SunStar®

USER'S MANUAL

SPS/C-5050 Series
SPS/C-8050 Series

Independent Direct Drive,
Electronically Controlled
Pattern

1) FOR AT MOST USE WITH EASINESS, PLEASE CERTAINLY READ THIS MANUAL BEFORE STARTING USE.
2) KEEP THIS MANUAL IN SAFE PLACE FOR REFERENCE WHEN THE MACHINE BREAKS DOWN.

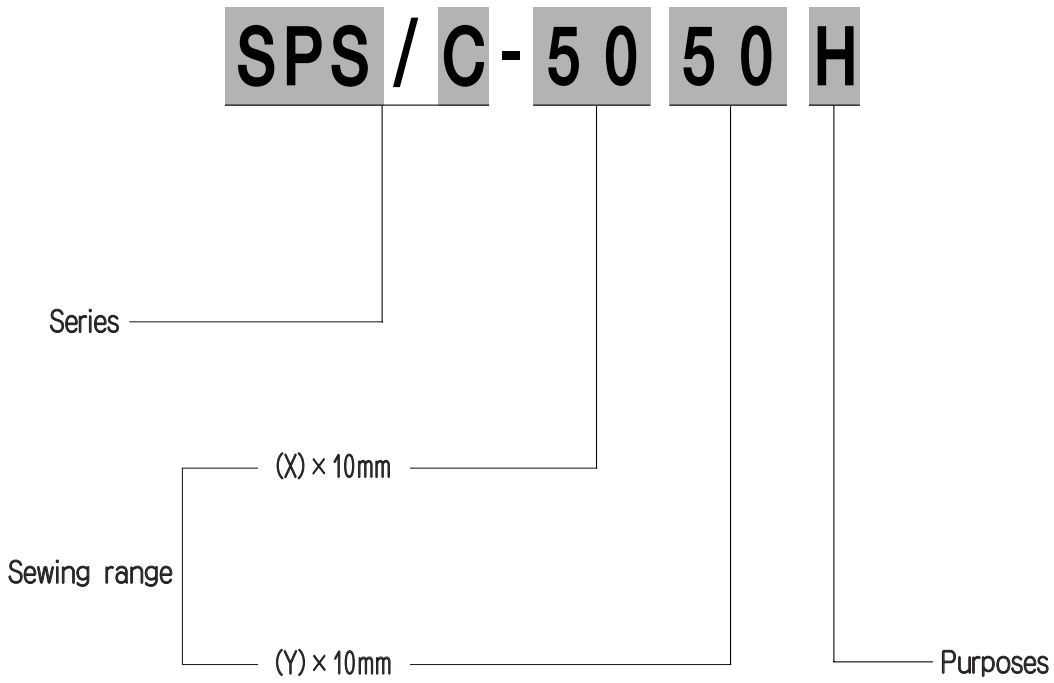
SUNSTAR MACHINERY CO., LTD.

MME-041028

1. Thank you for purchasing our product. Based on the rich expertise and experience accumulated in industrial sewing machine production, SUNSTAR will manufacture industrial sewing machines, which deliver more diverse functions, high performance, powerful operation, enhanced durability, and more sophisticated design to meet a number of user's needs.
2. Please read this user's manual thoroughly before using the machine. Make sure to properly use the machine to enjoy its full performance.
3. The specifications of the machine are subject to change, aimed to enhance product performance, without prior notice.
4. This product is designed, manufactured, and sold as an industrial sewing machine. It should not be used for other than industrial purpose.

SUNSTAR MACHINERY CO., LTD.

PATTERN S/M Model Series Patterns



☐ Purposes
H : Heavy material

CONTENTS

1

Safety Rules

Safety labels in the manual are categorized into danger, warning and caution. Failure to follow the safety rules may result in physical injuries or mechanical damages.

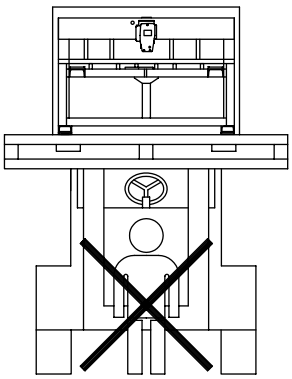
Danger : Instructions here shall be observed strictly. Otherwise, the user could suffer damage from installation, movement, and repair.

Warning : Instructions here shall be observed strictly. Otherwise, the user could suffer severe physical injuries.

Caution : Instructions here shall be observed strictly. So the user could prevent expected malfunction.

1) Machine movement

Danger



※ Remove obstacles and do not allow people pass under the machine.

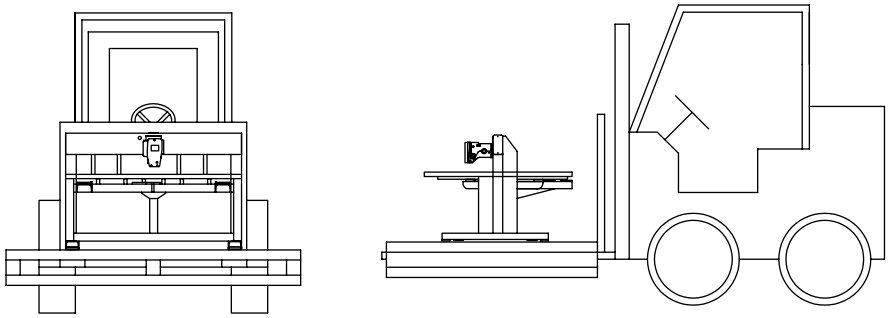
Only personnel with a full understanding of the safety rules should move the machines. The following directions must be observed when moving the machines.

1) Delivery by men

In the case, the worker should wear safety shoes and hold tightly on the left and right sides.

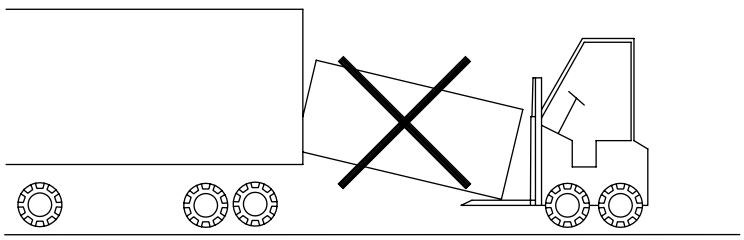
2) Delivery by forklift

The forklift should sustain the weight of the machine and be big enough to deliver the machine. When lifting the machine, put the center of gravity of the machine on the fork arm as in the figure 1-1 by using the pallet.



[Figure 1-1]

[Warning] Especially when using the forklift or crane, unlades the machine horizontally to prevent deformation of the machine and an exposure of a man to danger.



[Figure 1-2]

2) Machine installation

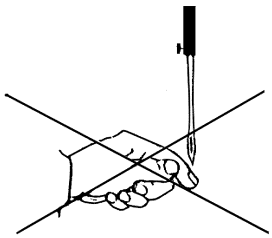
Because physical damages such as the functional obstacles and breakdowns are likely to occur according to the environment in which the machine is being installed. Therefore, the following preconditions should be fulfilled.

1) The worktable or desk on which the machine would be installed should be strong enough to sustain the weight (see the nameplate) of the machine.
2) Because machines are apt to be contaminated and corroded by dust and moisture, you should install Air Conditioner and clean the machines regularly.
   Do not operate the machine with radiation cover open. The air filter on the upper side of control box should be cleaned once a week.
3) Keep the machines out of the direct rays of the sun. If exposed too much to the direct rays of the sun, the machine may discolor and deform.
4) Keep right and left sides and the backside of the machines off at least 50cm from the wall to secure enough space to repair.

[Note] The details about the installment of the machine are described in No. 4 Installating the machine.

5) Danger of Explosion: In order to avoid danger of explosion, do not run the machine if there is highly combustible material in the air.
6) Illumination: Because of the peculiarity of the machine, any illuminators are not equipped. So, users should install the lighting apparatus around the working area.
7) Danger of fall: Do not install the machine on an unstable stand or table. If the machine falls, it will lead to physical injuries and mechanical damages. When moving the machine, protect it from outside shock and do not stop abruptly lest it should fall.

3) Machine operation



SPS/C-5050 is manufactured to sew textiles and other similar material.
Be aware that the body of the machine has labels of caution or warning on each dangerous part to highlight the safety regulations. In case of running the machine, users should observe the following things.

1) Before operating the machine, please read the manual and understand fully the details on its operation.
2) Don't forget to put on the garment suited for the safe work.
   Long hair, necklaces, bracelets, wide sleeves etc. are likely to be dragged into the machine in operation. Wear shoes without slip to avoid danger.
3) When operating the machine, make sure that there is no one near the working parts of it.
4) Keep your hands or parts of the body away from running parts of the machine like a needle, hook, thread take-up spring, pulley etc.
5) Do not remove any safety cover protecting pulley or shaft, while running the machine.
6) Before opening the electric box such as a control box, make sure without fail to shut off the power supply and make sure that the power switch should be "off."
7) Before rotating the upper shaft manually, make sure without fail that the power switch should be "off."
8) When threading the needle or checking the machine after sewing, be sure to stop the machine.

4) Machine operation

Instructions here should be observed. Otherwise the user could face mechanical damages such as the functional obstacles and breakdowns. Therefore, the following preconditions should be fulfilled.

1) Don't put things on the table of machine.
2) Don't use crooked needle or needle whose tip is blunt.
3) Use needle plate fit for the work

5) Machine troubleshooting

In need of troubleshooting, it should be done by the trained A/S engineer of our company.

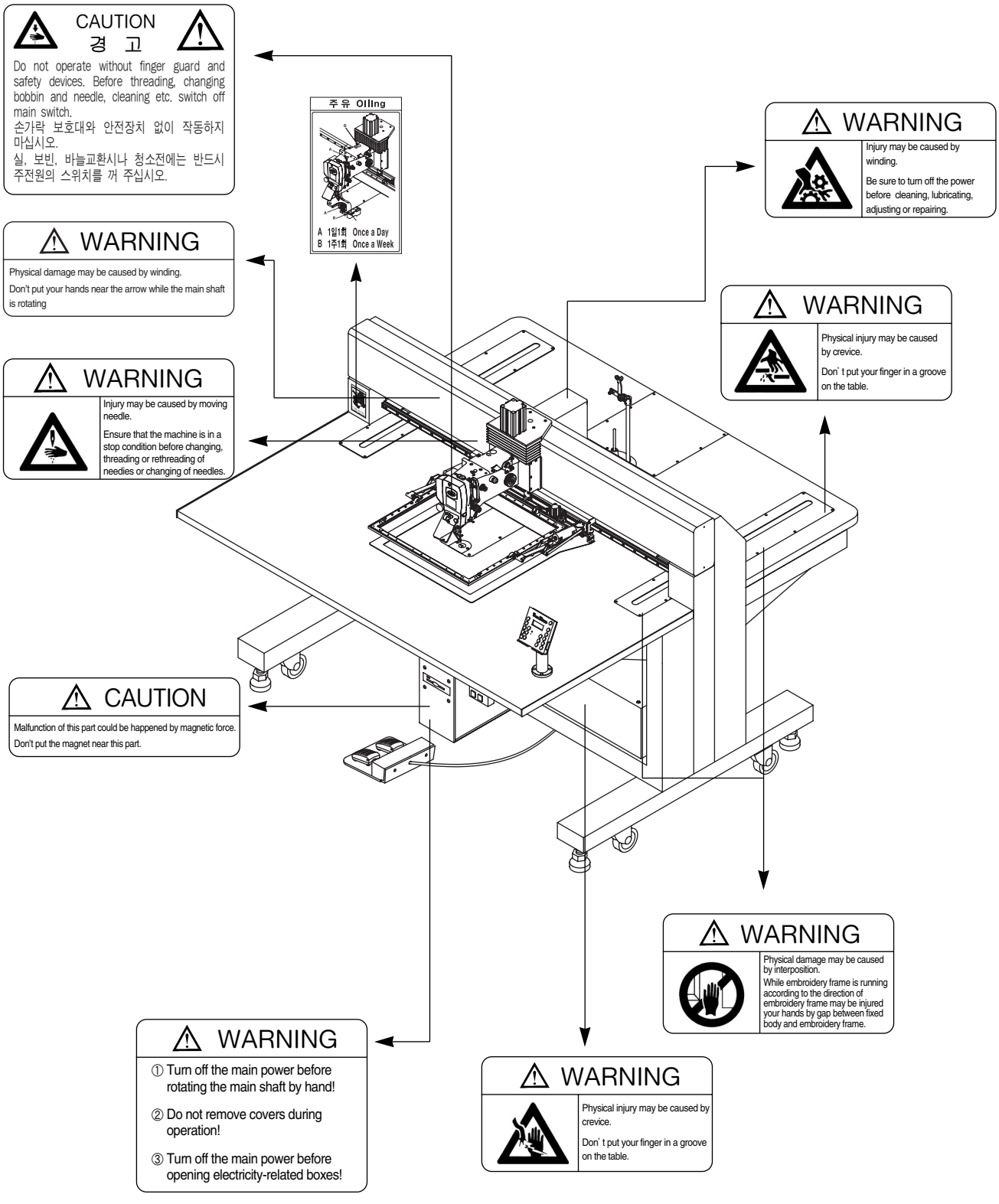
1) Before cleaning and repair, be sure to shut off the power supply. And wait for about 4 minutes until the machine discharges completely.

[Caution] For main motor, X/Y drive box, it takes 10 minutes to discharge completely after the power is shut off.

2) Even specification or a part of or the entire machine should not be modified without any consultation with our company. The modification would undermine safety of the operation
3) In case of repair, you should replace the damaged part with the genuine parts of our company (SunStar).
4) After repair, please put again the safety covers disjointed during repairing.

6) Position of caution marks	The labels of “Caution” are attached to the machine for safety. When operating the machine, make sure to follow the safety rules that each “Caution” tells.

1) Position of Caution Marks



7) Contents of warning

1) Contents

ⓐ

[Caution] The safety cover in the warning label refers to all covers around the operational section.

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ⓒ

ⓓ

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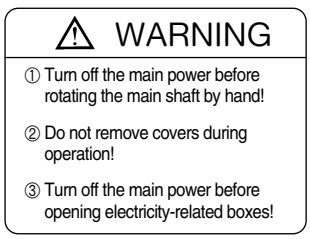

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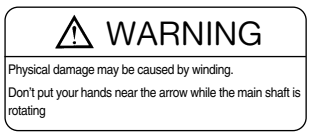

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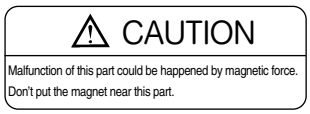


2

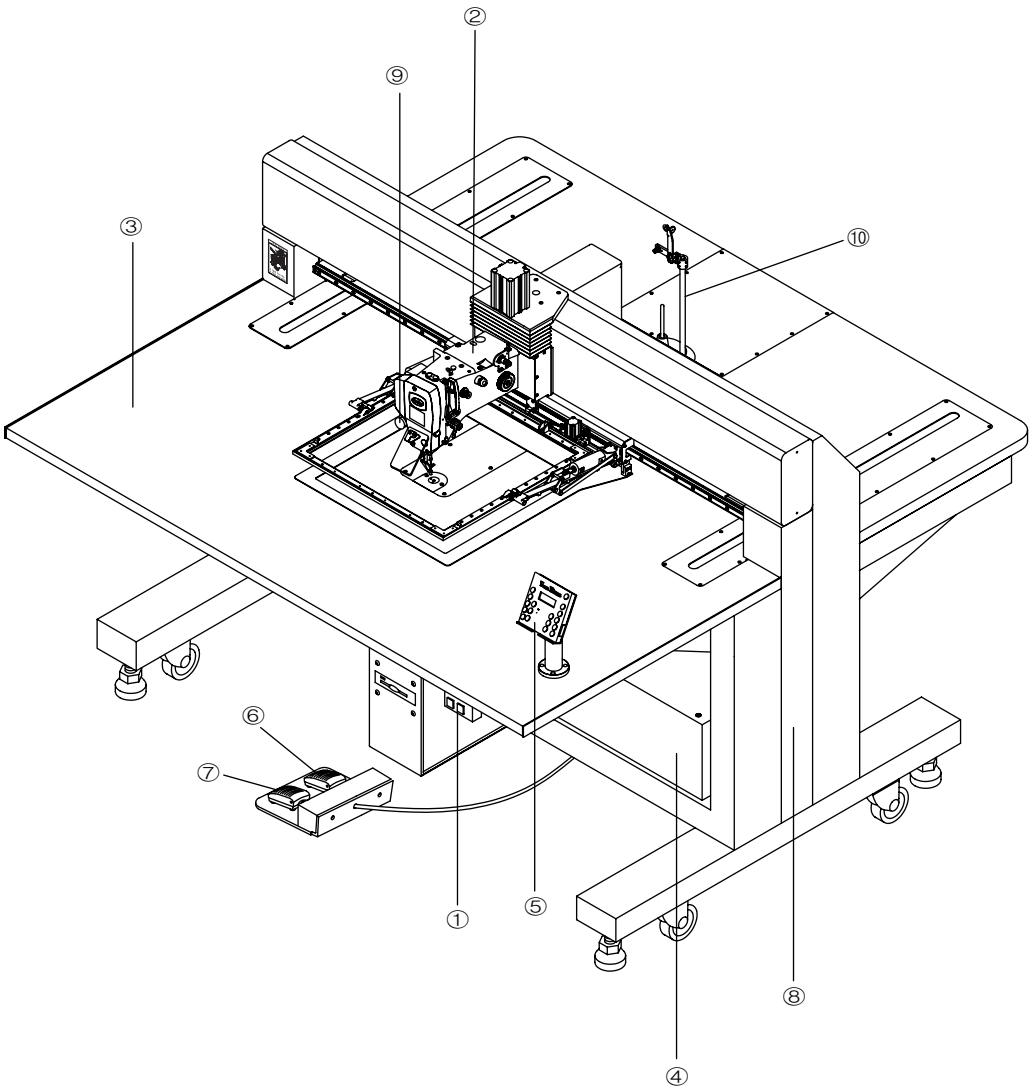
Machine specification

Sewing range	X(horizontal) : 500mm Y(anteroposterior) : 500mm
Max sewing speed	2,300spm (less than 3mm stitch width)
Stitch width	0.1～12.7mm
Conveying Method	By motor
Needle bar stroke	41.2mm
Needles	DP×17 , DP×5
Feed plate height	80mm(Standard)
Presser foot stroke	Normal: 4mm [0.7 ~ 7mm]
Presser foot height	22mm
Arm height	50mm
Hook	Forward rotating double hook
Bobbin case	Bobbin case for forward rotating double hook
Bobbin	Bobbin for double hook
Storage device	3.5 ″ floppy disk (2HD) Storage pattern: maximum 691 pattern/disk
Emergency stop function	Emergency stop function is available during the machine operation
Maximum speed	Max speed can be limited between 180 ~ 2,000spm by using an exterior switch
Pattern selection	Wide range of patterns from 1 to 999 available
Memory backup	Operation point stored in case that the machine stops working, as in a blackout
Second original point	During the operation, needle position can be set at any randomly chosen point by using Jog Key
Main motor	500W SERVO motor
Power	600VA
Proper temperature	5℃～40℃
Proper humidity	20％～80％
Voltage	Rated at ±10％ 50/60㎐
Air pressure	4.5~5.5kg/cm² (0.44~0.54MPa)

3

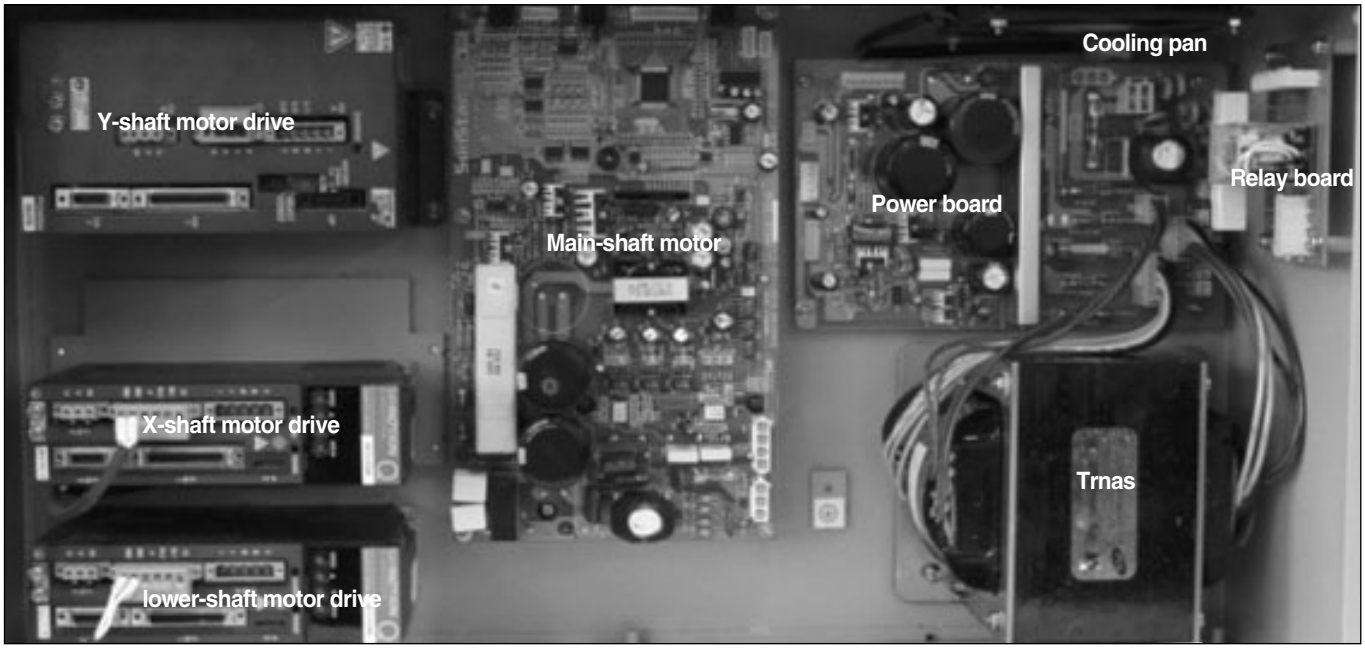
Machine Composition

1) Name of parts

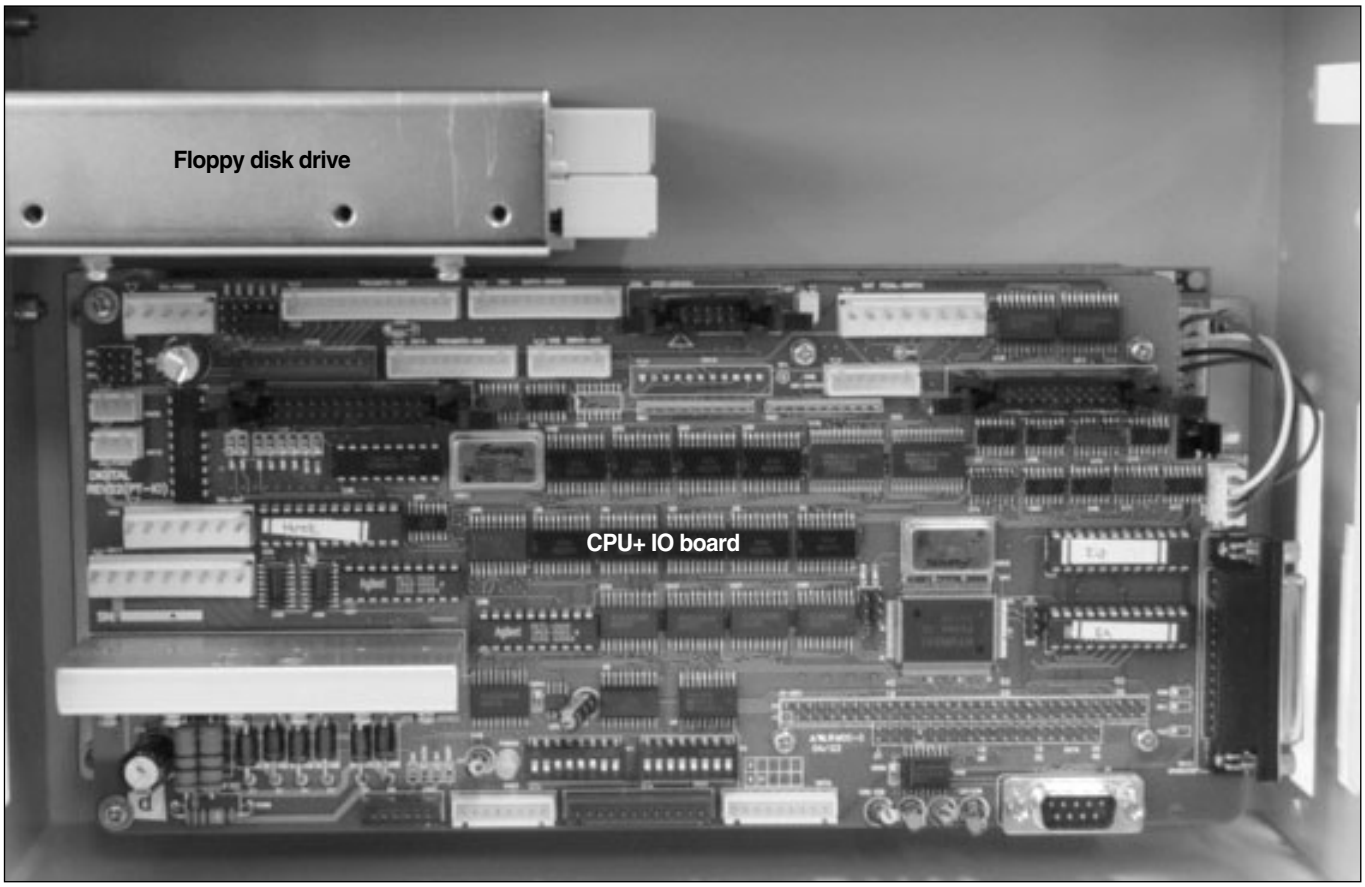


① Power on/off
② Arm
③ Table
④ Control box
⑤ Operation box
⑥ Sewing pedal
⑦ Upper feed plate pedal
⑧ Body
⑨ Emergency stop switch
⑩ Thread stand

2) Internal structure of control box



3) Internal structure of PC box



4

Installing the machine

1) Conditions for installing the machine

A. In order to prevent accident by malfunctioning, do not operate the machine in the place where rated voltage is more than ±10%.

B. In order to prevent accident by malfunctioning, check if air pressure is proper at devices like air cylinder, before operating the machine.

C. In order to use the machine safely, operate the machine under the following conditions.

⇒ The machine should be operating at : 0° ~40℃(32° ~104°F)

⇒ The machine should be stored at : -10° ~60℃(14° ~140°F)

D. Humidity: within 45 ~ 85% (relative humidity)

2) Conditions for power supply

A. Voltage

- Voltage should be within 10 percent of the rated voltage.
- Frequency should be within 1 percent of the rated frequency (50/60Hz).

B. Electromagnetic wave noise

It is required for the machine not to share power with products releasing strong magnetism and high frequency, and to keep the machine away from them.

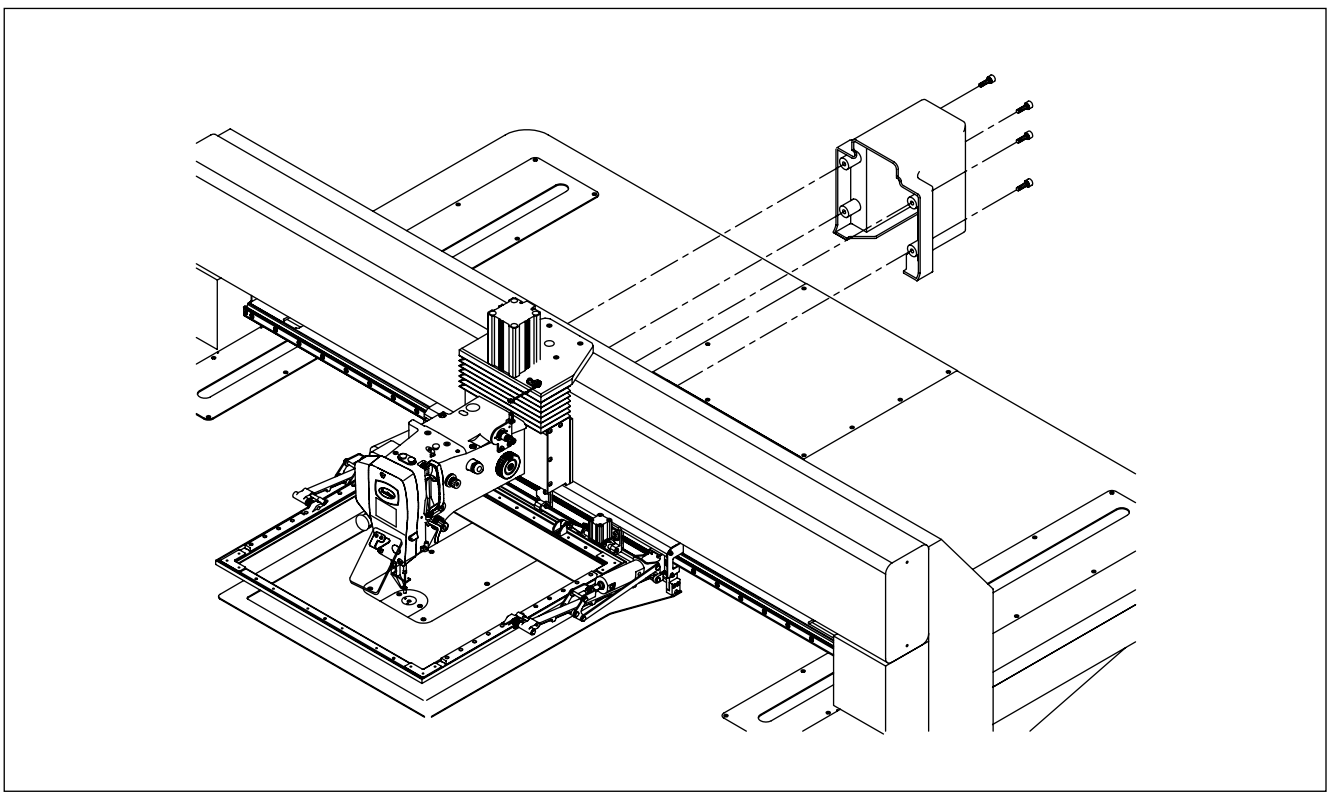
C. Make sure to use safe low voltage when it is needed to attach auxiliary devices or accessories to controller.

D. Be careful not to spill water or coffee on control box and Motor.

E. Do not fall control box and motor.

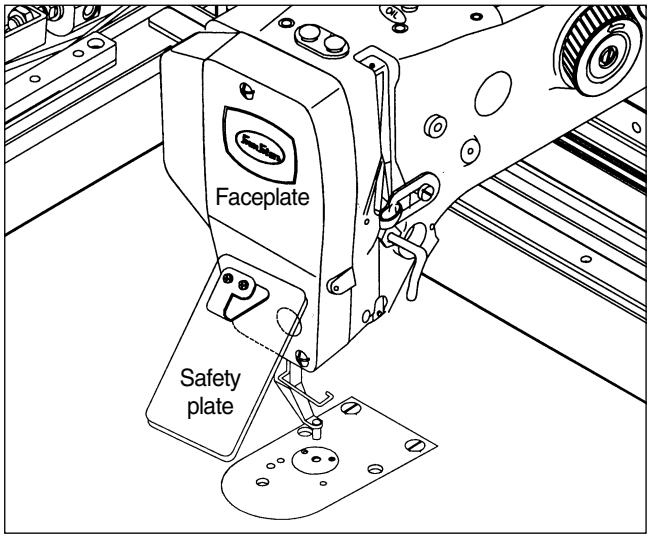
3) Assembling peripheral devices

A. Attach belt cover to the machine by using clamp screws.



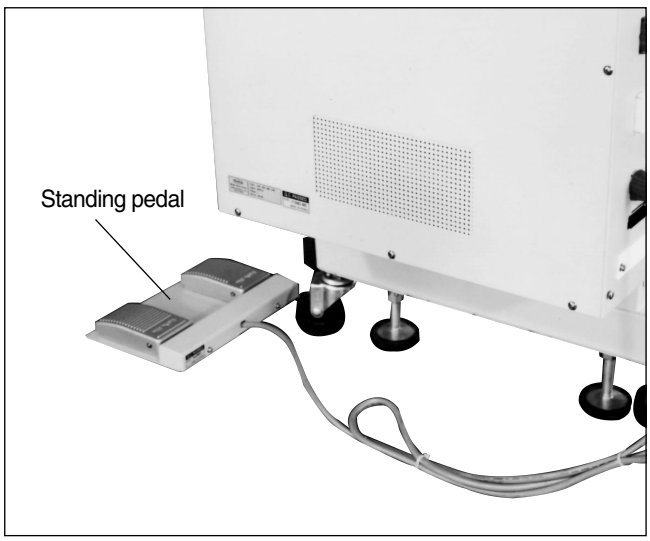
[Fig. 1]

B. Attach safety plate to faceplate.
(Safety plate must be attached before operation to prevent accident.)



[Fig. 2]

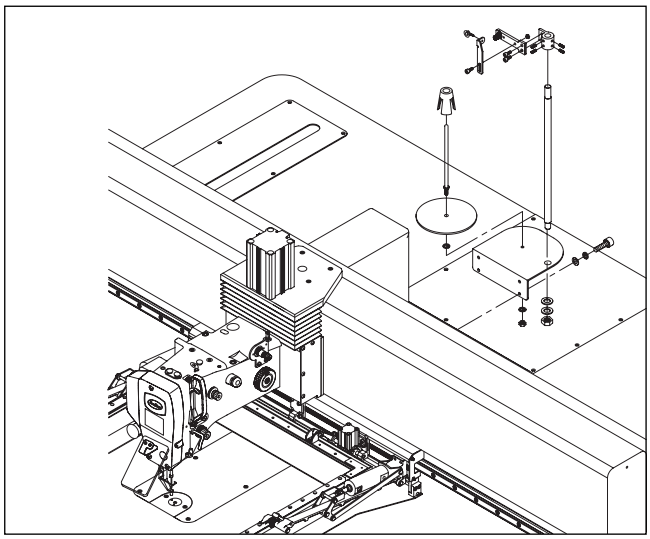
C. Connect the plug of standing pedal to the control box.



[Fig. 3]

D. Install thread stand on the machine body.

[Caution]
Be careful while installing thread stand, or parts can fall down and cause physical injuries.



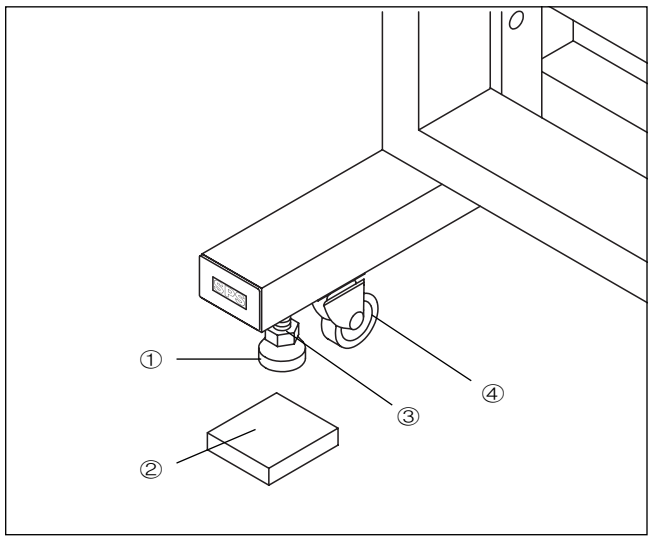
[Fig. 4]

E. Table Leg Base

ⓐ Put vibration-proof rubber② under the lever adjuster①.

ⓑ Loosen nut③ and turn the lever adjuster① until the caster④ makes an idle rotation.

ⓒ After installation, fasten nut③ to fix the lever adjuster①.



[Fig. 5]

F. Attaching air pressure controlling parts

[Caution]
For the safety, do work with the power switch off.

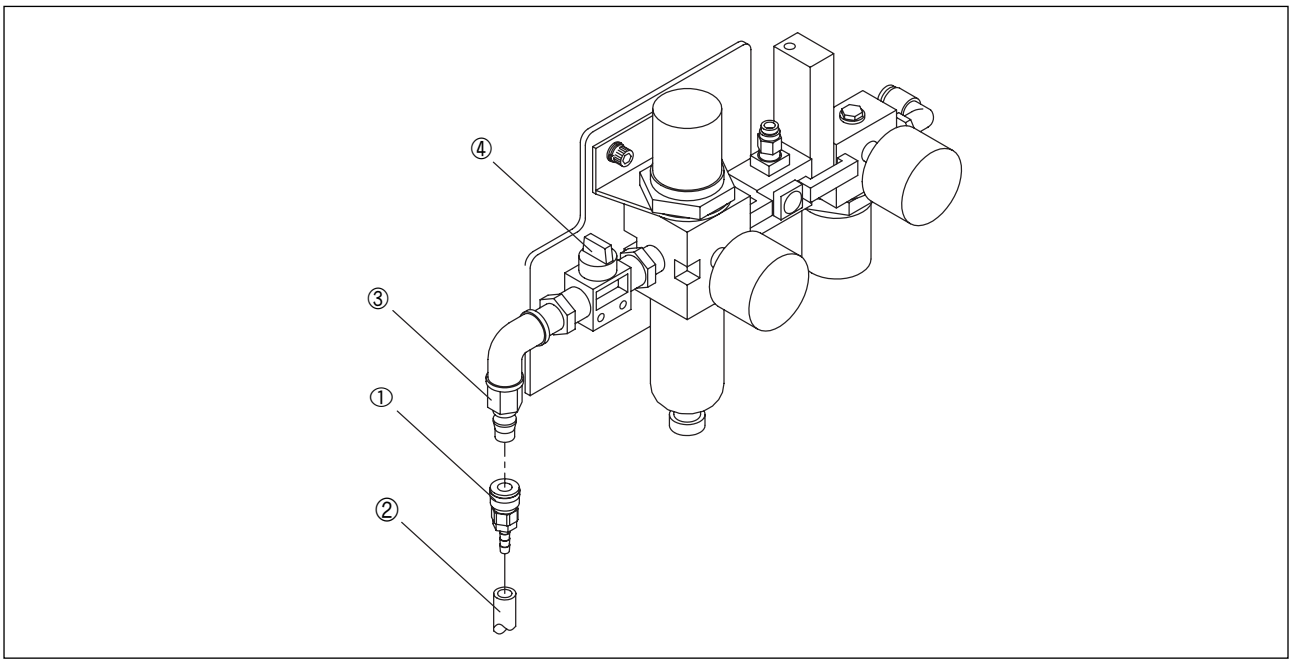
ⓐ Link quick joint socket① to air horse②.

ⓑ Link quick joint socket① to quick joint plug③.

ⓒ Open finger valve④ to inflow air and adjust air pressure to 4.5~5.5kgf/cm^2 (0.44~0.54MPa).

[Caution]
When the air pressure is low under(4kgf/cm^2) during operation, the machine stops with the error message. The error message: Err 24(Low Pressure!)

[Note]
When closing finger valve after use, the remaining air will automatically go out with the remaining pressure displayed at 0kgf/cm^2 (0MPa).



[Fig. 6]

5

Preparation before operating machine

1) Setting voltage

A. Control box internal structure of SPS/c-series is as the following figure 7.

B. Check if the position of power voltage switching connector on power board and used trans are properly selected according to the input voltage as in the table1, table2.

For example) In case of 220 voltages, used trans model should be "SPS-5050-220CE" and the position of power voltage switching connector should be "JP5".

※ Trans model sticker is attached on the top of trans.

Input voltage	Power voltage switching connector
95V~105V	JP4
106V~115V	JP3
116V~125V	JP2
200V~230V	JP5
231V~245V	JP4
345V~415V	JP3
416V~480V	JP2

[Table 1. Voltage switching connecter position]

Power voltage \ Machine model	SPS/C-Series
100V~120V	″SPS-5050-220CE″
380V~415V	″1Phase 2.2KA 415V″
200V~220V	″SPS-5050-220CE″

[Table2. Used trans model according to input power voltage]

C. Check if power switch is for three-phase or one-phase.

D. If the settings in B and C are not proper, it may result in the machine breakdown. Therefore, follow the following instruction.

ⓐ When power voltage switching connector is put at the wrong place.

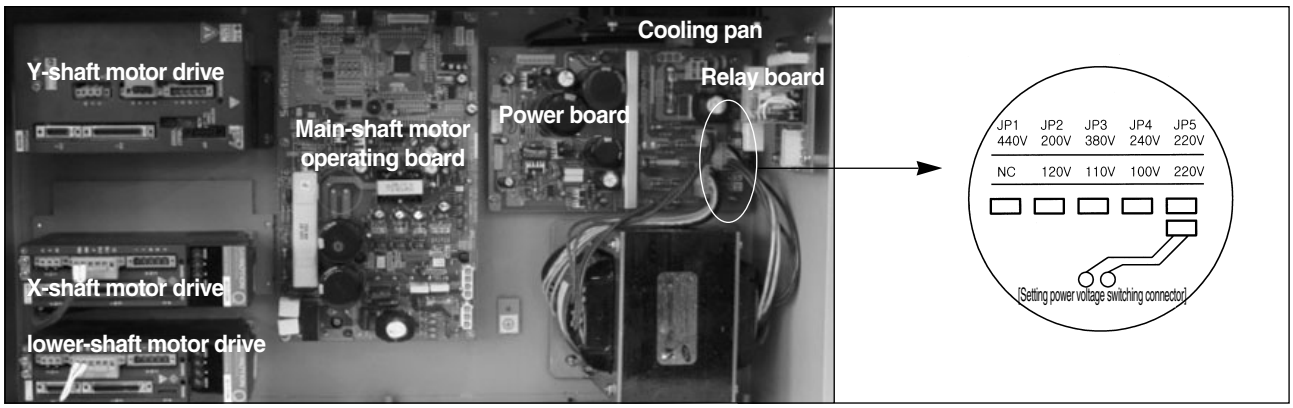
① Separate connector linked to trans from power board of CN7, CN8, and CN9.

② Switch the power voltage switching connector into the right place of table1 and plug it.

③ Connect connector linked to trans with power board of CN7, CN8, and CN9.

ⓑ If used trans and power switch are not in accordance with the specification, exchange or repair at the purchasing place.

[Note]
Make sure that the air should be filled before turning on the power switch.

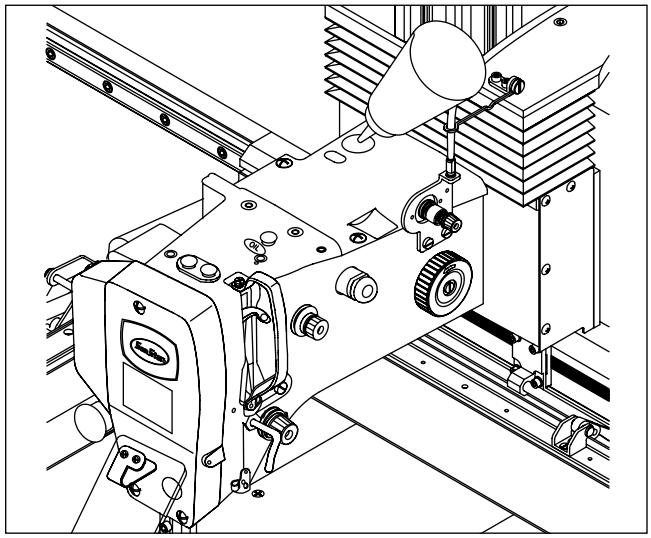


[Setting power voltage switching connector] [Fig. 7]

2) Oil Supply

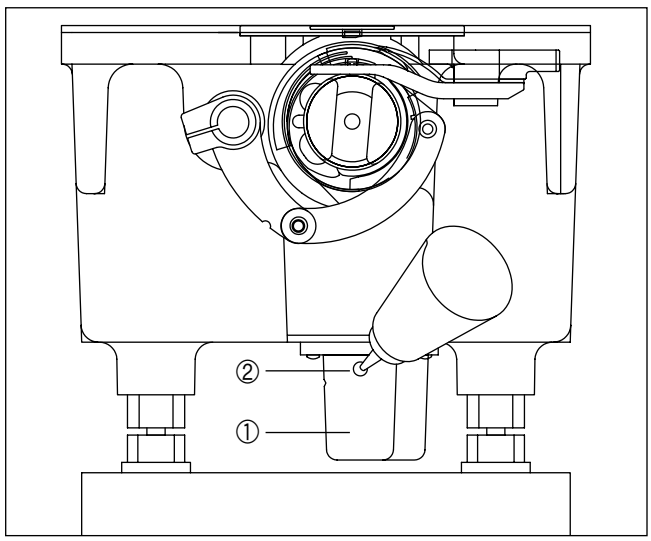
A. After checking the remaining oil in the oil tank installed on the arm, supply enough oil.

[Caution]
Make sure to supply oil when using the machine for the first time or after not using it for a long time.



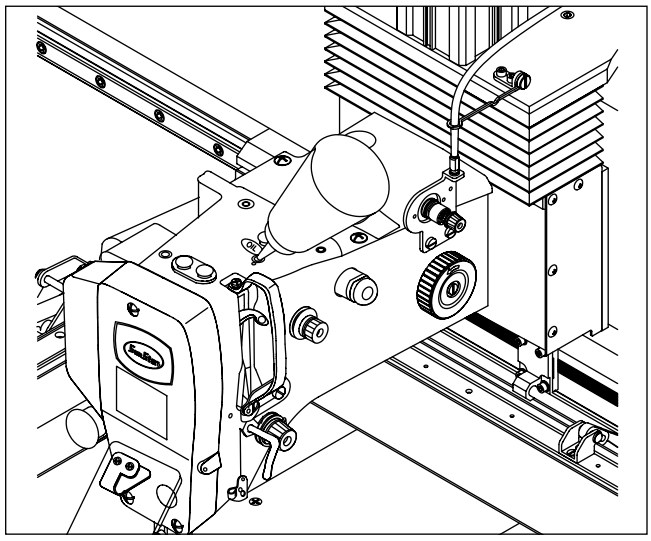
[Fig. 8]

B. As in the figure, check the remaining oil in the oil tank① installed on the bed beneath the table and supply enough oil through the oil inlet②.



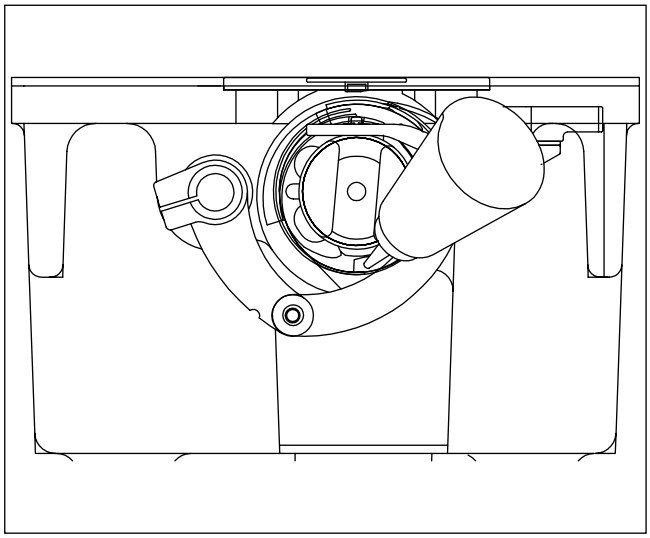
[Fig. 9]

C. Supply enough oil through the oil inlet on the upper part of the arm.



[Fig. 10]

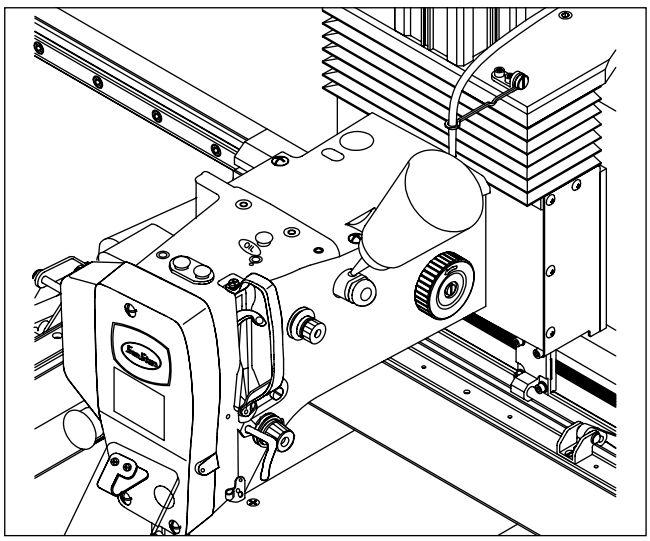
D. Open bobbin case, supply enough oil to the extent that the oil soaks around the hook.



[Fig. 11]

E. Fill the tank on right side of ARM with silicon oil.

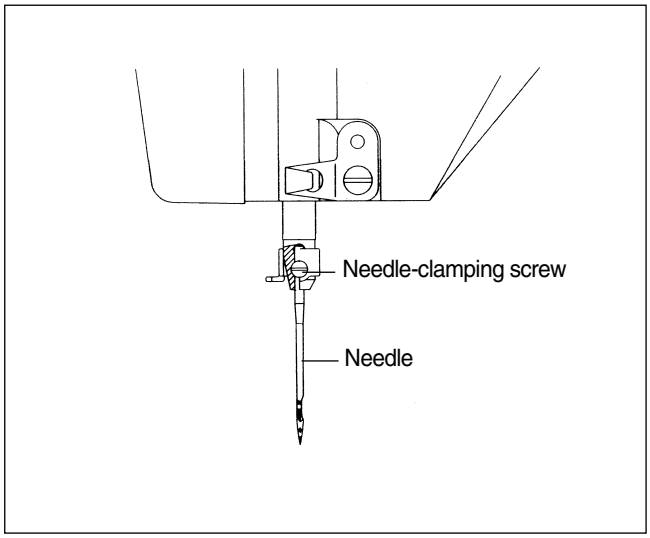
F. Fill to the tank of oil of the arm (fig 8) and of the bed (fig 9) 1 time to the week, and lubricate the part superior of the arm (fig 10) and the environs of the hook (fig 11) 1 time to the day.



[Fig. 12]

3) Inserting needle

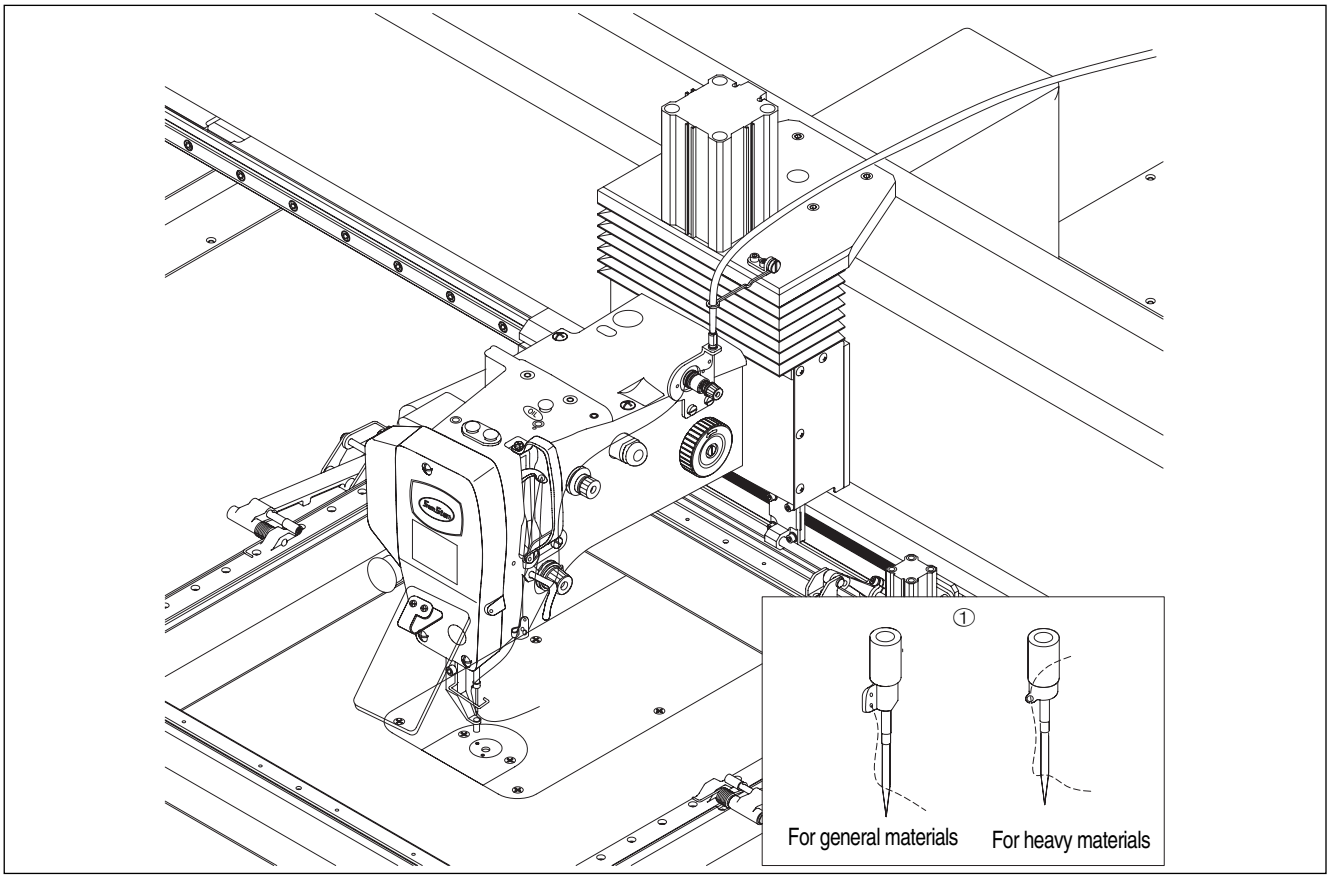
Unfasten needle clamp screw on needle bar, with the long groove on the needle facing forward, insert needle to the point where its top end meets the end of the needle bar hole, and then fasten the screw.



[Fig. 13]

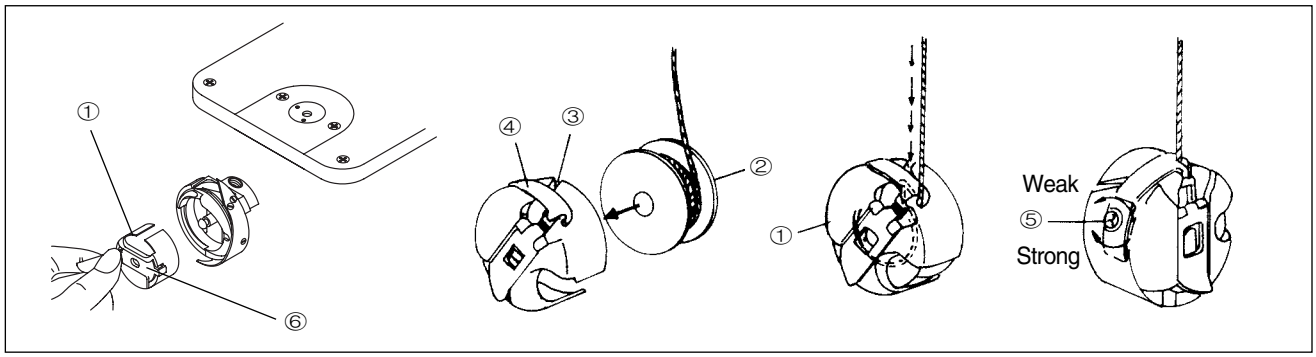
4) Inserting upper thread

A. Place the thread take-up lever to the highest position and route the upper thread as in Figure. In case of thread guide on the needle bar, route the thread as in Figure①.



[Fig. 14]

5) Inserting lower thread and adjusting lower thread tension



[Fig. 15]

A. Insert the bobbin ② into the bobbin case ①, insert the thread through the thread groove ③ and then make the thread pass under the tension adjusting spring ④. Turning the tension adjusting screw ⑤ clockwise will make the tension strong and turning the screw counter-clockwise will make the tension weak. It is standard that, while you grab the end of the thread coming out of the thread groove, the bobbin case ① drops gradually by its own gravity. (See Figure 15)

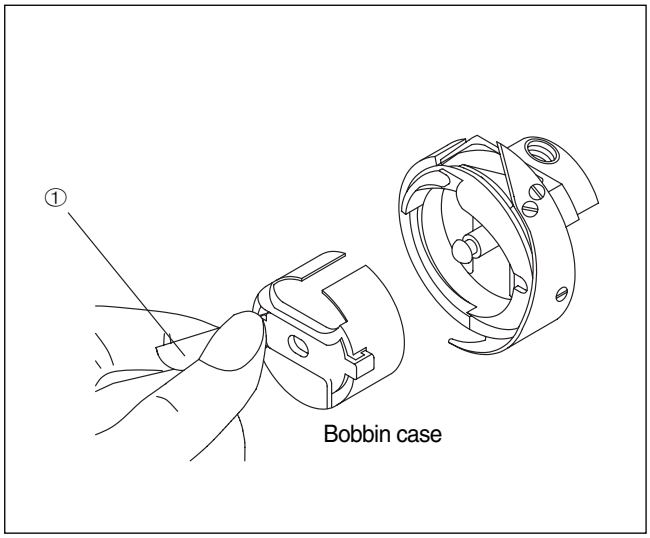
B. Attaching and detaching bobbin case

Grab the bobbin case handle ⑥ and insert it into the hook. Grab the handle ⑥ and pull the bobbin to detach it. (The bobbin ② will be detached, when the handle is let go of.) (See Figure 15)

6) Attaching and detaching bobbin case

Hold the grip of the bobbin case ① and insert it into the hook until a click is heard.

[Caution]
If the machine operates without bobbin case fully inserted, the thread may get tangled or bobbin case may be detached.

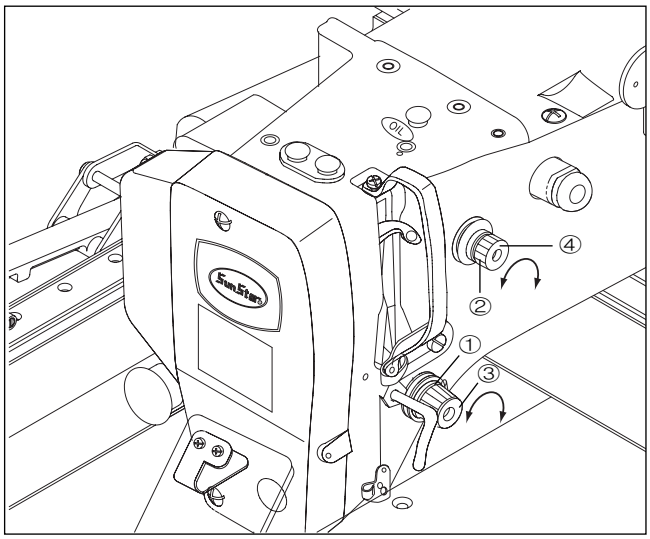


[Fig. 16]

7) Adjusting tensions of upper and lower thread

A. Adjusting upper thread tension

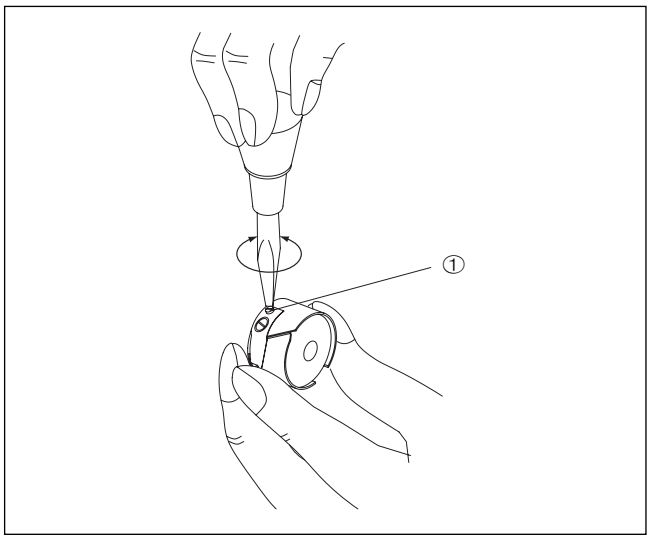
As in Figure, turning clockwise the tension adjustment nuts ③, ④ of the major thread control assembly ① and the auxiliary thread control assembly ② respectively makes the upper thread tension stronger and turning counter clockwise makes it weaker.



[Fig. 17]

B. Adjusting lower thread tension

As in Figure, turning clockwise the tension adjustment nut ① of the bobbin case makes the lower thread tension stronger and turning counter clockwise makes it weaker.

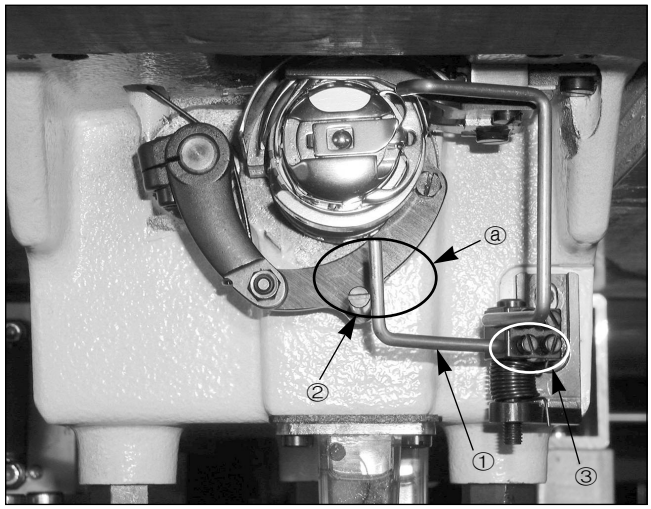


[Fig. 18]

8) Adjustment of bobbin catcher

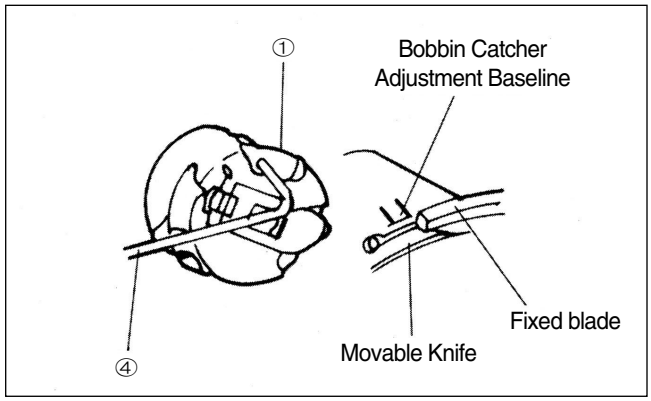
A. Operating the bobbin catcher

If the bobbin pressure rod lever① is not working as in Figure, adjust the end of the bobbin pressure rod lever① so that it is placed likeⓐ at the end of the mes connecting link ②. Then, loosen the operation bobbin pressure rod lever fixing screw③ and adjust.



[Fig. 19]

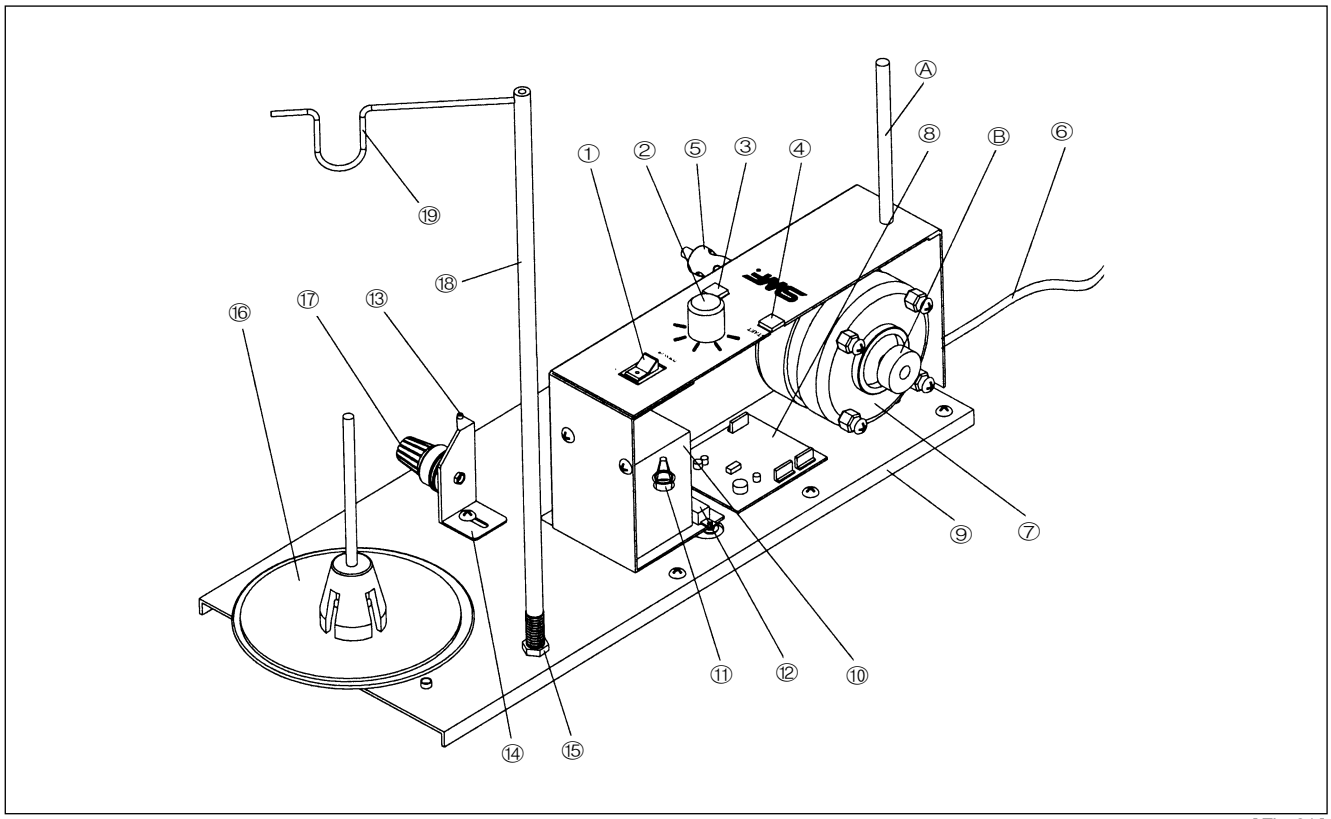
B. As in Figure 20, if the trimming was done manually, stop the machine when the edge of the fixed knife meets the bobbin catcher adjustment baseline that is marked on the top. Loosen the bobbin catcher fixing screw⑤ and adjust the bobbin catcher so that the contact surface of the bobbin catcher④ lightly touches the center of the protruding part of the bobbin①. Once the operation is completed, check to see whether the bobbin catcher springs back lightly.



[Fig. 20]

9) Using bobbin winder

1) Names and Functions of main parts



[Fig. 21]

① Power SW: Main power switch
② Time: Volume adjusting the amount of thread when wound on bobbin.(MIN↔MAX)
③ Stop: Stop Button
④ Start: Start Button
⑤ Thread Winder Shaft: Shaft winding thread with bobbin inserted
⑥ AC Cord: Power Cable
⑦ Motor
⑧ Board
⑨ Base
⑩ Trans
⑪ Fuse Box: Device for changing fuse
⑫ Switching switch: Select type of power (AC 110V↔AC 220V)
⑬ Ceramic islet: Thread inserting hole
⑭ Holder of Tension Adjustment Device
⑮ Nut: Fix thread holder stand
⑯ Spool Base: Plate-shaped base for spool
※ Composed of Spool base, base nut, base sponge, spool holder, and spool stand.
⑰ Tension Adjustment Device: Adjust tension of thread wound on bobbin.
⑱ Thread Holder Stand
⑲ Thread Holder: Device preventing tangle of thread falling from spool
Ⓐ Bobbin Stand: To release left thread of bobbin after use
Ⓑ Hand wheel: Device to turn bobbin which spins along with bobbin shaft

2) Winding lower thread

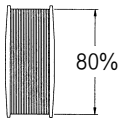
① Insert the bobbin into the bobbin winder shaft, wind the thread manually five to six times as bobbin winds it, and then press the START button. Bobbin turns with winding the thread.

② Built-in timer automatically STOP bobbin winder. However, whenever the bobbin needs to stop, press the stop button.

3) Adjusting the amount of thread

① As in Figure 22, thread should be wound about 80 percent parallel with the bobbin.

② TIME dial control the amount of thread wound. If the dial turns to MAX , the amount will increase.



[Fig. 22]

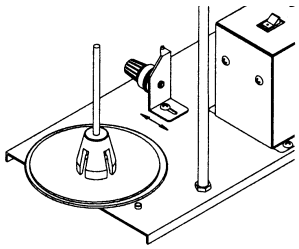
[Caution]

- If too much lower thread is wound, the lower thread would have a release problem.
- If the lower thread winds bobbin about 80 percent, it is about 80 meters long for the standard bobbin.

4) Adjusting lower thread wind

① Thread should be wound parallel with the bobbin. If it doesn't, unfasten the clamp screw of the thread guide body on the thread winder and adjust the thread guide body horizontally, as in Figure 23.

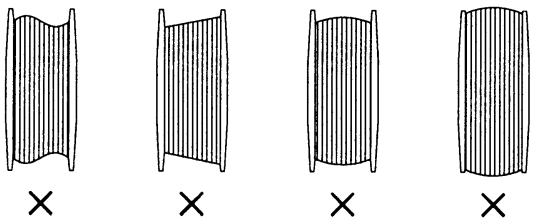
② Tension of the thread wound can be adjusted with the tension adjustment nut.



[Fig. 23]

[Caution 1]

If lower thread winds as in the following figures, thread may break, lower thread be skipped, or thread get tangled, because of the problem with release of the lower thread.



[Fig. 24]

[Caution 2]

If lower thread winds too strongly, problems may occur like lower thread breaking and shortened lower thread, because lower thread is not released smoothly.

5) Specification

Model	Speed	Power Supply	Machine Weight	Package Weight
BW-02 (Bobbin Winder)	3,200rpm	AC 110/220V 50/60Hz 10W	420 × 155 × 125 3.9kg	450 × 190 × 170 4.5kg

6) Caution

① Before using, make sure to check voltage.
(This machine is set for both 100/220voltage but set for 220V upon shipment.
To use 110V, adjust Switching switch under the machine)

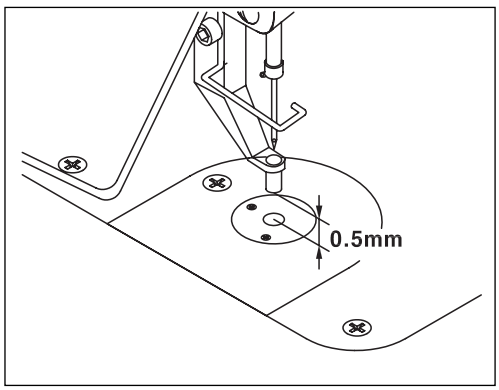
7) Troubleshooting

① When the machine doesn't work, check and replace fuse or switch.
② When the bobbin shaft doesn't stop, replace parts of volume or "TR1" on board.
③ When the machine doesn't start or stop, replace start switch or IC.
④ When the voltage is not suitable, the machine may not work with sound of 'click'.
At that time, replace parts of "Q1" on board.

10) Adjusting the Height of the Presser Foot

① Unfasten presser foot screw ① with the needle bar at the lowest position.
② Adjust the height so that the presser foot botton comes 0.5mm(the thickness of the thread used)above the sewing material. Then, tighten the screw.

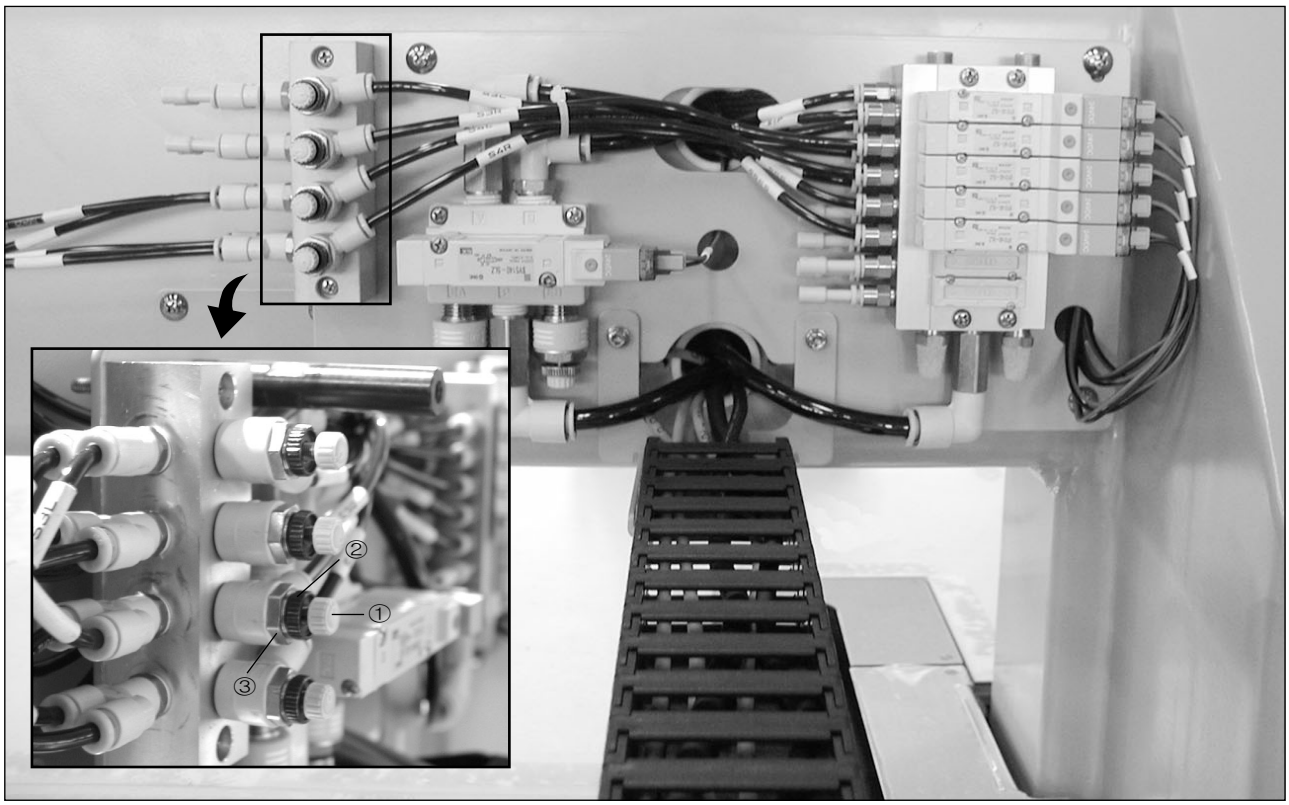
[Caution]
After adjusting the height of presser foot, confirm the position of wiper.
· Too excessive gap can cause jumping.
· Insufficient gap can cause a failure in thread adjustment.



[Fig. 25]

11) Adjusting up-down speed of upper feed plate

A. If the holder② of the speed controller① is turned clockwise as in the figure, down-speed will decrease. If the holder is turned counter-clockwise, the speed will increase. Adjust at a proper speed and fix with clamp screw③.
(Make a balanced adjustment on the left and right sides.)



[Fig. 26]

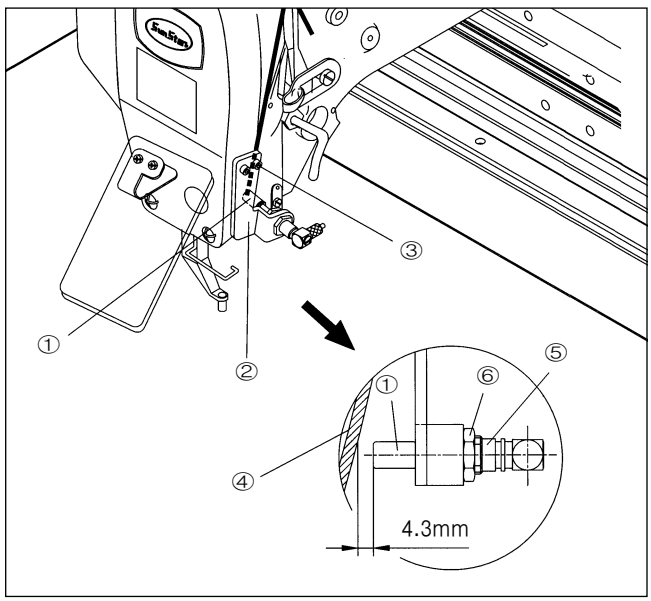
12) Adjusting upper thread holding device

A. Check that upper thread holding pin cylinder knuckle ① is positioned in the middle of the way that upper thread follows.

B. If the knuckle ① is not positioned that way as mentioned in A., unfasten the two clamp screws ③ of upper thread holding bracket ②, position the knuckle in the middle as mentioned in A, and then fasten clamp screw ③ firmly.

C. It is standard that the end of knuckle ① stays 4.3mm away from Arm ④.

D. To adjust the clearance between nut and Arm, unfasten two nuts of pin cylinder ⑤, correct the clearance, and then fasten the two nuts ⑥ firmly.

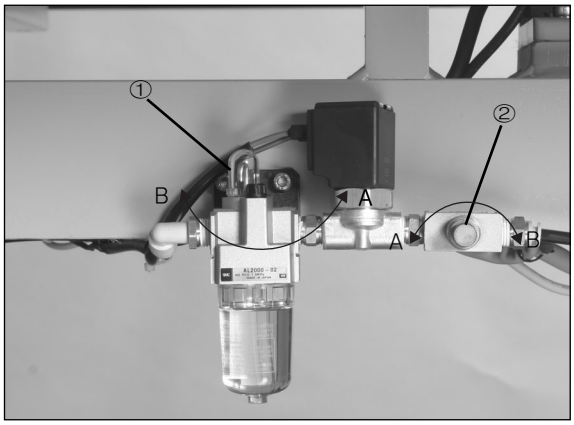


[Fig. 27]

13) Adjust hook lubrication

ⓐ Turn the screw ① toward A and lubrication volume will increase. If it is turned toward B, lubrication volume will decrease.

ⓑ Turn the handle② toward A and lubrication volume will increase. If it is turned toward B, lubrication volume will decrease.



[Fig. 28]

14) Caution for the use of floppy disk

When using floppy disk, the following caution should be adhered.

> [Caution]
> After formating, any floppy disk on sale is available. But make sure to use authorized disk.

ⓐ Keep floppy disk away from magnet or magnetic items such as television.

ⓑ Be away from overheat, humidity, and direct sunlight when it is stored.

ⓒ Don't put heavy things on floppy disk.

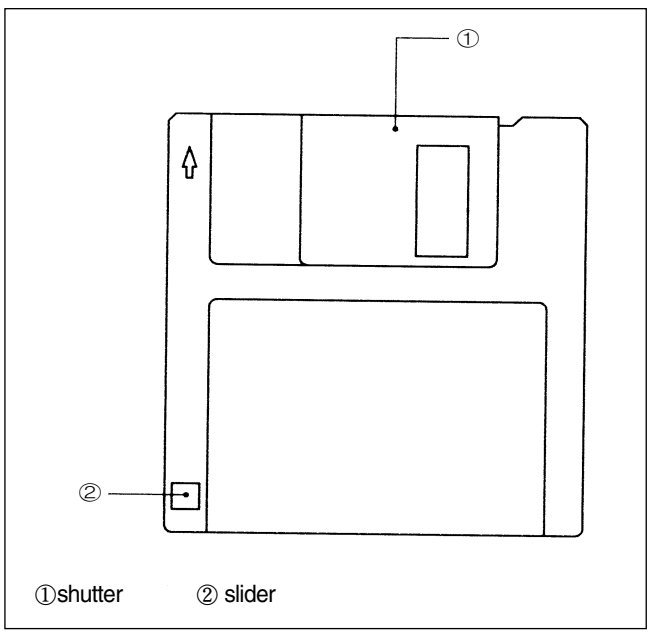
ⓓ Don't remove floppy disk from disk drive when formatting the disk or inputting and outputting data.

ⓔ Be sure not to open the cover of floppy disk drive.

ⓕ If the slider② is open, data can not be input to floppy disk.

ⓖ If one disk is used for reading and writing on and on, there would be error on the disk.

ⓗ The important design data would be better to be stored in two floppy disk.



[Fig. 29]

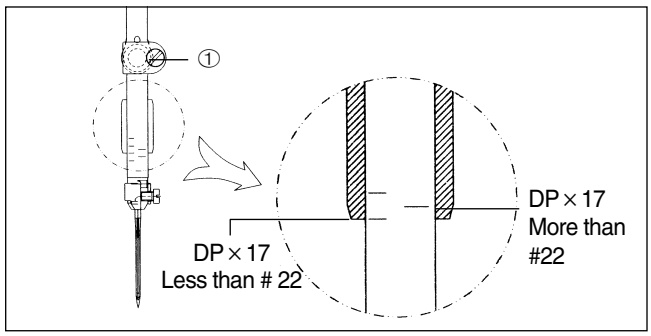
6

Repairing the machine

Caution	Upon shipment, the machine is adjusted for the best performance. Arbitrary adjustment of the machine is not required. If some parts should need to be replaced, use only genuine parts authorized by SUNSTAR MACHINERY CO., LTD.

1) Adjusting needle bar

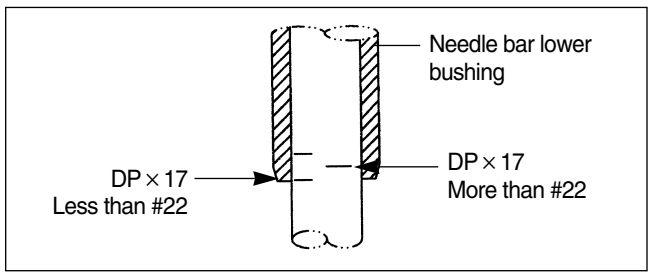
With needle bar at its lowest position, unfasten needle bar holding clamp screw ①, align, as in the Figure, upper carved line corresponding to the needle to be used with the end of needle bar bushing, and then fasten needle bar holding clamp screw ①.



[Fig. 30]

2) Adjusting needle and hook

A. As in the Figure on the right, with needle bar at its lowest position, align lower carved line corresponding, when the bar is up, to the needle with the end of needle bar bushing.

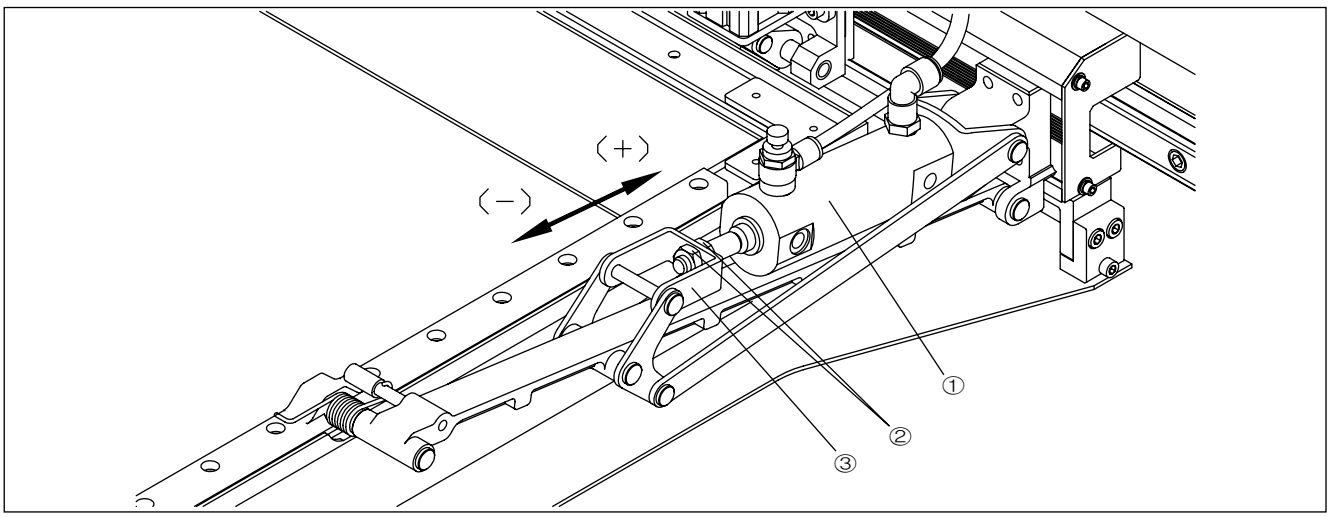


[Fig. 31]

3) Adjusting feed plate height

Unfasten clamp screws ② at the end of air cylinder ① shaft that is placed on both sides of upper clamp device. Moving cylinder knuckle ③ toward cylinder increases feed plate height, and moving the knuckle in opposite direction decreases it. After moving cylinder knuckle to a proper position, fasten it firmly with clamp screws.

[Caution]
Imbalanced heights of upper clamp device on both sides could lead to a physical damage.

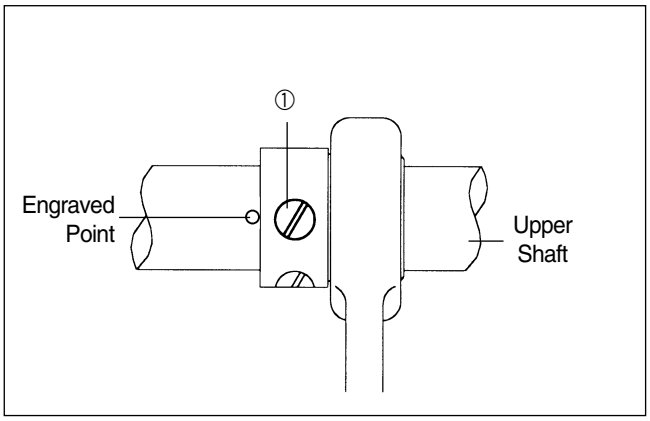


[Fig. 32]

4) Adjusting the Presser Foot Devices

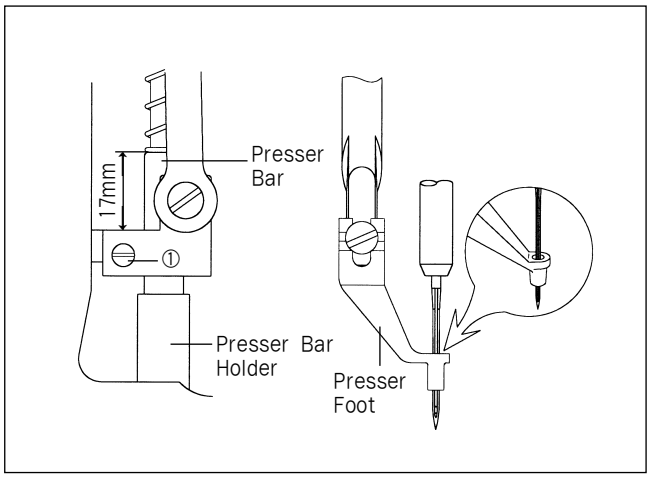
A. Conform the end of presser foot operating cam to the center of punched mark, and conform the cam's punched line to the punched mark of upper axis, and then tighten Clamp①.

[Cautions]
If the presser foot operating cam is improperly positioned, The up-and-down moving of presser foot is in inconformity, therefore the presser foot may collide with the needle bar.



[Fig. 33]

B. Project the presser bar about 17㎜ from the presser bar holder, check if the needle passes through the center of presser foot, then tighten Clamp①.



[Fig. 34]

C. Loosen Fork Crank Clamp①, and place the single screw② of presser foot link to the right of the adjusting arm.

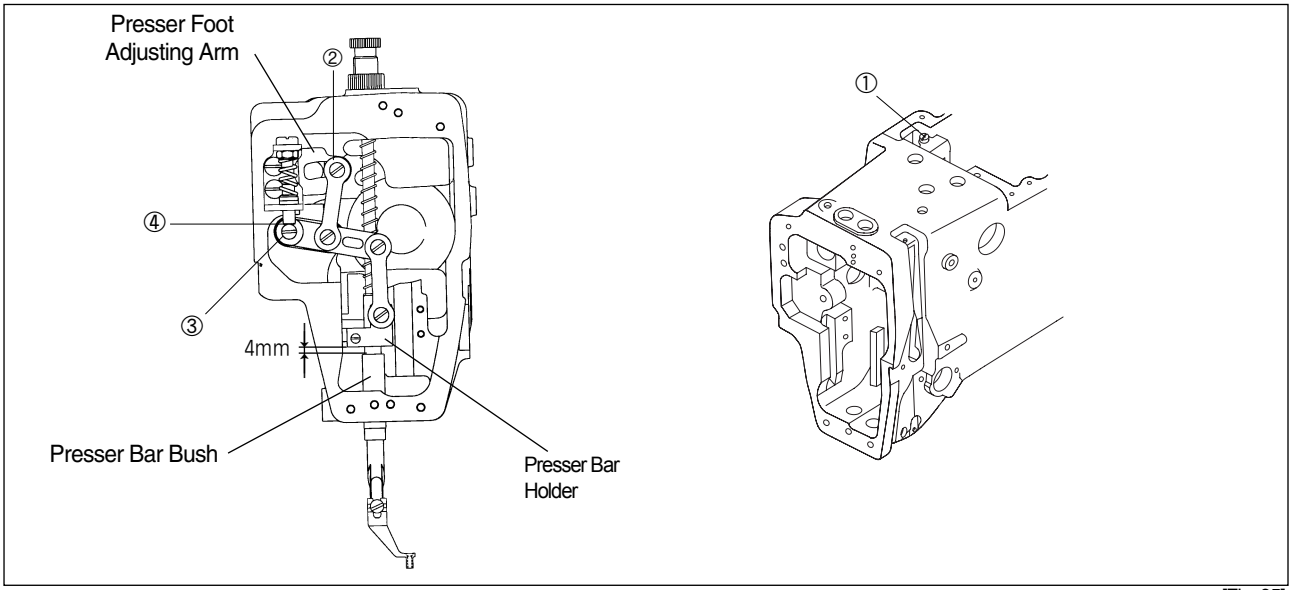
D. Conform the fixing single screw③ of presser foot moving link to the end④ of position link stopper.

[Caution]
If there is space between presser bar handle and presser bar bush, interference and noise is occurring during machine operation. Screws are not fastened tightly after adjustment; it can cause breakage during operation.

E. To set up 4㎜ of the interval between Presser Bar Holder and Presser Bar Bushing, rise up the presser bar and tighten Fork Crank Clamp①.

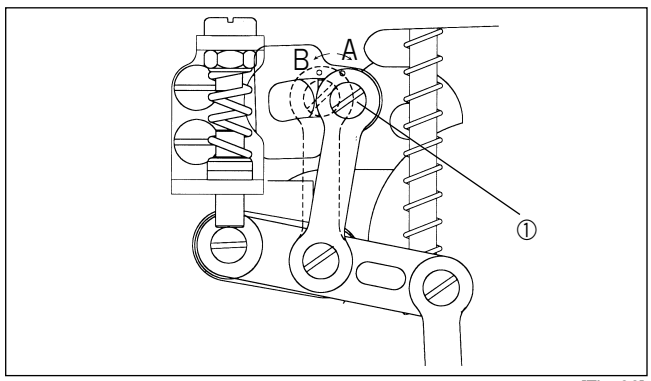
F. Check the tightening status of screws, and adjust the presser foot' s stroke.

[Cautions]
If there is no interval between Presser Bar Holder and Presser Bushing, the machine may be interfered during its operation. If the handle is completely tightened, the machine may be damaged during its operation.



[Fig. 35]

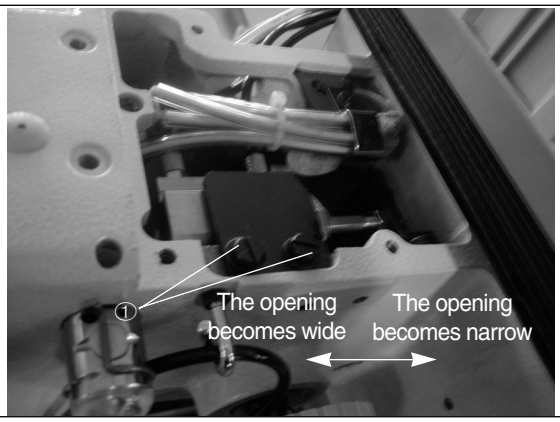
G. Adjustment of Presser Foot Stroke(Adjustment of Presser Foot UP/DOWN Motion) After unfastening stud screw ① of presser foot adjusting arm, placing it to A direction, presser foot stroke increases. Placing to direction B, stroke decreases.(It is set to 4mm at the moment of factory shipping).



[Fig. 36]

5) Adjusting thread release and dish opening width

ⓐ Unfasten the thread release air cylinder bracket clamp screw ①.
ⓑ Operate a trimming to open and widen the thread guide dish.
ⓒ Adjust the opening of the thread guide dish to be 0.6 ~ 0.8mm wide for general materials, and 0.8 ~ 1mm for heavy materials.
ⓓ The closer the thread release air cylinder is to the needle bar, the wider the opening of thread guide dish becomes; and the closer the thread release air cylinder is to the upper shaft motor, the narrower the opening becomes.
ⓔ After adjusting the opening of the dish, fasten the clamp screw with the cylinder operating smoothly.

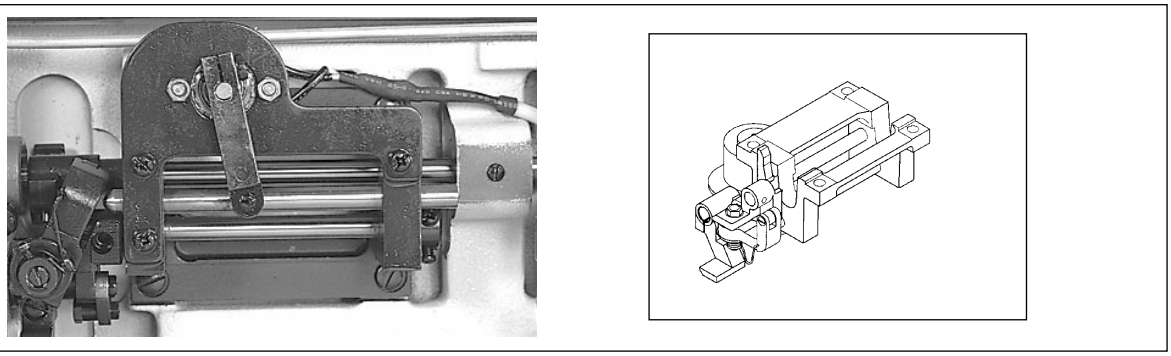


[Fig. 37]

6) Adjusting Parts related to Trimming

A. Structure of Trimming device

The Trimming Structure of the machine is shown in the following figure38.



[Fig. 38]

[Caution]

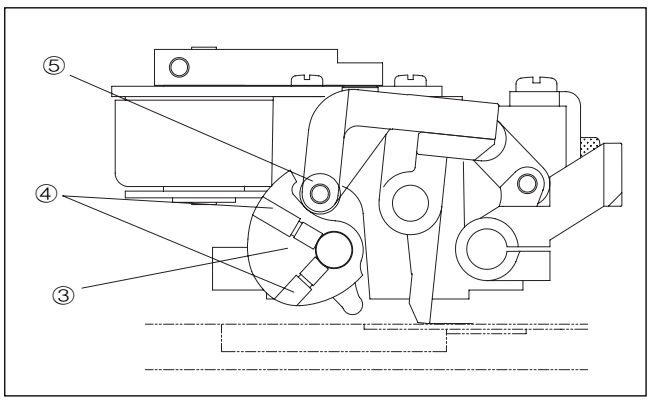
This machine adopts trimming gear pattern in which gear source is the cam in the lower shaft. Therefore, at the time of adjusting the machine, if the sewing machine is rotated with the trimming solenoid running, there will be damage on both movable knife and needle caused by the collision of them. When operating the machine with solenoid running, make sure to operate within the regular trimming length (from lower part to upper part of needle bar).

B. Adjusting trimming cam

a) Standard position of trimming cam ③ is referred to the point when trimming cam ③ contacts trimming cam roller ⑤, movable knife is at its standard position, and carved point ① of the machine meets yellow carved point ② on the pulley.

b) Unfasten trimming cam clamp screw ④ to place trimming cam at its standard position.

c) After adjustment, fasten trimming cam clamp screw ④ firmly.

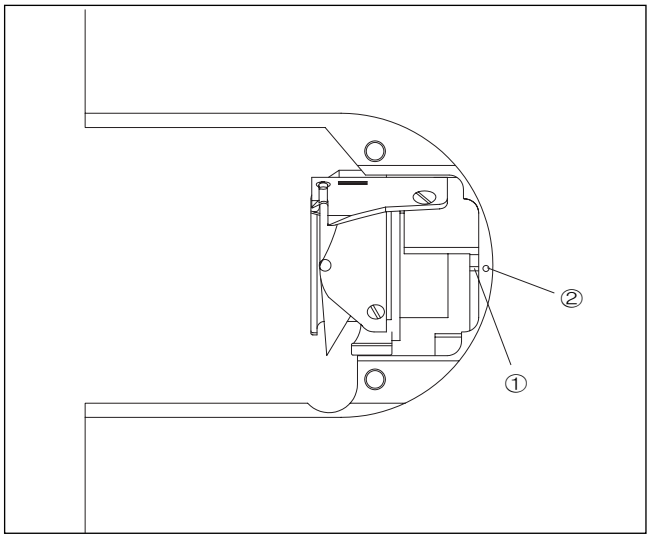


[Fig. 39]

C. Adjusting movable knife position

a) Adjusting movable knife position

As in the Figure 40, standard position of movable knife is referred to the point when slot of trimming holder is aligned with carved point on the upper part of bed.

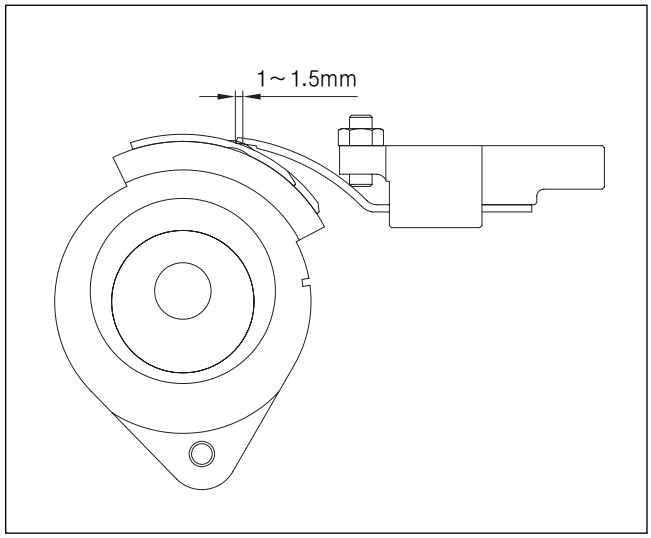


[Fig. 40]

b) Adjusting movable knife movement

ⓐ Operate the machine, with solenoid at work, and movable knife will be rotated by trimming cam. It is standard that cutting edge of movable knife moves about 1 ~ 1.5mm from the edge of fixed knife, when movable knife moves to the max.

ⓑ Trimming lever can be used for adjustment. (See the Figure 41)



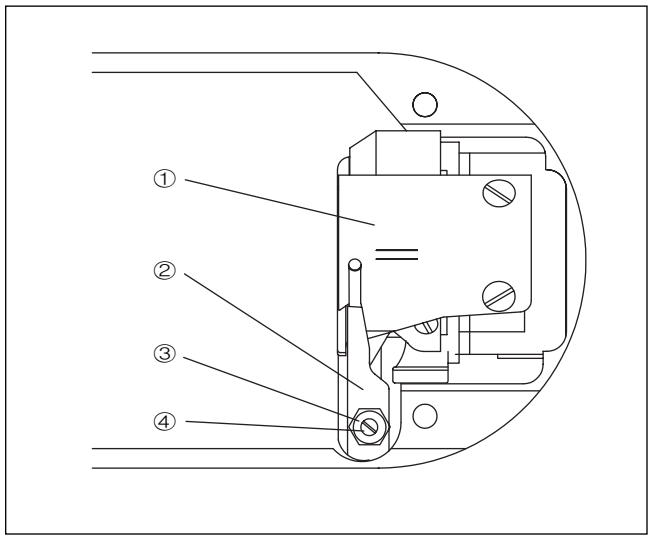
[Fig. 41]

D. Adjusting knife tension

ⓐ As in the figure 40, it is standard that movable knife① and fixed knife② meet at the beginning.

ⓑ In case of poor trimming caused by using thick thread, increase tension of movable knife.

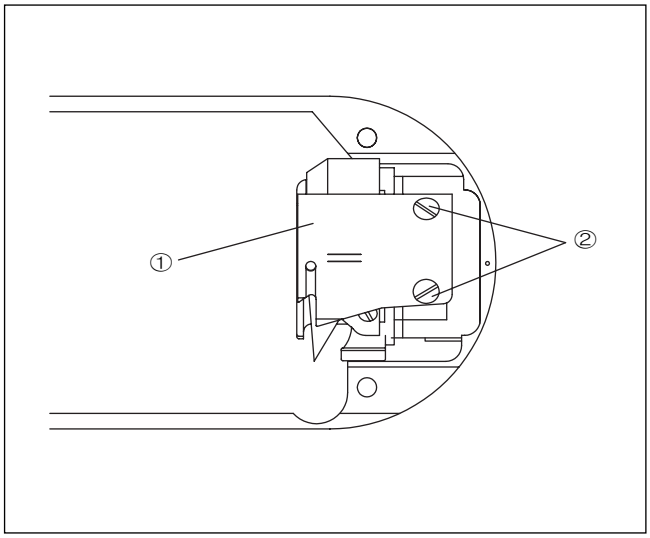
ⓒ To adjust tension of movable knife, as in the figure 42, loosen tension control screw of movable knife③ and then adjust with control screw④. After adjustment, make sure to fasten tension control screw.



[Fig. 42]

E. Changing movable knife

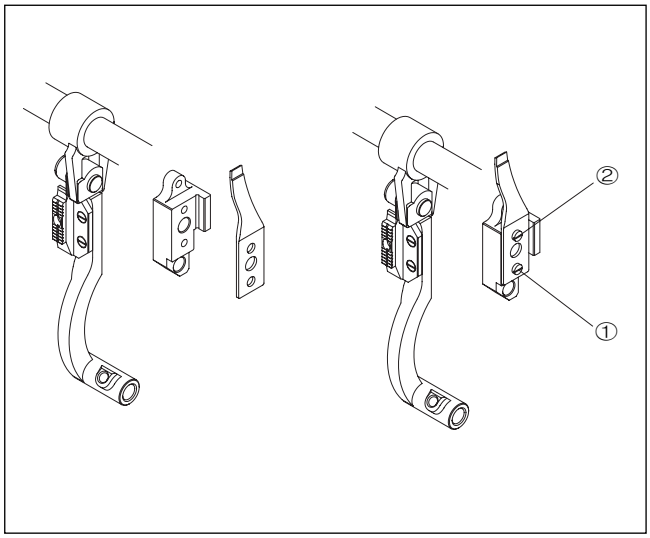
Turn pulley by hand to put needle at the highest place. And then remove needle plate and loosen the 2 fixed screws of movable knife as in the figure 43 to take off the knife. To assemble replacement parts, follow the reverse order of disassembling.



[Fig. 43]

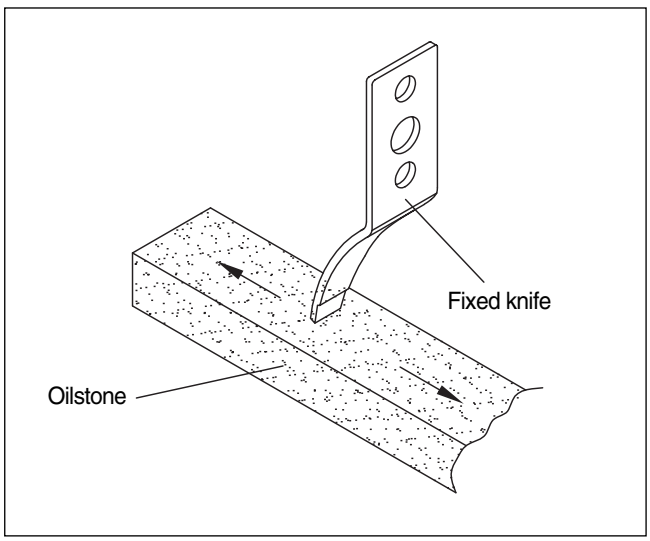
F. Replacing fixed knife

ⓐ As in the Figure 44, unfasten fixed knife clamp screw on fixed knife base to disassemble it. To assemble, follow the reverse order of disassembling.



[Fig. 44]

ⓑ If thread is not trimmed or thread is not cut clean, check cutting edge of fixed knife.
If the edge of fixed knife is worn, as in the figure 45, hone the fixed knife on a oilstone.

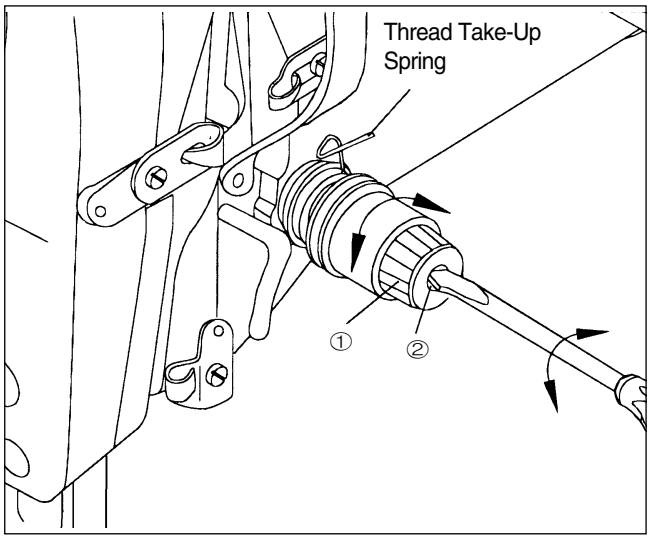


[Fig. 45]

7) Adjusting the Main Thread Control Device

ⓐ If the tension control nuts① of thread control device is turned clockwise, the tension of upper thread will increase. If turned counter-clockwise, the tension will decrease. Because the tension control is affected by sewing conditions such as sewing material, thread and stitch, adjust tension according to conditions.

ⓑ To adjust tension of thread take-up spring, insert drive in the groove of thread tension control device②. Then turning the drive clockwise will increase tension of thread take-up spring and turning counter- clockwise decrease the tension.



[Fig. 46]

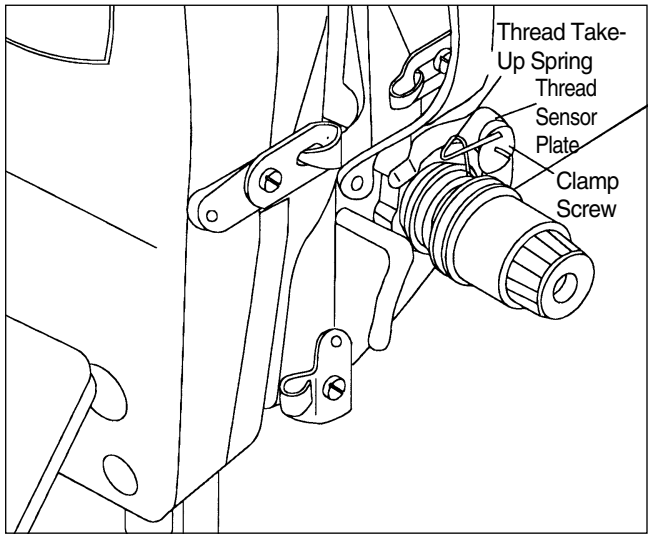
8) Adjusting Upper Thread Sensor Device

ⓐ Under the condition that thread does not hang on thread take-up spring, loosen the clamp screw of thread sensor plate and adjust thread take-up spring to contact sensor plate. After that, fasten clamp screw.

ⓑ When changing stroke of thread take-up , adjust the position of thread sensor plate so that thread take-up spring contacts sensor plate.

[Caution]

Make sure that thread sensor plate should be away from other metal but thread take-up spring. Otherwise there could be thread sensor miss.



[Fig. 47]

9) Adjusting speed of arm lifter

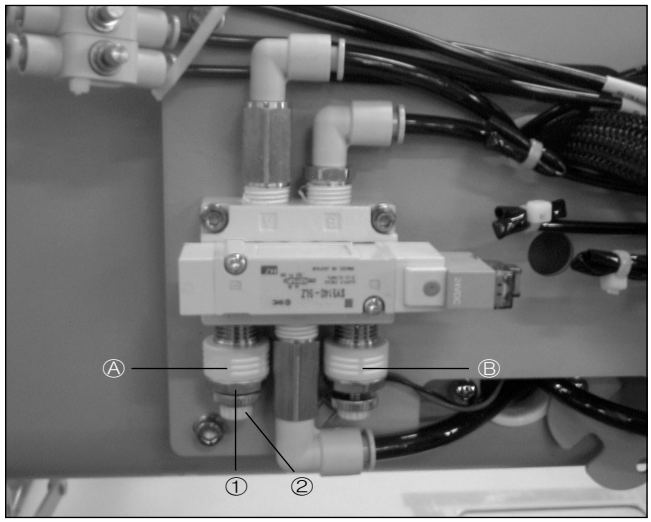
ⓐ To adjust speed of arm lifter, adjust escape controlling valve Ⓐ, Ⓑ.

ⓑ Escape controlling valve Ⓐ, Ⓑ have function as followings.

- Escape controlling valve Ⓐ: Adjust the descending speed of arm lifter.
- Escape controlling valve Ⓑ: Adjust the ascending speed of arm lifter.

ⓒ Loosen fixing nut of escape controlling valve ①. Turning adjusting knob② clockwise will decrease the speed and turning adjusting knob counterclockwise will increase the speed.

ⓓ After adjusting the speed, fasten fixing nut of escape controlling valve ①.



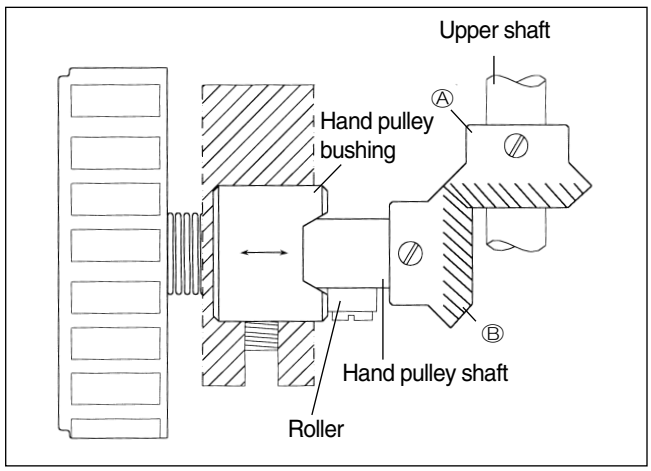
[Fig. 48]

10) Adjusting Hand Pulley Device

ⓐ After aligning the hand pulley gear Ⓑ with the end of hand pulley shaft, fasten with clamp screw.

ⓑ After making proper clearance between the hand pulley gear Ⓐ and the gear Ⓑ, fasten with clamp screw.

ⓒ When roller meets the end of hand pulley bushing, adjust bushing in the arrow direction to reduce backlash between the gear Ⓐ and Ⓑ.



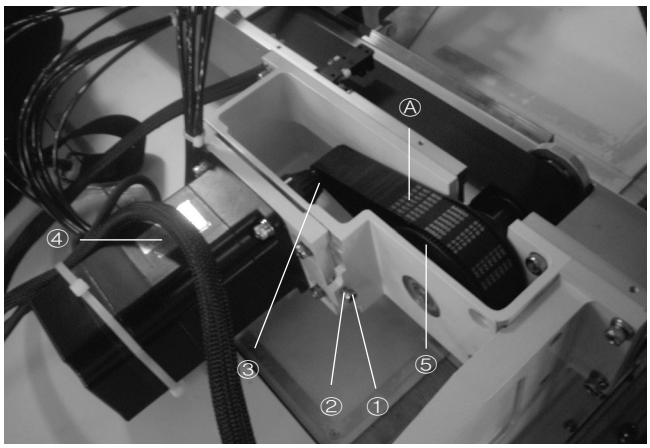
[Fig. 49]

11) Adjusting tension of operating belt

[Note]
1. Adjusting tension of operating belt might affect stitch quality and operation. Therefore when tension adjustment is necessary, turn to the company serviceman or an expert.
2. Make sure to turn off the power switch when adjusting tension of each operating belt.

A. Specification of operating belt tension adjusting device. (Sonic belt tensiometer)
   ⓐ Model: U-505 series sonic belt tensiometer standard.
   ⓑ Manufacturer: UNITTA.

B. X-shaft timing belt
   a) Motor operating timing belt.
      ① To check tension of X-motor operating timing belt, use sonic belt tensiometer after separating X-motor base surface cover from the main body.
      ② Adjust X-motor operating timing belt to make sure that the measured value of sonic belt tensiometer should be 12~13kg when the belt center Ⓐ of the final operating pulley⑤ and operating pulley③ is flipped over with finger or stick.
      ③ When adjusting tension of X-motor operating timing belt, input data of sonic belt tensiometer is as followings.
      Weight: 2.5gf/m
      Wide: 25mm/#R
      Span : 116mm
      ④ When adjusting tension of X-motor operating timing belt, loosen nut② linked to tension adjusting bolt① and turn tension adjusting bolt① clockwise. Then operating pulley③ and motor④ will be pushed into the direction of bolt, which leads to the increase of tension of timing belt. And turning tension adjusting bolt① counterclockwise will decrease the belt tension.
      ⑤ After adjusting tension, make sure to fasten nut②.



[Fig. 50]

b) X-conveying timing belt

① Check the X-conveying timing belt tension by detaching the upper cover of X fixing frame from the body of the machine and using sonic belt tensiometer.

② Adjust the X-conveying timing belt tension by moving the X conveying frame ① to the left end and then flipping with fingers or sticks the middle of the belt that stretches from the end of the timing belt fixing plate block ② to the X-final operating pulley ③. Make sure that the measured value of the sonic belt tensiometer is 26 ~ 27kgf.

③ Input data for the sonic belt tensiometer, when adjusting X-conveying timing belt tension.
Weight: 3.8gf/m
Wide: 35mm/#R
Span: 566mm

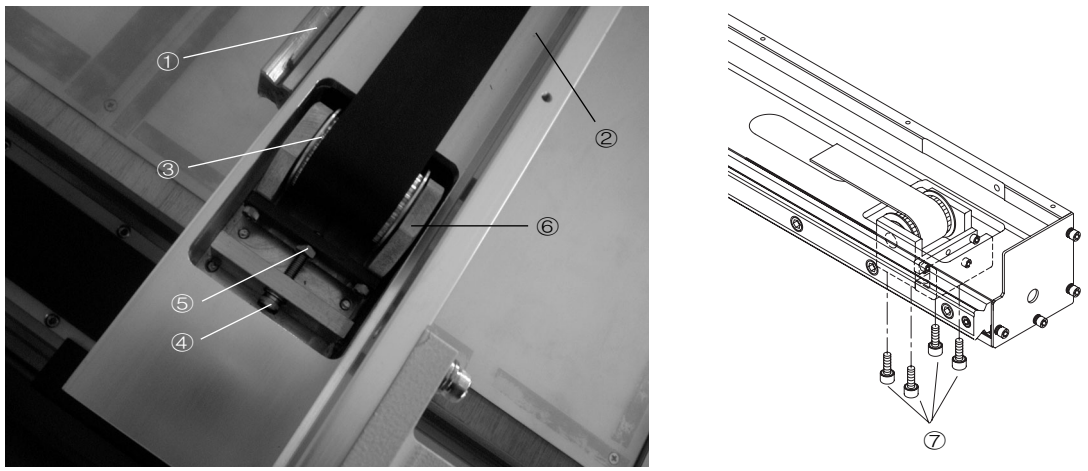
④ In order to adjust X-conveying timing belt tension, unfasten the nut ⑤fastened on the tension adjusting bolt ④ and unfasten the bolts⑦ (four) that fix the final operating pulley bracket to the extent that the bracket ⑥ can move.

[Caution]
Turning tension adjusting bolts④ without unfastening fixing bolts⑦ will lead to physical damages to the machine.

⑤ Turn the tension adjusting bolts④ clockwise. Then the final operating pulley③ and the final operating pulley bracket⑥ will be pushed into the direction of the bolt, which leads to the increase of tension of timing belt. And turning the bolts ④ counter_clockwise will decrease the belt tension.

⑥ After adjusting tension of the belt, fasten nuts② and fixing bolts⑦ firmly.

⑦ Fasten ⑥ using the four bolts which tighten the bracket.



[Fig. 51]

C. Y-shaft timing belt

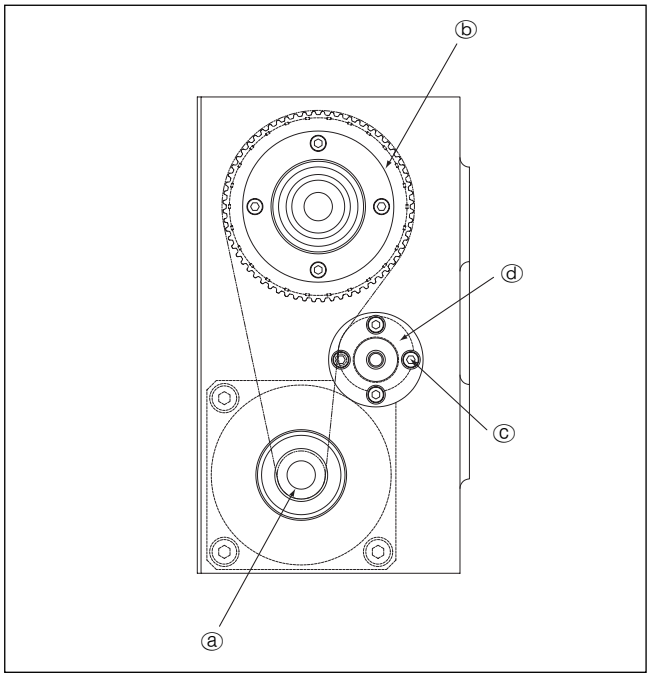
a) Timing belt at motor operating parts

① Check timing belt tension of the Y-motor operating parts by detaching the Y motor base cover from the body of the machine and using sonic belt tensiometer.

② Adjust timing belt tension of the Y-motor operating parts by flipping with fingers or sticks the middle of the belt that stretches from the operating pulley ⓐ to the final operating pulley ⓑ. Make sure that the measured value of the sonic belt tensiometer is 30 ~ 31kgf.

③ Input data for the sonic belt tensiometer, when adjusting the timing belt tension of the Y-main shaft motor operating parts.
Weight: 003.8gf/m
Wide: 40mm/#R
Span: 137mm

④ In order to adjust timing belt tension of the Y-motor operating parts, unfasten the four idler bracket fixing screws ⓒ. Then pushing the idler ⓑ to the left will increase the tension; while pushing it to the right will decrease the tension.



[Fig. 52]

b) Y-conveying timing belt

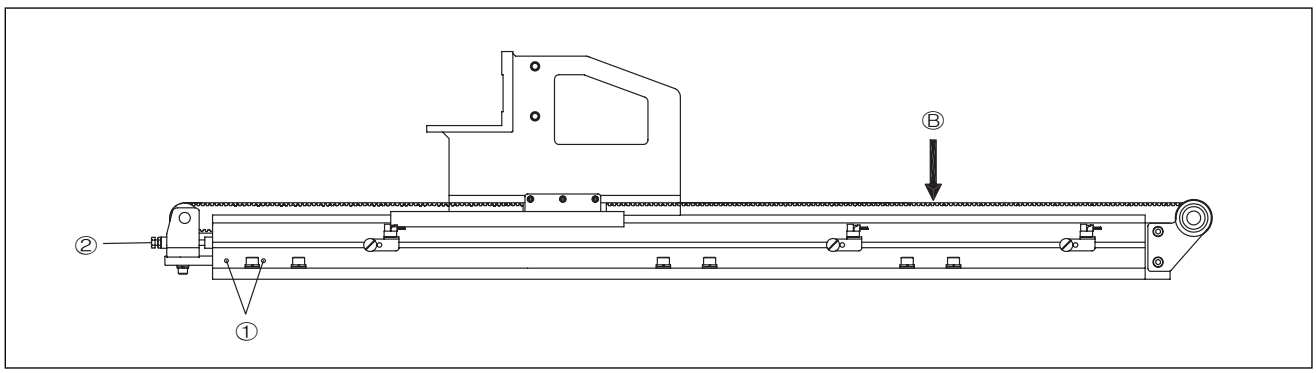
① Check Y-shaft timing belt tension by moving X-fixing/conveying frame, as in the Figure, to the frontal extreme and using sonic belt tensiometer.

② Adjust Y-shaft timing belt tension by flipping with fingers or sticks the middle of the belt that stretches from the end of the feed bracket to the center Ⓑ of the operating pulley. Make sure that the measured value of the sonic belt tensiometer is 37 ~ 38kgf.

③ Input data for the sonic belt tensiometer, when adjusting Y-shaft timing belt tension.
Weight: 3.8gf/m
Wide: 48mm/#R
Span: 840mm

④ In order to adjust Y-shaft timing belt tension, unfasten the tension base clamp screws ① and turning tension adjusting bolt ②. Turning the tension adjusting bolt ② clockwise will increase the belt tension; while turning it counter-clockwise will decrease the tension.

⑤ After adjusting the tension, fasten tension base clamp screw ① firmly.



[Fig. 53]

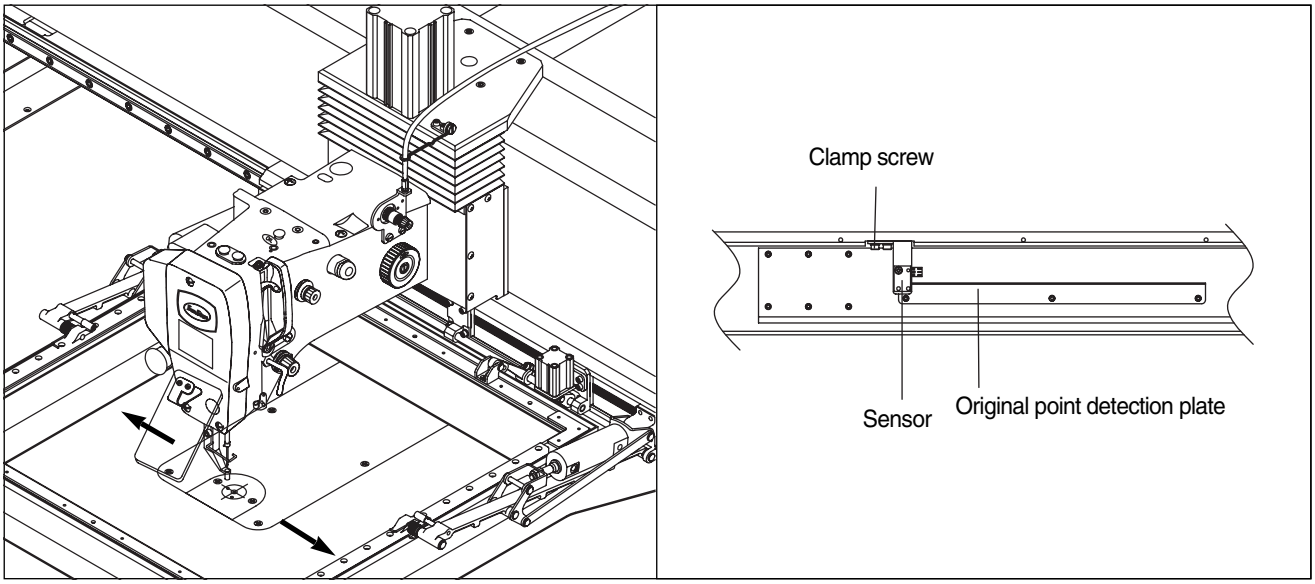
12) Setting X-Y Original Point

A. Setting X-shaft original point.

ⓐ Remove the surface cover of X-fixing frame.

ⓑ Move the upper feed plate to the center of X-shaft.

ⓒ As in the figure, loosen the clamp screw of X-sensor bracket and place X-sensor plate attached on the X-timing belt fixing plate block at the center of the sensor. And then fasten fixing screw.

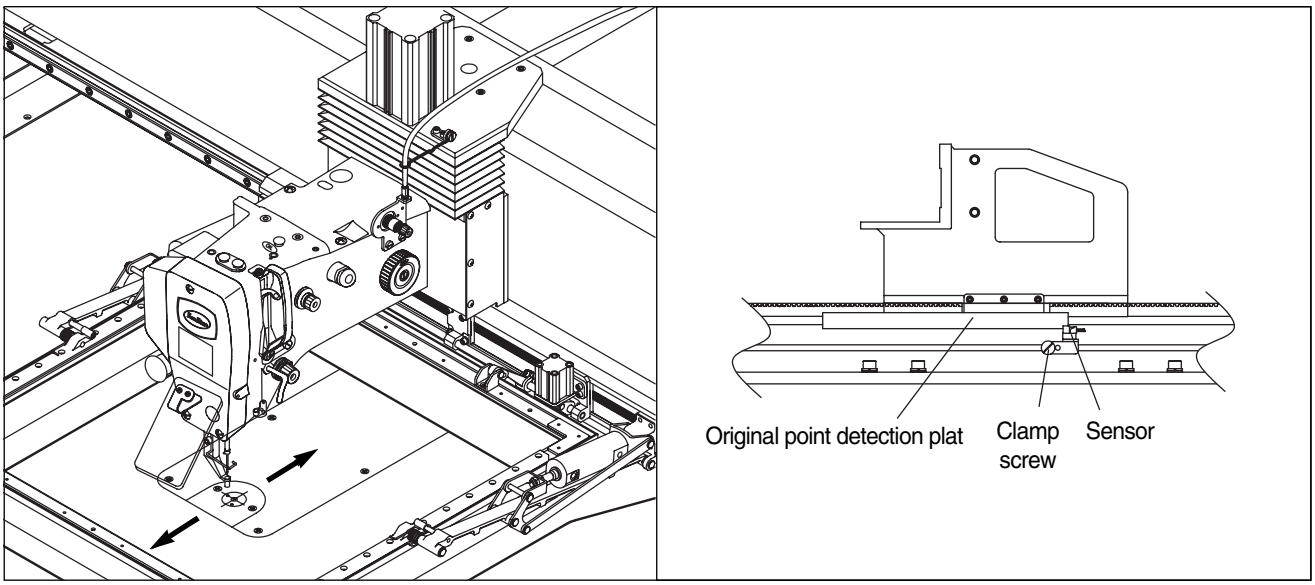


[Fig. 54]

B. Setting Y-shaft original point.

ⓐ Move the upper feed plate to the center of Y-shaft.

ⓑ As in the figure, loosen the clamp screw of Y-sensor bracket and place X-sensor plate at the center of the sensor. And then fasten clamp screw.

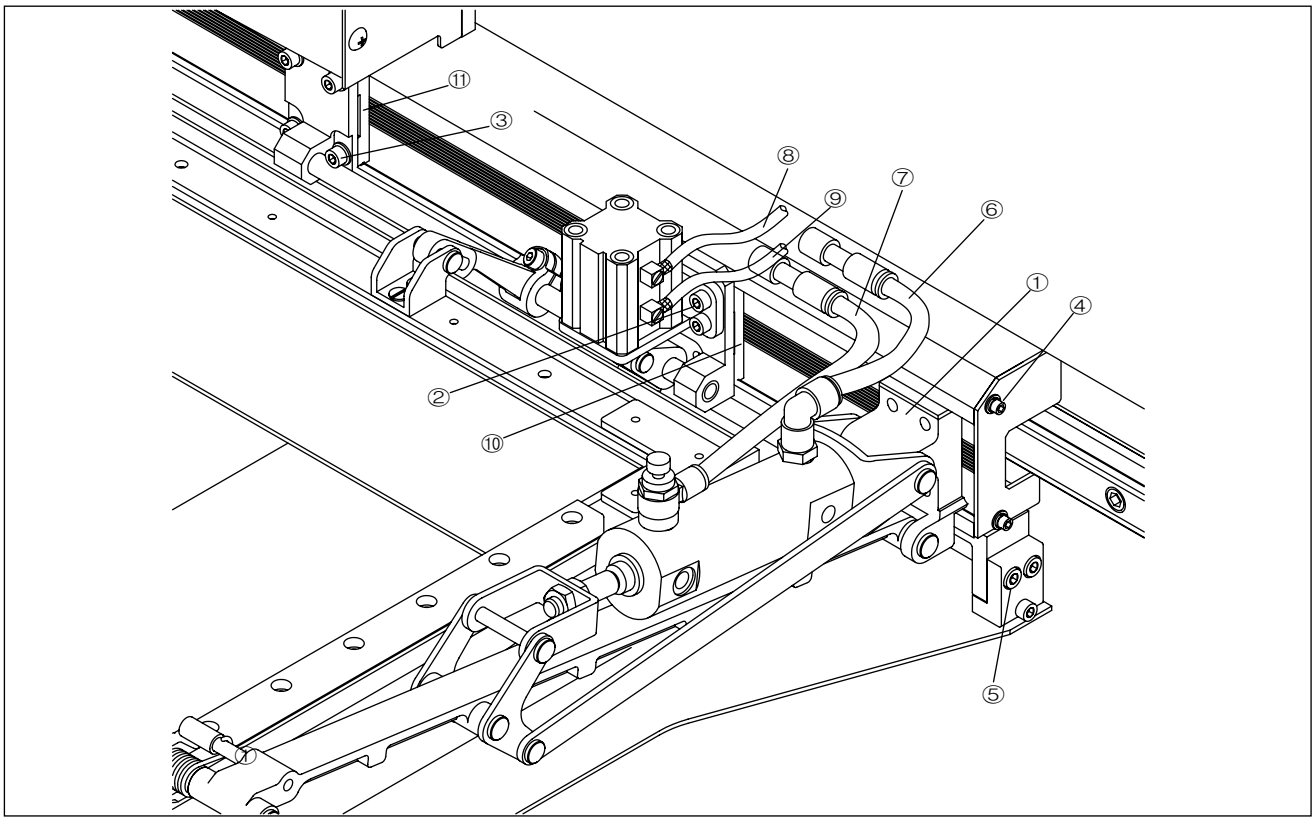


[Fig. 55]

13) Switch from up/down clamp method to cassette method

(1) Separate the up/down clamp

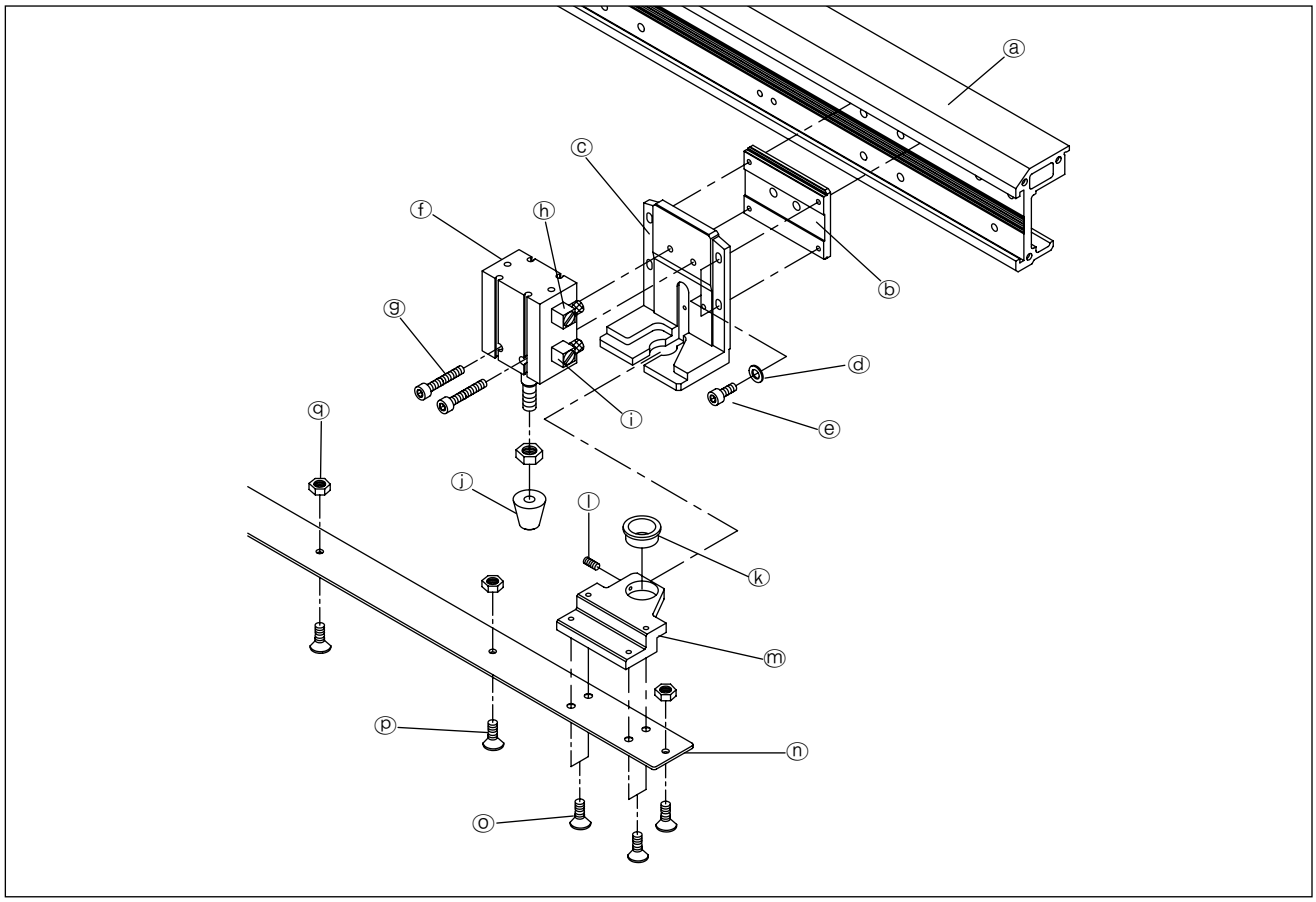
A. Loosen the fastening nut① of the upper clamp bracket.
B. Loosen the fastening nut② of the auxiliary clamp base A.
C. Loosen the fastening nut③ of the auxiliary clamp base B.
D. Loosen the fastening nut④ of the X-transfer frame cover.
E. Loosen the fastening nut⑤ of the lower clamp knuckle B.
F. Take out the air cylinder cable⑥ of the upper clamp.
G. Take out the air cylinder cable⑦ of the upper clamp.
H. Take out the air cylinder cable⑧ of the auxiliary clamp.
I. Take out the air cylinder cable⑨ of the auxiliary clamp.
J. Separate the upper and lower clamps.
K. Remove the auxiliary clamp base holder A⑩ from the X-transfer frame.
L. Remove the auxiliary clamp base holder B⑪ from the X-transfer frame.
M. Remove the air cylinder cables⑥ and ⑦ of the upper clamp.



[Fig. 56]

(2) Assemble the cassette

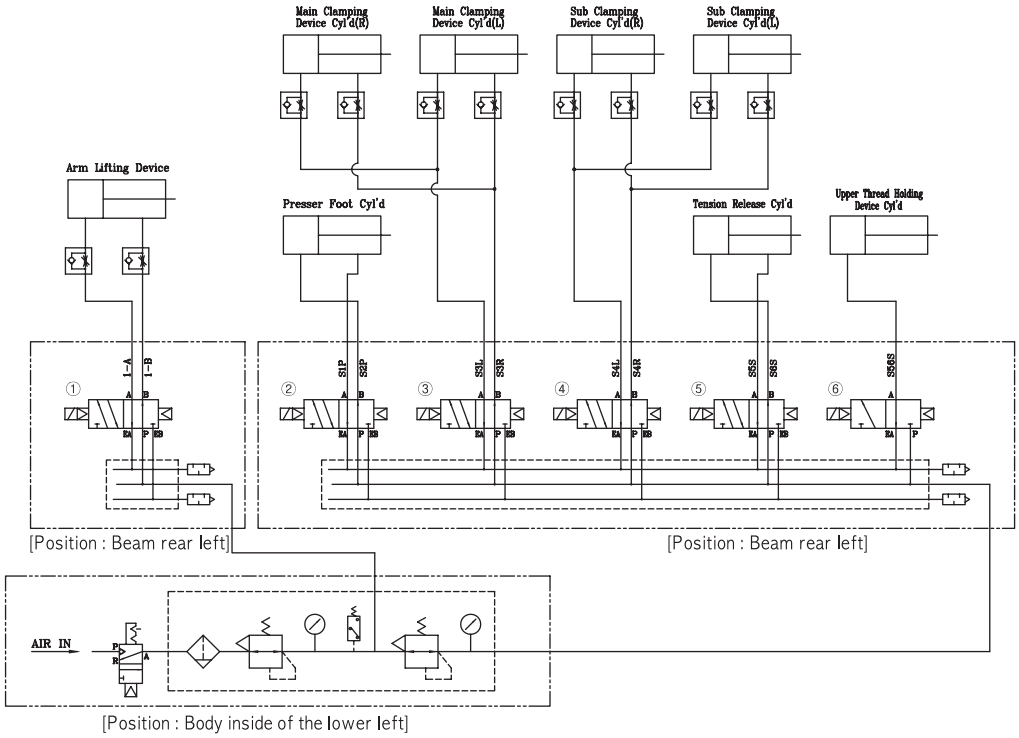
A. Put the pallet cylinder bracket holderⓑ together with the X-transfer frameⓐ.
B. Assemble the pallet cylinder bracketⓒ using the pallet cylinder bracket fastening nutⓔ and the pallet cylinder bracket fastening washerⓓ.
C. Assemble the pallet air cylinderⓕ using the pallet air cylinder fastening nutⓖ.
D. Assemble the pallet cylinder shaftⓙ.
E. Put together the auxiliary bracketⓝ of the pallet cylinder and the bracket holderⓜ of the pallet cylinder by using the pallet cylinder bracket holder fastening nutⓞ.
F. Assemble the pallet customized to the customer environment by using the auxiliary bracketⓝ of the pallet cylinder and the auxiliary bracket fastening nut of the pallet cylinderⓟ.
G. Insert the upper clamp air cylinder cable⑧ into the pallet air cylinder fittingⓗ of the pallet air cylinderⓕ as in figure 56.
H. Insert the upper clamp air cylinder cable⑨ into the pallet air cylinder fittingⓘ of the pallet air cylinderⓕ as in figure 56.



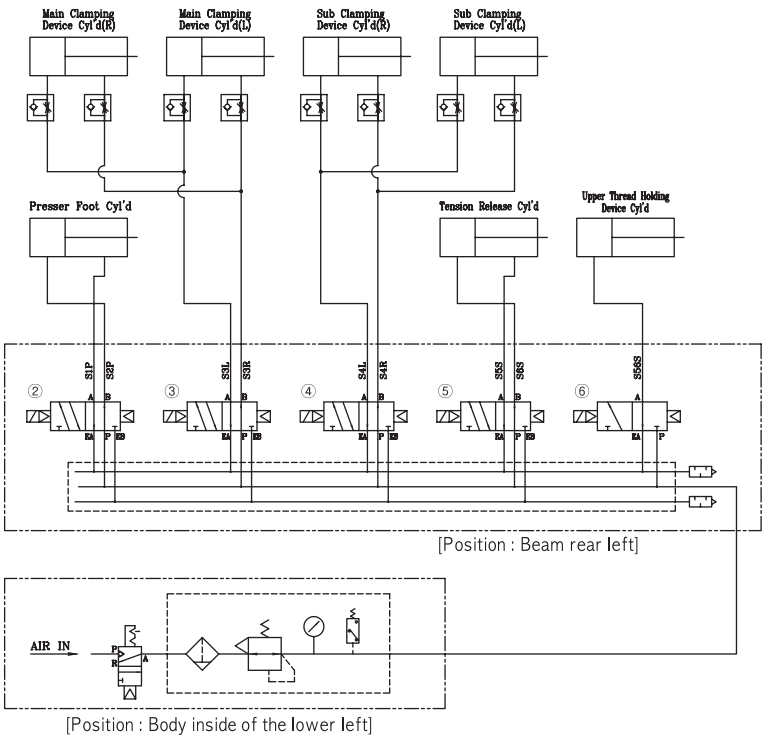
[Fig. 57]

14) Air System Schematic Diagram

[SPS/C-5050H-01 Air System Circuit Diagram]



[SPS/C-5050H-02 Air System Circuit Diagram]



7

CAUSE OF BREAK-DOWN AND TROUBLESHOOTING

No.	Type of Breakdown	Cause	Troubleshooting
1	Error on operation or drive of machine	Too loose belt tension and damage on belt	Adjust the belt tension or exchange it
		Fuse shortage for main power or after circuit	Check the fuse shortage of main shaft drive motor in a controller box, exchange it
		Deviation from Y and Y limit of feed bracket	Move the feed bracket to normal place (inside limit switch)
2	Bad position of stopping position	Slackness of main drive belt	Adjust the belt tension
		Wrong position of upper shaft sensor plate or photo sensor	Adjust the position of upper shaft sensor plate or exchange the photo sensor
3	Needle break	Damage on needle(Bending of needle, cracks on needle hole or groove, and abrasion or transformation of needle tip)	Exchange the needle
		Wrong installation of needle	Install the needle properly
		Contact of needle with shuttle	Adjust the distance properly between a needle and shuttle
4	Thread is cut	Wrong insertion of thread	Insert the thread properly
		Wrong installation of needle (Needle height, needle direction)	Reinstall the needle
		Damage on needle (Bending of needle, cracks on needle hole or groove, and abrasion or transformation of needle tip)	Exchange the needle
		Excessive tension of upper thread and under thread	Adjust the tension
		Excessive tension and stroke of take-up lever spring	Adjust the tension and stroke of take-up lever spring
		Crack on the thread controlling hole of shuttle surface spring	Exchange the shuttle surface spring
5	Stitch skipping	Use of bending needle	Exchange the needle
		Use of needle whose size is not fit to thread	Exchange the needle
		Wrong installation of needle	Reinstall of needle
		Improper timing and needle	Readjust the timing for a needle and shuttle
		Large interval between a needle groove and shuttle point	Readjust the timing for a needle and shuttle
		Excessive tension and stroke of take-up lever spring	Adjust the tension and stroke of take-up lever spring

No.	Type of Breakdown	Cause	Troubleshooting
6	Ineffective sense of upper thread	Bad connection between take-up lever spring and detecting plate	Clean up the take-up lever spring and detecting plate. Adjust the tension of take-up lever spring and connecting condition of detecting plate
		Bad connection of wire with thread sensor plate	Reconnect the wire with thread sensor plate
7	Poor quality of thread tightening	Weak tension of upper thread	Adjust the tension of upper thread
		Weak tension of under thread	Adjust the tension of under thread
		Improper timing of needle and shuttle	Readjust the timing of needle and shuttle
8	Mistakes of Trimming	Slackness of exchange tension between moving mes and fixed mes	Adjust the tension of fixed mes
		Groove abrasion on blade of moving mes and fixed mes	Exchange the moving and fixed mes
		Wrong position of trimming cam	Readjust the position of trimming cam