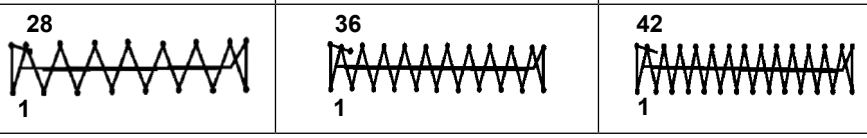
ENGLISH

MOL-254N
INSTRUCTION MANUAL

CONTENTS

I. SPECIFICATIONS

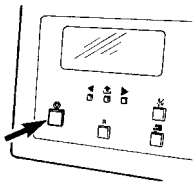
1. Machine head specifications

1	Max. sewing speed	2,500sti/min (sewing pitch : 3.4 mm or less)
2	Hook	Horizontal semi-rotary hook (oil wick lubrication)
3	Bobbin	1.8 fold hook
4	Thread take-up	Link-type thread take-up lever
5	Needle	DP×17 #19 to #21 For domestic : DP×17 #19 For export : DP×17 #21
6	Range of thread specification	Cotton thread #30 to #50, spun thread #30 to #50
7	Number of stitches	Panel selection method from among 28 stitches, 36 stitches and 42 stitches (28 stitches at the time of delivery) (Max. 64 stitches when external ROM is used.)
8	Replacement of number of stitches	Panel selection method
9	Number of bartacking patterns stored in memory	Standard number of patterns : 9 patterns (Max. 99 patterns when external ROM is used.)
10	Needle bar stroke	45.7 mm
11	Stitch adjustment method	Panel input method
12	Bartacking width	1.0mm to 3.0 mm (2.3 mm at the time of delivery)
13	Bartacking length	7.0mm to 22.0 mm (10.0 mm at the time of delivery)
14	Needle entry	28 stitches / 36 stitches / 42 stitches 
15	Thread trimming method	By the thread trimmer cam - Knife type (Near side: Driven by an air cylinder Far side: Driven by a solenoid valve)
16	Lift of cloth presser foot	24mm (from top surface of cloth presser lower plate to bottom surface of cloth presser)
17	Cloth feed method	Intermittent feed (2-shaft drive by stepping motor)
18	Sewing machine drive method	DD • AC servomotor (550W) mounted onto machine head
19	Thread presser drive method	Air cylinder drive
20	Cloth presser drive method	Air cylinder drive
21	Wiper drive method	Air cylinder drive
22	Sewing machine lubrication method	Manual oiling (centralized oil-wick lubrication)
23	Lubricating oil	New Defrix Oil No. 2
24	Center distance of needle adjustment method	Needle portion : manual moving method Hook portion : stepping motor drive moving method (in 0.01 mm steps)
25	Length of center distance of bartacking	43.0mm to 70.0mm (57.15mm (2 and 1/4") at the time of delivery)
26	Loop width	9mm to 20mm (12mm at the time of delivery)
27	Allowance of loop folding	8mm to 11mm (excluding cross cut section)
28	Allowance of loop presser	3mm to 4mm
29	Loop cut method	Selection of cross cut and straight cut (Cross cut at the time of delivery)

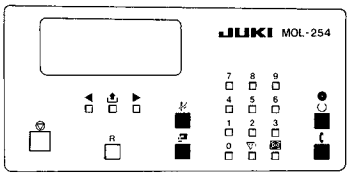
30	Loop cut	Cutting method by engaging moving knife with counter knife
31	Loop bending	Fork rotating and bending type
32	Loop supply drive method	Front and rear assisted drive method (stepping motor)
33	Loop length setting	Automatic recognition method
34	Loop splice detection	Potentiometer automatic splice detection method
35	Bobbin thread winder device	Interlocked with the main shaft (electric bobbin thread winder is an optional part)
36	Temporary stop function	Possible to stop the machine during sewing
37	Bobbin thread counter	Selection method of UP/DOWN counter (Front and rear hooks can be separately set. Device automatically stops at COUNT UP.)
38	Fork drive method	AC servomotor
39	Loosing loop mechanism	Set on the panel and by the stopper mechanism (manual)
40	Belt loop detection	Optional
41	Pull-out of the belt loop	Optional
42	Needle thread breakage detector	Optional
43	Needle cooler	Optional
44	Air gun	Optional
45	Table height	Manual up/down system 890mm to 1200mm (from floor level to top surface of throat plate) 920mm ～ 1250mm (from floor level to top surface of throat plate) (Handle-type lifting table)
46	Dimensions	Width : 1200mm Length : 900mm Height : 1380mm (excluding thread stand) (When the machine is lowered to its lowest position) Handle-type lifting table Width : 1200mm Length : 800mm Height : 1350mm (excluding thread stand) (When the machine is lowered to its lowest position)
47	Weight	200Kg 230Kg (Handle-type lifting table)
48	Power consumption	500VA
49	Operating temperature range	5 °C to 35 °C
50	Operating humidity range	35% to 80% (no dew condensation)
51	Line voltage	AC200V, 220V, 230V, 240V, ±10% (Power frequency : 50/60 Hz)
52	Air pressure used	0.5MPa
53	Air consumption	52ℓ/min. (Nℓ/ min) (Splice processing : 1 cycle/min, excluding optional)
54	Noise	- Equivalent continuous emission sound pressure level (L_{pA}) at the workstation : A-weighted value of 80.5 dB; (Includes K_{pA} = 2.5 dB); according to ISO 10821-C.6.3 -ISO 11204 GR2 at 2,500 sti/min for the sewing cycle, 1.2s ON (Pattern : No.1, 28 Stitches, Max Speed). - Sound power level (L_{WA}) ; A-weighted value of 90.5 dB; (Includes K_{WA} = 2.5 dB); according to ISO 10821-C.6.3 -ISO 3744 GR2 at 2,500 sti/min for the sewing cycle, 1.2s ON (Pattern : No.1, 28 Stitches, Max Speed).

II. NAMES AND FUNCTIONS OF COMPONENTS

Temporary stop switch
The switch is used to temporarily stop the machine operation.



Operation box panel <P.17 >
The panel is used to specify/display/actuate functions.

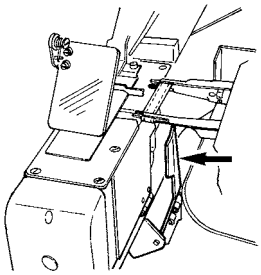


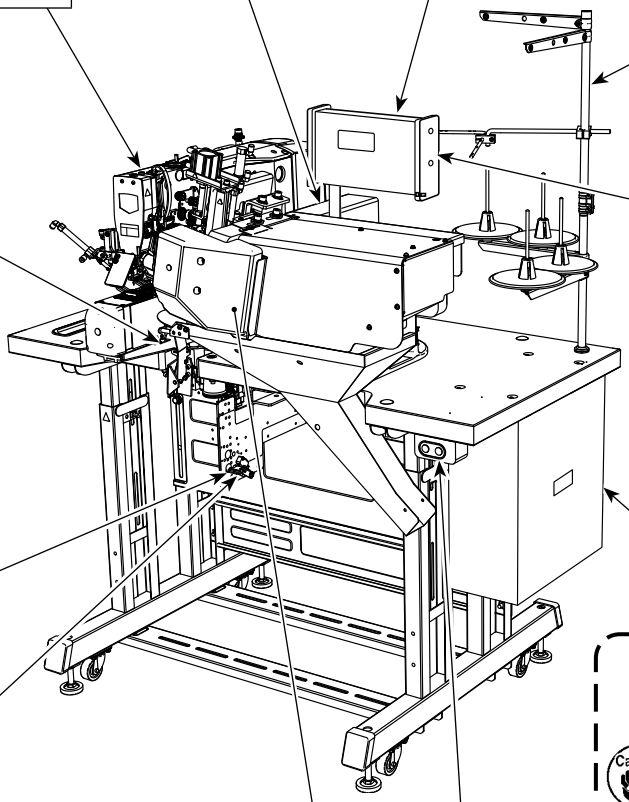
Sewing machine head
The machine head performs sewing while making the motor drive the needles.

Clamp feed device
The device is used to assist in loop feeding.

Thread stand
The stand is used to set needle thread and the thread to be supplied to the bobbin winder.

Start switch
Start switch used for starting up the sewing.





DIP switches

Used to select functions.
(Operated by removing the cover on the right side of the panel.)

Belt loop detector
It detects whether or not the belt loop is normally fed. (Optional)

Control box
Controls the whole machine.

Belt-loop pull-out device
It lowers the tension applied to the belt loop to stabilize the supply of the belt loop.
It also detects that the belt loop is fed normally. (Optional)

Loop supplying device
Performs a series of loop supplying procedure.

Caution

The <P.17 > appearing in the text above indicates that a detailed explanation for the relevant component is given on page(s) 17.

Power switch

For single phase(For general export)
ON : Press the green button.
OFF : Press the red button.

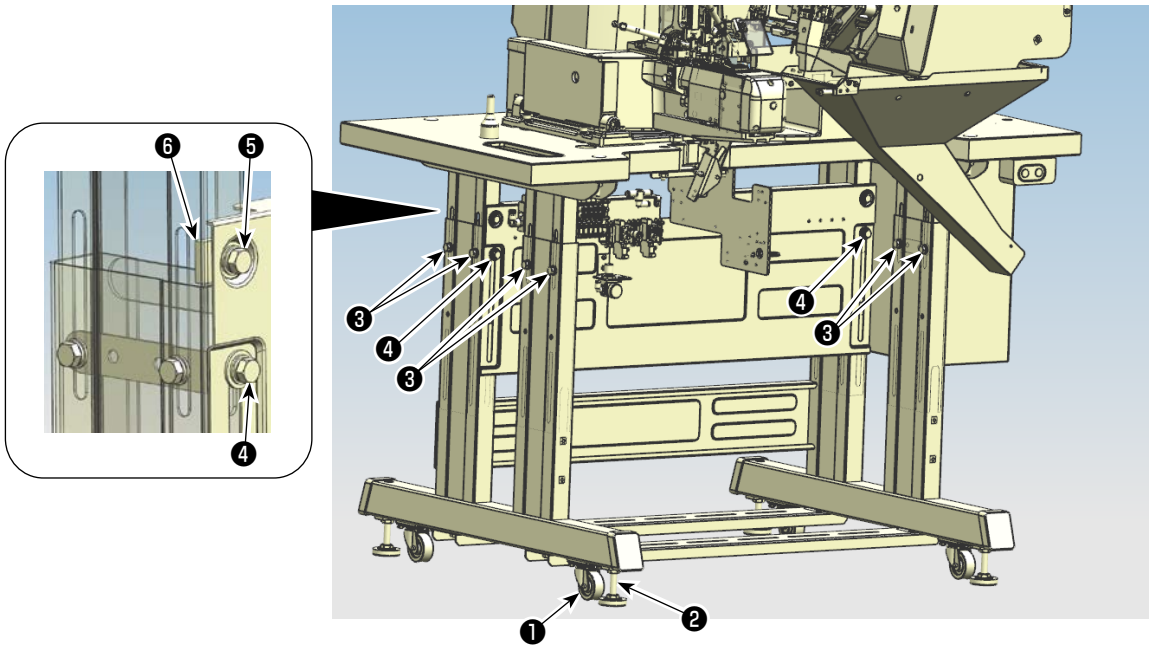
For 3-phase
ON : Press the black button.
OFF : Press the red button.

III. INSTALLATION

1. Fixing the table stand

WARNING

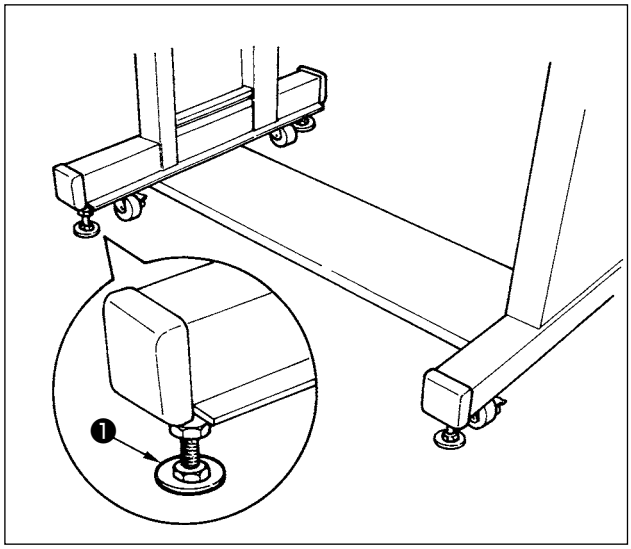
1. **To prevent an accident resulting in injury or death, move the machine first to a horizontal and stable place. Then, lower adjuster bolts ❷ (at four locations) located at the side of casters ❶ to secure the machine.**
2. **If you want to increase the height of the table stand, loosen fixing bolts ❸ and ❹ of the table stand and adjust the table stand height.**
   If you want to lower the table stand, remove fixing bolt ❺ and nut ❻ , loosen fixing bolts ❸ and ❹ and adjust the table stand height. (Keep ❺ and ❻ so that they are not lost.)
   After you have adjusted the table stand height, make sure that the top surface of the table is level.
   If the fixing bolts are left loosened, there will be a risk of sudden falling of the table stand.
   Be sure to carry out the work very carefully with four or more workers.



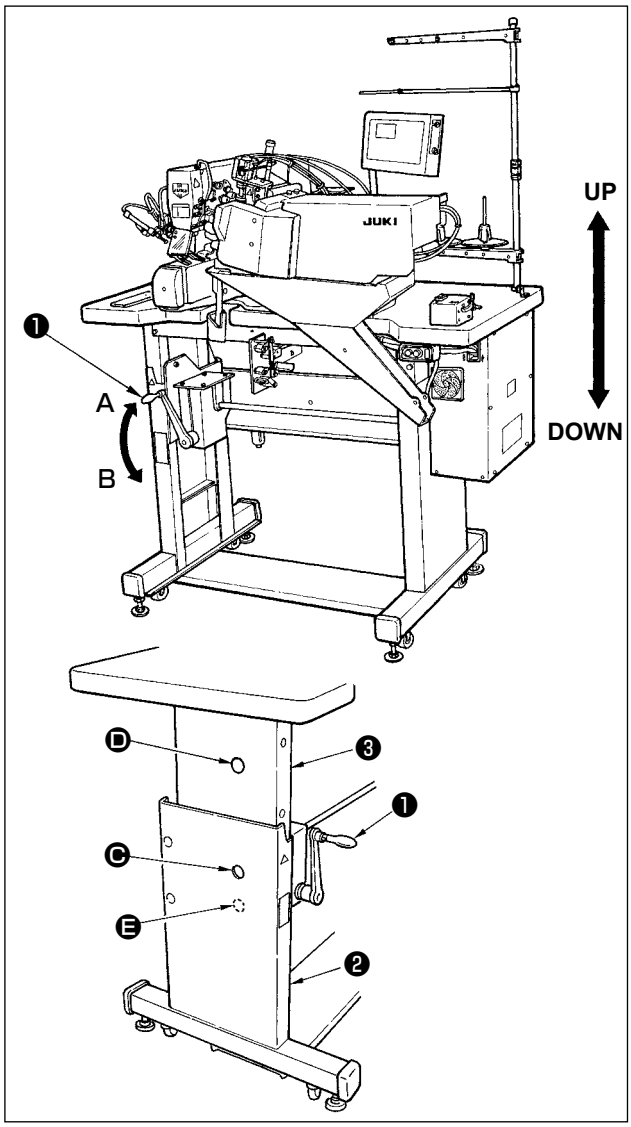
2. Securing the table stand when using the handle-type lifting table

WARNING

To prevent an accident resulting in injury or death, move the machine first to a horizontal and stable place. Then, lower adjuster bolts ❶ (at four locations) to secure the table stand.



3. Adjusting the height of the sewing machine table when using the handle-type lifting table

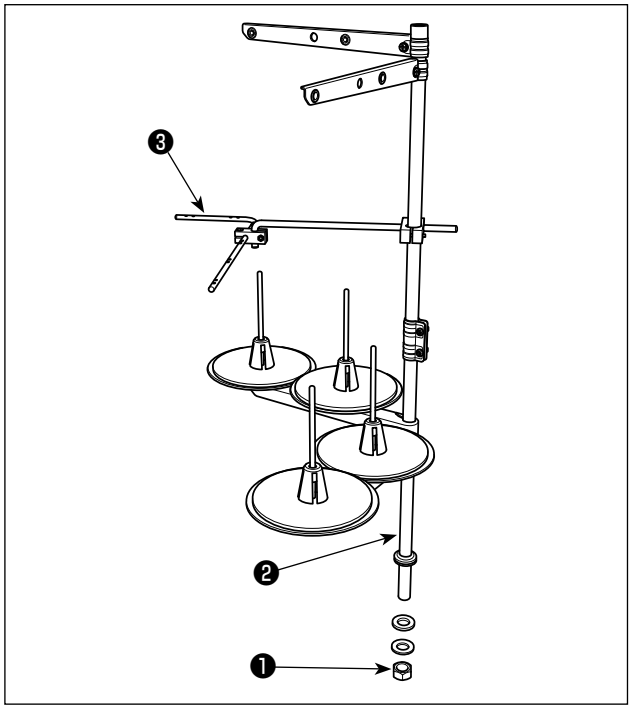


1) Turn table up/down handle ❶ as shown on the seal located on the left side of the handle. Turn it clockwise in the direction **A** to go up and counterclockwise in the direction **B** to go down.

The height of the table is set in the lowest position at the time of delivery. Be sure, at first, to make the table go up. Be careful that you do not turn the handle further from the lowest position or highest position of the table.

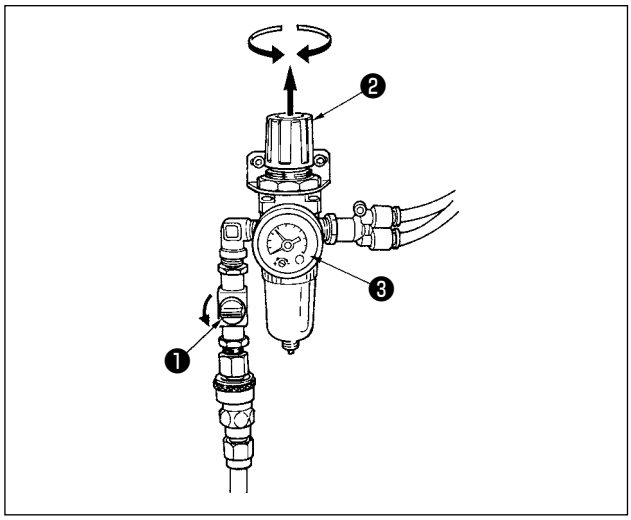
2) The lowest position of the table is the position where hole Ⓒ of the lower stand ❷ is aligned with hole Ⓓ of the upper stand ❸ . The highest position is the position where hole Ⓒ of the lower stand is aligned with hole Ⓔ of the upper stand ❸ .

4. Installing the thread stand



1) Assemble the thread stand and set it in the hole located in the upper right of the machine table.
2) Tighten locknut ❶ to fix the thread stand.
3) Attach the thread guide arm (asm.) ❸ to the thread stand.
4) When ceiling wiring is possible,pass the power cord through spool rest rod ❷ .

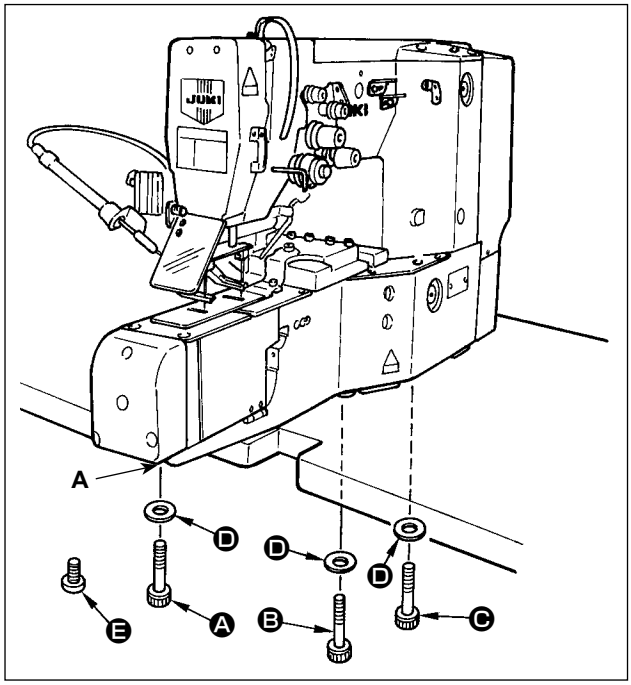
5. Air adjustment



Open air cock ❶ , pull up and turn air regulator knob ❷ , and adjust so that air pressure gauge ❸ indicates 0.5 MPa. Then push down the knob to fix it.

* When closing air cock ❶ , air comes out.

6. Removing the head fixing bolt

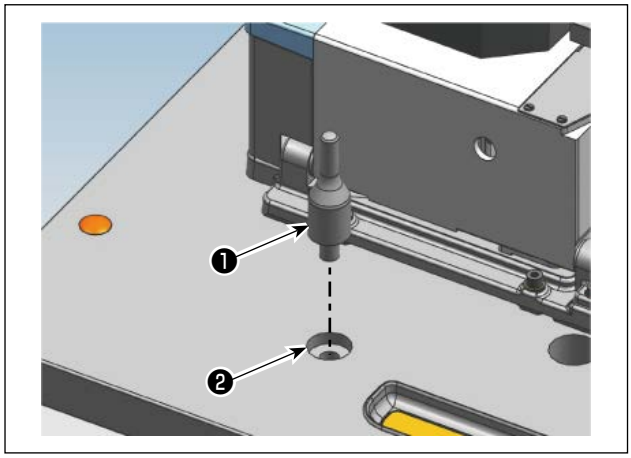


Remove the transport fixing bolts, Ⓐ, Ⓑ and Ⓒ,and washer Ⓓ.

It is recommended that you should keep the transport bolts with care.

For portion **A**, tighten screw Ⓔ (Part No. SS5680740SP) supplied with the machine as accessory after removing the fixing bolt. (To prevent oil leakage)

7. Installing the head support rod



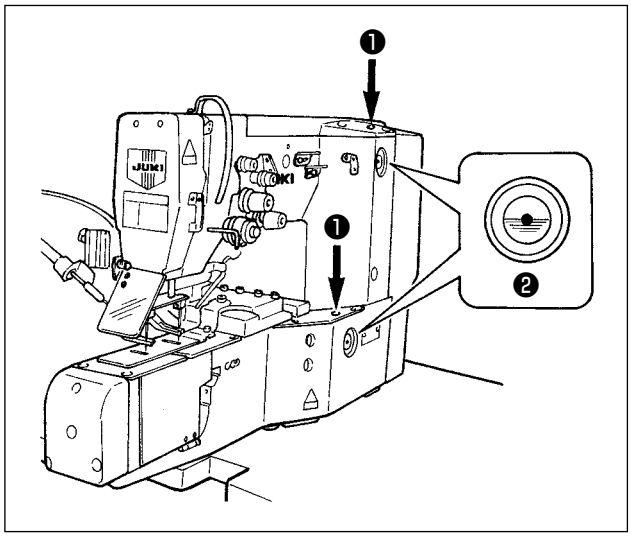
Insert the included head support rod ❶ into the table ❷ hole.

IV. PREPARATION

1. Lubrication

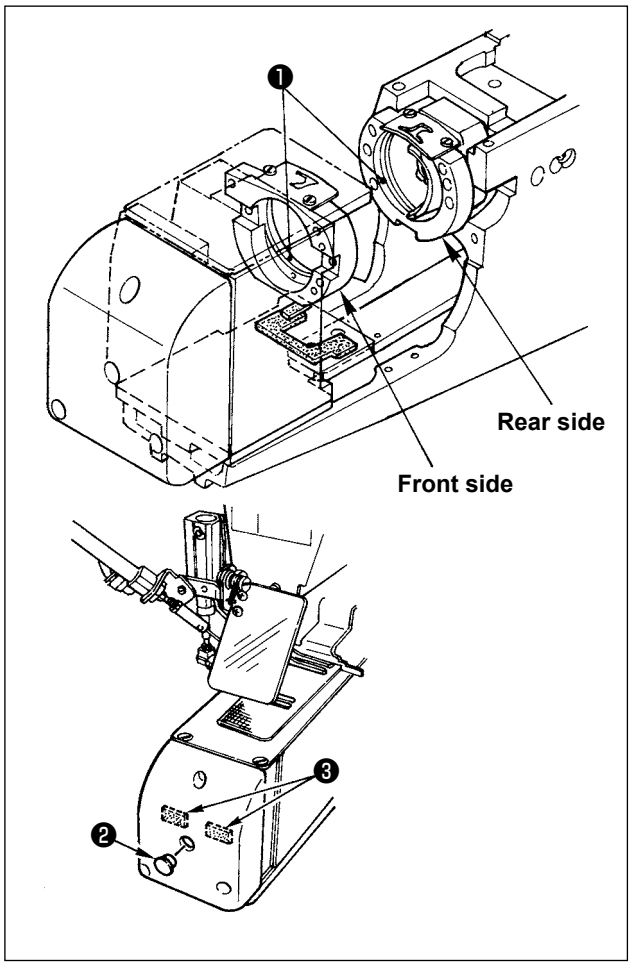
WARNING
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

(1) Machine head



Apply oil from oil lubricating inlet ❶ (2 places) to the red mark in the center of oil gauge ❷ once a day.

(2) Hook race surface



Rear side

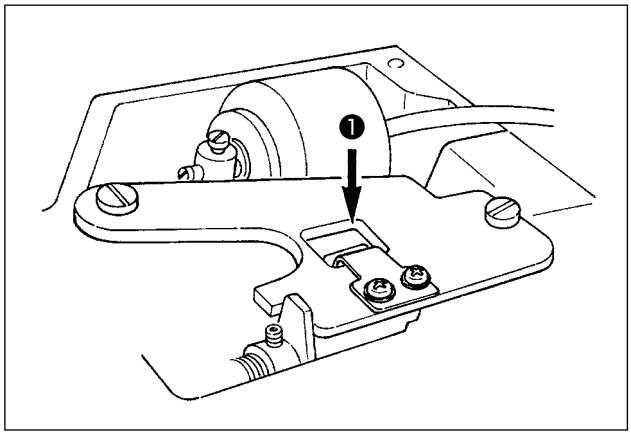
1) Apply a drop of oil to hook race surface ❶ to such an extent that the race surface is blurred with oil.

Front side

2) Apply a drop of oil to the hook race surface ❶ . Remove rubber plug ❷ and apply oil to hook base felt ❸ .

Be sure to apply oil when operating the sewing machine again after an extended period of disuse.

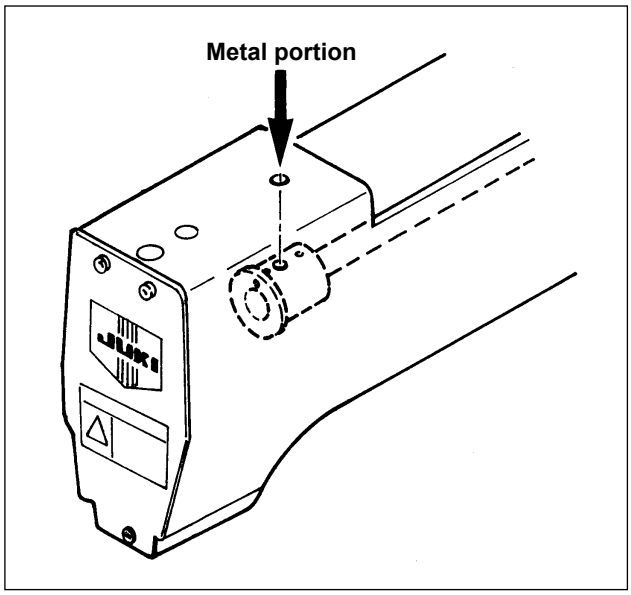
(3) Crank rod lubricating plate



Remove the arm cover and apply oil to the crank rod lubricating plate ❶ .

Be sure to apply oil when operating the sewing machine again after an extended period of disuse.

(4) Main shaft front bushing portion



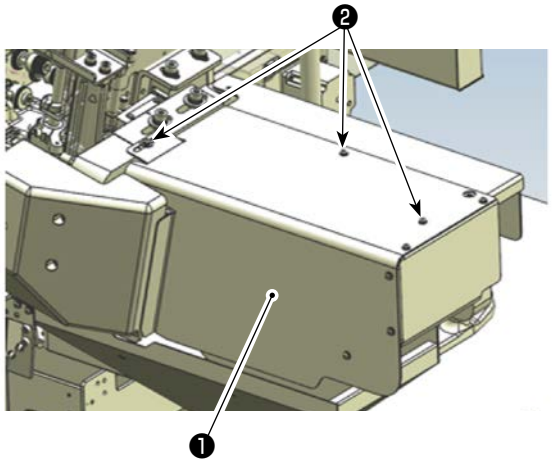
Apply oil to the main shaft front bushing portion.

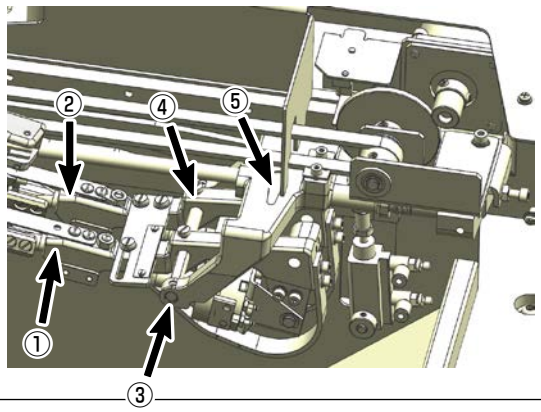
Be sure to apply oil when operating the sewing machine again after an extended period of disuse.

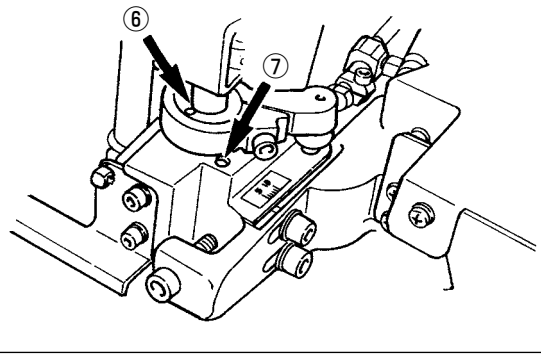
(5) Loop supplying device

WARNING

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







Lubrication method

Loosen cover setscrew ❷ and remove cover ❶ , and apply oil to all the lubricating locations painted in yellow (marked with a thick arrow).

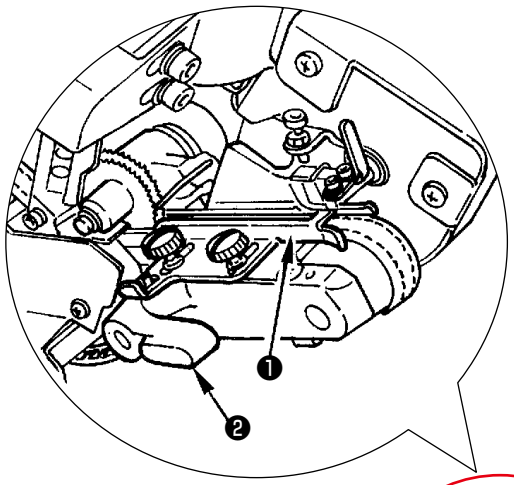
- ○ Front ① and rear ② of the fork folding shaft
- ○ Front ③ and rear ④ of receiving portion of the fork folding shaft connecting shaft
- ○ Slider portion ⑤
- ○ Top ⑥ and bottom ⑦ of loop cut portion

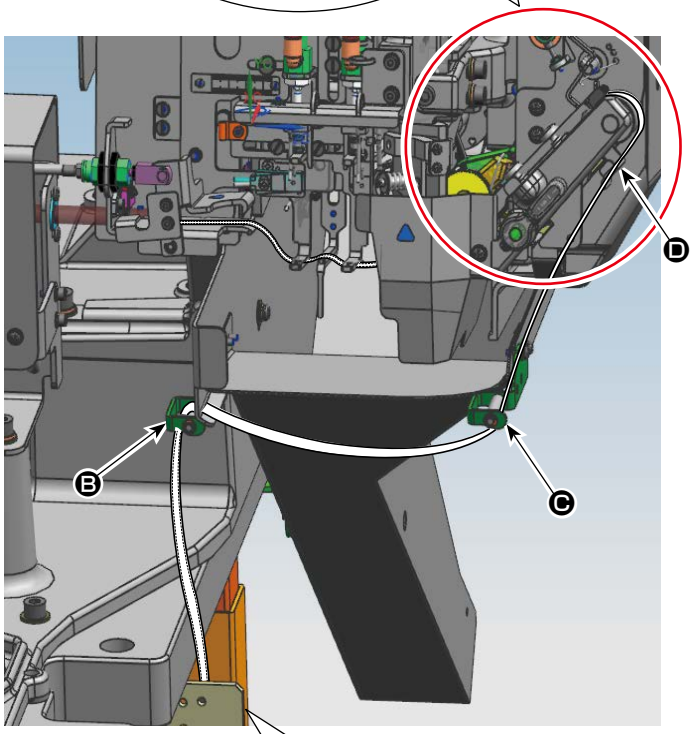
The oiling has to be carried out once a day.

2. Passing a belt loop

WARNING

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





1) Pass a belt through belt loop guides Ⓑ, Ⓒ, and Ⓓ in the written order.
2) Pass the belt loop through adjust binder ❶ .
3) Press down feeding roller ❷ by hand and insert the loop under the roller.

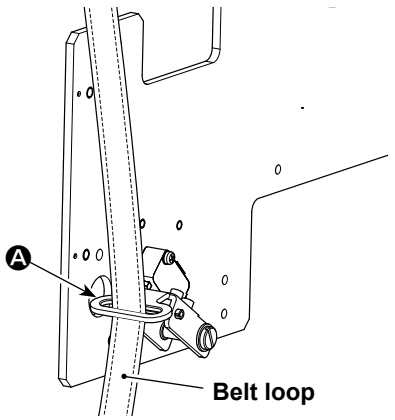
Caution

- **Refer to "VII-4. Adjusting the belt loop splice detector" P.41 for adjusting the belt loop splice.**
- **Refer to "VII-2. Adjusting the width of belt loops" P.38 for adjusting the width of belt loop.**

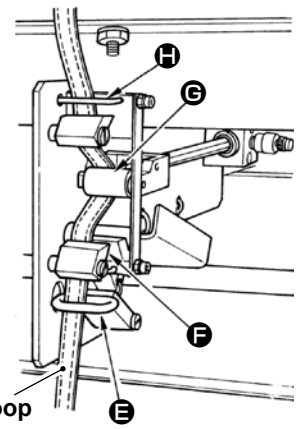
★ If your sewing machine is equipped with the optional belt loop detector, pass the belt through Ⓑ after passing it through Ⓐ.

★ If your sewing machine is equipped with the optional belt-loop pull-out device, pass the belt through Ⓔ, Ⓕ, Ⓖ and Ⓗ respectively.

Belt loop detector

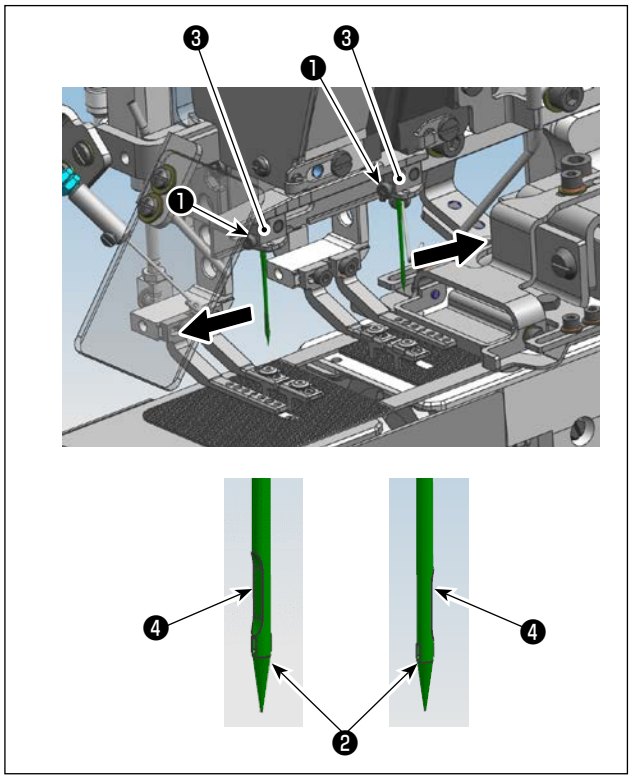


Belt-loop pull-out device



3. Attaching the needle

WARNING
Turn the power switch OFF before starting the work.



1) Loosen setscrews ❶ .
2) Insert needles ❷ fully into the hole in needle fitting base ❸ until the end of hole is reached. At this time, set scarf ❹ of needle ❷ on front side to the front side and that of the needle on the rear side to the rear side (refer to left illustration).
3) Tighten setscrews ❶ .

If burr or return should occur at the needle tip, replace the needle since it will cause thread breakage or needle breakage although it depends greatly on the application conditions.
Be sure to check the needle before starting the work.

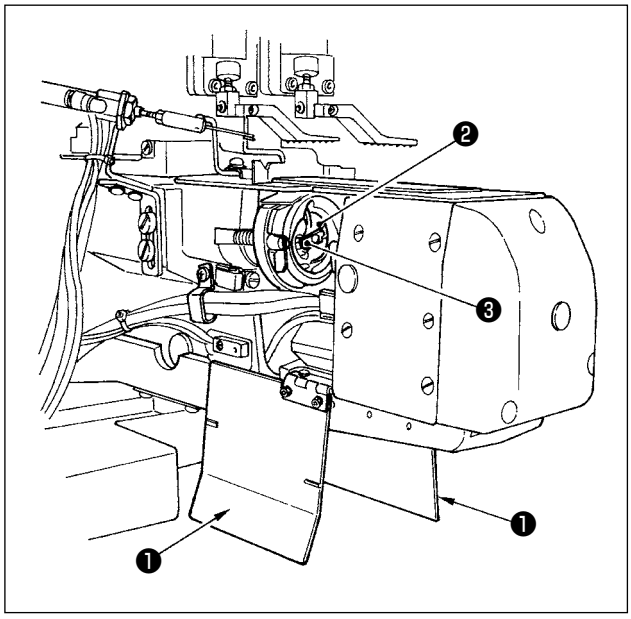
Use a suitable count for sewing since it varies in accordance with sewing conditions.
1. Needle ····· DP×17 #19 to 21(export standard : DP×17 #21)(domestic standard : DP×17 #19)
2. Thread ····· Cotton thread : #30 to 50
Spun thread : #30 to 50

When using needle or thread other than the aforementioned needle or thread, gradually increase the speed after performing confirmation of sewing state at a low speed rotation of the sewing machine. Otherwise, needle breakage may occur.

4. Setting the bobbin case

WARNING

Turn the power switch OFF before starting the work.
The hook base on this side moves when the power switch is turned ON.
So, be careful not to allow your hand or the like to be caught in the hook base.

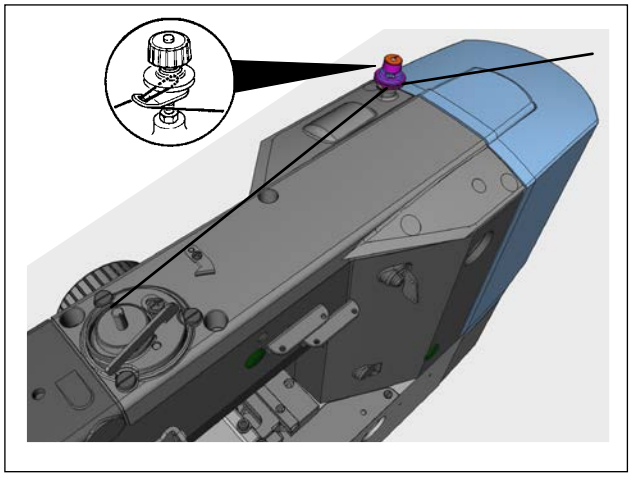


1) Press the bobbin replacement switch on the panel and widen the center-to-center distance between the hooks.
2) Turn OFF the power switch.
3) Open hook base cover ❶ (Both right and left sides)
4) Raise latch ❸ of bobbin case ❷ and take out the bobbin case. Hold latch ❸ and the bobbin does not fall.
5) When setting, insert the bobbin case fully into the hook shaft, close latch ❸ , and close hook base cover ❶ .
6) Perform the same procedure for front side and rear side.
7) Turn ON the power switch.

Caution

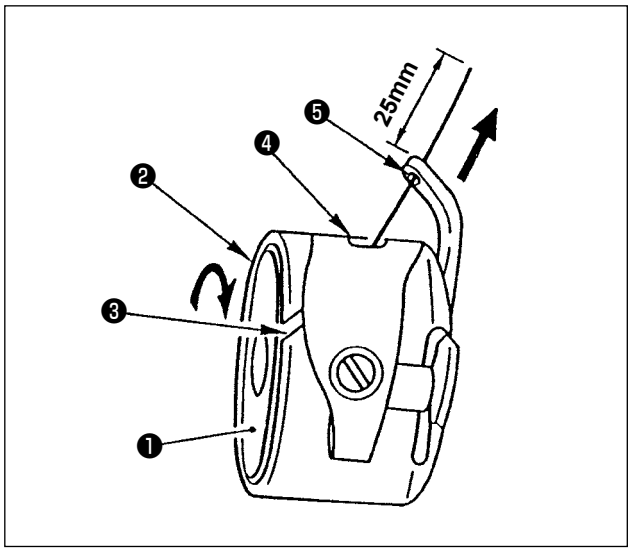
1. The sewing machine does not start even when the start switch of the sewing machine is pressed with hook base cover ❶ opened.
2. If the insertion of bobbin case ❷ is insufficient, it will fall away from the hook shaft during sewing.

5. Winding the bobbin thread



Thread the bobbin winder and wind the bobbin thread onto the bobbin as illustrated in the figure.

6. Setting the bobbin into the bobbin case



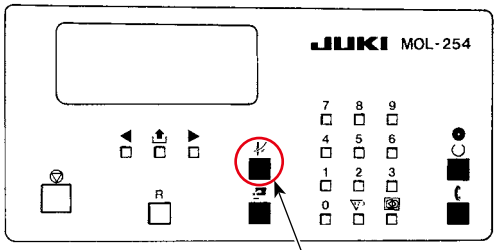
1) Hold bobbin ❶ so that thread is “left twist” (Z-twist), and set the bobbin into bobbin case ❷.
2) Pass the thread through thread slit ❸ in bobbin case ❷ , and continue pulling the thread. By so doing, the thread will pass under the thread tension spring and come out from notch ❹ . At this time, adjust so that bobbin ❶ rotates in the direction of arrow when the thread is pulled.
3) Pass thread through thread hole ❺ in the hook portion and draw out the thread by 25 mm from thread hole ❺ .

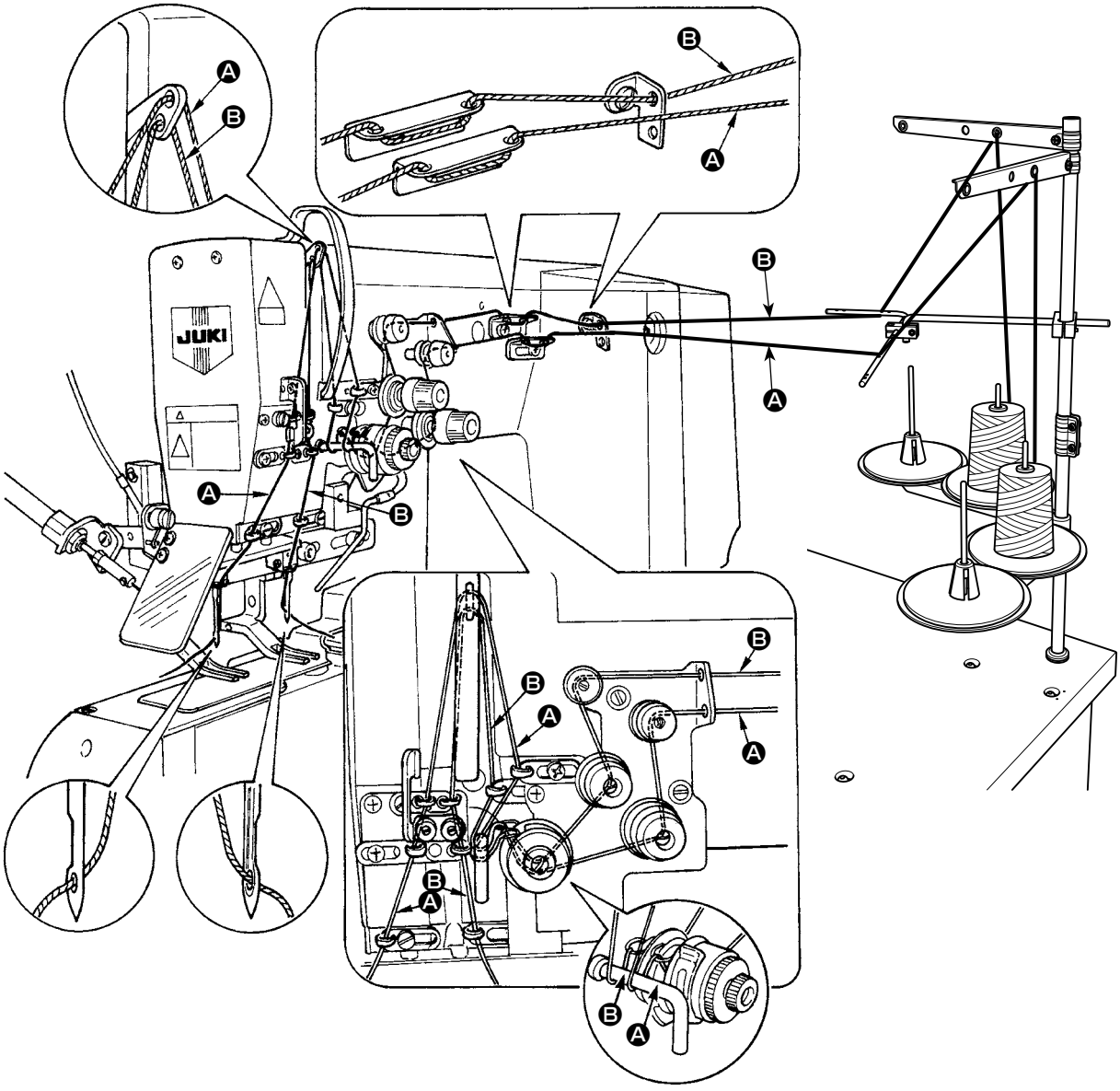
7. Threading the machine head

WARNING

When threading the machine head, lower the cloth presser foot by pressing "Threading" switch on the operation box or turn OFF the power switch.

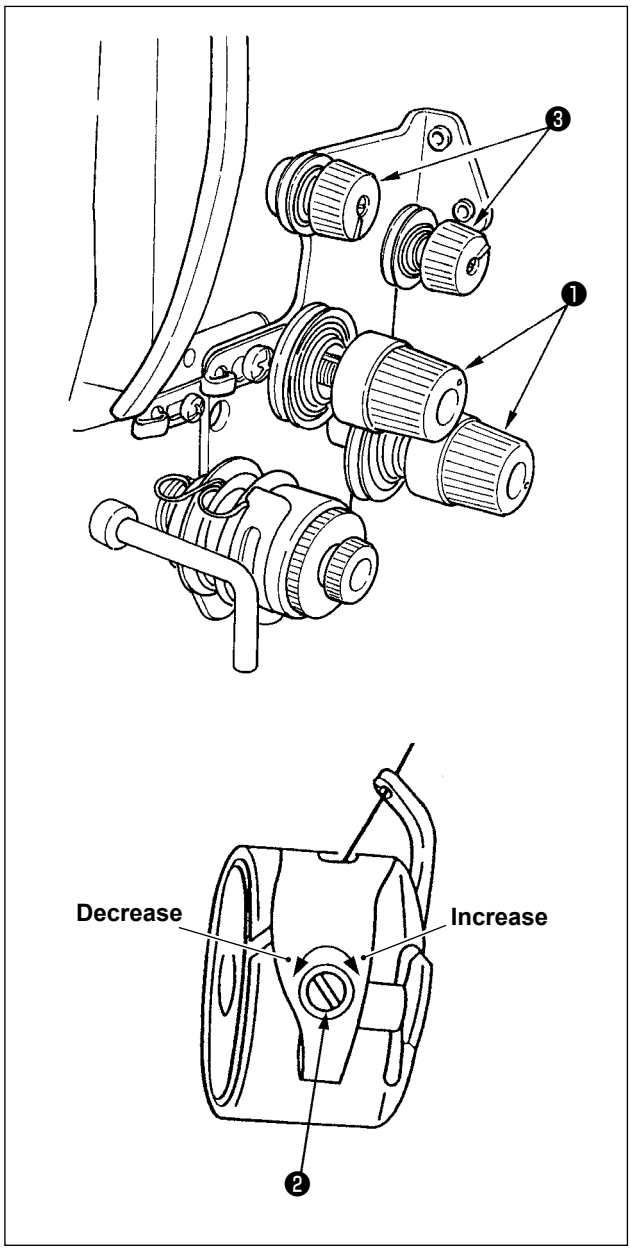
Power switch





Thread the machine head as shown in the illustration given above.

8. Adjusting the thread tension



(1) Adjusting the needle thread tension

As you turn thread tension No. 2 knob ❶ clockwise, the needle thread tension will be increased, and as you turn it counterclockwise, the needle thread tension will be decreased.

(2) Adjusting the bobbin thread tension

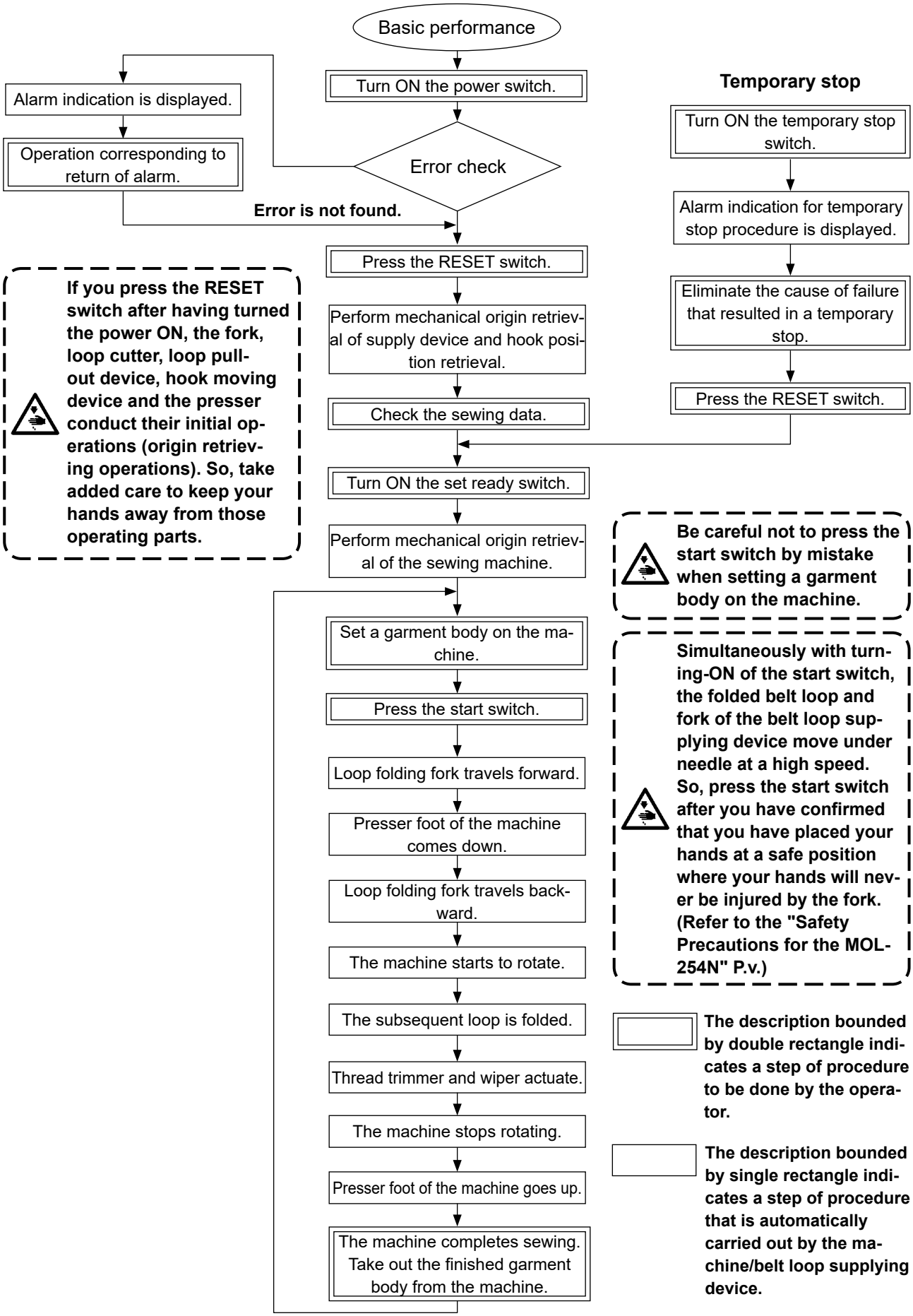
As you turn tension adjust screw ❷ attached to the bobbin case clockwise, the bobbin thread tension will be increased, and as you turn it counterclockwise, the bobbin thread tension will be decreased.

(3) Adjusting the thread remaining length

As you turn thread tension No. 1 knob ❸ clockwise, the thread remaining length on the needle after thread trimming will be shorter, and as you turn it counterclockwise, the thread length will be longer. (Shorten the thread length to such an extent that the thread does not slip out of the needle.)

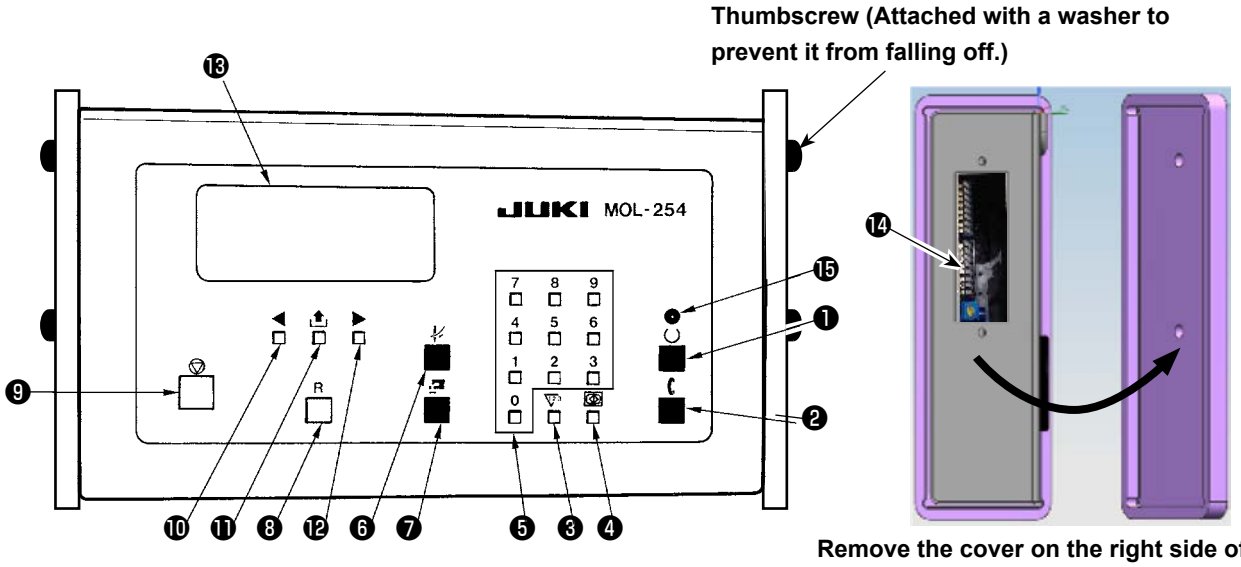
V. Basic operation flow chart

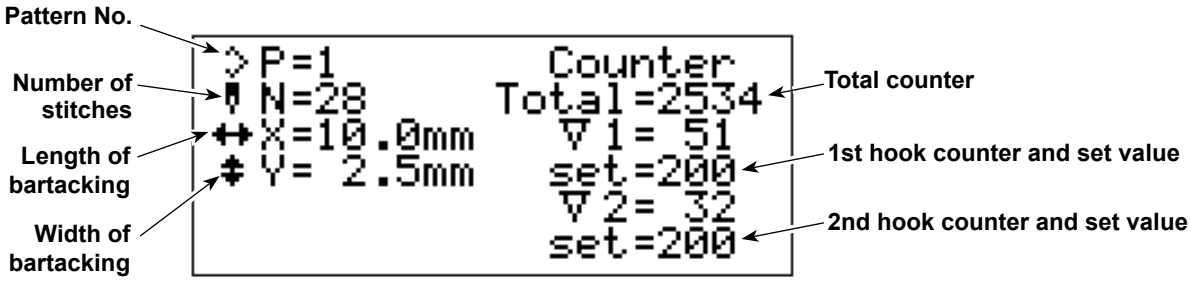
1. Basic performance



VI. Operation

1. Names and functions of operation box panel



Name of switch	Function
❶ Set ready switch	When this switch is pressed, the sewing machine enters the sewing stand-by state, and the display screen changes over to the sewing screen. Sewing ready lamp (green) lights up in the sewing stand-by state. When pressing the set ready switch again, the lamp goes out and the setting screen appears. **(Caution) A hazardous state arises when this switch is turned ON, since the belt loop supplying device operates at a high speed. Keep your hands or any other part of your body away from the area of loop supplying device drive and under the presser foot of the machine.**
	
❷ Set-back switch	a. This switch is used to re-set a belt loop at the stand-by position. **(Caution) 1. A hazardous state arises when this switch is turned ON, since the belt loop supplying device operates at a high speed. Keep your hands or any other part of your body away from the area of the belt loop supplying device drive and under the presser foot of the machine.** **2. When fullness is set, if you turn on this switch while the belt loop is held in the fork, the belt loop may be supplied twice, so turn off the power switch, remove the belt loop, and then turn on the power switch again.** b. When selecting step operation, this switch acts as the step-feed switch.

Name of switch	Function
❸ Counter key 	This key is used to enter the counter setting screen. (Refer to **"VI-2. Explanation of the counter" P.20**.)
❹ Standard screen key 	a. This key is used to enter the setting screen. b. When changing the sewing data, keep pressing this key for 10 seconds to release data-lock, In addition, data is locked when keeping pressing this key again. c. Pressing the standard screen key, press the ten key [3], and the belt loop is put in the state of being removed. (Refer to **"VII-16. Belt loop retaining release function" P.51**.)
❺ Ten key	These keys are used when inputting various numeric data.
❻ Needle threading switch 	Presser foot of the machine comes down and the threading is facilitated. **(Caution) A hazardous state arises when this switch is turned ON, since the belt loop supplying device operates at a high speed. Keep your hands or any other part of your body away from the area of the belt loop supplying device drive and under the presser foot of the machine.**
❼ Bobbin replacement switch 	This switch is used when replacing bobbin. Center-to-center distance between 1st hook and 2nd hook can be widened to the maximum. **(Caution) A hazardous state arises when this switch is turned ON, since the belt loop supplying device operates at a high speed. Keep your hands or any other part of your body away from the area of the belt loop supplying device drive and under the presser foot of the machine.**
❽ Reset switch 	Screen returns from the alarm display screen or the like to the standard screen. The following functions are performed. 1. When the RESET switch is pressed after the power is turned on, the sewing machine belt loop supplying device carries out origin retrieval and the display screen changes over to the setting screen. 2. Release of the alarm (When the alarm screen is displayed.) 3. Reset of the sewing counter (When the counter screen is displayed.) (When the count up screen is displayed.) 4. Reset of the total counter (When the counter screen is displayed.) 5. End of the check program  Display screen immediately after the power to the machine is turned ON **(Caution) A hazardous state arises when you press this switch after having turned the power ON, since the belt loop supplying device operates at a high speed. Keep your hands or any other part of your body away from the operating area of loop supplying device and under the presser foot of the sewing machine.**
❾ Temporary stop switch 	This switch is used to temporarily stop the operation or stop the operation. **(Caution) Re-start cannot be performed when the temporary stop switch is operated during the operation.**

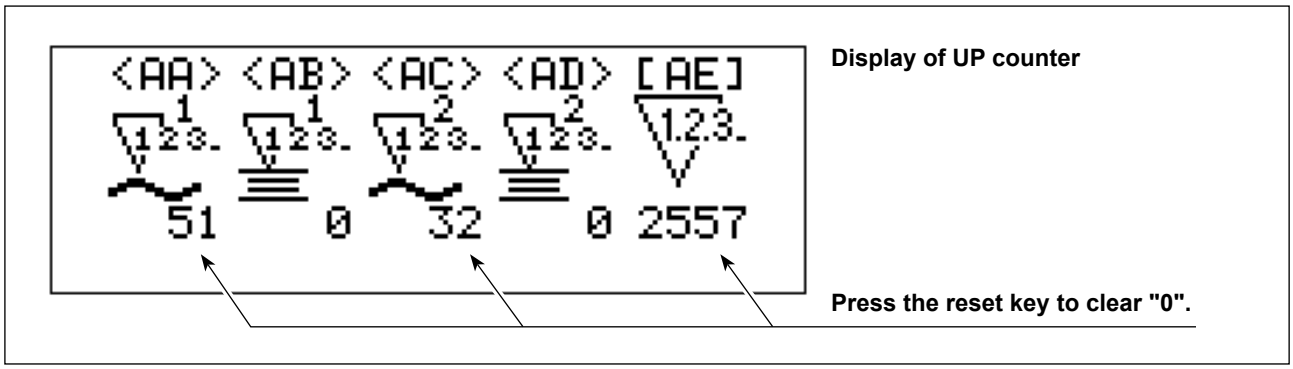
Name of switch	Function
⓾ Left cursor key 	a. This key scrolls setting item to the left when displaying setting screen or the like. b. This key performs presser foot jump feed operation (traveling backward) when displaying the sewing screen. (Refer to **"VI-3. Confirmation of needle entry point" P.21**.)
⓫ Screen change-over key 	This key selects setting item.
⓬ Right cursor key 	a. This key scrolls setting item to the right when displaying setting screen or the like. b. This key performs presser foot jump feed operation (traveling forward) when displaying the sewing screen. (Refer to **"VI-3. Confirmation of needle entry point" P.21**.)
⓭ Display screen	This screen performs various displays.
⓮ DIP switches	These switches change over various settings. (Refer to **"VI-6. Setting of DIP switches" P.31**.)
⓯ Set ready LED switch	Green color

2. Explanation of the counter

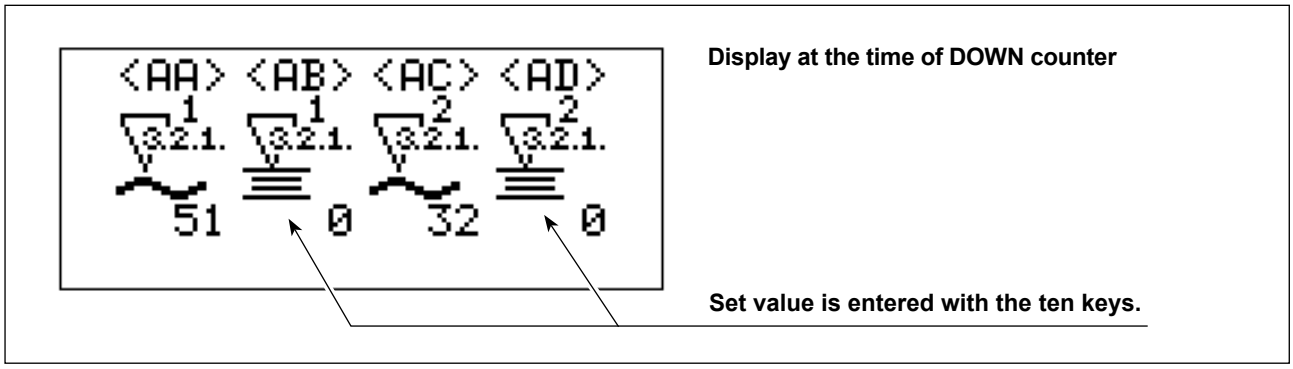
Count operation means that number of times of sewing is added or subtracted when sewing is completed while one loop is regarded as "1".
When the number of times of sewing reaches the specified value, the sewing machine automatically stops, and the hook on front side widens to front side. Turn OFF the power and replace the bobbin with a new one.

Operation

- ○ Make the set ready LED go out.
  (Press the set ready key (green color), and light-up and go-off are repeated.)
- ○ Press the counter key and the count setting screen is displayed as given below.



When the screen change-over key is pressed while selecting pictograph Nos. <AA> to <AD>, the counter is changed over UP counter to DOWN counter.



- ○ Count can be individually set to the first hook and the second hook.
  (• This setting is convenient when bobbin thread amount to be used of the respective hooks is different from each other.
  • When replacing bobbins as a set, count UP or DOWN operates by setting of either one only.)

<AA> 1st hook counter

<AB> 1st hook counter value (set value)
When counter value is set to "0", count-end operation is not performed.

<AC> 2nd hook counter

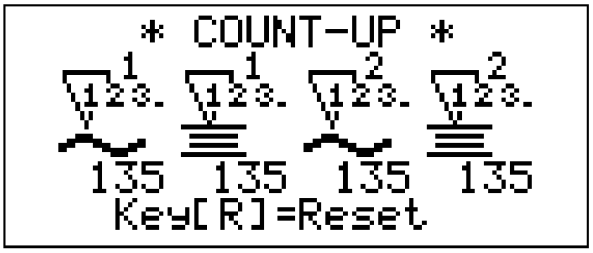
<AD> 2nd hook counter value (set value)
When counter value is set to "0", count-end operation is not performed.

<AE> Total counter
(UP counter function only)
- ○ **Clear with the reset key.**
  (Even when the power is turned OFF, data will remain. Be sure to reset before starting counting.)

Count UP screen

When the counter is in the state of count-up after sewing, the following screen is displayed.

* When setting 1st hook and 2nd hook individually, the part only to which count-up is performed is displayed.



Count-up screen

* Be sure to use the counter since the moving mechanism is provided on front side (1st hook).

After turning OFF the power switch and replacing the bobbin on the displayed side, turn ON the power and press the set ready switch. Then, count-up screen is displayed.
Here, press the reset switch **R** and clear the counter.

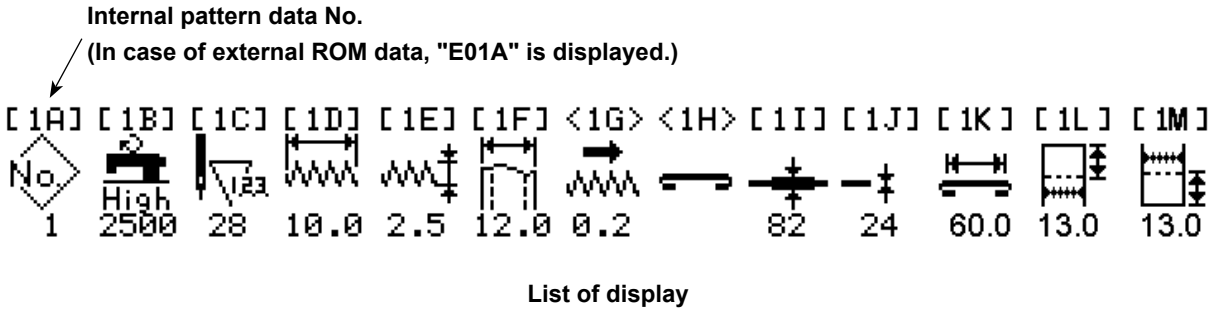
3. Confirmation of needle entry point

○ When the sewing screen is displayed, jump feed operation of presser foot only can be performed by pressing the left cursor key ◀ or the right cursor key ▶ .
Use this function when confirming the needle entry point or the like.
Traveling backward is performed with the ◀ key, and traveling forward with the ▶ key.
In addition, when jump feed operation screen is displayed, the presser foot moves up or down by pressing the needle threading switch .

When turning ON the needle threading switch , be sure not to place your hand or the like under the presser foot.

○ The screen returns to the sewing screen by pressing the **R** button.

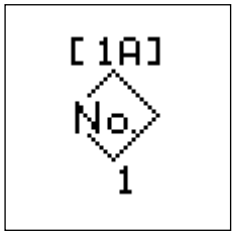
4. Setting screen



List of display

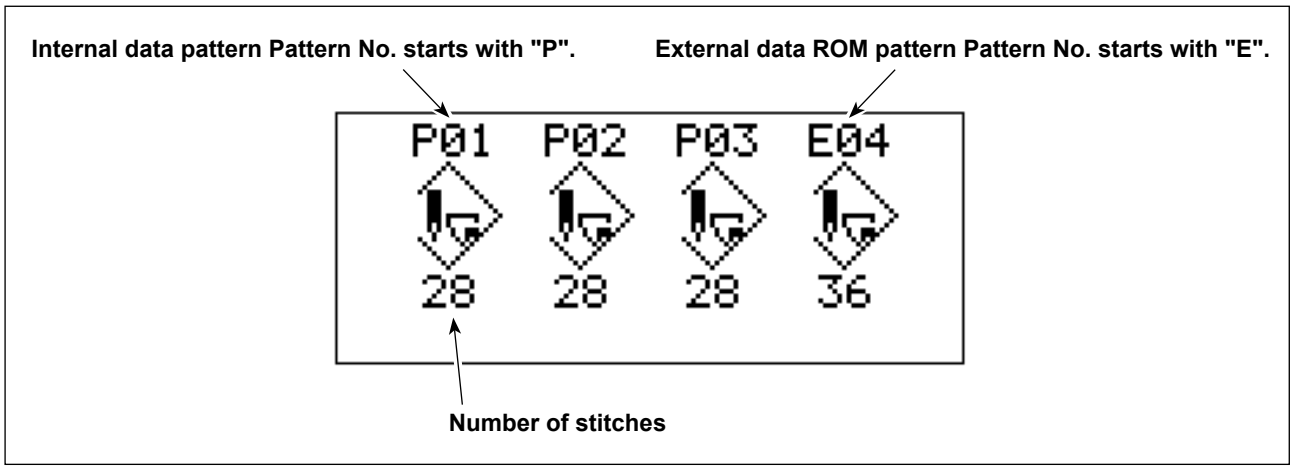
Setting of sewing data is performed.
The screen is displayed by pressing the program key.
When you desire to change the set value, keep pressing the standard screen key for 10 seconds. Data-lock is released.
When you desire to lock the data again, keep pressing standard screen key for 10 seconds.
In addition, when turning ON the power, it is recommended to release the lock only when it is necessary since the state before turning OFF the power has been stored in memory.

(1) Selection of the pattern



Sewing pattern No. is displayed.
Sewing pattern Nos. are 01 to 99 (internal patterns are 1 to 9.).
Press the screen change-over key , and screen moves to the sewing pattern selection screen.
From the 10th sewing pattern, enter the sewing pattern by reading the external data from the PM-1 and writing it on the ROM.

When the external data ROM is mounted, external data ROM has priority in display.

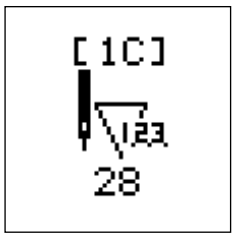


Press the screen change-over key and pattern of font which is flickering is selected. Then, screen moves to the sewing pattern setting screen.

(2) Setting of max. number of rotations

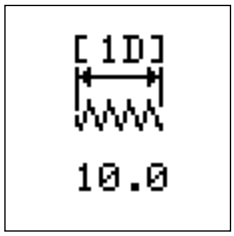
(Setting range : 500 to 2,500 sti/min)
Input with the ten keys.

(3) Setting of number of stitches



Sewing pattern should be selected from among 28-stitch, 36-stitch and 42-stitch patterns built in system ROM.

(4) Setting of bartacking length



(Setting range : 7.0 to 22.0 mm)

(5) Setting of bartacking width

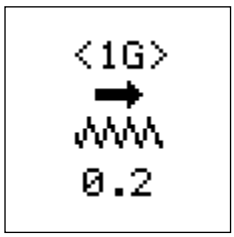
(Setting range : 1.0 to 3.2 mm)

(6) Setting of belt loop width

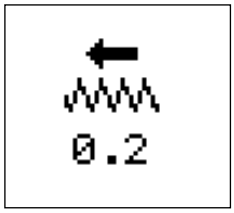
(Setting range : 9 to 20 mm)
This setting makes the machine memorize the belt width so that the sewing position is symmetrical to the center when bartacking length is changed.

(7) Fine adjustment of bartacking position

Sewing position may slightly move when a loop is changed to the other loop of different width or to the other loop of different material.
Use this setting when compensating the correction amount at this time.



Moves to the right as much as the set value.

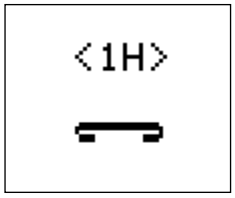


Moves to the left as much as the set value.

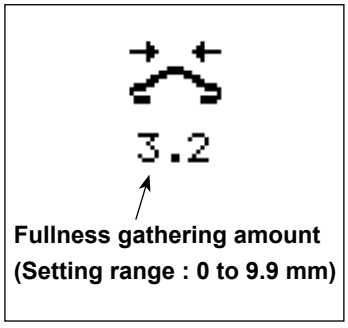
○ Moving direction changes with the press of the screen change-over key .

(8) Fullness setting

Changeover of standard to fullness alternatively (***1**)



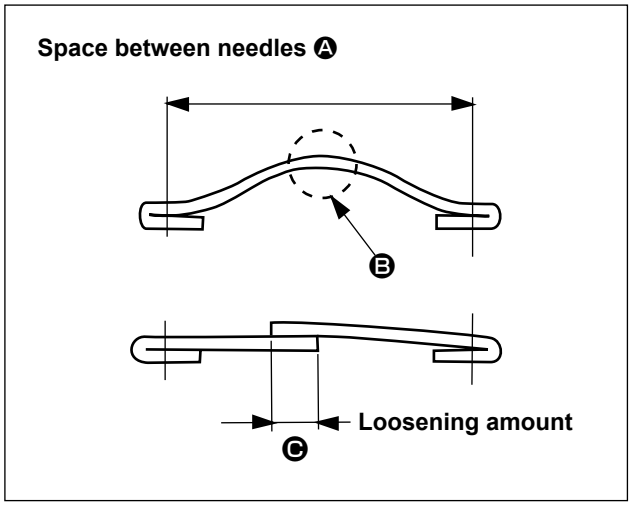
Standard sewing



Fullness sewing

*1 Not displayed if fullness device (refer to **"VI-6. Setting of DIP switches" P.31** for the DIP switch SW3 on the lower side of the panel) has been stopped.

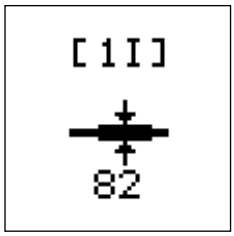
Set value (fullness gathering amount)
Loop of double input value is supplied in surplus.
Be sure to perform trial stitching, however, since input value may be different from the expected value in accordance with waist and thickness of the loop or center-to-center distance between bartacks.



1) Max. loosening amount
Loosening amount is the amount Ⓒ which has cut Ⓑ.
Operate the machine referring to the following table.

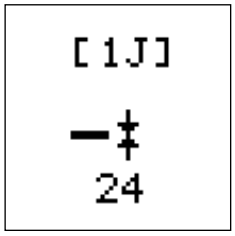
Space between needles Ⓐ	Loosening amount Ⓒ
43 to 45 mm	7 mm
46 to 50 mm	8 mm
51 to 55 mm	9 mm
56 to 60 mm	10 mm
61 to 65 mm	11 mm
66 to 70 mm	12 mm

(9) Setting of the belt loop splice detection



Make the machine memorize the thickness of belt loop splice.

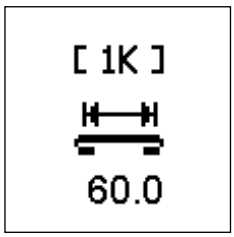
(10) Setting of the belt loop detection



Make the machine memorize the thickness of belt loop and make the machine stop when the belt loop runs out.

For the aforementioned (9) and (10)
When the pattern is changed, set again since data is memorized by each pattern data.
Therefore, it is not necessary to set again if the sewing products are the same since pattern data and loop that have been entered once are controlled by the machine.
Refer to **"VII-4. Adjusting the belt loop splice detector" P.41** for the setting procedure.
When setting the belt loop splice and detection using the actual product, it is possible to set with either (9) or (10).

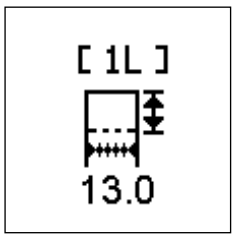
(11) Setting the loop length



(Setting range : 50.0 to 80.0 mm)
Input the length of the loop after its both ends have been folded.

* If the DIP switch SW7 located on the upper side of the side face of the panel is set to OFF, this pictograph will not be displayed.

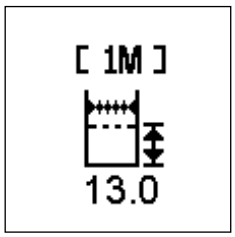
(12) Setting the folding length (on the loop grasping side)



(Setting range : 10.0 to 20.0 mm)
Input the folding length on the far side of the operator.

* If the DIP switch SW7 located on the upper side of the side face of the panel is set to OFF, this pictograph will not be displayed.

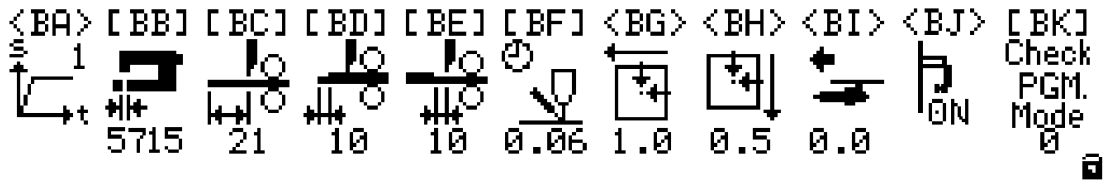
(13) Setting the folding length (on the cutter side)



(Setting range : 10.0 to 20.0 mm)
Input the folding length on the near side of the operator.

* If the DIP switch SW7 located on the upper side of the side face of the panel is set to OFF, this pictograph will not be displayed.

5. Adjustment screen



List of display

Pressing the standard screen key , press ten key "0", and adjustment screen is displayed.

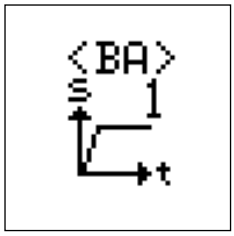
At this time, when the No. 2 of the upper stage DIP switches located on the right side face of the operation box panel is set to:

OFF : Display only

ON : Setting is possible.

A padlock mark on the lower right of the panel display screen represents the state.

(1) Sewing machine start-up speed



Start-up speed can be selected from among 5 stages. (Standard value : 3)
Change the start-up speed to slow if thread slip-off at the start of sewing should occur.

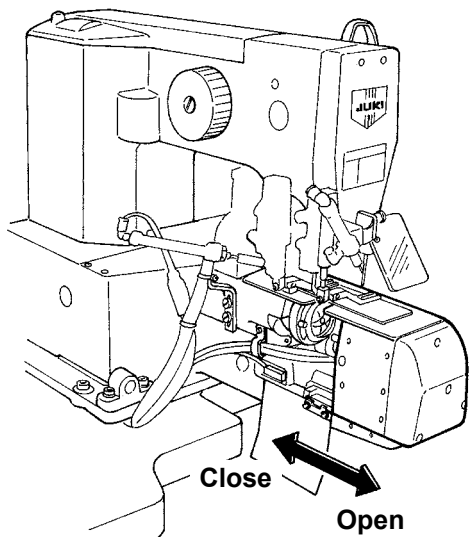
1 ⟷ **5**
Fast **Slow**

(2) Adjusting the 1st hook

WARNING
Operate by only an operator who has a proper knowledge and operation training since needle-to-hook timing adjustment is performed after turning ON the power.

Enter the 1st hook adjustment screen with the selection key .
The value displayed on the pictograph represents the distance between 1st hook and 2nd hook (reference).

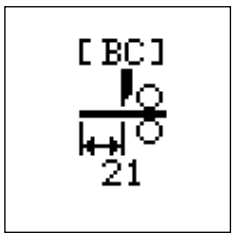
Perform opening / closing of the hook cover after entering the 1st hook adjustment screen.



The hook moves in a unit of 0.01 mm with the ten key "1" (open) or "7" (close), and moves in a unit of 0.1 mm with the ten key "2" or "8".
To ensure safety, however, the keys "2" and "8" cannot be accepted when the thread take-up lever is not positioned in its upper dead point.

1. **Be sure to press the R key to register after performing hook position adjustment.**
2. **Be careful not to allow your hand to be caught in the hook base by the move of the hook base on front side during performing hook position adjustment.**

(3) Belt feeding amount

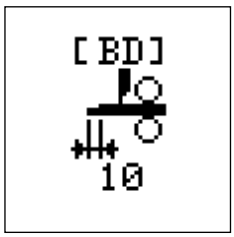


Setting of the length when belt loop is picked out (unit : mm)
Folding amount of belt loop in the rear side changes.
The longer the belt loop is picked out, the more the folding amount increases.

The value and the value of folding length are not the same since there is a difference in mechanical adjustment value.

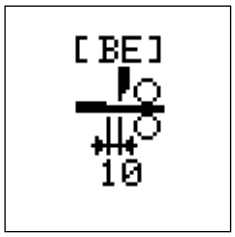
When setting the folding amount of belt loop in the front side, adjust the loop feeding unit. (Refer to **"VII-1-(8) Moving the loop feeding unit" P.37**.)
At this time, be sure to re-turn ON the power after the adjustment.
If you change this value, the folding length will be changed. Check [1L] and [1M].

(4) Setting of splice cutting (front)

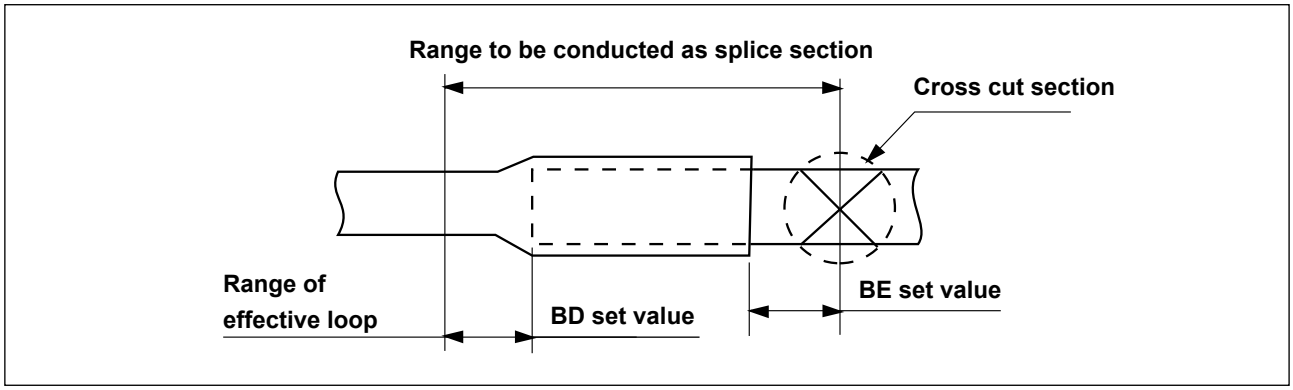


This setting inputs the distance to conduct as a defective loop the front side from the position where the top end of splice is confirmed. (Unit : mm)
Splice section at the top end of splice is gradually swollen, and the accuracy of detection varies in accordance with the material of loop.
This setting is to compensate the error of accuracy of detection.
In addition, it may be necessary to adjust the error in accordance with the width of belt loop.

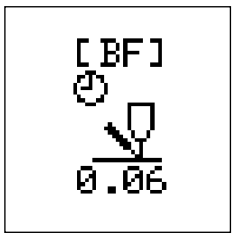
(5) Setting of splice cutting (rear)



This setting inputs the distance from the rear end of splice section to the position to cut the loop. (Unit : mm)
The loop should be cut in the slight rear of splice section since the cross cut is applied to the loop. Otherwise, the splice section gets mixed with the loop.
The standard set value of [BD] or [BE] value is 10mm.

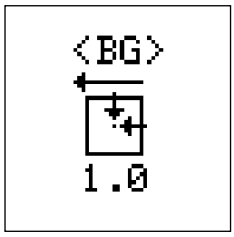


(6) Setting of wiper operating time (Unit : sec)



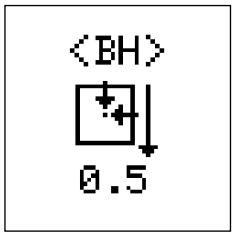
Setting of wiper operating time is performed. (Unit : sec.)
Change the operating time when the operating time is short and thread cannot be wiped.
Input the change with the ten key. (Standard setting : 0.06)

(7) X-axis origin compensation of the sewing machine presser (unit : mm)



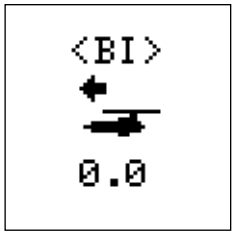
This adjustment is performed when the position of the presser and needle is shifted due to unexpected accident or the like.
(This adjustment is not used unless replacement of X-Y table, or adjustment of X-Y table sensor slit is performed.)
Move the X-axis origin to the right or left.
Enter the adjustment screen with the screen change-over key ⇧ .
Adjust with the ten keys following instructions in the screen.

(8) Y-axis origin compensation of the sewing machine presser (Unit : mm)



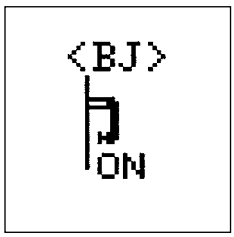
This adjustment is performed when the position of the presser and needle is shifted due to unexpected accident or the like.
(This adjustment is not used unless replacement of X-Y table, or adjustment of X-Y table sensor slit is performed.)
Lower the Y-axis origin.
Enter the adjustment screen with the screen change-over key ⇧ .
Adjust with the ten keys following instructions in the screen.

(9) Fork origin compensation



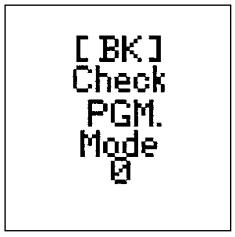
This setting performs compensation of the position where the fork catches the belt loop.
Left direction makes the fork travel forward, and right direction makes it travel backward.
Changeover of front/rear direction can be performed with the screen change-over key ⇧ .
Data of compensation amount is memorized in ROM. It is recommended, however, to take a memo of the data for preparing the worst.

(10) Setting of thread presser operation



This setting performs the selection of operation/non-operation of the thread presser. ON/OFF of the operation can be changed over with the screen change-over key ⏏. Make this setting OFF when damage is given to the thread by the pressure of the thread presser.

(11) Selection of check program mode



After inputting the aforementioned mode No., the check program can be actuated with the screen change-over key ⏏.
Do not use this mode since it is used for maintenance and inspection by the manufacturers.

(12) Adjustment data value at the time of delivery

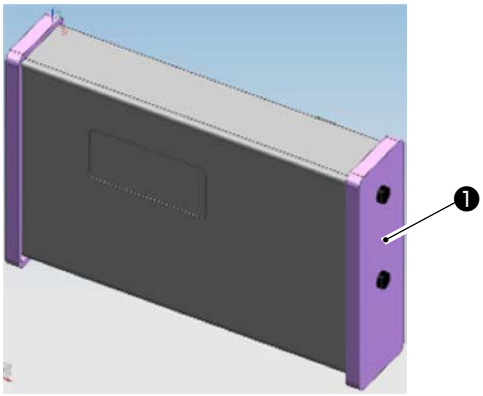
A sheet on which the adjustment values peculiar to this machine are described is enclosed with this machine. Keep the sheet with care. If the replacement of the circuit board should occur due to the trouble, re-entry is necessary. Take a memo when changing the value of <BG>, <BH>, or <BI>.

MOL-254N **Adjustment Sheet**

MOL Mfg.No	

Data No	Data Name	Adjustment value	NOTE
<BB>	Hook-Position		Hook position data at the time of delivery
<BG>	X-Origin		X-axis origin compensation value
<BH>	Y-Origin		Y-axis origin compensation value
<BI>	Fork-Origin		Fork origin compensation value

6. Setting of DIP switches



You can set the DIP switches by removing the cover ❶ on the right side of the panel.

Upper side of side face

No.	Name (function) of mode	Standard setting	Description
SW1	Expansion of setting range	OFF	When the switch is set to ON, limitation item is ineffective.
SW2	Adjustment screen protect	OFF	When the switch is set to ON, protect is released.
SW3	Thread breakage detection	OFF	When the switch is set to ON, detection is effective.
SW4	Auxiliary loop feeding device	OFF	When the switch is set to ON, the device actuates.
SW5	Air pressure sensor	OFF	When the switch is set to ON, the sensor is ignored.
SW6	Garment body alignment	OFF	When this switch is set to ON, the function is effective.
SW7	Loop folding allowance short mode	ON	When the switch is set to ON, the mode is effective.
SW8	Sewing machine durability operation switch	OFF	When the switch is set to ON, the drive starts (used in the maintenance screen).

It is possible to change during turning ON the power.

Lower side of side face

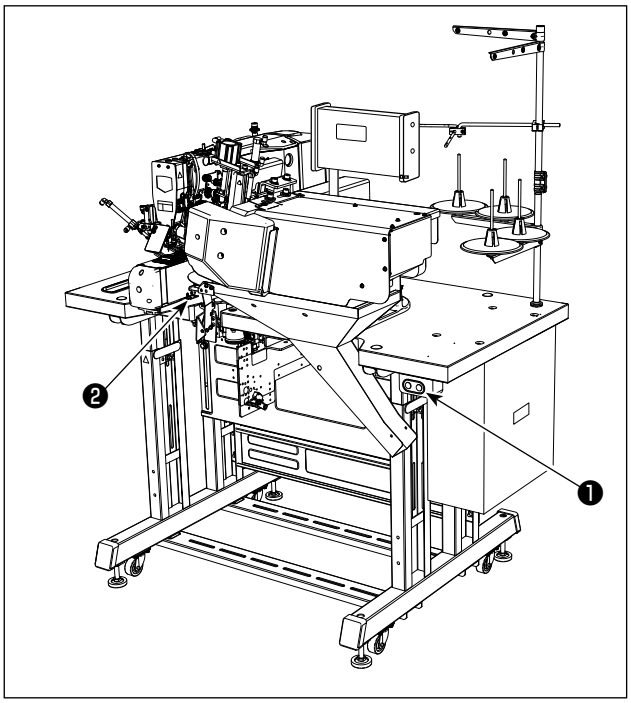
No.	Name (function) of mode	Standard setting	Description
SW1	Manual sewing operation	OFF	When the switch is set to ON, operation of the supplying device stops.
SW2	Step operation	OFF	When the switch is set to ON, step operation is effective.
SW3	Fullness device	ON	When the switch is set to ON, the device operates (change of set-back operation).
SW4	Belt loop retaining when turning ON the power	OFF	When the switch is set to ON, the loop is dropped.
SW5	Splice detection	OFF	When the switch is set to ON, the detection is ignored.
SW6	Cross cut	OFF	When the switch is set to ON, the cut is changed to straight cut.
SW7	Changeover of the splice determination	OFF	When the switch is set to ON, the portion that is thinner than the splice detection setting is determined to be a splice.
SW8	Switch for production	OFF	Operate with the switch OFF at any time.

Perform setting of the switches after turning OFF the power, and re-turn ON the power.

7. Operation

WARNING

Operate the machine after you thoroughly understand a series of procedure steps referring to the basic operation flow chart. (Refer to "V-1. Basic performance" P.16.)



Operate the machine following the steps of procedure described below.

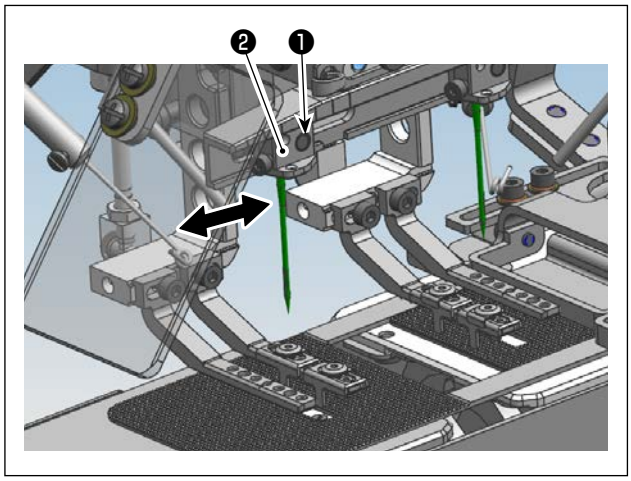
1) Turn ON the power switch.
   (Turn ON switch ❶ .)
2) Set a garment body to be sewn on the machine.
3) Press the start switch. (Press switch ❷ .)
4) After the machine completes predetermined steps of procedure, the machine actuates the thread trimmer to cut needle and bobbin threads, automatically lifts the presser foot, then stops.

VII. MAINTENANCE

1. Changing the center-to-center distance between bartacks

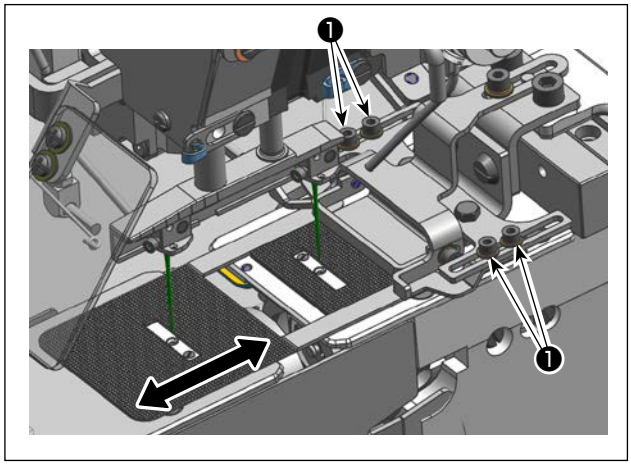
The center-to-center length between the needles can be adjusted between 43 mm to 70 mm.

(1) Changing the needle gauge



1) Loosen needle base setscrew ❶ from the rear face side.
2) Move needle base ❷ in the direction of the arrow to change the needle gauge.
   (The adjustable range is from 43 mm to 70 mm.)
3) After the adjustment, tighten setscrew ❶ from the rear face side.

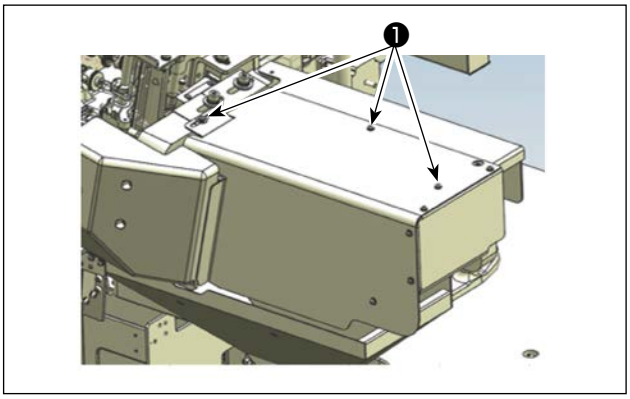
(2) Adjusting the lower plate



1) Loosen setscrews ❶ of the lower plate B.
2) Align the center of the slot in the lower plate B with the center of the needle. Then, tighten setscrews ❶ .

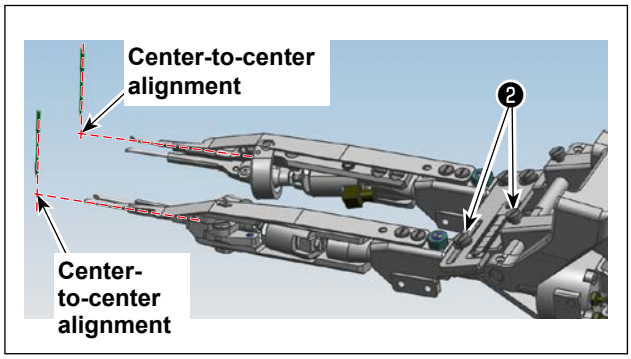
* Be sure to check the needle entry (whether or not the needle eyelet is hidden in the slot) before sewing.
Refer to **"VI-3. Confirmation of needle entry point" P.21** for the checking method.

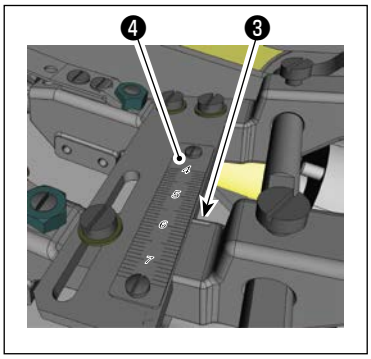
(3) Changing the fork



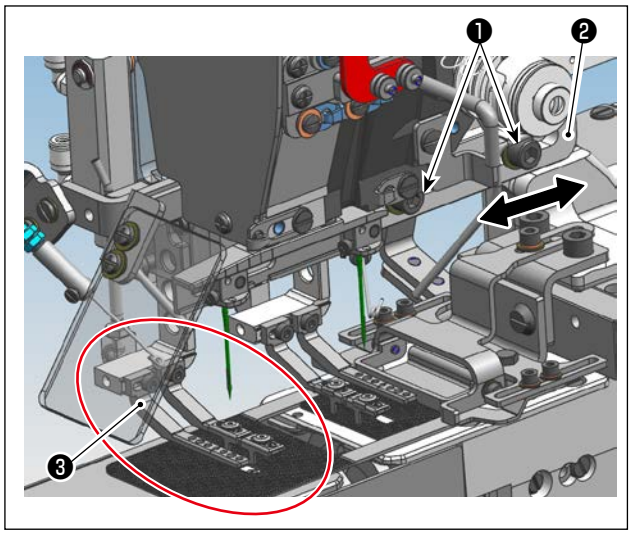
1) Loosen cover setscrews ❶ to remove the cover.
2) Loosen setscrews ❷ . Move the near-side fork (indication mark ❸) to align it with scale ❹ (loop length). Then, tighten setscrews ❷ .

* At this time, the fork and the needle are at the position where their centers are aligned.



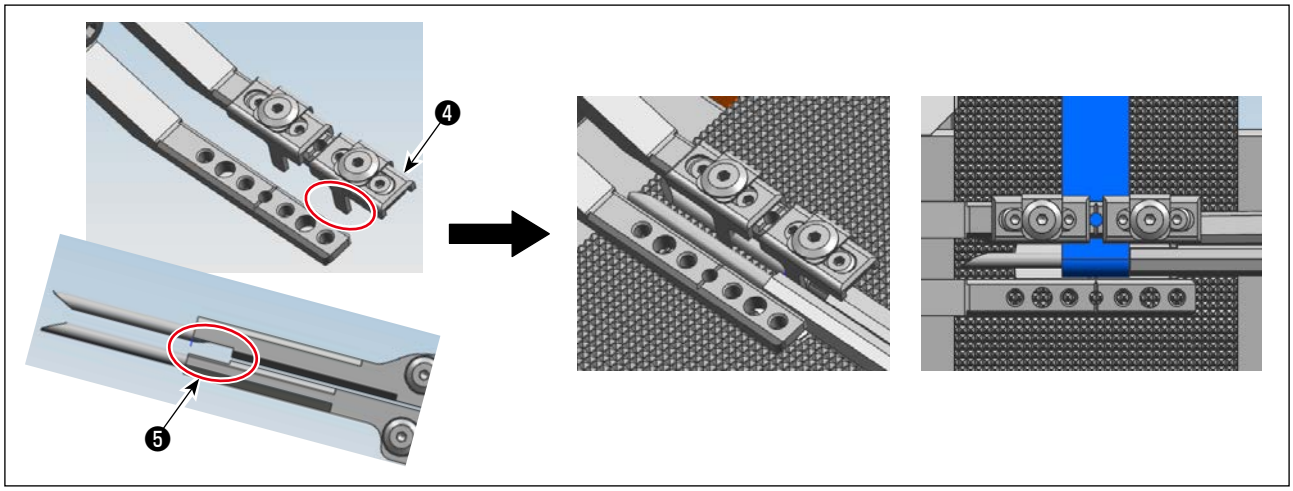


(4) Changing the presser foot

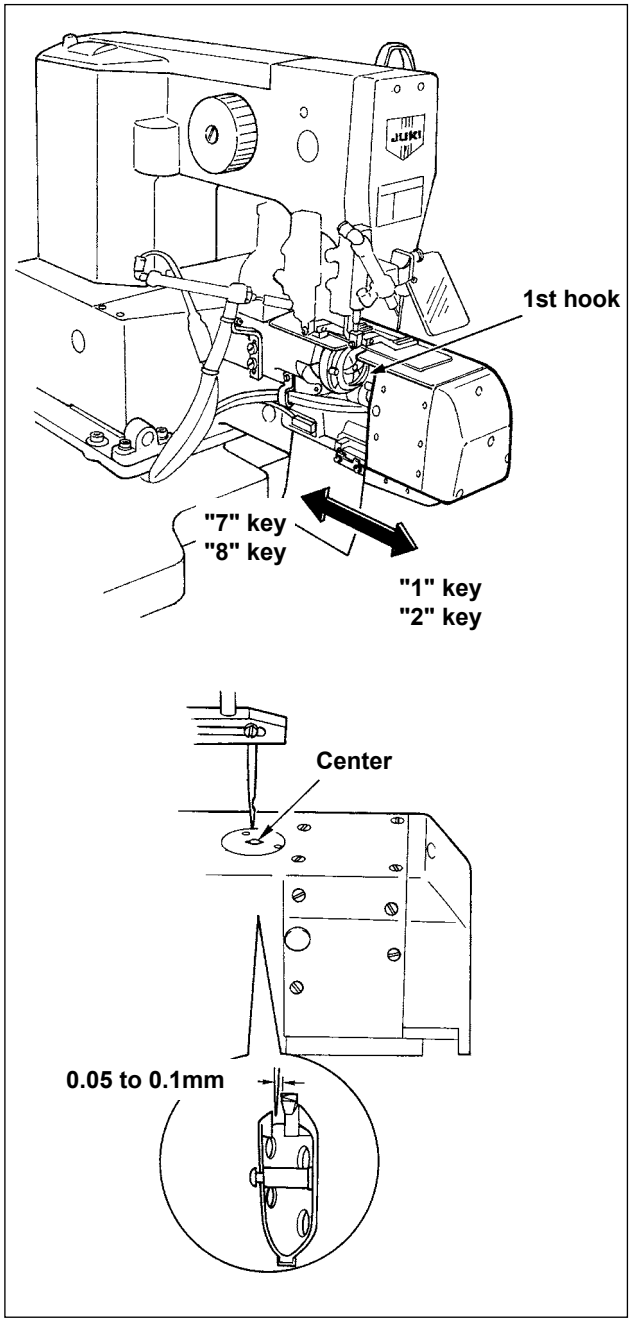


1) Loosen two setscrews ❶ of the front presser foot base.
2) Move the fork to the underside of the needle. Move front presser foot base ❷ in the direction of the arrow.
3) Lower presser foot ❸ to the position at which the claw of loop guide ❹ fits in notch portion ❺ of the fork, and tighten two setscrews ❶ of the front presser foot base.

* The positional relation between the presser foot (the loop guide and the garment body presser) and the loop is as shown in the figure.



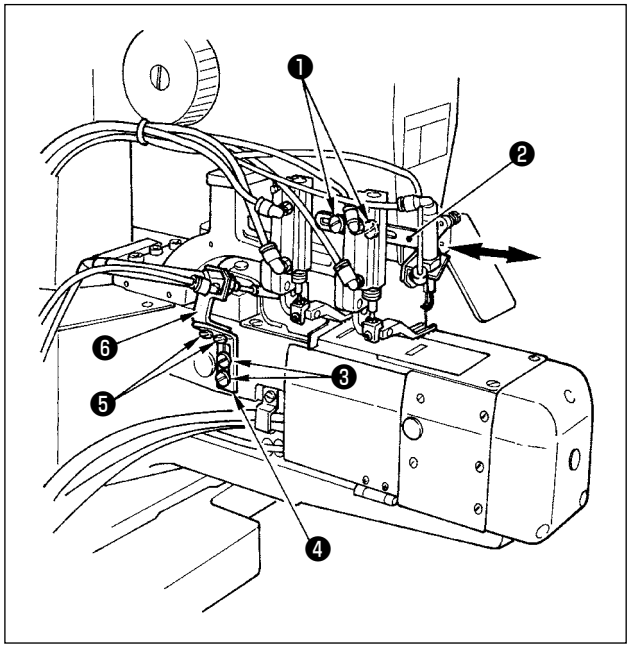
(5) Adjusting the 1st hook position

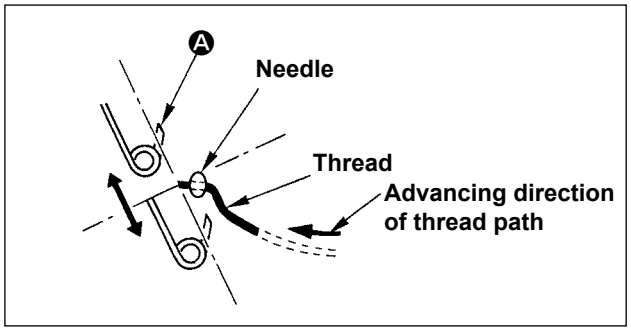


1) Turn ON the power.
   When the data is locked, keep pressing the standard screen key for 10 seconds to release the data lock key.
2) Simultaneously press [⊙] key and "0" key, and the setting mode screen appears.
3) Select [BB] with ◀ ▶ key.
4) Press [↑] key, and the hook moving mode screen appears.
5) Press "2" key or "8" key, and the hook moves in increments of 0.1 mm. In addition, if you keep pressing the key, the hook moves continuously.
   Press "1" key or "7" key, and the hook moves in increments of 0.01 mm.
   Refer to the illustration for the key to be pressed and the moving direction.
6) The hook moves to the position where the center of needle hole is almost aligned with the center of needle with the "2" key or "8" key.
7) Fine adjustment is performed with the "1" key or "7" key. Perform the adjustment while checking the clearance between the blade point and needle.
   At this time, adjust so that a clearance of 0.05 to 0.1 mm is provided between the blade point of inner hook and needle.
8) Return the screen to the initial screen with "R" key after the adjustment.

- **If the needle stop position varies, "2" and "8" keys are ineffective and the panel display disappears.**
- **It is not necessary to adjust the needle-to-hook timing.**
- **Be careful not to allow your hand to be caught in the hook base by the move of the hook base on front side during performing hook position adjustment.**

(6) Adjusting the wiper





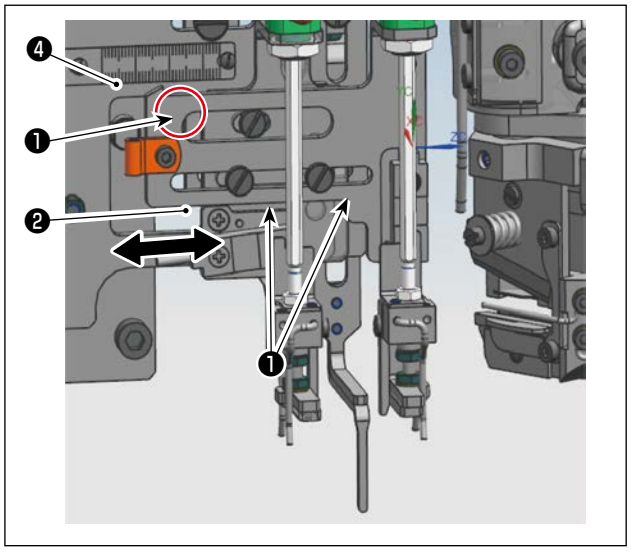
In case of front side (in the state where the machine stops)

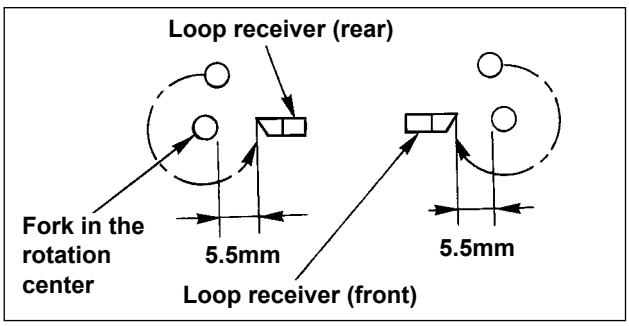
1) Loosen two setscrews ❶ and wiper base A ❷ moves in the direction of arrow.
2) Adjust the position when moving the wiper by hand as shown in the illustration so that section Ⓐ which catches thread comes in contact with thread and enters further than thread when it extends to the maximum.
   (Adjust so that the wiper does not come in contact with needle. It is all right if the wiper section is bent.)
3) Tighten two setscrews ❶ after the adjustment.

In case of rear side (It is not necessary to adjust since normally, this wiper is fixed.)

1) Loosen two setscrews ❸ and wiper base B ❹ moves up or down.
2) Loosen two setscrews ❺ and wiper base C ❻ moves front and rear.
3) Adjusting position is the same as the aforementioned (1) 2).
4) Tighten two setscrews each of ❸ and ❺ after completion of the adjustment.

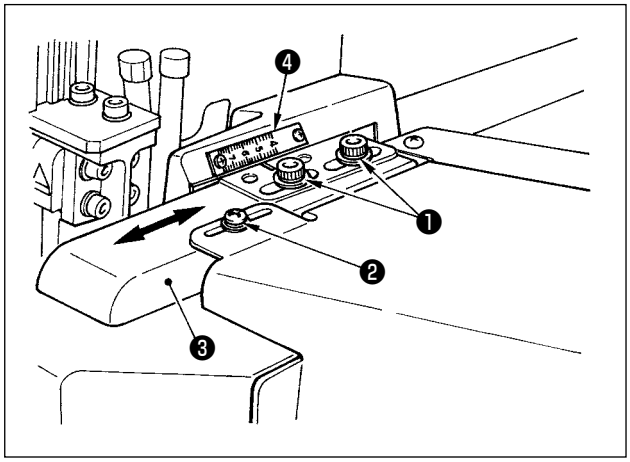
(7) Changing the loop receiver





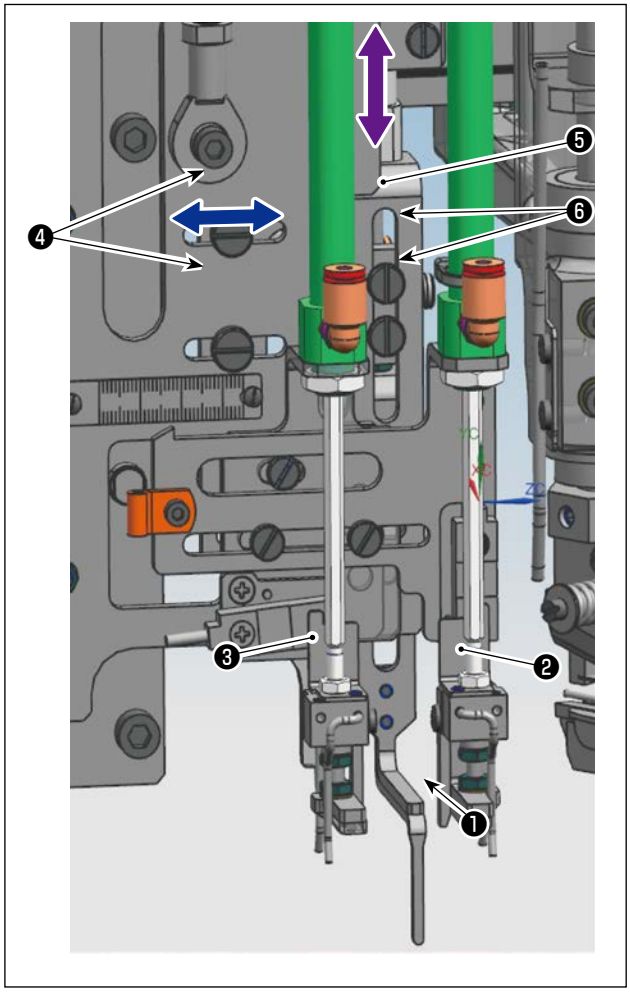
Loosen setscrews ❶ . Move loop receiver (front) ❷ until its pointer ❸ is aligned with scale ❹ (loop length). Then, tighten setscrews ❶ .

(8) Moving the loop feeding unit



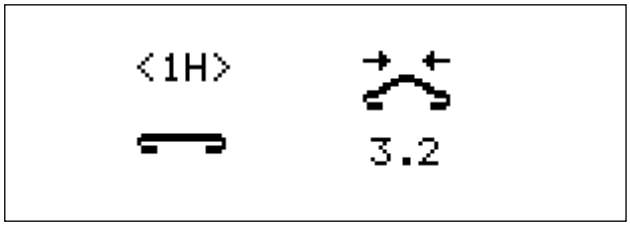
Loosen screw ❶ and ❷ , move knife unit guide rail ❸ to align the engraved line to scale ❹ .

(9) Changing the fullness unit



Loosen setscrews ❹ . Move fullness lever ❶ to the right and left (↔) to position it almost at the center between loop receiver (front) ❷ and loop receiver (rear) ❸ . Then, tighten setscrews ❹ .

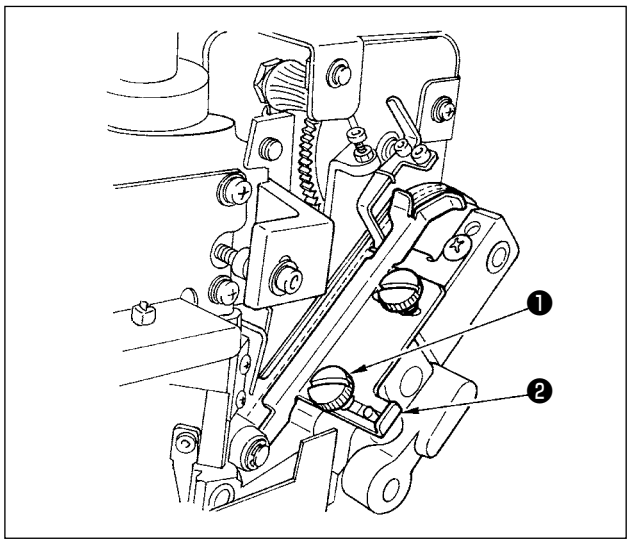
(10) Fullness gathering amount on the panel



1) Change the data value of <1H> to an appropriate value.
2) Loosen setscrews ❻ of fullness stopper ❺ . Move the fullness stopper up and down (↔) in accordance with the fullness gathering amount <1H>. Then, tighten setscrews ❻ .

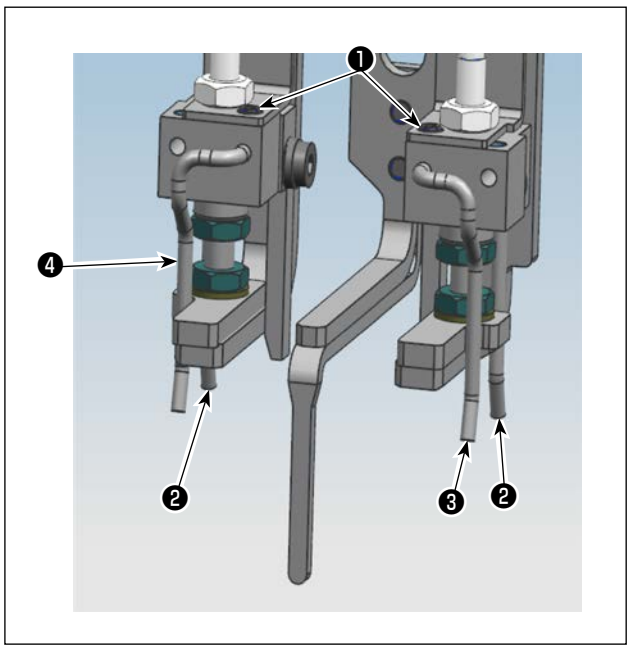
2. Adjusting the width of belt loops

(1) Changing the binder



Loosen screws ❶ and adjust the position of loop width guide ❷ so that a clearance of 1 mm (as thick as the splice section) is provided between the belt loop and the binder. Then, tighten screws ❶ .

(2) Adjusting the loop gathering claw



1) Loosen setscrews ❶ . Press the belt loop against loop gathering claw B ❷ .
2) Press loop gathering claws A ❸ and ❹ against the loop and tighten setscrews ❶ .

(3) Adjusting the cross cut position

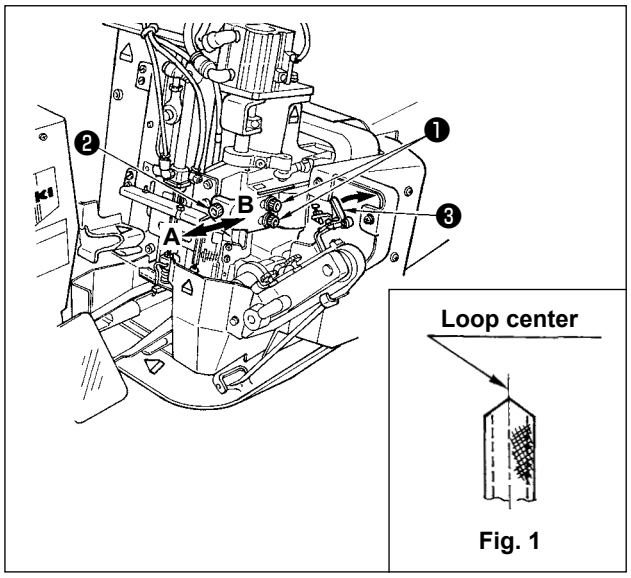
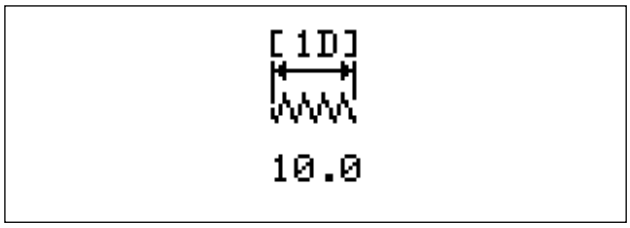


Fig. 1

Loosen main body setscrews ❶ , turn adjustment screw ❷ and move the setscrews in the direction **A** or **B** to adjust the position of the main body so that the cut belt loop becomes the loop center as shown in Fig. 1.
Pull the belt loop splice detector lever ❸ to front side, and the necessary amount of the loop can be fed. Further, pressing the standard screen key , press ten key 3. Then, the loop presser unit releases the loop. Again, pressing the standard screen key , press the ten key 3. Then, the loop can be cut. Use this function when performing the adjustment.

Caution **The aforementioned operations can be actuated only when the setting screen is displayed.**

(4) Changing the length of bartacking

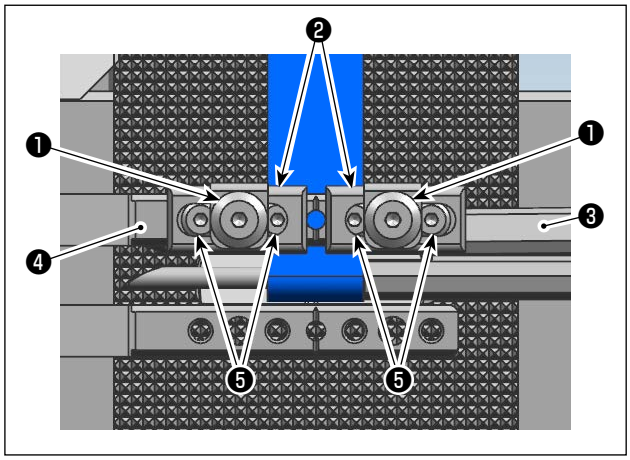


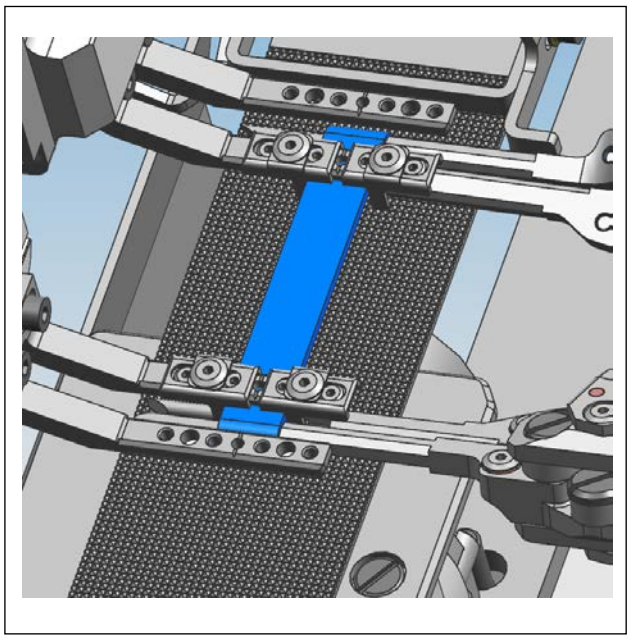
Change the 1D bartacking length data on the setting screen.

(5) Changing the value of belt loop width

Change the data of loop width of 1F in the setting screen.

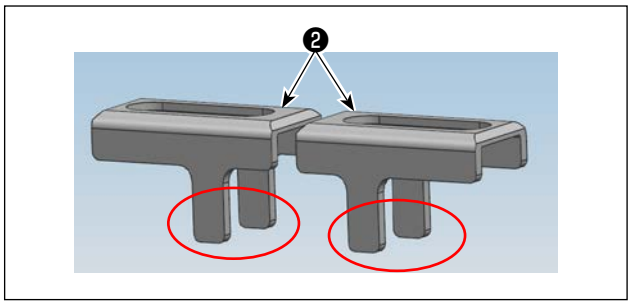
(6) Changing the loop guide





1) Move fork ❸ to the underside of presser foot ❹ under the step mode.
2) Loosen loop guide setscrews ❶ . Move loop guide ❷ until its claw portion slightly comes in contact with the loop. Then, tighten setscrews ❶ .

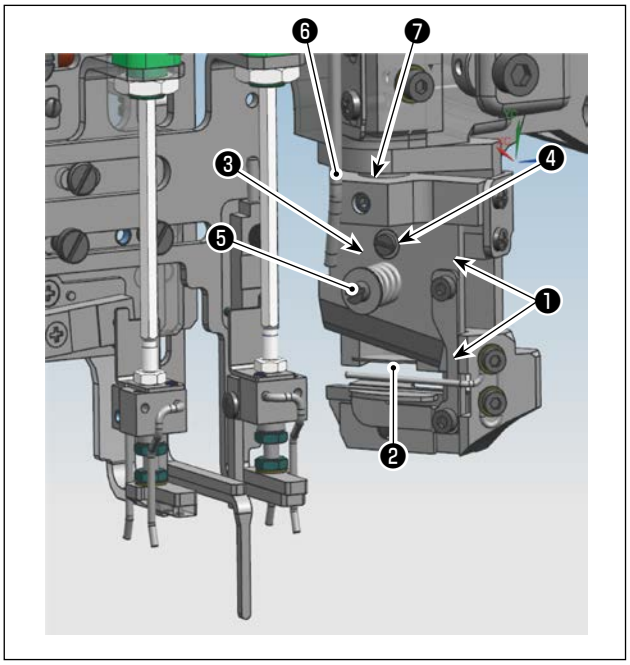
* When changing the thickness of the belt loop, adjust the loop guide ❷ by loosening the loop guide setscrews ❶ and rotating the loop guide height adjustment screw ❺ . This may cause sewing failures such as stitch skipping.
If the adjustment range is exceeded, especially for thin fabrics, cut off the tip of the included loop guide.



3. Replacing loop cut moving knife

WARNING
Turn OFF the power and the air.
Take care not to cut your fingers with moving knife ❺ during work.

(1) Removing the moving knife



Remove setscrews ❶ from the loop receiver, then remove loop receiver ❷ . Remove setscrew ❸ from the knife presser spring collar, then remove knife presser spring ❹ and moving knife ❺ .
When installing, follow the aforementioned procedure for removing the moving knife in the reverse order.

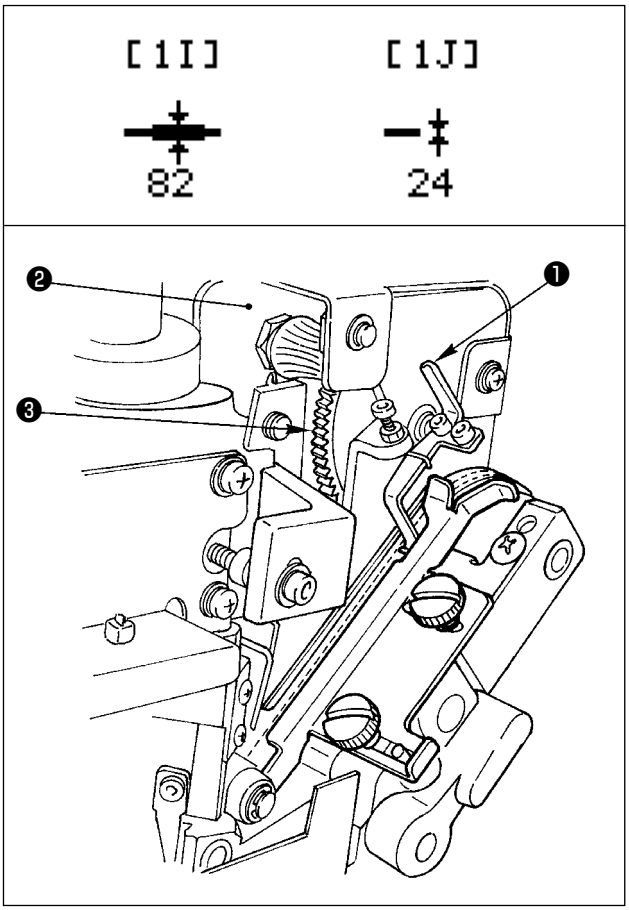
(2) Adjustment

If the top face of moving knife ❺ is not flush with moving knife mounting base (no clearance is provided between the knife and the base), when attaching moving knife ❺ in position, loosen setscrew ❼ and perform the adjustment by changing the position of moving knife mounting base ❻ .

4. Adjusting the belt loop splice detector

WARNING

To secure safety, be sure to conduct adjustment while the Set ready LED goes out.
This adjustment has to be carried out with the power switch ON.



1) Flashing to [1I] or [1J] in the setting screen, press ⇧ key to enter the splice input screen.
2) Press the ten key [1].
3) When the zero level is entered, the ten key [0] is not displayed. However, when the zero level (when there is no loop) has not been entered even one time, press the ten key [0].
   *** Refer to the Caution.**
4) Set a belt loop on the machine and keep pressing the ten key [7] of the loop feed button to pass the normal loop section and splice section up to detection lever ❶ .
5) Enter the ten key [9].
6) Press the R key to return to the setting screen.

When the belt loop splice detector (potentiometer ❷ and gear ❸) is adjusted, or CPU circuit board is replaced, a slip occurs in the zero level. Be sure to set the zero level again in accordance with the procedure given below before adjusting the belt loop splice detector. (Refer to "Numeric value input method (applied volume)" P.41.)

```
∗ Belt Loop ∗
◇ P=1                    level (0)
    Key [1] = level
              Adjustment
    Key [R] = Return
```

① Flashing [1I] or [1J] in the setting screen, press ⇧ key to enter the splice input screen.

```
∗ Belt Loop ∗
                         level (30)
[7] = Feed
[9] = set
[R] = Return
```

② Press the ten key [1].
The display screen is as shown on the left side. When pressing the ten key [0] without inserting the belt loop in this screen, the zero level is set.

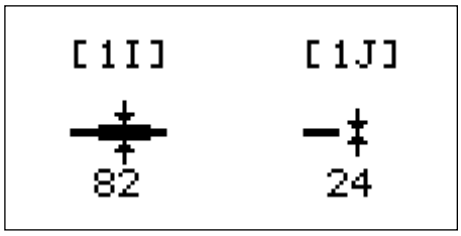
Adjusting the belt loop splice detector

Numeric value input method (applied volume)

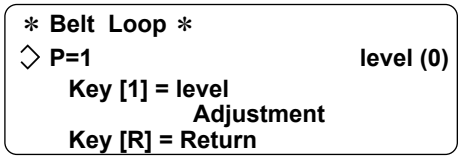
When the pattern No. is changed, it is necessary to re-input splice level. However, when changing other setting using the same belt loop,the value can be directly entered by entering the value with the ten keys in flashing state of [1I] (Thickness of splice section) and [1J] (thickness of normal loop).

As for the numeric value, enter the same data as the pattern data that is adjusted to the actual belt loop since there is no correlation between the numeric value and the thickness of the belt loop.

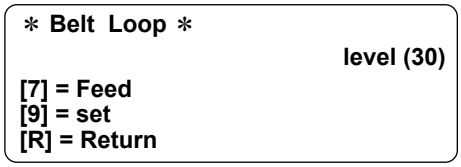
5. Adjustment of the belt loop without splice



1) Flashing [1I] or [1J] in the setting screen, press ⇧ key to enter the splice input screen.



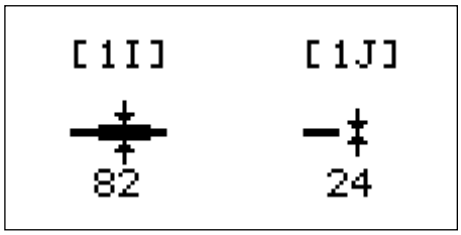
2) Press the ten key [1].



3) Set a belt loop and keep pressing the ten key [7] of the loop feed button.
(For approximately two seconds)

4) Press the ten key [9] to set the data.

5) Press the **R** key to return to the setting screen.

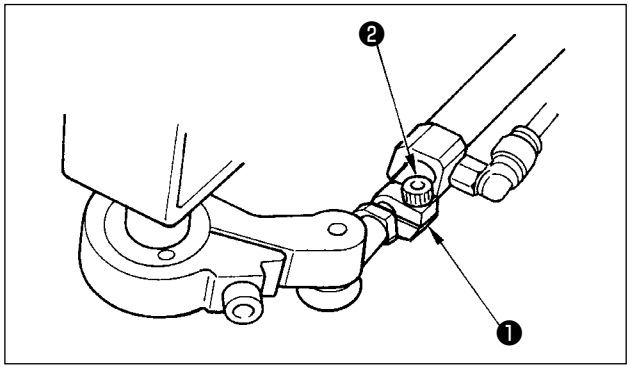


6) Here, enter with the ten key the numeric value as much as approximately 4-times of the data value of [1J] in the state of flashing [1I] (thickness of splice section) data.
Example) Enter 82 → 96.

A belt loop without splice, when setting in the step 6) is not performed, cannot distinguish the thickness from the thickness of normal loop, and the error (AL-56) may occur during sewing. Be sure to perform the aforementioned setting for the belt loop without splice.

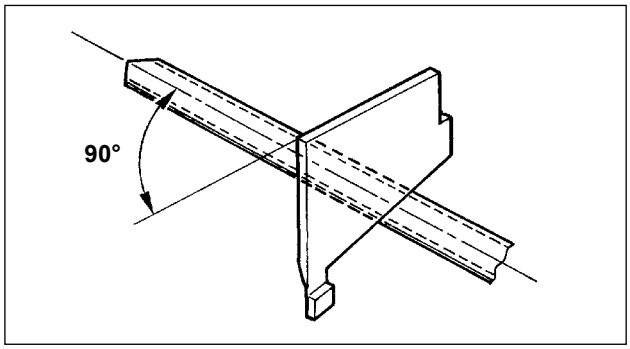
6. Changing the straight cutting

(1) Changing the knife position

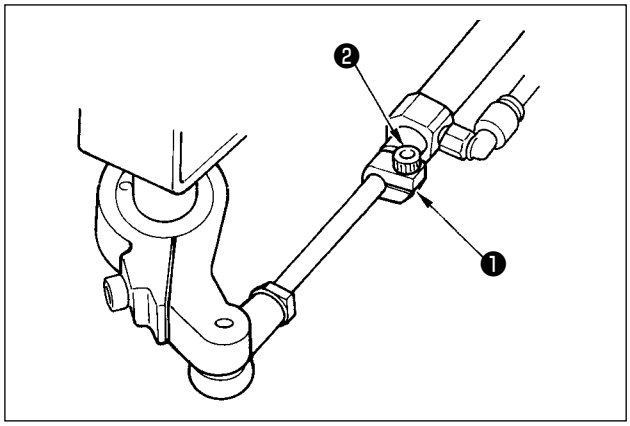


1) Stop the air supply.

2) Loosen setscrew ❷ in clamp collar ❶ .

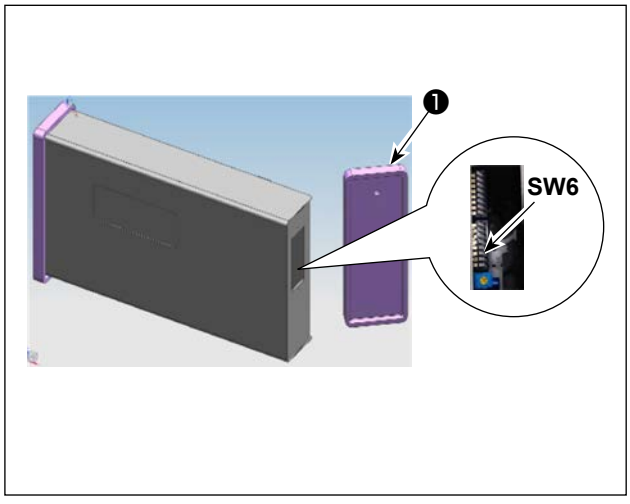


3) Adjust so that the moving knife is at right angle against the loop.



4) Fit clamp collar ❶ to the bushing on the rod side of cylinder, and fix it with setscrew ❷ .

(2) Changing the DIP switch

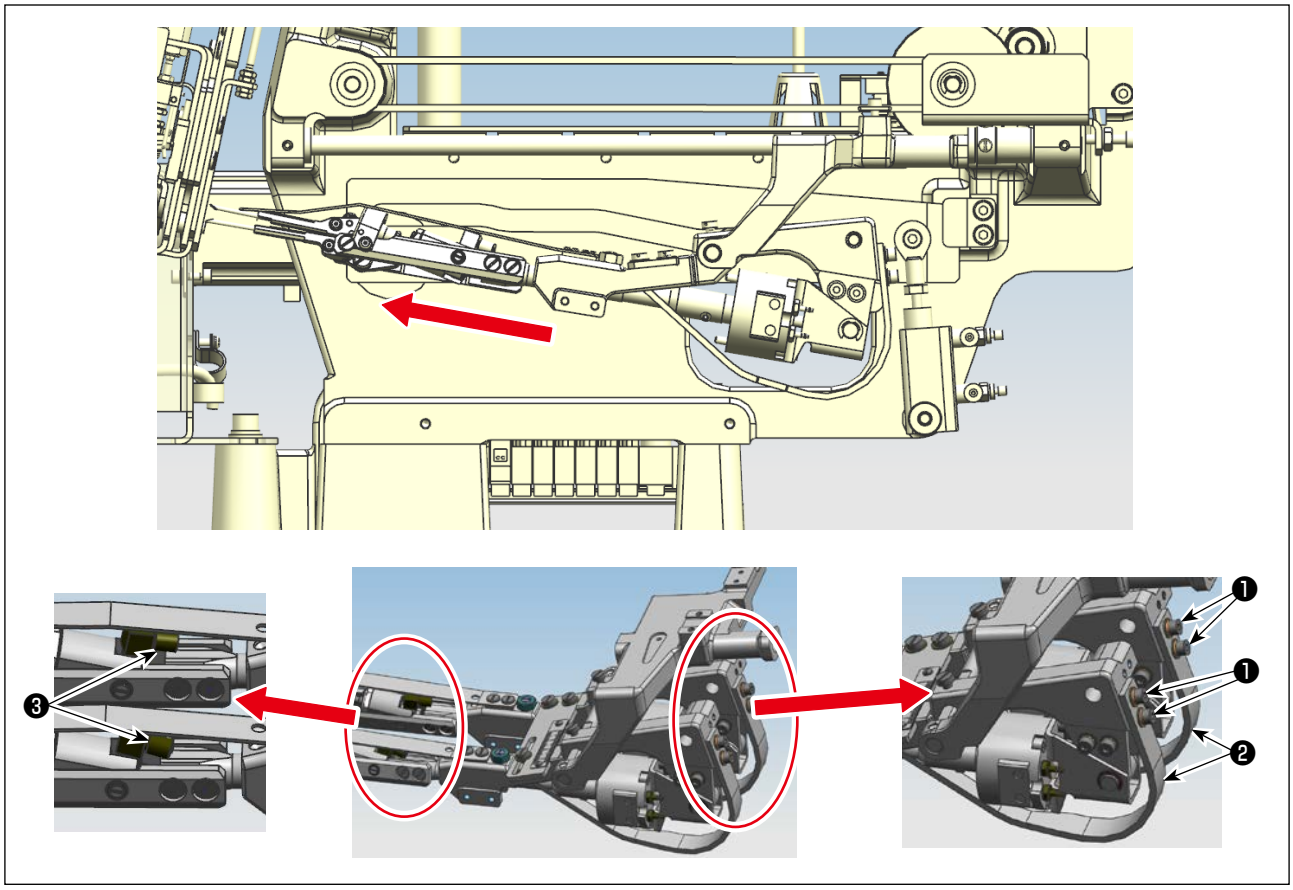


Remove the cover ❶ on the right side of the panel, and then set the DIP switch on the lower side of the side panel to ON.
(Refer to **"VI-6. Setting of DIP switches" P.31**.)

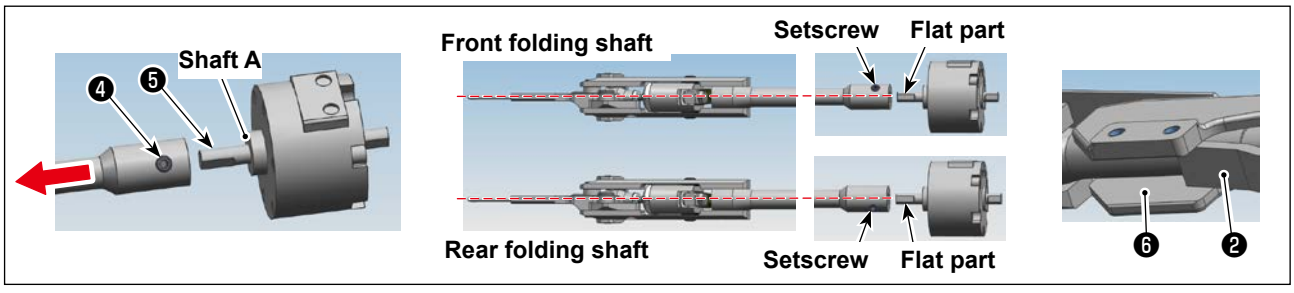
7. Replacing the loop folding shaft

WARNING

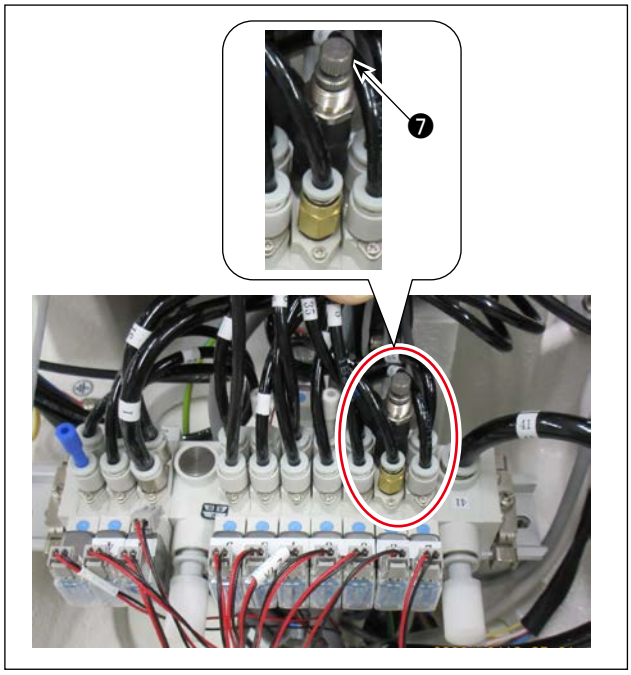
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



1) Turn OFF the power switch and the air.
2) Loosen folding shaft presser spring setscrews ❶ so that folding shaft presser springs ❷ do not push up the folding shafts.
3) Loosen the screws of joints ❸ and draw out the air tubes from joints ❸ .



4) Loosen folding shaft setscrew ❹ .
5) Move the folding shaft in the direction of the arrow to draw it out from driving gear shaft ❺ .
6) Take care not to mix up the front and rear loop folding shafts when installing them. Aligning setscrew ❹ with the flat part of gear shaft ❺ , press the loop folding shaft against the shaft A and tighten setscrew ❹ .
7) Insert the air tubes you have drawn out back to the respective joints ❸ and tighten the screws.
8) Tighten setscrews ❶ at the position where the tip of folding shaft presser spring ❷ does not come in contact with the inner surface of folding shaft bushing ❻ .

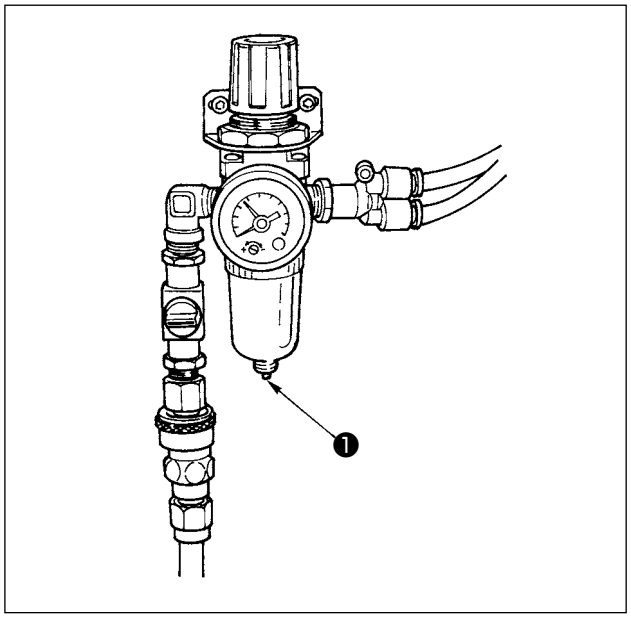


9) Adjusting the loop folding pressure
Minimize the loop folding pressure as long as both ends of the loop to be used can be folded.

[Adjustment]

Turn the adjustment screw of loop-folding pressure reducing valve ❼ on the base plate counterclockwise to minimize the pressure. Then, turn it clockwise gradually to increase the pressure to such a value as to fold the loop.

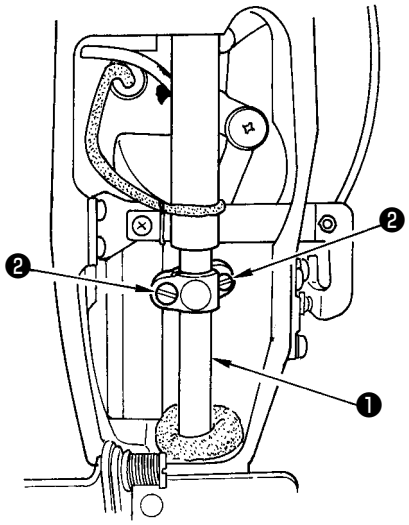
8. Draining

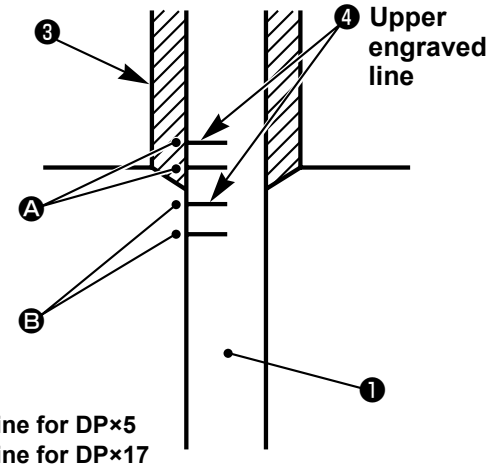


1) Draining has to be carried out once a day.
2) Press the portion ❶ upward, and draining is automatically performed.

9. Adjustment of the height of the needle bar

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





Ⓐ : Engraved line for DP×5
Ⓑ : Engraved line for DP×17

Bring needle bar ❶ to its lowest point, loosen two setscrews ❷ in the needle bar connection, and adjust the height of the needle bar so that upper engraved line ❹ on the needle bar meets the bottom end of needle bar lower bushing ❸ .

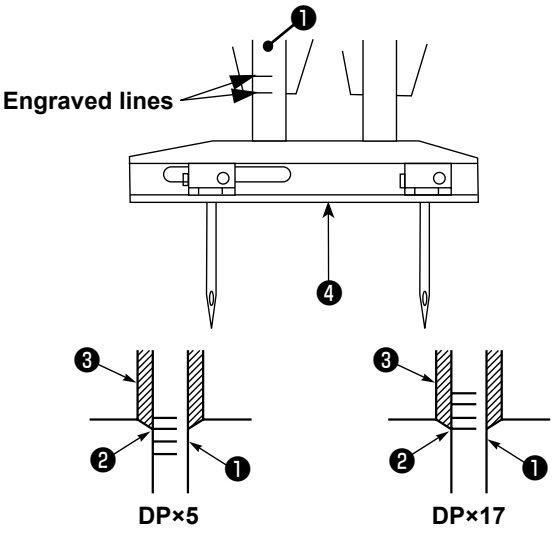
Be sure to check that there is no unevenness of torque after the adjustment.

* If stitch skipping should occur in accordance with the sewing conditions, lower the needle bar from upper engraved line ❹ on the needle bar by 0.5 to 1 mm to adjust the height.

10. Adjusting the needle-to-hook timing

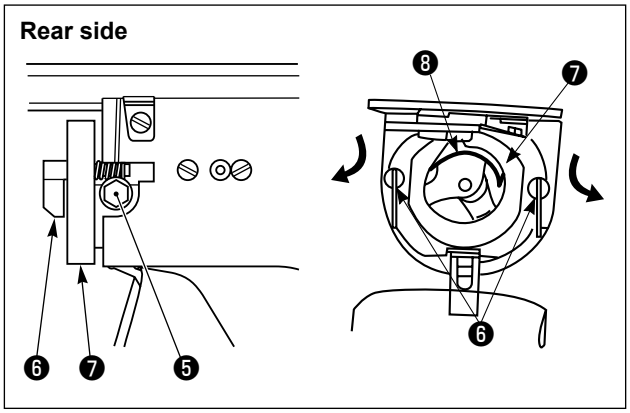
WARNING
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

Relation between needle and engraved lines



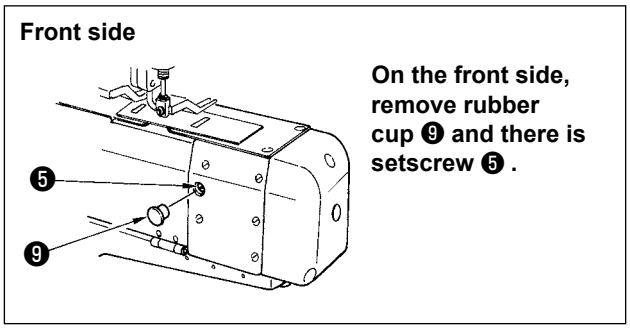
1) Turn the pulley by hand to lift needle bar ❶ from its lowest point until its lower marker line ❷ is aligned with the lower end of needle bar lower bushing ❸ .

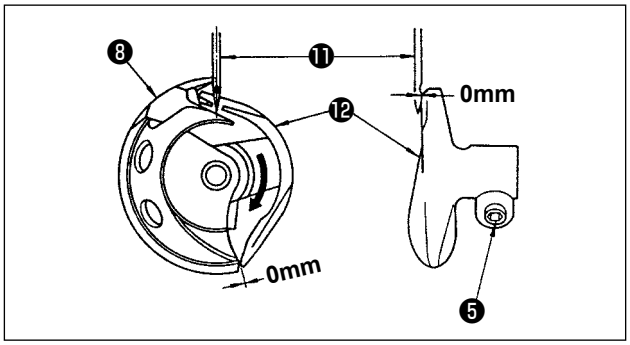
* When you use a DPx5 needle, check to make sure that needle bar frame ❹ does not come in contact with the presser foot.



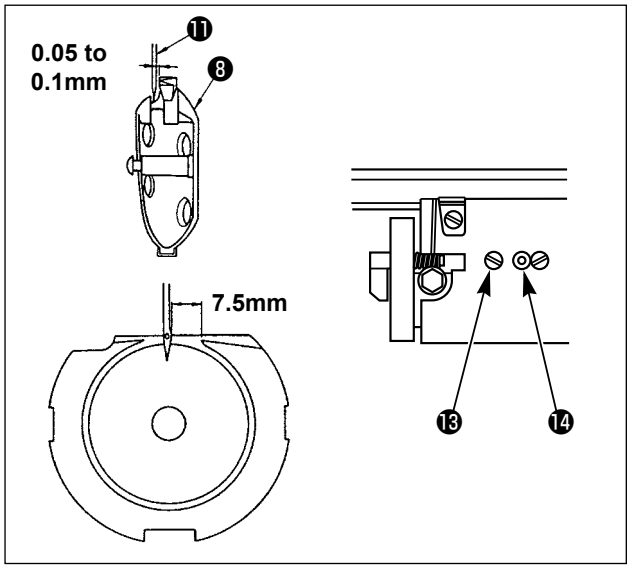
2) Loosen driver setscrew ❺ , open inner hook presser hooks ❻ to the right and left sides, and remove inner hook presser ❼ .

Caution At this time, be careful so as not to drop inner hook ❽ .





3) Align the blade point of inner hook ❽ with the center of needle ⓫ and adjust so that a clearance of 0 mm is obtained between the front end face of the driver and the needle since driver ⓬ receives the needle at its front end face to prevent the needle from being bent. Then, tighten driver setscrew ❺ .



Rear side

4) Loosen shuttle setscrew ⓭ , turn shuttle adjustment shaft ⓮ clockwise or counterclockwise, and adjust the longitudinal position of the shuttle so that a clearance of 0.05 to 0.1 mm is obtained between needle ⓫ and inner hook ❽ .

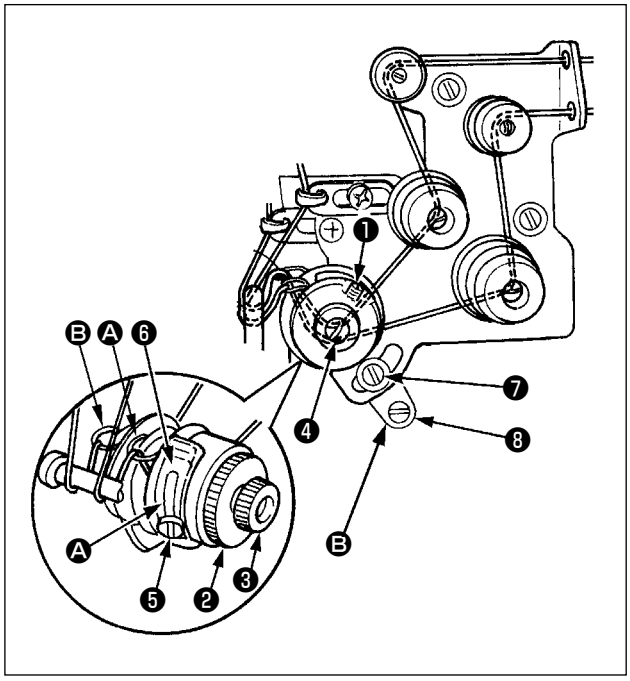
5) After adjusting the longitudinal position of the shuttle, adjust the direction of rotation so that a clearance of 7.5 mm is provided between the needle and the shuttle. Then, tighten shuttle setscrew ⓭ .

Front side

Refer to **"VII-1-(5) Adjusting the 1st hook position" P.35** .

11. Thread take-up spring

WARNING
Turn the power switch OFF before starting the work.



(1) Adjusting thread take-up spring Ⓐ (front side)

1) Loosen screw ❶ .
2) Turn knob ❷ clockwise to increase the pressure, and counterclockwise to decrease the pressure.
3) After the adjustment, tighten screw ❶ .

(2) Adjusting thread take-up spring Ⓑ (rear side)

1) Loosen thread take-up spring adjustment nut ❸ .
2) Turn thread take-up guide presser ❹ clockwise to increase the pressure, and counterclockwise to decrease the pressure.
3) After the adjustment, tighten thread take-up spring adjustment nut ❸ .

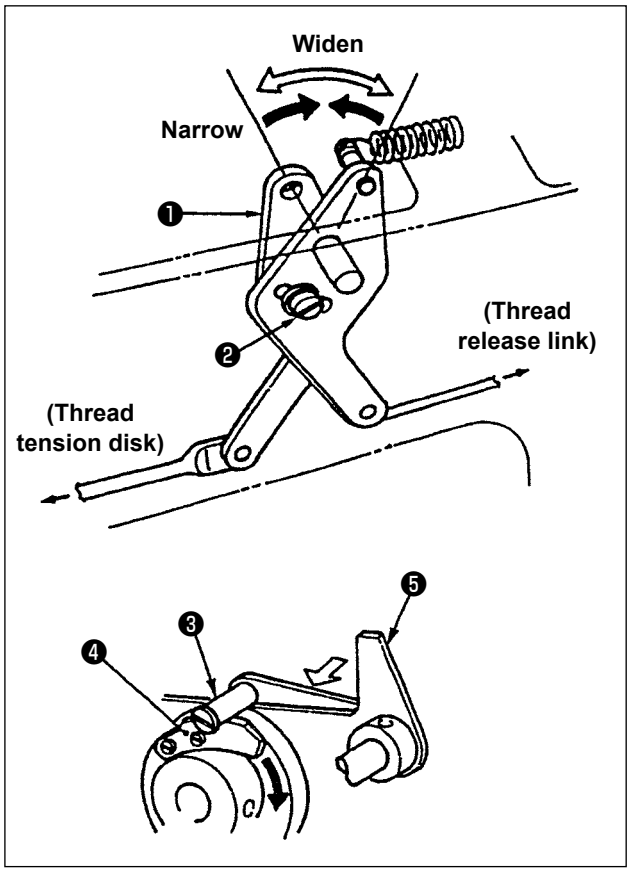
(3) Adjusting the stroke of the thread take-up spring, front side

1) Loosen setscrew ❺ in the thread take-up spring adjusting plate.
2) Move thread take-up spring adjusting plate ❻ . Move it clockwise to increase the stroke, and counterclockwise to decrease the stroke.

(4) Adjusting the stroke of the thread take-up spring, rear side

1) Loosen setscrew ❼ in the thread take-up spring adjusting plate.
2) Move thread take-up spring adjusting plate ❽ . Move it clockwise to increase the stroke, and counterclockwise to decrease the stroke.

12. Adjusting the rising amount of the thread tension disk



1) Remove the arm cover and confirm that thread release pin ❸ rides on thread release notch ❹ .
2) If the pin does not ride on the notch, press cam follower ❺ in the direction ⇨ by hand, make the main shaft rotate in the normal direction to bring to the state as shown in the illustration.
3) In such a state as the illustration, loosen screw ❷ in the thread release adjusting arm and move thread release adjusting arm ❶ to the right or left. The rising amount of the tension disk changes by moving it to the right or left.

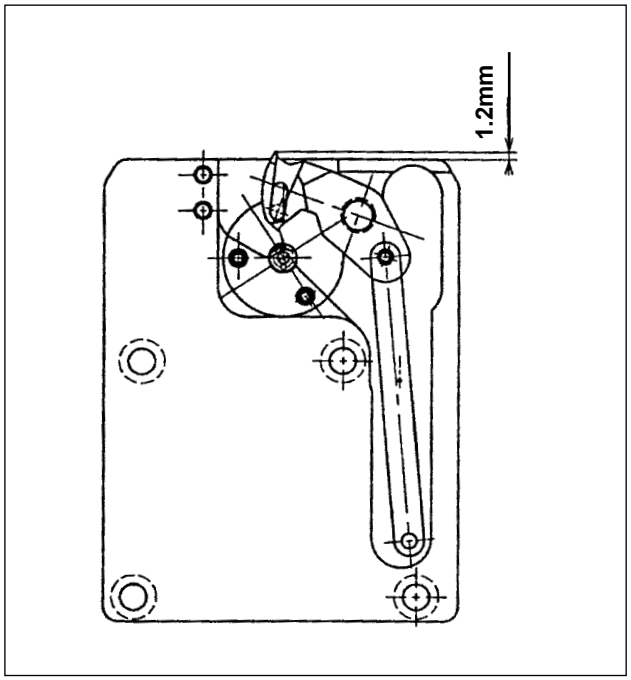
   0.6 to 1.0mm

If the rising amount is small, the length of remaining thread after thread trimming varies. Also, if it is large, defective disk closing after releasing the disk rising will occur.

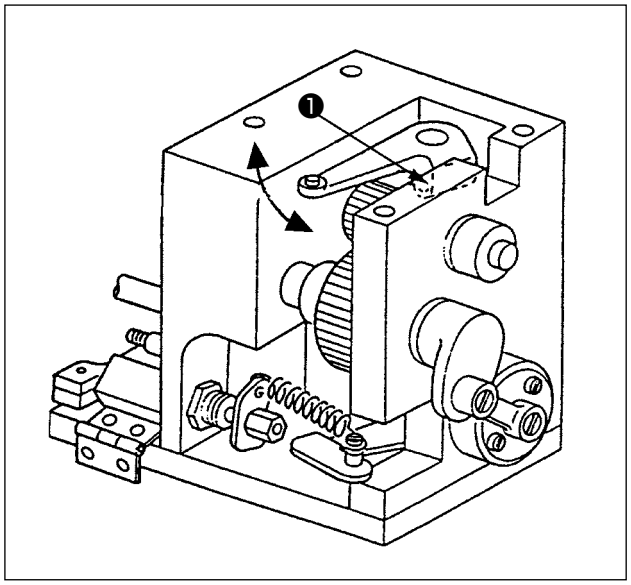
13. Adjusting the moving and counter knives

WARNING

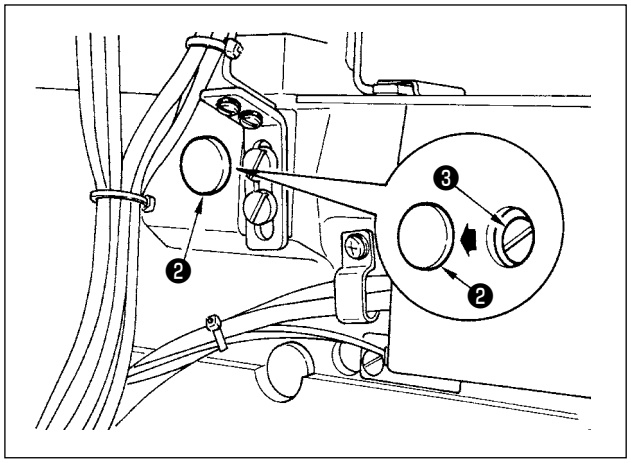
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



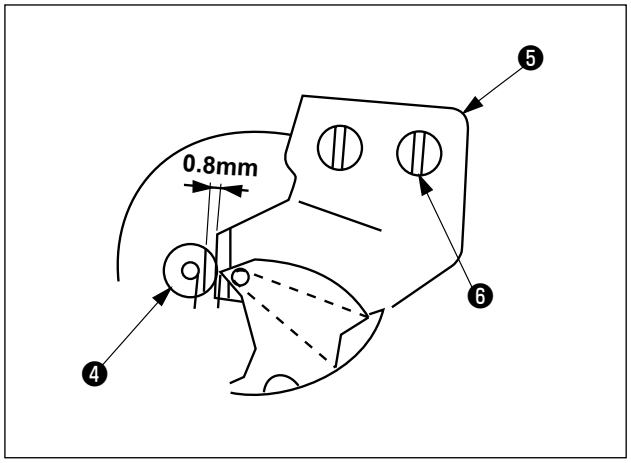
1) Adjust so that the top end of the moving knife protrudes by 1.2 mm from the front end of the throat plate.



2) **Front side**
Loosen setscrew ❶ in the thread trimming arm and adjust by moving it in the direction of arrow.

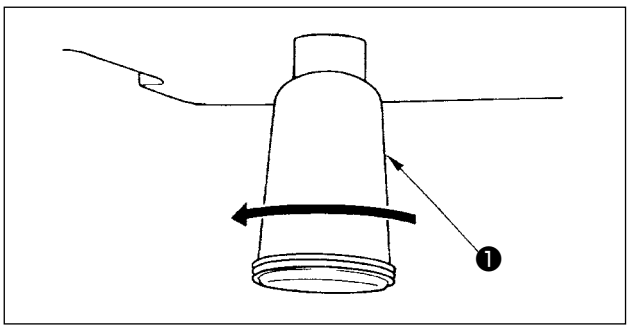


3) **Rear side**
Remove rubber cap ❷ located on the machine bed side and adjust by loosening setscrews ❸ in the thread trimming connection plate.



4) Loosen setscrew ❻ and adjust so that a clearance of 0.8 mm is provided between needle hole guide ❹ and counter knife ❺ .
(Same adjustment procedure for both front side and rear side)

14. Draining waste oil

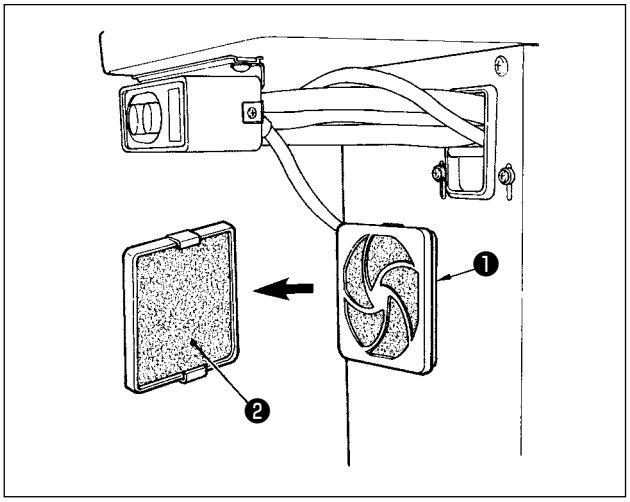


When polyethylene oiler ❶ becomes filled with oil, remove polyethylene oiler ❶ and drain the oil.

15. Cleaning the air filter

WARNING

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

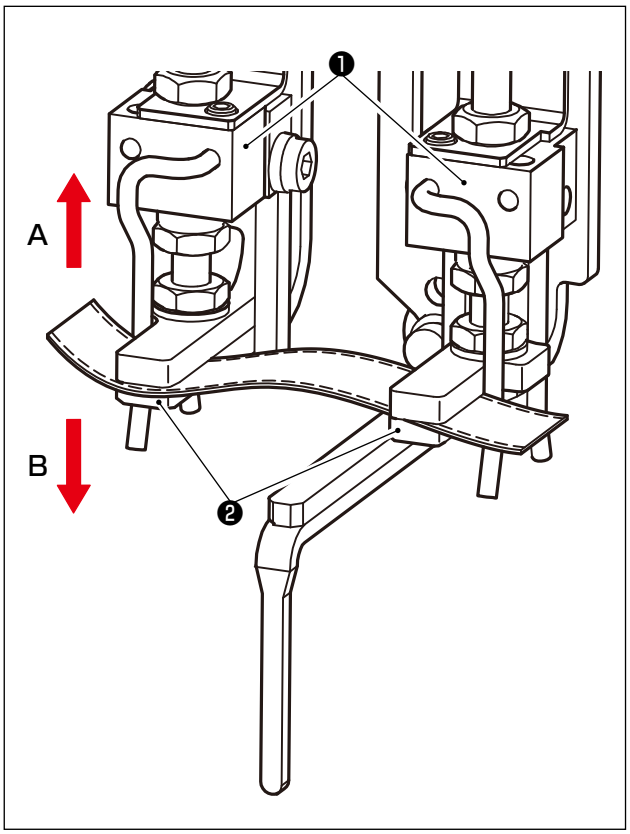


Clean filter ❷ of the control box fan once every week.

Temperature in the control box rises unless the filter is cleaned. As a result, it will be a cause of trouble (AL-13).

1) Pull screen kit ❶ in the direction of arrow to remove it.
2) Wash filter ❷ under running water.
3) Reinstall filter ❷ and screen kit ❶ in the original positions.

16. Belt loop retaining release function

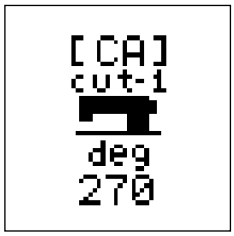


In case there is a belt loop currently held between the loop pressers and the loop receivers when performing adjustment of the machine, remove the belt loop. Pressing the standard screen key [◈], press the ten key [3], and loop pressers ❶ go up in the direction of **A**, and loop receivers ❷ come down in the direction of **B**. Perform the adjustment after removing the belt loop.

17. Maintenance screen

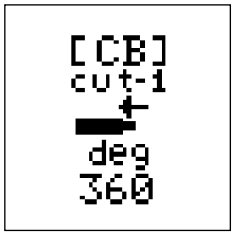
Turn ON the upper DIP SW No. 2 located on the right side of the operation box panel, and pressing the standard screen key , press ten key “1” to enter the adjustment screen.

(1) [CA] Setting of starting angle of the 1st hook thread trimming cylinder drive



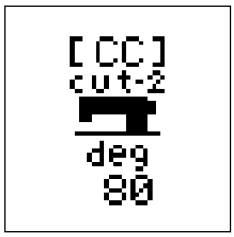
Starting angle of the 1st hook thread trimming cylinder drive can be set.
The angle at which the rod of thread trimming lever enters the cam is specified.

(2) [CB] Setting of ending angle of the 1st hook thread trimming cylinder drive



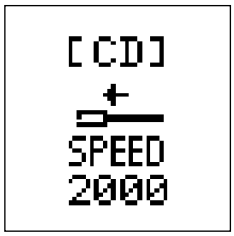
Ending angle of the 1st hook thread trimming cylinder drive can be set.
Angle at which thread is actually trimmed is specified.

(3) [CC] Setting of starting angle of the 2nd hook thread trimming solenoid drive



Starting angle of the 2nd hook thread trimming solenoid drive can be set.
The angle at which the rod of thread trimming lever enters the cam is specified.

(4) [CD] Setting of the speed of the loop clamp feed unit

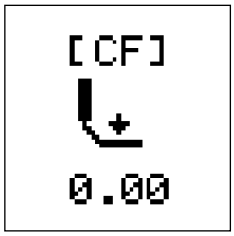


Maximum speed of the longitudinal movement of the loop clamp feed unit can be set.
Standard setting : 2,000 Unit : PPS
Standard speed of the loop clamp feed unit is determined at the necessary speed for actually performing sewing work.
If the speed is set at more than 2,000, the speed of the loop clamp feed unit is increased and the cycle time of the machine is increased. However, it is necessary to actually limit the handling time within 0.5s and not substantial to increase the speed more than 2,000.
Further, speed is inverse proportion to driving torque. If the speed is increased, the torque is decreased, and drawing force of belt loop is decreased.

(5) [CE] Setting of the machine head X-Y drive timing

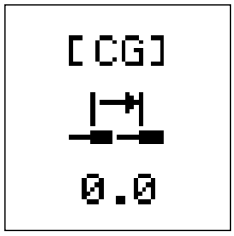
Timing of the movement of needle and movement of machine head X-Y can be selected.
Standard is 50°, and 30° and 70° can be selected.
The angle to be set means the ending angle of the X-Y movement. The setting is changed depending on the problem whether needle pierces or needle comes off since the time of X-Y movement is the same.

(6) [CF] Setting of the period of time during which the cloth presser foot stops



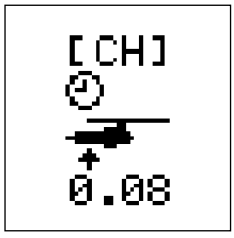
The cloth presser foot when delivering the belt loop presses belt loop and the fork comes off after a certain time has passed. The period of this time can be set.
Standard set value is 0.00s.
If the dog ear is dissatisfied, set the period of this time longer so that the cloth presser foot can securely press the belt loop.
However, the cycle time is extended as much as the set value.

(7) [CG] Setting of traveling backward distance of the fork at low speed at the time of set back



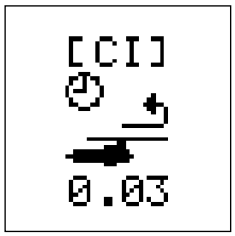
When performing the set back, the loop travels backward further from the place where it comes in contact with the stopper plate.
This is the function to travel backward the fork at low speed to securely eliminate the loop at this time.
This function does not work at set value “0”. The function works with the input value and the traveling backward distance is inputted.
The speed of traveling backward at this time is constant and cannot be changed.

(8) [CH] Setting of the length of time at the time of change-over of the supply slide base cam



Standard setting time is 0.08s.
Perform change-over of the supply cam up/down cylinder before this time in anticipation of the time when the supply slide base travels backward to the end of its stroke.

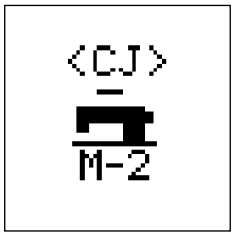
(9) [CI] Setting of waiting time when the supply slide base travels backward to the end



Standard setting time is 0.03s.
The recommended value for the MOL-254N (Model setting: CO=01) is 0.1s.
Length of time to wait for calming down of damping of the jumping movement when the folding shaft is changed over to up position by means of the change-over of cam.
If the shaft goes to clamp the belt loop before calming down of damping of the jumping movement, the shaft may not be able to securely clamp the belt loop.
The setting time affects the cycle time when the belt loop is clamped at the first time, and set back is performed.
When sewing is continuously performed, it takes time until the belt loop is drawn out and this setting time does not affects the cycle time.

When clamping mistake of the belt loop occurs even if the setting time is extended, slippage of the height of fork is considered. Check the installing dimension of the components.

(10) [CJ] Function of individual operation of the machine head



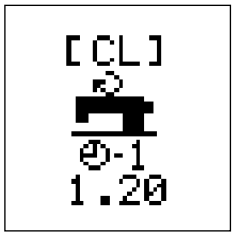
Driving of the machine drive motor only is performed.
The respective modes, M-0, M-1 and M-2 can be selected.
M-0 : Individual operation of machine head is prohibited. (Normal operation is prior.)
M-1 : Machine head drive motor runs at the specified speed.
M-2 : Machine head drive motor runs at the specified speed and stop of setting time is repeated.

Start button for starting operation is the starting switch of the upper DIP SW No. 8 located on the right side of the operation box panel for safety.

(11) [CK] Setting of the number of revolutions of the machine head motor

Number of revolutions of the machine head motor when operating [CJ] is set.
This is the number of revolutions at the time of start, and the number of revolutions can be changed through the operation box panel when the machine head starts up.
This is not displayed unless M-1 or M2 of [CJ] setting is set.

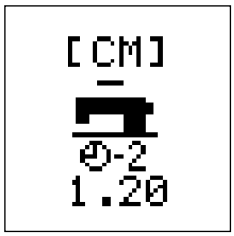
(12) [CL] Setting of the machine head motor operating time



Operating time of the machine head when operating [CJ] is set. This setting performs operation and stop based on the number of revolutions set in [CK] and stop time of set value in [CM].
Operation or stop is performed based on [CM] set value.
This is not displayed unless M-2 of [CJ] setting is set.

The machine head operates within the setting time regardless of the number of stitches.

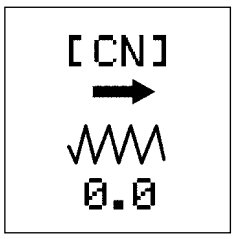
(13) [CM] Setting of the machine head motor stop time



Stop time of the machine head when operating [CJ] is set. This setting performs operation and stop based on the number of revolutions set in [CK] and operating time of set value in [CL].
This is not displayed unless M-2 of [CJ] setting is set.

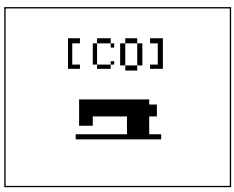
The machine head operates within the setting time regardless of the number of stitches.

(14) [CN] Setting of the position compensation of the machine head and the supply device



Compensation of the position of the machine head and the supply device is performed.
Positioning using the positioning jig or the like is performed in the production line. However, the final fine adjustment is electrically performed.

(15) [CO] Setting of the model

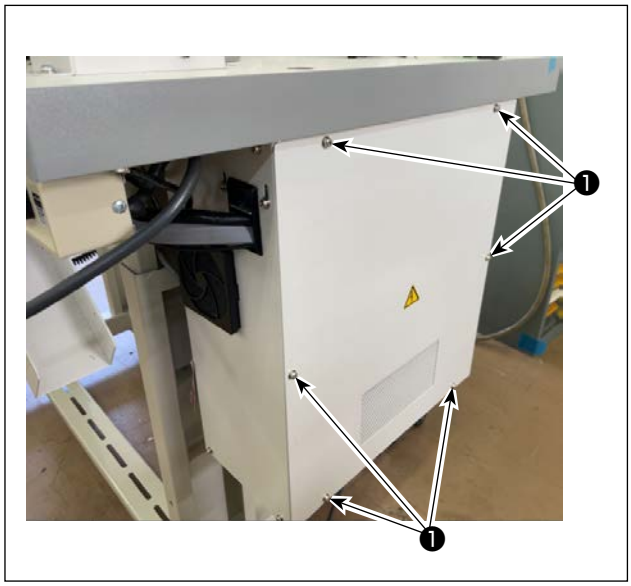


0 : MOL-254
1 : MOL-254N
Carry out setting in accordance with the model of the sewing machine you use.
If this setting does not match the model, the belt loop length will not be correct.

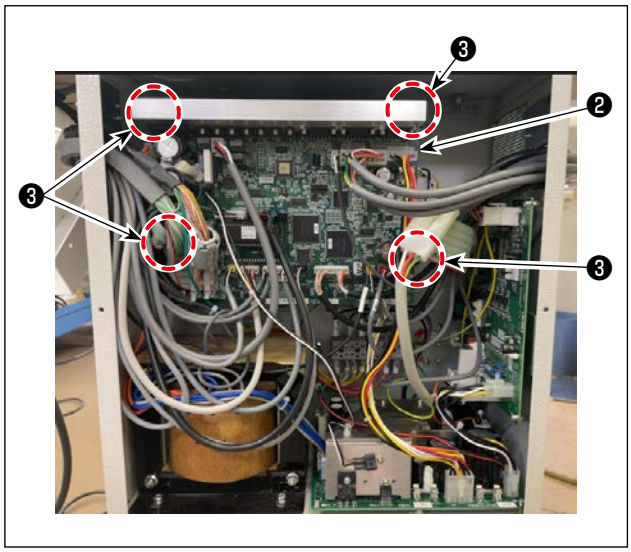
18. Disposal of batteries

A built-in battery is installed on the MAIN PCB in the electrical control box for backing up the memory when the power is OFF.
Appropriately dispose of the battery pursuant to the laws and regulations of your country.

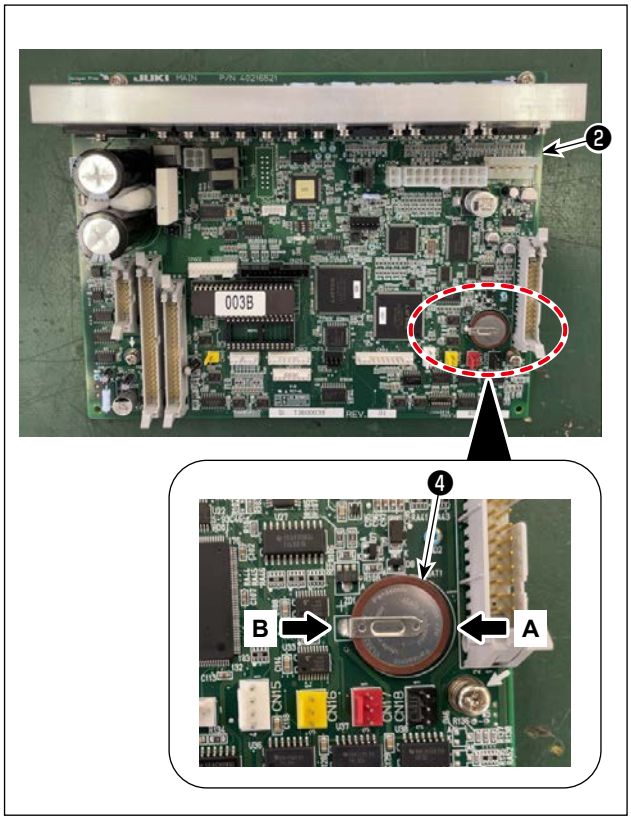
[How to remove the battery]



1) Remove six setscrews ❶ of the lid of the electrical control box to open the lid.

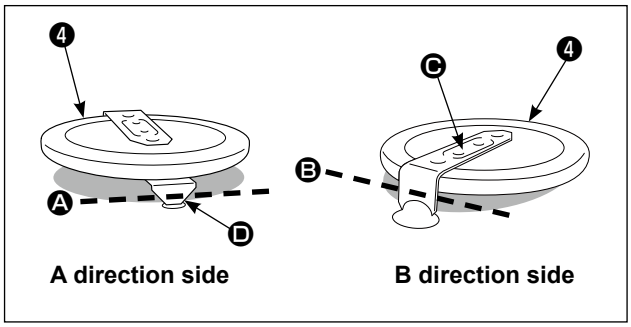


2) Remove the connectors connected to MAIN PCB asm. ❷ . Remove four PCB setscrews ❸ to remove the PCB.



3) ❷ is the MAIN PCB you have removed.

4) ❹ is the backup battery.
Type : VL2020



5) Cut metal plate (Ⓓ) that secures battery (Ⓐ) with nippers or the like at position
6) Cut metal plate (Ⓒ) that secures battery ❹ with nippers or the like at position (Ⓑ). Then, remove battery ❹ .

Carefully protect your fingers from being cut with the cut edge of the metal plate.

VIII. ALARM LIST

Alarm No. is displayed in the display screen of the operation panel when an alarm occurs.

No.	Item	Description
AL-01	Trouble M-axis motor driver (Trouble SDC)	Servomotor for the sewing machine is trouble. Refer to the alarm list for SDC printed circuit board.
AL-04	Trouble X-axis feed	In case where pulse output is not completed within the specified feed section.
AL-07	Trouble Y-axis feed	In case where pulse output is not completed within the specified feed section.
AL-10	Insufficient air pressure	This occurs when the air pressure sensor detected insufficient pressure.
AL-11	Temporary stop	This occurs when “Temporary stop” button on the operation panel is pressed.
AL-13	Abnormal temperature	This occurs when temperature in the control box is abnormally high.
AL-15	Trouble start switch	Start switch is pressed at any time.
AL-20	No pattern	The pattern has not been registered.
AL-21	Thread trimming detection	This occurs after completion of sewing when thread breakage was detected during sewing.
AL-25	Outside input data value	This occurs when the numeric value entered in the panel is outside of the range of each item. Alarm is displayed from the result of stitch length calculation as well.
AL-26	Outside input data value	Fork excessively advances and comes in contact with the stopper when sewing by the numeric value entered in the panel.
AL-30	Trouble X movement limit	In the case where the sewing table reached movement limit value.
AL-31	Trouble Y movement limit	In the case where the sewing table reached movement limit value.
AL-32	Safety SW error	This occurs when pressing the start switch while the machine head is tilted.
AL-41	Trouble needle up	When operation starts, the needle up position is checked. This alarm occurs when the needle up detection is not performed at this time.
AL-43	Trouble setting of belt loop thickness	This occurs when setting of thickness of belt loop cut section is not performed.
AL-44	Trouble RAM	This occurs when turning ON the power, and when a defect is detected in checking of RAM on CPU printed circuit board.
AL-45	Trouble belt loop supplying device	This occurs when the drawing device (pull-out device) is not in the predetermined position. (This occurs in case of step-out of stepping motor.)
AL-46	Warning for no existence of belt loop	This occurs when the belt loop thickness comes down to the level of no existence of loop.
AL-48	Trouble fork movement	This occurs when movement of servomotor is not completed within a certain period of time or when traveling backward end sensor does not operate although the fork is traveled backward by the initialization operation.
AL-49	Servo alarm for belt loop supplying device	This occurs when “servo for belt loop supplying device” on CPU printed circuit board outputs alarm. Refer to the alarm list for MAIN printed circuit board.
AL-50	Trouble communication	When trouble has occurred in communication function inside MAIN printed circuit board.

No.	Item	Description
AL-51	Trouble signal at the traveling forward end of fork	
AL-52	Servo free for belt loop supplying device	
AL-53	Trouble movement of servo for belt loop supplying device	
AL-55	Occurrence of belt loop block	
AL-56	Trouble belt loop elimination	This occurs when belt loop cut section of 200 mm or more is detected.
AL-57	Trouble belt loop clamp	This occurs when belt loop clamp cannot clamp belt loop.
AL-61	Hook cover release	This occurs when hook cover is opened (excluding bobbin replacement, bobbin clearance adjustment and threading operation).
AL-62	Trouble hook movement origin sensor	This occurs when origin is not detected although hook movement is performed and origin retrieval is performed.
AL-63	Abnormal temperature of POWER circuit board	This occurs when temperature of POWER circuit board is abnormally high.

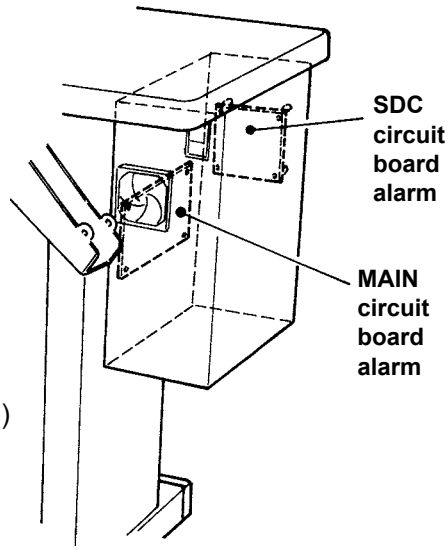
WARNING

It is necessary to remove the control box cover in order to check the alarm indication lamp on the printed circuit board in the state that the power is turned ON. There is a danger of electric shock by contacting high voltage section. So, never place your hands in the control box.

Check with the number of blinking times of the red LED lamp on the printed circuit board.
Count the long blinking as “1st” and continue to count the short blinking as “2nd” time and after.

* Alarm list for SDC printed circuit board (refer to the item of No. AL-01.)

1st time - Motor-lock
2nd time - Trouble upper dead point sensor
3rd time - Detection of trouble motor encoder
4th time - Detection of trouble motor position sensor
5th time - Signal of motor driver element error
6th time - Detection of low voltage of power voltage
7th time - Detection of motor control current limitation value
8th time - Detection of high voltage of power voltage
9th time - Trouble motor rotation direction
10th time - Input of motor control method



* Alarm list for MAIN printed circuit board (refer to the item of No. AL-49.)

1st time - Motor-lock
2nd time - Blown-out of fuse
3rd time - Trouble power voltage, outside of range of power voltage
4th time - Trouble boosting voltage, trouble of predriver inside the printed circuit board
5th time - Disconnection of encoder cable
6th time - Detection of predriver abnormal current
7th time - Abnormal temperature of predriver, abnormal rise of temperature inside control box.
8th time - Shift of fork position
9th time - Fork overrun error
10th time - Accumulated pulse overflow
11th time - Trouble overload
12th time - Trouble overload
13th time - Trouble number of rotations
14th time - System error
15th time - Loop sensor detection error

IX. PHENOMENA, CAUSES AND CORRECTIVE MEASURES OF TROUBLES IN SEWING

No.	Phenomenon	Cause	Corrective measure
1	Thread slips off the needle eyelet at the start of sewing.	① Stitches skip at the start of sewing.	Make a clearance of 0.05 to 0.1 mm between needle and hook. Delay the sewing speed at the start of sewing.
		② Length of needle thread remaining at the needle after thread trimming is short.	Decrease tension of the thread tension No. 1. Increase tension of the thread take-up spring. Decrease stroke of thread take-up spring.
		③ Bobbin thread is short.	Decrease tension of the bobbin thread. Adjust the disk rising timing.
2	Thread breakage occurs many times.	① Hook or driver has a scratch.	Remove the part and polish it with a fine grind stone or buff.
		② Finish of needle eyelet is not good.	Replace the needle with a new one.
		③ Presser foot comes in contact with needle.	Adjust position of the presser foot.
		④ Shuttle groove is clogged with thread waste.	Remove the thread waste.
		⑤ Needle thread tension is too high.	Decrease tension of the needle thread.
		⑥ Thread take-up spring pressure is too strong.	Decrease tension of the thread take-up spring.
		⑦ Arm thread guide has a scratch.	Polish it with buff or replace it with a new one.
		⑧ Thread is weak.	Delay the sewing speed.
3	Needle breakage occurs many times.	① Needle is bent.	Replace the needle with a new one.
		② Presser foot comes in contact with needle.	Adjust position of the presser foot.
		③ Needle is too thin.	Change the needle No. in accordance with sewing products.
		④ Needle is excessively bent by driver.	Adjust the position of the needle and driver.

No.	Phenomenon	Cause	Corrective measure
4	Thread cannot be cut.	① The last stitch skips.	Adjust the needle-to-hook timing.
		② Initial position of moving knife is not proper.	Adjust initial position of the moving knife.
		③ Counter knife is not sharp.	Replace the counter knife with a new one.
5	Stitches skipping occurs many times.	① Needle-to-hook timing is not proper.	Adjust the needle-to-hook position.
		② Clearance between needle and inner hook is too large.	Adjust the needle-to-hook position.
		③ Needle is bent.	Replace the needle with a new one.
		④ Needle is excessively bent by driver.	Adjust position of the driver.
		⑤ Attaching the needle is changed.	Attach the needle with the long groove turned slightly to the right.
		⑥ Change the height of the loop guide.	Make the tip of the loop guide higher than the garment body.
6	Poorly tensed stitches are made.	① Needle thread tension is not sufficient.	Increase tension of the needle thread.
		② Thread tension disk No. 2 is rising.	Adjust rising amount of the thread tension disk.
		③ Cloth feed timing is not proper.	Adjust the cloth feed timing.

X. PHENOMENA, CAUSES AND CORRECTIVE MEASURES OF TROUBLE

Phenomenon	Cause	Corrective measure
1. Belt loops cannot be cut.	1. Moving knife fails to cut belt loops sharp.	Grind the blade section of the moving knife or replace the moving knife with a new one.
	2. Moving knife and counter knife fail to properly engage with each other.	Check whether the the moving knife collar setscrew has loosened.
	3. Moving knife drive cylinder fails to work.	Check operation of cylinder or solenoid valve, or check whether air pipe is crushed.
	4. Position of the moving knife cylinder sensor is shifted.	Check operation of the sensor and adjust the position.
2. Belt loops cannot be cut neatly.	1. Blade of the moving knife/counter knife has worn out. 2. Mounting failure of the counter knife. 3. Blade of the moving knife/counter knife is nicked.	Grind the blade of the moving knife/counter knife or replace it with a new one.
3. Loop is not cross-cut at the center.	1. The loop cutting position of the knife for cutting the loop is wrong.	Refer to the item of “Adjusting the width of belt loops”. (Refer to **"VII-2. Adjusting the width of belt loops" P.38**.)
	2. Loop guide B is not high enough and is pushing on the belt loop when knife is rotated.	Raise the height of loop guide B to provide a clearance with the belt loop.
4. Belt loop clogs in the binder.	1. Inside measurement dimension of the binder does not correspond with the belt loop.	Turn OFF the power switch and remove the loop that clogs in the binder. Adjust the binder to the loop width (splice section).
	2. Moving knife does not fully go up.	Check whether air pipe is crushed.
5. Belt loop folding amount is excessive or too small.	1. Folding amount on front side Adjustment of the loop feeding unit is not proper.	Adjust the loop feeding unit.
	2. Folding amount on the rear side Data value of item (BC) in the adjustment screen is not proper.	Adjust and change the data of (BC) value in the adjustment screen.

Phenomenon	Cause	Corrective measure
6. Splice section is not discharged and sewn as a loop.	1. (BD) or (BE) value in the setting screen is not proper. 2. Splice detection data set value is not proper.	Adjust and change the value of top end portion of splice (BD). Adjust and change the value of rear end portion of splice (BE). Re-input the splice detection data. (Refer to **"VII-4. Adjusting the belt loop splice detector" P.41**.)
7. Clamp feed section cannot clamp belt.	1. Loop feeding data (BC) is not proper. 2. Loop is caught.	Adjust and change (BC) value in the adjustment screen. Check whether the loop is caught and remove the place of trouble.
8. Clamp feed section cannot pull out the specified amount of the loop.	1. Loop feeding data (BC) is not proper. 2. Loop is caught.	Adjust and change (BC) value in the adjustment screen. Check whether the loop is caught and remove the place of trouble
9. Bartacking position does not correspond with the loop position.	Position of loop gathering claw is not proper as in such a case that the loop gathering claw does not gather the loop.	Adjust position of the loop gathering claw. Refer to the item of “Adjusting the width of belt loops”. (Refer to **"VII-2. Adjusting the width of belt loops" P.38**.)
10. Bartacking position does not correspond with the loop position.	Loop width set value (1F) is not proper. Position is shifted due to the characteristics of the material.	Adjust and change set value (1F). Adjust and change set value (1G).
11. Length of the loop fed is short. (MOL-254)	The feed mechanism does not match the model setting.	Conduct the model setting (CO).
12. Length of the belt-loop fed is long. (MOL-254N)	The feed mechanism does not match the model setting.	Conduct the model setting (CO).

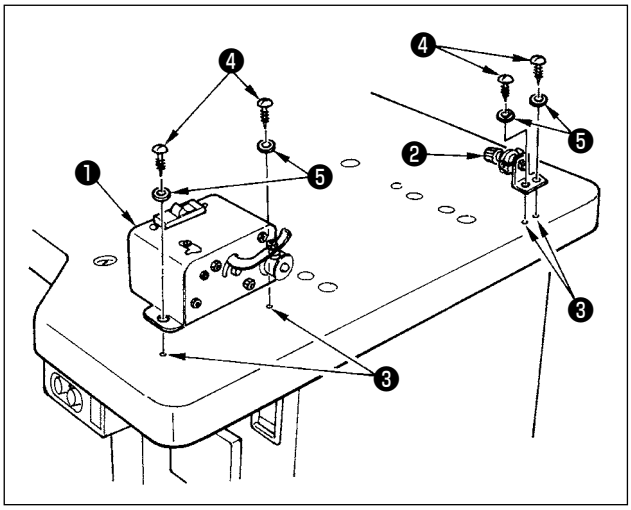
XI. OPTIONAL

Name	Function
1. Belt loop detector (40285831)	The belt loop detector generates an alarm if loops are entangled and cannot be supplied as specified.
2. Belt-loop pull-out device (40308006)	It is the device that slackens the belt loop to lower the tension applied to it so as to stabilize the supply of the belt loop. It generates an alarm if the belt loop is entangled and cannot be supplied as specified.
3. Air gun (40285832)	Air spray
4. Needle cooler (40285833)	It decreases the rise of needle heat, and decreases occurrence of needle thread breakage due to needle heat.
5. Needle thread breakage detection device (40285834)	It detects when needle thread is broken, and stops to make the alarm display.

XII. Optional parts

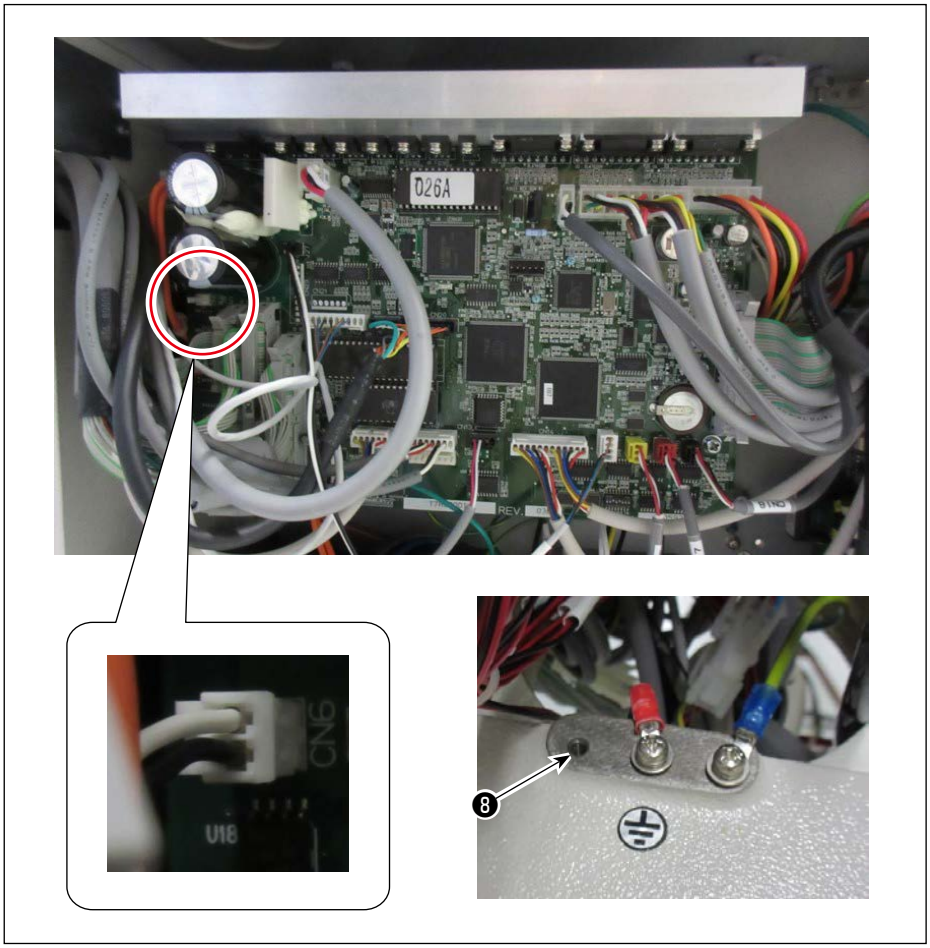
1. Tabletop mounting type bobbin thread winder

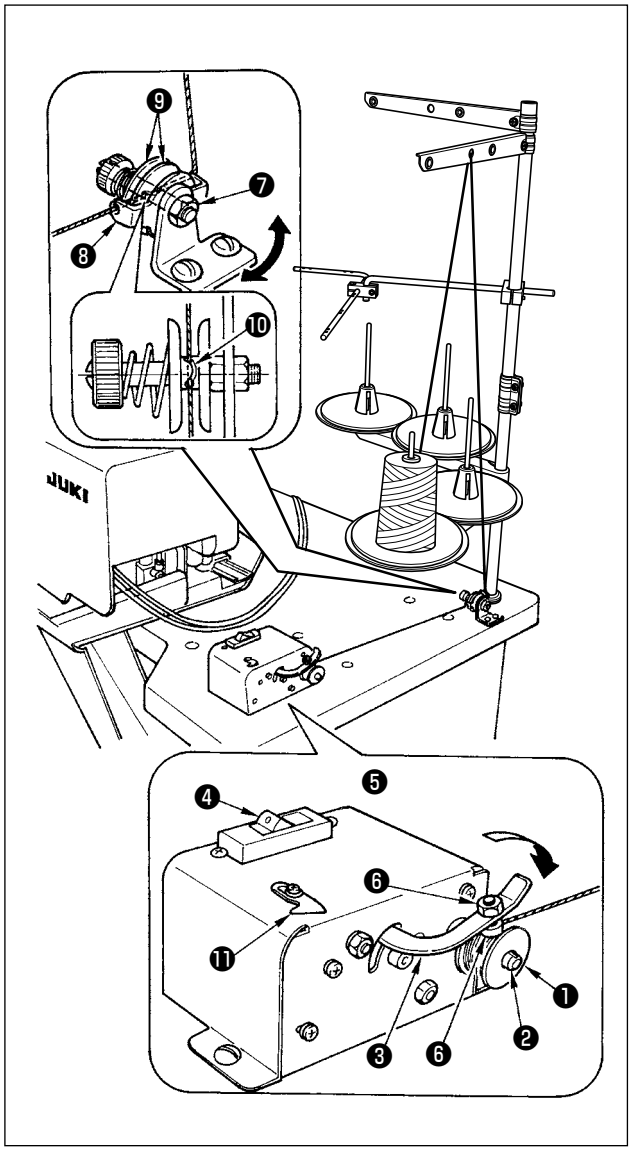
Name	Part number × Quantity	
Electric bobbin thread winder	❶ 13870266 × 1	❺ WP0501016SC × 4
	❷ 13889951 × 1	❻ M85066100A0× 1
	❹ SK3412001SE × 1	❼ SL4040891SC × 1



[Installation method]

1) Secure bobbin thread winder ❶ and bobbin thread winding tension controller ❷ respectively with screws ❹ and washers ❺ while aligning them with prepared holes ❸ in the right side of the table as shown in the figure on the left.
2) Insert the cable of bobbin thread winder ❶ into junction cable ❻ (8P).
3) Remove the lid of the electrical control box. Insert junction cable (2P) into the CN6 of the MAIN PCB. Then, attach the lid.
4) Secure the ground wire of bobbin thread winder ❶ to vacant tap ❽ with screw ❼ .





[Winding the bobbin thread]

1) Insert bobbin ❶ into bobbin shaft ❷ .
2) Pass thread through thread guide ❽ , open thread tension disks ❾ , and enter the thread into the slit of thread tension post ❿ .
3) Wind thread 4 to 5 turns with bobbin ❶ in the direction of arrow, press bobbin presser ❸ to bobbin side (in the direction of arrow), and turn switch ❹ ON. Then, thread winding starts.
4) To adjust the thread winding amount, loosen thread winding amount adjustment nut ❺ , and perform the adjustment with thread winding amount adjustment screw ❻ . When screwing in screw ❻ , thread winding amount decreases, and increases by turning the screw in the reverse direction.
5) When the thread is one-sidedly wound with bobbin ❶ , loosen screw ❼ and move thread guide ❽ in the direction of arrow to adjust.
6) When thread winding with bobbin ❶ is completed, put thread on thread cutter ⓫ to cut it.

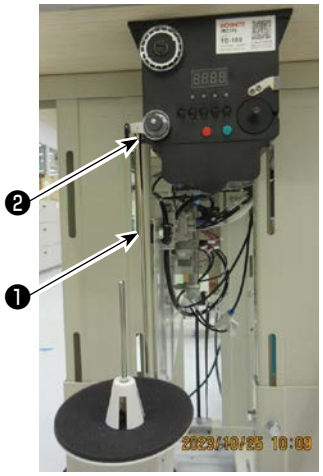
For reference, wind the bobbin thread around the bobbin to the extent of 80 % of its capacity.

The bobbin thread winder incorporates a safety device to protect the motor against heat caused by continuous operation or overload caused by winding path anomalies.

If the motor fails to run when switch ❹ of bobbin case holder positioning finger ❸ is placed in ON, the bobbin thread winder is in the state where its protective device is working. Approximately five minutes after you have turned OFF switch ❹ , the protective device will be reset to allow the motor to run normally. When resetting the protective device, check the thread winding path for anomalies.

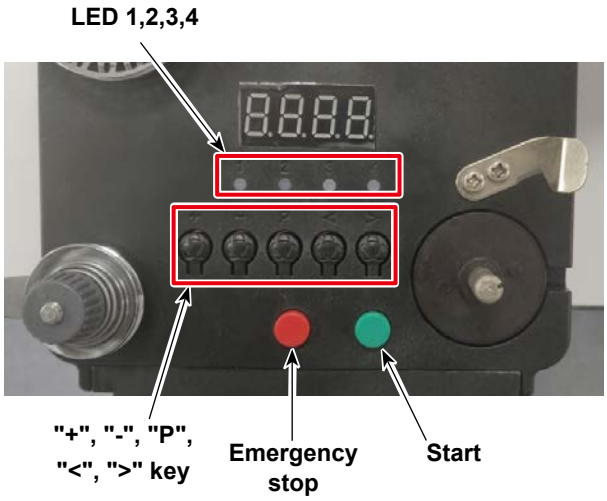
2. Under-table mounting type bobbin thread winder

Name	Part number
Bobbin thread winder (asm.)	40228356

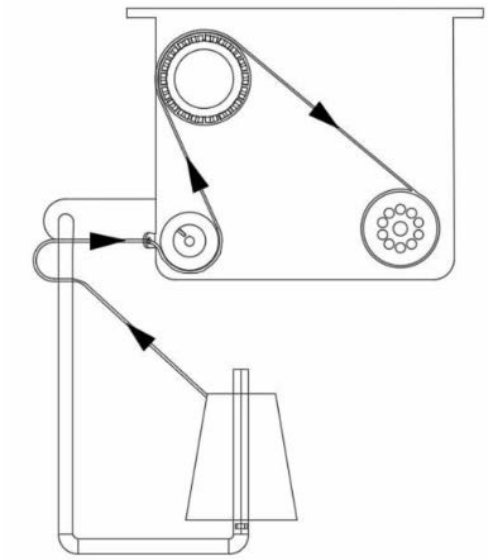


[Installation method]

Insert bobbin thread winder mounting rod ❶ into hole ❷ in the bobbin thread winder and secure with a nut.



Threading Diagram



[Winding the bobbin thread]

1. Button description

1) Red button: emergency stop, press this button for 2 seconds will be reset.
2) Green button: Start
3) "P" key: function key, Hold down "P" key for 2 seconds to enter parameter setting, after setting is finished, press this key again for 2 seconds to keep parameter.
4) "+" key: numbers from 0 to 9
5) "-" key: numbers from 9 to 0
6) "<" key: turn left
7) ">" key: turn right

2. Indicator light

1) Parameter indicator light
2) Production failure indicator light
3) Stop indicator light
4) Work indicator light

3. Parameter setting

Hold down "P" key for 2 seconds to enter the parameter setting inter face.

A: The thread length setting is 0 to 99.9 meters
B: Compensate for 0 to 9.9 meters
C: The bobbin calculate to thread length 0 to 99.9 meters
D: Motor speed: F1 (fast), F2 (medium), F3 (slow)
E: LED lamp brightness: H0 (OFF), H1 (darkest), H2, H3, H4, H5 (brightest)