



USER'S MANUAL

KM-857,867 Series

High post, 1,2 needle, drop
feed, needle feed, sewing
machine.

- 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-090929



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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Safety Rules for Machines

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

[The meaning of the safety labels]



Instructions here shall be observed strictly.
Otherwise, the user may be killed or suffer severe physical injury.



Instructions here must be observed, or the user may suffer fatal or severe physical injury.



Instructions here should be observed, or the user may face physical injury or mechanical damages.

[The meaning of symbols]






This symbol means a must-not.



This symbol means a must for safety.



This symbol means that an electric shock may be caused if the instruction is not followed properly.

<p>1-1) Machine mobilization</p>  <p>Danger</p>	<p>Only personnel with a full understanding of the safety rules should move the machine. The following directions must be observed when transferring the machine.</p> <ul style="list-style-type: none"> Ⓐ At least 2 persons should move the machine together. Ⓑ In case the machine should be transported, wipe the oil covered on the machine to prevent accidents.
<p>1-2) Machine Installation</p>  <p>Caution</p>	<p>Because the physical damage such as the functional obstacles and breakdown are likely to occur depending on the environment in which the machine is installed. The following preconditions must be met.</p> <ul style="list-style-type: none"> Ⓐ Please unpack the machine package in order. Be careful of the nails in the wooden box. Ⓑ Because machines are apt to be contaminated and corroded by dust and moisture, install a climate controller and clean the machines regularly. Ⓒ Keep the machine out of the direct rays of the sun. Ⓓ Keep both sides and the backside of the machines off at least 50cm from the wall to secure enough space to repair. Ⓔ Danger of Explosion Don't run the machine near the places with any dangers of explosion. Don't run the machine near the places with any dangers of explosion, including places where the spraying product like aerosol are used in large quantities or oxygen are dealt with, unless the exact actions concerning the operation are guaranteed to avoid the explosion. Ⓕ Because of the characteristics of the machine, illuminators are not equipped. So, users should install the lighting apparatus around the working area. <p>[Note] The details about the installment of the machine are described in No. 2 Installations.</p>
<p>1-3) Troubleshooting</p>  <p>Danger</p>	<p>If in need of troubleshooting, call a trained A/S engineer who has been educated by sunstar.</p> <ul style="list-style-type: none"> Ⓐ Before cleaning and repair, be sure to turn off the power supply. And wait for about 4 minutes until the machine discharges completely. Ⓑ Part or the entire machine should not be modified without any consultation with our company Ⓒ In case of repair, change the damaged part into the standard article of our company Ⓓ After repair, put back the safety cover that was removed while repairing

1-4) Machine Operation



KM-857/867 series are manufactured for industry use to sew textiles and other similar material. In case of running the machine, users should observe the following things.

- Ⓐ Before operating the machine, read the manual and understand fully the details about its operation.
- Ⓑ Don't forget to put on garment suitable for safe work.
- Ⓒ Keep your hands or a part of the body away from the running part of the machine like the needle, hook, thread take-up spring and pulley etc.
- Ⓓ Don't remove any kind of cover for safety while running the machine.
- Ⓔ Be sure to connect the earthed line.
- Ⓕ Before opening the electric box such as a control box, be sure to shut off the power supply and make sure that the power switch should be put on "off".
- Ⓖ When threading the needle or before checking after sewing, be sure to stop the machine.
- Ⓗ Don't switch on the power supply with the foot on the pedal.
- Ⓘ Don't run the machine when the cooling fan is clogged. Be sure to clean the air filter in the control box once a week.
- ⓫ If possible, keep the machine away from strong electromagnetic fields like high frequency welding machine.

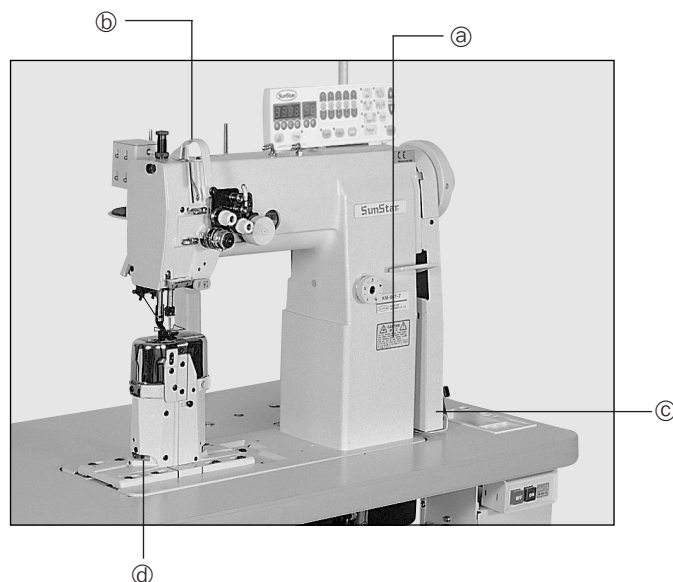


Always start the machine with safety covers in place since fingers or hands could be injured or cut off by the belt. Turn off the power switch during check-ups or adjustments.

1-5) Safety Device



- Ⓐ Safety Label: Cautions that need to be heeded to during operation.
- Ⓑ Thread take-up spring cover: a device to prevent the human body from touching the thread take-up spring.
- Ⓒ Belt cover: a device to prevent hands, feet and clothing from getting jammed by the belt
- Ⓓ Finger guard: a device to prevent fingers from contacting the needle.



1-6) Position of Caution Mark


CAUTION
경고



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.

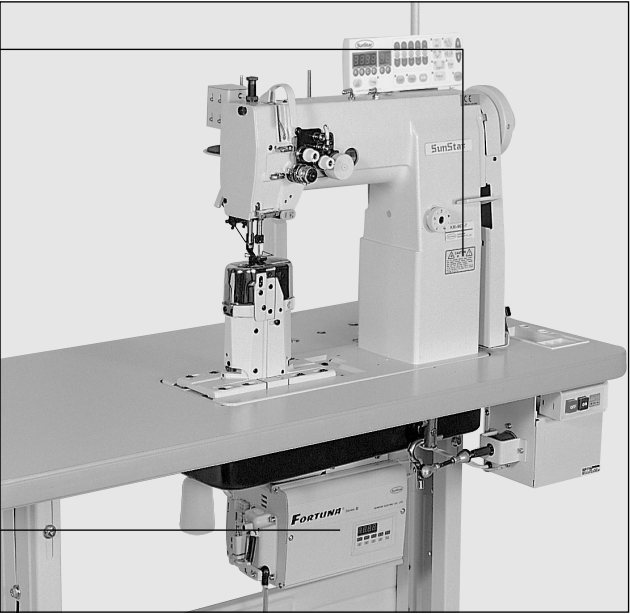

CAUTION
경고



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

“Caution” is adhered to the machine for safety.
In case of starting to run the machine, read the directions of “Caution” carefully.

[Position of Caution Mark]



1-7) Content of “Caution”




CAUTION
경고



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.
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CAUTION
경고



Hazardous voltage will cause injury. Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplugging a power cord.
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1 Specifications

1) Machine Types

No.	Model No.	Model Name
1	KM-857	High post type 1 needle, drop feed, needle feed sewing machine (standard hook)
2	KM-857-7	High post type 1 needle, drop feed, needle feed sewing machine with automatic trimmer (standard hook)
3	KM-867	High post type 2 needle, drop feed, needle feed sewing machine (standard hook)
4	KM-867-7	High post type 2 needle, drop feed, needle feed sewing machine with automatic trimmer (standard hook)

2) Specifications of the machine

Model type		KM-857	KM-857-7	KM-867	KM-867-7
Item					
Purpose		Medium material - heavy material			
Max. sewing speed		3,000SPM			
Max. no. of stitches		5mm			
Needle bar stroke		33.4mm			
Feed dog height		1mm			
Presser foot height	Manual	7mm			
	Knee	18mm			
	Automatic		13mm		13mm
Post height		178mm			
Needle used		DP × 17 #18(#14~#22)			
Feeding method		Low pressure circular automatic feeding			
Needle width gauge		1/16"~1" (1.6mm~25.4mm)			

3) Specifications of servo motor controller (trimming type: KM-857-7, KM-867-7)

MODEL	VOLT	WATT	HERTZ
SC55-1B	1 phase 110V	550W	50/60 Hz
SC55-2B	1 phase 220V	550W	50/60 Hz
SC55-3B	3 phase 220V	550W	50/60 Hz

4) Specifications of clutch motor (non-trimming type: KM-857, KM-867)

MODEL	VOLT	WATT	HERTZ
HEC-1701	1 phase 220V	250W	50/60 Hz
HEC-1703	3 phase 220V/380V	250W	50/60 Hz
HEC-1705	3 phase 220V	400W	50/60 Hz
HEC-1706	1 phase 220V	400W	50/60 Hz








5) Peripheral automation devices (optional: trimming type)

Optional Device	Model	Usage
Auto Knee Lifting System	SPF-3A	A solenoid operating structure where the presser foot gets lifted automatically with pedal reverse gear stage 1 operation.
Production Counter	SCOUN-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	A device needed when only one operator runs several sewing machines. Pedals for acceleration, thread trimming, presser foot and ascending are built separately. There are two types: SPDL-1 for fixed speed type and SPDL-2 for adjustable speed type.

2

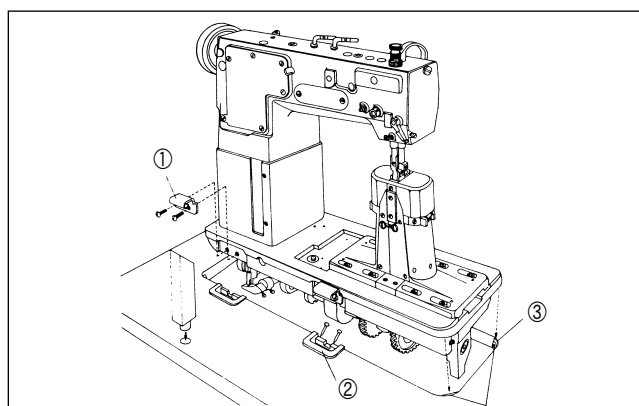
Installation

Warning

	► Installation of the machine should be performed by a trained engineer.
	► Any electrical wiring must be performed by a qualified technician or agent.
	► The machine weighs over 53kg. At least 2 persons should carry out the installing work.
	► Plug in after the installation is complete. If the operator mistakenly steps down on the pedal with the plug in, the machine will start automatically and can cause physical injuries.
	► Connect the ground (earth) wire. An unstable connection may result in an electric shock or a malfunction.
	► Place the belt cover on top of the machine.
	► Use both hands when bending the machine backwards or returning it to the normal position. Using only one hand can lead to severe hand injuries due to the weight of the machine.

1) Installation of machine head

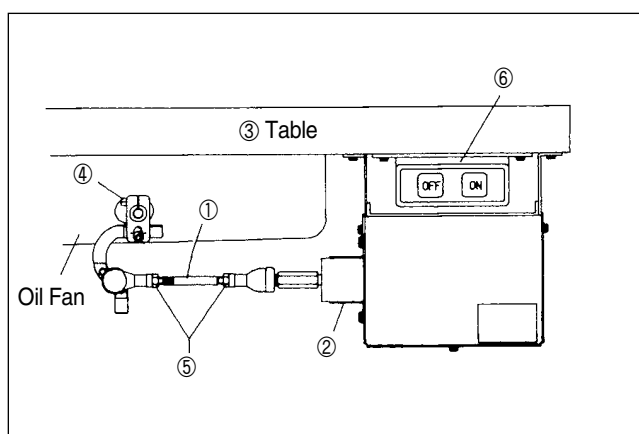
※ Fix the two head hinges ① to the bed. Settle the machine onto the table where the hinge rubber ② and cushion rubber ③ are inserted. (see figure 1)



[Figure 1]

2) Installation of knee lifting solenoid and power switch box

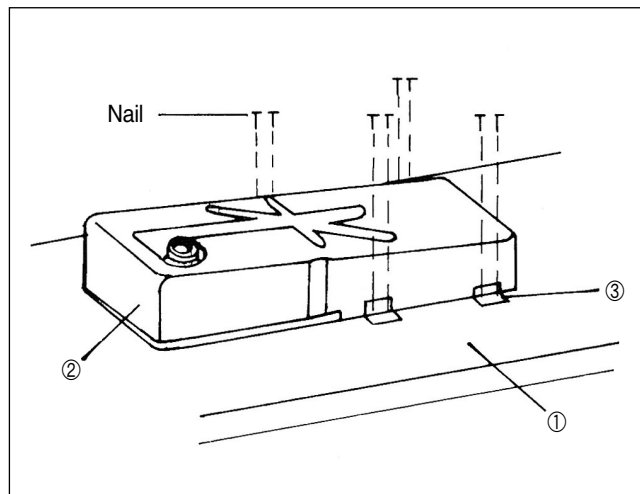
- (1) When attaching the power switch box ⑥, refer to figure 2 to make sure that it is placed at the very center of the solenoid bracket.
- (2) After attaching the solenoid onto the table, unfasten the screw ④ to adjust the center of middle linking bar ① and the center of solenoid shaft ② in parallel position with the lower side of the table ③. After the adjustment is over, fasten the fixing screw tightly. (see figure 2): assembling position diagram can be found inside the solenoid box.
- (3) The presser foot height of the sewing machine can be adjusted after unfastening the fixing nut ⑤ and then turning the middle linking bar ① clockwise to raise and counterclockwise to lower. After finishing the adjustment, tightly fasten the fixing nut ⑤.
- (4) According to the installation position of knee-lifting solenoid, the operation noise, operation load and presser foot elevation range may differ. Please assemble so that the machine will operate smoothly.



[Figure 2]

3) Installation of oil fan

※Insert the projecting part of the oil fan ② into the respective machine holes on the lower side of the table ①, and then push securely to the right. Fix the oil fan to the four fixing spots ③ using 4 nails. (see figure 3)



[Figure 3]

Caution



- ▶ Be sure to plug in after finishing oil supply,
If the user steps on the pedal by mistake, the machine will start automatically, and this might lead to physical injuries.
- ▶ When handling lubricant, use safety goggle or gloves to prevent the lubricant from coming into contact with the eyes or skin. This may cause inflammation. And never drink lubricants. They may cause vomiting or diarrhea. Please keep out of the reach of children.

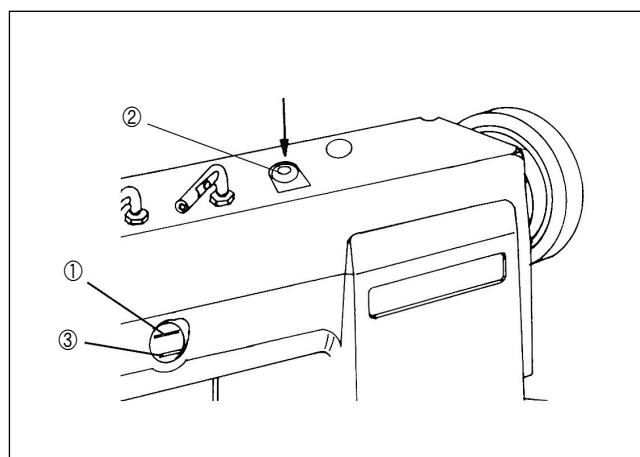


- ▶ Make sure to supply oil when using it for the first time or after not using it for a long time.

4) Lubrication

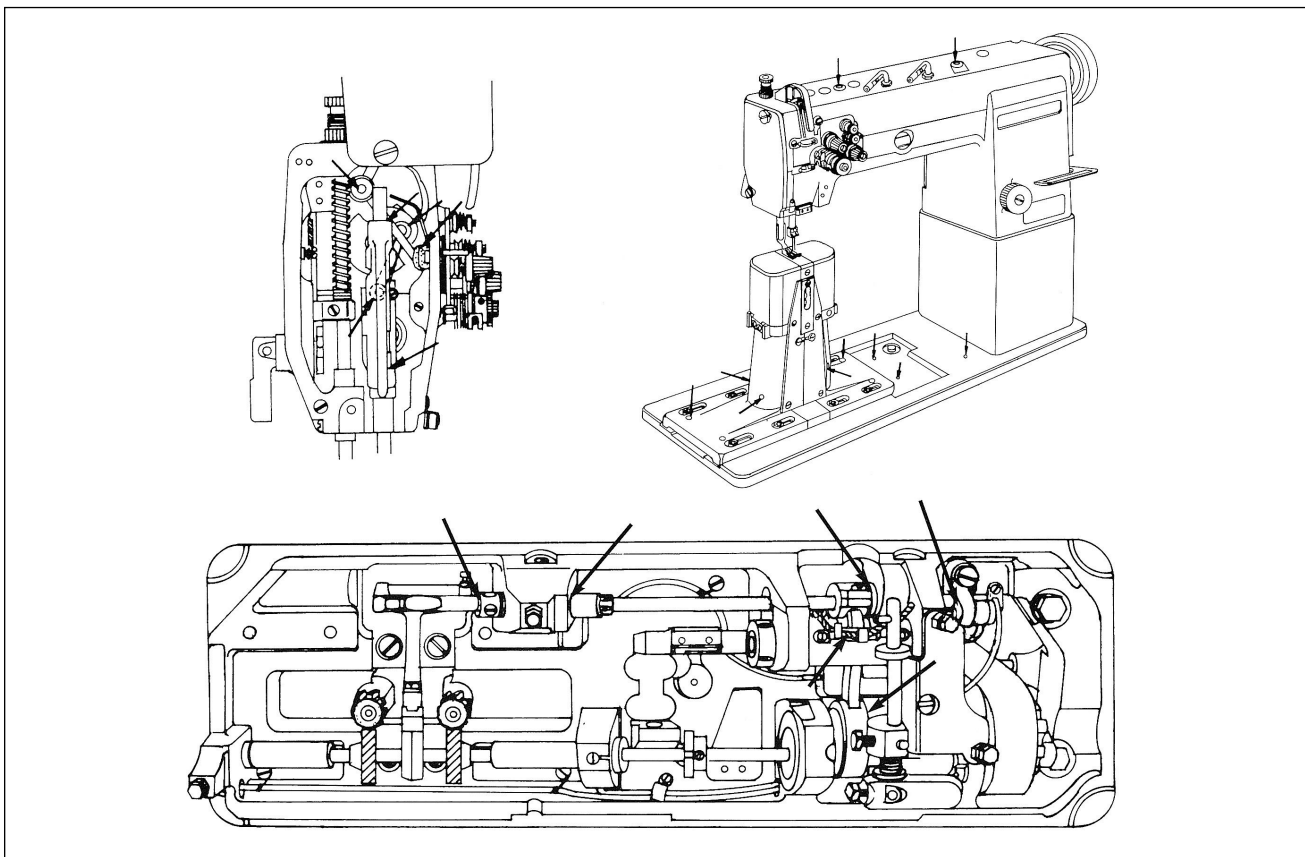
(1) Oil tank check

As in figure 4, pour the oil into the oil hole ② until the oil tank's oil level reaches the red maximum line ①. While using the machine, replenish the oil immediately when the oil level goes down to the minimum level ③, back to the red maximum level ①. Make sure to check the oil level once a day.



[Figure 4]

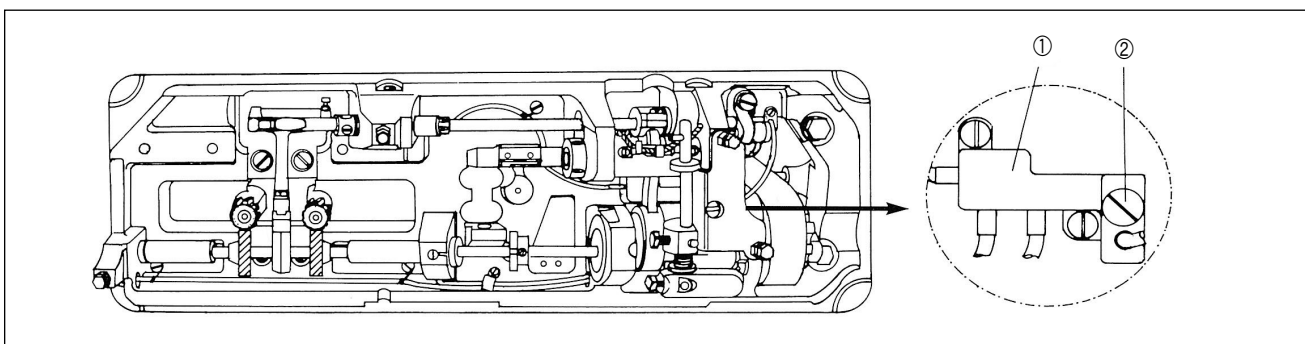
- (2) As in figure 5, make sure to supply oil into the oil holes marked in red and into each friction part, before moving the sewing machine.



[Figure 5]

(3) Supply level adjustment of oil supply terminal

The amount of oil supplied from the arm's oil tank to the front and middle bushing of the lower shaft and the front bushing of the horizontal push stick can be adjusted using the adjustment screw ② of the oil supply terminal ①. The amount of oil supply decreases when turned clockwise, and increases when turned counterclockwise. (see figure 6)

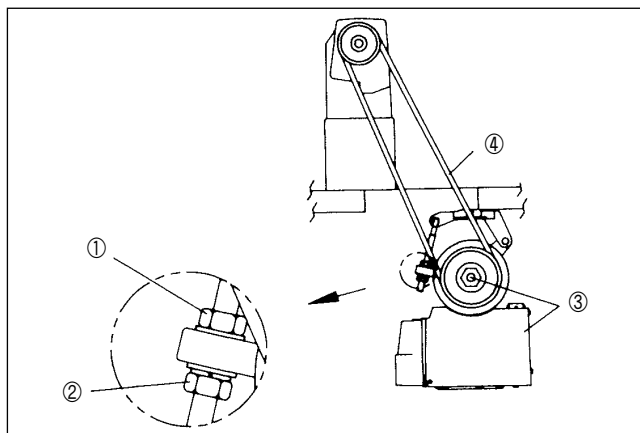


[Figure 6]

- (4) As test operation, run the machine for 10 minutes at about 1,500 SPM. For the first 4~5 days of using the machine, operate the machine at less than 2,400 SPM per minute. Then, start using at normal pace. This will help maintain good performance of the machine along the way.

5) Adjustment of belt tension

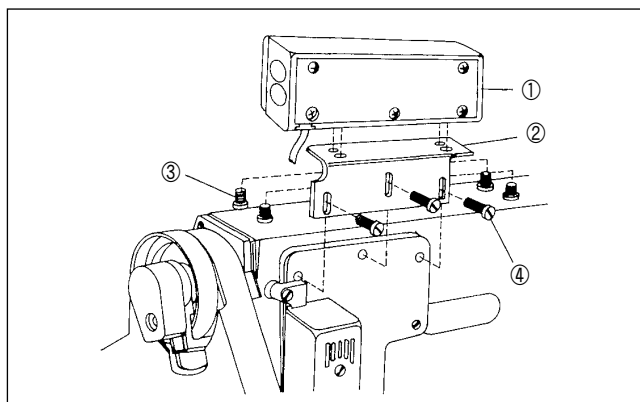
Once the motor is installed, when the fixing nuts ①,② are fully unfastened on both sides, tension is created to the belt ④ due to the weight of the motor ③. At this moment, fasten the fixing nut ① first, then fasten the fixing nut ② tightly. (See figure 7)



[Figure 7]

6) Installation of program unit (automatic trimming type)

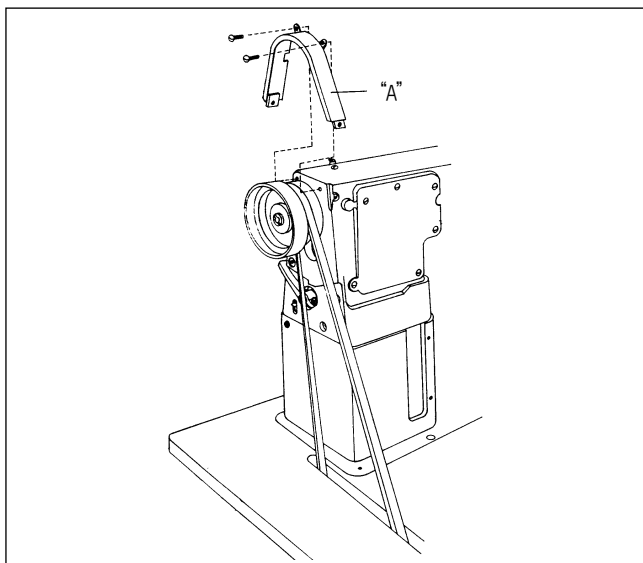
- (1) Fix the bracket ② onto the program unit ①, using 4 fixing nuts ③.
- (2) Then, use 3 fixing bolts ④ to tightly fix the bracket ②, where the program unit ① has been attached, along with the back cover. (see figure 8)



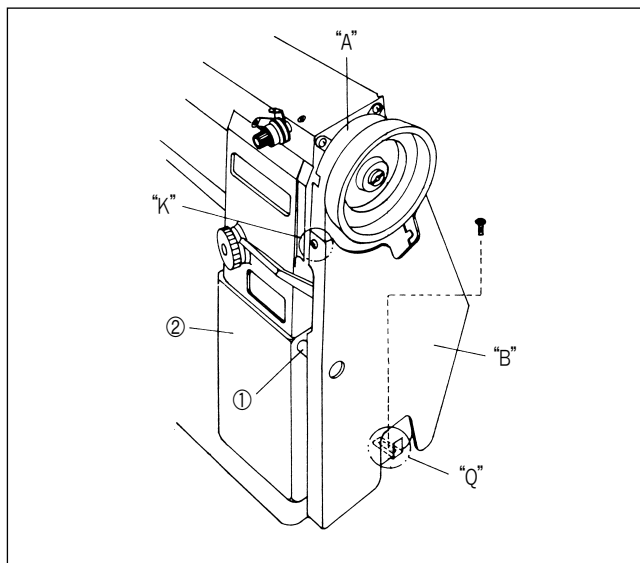
[Figure 8]

7) Installation of belt cover

- (1) Attach belt cover "A" onto the back of the machine body as seen in figure 9.
- (2) As seen in figure 10, assemble the belt cover support pin ① to the arm base ②, and then attach the belt cover "B" to the machine. Now, if a bobbin winder is attached on the table, lay down the machine body on its back and attach the belt cover "B".
- (3) Fix the belt covers "A" and "B" as can be seen on part "K" of the figure.
- (4) Fix the lower part of the belt cover "B" onto the machine bed like part "Q" of the figure.



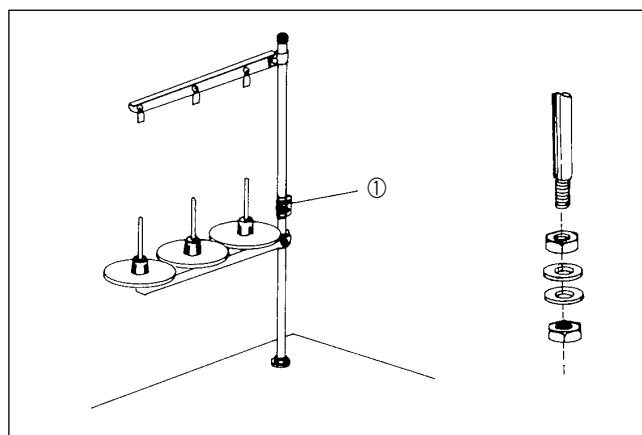
[Figure 9]



[Figure 10]

8) Installation of thread stand

As seen in figure 11, fix the thread stand ① to the table using the washer and nut on the right.



[Figure 11]

9) Synchronizer assembling and its control method (automatic trimming type)

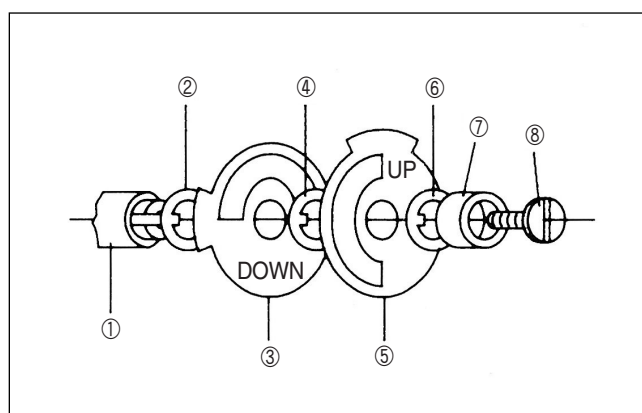
(1) Installation of synchronizer

Assemble in the order of marked number as can be seen in figure 12. Then, following the figure 13, make adjustments to place the photo film at the center of the sensor housing①, by moving the shaft ② to the right and left. Then, tighten the 2 fixing screws ③ using the hexagonal wrench④.

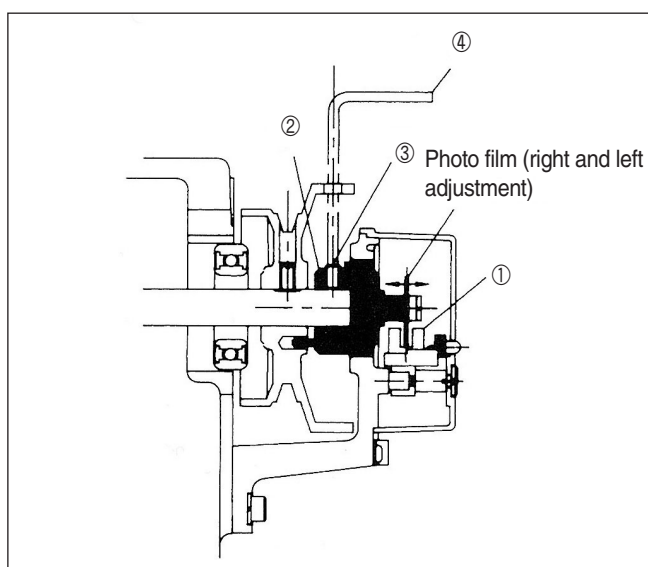
[Note]

A) As seen in figure 12, make sure that the marks “DOWN” and “UP” face the front when looking from the pulley side.

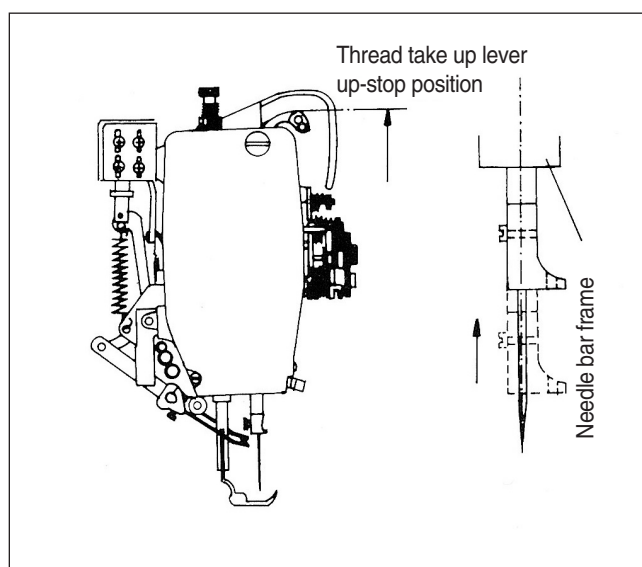
B) Film adjustment is completed upon shipment.



[Figure 12]



[Figure 13]



[Figure 14]

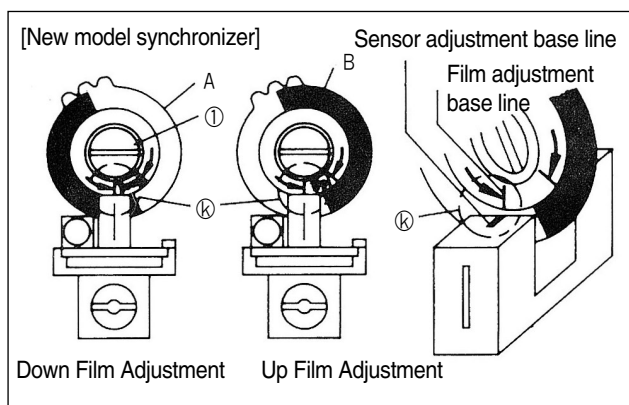
(2) Film adjustment of synchronizer

A. For new model type (see figures 14, 15)

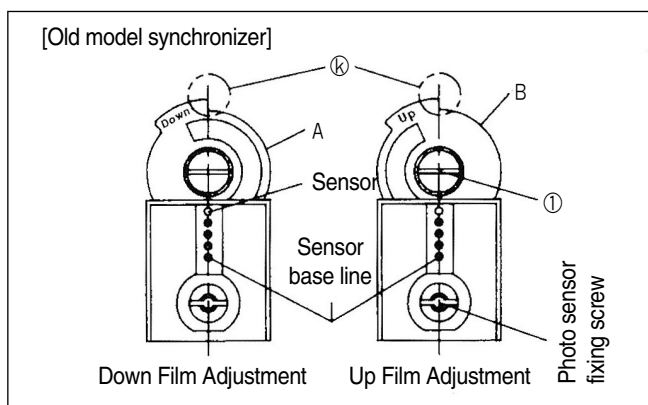
Manually turn the pulley so that the needle bar is placed where it starts rising from the lowest point. Unfasten the film fixing screw ① in figure 15, and for “DOWN” film A, align the film adjustment base line with the sensor adjustment base line, as can be seen in ㊦. Then, using the fixing screw ①, fasten only as much as to prevent the film from turning. In the same method, place the thread take up lever in the highest point. Once again unfasten the fixed screw ①, and align the “UP” film B like ㊦. Now, be careful not to move the previously set “DOWN” film A.

B. For old model type (see figure 16)

Adjust in the same method as new model to make the right side ㊦ of the film’s projecting part aligned to the center of the sensor base line.



[Figure 15]

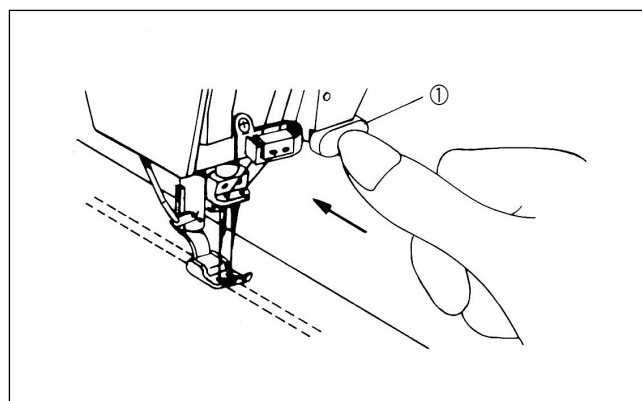


[Figure 16]

10) Reverse button function (automatic trimming type)

If the reverse button ① is pressed while sewing forward, reverse sewing takes place immediately. If the machine is stopped first and the button ① is pressed before stepping the pedal to start the machine, reverse sewing will take place from the start. Also by pressing button ① while the machine is in stop position, the high-low position of the needle bar can be changed. If the button ① is pressed once when the needle bar is in down-stop position, the needle bar changes to up-stop position. Once again, if the button ① is pressed twice consecutively within 1 second, the needle bar changes to down-stop position.

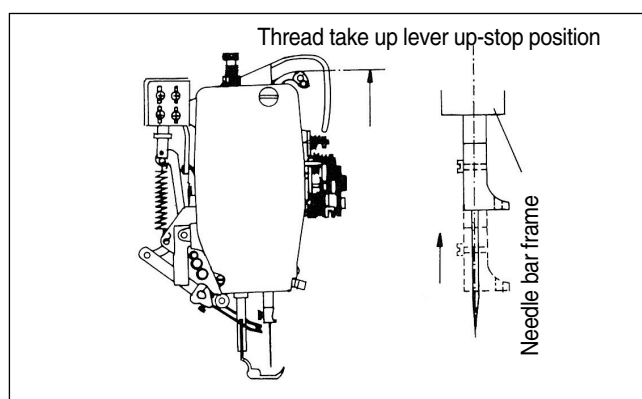
In short, it has both the reverse sewing and needle up-down position change functions. (See figure 17)



[Figure 17]

11) Checking stop position of the machine (automatic trimming type)

After changing the up-down position of the needle by pressing the reverse button, check the stop position of the machine. Check whether the thread take-up lever is in the highest position when the needle is in up-stop position. When the stop position is incorrect, there might be problems to the trimming function, hence the photo film location of the synchronizer must be corrected. That is, the needle up-stop position is the same as the needle bar’s stop position once the trimming action takes place. So there is no problem with the timing of the trimming action. (See figure 18) (See ‘location detector adjustment’ on page 14)



[Figure 18]

3

Adjustment of the machine



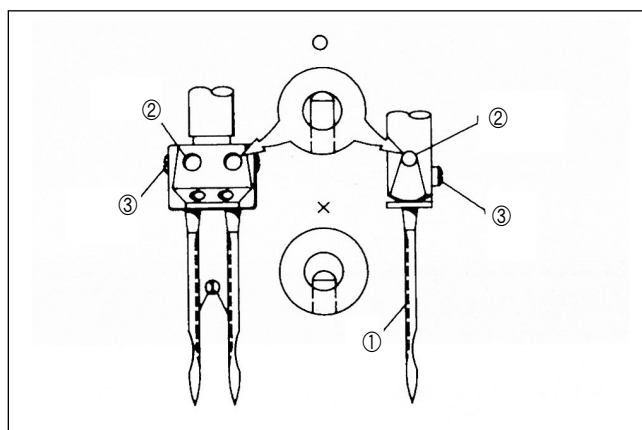
Caution



- In case of setting the needle, be sure to switch off the power supply. If the user steps on the pedal by mistake, the machine will start automatically, and this might lead to physical injuries.
- When using the clutch motor, remember that the motor revolves for a while even after switching off the power supply due to inertia. Make sure to start working only after the motor has come to a complete stop.

1) Inserting needle

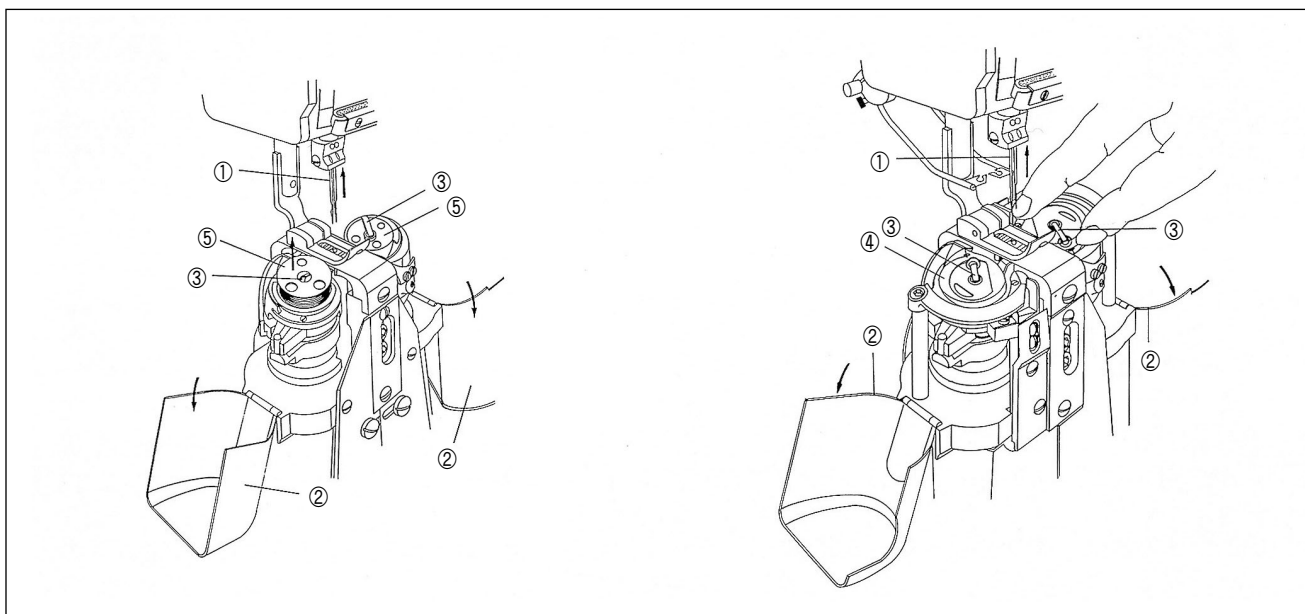
As in figure 19, place the upper end of the needle closely adhered to the upper side of the stopper hole ②, with the needle groove ① facing inward. Fix the needle with a fixing screw ③.



[Figure 19]

2) Removing bobbin and bobbin case

Place the needle ① in the highest position, and then just like in figure 20, open the hook covers ② on the left and right. Raise the bobbin holder ③ to remove the bobbin case ④ and the bobbin ⑤.

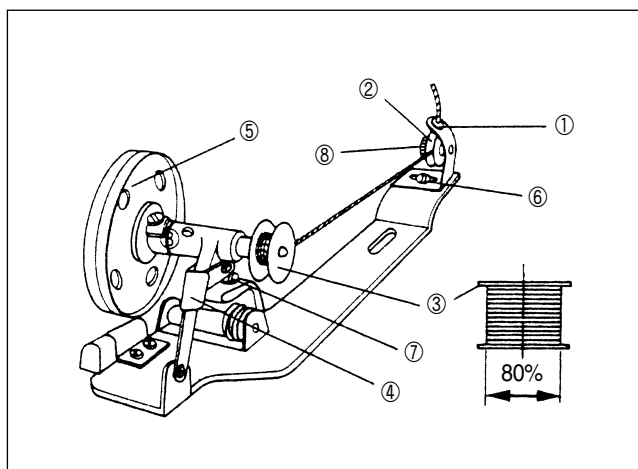


[Figure 20]

3) Winding lower thread

(1) Winding the lower thread

- Insert the thread into the hole ①, and put it around the back of tension adjustment plate ② to the front side.
- Bring the thread towards the bobbin ③, and wind it around 5~6 times starting from the bottom.
- Push the lever ④ to make the pulley ⑤ touch the V-belt, and then operate the machine.
- When the lower thread is fully wound to the bobbin, pulley ⑤ will automatically detach from the V-belt.
- The adequate amount of thread wound to the bobbin is about 80%. [See figure 21]



[Figure 21]

(2) Adjustment of lower thread winding.

- If the lower thread winds irregularly, unfasten the screw ⑥, and adjust by moving to the left and right. Fasten back the screw ⑥ when the adjustment is complete.
- The amount of lower thread wound increases when the adjusting screw ⑦ is turned clockwise, and decreases when turned counter clockwise.
- The tension of the lower thread wound to the bobbin grows when the nut ⑧ is turned clockwise, and drops when turned counter clockwise.



Caution

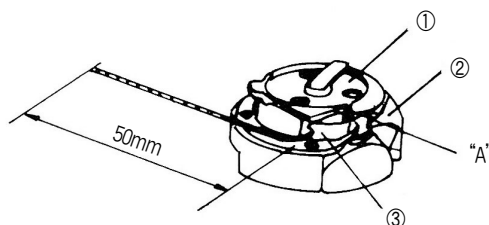


- ▶ When adjusting the tension of the lower thread, be sure to switch off the power supply. If the user steps on the pedal by mistake, the machine will start automatically, and this might lead to physical injuries.
- ▶ When using the clutch motor, remember that the motor revolves for a while even after switching off the power supply due to inertia. Make sure to start working only after the motor has come to a complete stop.

4) Routing lower thread

[Applied Model Types]

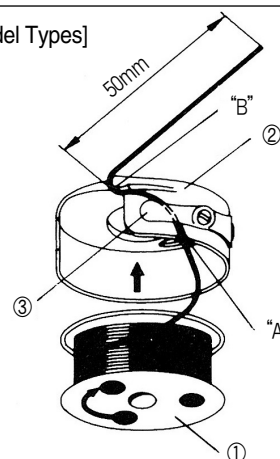
- KM-857
- KM-867



- Insert the bobbin ① into the hook ②.
- Insert the thread through "A" part of the hook ②, and pull it out from the end of the lower thread tension adjustment plate ③.
- The adequate length of the pulled-out lower thread is 50mm.

[Applied Model Types]

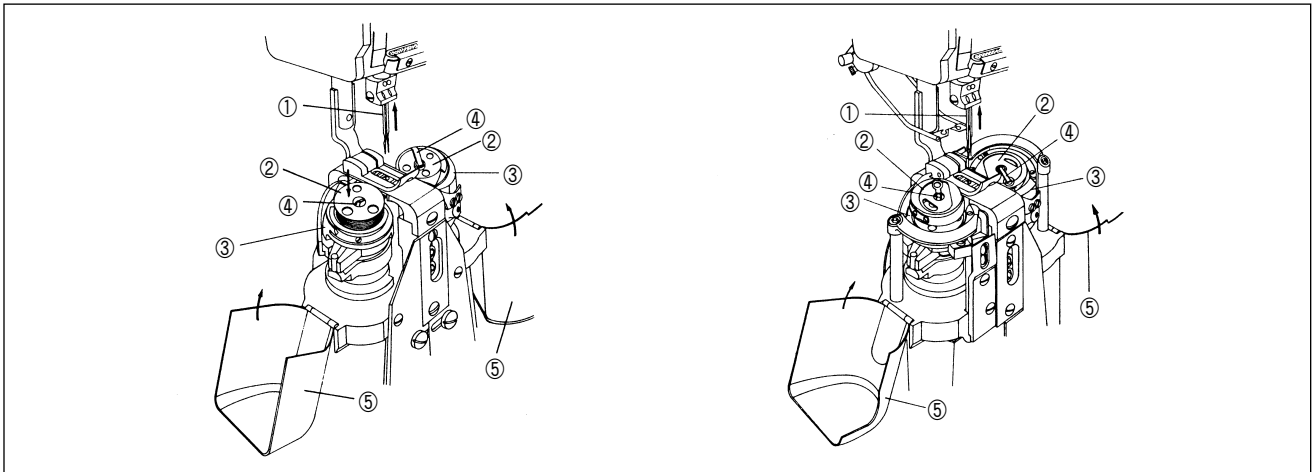
- KM-857-7
- KM-867-7



- Insert the bobbin ① into the bobbin case ②.
- Insert the thread through "A" part of the hook ②, and pull it out from the end of the lower thread tension adjustment plate ③.
- Pass the pulled-out thread through "B" of the bobbin case ②, and insert it into the hook.
- The adequate length of the pulled-out lower thread is 50mm.

5) Inserting bobbin

Stop the needle ① at the highest position. Following the figure 22, insert the bobbin (where the thread is rolled onto) or the bobbin case ② into the hook ③. After laying down the bobbin holder ④, close the slide plates on the right and left ⑤.



[Figure 22]



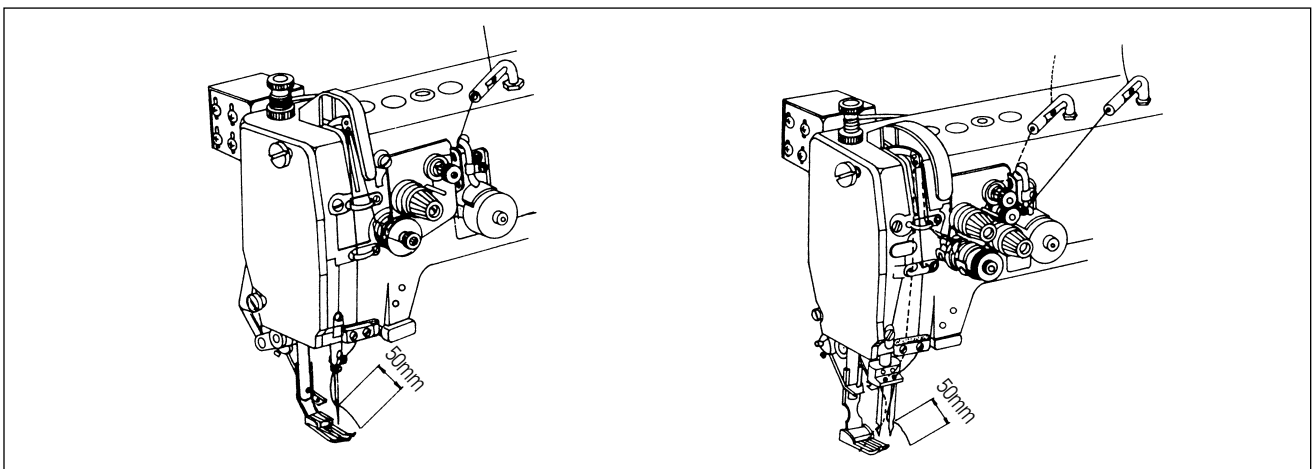
Caution



- ▶ When taking up the upper thread, be sure to switch off the power supply. If the user steps on the pedal by mistake, the machine will start automatically, and this might lead to physical injuries.
- ▶ When using the clutch motor, remember that the motor revolves for a while even after switching off the power supply due to inertia. Make sure to start working only after the motor has come to a complete stop.

6) Routing upper thread

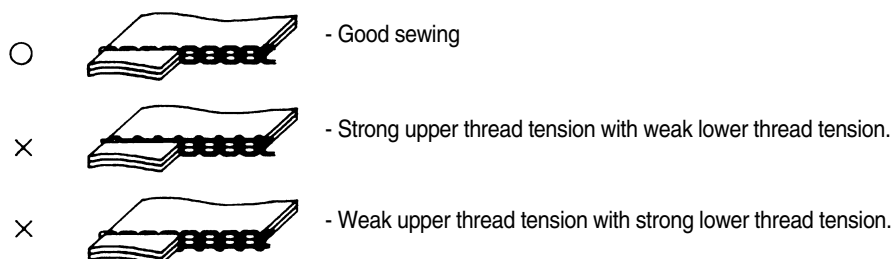
Place the thread take-up lever to the highest position and hang the upper thread like in figure 23. The adequate length of upper thread extending from the needle hole is 50mm for initial sewing.



[Figure 23]

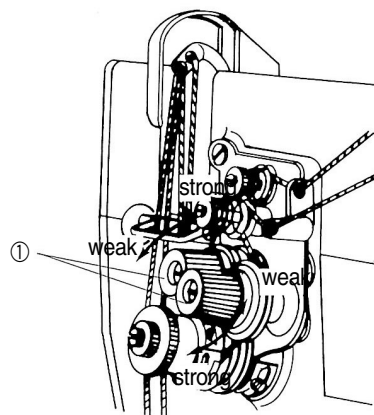
7) Adjusting thread tension

The result of the needlework depends on the sewing conditions such as the sewing material, used thread and stitch length. So please adjust as fit.



(1) Adjusting the upper thread tension

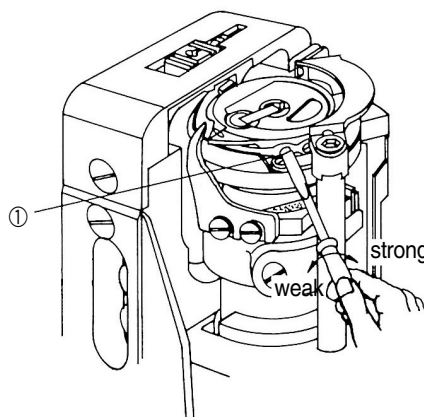
Like in figure 24, turning the tension adjustment nut ① of the thread tension control assembly clockwise makes the upper thread tension stronger and turning counterclockwise makes it weaker.



[Figure 24]

(2) Adjusting the lower thread tension

Like in figure 25, turning the tension adjustment nut ① of the hook clockwise makes the lower thread tension stronger and turning counterclockwise makes it weaker.



[Figure 25]

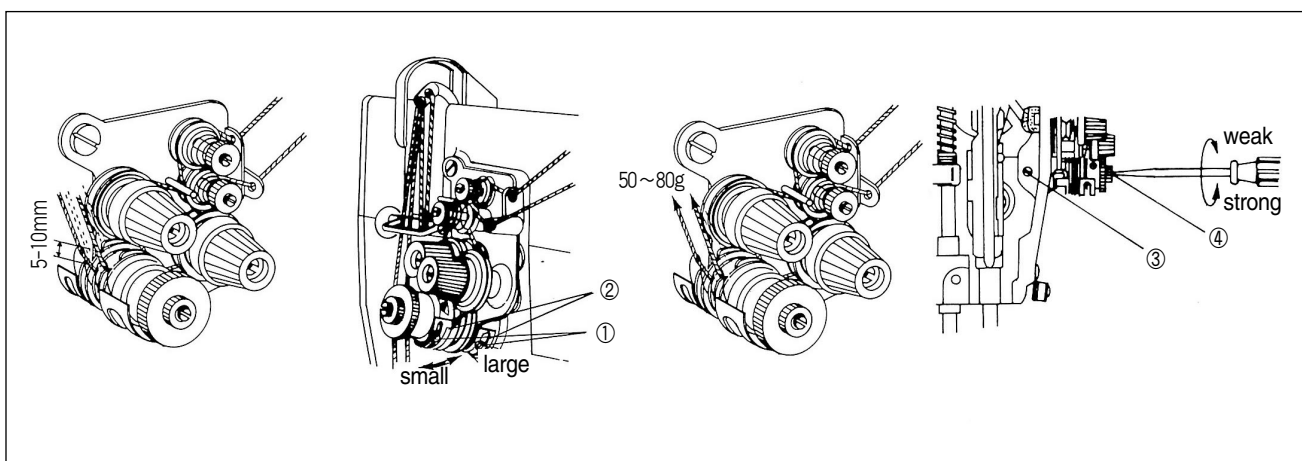
(3) Adjusting the tension of thread take up lever spring

A) Adjusting the thread take up stroke

As in figure 26, loosen the stopper clamp screw ①, and turn the thread take up lever spring stopper ② clockwise to make the stroke smaller and counterclockwise to make it bigger. The thread take up stroke is normally 5~10mm.

B) Adjusting the thread take up tension

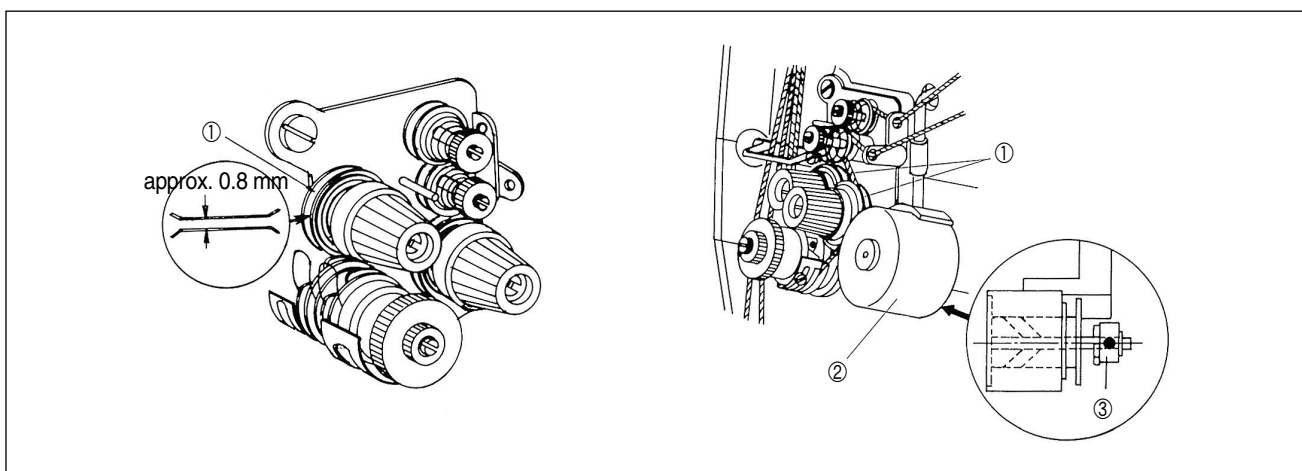
As in figure 26, loosen the screw ③ of the thread tension control assembly shaft, and insert the driver into the groove ④ of the thread tension control assembly shaft. Turn clockwise to make the spring tension stronger and counterclockwise to make it weaker. The thread take up spring tension is normally 50~80g.



[Figure 26]

(4) Adjusting the thread release stroke. (automatic trimming type)

If the upper thread falls out from the needle hole after trimming, check whether the plate ① opens while the trimming is in action. For the adjustment of plate opening level, put the solenoid ② in action, and adjust by moving solenoid collar ③ back and forth to make the opening of the thread tension adjusting plate ① 0.8 mm. Also, when the thread release solenoid is not in action, check whether the plates are closely adhered to each other. (See figure 27)



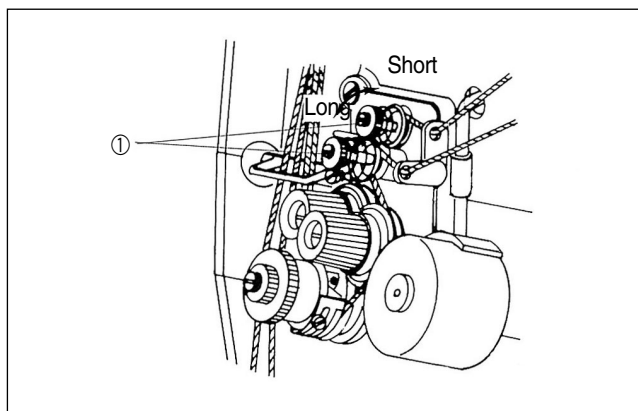
[Figure 27]

[Caution]

If the plates do not open enough during the trimming action even when the assembling is good, check whether or not the upper thread length adjustment volume, which is at the front of the control box, is low.

(5) Adjusting the auxiliary thread tension control assembly (automatic trimming type)

As in figure 28, when the auxiliary thread tension adjustment nut ① is turned clockwise, the length of the thread after trimming gets short. The other way makes the thread long. The appropriate length of the upper thread on the needle after trimming is 35~45mm. (This can also be done by using the remaining upper thread length adjustment volume of the control box.)



[Figure 28]



Caution



- ▶ Be sure to place back safety devices and check whether they function properly, after disassembling and adjustments.
- ▶ Use both hands when bending the machine backwards or returning it to the normal position. Using only one hand can lead to severe hand injuries due to the weight of the machine.



- ▶ Be sure to pay caution to safety when making adjustments with the power switch on.
- ▶ The machine must be repaired and inspected only by trained technicians.
- ▶ Qualified technicians or agent must perform electrical repairs or inspections.

8) Adjusting height and pressure of the presser foot

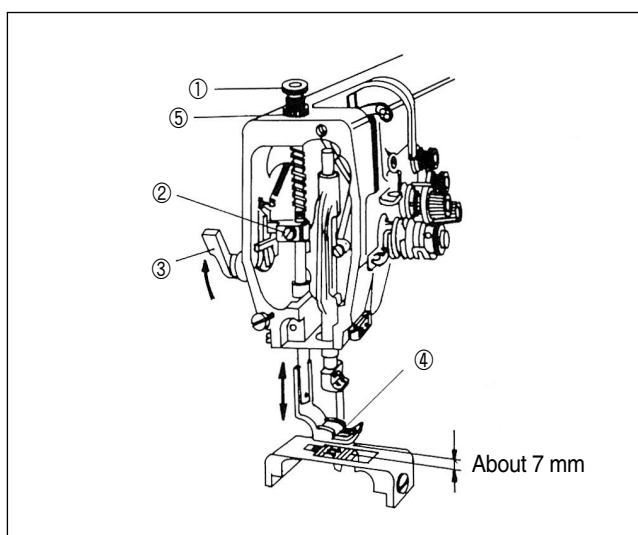
(1) Adjusting the height of the presser foot

Loosen the pressure adjustment screw ① and the presser bar bracket clamp screw ②. Lift the presser bar lifter ③. Make the distance between the upper side of the needle plate and the lower side of the presser foot ④ 7mm. Then, tightly fasten the bracket clamp screw ②. (See figure 29)

Be careful not to turn the presser bar.

(2) Adjusting the tension of the presser foot

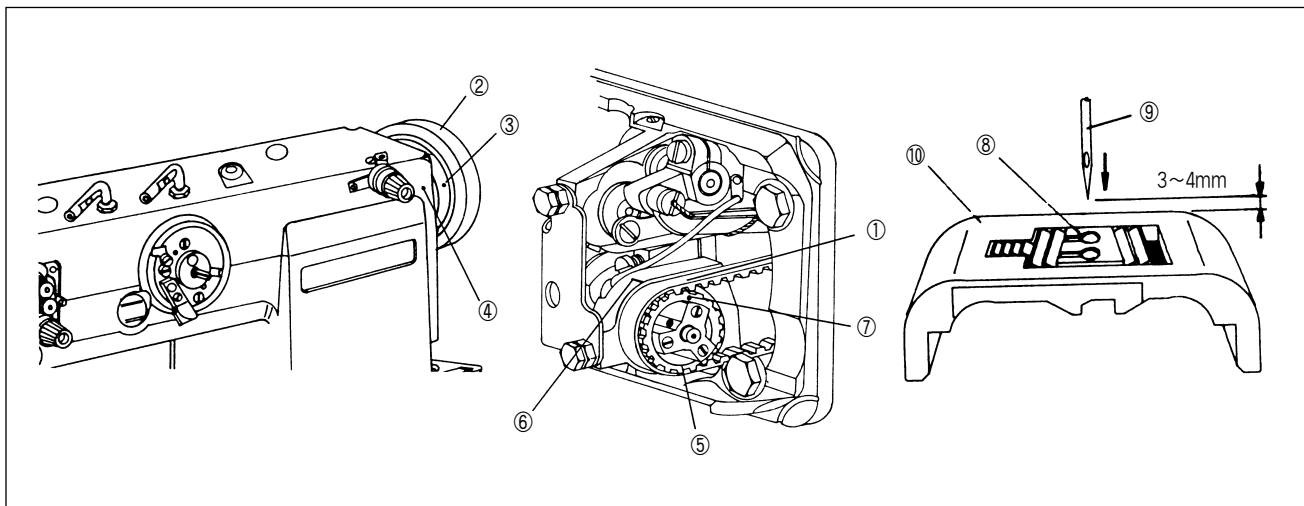
Turning the pressure adjustment screw ① to the right increases the presser foot tension, and turning it to the left makes it weaker. After adjusting, make sure to tighten the fixing nut ⑤. (See figure 29)



[Figure 29]

9) Adjusting needle and feed dog timing

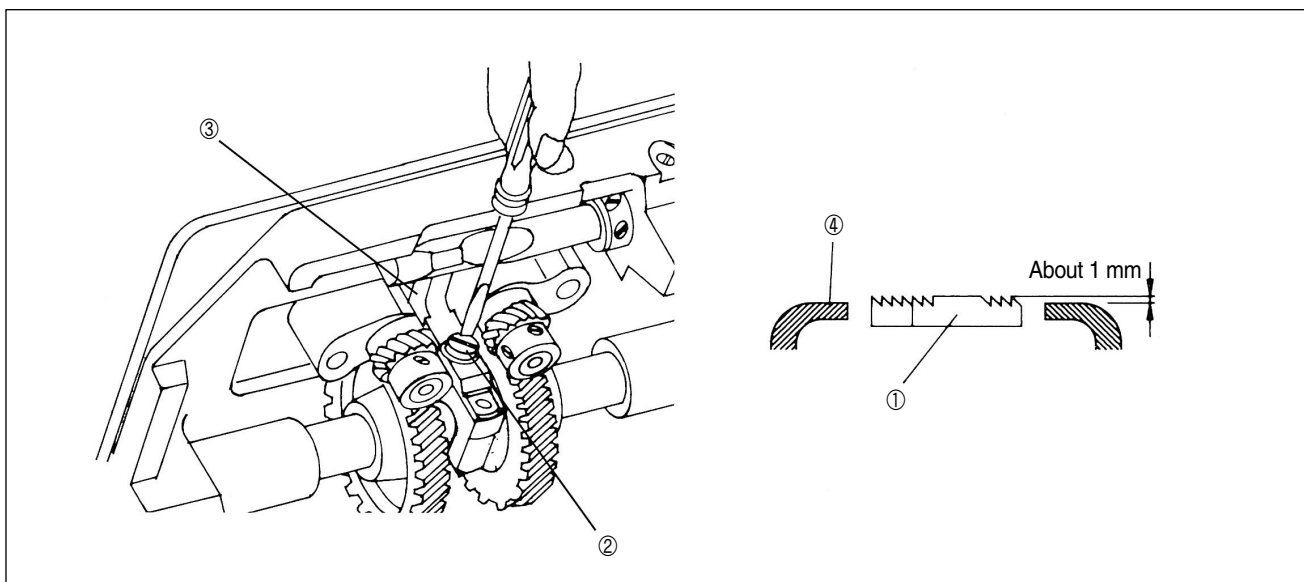
- (1) After removing the needle, lay down the machine on its back and remove the timing belt ①.
- (2) Turn the pulley ② to align the highest position ③ of the pulley's thread take up lever with the position ④ of the arm. Then rotate the timing pulley ⑤ to align the bed base point ⑥ with the timing pulley's base point ⑦. Hang the timing belt ① in this position.
- (3) After adjustment, when the feed dog ⑧ comes up from below the needle plate, and the upper side of the feed dog meets the upper side of the needle plate ⑩, check to see if the needle descends and the needle point ⑨ stops at about 3~4mm distance from the upper side of the needle plate, as can be seen in the figure. (See figure 30)



[Figure 30]

10) Adjusting height of the feed dog

Turn the pulley to place the feed dog ① in the highest point. Loosen the feed dog base clamp screw ② and move the feed dog base ③ up and down to make the feed dog ① protrude out in parallel to the upper side of the needle plate ④ for about 1 mm. (See figure 31)

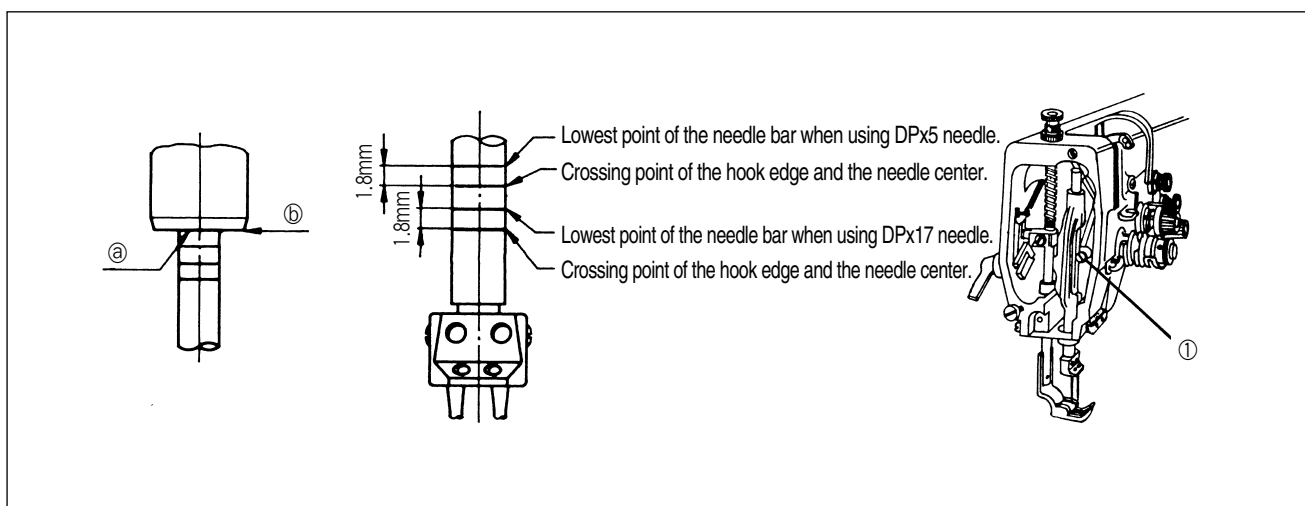


[Figure 31]

11) Adjusting needle and hook timing

(1) Fixing the height of the needle bar

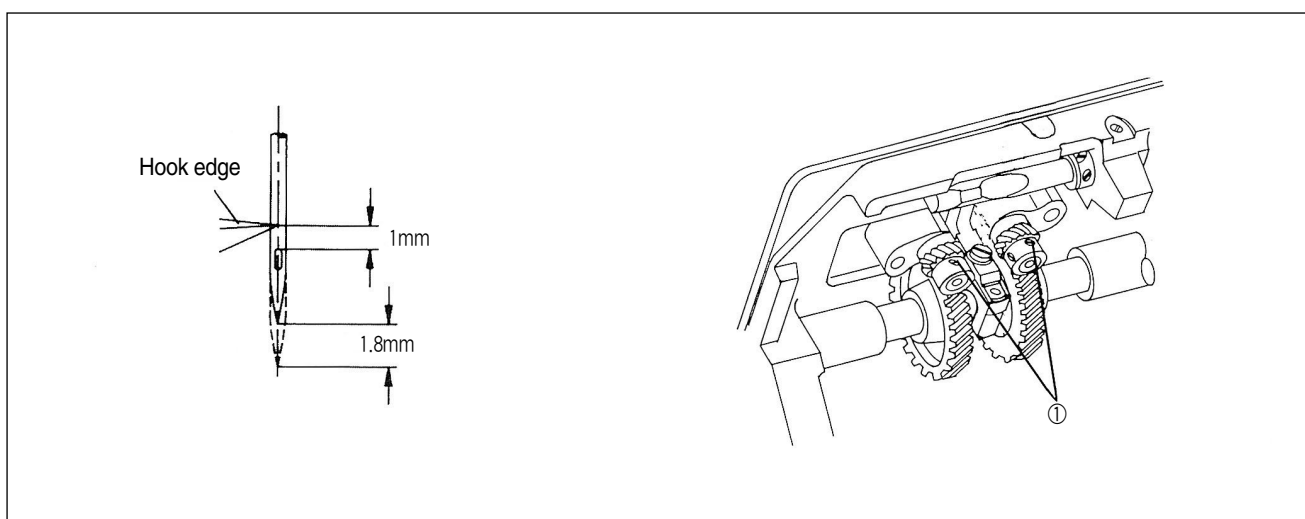
※ Turn the pulley to place the needle bar in the lowest position. Loosen the needle bar holding screw ①, adjust so that the needle bar carved sign ② meets the end of the frame ③ like in figure 32, then tighten the screw.



[Figure 32]

(2) Adjusting the timing of hook edge and needle center crossing

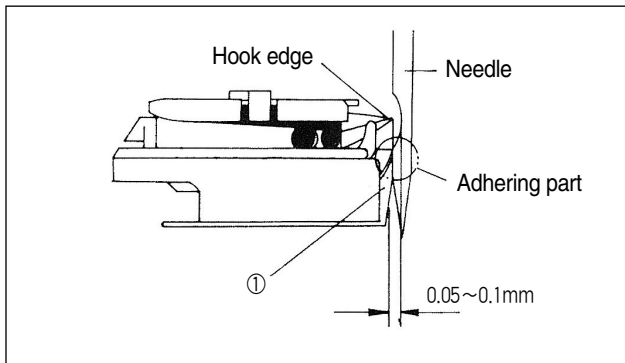
First, set the stitch length (DIAL) to 2.5mm. Adjust the hook gear clamp screw ① so that like in figure 33, the hook edge fall sexactly at the center of the needle center when the needle bar is raised 1.8mm from its lowest position. When this is done, the hook edge will be placed at about 1mm above from the front of the needle thread hole.



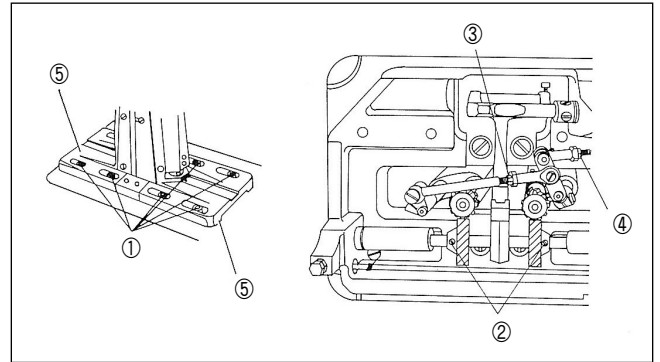
[Figure 33]

(3) Adjusting the distance between the needle and the hook edge

Raise the needle from its lowest point so that the hook edge meets the needle center. Like in figure 34, when the lower part of the needle meets the balance point of the hook's needle guide plate ① (adjust the needle guide form), adjust the distance between the hook edge and the inner side of the needle groove to 0.05~0.1mm. Loosen ① ② ③ ④ of figure 35 and move the hook base to the left and right ⑤ for adjustment.



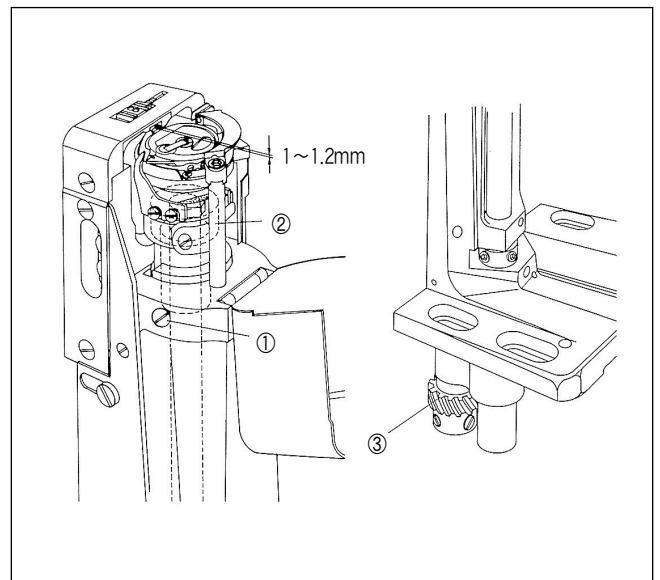
[Figure 34]



[Figure 35]

12) Clearance adjustment between upper side of hook stopper and upper side of needle plate groove

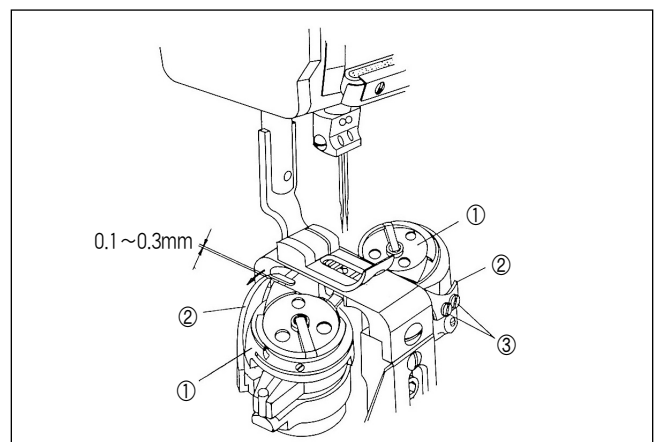
Like in figure 36, the normal distance between the upper side of the hook stopper and the upper side of the needle plate groove is 1~1.2mm. This distance may impact the thread separation during sewing adjustment and trimming, hence it must be checked. If the distance is not as recommended, it has to be adjusted by moving the hood base bushing ② up and down as seen in figure 36. Make sure the adjustments are made after carefully observing the assembled position of the peripheral parts. The hook base bushing ② is fixed in one position by a fixing screw ①. Hence the hook shaft gear ③ has to be unfastened in order to change the up/down position. When this is done, it should move smoothly without the hook shaft moving up and down. Also, fix the lower shaft gear, maintaining the hook edge and needle timing unchanged.



[Figure 36]

13) Clearance adjustment between hook and opener

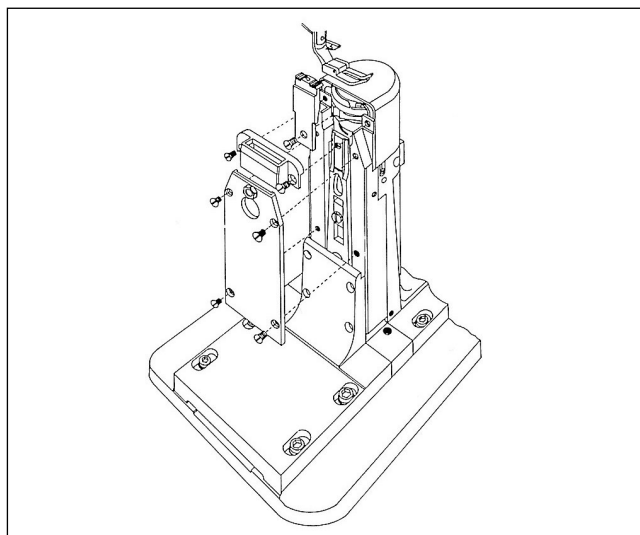
Loosen the opener clamp screw ③ and turn the opener ② to the right and left so that the distance between the hook ① and the opener ② is 0.1~0.3mm when the opener ② is pulled to its max towards the arrowed direction. (See figure 37)



[Figure 37]

14) Replacing feed dog

- (1) For KM-857 series, refer to figure 38 to replace the feed dog.

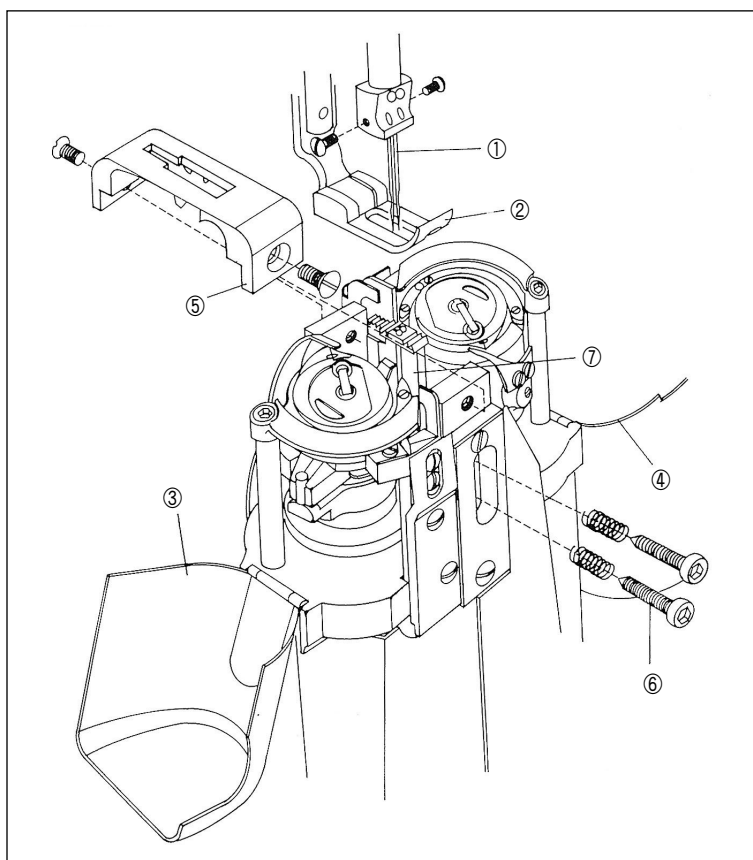


[Figure 38]

- (2) Feed dog replacement method for KM-867 series is very simple, as they have adopted the 'quick change' type structure. Please refer to the following explanation and figure 39.

[Disassembling Order]

- A) Disassemble the needle①
- B) Disassemble the presser foot②
- C) Open the left and right hook covers③④
- D) Disassemble the needle plate⑤.
- E) Unfasten 2 of the feed dog fixing bolts⑥ for about 3 cycles
- F) Using a driver, lift the feed dog⑦ and take it out.



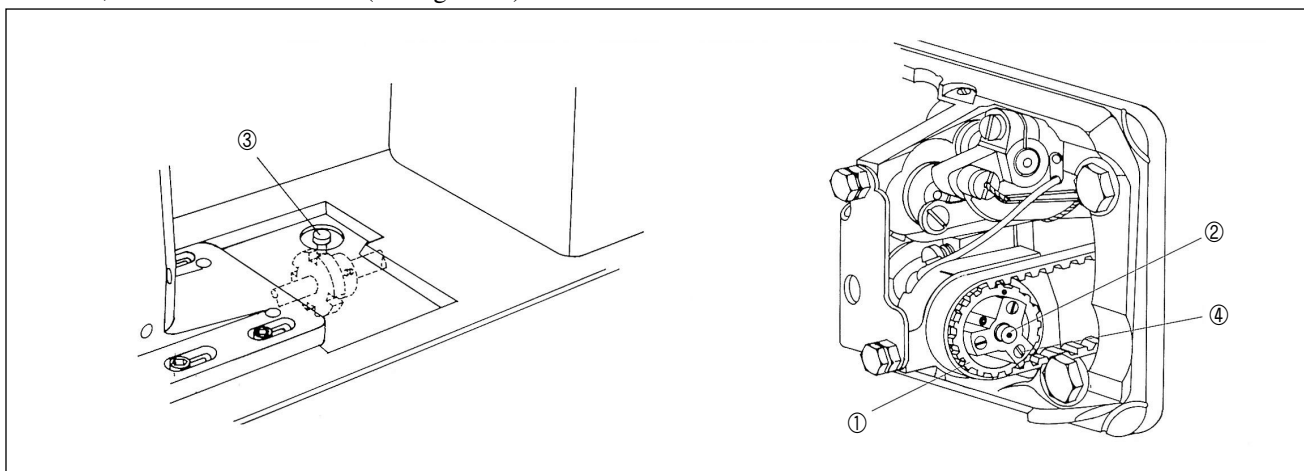
[Figure 39]

※ Assembling can be done in the reverse order. Make sure that the feed dog is securely inserted before tightening the fixing bolt⑥.

15) Adjustment of safety device

When there is overload in the machine during the operation, the safety device pulley ① and the lower shaft ② get separated, thereby not passing the driving power of the upper shaft to the lower shaft ②. Hence major parts are protected from damage. In this case, the power switch needs to be turned off, and the cause of the overload needs to be removed. Then, lay down the machine on its back and turn the pulley, while pressing the latch button ③. Safety device pulley ① and the lower shaft ② will come back to its original position.

※ The load in which the safety device gets activated can be adjusted by turning the adjusting screw ④ clockwise for large load, and left for small load. (See figure 40)



[Figure 40]

16) Adjusting trimming device

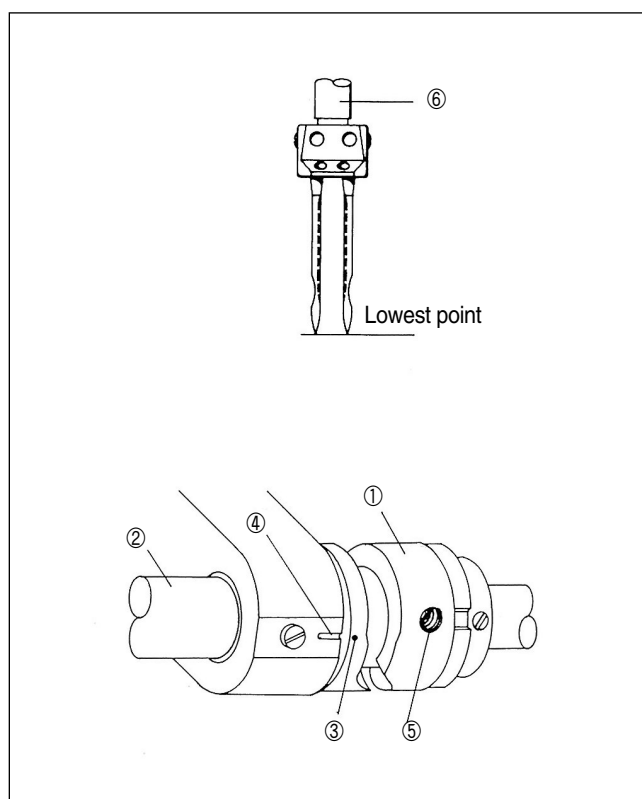
(1) Adjusting the trimmer driving part

A) Fixing the position of the trimming cam (See figure 41)

a) Turn the pulley manually to place the needle bar ⑥ at its lowest position.

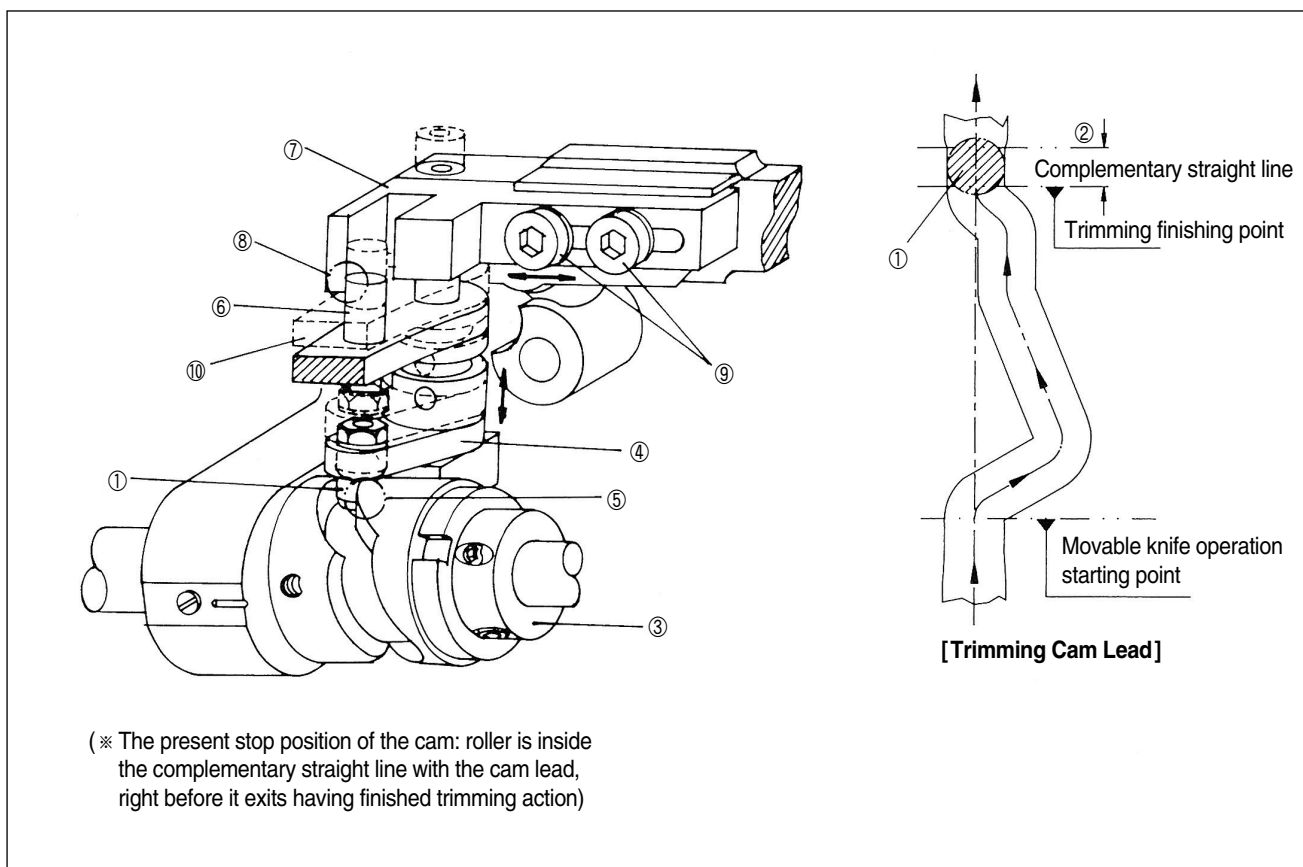
b) With the left side of the trimming cam ① softly attached to the right side of the lower shaft medium bushing ②, turn the cam to align the base point ③ with the carve ④ in the lower shaft medium bushing crank.

c) Fasten tightly the trimming cam fixing crews (3) ⑤. Now, turn the pulley manually to see whether or not the machine turns smoothly.



[Figure 41]

B) Adjusting the stopper pin holder (See figure 42)

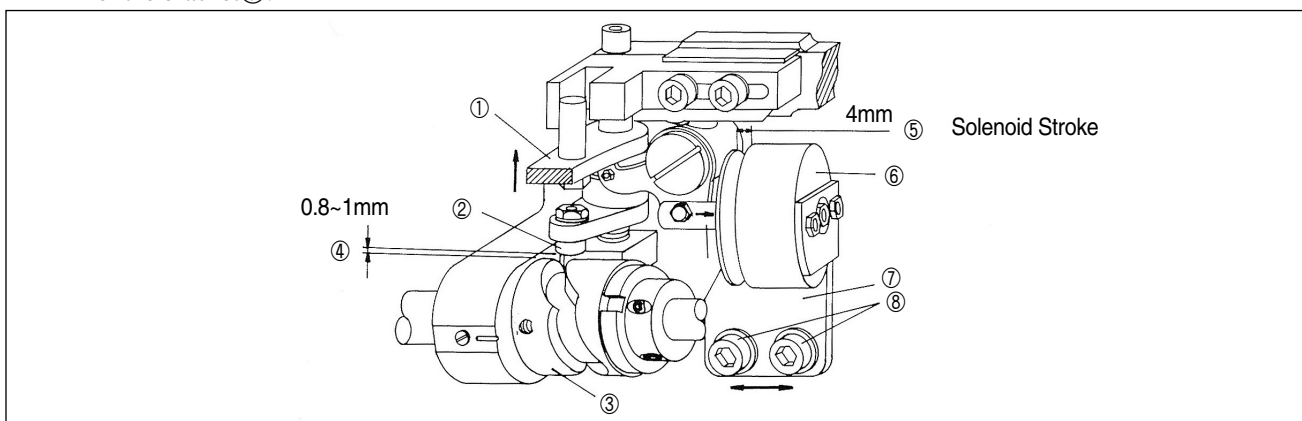


[Figure 42]

- a) Make sure to turn the machine pulley to place the trimming cam ③ in the right position, so that the roller ① can enter the complementary straight line ② range after finishing trimming marked in the trimming cam lead.
- b) Press down the trimmer shake linkage ④ to make the roller ① come inside the trimming cam ③,
 - Ⓐ Adjust the holder ⑦ to make the right equal point of the roller ① adhere ⑤ smoothly to the inner right side of the cam's complementary straight line ②, and the left equal point of the stopper pin ⑥ adhere ⑧ smoothly to the inner left side of the stopper pin holder ⑦. Once this is done, tightly fasten the fixing screw ⑨.
 - Ⓑ Once such adjustments are made, the trimmer shake linkage ④ will not move even when shaken to its sides (the roller is inside the cam). Make sure to check if the shake linkage ④ returns to up position ⑩ quickly and smoothly when released. If not, proceed with horizontal adjustment of stopper pin holder ⑦.

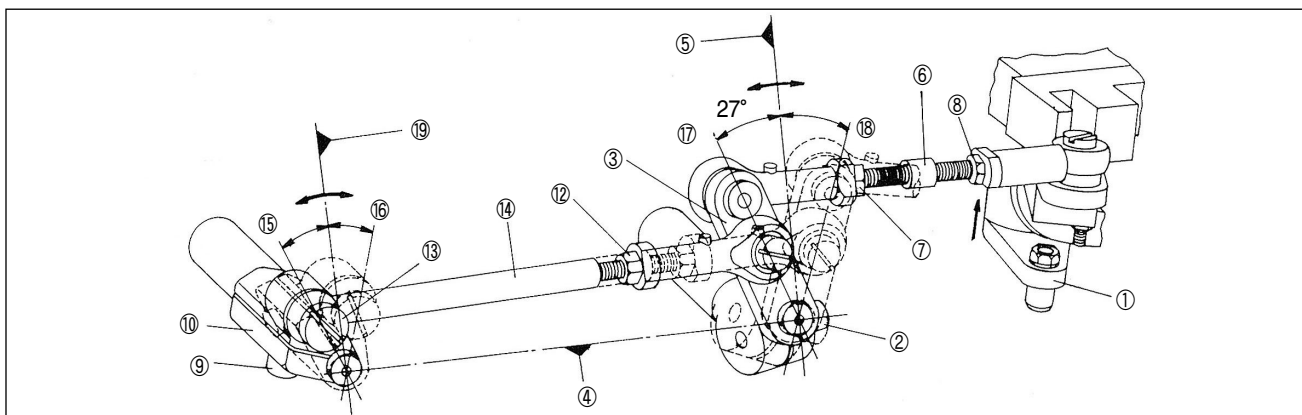
C) Fixing the position of the trimmer solenoid (see figure 43)

- a) When the whole trimmer shake linkage① is in up position, that is, when it has come back to its original position after finishing trimming, the distance④ between the lower part of the roller② and the equal point of the trimming cam ③ is about 0.8~1mm. Assuming that this distance④ never changes, adjust the position of solenoid bracket⑦ horizontally, where the solenoid housing⑥ is attached, to make the solenoid stroke⑤ 4 mm. Then, tightly fasten with fixing screw⑧.
- b) After adjusting the solenoid stroke⑤, manually operate the solenoid shaft ⑨ towards the arrow direction. See whether it returns to its original position fast and smooth when released. If not, proceed with horizontal adjustment of the bracket⑦.



[Figure 43]

(2) Adjustment of linking device for movable knife shaft and the trimmer driving part (see figure 44)



[Figure 44]

- A) When the previously explained adjustment of trimmer driving part is complete, it is in its normal position where the trimmer shake linkage① has returned to its up position after trimming action.
- B) First, loosen the fixing screw② of the movable knife shaft (right), hold the initial assembling angle of the crank (right) ③ to be about 27° to the left from the perpendicular line drawn to its center④. To make sure that this position is maintained, adjust the length of the ball joint linking bar⑥, and tightly fasten the fixing screw② of the crank (right). (For the adjustment of the ball joint linking bar⑥, turn the linking bar⑥ after loosening the nuts (left)⑦ and (right)⑧. Nut (left) is left screw and nut (right) is right screw.)
- C) Then, loosen the fixing screw ⑨ of the movable knife shaft crank (left), and in the same angle as the crank(right)'s③ lower assembling angle ⑪, place the crank(left) ⑩. Unfasten the fixing bolt ⑫ and hinge screw⑬ to adjust the length of the connecting rod ⑭, and then fasten the fixing bolt ⑬ and hinge screw⑫ to make sure this position holds.
- D) When the linking device is connected as such, the movement angles ⑮⑯⑰⑱ of crank (left)⑩ and (right)③ during trimming movement results in an equal angle movements for left and right, against the perpendicular lines⑤ and ⑲ that are drawn from the center line ④ of both sides of the movable knife shafts. Hence, it can be said that the trimming movement is very light.
- E) For KM-857-7, refer only up to the assembling direction down to the movable knife shaft crank (right)③.

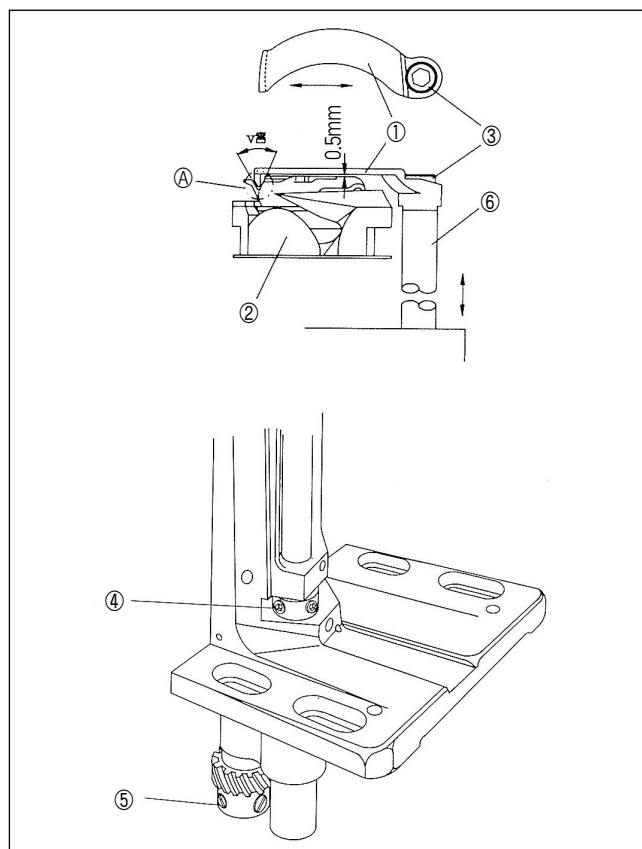
(3) Adjusting movable knife and fixed blade(See figure 45)

A) Adjusting the position of movable knife and hook

a) As in picture ① unfasten the movable knife fixing screw ③ to adjust the movable knife so that the edge of the movable knife ① sits at the very center of the hook's ② V-shaped groove. Tightly fasten after sideway adjustment.

b) Adjust the distance between the movable knife ① and the upper side of the hook ② to be 0.5mm.

※ To adjust, unfasten the clamp screw ⑤ of the hood shaft gear and the clamp screw ④ of the movable knife shaft collar. Vertically adjust the movable knife shaft ⑥, and then tightly fasten the clamp screws ④ ⑤.



[Figure 45]

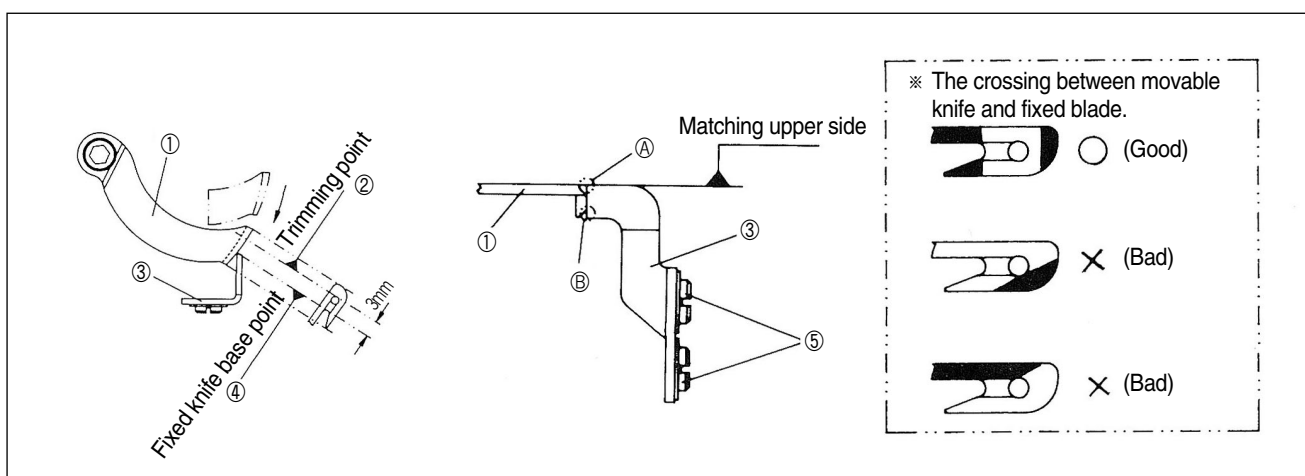
B) Adjusting movable and fixed knife (See figure 46)

a) Like in figure 46, manually operate the movable knife ① and then slowly reposition it in its original place. Now, just like in the figure, place the fixed knife so that the fixed knife ③ edge ④ touches 3mm before the movable knife's trimming point ②.

b) Match the upper side of the fixed blade ③ and movable knife ①. Fully adhere the upper ① and lower ② parts of the fixed blade edge with the outer side of the movable knife edge.

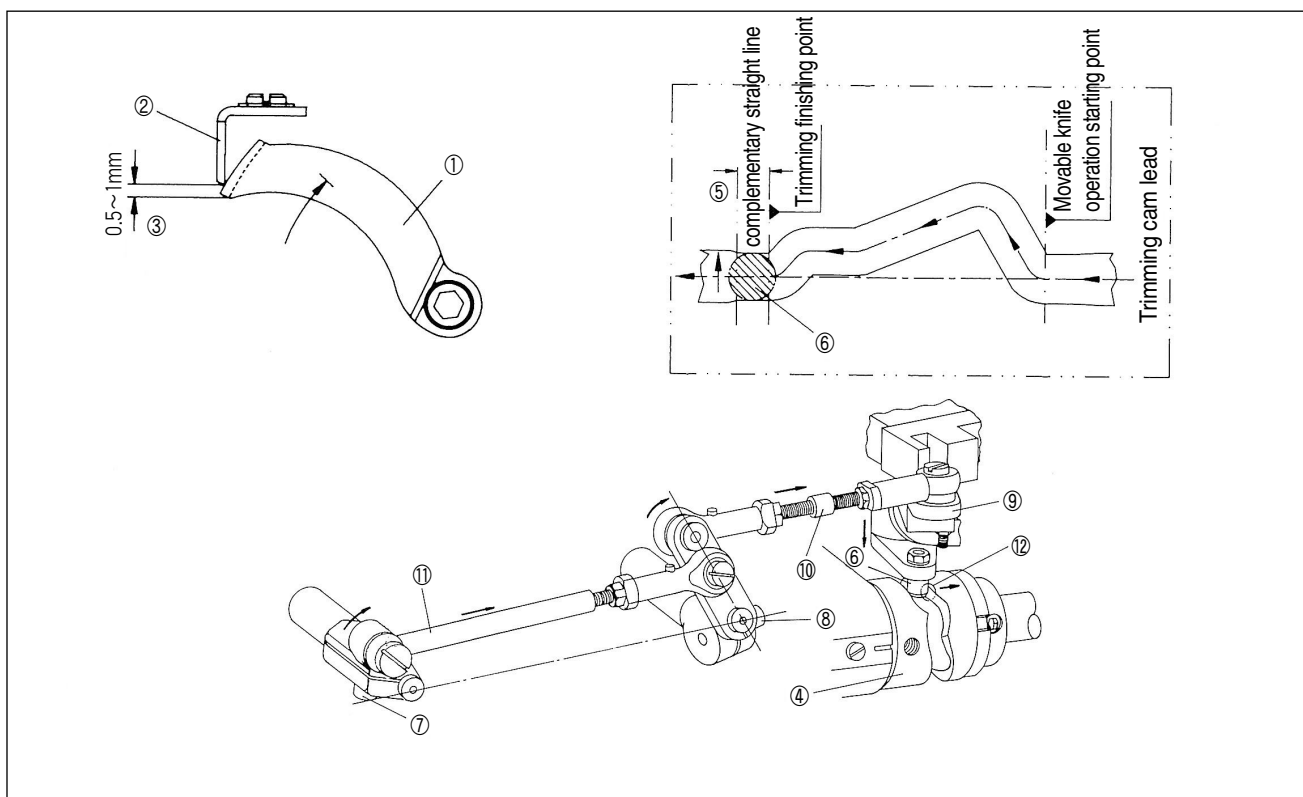
c) Under this condition, tightly fasten the fixed blade clamp screw ⑤. Be careful so that the fixed blade does not move.

d) Once the adjustment is complete, operate manual trimming once again to check the crossing of the movable and fixed knives crossing.



[Figure 46]

C) Final fixing of movable knife's initial position (see figure 47)



[Figure 47]

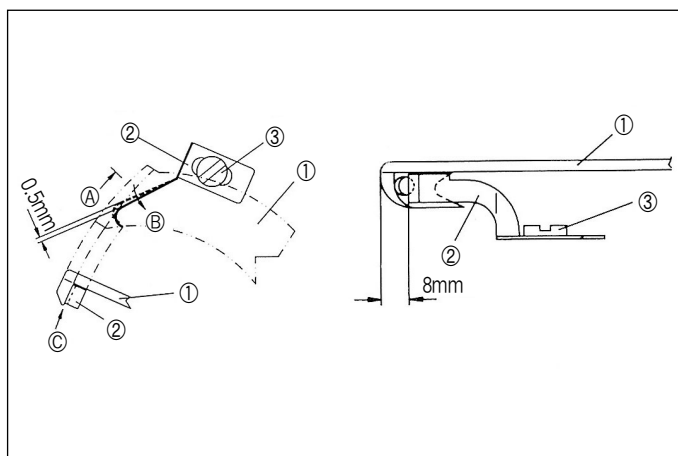
※ The standard initial assembling position of the movable knife ① is where the movable knife-edge protrudes about 0.5~1 mm ③ from the fixed blade② edge, when the trimming action is finished, that is, when the movable knife is in its initial stop position. When fixing the position of the movable knife, the following directions must be followed so that the power generated in the cam ④ is delivered without any loss to the trimming action.

[Adjustment Order]

- Turn the pulley manually to position the cam so that the roller⑥ can enter the complementary straight line⑤ right after the trimming cam④ finishes trimming.
- Slightly loosen the fixing crews ⑦ ⑧ of the left and right movable knife shaft crank.
- With the roller ⑥ inside the cam by pressing the trimmer shake linkage ⑨, push the ball joint linking bar ⑩ or the left and right movable knife shaft linking bar ⑪ slightly to the right, so that there isn't any impact to each connecting device. Then, adjust the roller ⑥ to protrude out about 0.5~1mm from the cam complementary straight line edge just line ⑫ of the figure. After the adjustment is made, tightly fasten the left and right crank fixing screws ⑦ ⑧.
- When willing to adjust only slightly the initial position of the left and right movable knives, use the ball joint linking bar⑪. If only the left movable knife is to be slightly adjusted, then use the linking bar⑪.

D) Adjusting lower thread holder

When the movable knife ① returns to its initial position after completing its trimming action (arrow ①), like in figure 48, adjust the lower thread holder by loosening the fixing screw ③ to make the distance between the movable knife edge and lower thread holder edge approximately 8mm and to make the middle point of the lower thread holder ② edge to move 0.5mm towards inside (arrow ②). Now, make sure to check that the inner side of the movable knife and the middle point of the lower thread holder edge are closely adhered as can be seen in part ③.

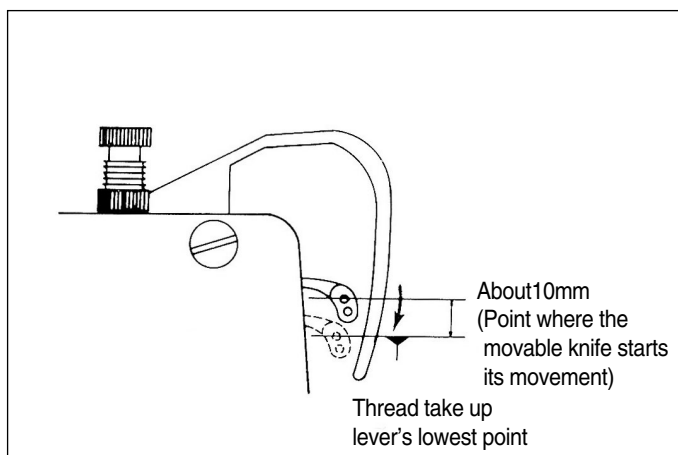


[Figure 48]

(4) Checkpoints on the assembling status of other trimming devices

A) Check the starting point of the movable knife when the trimming action takes place

※ Operate the trimming action manually to check whether the thread take up lever is about 10mm higher than its lowest point when the movable knife starts working, as in figure 49.



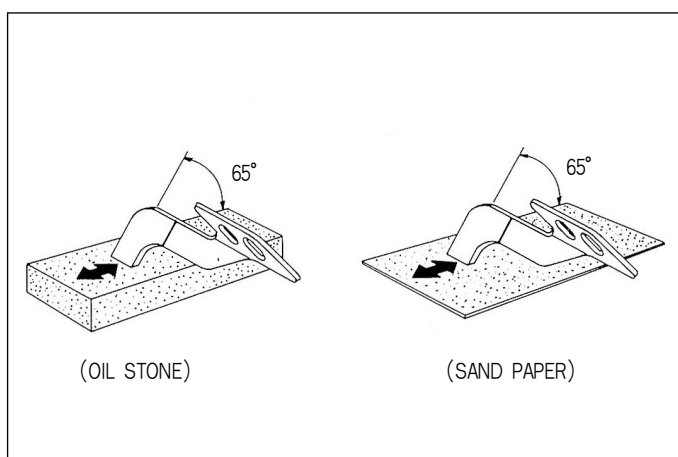
[Figure 49]

B) Maintenance of fixed blade

When the thread does not get trimmed or if the trimmed section of the thread is sloppy, please check the edge condition of the fixed blade.

If the edge of the knife is too dull, sharpen the edge using oil stone or fine sand paper.

(See figure 50)

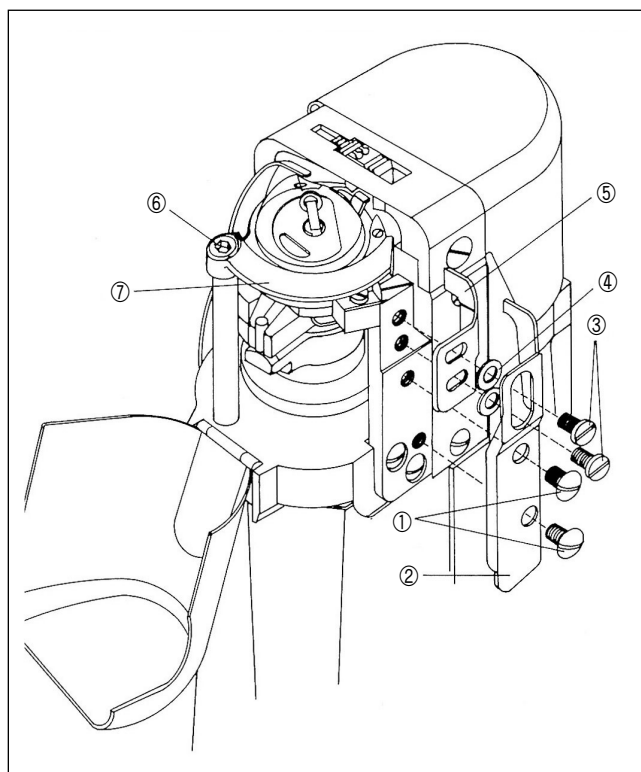


[Figure 50]

17) Replacing movable knife and fixed blade

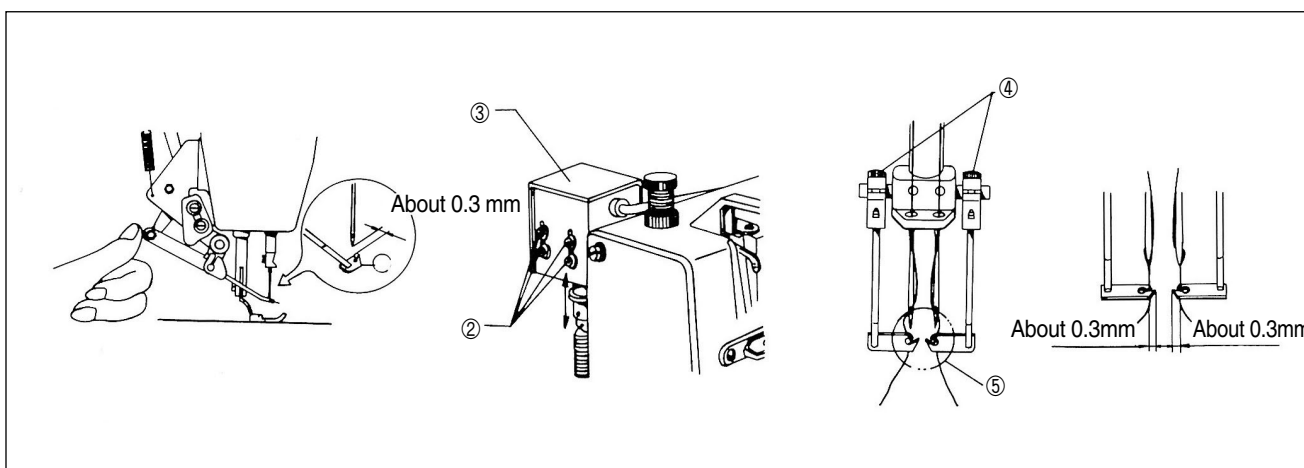
- (1) Open the hook cover
- (2) Loosen the screw ①, and remove the fixed blade holder cover ②.
- (3) Loosen the screw ③, and disassemble the washer ④ and the fixed blade ⑤.
- (4) Loosen the bolt ⑥, and disassemble the movable knife ⑦.

※ Assembling method is the reverse of disassembling method.



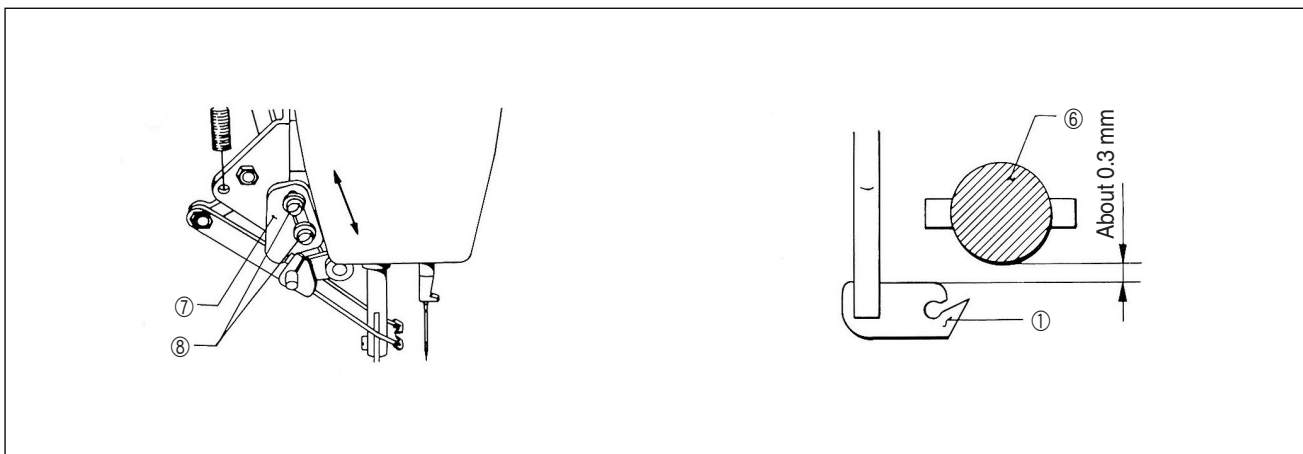
[Figure 51]

18) Adjustment of wiper



[Figure 52]

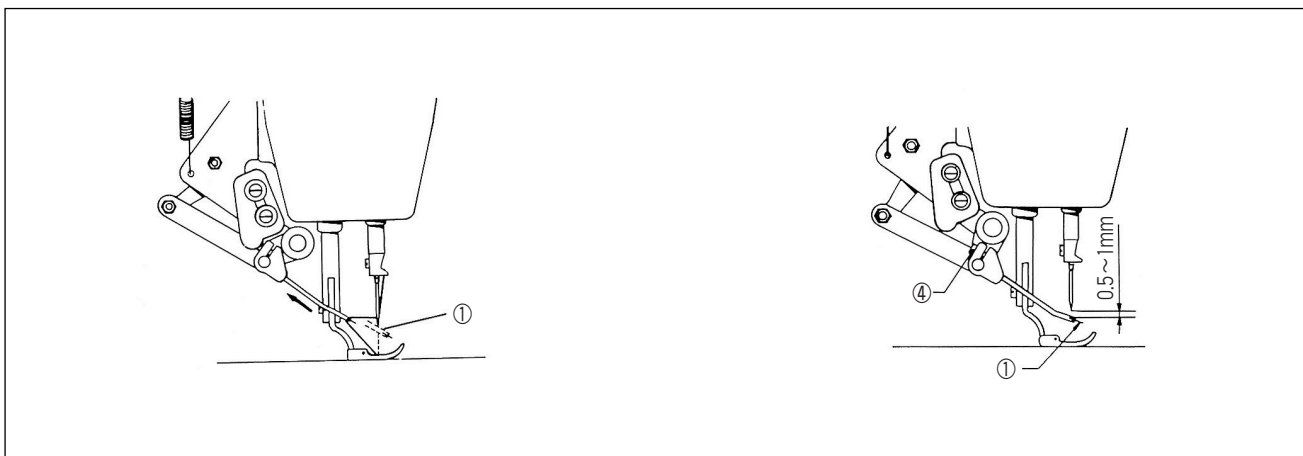
- (1) Stop the needle in up-stop position. (up-stop needle position of the control after trimming)
- (2) Set the stitch length dial at "2".
- (3) When pressing with hand as in the above picture, the wiper ① edge should protrude about 0.3 mm from the needle edge.
Loosen the four clamp screws ② to vertically adjust the solenoid ③.
- (4) Route the thread onto the two needles.
- (5) The position of the wiper edge ① should look like the picture ⑤, where the two hooks of the wiper ① can securely route the thread. To do so, loosen the clamp screws ④ of the wiper and horizontally adjust the wiper ①.



[Figure 53]

(6) When the wiper ① is in stand-by position, the distance between the wiper edge ① and the presser bar ⑥ equal point should be about 3 mm. To do so, loosen the clamp screw ⑧ and vertically adjust the stopper ⑦.

※ Depending on the thread type, there are cases where the thread cannot be routed to the wiper edge. Hence, it is necessary to bring the wiper into the range of the needle where the thread from the sewing material can be routed. Make sure that the needle fixing screw does not get in the way of the wiper.



[Figure 54]

(7) The trace of wiper ① edge is as the above picture. Adjust the wiper ① edge by loosening the clamp screw ④ and vertically adjusting the distance between the needle edge and wiper to 0.5~1mm.

19) Replacing gauge set for needle width

(1) Disassembling order

[Caution] Turn off the power switch.

1. Open the hook cover.

2. Remove the needle

3. Disassemble the needle holder

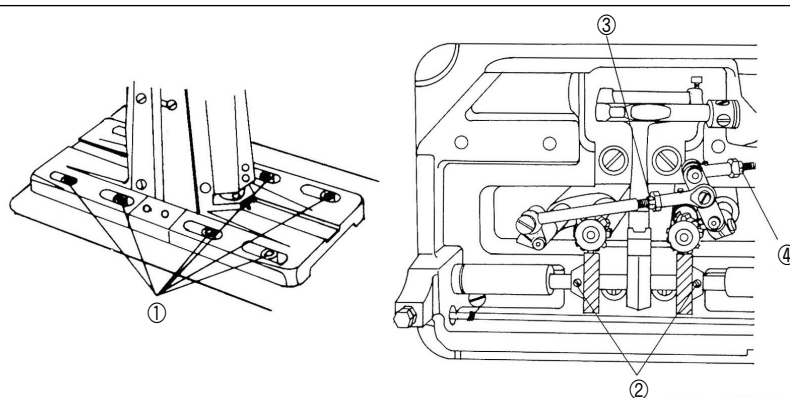
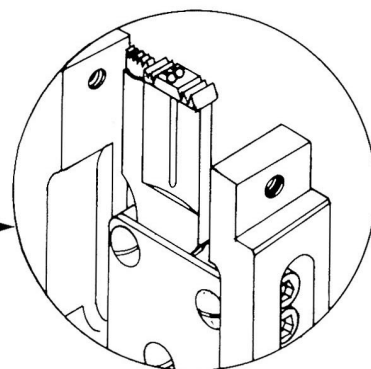
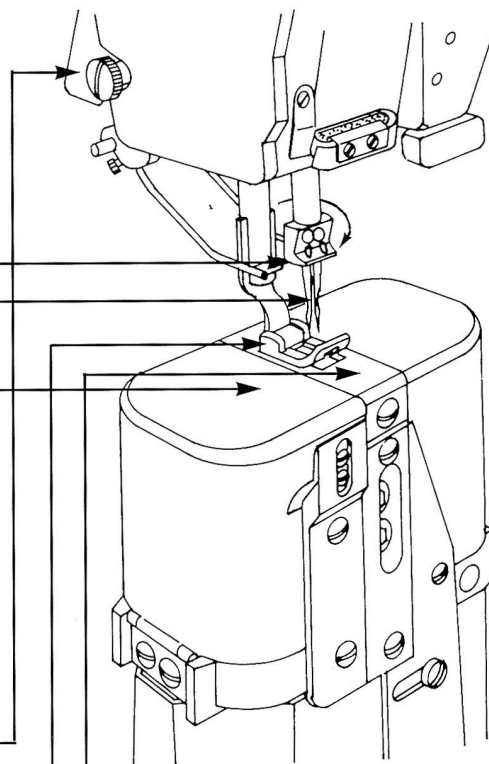
(※ Turn it towards the arrowed direction for removal: KM-867 series)

4. Lift the presser bar lifter to raise the presser foot

5. Disassemble the presser foot

6. Disassemble the needle plate

7. Disassemble the feed dog



[Adjusting the left/right hook base]

For KM-867 series

When replacing with a wider or narrower gauge than the needle width in use, the hook edge and needle distance need to be readjusted. To do so, loosen the screws ①②③④, make the adjustment, and then fasten them back.

(2) Assembling order

※ After assembling in the reverse order of disassembling, adjust the left and right hook base.

4

Cause of trouble and troubleshooting

1) 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 and push in to its highest level.
		Needle	Needle is bent	Change the needle
		Feed dog timing	Bad timing of feed dog	Adjust the timing of feed dog
		Gap between needle and hook	Bad timing of needle and hook	Adjust the timing of needle and hook
			The heads of the needle and the hook interfere each other.	Adjust the location of the hook
2	Thread breaks	Threading method	Wrong threading (inserted from the opposite side)	Thread the needle correctly
		Needle	Bent needle	Change the needle
		Direction and height of needle	Needle inserted in the wrong direction and height	Insert the needle correctly
		Upper thread tension	Too tight upper thread tension	Reduce the tension of upper thread
		Lower thread tension	Too tight lower thread tension	Reduce the tension of lower thread
		Thread take up stroke	Too large stroke	Adjust the stroke level
		Hook	There is a scratch on the hook edge	Remove the scratch on the hook edge
		Feed dog	There is a scratch on the needle hole of the feed dog	Remove the scratch on the feed dog
		Needle plate	There is a scratch on the thread case and around the needle plate	Remove the scratch on the needle plate.
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 up to its highest level.
		Needle	Bent needle	Change the needle
		Threading	Wrong direction	Insert the thread in the right way.
		Hook timing	The timing between the needle and hook is bad	Adjust the timing between the needle and hook
		Gap between the needle and the hook	Needle and hook are too far apart	Adjust the position of the hook

No	Symptom	Checkpoints	Root cause	Corrective action
4	Upper thread falls out when starting to sew or sewing is skipped.	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
		Check the oil felt tension of upper thread	The upper thread oil felt is pressing the thread too strongly.	Adjust the felt tension
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 spring's stroke
		Thread release adjustment volume on the control box	Volume is adjusted to too low	Increase the volume adjustment.