



# USER'S MANUAL

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## KM-1640BL-7

Semi-direct, one-needle,  
upper & lower feed lock stitch  
machine with automatic thread  
trimmer with large hook

- 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-120911





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.**

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# Machine safety regulations




Safety instructions on this manual are defined as Danger, Warning and Notice.

If you do not follow the instructions, 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.

<p><b>1-1) Transporting machine</b></p>  <p><b>Danger</b></p>	<p>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.</p> <ul style="list-style-type: none"> <li>Ⓐ More than 2 people must transport the machine.</li> <li>Ⓑ To prevent accidents from occurring during transportation, wipe off the oil on the machine completely.</li> </ul>
<p><b>1-2) Installing machine</b></p>  <p><b>Warning</b></p>	<p>The machine may not work properly or breakdown, if installed in certain places, Install the machine where the following qualifications agree.</p> <ul style="list-style-type: none"> <li>Ⓐ Remove the package and wrappings from the top. Take special notice on the nails on the wooden boxes.</li> <li>Ⓑ Dust and moisture stains and rusts the machine. Install an airconditioner and clean the machine regularly.</li> <li>Ⓒ Keep the machine out of the sun.</li> <li>Ⓓ Leave sufficient space of more than 50cm behind, and on the right and left side of the machine for repairing.</li> <li>Ⓔ <b>EXPLOSION HAZARDS</b> Do not operate in explosive atmospheres. To avoid explosion, do not operate this machine in an explosive atmosphere 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.</li> </ul> <p>[Refer] Details for machine installation are described in 4. Installation.</p>
<p><b>1-3) Repairing machine</b></p>  <p><b>Caution</b></p>	<p>When the machine needs to be repaired, only the assigned troubleshooting engineer educated at the company should take charge.</p> <ul style="list-style-type: none"> <li>Ⓐ Before cleaning or repairing the machine, turn off the main power and wait 4 minutes till the machine is completely out of power.</li> <li>Ⓑ Not any of the machine specifications or parts should be changed without consulting the company. Such changes may make the operation dangerous.</li> <li>Ⓒ Spare parts produced by the company should only be used for replacements.</li> <li>Ⓓ Put all the safety covers back on the machine after the machine has been repaired.</li> </ul>

#### 1-4) Operating machine



KM-1640BL-7 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

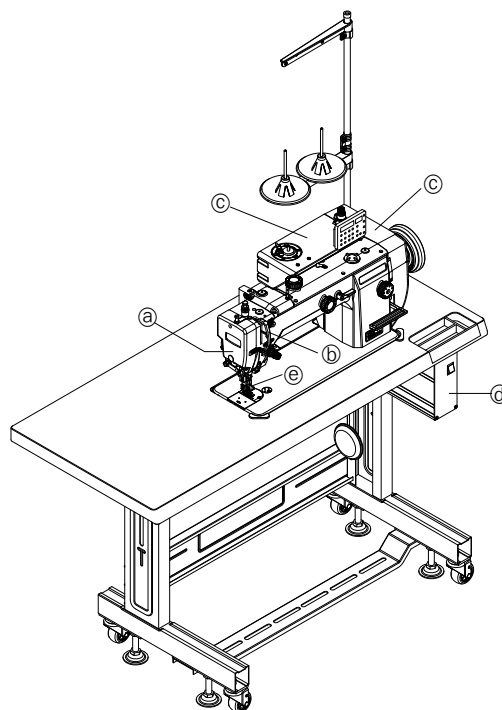
##### [ Warning ]

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

#### 1-5) Safety devices



- Ⓐ Safety label : It describes cautions during the machine operation.
- Ⓑ Thread take-up cover : It prevents any contact between body and take-up lever.
- Ⓒ Motor cover : A device intended to avoid potential risks of getting hands, feet or clothes jammed by the motor
- Ⓓ 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**  
주 의

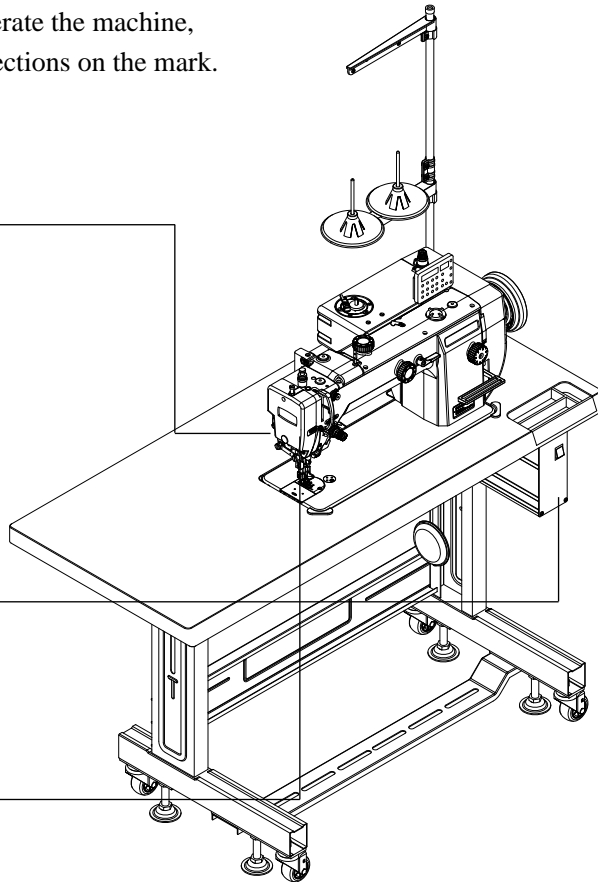
Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.  
손가락 보호대와 안전장치 없이 작동하지 마십시오.  
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

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



## 1-7) Contents of marks



### 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.

3)



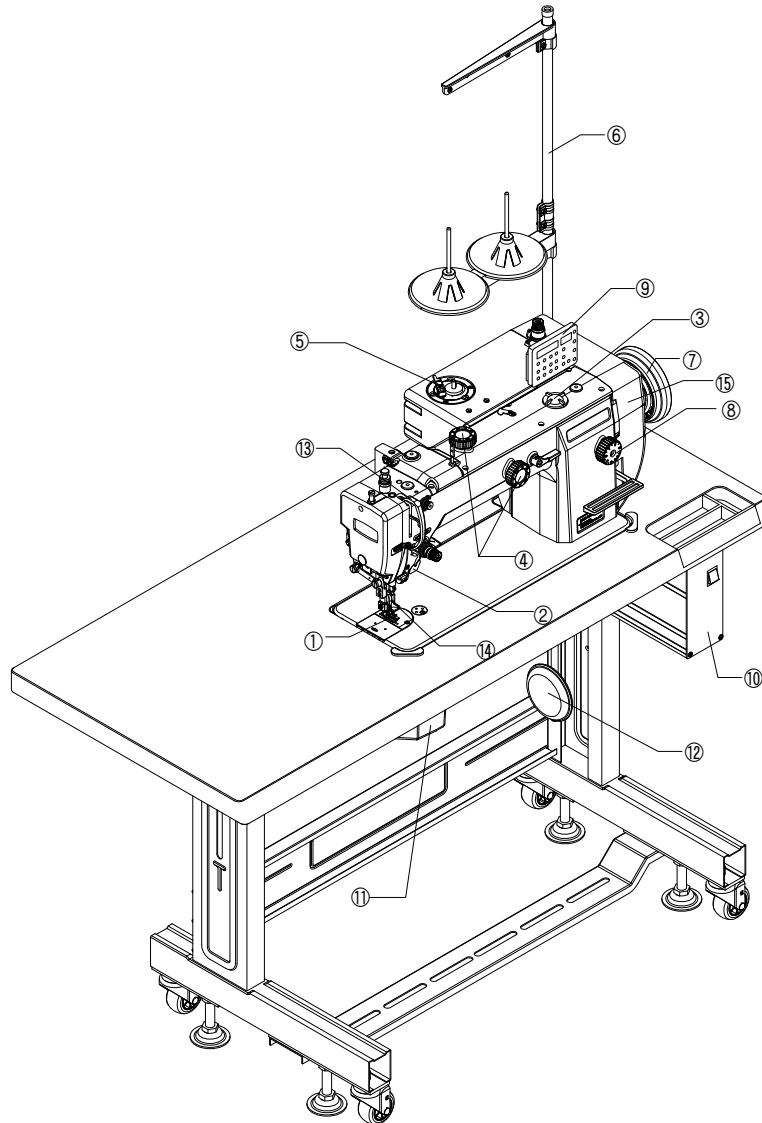
2)

**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.

# 2

## Names of main parts



[Fig. 2-1]

- |                     |                      |
|---------------------|----------------------|
| ① Presser Foot      | ② Reverse Button     |
| ③ Oil Window        | ④ Climb Dial         |
| ⑤ Thread Winder     | ⑥ Thread Stand       |
| ⑦ Pulley            | ⑧ Stitch Length Dial |
| ⑨ OP Unit and Panel | ⑩ Control Box        |
| ⑪ Oil Fan           | ⑫ Lap Switch         |

### Safety Devices

- |                              |                |
|------------------------------|----------------|
| ⑬ Thread Take-up Lever Cover | ⑭ Finger Guard |
| ⑮ Motor Cover                |                |

# 3

## Specification

### 3.1) Sewing machine

Model Name		KM-1640BL-7
Item		
Speed		Max 2,000 SPM
Max stitch length		Max 9mm
Needle		DP × 17 #22, DB × 1 #22
Thread take-up stroke		73mm
Needle bar stroke		38mm
Presser foot stroke		2 ~ 5.5mm
Presser foot ascending amount	Manual	7mm
	Auto	16mm
Hook		Vertical 2times Hook
Usage		Heavy materials
Automatic trimmer		Basic specifications
Auto Back Tack		Basic specifications
Automatic presser foot lift device		Options
Lubrication		Auto Lubrication
Main Motor		750W AC Servo motor
Power		1 Phase : 100~240V 3 Phase : 200~440V, 50/ 60HZ

### 3.2) Peripheral Automation Devices Specifications(options)

Optional device	Model	Usage
AUTO KNEE LIFTING SYSTEM	SPF-7	A solenoid operating structure where the presser foot gets lifted automatically with pedal reverse gear stage 1 operation.
PRODUCTION COUNTER	SCOUND-1	A counting device, which indicates the completed quantity on the program unit panel, including added, subtracted, corrected or remaining quantity along with other performance rates.
MATERIAL EDGE SENSOR	SEDG-1B SEDG-2B	A device that senses the edge or thickness of the sewing material to stop the machine without manual pedaling. Available in two types: SEDG-1B for edge sensing type and SEDG-2B for thickness sensing type.
STANDING PEDAL	SPDL-1 SPDL-2	An essential device when one person is operating multiple sewing machines. Has different pedals for acceleration, thread trimming, presser foot and ascending pedal. Types consist of SPDL-1 for fixed speed, and SPDL-2 for variable speed.

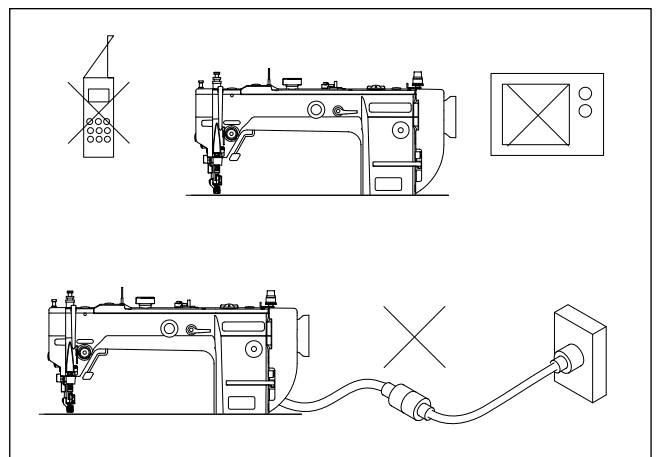
## Installation



- 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

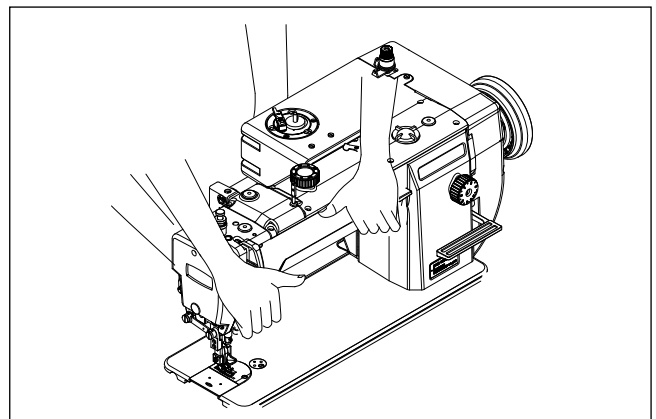
- 1) Do not install the machine near television, radio or telephone; or the operation of machine can be interfered with by the noise from the appliances.
- 2) Connect the ground (earth) wire. An unstable connection may result in malfunction



[Fig. 4-1]

### 4.2) Machine delivery

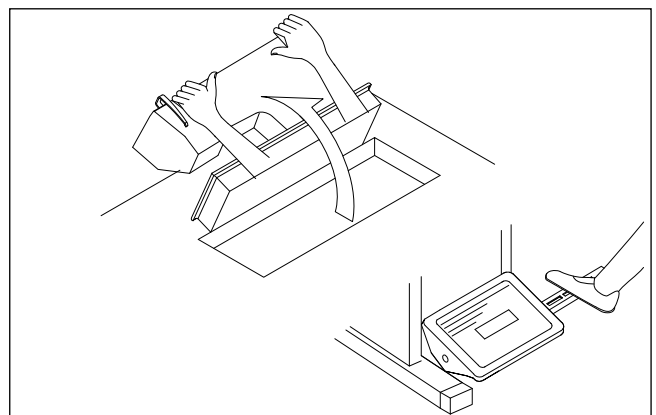
- 1) There should be two people to move the machine, as in the Figure.



[Fig. 4-2]

### 4.3) Bending the machine backwards

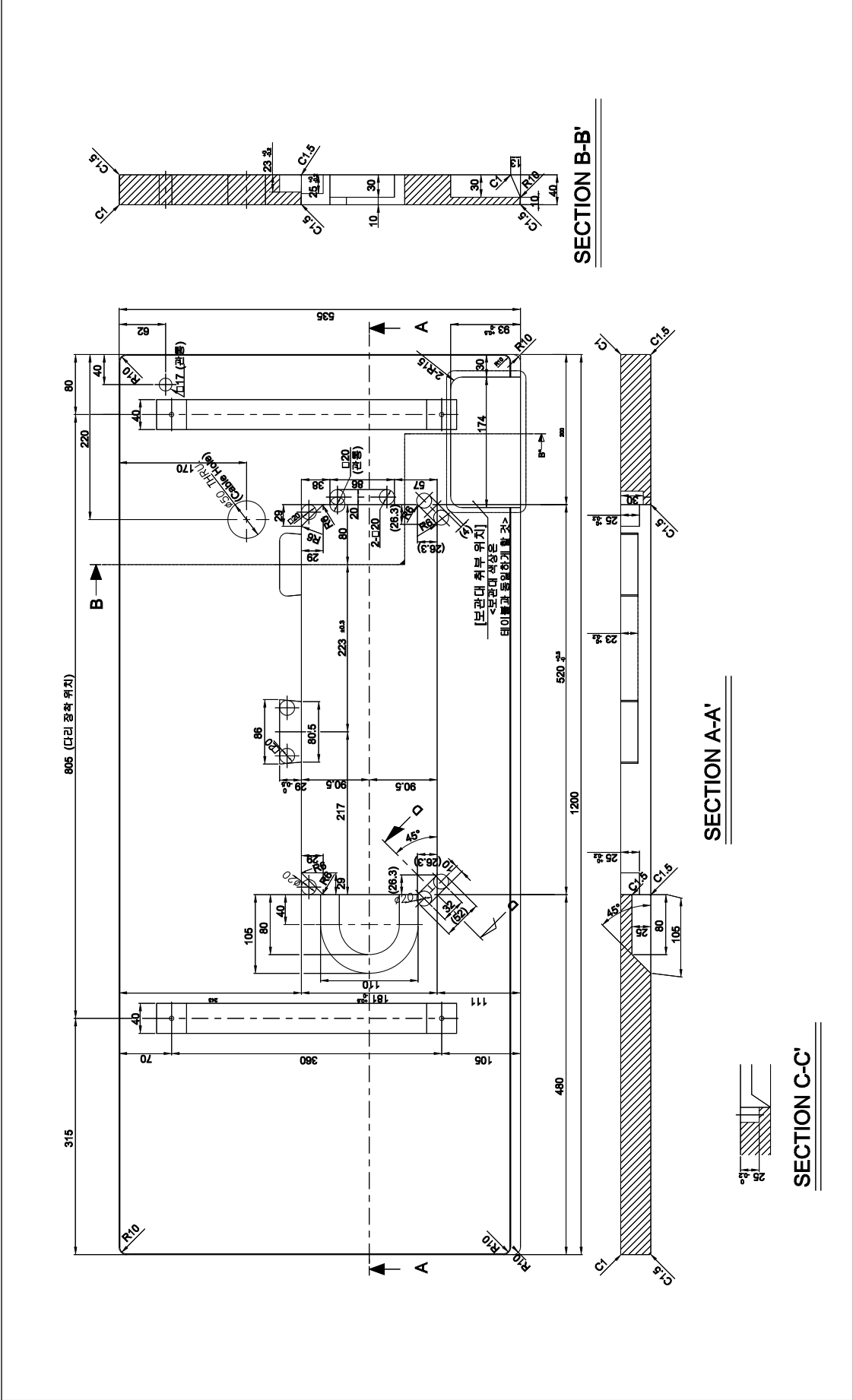
- 1) Bend the machine backwards with two hands grabbing upper part of the body. Make sure to press the lower part of the board leg of the machine, or the whole body of machine falls backwards, leading to physical injuries.



[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.

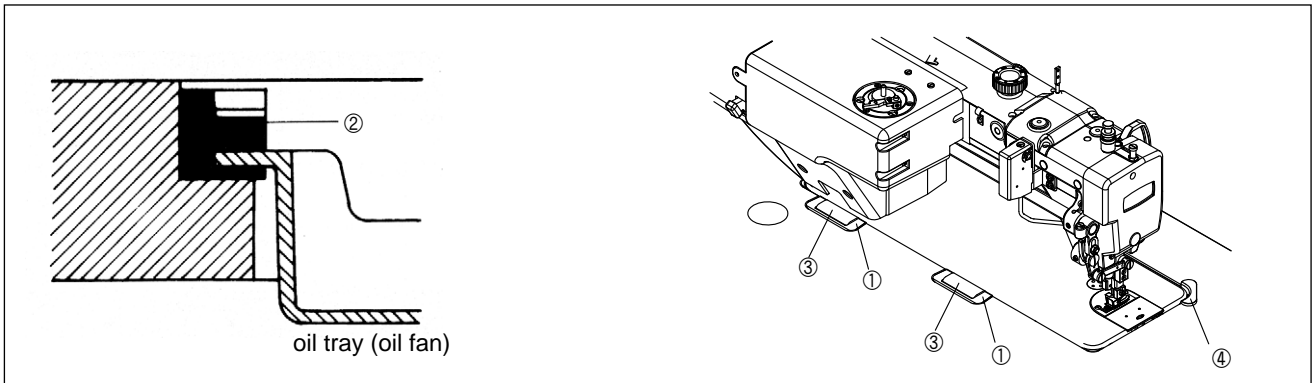


[Fig. 4-4]

## 4.5) Installation of Sewing Machine Body

### 4.5.1) Installation of Hinge, Oil Pan and Machine

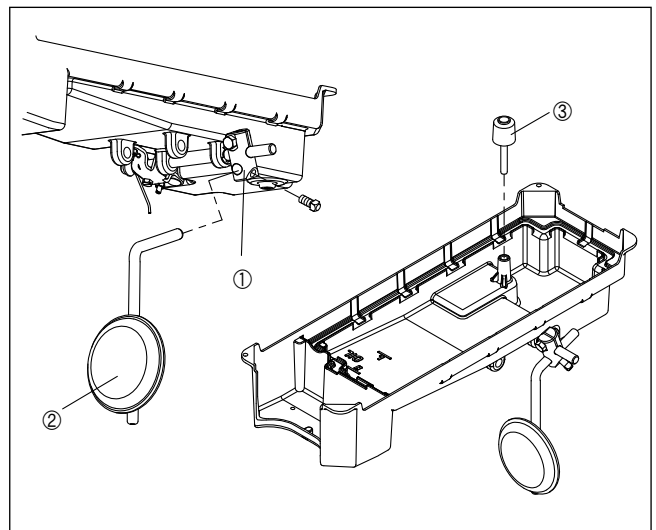
1 Insert the hinge rubber① into the table. After inserting the oil tray in the middle of head supporting rubber B② as shown in the figure 1, install it into the table. Insert the machine head hinge③ into the bed holes. By inserting it into the hinge rubber①, stand the machine on the head support rubber A④ and the head support rubber B②.



[Fig. 4-5]

### 4.5.2) Installation of Knee Lift Pad

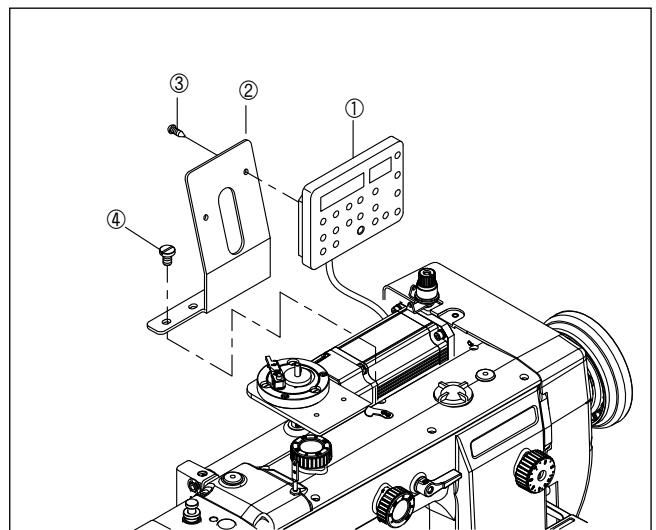
- A. Insert a knee lift pad② in a knee support shaft point① assembled in the oil pan and adjust the position for the user to fix it.
- B. Insert a knee lift rod cap③ in the hole of the oil pan as shown in the figure.



[Fig. 4-6]

### 4.5.3) OP Panel

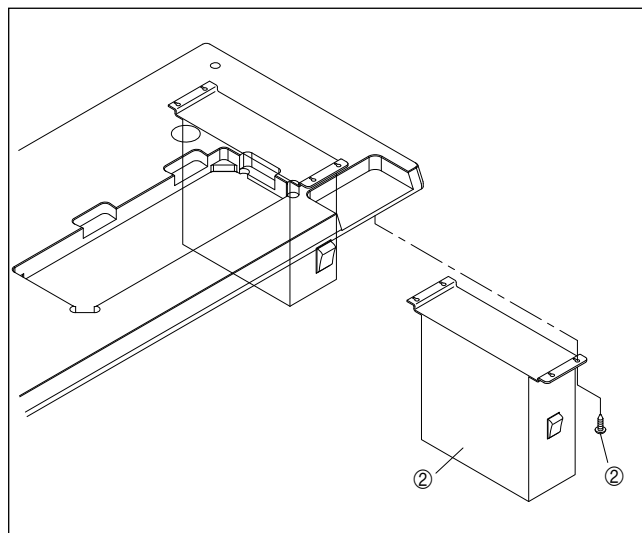
Fix the operating panel① to the bracket② using a bolt③ and then fix it to the upper part of the rear arm using a bolt④.



[Fig. 4-7]

#### 4.5.4) Control Box

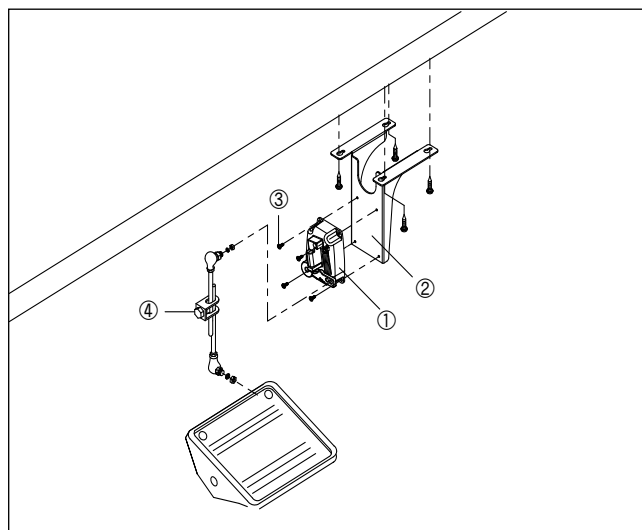
- 1) Attach the control box ① undersurface of the table with 4 bolts ② as shown in the figure.



[Fig. 4-8]

#### 4.5.5) Pedal switch and connecting rod

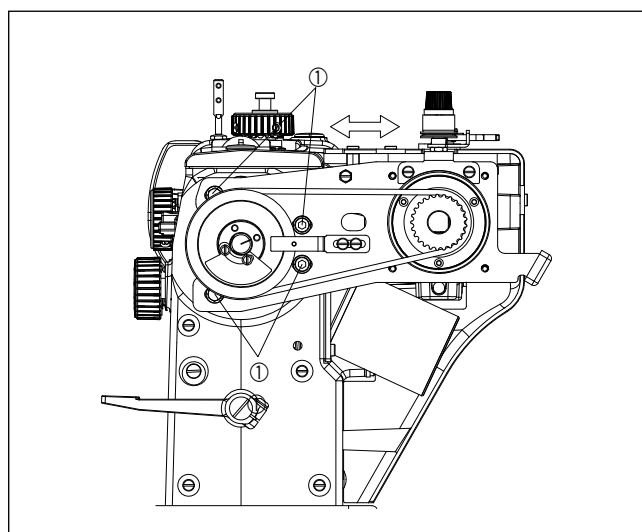
- 1) Attach pedal switch ① to pedal switch bracket ② with four bolts ③.
- 2) As in the Figure, attach pedal switch bracket ② to the lower part of table.
- 3) Connect one end of the connecting rod ④ with pedal switch and the other end with pedal, and then adjust length of the rod.



[Fig. 4-9]

#### 4.5.6) Adjustment of Belt Tension

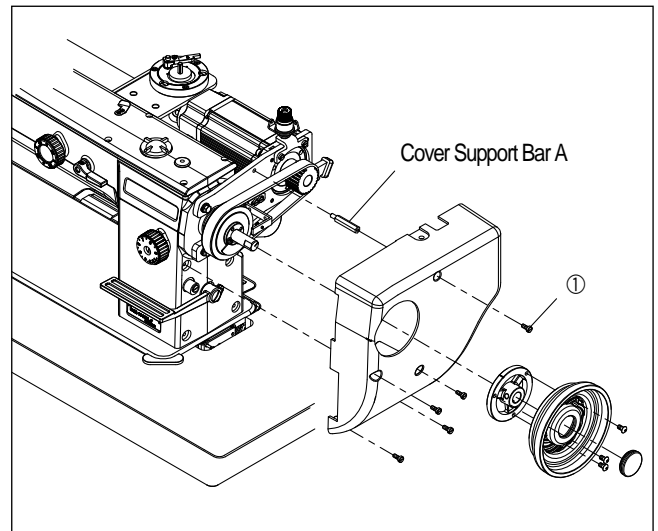
Remove a hand pulley and a motor cover. Loosen the main motor bracket screw ① and adjust the tension by moving the main motor bracket from side to side.



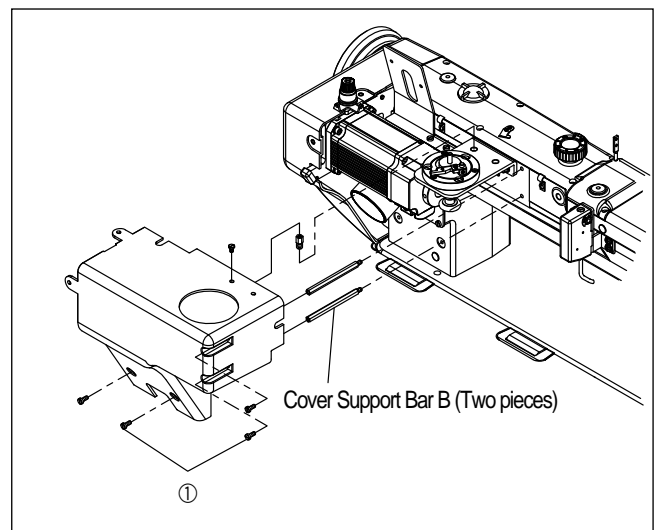
[Fig. 4-10]

#### 4.5.7) Installation of Motor Cover

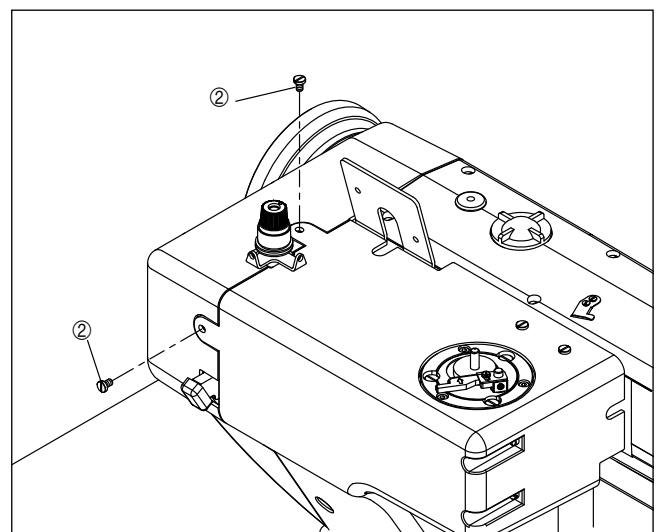
- 1) Cover A is assembled at the right end of the arm as shown in the figure. Then fix it to the arm using 5 screws①.
- 2) After assembling the cover A, assemble a hand pulley into the upper shaft.
- 3) Cover B is assembled at the back of the arm as shown in the [Figure 4-12]. Assemble a P/U bracket before assembling.
- 4) Fix is to the arm using 4 screws①.
- 5) Cover A and B are fixed with the screw② as shown in the [Figure 4-13].



[Fig. 4-11]



[Fig. 4-12]



[Fig. 4-13]



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.)

#### 4.5.8) Lubrication

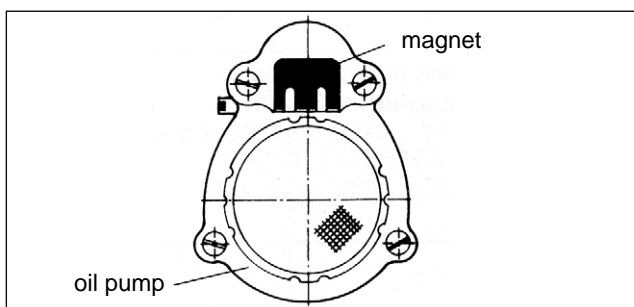
##### A. Attachment of magnet for sweeping up chips

Attach the magnet for sweeping up chips included in the accessory box to the oil pump inside of the bed. (Refer to Figure 4-14)

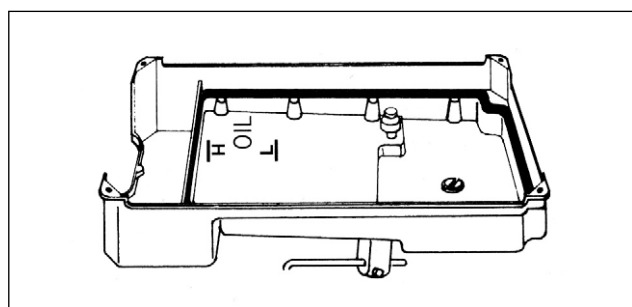
※ Do not use the magnet for other usages. Running the sewing machine without the magnet could cause mechanic problems and affect the endurance of the machine.

##### B. Inserting lubricant to oil tray (oil fan)

- Fill the lubricant to "HIGH" position. (Refer to Figure 4-15)
- Please use SUNSTAR lubricant exclusive for industrial sewing machine or SHELL' s TELLUS C10.
- When the lubricant in use is at LOW position, fill it immediately to HIGH position.
- Most suitable period of changing lubricant is 1 time in two weeks.



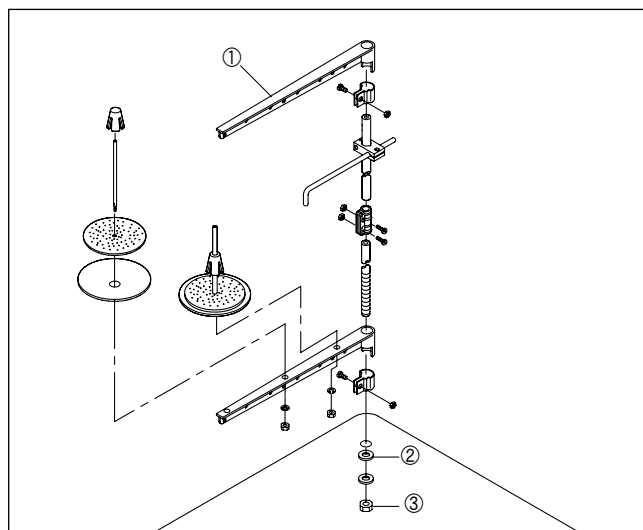
[Fig. 4-14]



[Fig. 4-15]

#### 4.5.9) Thread spool stand assembly

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



[Fig. 4-16]

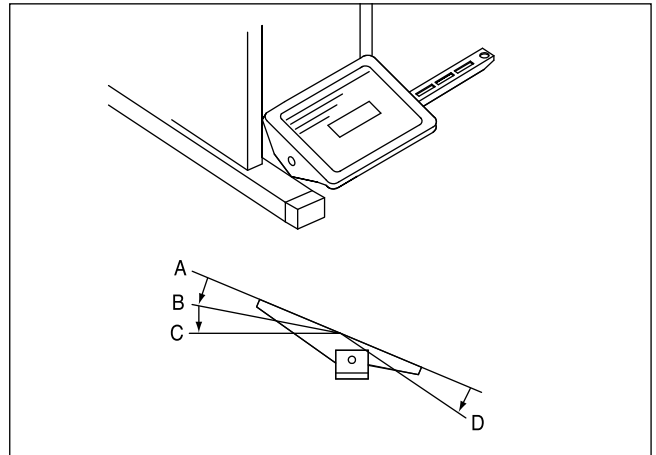
## 4.6 Trial run (Pedal operation)



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.

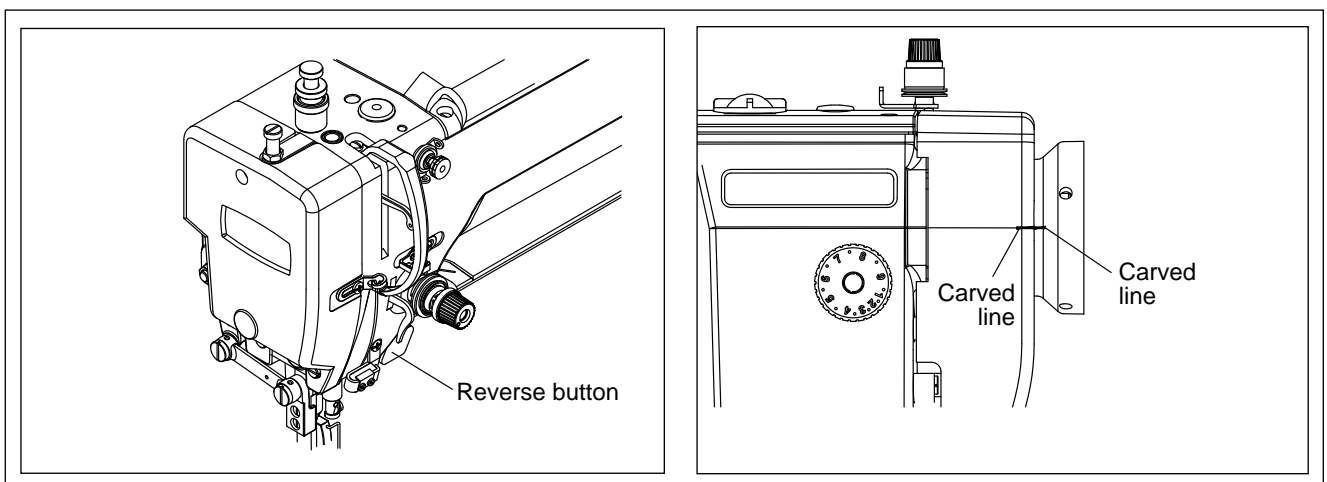


[Fig. 4-17]

## 4.7) Check for machine stop position

Press a reverse button to move a needle up and down, then please check the regular position of the machine.

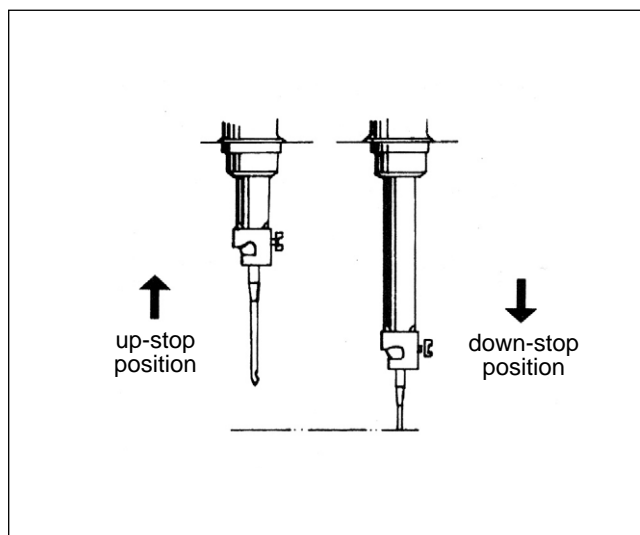
Check the carving of the hand pulley is matched with the carving of the motor cover A when the needle is located on the upper stop position. If the stop position is wrong, remove the motor cover A and change the sensor plate position of the upper stop. The upper stop position of the needle is identical with the stop position of the needle bar after thread trimming.



[Fig. 4-18]

#### 4.8) Reverse button function (for automatic trimming type)

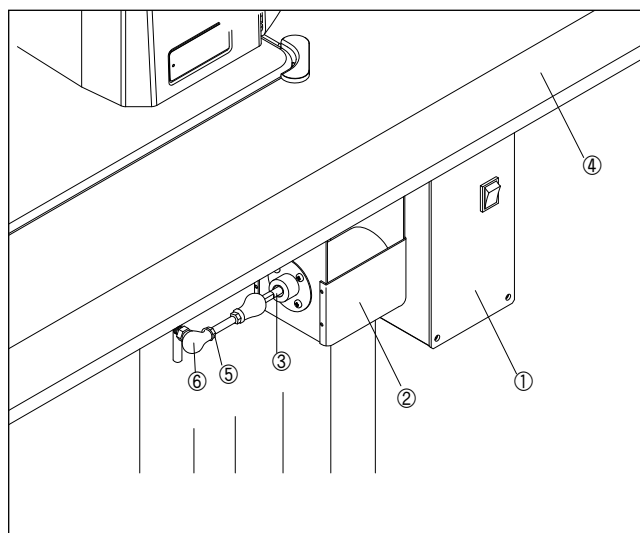
Pressing the reverse button during forward sewing will start reverse sewing immediately. When you stop the machine and restart it by stepping down on the pedal with the reverse button already pressed down, you can perform reverse sewing from the beginning. When the machine is in a “stop” mode, you can change the up-down position of the needle bar by pressing the button. Lightly pressing the button once when the needle is in a down-stop position will stop the needle bar in a high position. Pressing the reverse button twice within less than a second when it is in an up-stop position will stop the needle bar in a low position.



[Fig. 4-19]

#### 4.9) Installation of Automatic Knee Lifter Solenoid(options) and Power Switch Box

- 1) Please ensure that the control box ① should be placed in the middle of the solenoid bracket ② by referring to the figure 4-20 when you attach the control box.
- 2) Attach the solenoid to the table ④ following the assembling instructions enclosed in the solenoid box. Then adjust the position of the link bowl ⑥ by loosening a nut ⑤ to make the center of the solenoid shaft ③ and the undersurface of the table to be horizontal. After adjusting, tighten the nut firmly.
- 3) The sound, operation load and the presser foot lifting can change depending on the attachment state of the knee lift solenoid. Assemble to make it work smoothly.



[Fig. 4-20]

# 5

## Preparations for sewing

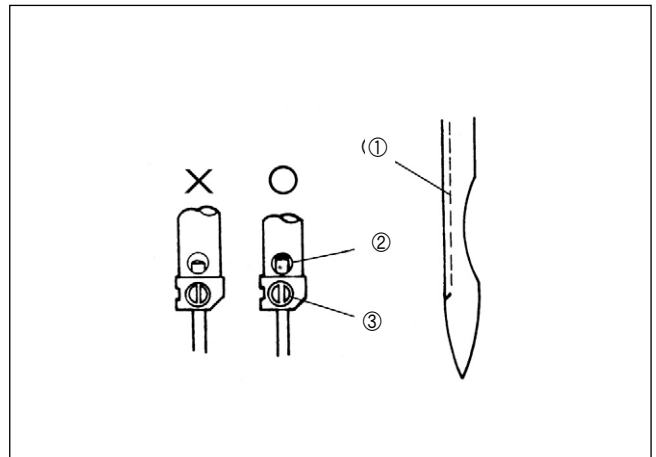
### 5.1) Installing needle



Caution

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

Move the needle upper end so that it directly touches the upper side of the stopper hole② when the groove① of the needle is on the left. Then, use the clamp screw③ to fix the position of the needle. (Refer to figure 5-1)



[Fig. 5-1]

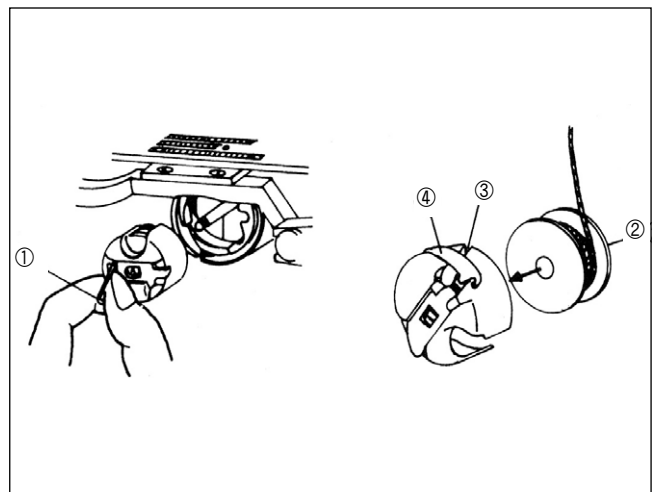
### 5.2) Bobbin Insertion and Removal



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.

- A. Insert the bobbin into the bobbin case. Later, insert the thread into the thread groove① and place it under the spring④ of thread adjusting plate.
- B. Inserting and removing the bobbin case  
Insert into the hook by grabbing the bobbin case handle①. Pull out the handle① when you remove the bobbin. (The bobbin② removes itself when you release the handle.)



[Fig. 5-2]

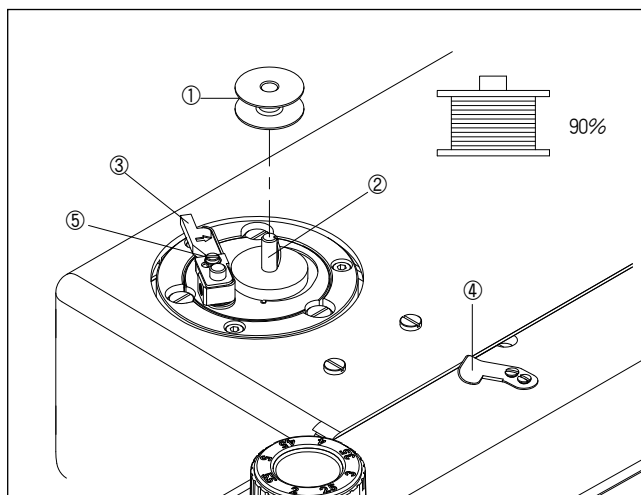
### 5.3) Winding lower thread



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) When pressing pedal, the machine starts to operate and thread winds on bobbin.
- 6) When thread winding is done, bobbin operating plate③ returns automatically.
- 7) Remove bobbin and cut thread with bobbin winder knife④.
  - ※ To adjust the amount of bobbin winding, loosen screw⑤ and adjust bobbin winder adjusting plate③.



[Fig. 5-3]



Caution

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

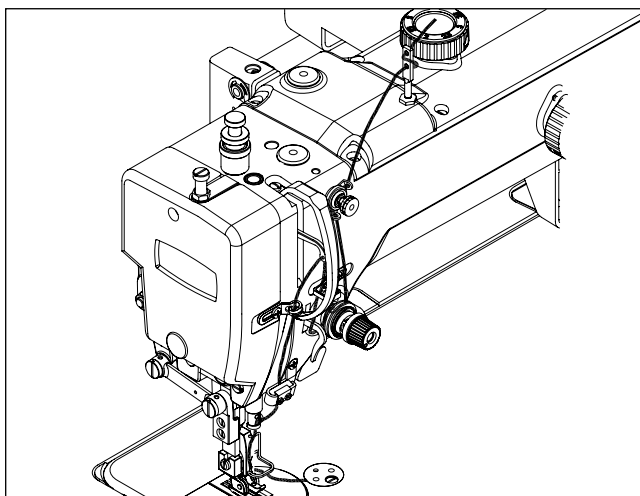
### 5.4) Inserting upper thread



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

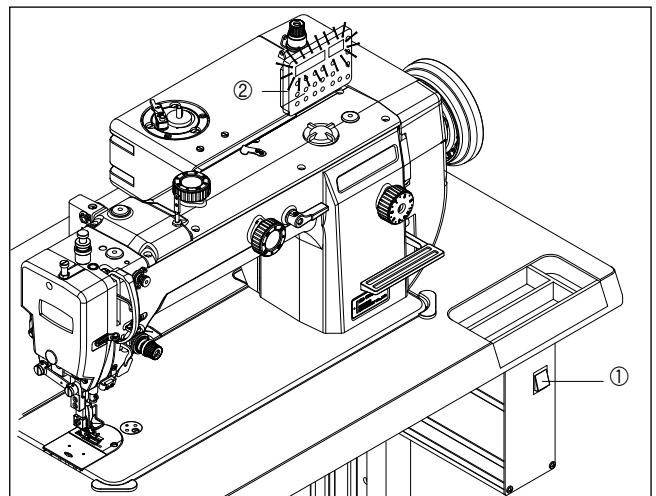


Caution

- 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) 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

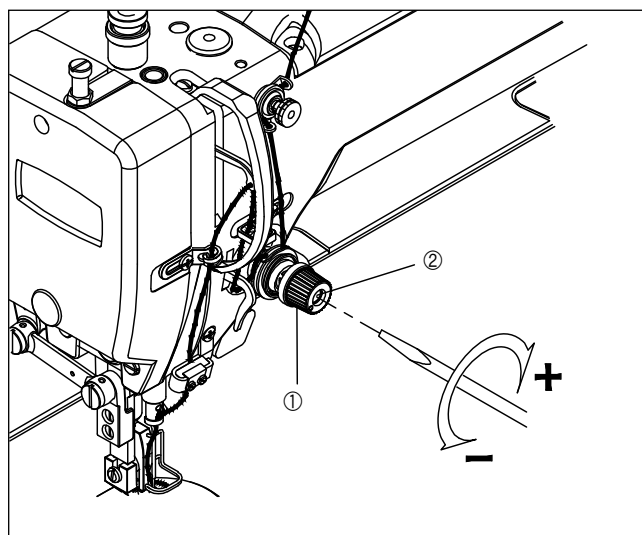
### 6.2.1) Adjusting upper thread

#### A. Thread control assembly

Like in Figure 6-2, turning the tension adjustment nut ① of the thread tension control assembly clockwise makes the upper thread tension stronger and counterclockwise makes it weaker. The result of the needlework depends on the sewing conditions such as the sewing material, used thread and stitch length. So please adjust as desired.

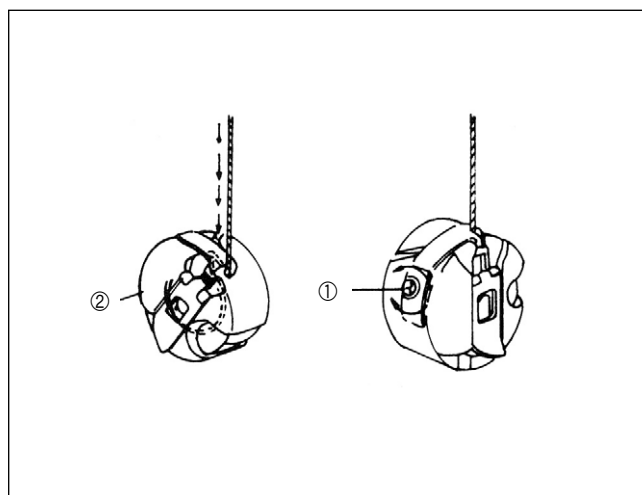
#### B. Adjusting the thread take up tension

As in Figure 6-2, insert the driver into the groove ② of the thread tension control assembly. Turn clockwise to make the spring tension stronger and counter clockwise to make it weaker.



[Fig. 6-2]

**6.2.2)** The tension of the lower thread becomes larger when you turn clockwise the tension adjustment screw ① and becomes smaller when you turn in counterclockwise. When hold the end of thread, make sure that the bobbin case ② should drop by gravity in order to adjust the lower thread tension.



[Fig. 6-3]

# 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. Even 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( oil pan)	Everyday
3	Check the oil flow at the front side of arm	Everyday
4	Check hook lubrication	One/week
5	Check oil leak of the machine	One/month

## 7.2) Cleaning

### 7.2.1) Cleaning Frequency and Method

 <b>Caution</b>	<ul style="list-style-type: none"><li>1) Make sure to turn off the power of the machine before cleaning.</li><li>2) The parts disassembled for cleaning should be assembled in the reverse order of disassembly.</li></ul>
---	--

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

## Maintenance and Adjustment of Sewing

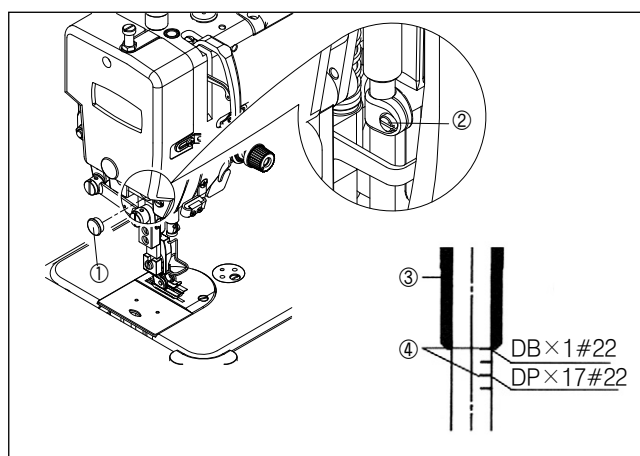


Caution

- 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) Adjusting needle bar

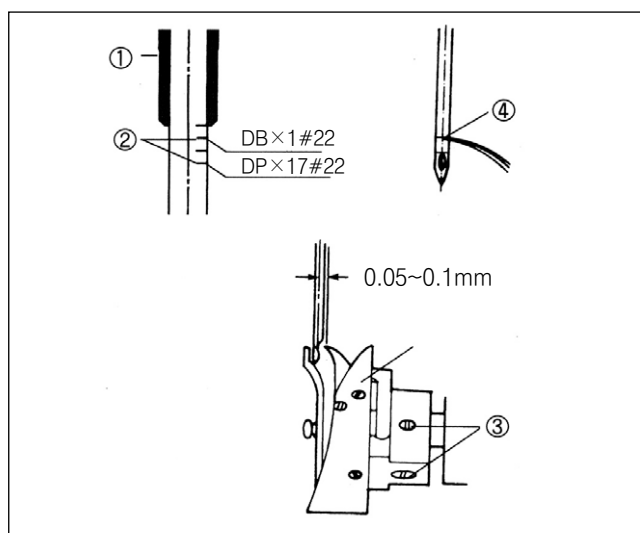
As in Figure 8-1, place the needle bar in the lowest position by pulling out the needle bar adjusting hole rubber cover① and rotating the pulley, and then loosen the needle bar holder clamp screw② and move the needle bar such that the needle bar's lowest position mark carved sign④ is aligned with the lower side of the needle bar lower bushing③. After fixing tightly the needle bar holder clamp screw② and place the rubber cover①.



[Fig. 8-1]

### 8.2) Adjusting timing of needle and hook

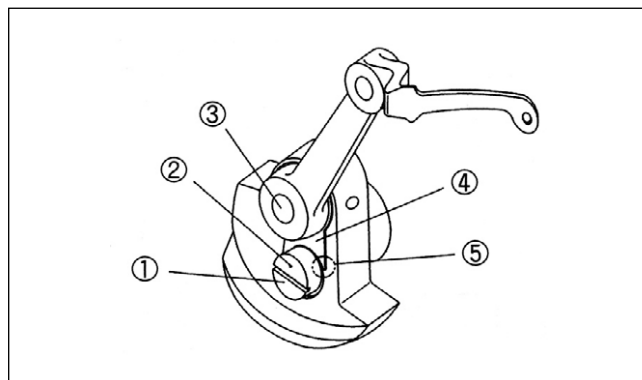
As in Figure 8-2, align the lower side of the needle bushing① with the fixed hook position carved line② marked in the needle bar. Then, loosen three hook fixing bolts③. When the hook edge④ is aligned with the center of needle, turn the loosened hook so that the clearance between the needle groove inside carved in the lateral side of the needle and the hook edge④ becomes 0.05~0.1mm. Later, tight again the three fixing bolts③.



[Fig. 8-2]

### 8.3) Adjusting lubrication of thread take-up spring part

As in the figure 8-3, the more the point② of the control plate of oil flow① goes close to the center of hole of thread take-up crank shaft, the more oil comes. On the other hand, the more the point goes close to the corner⑤ of the link cam washer, the less oil comes. And when the point goes past the corner of the link cam washer④, the oil does not come out.



[Fig. 8-3]

### 8.4) Adjusting lubrication of hook

#### A. Confirming the amount of lubrication

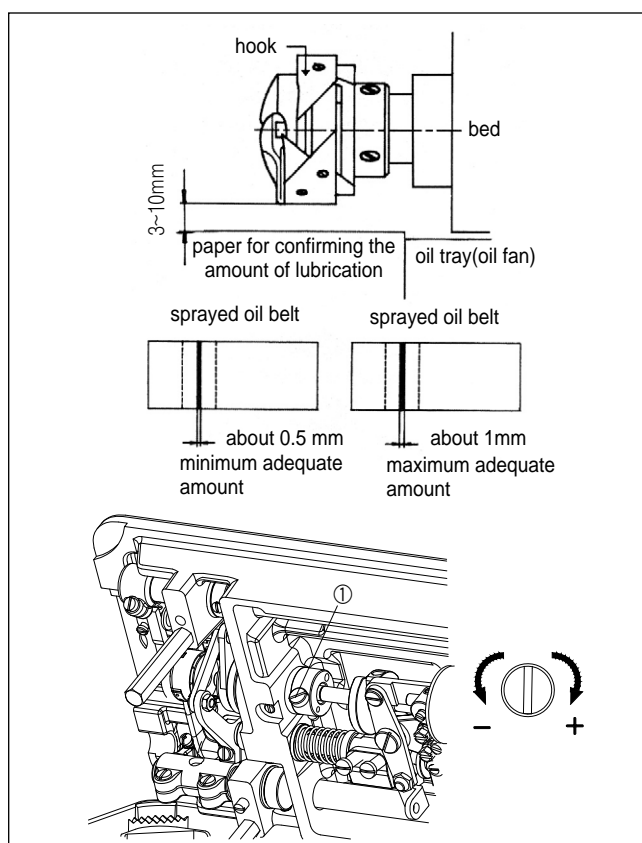
a) Perform an idle rotation for about 3 minutes of the machine. Later, place the paper for confirming the amount of lubrication as in Figure 8-4 and rotate the machine for 5 seconds to confirm the amount of oil sprayed to the paper.

b) Perform 3 times of confirming the amount of lubrication. The adequate adjusted amount is a state where the maximum and minimum amounts do not fall short of or exceed the amount shown in the picture.

(If the amount of lubrication is too small, it could invite the hook seizure, and if the amount is too large, it could cause a contamination by oil.

#### B. Adjusting the amount of lubrication

When you turn clockwise(+)the lubrication adjustment screw① inserted in the front bushing of the lower shaft, the amount of oil will increase while turning to counterclockwise(-) will decrease the amount.



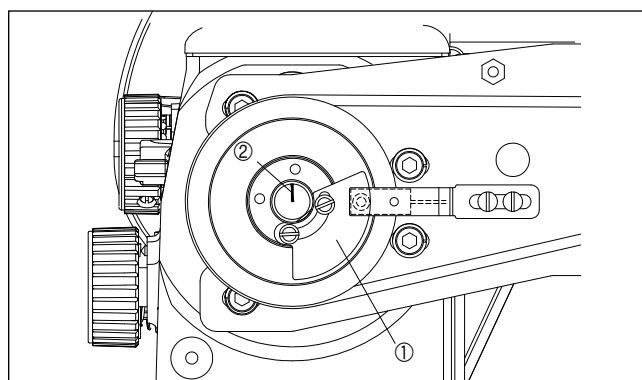
[Fig. 8-4]

### 8.5) Adjustment of Top Stop Position

A. Remove the hand pulley and motor cover A.

B. The top stop sensor plate① on the top stop position is like in the figure and the upper shaft angle② should be upward.

C. Make sure that the position for carving② is upward by adjusting the position of the top stop sensor plate.



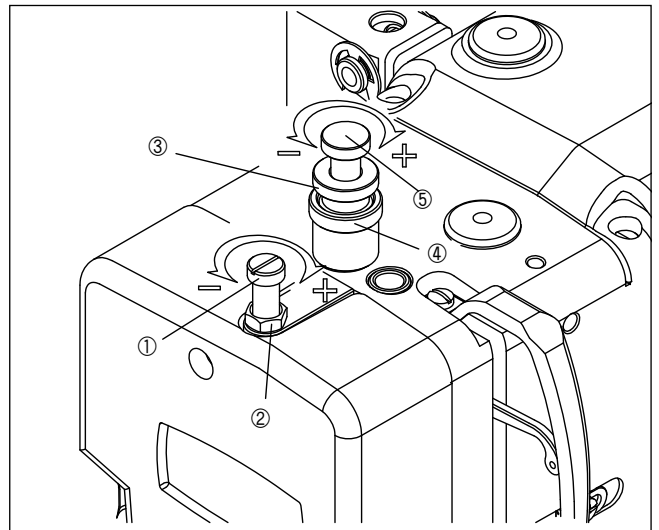
[Fig. 8-5]



- After disassembling and adjusting a safety device, always place it back to the original position and check whether it functions as intended.
  - Use both hands when pushing the machine backward or returning it to the original position. Due to the weight of the machine, your hand can get stuck in the machine if you should slip.
  - When adjusting the machine with the switch on, be sure to pay extreme caution.
- 
- Only trained engineers must perform troubleshooting or inspection of the machine.
  - For electrical repair or inspection, consult with qualified technicians or agent.

## 8.6) Adjusting presser foot pressure

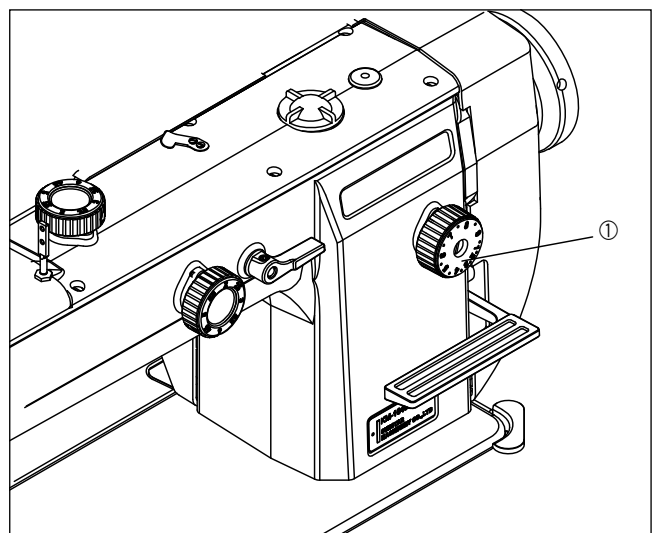
As shown in Figure 8-6, the pressure of the upper feed presser foot becomes stronger when you turn the pressure adjustment screw① clockwise, and becomes weaker in case of turning it counterclockwise. After the adjustment, be sure to tight the fixing nut②. The auxiliary presser foot is same to the upper feed presser foot: the pressure increases when you turn the pressure adjustment screw③ clockwise, and becomes weaker in case of turning it counter clockwise. After the adjustment, be sure to tight the fixing nut④. In case of fine adjustment, use the auxiliary pressure adjustment screw⑤.



[Fig. 8-6]

## 8.7) Adjusting stitch length

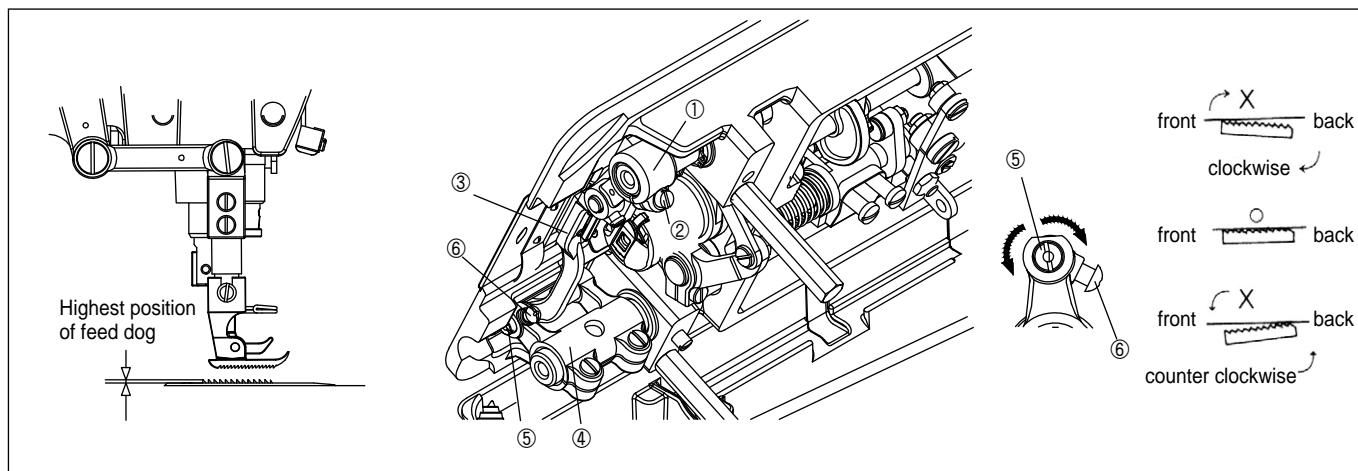
As shown in Figure 8-7, the number marked in the stitch control dial① means the stitch width in mm. Adjust it in sideways and fix it to your desired number of stitch width.



[Fig. 8-7]

## 8.8) Adjusting feed dog height and inclination

- A. Adjust the height of the feed dog③ by loosening the clamp screw② of the leverage crank(front) and moving the leverage crank(front)①.
- B. To adjust the inclination of the feed dog, loosen the fixing screw of feed dog inclination adjustment crank⑥ in the horizontal pushing crank④ first. Later, adjust it by rotating until 90 degree the feed dog inclination adjustment shaft⑤. When you turn the shaft⑤ clockwise, the front of feed dog goes up while the rear part of the feed dog is up with counter clockwise direction.(Refer to figure 8-8)
- C. Check the height of feed dog③ because the height of it changes after the adjustment of feed dog③.

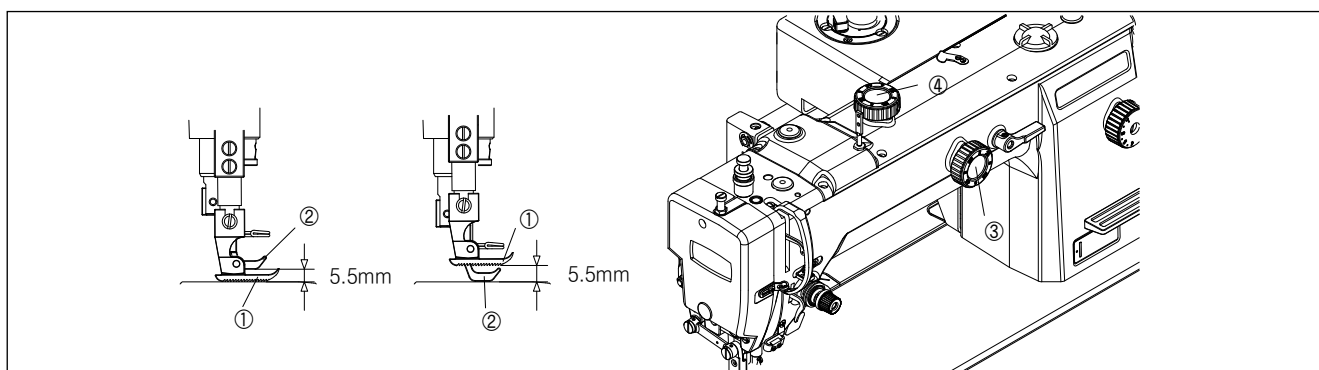


[Fig. 8-8]

## 8.9) Adjusting auxiliary presser foot and upper feed presser foot

Normally, the auxiliary presser foot and the upper feed presser foot work vertically with a same height difference. In accordance with the material type, there are some cases in which run the auxiliary presser foot① and the upper feed presser foot② at the same pace, or sometimes, at different paces. In these cases, please adjust the height as follows:

- In case of running vertically the auxiliary presser foot and the upper feed presser foot at the same height



[Fig. 8-9]

- a) The vertical running range of the auxiliary presser foot① and the upper feed presser foot② is from 2 to 5.5 mm.
- b) The vertical running amounts of the auxiliary presser foot① and the upper feed presser foot② are easily adjustable from the climb device dial attached to the front side of the machine.
- c) The dial④ attached to the upper cover is a dial which controls the running amount dial③. Only when the numbers of ③ and ④ are identical, the auxiliary presser foot and the upper feed presser foot can be run at the same height.
  - ex) When the running amount of the two presser feet are adjusted to 4mm  
First, adjust the number of the dial attached to the upper cover to 4, and make the number the dial at front side of the machine 4. When you adjust the number from lower one to a higher, you should adjust the dial ④ first. In the reverse case, the adjustment of the dial③ should be done first.

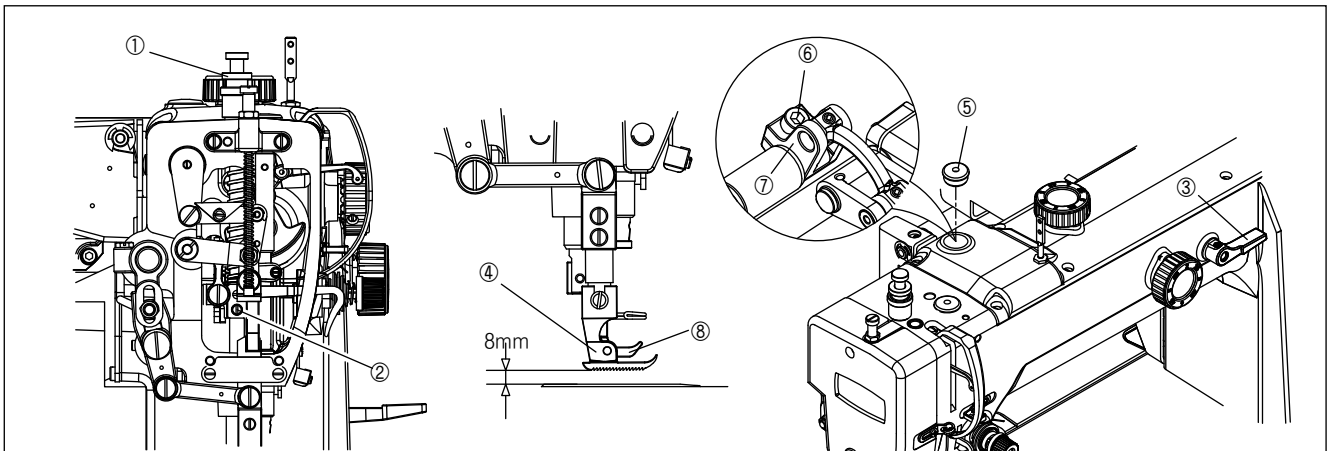
- In case of running vertically the auxiliary presser foot and the upper feed presser foot at the same height

#### A. Adjusting the auxiliary presser foot

- Loosen the presser bar pressure adjustment screw① and the bracket fixing screw②.
- Adjust vertically the bracket fixing screw② so that the auxiliary presser foot④ goes up by 8mm from the upper side of the needle plate when the presser bar lifter③ is up.
- When the adjustment is finished, fix tightly the bracket fixing screw② and adjust adequately the pressure adjustment screw①.
- After adjust height of the auxiliary presser foot④, adjust upper feed presser foot.

#### B. Adjusting the upper feed presser foot

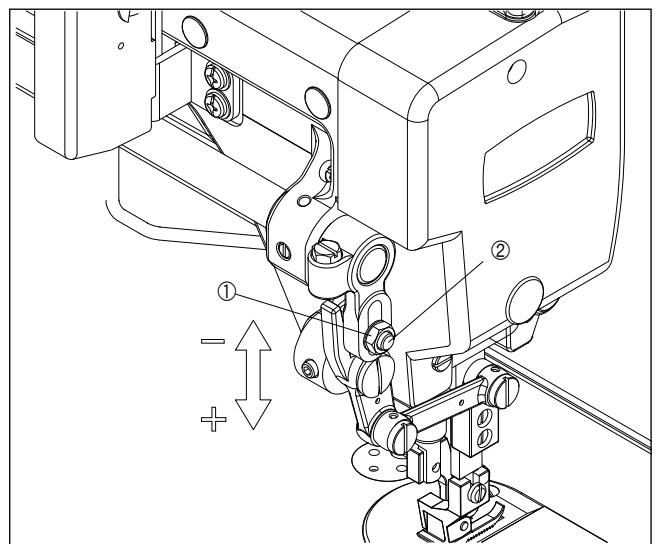
- Place the thread take up at the lowest position and lower the presser bar lifter③.
- Open the rubber cover⑤ of the upper cover and loosen the clamp screw⑥.
- A different adjustment of vertical running amount between the auxiliary presser foot④ and the upper feed presser foot⑧ is possible by adjusting the presser foot vertical move crank⑦.
- When the adjustment is finished, fix tightly the clamp screw⑥ of the vertical move crank, and place the rubber cover⑤.



[Fig. 8-10]

### 8.10) Adjusting feeding amount of auxiliary presser foot

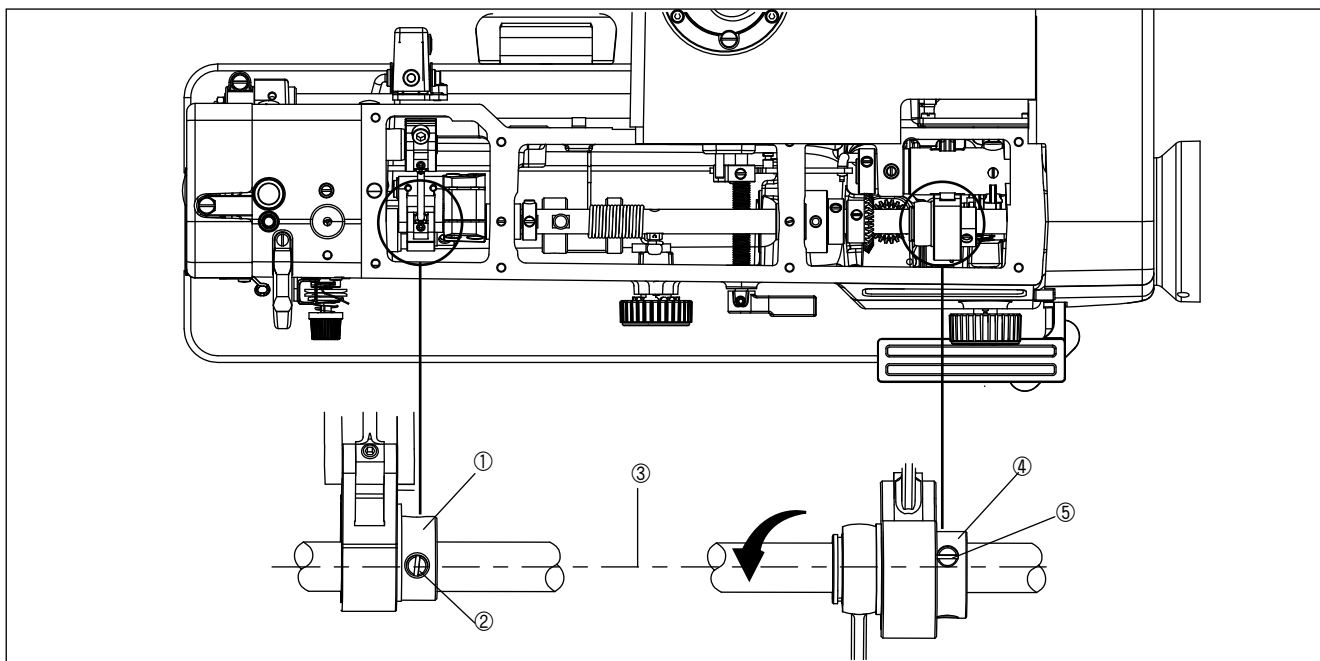
The normal proportion of feeding amount between the feed dog and the auxiliary presser foot is 1:1. You can adjust the feeding amount of the auxiliary presser foot in accordance with the conditions of materials in use. As in Figure 8-11, loosen the nut① and move upward the presser foot vertical move control shaft②, and the feeding amount becomes smaller. If you move it downward, the amount increases. Be sure to tight the nut① when the adjustment is finished.



[Fig. 8-11]

## 8.11) Adjusting feed cam

The timing of the feed dog and the needle is determined by moving vertically the feed cam④. First, turn the pulley with hands to fix the needle bar to the highest point. The standard position will be when the center of the No. 1 fixing bolt② of the presser foot vertical move cam① is aligned with the center line of the upper shaft③, the bottom of the No. 1 fixing bolt⑤ of the feed cam④ is aligned with the center line of the upper shaft③.

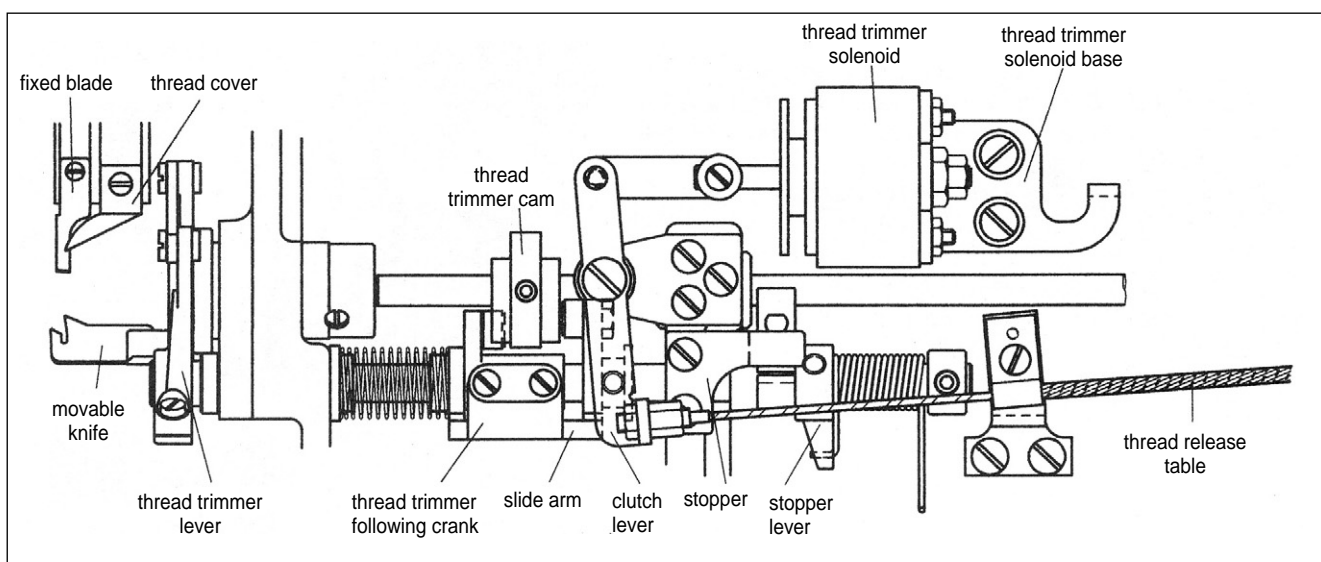


[Fig. 8-12]

## 8.12) Adjusting for thread trimmer

### A. Structure of thread trimmer

The structure of the thread trimmer of this machine is as follows in Figure 8-13:



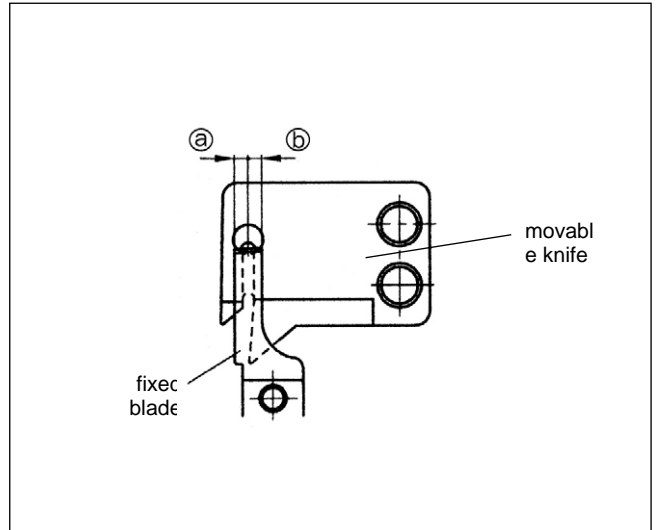
[Fig. 8-13]



This sewing machine is run by the thread trimming driving method, which uses the cam attached to the lower shaft as driving force. Thus, if you rotate the machine with the thread trimming solenoid is in operation in time of the machine adjustment, the moving knife collides with the needle causing harms on the both parts. So, when you run the machine with the solenoid in operation, run only in the regular thread trimming course (down stop ~ up-stop of the needle bar).

#### B. Adjusting fixing blade and movable knife

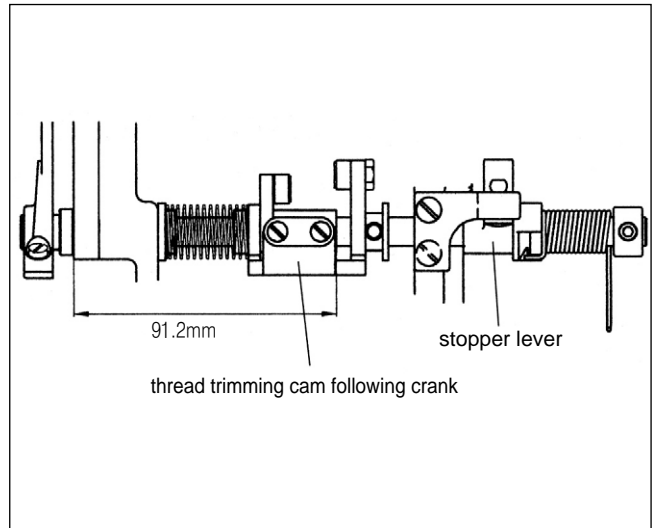
- a) Like in Figure 8-14, the standard position is where the cut part of the movable knife is aligned with the center of the fixed blade.
- b) When part (a) becomes bigger in Figure 8-14, three pieces of threads are to be produced, causing the thread missing after the trimming. If part (b) becomes bigger, it can cause a trimming miss. So be cautious in adjusting the right position.



[Fig. 8-14]

#### C. Adjusting the trimmer driving part

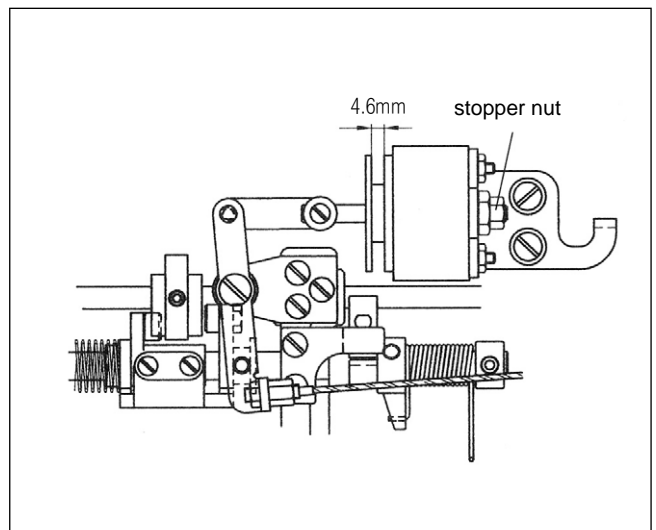
- a) The standard assembly position is shown in Figure 8-15.
- b) Fix the thread trimming following crank to the trimming shaft as shown in the figure.
- c) Fix the stopper lever to the bed so that the lever can smoothly rotate in a range where the gap of the trimming shaft does not occur.



[Fig. 8-15]

#### D. Adjusting the thread trimmer solenoid

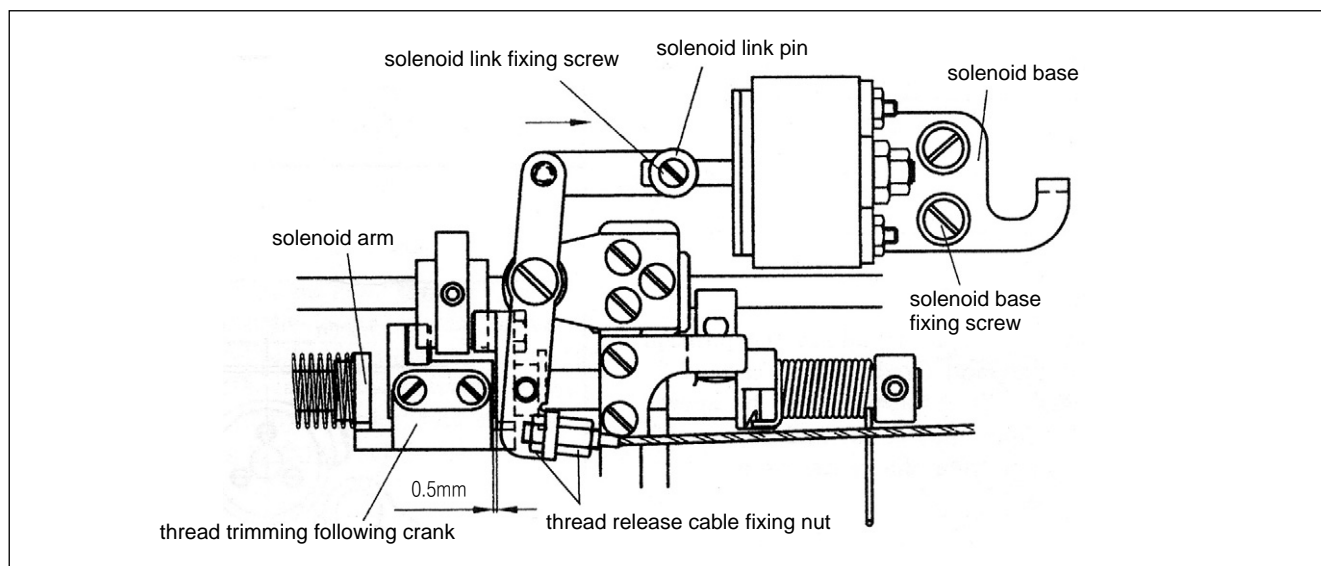
- a) Working amount of the thread trimming solenoid
  - ① The standard working amount of the thread trimming solenoid is 4.6mm as shown in Figure 8-16.
  - ② Use the thread trimming solenoid stopper nut to control the working amount.



[Fig. 8-16]

b) Adjusting the thread trimming solenoid

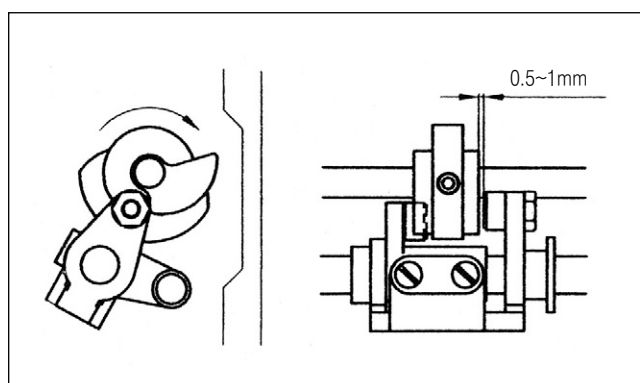
- ① First, loosen the solenoid link pin fixing screw. Later, fix the solenoid base clamp screw where the clutch lever moves smoothly. Then, attach the slide arm to the right side. Fix the thread trimming solenoid link pin fixing screw where the solenoid stopper is attached to the solenoid.
- ② If you run the solenoid under this circumstance, a gap of 0.5mm occurs between the thread trimming following crank and the slide arm as shown in Figure 8-17. This state is the standard.



[Fig. 8-17]

E. Adjusting the thread trimming cam

- a) Under the thread trimming solenoid is in operation, rotate the trimming cam clockwise and fix the cam when it connected with the roller. (Refer to Figure 8-18)
- b) When the thread cam following crank returned by stopping the operation of the thread trimming solenoid, the edge end between the cam and the roller should be from 0.5 to 1.0mm. It is the standard. (Refer to Figure 8-18)



[Fig. 8-18]



The standard position of the thread trimming cam following crank before its operation is shown in Figure 8-19. If the position of the roller is changed, adjust it with stopper and perform the adjustment describe above in a~b.

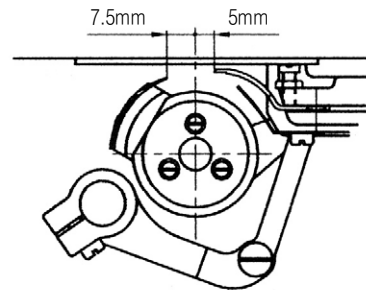


[Fig. 8-19]

## F. Adjusting the position of blade

### a) Adjusting the position of the movable knife and the fixed blade

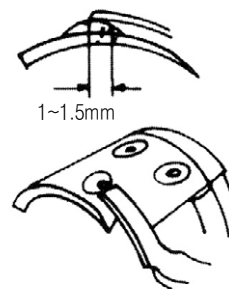
The standard position of the movable knife is 7.5mm from the needle center, and 5 mm for the fixed blade.



[Fig. 8-20]

### b) Adjusting the progress amount of the movable knife

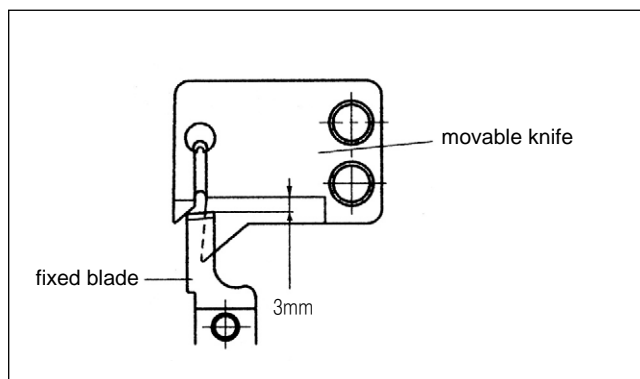
- ① If you run the machine putting the solenoid in the operation mode, the movable knife will rotate by the thread trimming cam. The standard will be where the cut part of the movable knife progresses 1.5 to 2mm from the end edge of the fixed blade when the progress amount of the movable knife is in its maximum.
- ② Adjustment is available by using the thread trimming lever.



[Fig. 8-21]

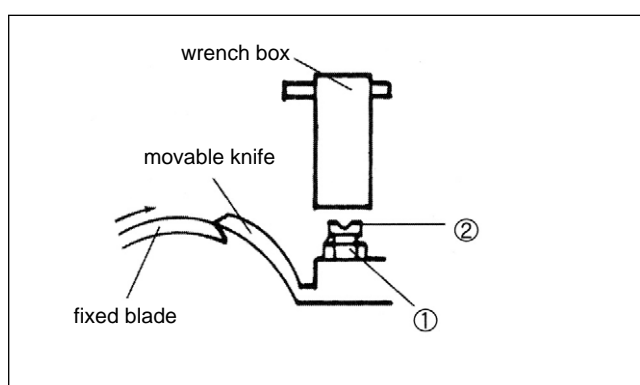
### 8.13) Adjusting blade pressure

- A. As in Figure 8-22, the standard is when the contact between the movable knife and the fixed blade begins.
- B. In particular, when the cutting quality gets worse by using a thick thread, strengthen a little bit the tension of the fixed blade.



[Fig. 8-22]

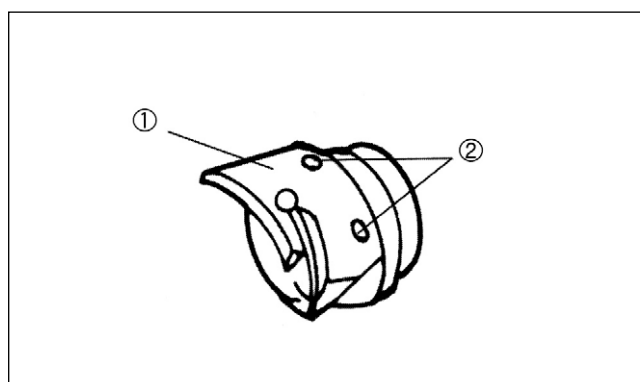
- C. How to adjust the tension of the fixed blade; loosen the nut①(for adjusting tension of fixed blade) using a wrench box as shown in the figure 8-23 and adjust it with the screw②(for adjusting tension). After adjusting, tighten the nut①(for adjusting tension) using a wrench box.



[Fig. 8-23]

### 8.14) Exchanging movable knife

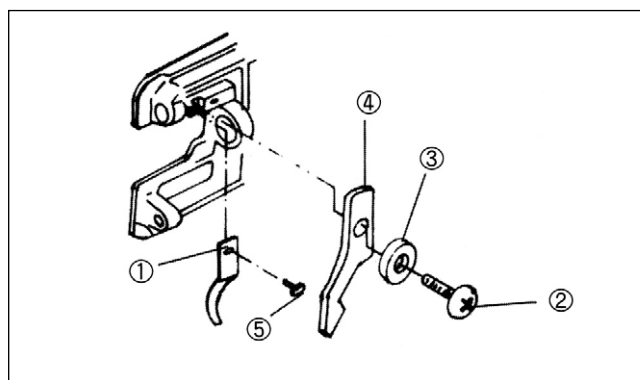
Place a needle at the top by turning the pulley when replacing the movable blade①and take off the needle plate by loosening two fixed screws② indicated in the figure 8-24. When assembling the exchange, assemble it in reverse order of disassembling.



[Fig. 8-24]

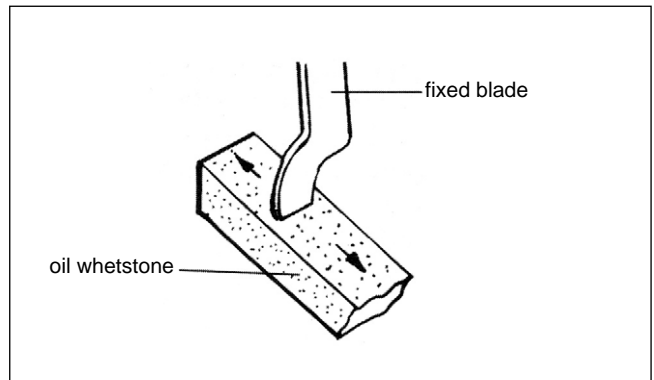
### 8.15) Exchanging fixed blade

- A. When exchanging the fixed blade①, pick the washer③ and the inner bobbin stopper④ out by loosening the screw② indicated in the figure 8-25 then disassemble by loosening the fixed blade screw⑤. When assembling the exchange, assemble it in reverse order of disassembling.



[Fig. 8-25]

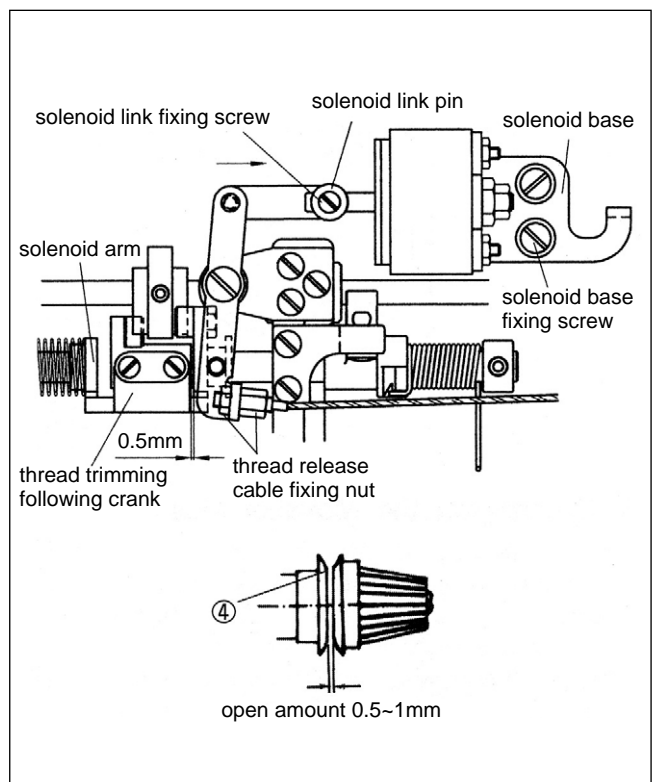
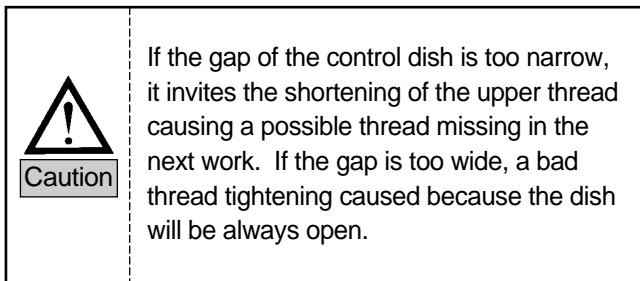
- B. In case that the thread is cut or the cut part of the thread is not neat, please confirm the cutting part of the fixed blade. If the bottom of the fixed blade is worn, sharpen the end of the blade using an oil whetstone. (Refer to Figure 8-26)



[Fig. 8-26]

## 8.16) Adjusting thread release

- A. Adjust such that the dish of upper thread tension controller opens about 1mm when the thread trimming solenoid is in the operation.
- B. Adjustment is available by loosening the thread release cable fixing nut and wire. (Refer to Figure 8-27)



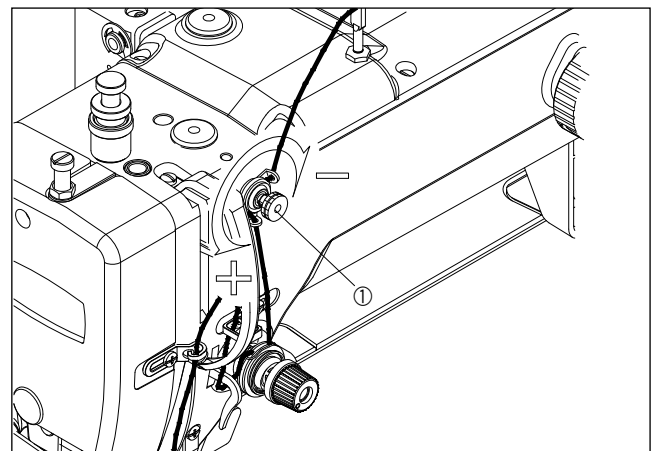
[Fig. 8-27]

## 8.17) Adjusting remaining amount of upper thread

After thread trimming, adjust the spare upper thread amount of the needle with the auxiliary thread tension adjusting nut①.

The remaining thread becomes shorter when you turn it right, and the thread becomes longer if you turn left.

(Refer to Figure 8-28)



[Fig. 8-28]

# Causes of Troubles and Troubleshooting

## 1) Sewing machine troubleshooting

No	Symptom	Checkpoints	Root cause	Corrective action
1	Needle breaks	Direction and height of needle	Needle is inserted into wrong position	Reinsert the needle correctly
		Needle	Needle is bent	Change the needle
		Timing of feed dog	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	Change 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	Poor thread adjustment	Thread tension	Upper and lower thread tensions are bad	Adjust the upper and lower thread tensions
		Thread take up spring tension	Thread take up spring tension is inadequate	Adjust the thread take up spring tension
		Gap between opener and hook	The gap between the opener and hook is inadequate	Adjust the gap between the opener and hook
4	Upper thread falls out when starting to sew or sewing is skipped.	Direction and height of needle	Needle is inserted into wrong position	Reinsert the needle correctly and push in to its highest level.
		Needle	Needle is bent	Change the needle
		Threading	Wrong direction	Insert the thread in the right way.
		Gap between the needle and the hook	The timing between the needle and hook is bad	Adjust the timing between the needle and hook
		Remaining upper thread length after trimming	The length of the remaining upper thread is too short	Increase the adjustment volume of the upper thread on the control box
		Lower thread holder	After trimming, lower thread holder does not hold the lower thread	Adjust the location and tension of the lower thread holder.
		Check the up-stop position of the needle	Due to problems in the up-stop position of the needle, the thread take up lever pulls the upper thread out of the needle when the sewing starts	Readjust the needle's up-stop film position
5	Trimming miss	The gap between the movable knife and the hook	The height and distance between the movable knife and the hook do not match	Readjust the movable knife setting position
		Check the tension of fixed knife	Tension and contact of movable and fixed knives are bad	Correct the tension adjustment and surface contact of movable and fixed knives.
		Direction of the needle	Needle is not inserted correctly	Insert the needle correctly
		Blade side of movable and fixed knives	Scratch and abrasion of movable and fixed knives	Replace movable knife or fixed knife.
		Trimming cam timing	The timing of trimming cam is wrong	Adjust the timing of trimming cam
		Thread release stroke	Thread release stroke is too small	Readjust the thread release stroke
6	Too short thread length after trimming	Trimming timing	Wrong trimming timing	Adjust the trimming timing
		Opening of the thread tension adjusting plate	The opening on the thread tension control plate is too small	Adjust the thread release stroke
		Tension of auxiliary thread tension adjustment assembly	Too strong tension on the auxiliary thread tension control assembly	Adjust the tension of the auxiliary thread tension control assembly
		Thread take up stroke	Thread take up stroke is too large	Adjust the thread take up stroke
		Thread release adjustment volume on the control box	Volume is adjusted to too low	Increase the volume adjustment.