

ENGLISH

**LU-2220N-7
INSTRUCTION MANUAL**

CONTENTS

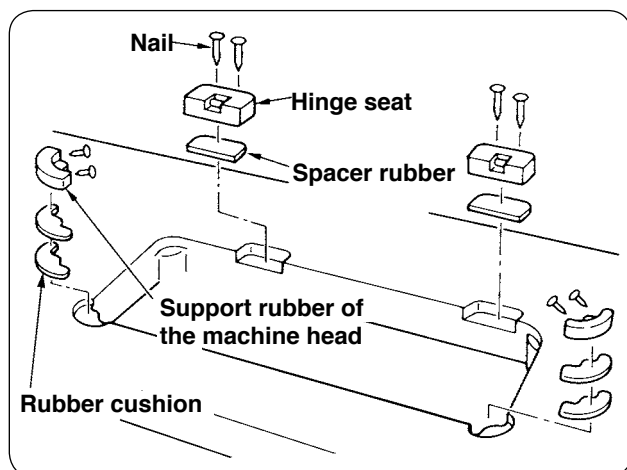
1. SPECIFICATIONS	1
2. INSTALLATION	1
3. ADJUSTING THE BELT TENSION	2
4. INSTALLING THE SYNCHRONIZER SUPPORT ROD	3
5. ATTACHING THE BELT COVER	3
6. INSTALLING THE KNEE SWITCH	4
7. INSTALLING THE AIR DRIVE UNIT	4
(1)Installing the air control unit	4
(2)Connecting the air hose.....	5
(3)Adjusting the air pressure	6
8. INSTALLING THE THREAD STAND	7
9. LUBRICATION.....	7
10. ATTACHING THE NEEDLE	9
11. ATTACHING/REMOVING THE BOBBIN	9
12. THREADING THE HOOK	10
13. INSTALLING THE THREAD GUIDE.....	10
(1)Installing the needle thread guide rod.....	10
(2)Installing the bobbin winder thread guide	10
14. WINDING A BOBBIN	11
15. ADJUSTING THE AMOUNT OF OIL IN THE HOOK	11
16. THREADING THE MACHINE HEAD	12
17. ADJUSTING THE STITCH LENGTH.....	13
18. THREAD TENSION	13
(1)Adjusting the length of thread remaining after thread trimming	13
(2)Adjusting the needle thread tension.....	13
(3)Adjusting the bobbin thread tension.....	13
19. THREAD TAKE-UP SPRING	14
(1)When you want to change the stroke of the spring :	14
(2)When you want to change the tension of the spring :	14
20. HAND LIFTER / HANDHEBEL	14
21. ADJUSTING THE PRESSURE OF THE PRESSER FOOT	14
22. NEEDLE-TO-HOOK RELATION.....	15
23. ADJUSTING THE HOOK NEEDLE GUARD	15

24. ADJUSTING THE BOBBIN CASE OPENING LEVER	16
25. ADJUSTING THE THREAD TRIMMING MECHANISM COMPONENTS	16
(1) Positioning the thread trimming cylinder joint	16
(2) Moving knife (Adjusting the vertical position)	17
(3) Counter knife (Adjusting the vertical position).....	18
(4) Thread guide installing position.....	18
(5)-1. Counter knife (Adjusting the travel amount) (Positioning of the counter knife base stopper).....	19
(5)-2. Counter knife (Adjusting the lateral position).....	20
(6) Adjusting the knife pressure	21
(7)-1. Initial position of the moving knife drive arm and the moving knife	22
(7)-2. Mounting position of the moving knife returning plate	23
(7)-3. Adjusting the clearance between the moving knife drive arm and the moving knife drive arm stopper	23
(8) Adjusting the thread trimming cam timing.....	24
(9) Installing position of the clamp spring	25
(10) Adjusting the condensation amount.....	26
(11) Explanation of the solenoid valve	27
26. ADJUSTING THE LIFTING AMOUNT OF THE PRESSER FOOT AND THE WALKING FOOT	28
27. SEWING SPEED TABLE	28
(1) Max. sewing speed in accordance with the amount of the alternating vertical movement of the walking foot and the presser foot	28
28. RESETTING THE SAFETY CLUTCH.....	28
29. OPERATION SWITCHES	29
30. KNEE SWITCH	31
31. CAUTIONS WITH REGARD TO THE SEWING OPERATION	31
32. TROUBLES IN SEWING AND CORRECTIVE MEASURES	32

1. SPECIFICATIONS

Model	LU-2220N-7
Applications	Car seats, furniture, etc.
Sewing speed	Max. 3,500 sti/min See “ 27. SEWING SPEED TABLE” on page 28.
Stitch length (max.)	Normal feed : 9 mm Reverse feed : 9 mm
Needle	SCHMETZ 134 x 35R (Nm 110 to Nm 160)
Hook	Vertical-axis, 1.6-fold hook
Lift of presser foot	Hand lifter lever : 9 mm Knee lifter : 16 mm
Lubricating oil	JUKI New Defrix Oil No. 1
Noise	<p>- Equivalent continuous emission sound pressure level (L_{pA}) at the workstation : A-weighted value of 85.5 dB; (Includes $K_{pA} = 2.5$ dB); according to ISO 10821- C.6.2 -ISO 11204 GR2 at 3,500 sti/min.</p> <p>- Sound power level (L_{WA}) ; A-weighted value of 91.0 dB; (Includes $K_{WA} = 2.5$ dB); according to ISO 10821- C.6.2 -ISO 3744 GR2 at 3,500 sti/min.</p>

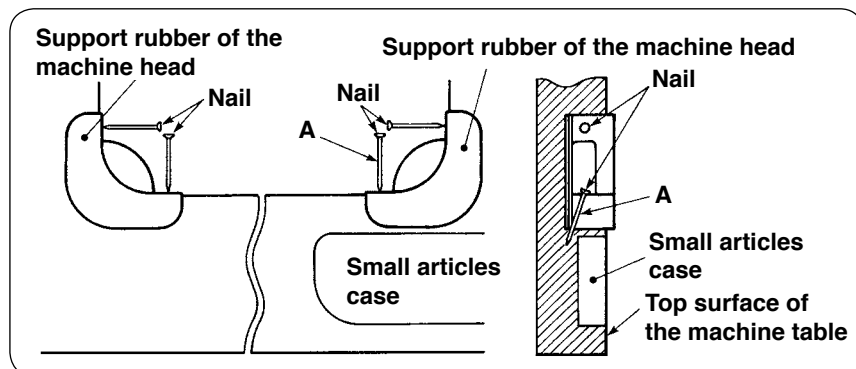
2. INSTALLATION

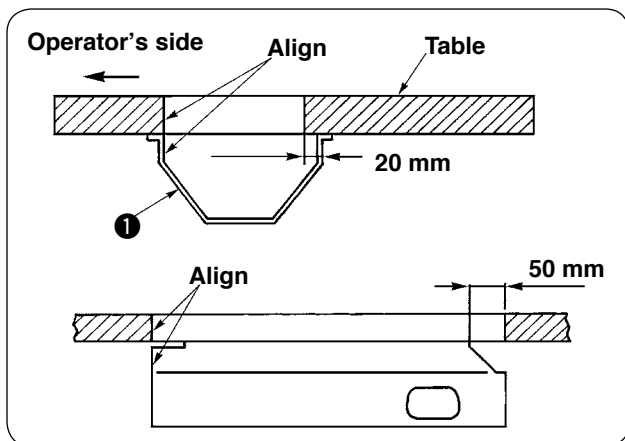


- 1) When carrying the sewing machine, be sure to carry by two people.
- 2) Do not place a protruding object, such as a screw driver, at a place where the sewing machine is to be installed.
- 3) Fix the hinge seats and the support rubbers supplied with the machine on the table using nails.

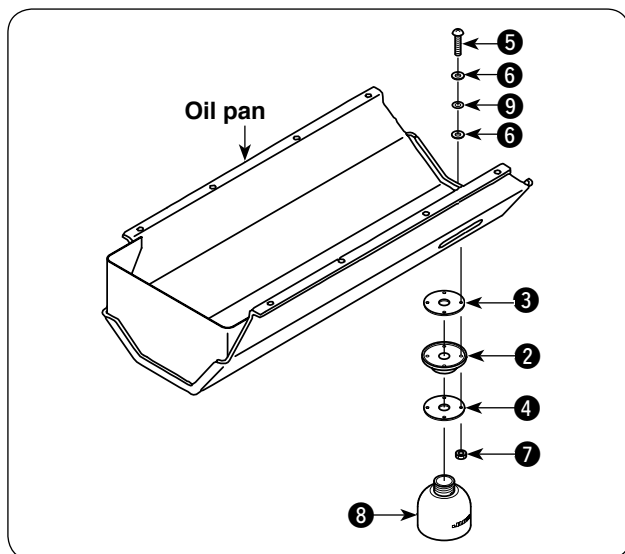


When driving nail A, drive it slantingly so that it does not pass through the side of the small articles case.





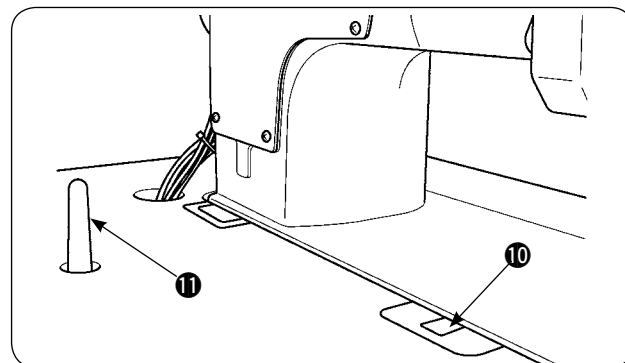
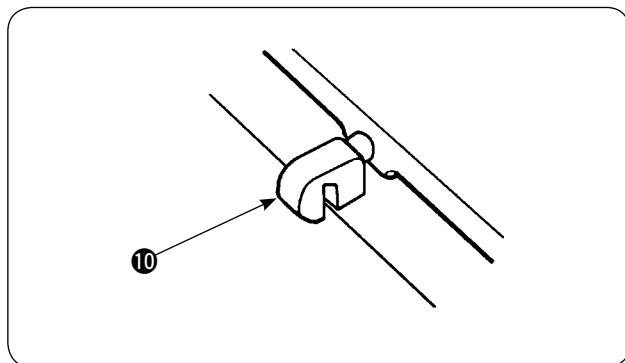
- 4) Fix oil pan ① supplied with the machine on the table in 8 places with wood screws.



- 5) Attach drain plug ②, oil seal ③ and washer ④ to the oil pan. Attach packing ⑥ and washer ⑨ to screw ⑤ and fix them with nut ⑦.
- 6) After they are fixed, screw in waste oil container ⑧ into drain plug ②.

- 7) Insert hinge ⑩ into the bed hole, engage the hinge with the rubber hinge of the table, and put down the machine head onto the head support rubber at four corners.

- 8) Install head support bar ⑪ firmly on the table by inserting it into the table hole until it will go any further.

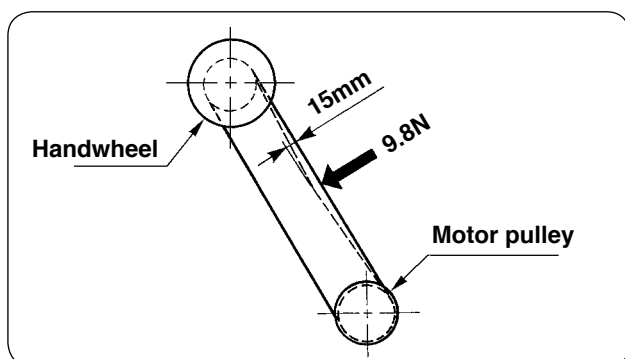


3. ADJUSTING THE BELT TENSION



WARNING :

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



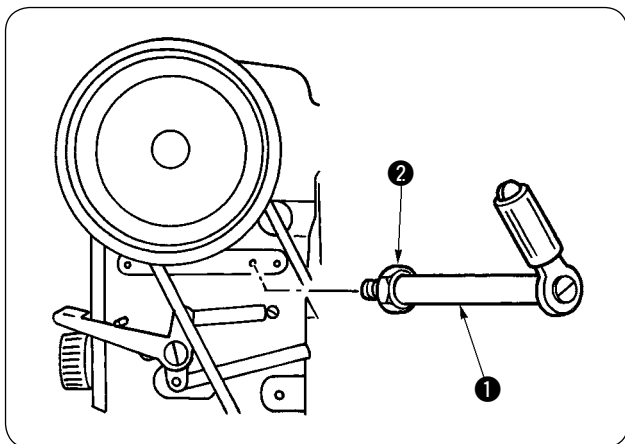
Adjust the belt tension with the height of the motor so that the belt sags 15 mm when the center of V belt is applied with a 9.8N load.

4. INSTALLING THE SYNCHRONIZER SUPPORT ROD



WARNING :

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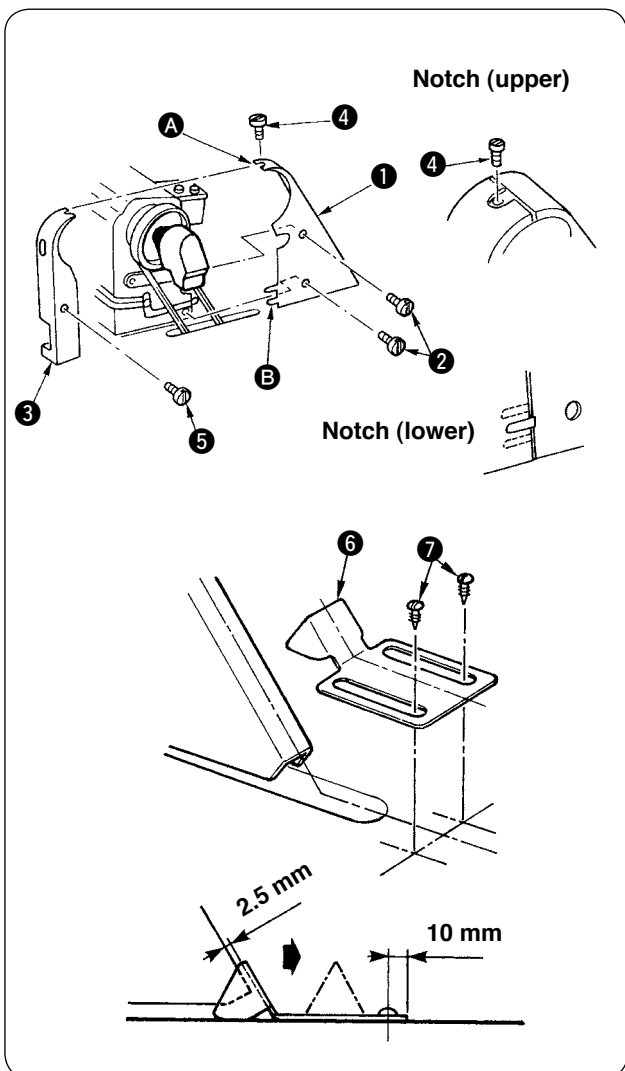
- 1) Attach synchronizer support rod ① to the arm using attaching nut ②.

5. ATTACHING THE BELT COVER



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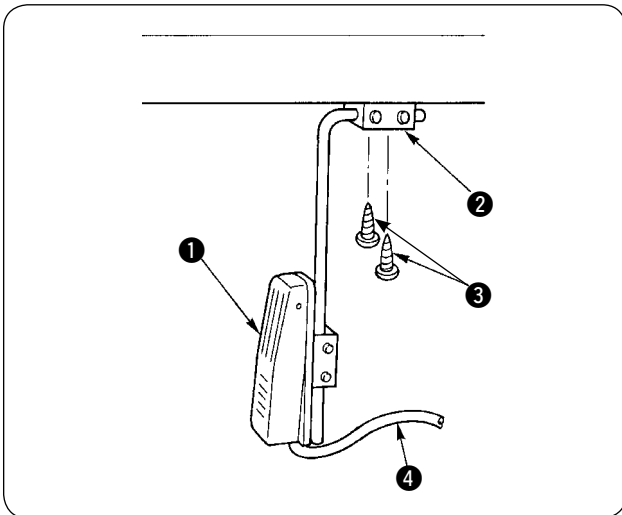


- 1) Fix belt cover (rear) ① on the arm with screws ②.
- 2) Fit belt cover (front) ③ to notch (upper) A and notch (lower) B of the belt cover (rear).
- 3) Fix belt cover (front) ③ with screws ④ and ⑤.
- 4) Fix belt cover auxiliary plate ⑥ at the position of 10 mm from the rear end with wood screws ⑦ when there is a clearance of 2.5 mm between the belt cover and the auxiliary plate.
- 5) When tilting the machine head, loosen wood screws ⑦ and move the belt cover auxiliary plate in the direction of the arrow until it stops. Then, tilt the machine head.



After attaching the belt cover, confirm whether or not the respective cords do not come in contact with the belt and the handwheel. Disconnection of the cords will result when they come in contact with one another.

6. INSTALLING THE KNEE SWITCH



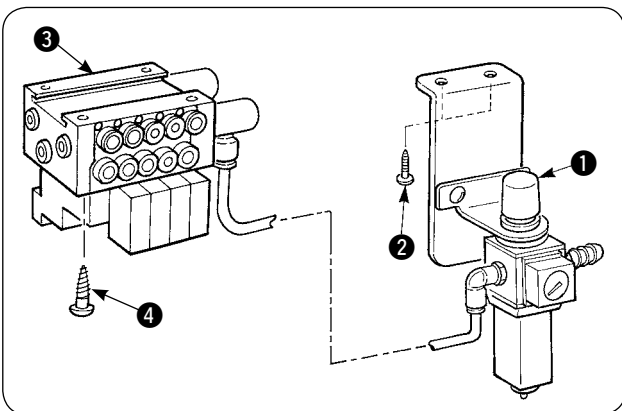
- 1) Attach supporting base **2** of knee switch **1** onto the underside of the table using wooden screws **3**.
- 2) Fix cord **4** to an appropriate position on the table using a staple supplied with the machine so as to prevent the cord from hindering the operation.

7. INSTALLING THE AIR DRIVE UNIT



WARNING :

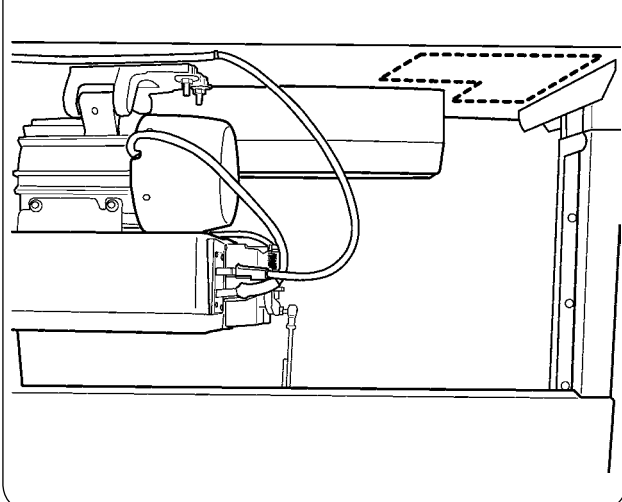
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



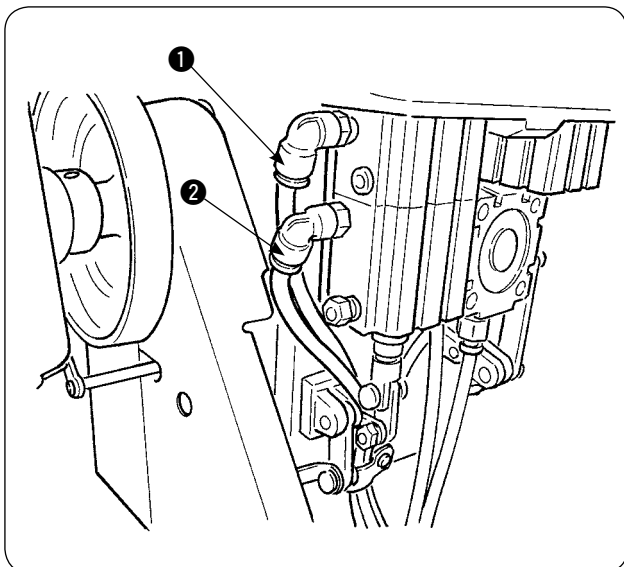
(1) Installing the air control unit

- 1) Install regulator (asm.) **1** on the bottom surface of the table with wood screw **2** supplied as accessories.
- 2) Install air control unit (asm.) **3** on the bottom surface of the table in four places with wood screws **4** supplied as accessories.

Rear view of table

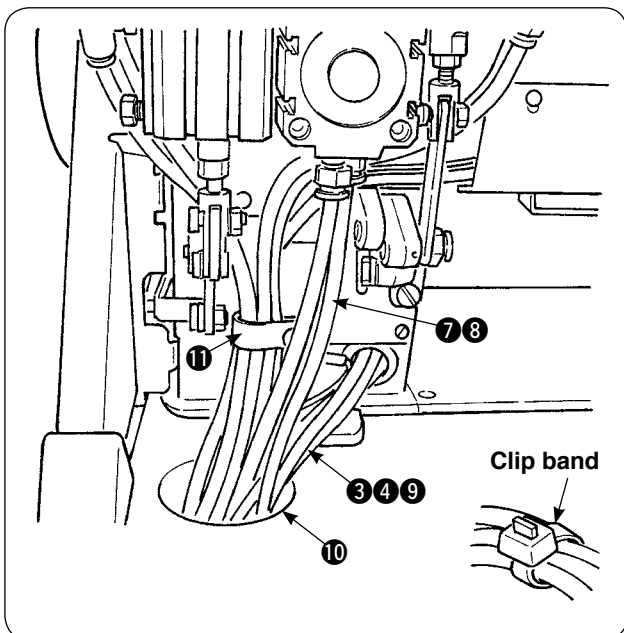


- 3) Install regulator (asm.) **1** and air control unit (asm.) **3** in the broken line frame as shown in the illustration on the left side. Determine the installing position where it is convenient to the user.

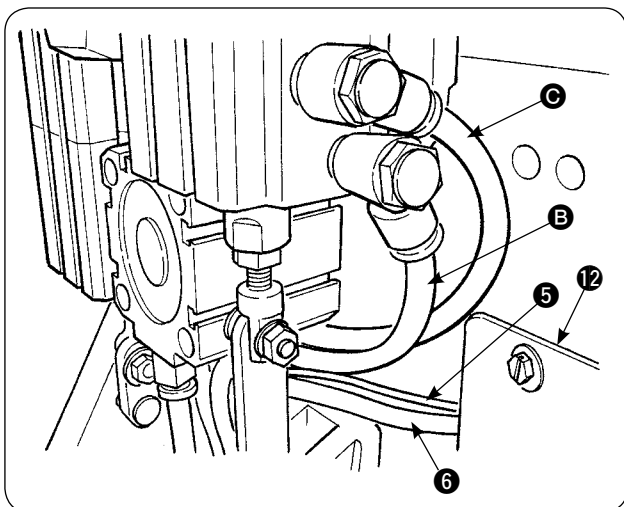


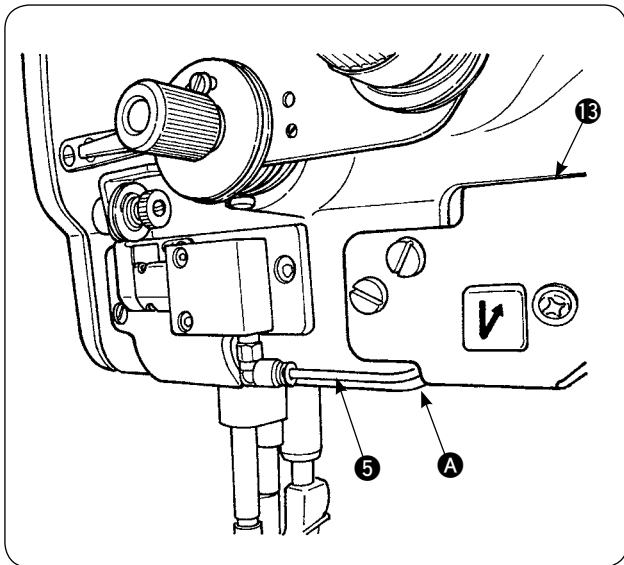
(2) Connecting the air hose

- 1) Connect the air hoses coming from the air control unit to the air cylinders of the sewing machine as shown in the illustration. Adjust the seal Nos. pasted on the hoses to those pasted on the joints, and connect as described in the list.
Be sure to pass the hoses through hole 10 in the table.
After connecting them, bundle air hoses 1, 2, 5, B, and C, 6-stage switch cord 6 using cable clip 11 of the machine head.
Directly pass air hoses 7 and 8 through hole 10 in the table.

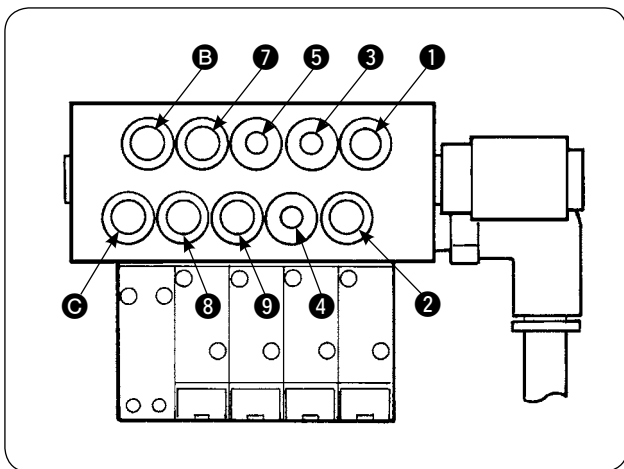


- 2) Pass air hoses 3, 4 and 9 coming from the sewing machine through hole 10 in the table, and connect them to the air control unit.
(There are clip bands in the accessories. Use them to arrange the air hoses if necessary.)

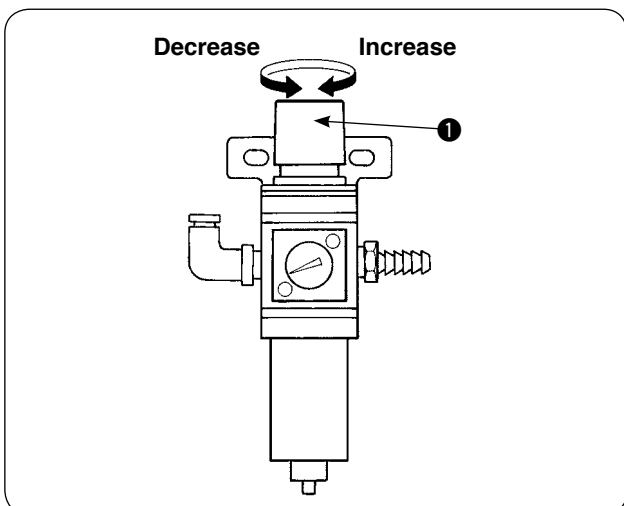




- 3) Pass air hoses ⑤ through cord cover ⑫ the same as 6-range switch cord ⑥, pass them through clearance A between 6-range switch ⑬ and the machine arm, and connect them to the joint of air hoses ⑤.



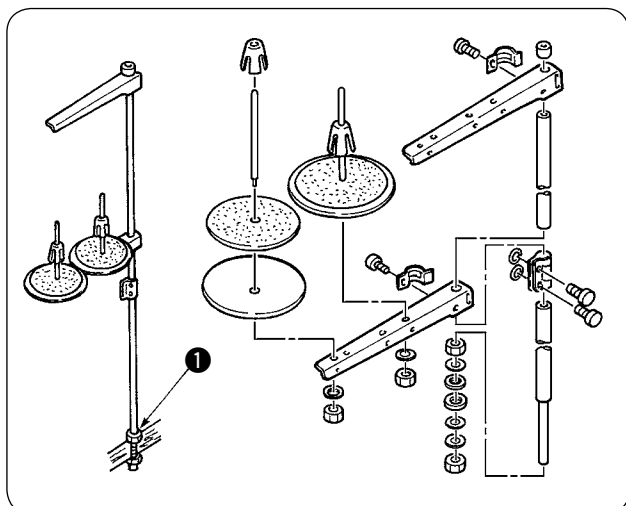
	Solenoid valve	Cylinder
Condensation	①	①
BT	②	②
Thread trimming	③	③
Thread trimming	④	④
Thread clamp	⑤	⑤
FL	⑦	⑦
FL	⑧	⑧
DL	⑨	⑨
2P	⑩	⑩
2P	⑪	⑪



(3) Adjusting the air pressure

Adjust the air pressure to 0.4 to 0.5 MPa using air pressure regulating knob ① of regulator. Pull knob ① up and turn it to properly adjust the operating air pressure. After the adjustment, press the knob down into the home position.

8. INSTALLING THE THREAD STAND



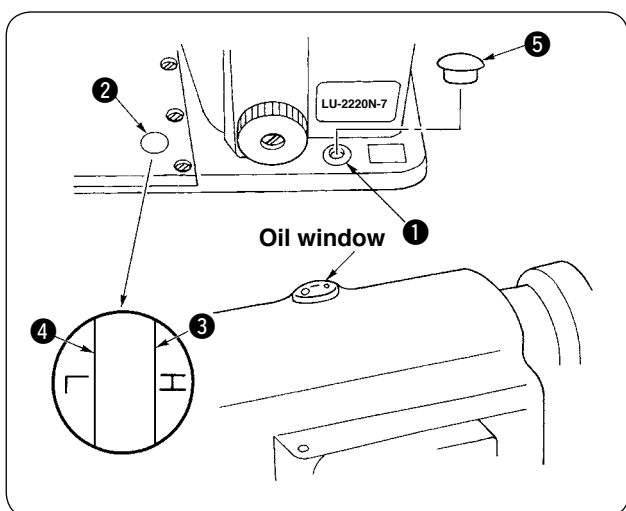
- 1) Assemble the thread stand and set it to the hole of the table.
- 2) Tighten locknut ① to fix the thread stand.

9. LUBRICATION



WARNING :

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

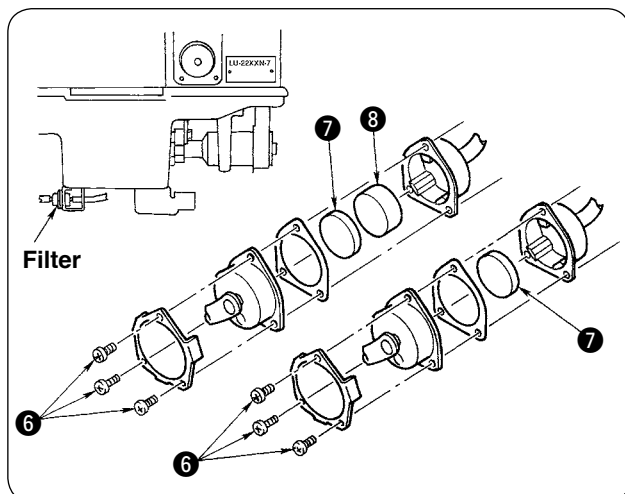
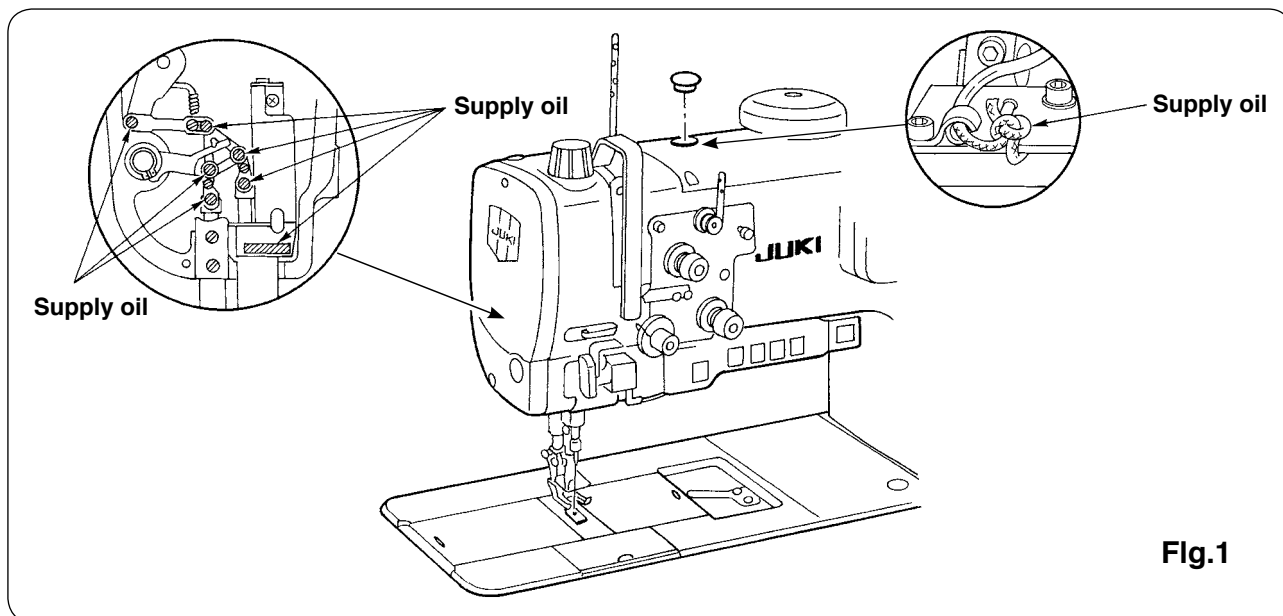


- 1) Pour the JUKI New Defrix Oil No. 1 into the oil tank in the bed from lubrication hole ① until H level ③ of oil gauge ② is reached.
- 2) Add the same lubricating oil as soon as the oil level has come down to L level ④.
- 3) After the lubrication, operate the sewing machine and check that the oil rises up to the oil sight window.



1. Do not use any lubrication oil other than the specified type. Be sure to close cap ⑤ of the oil hole.
2. When you operate your machine for the first time after the set-up or after an extended period of disuse, apply two or three drops of oil to the sections indicated with arrows. (Refer to Fig. 1 on the next page.)
3. When you start the use of the sewing machine which has not been used for an extended period of time, be sure to break in the sewing machine at 1,800 sti/min for approximately 10 minutes.

- In the case where the machine is operated with the hook filled with normal amount of oil, the oil level descends from H level to the L level in approximately 100 hours .



[Cleaning the filter]

- 1) Approximately once a month, remove screws **6** from the filter case and clean magnet **7** and filter element **8** inside the filter.
- 2) If the filter is clogged with soil, circulation failure will result.

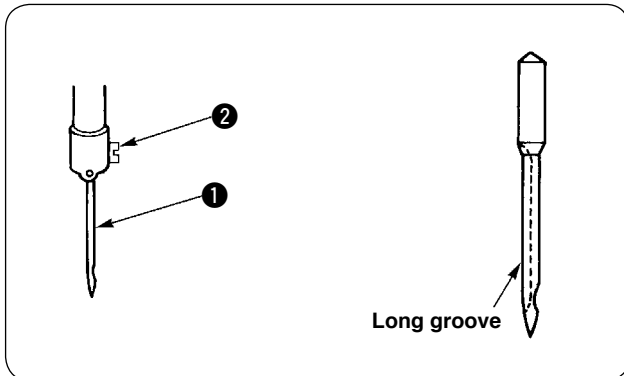
This will give rise to oil leakage from the upper portion of the hook driving shaft saddle.

10. ATTACHING THE NEEDLE



WARNING :

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Use a SCHMETZ 134 x 35R needle.

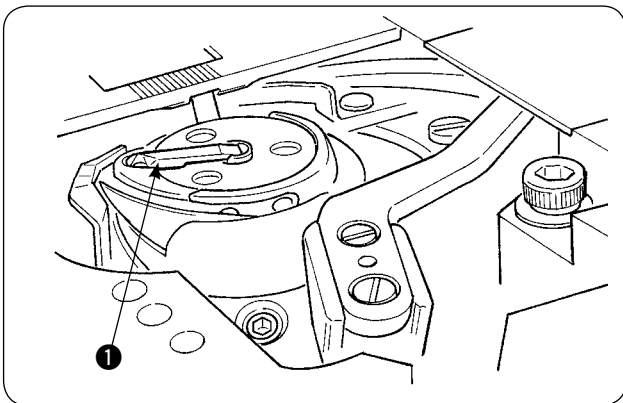
- 1) Turn the handwheel to bring the needle bar to the highest position of its stroke.
- 2) Loosen needle clamp screw ②, and hold needle ① so that the long groove in the needle is facing exactly to the left.
- 3) Push the needle ① deep into the needle clamp hole until it will go no further.
- 4) Tighten needle clamp screw ② firmly.

11. ATTACHING/REMOVING THE BOBBIN



WARNING :

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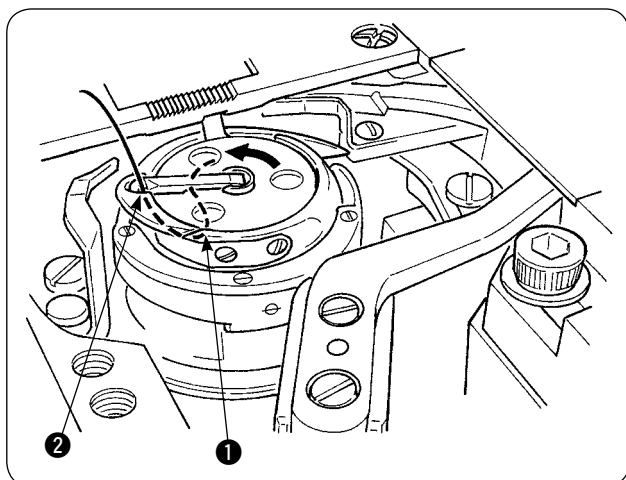
- 1) Lift latch ① of hook, and take out the bobbin.
- 2) Put the bobbin into the shaft in the hook correctly and release the latch.

12. THREADING THE HOOK



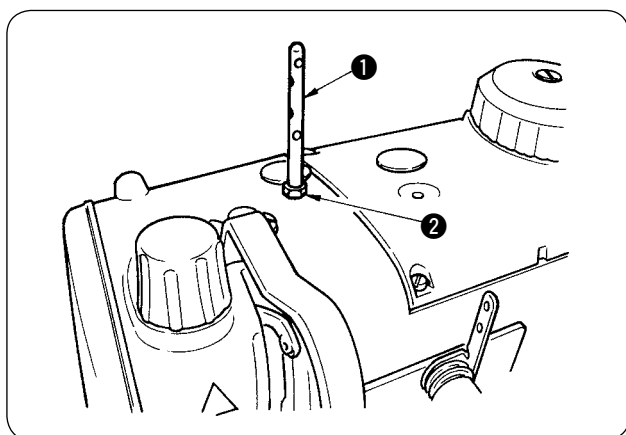
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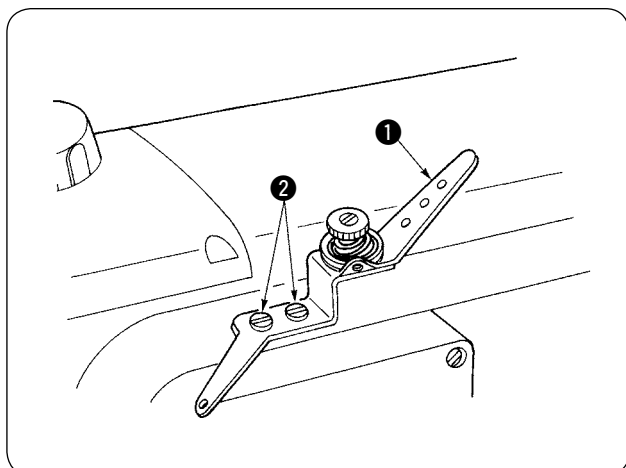
- 1) Pass the thread through thread path **1** in the hook and thread hole **2** in the lever, and draw the thread.
Now, the thread will be brought to the thread hole **2** via the tension spring.
- Make sure that the bobbin revolves in the direction of the arrow when you draw the thread.

13. INSTALLING THE THREAD GUIDE



(1) Installing the needle thread guide rod

- 1) Install needle thread guide rod **1** with nut **2**.



(2) Installing the bobbin winder thread guide

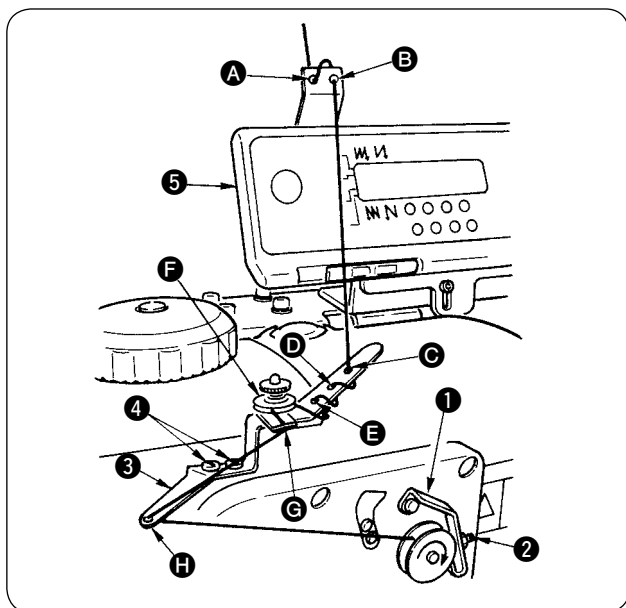
- 1) Attach bobbin winder thread guide **1** to the bobbin winder on the machine arm using screws **2**.
- 2) Adjust the position of the thread guide referring to **"14. WINDING A BOBBIN"**.

14. WINDING A BOBBIN



WARNING :

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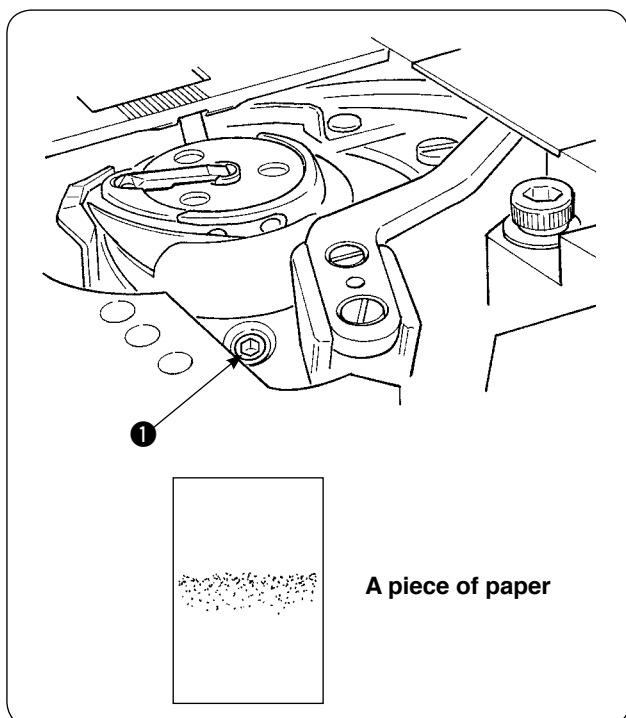
- 1) Pass the thread in the order, **A** through **H**. Then wind it several turns round the bobbin.
- 2) Tilt bobbin presser **1**.
- 3) Adjust bobbin thread amount adjustment screw **2** to wind a bobbin about 90% of its capacity. Turn the screw counterclockwise to increase the amount of thread to be wound round the bobbin, or clockwise to decrease it.
- 4) If the bobbin is wound unevenly, correct it by moving thread guide **3** of the bobbin winder back or forth. Then tighten screws **4**.
- 5) When the bobbin is filled up, the bobbin presser automatically releases the bobbin and the bobbin winder stops running.

15. ADJUSTING THE AMOUNT OF OIL IN THE HOOK



WARNING :

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



- 1) Adjust the amount of oil in the hook by turning oil amount adjustment screw **1** mounted on the hook.
- 2) Turning the adjustment screw clockwise will decrease the amount of oil in the hook or counterclockwise will increase it.
- 3) Place a piece of paper near the periphery of the hook, and run the machine for approximately five seconds. The proper amount of oil in the hook is obtained when the oil spots lightly make stripes on the paper as shown in the figure.

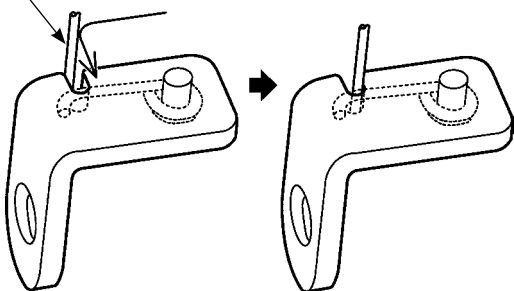
16. THREADING THE MACHINE HEAD



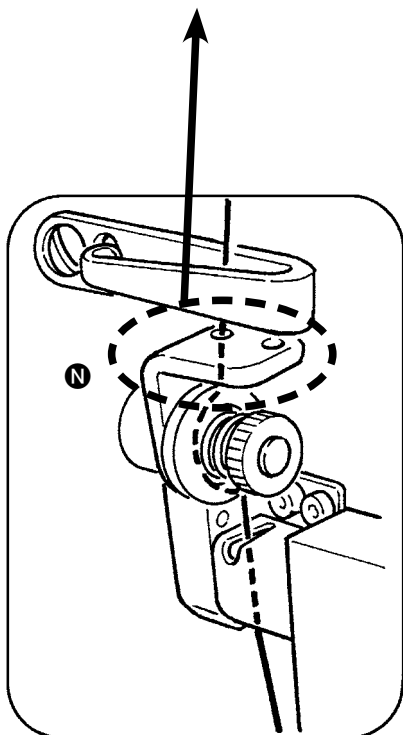
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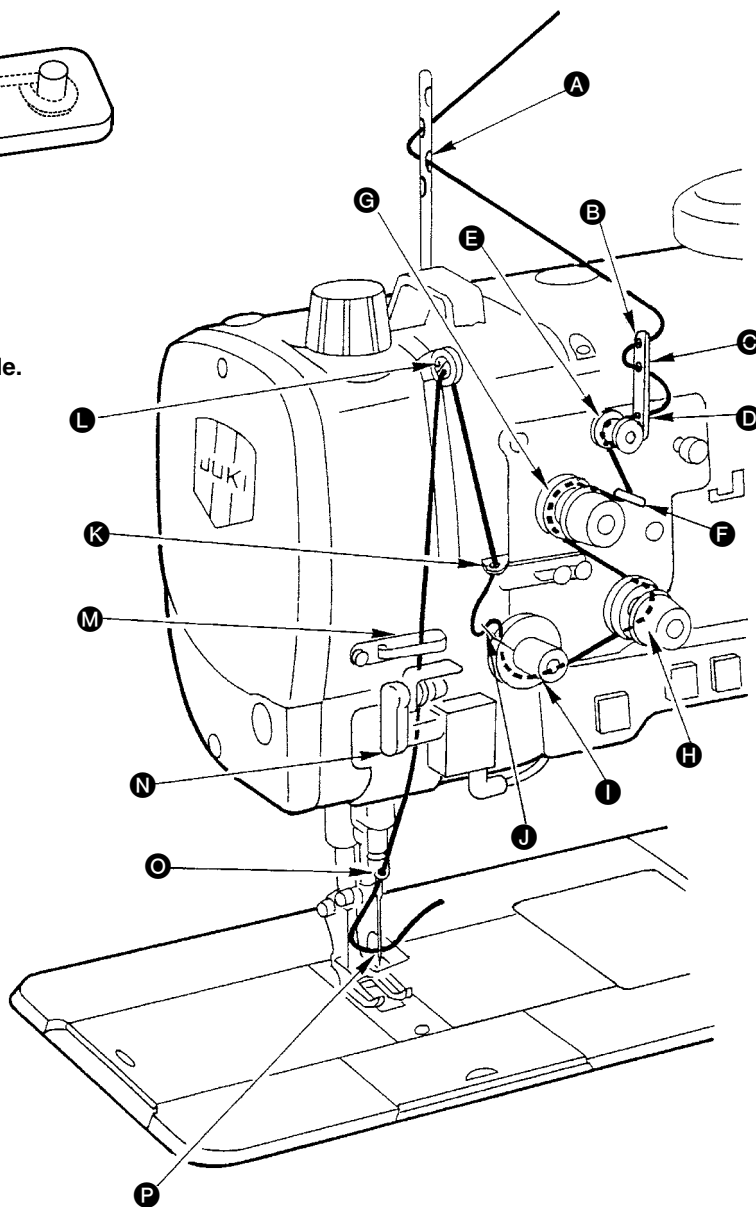
Needle thread



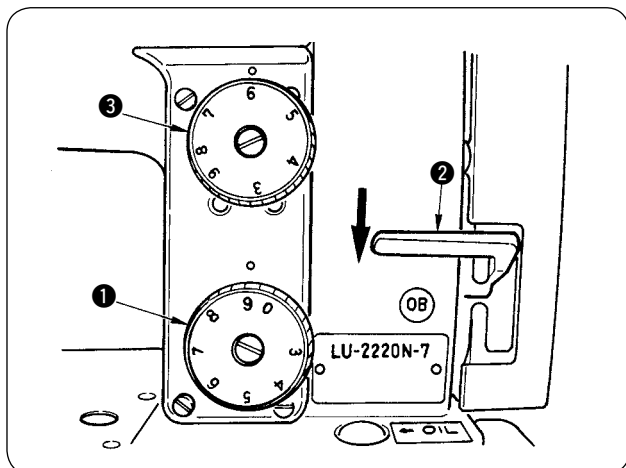
Threading method :
draw the thread to the operator's side.



Thread the machine head following the order of **A** through to **P** as shown in the illustration given above.



17. ADJUSTING THE STITCH LENGTH



Turn standard feed adjusting dial **1** or 2P feed adjusting dial **3** counterclockwise or clockwise so that the number corresponding to the desired number is brought to the top of the dial until the marking spot is reached.



When turning 2P feed adjusting dial **3**, be sure to confirm that 2P switch is OFF. The scale 3 or less of 2P feed adjusting dial (place where the dial stops with the dial stopper) is for adjusting the 2P feed adjusting dial to "0" point. The scale 3 or less cannot be used.

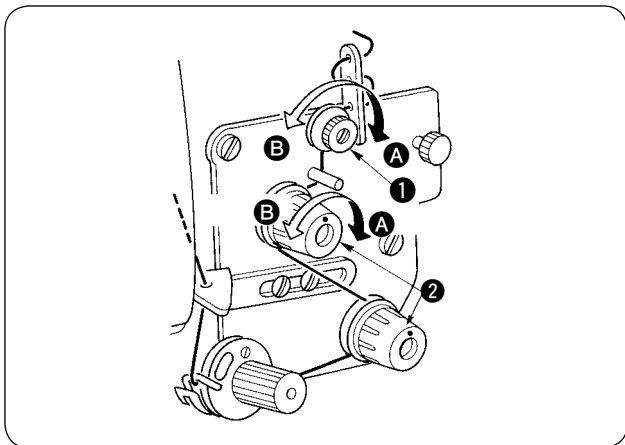


For the details of 2P device, refer to "29. OPERATION SWITCHES".

[Reverse feed stitching]

- 1) Press down reverse feed control lever **2**.
- 2) Reverse feed stitching can be performed as long as you keep pressing the lever down.
- 3) Release the lever, and the machine will run in the normal feed direction.

18. THREAD TENSION



(1) Adjusting the length of thread remaining after thread trimming

Turn thread tension nut No. 1 **1** clockwise **A** to shorten the length of thread remaining after thread trimming. Turn the nut counterclockwise **B** to lengthen it.

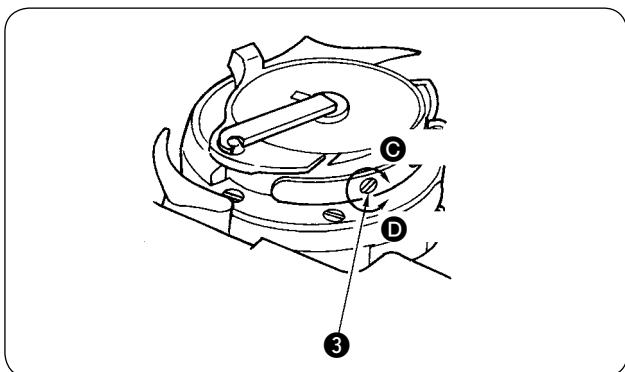
(2) Adjusting the needle thread tension

Turn thread tension nut No. 2 **2** clockwise **A** to increase the needle thread tension, or counterclockwise **B** to decrease it.



WARNING :

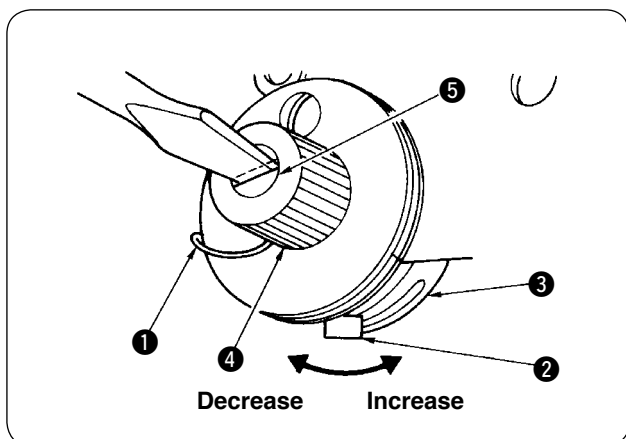
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



(3) Adjusting the bobbin thread tension

Turn tension adjustment screw **3** clockwise **C** to increase the bobbin thread tension, or counterclockwise **D** to decrease it.

19. THREAD TAKE-UP SPRING



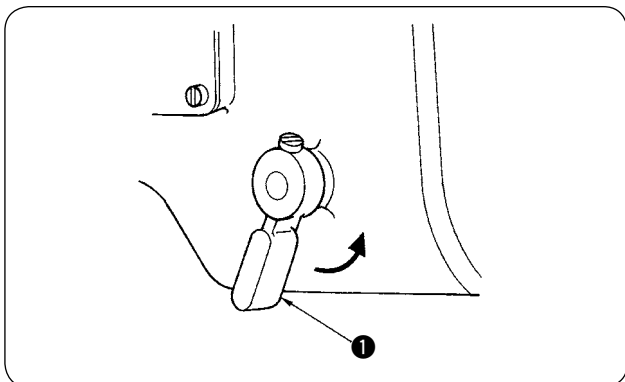
(1) When you want to change the stroke of the spring :

- 1) Loosen screw ② in the stopper, and move stopper ③ to the right or left to change stroke of thread take-up spring ①.
- 2) Move the stopper to the right to increase the stroke of the thread take-up spring, or the left to decrease it.

(2) When you want to change the tension of the spring :

- 1) Loosen nut ④, and move spring stud ⑤ counterclockwise to increase the tension of the spring, or clockwise to decrease it.

20. HAND LIFTER / HANDHEBEL



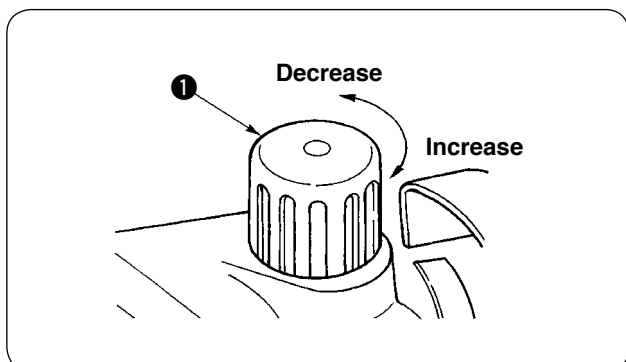
- 1) When you want to keep the presser foot in the lifted position, turn hand lifter ① in the direction of the arrow. This makes the presser foot rise 9 mm and stay at that position.
- 2) To make the presser foot come down to its home position, lower the hand lifter.

21. ADJUSTING THE PRESSURE OF THE PRESSER FOOT



WARNING :

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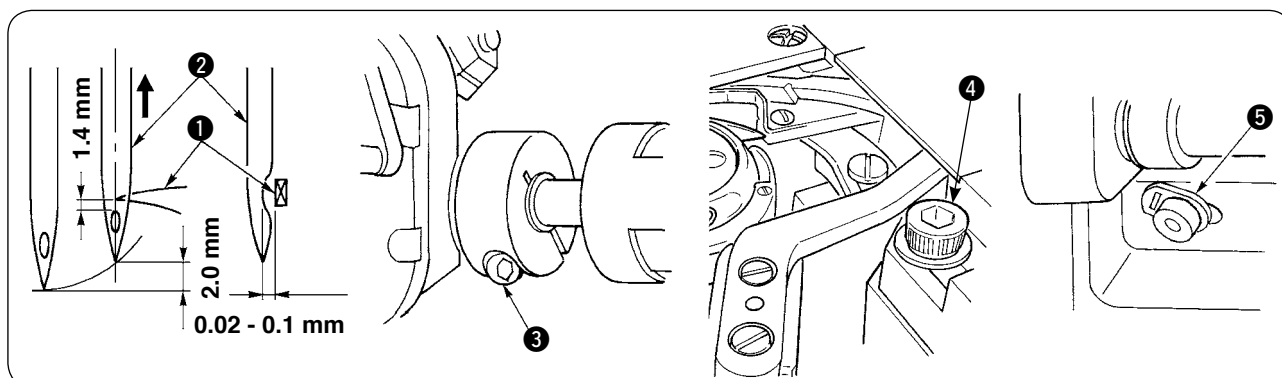
- 1) Turn presser spring regulating dial ① clockwise to increase the pressure of the presser foot, or counterclockwise to decrease it.
(Be sure to operate the sewing machine with the pressure of the presser foot minimized as long as the presser foot securely holds the material.)

22. NEEDLE-TO-HOOK RELATION



WARNING :

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



- 1) Adjust the standard feed adjusting dial to "0".
- 2) Loosen hook driving shaft set collar clamping screw ③, and turn the handwheel counterclockwise to make the needle bar ascend by 2.0 mm from the lowest position of its stroke.
- 3) In the state described in 2), align blade point ① of the hook with the center of needle ②, and tighten hook driving shaft set collar clamping screw ③. At this time, a clearance of 1.4 mm is provided between the blade point of the hook and the top end of the needle eyelet. (As reference, the handwheel pointer meets the marker line of the scale L on the handwheel.)
- 4) Loosen screw ④ in the top face of the bed and screw ⑤ in the hook driving shaft saddle, and adjust so that a clearance of 0.02 to 0.1 mm is provided between the blade point of hook and the needle by moving the hook driving shaft saddle to the right or left. Once the specified clearance is obtained, securely tighten screws ④ and ⑤.
- 5) Set the standard feed adjusting dial to maximum value, and check that the blade point of the hook does not come in contact with the needle.



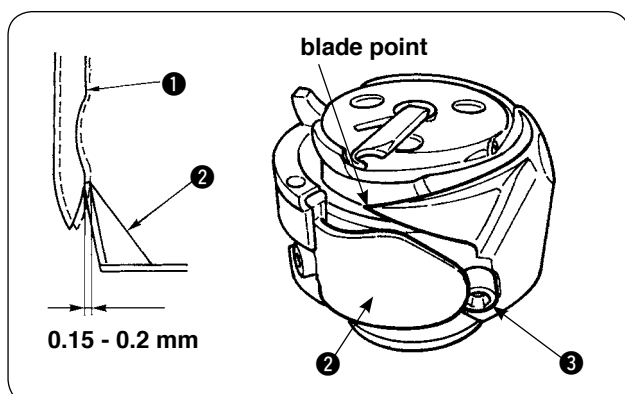
The operation panel could come in contact with the thread stand when tilting the machine head. To protect the relevant parts from contact, shift the thread stand to a position at which the thread stand does not interfere with the control panel.

23. ADJUSTING THE HOOK NEEDLE GUARD



WARNING :

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



When a hook has been replaced, be sure to check the position of the hook needle guard.

As the standard position of the hook needle guard, hook needle guard ② must push the side face of needle ① to lean the needle by 0.15 to 0.2 mm away from its straight position. If not, adjust the hook needle guard by bending it.

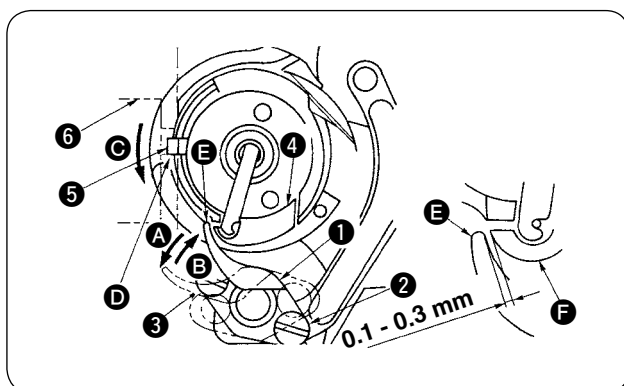
- 1) If you want to move the hook needle guard inwards, turn adjusting screw ③ clockwise.
- 2) If you want to move the hook needle guard outwards, turn adjusting screw ③ counterclockwise.

24. ADJUSTING THE BOBBIN CASE OPENING LEVER



WARNING :

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



- 1) Turn the handwheel to move bobbin case opening lever ① in the direction of the arrow A, and loosen screw ②.
- 2) Turn the handwheel to move bobbin case opening lever ① in the direction of arrow B, and loosen screw ③.
- 3) Turn bobbin case ④ in the direction of arrow C to until bobbin case stopper ⑤ rests in groove D on throat plate ⑥. In this state, adjust so that a clearance of 0.1 to 0.3 mm is provided between top end E of bobbin case opening lever and protrusion F on the bobbin case when they approach most. Then, tighten screws ② and ③.

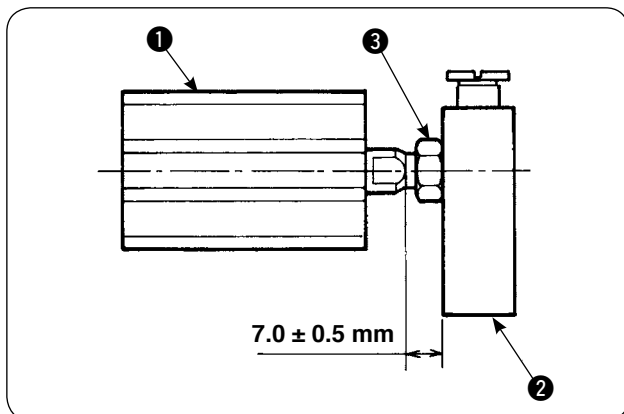
25. ADJUSTING THE THREAD TRIMMING MECHANISM COMPONENTS



WARNING :

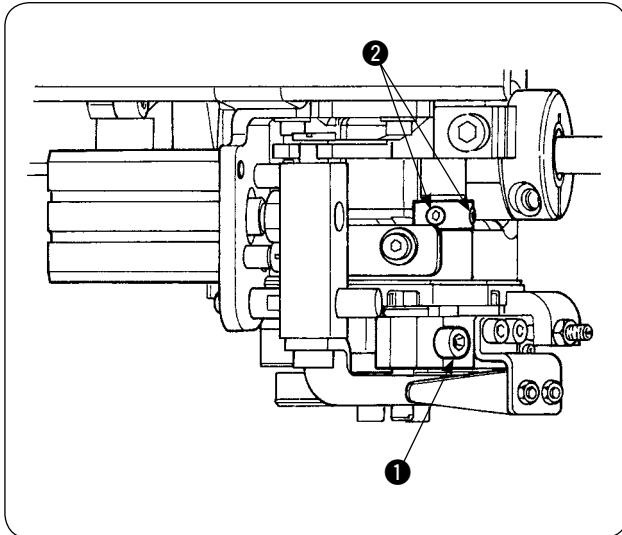
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

(1) Positioning the thread trimming cylinder joint

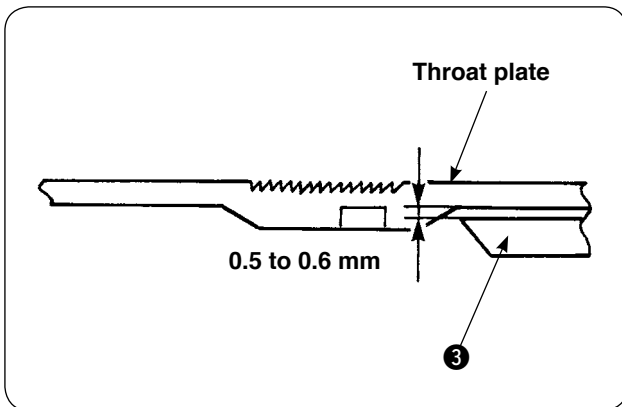


Assemble thread trimming cylinder ① and thread trimming cylinder joint ② as illustrated in the sketch at left and secure with nut ③.

(2) Moving knife (Adjusting the vertical position)

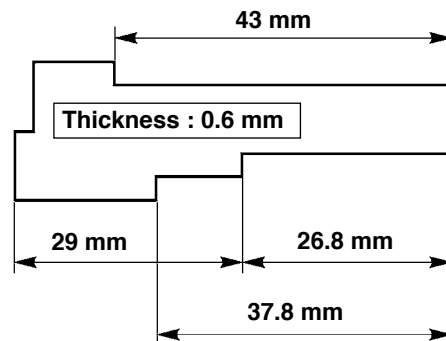


- 1) Loosen moving knife drive arm clamping screw ❶ and moving knife shaft thrust collar setscrew ❷ and tighten them again after adjusting the vertical direction of moving knife ❸. When tightening moving knife drive arm clamping screw ❶, perform the items (6), (7), (8) and (9) that are mentioned later.

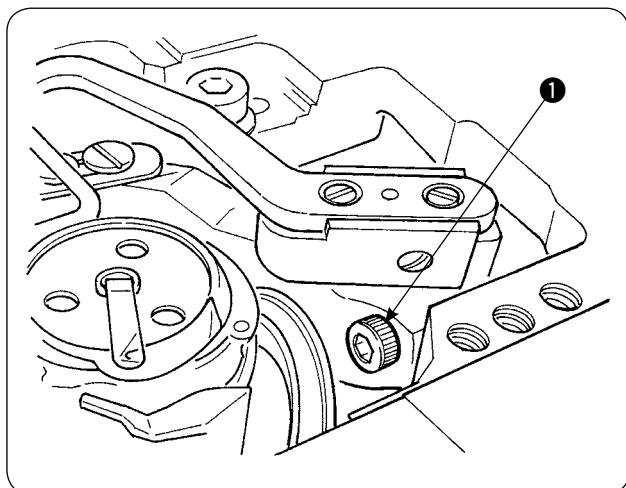


- 2) The vertical position of moving knife is the position where the clearance between the bottom surface of throat plate (reverse side) and the top surface of moving knife ❸ is 0.5 to 0.6 mm. (At the time of adjustment, the gauge for adjustment supplied as accessories can be used.)

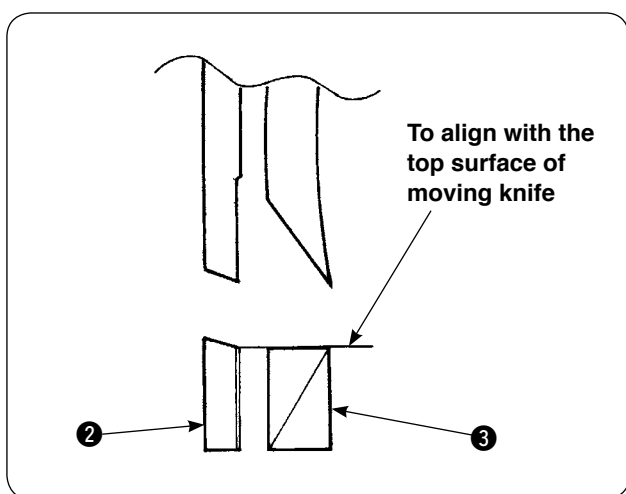
Gauge for adjustment supplied as accessories



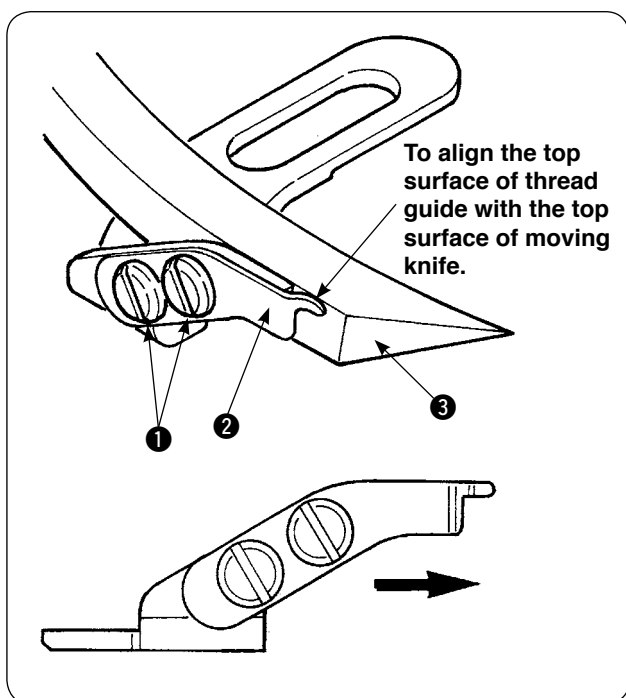
(3) Counter knife (Adjusting the vertical position)



- 1) Loosen counter knife base clamping screw ❶, adjust it to the position where the upper end of the blade section of counter knife ❷ aligns with the top surface of moving knife ❸, and tighten the screw again. (At this time, be careful of the blade point of hook. It is safe to work while adjusting the main shaft angle to the position near L engraved marker line.)

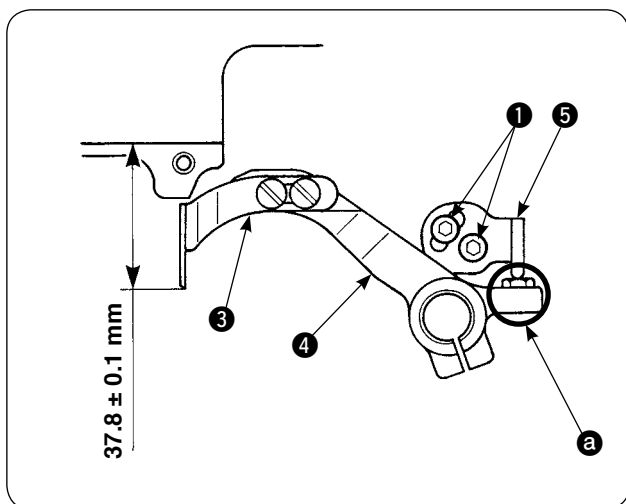


(4) Thread guide installing position



- 1) Loosen thread guide setscrews ❶ and tighten them again after adjusting the position of thread guide ❷.
Installing position : The top surface of thread guide ❷ should align with the top surface of moving knife ❸ in the vertical direction and the thread guide should be fixed after fully moving it to the direction of the arrow mark as shown in the figure in the longitudinal direction.

(5)-1. Counter knife (Adjusting the travel amount) (Positioning of the counter knife base stopper)



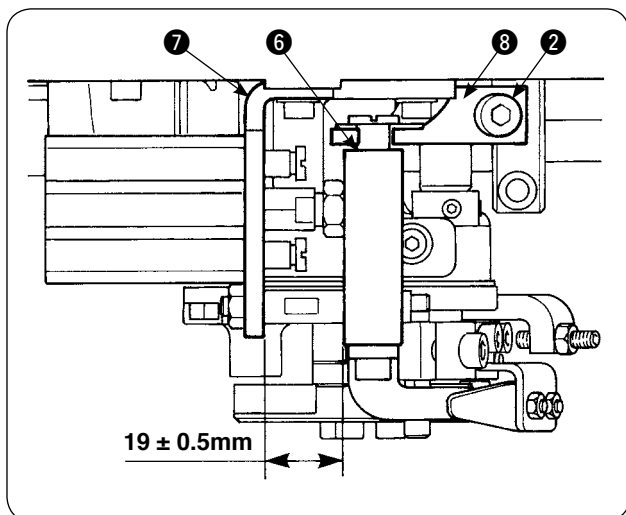
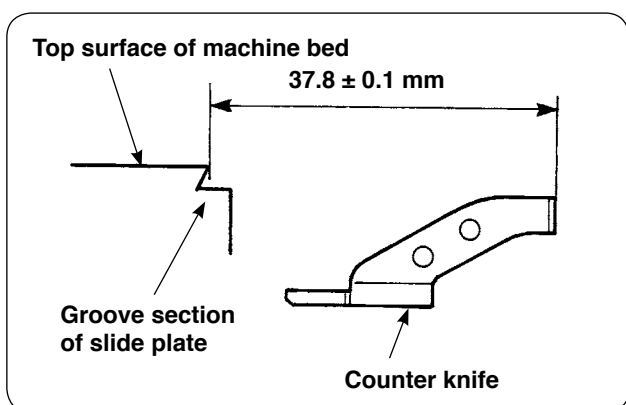
1) Turn the handwheel to bring counter knife to the lower dead point of the thread take-up lever, and loosen knife base stopper setscrews ① and counter knife driving arm clamping screw ②.

2) When the top end of counter knife ③ is spaced 37.8 ± 0.1 mm from the bed slide groove, bring counter knife base ④ into contact with counter knife base stopper ⑤ (as shown in a). (At this time, you may use the adjusting gauge supplied with the unit.)

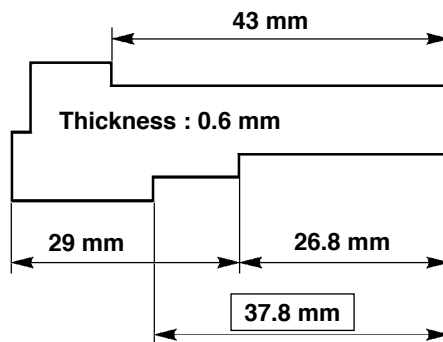
3) Tighten counter knife base stopper setscrews ①.

4) In the state as described in Step 2), adjust the clearance provided between thread trimming cylinder joint ⑥ and cylinder mounting plate ⑦ to 19.0 ± 0.5 mm. Tighten counter knife driving arm clamping screw ②.

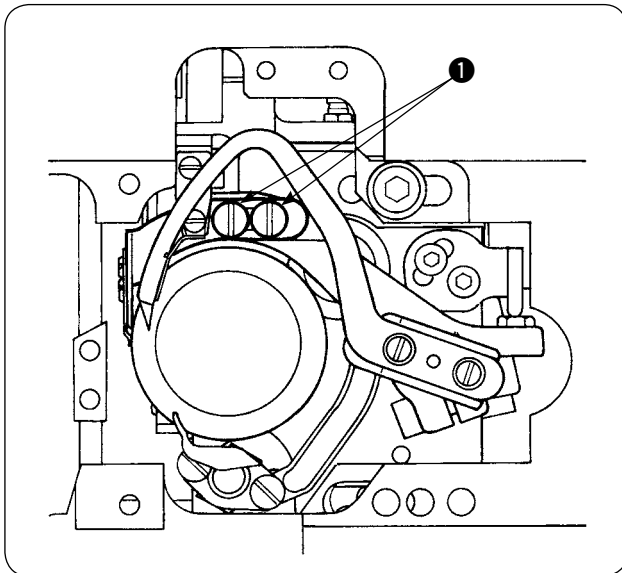
(At this time, remove the longitudinal play by moving counter knife base ④ downward and moving counter knife driving arm ⑧ upward.)



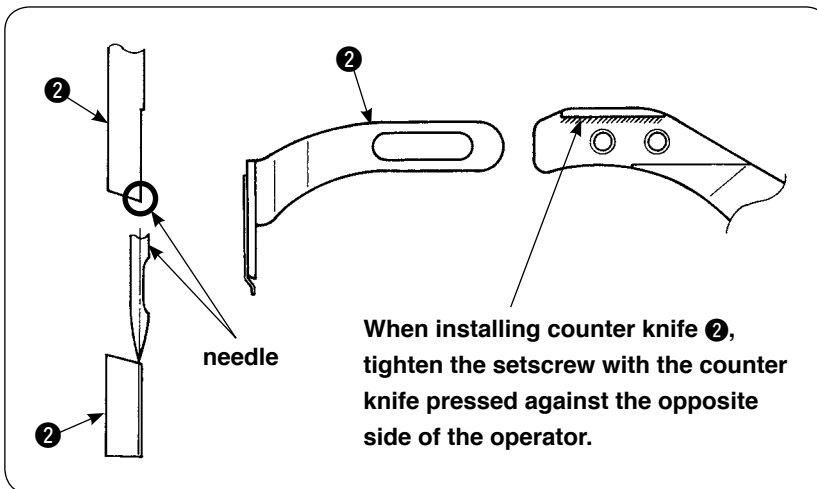
Gauge for adjustment supplied as accessories



(5)-2. Counter knife (Adjusting the lateral position)



- 1) Loosen counter knife setscrews ①.
- 2) Set the stitch dial at "0," and set the thread take-up lever at the lower dead point. Manually actuate the solenoid valve to put the thread trimming cylinder into the state where it projects. (Press the manual switch of solenoid valve No. 3 to lock the solenoid value. Refer to "(11) Explanation of the solenoid valve".)

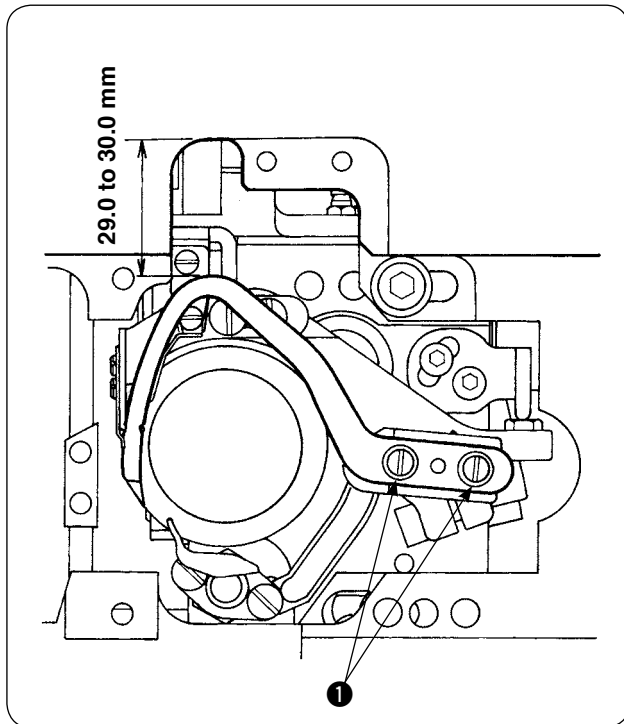


- 3) Keeping the state as described in Step 2), move counter knife to the right or left to align the top end of the counter knife ② with the needle tip, and tighten counter knife setscrew ①.
- 4) Release the solenoid valve which has been manually actuated in Step 2). (Refer to "(11) Explanation of the solenoid valve".)

Confirmation : Actuate the solenoid valve by hand to move the thread trimming air cylinder and confirm the followings in the state that the counter knife base comes in contact with the counter knife base stopper :

- Distance between the tip of counter knife and the machine bed is 37.8 ± 0.1 mm.
- The clearance provided between the cylinder joint and the cylinder mounting plate is 19.0 ± 0.5 mm.
- The top end of the counter knife is aligned with the needle tip (center of the needle).

(6) Adjusting the knife pressure

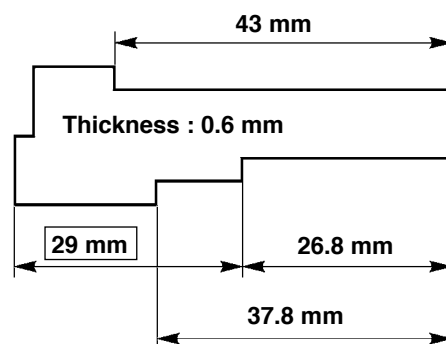


- 1) Set the thread take-up lever at the lower dead point. Manually actuate the solenoid valve to put the thread trimming cylinder into the state where it projects.
(Press the manual switch of solenoid valve No. 3 to lock the solenoid value. Refer to "(11) Explanation of the solenoid valve".)
- 2) Keeping the state of 1), slowly turn the handwheel by hand, and adjust the distance of R section of the moving knife and the end of machine bed to the position of 29 to 30 mm.
(At this time, the gauge for adjustment supplied as accessories can be used.)
- 3) Loosen moving knife setscrews ❶ and tighten them again after adjusting the knife pressure.
- 4) Release the solenoid valve which has been manually actuated in Step 1). (Refer to "(11) Explanation of the solenoid valve".)

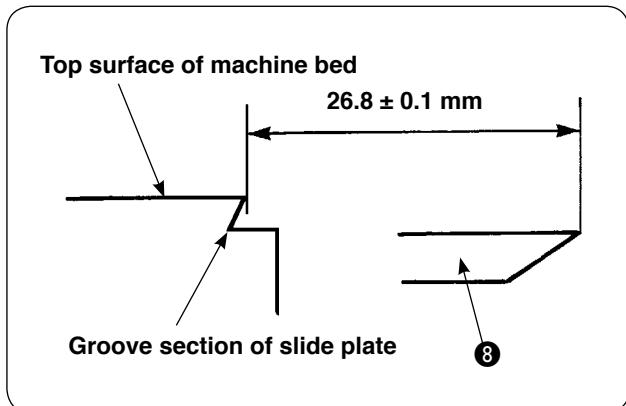
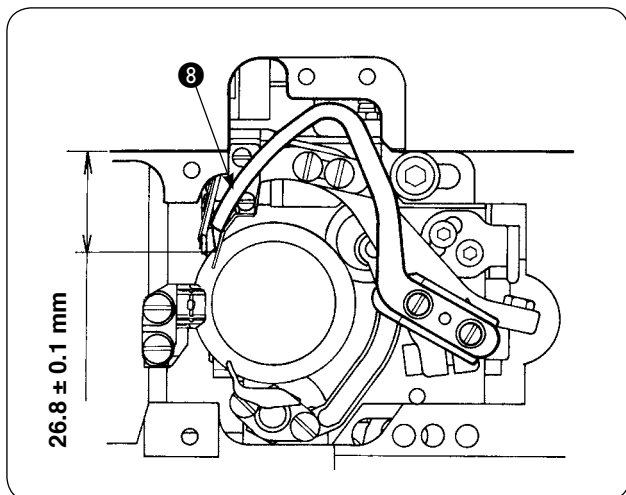
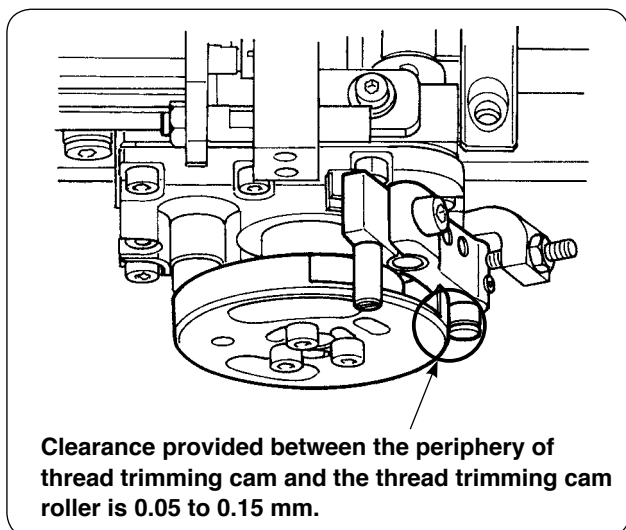
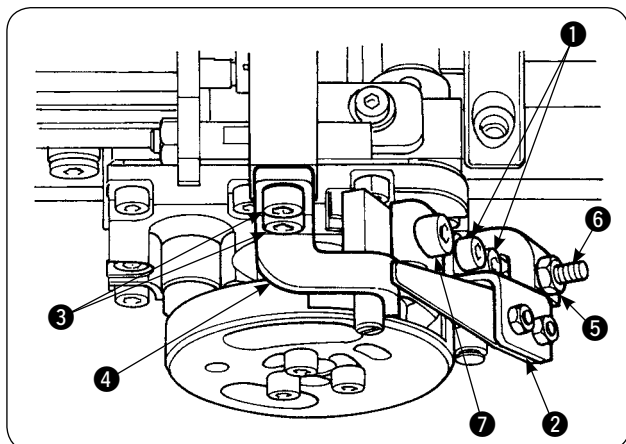
***1 :** When the knife pressure is low, tighten moving knife setscrews ❶ while lightly pressing the moving knife to the counter knife. When the knife pressure is high, worn-out or damage of the blade section will be caused . So, adjust the knife pressure as low as possible.

***2 :** When thread cannot be cut even when the knife pressure is increased, change the height of moving knife or counter knife within the range of adjustment and adjust so that the blade sections meet together. The height of moving knife and counter knife should be a clearance of 0.5 to 0.6 mm between the knife and the bottom surface of throat plate.

Gauge for adjustment supplied as accessories



(7)-1. Initial position of the moving knife drive arm and the moving knife



- 1) Tilt the sewing machine. Manually actuate the solenoid valve when the thread trimming cam roller does not fit in the cam groove to put the thread trimming cylinder into the state where it retracts.

(Press the manual switch of solenoid valve No. 4 to lock the solenoid valve. Refer to "(11) Explanation of the solenoid valve".)

- 2) Loosen setscrew ① for the leaf spring (asm.) to remove leaf spring (asm.) ②.
- 3) Loosen moving knife return plate setscrews ③ and remove moving knife return plate ④.
- 4) Loosen moving knife drive arm stopper nut ⑤ and loosen moving knife drive arm stopper screw ⑥.
- 5) Loosen moving knife drive arm clamping screw ⑦.
- 6) Adjust the clearance between the thread trimming cam roller and the periphery of thread trimming cam to 0.05 to 0.15 mm, and adjust moving knife ⑧ to the initial position.

The initial position of moving knife is the position where the distance between the top end of moving knife and the machine bed is 26.8 ± 0.1 mm.

(At this time, the gauge for adjustment supplied as accessories can be used.)

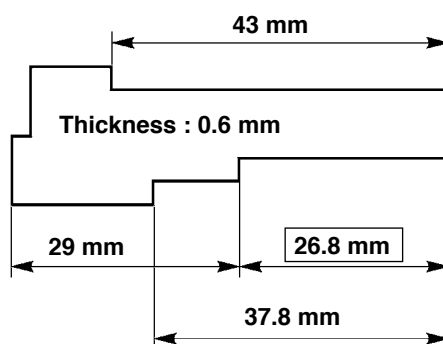
- 7) Keeping the state of 6), tighten moving knife drive arm clamping screw ⑦.

(Tightening torque : 5.9 to 6.9 N·m)

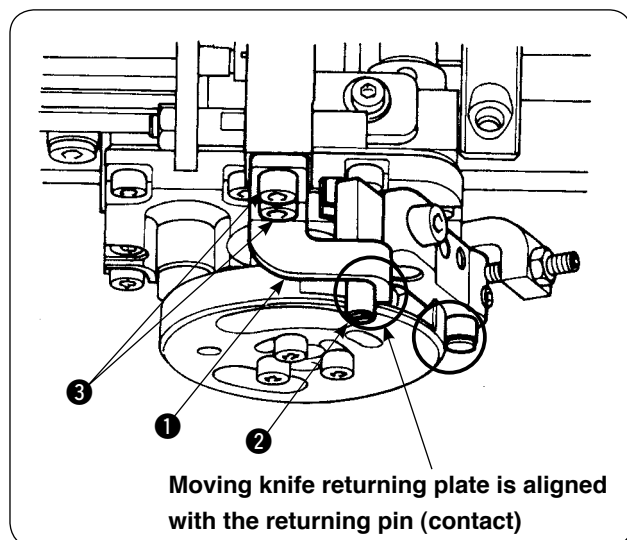
At this time, for the vertical direction of moving knife drive arm, both ends of the bottom surface of moving knife drive arm and the lower end of moving knife shaft align with each other.

To be continued to "(7)-2. Mounting position of the moving knife returning plate"

Gauge for adjustment supplied as accessories



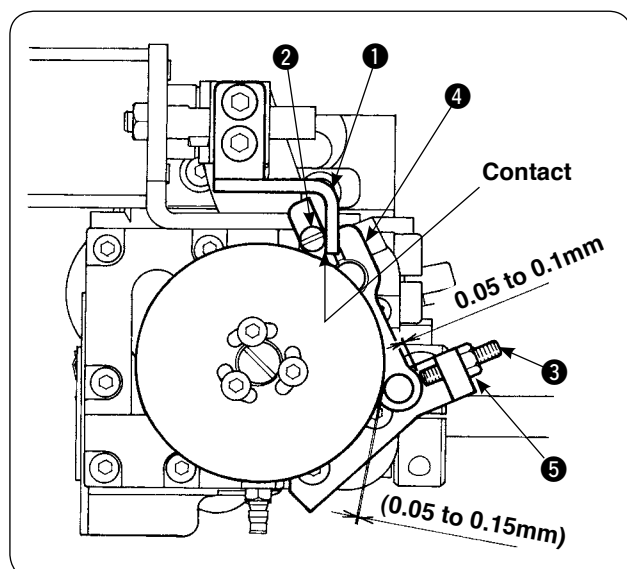
(7)-2. Mounting position of the moving knife returning plate



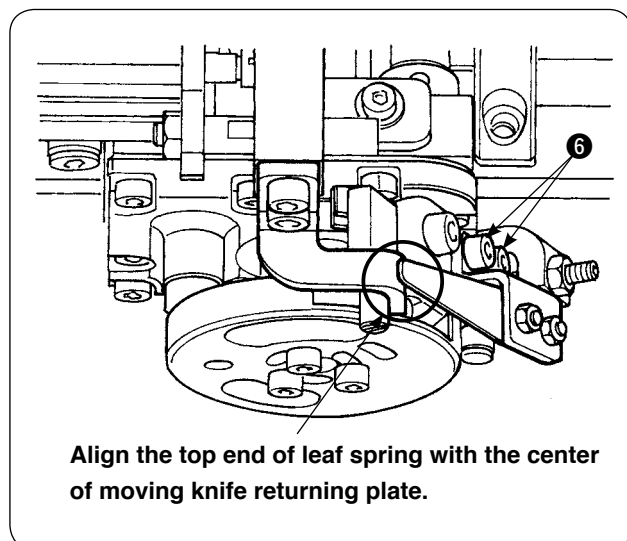
- 1) Maintaining a clearance of 0.05 to 0.15 mm between the periphery of thread trimming cam and the thread trimming cam roller and the periphery of thread trimming cam, bring moving knife returning plate ① into contact with moving knife returning pin ②, and secure the moving knife returning plate with moving knife returning plate setscrews ③.

To be continued to "(7) - 3. Adjusting the clearance between the moving knife driving arm and the moving knife driving arm stopper"

(7)-3. Adjusting the clearance between the moving knife drive arm and the moving knife drive arm stopper

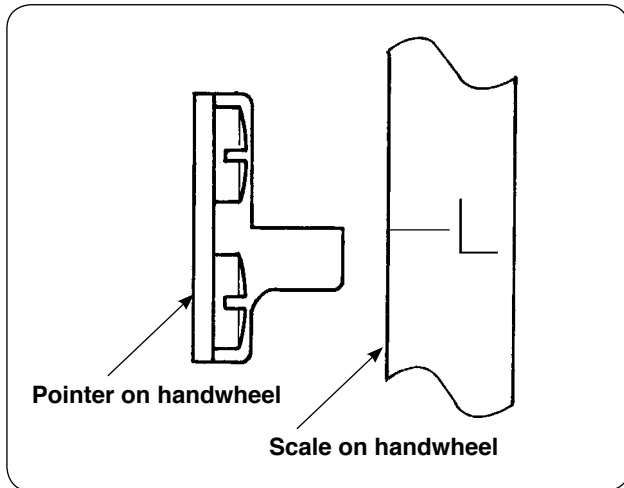


- 1) In the state where moving knife returning plate ① comes in contact with moving knife returning pin ②, adjust so that a clearance of 0.05 to 0.1 mm is provided between moving knife driving arm stopper screw ③ and moving knife driving arm ④, and secure the moving knife driving arm stopper screw with nut ⑤.
- 2) Align the top end of leaf spring with the center of the moving knife returning plate, and secure the leaf spring with leaf spring (asm.) setscrews ⑥.
- 3) Release the manual switch of the solenoid valve, which has been actuated in step (7) - 1- 1.. (Refer to ["\(11\) Explanation of the solenoid valve"](#).)



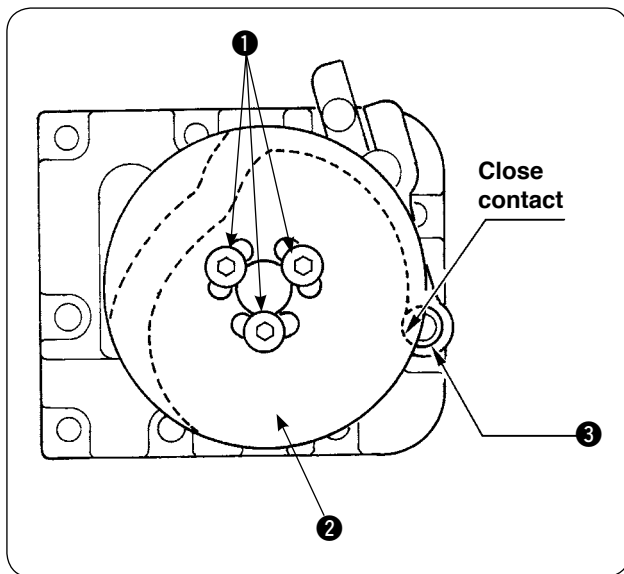
When the machine lock has occurred during thread trimming operation, confirm whether or not the adjustment values of (7)-1 to 3 are proper.
When they are not proper, it is necessary to perform re-adjustment.

(8) Adjusting the thread trimming cam timing

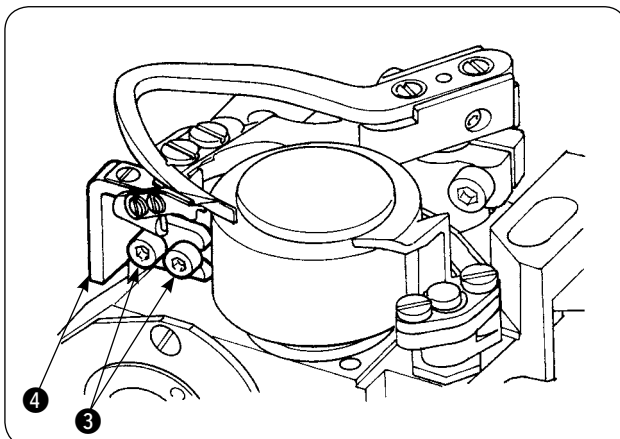
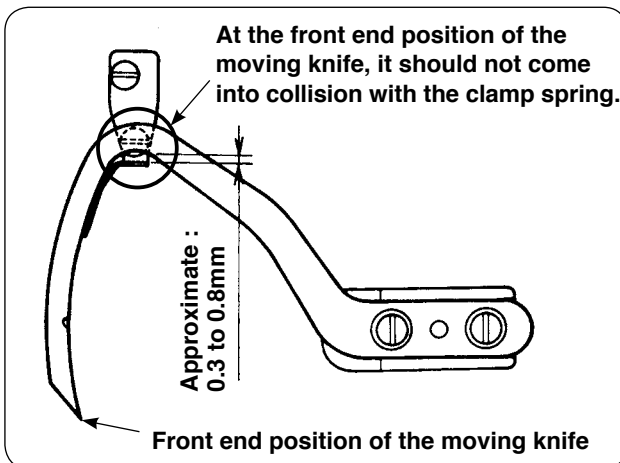
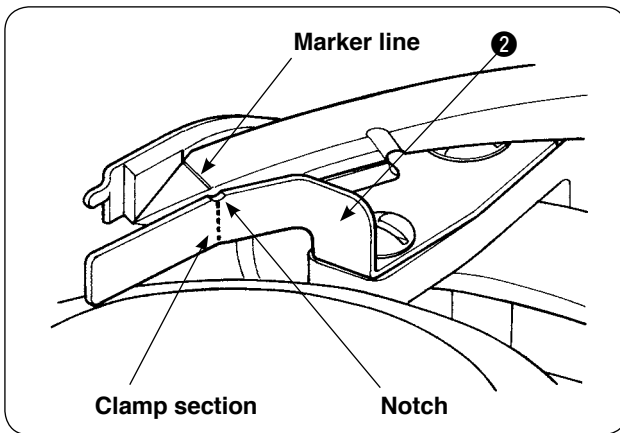
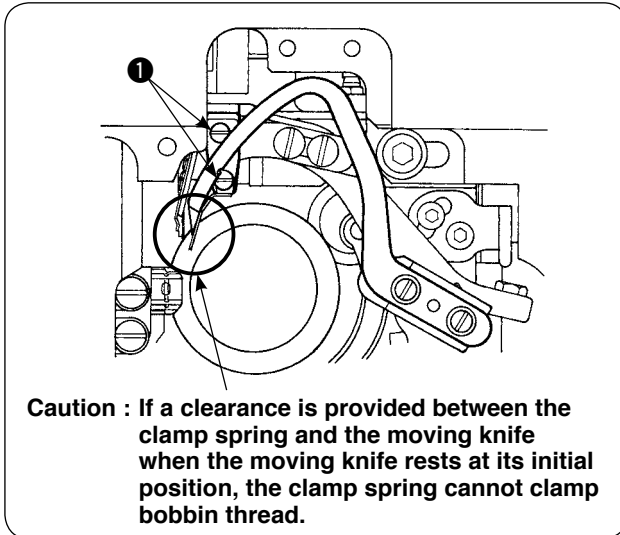


- 1) Loosen thread trimming cam setscrews ❶ and tighten them again after adjusting the position of thread trimming cam ❷.
- 2) The position of thread trimming cam is the position where thread trimming cam roller ❸ comes in contact with R section where it starts entering the cam groove when the position of handwheel is at L engraved marker line.

Confirmation : Make sure again of the position of L engraved marker line and R section where the roller starts entering the cam groove after fixing the thread trimming cam.



(9) Installing position of the clamp spring

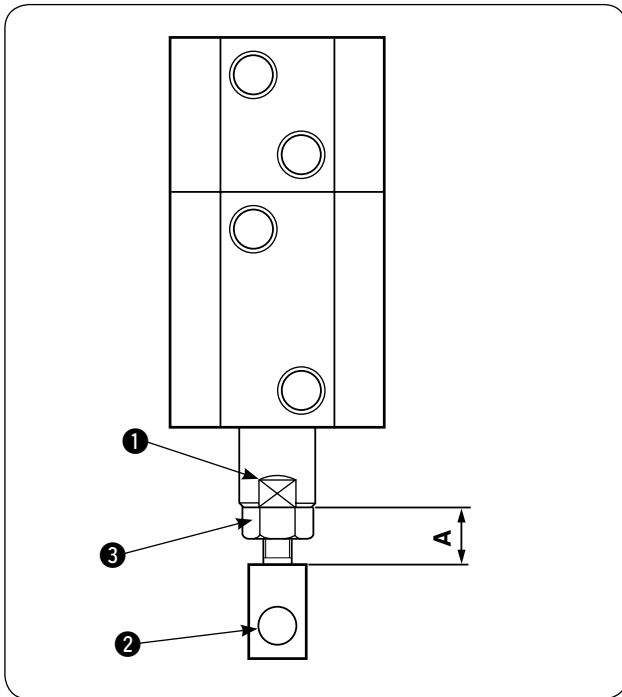


- 1) When the moving knife rests at its initial position, loosen clamp screw setscrew ❶.
- 2) Align the marker line on the top face of moving knife with the notch in clamp spring ❷. (It's a guide for adjustment)
- 3) Bring the clamp section of clamp spring ❷ into contact with the moving knife, and secure the clamp spring with clamp spring clamping screw ❶. (Tightening torque: 0.2 to 0.3 N·m)
When bringing the clamp section of clamp spring ❷ into contact with the moving knife, also bring the top end of clamp spring near the moving knife. The top end of clamp spring should come in contact with the moving knife when the moving knife operates.

* After the adjustment of the mounting position of the clamp spring, carefully check for "❶ Contact between the clamp spring and the hook," and "❷ Contact between the clamp spring and the moving knife (at its front end position)." Contact between those parts can cause a breakage of the clamp spring.

* When the position of the clamp spring cannot be adjusted even clamp spring setscrews ❶ are loosened, loosen clamp spring base setscrews ❸ and move clamp spring base ❹ to the operator's side to adjust.
(The position in vertical direction of the clamp spring base has to be placed to the hook shaft base. Therefore, tighten the clamp spring base with setscrews ❸ while lightly pressing it in downward direction.

(10) Adjusting the condensation amount



- 1) Loosen lock nut ③ of reverse feed cylinder knuckle joint ②.
- 2) Adjust the clearance between the top end of reverse feed cylinder rod ① and the end of reverse feed cylinder knuckle joint ② referring to the standard of the table. (It is possible to adjust by turning rod ①.)
- 3) After the adjustment, tighten lock nut ③.

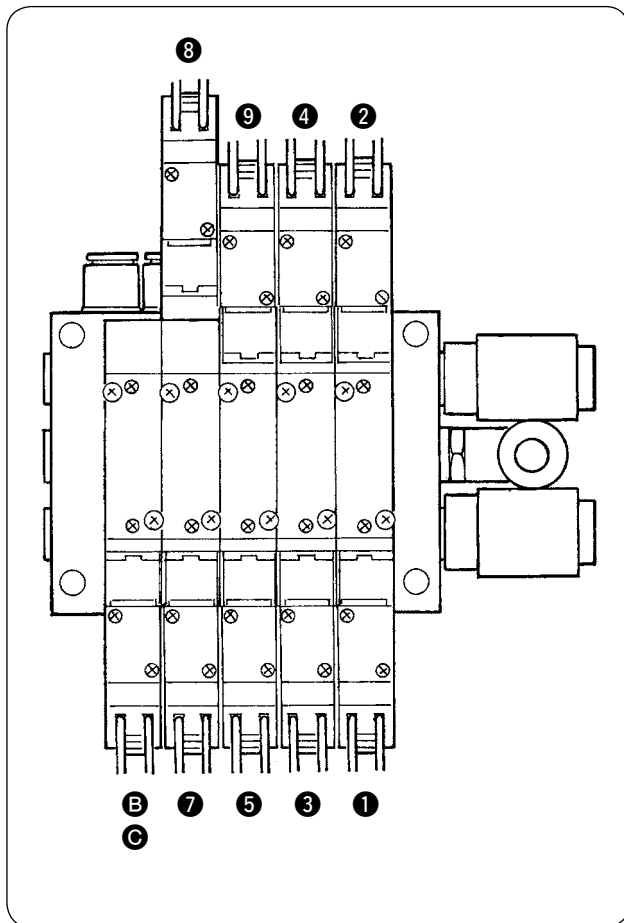
Confirmation :

1. Perform the thread trimming sewing in practice.
2. Confirm that the condensation amount (pitch before one stitch of thread trimming) is proper (*) in accordance with the sewing conditions.

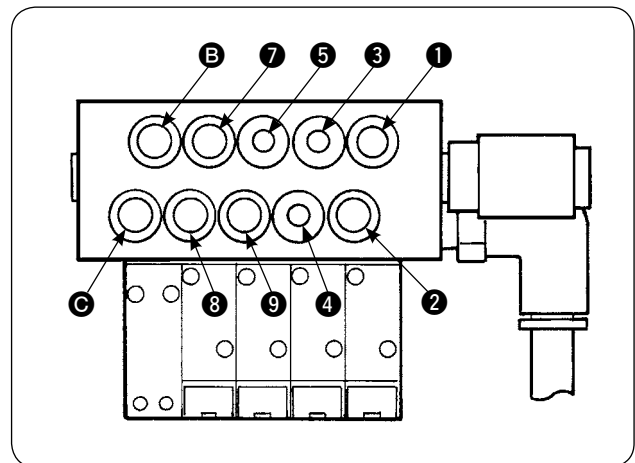
* The length of thread remaining on the cloth side is shortened by decreasing the condensation amount. When the amount is excessively decreased, however, the cloth is tore by the seams and the stitch skips. As a result, thread trimming trouble occurs. In addition, when the amount is excessively increased, thread-handling trouble occurs. As a result, thread trimming trouble occurs. Condensation amount of 1.5 to 2 mm is recommended.

		Condensation amount (Standard)
Dimension A	11.5 mm	1.5 mm
	12.0 mm	2.0 mm

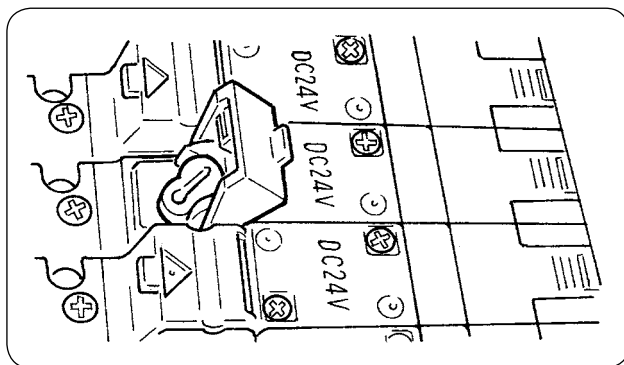
(11) Explanation of the solenoid valve



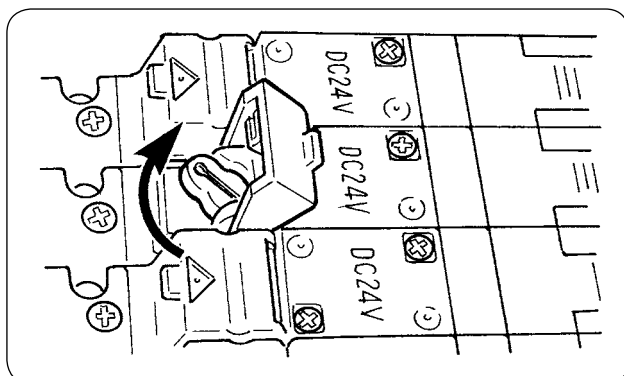
- ① Condensation
- ② BT
- ③ Thread trimming ON (Cylinder is pushed out.)
- ④ Thread trimming OFF (Cylinder is drawn.)
- ⑤ Thread clamp (Cylinder is pushed out.)
- ⑦ FL (Presser foot rises.)
- ⑧ FL (Presser foot lowers.)
- ⑨ DL (Cylinder is pushed out.)
- B(C) 2P



With regard to the switch of solenoid valve (Manual)



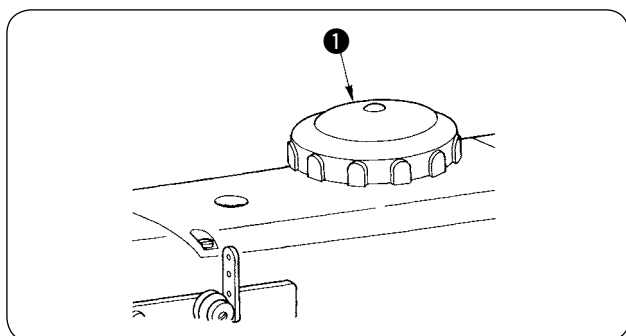
- 1) By pressing the switch (green) inside the cover, the solenoid valve can be actuated by hand.



- 2) By turning the switch in the direction of the arrow mark while pressing it, it is possible to lock. By turning the switch in the reverse direction of the arrow mark, it is possible to release the lock.

* When turning ON the power, confirm that all covers of the solenoid valve are closed. (Under the state that the manual switch is locked, the covers are not closed and it is possible to prevent the malfunction of the solenoid valve.)

26. ADJUSTING THE LIFTING AMOUNT OF THE PRESSER FOOT AND THE WALKING FOOT



The lifting amount of the presser foot and the walking foot is adjusted using dial ❶. Turn the dial clockwise to increase the lifting amount or counterclockwise to decrease it.

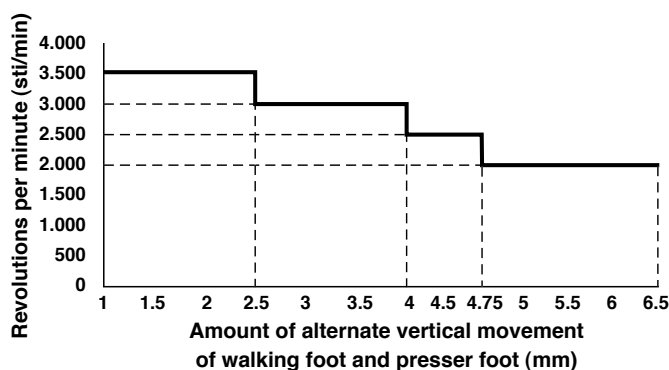
27. SEWING SPEED TABLE

The maximum sewing speed has been specified in accordance with sewing conditions as shown in the table below. Set the maximum sewing speed appropriately in accordance with the sewing conditions given taking care not to exceed the corresponding specified value.

(1) Max. sewing speed in accordance with the amount of the alternating vertical movement of the walking foot and the presser foot

1) When stitch length is 6 mm or less

2) When stitch length is more than 6 mm and 9 mm or less



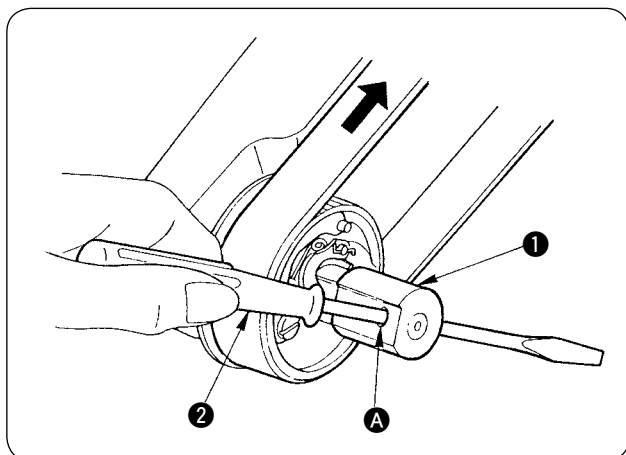
Amount of alternate vertical movement of walking foot and presser foot	Revolutions per minute
1 to 6.5 mm	2.000 sti/min

28. RESETTING THE SAFETY CLUTCH



WARNING :

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

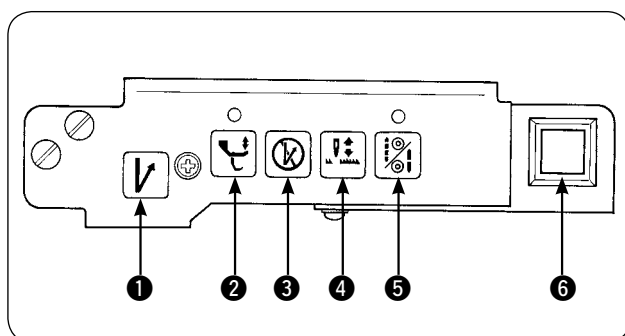


The safety clutch functions when an excessive load is applied to the hook or the other components during sewing.

While the safety clutch is functioning, the hook will never rotate even if turning the handwheel.

- 1) Reset the safety clutch with the sewing machine tilted.
- 2) Fit screwdriver (medium) ❷ supplied with the machine as an accessory in hole A in safety clutch bushing ❶.
- 3) Holding screwdriver ❷ by hand to prevent safety clutch bushing ❶ from rotating, turn the handwheel in the reverse direction of rotation.
- 4) The resetting procedure completes when the handwheel clicks.

29. OPERATION SWITCHES



① One-touch type reverse feed switch

- While the machine is in operation, the machine performs reverse feed stitching as long as this switch is held pressed, and resumes normal feed stitching when the switch is released.
- If this switch is pressed while the machine is at rest, the feed will be set to the reverse feed state. (The sewing machine does not run.) If it is released, the feed will return to the normal feed state.

② Alternating vertical movement amount change-over switch

If this switch is pressed the amount of the alternating vertical movement of the walking foot and the presser foot will be maximized. (Lamp above the switch lights up)

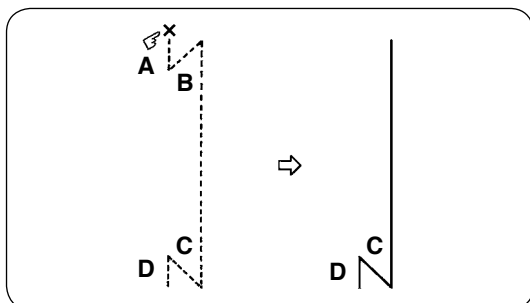
Use this switch when a multilayered portion of the sewing product is not smoothly fed.


When performing the alternating vertical movement amount change-over with the knee switch, fix the knee switch supplied with the machine on the table with wood screws and use it. For the wiring, refer to "INSTRUCTION MANUAL (SUPPLEMENT) for sewing machines for leather and heavy-weight materials".

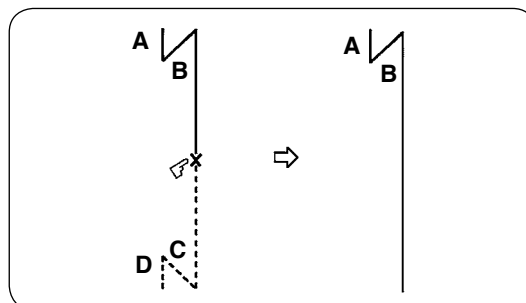
③ Automatic reverse feed stitching cancellation/addition switch


- If this switch is pressed when the following automatic reverse feed stitching has been specified, the reverse stitching will not take place (for once immediately after it is pressed). (Example 1)
- If this switch is pressed when no automatic reverse feed stitching has been specified, the reverse feed stitching will take place (once immediately after it is pressed). (Example 2)

(Example 1) In the case where both automatic reverse feed stitching for start and that for end have been specified :

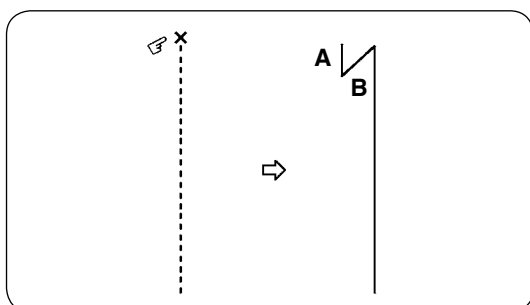



If the  switch is pressed before starting sewing, the automatic reverse feed stitching for start (between A and B) will not be carried out.

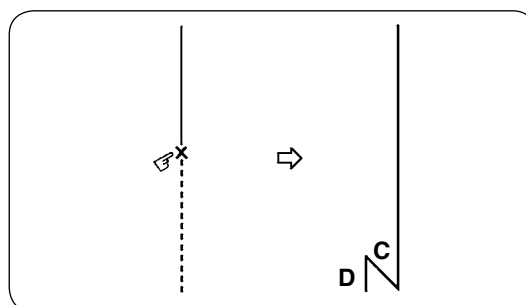



If the  switch is pressed during sewing, the automatic reverse feed stitching for end (between C and D) will not be carried out.

(Example 2) In the case where neither automatic reverse feed stitching for start nor that for end have been specified :



If the  switch is pressed before starting sewing, the automatic reverse feed stitching for start (between A and B) will be carried out.



If the  switch is pressed during sewing, the automatic reverse feed stitching for end (between C and D) will be carried out.

④ Needle lifting switch

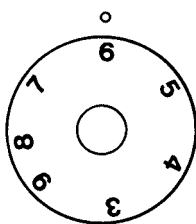
If this switch is pressed, the machine will travel from the needle-down stop position to the needle-up stop position.



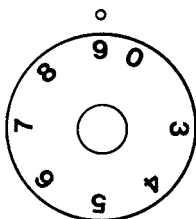
When raising the machine head which has been tilted, do not hold the operation switch to raise it.

Example

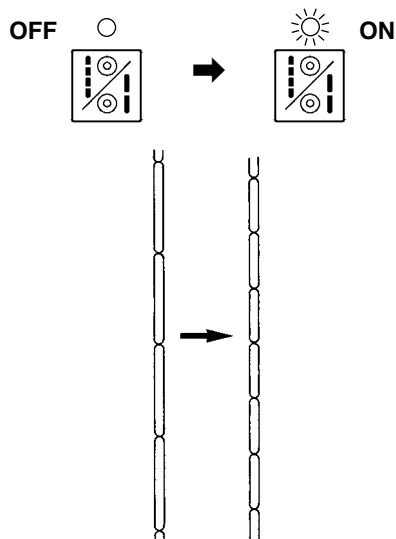
- 2P feed adjusting dial scale : 6



- Standard feed adjusting dial scale : 9



- If this switch is pressed, stitch length is changed over from 9 to 6.



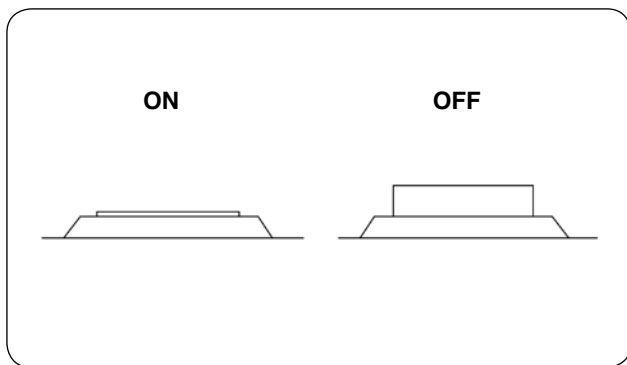
- If this switch is pressed again, stitch length returns from 6 to 9.

⑤ 2P switch

If this switch is pressed, the stitch length is changed over to that of the scale on the feed adjusting dial. (Lamp in the button is lit up.)



Be sure to make the number of 2P feed adjusting dial less than that of the standard feed adjusting dial.



6 Needle thread clamp switch

When the needle thread clamp switch is turned ON, the needle thread clamp motion is performed at the start of sewing, and when it is turned OFF, the needle thread clamp motion is not performed. However, the needle thread clamp device as well as the presser foot lifting motion does not function until the thread trimming is performed after turning ON the power.

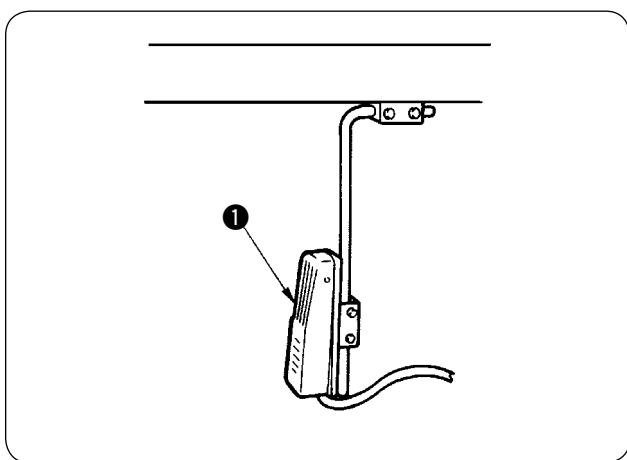
In addition, when the presser foot is lifted after thread trimming motion, the needle thread is clamped with the needle thread clamp device, but when the needle thread clamp switch is turned OFF, the needle thread is released.




Needle thread clamp switch can be set to effective or ineffective by setting of the motor.

For the details, refer to the Instruction Manual (Supplement).

30. KNEE SWITCH



If knee switch ❶ is pressed, the amount of the alternating vertical movement of the walking foot and the presser foot will be maximized. (Same with the performance carried out by pressing the alternating vertical movement amount change-over switch “” on the machine head.)



The knee switch can be used as the presser lifting switch by setting of the motor. (When the switch is used as the presser lifting switch, the function as the alternating vertical movement amount changeover switch is lost.)

For the details, refer to the Instruction Manual (Supplement).

31. CAUTIONS WITH REGARD TO THE SEWING OPERATION

1. Be sure to perform the sewing operation after confirming that the needle bar position (needle UP stop position/needle DOWN stop position) when the sewing machine stops is properly positioned. (For the setting of the designation of needle bar position, refer to the Instruction Manual (supplement).)
2. Perform a trial sewing and confirm the finished state of sewing since the state at the start of sewing is different from that at the end of sewing in accordance with the sewn product (material and thread).
3. When using the needle thread clamp device, use it together with the reverse feed stitching at the start of sewing.
4. Be sure to perform the thread trimming motion on the cloth.

32. TROUBLES IN SEWING AND CORRECTIVE MEASURES

Troubles	Causes	Corrective measures
<p>1. Thread breakage (Thread frays or is worn out.)</p> <p>(Needle thread trails 2 to 3 cm from the wrong side of the fabric.)</p>	<ol style="list-style-type: none"> ① Thread path, needle point, hook blade point or bobbin case resting groove on the throat plate has sharp edges or burrs. ② Needle thread tension is too high. ③ Bobbin case opening lever provides an excessive clearance at the bobbin case. ④ Needle comes in contact with the blade point of hook. ⑤ Amount of oil in the hook is too small. ⑥ Needle thread tension is too low. ⑦ Thread take-up spring works excessively or the stroke of the spring is too small. ⑧ Timing between the needle and the hook is excessively advanced or retarded. 	<ul style="list-style-type: none"> ○ Remove the sharp edges or burrs on the blade point of hook using a fine emery paper. Buff up the bobbin case resting groove on the throat plate. ○ Decrease the needle thread tension. ○ Decrease the clearance provided between the bobbin case opening lever and the bobbin. Refer to "24. ADJUSTING THE BOBBIN CASE OPENING LEVER." ○ Refer to "22. NEEDLE-TO-HOOK RELATION." ○ Adjust the amount of oil in the hook properly. See "15. ADJUSTING THE AMOUNT OF OIL IN THE HOOK." ○ Increase the needle thread tension. ○ Decrease the tension of the spring and increase the stroke of the spring. ○ Refer to "22. NEEDLE-TO-HOOK RELATION."
2. Stitch skipping	<ol style="list-style-type: none"> ① Timing between the needle and the hook is excessively advanced or retarded. ② Pressure of the presser foot is too low. ③ The clearance provided between the top end of the needle eyelet and the blade point of hook is not correct. ④ Hook needle guard is not functional. ⑤ Improper type of needle is used. 	<ul style="list-style-type: none"> ○ Refer to "22. NEEDLE-TO-HOOK RELATION." ○ Tighten the presser spring regulator. ○ Refer to "22. NEEDLE-TO-HOOK RELATION." ○ Refer to "23. ADJUSTING THE HOOK NEEDLE GUARD." ○ Replace the needle with one which is thicker than the current needle by one count.
3. Loose stitches	<ol style="list-style-type: none"> ① Bobbin thread does not pass through the tension spring of the inner hook. ② Thread path has been poorly finished. ③ Bobbin fails to move smoothly. ④ Bobbin case opening lever provides too much clearance at the bobbin. ⑤ Needle thread tension is too low. ⑥ Bobbin thread tension is too low. ⑦ Bobbin has been wound too tightly. ⑧ Thread is thick. ⑨ Thread supplying amount of thread take-up lever is excessively large. 	<ul style="list-style-type: none"> ○ Thread the bobbin thread correctly. ○ Remove rough parts with a fine emery paper or buff it up. ○ Replace the bobbin or hook with a new one. ○ Refer to "24. ADJUSTING THE BOBBIN CASE OPENING LEVER." ○ Increase the needle thread tension. ○ Increase the bobbin thread tension. ○ Decrease the tension applied to the bobbin winder. ○ Replace the feed dog with one for thick thread. ○ Remove the pre-tension of needle thread clamp device. ○ Increase the needle count. ○ Move the thread take-up thread guide to the right side to decrease the supplying amount by the thread take-up lever.

Troubles	Causes	Corrective measures
4. Thread slips off the needle eyelet simultaneously with thread trimming.	① Thread tension given by the tension controller No. 1 is too high.	○ Decrease the thread tension given by the tension controller No. 1.
5. Thread slips off the needle eyelet at the start of sewing.	① Thread tension given by the tension controller No. 1 is too high. ② Clamp spring has improper shape. ③ Bobbin thread tension is too low.	○ Decrease the thread tension given by the tension controller No. 1. ○ Replace the clamp spring with a new one or correct the current one. ○ Increase the bobbin thread tension.
6. Defective sharpness at the time of thread trimming.	① The blades of moving knife and counter knife have been improperly adjusted. ② The knives have blunt blades. ③ Needle thread tension is too low. ④ Bobbin thread tension is too low.	○ Refer to "25. ADJUSTING THE THREAD TRIMMING MECHANISM COMPONENTS" . ○ Replace the moving knife and counter knife with new ones, or correct the current ones. ○ Increase the needle thread tension. ○ Increase the bobbin thread tension.
7. Thread is not trimmed.	① Initial position of the moving knife has been improperly adjusted. ② Bobbin thread tension is too low. ③ Position of the thread guide is improper. ④ Torque at the time of cutting thick thread is insufficient.	○ Refer to "Adjusting the initial position of the knife" in the Engineer's Manual. ○ Increase the bobbin thread tension. ○ Refer to "25. (4) Thread guide installing position." ○ When using thick thread equivalent to #4 or #5, delay the UP stop position. Refer to "Function No. 112" of the Instruction Manual for SC-510. Refer to "Function No. 143" of the Instruction Manual for SC-922.
8. Thread breaks at the start of sewing after thread trimming.	① The needle thread is caught in the hook.	○ Shorten the length of thread remaining on the needle after thread trimming. Refer to "18. THREAD TENSION."
9. Stitch skipping occurs at the start of sewing after thread trimming.	① Bobbin thread is not clamped after thread trimming. ② Position of the thread guide is not proper. ③ Number of revolutions is too fast and needle thread cannot catch bobbin thread. ④ Bobbin thread tension is too low. ⑤ Length of needle thread remaining at the needle after thread trimming is too short.	○ Check again the installing position of clamp spring. ○ Refer to "25. (4) Thread guide installing position." ○ Increase the number of stitches of soft start at the setting of motor. Refer to "Instruction Manual for motor". ○ Increase the bobbin thread tension. ○ Decrease the pressure applied by the pretension disk of the thread clamping device or remove the pretension disk. When frictional thread is used, turn OFF the thread clamping device at the time of thread trimming. Refer to "Function No. 120" in the Instruction Manual for the SC-510. Refer to "Function No. 157" of the Instruction Manual for SC-922.