SunStar

USER'S MANUAL

KM-1170 SERIES

1-Needle, Unison Feed
Lock Stitch M/C

KM-1172 SERIES

2-Needle, Unison Feed
Lock Stitch M/C

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 CO., LTD.

MME-120201

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 CO., LTD.

Contents

1

Machine safety regulations

Safety instructions on this manual are defined as Danger, Warning and Notice.
If you do not follow the instructoins, physical injuries and machine damages might be occurred.

Danger : This indication should be observed definitely. If not, there will be a danger during the installation, conveyance and maintenance of the machine.

Warning : When you follow this indication, injuries from the machine can be prevented.

Caution : When you follow this indication, error on the machine can be prevented.

1-1) Transporting machine  Danger	Those in charge of transporting the machine should have a full understanding of the machine. The following indications should be followed when the machine is being transported. ⓐ More than 2 people must transport the machine. ⓑ To prevent accidents from occurring during transportation, wipe off the oil on the machine compeletely.
1-2) Installing machine  Warning	The machine may not work properly or breakdown, if installed in certain places, Install the machine where the following qualifications agree. ⓐ Remove the package and wrappings from the top. Take special notice on the nails on the wooden boxes. ⓑ Dust and moisture stains and rusts the machine. Install an airconditioner and clean the machine regularly. ⓒ Keep the machine out of the sun. ⓓ Leave sufficient space of more than 50cm behind, and on the right and left side of the machine for repairing. ⓔ EXPLOSION HAZARDS Do not operate in explosive atmospheres. To avoid explosion, do not operate this machine in an explosive atomsphere including a place where large quantities of aerosol spray product are being used or where oxygen is being administered unless it has been specifically certified for such operation. [Refer] Details for machine installation are described in 4. Installation.
1-3) Repairing machine  Caution	When the machine needs to be repaired, only the assigned troubleshooting engineer educated at the company should take charge. ⓐ Before cleaning or repairing the machine, turn off the main power and wait 4 minutes till the machine is completely out of power. ⓑ Not any of the machine specifications or parts should be changed without consulting the company. Such changes may make the operation dangerous. ⓒ Spare parts produced by the company should only be used for replacements. ⓓ Put all the safety covers back on the machine after the machine has been repaired.

1-4) Operating machine

Warning

KM-1170/KM-1172 Series were designed as industrial sewing machines to perform sewing on fabric, leather, and other similar materials. Please observe the following instructions during machine operation.

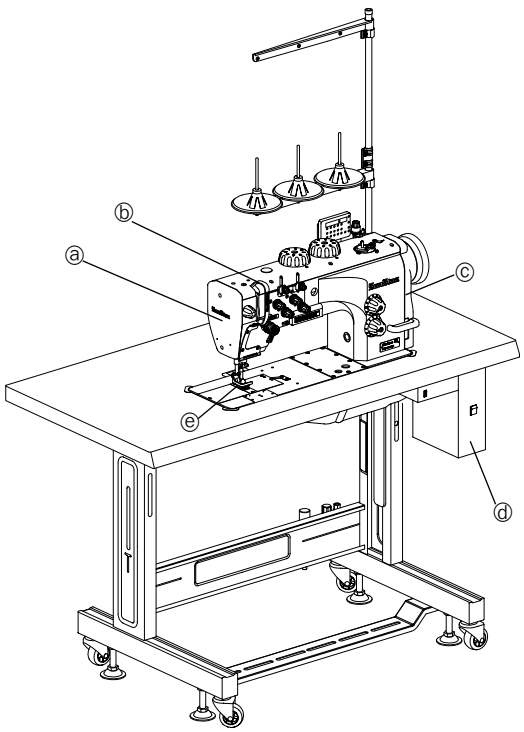
ⓐ Read through this manual carefully and completely before operating the machine.
ⓑ Wear proper clothes for work.
ⓒ Keep hands or other parts of the body away from the machine's operation parts (needle, shuttle, thread take-up lever, pulley, etc.) when the machine is operating.
ⓓ Keep the covers and finger guard on the machine during operation.
ⓔ Be sure to connect the earthing conductor.
ⓕ Turn off the main power and check if the switch is turned "off" before opening electric boxes such as the control box.
ⓖ Stop the machine before threading the needle or checking after work.
ⓗ Do not step on the pedal when turning the power on.
ⓘ If possible, install the machine away from source of strong electrical noise such as high frequency welding machines

[Warning]
Keep motor cover in place before operating, turn off power before inspecting or adjusting.

1-5) Safety devices

Caution

ⓐ Safety label : It describes cautions during the machine operation.
ⓑ Thread take-up cover : It prevents any contact between body and take-up lever.
ⓒ Belt cover : A device intended to avoid potential risks of getting hands, feet or clothes jammed by the belt
ⓓ Label for specification of power : It describes cautions for safety to protect electric shock during the motors' rotation. (Voltage input / use Hz)
ⓔ Finger guard : It prevent contacts between finger and needle.



1-6) Caution mark position

Caution mark is attached on the machine for safety.
When you operate the machine, follow the directions on the mark.

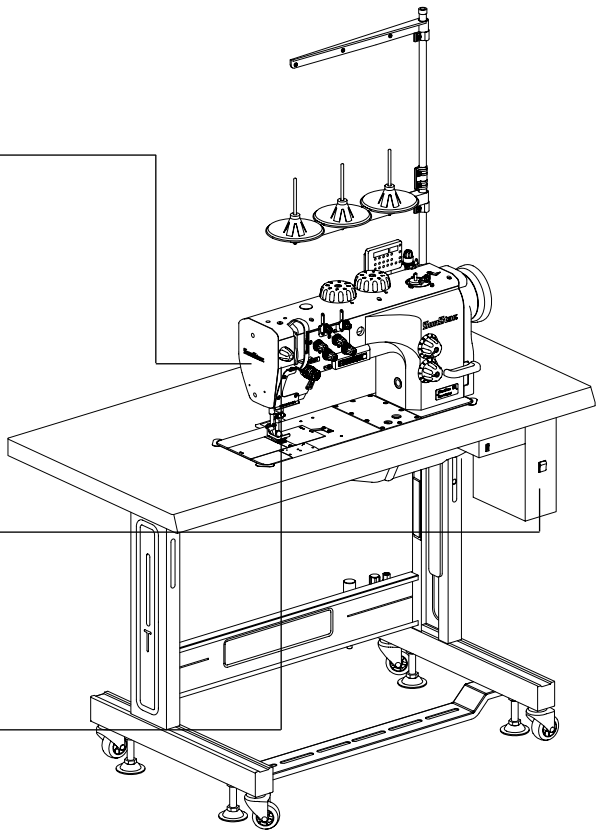
CAUTION
주 의

Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

WARNING
경 고

Hazardous voltage will cause injury.
Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

CAUTION
경 고



1-7) Contents of marks

Warning

Caution

1)

CAUTION
주 의

Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

2)

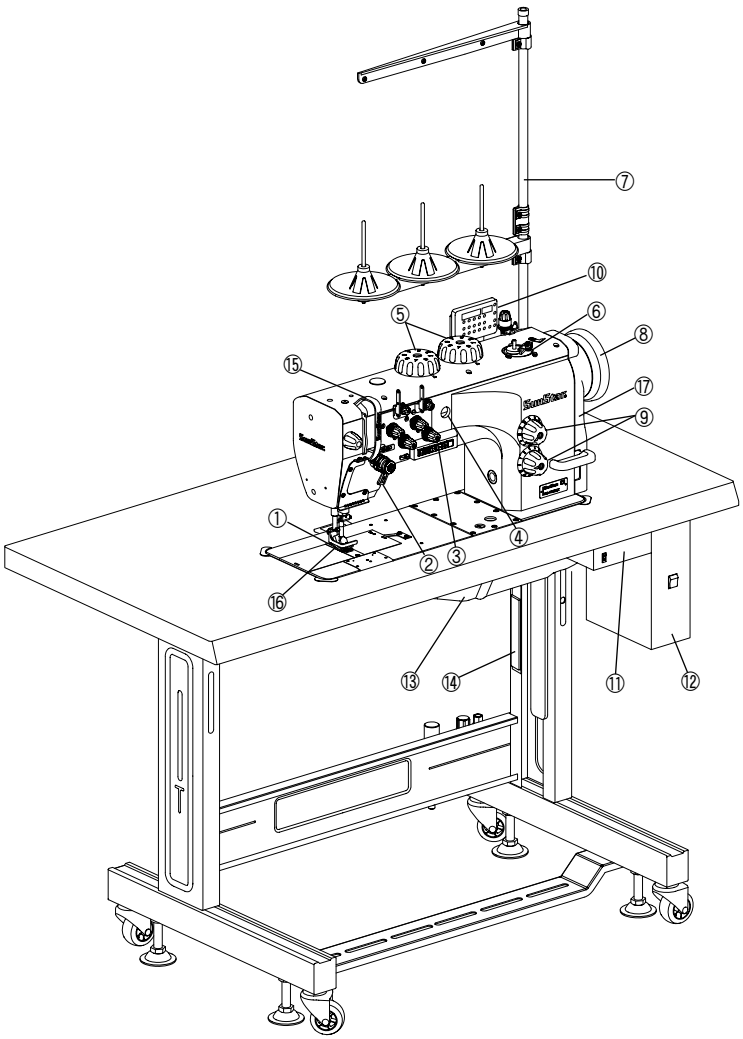
WARNING
경 고

Hazardous voltage will cause injury.
Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

3)

2

Names of main parts



[Fig. 2-1]

① Presser Foot
② Reverse Button
③ Function Switches
④ Oil Window
⑤ Climb Dial
⑥ Thread Winder
⑦ Thread Stand
⑧ Pulley
⑨ Stitch Length Dial
⑩ OP Unit and Panel
⑪ LED Lamp SMPS
⑫ Control Box
⑬ Oil Fan
⑭ Lap Switch

Safety Devices

⑮ Thread Take-up Lever Cover
⑯ Finger Guard
⑰ Belt Cover

3

Specifications

Machine Type

KM-117 □ BLX □ - □

Code	Needle
0	1 Needle
2	2 Needle

Code	Sewing materials
None	Medium and heavy materials
H	Super heavy materials

Code	Trimming
None	Non-trimming
7	Trimming

Specifications \ Model name		KM-1170BLX	KM-1170BLX-7	KM-1172BLX	KM-1172BLX-7	KM-1170BLXH	KM-1172BLXH
Usage		For medium/heavy materials				For super heavy materials	
Lubrication method		Automatic lubrication type					
Needle		1		2		1	2
Thread trimming style		Non-trimming	Thread trimming	Non-trimming	Thread trimming	Non-trimming	
Hook		Horizontal large hook (2.5x)					
Max. sewing speed [spm]		3,200	3,500(P=1~8mm) 2,000(P=9~12mm)	3,000	3,000(P=1~8mm) 2,000(P=9~12mm)	2,800(P=1~8mm) 1,600(P=9~12mm)	2,000(P=1~8mm) 1,600(P=9~12mm)
Thread take-up lever stroke [mm]		82.8					
Height of feed dog[mm]		1.0					
Max. stitch[mm]		12					
Needle bar stroke[mm]		40					
Presser foot lifting	Manual[mm]	12					
	Automatic[mm]	20					
Auto thread trimming device		-	Pneumatic cylinder	-	Pneumatic cylinder	-	
Needle		DP × 35 (#12 ~ #23) 134-35 (Nm80~160)				DP × 35 (#22 ~ #25) 134-35 (Nm140~200)	
Available space for sewing[mm]		335 × 148					
Motor	V-Belt	Clutch (600W)	-	Clutch (600W)	-	-	-
	Semi-Direct	-	Servo (750W)	-	Servo (750W)	Servo (750W)	Servo (750W)
Automatic trimmer		-	Basic specifications	-	Basic specifications	-	-
Manual backtack lever		Basic specifications	Basic specifications	Basic specifications	Basic specifications	Basic specifications	Basic specifications
utomatic backtack device		-	Basic specifications	-	Basic specifications	Basic specifications	Basic specifications
Automatic presser foot lift device		-	Basic specifications	-	Basic specifications	Basic specifications	Basic specifications

⊙ Speed

Intersection of presser foot	Max. Sewing speed[RPM]			
	For medium/heavy materials		For super heavy materials	
	KM-1170BLX-7	KM-1172BLX-7	KM-1170BLXH	KM-1172BLXH
3.5 under	3,500(3,000)	3,000	2,800	2,000
3.5~4.0	3,200(3,000)	2,800	2,600	1,900
4.0~4.5	2,900	2,600	2,400	1,800
4.5~5.0	2,600	2,400	2,200	1,750
5.0~5.5	2,400	2,200	2,000	1,700
5.5~6.0	2,200	2,000	1,800	1,650
6.0 above	1,800	1,800	1,600	1,600

Sweat width[mm]	Max. Sewing speed[RPM]			
	KM-1170BLX-7	KM-1172BLX-7	KM-1170BLXH	KM-1172BLXH
9.0 under	Control by intersection of presser foot		Control by intersection of presser foot	
9.0 above	2,000		1,600	

Note

1) Max. RPM priority is limited to low RPM.

2) Figures in parenthesis refer to the normal RPM.

3) No speed control function by intersection of presser foot and stitches in case of non-trimming clutch motor specifications.

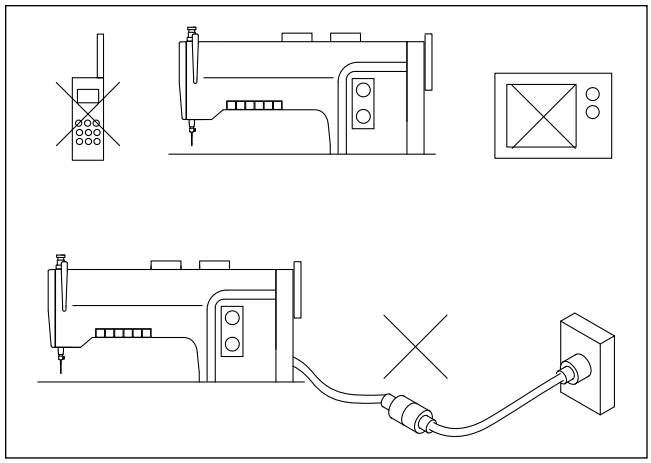
4

Installation

Caution	• Only trained technicians should install and wire up the machine. • The machine weighs over 50 kg. More than two persons should install the machine. • Do not plug in the machine until installation is completed. If the operator mistakenly steps down on the pedal with the plug in, the machine will start automatically and can cause physical injuries. • Use both hands when bending the machine backwards or returning it to the original position. Using only one hand can lead to severe hand injuries due to the weight of the machine.

4.1) Installation place

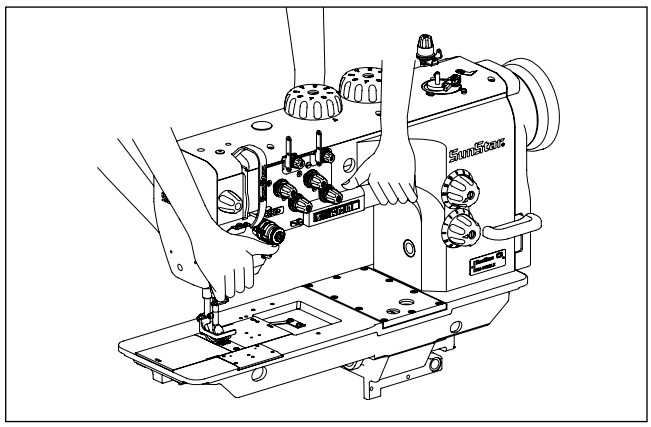
1) Do not install the machine near television, radio or telephone; or the operation of machine can be interfered with by the noise from the appliances.
2) Connect the ground (earth) wire. An unstable connection may result in malfunction



[Fig. 4-1]

4.2) Machine delivery

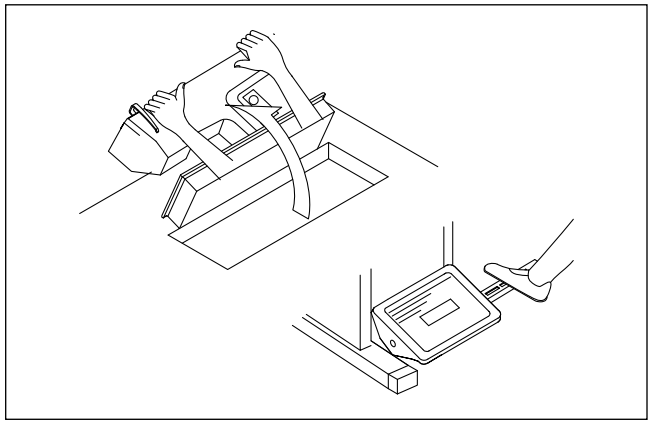
1) There should be two people to move the machine, as in the Figure.



[Fig. 4-2]

4.3) Bending the machine backwards

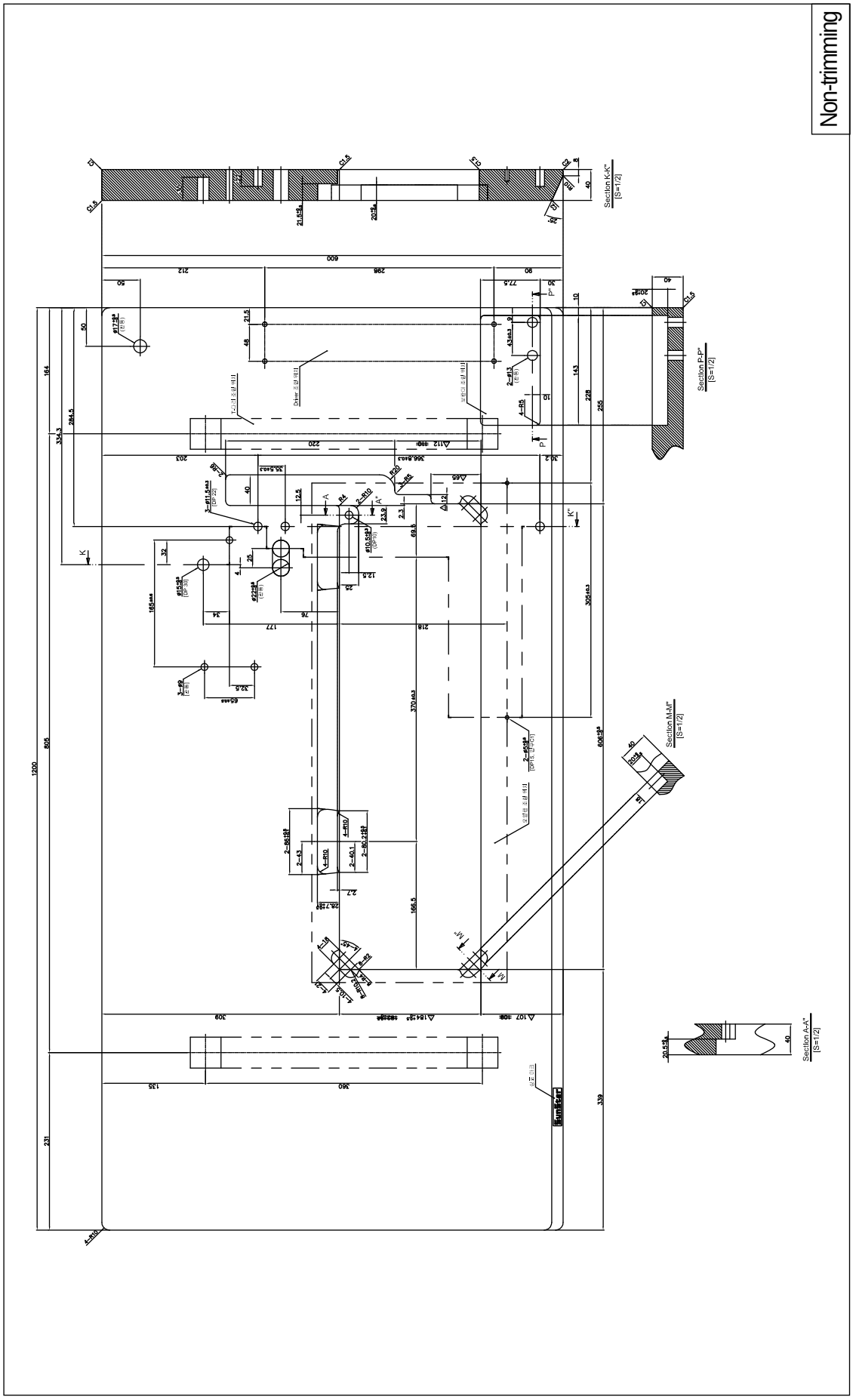
1) Bend the machine backwards with two hands grabbing upper part of the body. Make sure to press the lower part of the board leg of the machine, or the whole body of machine falls backwards, leading to physical injuries.



[Fig. 4-3]

4.4) Table drawing

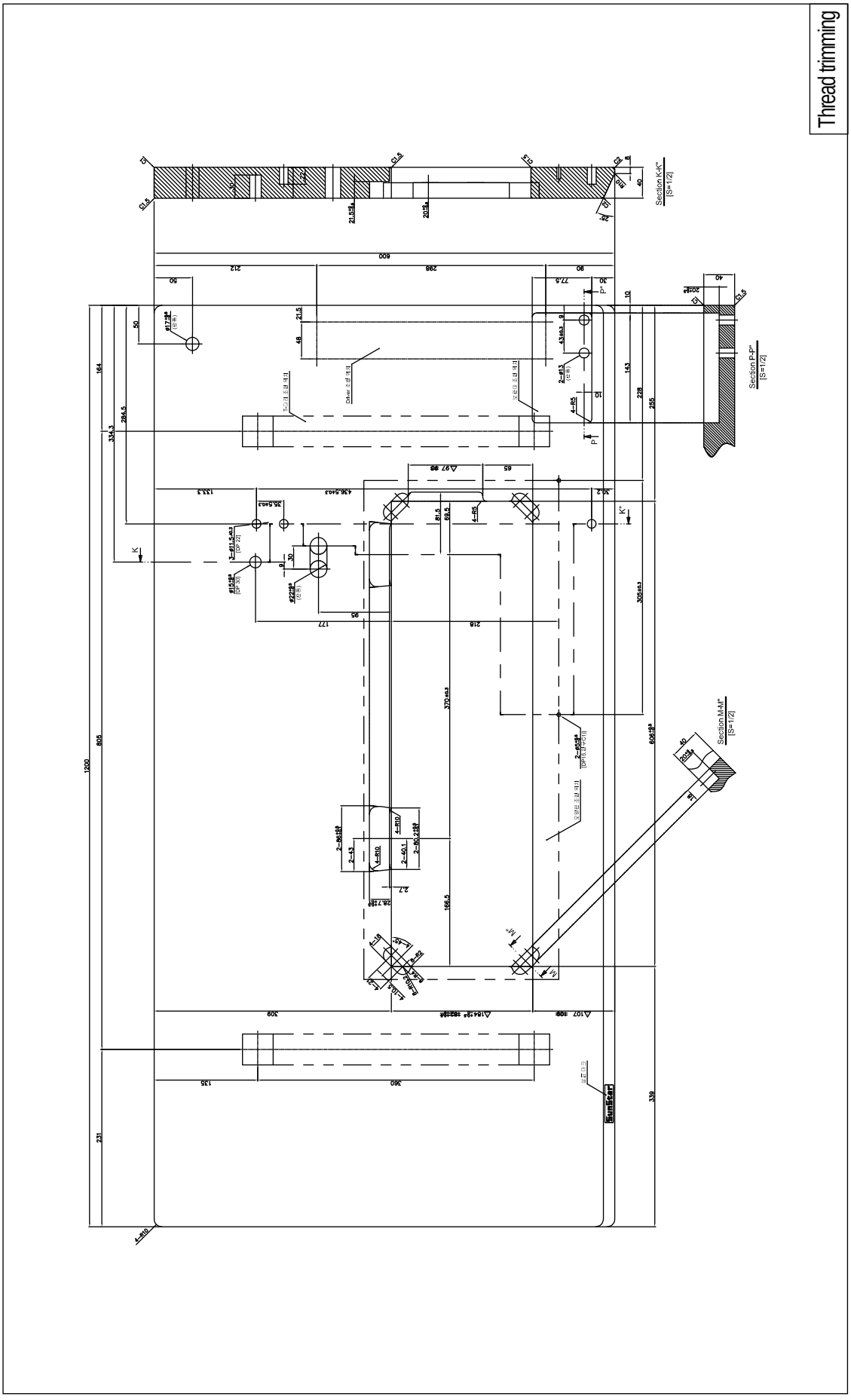
Please use the table provided by Sunstar. When using self-made table , the thick of table should be more than 40mm. Please use table strong enough to sustain the weight of the machine.



[Fig. 4-4]

Thread trimming

[Fig. 4-5]

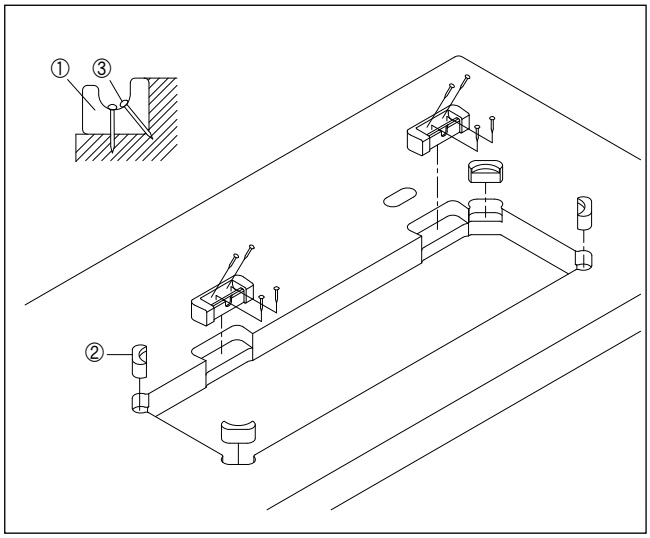


4.5) Installation of Sewing Machine Body

4.5.1) Hinge and Bed Supporting Rubber

1) Fix the hinge rubber ① (2EA) and the bed supporting rubber ② (4EA) at the grooves on the table using nails ③.

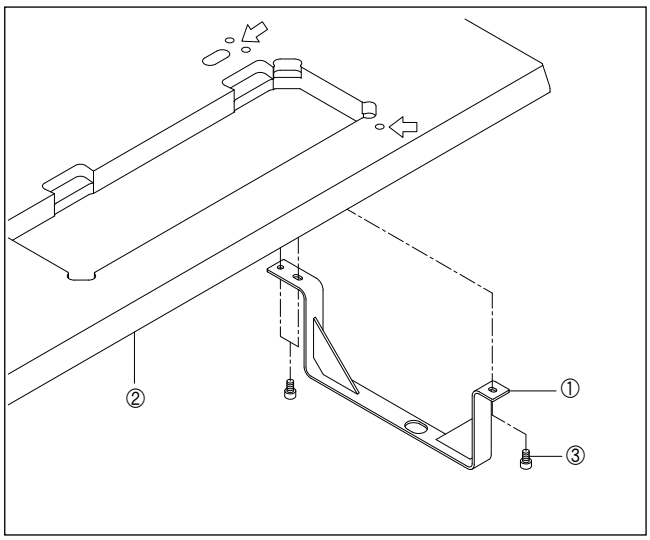
2) Adjust the height of the bed and the table with the accessories that are hinge rubber spacer and bed-support rubber spacer.
It is recommended for the bed to be positioned 2~3mm over the table.



[Fig. 4-6]

4.5.2) Presser Foot Lift Cylinder Bracket

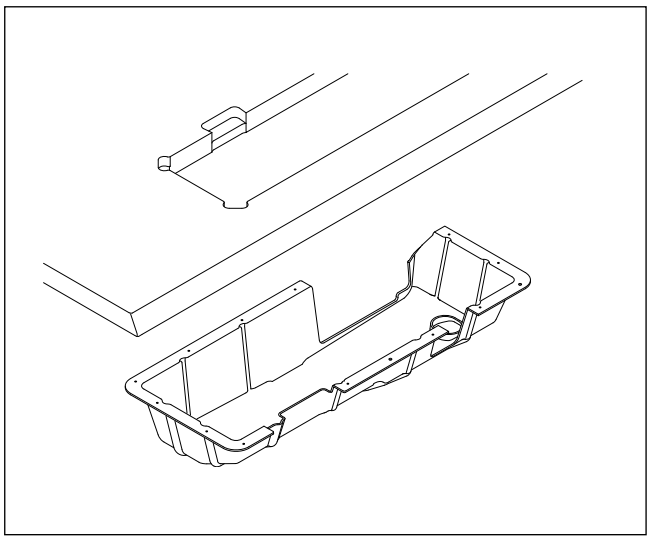
Fix the presser foot lift cylinder bracket① under the table② as in the figure using the M8 hexagonal bolt ③.



[Fig. 4-7]

4.5.3) Oil Fan

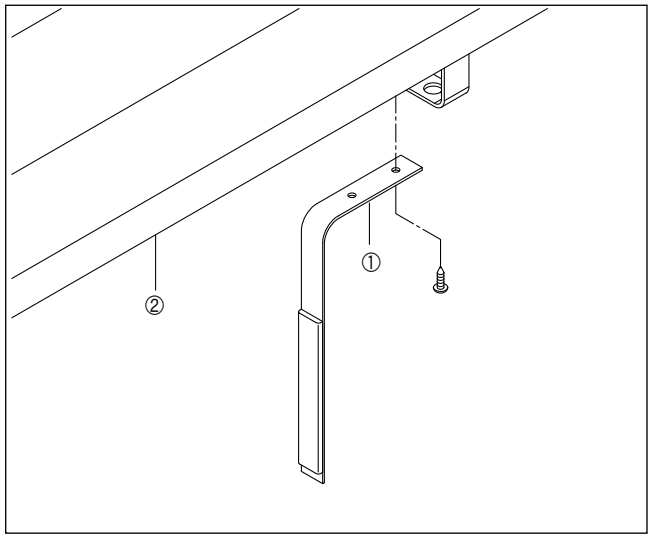
Fix the oil pan① inside the accessory box with M4 hexagon socket headless bolt② under the table like the figure. Attach the remained parts using wood nuts.



[Fig. 4-8]

4.5.4) Lap Switch

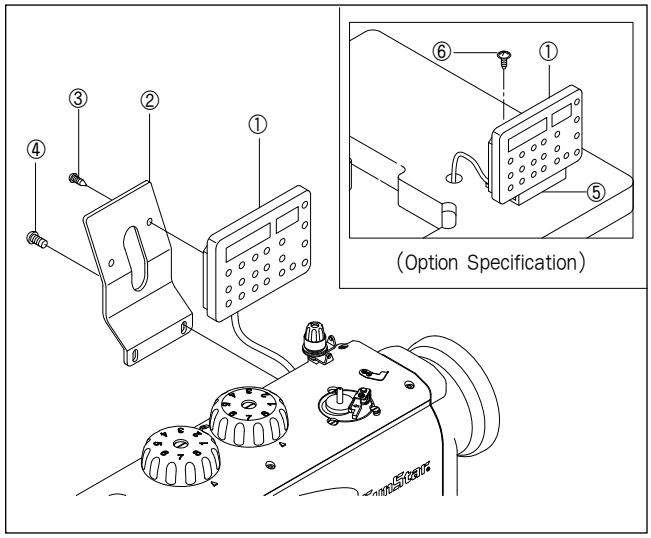
Attach the lap switch ① beneath the table ② considering the user's working position with screws.



[Fig. 4-9]

4.5.5) OP Panel

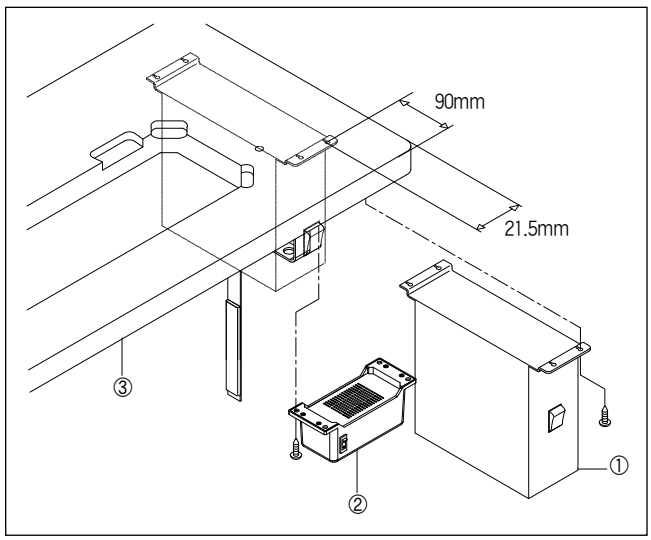
Fix the operating panel① to the bracket② using a bolt③ and then fix it to the upper part of the rear arm using a bolt④.
(Optional : Fix the OP bracket⑤ to the table face using a tapping screw⑥.)



[Fig. 4-10]

4.5.6) Control Box and LED Lamp SMPS

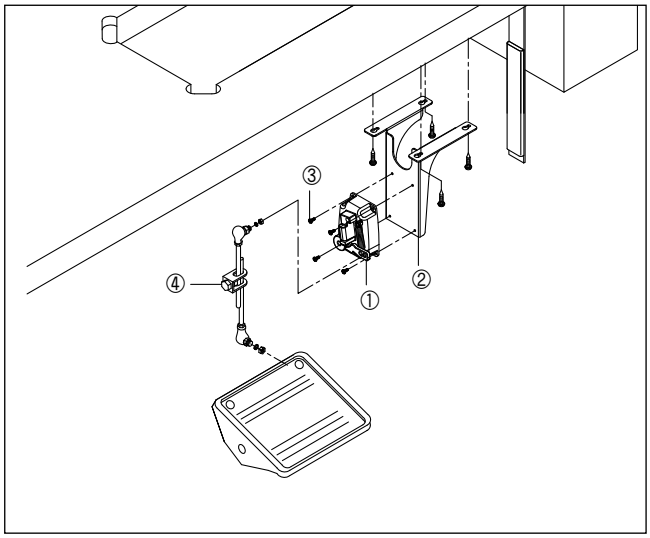
Attach the control box① and the LED lamp SMPS② beneath the right side of the table③ using screws and fix them at the places as in the figure.



[Fig. 4-11]

4.5.7) Pedal switch and connecting rod

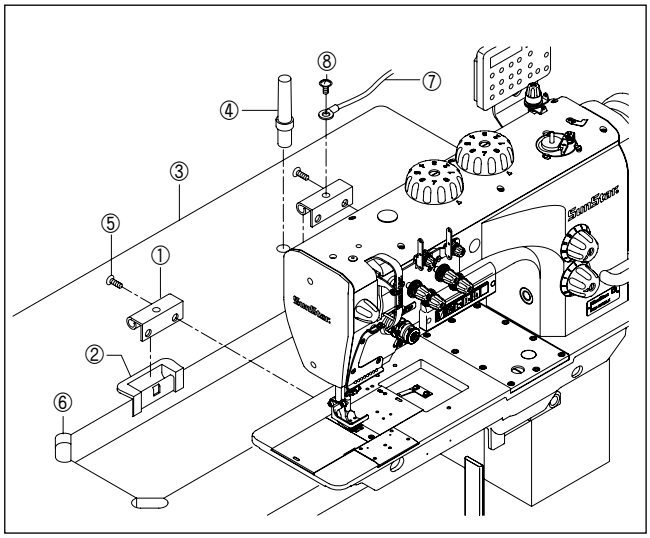
1) Attach pedal switch ① to pedal switch bracket ② with four bolts ③.
2) As in the Figure, attach pedal switch bracket ② to the lower part of table.
3) Connect one end of the connecting rod ④ with pedal switch and the other end with pedal, and then adjust length of the rod.



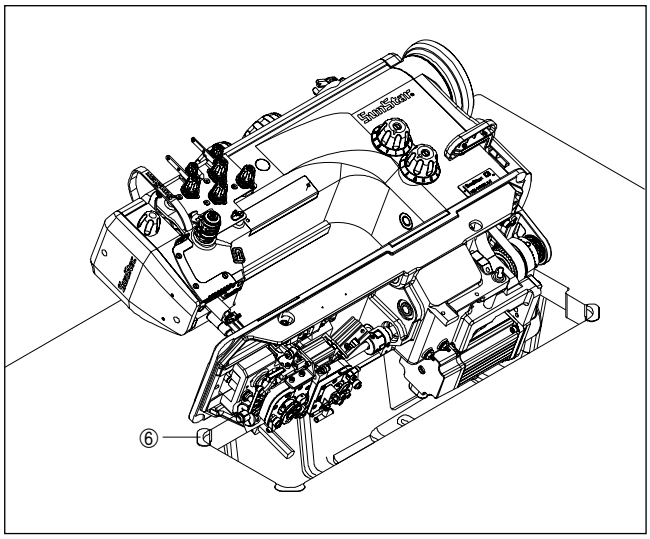
[Fig. 4-12]

4.5.8) Sewing Machine Body

1) Place the two hinges① on the rear bed of the sewing machine and tightly fasten them using the screw⑤.
2) As shown in figure 4-14, put the hinge① into the hinge rubber② on the table③ laying the and put down the sewing machine on the bed-support rubber⑥.
3) Insert the machine body sustaining pole④ into table③ completely. If the pole is not inserted completely, that may cause accidents because the pole cannot sustain the weight of machine body firmly, when the body bent backwards.
4) Install the sewing machine body on the table and fix the grounding wire⑦ on the hinge① using a screw⑧.



[Fig. 4-13]

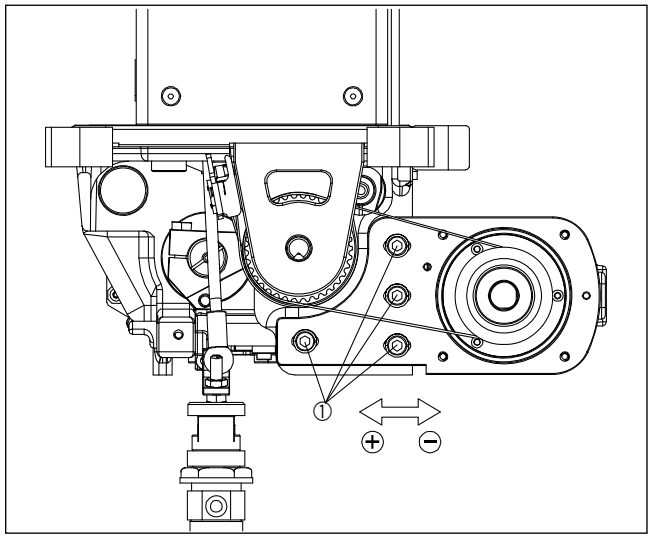


[Fig. 4-14]

4.5.9) Adjustment of Belt Tension (Non-trimming model)

1) Semi-direct Drive Motor Specifications

Tightening the screw in the middle of motor bracket hole① is the standard. However, the tension is increasing when the screw is tightened on the left of the motor bracket hole and the tension is decreasing when the screw is tightened on the right of the hole.

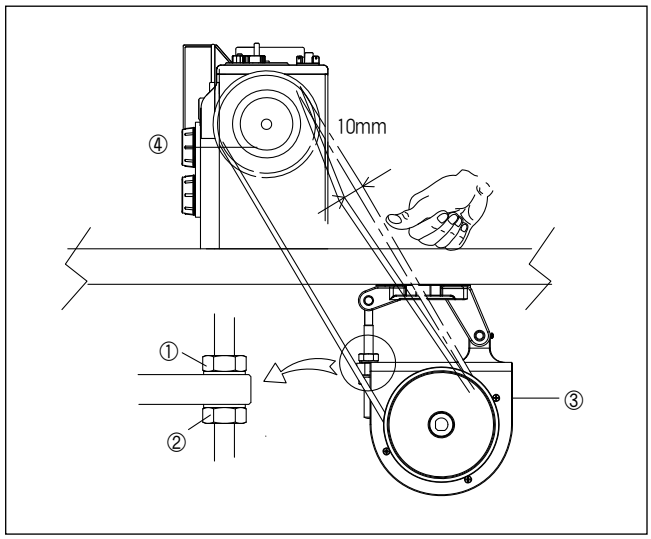


[Fig. 4-15]

2) V-Belt Drive Motor Specifications

Install the motor and sufficiently loosen the fixing nuts ①, ②. Then due to the weight of the motor ③, tension is generated at the belt ④. Fix the fixing nut ① in this position and then tightly fasten the fixing nut ②.

Adjust the tension of the belt to make the belt pressed 10mm when the center is pressed by a finger as in the figure, and tightly fasten the fixing nut ②.

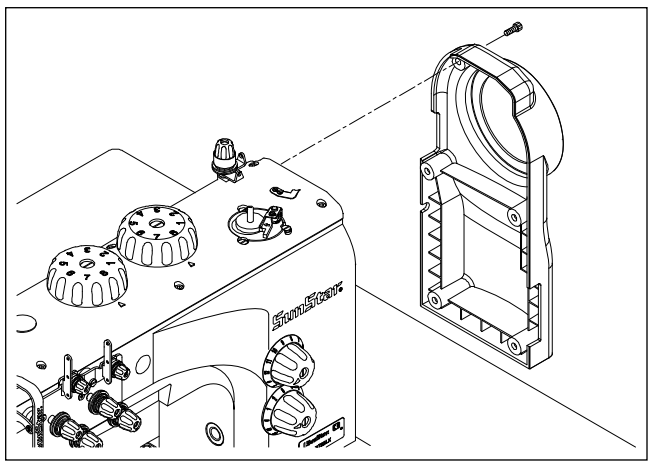


[Fig. 4-16]

4.5.10) Belt Cover Installation (Non-trimming model)

(1) Semi-direct Drive Motor Specifications

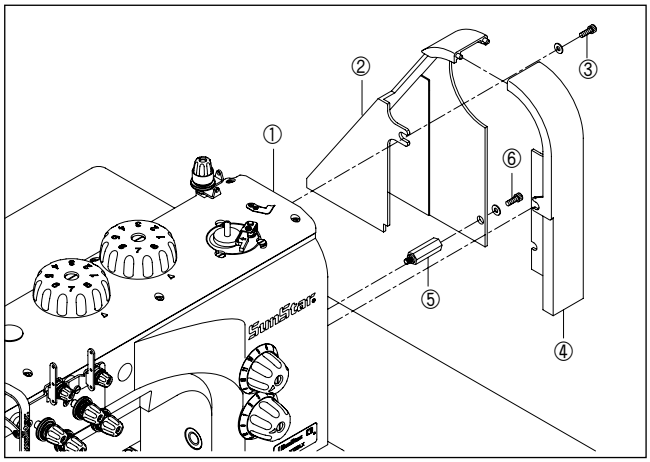
Tighten the screws (5EA) firmly.



[Fig. 4-17]

(2) V-Belt Drive Motor Specifications

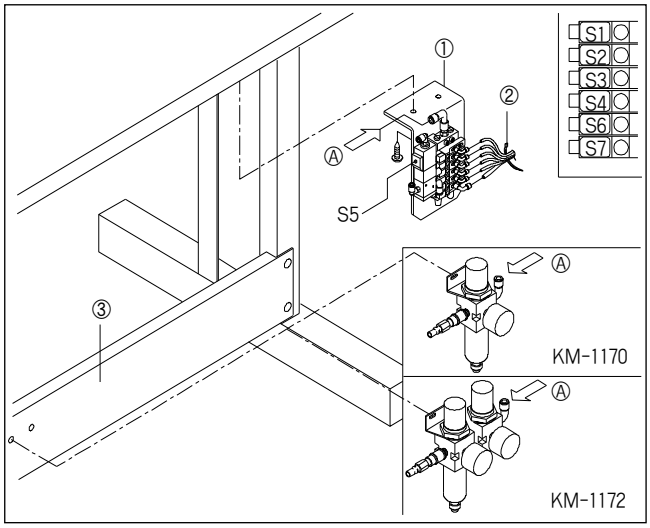
1) Fix the belt cover on the upper right side of the arm ① and the fixing grooves of the belt cover ② using screws ③.
2) Accurately assemble the belt covers②,④ and fix the belt cover② using screws following the same method. When the assembled belt cover is fixed to the stud bolt⑤ using screws⑥, the belt cover installation is complete.



[Fig. 4-18]

4.5.11) Pneumatic Parts Installation and Function Check

1) As in the figure, fix the pneumatic unit ① to the lower part of the table using the wood screw and fix the regulator to the table T-leg stiffened plate ③.
2) Connect the pneumatic tubes according to label signs and bind the tubes with other lead lines using the belt clips ②.
3) Use the regulator ④ to set the default pneumatic pressure at 0.6Mpa.
4) When applying the seam center guide presser foot, make sure that the pneumatic pressure of the regualtor ⑤ is no highr than 0.3Mpa.



[Fig. 4-19]

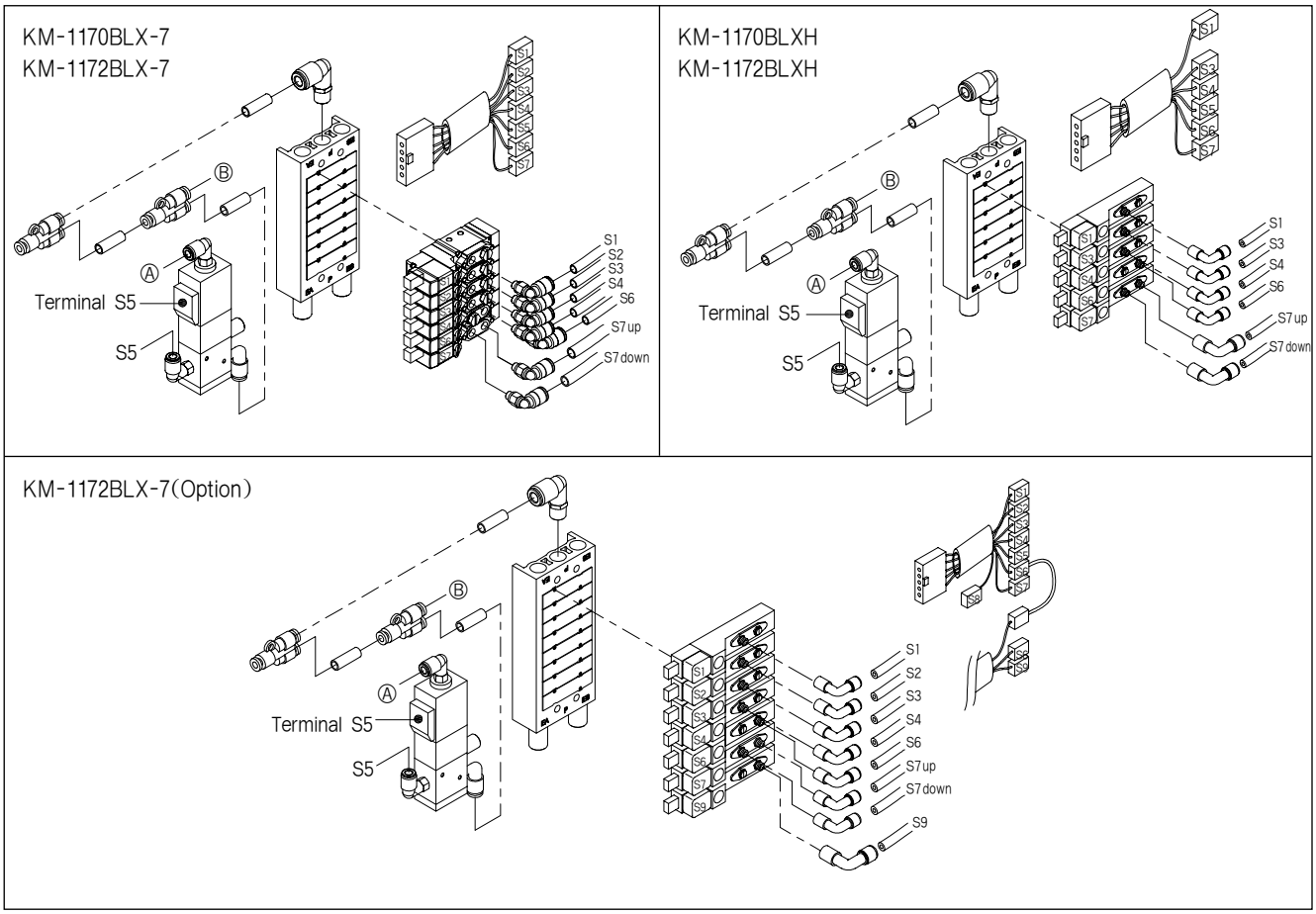
4.5.12) Description of label symbols

Label Sign	Classification	Function
S1	Backtack	Add the initial and last backtack sewing function and perform reverse sewing
S2	Trimming	Perform trimming
S3	Hem height difference	When the cylinder is in motion, sewing is performed using the higher value of the two climb dials attached to the machine.
S4	Stitch length conversion	When the cylinder is in motion, sewing is performed using the lower value of the two stitch length dials attached to the machine.
S5	Thread release(Main)	It operates when trimming and presser foot automatic lift are performed to loosen the tension of the upper thread.
S6	Thread release(Sub)	Turn on/off the tension of the upper thread using the function switch.
S7	Presser foot	Lift the presser foot 18mm from the top of the needle plate.
S8	Seam Center Guide	It is used to create sewing lines in parallel along the seam in case of using two needles.

Note

However, when the left/right removable thread adjustment device, an optional device is applied, S6 refers to SubL, and S9 refers to SubR.

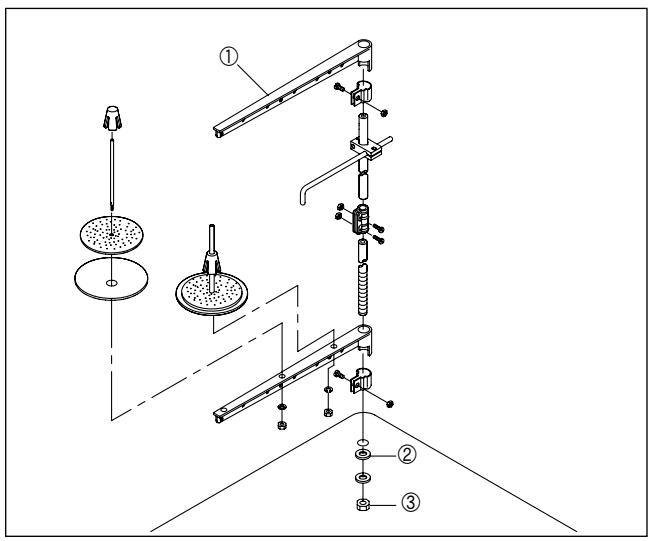
4.5.13) Pnematic wiring diagram by model



[Fig. 4-20]

4.5.14) Thread spool stand assembly

Secure the thread spool stand assembly① onto the table using washer② and nut③ on the right side.



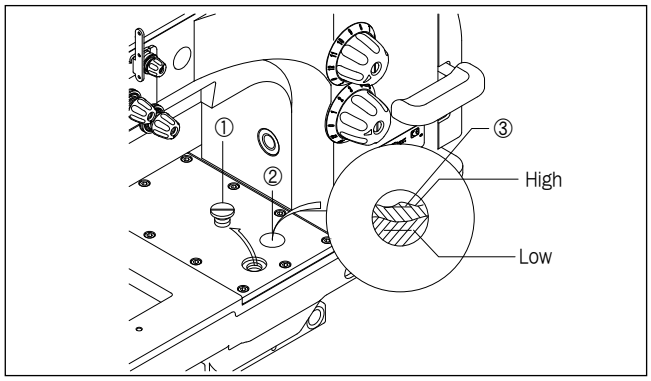
[Fig. 4-21]

4.6) Supplying oil

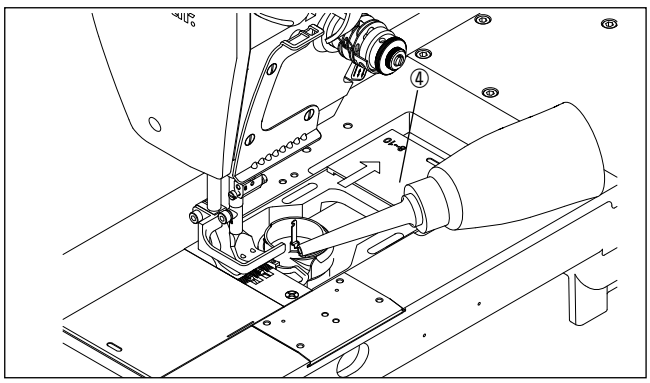
Caution	• Plug in only after oil supply is finished. If the operator mistakenly steps on the pedal with the plug in, the machine will start automatically and can cause severe injuries. • When handling lubricants, wear protective glasses or gloves to prevent lubricants from contacting with your eyes or skin. Wash your hands in running water with soap when they are smeared with lubricant. If lubricant is in the eye, instantly wash it with running water and see a doctor. • Never drink lubricants since they can cause vomiting or diarrhoea. Go to see a doctor, if you mistakenly drink lubricant. • Keep lubricant away from the reach of children and the youth.

Caution	• Operate the machine only after supplying oil when the machine is used for the first time or has been left unused for a long time. • Only use genuine lubricant of this company. (Lubricant is in the accessory box.)

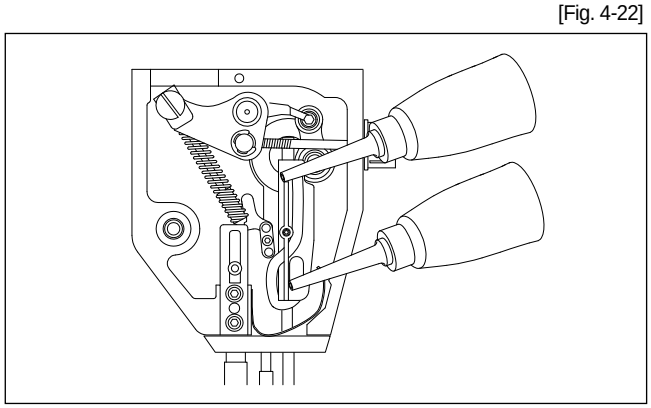
1) Lubrication to Bed
   Loosen the oil tank entrance screw ① and supply oil until the oil gauge ② reaches the "HIGH" mark③. When oil supply is completed, tightly fasten the screw ①. Upon initial installation, run the machine for 30 minutes and supply oil until the "HIGH" mark.
2) Lubrication to Face Plate
   isassemble the faceplate by loosening two faceplate screws and supply oil to the indicated part as shown in the figure. After lubrication, reassemble the faceplate.
3) Lubrication to Hook
   Open the slide plate③ and supply oil to the indicated part as shown in the figure.
4) Oil Window Check
   Turn on the power after lubrication on each sliding part and check the oil flow at the oil window⑤ on the front part of the arm by rotating the sewing machine at low speed for five minutes. Operate the machine at the rate of 2,000spm during four or five days after starting to use it, then machine performance will continue to be in best shape.

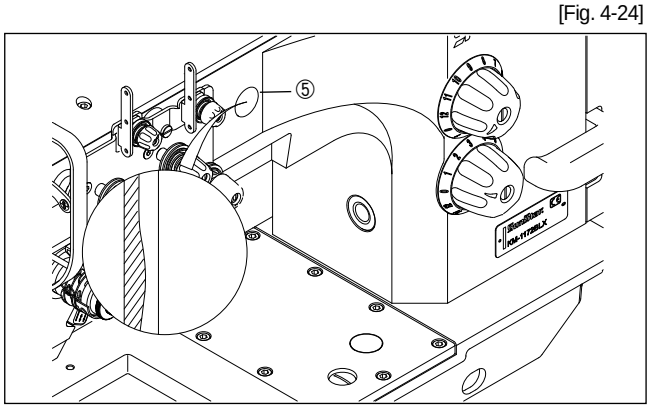


[Fig. 4-22]



[Fig. 4-24]


[Fig. 4-23]



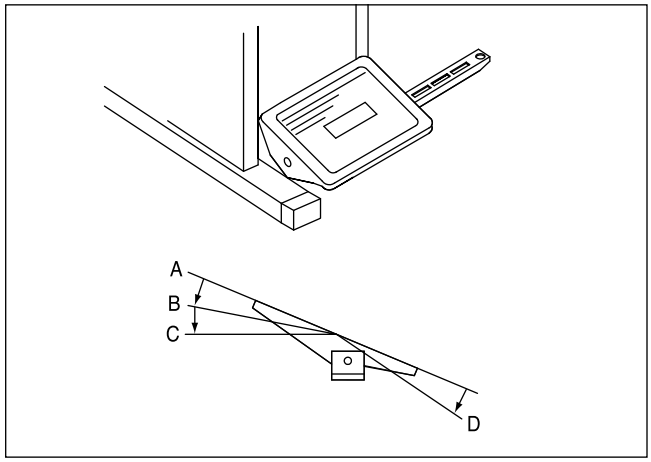
[Fig. 4-25]

4.7) Trial run (Pedal operation)

Caution

Make sure not to touch or press down parts that are operating or moving during operation. Failure to follow the safety rules may result in physical injuries or mechanical damages.

1) Press pedal lightly to the position of B to check if the machine is operating low-speed sewing.
2) Press pedal to the position of C to check if the machine is operating high-speed sewing.
3) Press pedal backward and forward. And then put the pedal at neutral position of A to check if needle stops lower than the upper surface of needle plate.(in case that needle down stop is set)
4) When pressing pedal to the position of D(or pressing pedal the position of to D and then replacing pedal to the position of A), needle will stop higher than the upper surface of needle plate after trimming.



[Fig. 4-26]

4.8) Machine Stop Position Check

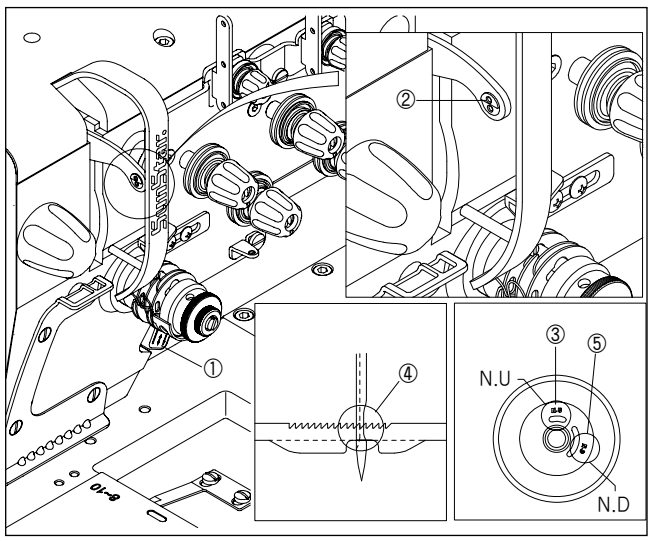
Press the reverse button① to make the needle to the highest and lowest position, and check the stop position of the machine. When the stop position is improper, trimming may be faulty. In this case, the position of the magnetic holder imbedded in the pulley should be corrected.

4.8.1) Check for up-stop position of needle bar

Upper stop position of the needle bar is that the thread take-up② is on the top. When the position is incorrect, adjust the magnetic holder③ position built in the N.U seal of the pulley left and right.

4.8.2) Needle Bar Lower Stop Position Check

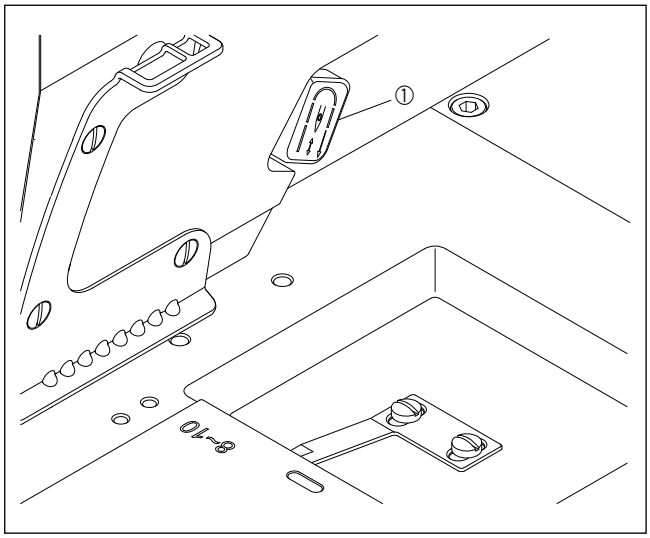
The lower stop position of the needle bar is at the center of needle groove④crosses the surface of needle plate. When the position is wrong, adjust the mounted magnetic holder⑤of the N · D imprinted poly from side to side.



[Fig. 4-27]

4.9) Back tack button (thread trimming type)

Pressing the back tack button or reverse button① during forward sewing will start reverse sewing immediately. When you stop the machine and restart it by stepping down on the pedal with the reverse button① already pressed down, you can perform reverse sewing from the beginning. When the machine is in a "stop" mode, you can change up-down position of the needle bar by pressing the reverse button. Lightly pressing the button once will stop the needle bar in a high position. Pressing the reverse button① twice within less than a second will stop the needle bar in a low position. In short, the button delivers two functions: one for reverse sewing and the other for converting vertical position of the needle.



[Fig. 4-28]

4.10) Functional description of function switches

KM-1170BLX KM-1172BLX	
KM-1170BLX-7 KM-1170BLXH	
KM-1172BLX-7 KM-1172BLXH	
KM-1172BLX-7 (Option)	
KM-1172BLX-7 (Option)	

[Fig. 4-29]

1) : Stitch length conversion switch
When the switch is turned on, the lower positioned dial among the two stitch length setting dials attached to the machine is applied. When the switch is turned off, the higher located dial among the two stitch length dials is applied.

2) : Auto backtack select switch
The switch selects the addition or deletion of the initial and last backtack sewing function.

3) : Presser bar overlapping change switch
When pressing the switch, the lamp is on. Then the presser bar overlapping volume is changed to the value set at the top cover dial B. When pressing it again, the lamp is off. Then the value set at the top cover dial A becomes the presser bar overlapping volume.

4) : Supplementary thread tension switch
When the switch is not pressed, the tread tension is low. When the switch is pressed, the dish is closed, and the thread tension increases.

5) : Needle bar upper stop switch
Regardless of the machine stop position, the switch sends the needle bar to the highest stop position.

6) : Seam Center Guide Operation Switch (KM-1172 Only)
The seam center guide operation switch works at the 2 needles and it is used to stitch symmetry line on the material with stitching line.

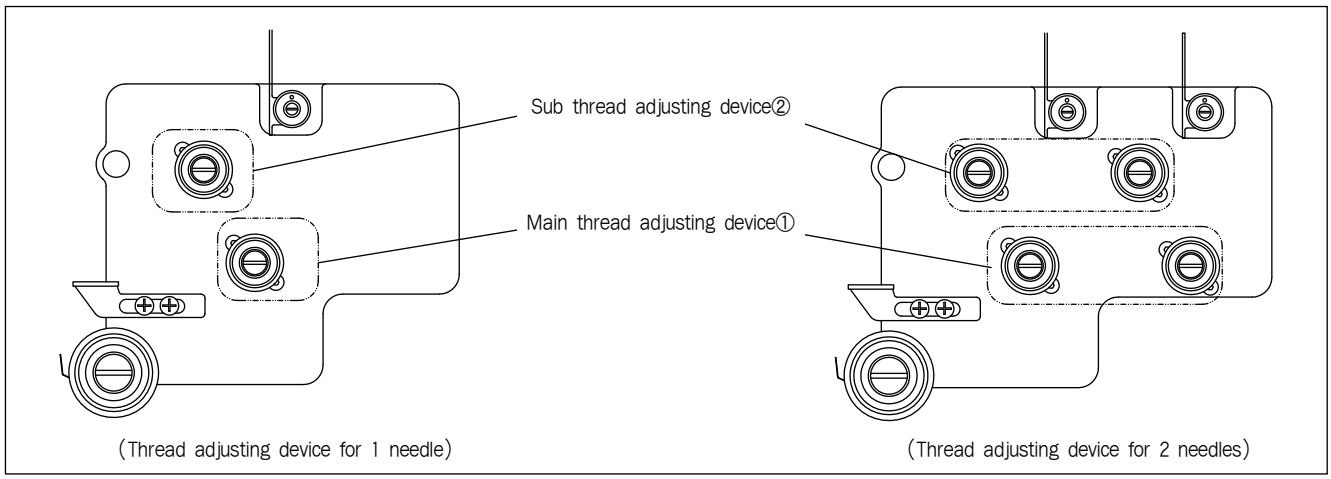
7) : Left auxiliary thread tension switch
When the switch is not in operation, the thread tension is released. When the switch is pressed, the left auxiliary dish is closed, and the thread tension increases.

8) : Right auxiliary thread tension switch
When the switch is not in operation, the thread tension is released. When the stitch is pressed, the right auxiliary dish is closed, and the thread tension increases.

4.11) Adjusting Parameter of Sub Thread Adjusting Device

- The default value of A-95 is “0”.

Parameter No.	Set Value	Function Name
A-95	0	Press the sub thread tension operation switch to operate second thread tension adjusting device② when stitching and using main thread tension adjusting device① then the plate of the device② is closed and the lamp is on at the same time. After trimming, the sub thread tension switch is automatically turned off.
	1	In the case where A-95’s parameter is set at “1”, the lamp of the sub thread tension switch is on, and the sub thread adjusting device ② is running like the main thread adjusting device①. In this case, even after trimming, the sub thread tension switch is not automatically turned off. In order to release the tension of the sub thread adjusting device②, press the sub thread tension switch to turn it off.



[Fig. 4-30]

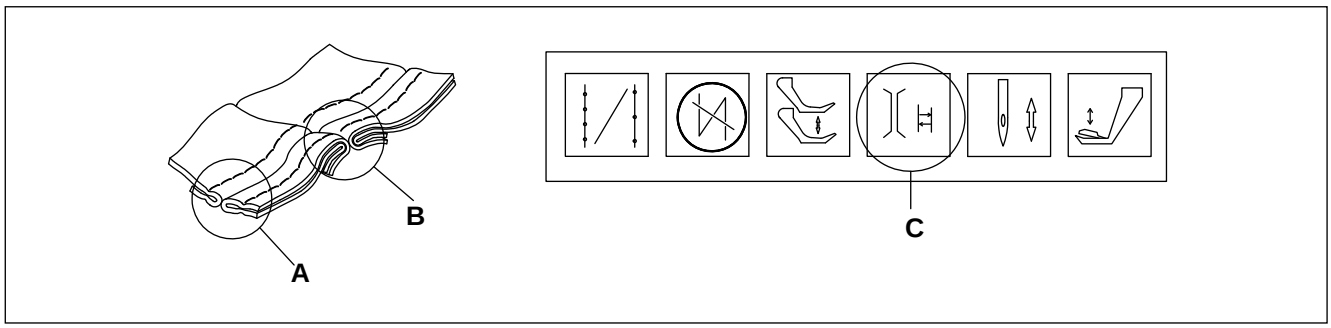
4.12) How to Use Dual Tension

1) Main Thread Adjusting Device
   - Adjust tension of the main thread adjusting device① in line with the main sewing material conditions.
   - Adjust the main thread adjusting device① and the tension of the lower thread in order to create loops at the center of the sewing material at even stitch length.
2) Sub Thread Adjusting Device
   - The sub thread adjusting device② enables users to easily increase the tension of the upper thread according to the sewing material height difference and conditions.
     For two-needle model, if a dual tension individual operating type (optional) is used, the left and right tension of the upper thread can be independently adjusted while sewing materials with height difference on the left and right sides.
   - The sub thread adjusting device② should be adjusted in line with the tension of the main thread adjusting device① and the conditions of sewing materials with height difference.
3) Operating Main · Sub Thread Adjusting Devices
   - The main · sub thread adjusting devices①, ② are run by pneumatic pressure. In particular, the sub thread adjusting device② can be turned on and off easily with functional switches.
   - The sub thread adjusting device can be left, right independently run as an optional function. The left, right function switches can be used to turn on and off the tension.
   - During sewing, when the sub thread adjusting device or the left, right sub thread adjusting device in terms of independently running type is pressed, the lamp is turned on and at the same time the tension of the upper thread increases. When the button is pressed again, the lamp is turned off, and the tension of the upper thread decreases.

4) Examples of Dual Tension Application

4-1) Basic Specifications

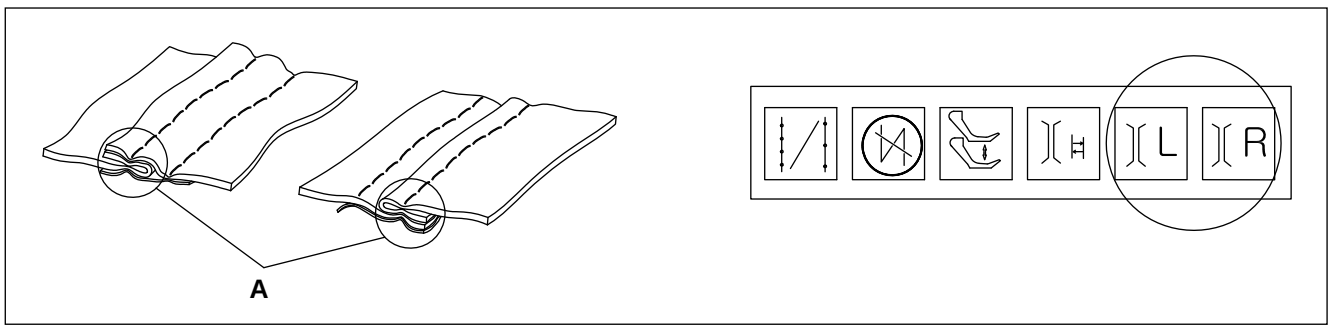
- For the sewing process of handling significant height difference of sewing material, the presser foot cross overlap and the tension of the upper thread should be increased to get best sewing quality.
- Turn off the dual tension button C and adjust the tension of the main thread adjusting device according to the conditions of the main sewing material A.
- Turn on the dual tension button C and adjust the tension of the sub thread adjusting device according to the conditions of the thick sewing material B.
- Proceed with general sewing work after the dual tension button C is turned off. When the machine reaches Point B on the sewing material, press the dual tension button C to increase the upper thread tension. When the sewing for height difference is completed, press the dual tension button C to decrease the upper thread tension and continue sewing.



[Fig. 4-31]

4-2) Optional Specifications

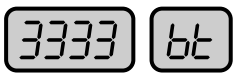
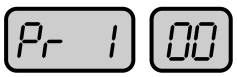
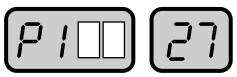
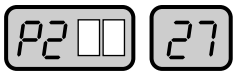
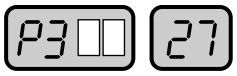
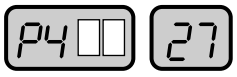
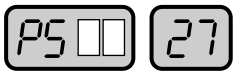
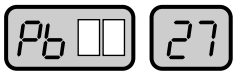
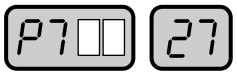
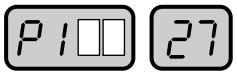
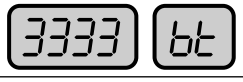
- When sewing the materials with different height on left and right sides, the independently operating (optional) dual tension can be used to get the best sewing quality.
- As in Figure 4-26, when sewing the materials with different height on left and right sides, upper thread tension should be given differently to the left and right sides to get the best sewing quality. As such, the sub thread adjusting device should be adjusted as follows:
  ① Basic specifications: The sub thread adjusting device that supplies upper thread to the thick part A is reset every time of operation.
  ② Optional specifications: Turn on the button to operate the sub thread adjusting device that supplies upper thread to the thick part A between the independently operating function switch's dual tension L and R.
- After the sewing with height difference is done, manually adjust the tension of the sub thread adjusting device to return to default value in case of basic specifications, and press the dual tension L, R button to reduce the upper thread tension in case of the optional specifications.



[Fig. 4-32]

4.13) Method for Adjustment of a Potentiometer

■ **How to set**

No	How to operate	Screen display	Details
1	Turn on the power		• Sewing initial screen
2	Press PROG button, then press A button while holding down PROG button to change screen		• Initial screen for parameter group A
3	Press E and F button to move to parameter number 27		• P1 setting screen for group A item 27
4	Set the the adjustment dial for mutual overlapping portion of presser foot to 3.5[mm] and press the ENTER key then the screen is automatically changed with the buzzer sound.		• P2 setting screen for group A item 27
5	Set the the adjustment dial for mutual overlapping portion of presser foot to 4[mm] and press the ENTER key then the screen is automatically changed with the buzzer sound.		• P3 setting screen for group A item 27
6	Set the the adjustment dial for mutual overlapping portion of presser foot to 4.5[mm] and press the ENTER key then the screen is automatically changed with the buzzer sound.		• P4 setting screen for group A item 27
7	Set the the adjustment dial for mutual overlapping portion of presser foot to 5[mm] and press the ENTER key then the screen is automatically changed with the buzzer sound.		• P5 setting screen for group A item 27
8	Set the the adjustment dial for mutual overlapping portion of presser foot to 5.5[mm] and press the ENTER key then the screen is automatically changed with the buzzer sound.		• P6 setting screen for group A item 27
9	Set the the adjustment dial for mutual overlapping portion of presser foot to 6[mm] and press the ENTER key then the screen is automatically changed with the buzzer sound.		• P7 setting screen for group A item 27
10	Set the the adjustment dial for mutual overlapping portion of presser foot to 8[mm] and press the ENTER key then the screen is automatically changed with the buzzer sound.		• Set Completion
11	After setting is complete, push PROG button to go back to the initial screen		• Sewing initial screen

▶When setting each step of P1, P2 and P3, be sure to press PROG button to save the set value. Otherwise, the set value will not be saved.

▶If you turn off the power before completing step 10, you will have to start over again.

▶The set value of the Potentiometer will be erased if you initialize. Initialize only when it is necessary. Remember that you have to reset the Potentiometer after initialization.

▶If the potentiometer connector is not connected or the cabel is broken, the number in □□ display area remains fixed.

■ **Relation between presser foot lifting amount and maximum speed of the sewing machine**
(page 11. ⊙speed Will have to refe)

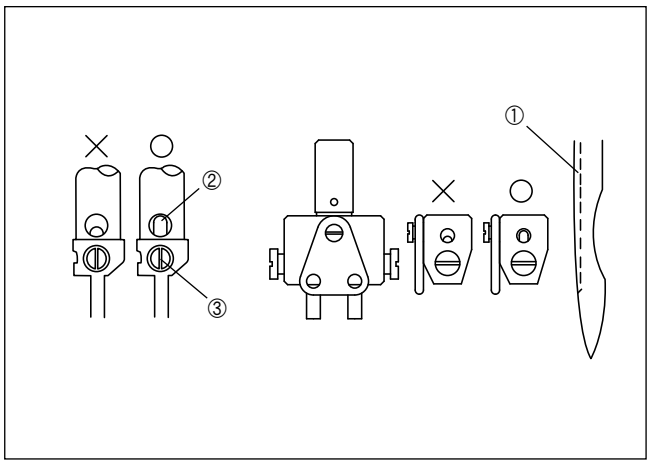
5

Preparations for sewing

5.1) Installing needle

> Caution
>
> Always turn off the power when mounting a needle.
> If the pedal is accidentally stepped, the machine might unexpectedly operate, causing injury.

1) Turn the pulley of machine to raise needle bar to its highest position.
2) Unfasten the fixing screw③.
3) Place the long groove of the needle① to the opposite direction of fixation screw③ and push it into the end of inside as shown in the figure② then tighten the screw③.



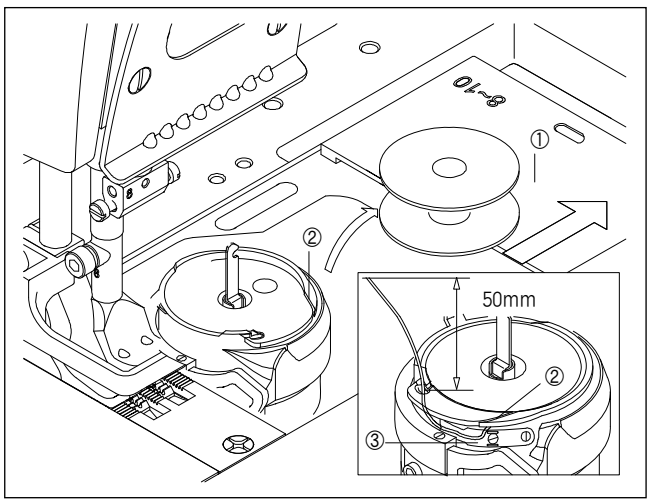
[Fig. 5-1]

5.2) Bobbin Insertion and Removal

> Caution
>
> Make sure to turn off the power switch when removing the bobbin case.
> If the pedal is accidentally stepped, the machine might unexpectedly operate, causing injury.

5.2.1) Bobbin Removal

- Turn the sewing machine pulley to place the needle above the needle plate.
- Open the sliding plate ① and vertically erect the flaps holding the bobbin.
- Remove the bobbin from the bobbin case using tweezers.



[Fig. 5-2]

5.2.2) Bobbin Insertion

Take out the lower thread from the bobbin through the thread passage② and below the tension spring plate③, and make the loose lower thread length 50mm.

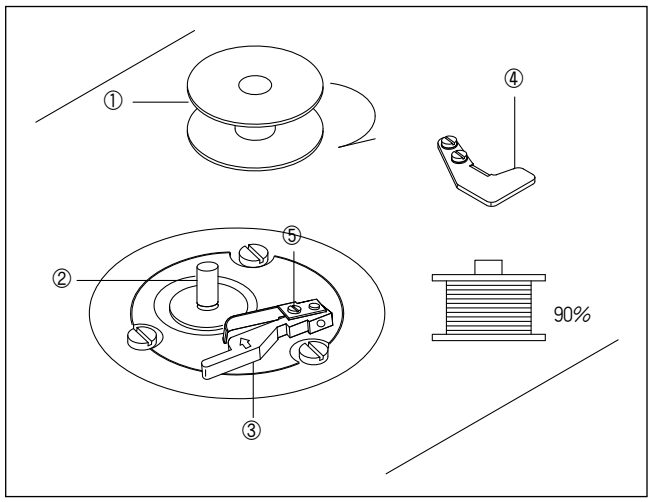
Bobbin can be inserted in the reverse order of the bobbin removal.

5.3) Winding lower thread

Caution

Make sure not to touch or press down parts that are operating or moving during thread winding.
Failure to follow the safety rules may result in physical injuries or mechanical damages.

1) Turn on the power switch.
2) Insert bobbin① into bobbin winder shaft②.
3) Wind thread on bobbin① several times in the arrow direction.
4) Push bobbin operating plate③ in the direction of bobbin.
5) Raise presser bar with presser bar lifter.
6) When pressing pedal, the machine starts to operate and thread winds on bobbin.
7) When thread winding is done, bobbin operating plate ③ returns automatically.
8) Remove bobbin and cut thread with bobbin winder knife④.
   ※ To adjust the amount of bobbin winding, loosen screw⑤ and adjust bobbin winder adjusting plate ③.



[Fig. 5-3]

Caution

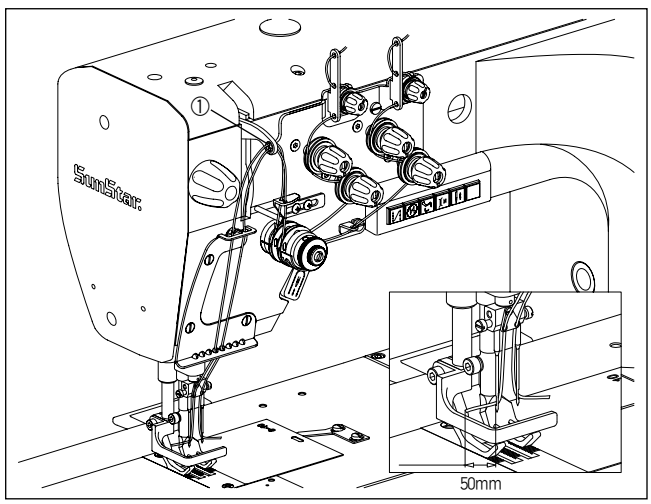
Make sure that thread should be regulated to wind 90% of bobbin capacity.

5.4) Inserting upper thread

Caution

Always turn off the power when inserting upper thread.
If the pedal is accidentally stepped, the machine might unexpectedly operate, causing injury.

1) Place the thread take-up ① at its the highest position by turning pulley before inserting the upper thread.
2) The adequate length of upper thread extending from the needle hole is 50mm.



[Fig. 5-4]

6

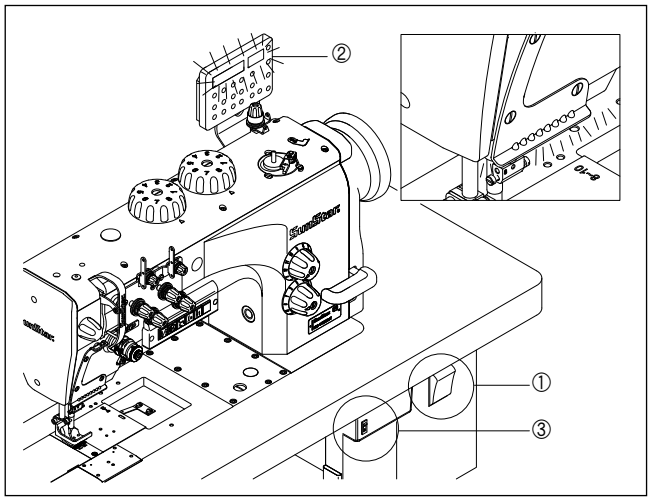
Sewing

Caution

- Wear protective gears for safety. Operation without them may lead to physical injuries.
- Turn off the machine in the following situations.
  If the operator mistakenly steps on the pedal with the plug in, the machine will start automatically and can cause severe injuries.
  - When inserting upper thread
  - When replacing bobbin or needle
  - When the machine not in use or the operator leaving the work place.

6.1) Sewing

1) Press ON button of power switch ①.
2) Lamp on the control panel ② turns on and machine is ready to operate.
3) Control sewing conditions by using control panel ②. (See user's manual of Fortuna IV.)
4) When the button ③ is pressed to LED On, LED lamp blinks.
5) Step on the pedal to operate.



[Fig. 6-1]

6.2) Adjusting thread tension

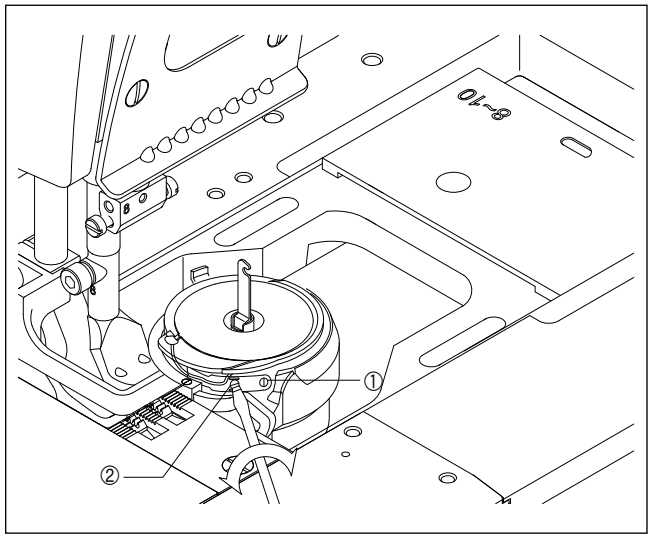
Caution

When inserting and removing bobbin case, make sure to turn off the power switch.
If the pedal is accidentally stepped, the machine might unexpectedly operate, causing injury.

Sewing Type	Cause	Troubleshooting
	Good sewing in balance	
	Upper thread tension is too weak Lower thread tension is too strong	Make upper thread tension strong or make lower thread tension weak
	Upper thread tension is too strong Lower thread tension is too weak	Make upper thread tension weak or make lower thread tension strong

6.2.1) Tension adjustment of the lower thread

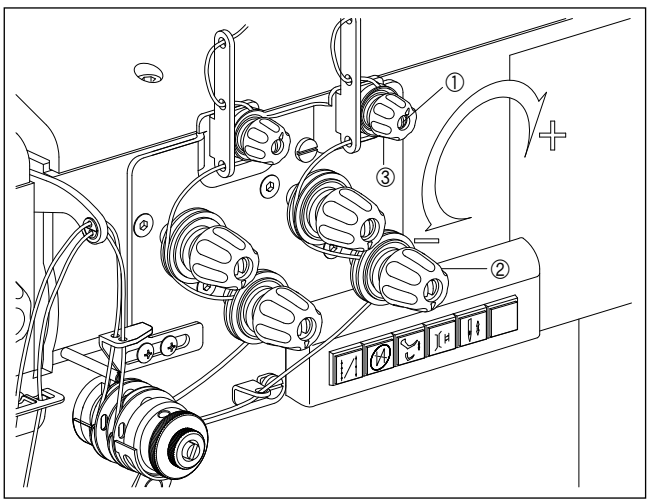
If you turn screw② on the spring plate① mounted in hook in a clockwise direction, the lower thread tension will become stronger and when turned in a counterclockwise direction, weaker.



[Fig. 6-2]

6.2.2) Thread Trimming Sub Thread Tension Adjusting Device

The tension of thread trimming sub thread tension adjusting device① should be set lower than the tension of main thread tension adjusting device②. Turn the nut③ in a clockwise direction to increase the tension and turn it counter-clockwise to decrease the tension.



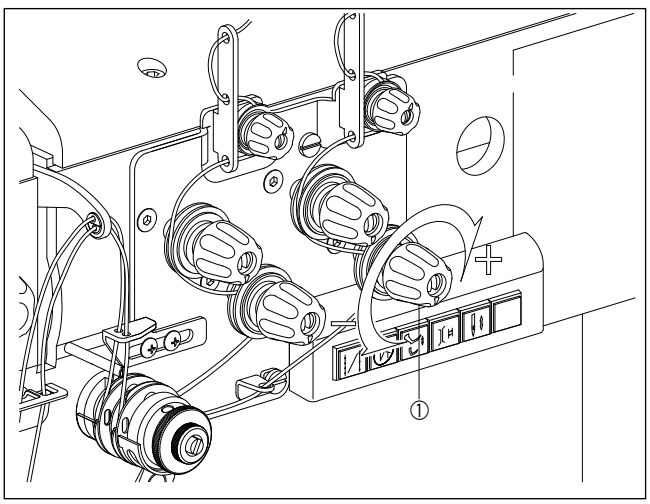
[Fig. 6-3]

Caution

Readjust the tension of main thread tension adjusting device② after adjusting thread trimming sub thread tension adjusting device.

6.2.3) Main thread adjusting device

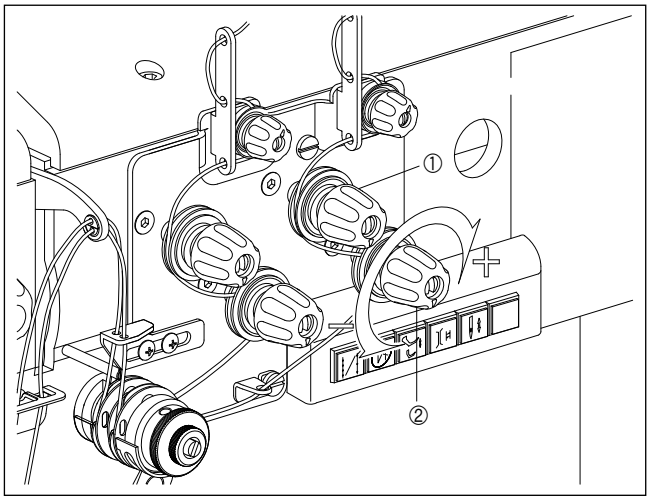
1) The tension of the main thread adjusting devices ① should be set at the minimum as possible.
2) Loops should be created at the center of the sewing material. Make sure that thread break does not occur on the ultra light material due to strong thread tension.
3) Adjust the main thread adjusting devices① to create stitches at regular length. When the nut is turned clockwise, the tension increases. When the nut is turned counter-clockwise, the tension weakens.



[Fig. 6-4]

6.2.4) Supplementary thread adjusting device

1) The supplementary thread adjusting devices① play a supplementary role in strengthening thread tension in a prompt manner.
2) The tension of the supplementary thread adjusting devices① should be set lower than that of the main thread adjusting devices②. The tension can be turned on/off with the functional switch.
3) The tension of the supplementary thread adjusting device gets stronger when it is turned clockwise. It gets weaker when the device is turned counter-clockwise.

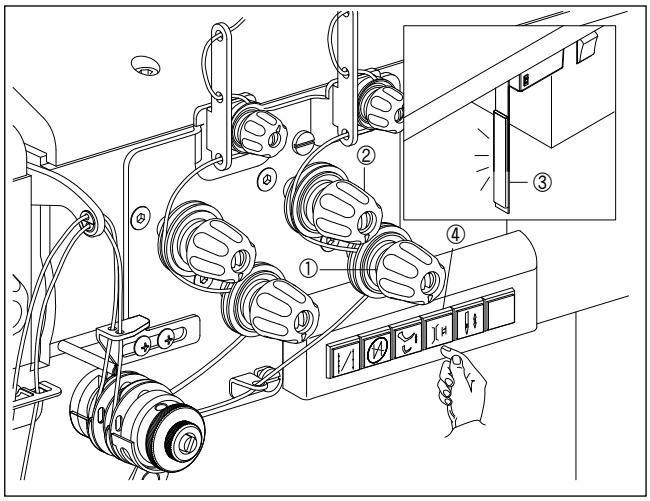


[Fig. 6-5]

6.2.5) Operation of thread adjusting device

The main and supplementary thread adjusting devices①,② are automatically in operation.

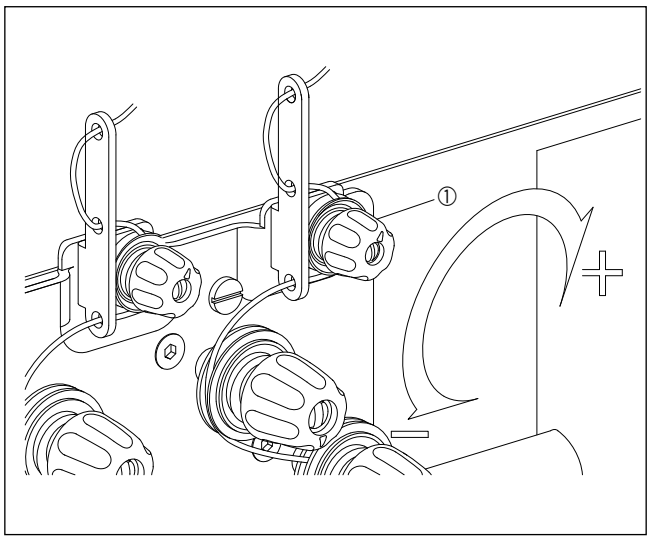
※ When trimming or auto presser bar lift③ is activated, the tension of the main and supplementary thread adjusting devices is released. The supplementary thread adjusting devices② can be turned on/off with the functional switch④.



[Fig. 6-6]

6.3) Adjusting upper thread length after trimming

1) During thread trimming, only the tension of sub thread tension adjusting device① works not the tension of main device.
2) The adequate length of upper thread after trimming is 50 ~ 60mm.
3) Strengthen the tension of thread trimming sub thread tension adjusting device① to shorten the upper thread of the needle after trimming and vice versa.

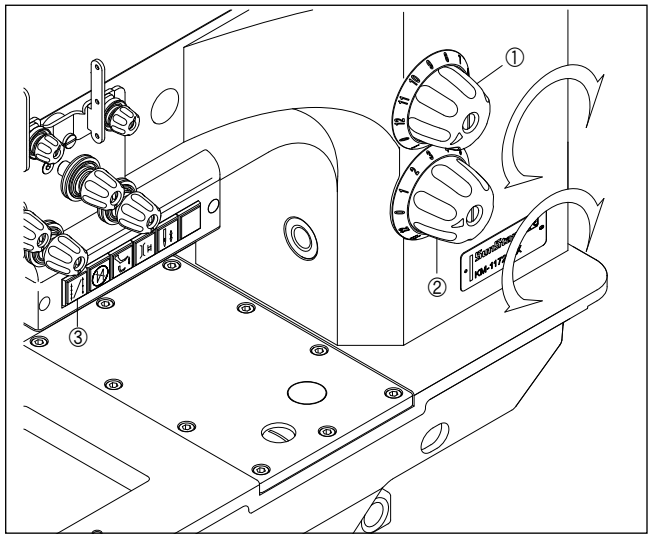


[Fig. 6-7]

6.4) Adjustment of the stitch length

Adjusting dial① and ② designed to control the stitch length can be set up with two different lengths, and change the stitch length whenever switch③ is pressed down. After pressing down switch ③ to turn the switch on, the sewing machine will carry out sewing at the stitch length as set on dial②. When pressing down switch③ again to turn the switch off, the machine will start sewing at the stitch length as set on dial①.

④



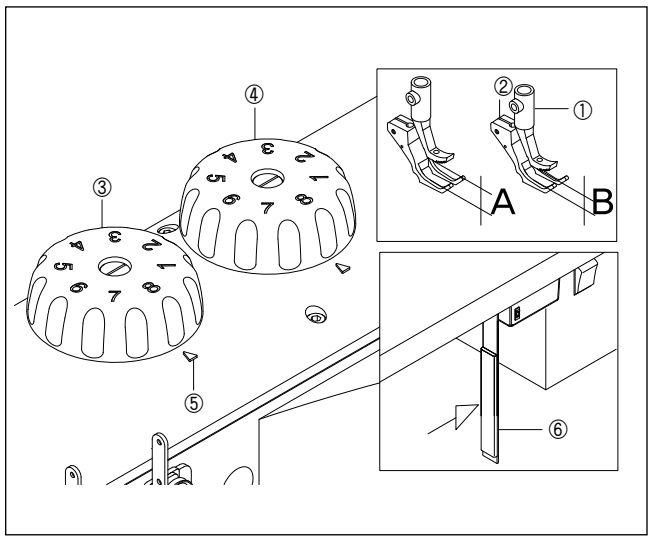
[Fig. 6-8]

Caution

- The set value of the stitch length dial② should be always lower than the set value of the dial①. Please beware of damage on the parts when turning the dial by force to set the value of the dial② at the higher level of the dial①.
- The function of the stitch length dial② is available only for trimming type machines. Stitch length dial ① is installed for non-trimming types.

6.5) Adjustment of Presser Foot Lift

The overlap between the main presser foot① and the sub presser foot② could be set at 1~8mm using the climb dials③, ④ which adjust the presser foot lift. Place the desired numbers of the climb dials③, ④ at the punched mark⑤, and the main presser foot① and the sub presser foot② overlap according to the set value. In addition, during the sewing process when the hem height difference is high, the lap switch⑥ can be used. When the lap switch is pressed, the set value at the dial ④ becomes the overlap value of the presser feet. When the lap switch is pressed once again, the overlap value is converted back into the value of the dial③.

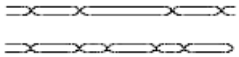
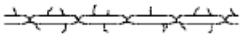


[Fig. 6-9]

Caution

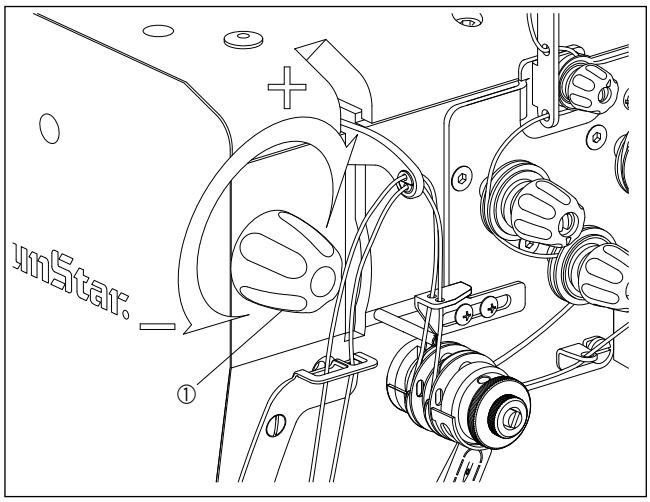
The set value of the stepped pulley control dial④ should be always higher than the set value of the dial ③. Please beware of damage on the parts when turning the dial by force to set the value of the dial④ at the higher level of the dial③.

6.6) Adjustment of Presser Foot Pressure

Stitch Type	Cause	Solution
	Balanced good stitch	
	Stitch skipped, inconsistent stitch length	Increase pressure
	Puckering	Decrease pressure

6.6.1) Presser Foot Pressure

1) Adjust the presser foot pressure to remain weak if possible (to the extent that the sewing fabric is slipped away)
2) Turn the pressure adjusting dial① to adjust the presser foot pressure.
3) When the dial is turned clockwise, the pressure gets stronger. Otherwise, the pressure gets weaker.



[Fig. 6-10]

7

Inspecting and checking

Caution	To maintain proper performance of machine and use it for a long time, clean machine regularly according to the following way. Evan when machine is not in use for a long time, clean according to the following way before using the sewing machine.

Caution	• Turn off the power switch before operation. Pressing pedal by mistake may operate machine and result in injuries. • When handling lubricants, wear protective glasses or gloves to prevent lubricant from contacting with your eyes or skin. Wash your hands in running water with soap when they are smeared with lubricant. If lubricant is in the eye, instantly wash it with running water and see a doctor. • Never drink lubricants since they can cause vomiting or diarrhea. Go to see a doctor, if you mistakenly drink lubricant. • Keep the oil out of the reach of children. Keep the oil away from heat. • Use both hands when bending the machine backwards or returning it to the original position. Using only one hand can lead to severe hand injuries due to the weight of the machine.

7.1) Regular Check Points

1) Cleaning, lubrication, and grease supply for particular areas should take place on a regular basis to keep the machine at the best conditions.
2) Check the tension of each driving belt.
3) When the regular checks are not properly performed, the following problems might result.
   - Abnormal abrasion of the oiled parts due to the lacking supply of lubricant and grease
   - Abnormal operation due to the dust and foreign materials stuck around the driving parts
4) If the machine was left unused for a long time, resume its operation after cleaning and maintenance activities.

NO	Checklist	Interval of inspection
1	Around the Hook, Thread trimming, Needle plate, Feed dog cleaning(fluff, thread, a piece of cloth)	Everyday
2	Check the oil amount(changer box, oil pan)	Everyday
3	Check the oil flow at the front side of arm	Everyday
4	Check hook lubrication	One/week
5	Check V-belt (Non-trimming model) tension	One/week
6	Check the air-pressure regulator Level(water level)	Everyday
7	Check oil leak of the machine	One/month

7.2) Cleaning

7.2.1) Cleaning Frequency and Method

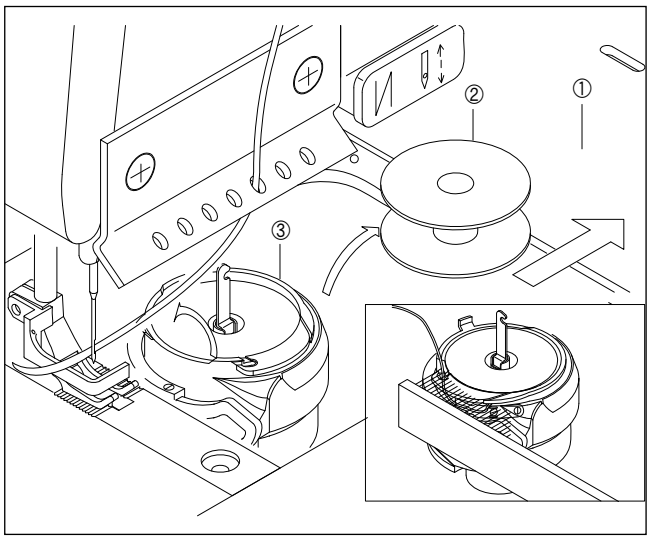
Caution	1) Make sure to turn off the power of the machine before cleaning. 2) The parts disassembled for cleaning should be assembled in the reverse order of disassembly.

NO.	Required Parts for Cleaning	Cleaning Frequency
1	Around Hook	Daily
2	Thread take-up lever / thread tension adjusting device	Once a week
3	Around of moving blade and fixed blade (Please remove dust on the moving and fixed blade under the needle plate with air.)	Three times a week
4	Treatment of Waste Oil	Once a month

7.3) Daily Cleaning

7.3.1) Cleaning

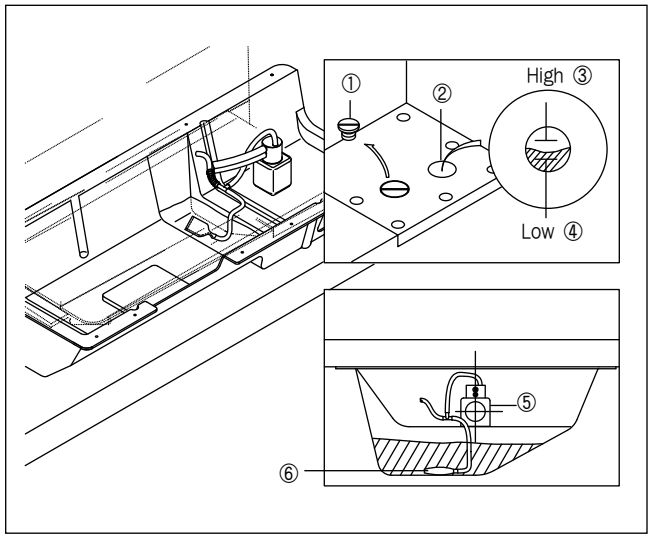
1)Set the needle at the top.
2)Open the slide plate① and separate the bobbin② from the hook③.
3)Remove dust from the hook③ with soft cloth or brush and check the damage at the hook.
4)After cleaning install the bobbin② to hook③.



[Fig. 7-1]

7.3.2) Oil Supply

1) Oil Volume Check
   - Look at the oil window② on the bed cover. When the oil is at the “HIGH” mark③, it means oil is sufficient.
   - If oil is below the “LOW” line ④, supply more lubricant following the order below.
2) Oil Supply
   - Use the authentic SunStar lubricant. (Lubricant can be found in the accessory box).
   - Loosen the oil supply entrance screw ①.
   - Supply lubricant until the oil reaches the “HIGH” line ③ on the oil window of the bed cover. Make sure that lubricant does not overflow.



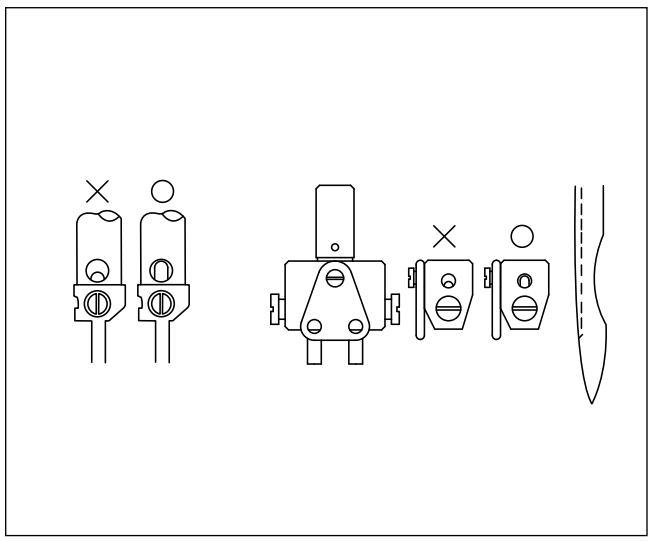
[Fig. 7-2]

Caution

1) Make sure that lubricant does not move above the “HIGH” line ③. If not, lubricant might leak. When oil supply is completed, tightly fasten the oil tank entrance screw ①.
2) When the sewing machine sits on the table safely, please pay attention to make the oil tank⑤ is perpendicular. If it leans to one side, oil might leak out.
3) Please make sure that the reflux filter⑥ is on the groove of the oil pan. Otherwise, oil cannot be properly inhaled.

7.3.3) Checking

1) If the needle is deformed or the edge is damaged, replace the needle with new one. (See 5-1 Needle Installation)
2) Check if upper thread is inserted correctly. (Refer to 5.4 Inserting upper thread)
3) Run trial sewing.



[Fig. 7-3]

8

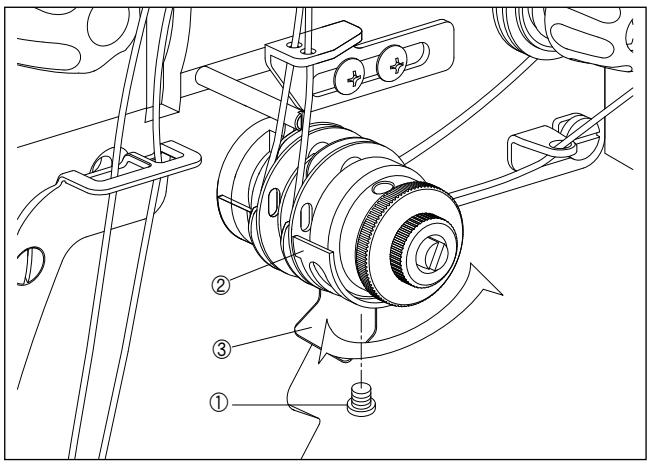
Maintenance and repair

Caution

- For machine maintenance and repair, consult with qualified technicians.
- For electrical maintenance and repair, consult with qualified technicians or agencies.
- When safety devices are disassembled, make sure to return them to original positions.
- Use both hands when bending the machine backwards or returning it to the original position. Using only one hand can lead to severe hand injuries due to the weight of the machine.
- Turn off the switch and pull the plug. Pressing pedal by mistake may result in physical injuries.
  - Inspection, maintenance, repair
  - Exchanging expendable parts such as needle, hook, knife.
  - Adjusting hook oil flow
- In case you operate the machine when the power is on, please take special precaution.

8.1) Adjustment of Thread Take-up Lever Spring

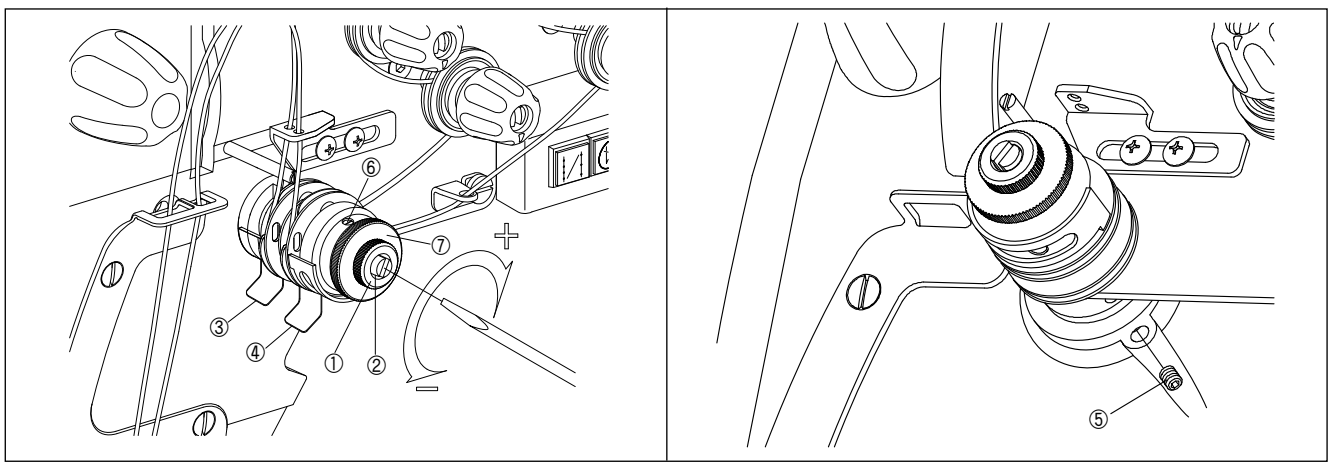
1) Loosen the stopper tightening screw① as in the figure and turn the thread take-up spring stopper② counterclockwise. Then the operating scope of the thread take-up lever spring③ becomes narrower. Otherwise, the operating scope becomes wider.
   ※ The standard operating scope of the thread take-up lever is 5~10mm.



[Fig. 8-1]

2) Adjusting Tension of Thread Take-up Spring A
   Loosen the thread tension adjusting device shaft nut① and fixation screw⑤, turn the groove of thread tension adjusting device shaft② with driver in a clockwise direction to decrease the tension of thread take-up spring③ and turn it counter-clockwise to increase the tension.

3) Adjusting Tension of Thread Take-up Spring B
   Loosen the fixation screw⑥ and turn the adjusting collar⑦ in a clockwise direction to decrease the tension of spring④ and turn it counter-clockwise to increase the tension.

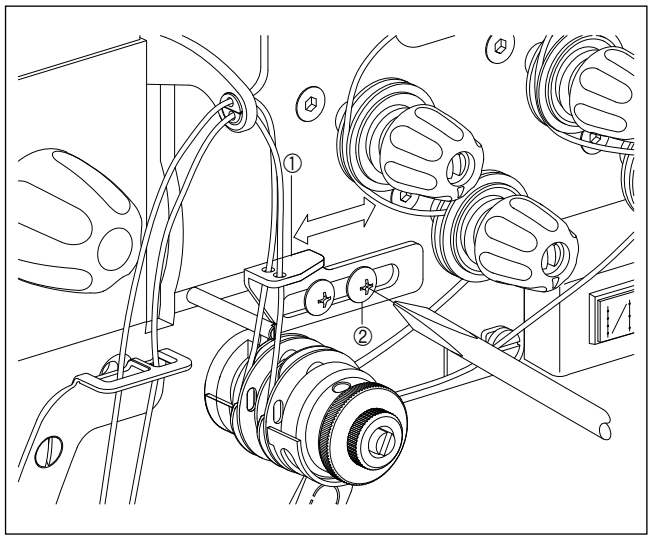


[Fig. 8-2]

8.2) Adjustment of Thread Guide on Thread Adjusting Device

When the two tightening screws ② are at the center of the thread guide ① on the thread adjusting device, this is a standard position.

1) Loosen the tightening screw ② and move the thread guide ① on the thread adjusting device left or right.
2) During stitching thin materials, move the thread tension adjusting device thread guide① to the left side. (The amount of thread at the thread take-up lever increases.)
3) During stitching heavy materials, move the thread tension adjusting device thread guide① to the right side. (The amount of thread at the thread take-up lever decreases.)



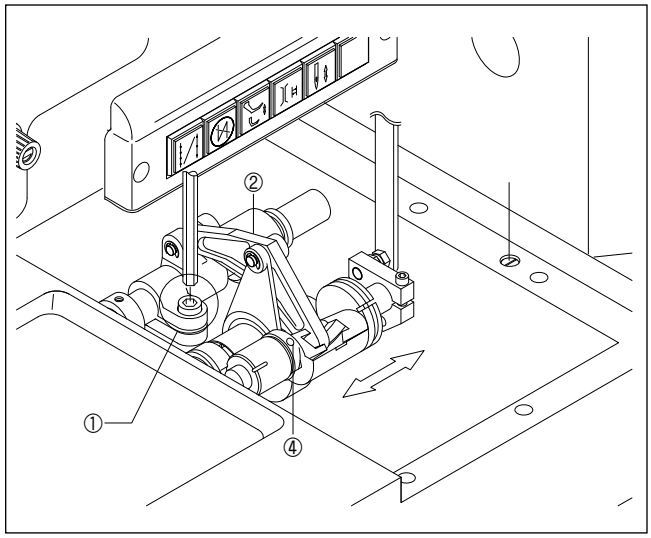
[Fig. 8-3]

8.3) Adjustment of Feed Dog Position.

8.3.1) Feed Dog Position When Stitch Length is 0

When stitch length is 0, the feed dog's feed is 0. In this case, if the feed dog's feed is not 0, please perform the follow setting.

1) Open the bed cover.
2) Loosen the horizontal crank fixing screw① and turn the upper shaft pulley. Check if the switch connection rod② moves, when the upper shaft pulley is turned.
3) When the switch connection rod② moves, loosen the switch connection crank fixing screw③ and adjust the angle of the switch by using the angle adjusting hole of the switch④.
4) When the upper shaft pulley is turned and the switch connection rod does not move, completely fix all fixing screws.



[Fig. 8-4]

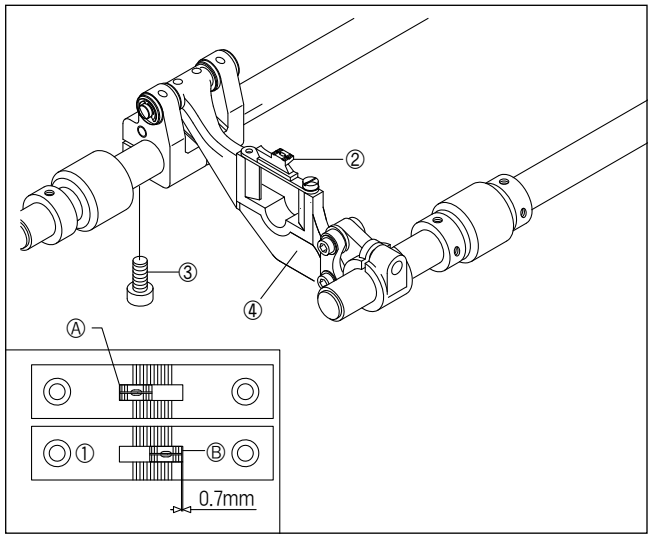
Caution

1) In the case of wrong feed adjustment, stitch length could be different when moving forward and backward.
2) Feed regulator should be fixed with feed regulator guide screw⑤ not to move it in a direction of arrow (X) because tight fixation can interfere with feed regulator's operation.

8.3.2) Feed Dog Position on Needle Plate

When the stitch length is maximum, the feed dog position② in the needle plate hole① should be identical from the front (A) and back (B) on the needle plate. The minimum figure is 0.7mm. If they are not identical, please perform the follow setting.

1) Loosen the fixing screw③ for the feed dog supporting crank④.
2) Adjust the feed dog base④ to set the distances of (A) and (B). Completely fix the fixing screw④ for the feed dog supporting crank.

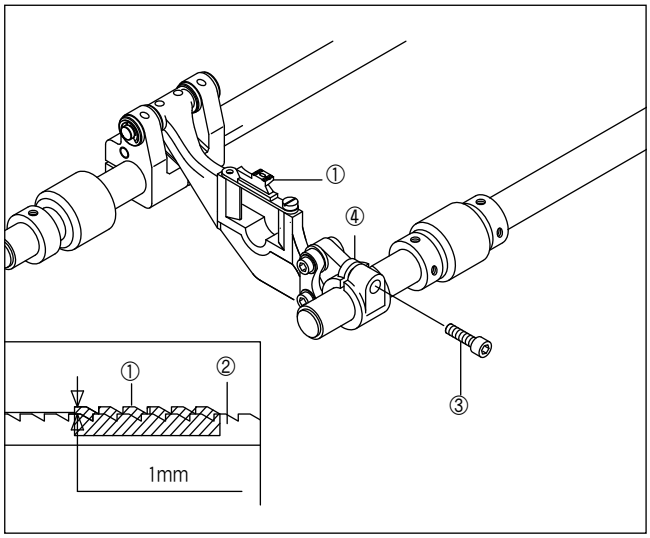


[Fig. 8-5]

8.4) Height adjustment of feed dog

Set the stitch count at the minimum and place the feed dog① at the maximum height. The normal condition is that the feed dog① is located 1mm above the needle plate②. If it is not in the normal condition, take actions as below to adjust the feed dog height.

1) Turn the upper shaft pulley of the sewing machine to place the feed dog at the highest position.
2) Lean the sewing machine backward.
3) Slightly loosen the fixing screw for the feed lift shaft crank③.
4) Turn the feed lift shaft crank④ to adjust the feed dog height to be 1mm.
5) When adjustment is completed, tightly fasten the fixing screw③.



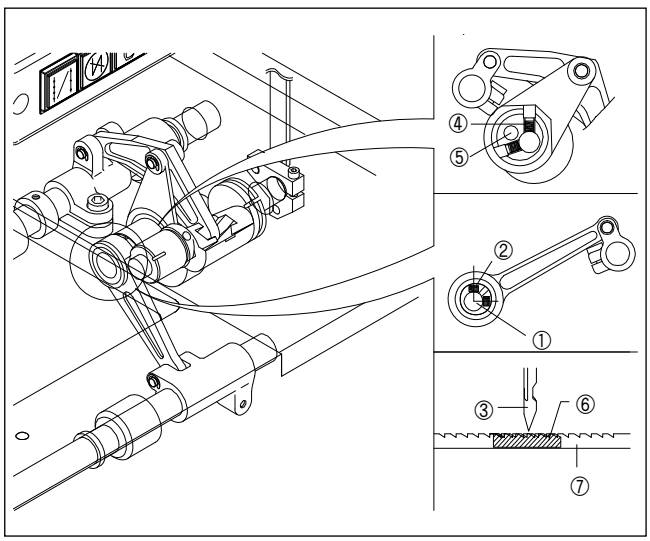
[Fig. 8-6]

Caution

When the feed lift shaft crank ④ is turned, make sure that it does not move toward the shaft.

8.5) Adjustment of feed lift shaft cam and lower feed cam

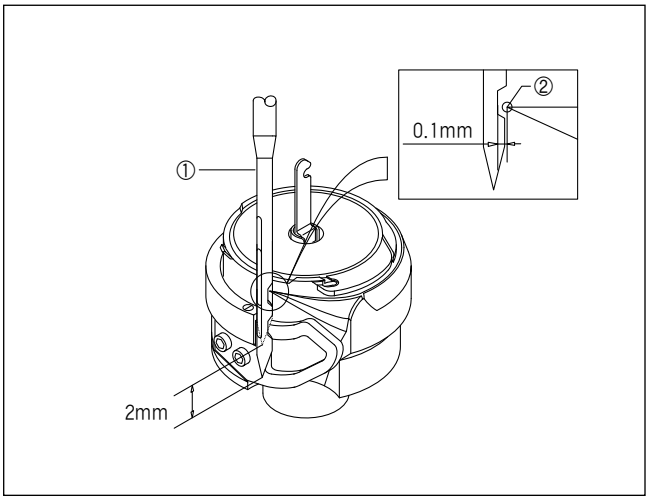
1) After setting up the stitches at the minimum, put the needle bar at the lowest position.
2) Adjust the direction of the second screw② on the feed lifting cam① to the vertical upward and tighten it firmly.
3) Lift the needle bar to the highest point.
4) Adjust the direction of the first screw④ on the lower feed cam⑤ to the vertical upward and tighten it firmly.
5) When the adjustment is made as above, the tips of the needle③ and the feed dog⑥ contact the face of the needle plate⑦.
   Otherwise, make adjustment as above following the above methods.
6) After setting up, tighten all the screws firmly.



[Fig. 8-7]

8.6) Needle and Hook Timing

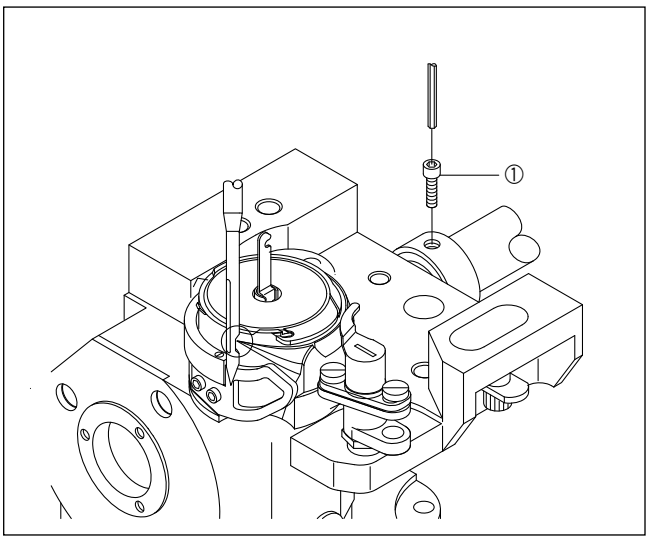
Set up the stitches at the minimum and put the needle① 2mm above the lowest position, then the blade of hook ② is in the middle of the needle(or 2/3 position downward). The appropriate distance between the needle groove and the hook edge② is 0.1mm. At this time, the hook edge② should not contact the needle ①. If the above conditions are not met, perform the following adjustments.



[Fig. 8-8]

8.6.1) Adjustment of Needle and Hook Timing

1) Disassemble the needle plate.
2) Lean the machine backward. Loosen the lower shaft collar fixing screw ① and set the needle position 2mm above the lowest position.
3) Turn the hook shaft to place the hook edge at the center of the needle and tightly fasten the fixing screw ① for the lower shaft collar.



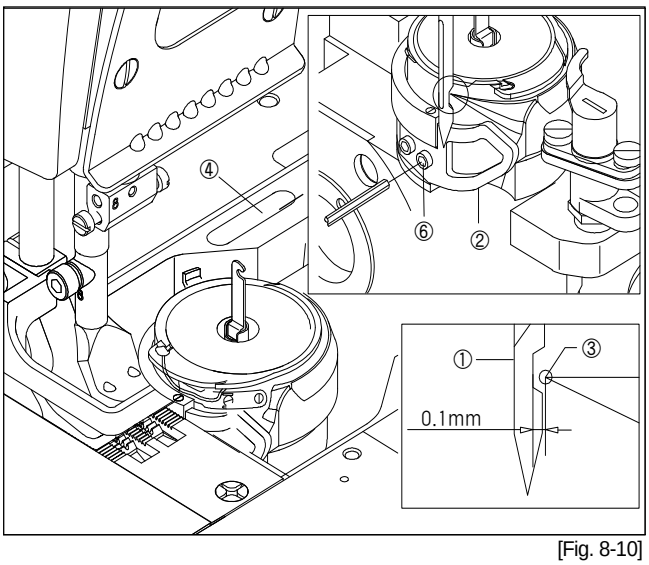
[Fig. 8-9]

8.6.2) Clearance adjustment between needle and hook

1) Loosen two hook base screws④ and lower shaft collar screw and adjust the space between the needle ① and the hook blade③ to 0.1mm by adjusting the position of the hook base.
2) Adjust the position and tighten firmly each fixed screw.

8.6.3) Adjustment of Hook Needle Guide Position

The normal condition is that the distance between the needle① and the needle guide② of the hook is 0.1 when the needle bar is lifted 2mm from the lowest point. (When the Needle Guide fixing screw ⑥ is turned clockwise, the needle ① gets away from the needle guide②. Otherwise, the needle gets closer to the needle guide).



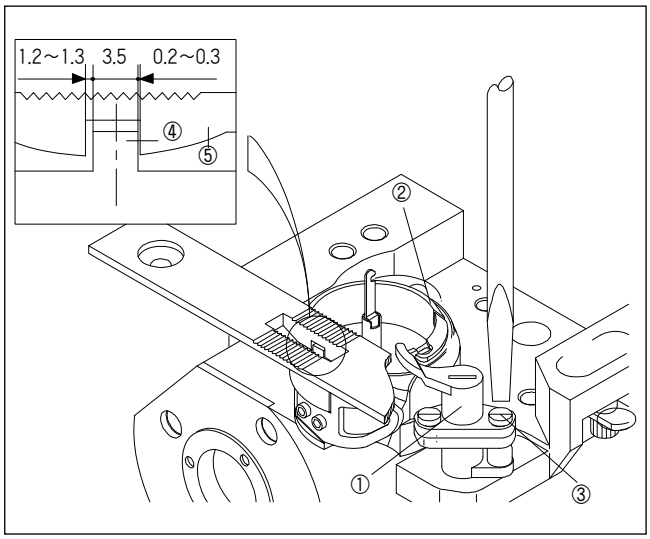
[Fig. 8-10]

Caution

When needles are replaced. Check the distance between the needle and the hook.

8.7) Clearance adjustment of hook and opener

Bring the opener① to the hook② as close as possible and loosen the fixing screw③ of the opener. Adjust the open space between hook stopper④ and the groove⑤ of the needle plate to 1.2~1.3mm then tighten the opener screw③ firmly.



[Fig. 8-11]

8.8) Lubrication adjustment of hook

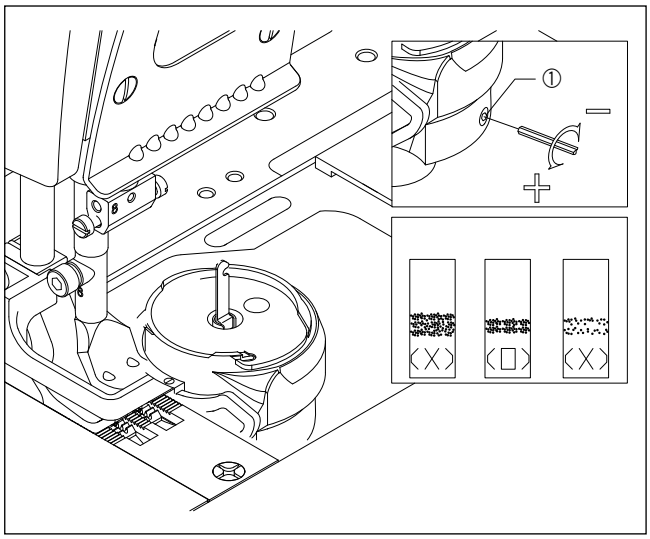
8.8.1) Checking the oil supply level of hook

After racing the sewing machine for three minutes, secure the oil flow checking paper on the right side of the hook and run the machine at a maximum speed for ten seconds. (You may use any type of paper) As shown in the figure, check the oil tape marked on the paper.

8.8.2) Adjustment of the oil supply level

Make the adjustment when the quantity of oil supply is not adequate.

a) Take off the sliding plate (left).
b) Turn the machine manually until you see the adjusting screw① for the oil supply level of the hook.
c) The amount of the oil supply will decrease when the adjusting screw① is turned in a clockwise direction, and increase when turned in a counterclockwise direction. Check the level of the oil supply after adjustment.

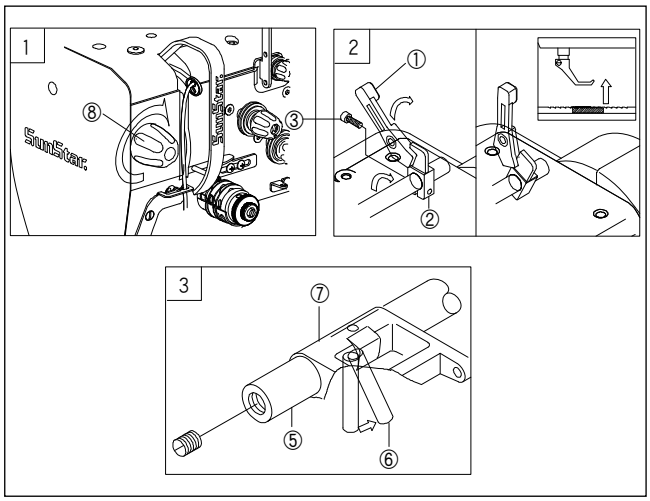


[Fig. 8-12]

8.9) Adjustment of Presser Foot Height

1) The lifting of the presser foot is 12mm(manually) and 20mm(automatically). This is the standard. How to adjust is below.

2) Adhere the pin⑥ inserted into the press bar lifting shaft⑤ to the presser bar lifting bracket⑦. After facing presser foot lifting lever① and the presser foot lifting block② closely, tighten the screw③ firmly.



[Fig. 8-13]

Caution

Please be noted that the presser bar lifting spring could be separated when the presser foot pressure adjusting dial⑧ is fully released.

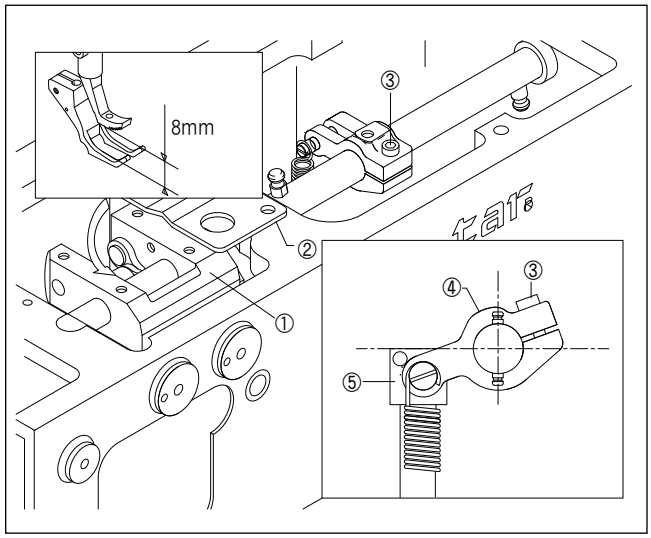
8.10) Timing adjustment of the main · auxiliary presser foot and needle

8.10.1) Adjustment of maximum ascending amount of the main · auxiliary presser foot

The maximum overlapping portion of main and sub presser foot is 8mm. First of all, set the upper cap dial to "1" and get rid of the upper cap then move the climb device body① until it gets to the stopper plate ② in the direction of the arrow.

Lift the cylinder knuckle⑤ of the climb shaft 1mm then tighten the screw③.

When the regulation ends reassembles the upper cap lid.

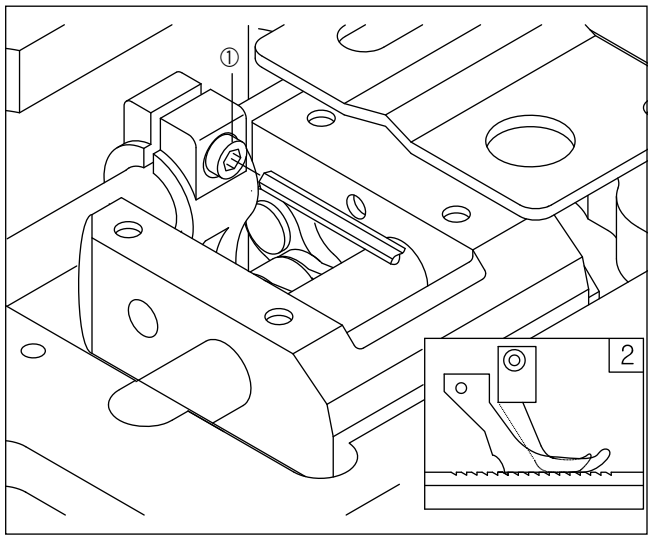


[Fig. 8-14]

8.10.2) Adjustment of lifting amount of the main · auxiliary presser foot

The height of lifting amount of the main · auxiliary presser foot must be equal. Make the adjustment as indicated below.

1) Set the presser foot overlap at the maximum.
2) Take out the rubber cap from the upper lid.
3) Loosen the clamp screw① and turn the machine until the needle tip and the upper part of the feed dog come to meet on the surface of the needle plate.
4) As in 2 above, make the main and subordinate presser feet contact the needle plate at the same time and after that, tightly fasten the tightening screw① to finish the adjustment.
5) After adjustment, place back the rubber cap on the upper lid.

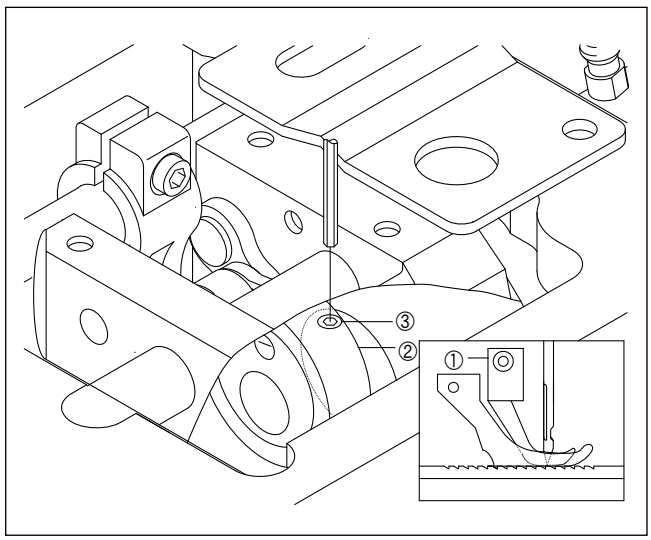


[Fig. 8-15]

8.10.3) Timing adjustment of the main · auxiliary presser foot and needle

As a standard, the needle tip enters the needle hole of the feed dog immediately after the main presser foot ① touches the feed dog. Likewise, the main presser foot① comes apart from the feed dog right after the needle tip comes out of the feed dog. Refer to the following for adjustments.

1) Disassemble the upper lid with the dial set at "1".
2) Loosen two fixing screws of vertical movement cam② of the presser foot.
3) Fit the Num. 1 screw③ of the cam② to the carving hole of the upper shaft and tighten two cam fixation screws firmly.
4) Place back the upper lid after adjustment.



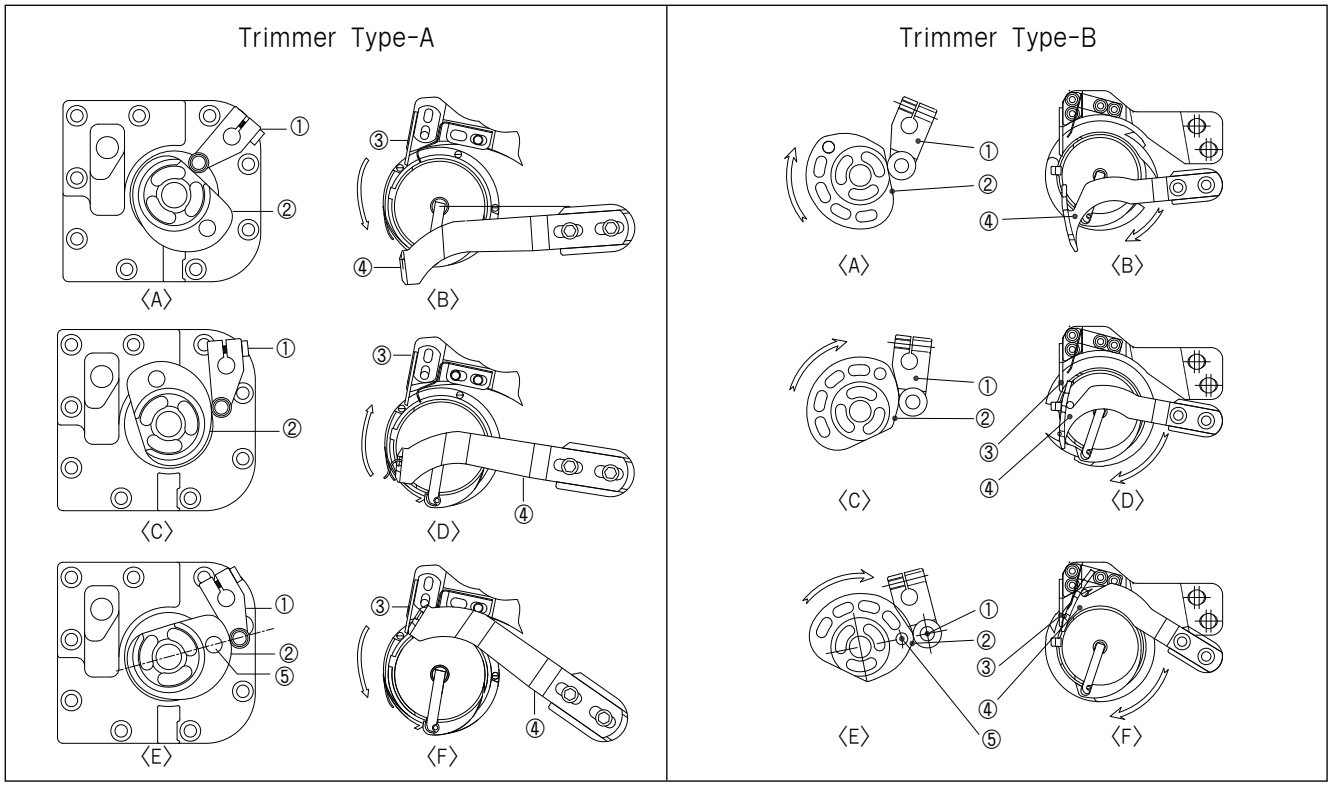
[Fig. 8-16]

8.11) Trimmer

8.11.1) Trimming Order

When the pedal is stepped backward during sewing, trimming is conducted. The following is the trimming order.

1) When a trimming signal is entered, as in Figure (A), the trimming roller lever ① is located at the lowest part of the curved line of the trimmer cam. In this case, the moving blade ④ is parted from the fixed blade ③ as in Figure (B) and conducts a rotary movement toward the opener after passing above the bobbin.
2) As in Figure (C), the trimmer cam conducts the rotary movement and the trimmer roller lever ① contacts the cam. At this moment, the moving blade ④ holds the lower and upper threads as in Figure (D), and performs rotary movement toward the fixed blade ③.
3) When the trimmer roller lever ① and the trimmer cam②'s hole ⑤ are in a line as in Figure (E), the moving blade ④ trims the thread by contacting with the fixed blade ③ as in Figure (F).

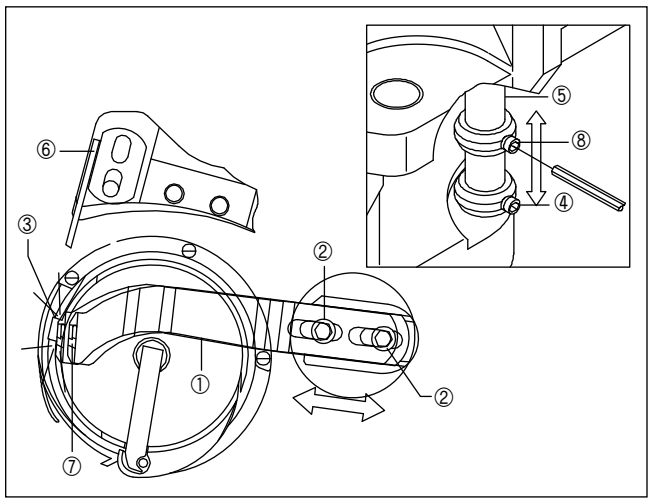


[Fig. 8-17]

8.11.2) Adjustment of Moving Blade

The moving blade① moves the upper and lower threads to the point of the fixed blade⑥. At this time, the moving blade① rotates while it does not touch the bobbin case, and trimming occurs through its contact with the fixed blade. Blades can be adjusted as follows:

1) Loosen the moving blade fixing screw② to the extent that the moving blade① has the space to move around.
2) Place the moving blade at the center of the fixed blade⑥ and the contact area with the moving blade⑦, and then tightly fasten the fixing screw ②.
3) Loosen the collar fixation screw④, ⑧ and loosen the screw of the thread trimming lever① in the [Figure 8-17].
4) Place the hole of the moving blade contact part⑦ at the center of the fixed blade⑥ and fix the collar with screw⑧ to the upper face, fix the collar with screw④ to the lower face then tighten screws firmly. As shown in the figure<E> of the [Figure 8-17], tighten the screw of the thread trimming lever①.

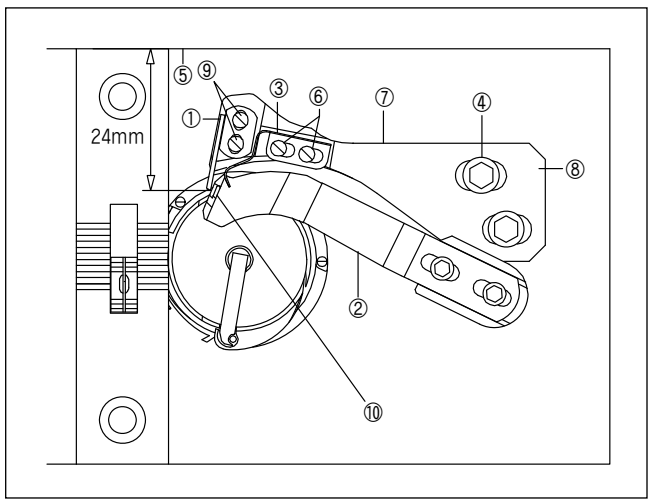


[Fig. 8-18]

8.11.3) Fixing Screw and Lower Thread Holder

When the fixed blade ① is half entered into the moving blade, trimming is conducted safely at the lowest possible pressure. At the time of trimming, the lower thread holder③ contacts the moving blade ② stably holding the lower thread. Adjustment can be conducted as follows.

1) Loosen the tightening screw④, and place the hook base⑦ and the fixing blade base⑧ closely. Fasten the tightening screw④ at the hole center. Loosen the fixing screw⑨ and adjust the distance between the slide plate guide⑤ and the fixing blade tip① at some 24mm. After that, tightly fasten the fixing screw⑨.
2) In case of the lower thread holder③, loosen the lower thread holder screw⑥ and adhere the lower thread to the inside⑩ of the blade② with small pressure not to hold lower thread too strong or too weak, then tighten the screw⑥ firmly.

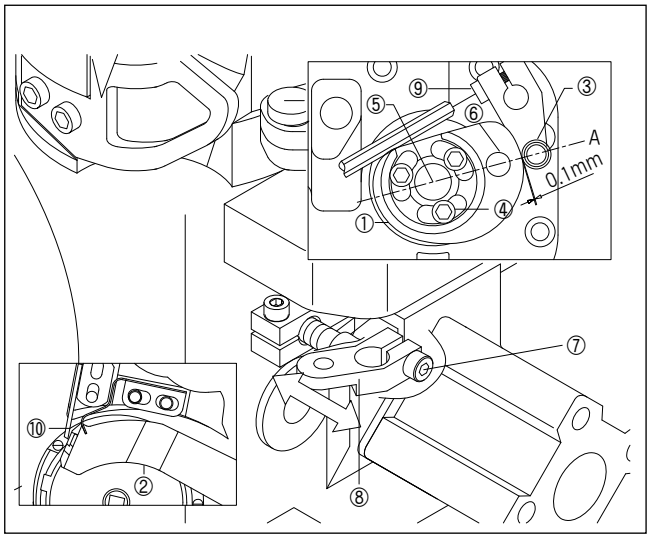


[Fig. 8-19]

8.11.4) Adjustment of Trimmer Cam and Lever

The location of the trimmer cam① is determined by the movement of the moving blade②. Upon trimming, the trimming lever roller③ contacts the lowest curved line of the trimmer cam. However, during sewing, the trimmer lever roller③ and the trimmer cam① do not contact each other. To make it sure, adjustment can be conducted as follows.

1) Loosen three trimmer cam fixing screws④ and the trimmer lever tightening screw⑨.
2) At the top of the thread take-up lever, adjust the cam to make the opener shaft center⑤, the setting hole⑥ of the thread trimming cam and the thread trimming lever roller center③ located on the same line as shown in the figure A.
   (At this moment, the position of moving blade② is on the thread trimming complete position as shown in the figure <F> of the [Figure 8-17].)
3) Tightly fasten three fixing screws④ and the trimmer lever tightening screw⑨.
4) Loosen the trimmer clamp fixing screw⑦
5) Adjust the trimmer cylinder shaft⑧ to make the moving blade② contact the fixed blade⑩ for trimming when the trimmer cylinder stroke is maximum.
6) Tightly fasten the fixing screw⑦.

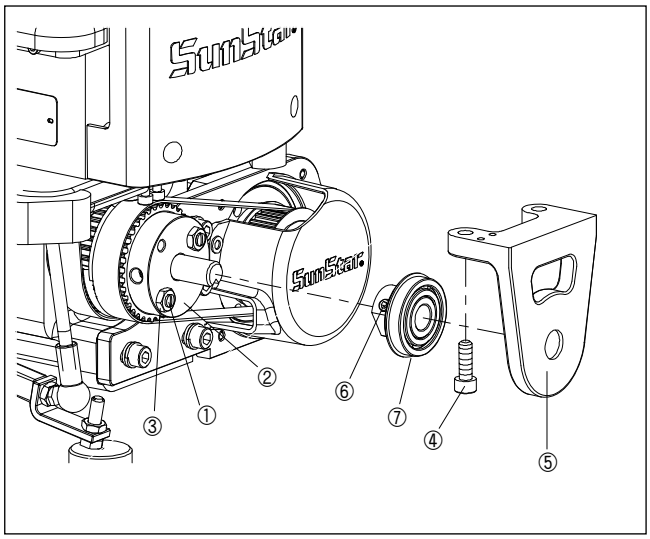


[Fig. 8-20]

8.12) Safety Clutch

The safety device for the lower shaft timing pulley ② is to prevent hook damage caused by thread winding around the hook or the setting disruption.

1) Slightly loosen two piston stopper screw nuts③.
2) When the two piston stopper screws① are turned clockwise, it increases torque, and vice versa. After torque adjustment, tightly fasten the nut③.



[Fig. 8-21]

9

Causes of troubles and troubleshooting

No	Symptom	Checkpoints	Root cause	Corrective action
1	Needle breaks	Direction and height of needle	Needle is inserted into wrong direction.	Reinsert the needle correctly.
		Needle	Needle is bent.	Replace the needle.
			Bad timing of feed dog.	Adjust the timing of feed dog.
		Ascending level of needle bar	Bad timing of needle and hook.	Adjust the timing of needle and hook.
		Height of needle	Bad timing of needle and hook.	Adjust the timing of needle and hook.
		Gap between needle and hook	Bad timing of needle and hook.	Adjust the timing of needle and hook.
2	Thread breaks	Threading method	Wrong threading.	Thread the needle correctly.
		Needle	Bent needle or broken needle tip.	Replace the needle.
		Direction and height of needle	Needle inserted in the wrong position.	Insert the needle correctly.
		Upper thread tension	Too tight upper thread tension.	Reduce tension of upper thread.
		Lower thread tension	Too tight lower thread tension.	Reduce tension of lower thread.
		Working capacity of take-up lever spring	Loose upper thread.	Adjust take-up lever spring.
3	Stitch skips	Direction and height of needle	Needle inserted in the wrong position.	Reinsert the needle in the right direction.
		Needle	Bent needle or broken needle tip.	Replace the needle.
		Threading	Thread passing at wrong position.	Replace the needle.
		Ascending level of needle bar	Wrong timing of needle and hook.	Adjust the timing of needle and hook.
		Height of needle bar	Wrong timing of needle and hook.	Adjust the timing of needle and hook.
		Gap between needle and hook	Wrong timing of needle and hook.	Adjust the timing of needle and hook.
			Remaining length of upper thread is short .	Adjust the thread adjusting device.
		Racing-proof spring of bobbin case	Due to bobbin racing during trimming, lower thread dropping from bobbin case becomes too short to go up.	Replace the racing protection spring.
		Take-up lever spring	Unable to lift lower thread due to weak take-up lever spring.	Adjust the working capacity of take-up lever spring.

No	Symptom	Checkpoints	Root cause	Corrective action
4	Upper thread does not sink.		Too tight upper thread tension.	Reduce tension of upper thread.
			Too loose lower thread tension.	Increase tension of lower thread.
5	Lower thread does not sink.		Too weak upper thread tension.	Increase upper thread tension.
			Too strong lower thread tension.	Decrease tension of lower thread.
6	Trimming errors	Tension of fixed blade	Tension not aligned between movable and fixed blades.	Adjust tension of movable and fixed blade.
		Edge of movable and fixed blades	Abrasion in blade groove of movable and fixed blades.	Replace movable and fixed blades.
		Direction of needle	Wrong needle insertion.	Reinsert the needle correctly.
		Check the crossing of trimmer cam notch mark and blade	Insufficient crossing quantity of movable and fixed blade.	Adjust the strokes of movable and fixed blades.
7	Upper thread is pulled out when sewing commences.		Too strong upper thread tension.	Adjust tension of upper thread.
			Too thick a needle for thread.	Check thickness of needle.
		Check the Up-stop position of needle	Take-up lever pulls out the upper thread because the needle up and down position is too high.	Adjust the up-stop position of needle.