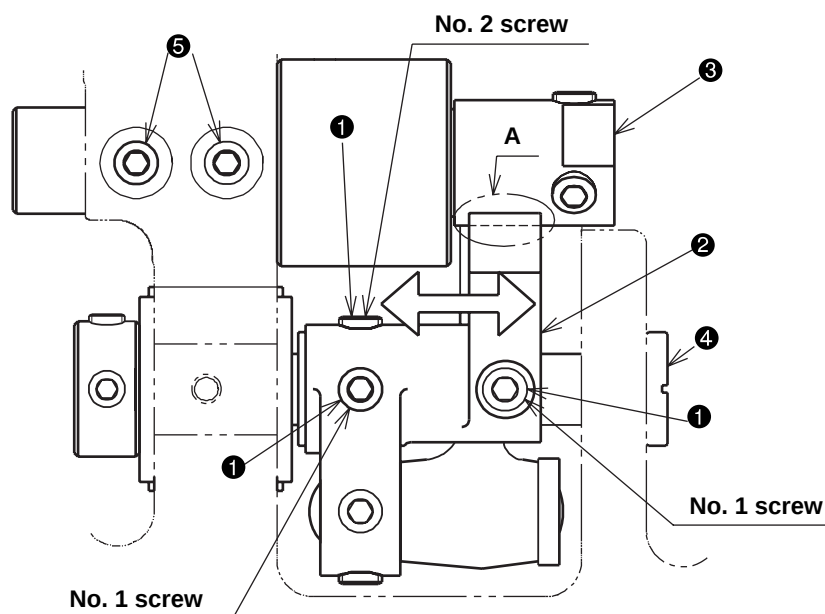
1. Size of lower shaft backlash is 0.1mm at the tip of the driver ⑤. The shaft is required to rotate smoothly.
2. Define the stop position of the lower shaft ⑥ so that the set screw ⑦ settles almost in the center of the flat section ⑧ of the lower shaft ⑥.



(11) Oscillator gear positioning

Standard Adjustment

1. When the oscillator is lightly swung by a finger in the direction of the arrow, the oscillator ② is fixed in the center position of swinging.

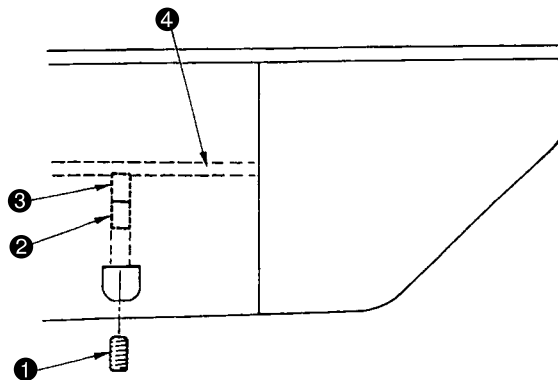


Adjustment Procedures	Results of Improper Adjustment
1. Lower shaft backlash 1) Loosen the two set screws ❶. 2) Turn the lower shaft rear metal ❷ in the direction of the arrow and adjust the backlash, keeping the metal to contact closely with Face A. Size of backlash is 0.1mm at the tip of the driver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

Adjustment Procedures	Results of Improper Adjustment
1. Loosen the two set screws ❸ and increase the backlash of the lower shaft gear ❹. (Caution) 1. If the lower shaft gear ❹ has insufficient backlash, the oscillator ❶ does not swing correctly. In such a case, refer to [(10) Lower shaft backlash adjustment and connection/disconnection] and provide a sufficient backlash. 2. The three set screws ❶ should have been loosened in advance. In this case, the second screw of the set screws ❶ should be loosened first. Then, the first one can be loosened. 3. Lightly swing the whole body of the oscillator ❶ with a finger in the direction of the arrow. Decide the positioning of the oscillator ❶ so that it stays in the center of swinging. 4. Loosen the three set screws ❶ and then fix them so that the oscillator ❶ is not displaced from the center of swinging. (Tighten the first screw first so that it comes in contact flatly with the oscillator shaft ❷. Then, tighten the second one.) 5. Make backlash adjustment for the lower shaft gear ❹, according to [(10) Lower shaft backlash adjustment and connection/ disconnection]. (Cautions) 1. In the case of disassembly and adjustment, grease-up treatment is always needed for the specified places (2 positions) and the gear area A of the oscillator ❶. 2. When the crank rod (under-cam) is removed, actions for under-cam positioning must be taken, without fail. Refer to [(3) Crank rod connection/ disconnection].	o If the position for fixing the oscillator ❶ is inadequate, this can also be a cause of the frictional wear or lock-up of the oscillator pin, crank rod lid, under-cam, and the crank rod.

(12) Adjustment of hook oil amount

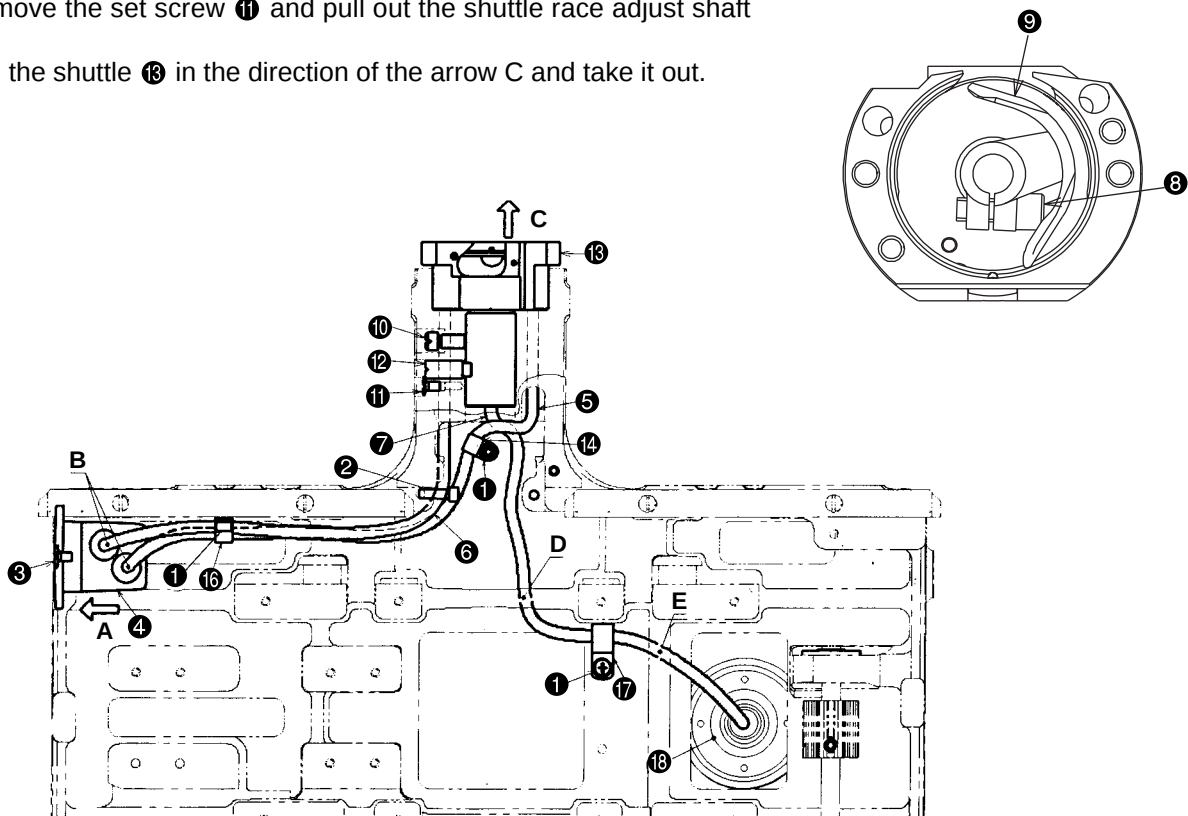
Standard Adjustment



(13) Shuttle connection / disconnection and oil wick piping

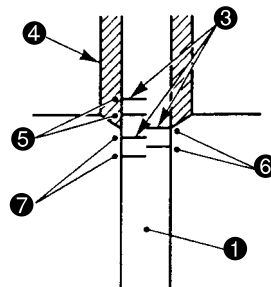
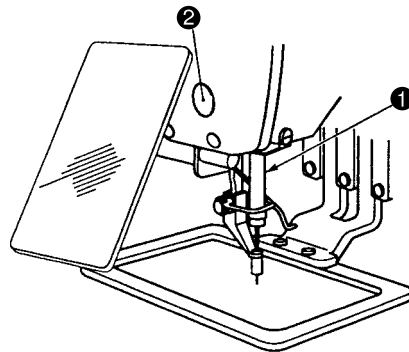
Procedures of disassembling

1. Loosen the three set screws ①.
2. Cut the harness bands ②.
3. Remove the set screw ③ and pull the oil tank ④ in the direction of the arrow A.
4. Pull Part B upwards of the two lubrication pipes ⑤ and ⑥. Take them out of the oil tank ④.
5. Release the clamp ⑦ of the oil drain pipe ⑦.
6. Loosen the set screw ⑧ and take out the driver ⑨.
7. Loosen the set screw ⑩.
8. Remove the set screw ⑪ and pull out the shuttle race adjust shaft ⑫.
9. Pull the shuttle ⑬ in the direction of the arrow C and take it out.



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

Procedures of assembling
1. Pass the two lubrication pipes ❺ and ❻ and the oil drain pipe ❼ through the frame, and mount the shuttle ❸. 2. Pass the lubrication pipe ❺ along the upper side of the oil drain pipe ❼. Hold the lubrication pipe ❺ with the pipe holder ❹ and fix it with the set screw ❶. At that time, make sure not to let the lubrication pipe ❺ and the oil drain pipe ❼ come in contact with the thread cutter connector rod and the lower shaft. 3. Fix the lubrication pipe ❻ to the bed by means of the harness band ❷. 4. Fix the two lubrication pipes ❺ and ❻ with the cord clamps ❹ and the set screws ❶. At that time, make sure not to permit the lubrication pipes ❺ and ❻ to come in contact with the needle thread clamp connector link. 5. Insert the two lubrication pipes ❺ and ❻ in the oil tank ❸ and fix this oil tank ❸ to the frame with the set screws ❸. 6. Fix the needle thread clamp sensor cord and the oil drain pipe ❼ with the cord clamp ❶. At that time, pass the oil drain pipe through the head holes in two positions D and E. 7. Insert the oil drain pipe ❼ in the oil reservoir ❸. 8. Fix the shuttle ❸ and mount the driver ❶ with the set screw ❸. Refer to [(15) Hook adjustment]. * Harness bands ❷ : Part No. EA9500B0100

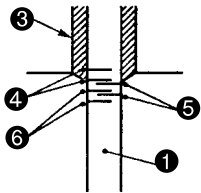
(14) Adjusting the height of the needle bar**Standard Adjustment**

- ⑤ : Marker line for DP x 5
- ⑥ : Marker line for DP x 17
(with needle count higher than #22)
- ⑦ : Marker line for DP x 17
(with needle count lower than #22)

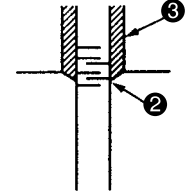
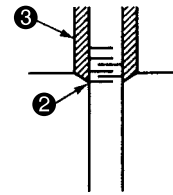
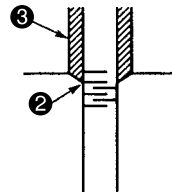
Adjustment Procedures	Results of Improper Adjustment
* Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state. 1. Bring the needle bar ❶ down to the lowest position, loosen the needle bar connection screw ❷ and align the upper engraved line ❸ on the needle bar with the bottom end of the needle bar lower bushing ❹. 2. Change the adjusting position according to needle sizes. (Caution) Be sure that torque is even after adjustment.	

(15) Hook adjustment

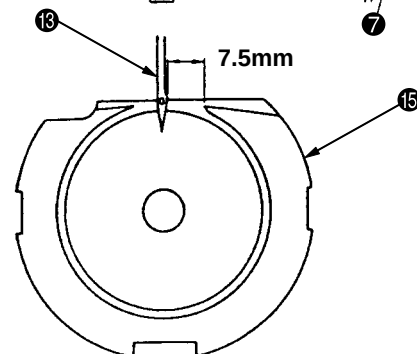
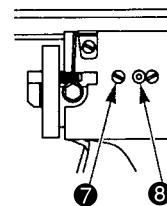
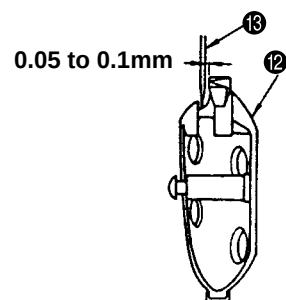
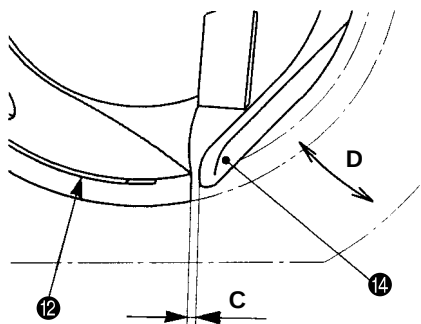
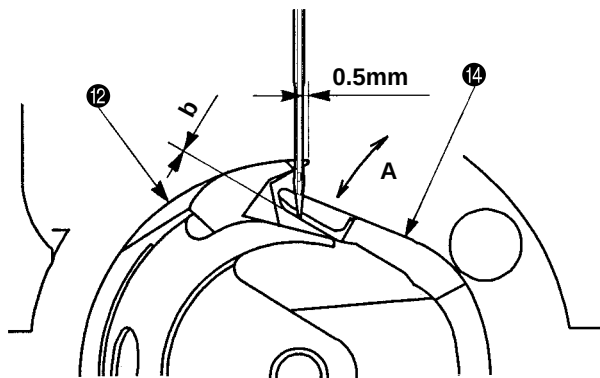
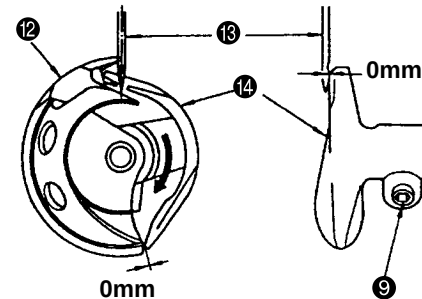
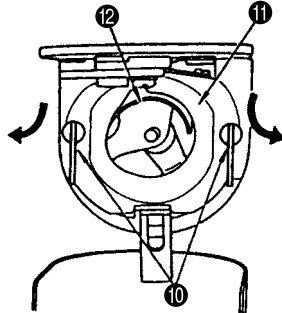
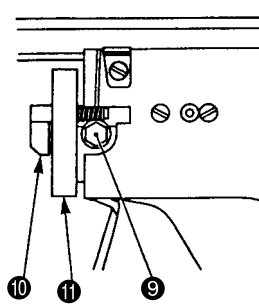
Standard Adjustment



- ④: Marker line for DP x 5 needle
- ⑤: Marker line for DP x 17 needle (with needle count higher than #22)
- ⑥: Marker line for DP x 17 needle (with needle count lower than #22)



When a DP x 5 needle is used DP x 17 needle (of which needle count is lower than #22) is used. DP x 17 needle (of which needle count is higher than #22) is used.

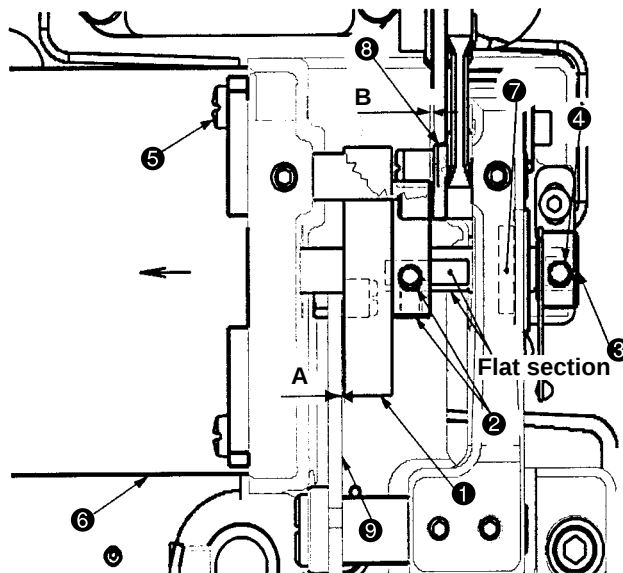


Adjustment Procedures	Results of Improper Adjustment
* Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state. 1. Turn hand wheel by hand to ascend the needle bar ❶. Adjust so that lower marker line ❷ on the ascending needle bar aligns with the bottom end of the needle bar bushing lower ❸. 2. Loosen setscrew ❹ in the driver. Drawing bobbin case opening lover hook ❿ toward you, open it to the right and left until bobbin case opening lover ⓫ comes off. (Caution) At this time be careful not to let inner hook ❷ come off and fall. 3. Refer to 5. below and make tentative adjustments of timing for the inner hook ❷. 4. Turn the pulley by hand and make adjustments for the needle location block of the driver ❶ by bending it in the direction of Arrow A so that the clearance b attains 0mm to 0.5mm between the needle tip and the lowest end of the needle location block of the driver ❶ when the needle tip of the inner hook ❷ is protruded by 0.5mm from the right end of the needle ❸. 5. Make an adjustment so that the blade point of the inner hook ❷ is aligned with the center of the needle ❸, and that the clearance between the front end of the driver ❶ and the needle ❸ is 0 mm because the front end of the driver ❶ receives the needle to prevent needle bending. Then, tighten the set screw ❹ securing the driver. 6. Make adjustments so that the clearance (C) in the revolving direction attains 0.3mm to 0.6mm between the inner hook ❷ and the driver ❶ by bending the inner hook holder block (reverse side of the needle location block) of the driver ❶ in the direction of the arrow (D). (Caution) Make sure not to damage the shuttle ❶ race plane while making adjustment of the driver ❶. 7. Loosen the set screw ❷ securing the shuttle ❶, and adjust the front-rear position of the shuttle by rotating the shuttle adjusting shaft ❸ so that the clearance between the needle ❸ and the blade point of the inner hook ❷ becomes 0.05 to 0.1 mm. 8. After adjusting the front-rear position of the shuttle ❶, set the clearance between the needle ❸ and the shuttle ❶ to 7.5 mm by adjusting the rotating direction, and tighten the set screw ❷ securing the shuttle.	

(16) Thread trimmer presser lifter cam connection/disconnection

Procedures of disassembling

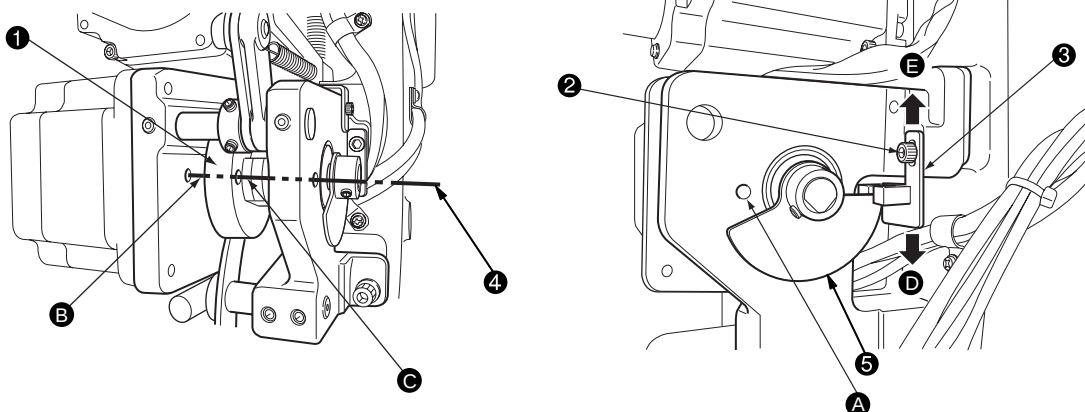
1. Loosen 2 set screws ② securing the presser lifter and thread trimmer cam (hereafter called "cam") ①.
2. Loosen the two set screws ④ and remove the sensor slit ③.
3. Remove the four set screws ⑤ and take out the presser lifting motor ⑥ in the direction of the arrow. In some cases, the bearing ⑦ and the motor shaft seem to be tightly coupled. Pull out the motor shaft in the direction of the arrow straightforward in order not to hurt the bearing ⑦.
At that time, the cam ① may come down. Handle it with care, not to damage it.



(17) Thread trimmer and presser origin sensor adjustment

Standard Adjustment

When origin retrieval (at start switch on) is conducted in the test mode I07 (IP-400) or CP-6 (CP-20), the standard holes of the sewing machine frame (A and B) are aligned with the standard hole C of the thread trimmer and presser lifter cam ①.



Procedures of assembling

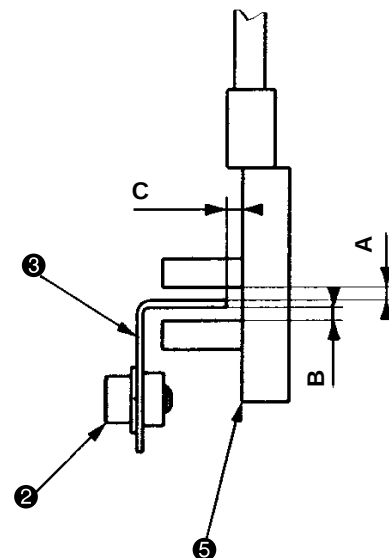
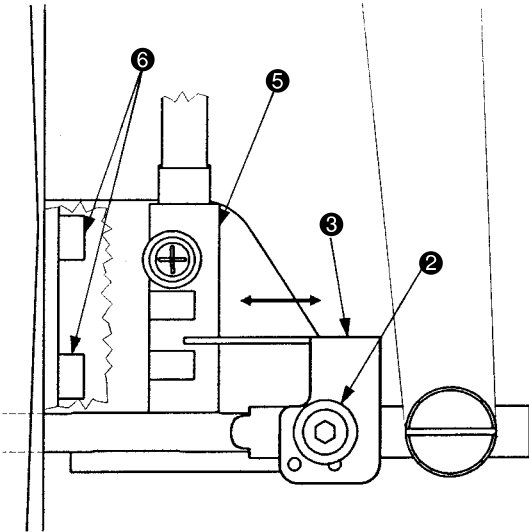
1. Apply a proper amount of grease (Juki Grease A) to the grooved cam block of the cam ❶, the peripheral cam block, and the rollers of the presser bar lifter link ❸ and the thread trimmer link ❹. Refer to "10.-(4) Parts to which grease • lock-tight is applied o TENSION RELEASE & THREAD TRIMMER MECHANISM COMPONENTS."
2. While the cam ❶ is being inserted in the shaft of the presser lifting motor ❺, mount the assembly on the sewing machine frame and tighten the four set screws ❽. The insertion of the cam should be done gently in order not to hurt the bearing ❿.
3. Clearance B toward the presser bar lifter link ❸ and Clearance A toward the thread trimmer link ❹ should be equally distributed. For this purpose, adjust the position of the cam ❶ and fix it with the use of the two set screws ❽. (Apply the screws to the flat section at both ends of the shaft.)
* If it is difficult to examine Clearance B, Clearance A should be adjusted to 0.5mm ~ 0.7mm during assembly.
4. Mount the sensor slit ❸ with the two set screws ❿ so that the end plane of the motor shaft can approximately coincide with that of the sensor slit ❸. (Join the flat section for installation.)
* Confirm that the slit plate of the sensor slit ❸ does not interfere with the presser bar lifter sensor.
5. Refer to "3.-(17) Thread trimmer and presser origin sensor adjustment" and make sensor adjustments.

Adjustment Procedures	Results of Improper Adjustment
1. Start the test mode I07 (IP-400) or CP-6 (CP-20). 2. Tread on the pedal for the retrieval of the thread trimmer and presser bar lifter (cam) origin. 3. Make sure that the standard holes (A and B) of the thread trimming motor stand are aligned with the standard hole C of the thread trimmer and presser lifter cam ❶ using a bar ❷. 4. If the standard hole C of the thread trimmer and presser lifter cam ❶ is too high (E direction), loosen the set screw ❸ and move the sensor mounting plate ❹ upward (E direction) and secure it. If the standard hole C of the thread trimmer and presser lifter cam ❶ is too low (D direction), loosen the set screw ❸ and move the sensor mounting plate ❹ downward (D direction) and secure it. After securing the sensor mounting plate ❹, conduct origin retrieval by pressing the pedal to make sure that the standard holes are aligned. 5. Repeat the above steps 2 to 4 until the coincidence is confirmed. (Caution) Tighten the set screw ❸ after confirming that there is no interference between the sensor slit plate ❹ and the sensor.	o If the standard holes are not aligned, the thread trimming timing error occurs and defective thread trimming and unthreading at the beginning of sewing may be caused.

(18) Adjusting the thread trimmer sensor

Standard Adjustment

After completion of origin retrieval (at start switch on) in the test mode I07 (IP-400) or CP-6 (CP-20), press the + key ④ 6 to 8 times, and the thread trimmer sensor is turned off (IP-400: The contents ⑦ on the operation panel change from "  " to "  ", CP-20: The display ① of 10th digit on the operation panel changes from "1" to "0".)



Adjustment Procedures	Results of Improper Adjustment
1. Start the test mode I07 (IP-400) or CP-6 (CP-20). 2. Tread on the pedal to perform origin retrieval for the thread trimmer cam. (Confirm that the origin is in the correct position. Then, proceed to the procedures shown below. Refer to “(17) Thread trimmer and presser origin sensor adjustment.”) 3. Press the + key ③ (IP-400) or ④ (CP-20). Make sure that the contents ⑦ (IP-400) on the operation panel change from “” to “” or that the value ① (CP-20) on the operation panel changes from “11” to “01” after pressing the + key 6 to 8 times. 4. If the change occurs by pressing the + key other than 6-8 times, or the change does not occur, loosen the set screw ② and adjust the sensor slit ③ finely in the arrow direction. 5. After the sensor slit ③ has been fixed, tread on the pedal and make origin retrieval for the thread trimmer cam. Examine the sensor changeover position in the steps 3. and 4. above. 6. Repeat the steps 2. ~ 5. above until the coincidence is secured. (Caution) During adjustments, check the clearances A, B, and C of the sensor slit ③ and the sensor ⑤. If the clearances seem to be insufficient, use the set screws ② and ⑥ to correct the gradient. While taking this action, continue to work on the steps above.	- o If the thread trimmer sensor changeover takes place outside the range, the moving knife may interfere with the needle. This will be a cause of injury or the breakage of parts. - o If the thread trimmer sensor changeover does not take place, Error 305 occurs and the sewing machine fails to start operating. - o If the sensor slit ③ has no clearance against the sensor ⑤, this can be a cause of destruction in the sensor slit ③ or the sensor ⑤.

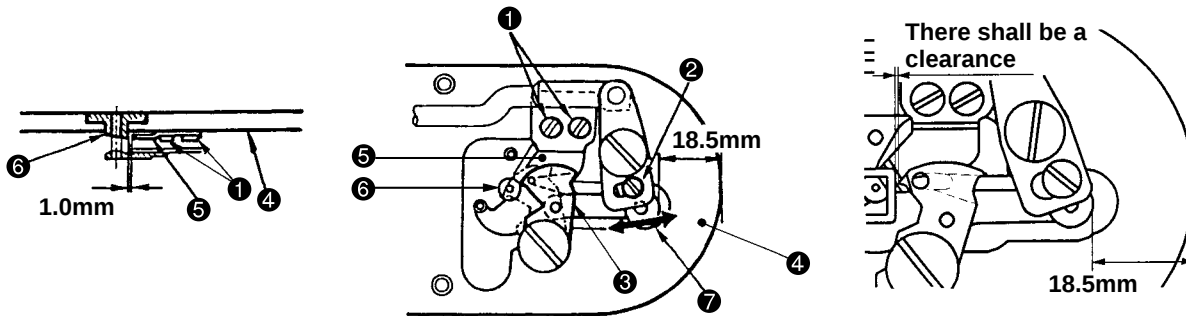
(19) Adjustment of the moving knife and counter knife position

Standard Adjustment

Counter knife position : The clearance between the counter knife ⑤ and the needle hole guide ⑥ is 1.0mm.

Moving knife position : Before thread trimmer operation (standby state), the distance from the throat plate ④ front end to the tip of the thread cutter lever (small) ⑦ is 18.5mm.

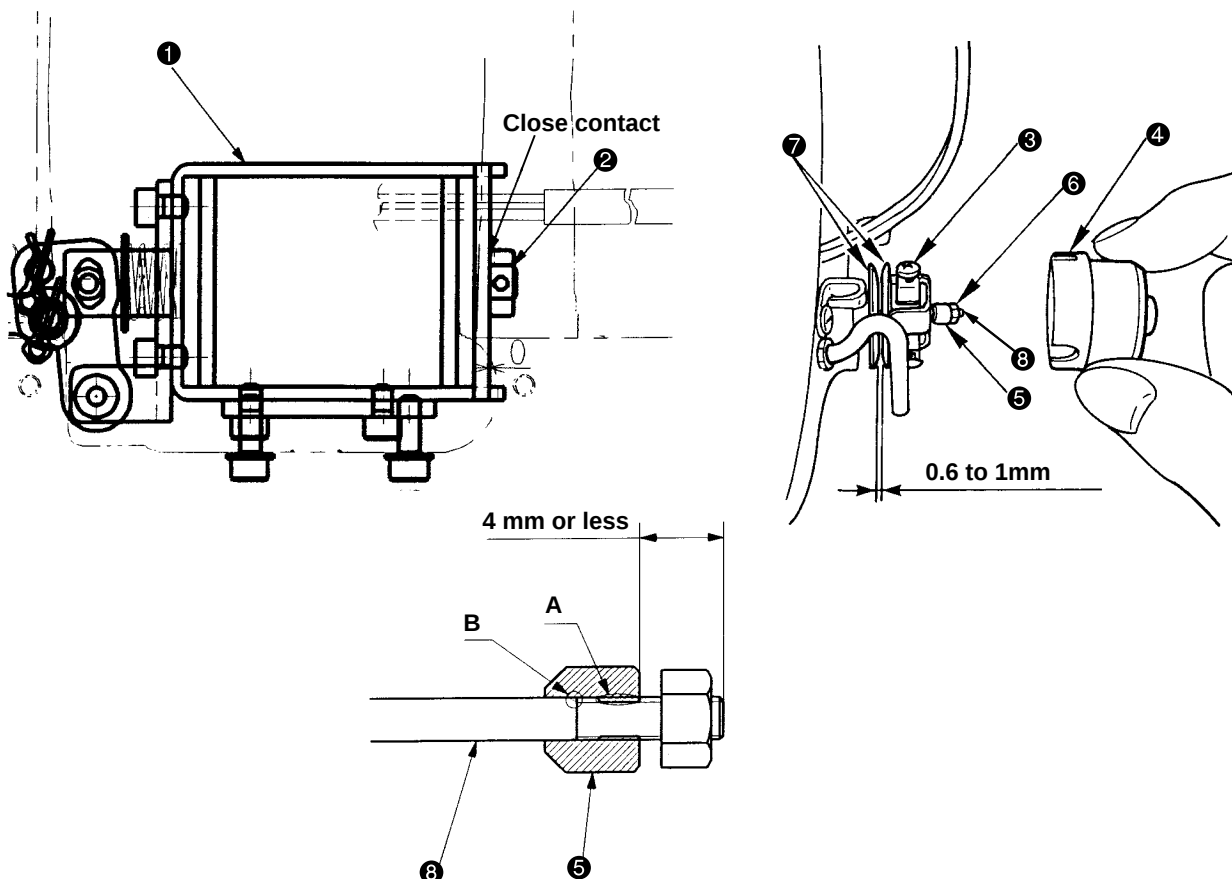
However, there shall be a proper clearance toward the moving knife tip during needle thread clamp and feed forward.



(20) Floating amount of the thread tension disk

Standard Adjustment

When the sewing machine power supply is turned off (AT solenoid ① is OFF), the gap between AT thread tension disk ⑦ is 0.6 ~ 1mm.

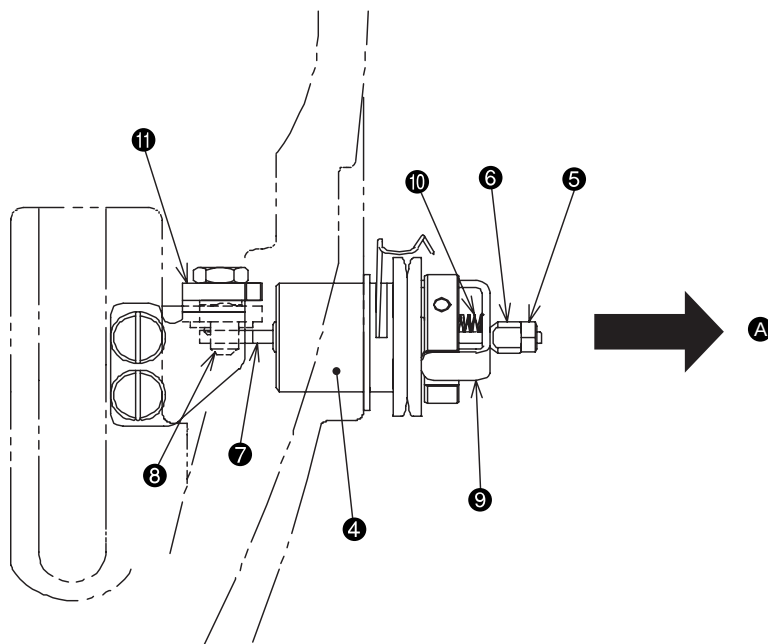
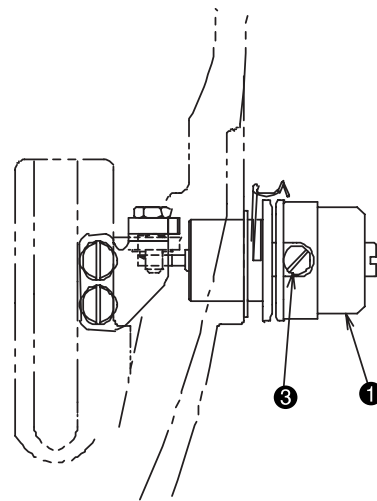
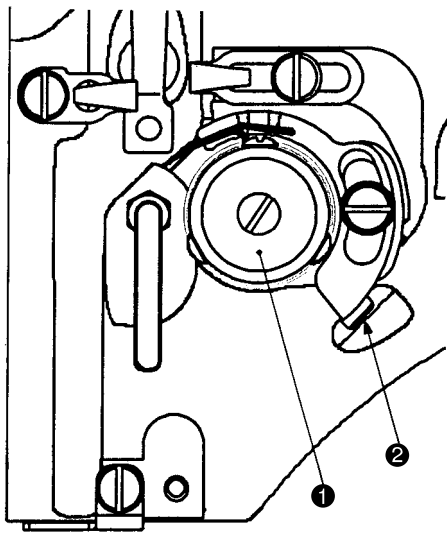


Adjustment Procedures	Results of Improper Adjustment
- Counter knife position Loosen the counter knife set screw ❶ to adjust the position. - Moving knife position Loosen the screw ❷ to adjust the position.	- o If the clearance is less than 1.0mm, thread may be cut by the counter knife ❺ blade when the thread is pulled with the moving knife ❸. In this case, upper and lower threads are cut into short pieces. - o If the clearance is more than 1.0mm, the residual thread length after thread cutting operation becomes longer beneath the work.

Adjustment Procedures	Results of Improper Adjustment
- Turn off the power supply and look for any close contact between the AT solenoid ❶ and the thrust collar ❷. - Loosen the three set screws ❸ and remove the thread tension cap ❹. - Hold the tension releasing pin adjust collar ❺ not to let it rotate, and loosen the nut ❻. - Turn the tension releasing pin adjust collar ❺ and adjust the gap between the thread tension disk ❼. (Adjustment of thread tension disc floating) - Hold the tension releasing pin adjust collar ❺ and tighten the nut ❻. Mount the thread tension cap ❹ by means of the set screw ❸. - Turn on the power supply and set up the thread tension. Confirm that the thread tension disk ❼ are closed. (Caution) When the tension releasing pin adjusting collar ❺ is rotated, the thread section should not be engaged with the incomplete thread section of the thread tension releasing pin ❸. (The thrusting distance of the thread tension releasing pin ❸ should be 4 mm or less from the tension releasing pin adjusting collar ❺.) * If the amount of disc floating cannot be adjusted properly under the condition that the thrusting distance is 4 mm or less, loosen the set screw ❸ and adjust the AT link unit (front) in the right-left direction. Refer to “(22) AT unit connection/disconnection”.	- o If the amount of disc floating is too less, the residual thread length can be changed or shortened when the thread is thick. - o If the amount of disc floating is too much, the thread tension discs ❼ cannot close completely and normal thread tension may fail to be chosen. This can be a cause of imperfect sewing. - o If the thread section of the tension releasing pin adjusting collar ❺ is engaged with the incomplete thread section of the thread tension releasing pin ❸, the thread tension releasing pin ❸ may be damaged.

(21) Second thread tension connection / disconnection**Procedures of disassembling**

1. Loosen the set screw ❷.
2. Remove three setscrews ❸ and take out the thread tension cap ❶.
3. Remove the nut ❺ and the tension releasing pin adjusting collar ❻. Then take out the thread tension disc pressing plate ❾ and three thread tension disc return springs ❿.
4. Pull out the second thread tension ❹ to remove it. (Arrow A)
5. For reassembly, follow the steps of 4. to 1. above.

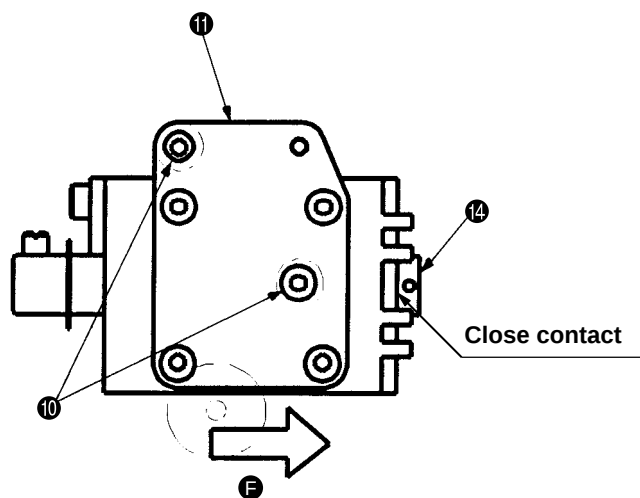
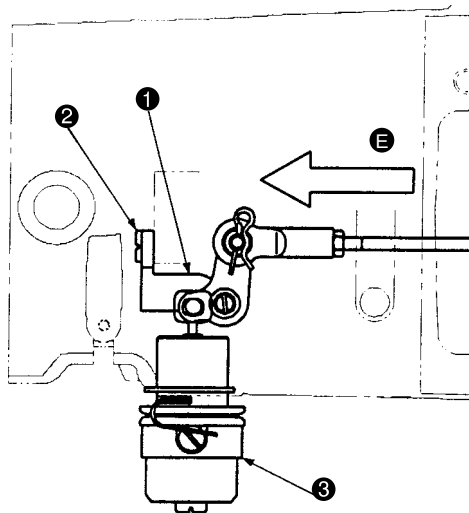


Procedures of assembling

1. When mounting the second thread tension ④, confirm in advance that the pin block ⑧ of the AT link unit (front) ⑪ is exactly settling in the hole of the thread tension pressing pin ⑦. If you try to mount the second thread tension ④ forcedly with the pin area left disengaged, this may result in breakage in the thread tension pressing pin ⑦ or malfunction.
2. After the completion of mounting, make adjustments of (20) Floating amount of the thread tension disk and (39) Adjustment of thread take-up spring; 1) Stroke adjustments.

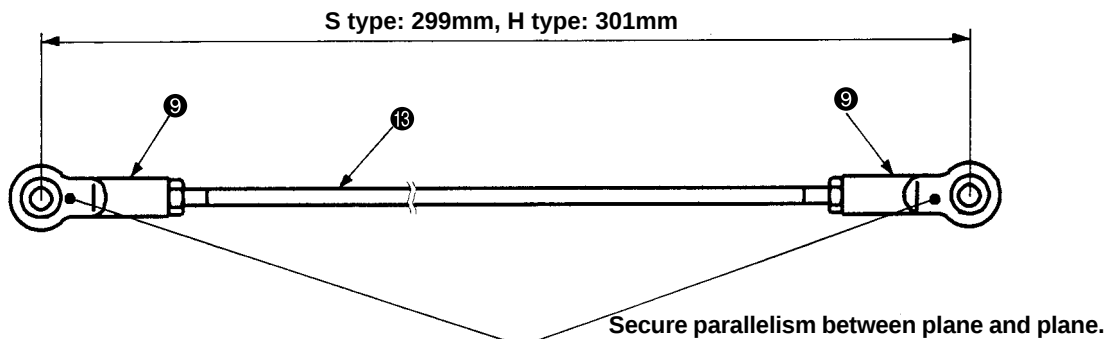
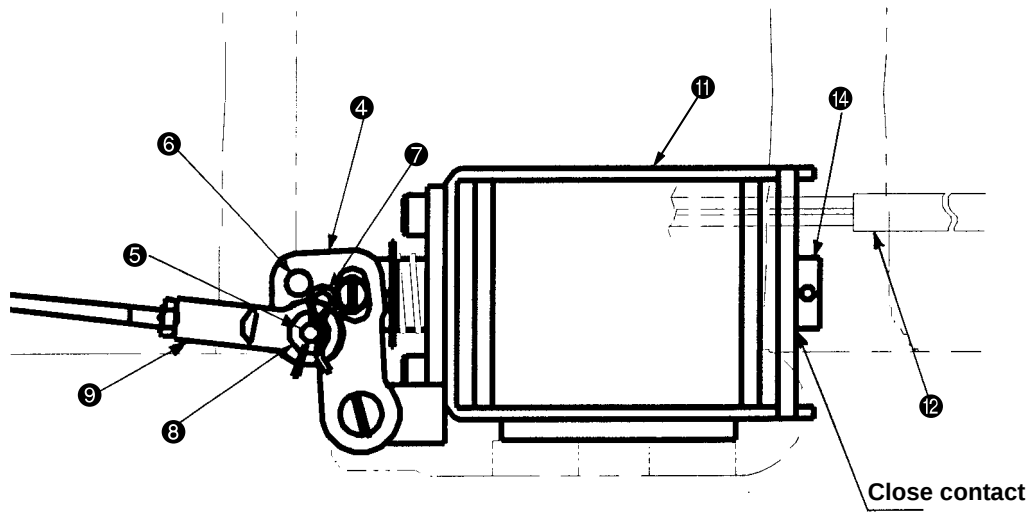
(22) AT unit connection / disconnection**Procedures of disassembling**

1. Remove the set screw ② of the AT link unit (front) ① and take out the second thread tension ③. ((21) Refer to "Second thread tension connection / disconnection.")
2. Draw out the cotter pin ⑦ from the pin block ⑤ (H type) or ⑥ (S type) of the AT link unit (rear) ④. Be careful not to drop the washer ⑧ at that time.
3. Lift the AT joint block ⑨ of the AT unit upward to remove the block from the pin block ⑤ (H type) or ⑥ (S type) of the AT link unit (rear) ④.
4. Draw out the AT link unit (front) ① from the plane side (in the direction of the arrow ⑤) and remove it.
5. Remove the two set screws ⑩ and take out the AT solenoid unit ⑪.
6. For reassembly, follow the steps of 5. to 1. above.



Procedures of assembling

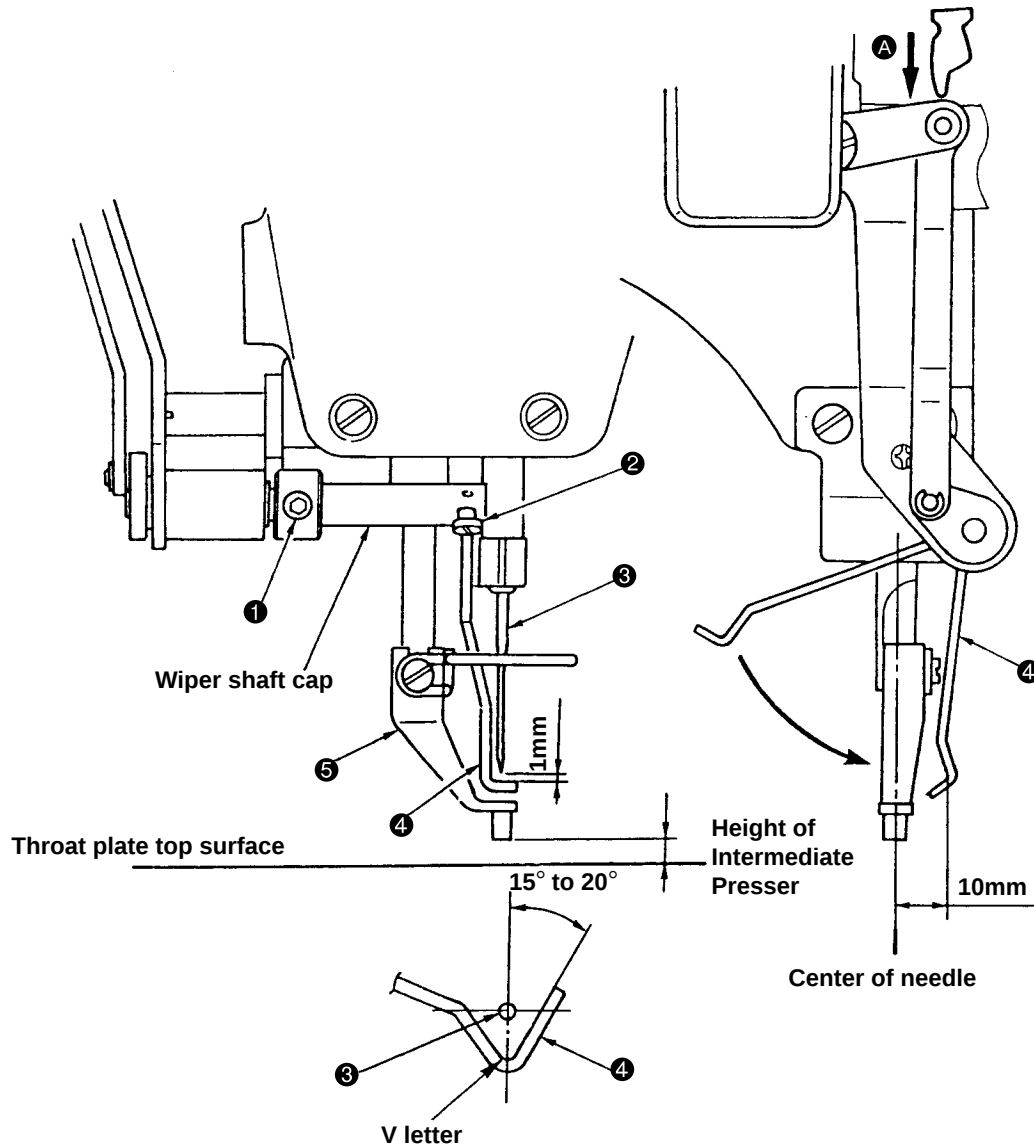
1. For incorporating the AT solenoid unit ⑪ into the system, run the solenoid cable ⑫ from the rear of the AT solenoid unit to the rear end of the machine arm.
2. The center-to-center distance between the AT joints ⑨ of the AT connector rod ⑬ is 299 mm for S type and 301 mm for H type.
When the AT joints ⑨ are disassembled or assembled, make sure that the center-to-center distance is correct, and that the front and rear of the AT joints ⑨ are parallel. Failure to observe this may cause AT malfunction resulting in incorrect thread tension.
(When the AT joint ⑨ is turned 4 times, the feed move amount comes to attain 2mm.)
3. For the pin block of the AT link unit (rear) ④, use the pin block ⑤ for H type and the pin block ⑥ for S type. The wrong pin position may cause AT malfunction resulting in incorrect thread tension.
4. After completion of all assembly work, make sure that the thrust collar ⑭ closely contacts with the AT solenoid unit ⑪. If there is a clearance between them, loosen 2 set screws ⑩ and move the AT solenoid unit ⑪ to the rear (Arrow ➤) and secure it again.
* If the above-mentioned center-to-center distance is great between the AT joints ⑨, the clearance will be opened wider.



(23) Wiper adjustment

Standard Adjustment

1. When lowering the intermediate presser at the stop position after thread trimming (needle ③ height from the top surface of throat plate is 17.7 mm.) and pressing wiper link section A, adjust the clearance between the center of needle ③ and the inside of V letter of the wiper ④ to 10 mm.
2. Press wiper link section A on the way and when the wiper ④ has come to the underside of needle, adjust the clearance to 1 mm.
3. The opening angle of the top end of the wiper ④ is 15° to 20°.



(Caution) The intermediate presser supplied as standard accessory is available up to 5 mm material thickness.

However, the intermediate presser can not be used for the 3 mm material thickness or more since the wiper can not pass the space between the tip of needle and the intermediate presser.

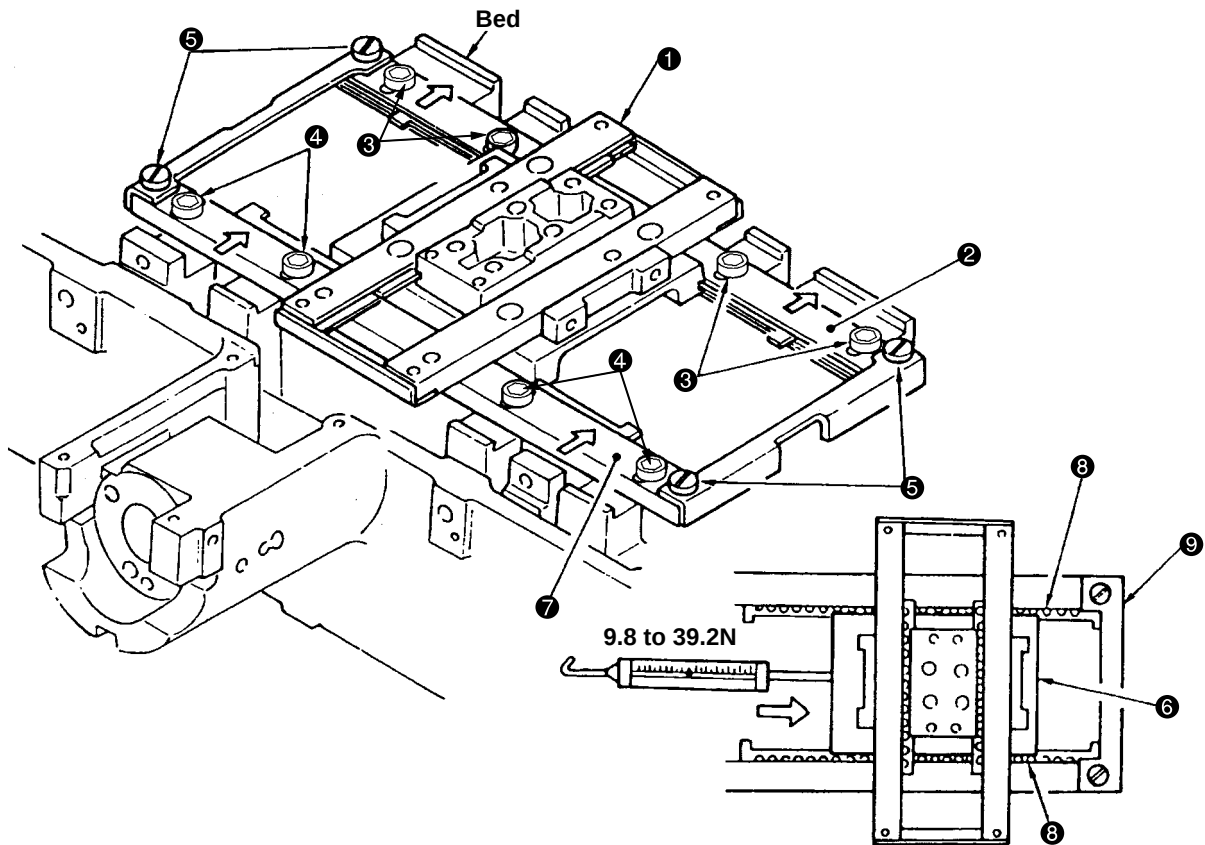
Turn OFF the wiper switch in case of 3 mm material thickness or more.

Adjustment Procedures	Results of Improper Adjustment
1. Turn OFF the power after stopping the thread trimming, or turn ON the threading switch and lower the intermediate presser ⑤. (Caution) As for the height of needle ③ when adjusting the wiper ④, set the height when the sewing machine stopped after trimming the thread actually. 2. Push wiper link section ① and move the top end of the wiper ④ to the under side of the needle. 3. In the state of the above item 2. , loosen setscrew ② and adjust the clearance between the wiper and the tip of the needle should be (1 mm) and the opening angle should be (15° To 20°). Then tighten setscrew ② . 4. Push wiper link section ① to the last and loosen setscrew ① . 5. In the state of the above item 4. , adjust the longitudinal (10 mm) and lateral positions of the wiper ④. Then tighten setscrew ① .	- o If the clearance between the wiper ④ and needle ③ is too small, the wiper comes in contact with the needle ③ due to uneven stop position of the main shaft, causing needle breakage. - o If the clearance between the wiper ④ and needle ③ is excessive, the wiper comes in contact with the intermediate presser ⑤ and the wiper will damage the intermediate presser ⑤. Also, the intermediate presser ⑤ can not go up. - o If a clearance of 10 mm between the inside of V letter of the wiper ④ and the center of needle ③ is mistakenly set, the wiper fails to spread the thread. - o Similarly, If the center of needle does not align with the V letter of the wiper ④, the wiper fails to spread the thread. - o If the opening angle of the wiper ④ is excessive, thread sweeping failure will occur.

(24) Adjusting the pre-load of the X-Y table

Standard Adjustment

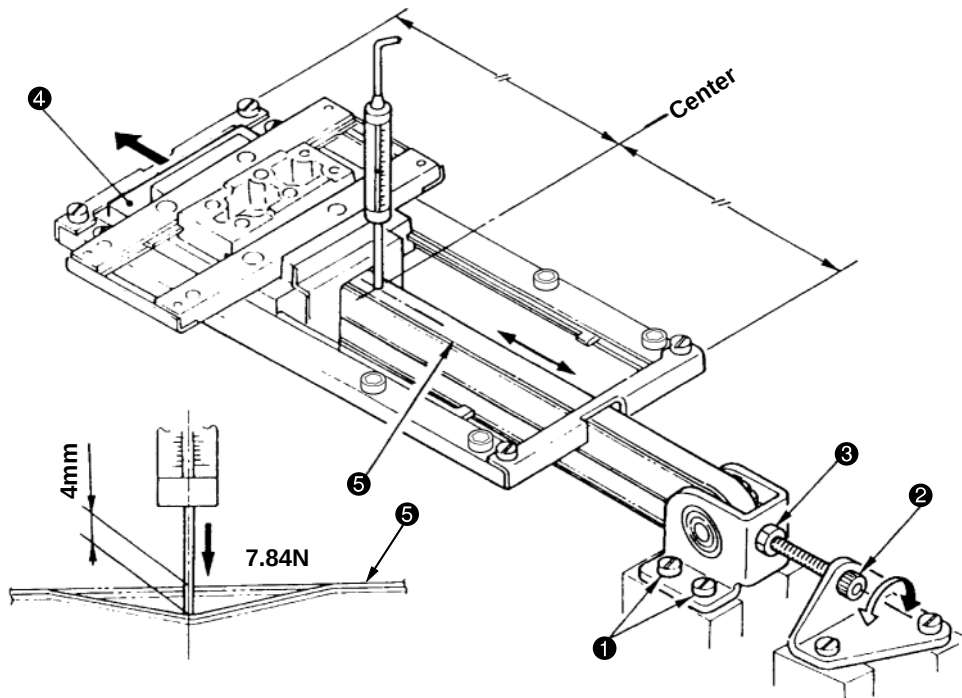
When removing the X-Y table assy ❶ from the sewing machine, re-adjustment of the pre-load is necessary for the X axis only.



Adjustment Procedures	Results of Improper Adjustment
1. Hold down the X fixed race (rear) ② in the direction of the arrow to tighten 4 set screws ③. 2. Loosen 4 set screws ⑤. 3. Hold down the X fixed race (front) ⑦ in the direction of the arrow to tighten 4 set screws ④. * Then, adjust the retainer compensating torque between 9.8 to 39.2 N (1 to 4 kgf) on both right and left sides. 4. Tighten 4 set screws ⑤. * Retainer compensating torque: This is a load necessary to move the race table ⑥ after the retainer ⑧ has come in contact with the X stopper ⑨. This torque should be measured when the belt is slack before pulse motor installation.	

(25) Adjustment of the tension of the X timing belt

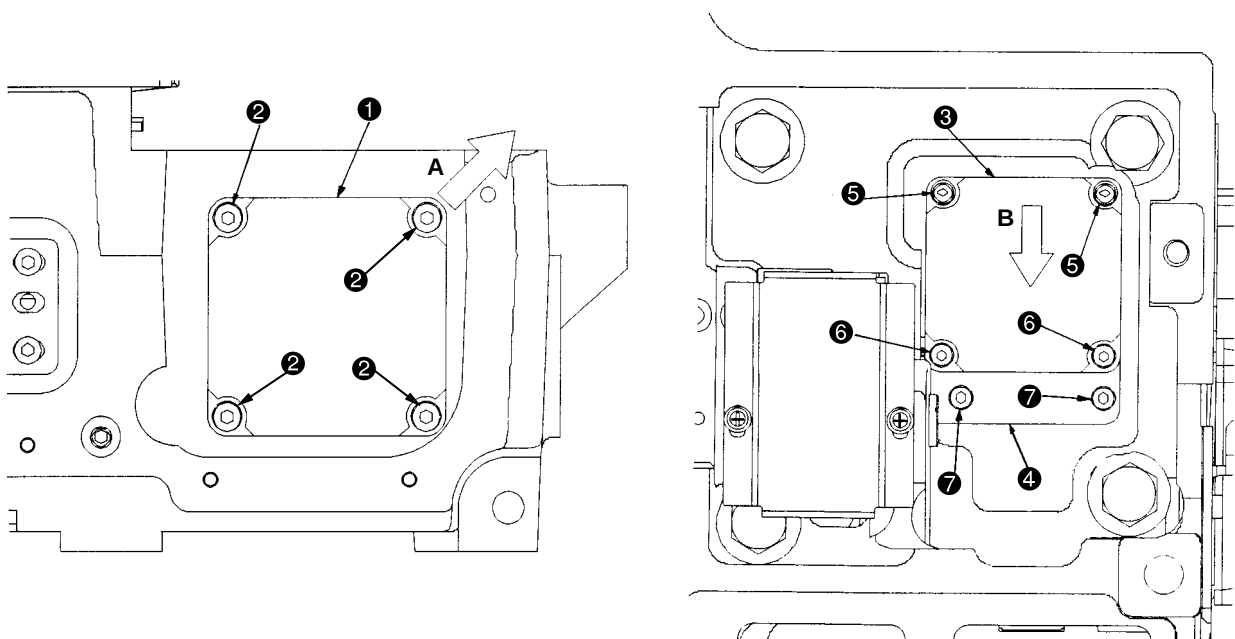
Standard Adjustment



(26) Adjustment to positions of X-motor and Y-motor (Backlash adjustment to gear)

Standard Adjustment

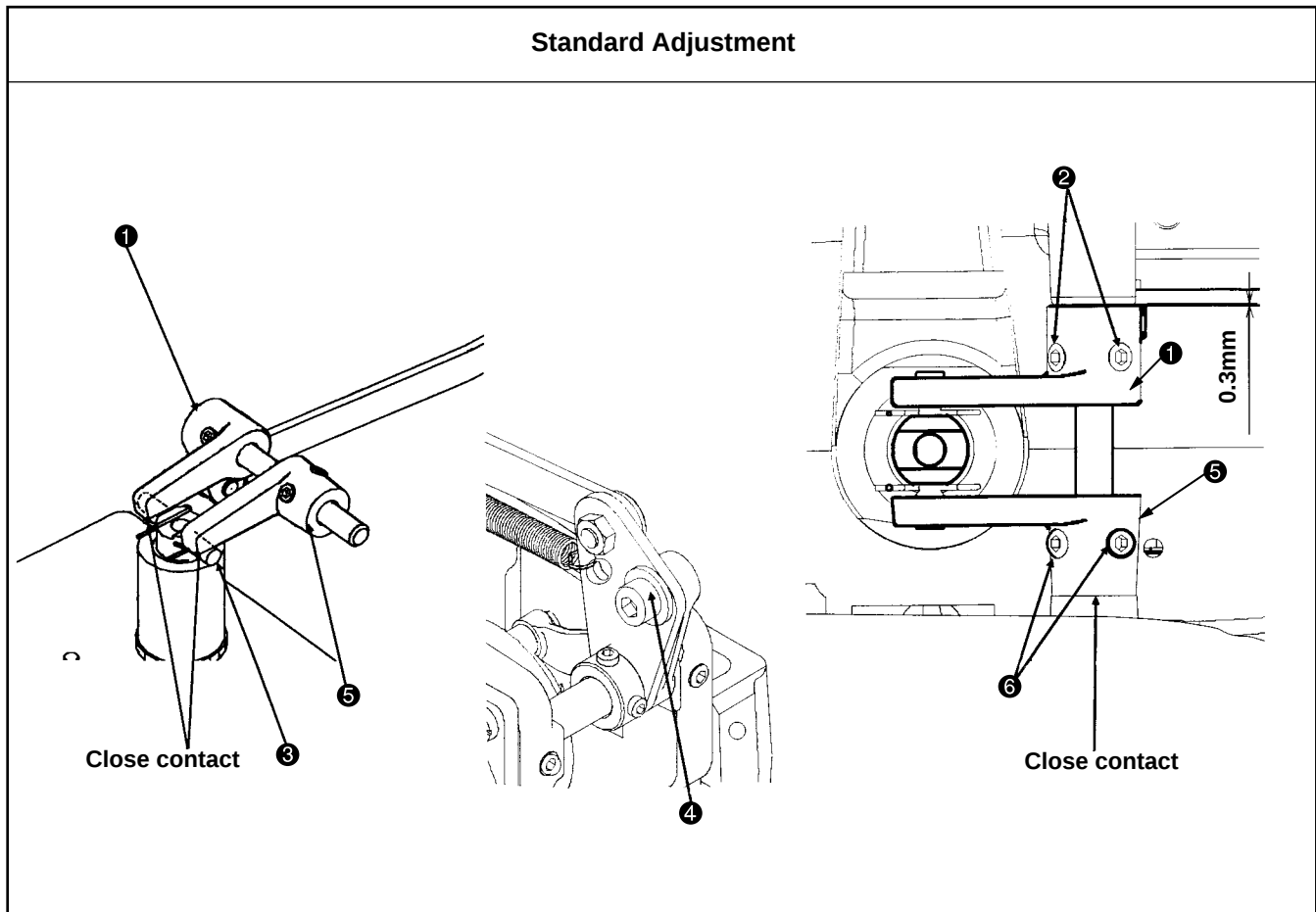
1. Hold down the X motor ① in the direction of Arrow A and secure it.
2. Hold down the Y motor ③ in the direction of Arrow B and secure it.



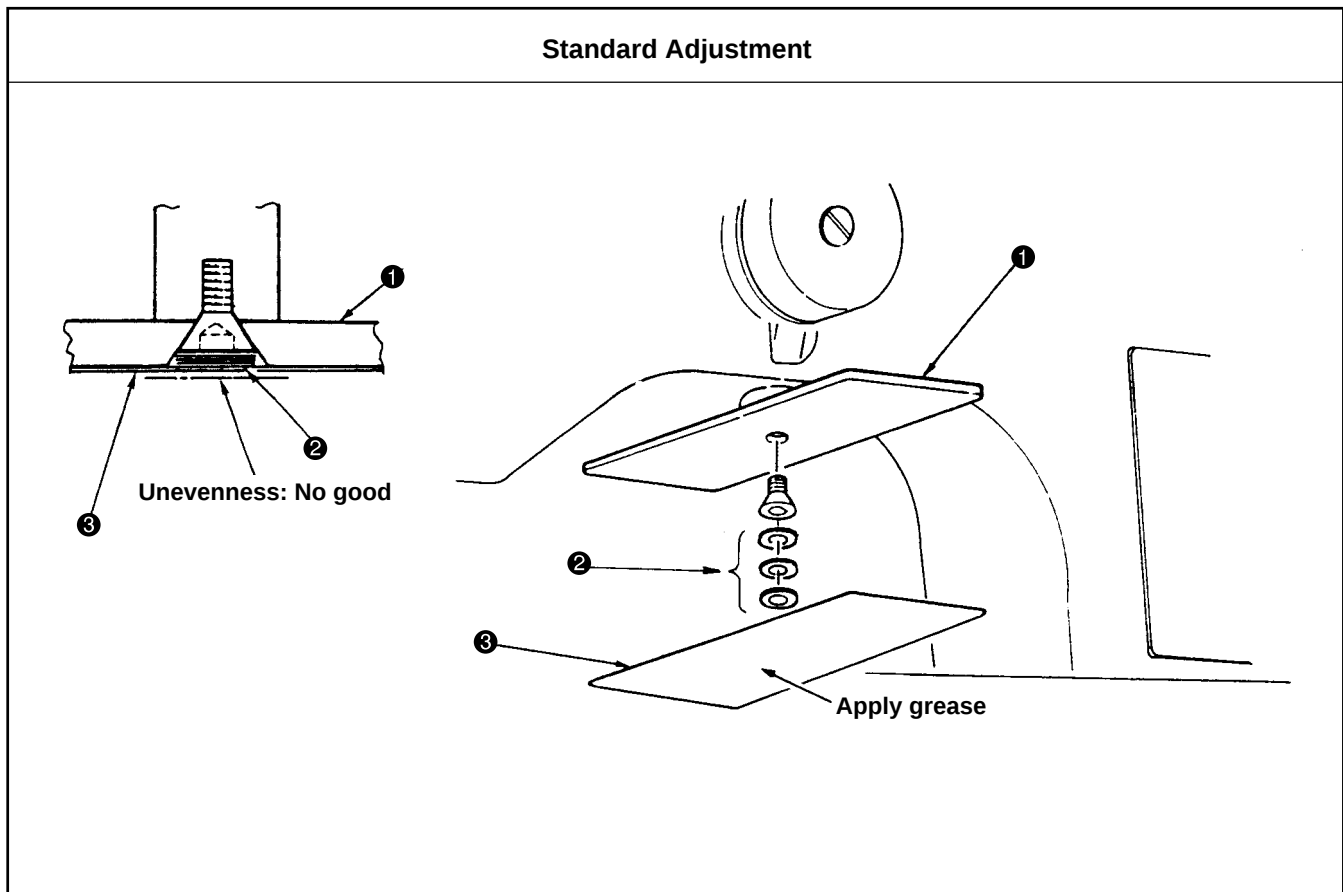
Adjustment Procedures	Results of Improper Adjustment
1. Move the race table ❹ to the left end (in the direction of the arrow). 2. Tighten the adjusting screw ❷ and fix the nut ❸ so that the load point makes a warp of 4mm when a load of 7.84N (800gf) measured by a spring balance is applied to the timing belt ❺. 3. Tighten the set screw ❶ and check the amount of deflection again.	- o If the tension is excessive, it will cause timing belt ❺ breakage. - o If the tension is too low, it will cause failure of the feed.

Adjustment Procedures	Results of Improper Adjustment
1. Loosen 4 set screws ❷ securing the X motor ❶. 2. Hold down the X motor ❶ in the direction of Arrow A and tighten 4 set screws ❷ to secure the X motor ❶. 3. Loosen 2 set screws ❺, 2 set screws ❻, all of which secure the Y motor ❸, and 2 set screws ❼ securing the Y motor mounting plate ❹. 4. Hold down the Y motor ❸ in the direction of Arrow B and tighten 2 set screws ❺ that are positioned upper. Then, tighten 2 set screws ❻ that are positioned lower and 2 set screws ❼ securing the Y motor mounting plate ❹.	- o If the X motor or Y motor is held down inadequately, feeding gear backlash is increased and needle location accuracy may be reduced. In addition, feeding error may be caused resulting in needle breakage, and other problems. - o If the pushing is excessive, the load of the feed will become large, causing the failure of the feed.

(27) Adjusting of the presser lower arm (Motor type only)



(28) Adjustment when the presser plate sheet is replaced (Motor type only)



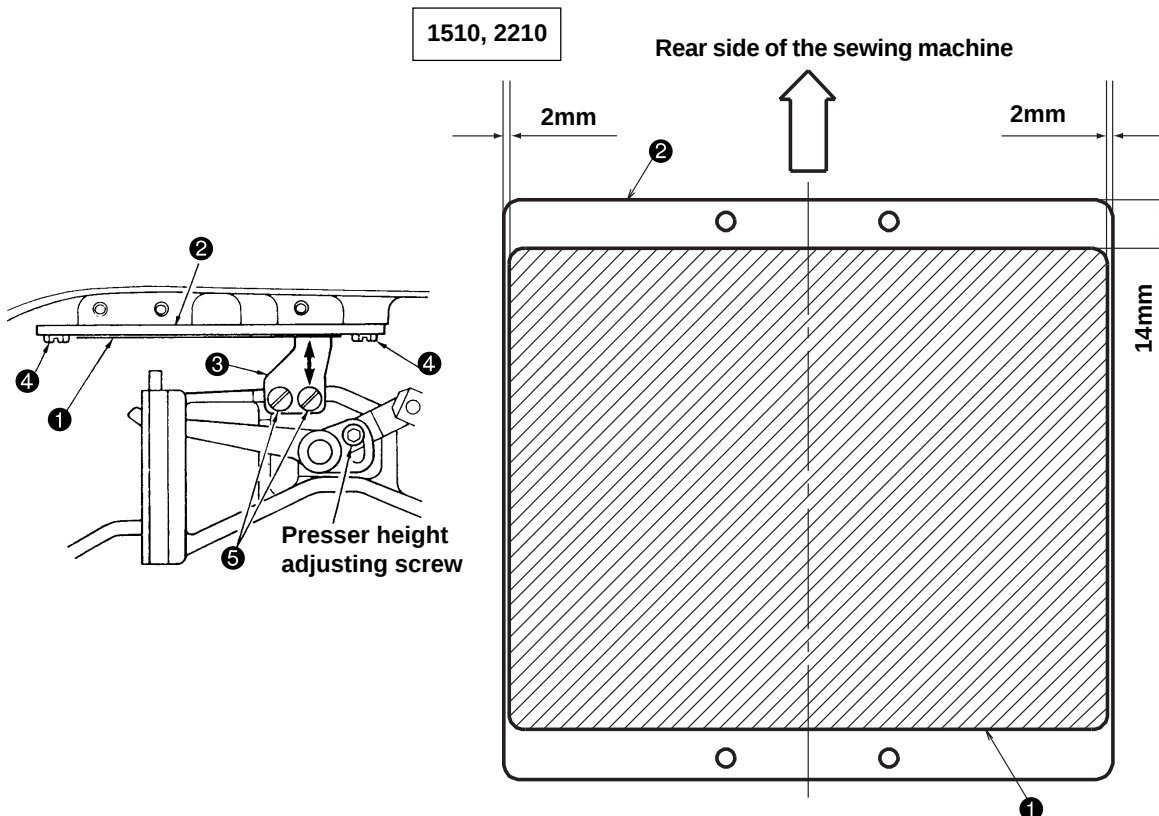
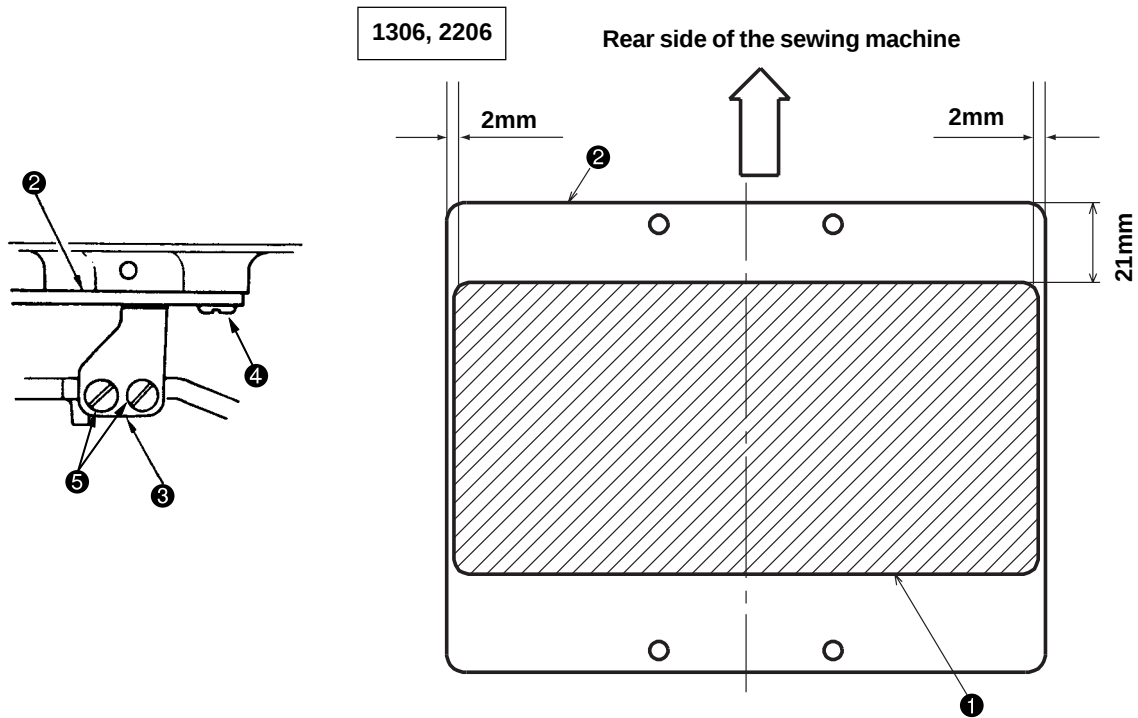
Adjustment Procedures	Results of Improper Adjustment
1. Secure the presser lower arm A ❶ so that the clearance between the holding arm and machine arm becomes 0.3 mm with 2 set screws ❷. 2. Use the adjusting screw ❹ to make sure that the presser lower arm A ❶ closely contacts with the holding pin ❸ under the condition of the presser lifted. 3. Make the angle between the presser lower arm B ❺ and pressing pin ❸ the same as the angle between the presser lower arm A ❶ and pressing pin ❸, and keep the machine arm to contact closely with the presser lower arm B ❺, and tighten the two set screws ❻.	- o If the angle of the presser lower arm A ❶ and B ❺ is not equal, it will cause loosening the arm asm. screws or the breakage. - o If the clearance is too small between the presser lower arm A ❶ and the arm, this can be a cause of maloperation during pushing down.

Adjustment Procedures	Results of Improper Adjustment
1. Put an appropriate number of the spacers ❷ into the presser plate ❶ to make the presser plate sheet ❸ even. 2. In regard to the application of grease, refer to "PRESSER PLATE & MANUAL PRESSER MECHANISM COMPONENTS" described in 10.-(4) Parts to which grease•lock-tight is applied.	o The step difference will cause malfunction of the feed.

(29) Height of the slider and pasting of the presser plate sheet (Pneumatic type only)

Standard Adjustment

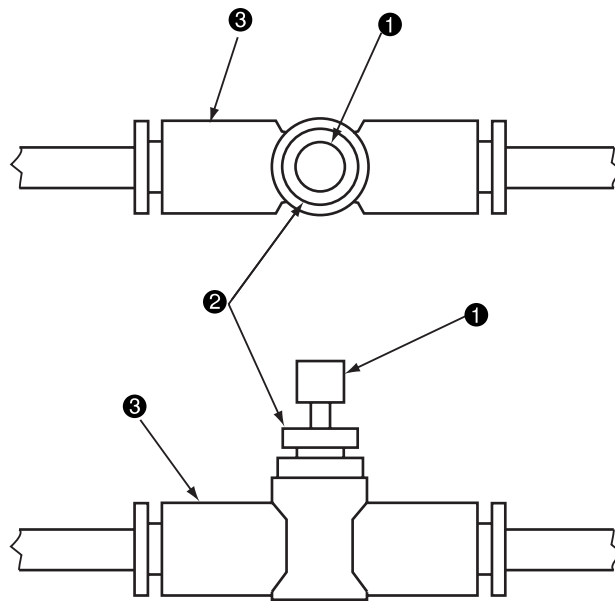
1. Follow the dimensions in the drawing below for pasting the presser plate sheet ❶ on the presser plate ❷.
Apply grease after pasting the sheet.
2. Bring the upper end of the slider ❸ into close contact with the presser plate ❷.



Adjustment Procedures	Results of Improper Adjustment
1. Remove 4 set screws ④ to remove the presser plate ②, and replace the old presser plate sheet ① with new one. 2. After mounting the presser plate ②, adjust the height of the slider ③ with 4 set screws ⑤. To position the height, lightly press the slider ③ to the presser plate ② when the presser goes up.	- o If the position where the presser plate sheet ① was pasted is wrong, abrasion of related components or peeling of the presser plate sheet ① may occur resulting in a feed error due to direct contact between the slider ③ and presser plate ②. - o Wrong slider ③ height may cause a feed error.

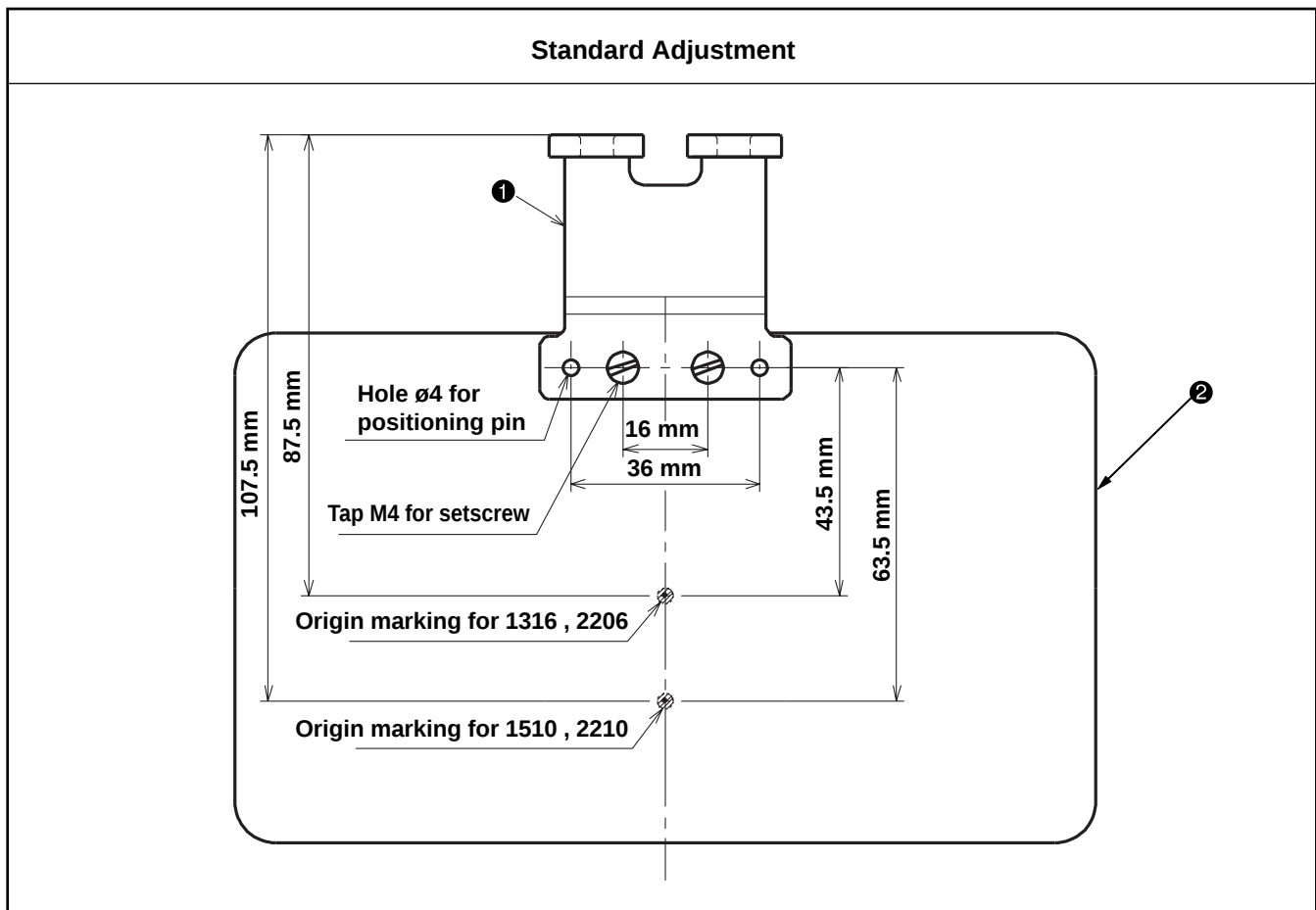
(30) Adjusting the speed of the work clamp feet (Pneumatic type only)**Standard Adjustment**

1. Adjust the knob 1 ❶ and the knob 2 ❷ of the speed controller ❸ mounted on the solenoid valve and make adjustments as described below.
 - Presser lifting (tube label: 1-A, 2-A) and presser lowering (tube label: 1-B, 2-B).
 - Loosen the knob 2 ❷ and turn the knob 1 ❶ once fully to the right in order to make 3 turns to the left. Since then, tighten the knob 2 ❷.

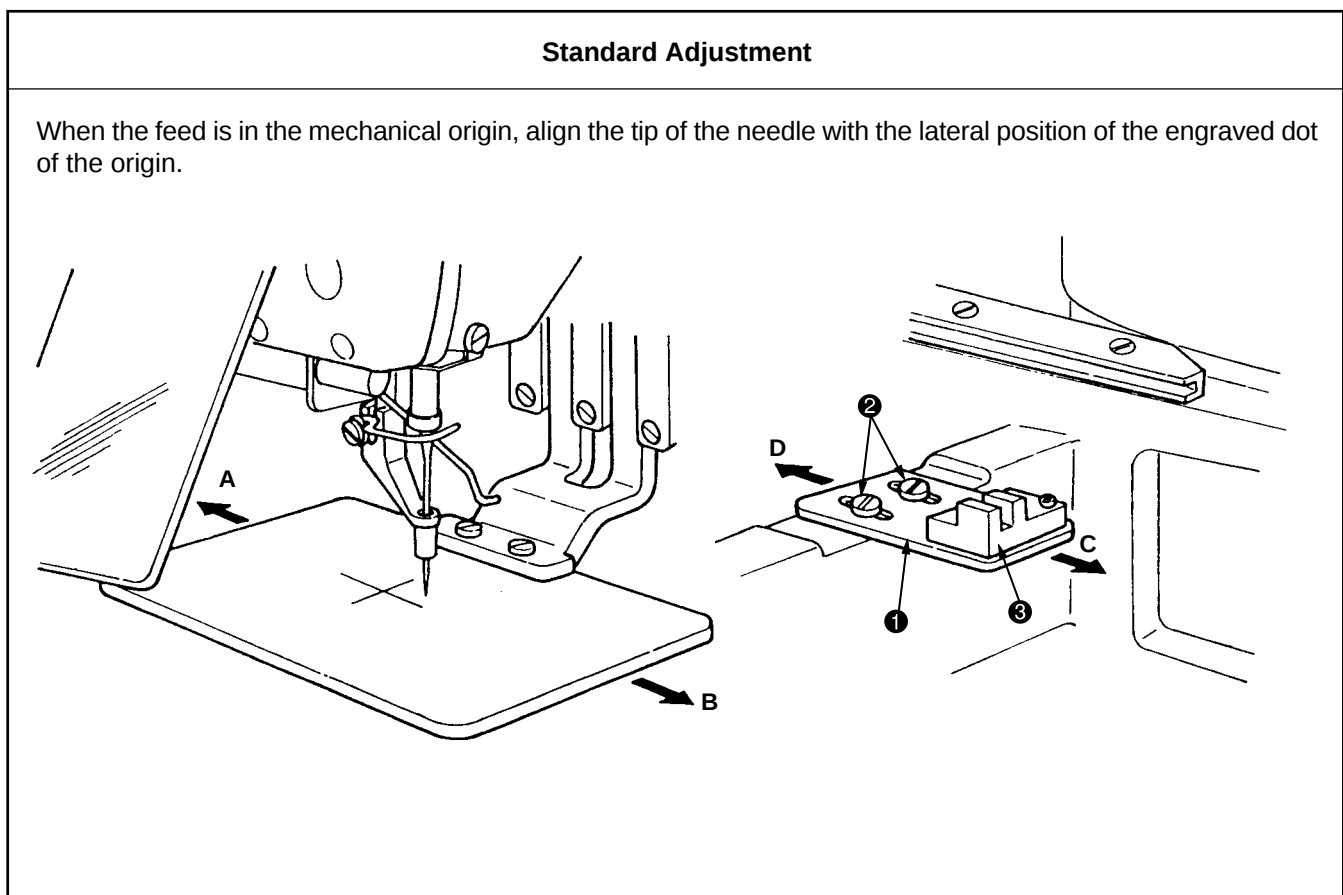


Adjustment Procedures	Results of Improper Adjustment
1. Adjust the speed referring to Standard Adjustment. 2. To increase the speed of lowering/raising the work clamp foot, turn the knob 1 ① counterclockwise. 3. To decrease the speed, turn the knob 1 ① clockwise.	- o When the work clamp foot comes down, the noise is big. - o The work clamp foot fails to rise.

(31) Making the origin setting gauge



(32) Adjusting the X origin sensor

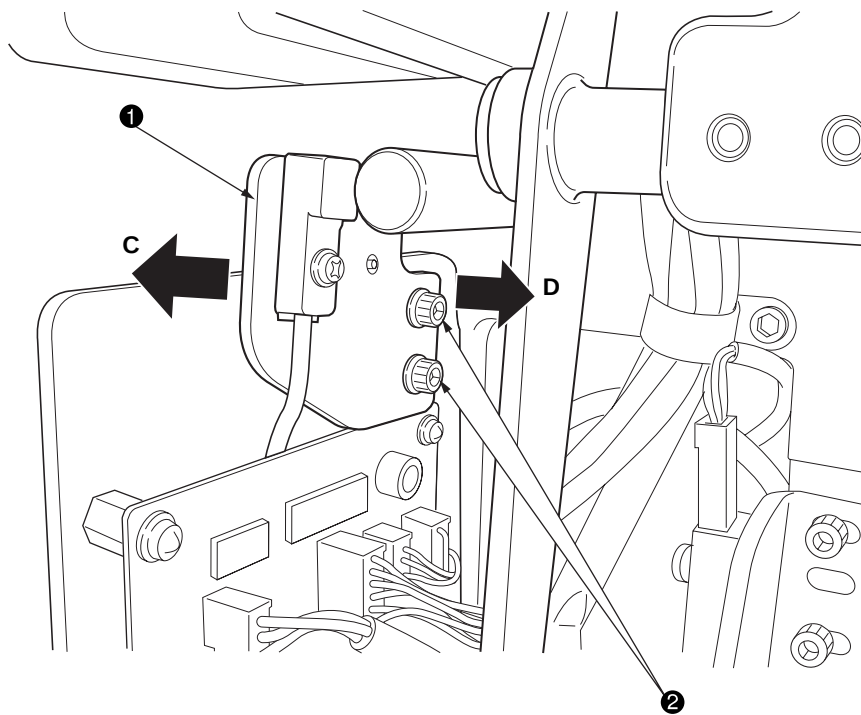
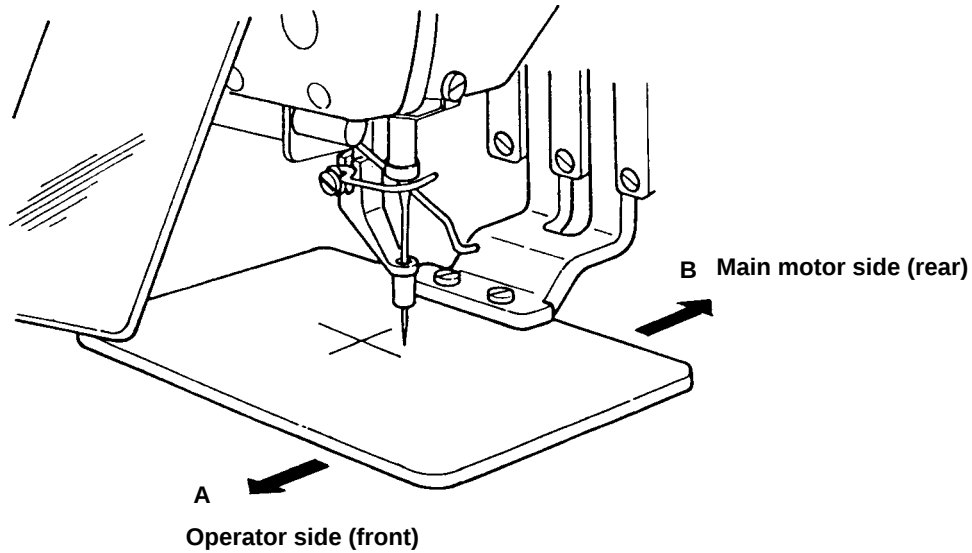


Adjustment Procedures	Results of Improper Adjustment
1. Make an origin setting gauge ❷ as shown in the figure, and attach it to the work clamp foot ❶.	

Adjustment Procedures	Results of Improper Adjustment
1. Start the test mode I06 (IP-400), or CP-2 (CP-20). 2. When the star pedal is depressed, the feed moves to the mechanical origin and stops. 3. Lower the needle and check the right and left displacement based on the engraved marking of the origin. 4. When the engraved marking of the origin is found to be displaced in Direction A from the needle tip, loosen the two set screws ❷ and adjust the sensor mounting plate ❶ in Direction C. After adjustments, tighten the two set screws ❷. 5. When the engraved marking of the origin is found to be displaced in Direction B from the needle tip, loosen the two set screws ❷ and adjust the sensor mounting plate ❶ in Direction D. After adjustments, tighten the two set screws ❷. (Caution) After the adjustment, make sure that the slit plate does not interfere with the sensor ❸.	

(33) Adjusting the Y origin sensor**Standard Adjustment**

When the feed is in the mechanical origin, align the tip of the needle with the longitudinal position of the engraved dot of the origin.

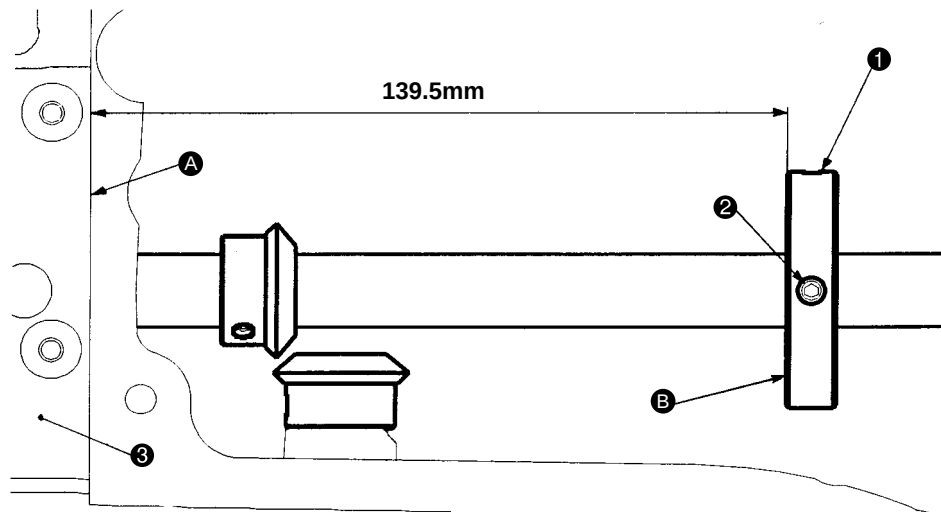


Adjustment Procedures	Results of Improper Adjustment
1. Start the test mode I06 (IP-400) or CP-2 (CP-20). 2. When the pedal is trodden on, the feed moves to the mechanical origin and then stops. 3. Lower the needle and check the front-rear displacement from the engraved marking of the origin. 4. When the engraved marking of the origin is found to be displaced in Direction A from the needle tip, adjust the sensor mounting plate ❶ in Direction C. (Loosen the set screws ❷ and fix the set screws ❷ after adjustments.) 5. When the engraved marking of the origin is found to be displaced in Direction B from the needle tip, adjust the sensor mounting plate ❶ in Direction D. (Loosen the set screws ❷ and fix the set screws ❷ after adjustments.)	

(34) Adjustment of the bobbin winder driving wheel position

Standard Adjustment

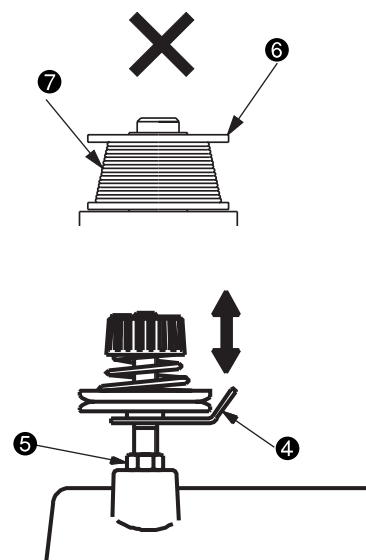
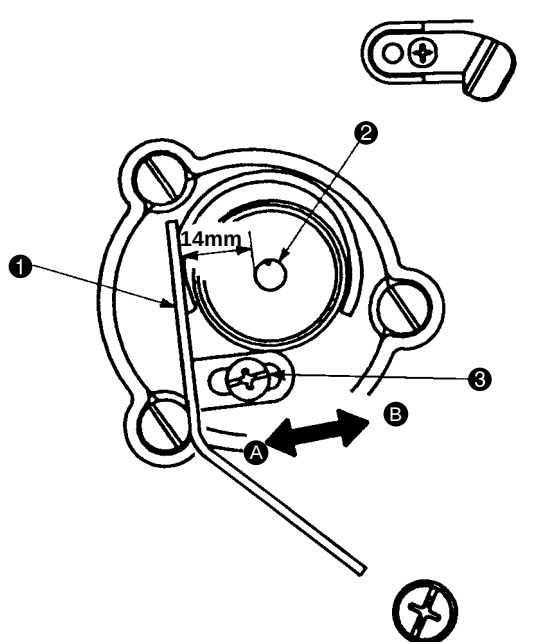
The distance is 139.5 mm between the measuring plane **B** of the bobbin winder driving wheel **1** and the cover mounting plane **A** of the sewing machine frame **3**.



(35) Adjusting the bobbin winder amount

Standard Adjustment

The position of the bobbin winder lever **1** is based on the standard that it is 14 mm apart from the bobbin winder shaft **2**. Try to perform bobbin winding actually and make fine adjustments of the bobbin lever set screw **3** in the directions of the arrows **A** and **B** so that the amount of thread winding becomes adequate (recommended value: 80 to 90% of the bobbin.)



Adjustment Procedures	Results of Improper Adjustment
1. Loosen the two set screws ❷ to adjust the position (139.5mm) of the bobbin winder driving wheel ❶ and fix it with the two set screws ❷.	- o If the distance of 139.5mm is insufficient, rubber ring wear may occur in the bobbin winder unit. In addition, the bearing life may be reduced in the bobbin winder unit. - o If the distance of 139.5mm is excessive, normal thread winding may fail. In addition, this will also cause rubber ring slippage in the bobbin winder unit and give rise to wear.

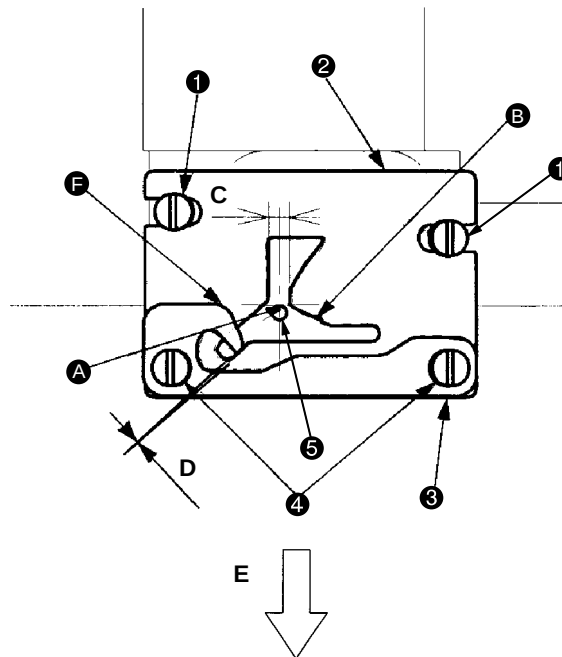
Adjustment Procedures	Results of Improper Adjustment
1. Loosen the set screw ❸ of the bobbin winder lever and adjust the distance to 14mm between the bobbin winder lever ❶ and the bobbin winder shaft ❷. After that, tighten the set screw ❸ of the bobbin winder lever. 2. Start the sewing machine and wind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

(36) Adjustment of the shuttle upper spring and lower thread holder position

Standard Adjustment

1. Shuttle upper spring ② : In regard to the right and left positioning, secure coincidence between the center of the needle ⑤ and that of the groove width C. For the front-rear positioning, join the needle rear end and the corner ① block.
2. Lower thread holder ③ : The amount of overlapping with the shuttle upper spring ② should be adjusted so that the thread of Vynlon #8 can pass smoothly when it is pulled in the direction of the arrow E. After the best positioning has been secured, fasten the two set screws ④.

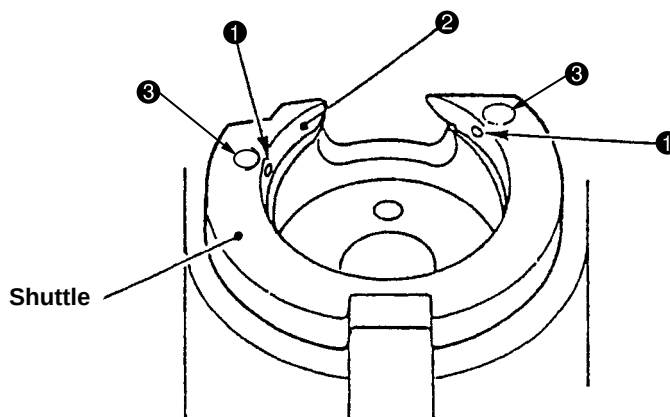
(Caution) If Part ③ and ⑤ is damaged, this is the cause of thread breakage, hangnail of thread, stain on thread, etc. Therefore, this part should be polished by the use of a buff or the like. In particular, the rear side should be handled with care.



(37) Shuttle felt

Standard Adjustment

- Two pieces of the shuttle felt ① are inserted in the holes of the shuttle race ②. Confirm that the shuttle felts ① are not overloaded when the inner hook is set and turned along the shuttle race ②.
- Shuttle packing ③ has been inserted in the hole of the shuttle race ②.



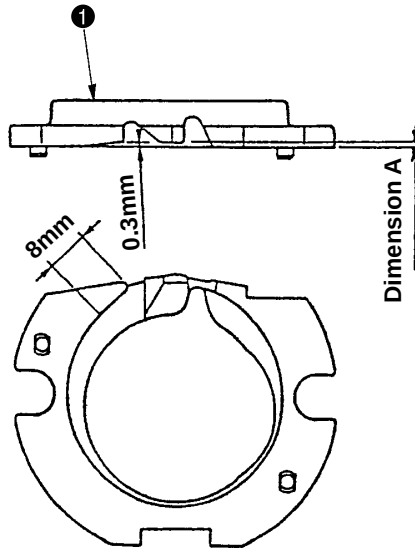
Adjustment Procedures	Results of Improper Adjustment
1. Remove the work feed bar, feed plate, and the throat plate. Adjust the positioning of shuttle upper spring ② with the set screws ① (2 pcs.). 2. Using the set screw ④, adjust the amount of overlapping D for the lower thread holder ③ and the shuttle upper spring ②. (Caution) The right and left positions can also change during (15) hook adjustments. Position adjustment for the shuttle upper spring ② should be done after the completion of standard hook adjustment, without fail.	- o If there is a front and rear displacement or a right and left displacement, needle thread biting may occur into the hook. Too much motion to the rear side will cause the moving knife to fail to hook the needle thread. - o Too much motion to the rear side will cause the moving knife to fail to hook the needle thread. - o Too much motion to the left side will cause the moving knife to fail to hook the bobbin thread.

Adjustment Procedures	Results of Improper Adjustment
1. If the shuttle felt ① seems to be protruded or it has been replaced with a new one, push it in by means of tweezers or the like. (Caution) Do not push it in excessively. Align the height and the plane of the shuttle race ②. 2. Confirm that the shuttle packing ③ has been mounted assuredly.	- o If the shuttle felt ① is protruded, this will be turned into a rotary load of the inner hook, causing a sewing error. - o If the shuttle felt ① is missing or pushed in too much, this will result in hook lubrication deficiency, causing hook overheating and wear. - o If the shuttle packing ③ has been missing, the shuttle felt ① and others may be lost, and this can be a cause of shuttle heating and wear.

(38) Shape of the shuttle race ring

Standard Adjustment

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

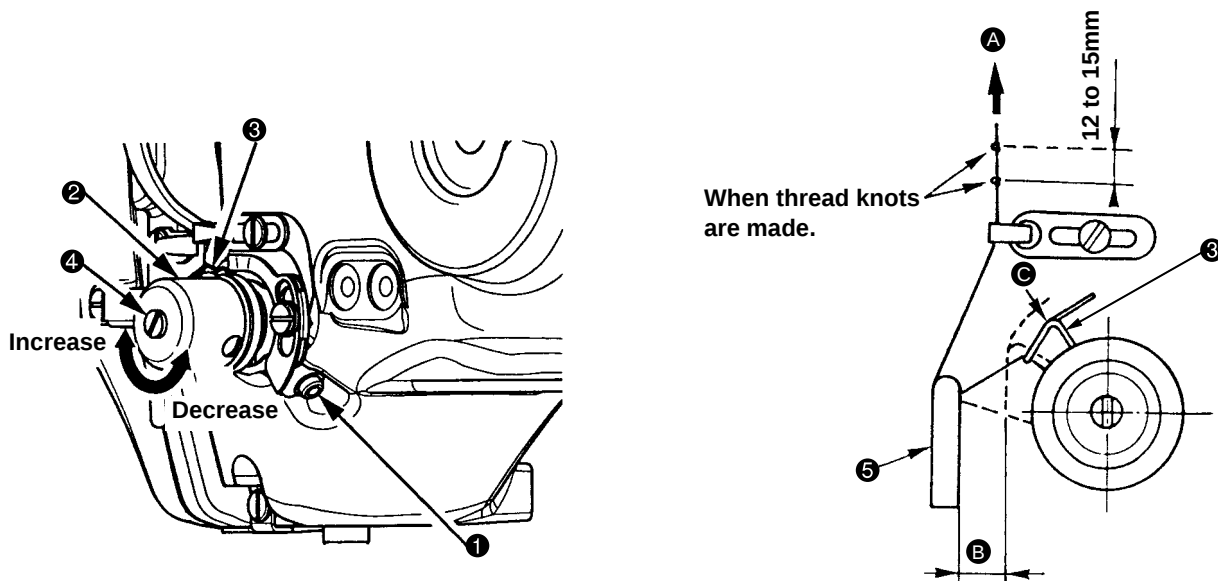


(39) Adjustment of thread take-up spring

Standard Adjustment

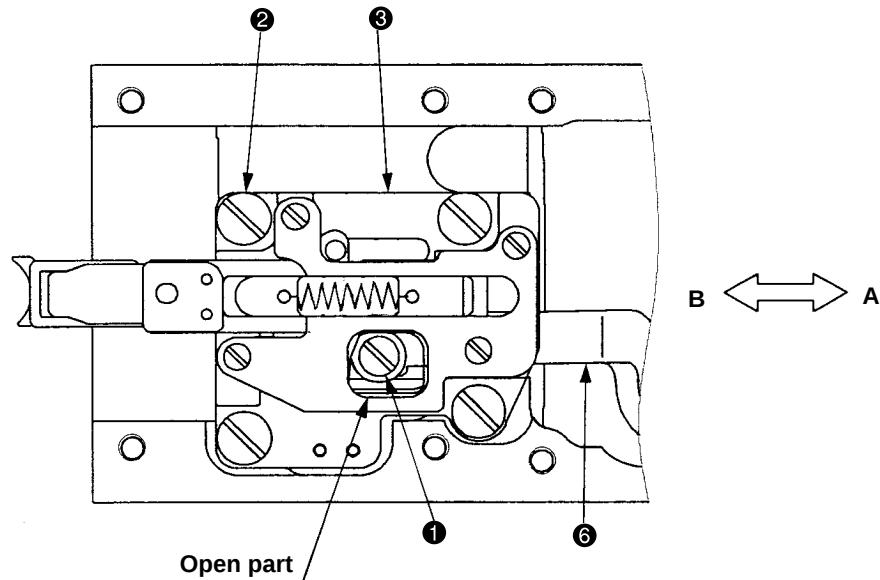
Stroke : The movable distance of the needle thread when the needle thread is pulled in the direction ❶ until the thread take-up spring ❸ stops. 12 to 15 mm for S type, 12 to 18 mm for H type.

Tension : Adjust the thread take-up spring tension in accordance with the thread tension. (Actually sew a material and adjust the thread take-up spring tension to an appropriate value.)



Adjustment Procedures				Results of Improper Adjustment
1. If the dimensions of 0.3 x 8mm are not secured, retouching is required with the aid of an oil stone.				
Dimension A (mm)	Part No.	Name of part	Remarks	
0.8	14103253	Shuttle race ring A	Optional	
1.3	14103352	Shuttle race ring B	Standard	
1.7	14103659	Shuttle race ring C	Optional	
1.9	B1817210DAD	Shuttle race ring D	Optional	

Adjustment Procedures		Results of Improper Adjustment
1) Stroke adjustment Loosen the set screw ❶, and turn the thread tension assembly ❷. Turning it clockwise increases the movable distance and thread drawing amount. 2) Adjustment of thread take-up spring tension Turn the thread tension post ❹ using a thin driver with the set screw ❶ tightened to adjust the thread take-up spring ❸ tension. Turning it clockwise increases the thread take-up spring ❸ tension, and turn it counterclockwise decreases the tension. (Caution) Set the stroke of the thread take-up spring ❸ shorter for thin threads with thread number #50 or higher.		- o If the stroke of the thread take-up spring is larger than the specified value: Length of remaining needle thread is shortened, causing the needle thread to slip off the needle at the sewing start. - o If the stroke of the thread take-up spring is smaller than the specified value: Needle thread breakage will occur at the time of thread trimming when using a thin thread. (Caution) If the thread take-up spring ❸ interferes with the L-shaped thread guide ❺, the thread take-up spring ❸ may fail to return to the initial position before thread trimming, and the length of remaining needle thread may be short. If such a trouble occurs, bend the section ❸ of the thread take-up spring ❸ to widen the clearance ❷.

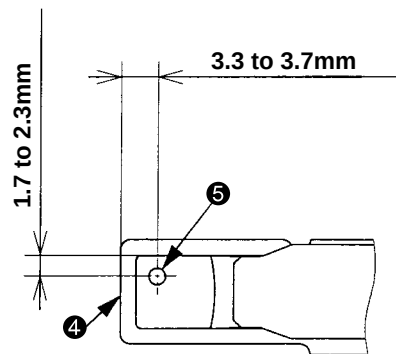


Procedures of assembling

1. Push the needle thread clamp device ③ in the direction of A and fix it with the four set screws ②. Tighten the hinge screw ①.
2. Turn on the power supply and press the  key twice so that the needle thread clamp support plate complete ④ is positioned at the far advanced end.
Confirm that the distance between the needle thread clamp support plate complete ④ and the needle ⑤ is 3.3 to 3.7mm and 1.7 to 2.3mm, respectively.
3. If the distance seems to be inadequate, loosen the four set screws ② and move the needle thread clamp device ③ for adjustment.

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

4. After the completion of the above-mentioned reassembly, make adjustments according to “(41) Adjusting the needle thread clamp sensor.”



(41) Adjusting the needle thread clamp sensor

Standard Adjustment

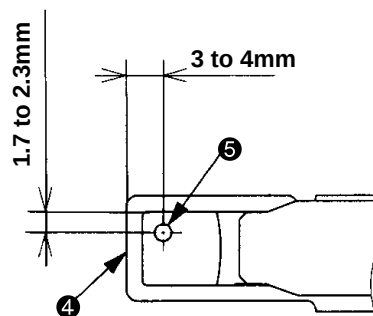
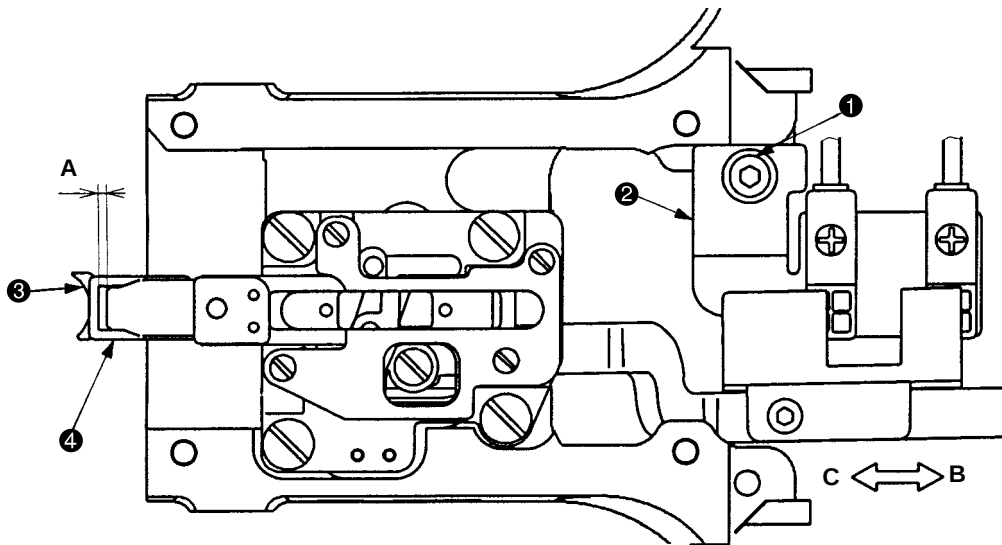
When the needle thread clamp support plate complete ④ is withdrawn by 3 to 4 pulses from the needle thread clamp position (**Caution 1., 2.**) the clearance A toward the needle thread clamp ③ becomes 0.

(Caution) 1. The needle thread clamp position is known as the position returned by one step from the most advanced position when the  key is pressed after the origin retrieval by the Test Mode I08 (IP-400) or CP-7 (CP-20).

2. According to the thread clamp specifications, the memory switch U69 may change.

S Type → 0

H Type → 1



Adjustment Procedures	Results of Improper Adjustment
In the first place, confirm that the setting value of the memory switch U69 is [0] for S Type and [1] for H Type. Since then, make the adjustments as specified below. 1. Start the Test Mode I08 (IP-400) or CP-7 (CP-20). 2. Tread on the pedal for needle thread clamp ❸ origin retrieval. 3. Press the  key twice and set the needle thread clamp support plate complete ❹ in the needle thread clamp position. 4. Confirm that the clearance A becomes 0 between the needle thread clamp ❸ and the needle thread clamp support plate complete ❹ when the [-] key is pressed 3 to 4 times (for 3 to 4 pulses), and that both the needle thread clamp ❸ and the needle thread clamp support plate complete ❹ move together when the [-] key is pressed again. 5. If the clearance A becomes 0 with 5 or more pulses, loosen the set screw ❶ and fix the sensor mounting plate ❷ after moving it in the direction B. If the clearance A becomes 0 with less than 3 pulses, loosen the set screw ❶ and fix the sensor mounting plate ❷ after moving it in the direction C. After the sensor mounting plate ❷ has been fixed, check the above-mentioned steps 2. to 4. 6. Using 3 to 4 pulses, repeat the steps 2. to 5. above until the clearance A becomes 0. 7. Tread on the pedal for needle thread clamp ❸ origin retrieval and define the most advanced position by pressing the  key once. 8. Confirm that the distances between the needle thread clamp support plate complete ❹ and the needle ❺ are kept at 3 to 4mm and 1.7 to 2.3mm, respectively. 9. If the distance is found to be inadequate, adjust the position toward the needle ❺ according to (40) Needle thread clamp device connection/disconnection. Since then, make the above-mentioned sensor adjustments again.	- o If there are too many pulses used until the clearance A becomes 0, this can be a cause of unthreading at the beginning of sewing. - o If the number of pulses is too small until the clearance A becomes 0, the resistance toward the needle thread becomes large and this can be a cause of thread breakage at the beginning of sewing. - o If the distance is improper between the needle thread clamp support plate complete ❹ and the needle ❺, this will give rise to interference between the needle thread clamp ❸ and the needle ❺.

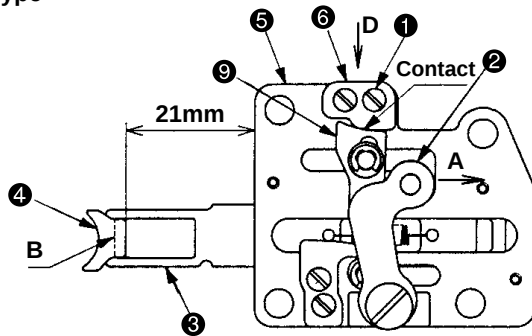
(42) Adjusting the needle thread clamp notch

Standard Adjustment

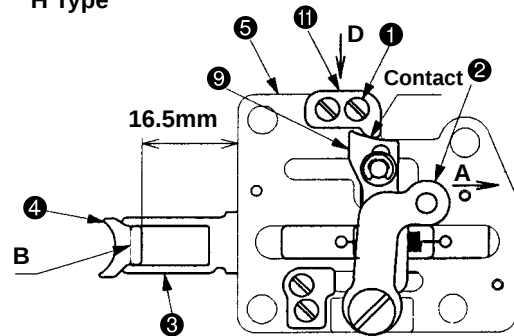
1. Needle thread clamp notch R position

- When the needle thread clamp link complete ② is pressed in Direction A, and Part B of the needle thread clamp support plate complete ③ and the needle thread clamp ④ begins to open, the distance between the needle thread clamp ④ and the needle thread clamp base ⑤ becomes 21mm for S Type and 16.5mm for H type.

S Type



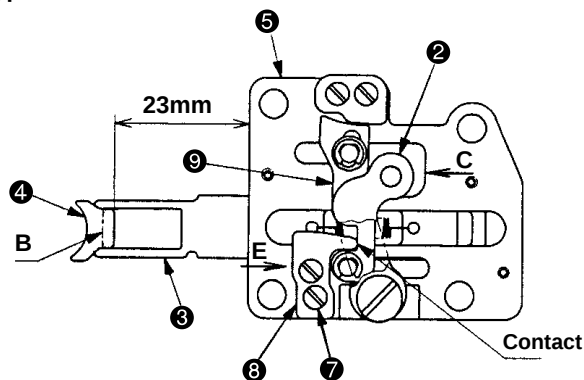
H Type



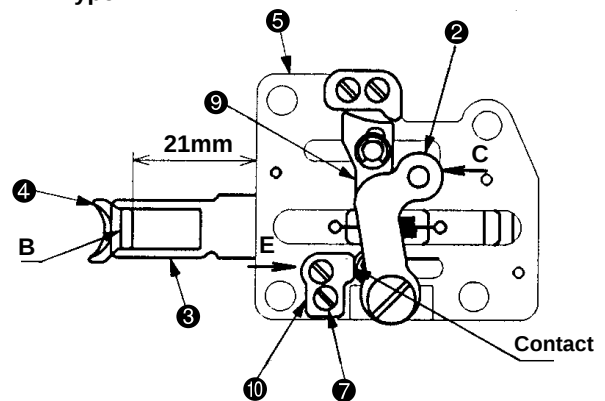
2. Needle thread clamp notch F position

- When the needle thread clamp link complete ② is pressed in Direction C, and Part B of the needle thread clamp support plate complete ③ and the needle thread clamp ④ begins to open, the distance between the needle thread clamp ④ and the needle thread clamp base ⑤ becomes 23mm for S Type and 21mm for H Type.

S Type



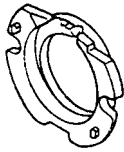
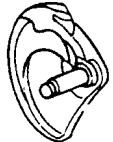
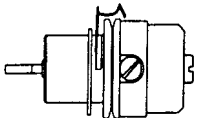
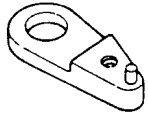
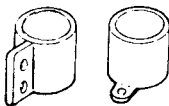
H Type



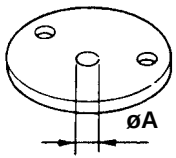
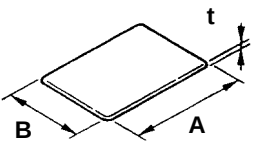
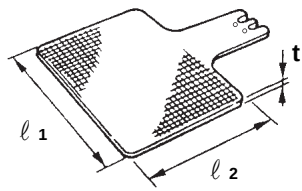
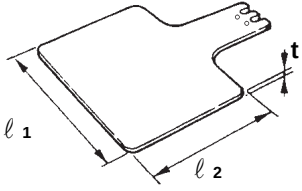
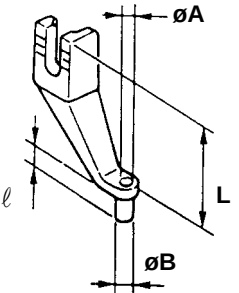
Adjustment Procedures	Results of Improper Adjustment
1. Needle thread clamp notch R adjustment 1) Loosen the two set screws ❶. 2) Press the needle thread clamp link complete ❷ in Direction A so that the distance between the needle thread clamp ❹ and the needle thread clamp base ❺ becomes 21mm for S Type and 16.5mm for H Type. Move the needle thread clamp notch R ❸ (S Type) or the needle thread clamp notch RH ❾ (H Type) in Direction D, lightly press it toward the needle thread clamp cam plate ❾, and tighten the two setscrews ❶.	- o If the distance is too long between the needle thread clamp ❹ and the needle thread clamp base ❺, the needle thread release timing becomes earlier and this can be a cause of unthreading at the beginning of sewing. - o If the distance is too short between the needle thread clamp ❹ and the needle thread clamp base ❺, the needle thread release timing is delayed and this can be a cause of needle thread end remaining on the rear side of the material.
2. Needle thread clamp notch F adjustment 1) Loosen the two set screws ❷. 2) Press the needle thread clamp link complete ❷ in Direction C so that the distance between the needle thread clamp ❹ and the needle thread clamp base ❺ becomes 23mm for S Type and 21mm for H Type. Move the needle thread clamp notch F ❸ (S Type) or the needle thread clamp notch FH ❾ (H Type) in Direction E, lightly press it toward the needle thread clamp cam plate ❾, and tighten the two setscrews ❷.	- o If the distance is too long between the needle thread clamp ❹ and the needle thread clamp base ❺, the needle thread release timing becomes earlier and this can be a cause of needle thread end remaining on the rear side of the material or jamming of needle thread into the needle thread clamp ❹. - o If the distance is too short between the needle thread clamp ❹ and the needle thread clamp base ❺, the needle thread clamp timing is delayed and this can be a cause of failure in needle thread clamping. - o Adjustments should conform to the adjustment values according to the needle thread clamp specifications (S Type or H Type). Otherwise, this can be a cause of failure in needle thread clamping operation.

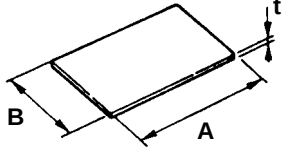
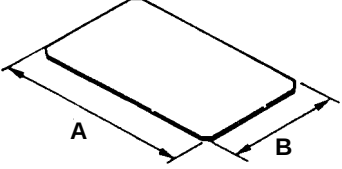
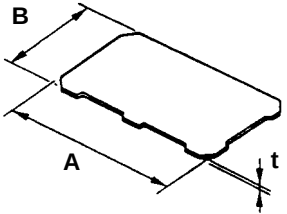
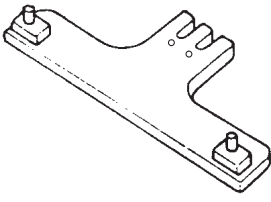
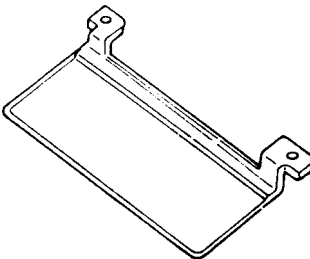
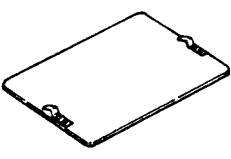
8. Table of exchanging gauge parts according to sewing specifications and needle size used

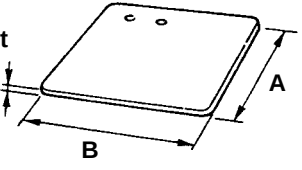
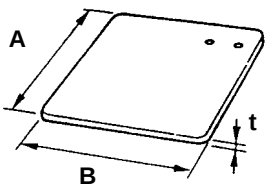
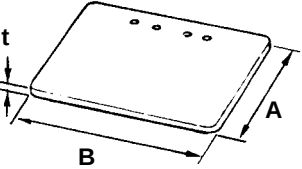
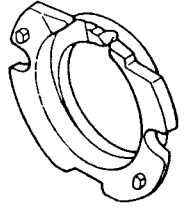
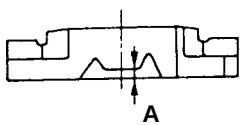
In accordance with the sewing condition, exchange the gauges referring to the following table.

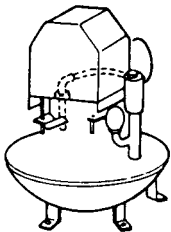
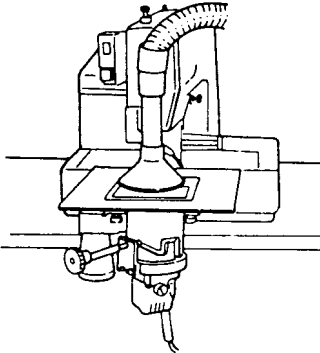
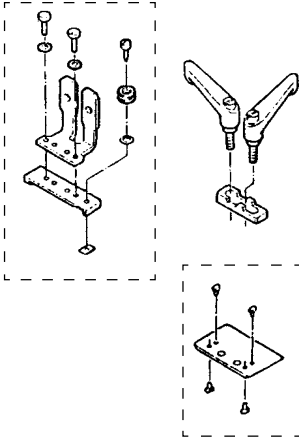
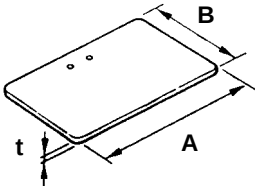
Gauge	Sewing spec. and needle size used	S type when delivered. #11 to #14	Knit. foundation garment	H type when delivered #16 to #20	#21 to #22	#23 to #26	When thick needle like MR type is used.
Needle hole guide 		B242621000A ø1.6	B242621000C ø1.6 (For knit)	B242621000B ø2.0	B242621000D ø2.4	B242621000F ø3.0 B242621000G ø3.0 (With counter bore)	
Shuttle race ring 	14103352 Needle guard 1.3 mm					14103659 Needle guard 1.7 mm	B1817210DAD Needle guard 1.9 mm
Shuttle 	40014964			40014965			
Intermediate presser 	40023632 ø2.2				B1601210D0B ø2.7	B1601210D0C ø3.5	
Tension controller No.2 asm. 	40010508			40029411			
Thread trimmer lever (small) asm. 	B24152800A0						
Needle bar thread guide 	40026883 2-hole			40026884 One hole			

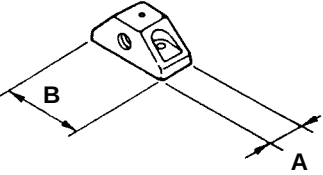
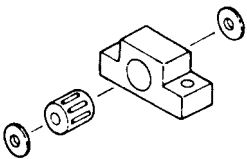
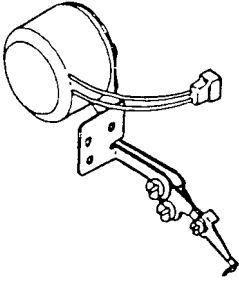
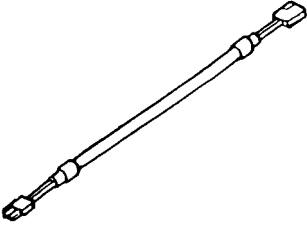
9. Option list

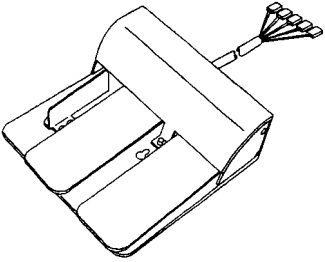
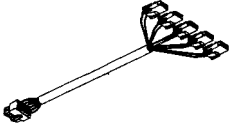
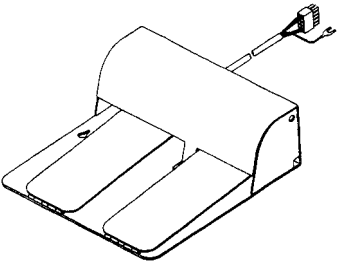
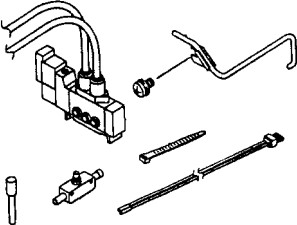
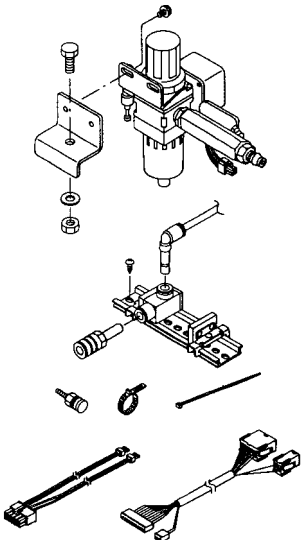
Name of parts	Type	Part No	Size (mm)
1. needle hole guide 	Needle hole guide (A) for light-weight material	B242621000A	ØA=1.6
	Needle hole guide (B) for medium-weight material	B242621000B	ØA=2.0
	Needle hole guide (C) for knitwear	B242621000C	ØA=1.6
	Needle hole guide (D) for heavy-weight material	B242621000D	ØA=2.4
	Needle hole guide (F) for heavy-weight material	B242621000F	ØA=3.0
	Needle hole guide (G) for heavy-weight material	B242621000G	ØA=3.0
	Needle hole guide (H) for heavy-weight material	B242621000H	ØA=3.0 (With counter bore)
	Needle hole guide (H) (Countermeasures against stitch skipping) Move the needle hole to have an eccentricity of 0.5mm behind the center in order to make the clearance narrower in front of the needle and wider behind it so that a loop can be established easily.		ØA=3.0 (Eccentric)
2. Work clamp blank for preventing slipping 	Rubber sheet for work clamp	B2591220000	A x B x t 250 x 200 x 1.5
	Sponge sheet for work clamp	B2564215000	A x B x t 300 x 200 x 1.5
	Work clamp material (A)	B2587220000	A x B x t 380 x 240 x 1
	Work clamp material (B)	B2588220000	A x B x t 380 x 240 x 1.5
3. Feed plate blank for processing  	Feed plate blank with knurl	B2556210D0A	$l_1 \times l_2 \times t$ 168 x 131 x 1.2
	Feed plate blank without knurl	B2556210D0B	$l_1 \times l_2 \times t$ 168 x 131 x 1.2
4. Intermediate presser 	Intermediate presser (A)	40023632	ØA x ØB x l x L 2.2 x 3.6 x 6 x 29.5
	Intermediate presser (B)	B1601210D0BA	ØA x ØB x l x L 2.7 x 4.1 x 6 x 29.5
	Intermediate presser (C)	B1601210D0CA	ØA x ØB x l x L 3.5 x 5.5 x 6 x 29.5
	Intermediate presser (E)	B1601210D0E	ØA x ØB x l x L 1.6 x 2.6 x 6 x 29.5
	Intermediate presser (F)	B1601210D0FA	ØA x ØB x l x L 2.2 x 3.6 x 9 x 29.5

Name of parts	Type	Part No	Size (mm)
5. Feed plate blank 	Sheet A for work clamp (Velboren) (Velboren)	B259522000A	A x B x t 1,000 x 675 x 1
	Sheet B for work clamp (Velboren)	B259522000B	A x B x t 1,000 x 675 x 3
	Sheet C for work clamp (Velboren)	B259522000C	A x B x t 1,000 x 675 x 2
 	Plastic feed plate inner plate	GMU12038000	A x B x t 140.8 x 72.5 x 1
	Aluminum feed plate inner plate	GMU12037000	A x B x t 140.6 x 72.5 x 1
6. Cassette holder  	Cassette holder installing base	B2593210DA0	
	Cassette holder assy	B2594210DA0	
7. Feeding frame blank 	Plastic blank	B2557210DA0	
	Aluminum blank	GMU120350A0	

Name of parts	Type	Part No	Size (mm)
8. Blank for processing   	Separated type right blank of outer frame with knurl Separated type outer frame blank without knurl (Left and right are common.)	40035609 40035608	A x B x t 97 x 81.5 x 4 A x B x t 97 x 81.5 x 4
	Separated type left blank of outer frame with knurl	40035610	A x B x t 97 x 81.5 x 4
	Presser blank of outer frame with knurl Presser blank of outer frame without knurl	40035606 40035607	A x B x t 97 x 164 x 4 A x B x t 97 x 164 x 4
9. Shuttle race ring compl.  	A B (Standard) C D	14103253 14103352 14103659 B1817210DAD	A=0.8 A=1.3 A=1.7 A=1.9

Name of parts	Type	Part No	Size (mm)
10. Compressor unit 		CU-01	
11. Economy type presser milling unit 		MU-12	
12. Inverting clamp unit	(Caution) For the head of S type, it is necessary to provide for the AMS-210E air set separately.	FU-05 40036596	
13. One-touch clamp device 	For S type For L type	B2585210DB0 B2586210DB0	
14. Inverting intermediate presser blank 	Metal Plastic	B43172100X0 162371T3	A x B x t 135 x 58 x 3.2 A x B x t 100 x 50 x 4

Name of parts	Type	Part No	Size (mm)
15. Inverting intermediate presser installing base  	Without bearing	D431421WJ0B D430121XB00 D431421WZ00 D431421WK00 D431421YF00 D4314210000	A x B 5 x 24 A x B 7 x 20 A x B 7 x 24 A x B 8 x 24 A x B 10 x 20 A x B 10 x 24
		Installing base B4314210A00 Bearing SB304000200 Washer B4328210000	
16. Wiper  	Side-sweeping wiper assy	40035867	
	Side-sweeping wiper repeater cable assy	40036668	

Name of parts	Type	Part No	Size (mm)
17. Pedal switch   	3-step pedal (PK47) Relay cable for 3-step pedal 2-step pedal (PK78)	GPK470010AB 40033875 40033831	
18. Needle cooler 	(Caution) For the head of S type, it is necessary to provide for the AMS-210E air set separately.	40035692	
19. AMS-210E air set 	To be exclusively used for Type S	40035693	

(3) Greasing • lock-tight parts

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

This sewing machine uses four types of grease as specified below. The recommendable brands of grease are listed in (4) Parts to which grease•lock-tight is applied. According to this information, replenish the most applicable grease to these parts.

*** Use ① Lithium Type consistency No. 2 for the parts where “Grease” is simply specified in (4) Parts to which grease•lock-tight is applied.**

① Penetration No. 2 lithium grease

This type of grease is used in general sliding parts.

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

② Templex N2 (Grease D) ••• Used for the feeding gear block.

10g tube JUKI Part No.: 13525506

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

10g tube JUKI Part No.: 40006323

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

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

10g tube JUKI Part No.: 40013640

3. Method of greasing

If no grease pump is available, fill a plastic oilcan with grease. Otherwise, an injector without a needle can be conveniently used.

4. Miscellaneous

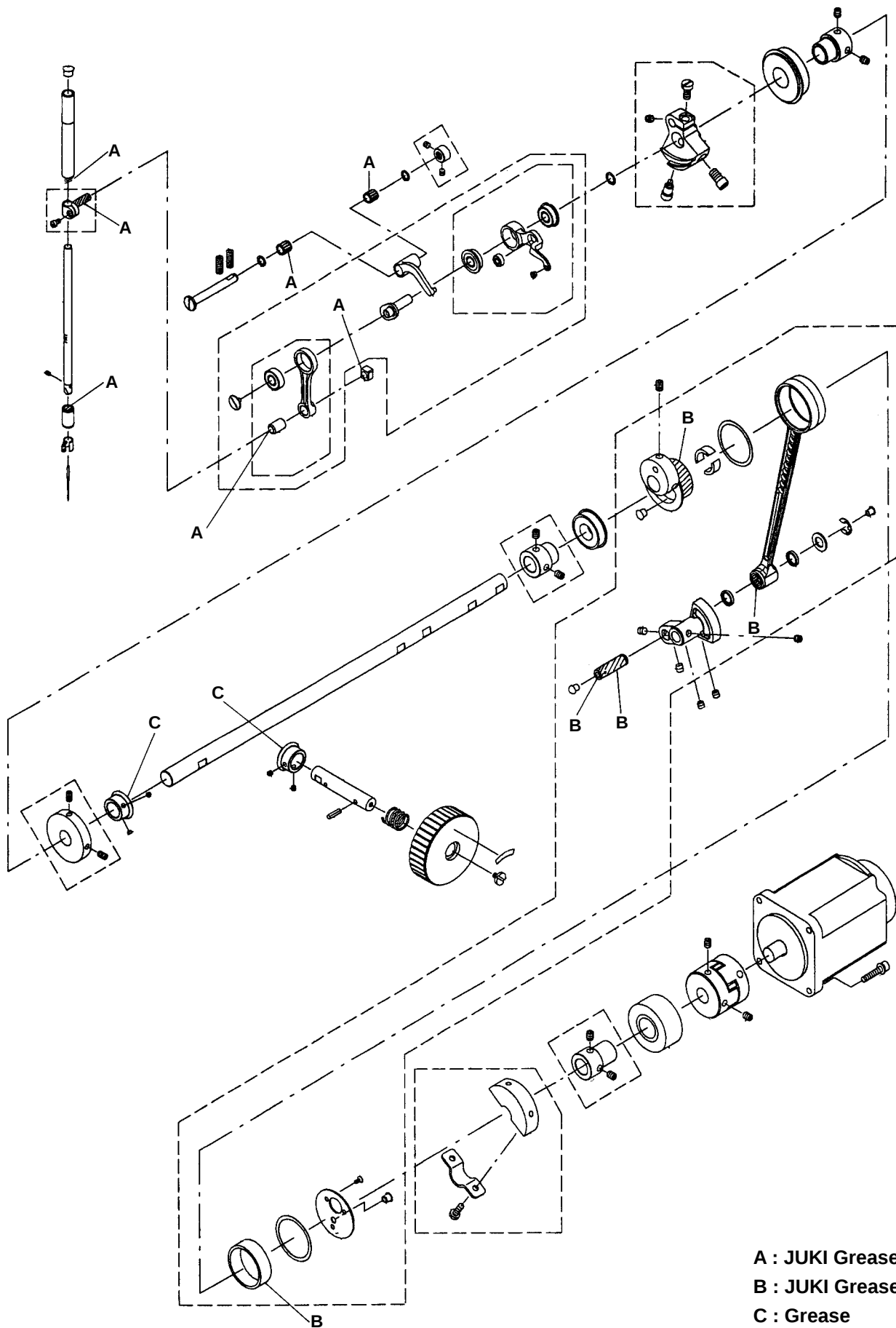
An injector to be used exclusively for coating / JUKI Part No. : GDS01007000

5. Application of Lock Tight

Apply Lock Tight 241 to section with the asterisk* .

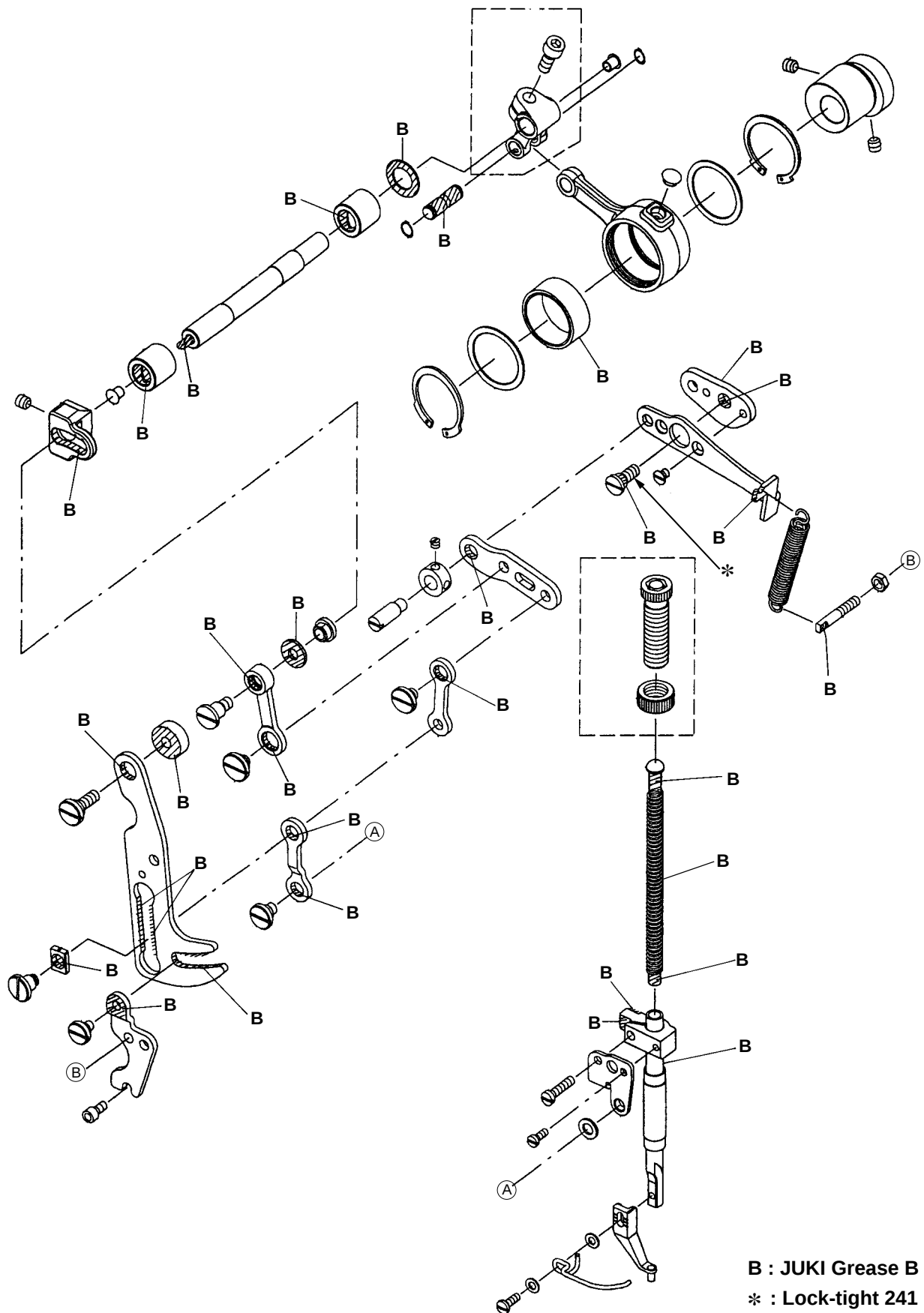
(4) Parts to which grease • lock-tight is applied

0 MAIN SHAFT & NEEDLE BAR COMPONENTS



A : JUKI Grease A
B : JUKI Grease B
C : Grease

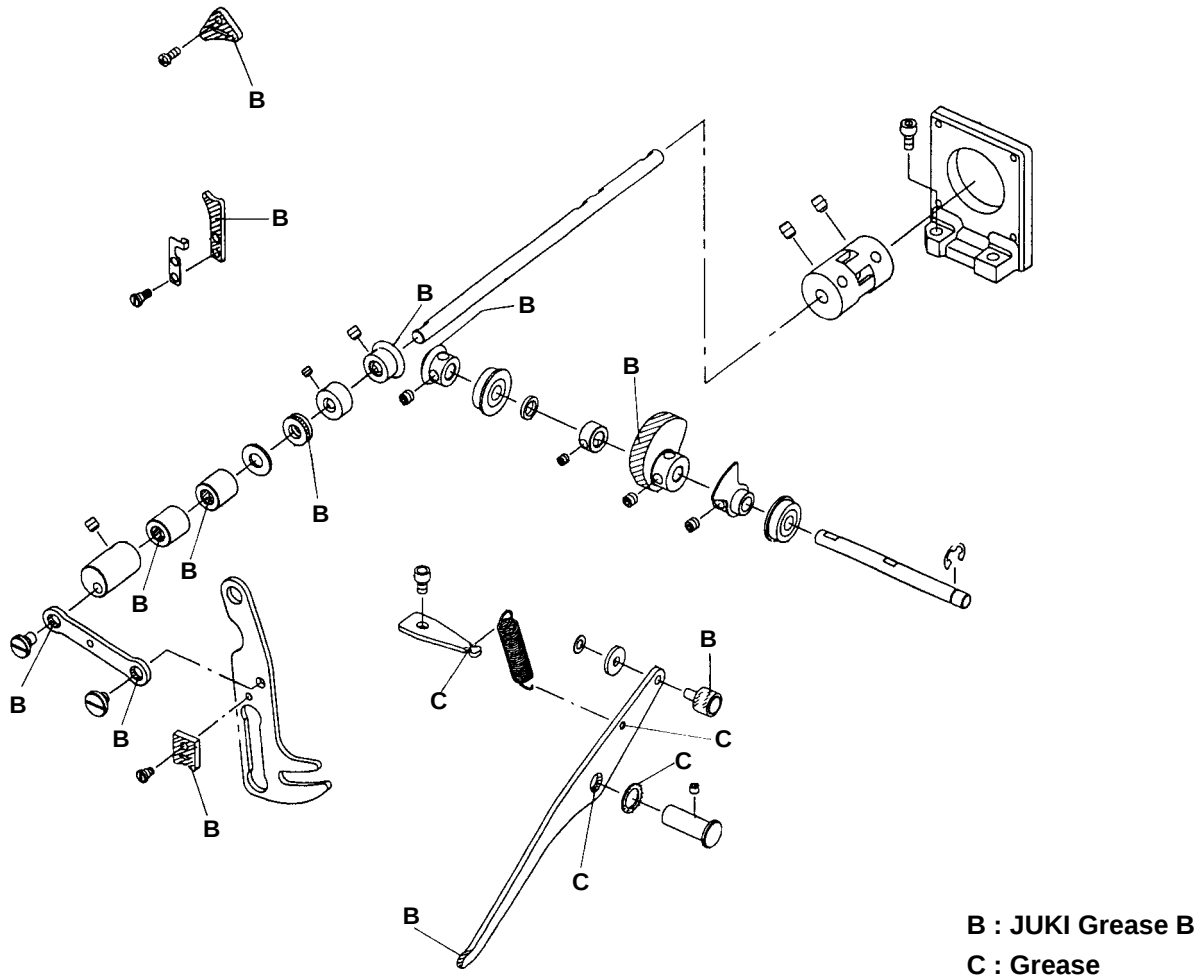
o PRESSER MECHANISM & PRESSER VARIABLE COMPONENTS (1)



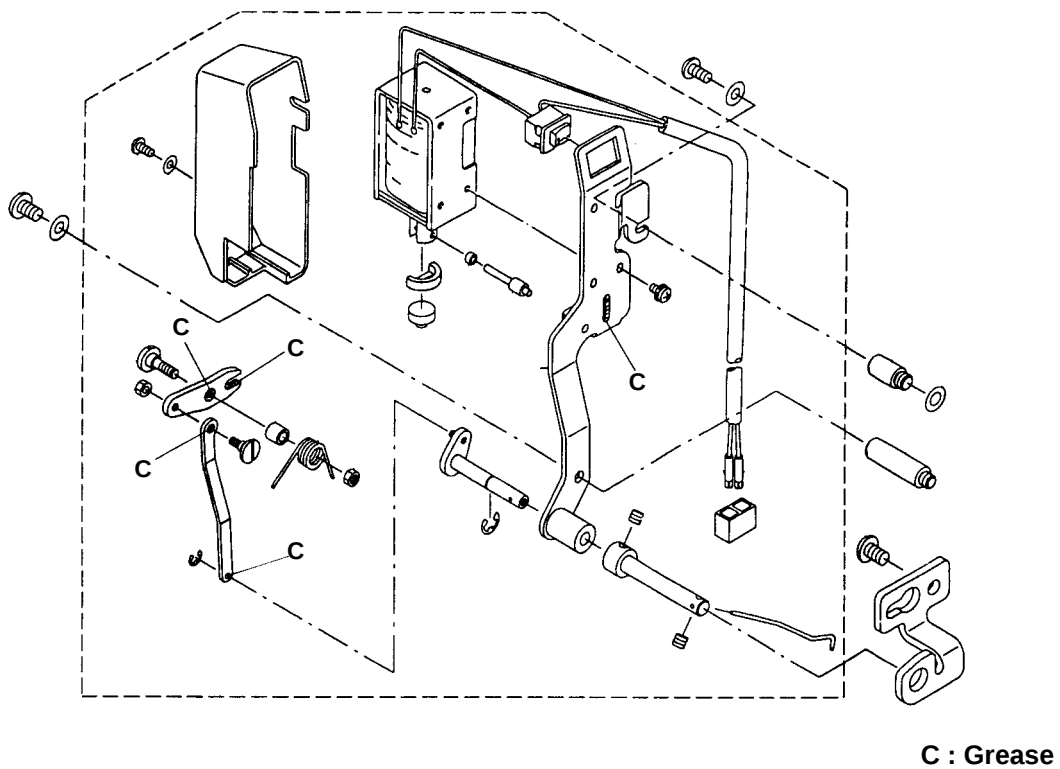
B : JUKI Grease B

*** : Lock-tight 241**

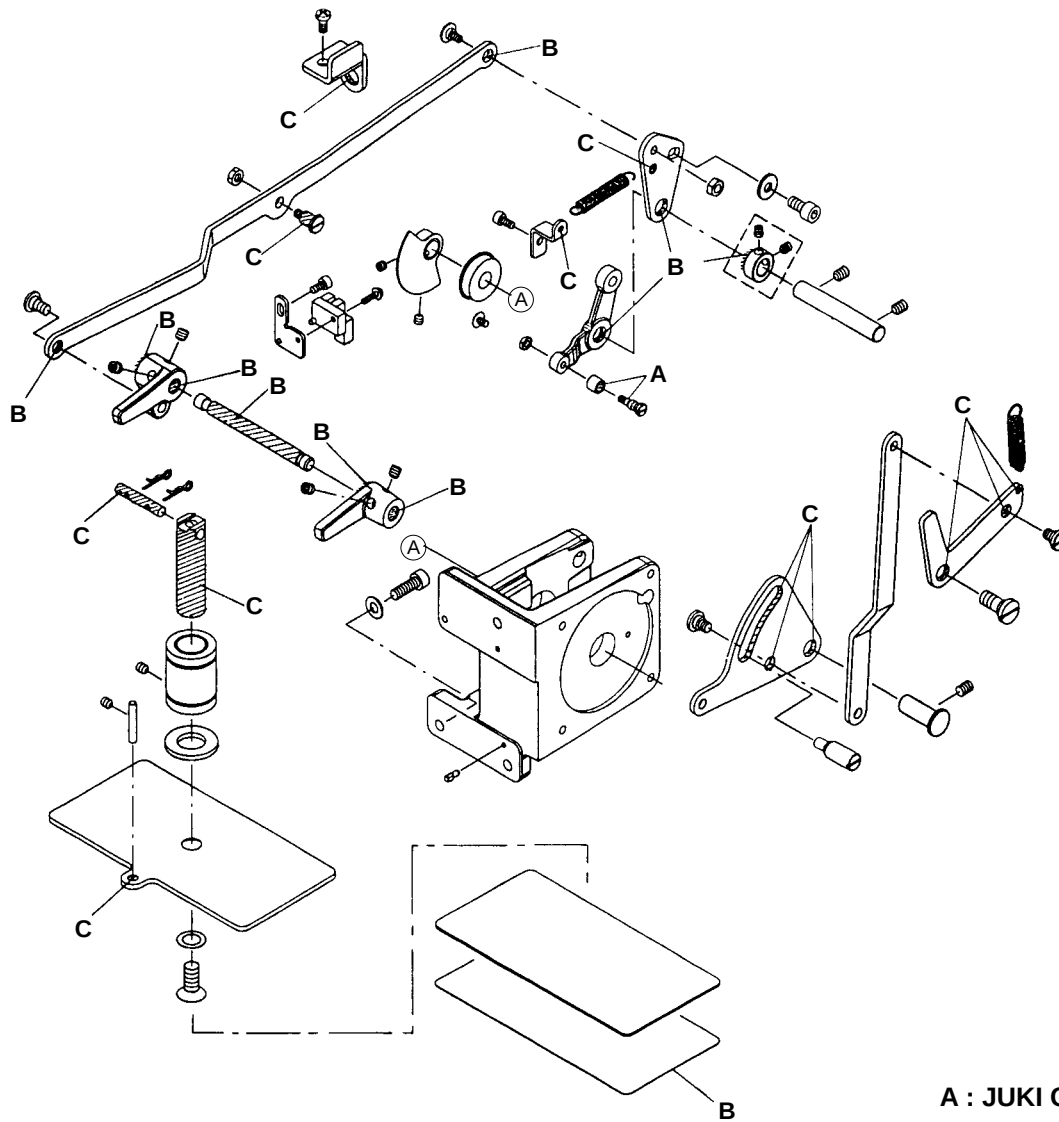
o PRESSER MECHANISM & PRESSER VARIABLE COMPONENTS (2)



o WIPER MECHANISM COMPONENTS

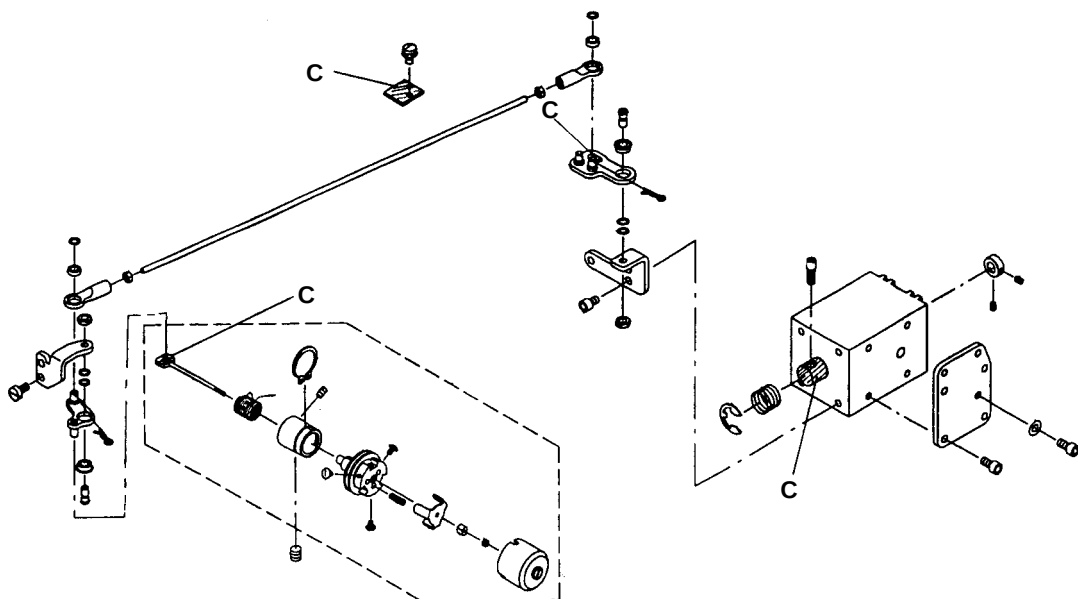


0 PRESSER PLATE & MANUAL PRESSER MECHANISM COMPONENTS



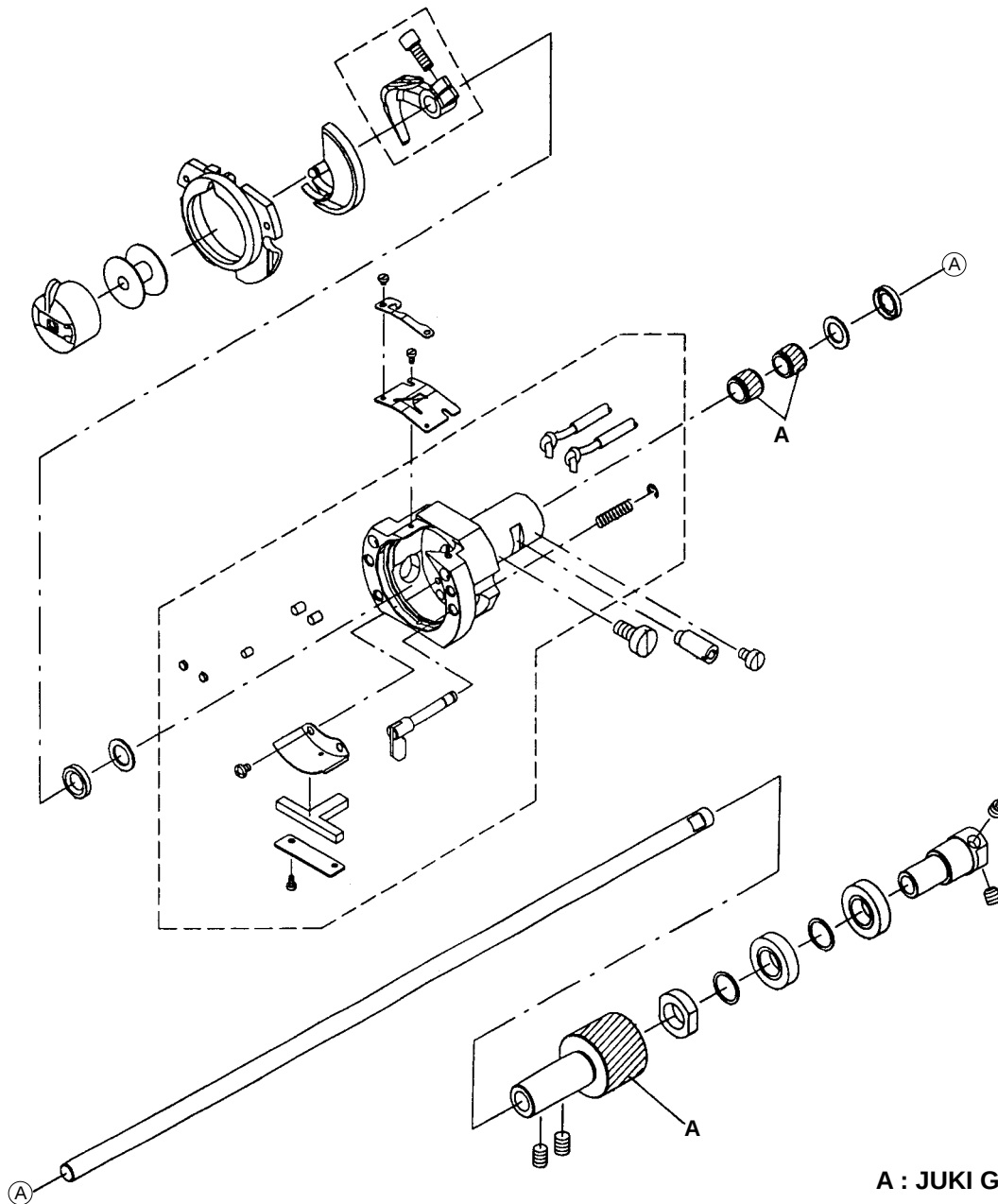
A : JUKI Grease A
B : JUKI Grease B
C : Grease

0 TENSION RELEASE & THREAD TENSION COMPONENTS



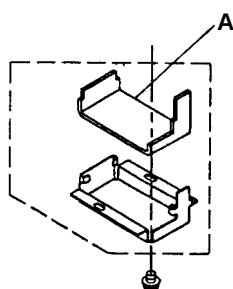
C : Grease

0 SHUTTLE DRIVER SHAFT COMPONENTS



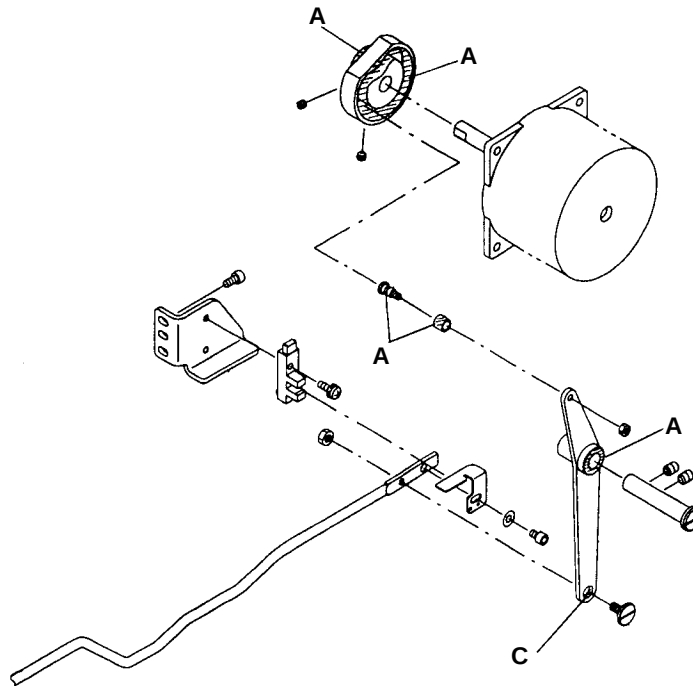
A : JUKI Grease A

0 FRAME & MISCELLANEOUS COVER COMPONENTS (2)



A : JUKI Grease A

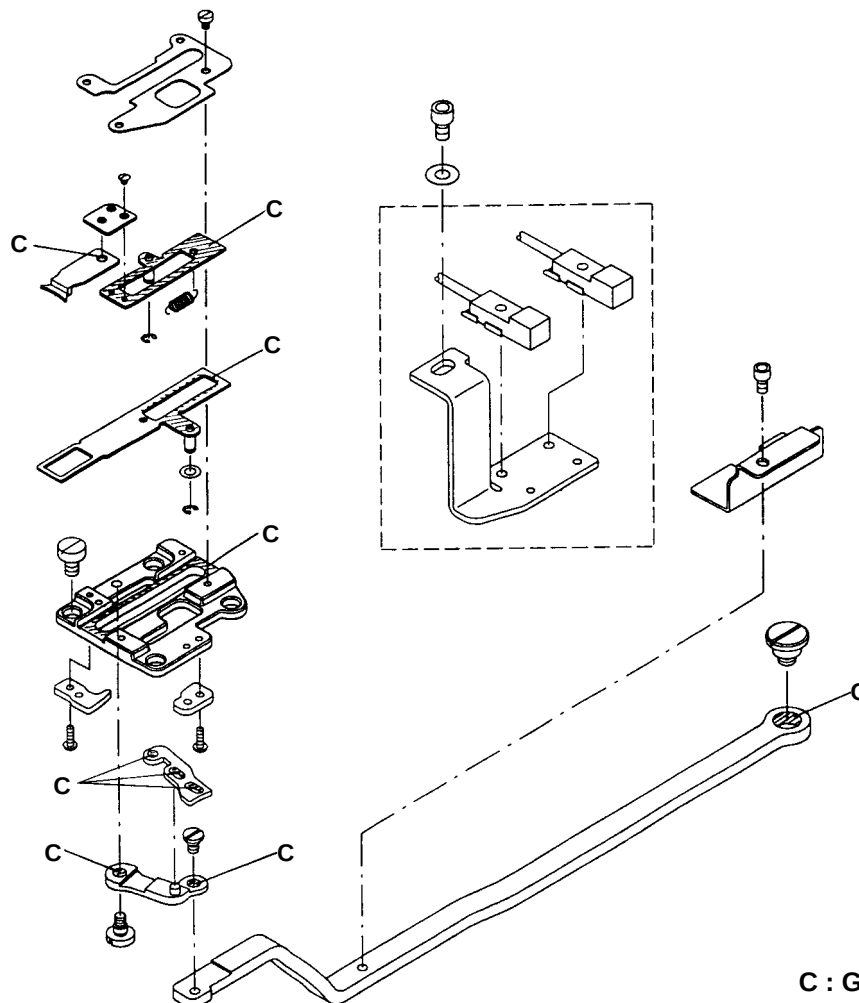
o TENSION RELEASE & THREAD TRIMMER MECHANISM COMPONENTS



A : JUKI Grease A

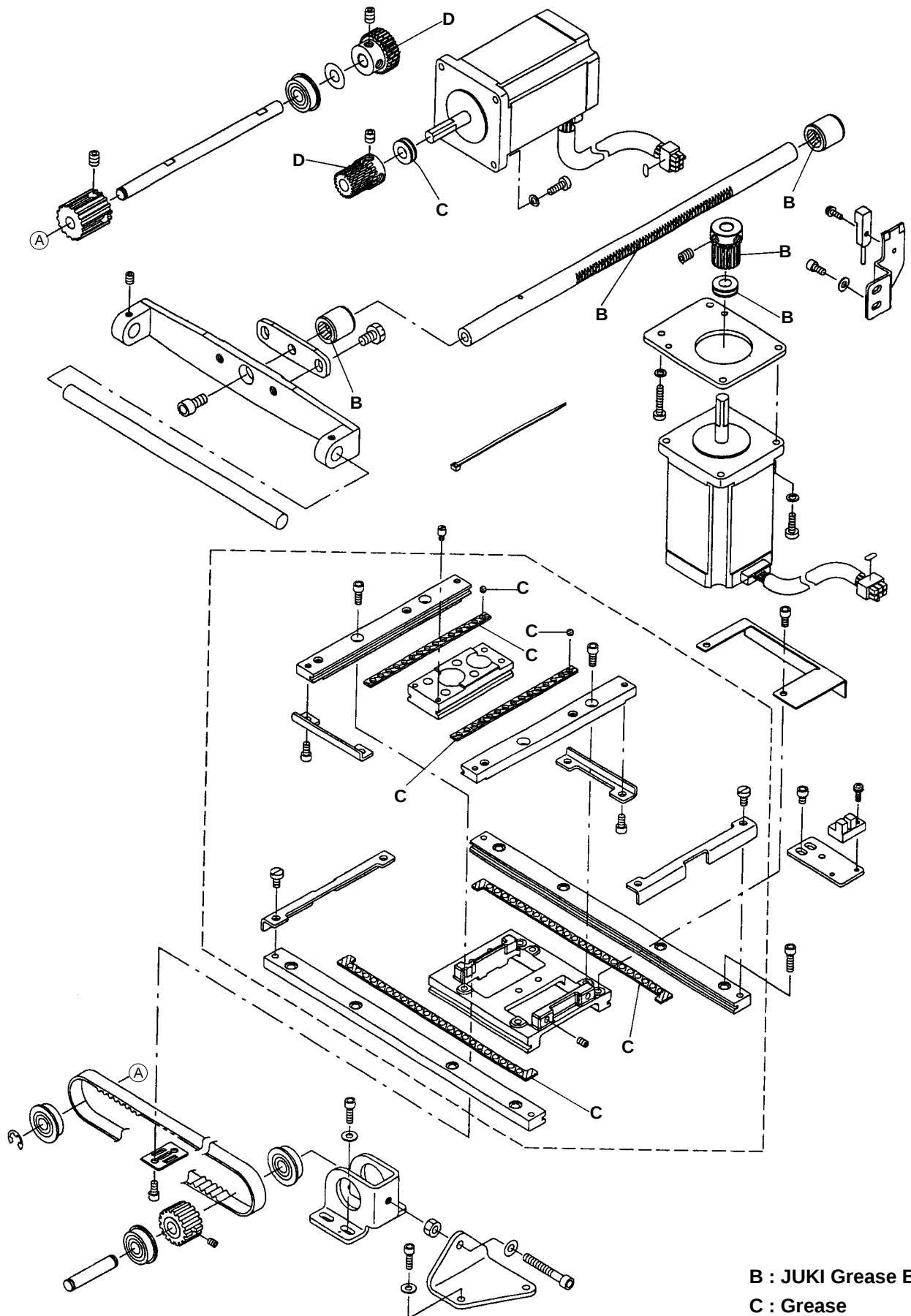
C : Grease

o THREAD CLAMP COMPONENTS



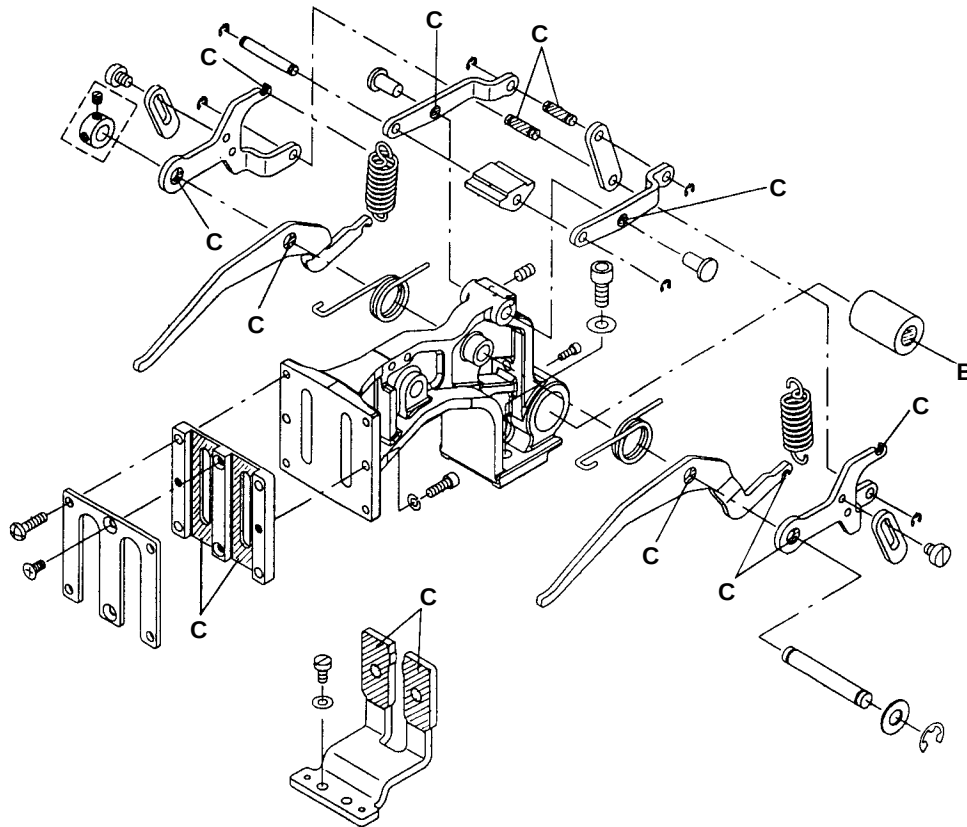
C : Grease

0 X-Y COMPONENTS



B : JUKI Grease B
C : Grease
D : Grease D

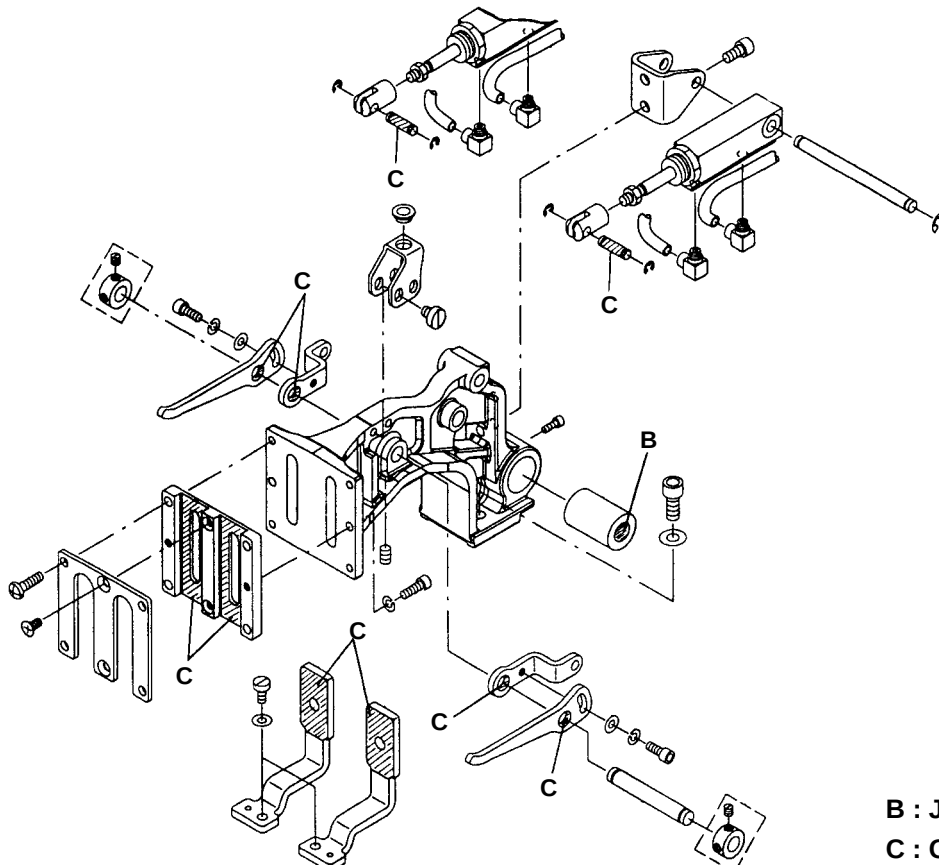
o CLOTH FEED MECHANISM COMPONENTS (FOR AMS-210EHS, ESS)



B : JUKI Grease B

C : Grease

o CLOTH FEED MECHANISM COMPONENTS (FOR AMS-210EHL, ESL)



B : JUKI Grease B

C : Grease

(5) Replenishing the designated places with grease

- * Perform grease supplement when the errors below are displayed or once a year (either one which is earlier). After performing grease supplement, call memory switch No. 245 and set the value to 10 with the reset key.

When the sewing machine has been used for a certain number or times of sewing, error code No. E220 is displayed on the operation panel at the time of turning ON the power. This display informs the operator of the time of replenishing the designated places with grease. Be sure to replenish the places with the grease below. Then call the memory switch No. 245 and set it to 10 with the RESET key.

Even after the display of the error No. E220, when the RESET key is pressed, the error is released, and the sewing machine can be continuously used. Afterwards, however, the error No. E220 is displayed every time the power is turned ON.

In addition, when the sewing machine is used further for a certain period of time after the display of error No. E220, the error No. E221 is displayed and the sewing machine fails to operate since the error cannot be released even when the RESET key is pressed.

When the error No. E221 is displayed, be sure to replenish the designated places below with grease.

Then start up the memory switch and set No. 245 to "0" with the RESET key.

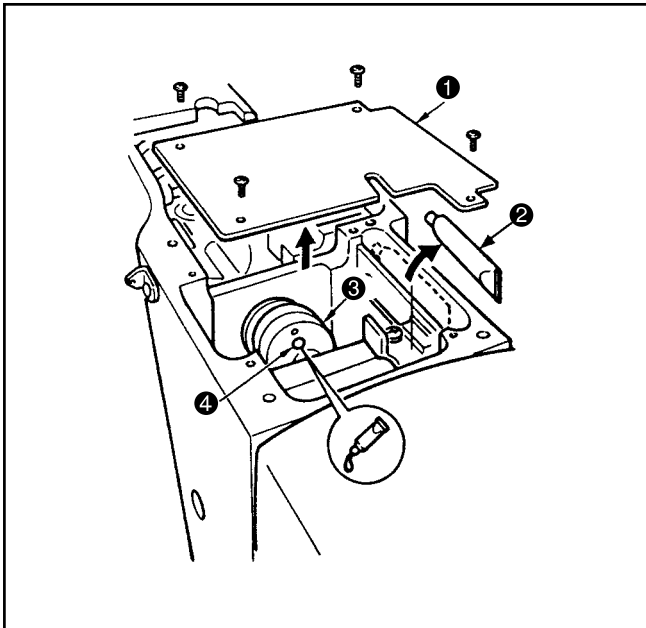
- (Caution)
1. After replenishing the places with grease, the error No. E220 or No. E221 is displayed again unless the memory switch No. 245 is changed to "0".
 2. Use grease tube (JUKI grease B Part No. : 40013640) supplied as accessories to replenish the designated places below with grease. If grease other than the designated one is replenished, damage of components will be caused.



WARNING:

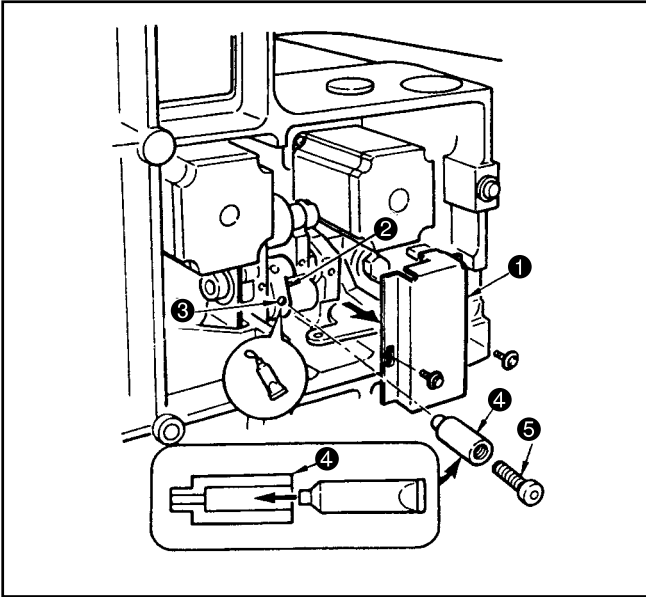
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

1) Replenishing the eccentric cam section with grease



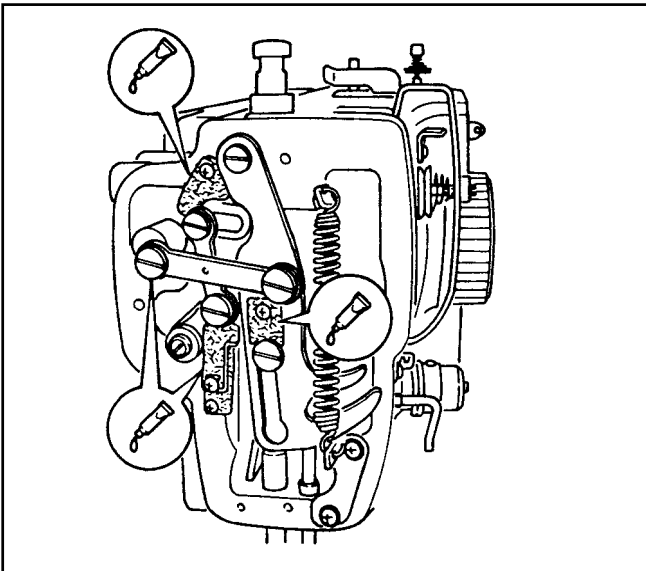
1. Open the upside cover ① and remove the JUKI grease B ②.
2. Remove rubber cap ④ located on the side of eccentric cam ③. Then replenish there with JUKI grease B ②.

2) Replenishing the oscillator pin section with grease



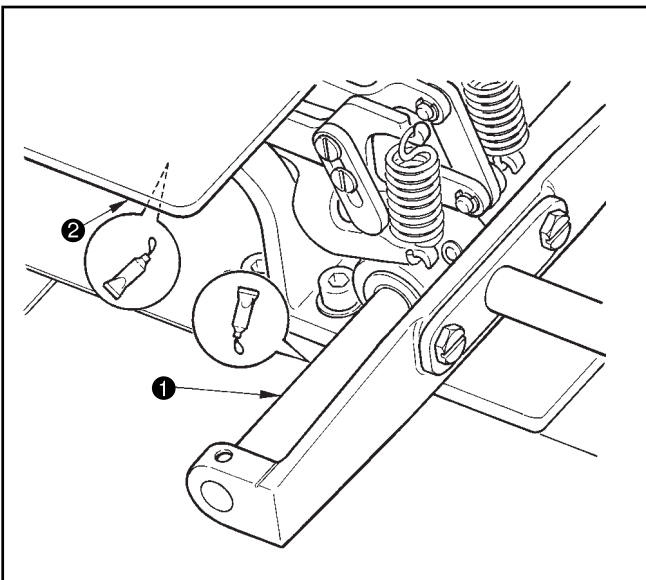
1. Tilt the machine head and remove the grease cover ①.
2. Fill joint ④ supplied as an accessory with JUKI Grease B.
3. Remove setscrew ③ in oscillator gear ② and screw in joint ④ into the screw hole.
4. Screw in screw ⑤ supplied as accessories to the joint ④ and replenish there with JUKI grease B.
5. Securely tighten setscrew ③ which has been removed after replenishing with the grease.

3) Grease supplement to the face plate section



1. Open the face plate cover.
2. Supplement JUKI grease B to the felt section (3 places) and the hinge screws around them.

4) Grease supplement to X guide shaft bearing



1. At the same time, apply JUKI grease B to the rear faces of X guide shaft ① and presser plate ②.



Collier Equipment

The home of **CEDAR** *Special* &
CEDAR Systems Automated Sewing Devices

www.cedarspecial.com

Collier Equipment
100 Mill Creek Circle/Po Box 175
Lexington, Alabama 35648 USA
Phone: (256)229-6595 Fax: (256)229-6779