

ENGLISH

**PS-910-13090
INSTRUCTION MANUAL**

CONTENTS

1. SPECIFICATIONS	1
2. CONFIGURATION.....	3
3. INSTALLATION	4
3-1. Setting up the sewing machine	4
3-1-1. Unpacking	4
3-1-2. Setting up the X-feed mechanism.....	6
3-1-3. Setting up the table	9
3-1-4. Setting up the switches, bobbin thread winder and switch button (asm.)	11
3-1-5. Points to be checked and precautions to be taken before turning the power ON	12
3-1-6. Installing the air hose	14
3-1-7. Cautions for the compressed air supply (source of supply air) facility.....	15
3-1-8. Checking the needle entry point and hook timing	16
3-1-9. Checking the concentricity (How to handle the case where you have checked the timing between the needle entry and the hook as described in 3-1-10 and have found it is not correct)	18
3-2. Installing the bobbin winder device	30
3-3. How to use the bobbin thread winder.....	30
3-4. Precautions for installation of the machine	31
4. PREPARATION OF THE SEWING MACHINE.....	32
4-1. How to attach / remove the cylinder lifting plate	32
4-2. Lubricating method and check of the oil quantity.....	33
4-3. Attaching the needle.....	35
4-4. Threading the machine head	36
4-5. Bobbin replacement procedure.....	37
4-6. Adjusting the Thread Tension	38
4-7. Adjusting the thread take-up spring and the thread breakage detector plate	42
4-8. ADJUSTING THE THREAD TAKE-UP STROKE	42
4-9. Needle-to-hook relationshi	43
4-10. How to wind a bobbin.....	45
4-11. Adjusting the position of the thread trimmer	46
4-12. How to confirm the amount of oil (oil splashes) in the hook	49
4-14. Adjusting the needle hole in the throat plate and the needle.....	51
4-15. Adjusting the disk presser pressure.....	52
4-17. Adjusting the electronic intermediate presser stroke.....	54
4-18. Adjusting the air blow for the needle thread and bobbin thread	55
4-19. Making a template.....	56

4-21. RFID (How to use the electronic label)	60
4-22. Configuration of the operation panel.....	63
4-24. Parameter List.....	66
4-25. Error Code List.....	73
5. MAINTENANCE OF SAWING MACHINE.....	82
5-1. TROUBLES AND CORRECTIVE MEASURES(SEWING CONDITIONS).....	86
5-2. Disposal of batteries	88
5-3. Replacing the fuse.....	89

1. SPECIFICATIONS

1	Sewing area (X,Y)(mm)	1300 × 900 (Cutting area Laser type :1090 × 860)
2	Feed motion of feeding frame	Intermittent feed (2-shaft drive by stepping motor)
3	Needle bar stroke	40 mm
4	Max. sewing speed	[S type] 3,000 sti/min (When stitching pitch is 2.2 mm or less) [H type] 1,800 sti/min (When stitching pitch is 3.5 mm or less) For other stitch pitches and numbers of revolutions, refer to Fig. 1.
5	Settable stitch length	0.5 to 12.7 mm
6	Needle	[S type] DB × 1 #8 (#7 to #14), DP × 5 #8 (#7 to #14) [H type] DP17 #21 To be chosen according to the model.
7	Hook	Double-capacity full-rotary hook
8	Intermediate presser stroke	4 mm (Standard)
9	Lift of intermediate presser	20 mm
10	Lift of disc presser	15 mm
11	Memory of pattern data	Max. 999 patterns
12	Number of patterns that can be identified	Max. 999 patterns
13	Program input method	USB
14	Data format	SLW data is applied to sewing machine application DXF.AI.PLT.DST data editing software * Change to SLW.
15	Main shaft servomotor power	750W
16	Power consumption	450VA
17	Input voltage	220V ±10%
18	Mass (gross mass)	With packaging : [Standard type] 721kg [Laser type] 791kg Without Without packaging : [Standard type] 636kg [Laser type] 706kg
19	Dimensions	2,100mm(W) × 2,326mm(L) × 1,537mm(H)
20	Operating temperature range	5 to 35 °C [Laser type] 1 to 35 °C
21	Operating humidity range	35 to 85 % (No dew condensation) [Laser type] 5 to 70 %
22	Storage temperature range	-5 to 60 °C [Laser type] -10 to 100 °C
23	Storage humidity range	20 to 85 % (No dew condensation, 85 % applies to the case where the temperature is 40 °C or lower) [Laser type] 20 to 85 % (No dew condensation)
24	Air pressure used	0.5 to 0.6 MPa
25	Needle highest position stop facility	After the completion of sewing, the needle can be brought up to its highest position.
26	Noise	- Equivalent continuous emission sound pressure level (L _{pA}) at the work- station : A-weighted value of 78.0 dB ; (Includes K _{pA} = 2.5 dB) ; according to ISO 10821- C.6.2 -ISO 11204 GR2 at 2,800 sti/min.
27	Lubricating oil	#10 (Equivalent to JUKI NEW DEFRIX OIL No. 1) #32 (Equivalent to JUKI NEW DEFRIX OIL No. 2), Lithium based grease No. 2 Grease information Manufacturer: WERATCHE Type and number: Lithium base 2# grease

S type

Stitch pitch and the sewing speed			
Number	Stitch pitch	Sewing speed	Remarks
1	2.8 mm	2,800 sti/min	
2	3.0 mm	2,500 sti/min	
3	4.0 mm	2,200 sti/min	
4	5.0 mm	1,800 sti/min	
Note: The sewing machine must not run at the maximum number of revolutions continuously for more than 15 minutes. The number of revolutions may vary even if the pitch is consistent due to the change in the needle and material.			

H type

Stitch pitch and the sewing speed			
Number	Stitch pitch	Sewing speed	Remarks
1	3.5 mm	1,800 sti/min	
2	4.0 mm	1,600 sti/min	
3	4.5 mm	1,400 sti/min	
4	5.0 mm	1,200 sti/min	
Note: The number of revolutions may vary even if the pitch is consistent due to the change in the needle and material.			

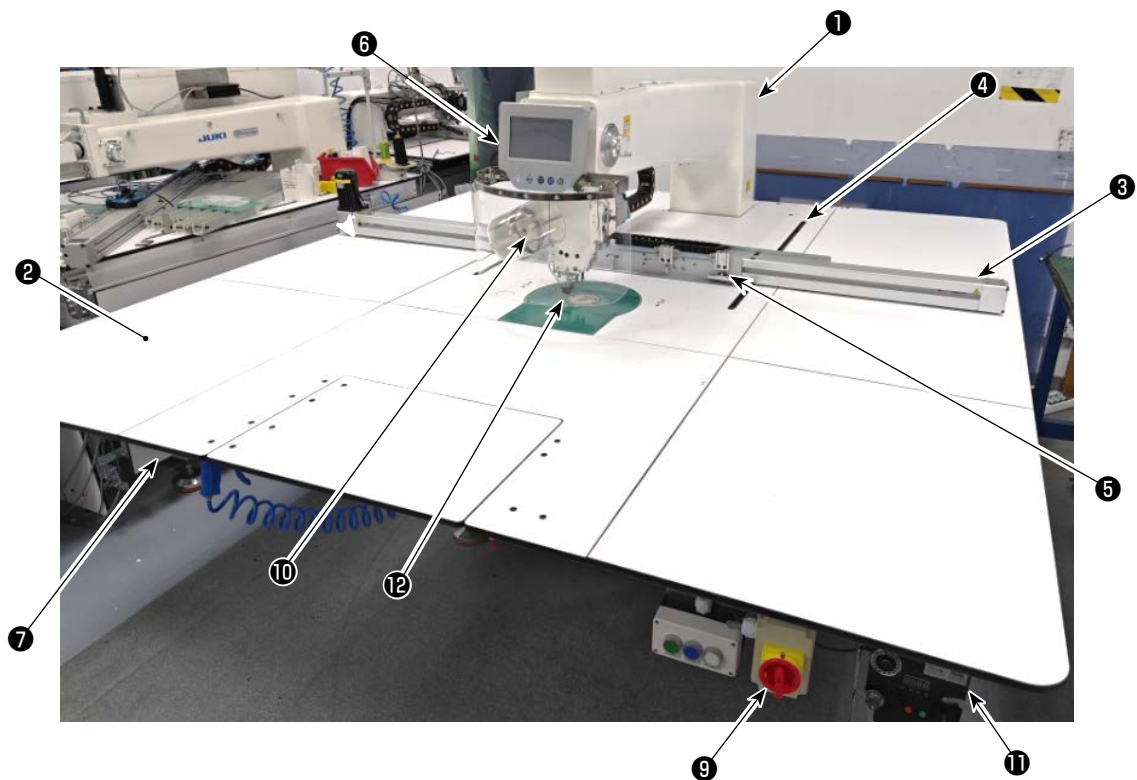
The sewing speed employed to check test sewing at the time of shipment is 2,800 sti/min for the S type or 1,800 sti/min for the H type.

The maximum number of revolutions of the sewing machine is 3,000 sti/min for both the S type and H type.

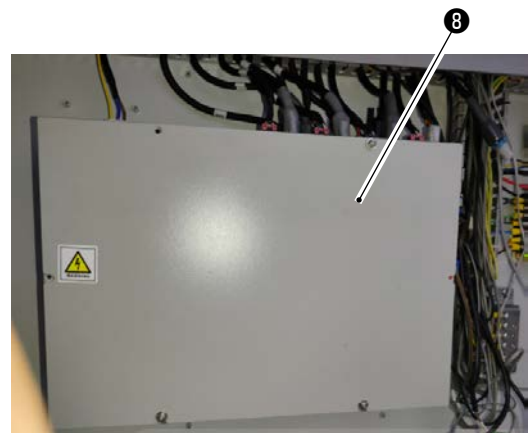
Fig. 1**Sewing of circular patterns**

When sewing circular patterns diameter of which is $\phi 60$ mm or less, sewing performance of the sewing machine may be affected by overrun of the lower rotating motor depending on the pattern.

2. CONFIGURATION



- ❶ Machine head
- ❷ Table
- ❸ X-axis feed mechanism
- ❹ Y-axis feed mechanism
- ❺ Cassette clamp device
- ❻ Operation panel
- ❼ Air control
- ❽ Electrical control box
- ❾ Power switch (also used as emergency stop switch)
- ❿ Thread stand
- ⓫ Bobbin winder device
- ⓬ Safety cover



3. INSTALLATION

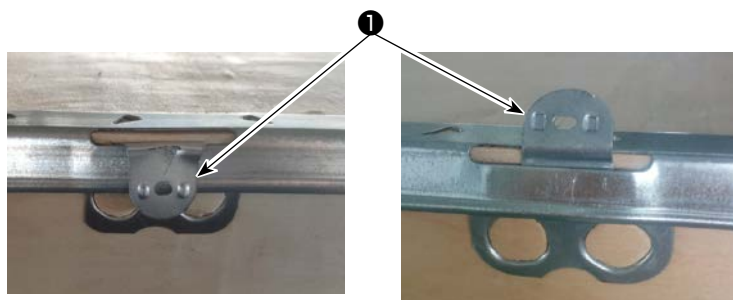
3-1. Setting up the sewing machine

3-1-1. Unpacking

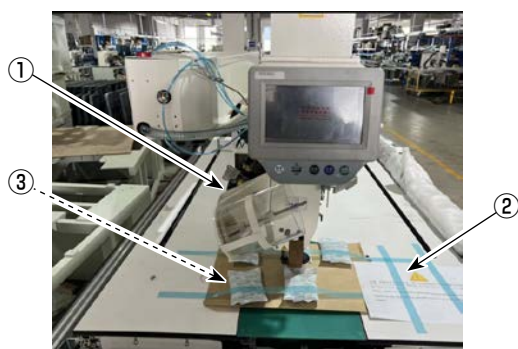
1) Lift clamp ① as shown in the picture.



If the clamp is not lifted up sufficiently, unpacking will not be smoothly carried out.



2) Detach top cover ② first. Then, detach the remaining covers from the four surfaces.



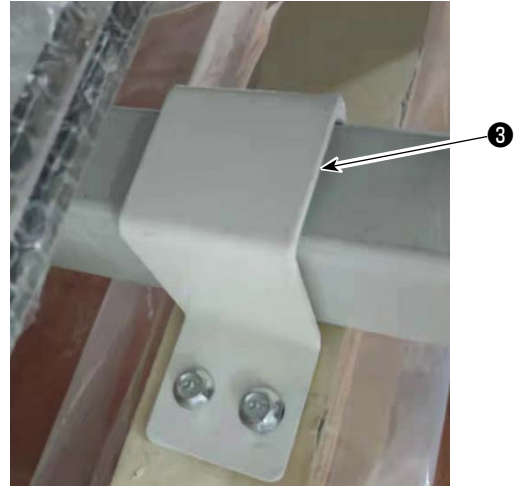
3) Remove the plastic cover.

The sewing machine is shipped with two precaution sheets and one needle entry sheet attached at the time of shipment.

- ① : Precaution sheet for setup
- ② : Precaution sheet for confirmation of center of needle
- ③ : Needle entry sheet



Check the contents described in the precaution sheets at the time of setup.
Check P12 and beyond for detailed contents.

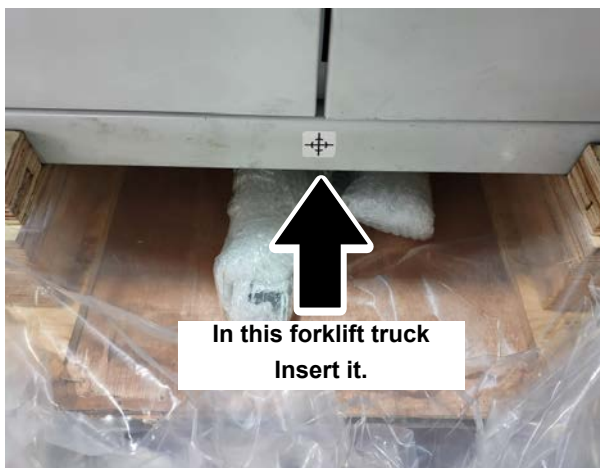


4) Remove front and rear sheet metal fittings ③ for fixing the sewing machine.

* Tools are packed in the accessory box for the sewing machine.



5) Remove parts, accessories and feed mechanism from the wooden crate.



6) Lift the sewing machine with a forklift to bring it to the specified location. (Weight of the sewing machine: 636 kg)



WARNING :

When working with a forklift, two or more people should handle the sewing machine while checking for safety.



- 7) Turning casters ④ , check to make sure that the sewing machine is put horizontally on the forks of the forklift.
Keep the sewing machine on the forks in such a way that it does not rattle.

3-1-2. Setting up the X-feed mechanism



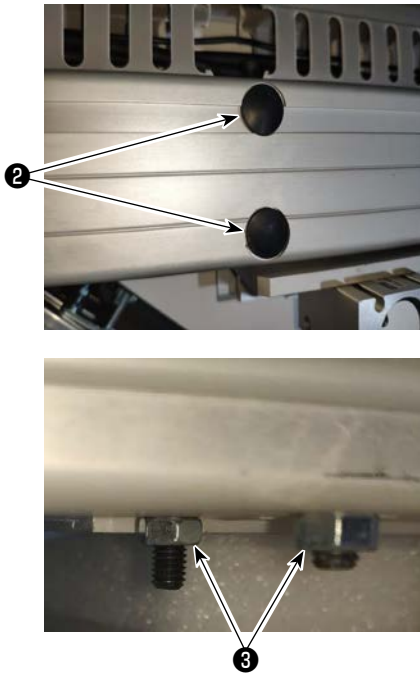
- 1) Detach clamping plates ① . Put the screws and nuts you have removed in the accessory box.



- 2) Unpack the X-feed mechanism.



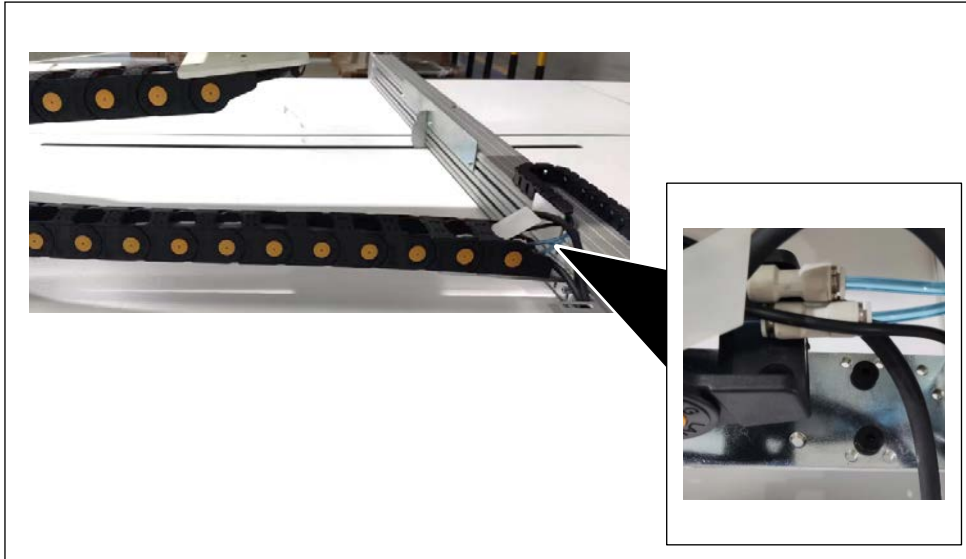
- 3) Lay the X-feed mechanism aside the main body of the sewing machine.
Move the clamp to the center of the X-feed mechanism.



- 4) Detach rubber plug **2** . Remove four nuts **3** on the opposite side with a wrench key. Take care not to allow the screws to slip off the mounting holes after you have removed the nuts.
Put the nuts you have removed in the accessory box.

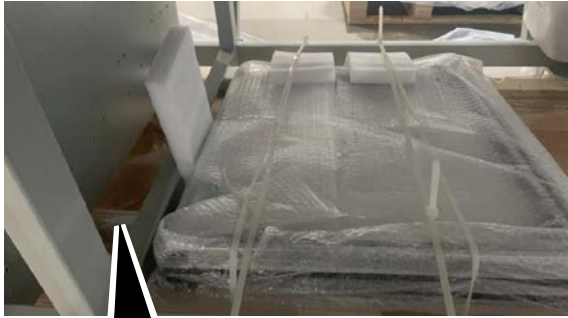


- 5) Aligning the screws with the taps of the X-feed support block, tighten the screws.



6) Connect the cable guide to the X feed mechanism. Then, tighten the screws.

3-1-3. Setting up the table



Support bars
Long bars, two pieces
Intermediate-length bars, two pieces
Short bars, four pieces

- 1) Take out support bars from under the table stand.
Remove packing materials.

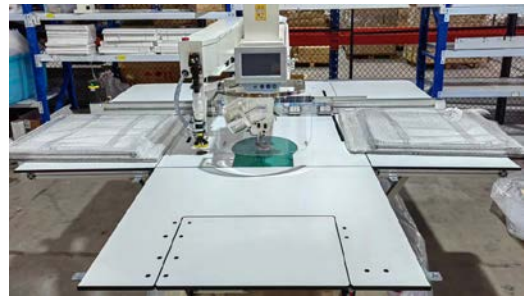
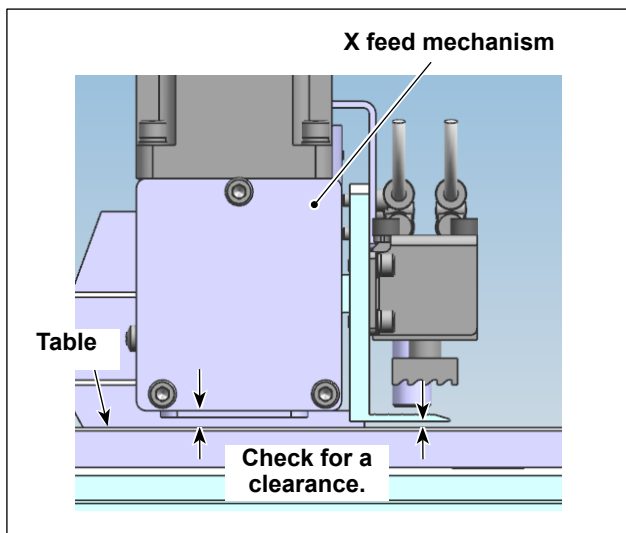
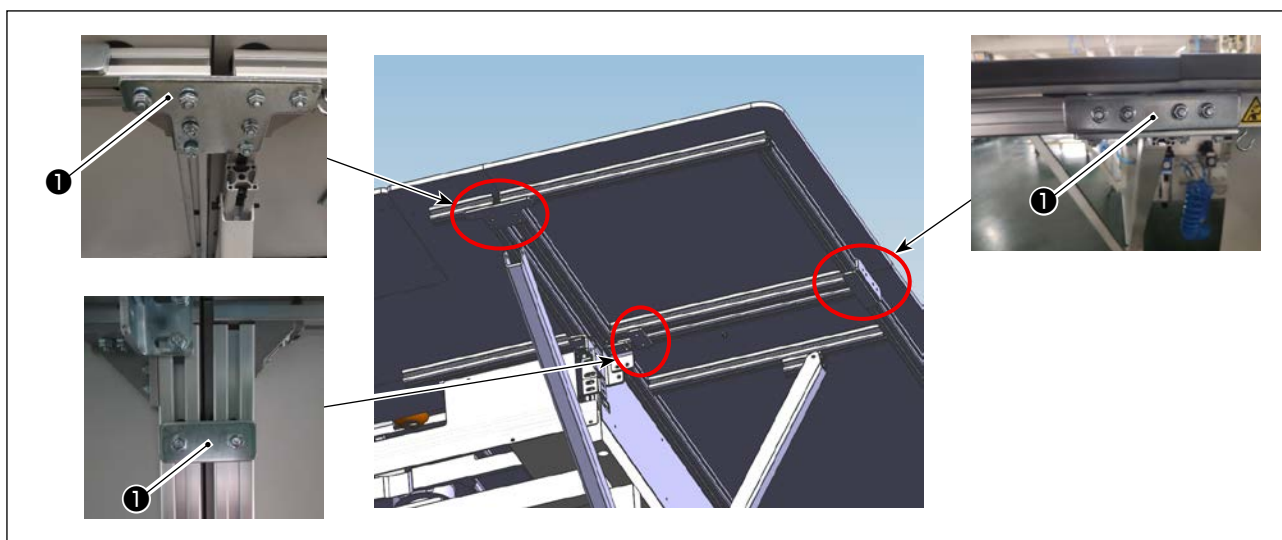


图 1

- 2) Set up the right and left tables with short bars (two each for the right and left tables). Set up the front table (middle) with two intermediate-length bars.
Tighten the screws as illustrated in Fig. 1.

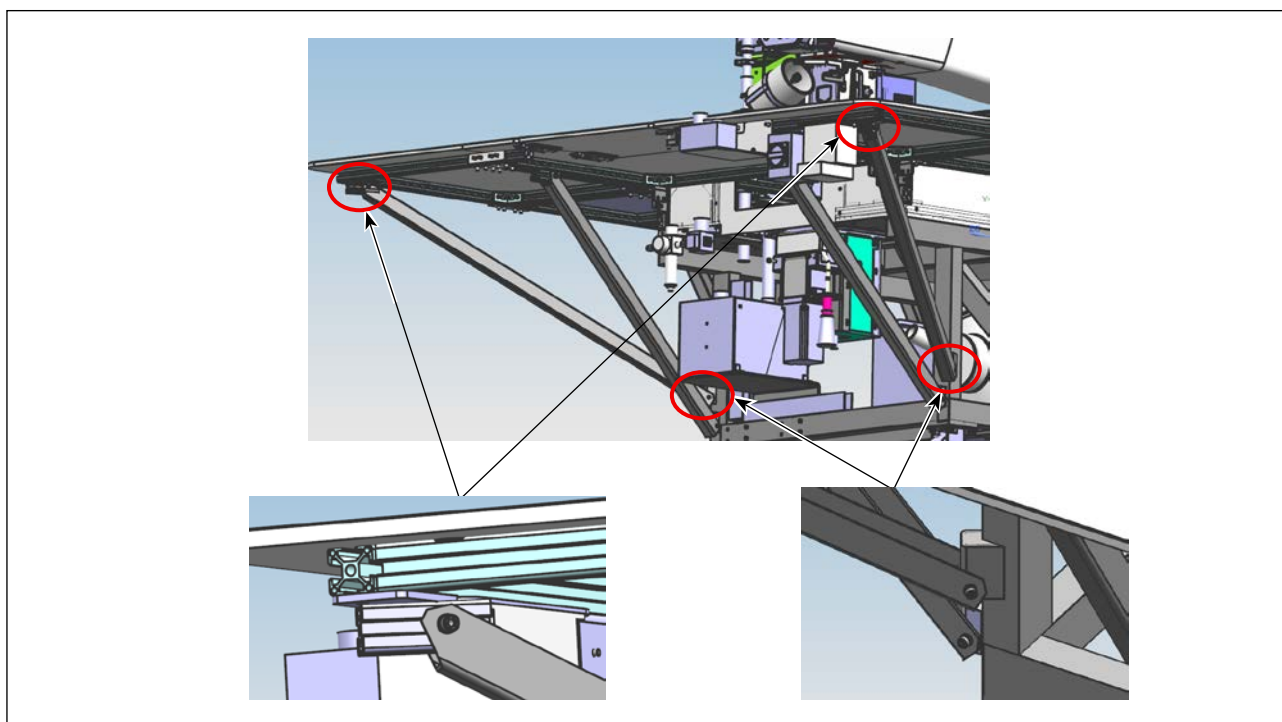


After you have set up the right and left sub tables, check to make sure that there is a clearance between the tables and the X-feed mechanism.



3) Set up the front tables (left) and (right).

Secure the aforementioned parts with dedicated link plates ❶ and the nuts.



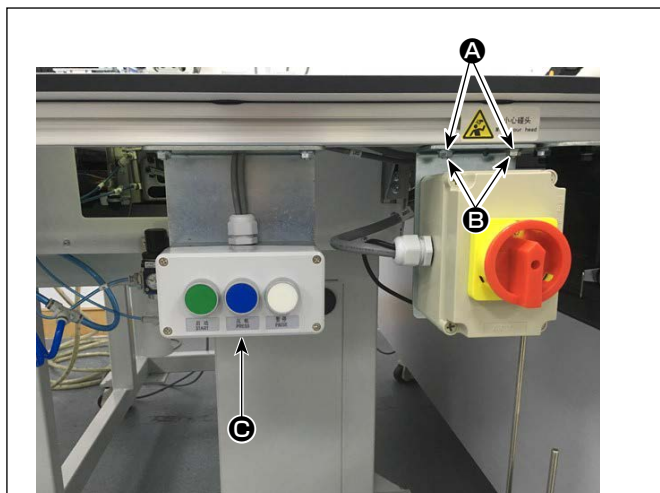
4) Attach long bars to the right, left and front tables.

3-1-4. Setting up the switches, bobbin thread winder and switch button (asm.)

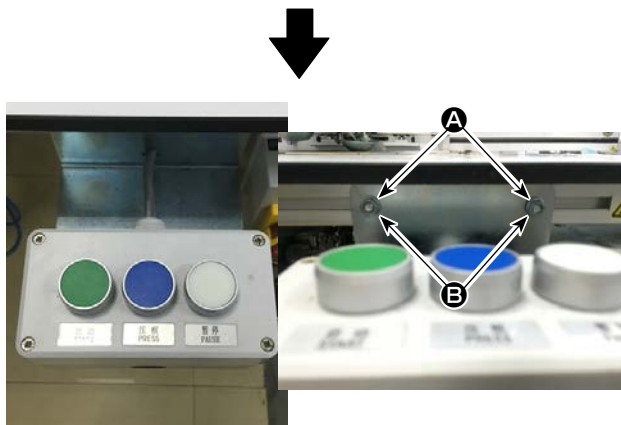


* Tools are packed in the accessory box for the sewing machine.

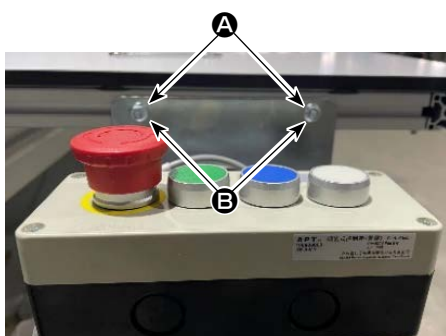
- 1) Secure the bobbin thread winder to the aluminum frame of the front table (right) with T-head screw **A** and nut **B**.



- 2) Secure the power switch plate to the aluminum plate of the front table (right) with T-head screw **A** and nut **B**.



- 3) For switch button (asm.) **C**, change round the direction of assembly. Then, secure it to the aluminum plate of the front table (right) with T-head screw **A** and nut **B**. Secure the switch button (asm.) so that its three switch buttons are faced upward.

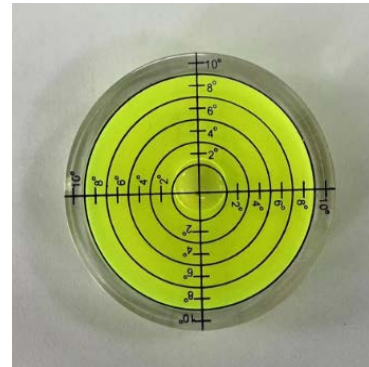
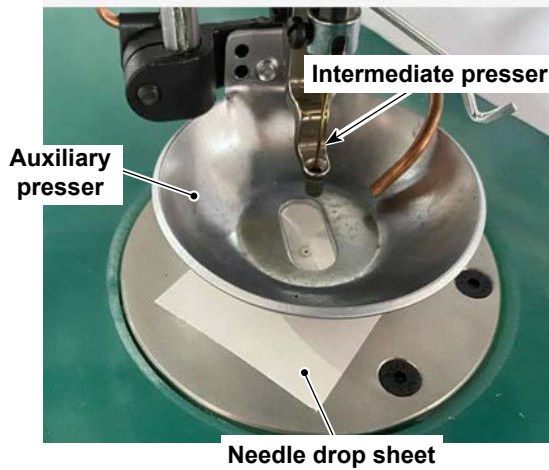


- 4) For the laser type model, also change installation of the power switch as shown in the figure.

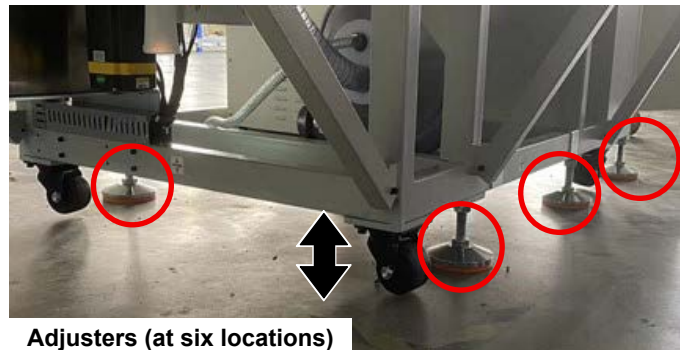
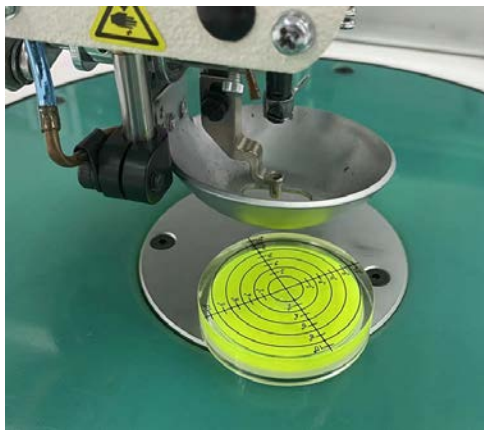


Changes described in the aforementioned steps 3) and 4) may not be carried out depending on the usage.

3-1-5. Points to be checked and precautions to be taken before turning the power ON



Packed together with the accessories Level 1



Adjusters (at six locations)

- 1) Place the level on the top surface of the throat plate. Adjust the adjusters up and down for leveling of the sewing machine while observing the level.
Adjust so that air bubble in the level is brought to the center (circle at the center).
Adjust the right and left two adjusters on the front side first as reference. Then, adjust the four adjusters on the rear side.
① Set-up attention sheet : 1) Check the horizontal state



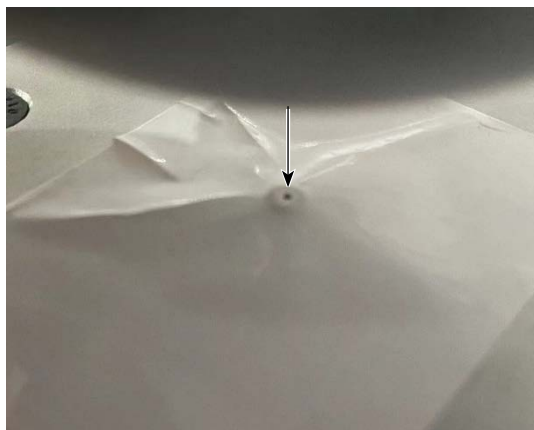
- 2) Inspect whether the electrical components and pneumatic components are correctly assembled.



- 3) Inspect whether the needle entry point is correctly aligned with the center of the needle hole in the throat plate of the sewing machine.



- 4) Move the XY feed by hand to check whether it can be moved smoothly.



Needle drop sheet



Digital pulley

- 5) Carry out steps 1) to 4) to make sure that there is no problem. As the last step, turn the power to the sewing machine and press the RESET key on the panel.

Turn the digital pulley to lower the needle to make sure that the tip of the needle is aligned with the needle entry marker on the needle entry sheet.

- ① Description on the Precaution sheet for setup:
- 2) Confirmation of the center of the needle and the center of the hole in the throat plate
- ② Precaution sheet for confirmation of center of needle:

If the needle-center misalignment is approximately 0.2 mm, correct it by adjusting the adjusters.

"If the needle-center misalignment is approximately 0.3 mm or more, adjustment of the hook driving shaft saddle will be necessary.

Contents described on P18 to P21"



If the needle-center is not aligned, sewing problems (such as stitch skipping and thread breakage) may occur. So, take added care.

3-1-6. Installing the air hose



WARNING :

Check to be sure that the air hose is fully inserted into the air cock before supplying the air to the machine so as to prevent the air from being blown directly to the human body. Then, carefully open the air cock.



1) Connecting the air hose

Connect the air hose to ❶ .



2) Adjustment of air pressure

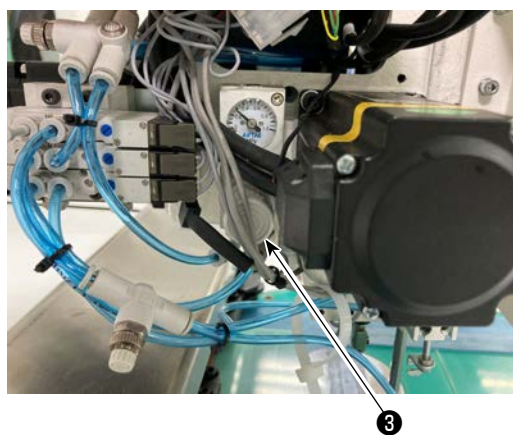
Pull up air regulating knob ❷ . Then, turn it to adjust the air pressure to 0.5 - 0.6 MPa.

Then, push down air regulator knob ❷ .

Pull air regulating knob ❸ toward the operator.

Then, turn it to adjust the air pressure to 0.15 MPa.

Then, push down air regulator knob ❸ .



❷ : Adjustment of the air pressure of the entire sewing machine

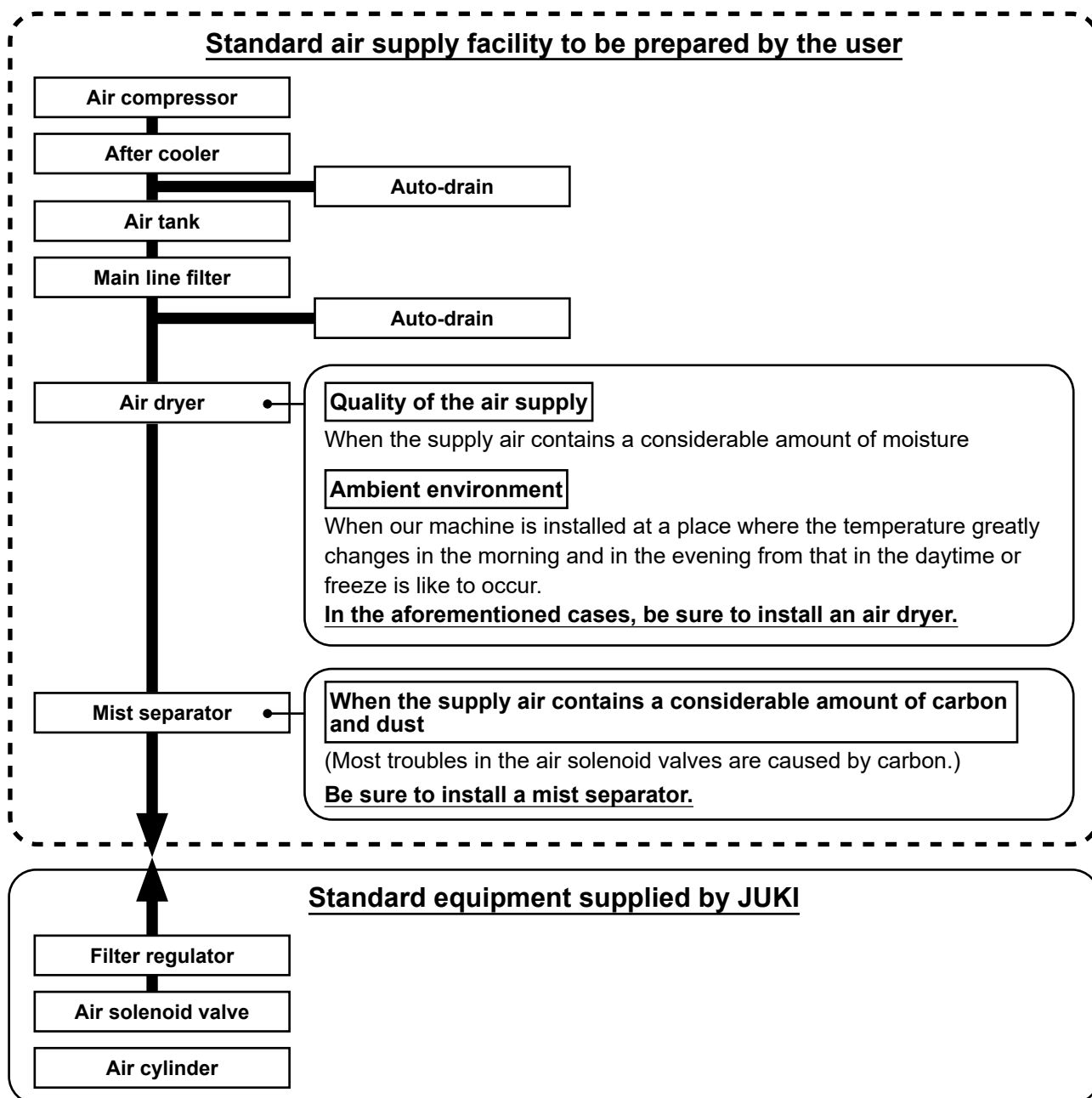
❸ : Adjustment of the air pressure of the disk presser

3-1-7. Cautions for the compressed air supply (source of supply air) facility

As large as 90 % of failures in pneumatic equipment (air cylinders, air solenoid valves) are caused by "contaminated air."

Compressed air contains lots of impurities such as moisture, dust, deteriorated oil and carbon particles. If such "contaminated air" is used without taking any measures, it can be a cause of troubles, inviting reduction in productivity due to mechanical failures and reduced availability.

Be sure to install the standard air supply facility shown below whenever the machine provided with pneumatic equipment is used.

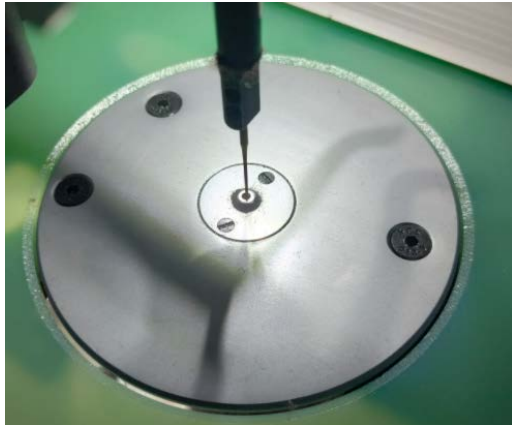
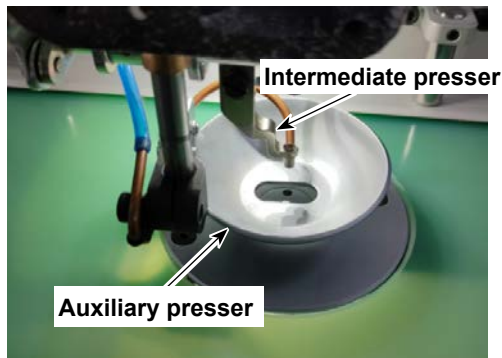


Cautions for main piping

- Be sure to slope main piping by a falling gradient of 1 cm per 1 m in the direction of air flow.
- If the main piping is branched off, the outlet port of the compressed air should be provided at the top part of the piping using a tee in order to prevent drain settling inside the piping from flowing out.
- Auto drains should be provided at all lower points or dead ends in order to prevent the drain from settling in those parts.



3-1-8. Checking the needle entry point and hook timing



* When the power to the sewing machine is in the ON state, reset the sewing machine first.

- 1) First, remove the auxiliary disk presser and the intermediate presser.

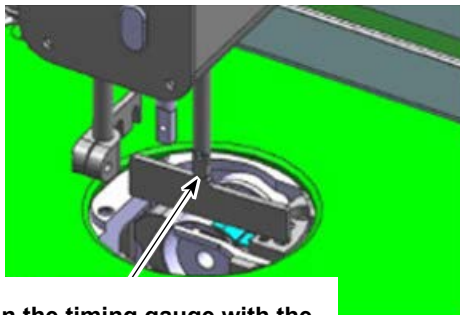
Check the alignment of the needle entry point of the sewing machine with the center of the throat plate. (Check the direction of 360 degrees.)

If the needle entry point is not aligned with the center of the throat plate, refer to the adjustment method on P18.

Be sure to carry out the aforementioned checking procedure whenever the installation status of the sewing machine is changed such as in the case of using it after changing its position in your plant or moving it to any other location.



- 2) Remove the throat plate. Turning the digital pulley, check the lower dead point of the needle bar with a timing gauge. If the needle-to-hook timing cannot be successfully adjusted, refer to the adjustment method on P36.



Digital pulley

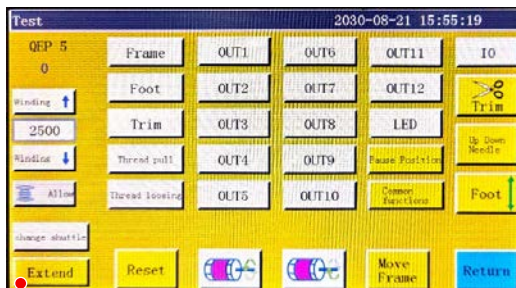


- 3) Remove the needle plate and inspect the hook alignment. (360 Check at the full circumference.)

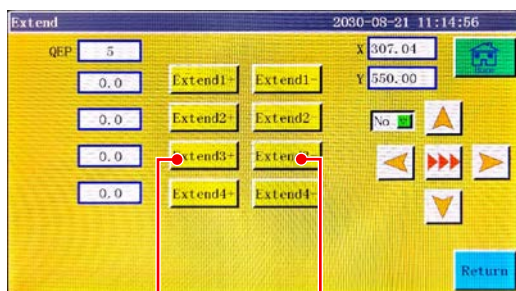


*** Note: How to turn the machine head**

- 1) Press "Next" ❶ on the Main screen to display the Test screen.



- 2) Press "Extend" ❷ to display the Extension screen.

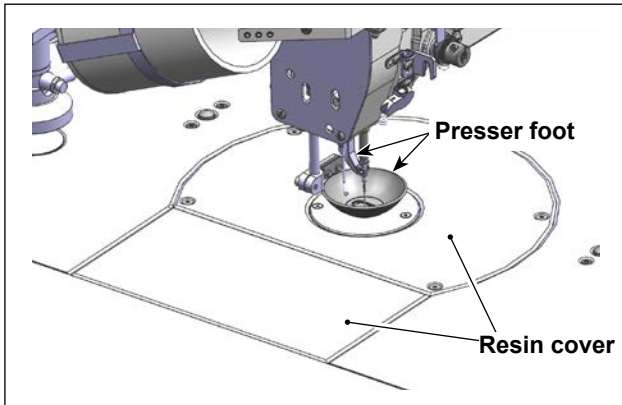


- 3) Press ❸ and ❹ to rotate the machine head and the hook driving shaft saddle.

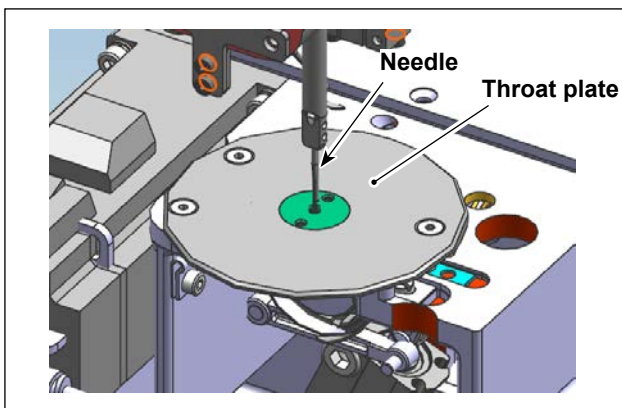
3-1-9. Checking the concentricity (How to handle the case where you have checked the timing between the needle entry and the hook as described in 3-1-10 and have found it is not correct)

1. Adjusting the concentricity between the hook driving shaft saddle and the needle bar

If the needle and the hole in the throat plate are not aligned, concentricity between them has to be adjusted. Correct the concentricity between the needle and the hole in the throat plate through the adjustment of their positions in four directions (0°, 90°, 180° and 270°).

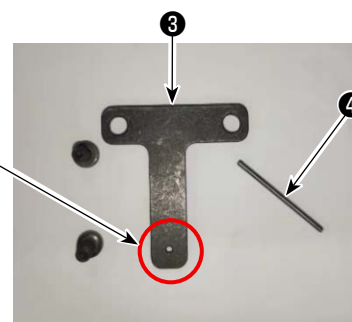
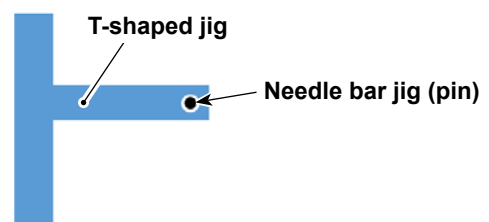
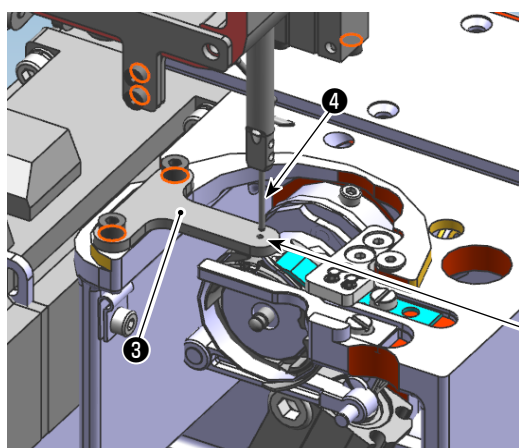


1) Remove two resin covers and presser foot.



2) Remove the throat plate and the needle.

Relation between the jig ③ and the needle bar jig ④ (pin)
Figure observed from above



- 3) Reset the hook driving shaft saddle to the 0° position.
- 4) Attach the concentricity adjustment jigs to the throat plate and to the needle with the respective screws.
(Put the T-shaped jigs with its marked surface faced upward.)

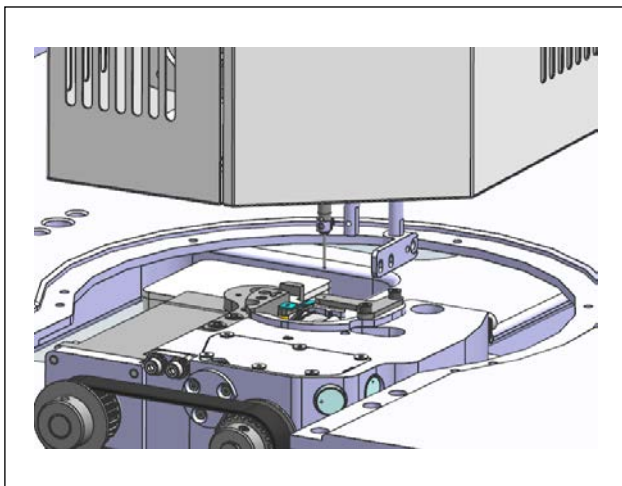


- 5) Adjust the T-shaped jig so that the needle bar jig passes through the hole in the T-shaped jig when lowering the needle bar.



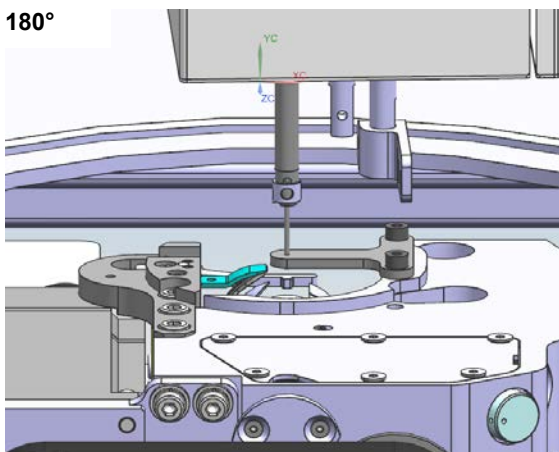
Insert needle bar jig ④ into the needle bar.

When you lower the needle bar, carefully check whether it interferes with other parts.

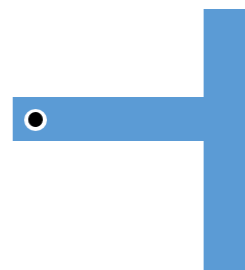


- 6) Lift the presser bar. Turn the hook driving shaft saddle up to the 180° position. Then, slowly lower the needle bar to check whether the needle bar jig enters the hole in the T-shaped jig.
Check the concentricity at the position that is in the 180° opposite direction in reference to 0° of the hook driving shaft saddle (the pin fits in the T-shaped jig).

180°

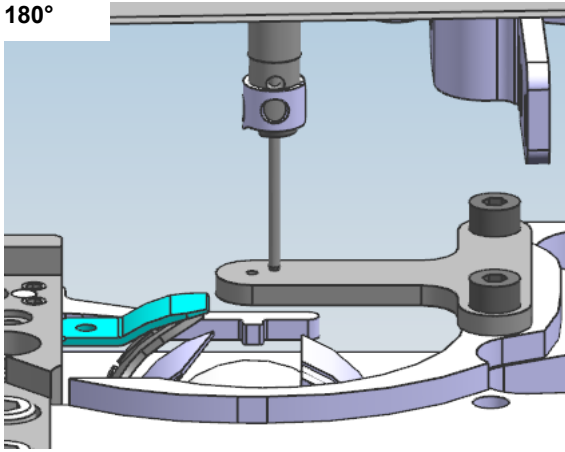


Relation between the jig and the needle bar jig (pin)
Figure observed from above

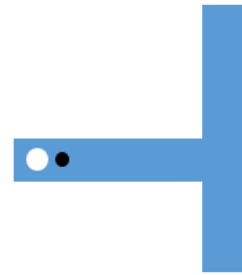


- 7) As long as the needle-center is exactly the same at the aforementioned two different positions, no adjustment will be necessary.

180°



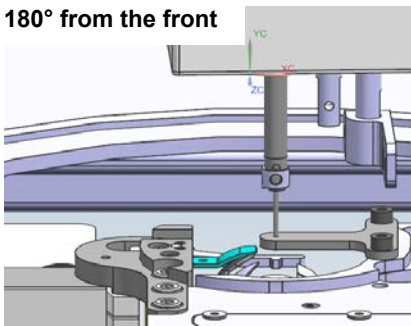
Relation between the jig and the needle bar jig (pin)
Figure observed from above



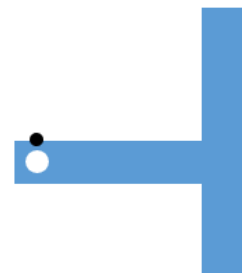
8) If the needle bar jig fails to enter the hole in the T-shaped jig, adjustment will be necessary. Check the misalignment direction.

- ① In the case of misalignment in the X direction, it is necessary to carry out adjustment in the X direction.
(X direction: Lateral direction toward the sewing machine)

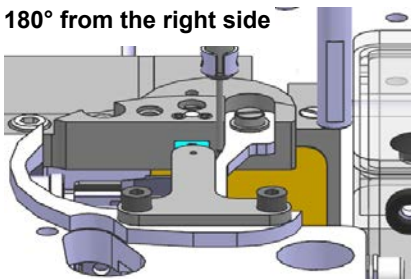
180° from the front



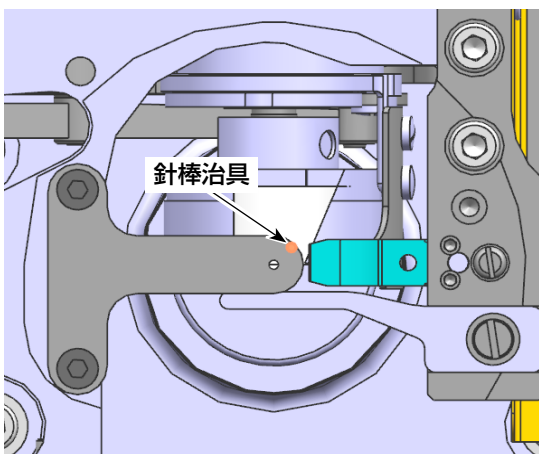
Relation between the jig and the needle bar jig (pin)
Figure observed from above



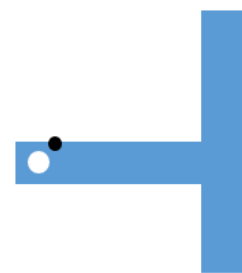
180° from the right side



- ② In the case of misalignment in the Y direction, it is necessary to carry out adjustment in the Y direction.
(Y direction: Longitudinal direction toward the sewing machine)

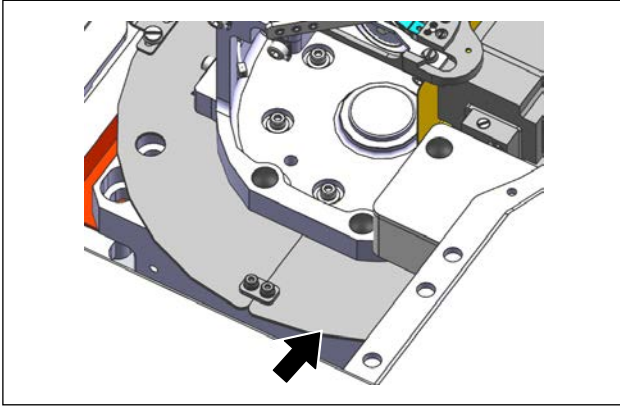


Relation between the jig and the needle bar jig (pin)
Figure observed from above



- ③ In the case of misalignment both in the X and Y directions, it is necessary to carry out adjustment in both the X and Y directions.
(Y direction: Longitudinal direction toward the sewing machine)

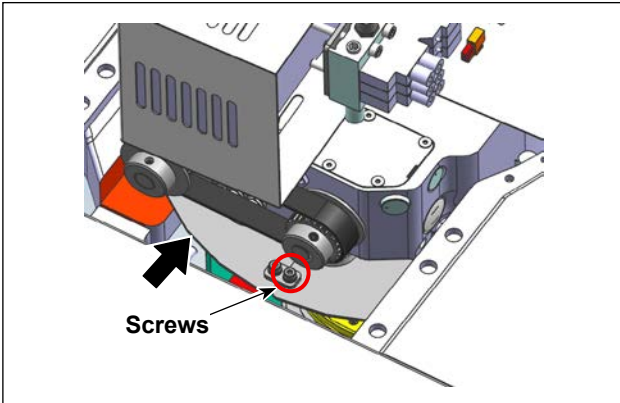
2. How to adjust the position of the hook driving shaft saddle



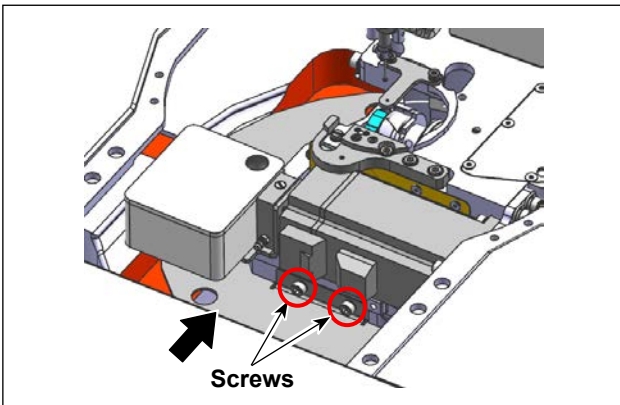
2-1. Preparation before adjustment

- 1) Remove the front left fixing screw. (3 mm hexagonal wrench)

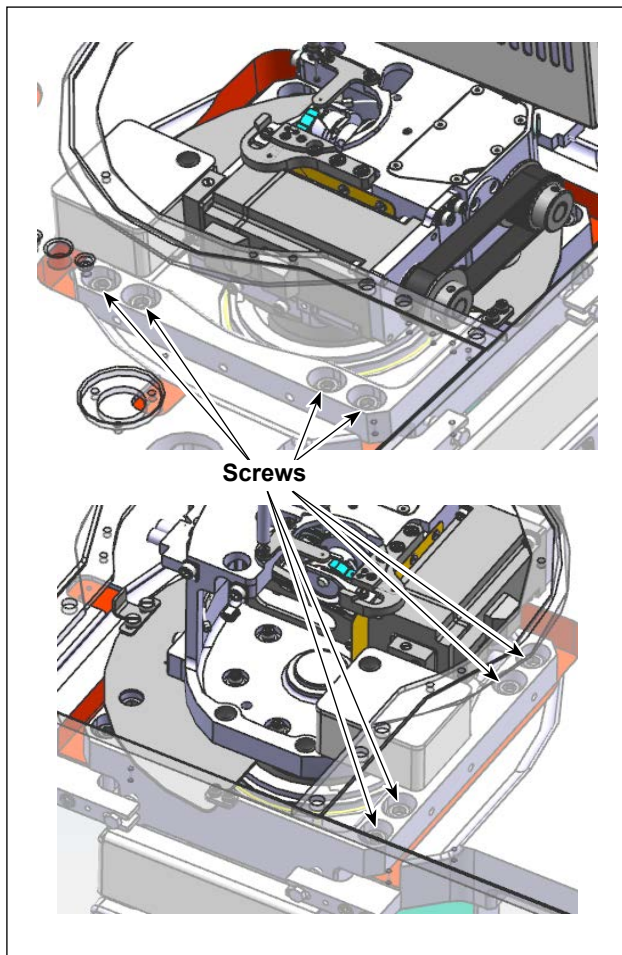
After you have carried out steps 1) to 3), remove the sheet metal on the right side toward the front of the sewing machine.



- 2) Turn the hook driving shaft saddle up to the 180° position. Remove the fixing screw on the right side. (3 mm hexagonal wrench)



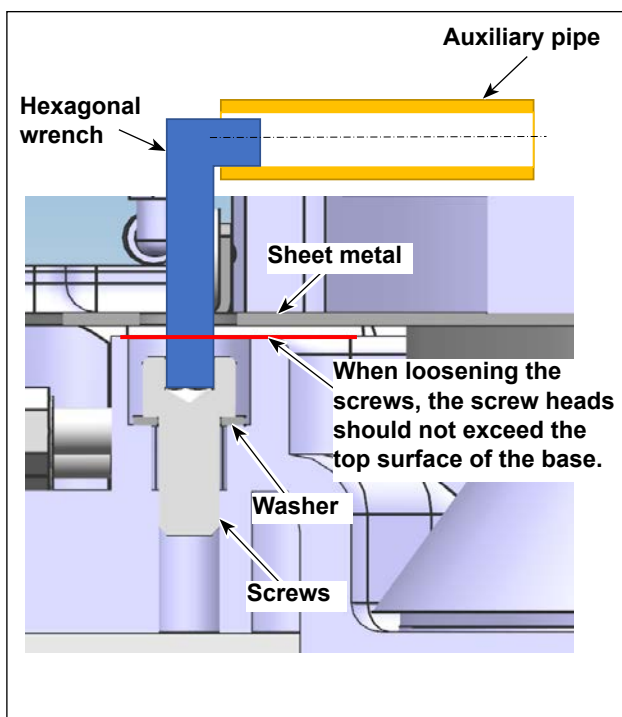
- 3) Turn the hook driving shaft saddle up to the 270° position. Remove two fixing screws and remove the sheet metal. (3 mm hexagonal wrench)



- 4) Slightly loosen eight screws that secure the hook driving shaft saddle. (8 mm hexagonal wrench, auxiliary pipe)

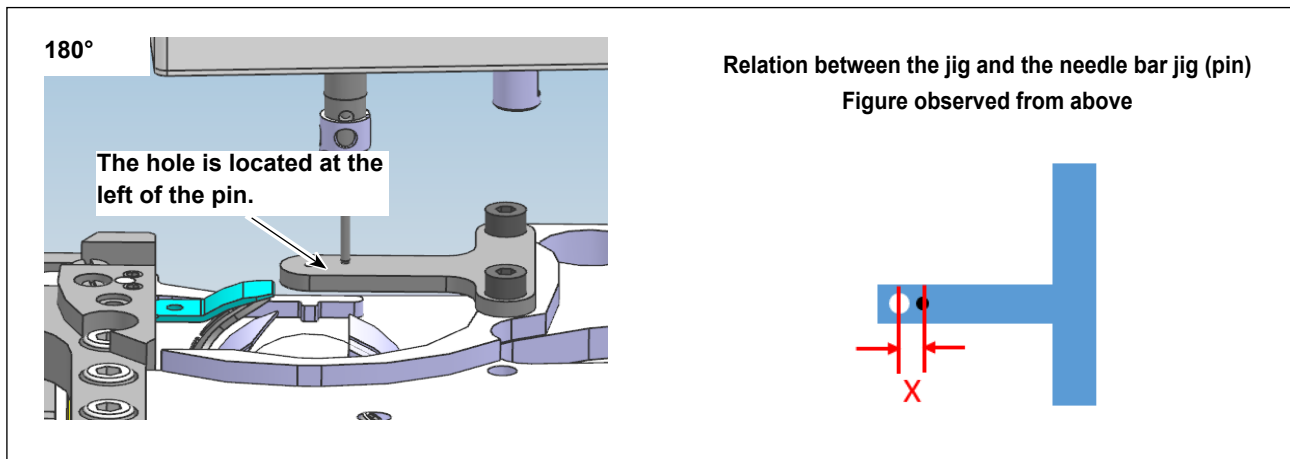


When you loosen the screws, the screw heads should not exceed the top surface of the base to prevent the sheet metal from interfering with the screws when turning the hook driving shaft saddle.

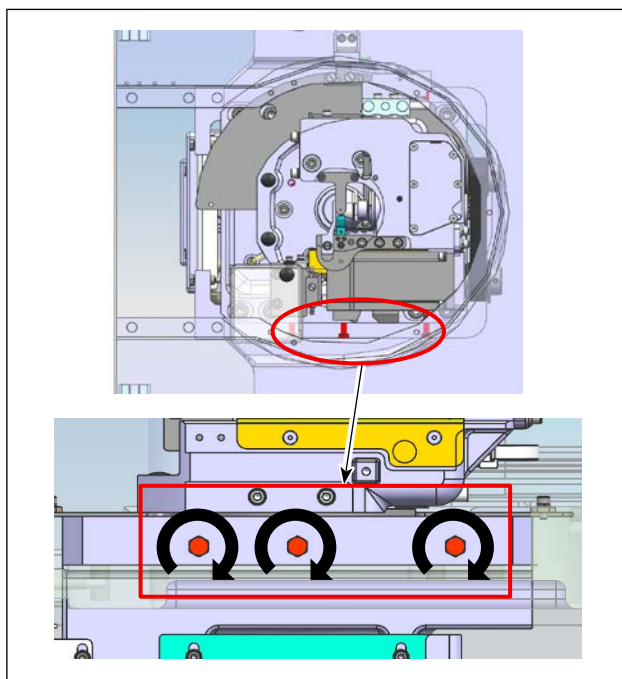


Use an auxiliary pipe or the like so that you can loosen the screws with ease.

2-2. Adjustment in the X direction

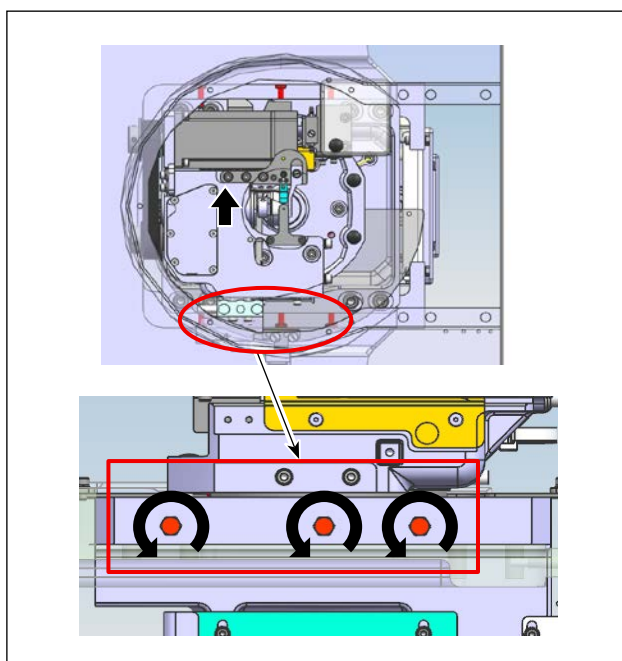


- 1) In the case the hole in the T-shaped jig is located at the left of the pin, it is necessary to adjust the hook driving shaft saddle toward the right.

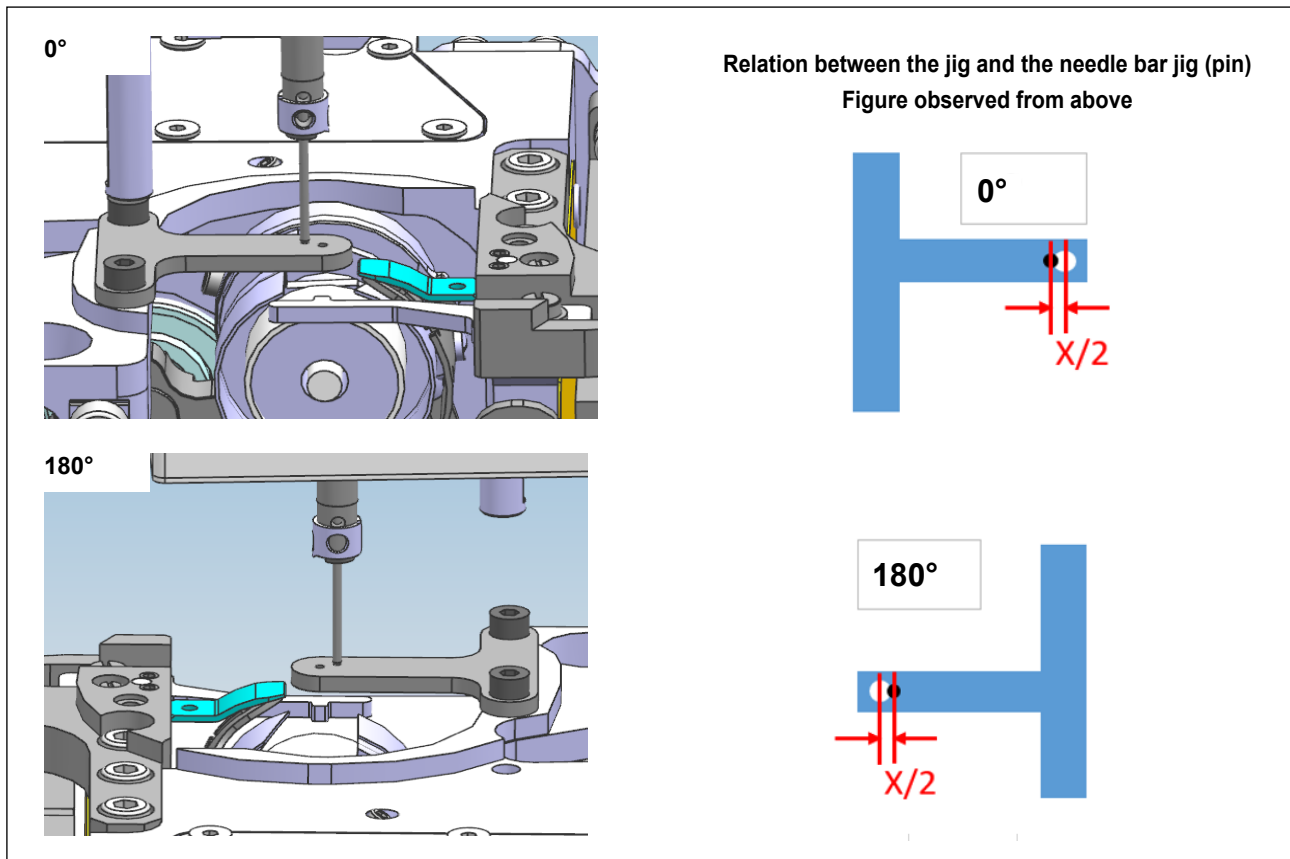


- 2) Tighten the screws (three pieces) of the hook driving shaft saddle as shown in the figure on the left. Tighten the screws by the distance of $X/2$ to form a gap between the screw heads and the base surface.

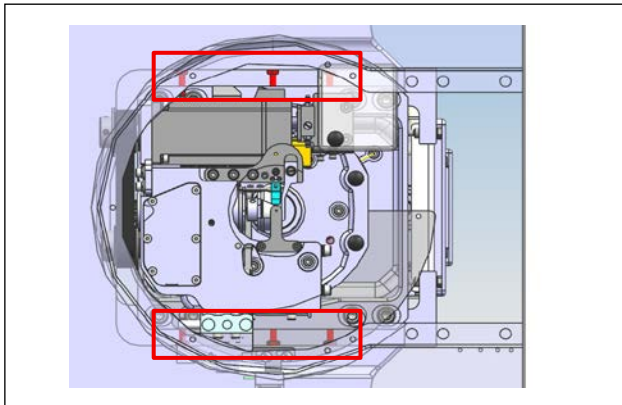
Form a gap between the screws and the base surface in the direction you want to move the base. Then, push in the base with the screw heads on the opposite side to move it.



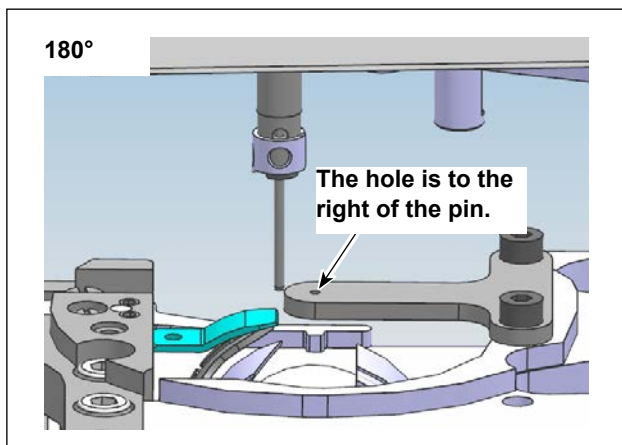
- 3) Tighten the screws (three pieces) in the hook driving shaft saddle as shown in the figure on the left. Loosen them by the distance of $X/2$. Then, press the screw heads against the base surface and move the base by pushing it out to the right.



- 4) Check the relative position between the needle bar jig and the hole in the T-shaped jig at the 0° and 180° positions. Then, carry out the adjustment steps 2) and 3) in repetition until the distance between the needle bar jig and the hole in the T-shaped jig at the 0° and that at the 180° are made equal.

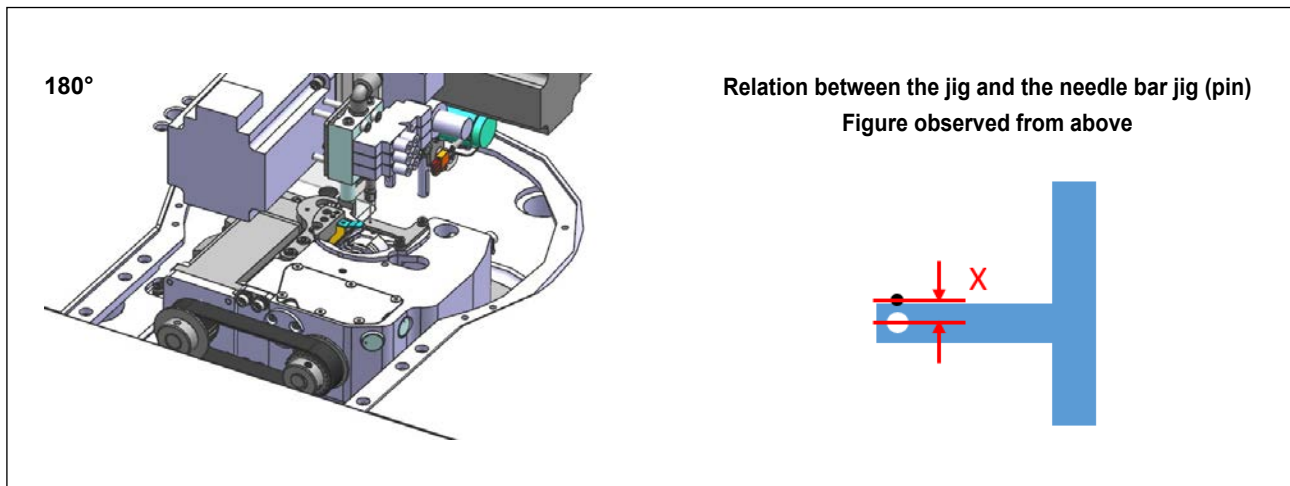


- 5) After the adjustment for equalization of the distances, adjust the positions of the right and left screws (six pieces) so that they are lightly pressed against the base surface.

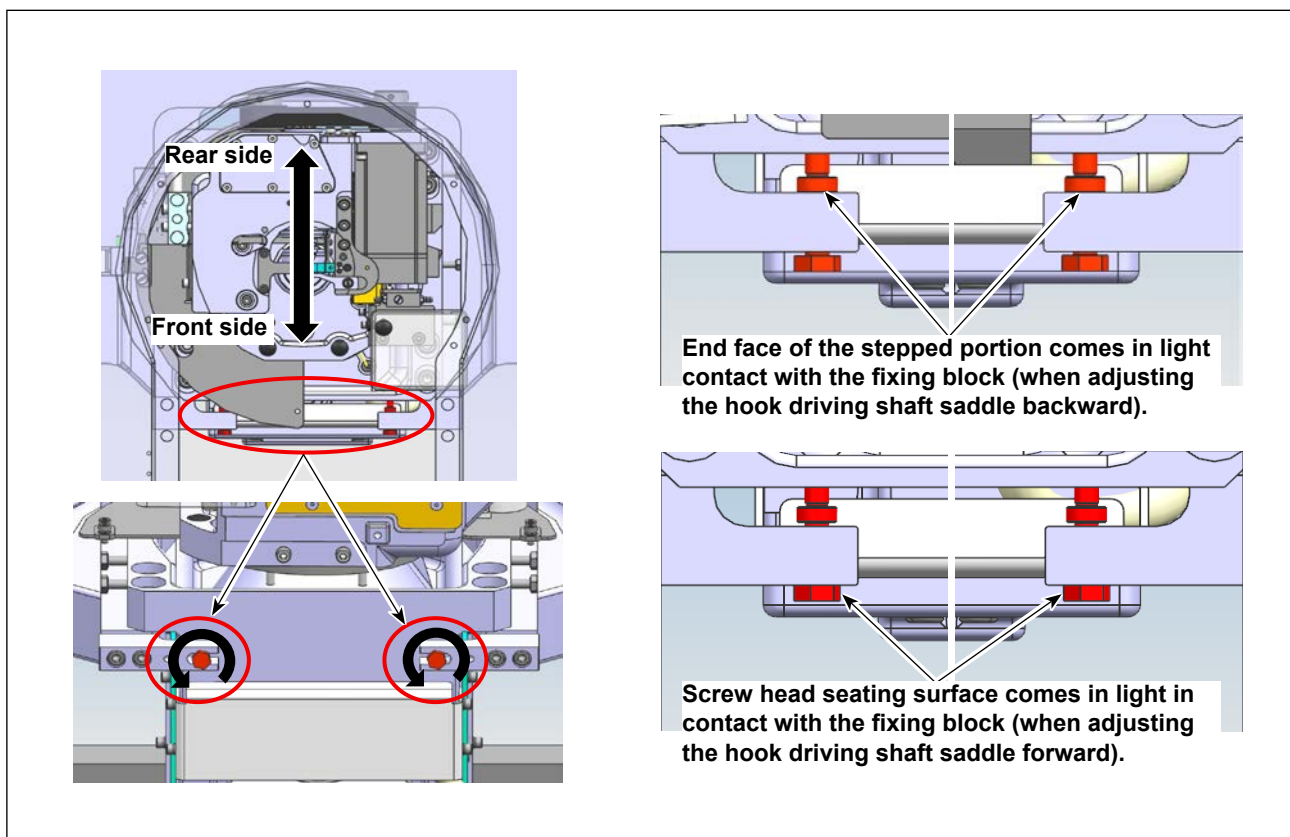


- 6) In the case the hole in the T-shaped jig is located at the right of the pin, it is necessary to adjust the hook driving shaft saddle to the left. The adjustment procedure is same as described above, but in the opposite direction.

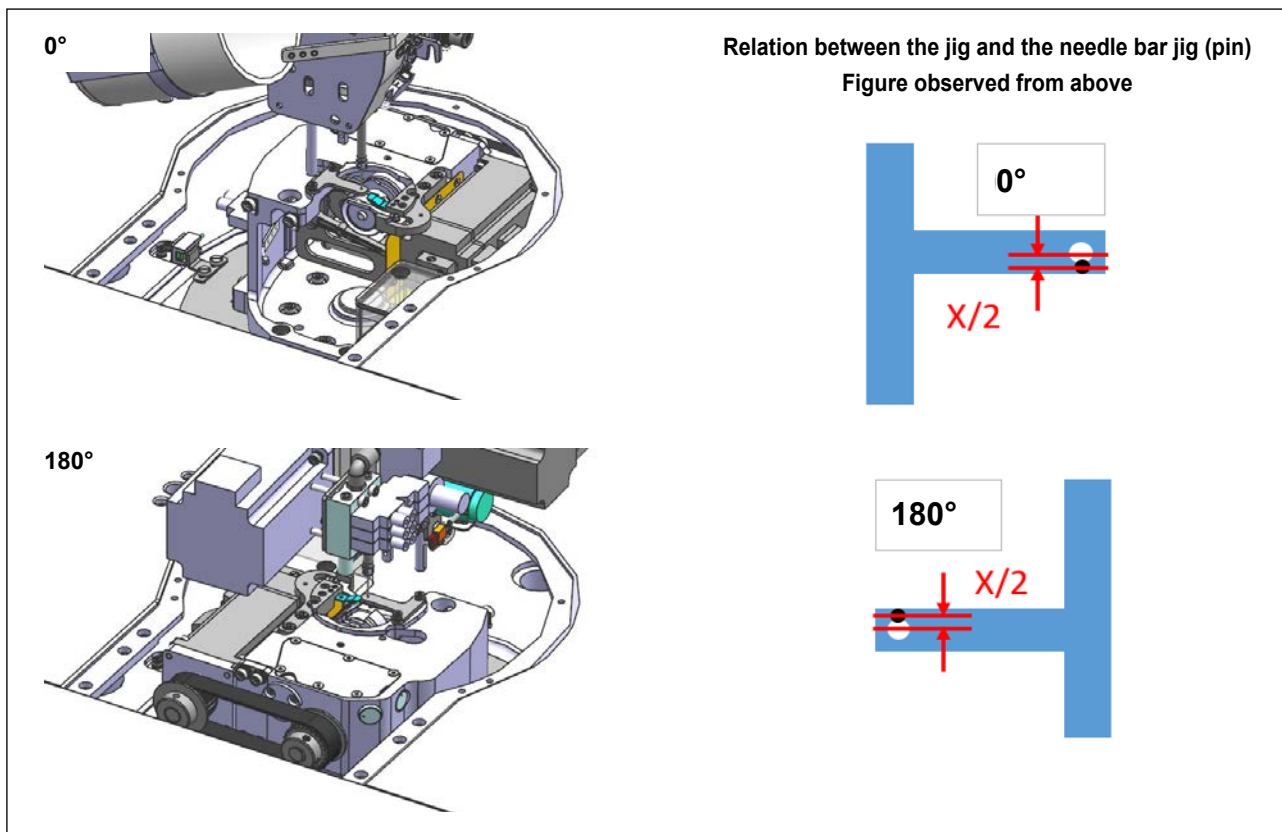
2-3. Adjustment in the Y direction (right angle of view)



- 1) In the case, the hole in the T-shaped jig located on the front side of the pin, it is necessary to adjust the hook driving shaft saddle backward.



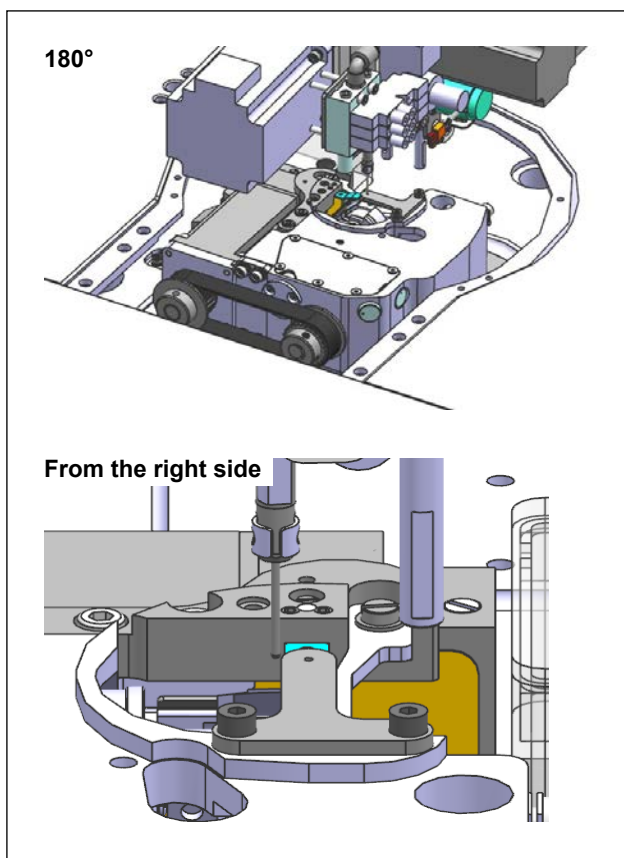
- 2) Loose two adjustment screws (two pieces) to allow the end face of the stepped portion to come in light contact with the fixing block.
After the aforementioned portions come in contact, turn the adjustment screws (two pieces) counterclockwise to move the hook driving shaft saddle backward by up to X/2.



- 3) Check the relative position between the needle bar jig and the hole in the T-shaped jig at the 0° and 180° positions. Then, carry out the adjustment 2) in repetition until the distance between the needle bar jig and the hole in the T-shaped jig at the 0° and that at the 180° are made equal.

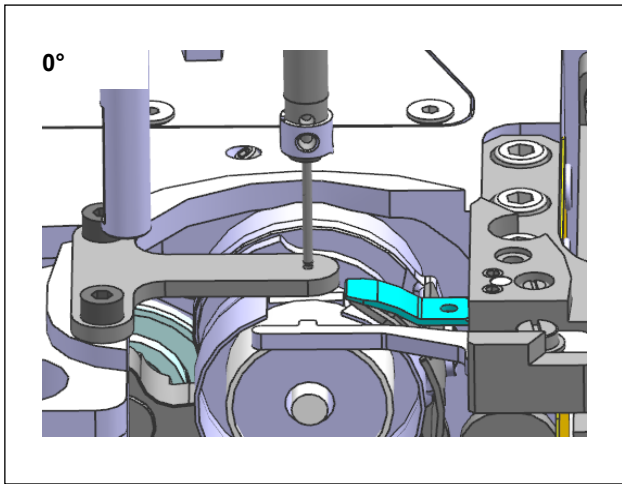
In the case you have adjusted the hook driving shaft saddle position more than necessary, bring the screw head seating surface into light contact with the block and adjust the hook driving shaft saddle in the opposite direction of 2).

Make the misalignment amount at the 0° and that at the 180° same.



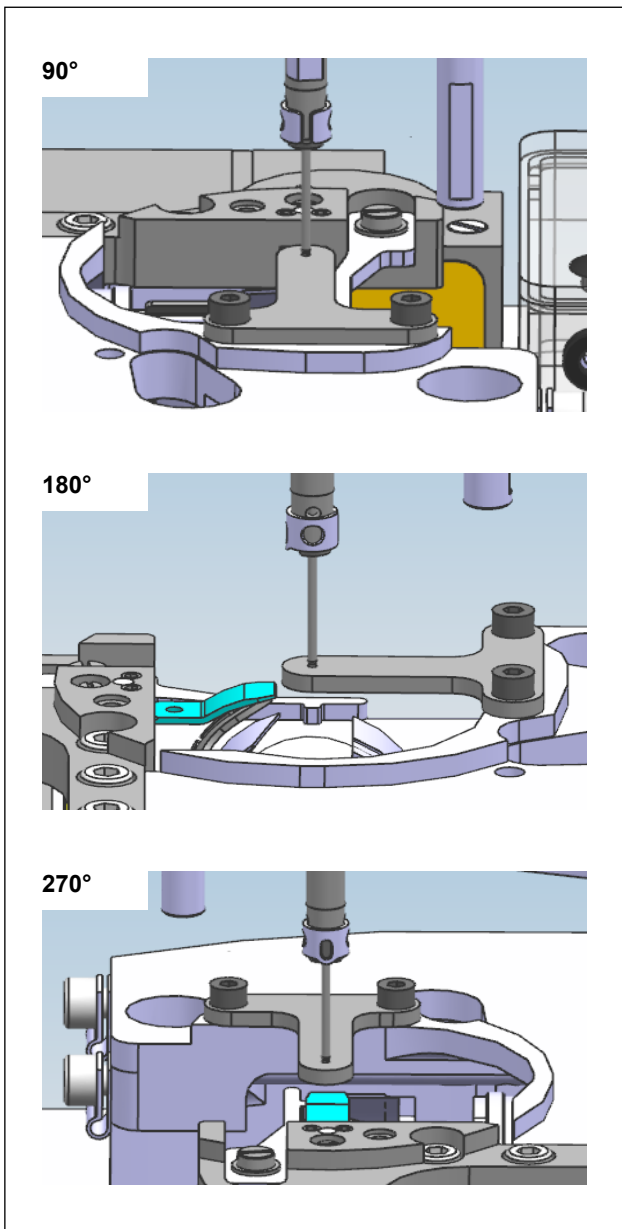
- 4) In the case the needle bar jig is displaced to the front side, it is necessary to adjust the hook driving shaft saddle forward.

The adjustment procedure is same as described above, but in the opposite direction.

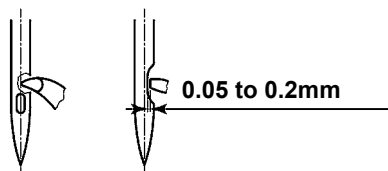


2-4. Confirmation and assembly after the adjustment

- 1) Once you have completed the adjustment in the X and Y directions, return the hook driving shaft saddle to the 0° position. Re-check the adjustment of the T-shaped jig to allow the needle bar jig penetrates the hole in the T-shaped jig.



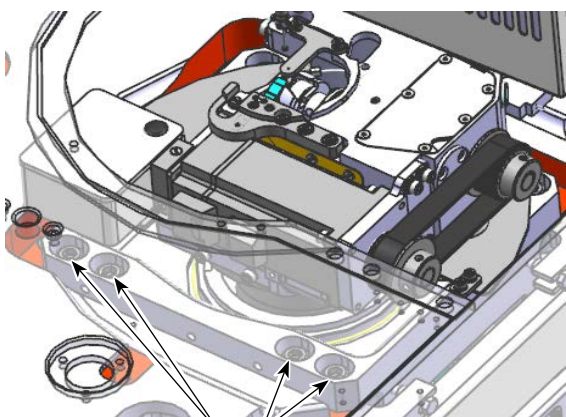
- 2) Turn the hook driving shaft saddle to the 90° position, 180° position and 270° position and check whether or not the needle bar jig enters the hole in the T-shaped jig.
If the needle bar jig fails to enter the hole, re-adjust the position of the hook driving shaft saddle in the X or Y direction.



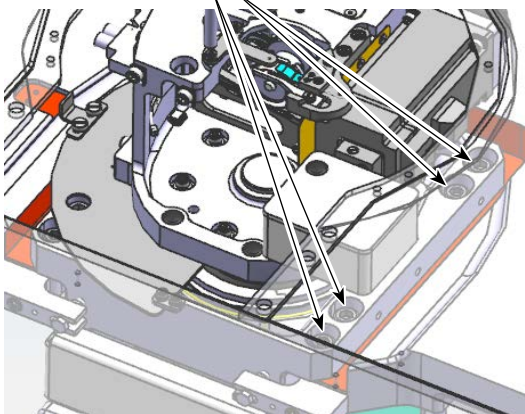
- 3) If you find no problem with centering of the hook driving shaft saddle in the four directions with the jigs, remove the needle bar jig and T-shaped jig lastly. Then, attach the needle and check whether the clearance provided between the needle and the blade point of the hook is within 0.05 to 0.2 mm in the four directions.

As long as all clearances are within the specification, the centering adjustment has been properly carried out.

On the other hand, if the clearance between the needle and the hook does not fall within the specification in all directions, it will be necessary to re-adjust the centering or hook timing.



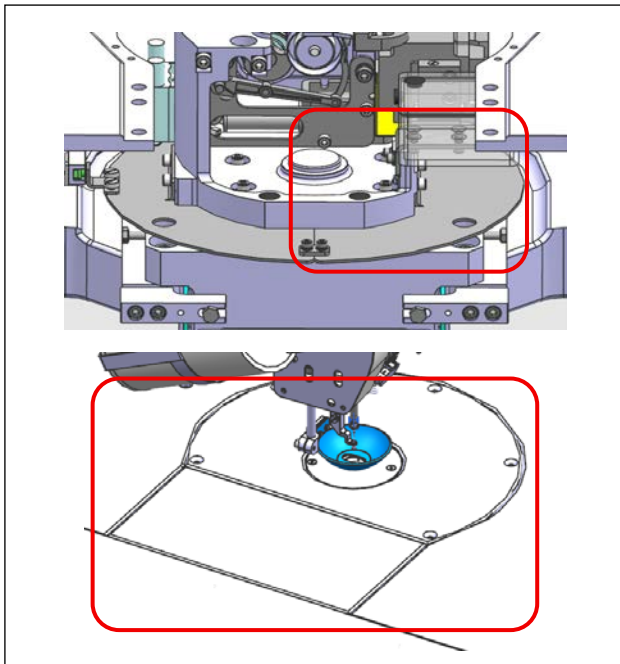
Screws



- 4) Temporarily tighten the setscrews (eight pieces) of the hook driving shaft saddle. Re-check the clearance between the needle and the blade point of the hook in the four directions.

As long as all clearances in the four directions fall within the specification, tighten the setscrews (eight pieces).

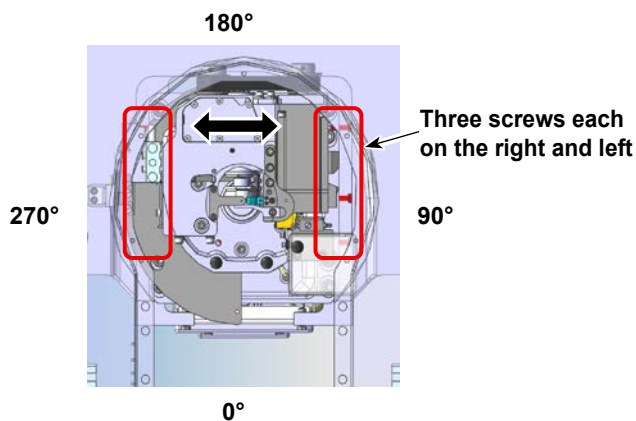
If you find a malfunction, carry out re-adjustment.



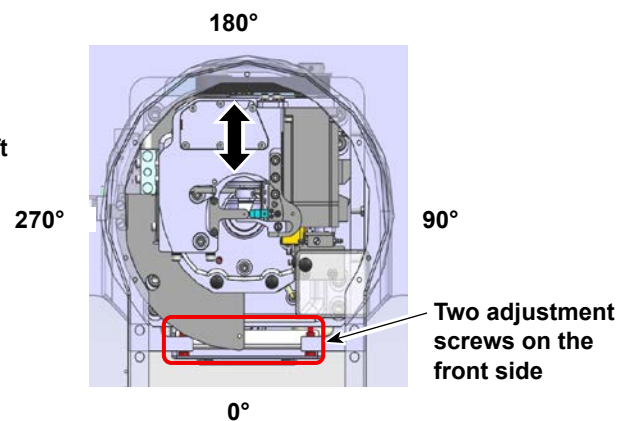
5) Lastly, restore the parts you have removed, such as the sheet metal, throat plate, resin covers and presser foot to the original positions.

[Image drawing of centering of the needle]

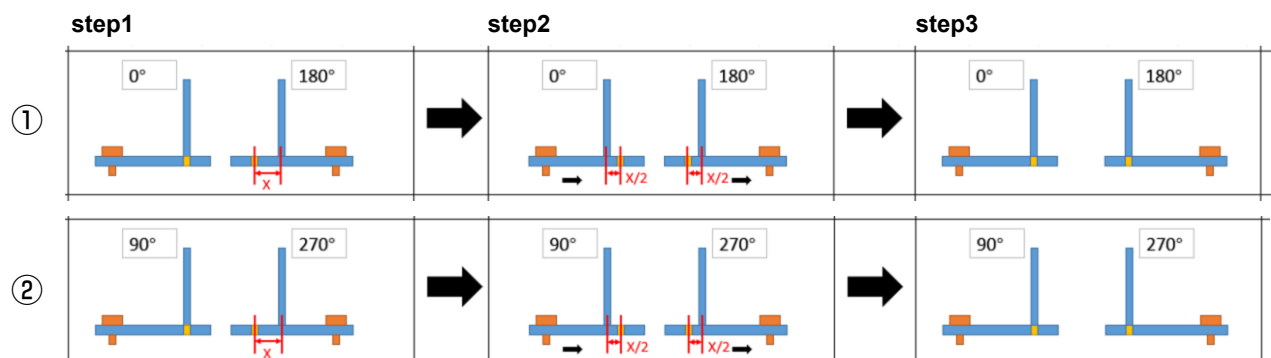
Adjustment in the lateral position ①



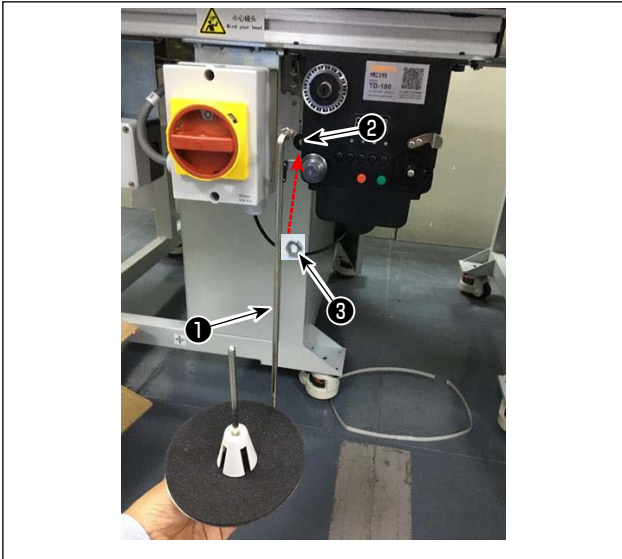
Adjustment of the longitudinal position ②



	step1	step2	step3	Adjustment points
① Lateral	Adjust the needle-center at 0° as reference. Then, turn by 180° and check the needle-center misalignment (amount and direction).	At 180°, adjust the misalignment to X/2 position, a half of the misalignment amount X.	Re-adjust the T-shaped jig to allow the pin to enter the hole in the jig.	Carry out lateral adjustment using three screws on the left and three ones on the right.
② Longitudinal	Align the needle-center at 90° as reference. Then, turn to 270° and check the needle-center misalignment (amount and direction).	At 270°, adjust the misalignment to X/2 position, a half of the misalignment amount X.	Re-adjust the T-shaped jig to allow the pin to enter the hole in the jig.	Carry out longitudinal adjustment with two adjustment screws on the front side.

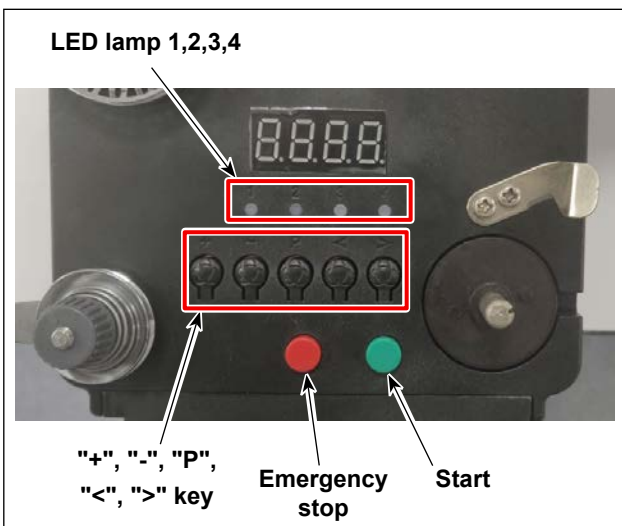


3-2. Installing the bobbin winder device



- 1) Insert bobbin winder disk mounting bar ① into hole ② in the bobbin winder and secure with nut ③.

3-3. How to use the bobbin thread winder



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: Thread length setting value:

0 to 99.9 m (when F is set to P0)

0 to 999 m (when F is set to P1)

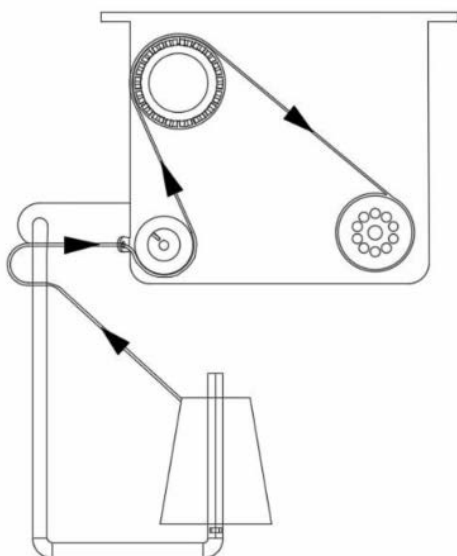
D: Motor speed: F1 (fast), F2 (medium), F3 (slow)

F: Thread length range changeover :

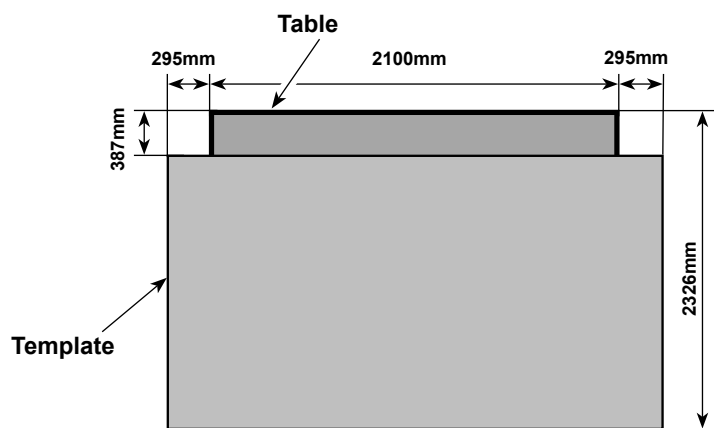
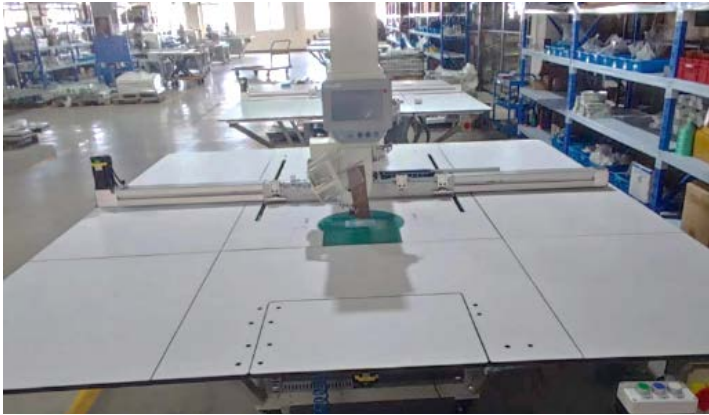
P0 (0 to 99.9 m)

P1 (0 to 99.9 m)

4. Threading Diagram



3-4. Precautions for installation of the machine



1. Depending on the size of template, the sewing machine may extend beyond the sewing machine table in X direction. Take care not to allow the machine to hit against someone standing near the table to cause injury.



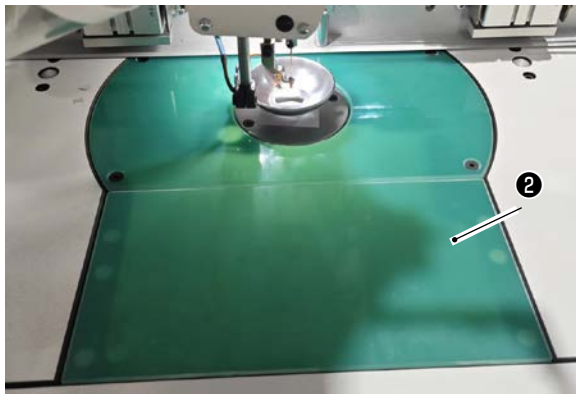
2. Be sure to secure a space as wide as 500 mm or more around the sewing machine table (i.e., both in lateral and longitudinal directions).

4. PREPARATION OF THE SEWING MACHINE

4-1. How to attach / remove the cylinder lifting plate



1) While the power to the sewing machine is turned ON, press switch ❶ .



2) Cylinder lifting plate ❷ comes off upward. Remove it. (The cylinder pushes up the lifting plate.)

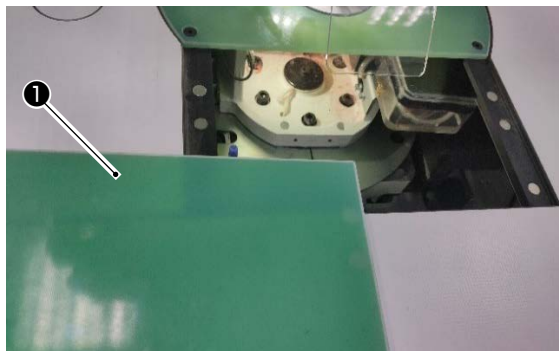
3) To install cylinder lifting plate ❷ , press switch ❶ . (The cylinder comes down to allow the cylinder lifting plate to be installed. The lifting plate is then secured with a magnet.)

4-2. Lubricating method and check of the oil quantity

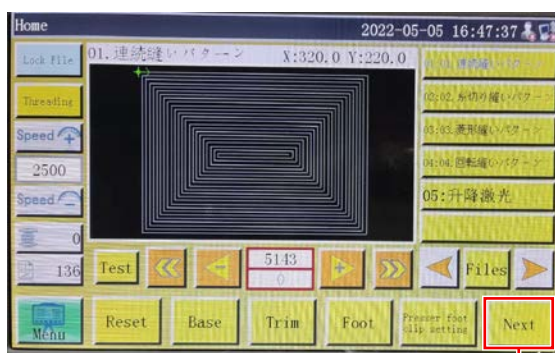


WARNING :

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



1) Detach cylinder lifting plate ① .



Screen A

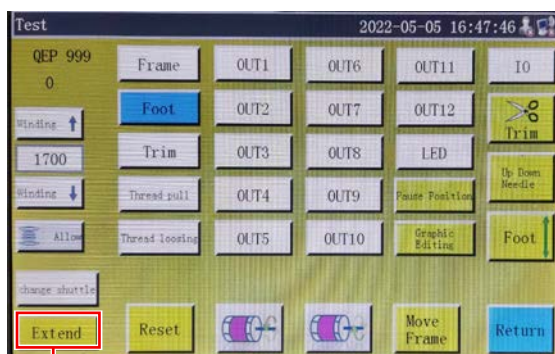
②

2) Remove cylinder lifting plate ① .

Press ② on the Start screen A to display the screen B.

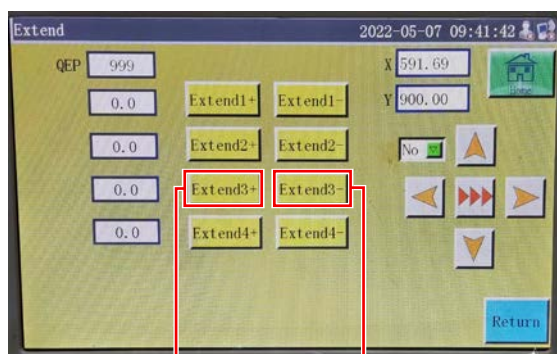
Then, press ③ to display the screen C. On the screen C, press ④ and ⑤ to rotate the bed and move lubricating rubber ⑦ of oil tank ⑥ to the outside of the bed.

Or turn the power OFF and rotate the resin cover.



Screen B

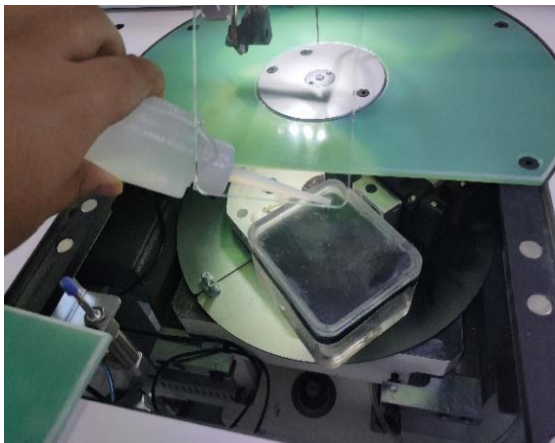
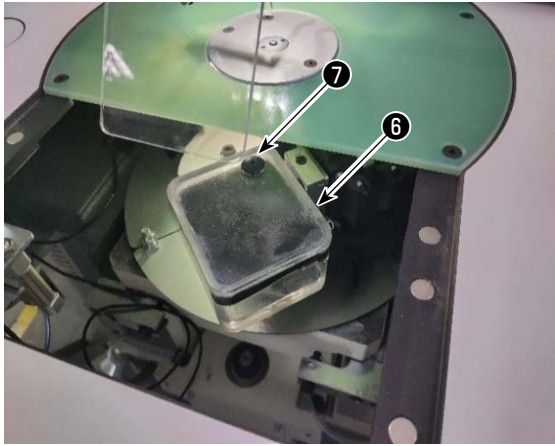
③



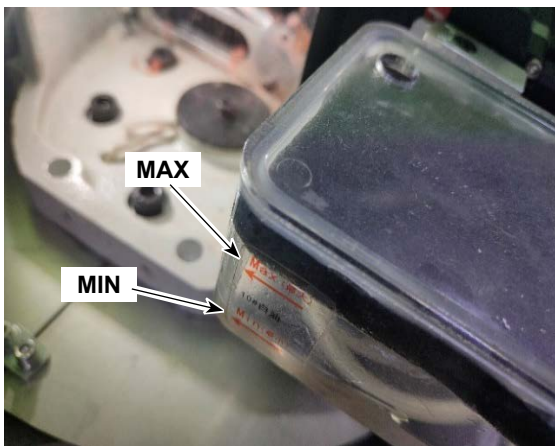
Screen C

④

⑤



3) Remove lubricating rubber ⑦ . Pour the supplied oil (or specified oil) into the oil tank.



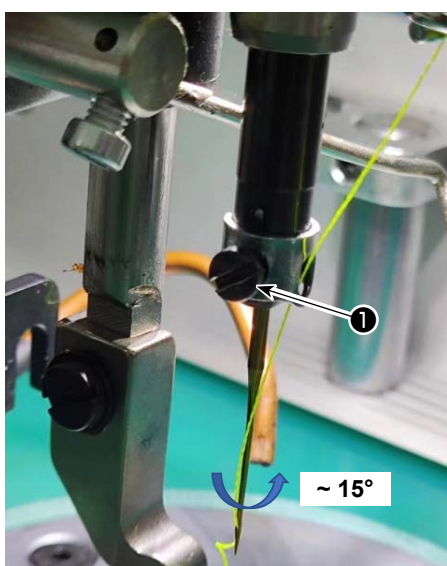
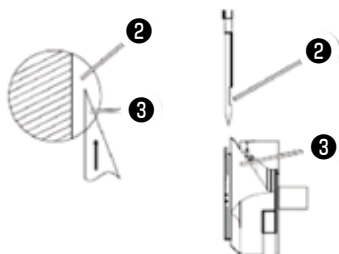
4) The proper amount of oil in the oil tank is between the Min and Max marker lines indicated on the oil tank.

4-3. Attaching the needle



WARNING :

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



1) Loosen screw ❶ to remove the needle.

Be sure to hold the needle so that its groove ❷ faces toward blade point ❸ of the rotary hook.

If polyester filament thread is used, it may be sometimes difficult for the wiper to spread the thread. In such a case, turn the needle counterclockwise to tilt it slightly (15° or less).

After you have turned the needle, re-check the hook timing (clearance between the needle and the hook).



2) Tighten screw ❶ .

In the case of replacing the needle with a needle which differs in specifications, be sure to re-adjust the distance from the rotary hook to the needle. If you neglect this re-adjustment, the problems listed below can occur.

1. Stitch skipping
2. Thread fray
3. Breakage of blade point of hook
4. Breakage of needle

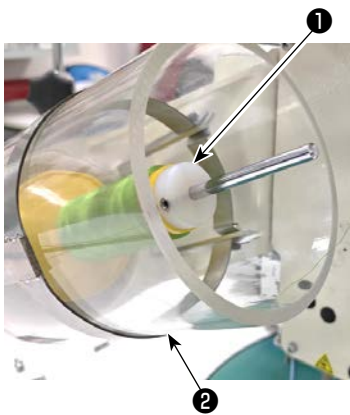


4-4. Threading the machine head

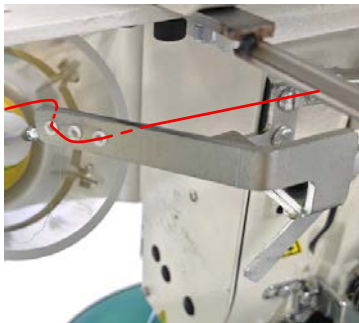


WARNING :

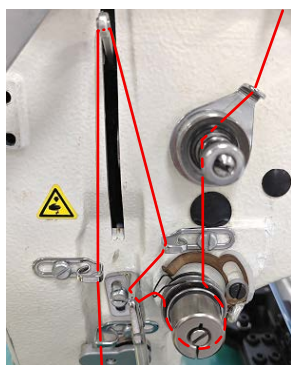
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



- 1) Put sewing machine thread ① on thread stand ② .



- 2) Pass the thread as shown in the figure.
Lastly, draw out the thread through the needle eyelet by 50 to 60 mm.

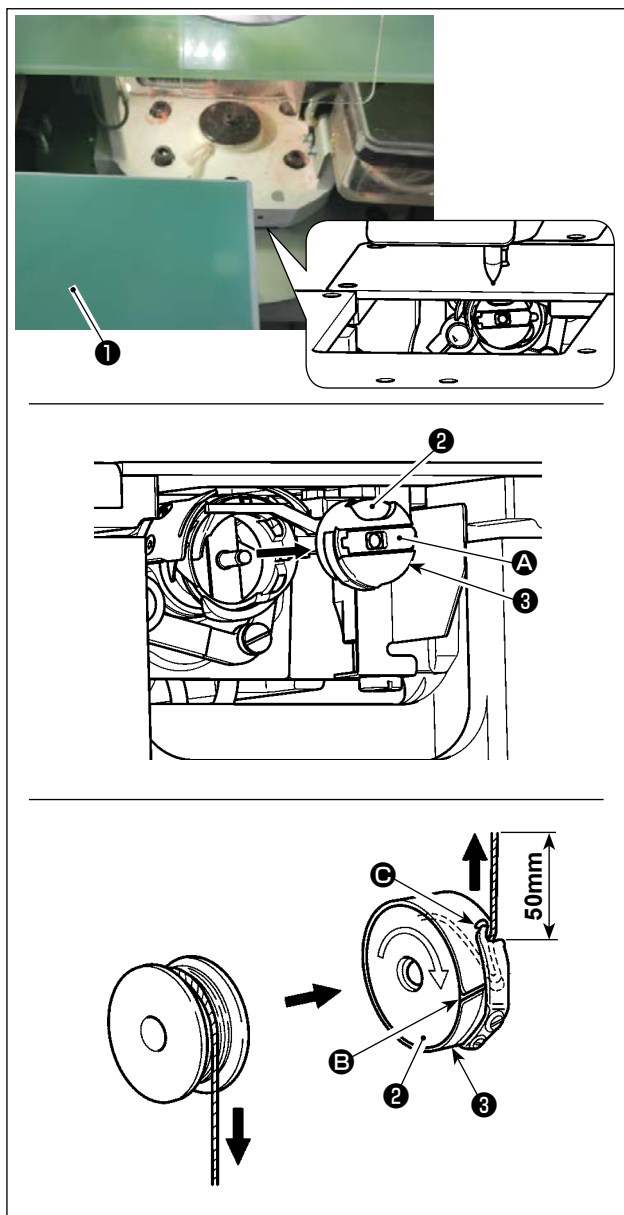


4-5. Bobbin replacement procedure



WARNING :

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



(1) Removing the bobbin case

- 1) Open cover ① . Then, the bobbin can be changed.
- 2) Raise latch A of bobbin case ③ , and remove the bobbin case ③ and the bobbin ② .



Check the position of your hands and the locations of goods before opening / closing cover ① so as to prevent the goods from being caught under the cover and to prevent bodily injury. In addition, do not push cover ① with your hands placed on it.

(2) Installing the bobbin

- 1) Set the bobbin ② into bobbin case ③ in the direction shown in the figure.
- 2) Pass the thread through thread slit B of bobbin case ③ , and pull the thread as it is. By so doing, the thread will pass under the tension spring and be pulled out from thread hole C.
- 3) Pull out the thread by 50 mm from thread opening C.



If the bobbin ② is installed in the bobbin case orienting the reverse direction, the bobbin thread pulling out will result in an inconsistent state.

(3) Installing the bobbin case

- 1) Place the bobbin case in the hook with its knob A tilted and fully push it into the hook until you hear it click.
- 2) Close cover ① .



If it is not fully inserted, bobbin case ③ may slip off during sewing.

4-6. Adjusting the Thread Tension

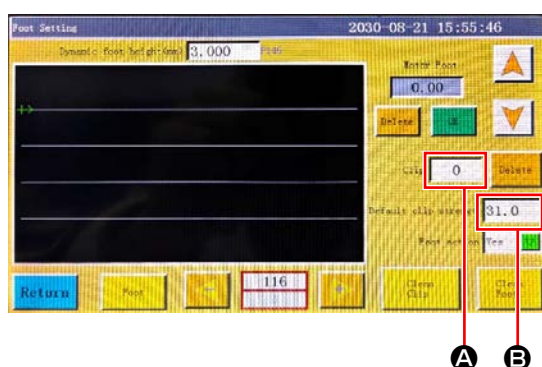


Fig. A



Fig. B



Fig. C

(1) Adjusting the needle thread tension

Thread tension controller No. 1 ①

When the tension disk of active tension ③ is loosened, a small amount of tension that is sufficient to control thread trimming has to remain. The remaining tension is produced by tension controller ①. It is possible to determine the length of thread trailing from the needle after automatic thread trimming by adjusting nut ② of the thread tension controller. The length of thread trailing from the needle is reduced by turning nut ② clockwise (+). It is increased by turning nut ② counterclockwise (-).

Active tension ③

The tension of active tension ③ (tension of the thread coming out of the needle eyelet) should be set as low as possible so that the threads intertwine at the center of the material (Fig. A). If the thread tension is excessively high when sewing a light-weight material, the material may become wrinkled or thread may break.

Adjust the tension by changing ① and ②.

The adjustment range is from 0 to 100. The higher the adjustment value, the higher the tension.

[Application range of ① and ②]

Save the tension setting of ① in the pattern data.

The set value will be automatically changed if you change over the pattern data.

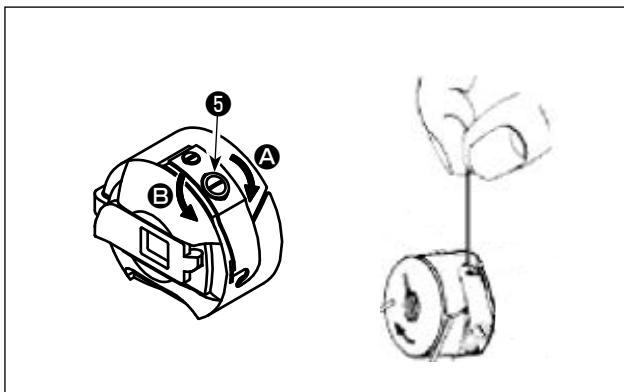
The tension setting of ② applies to all patterns. However, it is not saved in the pattern data. This means that the setting of ② will not be changed even if you change over the pattern data.

Refer to the next page for detailed instructions on how to use active tension ③.

Fig. A: Threads are interlaced together accurately at the center of material thickness.

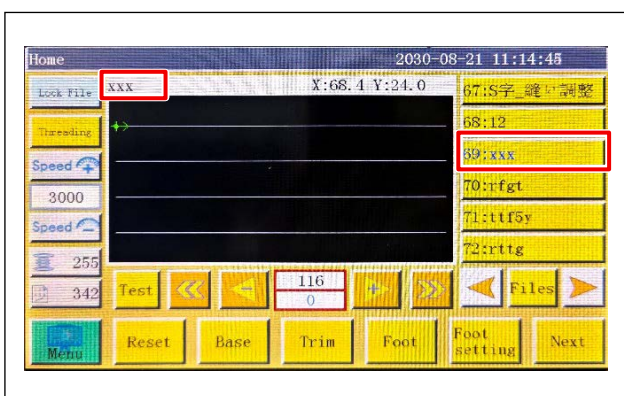
Fig. B: Needle thread tension is too low or bobbin thread tension is too high.

Fig. C: Needle thread tension is too high or bobbin thread tension is too low.



(2) Adjusting the bobbin thread tension

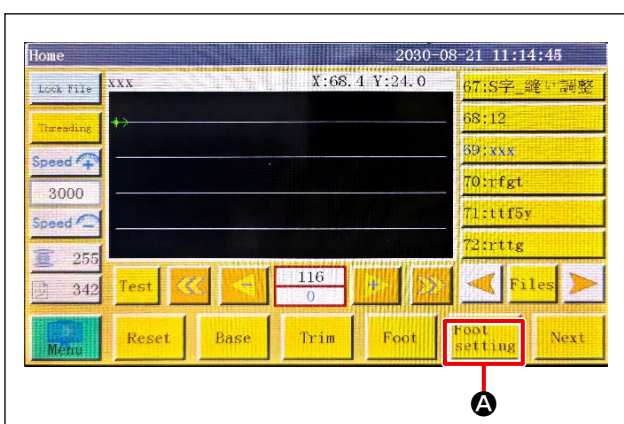
- 1) Turn tension adjusting screw **5** clockwise (in direction **A**) to increase or counterclockwise (in direction **B**) to reduce the bobbin thread tension. Recommended value: Approximately 25 g
The bobbin case will come down slowly by its dead weight by holding it as illustrated in the figure.



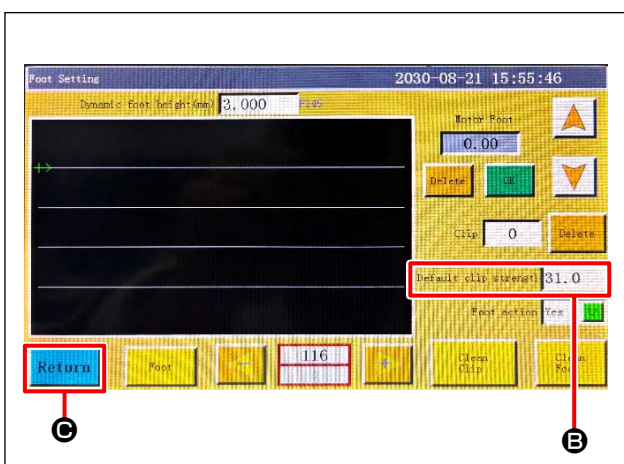
(3) Method for using the AT

1. Method for setting the AT thread tension

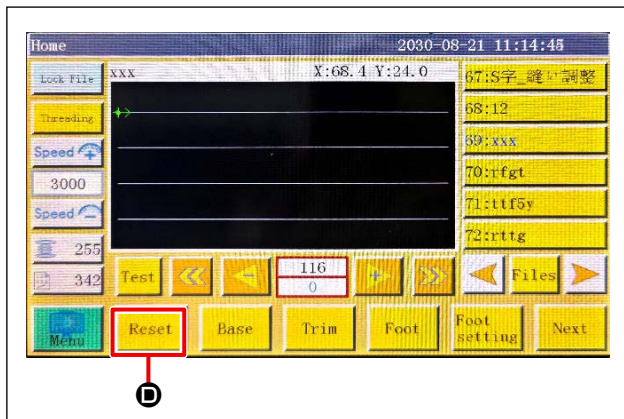
- 1) Select the sewing pattern thread tension for which you want to set.



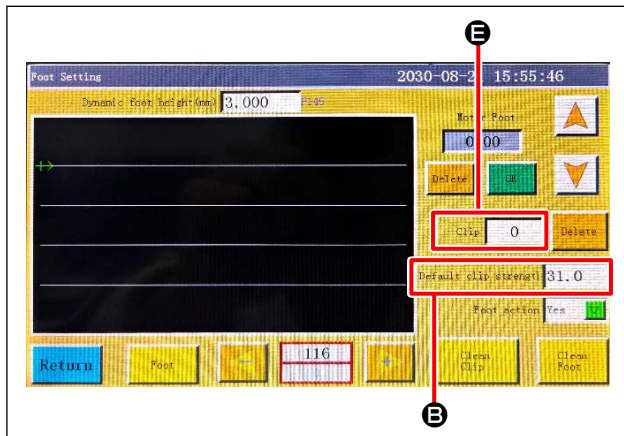
- 2) Press presser foot/thread tension setting button **A**.



- 3) A press on the default thread clamp **B** allows you to adjust the tension of the thread clamp. Enter an arbitrary set value and carry out test sewing. Confirm the appropriate set value of the tension of the thread clamp while observing the seam.
- 4) Press return button **C** to return to the main screen.



- 5) Press the reset button **D** on the main screen to return to the origin.



- 6) As with step 2), get into the Thread clamp tension setting screen and enter the set value in the Thread clamp **E**.

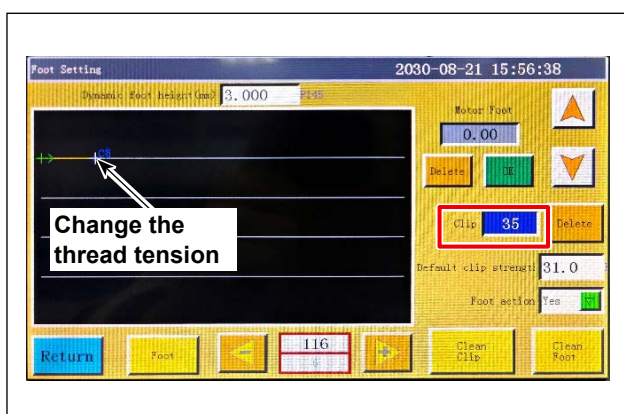
Set the Default thread clamp **B** to "1".



Thread clamp tension at the start of sewing 1: 30

1. Effective setting range of the default thread clamp and the thread clamp is from 1 to 100 (only integral numbers).

2. For the setting of the default thread clamp, only check the appropriate thread clamp tension by test sewing. Set the thread clamp at the time of actual production.



2. Method for changing the thread tension during sewing

- 1) Set a tension of the thread clamp at the location you want to change it at a midpoint of the seam line.

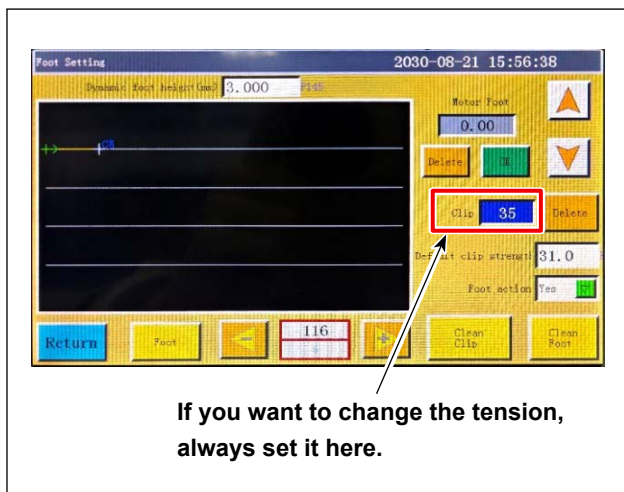
Thread tension setting method in the case of the picture shown on the left



Thread clamp tension at the start of sewing 1: 30

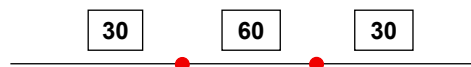
Thread tension from the changing point -

(To the end of sewing) : 60



- 2) If you want to change the thread tension again during sewing, set the thread tension in the entry field of "Thread tension 1" at a desired midpoint of the stitching line.

Thread tension setting method in the case of the picture shown on the left

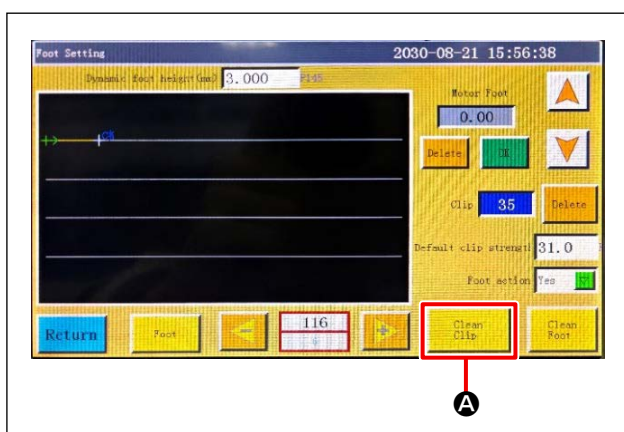


Thread tension 1 at the start of sewing : 30

Thread tension from the first changing point - : 60

Thread tension from the second changing point -
(To the end of sewing) : 30

Caution
The thread tension set in the entry field of "Thread tension 1" remains the same until the sewing is completed.



3. Method for deleting the changes in thread tension setting during sewing

- 1) If you press "Tension 1 button" **A** and "delete button" **B**, individual thread tension settings you have set in a sewing pattern will be totally deleted.



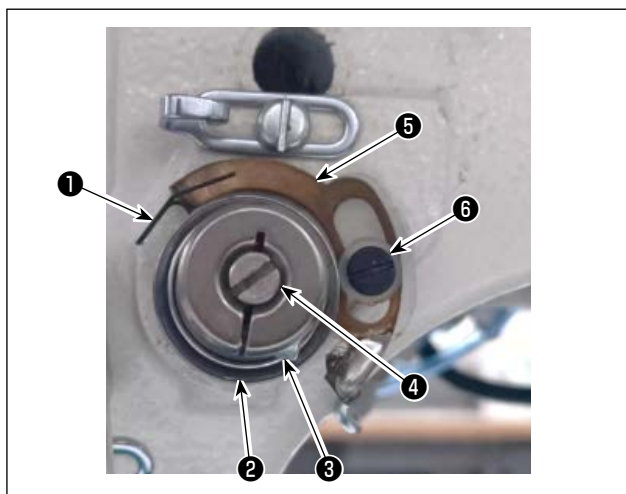
- 2) If you want to delete the individual thread tension settings separately, move cross mark cursor (+) to the target thread tension setting position and press delete button **B**.

4-7. Adjusting the thread take-up spring and the thread breakage detector plate



WARNING :

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



1) Adjusting the stroke

Loosen setscrew **2** and turn thread tension controller **3**. Turning it clockwise will increase the stroke of thread take-up spring **1** and, thereby, will increase the thread drawing amount.

2) Adjusting the pressure

To change the pressure of thread take-up spring **1**, insert a thin screwdriver into the slot of thread tension post **4** while setscrew **2** is tightened, and turn it. Turn it clockwise to increase the pressure of thread take-up spring **1**, or counterclockwise to decrease it.

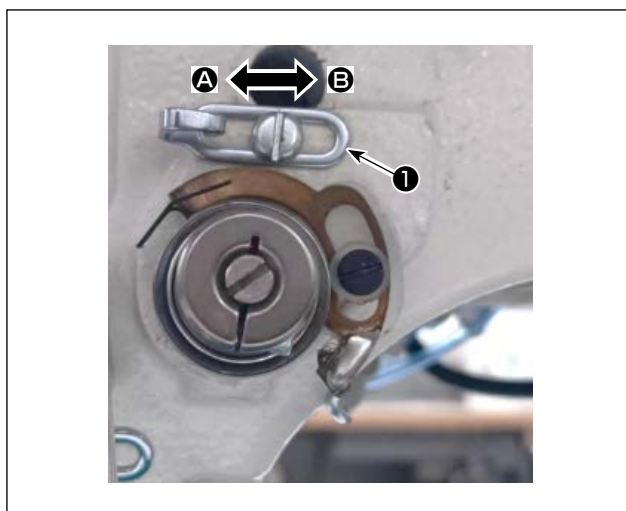
3) Adjusting the thread breakage detector plate

Loosen setscrew **6**. Adjust the position of thread breakage detector plate **5** so that the amount of contact between thread breakage detector plate **5** and thread take-up spring **1** is 0 to 0.2 mm.



Adjust so that thread breakage detector plate **5** does not come in contact with any metal parts other than thread take-up spring **1**. If it comes in contact with any other metal part, a malfunction may occur.

4-8. ADJUSTING THE THREAD TAKE-UP STROKE



1) When sewing heavy-weight materials, move take-up thread guide **1** to the left **A** direction to increase the length of thread pulled out by the thread take-up.

2) When sewing light-weight materials, move take-up thread guide **1** to the right **B** direction to decrease the length of thread pulled out by the thread take-up.

Reduce the thread take-up amount.

3) At the standard position of thread guide **1**, the center of elongated hole is aligned with the center of the screw.

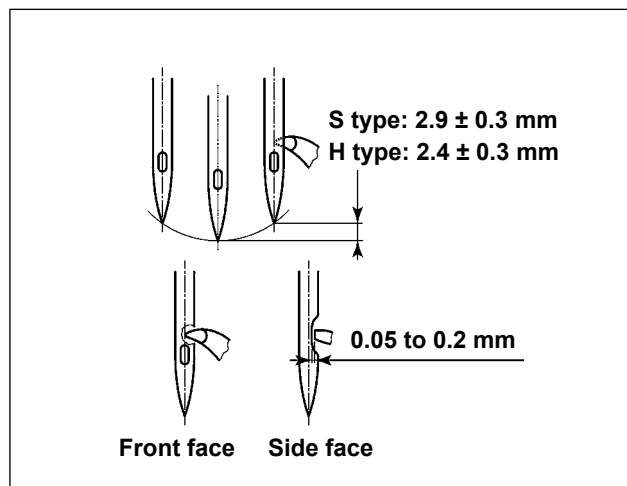
4-9. Needle-to-hook relationshi



WARNING :

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

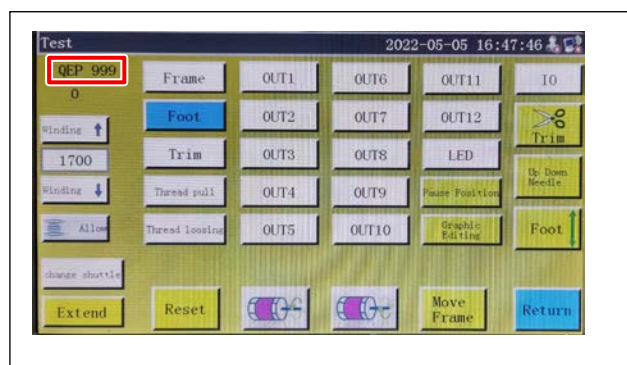
(1) Needle and hook, and angle setting



- 1) For the S type, the relation between the needle bar height and the hook position should be adjusted when the needle bar goes up from its lower dead point by 2.9 ± 0.3 mm. For the H type, it should be adjusted when the needle bar goes up from its lower dead point by 2.4 ± 0.3 mm.
- 2) When observing from the front face of the sewing machine, the blade point of hook seems to overlap with the center of needle.
- 3) When observing from the side face of the sewing machine, the clearance provided between the blade point of hook and the scarf of needle is 0.05 to 0.2 mm.

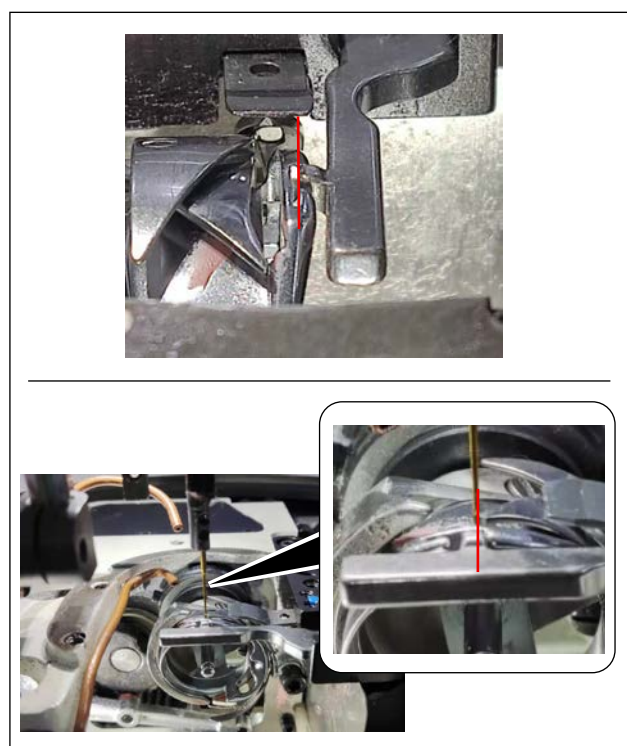


If thread breakage occurs, the thread can be tangled in the hook. In such a case, remove the thread being tangled in the hook carefully. Then, re-start sewing.



- 4) As shown in the figure, the electrical shaft angle setting QEP value displayed on the operation panel becomes 450 to 465 (reference value).

(2) Position of the needle and the inner hook holder

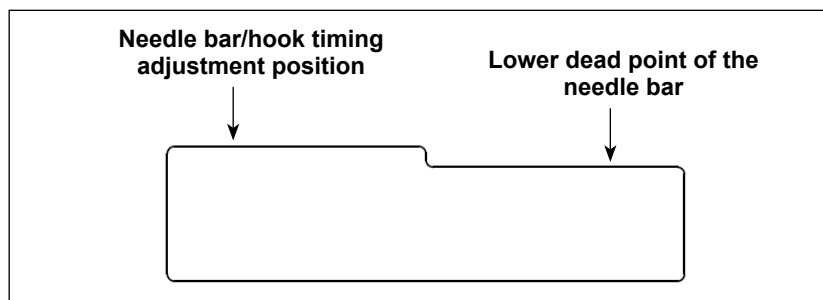


Longitudinal position of the inner hook holder and needle: The front end of needle is aligned with the inner hook.

Lateral position of the inner hook holder and needle: The rightmost end of projection of inner hook holder is aligned with the right side of needle.

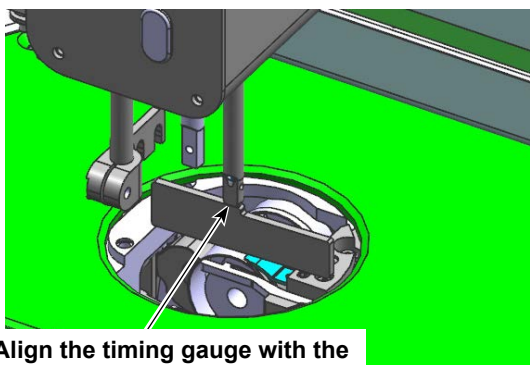
(3) Adjusting the hook timing

The timing gauge is supplied for the machine as an accessory.



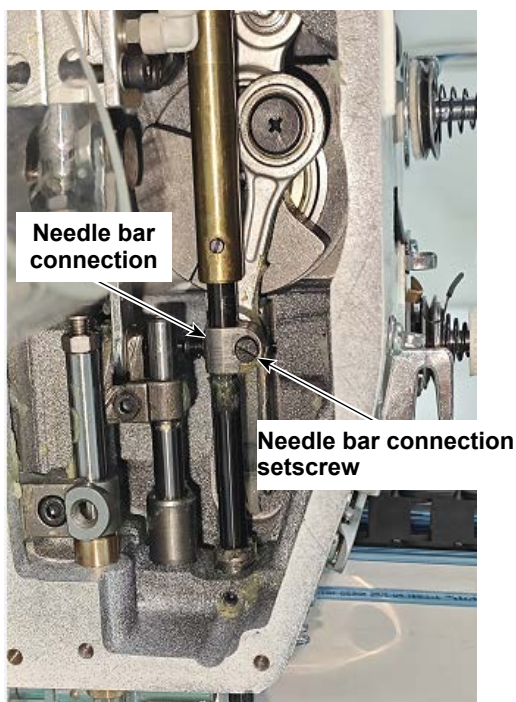
Adjust the timing between the needle bar and the hook according to the standard specification.

The timing gauge for the S type and that for the H type are different. (Each timing gauge has an engraved marker.)

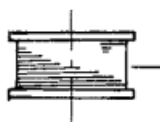
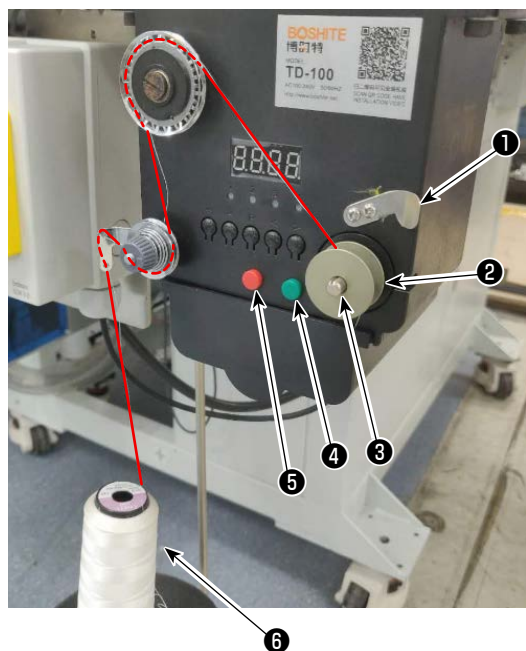


Align the timing gauge with the end surface of the needle bar.

- 1) Place the timing gauge on the hook driving shaft saddle. At first, adjust the lower dead point of the needle bar.
Loosen the needle bar connection screw and adjust the height of the needle bar.
- 2) Then, turn the timing gauge by 180 degrees of an angle longitudinally. Adjust the hook timing position.



4-10. How to wind a bobbin



Amount of thread wound on a bobbin: 80 % (recommended)

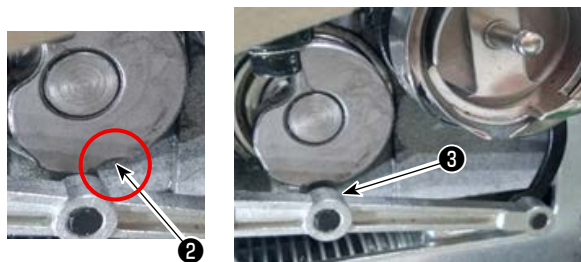
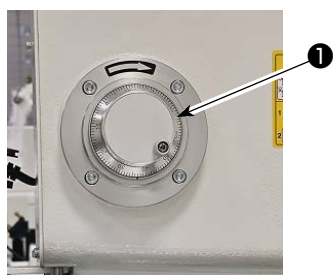
- 1) Put bobbin ② on bobbin winder shaft ③ .
- 2) Pass sewing thread ⑥ through spool rest rod.
- 3) Pass the thread as illustrated in the figure.
- 4) Manually wind thread on bobbin ② by several turns clockwise.
- 5) Press button ④ to start winding thread on the bobbin.
- 6) When the bobbin thread amount wound on the bobbin reaches the set amount (80 %), the bobbin winder automatically stops turning. Or, press button ⑤ to stop the bobbin winder.
- 7) Trim the thread with thread trimmer ① . Detach bobbin ② .

4-11. Adjusting the position of the thread trimmer



WARNING :

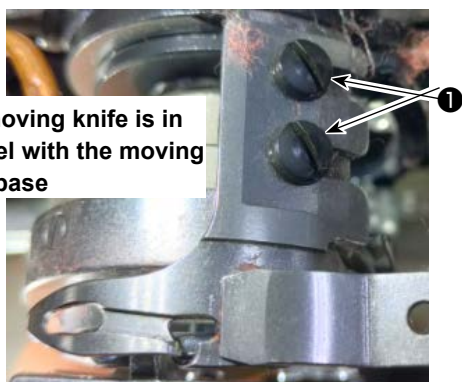
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



(1) Adjusting the position of the thread trimming cam

- 1) Turn pulley ① to engage needle bearing ③ of the thread trimmer connecting rod with groove ② in the thread trimming cam.

The shipping standard of the electrical shaft angle setting parameter QEP value is 200. Finely adjust this parameter value in accordance with the difference in materials.



The moving knife is in parallel with the moving knife base

(2) Adjusting the position of the moving knife and counter knife

- 1) Attach the moving knife to the moving knife base. Push the moving knife to the right to make the tail of the moving knife in parallel with the moving knife base. At this time, the blade point of moving knife is aligned with the needle. Tighten moving knife clamping screw ①.



Blade point of moving knife is aligned with the needle

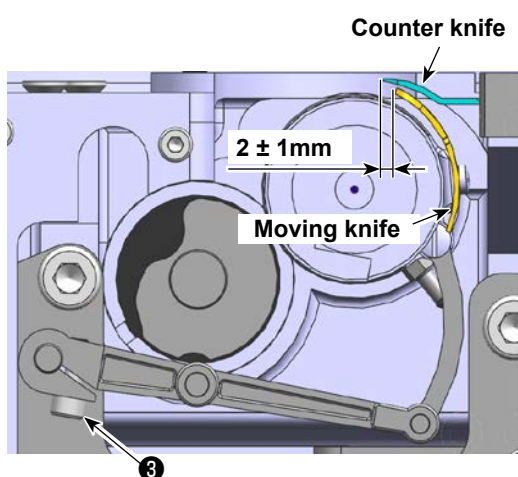
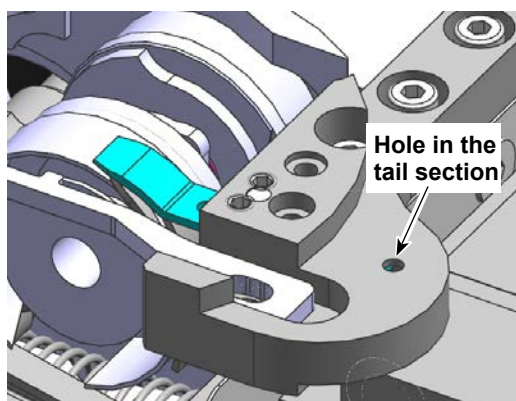


Blade point of moving knife



2) Install the counter knife.

There is a hole in the tail of the counter knife mounting plate. Insert a 2.5-mm hexagonal wrench into the hole. Then, tighten fixing screw ② of the counter knife while aligning the tail of the counter knife with the hexagonal wrench.



3) Loosen setscrew ③ of the moving knife rod. Adjust the clearance provided between the moving knife and the counter knife to 2 ± 1 mm. Then, tighten setscrew ③.

Mark both sides of the moving knife with a black marker pen.



- 4) Mark the 5-mm position of the moving knife blade with a black marker pen. Adjust the counter knife pressure with counter knife pressure adjustment screw ④ (two locations).

After the completion of the aforementioned adjustment, face down the moving knife and re-adjust the moving knife pressure repeatedly until both sides of the black marker on the moving knife blade are rubbed by the counter knife at the same time. In addition, try to adjust so that; the less the friction force between the moving knife and the counter knife is decreased, the better thread trimming result can be obtained.



Black markers on both sides of the moving knife are rubbed by the counter knife simultaneously.



4-12. How to confirm the amount of oil (oil splashes) in the hook

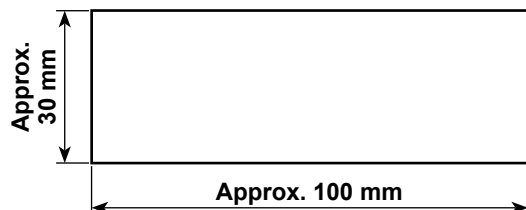


WARNING :

Be extremely careful about the operation of the machine since the amount of oil has to be checked by turning the hook at a high speed.

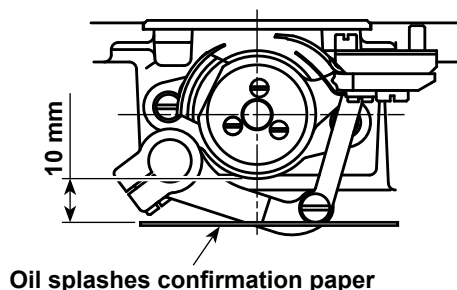
(1) How to confirm the amount of oil (oil splashes)

① Amount of oil (oil splashes) confirmation paper



* Use any paper available regardless of the material.

② Position to confirm the amount of oil (oil splashes)



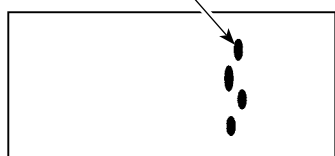
When carrying out the procedure described below, confirm the state that the needle thread from the thread take-up lever to the needle and the bobbin thread are removed, the presser foot is lifted and the slide plate is removed. At this time, take extreme caution not to allow your fingers to come in contact with the hook.

- 1) Check to make sure that the oil quantity is adequate referring to "4-2. Lubricating method and check of the oil quantity" p.33.
- 2) If the machine has not been sufficiently warmed up for operation, make the machine run idle for approximately fifteen minutes.
- 3) Place the amount of oil (oil splashes) confirmation paper under the hook while the sewing machine is in operation.
- 4) Confirmation of the amount of oil (oil splashes) should be completed in ten seconds.

(2) Sample showing the appropriate amount of oil (oil splashes)

Appropriate amount of oil (State of oil spots)

Splashes of oil from the hook

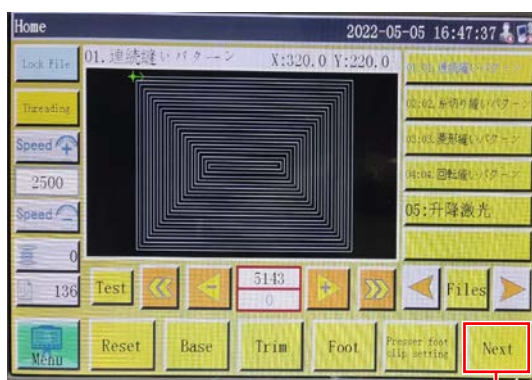


- 1) The state given in the figure above shows the appropriate amount of oil (oil splashes).
- 2) Check the oil amount (oil splashes) three times (on the three sheets of paper), and adjust so that it should not change.



Do not excessively increase/decrease the amount of oil in the hook. If the amount of oil is too small, the hook will be seized (the hook will be hot). If the amount of oil is too much, the sewing product may be stained with oil.

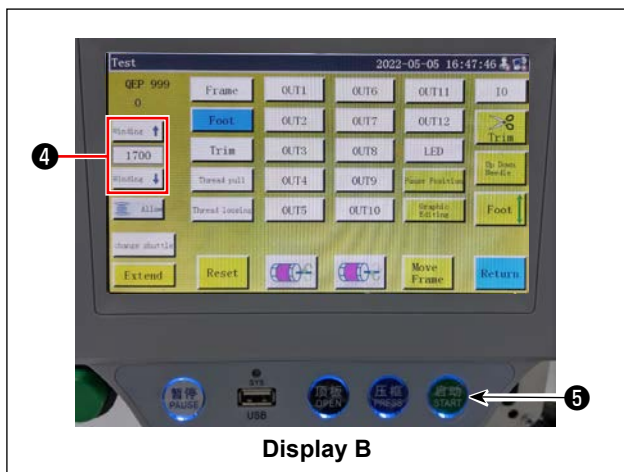
(3) Operation of the operation panel



Display A

③

- 1) Press ③ on the Start screen A to display the screen B.



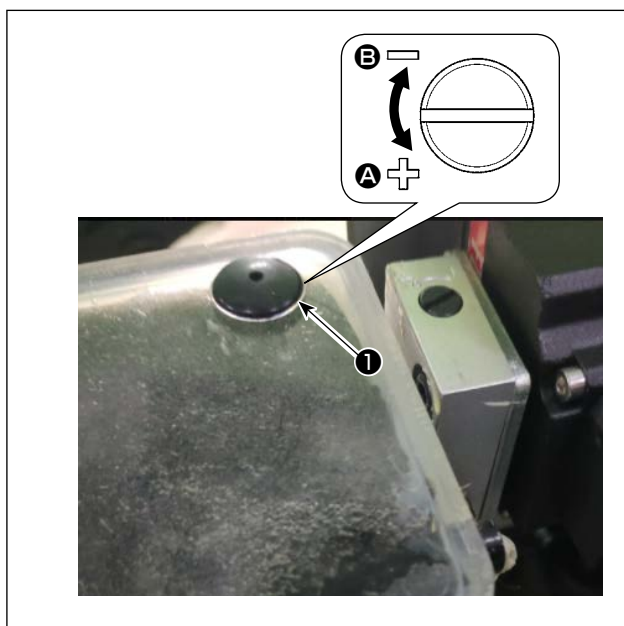
- 2) Press **4** to change the number of revolutions to 2500.
- Press **5** to run the sewing machine idle for 15 minutes. Then, measure the amount of oil.

4-13. Adjusting the amount of oil in the hook



WARNING :

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



- 1) Remove the cylinder lifting plate.
- 2) The oil amount is increased by turning screw **1** in the direction of arrow **A**, or decreased by turning it in the direction of arrow **B**.
- 3) After the completion of adjustment, attach the cylinder lifting plate.



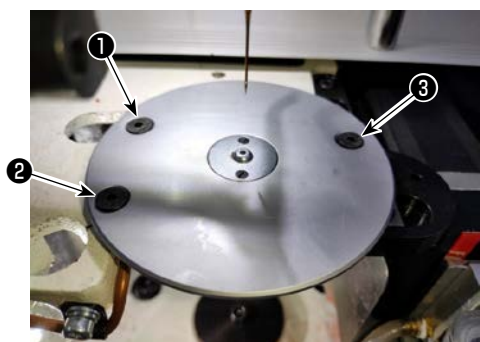
1. After the adjustment, check the oil quantity by running the sewing machine idle for approximately 30 seconds, as well as by checking it in comparison with the sample showing the adequate oil quantity. (Refer to "4-12. How to confirm the amount of oil (oil splashes) in the hook" p.49.)
2. In the case of adjusting the hook oil quantity, firstly adjust the oil quantity by turning oil quantity adjustment screw in the direction of arrow **A** to increase it. Then, adjust the hook oil quantity by turning the adjustment screw in the direction of arrow **B** to decrease it.
3. The hook oil quantity has been factory-adjusted at the time of shipment, based on the maximum sewing speed of sewing machine. When the customer always operate the sewing machine at a low speed, the hook oil quantity may run short causing a sewing machine failure. To prevent such a failure, adjustment of the hook oil quantity is required when the customer runs the sewing machine at a low speed at all times.

4-14. Adjusting the needle hole in the throat plate and the needle



WARNING :

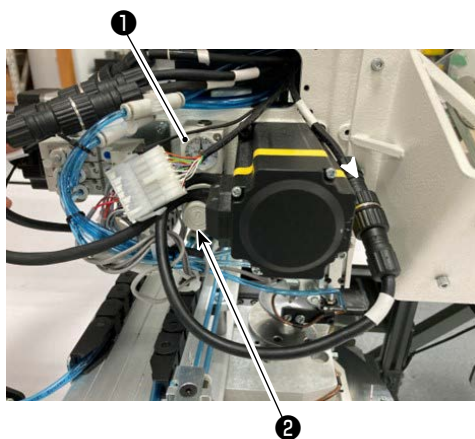
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



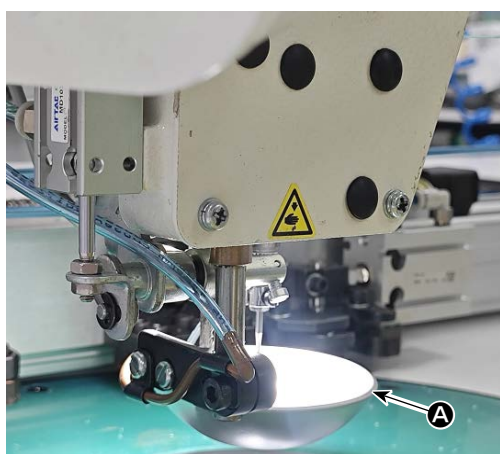
In the case the needle does not come down to the center of needle hole in the throat plate, the position of the throat plate can be finely adjusted with screws ❶ ❷ and ❸ .

- 1) Loosen screws ❷ and ❸ and lightly loosen screw ❶ . Then, move the throat plate to adjust so that the needle is aligned with the center of needle hole in the throat plate.
- 2) Tighten ❶ . Then, tighten ❷ and ❸ .

4-15. Adjusting the disk presser pressure



1) Adjust the disk presser air cylinder pressure regulation valve ❶. Pull up nut ❷. Then, turn the nut clockwise to increase the disk presser pressure or turn it counterclockwise to decrease it. The air pressure has been factory-set to 0.15 MPa at the time of shipment. Adjust it appropriately while checking the actual sewing state.



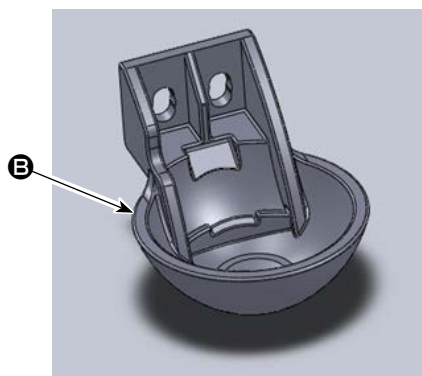
2) Changing the disk presser

Check the actual sewing operation. Use the disk presser or the plastic disk presser according to the condition of actual sewing operation.

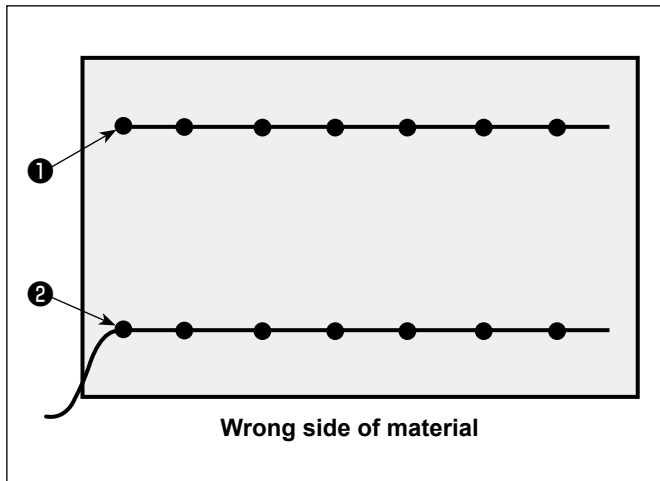
❶ Disk presser (factory-attached at the time of shipment)

❷ Plastic disk presser

When changing the disk presser with the plastic disk presser or vice versa, try to position the disk presser so that its bottom surface is in parallel with the hook cover. Adjust the height of the disk presser according to the actual material thickness (i.e., height) while taking care not to allow the disk pressers to come in contact with the intermediate presser.



4-16. Adjusting the thread end position at the beginning of sewing



It is possible to set the needle thread end position at the beginning of sewing to top side ❶ or underside ❷ of material.

Change over the setting of the wiper function between ON and OFF in accordance with these two conditions of the needle thread end position.

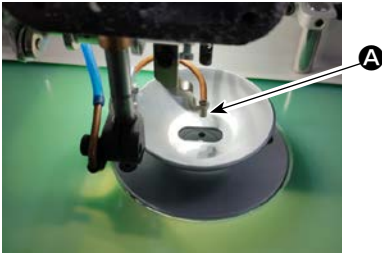
❶ To put the needle thread end on the top of material

Place the wiper function in OFF.


❷ To put the needle thread end on the underside of material

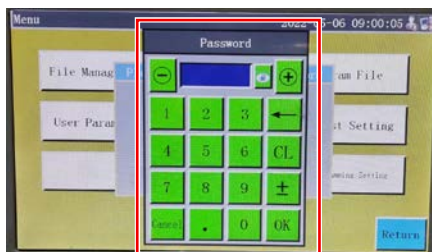
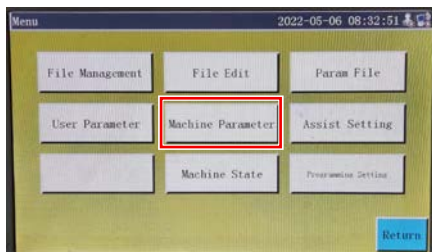
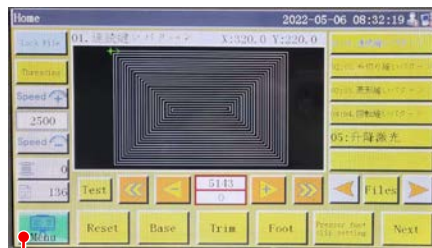
Place the wiper function in ON.

4-17. Adjusting the electronic intermediate presser stroke



It is necessary to adjust the intermediate presser stroke (A) appropriately since there would be the need for preventing stitch skipping depending on thickness or type of the material.

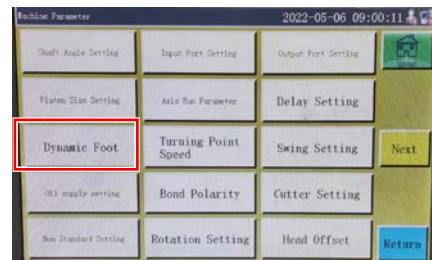
- 1) Press  ① on the main screen of electrical box.
- 2) When you press the "Machine setting parameter", ② is displayed.
When you enter the password "11111111", screen ③ is displayed.
- 3) On the screen that is displayed by pressing the "Presser follow-up setting", set the parameter (the follow-up height of presser foot has been factory-adjusted to 3 mm at the time of shipment).



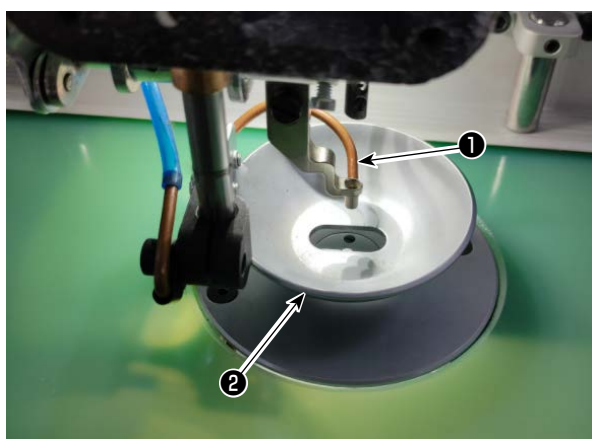
②



③

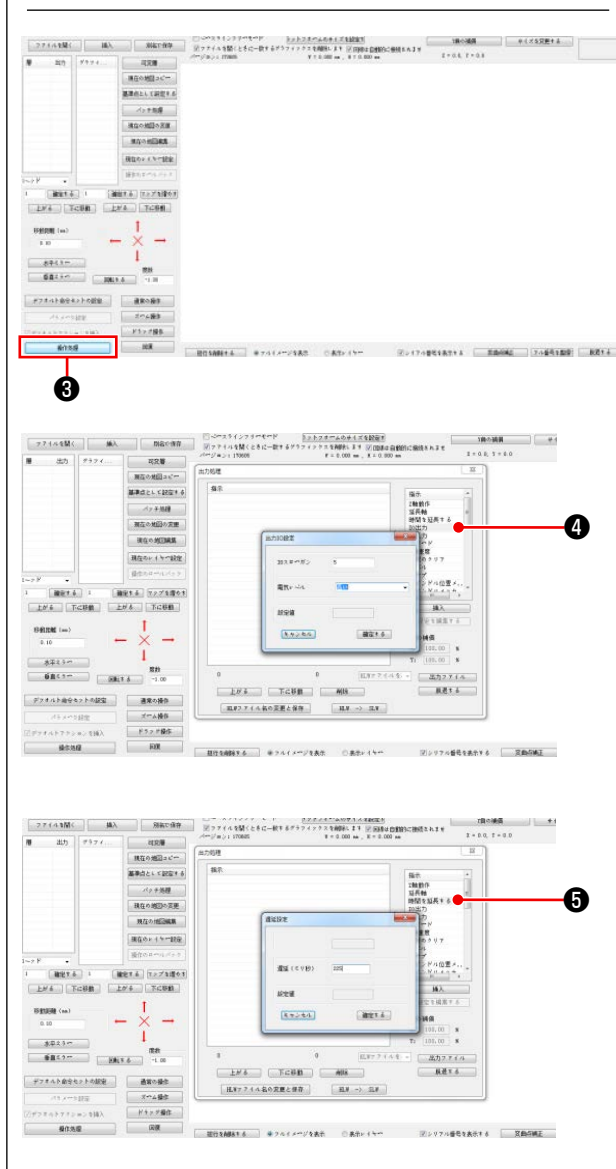


4-18. Adjusting the air blow for the needle thread and bobbin thread



Blow-up pipe ① blows air to blow up the thread end trailing from the needle to bring it under disk presser ② at the beginning of sewing by controlling the solenoid valve of the electrical system.

Thread end is pushed by air between the disk presser and the pattern at the beginning of sewing. In the case the thread end cannot be pushed due to the location and direction of slits on the pattern, adjust the blowing direction of the air to allow the thread end to be pushed by air.



Launch the pattern creation software to operate and process the pattern to be sewn.

On the screen that is displayed by clicking "Operation processing" ③, click ④ ("Enter I/O") and change the "I/O" to 5.

Change the "Level" to "high" ("low" refers to "turning OFF"). Click ⑤ ("Delay"). Change the "Delay (msec)" to 225.

The needle thread air blower and the wiper cannot be used simultaneously.

1. The wiper provides the function for bringing the needle thread above the presser foot.
2. The needle thread air blower provides the function for bringing the needle thread under the disk presser.

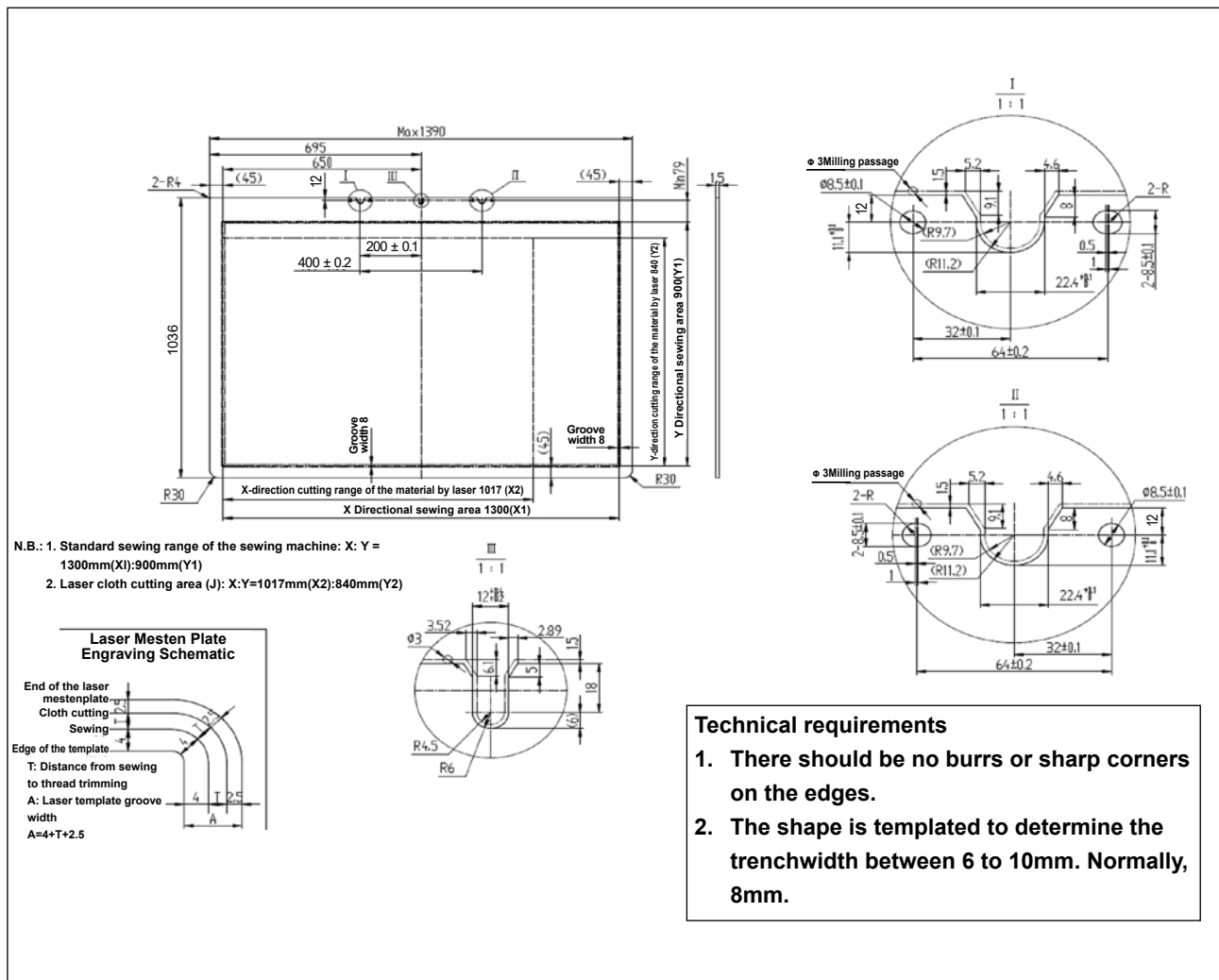


4-19. Making a template

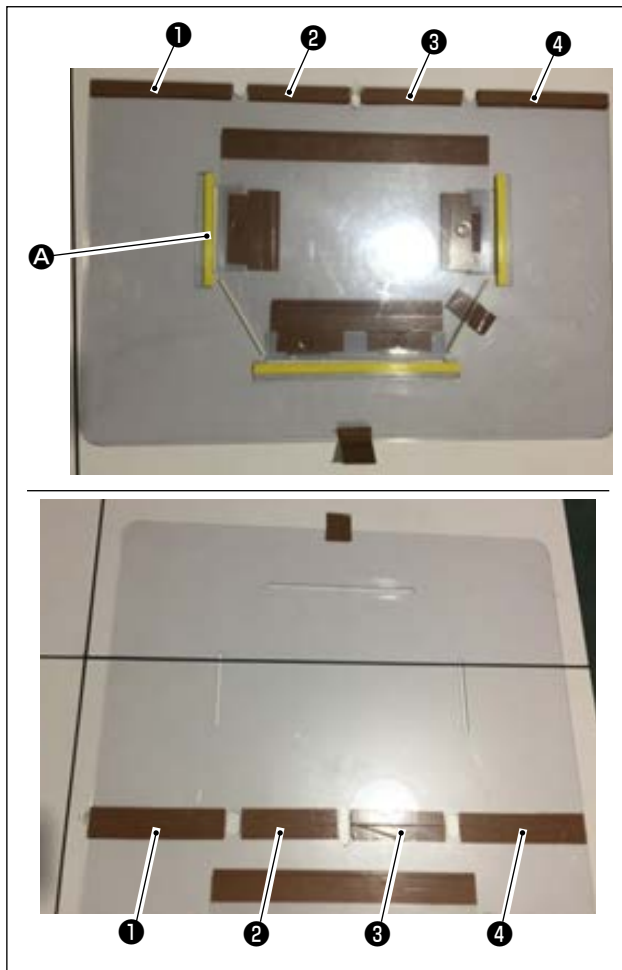
(1) Machining a template

13090 type template of dimensions of the maximum sewing range

- Material of template: PVC plate
- Template thickness: 1.5 mm thick PVC plate
- Adjust the template size according to the cloths and/or pattern to be sewn.
The size must not exceed the maximum dimensions of the relevant specifications.
- Check complexity of the pattern to be sewn. Then, select the sewing slits from the range of 6 mm to 10 mm according to the complexity of the pattern.
- Locus of sewing slits on the template should be designed according to the pattern to be sewn or intended machining.
- Select the suitable pattern carving machine. The template must be machined by the qualified engineers who have successfully finished the on-the-job training.
- After the completion of machining upper and lower templates, deburr the templates and the top surface of the template mounting plate.
- In the case the template is used only for the PS910, processing of I and II is not required. (Machining is required if interchangeability with other models is necessary.)



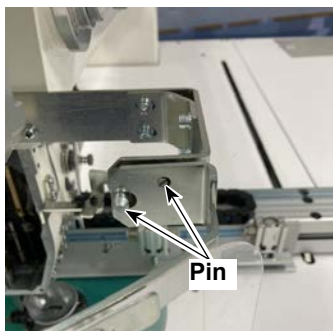
(2) Attaching the templates



Machine the upper and lower templates based on the design.

- 1) Put the upper template on the lower template, as shown in the figure, and adjust so that sewing slits **A** on the upper and lower templates are aligned. Affix exclusive template tape (36 mm wide) to portions **1** , **2** , **3** and **4** as illustrated in the figure.
- 2) To produce more beautiful seams, it is recommended to firmly secure the material at the correct position by affixing sand tape, double-sided adhesive tape, etc. on the slits of the upper and lower templates or put positioning pins at appropriate locations in order to prevent the material slippage.

4-20. Preparation for sewing

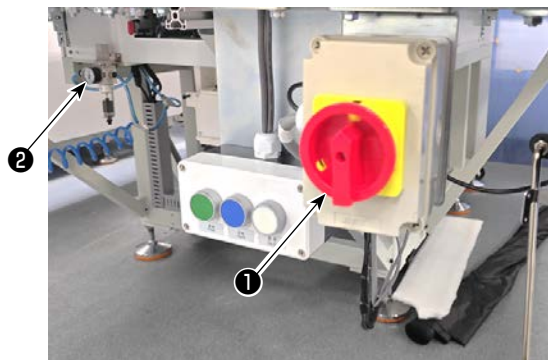


1) Lock the safety cover.

Be sure to lock the safety cover before turning the power to the sewing machine.

At the home position of the cover, fit the cover over the two pins to lock it securely.

- * If the safety cover is not locked securely, the safety sensor will fail to detect and fail to allow the sewing machine to start. So, be careful.



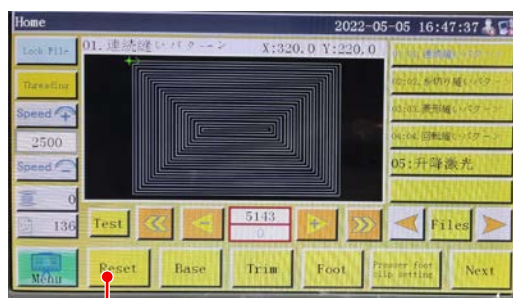
2) Turning ON the main power switch.

Press switch ❶ to turn ON the main power supply.

3) Turning ON the main air source switch

Move main air valve ❷ to the right to open the main air source.

- * If the operation panel freezes after you have turned the power ON, check whether the operation panel cable is connected properly.



4) Resetting the equipment

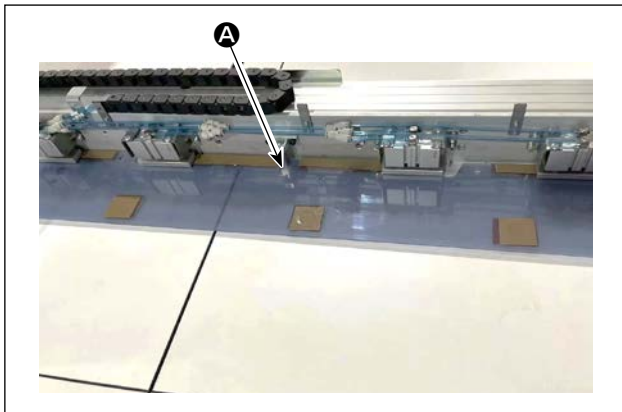
When the equipment is reset by pressing



❸, the needle stops at its upper stop position, and the disk presser and intermediate presser go up.

5) Read the pattern data to be sewn, or directly edit the pattern data on the operation panel.

Refer to the Instruction Manual for the computer-control system for details.



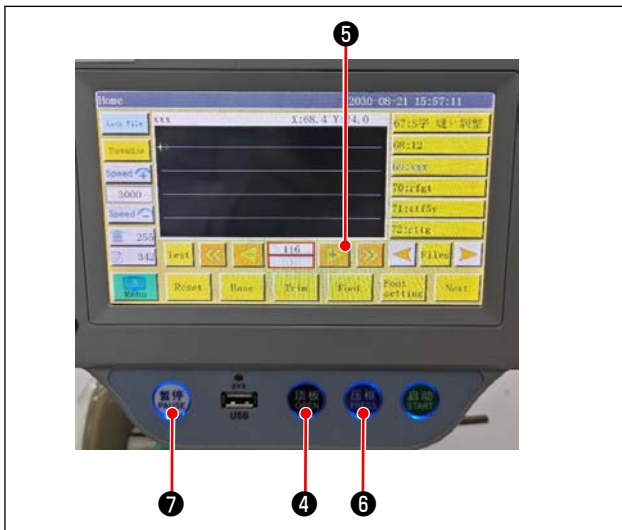
6) Attaching a pattern

Moving an empty pattern (with no material), fit positioning hole **A** on the pattern positioning plate on the positioning pin.

7) Reading the sewing pattern data

1. In the case an electronic label is attached to the pattern, the electrical system will automatically identify the sewing pattern program that matches the pattern from among those stored on the electronic label.
2. In the case no electronic label is attached to the pattern, manually select the sewing pattern data that matches the relevant pattern on the operation screen.

* Refer to **"4-21. RFID (How to use the electronic label)" p.60** for how to use the electronic label.



8) Selecting the reference

In order to align the locus of sewing pattern with the sewing slits of the pattern, it is necessary to set a reference. Specifically, set the reference referring to the Instruction Manual for the electrical system scanner.

After the completion of establishment of a reference, display the operation screen. When you keep button **5** held pressed, the pattern locus simulation sewing starts.

Operate the sewing machine once to check whether or not the sewing pattern locus is aligned with the pattern slits. If they are not aligned, re-adjust the reference.

To stop the operation while the simulation operation is being carried out, press button **7** to stop it.

9) Placing the material to be sewn

1. Detaching the pattern

When you move the pattern to the reset position and press clamp button **4** on the operation panel, two air cylinders on the X-direction linear module release the pattern. Take out the pattern.

2. Placing the material

Place the material to be sewn on the pattern. Then, check that the material is neatly arranged horizontally. In addition, secure the material with the holding method that matches the pattern to prevent the material from moving out of position. If the material has an infill of feather or cotton, squeeze the material to push out air as far as possible.

10) Setting the reset, pattern on which the material is placed, and the reference

- * Carry out resetting following the step of procedure 3).
- * Handling of the pattern on which the material is placed is described in the step of procedure 5).
- * Reference setting is carried out following the step of procedure 7).

11) Starting

Press the start button **6** on the operation panel to start sewing. Then, the sewing machine enters the automatic sewing mode.

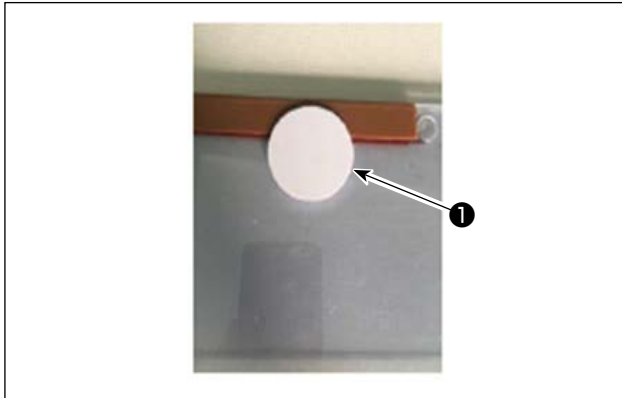
12) Temporary stop

If any accident occurs during sewing, press the temporary stop button **7** on the operation panel. Then, the sewing machine immediately stops operation.

13) Re-starting

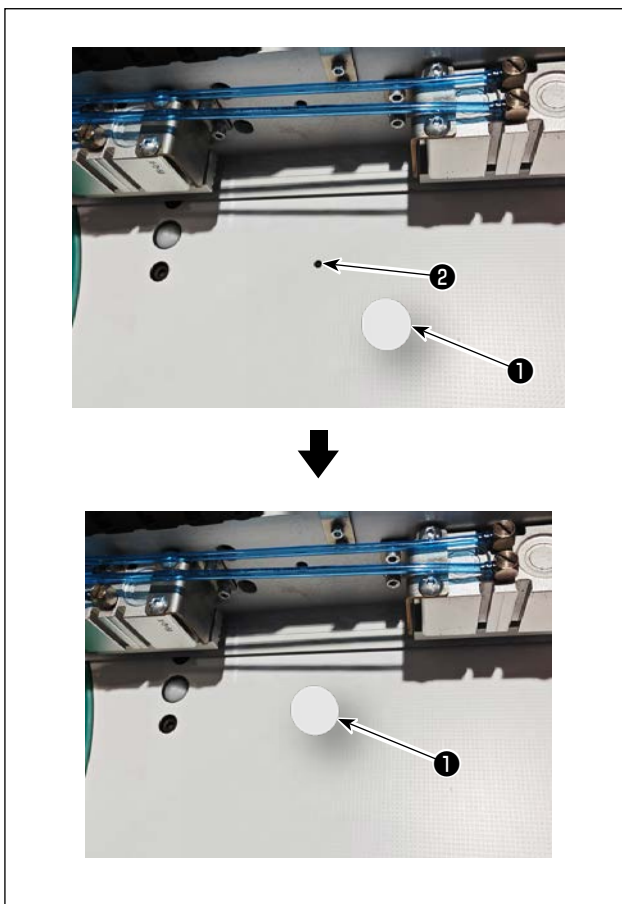
Once the aforementioned accident is eliminated, press Pause key **7** to reset the emergency stop mode. Then, press Start key **6** to re-start automatic sewing.

4-21. RFID (How to use the electronic label)



1. Attaching the electronic label

Attach electronic label ❶ onto the pattern with double-sided adhesive tape or the like.

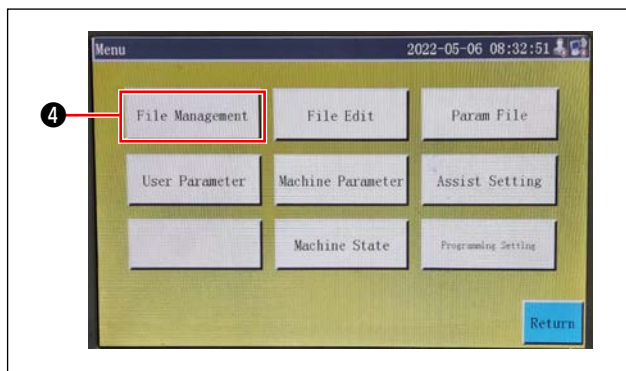


2. Writing sewing pattern data

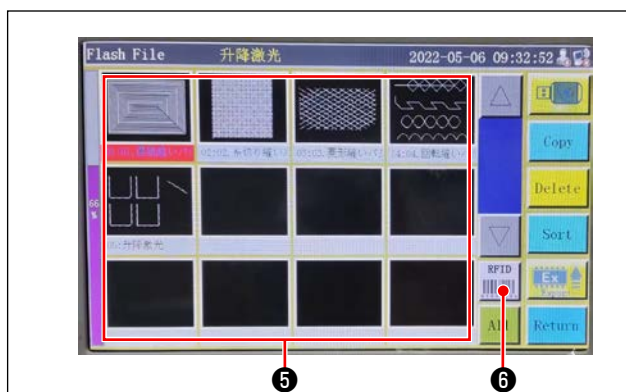
1) Place electronic label ❶ on black dot ❷ on the sewing machine table.



2) Press "Menu" ❸ on the initial screen.



3) Press the "File Management" ④ on the menu screen.



4) Select sewing pattern data ⑤ you want to write on the electronic label on the memory file screen. After you have made a selection, press "RFID" ⑥ to write the sewing pattern data on the electronic label.



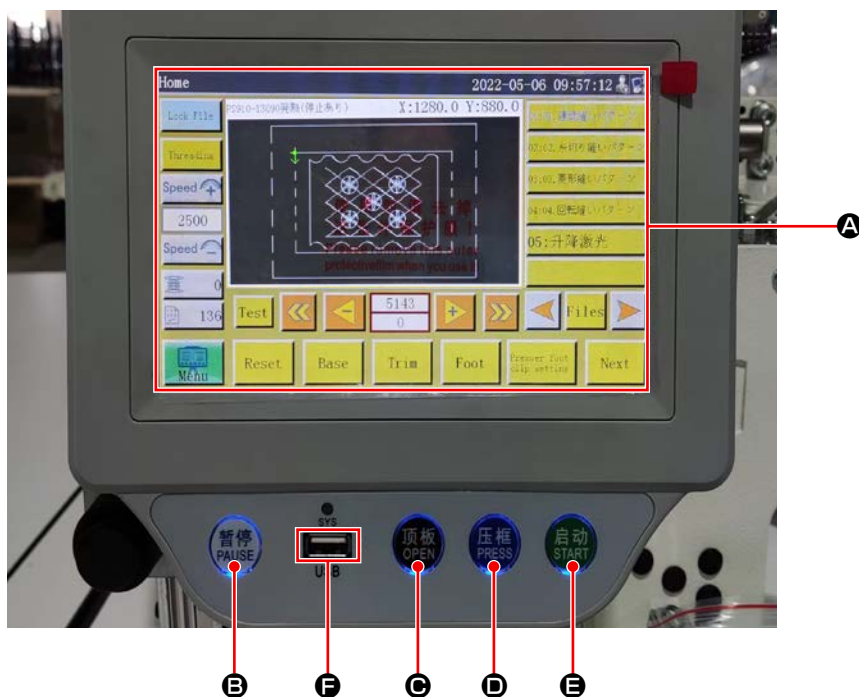


3. Read sewing pattern data

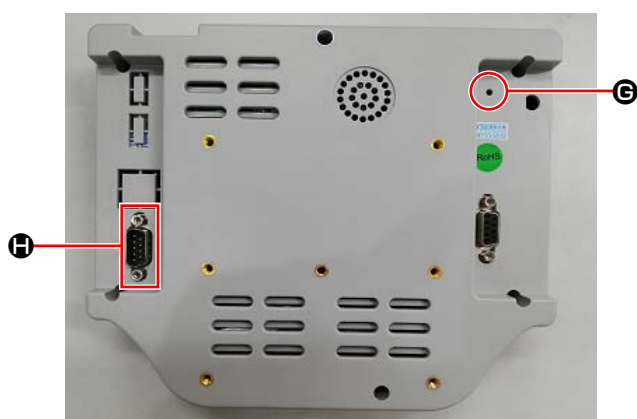
- 1) Press the 'self-lock' ❶ in the default window.
- 2) Place the electronic label with the sewing pattern data written on the black dot on the table.
- 3) The sewing pattern data written on the electronic label is read.



4-22. Configuration of the operation panel



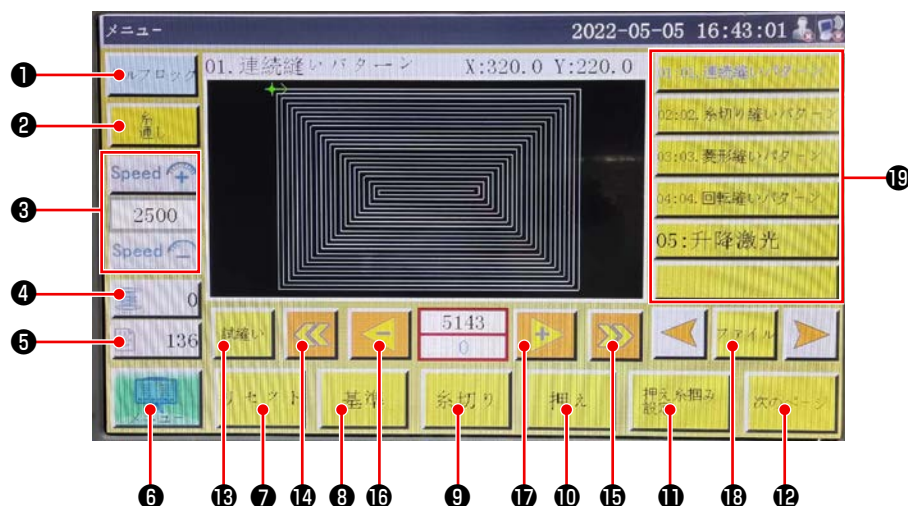
A	LCD portion of the touch panel	
B	PAUSE key	Used to temporarily stop sewing
C	OPEN key	Move the cylinder lifting plate up and down.
D	PRESS key	Used to move up/down the cassette holder
E	START key	Used to start sewing
F	USB port	



G	Reset button	Used to re-start the operation panel
H	COM port	RS232C

* This product is not provided with the Wi-Fi function.

Explanation of the operation panel screen

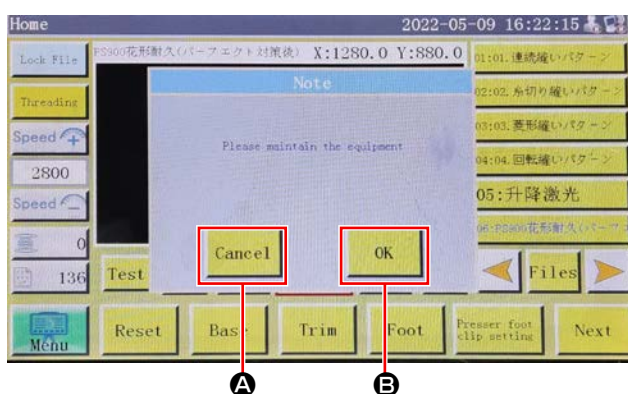
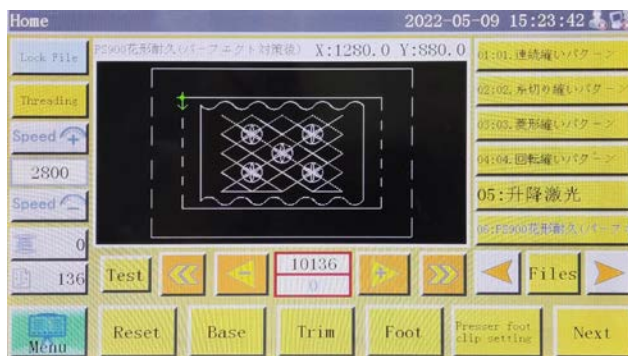


	Buttons / display	Description
①	Lock key	Used to lock the sewing pattern
②	Threading key	Used to thread the machine head
③	Main shaft speed change key	Used to change the sewing machine main shaft speed
④	Bobbin thread usage key	Used to display the amount of use of the bobbin thread and to move the screen to the setting screen *1
⑤	Sewing count key	Used to display the sewing count and to move the screen to the setting screen *1
⑥	Menu	Used to move the screen to the menu screen *1
⑦	Ready key	Used to return the sewing machine to its origin
⑧	Reference setting key	Used to move the screen to the reference setting screen *1
⑨	Trim key	Used to trim the needle thread and the bobbin thread.
⑩	Presser foot key	Used to operate the presser foot
⑪	Presser foot setting key	Used to move the screen to the presser foot setting screen *1
⑫	Page move key	Used to move the screen to the test mode screen *1
⑬	Test key	Used to operate the sewing pattern by jumping
⑭	Line segment return key	Used to return the sewing machine to the starting position of the previous continuous sewing by jumping
⑮	Line segment feed key	Used to feed the sewing machine to the starting position of the next continuous sewing by jumping
⑯	Single stitch return key	Used to return the sewing machine to the previous stitch. If this key is held pressed, fast-backward mode starts
⑰	Single stitch feed key	Used to feed the sewing machine to the next stitch. If this key is held pressed, fast-forward mode starts
⑱	File key	Used to move the screen to the sewing pattern selection screen
⑲	Sewing pattern selection	Select the sewing pattern to be used by touching it

*1. Refer to the Instruction Manual for the operation panel for details.

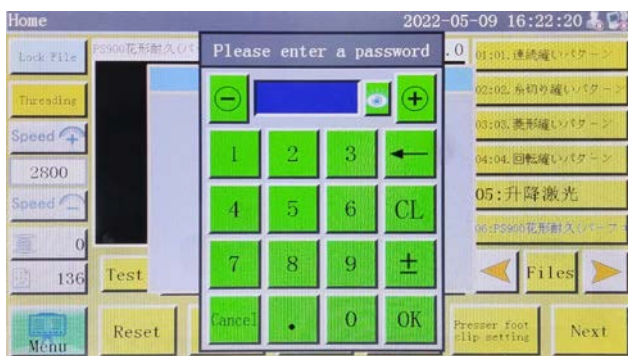
4-23. Maintenance mode

The maintenance mode is the mode under which the notice telling that the duration of use of the sewing machine has reached the time requiring maintenance is provided in order to extend the product life of the sewing machine. Under this mode, the maintenance screen is displayed on the operation panel. When the maintenance staff enters the user password, the maintenance screen is erased.



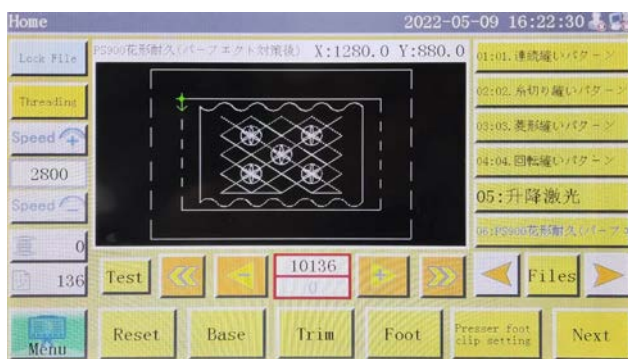
- 1) The maintenance screen is displayed when the time at which the sewing machine requires maintenance has come. (Approximately once every three months)

When cancel button **A** is pressed, the maintenance screen returns to the sewing screen. However, the maintenance screen is re-displayed one hour later.



- 2) When enter button **B** is pressed, the user password input screen is displayed provided that the user password has been set up in prior.

- 3) Add grease referring to **"5. MAINTENANCE OF SAWING MACHINE" p.82.**




- 4) Enter the user password. Then, the maintenance screen returns to the sewing screen.

4-24. Parameter List

Classifi- cation of parameters	No.	Parameter name	Range	Stan- dard value	Meaning of parameter and comment
Automatic machining	P1	Clamp is opened after the completion of auto- matic machining	Yes/No	Yes	Cassette clamp is lifted every time the continuous sewing cycle is completed
	P2	Number of stitches to be sewn at the beginning and end of sewing with the intermediate presser lowered	0 to 8	2	Number of stitches during which the in- termediate presser presses the material at the beginning and end of sewing
	P3	Thread trimming after the completion of auto- matic machining	Yes/No	Yes	Thread trimming is carried out every time the continuous sewing cycle is completed.
	P4	Position to which the needle is returned after the completion of auto- matic machining	Origin / secondary origin	Origin	"Origin" is the origin of absolute coordi- nates.
					"Secondary origin" is the secondary origin (offset point) added to the pattern.
	P5	Whether or not the thread tension is re- quired to be lowered	Yes/No	No	Whether or not the tension on the thread is loosened during jump
	P173	The presser foot fails to go up even when the shaft is moved.	Yes/No	No	The clamp foot is retained while a refer- ence is being set. On the "Main screen", keep the clamp foot held at its current position while moving the shaft. (Lifted or lowered) The "Main screen" is displayed after the operation panel is started up.
	P259	Automatic operation of the clamp	Yes/No	No	Whether the cassette clamp is turned ON at the beginning of sewing
	P240	Clamp operation in prior to the manual feed	Yes/No	No	Whether the cassette clamp is turned ON before the manual feed is carried out
	P6	Number of stitches to be sewn with overlapped at the beginning of sewing	OFF / 1 / 2	OFF	In the case of set value "1" or "2", sew- ing is carried out once or twice in rep- etition at the first needle entry position before proceeding to the next needle entry position at the time of starting the sewing machine. Setting of the number of reverse feed stitches at the beginning of sewing
					In the case of "OFF", the sewing ma- chine does not repeat sewing
	P7	Number of stitches to be sewn at the beginning of sewing without the thread tension release mechanism	0 to 255	0	The thread tension release mechanism is turned OFF while the sewing machine sews the set number of stitches at the beginning of sewing
	P147	Height of the interme- diate presser when it is lowered at the begin- ning of sewing	0 to 4	0.5	Intermediate presser height at the be- ginning of sewing
	P148	Height of the interme- diate presser when it is lowered at the end of sewing	0 to 4	0.5	Intermediate presser height at the end of sewing
	P161	Set presser foot oscil- lating range	Normal/Cut by half/Expand	Normal	

Classifi- cation of parameters	No.	Parameter name	Range	Stan- dard value	Meaning of parameter and comment
Automatic machining	P172	Reset the feeding frame after completion of work.	Yes/No	Yes	The middle presser foot motor is reset at the end of sewing.
	P248	Necessity of moving be- fore setting standards	Yes/No	Yes	
	P252	Clamp release error at reference setting	Yes/No	No	
	P794	IO1 of termination work	Yes/No	No	
	P796		High level/Low level	Low level	
	P795	IO2 of termination work	Yes/No	No	
	P797		High level/Low level	Low level	
Sewing start speed	P8	Starting speed of first hand (sti/min)	100 to 3000	300	Speed of the first needle
	P9	Second Hand Start Speed (sti/min)	100 to 3000	600	Speed of the second needle
	P10	Third Hand Start Speed (sti/min)	100 to 3000	900	Speed of the third needle
	P11	Starting speed of 4th hand (sti/min)	100 to 3000	1500	Speed of the 4th needle
	P12	5th Hand Start Speed (sti/min)	100 to 3000	2000	Speed of the fifth needle
	P170	Reverse sewing speed (sti/min)	100 to 3000	1500	Speed of sewing back
	P13	Need for sostoat	Yes/No	Yes	Low speed start
	P162	Start sewing 2-needle low speed required/not required	Yes/No	No	Whether the second stitch is sewn at a low speed
	P163	Sewing finish 2 needle low speed required/not required	Yes/No	No	Last 2 stitches slower
Speed Parameter	P14	Maximum spindle speed (sti/min)	100 to 4500	3000	Max. spindle speed
	P15	Empty feed speed (mm/ min)	100 to 40000	40000	Speed of empty feed
	P16	Inching speed (mm/ min)	100 to 20000	5000	Movement speed when modifying and creating patterns
	P160	Test sewing speed (mm/ min)	100 to 60000	5000	Trial sewing speed
	P17	Button speed 1 (mm/min)	100 to 20000	500	When manually moving a box or collect- ing a file, use the corresponding eight directional keys. ► Operating speed with icon

Classifi- cation of parameters	No.	Parameter name	Range	Stan- dard value	Meaning of parameter and comment
Speed Parameter	P18	Button speed 2 (mm/min)	100 to 20000	4000	8 Correspond to the two direction keys
					▶▶Operating speed with icon
	P19	Button speed 3 (mm/min)	100 to 20000	8000	8 Correspond to the two direction keys
					▶▶▶Operating speed with icon
	P217	Graphic edit speed (mm/min)	0-100000	Yes	
	P174	Head 2 Speed (mm/s)	0 to 2000	0	Velocity of XY shaft when using a laser scalpel
	P175	Head 3 Speed (mm/s)	0 to 2000	0	Velocity of XY shaft when using a laser scalpel
	P178	Continuous inching speed	Reduce/Mini- mum/Normal	Reduce	Movement speed when creating a pat- tern
	P773	Reverse speed (sti/ min)	0 to 3000	0	Speed of sewing back
	P20	Absence of thread spreading air wiper output IO	None/OUT1 to OUT8	None	
	P774	Number of stitches for sewing end speed limit	0 to 30	0	At the end of the figure, the speed is limited from the number of hands from the end.
	P775	Speed of sewing end speed limit	100 to 1800	100	This parameter is used in conjunction with P774 to obtain a particular velocity limit.
Clamp setting	P22	Prohibition of sewing when the fixture is raised	Yes/No	Yes	When the cassette clamp is raised, sewing prohibited.
	P23	Sequential order of the pedal operation	Normal/Special	Normal	
	P24	Pedal operation mode	1STA/1STB/ 1STC/2ST	1STA	
	P25	Sewing start thread gripping start angle	1 to 990	10	Thread grip ON at the start of sewing
	P26	Sewing start thread gripping end angle	1 to 990	10	Thread grip OFF at the start of sewing
	P27	Thread trimmer thread grip start angle	1 to 990	850	Grip start angle at thread trimming
	P28	Thread trimmer thread grip end angle	1 to 990	50	Grip end angle at thread trimming
	P781	Fixture required when moving	Yes/No	Yes	
	P863	Main shaft remains the same even when mov- ing the shaft	Yes/No	No	
	P743	Double Clamp Open Delay (ms)	0 to 5000	0	
	P744	Double Clamp Down Delay (ms)	0 to 5000	0	
	P114	Thread clamp type	Thread clamp/ Tension disk release	Thread clamp	

Classifi- cation of parameters	No.	Parameter name	Range	Stan- dard value	Meaning of parameter and comment
Bobbin winding setting	P29	Bobbin winding state	Permit/Prohibit	Permis- sion	Bobbin winder  允許
					Default state
	P30	Bobbin winder speed (sti/ min)	100 to 4500	800	Bobbin winder speed
	P31	Thread winding time setting (s)	1 to 63000	200	Setting the time of the spool
Speed ratio	P32	High speed ratio (%)	1 to 100	100	
	P33	Medium high speed ratio (%)	1 to 100	100	
	P34	Medium low speed ratio (%)	1 to 100	100	
	P35	Low speed ratio (%)	1 to 100	100	
Reset set- ting	P36	Clamp at reset	Yes/No	Yes	Cassette clamp lowers when returning to origin
	P264	Clamp release after manual reset	Yes/No	Yes	Press the return button to raise the cas- sette clamp when returning to the origin
	P38	Origin return method	XY simultaneous /X priority/Y prior- ity	XY con- currency	"Simultaneous XY " means that origin resetting starts at the same time, and "X preferred" means that x axis resets the origin first and Y axis resets the origin.
	P39	Home return velocity (mm/ min)	100 to 60000	18000	X and Y shaft speed at home return
	P303	Extended axis reset operating speed (mm/s)	1 to 2000	80	
	P756- P761	Output IO setting prior to resetting	OUT1 to OUT6/	No	Setting of pre-recovery IO
	P762- P767		High level/Low level	Low level	
	P741	XY axes 0 position cushion when resetting	No/X axis/Y axis/ XY axes	No	
	P216	Reset output IO enable	None/OUT1 to OUT8	None	
	P823	Output IO for resetting captured graphics is enabled.	Yes/No	No	
	P649	Alarm at reset error	Yes/No	No	
	P782- P787	Output IO setting after resetting	OUT1 to OUT6/ None	No	
	P788- P793		Rudder	No	
Provisional interruption setting	P45	Interval switch type	Self lock/Normal	Self lock	In the case of the "Self lock", the lock will not be able to automatically bounce when the key is pressed. In the case of the "Normal", the lock will be able to automatically bounce when the key is pressed.
	P799	Presser foot lift at stop	Yes/No	No	

Classifi- cation of parameters	No.	Parameter name	Range	Stan- dard value	Meaning of parameter and comment
Statistical setting	P49	Bottom thread clear when power is applied	Yes/No	No	Whether to set the remaining bobbin thread to 0 when the power is turned on
	P50	Work stops after the bobbin thread is used up.	Yes/No	Yes	"Yes" stops after the bobbin thread length reaches the full length.
	P51	Bobbin thread counter setting enabled	Yes/No	Yes	"Yes" automatically statistics the length of bobbin thread used when working
	P46	Counter clear when energized	Yes/No	Yes	Is the sewing counter set to 0 when the power is turned on?
	P47	Continue work after achieving the counter	Yes/No	Yes	Does the sewing counter continue after reaching the set value?
	P48	Counter setting enabled	Yes/No	Yes	Enable the sewing counter
	P52	Work time counter	Yes/No	Yes	"Yes" enables machining-time statistics function
	P779	Bobbin thread count mode	IN1 to IN4/ de- fault	Default	Bobbin thread quantity statistics mode
	P780	Adjustable bobbin thread reserve (mm)	0 to 600000	0	Adjusting the remaining bobbin thread length
Thread grip setting	P54	Sewing start thread gripping position	0 to 200	0	Thread grip position at the start of sew- ing
	P53	Thread trimmer thread clamp position	0 to 200	0	
	P212	Conversion point of graphics that are not for sewing	Yes/No	Yes	
	P627	First pin clamp IO start- ing	None/OUT1 to OUT12	OUT8	
	P477	Screw clamp IO after sewing	None/OUT1 to OUT12	OUT8	
	P824	First stitch starting out- put IO	None/OUT1 to OUT12	OUT8	
	P825	Output IO ON angle	0 to 10000	0	
	P826	Output IO OFF angle	0 to 10000	0	
Thread breakage detection	P55	Automatic thread break- age detection	Yes/No	Yes	"Yes" displays errors by stopping the operation after detecting thread break- age. Tread breakage detection function
	P57	Ignore the number of sewing hour hands.	1 to 255	5	The first set stitch count is not detected.
	P58	Detection of number of effective stitches at thread breakage	1 to 255	15	If the thread breakage of the set num- ber of stitches is detected continuously, it is considered that the thread is broken securely.
	P59	Delay in processing when breakage is de- tected	0.01 to 255	5	
	P929	Number of return stitch- es broken	0 to 20	0	
	P935	Broken thread detection mode	mode 1/mode 2	Mode 1	
	P207	Return to zero when thread breaks	Yes/No	No	

Classifi- cation of parameters	No.	Parameter name	Range	Stan- dard value	Meaning of parameter and comment
Thread breakage detection	P697	QEP2 is opened as the detection of bobbin thread	Yes/No	No	
	P237	Thread breakage IO	None /OUT1 to OUT12	None	
Thread trimming setting	P60	Thread trimmer spindle speed (r/min)	10 to 500	180	Spindle speed of thread trimmer
	P61	Thread trimming start delay (s)	0.01 to 6.55	0.01	Delay time at thread trimming start
	P62	Thread separation du- ration (s)	0.01 to 6.55	0.15	Wiper operation time
	P63	Delay of lifting the thread take-up presser foot (s)	0.01 to 6.55	0.25	Wiper OFF delay
	P64	Delay in starting the thread tension release (s)	0 to 6.55	0	
	P65	Needle thread trimmer for automatic air feed- ing after sewing	Yes/No	Yes	Whether to cut the thread when feeding by air
	P66	Wiper use or not	Yes/No	Yes	Using the wiper
	P67	Motor thread trimming mode	To-and-fro/Single time	To-and- fro	
	P68	Motor thread trimming stroke	1 to 100	23	
	P69	Delay of flat knife thread clamp	1 to 350	1	
	P164	Knife return speed ratio	10 to 100	100	
	P169	Starting mode for thread loosening	Angle / delay	Delay	Start-up timing method of the thread grip OFF
	P168	Thread loosening angle	0 to 999	730	Thread grip OFF angle
Energizing setting	P70	Return the hour hand to the upper stop position.	Yes/No	No	When the power is turned on, the posi- tion of the needle bar is up.
	P71	Automatically returns to the fixture home posi- tion when energized	Yes/No	No	Automatically returns to the original position at power-on
	P73	Presser foot is lifted when energized	Yes/No	No	The feeding frame moves up when the power is turned on.
	P72	Motor lock when ener- gized	Yes/No	No	
Other set- tings	P74	Air pressure detection required/not required	Yes/No	No	If the detected atmospheric pressure is too low when "Yes" is activated, it stops and alarms.
	P75	Repeated operation required/not required	Yes/No	No	Yes starts cyclic processing of the same file after startup
	P76	Repeated machining time (min)	1 to 65535	1440	Stop circulation process after the total time and time of circulation machining.
	P77	Repeated process inter- val (s)	0 to 20	2	Interval between completion of ma- chining and restart of machining during circulation machining

Classifi- cation of parameters	No.	Parameter name	Range	Stan- dard value	Meaning of parameter and comment
Other set- tings	P78	Work end position	End position/Ori- gin/Right/Sewing starting position	Origin	End position: End of point sewing where all XY axes coordinates are 0 (zero), restoration point
					Right: Rightmost point of the process- ing range
					Sewing starting position: First sewing point of a processing file
					Origin: Stop upon completion of pro- cessing
	P395	Template recognition method	Barcode/Elec- tronic label	Electronic label	File sequence number: Bar code identi- fication mode
					File name distinction: Electronic label recognition mode
	P81	Interface style	Classic/Simple	Classic	Classic: Virtual body button style
					Simple: Flat button style
	P685	Activate the pre-motion mode	XY simultaneous /X priority/Y prior- ity	XY con- currency	
	P755	Work Hollow Feed Mode	X Priority /Y Pri- ority/XY	XY con- currency	Movement mode of idle feed
	P241	Connect to Extended Screen	Yes/No	No	Yes allows you to view working files and other data on the display on an external extended display
	P79	Spindle needle stop back	0 to 160	0	
Auxiliary functions	P242	Voice prompt	High/Medium/ Low/Off	OFF	"High", "Medium" and "Low" indicate the volume level of each sound
	P21	Enable power failure memory	Yes/No	No	After turning on the power again, the progress of sewing before turning off the power will continue sewing.
	P194	File valid when leaving electronic label	Yes/No	No	
	P215	Start sewing	Yes/No	No	
	P214	Air blow at the end of sewing	Yes/No	No	
	P213	Continuous air blowing time	0	5000	
	P729	Imported graphic is not arranged at the center of the graphic	Yes/No	No	
	P206	Open output IO transfer	None/OUT1 to OUT12	None	
	P236	Laser output IO	None/OUT1 to OUT12	None	
	P205	Normal laser washing time	0 to 63000000	0	

4-25. Error Code List

Error code	Title	Details	Return method
E001	Initialization is not yet executed	<ul style="list-style-type: none"> Initialization is not executed when turning the power ON 	<ul style="list-style-type: none"> Press the "Reset" key.
E002	X axis sensor detection error	<ul style="list-style-type: none"> X axis positioning sensor fault 	<ul style="list-style-type: none"> Check the X axis sensor signal. Check to make sure that the cord is not broken. Check the X axis sensor connector for looseness or disconnection.
E003	Y axis sensor detection error	<ul style="list-style-type: none"> Y axis positioning sensor fault 	<ul style="list-style-type: none"> Check the Y axis sensor signal. Check to make sure that the cord is not broken. Check the Y axis sensor connector for looseness or disconnection.
E004	Intermediate presser shaft sensor detection error	<ul style="list-style-type: none"> Intermediate presser shaft positioning sensor fault 	<ul style="list-style-type: none"> Check the intermediate presser shaft sensor signal. Check to make sure that the cord is not broken. Check the intermediate presser shaft sensor connector for looseness or disconnection.
E006	Moving knife shaft sensor detection error	<ul style="list-style-type: none"> Moving knife shaft positioning sensor fault 	<ul style="list-style-type: none"> Check the sensor signal. Check to make sure that the cord is not broken. Check the sensor connector for looseness or disconnection.
E007	Main shaft motor encoder error	<ul style="list-style-type: none"> The main shaft motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> Check to make sure that the cord is not broken. Check the main shaft motor encoder connector for looseness or disconnection.
E020	X axis motor overvoltage	<ul style="list-style-type: none"> A voltage that is equal to or higher than the guaranteed voltage is applied. Application of an overvoltage has damaged the internal circuit. 	<ul style="list-style-type: none"> Check to make sure that the supply voltage of 92 V or higher is not applied. Check to make sure that there is nothing wrong with the power PCB.
E021	X axis motor low voltage	<ul style="list-style-type: none"> A voltage that is equal to or lower than the guaranteed voltage is applied. 	<ul style="list-style-type: none"> Check to make sure that the supply voltage of 80 V or lower is not applied. Check to make sure that there is nothing wrong with the power PCB.
E022	X axis motor overcurrent (software)	<ul style="list-style-type: none"> A current that is equal to or higher than the guaranteed current is applied. Motor is short-circuited by the overcurrent. 	<ul style="list-style-type: none"> Check to make sure that there is nothing wrong with the X axis motor. Check to make sure that there is nothing wrong with the power PCB.
E023	X Shaft motor overcurrent (software)	<ul style="list-style-type: none"> A current that is equal to or higher than the guaranteed current is applied. 	<ul style="list-style-type: none"> Check to make sure that there is nothing wrong with the X axis motor. Check to make sure that there is nothing wrong with the power PCB.
E024	X axis motor encoder error	<ul style="list-style-type: none"> The X axis motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> Check to make sure that the cord is not broken. Check the X axis motor encoder connector for looseness or disconnection.
E025	Disconnection of the X axis motor output connector	<ul style="list-style-type: none"> The connector of the X axis motor has slipped off. The motor current detection circuit is damaged. There is no feed back of the current. 	<ul style="list-style-type: none"> Check the X axis motor output connector for looseness or disconnection.

Error code	Title	Details	Return method
E026	X axis motor overload	<ul style="list-style-type: none"> • The X axis motor fails to rotate. • The X axis motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the X axis motor output connector for looseness or disconnection. • Check to make sure that the cassette holder moves smoothly.
E028	X axis motor A/D conversion error	<ul style="list-style-type: none"> • A/D conversion of the X axis fails to complete. 	<ul style="list-style-type: none"> • Re-turn the power ON. • Check to make sure that there is nothing wrong with the MAIN PCB.
E030	Y axis motor overcurrent	<ul style="list-style-type: none"> • A voltage that is equal to or higher than the guaranteed voltage is applied. • Application of an overvoltage has damaged the internal circuit. 	<ul style="list-style-type: none"> Check to make sure that the supply voltage of 92 V or higher is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E031	Y axis motor low voltage	<ul style="list-style-type: none"> • A voltage that is equal to or lower than the guaranteed voltage is applied. 	<ul style="list-style-type: none"> • Check to make sure that the supply voltage of 80 V or lower is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E032	Y axis motor overcurrent (hardware)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. • Motor is short-circuited by the overcurrent. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the Y axis motor. • Check to make sure that there is nothing wrong with the power PCB.
E033	Y axis motor overcurrent (software)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the Y axis motor. • Check to make sure that there is nothing wrong with the power PCB.
E034	Y axis motor encoder error	<ul style="list-style-type: none"> • The Y axis motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the Y axis motor encoder connector for looseness or disconnection.
E035	Disconnection of the Y axis motor output connector	<ul style="list-style-type: none"> • The connector of the Y axis motor has slipped off. • The motor current detection circuit is damaged. • Check the Y axis motor output connector for looseness or disconnection. 	<ul style="list-style-type: none"> • There is no feed back of the current.
E036	Y axis motor overload	<ul style="list-style-type: none"> • The Y axis motor fails to rotate. • The Y axis motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the Y axis motor output connector for looseness or disconnection. • Check to make sure that the linear module moves smoothly.
E038	Y axis motor A/D conversion error	<ul style="list-style-type: none"> • A/D conversion of the Y axis fails to complete. 	<ul style="list-style-type: none"> • Re-turn the power ON. • Check to make sure that there is nothing wrong with the MAIN PCB.
E040	Intermediate presser shaft motor overvoltage	<ul style="list-style-type: none"> • A voltage that is equal to or higher than the guaranteed voltage is applied. • Application of an overvoltage has damaged the internal circuit. 	<ul style="list-style-type: none"> • Check to make sure that the supply voltage of 92 V or higher is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E041	Intermediate presser shaft motor low voltage	<ul style="list-style-type: none"> • A voltage that is equal to or lower than the guaranteed voltage is applied. 	<ul style="list-style-type: none"> • Check to make sure that the supply voltage of 80 V or lower is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E042	Intermediate presser shaft motor overcurrent (hardware)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. • Motor is short-circuited by the overcurrent. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the intermediate presser shaft motor. • Check to make sure that there is nothing wrong with the power PCB.

Error code	Title	Details	Return method
E043	Intermediate presser shaft motor overcurrent (software)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is detected. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the intermediate presser shaft motor. • Check to make sure that there is nothing wrong with the power PCB.
E044	Intermediate presser shaft motor encoder error	<ul style="list-style-type: none"> • The intermediate presser shaft motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the intermediate presser shaft motor encoder connector for looseness or disconnection.
E045	Disconnection of the intermediate presser shaft motor connector	<ul style="list-style-type: none"> • The connector of the intermediate presser shaft motor has slipped off. • The motor current detection circuit is damaged. • Check the intermediate presser shaft motor output connector for looseness or disconnection. 	<ul style="list-style-type: none"> • There is no feed back of the current.
E046	Intermediate presser shaft motor overload	<ul style="list-style-type: none"> • The intermediate presser shaft motor fails to rotate. • The intermediate presser shaft motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the intermediate presser shaft motor output connector for looseness or disconnection. • Check to make sure that the intermediate presser moves smoothly.
E048	Intermediate presser shaft A/D conversion error	<ul style="list-style-type: none"> • A/D conversion of the intermediate presser shaft fails to complete. 	<ul style="list-style-type: none"> • Re-turn the power ON. • Check to make sure that there is nothing wrong with the MAIN PCB.
E060	Main shaft motor overvoltage	<ul style="list-style-type: none"> • A voltage that is equal to or higher than the guaranteed voltage is applied. • Application of an overvoltage has damaged the internal circuit. 	<ul style="list-style-type: none"> • Check to make that the supply voltage of 400 V or higher is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E061	Main shaft motor low voltage	<ul style="list-style-type: none"> • A voltage that is equal to or lower than the guaranteed voltage is applied. 	<ul style="list-style-type: none"> • Check to make sure that the supply voltage of 180 V or lower is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E062	Main shaft motor overcurrent (hardware)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. • Motor is short-circuited by the overcurrent. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the main shaft motor. • Check to make sure that there is nothing wrong with the power PCB.
E063	Main shaft motor overcurrent (software)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the main shaft motor. • Check to make sure that there is nothing wrong with the power PCB.
E064	Main shaft motor encoder error	<ul style="list-style-type: none"> • The main shaft motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the main shaft motor encoder connector for looseness or disconnection.
E065	Main shaft motor rotation failure (machine lock)	<ul style="list-style-type: none"> • The main shaft motor fails to rotate. • The main shaft motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the main shaft motor output connector for looseness or disconnection. • Check to make sure that the pulley can be manually turned without a hitch.
E066	Main shaft motor rotation failure	<ul style="list-style-type: none"> • The main shaft motor fails to rotate. • The main shaft motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the main shaft motor output connector for looseness or disconnection. • Check to make sure that the pulley can be manually turned without a hitch.

Error code	Title	Details	Return method
E067	Y axis motor overcurrent protection	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is detected. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the Y axis motor. • Check to make sure that there is nothing wrong with the power PCB.
E068	Y axis motor overcurrent (hardware)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. • Motor is short-circuited by the overcurrent. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the Y axis motor. • Check to make sure that there is nothing wrong with the power PCB.
E069	Y axis motor A/D conversion error	<ul style="list-style-type: none"> • A/D conversion of the Y axis fails to complete. 	<ul style="list-style-type: none"> • Re-turn the power ON. • Check to make sure that there is nothing wrong with the servo PCB.
E070	Y axis driver parameter error (hardware)	<ul style="list-style-type: none"> • The parameter set value of the Y axis driver is wrong. 	<ul style="list-style-type: none"> • Check the parameter of the Y axis driver.
E071	Y axis driver parameter error (software)	<ul style="list-style-type: none"> • The parameter set value of the Y axis driver is wrong. 	<ul style="list-style-type: none"> • Check the parameter of the Y axis driver.
E072	Y axis motor A/D conversion error	<ul style="list-style-type: none"> • A/D conversion of the Y axis fails to complete. 	<ul style="list-style-type: none"> • Re-turn the power ON. • Check to make sure that there is nothing wrong with the servo PCB.
E073	Disconnection of the Y axis motor encoder connector	<ul style="list-style-type: none"> • The Y axis motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the Y axis motor encoder connector for looseness or disconnection.
E075	Y axis motor encoder error (Z phase)	<ul style="list-style-type: none"> • The Y axis motor encoder (Z phase) cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the Y axis motor encoder connector for looseness or disconnection.
E079	Y axis motor overload	<ul style="list-style-type: none"> • The Y axis motor fails to rotate. • The Y axis motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the Y axis motor output connector for looseness or disconnection. • Check to make sure that the linear module moves smoothly.
E080	Y axis motor driver overload	<ul style="list-style-type: none"> • An overload on the Y axis driver is detected. 	<ul style="list-style-type: none"> • Check the Y axis motor output connector for looseness or disconnection. • Check to make sure that the linear module moves smoothly.
E085	Y axis motor deviation error	<ul style="list-style-type: none"> • The position deviation of the Y axis motor has exceeded the detection level. 	<ul style="list-style-type: none"> • Check to make sure that the linear module moves smoothly.
E088	Y axis motor overcurrent error (hardware)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the Y axis motor. • Check to make sure that there is nothing wrong with the power PCB.
E110	Y axis motor electronic gear ratio setting error	<ul style="list-style-type: none"> • Setting of the electronic gear ratio of the Y axis motor is wrong. 	<ul style="list-style-type: none"> • Change the Y axis motor.
E112	Main shaft motor short-circuit signal detection	<ul style="list-style-type: none"> • A short-circuit signal of the main shaft motor is detected. 	<ul style="list-style-type: none"> • Check to make sure that the main shaft is not short-circuited. • Check to make sure that there is nothing wrong with the power PCB.
E113	Main shaft motor encoder connector fault	<ul style="list-style-type: none"> • The main shaft motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the main shaft motor encoder connector for looseness or disconnection.
E120	Main shaft motor overload	<ul style="list-style-type: none"> • The main shaft motor fails to rotate. • The main shaft motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the main shaft motor output connector for looseness or disconnection. • Check to make sure that the pulley can be manually turned without a hitch.

Error code	Title	Details	Return method
E121	Main shaft motor driver overload	<ul style="list-style-type: none"> An overload on the main shaft motor is detected. 	<ul style="list-style-type: none"> Check the main shaft motor output connector for looseness or disconnection. Check to make sure that the pulley can be manually turned without a hitch.
E125	Main shaft motor power low voltage	<ul style="list-style-type: none"> A voltage that is equal to or lower than the guaranteed voltage is applied to the main power supply of the main shaft motor. 	<ul style="list-style-type: none"> Check to make sure that the supply voltage of 180 V or lower is not applied. Check to make sure that there is nothing wrong with the power PCB.
E140	1 Main shaft motor short-circuit signal detection	<ul style="list-style-type: none"> A short-circuit signal of the main shaft motor is detected. 	<ul style="list-style-type: none"> Check to make sure that the main shaft is not short-circuited. Check to make sure that there is nothing wrong with the power PCB.
E142	1 Main shaft motor A/D conversion error	<ul style="list-style-type: none"> A/D conversion of the main shaft fails to complete. 	<ul style="list-style-type: none"> Re-turn the power ON. Check to make sure that there is nothing wrong with the servo PCB.
E144	Parameter fault detection (software driver)	<ul style="list-style-type: none"> Setting parameter is defective. 	
E146	1 Main shaft motor encoder connector fault	<ul style="list-style-type: none"> The main shaft motor encoder signal cannot be detected. 	<ul style="list-style-type: none"> Check to make sure that the cord is not broken. Check the main shaft motor encoder connector for looseness or disconnection.
E149	1 Main shaft motor power low voltage	<ul style="list-style-type: none"> A voltage that is equal to or lower than the guaranteed voltage is applied to the main power supply of the main shaft motor. 	<ul style="list-style-type: none"> Check to make sure that the supply voltage of 180 V or lower is not applied. Check to make sure that there is nothing wrong with the power PCB.
E203	Main shaft motor malfunction	<ul style="list-style-type: none"> The main shaft motor fails to operate properly. 	<ul style="list-style-type: none"> Check to make sure that the version of the driver is the latest one. Turn the pulley to check to make sure that the main shaft motor runs without a hitch. Check to make sure that the main shaft motor encoder connector is properly connected. Check to make sure that the main shaft motor output connector is connected correctly.
E204	Main shaft motor reverse rotation	<ul style="list-style-type: none"> The main shaft motor rotates in the direction opposite to the specified direction. 	<ul style="list-style-type: none"> Check the main shaft motor encoder connector for looseness or disconnection. Check to make sure that the main shaft motor output connector is connected correctly.
E205	Cassette holder lifting	<ul style="list-style-type: none"> The cassette holder is in its upper position. 	<ul style="list-style-type: none"> Lower the cassette holder.
E206	I/O PCB failure	<ul style="list-style-type: none"> The I/O PCB has failed. 	<ul style="list-style-type: none"> Check the connector that connects the I/O PCB and MAIN PCB for looseness or disconnection. Change the I/O PCB.
E207	I/O signal timeout	<ul style="list-style-type: none"> There is a timeout for the signal from the I/O PCB. 	<ul style="list-style-type: none"> Carry out an "output test" to check the signal. Check the no-signal connector for looseness or disconnection.
E208	Drop in air pressure	<ul style="list-style-type: none"> The air presser has dropped. 	<ul style="list-style-type: none"> Check the air pressure. Check the air presser sensor connector for looseness or disconnection.
E210	Intermediate presser misalignment error	<ul style="list-style-type: none"> The origin position of the intermediate presser is wrong. 	<ul style="list-style-type: none"> Check the origin adjustment of the intermediate presser.

Error code	Title	Details	Return method
E213	Thread breakage detection error	<ul style="list-style-type: none"> • Thread breakage is detected. 	<ul style="list-style-type: none"> • Turn the power OFF. Check to make sure that the thread take-up spring moves smoothly.
E214	Sewing counter reaching the set value	<ul style="list-style-type: none"> • The sewing counter has reached the set value. 	<ul style="list-style-type: none"> • Reset the sewing counter.
E215	Bobbin thread counter reaching the set value	<ul style="list-style-type: none"> • The bobbin thread counter has reached the set value. 	<ul style="list-style-type: none"> • Reset the bobbin thread counter.
E216	Number of stitches limit error	<ul style="list-style-type: none"> • The number of stitches has exceeded the limit value. 	<ul style="list-style-type: none"> • Re-examine the pattern data.
E217	Pattern data read failure	<ul style="list-style-type: none"> • Pattern data that is not supported is used. • The pattern data is corrupted. 	<ul style="list-style-type: none"> • Examine the pattern data.
E218	Pattern data read timeout	<ul style="list-style-type: none"> • There is a timeout during reading of the pattern data. 	<ul style="list-style-type: none"> • Re-examine the pattern data.
E219	MAIN PCB error (exceptional condition)	<ul style="list-style-type: none"> • A defect has occurred in the MAIN PCB. 	<ul style="list-style-type: none"> • Change the MAIN PCB.
E220	Incompatible update file	<ul style="list-style-type: none"> • The update file that is not supported is used. • The update file is corrupted. 	<ul style="list-style-type: none"> • Check the update file.
E221	Update execution error	<ul style="list-style-type: none"> • The update file that is not supported is used. • The update file is corrupted. 	<ul style="list-style-type: none"> • Check the update file.
E222	Updating not yet executed	<ul style="list-style-type: none"> • Updating has not been executed. 	<ul style="list-style-type: none"> • Execute updating.
E224	Abnormal communication between the I/O PCB and MAIN PCB	<ul style="list-style-type: none"> • The I/O PCB fails to communicate with the MAIN PCB. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the connectors of the MAIN PCB and I/O PCB for looseness or disconnection.
E225	Abnormal communication between the operation panel and MAIN PCB	<ul style="list-style-type: none"> • The operation panel fails to communicate with the MAIN PCB. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the connectors of the MAIN PCB and operation panel for looseness or disconnection.
E226	Update file corruption	<ul style="list-style-type: none"> • The update file is corrupted. 	<ul style="list-style-type: none"> • Check the update file.
E227	Abnormal communication between the operation panel and MAIN PCB (during file transfer)	<ul style="list-style-type: none"> • The operation panel fails to communicate with the MAIN PCB when transferring a file. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the connectors of the MAIN PCB and operation panel for looseness or disconnection.
E228	Pattern data size is too large	<ul style="list-style-type: none"> • You have attempted to create pattern data that exceeds the the number of stitches and data volume the equipment can handle. 	<ul style="list-style-type: none"> • Re-examine the pattern data.
E229	Too large angle between stitches	<ul style="list-style-type: none"> • The angle between stitches is too large. 	<ul style="list-style-type: none"> • Re-examine the pattern data.
E230	Pattern data reading	<ul style="list-style-type: none"> • Pattern data is being read. 	<ul style="list-style-type: none"> • Wait for a while. (This is not an error.)
E231	Intermediate presser shaft motor overload	<ul style="list-style-type: none"> • The intermediate presser motor fails to rotate. • The intermediate presser motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the intermediate presser shaft motor output connector for looseness or disconnection. • Check to make sure that the intermediate presser moves smoothly.
E232	No insertion of external medium	<ul style="list-style-type: none"> • No medium is inserted. 	<ul style="list-style-type: none"> • Check to make sure that the medium is inserted correctly.

Error code	Title	Details	Return method
E233	Read & write error (external medium connection)	<ul style="list-style-type: none"> • Data cannot be read from the medium. • Data cannot be written on the medium. 	<ul style="list-style-type: none"> • Check the data in the medium. • Check to make sure that the medium is data-writable.
E234	Sewing area exceeded	<ul style="list-style-type: none"> • The sewing data has exceeded the possible range of sewing. 	<ul style="list-style-type: none"> • Re-examine the pattern data.
E235	File compatibility error	<ul style="list-style-type: none"> • The file is not compatible. 	<ul style="list-style-type: none"> • Check the file type.
E236	MAIN PCB memory corruption	<ul style="list-style-type: none"> • Memory error on the power PCB is detected. 	<ul style="list-style-type: none"> • Change the MAIN PCB.
E237	Password not yet set	<ul style="list-style-type: none"> • A password is not yet set. 	<ul style="list-style-type: none"> • Set a password.
E238	Unsupported editing	<ul style="list-style-type: none"> • Unsupported operation is contained in the pattern data. 	<ul style="list-style-type: none"> • Re-examine the pattern data.
E240	Abnormal communication between the operation panel and MAIN PCB	<ul style="list-style-type: none"> • The operation panel fails to communicate with the MAIN PCB. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the connectors of the MAIN PCB and operation panel for looseness or disconnection.
E241	Timing setting error	<ul style="list-style-type: none"> • Setting of the timing is wrong. 	<ul style="list-style-type: none"> • Re-examine the timing setting.
E242	Workable input I/O error	<ul style="list-style-type: none"> • Inoperable input/output settings are turned on. 	<ul style="list-style-type: none"> • Select "Workable Input IO" and turn off unnecessary input/outputs
E243	Work enable input I/O error	<ul style="list-style-type: none"> • Inoperable input/output setting is placed in ON. 	<ul style="list-style-type: none"> • Select "Work enable input IO" and place unnecessary input/output in OFF.
E244	I/O signal timeout	<ul style="list-style-type: none"> • There is a timeout during waiting for the I/O signal execution. 	<ul style="list-style-type: none"> • Carry out an "output test" to check the signal. • Check the no-signal connector for looseness or disconnection.
E245	Pattern execution timeout	<ul style="list-style-type: none"> • There is a timeout during waiting for the pattern data execution. 	<ul style="list-style-type: none"> • Re-examine the pattern data.
E246	File name character limit error	<ul style="list-style-type: none"> • The file name has a large number of characters. 	<ul style="list-style-type: none"> • Re-examine the file name.
E247	Intermediate presser lifting	<ul style="list-style-type: none"> • The intermediate presser is in its upper position. 	<ul style="list-style-type: none"> • Lower the intermediate presser.
E248	Cassette holder lifting	<ul style="list-style-type: none"> • The cassette holder is in its upper position. 	<ul style="list-style-type: none"> • Lower the cassette holder.
E249	Cloth cutting knife lifting	<ul style="list-style-type: none"> • The cloth cutting knife is in its upper position. 	<ul style="list-style-type: none"> • Lower the cloth cutting knife.
E250	Punching material running out		
E251	Return-to-origin error	<ul style="list-style-type: none"> • The origin position cannot be reached. 	<ul style="list-style-type: none"> • Check to make sure that the X axis origin is correctly adjusted. • Check to make sure that the Y axis origin is correctly adjusted. • Check to make sure that the intermediate presser shaft origin is correctly adjusted.
E252	Cloth cutting knife motor overload	<ul style="list-style-type: none"> • The cloth cutting knife motor fails to rotate. • The cloth cutting knife motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the cloth cutting knife connector for looseness or disconnection. • Check to make sure that the cloth cutting knife moves smoothly.
E400	Abnormal communication between the driver and MAIN PCB	The driver fails to communicate with the MAIN PCB.	

Error code	Title	Details	Return method
E401	Overcurrent protection detection (driver)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is detected. 	<ul style="list-style-type: none"> • Check to make sure that there is nothing wrong with the motor. • Check to make sure that there is nothing wrong with the power PCB.
E404	Parameter fault detection (hardware driver)	<ul style="list-style-type: none"> • Setting parameter is defective. 	
E405	Parameter fault detection (software driver)	<ul style="list-style-type: none"> • Setting parameter is defective. 	
E406	A/D conversion error detection (driver)	<ul style="list-style-type: none"> • A/D conversion fails to complete. 	<ul style="list-style-type: none"> • Re-turn the power ON. • Check to make sure that there is nothing wrong with the driver.
E407	Encoder connector fault detection (driver)	<ul style="list-style-type: none"> • The encoder signal cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the motor encoder connector for looseness or disconnection.
E408	Encoder error signal detection (AB phase driver)	<ul style="list-style-type: none"> • The encoder (A and B phases) cannot be detected. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the motor encoder connector for looseness or disconnection.
E410	Power supply part low voltage detection (driver)	<ul style="list-style-type: none"> • A voltage that is equal to or lower than the guaranteed voltage is applied. 	<ul style="list-style-type: none"> • Check to make sure that the supply voltage of 92 V or higher is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E411	Power supply part overvoltage detection (driver)	<ul style="list-style-type: none"> • A current that is equal to or higher than the guaranteed current is applied. • Motor is short-circuited by the overcurrent. 	<ul style="list-style-type: none"> • Check to make sure that the supply voltage of 180 V% or lower is not applied. • Check to make sure that there is nothing wrong with the power PCB.
E413	Motor overload detection (driver)	<ul style="list-style-type: none"> • The motor fails to rotate. • The motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the motor output connector for looseness or disconnection. • Check to make sure that the cassette holder moves smoothly.
E414	Driver overload detection (driver)	<ul style="list-style-type: none"> • An overload on the driver is detected. 	
E418	Motor overspeed detection (driver)	<ul style="list-style-type: none"> • The number of revolutions of the motor has exceeded the detection level. 	<ul style="list-style-type: none"> • Check to make sure that the cord is not broken. • Check the motor output connector for looseness or disconnection. • Check the motor encoder connector for looseness or disconnection.
E419	Motor position deviation error detection (driver)	<ul style="list-style-type: none"> • The position deviation of the motor has exceeded the detection level. 	<ul style="list-style-type: none"> • Check to make sure that the motor runs without a hitch.
E427	Detection of system mismatch between the motor and the driver(driver)		
E428	Return-to-origin error detection (driver)	<ul style="list-style-type: none"> • The motor fails to return to its origin. 	
E429	Power supply fault detection (driver)		
E444	Motor electronic gear ratio is out of range (driver)	<ul style="list-style-type: none"> • The setting of the motor electronic gear ratio is wrong. 	<ul style="list-style-type: none"> • Change the motor.

Error code	Title	Details	Return method
E448	Motor overload (driver)	<ul style="list-style-type: none"> • The motor fails to rotate. • The motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the motor output connector for looseness or disconnection. • Check to make sure that the cassette holder moves smoothly.
E449	Driver overload signal detection (driver)	<ul style="list-style-type: none"> • The motor fails to rotate. • The motor or the driver is damaged. 	<ul style="list-style-type: none"> • Check the motor output connector for looseness or disconnection. • Check to make sure that the cassette holder moves smoothly.
E450	Motor position deviation error detection (driver)	<ul style="list-style-type: none"> • The position deviation of the motor has exceeded the detection level. 	<ul style="list-style-type: none"> • Check to make sure that the motor runs without a hitch.
E452	Positive-direction movement limit detection (driver)	<ul style="list-style-type: none"> • The movement amount of the motor in the positive direction has exceeded the limit. 	<ul style="list-style-type: none"> • Return the cassette holder to its home position.
E453	Negative-direction movement limit detection (driver)	<ul style="list-style-type: none"> • The movement amount of the motor in the negative direction has exceeded the limit. 	<ul style="list-style-type: none"> • Return the cassette holder to its home position.
E478	Motor A/D conversion error (driver)		

Instruction file error list


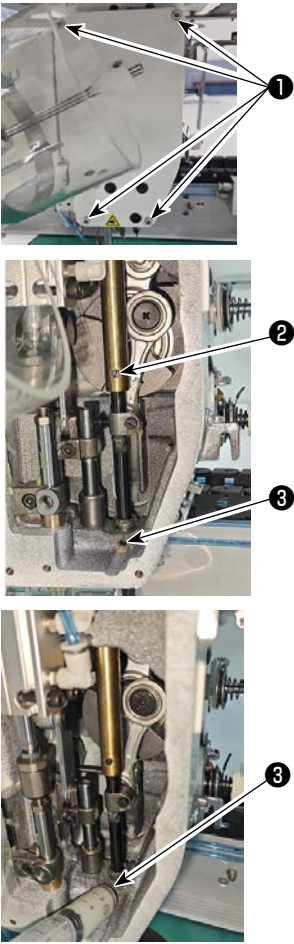
Error code	Description of error	Solution
W001	The top plate cover is opened.	Put the cover on the top plate.
W002	The table cover is opened.	Put the cover on the table.
W003	The safety cover is opened.	Put the safety cover in place.
W005	Lubricate	<p>Add grease.</p> <p>The number of days to be elapsed before the warning is given is set in the parameter file containing the grease-related data. So, if addition of grease is not necessary, press the "OK".</p>

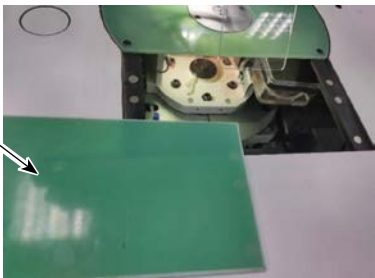
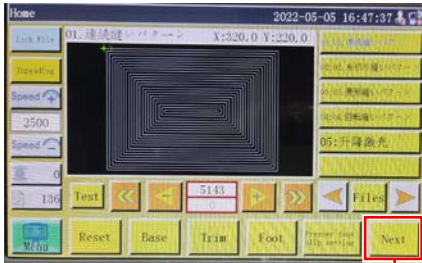
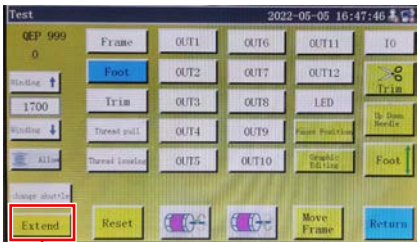
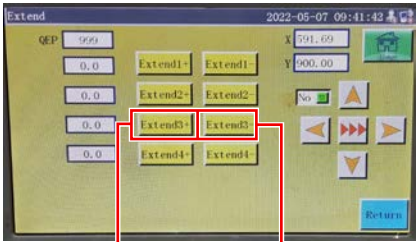
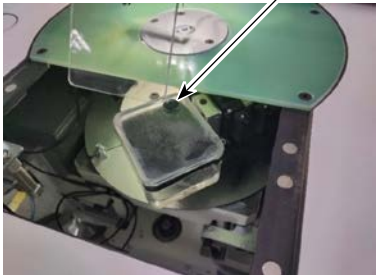
5. MAINTENANCE OF SAWING MACHINE

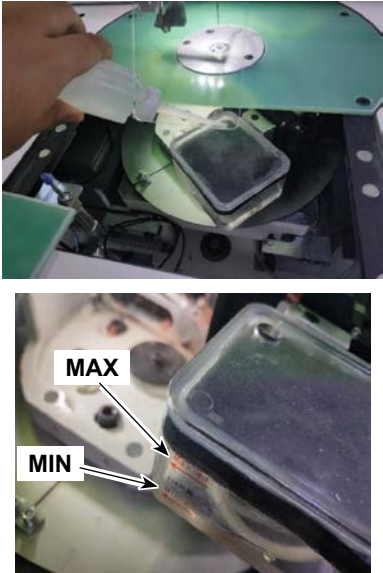
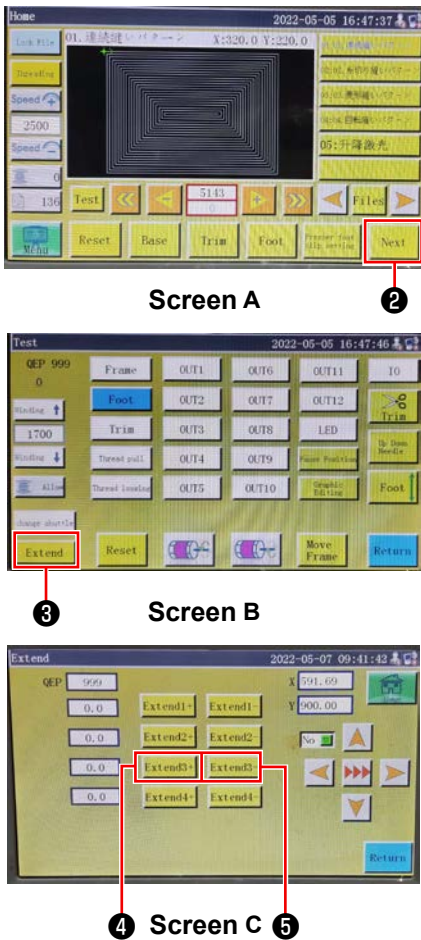


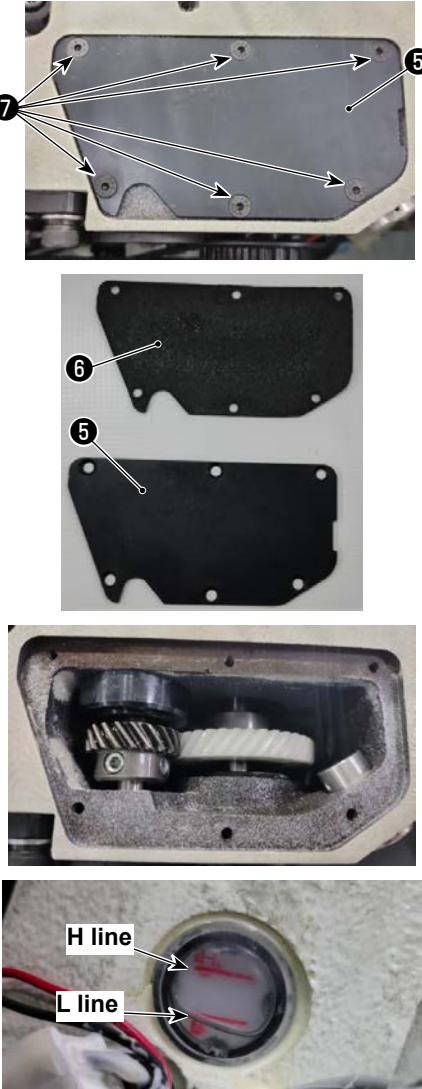
WARNING :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine. In addition, attach the covers which have been removed before operation back in place.

No.	Region	Explanation	Operating time
1	<p>The area under the throat plate, area surrounding the hook, bobbin case and its inner portion, thread trimming area, needle bar area, areas inside and outside of the presser foot, openings of the electronic control box such as air inlet and outlet, and the regions in which thread waste, thread end and other stains are likely to remain.</p> 	<p>Clean up the surface of equipment with a tool such as an air gun. In particular, clean up the regions in which the aforementioned thread waste, thread end and other stains are likely to remain.</p>	Eight hours
2	<p>Apply grease to the upper and lower bushing of the needle bar.</p> 	<ol style="list-style-type: none"> 1. Loosen screws ❶ of the face plate. Then, remove the face plate. 2. Loosen and remove screw ❷ of the needle bar upper bushing and screw ❸ of the needle bar lower bushing. 3. While aligning the lubricating hole of the grease gun with the tapped holes in the needle-bar upper and lower bushings, pour the grease. 4. The amount of the grease should not be smaller than 0.5 cm³. 5. After the greasing, tighten the screws of the needle-bar upper and lower bushings and put the face plate back into place. Tighten the screws of the face plate. 6. Use the JUKI Grease as the lubricating grease. Do not mix it with other lubricating greases. 	Operation for 720 hours

No.	Region	Explanation	Operating time
3	<p>Lubricate the hook oil tank.</p>   <p style="text-align: center;">Screen A</p>  <p style="text-align: center;">Screen B</p>  <p style="text-align: center;">Screen C</p> 	<p>1. Detach cylinder lifting plate ①.</p> <p>2. Press ② on the Start screen A to display the screen B. Then, press ③ to display the screen C. On the screen C, press ④ and ⑤ to rotate the bed and move lubricating rubber ⑦ of oil tank ⑥ to the outside of the bed.</p>	<p>If the oil level in the oil tank drops below the lower scale marker, replenish the oil tank with the accessory (or specified #10) oil.</p>

No.	Region	Explanation	Operating time
3		<p>3. Remove lubricating rubber ⑥ . Pour the supplied oil (or specified oil) into the oil tank. Lubricate up to the upper marker line.</p> <p>4. Attach rubber plug ⑥ .</p>	
4	<p>Adding the lubricating oil to the gear box</p>  <p style="text-align: center;">Screen A ②</p> <p style="text-align: center;">③ Screen B</p> <p style="text-align: center;">④ Screen C ⑤</p>	<p>1. Press ② on the Start screen A to display the screen B. Then, press ③ to display the screen C. On the screen C, press ④ and ⑤ to rotate the bed and move lubricating rubber ⑦ of oil tank ⑥ to the outside of the bed.</p>	<p>Replenish the gear box with No. 32 white oil if the oil surface shown on the level gauge falls below the lower scale mark A.</p>

No.	Region	Explanation	Operating time
4		<p>2. Loosen six fastening screws 7 and remove gear box cover 5 and cap 6 .</p> <p>3. Pour the #32 oil into the gear box slowly.</p> <p>4. The oil surface in the gear box can be checked through the oil sight window on the side face of the frame. Stop pouring of the lubricating oil when the oil surface reaches the center part (between the H and L lines) of the oil sight window.</p> <p>5. Attach gear box cover 5 and cap 6 .</p>	

5-1. TROUBLES AND CORRECTIVE MEASURES(SEWING CONDITIONS)

Troubles	Cause	Measures
1. The needle thread slips off at the start of bar-tacking.	<ul style="list-style-type: none"> ① Stitches are slipped at the start. ② The needle thread remaining on the needle after thread trimming is too short. ③ The bobbin thread is too short. ④ Needle thread tension at 1st stitch is too high. ⑤ Stitching pitch at 1st stitch is too small. 	<ul style="list-style-type: none"> ○ Adjust the clearance provided between the needle and the hook. ○ Set soft-start sewing at the beginning of sewing. ○ Decrease the tension of the thread tension controller No. 1. ○ Increase the tension of the thread take-up spring. ○ Decrease the bobbin thread tension. ○ Increase the clearance between the needle and the counter knife. ○ Decrease the needle thread tension at 1st stitch, and extend the duration of the AT operation at the beginning of sewing. ○ Make the stitching pitch at 1st stitch longer. ○ Decrease the needle thread tension at 1st stitch.
2. Thread often breaks or synthetic fiber thread splits finely.	<ul style="list-style-type: none"> ① The hook or the inner hook holder has scratches. ② The needle hole guide has scratches. ③ Thread enters the groove in the hook. ④ The needle thread tension is too high. ⑤ The tension of the thread take-up spring is too high. ⑥ The synthetic fiber thread melts due to heat generated on the needle. ⑦ When taking up the thread, the needle tip penetrates the thread. 	<ul style="list-style-type: none"> ○ Remove the hook and grind hook or the inner hook holder with a fine grind stone or buff them. ○ Buff the needle hole guide or replace it with a new one. ○ Detach the hook to remove the thread. ○ Decrease the needle thread tension. ○ Decrease the tension of the thread take-up spring. ○ Use the optional needle cooler. ○ Check the rough state of needle tip. ○ Use the ball-pointed needle.
3. The needle often breaks.	<ul style="list-style-type: none"> ① The needle is bent. ② The needle comes in contact with the intermediate presser. ③ The needle is too thin for the material. ④ Clearance between the needle and the hook is too small. 	<ul style="list-style-type: none"> ○ Replace the bent needle. ○ Adjust the position of the intermediate presser. ○ Replace it with a thicker needle according to the material. ○ Adjust the clearance between the needle and the hook.
4. Threads are not trimmed. (Bobbin thread only)	<ul style="list-style-type: none"> ① The counter knife is dull. ② Knife pressure of the counter knife is low. ③ The counter knife has been improperly positioned. ④ The last stitch is skipped. ⑤ Bobbin thread tension is too low. ⑥ Flopping of cloth 	<ul style="list-style-type: none"> ○ Replace the counter knife. ○ Adjust the knife pressure of the counter knife. ○ Correct the position of the counter knife. ○ Correct the timing between the needle and the hook. ○ Increase the bobbin thread tension. ○ Lower the intermediate presser height.
5. Stitch skipping often occurs.	<ul style="list-style-type: none"> ① Clearance provided between the needle and the hook is not correct. ② Position of the inner hook holder against the needle is not correct. ③ The needle is bent. ④ The needle thread after thread trimming is too long. 	<ul style="list-style-type: none"> ○ Adjust the clearance between the needle and the hook. ○ Adjust the position of the inner hook holder against the needle. ○ Replace the bent needle. ○ Decrease the tension of the thread take-up spring. ○ Increase the tension of the thread tension controller No. 1.
6. The needle thread comes out on the wrong side of the material.	<ul style="list-style-type: none"> ① The needle thread tension is not high enough. ② The needle thread after thread trimming is too long. 	<ul style="list-style-type: none"> ○ Increase the needle thread tension. ○ Increase the tension of the thread tension controller No. 1.
7. Threads break at time of thread trimming.	<ul style="list-style-type: none"> ① The knife has been improperly positioned. 	<ul style="list-style-type: none"> ○ Correct the position of the knife.

Troubles	Cause	Measures
8. Thread end of the 1st stitch comes out on the right side of the material.	① Stitch skipping at the 1st stitch. ② Needle used and thread used are thick in terms of the inner diameter of the intermediate presser. ③ Intermediate presser is not properly positioned in terms of the needle. ④ The direction of air blower is incorrect. As a result, needle thread at the tip of needle cannot be clamped with the disc presser.	○ Increase the length of needle thread remaining at the needle after thread trimming. ○ Change the current intermediate presser with another one which has a larger inner diameter. ○ Adjust the eccentricity between intermediate presser and needle so that needle enters in the center of intermediate presser. ○ Adjust the air-blowing direction of the air blower according to the direction of sewing so that the needle thread at the tip of needle can be clamped with the disc presser.
9. The needle thread is entangled in the inner hook holder.	① The clearance provided between the inner hook holder and the inner hook is too small.	○ Adjust the clearance provided between the inner hook holder and the inner hook appropriately according to the thickness of needle thread to be used.
10. The knotting section of bobbin thread at 2nd stitch at the sewing start appears on the right side.	① The bobbin runs idle excessively. ② Bobbin thread tension is too low. ③ The needle thread tension at 1st stitch is too high.	○ Adjust the height of idling prevention spring of the bobbin case appropriately. ○ Increase the bobbin thread tension. ○ Decrease the needle thread tension at 1st stitch.
11. The sewing machine is not able to carry out perfect stitching.	① The bed fails to rotate.	○ On the operation panel, select "Menu" and "Machine Param" in the written order. Then, enter "11111111" as a password. Then, select "Rotation Setting" and set the "Rotation along graph" to "Yes". Then, set the stitch pitch for sewing patterns again.

5-2. Disposal of batteries

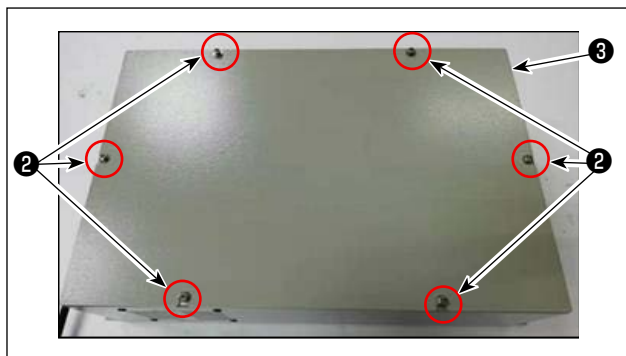


The operation panel has a built-in battery in order to operate the clock even when the power is turned OFF. Be sure to dispose of the battery following the local laws and regulations.

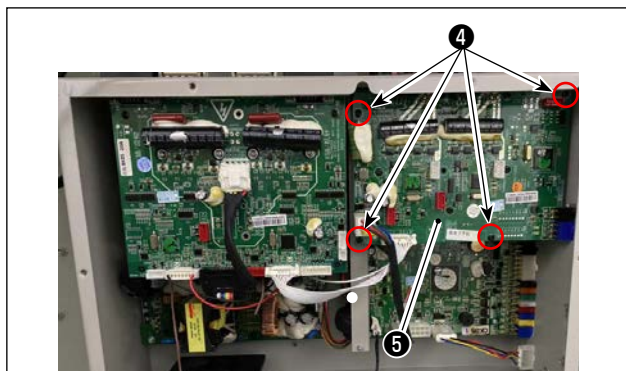
■ How to remove the battery



- 1) Release lock **1** of the door at the back or side face of the sewing machine to open the door.



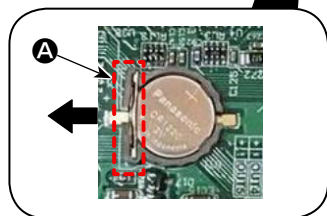
- 2) Remove cover setscrews **2** of electrical box **3** that is located inside the door. Then, detach the front cover of the electrical box.



- 3) Remove four screws **4** of PCB **5**. Remove PCB **5**.



- 4) Slide the stopper **A** of battery **6** in the direction of the arrow to remove battery **6**.

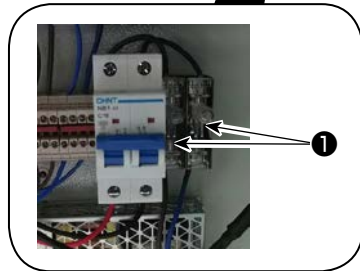
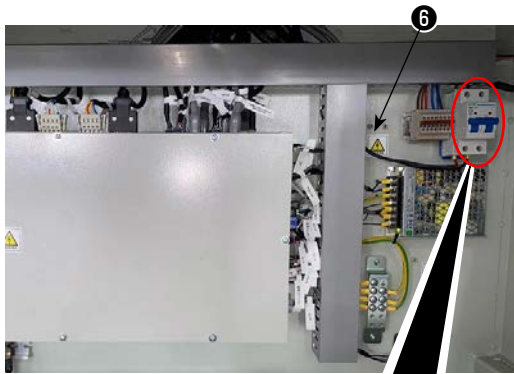


5-3. Replacing the fuse



WARNING :

1. To avoid electrical shock hazards, turn OFF the power and open the control box cover after about five minutes have passed.
2. Open the control box cover after turning OFF the power without fail. Then, replace with a new fuse with the specified capacity.



Two fuses are used.

- ❶ Fuse 250 V 20A (time lag fuse)
JUKI part number: 40292522