ENGLISH

IMPORTANT SAFETY INSTRUCTIONS

Putting sewing systems into operation is prohibited until it has been ascertained that the sewing systems in which these sewing machines will be built into, have conformed with the safety regulations in your country.
Technical service for those sewing systems is also prohibited.

1. Observe the basic safety measures, including, but not limited to the following ones, whenever you use the machine.
2. Read all the instructions, including, but not limited to this Instruction Manual before you use the machine.
   In addition, keep this Instruction Manual so that you may read it at anytime when necessary.
3. Use the machine after it has been ascertained that it conforms with safety rules/standards valid in your country.
4. All safety devices must be in position when the machine is ready for work or in operation.
   The operation without the specified safety devices is not allowed.
5. This machine shall be operated by appropriately-trained operators.
6. For your personal protection, we recommend that you wear safety glasses.
7. For the following, turn off the power switch or disconnect the power plug of the machine from the receptacle.
   7-1 For threading needle(s), looper, spreader etc. and replacing bobbin.
   7-2 For replacing part(s) of needle, presser foot, throat plate, looper, spreader, feed dog, needle guard, folder, cloth guide etc.
   7-3 For repair work.
   7-4 When leaving the working place or when the working place is unattended.
   7-5 When using clutch motors without applying brake, it has to be waited until the motor stopped totally.
8. If you should allow oil, grease, etc. used with the machine and devices to come in contact with your eyes or skin or swallow any of such liquid by mistake, immediately wash the contacted areas and consult a medical doctor.

9. Tampering with the live parts and devices, regardless of whether the machine is powered, is prohibited.
10. Repair, remodeling and adjustment works must only be done by appropriately trained technicians or specially skilled personnel. Only spare parts designated by JUKI can be used for repairs.
11. General maintenance and inspection works have to be done by appropriately trained personnel.
12. Repair and maintenance works of electrical components shall be conducted by qualified electric technicians or under the audit and guidance of specially skilled personnel.
    Whenever you find a failure of any of electrical components, immediately stop the machine.
13. Before making repair and maintenance works on the machine equipped with pneumatic parts such as an air cylinder, the air compressor has to be detached from the machine and the compressed air supply has to be cut off. Existing residual air pressure after disconnecting the air compressor from the machine has to be expelled. Exceptions to this are only adjustments and performance checks done by appropriately trained technicians or specially skilled personnel.
14. Periodically clean the machine throughout the period of use.

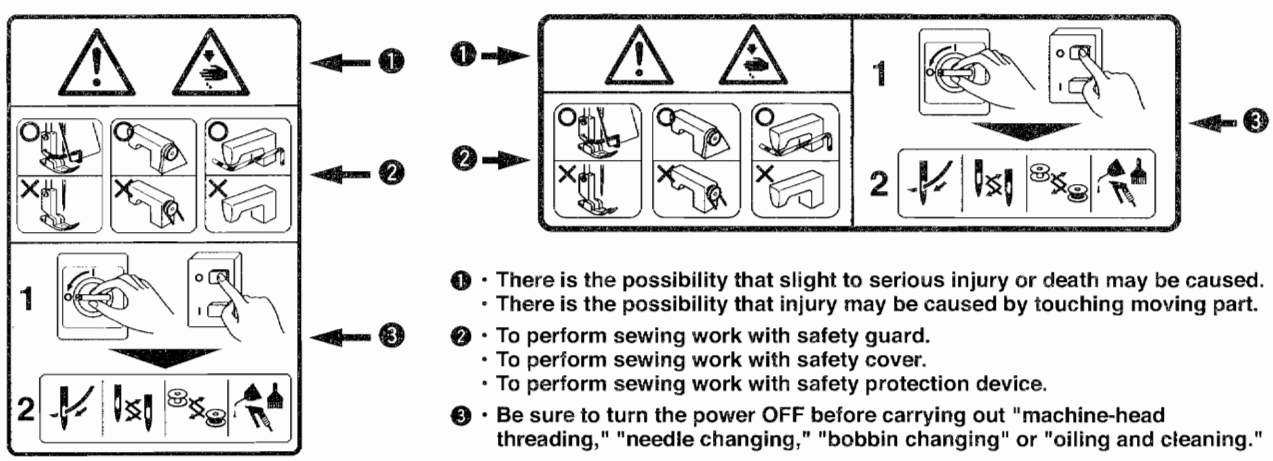
15. Grounding the machine is always necessary for the normal operation of the machine. The machine has to be operated in an environment that is free from strong noise sources such as high-frequency welder.
16. An appropriate power plug has to be attached to the machine by electric technicians. Power plug has to be connected to a grounded receptacle.

17. The machine is only allowed to be used for the purpose intended. Other used are not allowed.
18. Remodel or modify the machine in accordance with the safety rules/standards while taking all the effective safety measures. JUKI assumes no responsibility for damage caused by remodeling or modification of the machine.

19. Warning hints are marked with the two shown symbols.

Danger of injury to operator or service staff

Items requiring special attention



❶ · There is the possibility that slight to serious injury or death may be caused.
· There is the possibility that injury may be caused by touching moving part.

❷ · To perform sewing work with safety guard.
· To perform sewing work with safety cover.
· To perform sewing work with safety protection device.

❸ · Be sure to turn the power OFF before carrying out "machine-head threading," "needle changing," "bobbin changing" or "oiling and cleaning."

FOR SAFE OPERATION

1. To prevent accidents caused by electric shock, never open the motor control box cover or touch the components inside the control box while the power switch is ON.

1. Never bring your fingers under the needle when the power switch is turned ON or the machine is in operation..
2. Never bring your fingers, hair or clothes close to the handwheel and needle or place anything on the handwheel and under the needle while the machine is in operation.
3. Loudness and quality of sound will change by kind and shape of the sewing product including sewing speed, and sewing conditions by number of overlapped pieces, stitch length, etc. When using the sewing machine for a long period of time, there is a case where a sense of disharmony is felt sometimes. At this time, operate the sewing machine with your ears stopped by earmuffs or the like.
4. Be sure to turn OFF the power and perform the work after ascertaining that the sewing machine does not run even when the starting pedal is depressed in case of checking, adjusting, cleaning, threading or replacing the needle of the sewing machine.
5. Never operate the sewing machine with the ground wire for the power supply removed so as to ensure safety.
6. Be sure to turn OFF the power switch in advance in case of inserting/removing the power plug.
7. In time of thunder and lightning, stop your work and disconnect the power plug from the receptacle so as to ensure safety.
8. When you move the sewing machine from a cold place directly to a warm place, dew condensation may result. Turn ON the power to the machine after you have confirmed that there is no fear of dew condensation.
9. In case of maintenance, inspection, or repair, be sure to turn OFF the power switch and confirm that the sewing machine and the motor have completely stopped before starting the work. (In case of the clutch motor, it continues rotating for a while by the inertia even after turning OFF the power switch. So, be careful.)
10. Be careful of handling this product so as not to pour water or oil, shock by dropping, and the like since this product is a precision instrument.

CONTENTS

I . SPECIFICATIONS

Roller mechanism/clutch type

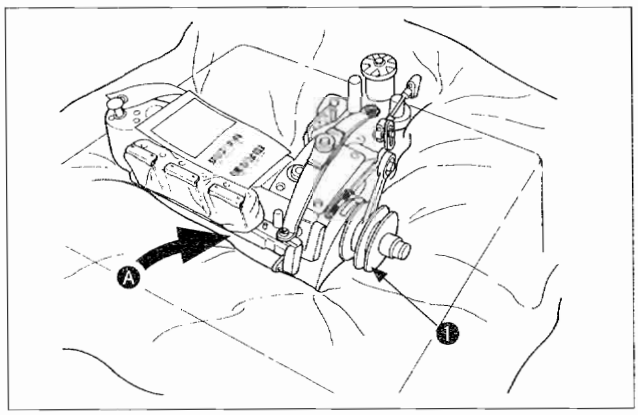
No.	Model / Item	Specifications	
		MS-3580SF/1SN	MS-3580SF/0SN
1	Stitch type	3-needle, 6-thread, double chainstitch machine (401 LSc-3)	
2	Application	Denim, working clothes, felt, etc.	
3	Max. sewing speed	4,500 rpm	
4	Sewing speed	3,500 rpm	
5	Needle gauge	8 gauge: 3.2 mm, total width: 6.4 mm	
6	Stitch length	2.1 to 3.6 mm (standard : 3.2 mm) at 1-inch intervals	
7	Needle (standard size)	UY130GS (standard)	
		140 (#22)	
8	Needle bar stroke	33mm	
9	Number of threads	6 pcs.	
10	External dimensions	H : 420 x W : 285 x D : 345 mm	
11	Machine head weight	23.5kg	
12	Lifting amount of presser	Max. 9 mm (At the time of delivery from factory : 6.5 mm)	
13	Feed roller width	11.9mm	
14	Feed roller shape	Standard (narrow type)	
15	Feed adjustment	Main feed : Slide type stitch pitch adjusting system	
		With differential feed lever adjusting system	Without differential feed
16	Lubrication	Automatic rotary pump lubrication system	
17	Lubricating oil	JUKI MACHINE OIL No. 18	
18	Oil tank capacity	Front tank capacity : 30 ml Rear tank capacity : 120 ml	
19	Installation	Table and auxiliary drive type	
20	Working temperature/ humidity ranges	Temperature : 5 - 35°C, humidity: 35 - 85% (No dew condensation permissible)	
21	Supply voltage/ frequency	Rated voltage ±10%, 50/60Hz	
22	Noise	Workplace-related noise at sewing speed n = 2,900 min^{-1} : $L_{PA} \leqq$ 84 dB (A) Noise measurement according to DIN 45635-48-A-1.	

ENGLISH

Ⅱ. INSTALLATION

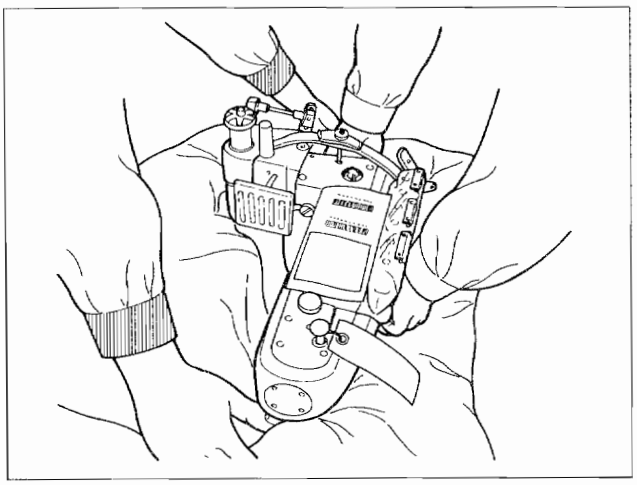
WARNING :
Be sure to perform the installation work of the machine head with two persons or more.

1. Installing the machine head

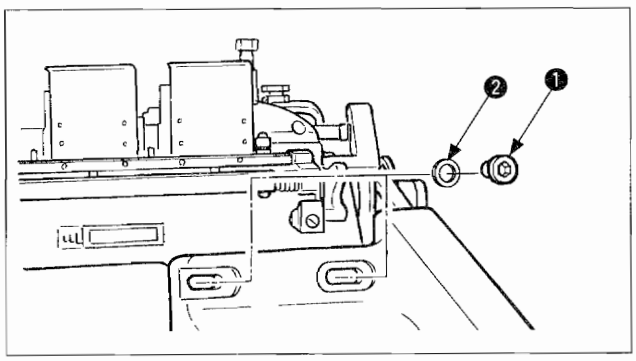


At the beginning, the procedure of pulling out the machine head after opening the package is explained.

1) There is a gap Ⓐ under the center of the frame. Put there one of your hands and support the machine head.
Next, hold handwheel Ⓑ with the other hand.



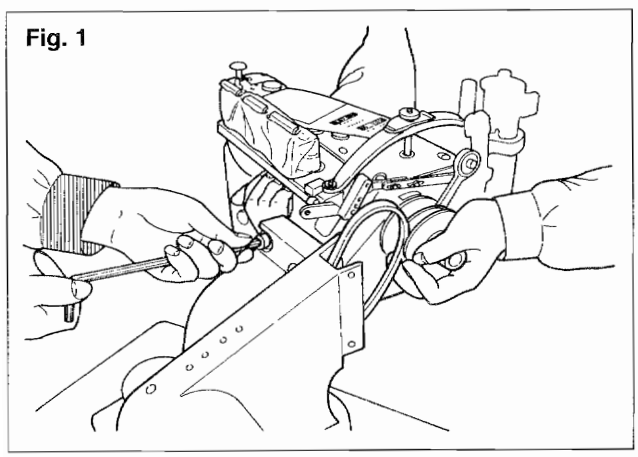
2) Pull out the machine head while another worker is pressing the packing material.



Next, the procedure of installing the machine head is explained.

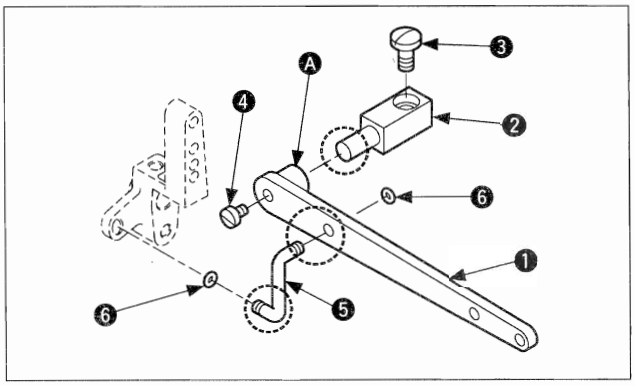
Fix the machine head with head fixing screw ❶ and washer ❷ by two persons or more as shown in Fig. 1.
In addition, tightening torque of head fixing screw ❶ is 12 to 15 N•m.

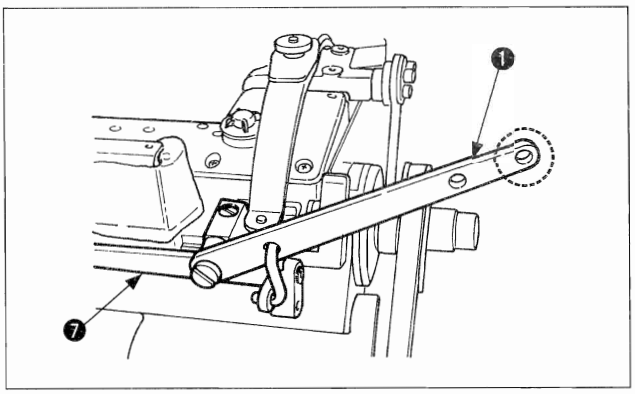
Fig. 1



The work of installing/removing the machine head is accompanied with the danger of the fall of machine head.
Be sure to use the exclusive lift or execute the work with two persons or more and do not take the hands off until the head fixing screw is securely tightened.
In addition, when tightening the fixing screw, laterally adjust the head position so that V-belt is set straight.
If the V-belt is set bent, the progress of abrasion of V-belt is increased.

2. Installing the presser lifting lever





At the beginning, insert boss section Ⓐ of presser lifting lever ❶ into bracket ❷.
In this state, fix it on thread tension base ❼ with setscrew ❸.
Next, pass connecting link ❺ as shown in the figure and insert O-ring ❻ into the both ends of it.
Finally, fix it with setscrew ❹.

Caution

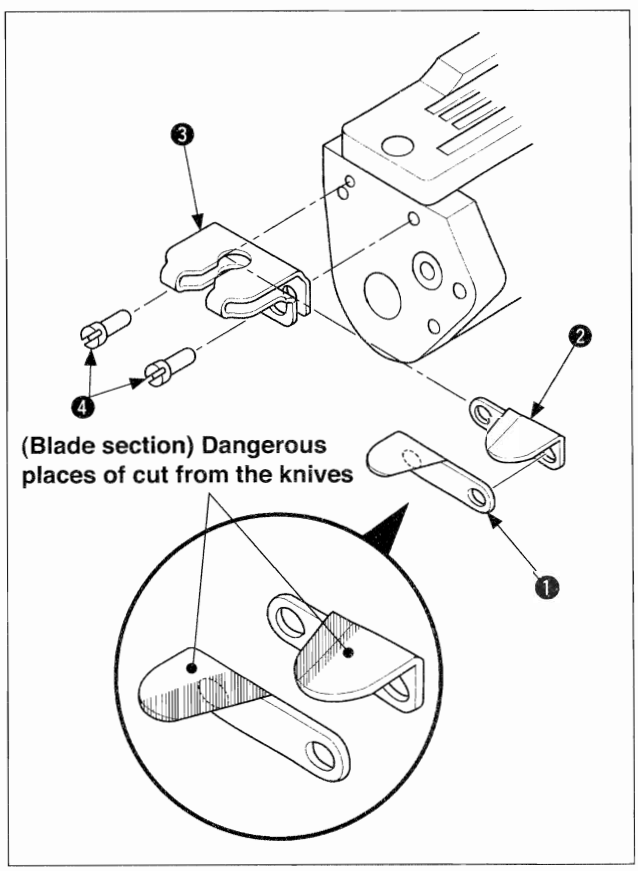
Apply the grease (Part No.: 40013640) supplied with the unit to the sliding parts encircled with ◌ (four locations) at least once every three months.

ENGLISH

3. Installing the thread trimming knife

CAUTION :

1. Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.
2. Do not touch your fingers or hands to the blade section of knife. so as to prevent fatal accidents.
3. Perform the adjustment work by the maintenance engineers who are familiar with the sewing machine and trained for the safety so as to prevent accidents caused by unfamiliarity or wrong adjustment.

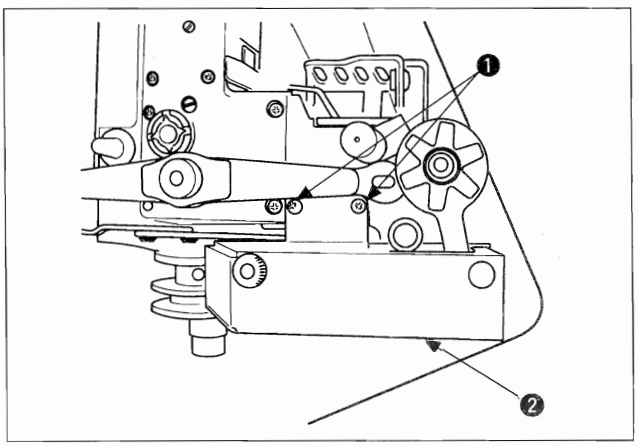


Put bottom thread trimming knife ❶ on top thread trimming knife ❷, insert them into knife cover ❸, and install them with two screws ❹ as shown in the figure.

Caution

When installing the knives, perform the work while taking care of the cut of fingers.

4. Installing the cloth puller cover

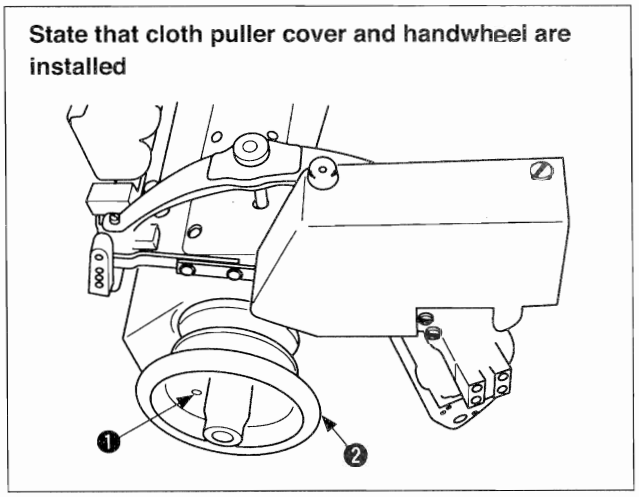


- Install top feed cloth puller cover ❷ with two setscrews ❶ supplied with the machine as accessories.
- Tightening torque of the screw is 2.5 to 3 N•m.

Turning the sewing machine by hand, perform positioning of the cover so that the cover does not come in contact with the sewing machine.

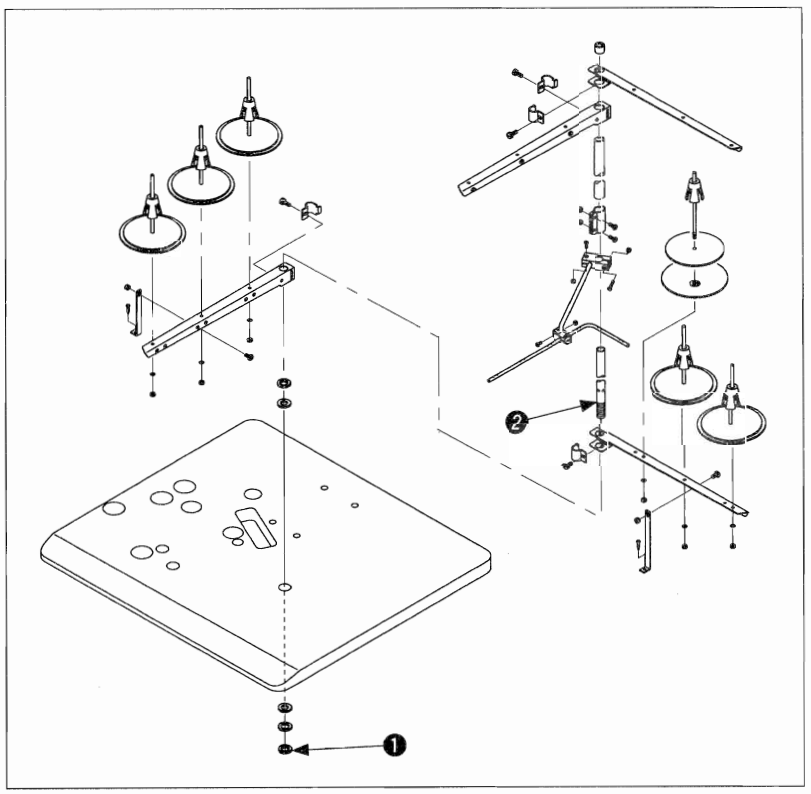
5. Installing the handwheel

State that cloth puller cover and handwheel are installed



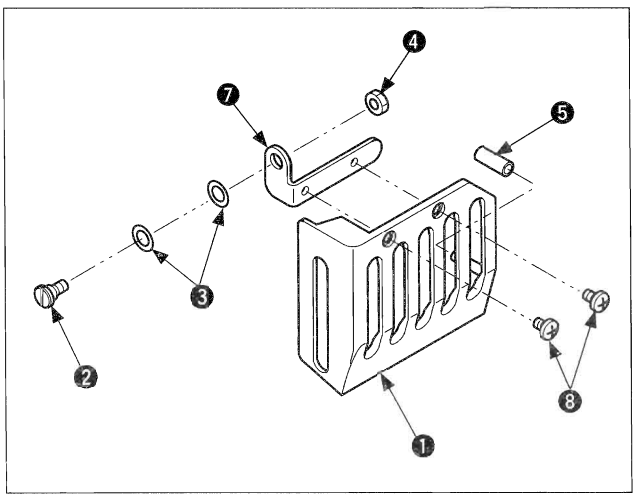
- Install handwheel ❷ with three setscrews ❶ supplied with the machine as accessories.
  (It is not necessary when MT03 is installed.)
- Tightening torque of the screw is 2.5 to 3 N•m.

6. Installing the thread stand



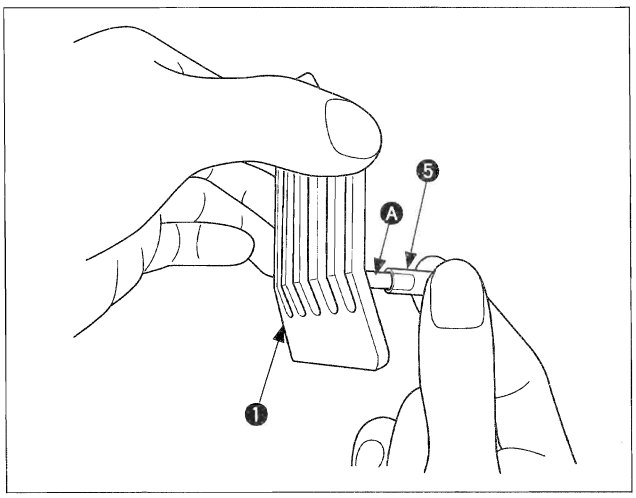
1) Assemble the thread stand as shown in the figure and install it in the hole of the table.
2) Tighten nuts ❶ to such an extent that the thread stand does not move.
3) When using power supplied by the overhead power line, pass the power supply cord through thread stand ❷.

7. Installing procedure of the thread take-up lever oil guard

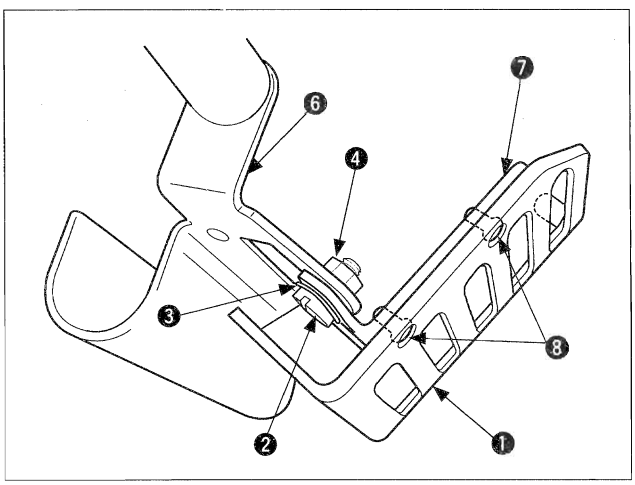


Attachments for the thread take-up lever oil guard are as shown in the left-hand figure.
Take them out from the accessory box.

❶ Thread take-up lever oil guard
❷ Hinge screw
❸ Wave washer
❹ Hexagon nut
❺ Tube hose
❼ Thread take-up lever oil guard base
❽ Screws for the thread take-up lever oil guard



First, insert tube hose ❺ into protrusion Ⓐ of thread take-up lever oil guard ❶ until it goes no further.
Be careful not to forcibly insert the tube hose since it may break.

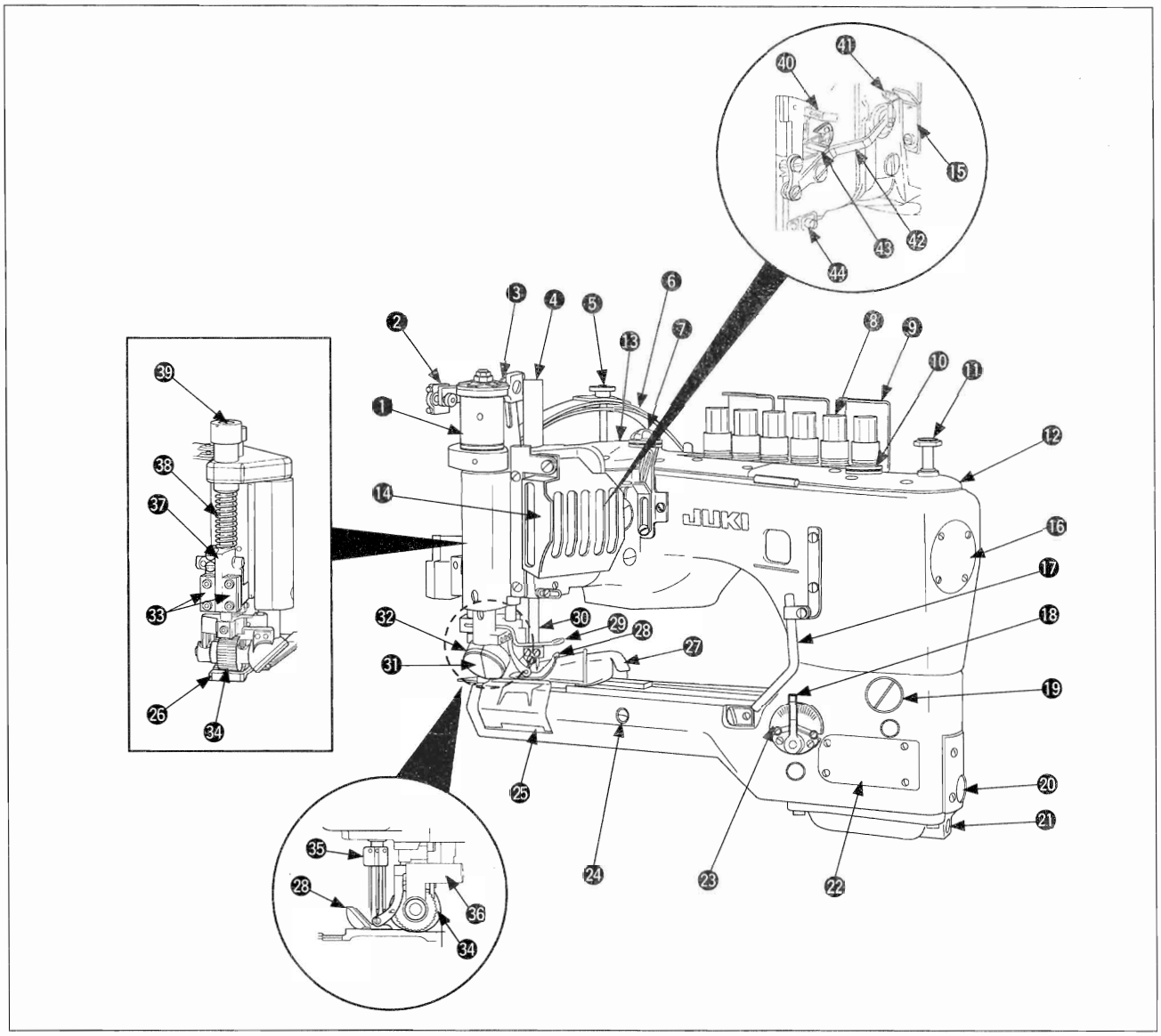


Then, install the aforementioned thread take-up lever oil guard ❶ on puller drive cover ❻ on the machine head side as illustrated in the figure at left.
Firstly, fix thread take-up lever oil guard base ❼ with hinge screw ❷ and wave washer ❸. Secondly, fix thread take-up lever oil guard ❶ on thread take-up lever oil guard base ❼ with screws ❽.
At this time, check to be sure that thread take-up lever oil guard ❶ can be smoothly opened/closed.
Finally, fix hexagon nut ❹ to prevent the hinge screw from loosening.

Tightening torque is 0.5 to 1.0 N•m as the standard.

Ⅲ. PREPARATION AND OPERATION

1. Names of machine head

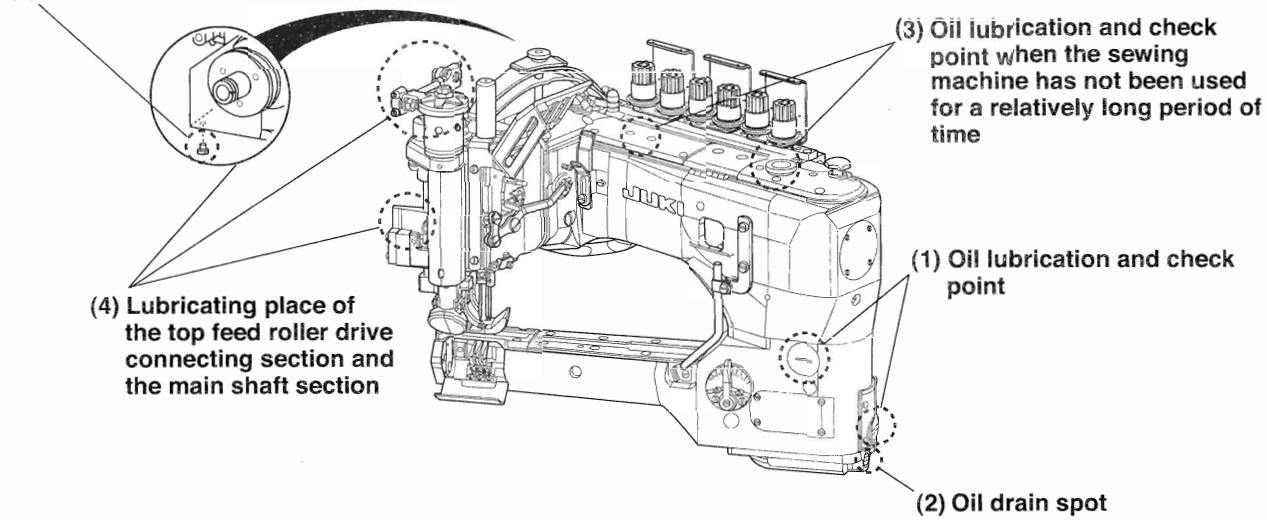


❶	Clutch asm.	⑯	End cover	㉛	Gear cover (front)
❷	Clutch rod	⑰	Looper thread guide pipe	㉜	Gear cover (rear)
❸	Clutch lever	⑱	Differential feed adjusting lever	㉝	Upper feed roller frame
❹	Cover for needle bar and roller	⑲	Window screw for both as stitch length adjustment and oil plug	㉞	Upper feed roller
❺	Pressure regulating nut	⑳	Oil gauge (front)	㉟	Needle clamp
❻	Pressure regulating plate spring assembly	㉑	Oil discharge screw (front)	㊱	Right and left guide plates
❼	Oil circulation inspection window (rear)	㉒	Cylinder side cover	㊲	Roller bar guide plate
❽	Thread tension knob	㉓	Gauge plate	㊳	Roller pressure regulating spring
❾	Thread guide	㉔	Feed rocking lever eccentric pin	㊴	Roller pressure regulating screw
❿	Oil circulation inspection window (front)	㉕	Looper cover	㊵	Needle thread lever-thread guide
⓫	Looper push button	㉖	Throat plate	㊶	Rocking thread take-up lever thread guide
⓬	Front top cover	㉗	Rolled hemming folder	㊷	Needle thread rocking thread take-up lever
⓭	Rear top cover	㉘	Presser	㊸	Needle thread support adjust plate
⓮	Thread take-up lever oil guard	㉙	Needle guard	㊹	Needle thread presser
⓯	Needle thread adjusting path	㉚	Needle bar		

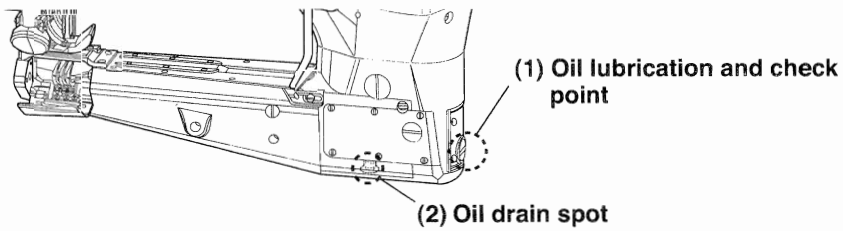
2. Lubrication

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

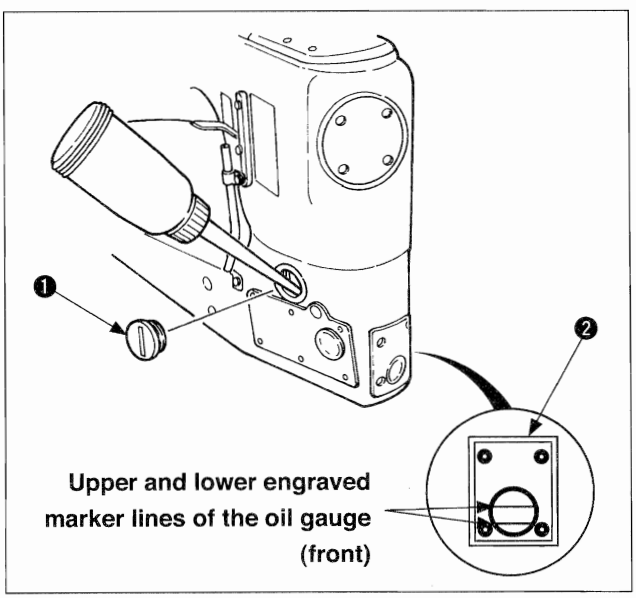
Machine head with differential feed



Machine head without differential feed



(1) Oil lubrication and check point

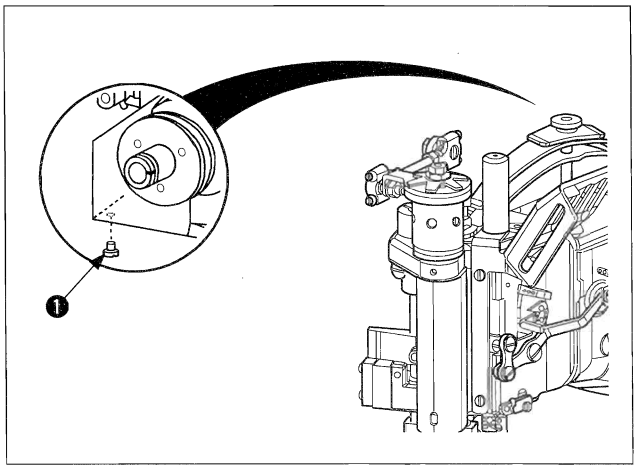


The sewing machine head section is of the rotary pump type auto lubrication system.
Remove oil plug ❶ and pour oil through the oil inlet until the upper engraved marker line on oil gauge (front) ❷ is reached. When starting pouring the oil, the oil is firstly fed to the rear part of the machine head. Therefore it appears that the oil level observed on the oil gauge gradually decreases. After running the machine for several hours, the oil amount becomes stable. At this time, re-check the oil level and add oil until the intermediate height between the upper and lower engraved marker lines is reached.

Reference **Apply JUKI MACHINE OIL 18 (Part No.: MML018900CA) supplied with the machine.**

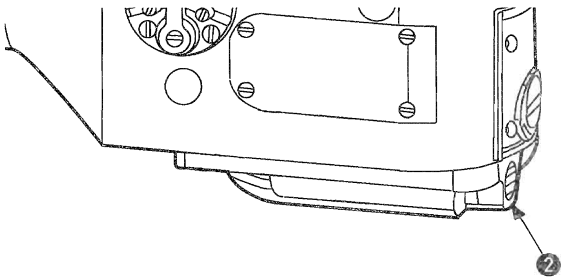
ENGLISH

(2) Oil drain spot

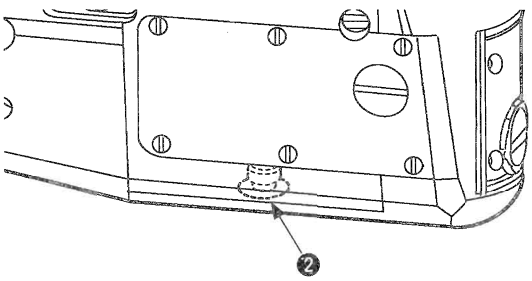


To replace the lubricant, remove the oil drain (front) and (rear) screws ❷ and ❶ . Upon the completion of oil drainage, tighten the oil drain (front) and (rear) screws ❷ and ❶ .

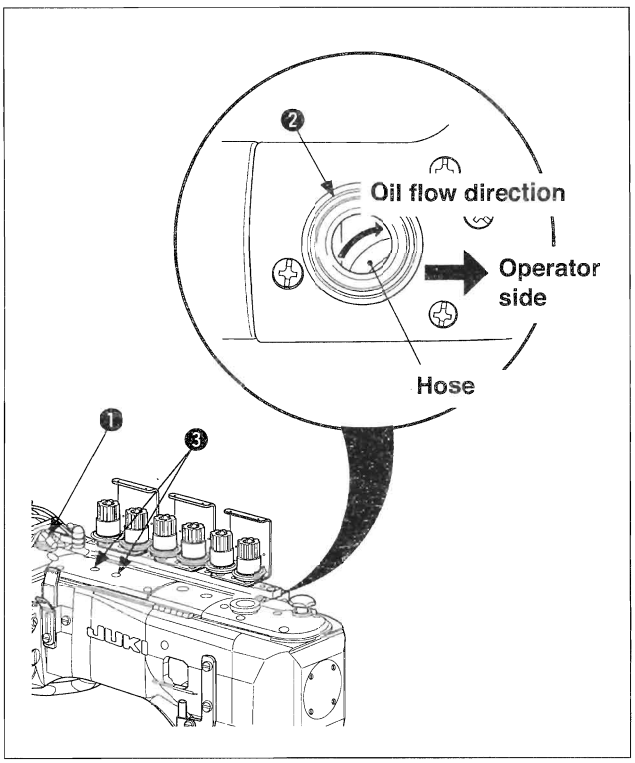
Machine head with differential feed



Machine head without differential feed

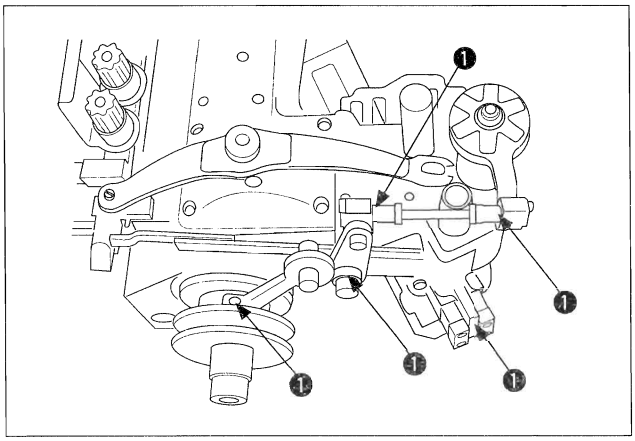


(3) Oil lubrication and check point when the sewing machine has not been used for a relatively long period of time

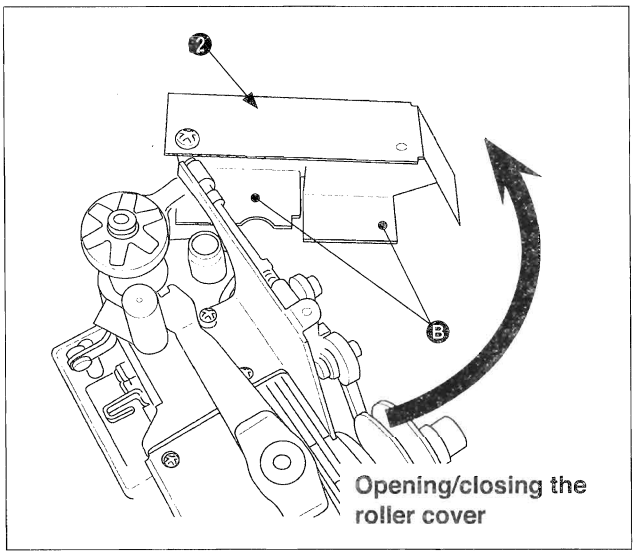


When the sewing machine has not been used for a relatively long period of time or something has been done to the components related to oil circulation at the time of maintenance and inspection, there is a case where the circulation function of oil has been lost. This occurs because air enters in the circulation route.
In this case, it can be checked with oil circulation check windows ❶ and ❷.
When the circulation of oil cannot be checked, remove two pump screws of ❸, apply a few drops of oil until the oil surface can be checked there.

(4) Lubricating place of the top feed roller drive connecting section and the main shaft section

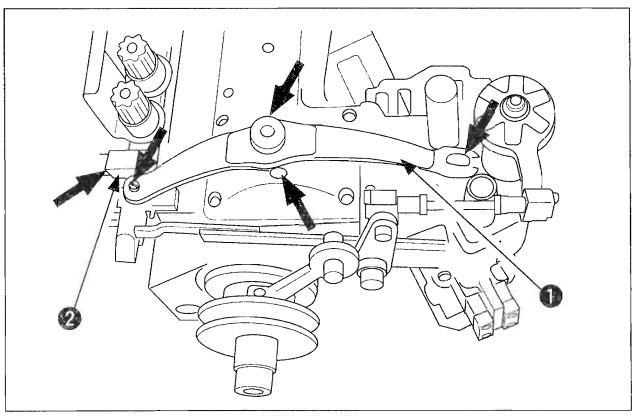


Apply one or two drops of oil once a week to five points ❶ of the upper feed roller drive connecting section and the main shaft section once every week.

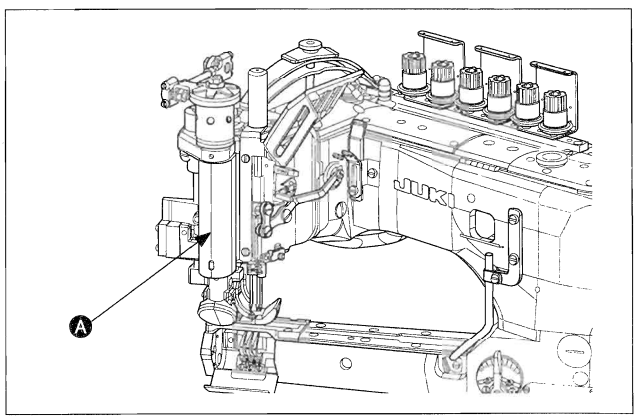


When applying oil to the top feed roller drive connecting section, perform oiling by opening and closing roller cover ❷.
In addition, when oil adheres to oil receiving sections Ⓑ of roller cover ❷, wipe it out.
Perform oiling to the main shaft section by removing the rubber plug of the belt cover when using MT03.
Remove the thumbscrew when opening and closing the roller cover.

(5) Grease applying place



Apply grease supplied with the machine as the accessories every three months, as a standard, to the respective slide sections of presser spring ❶ and presser lifting bracket ❷.



Reference

Remove the roller cover and apply grease (Part No.: 40013640) supplied with the unit to joining part Ⓐ of main shaft and hook driving shaft.

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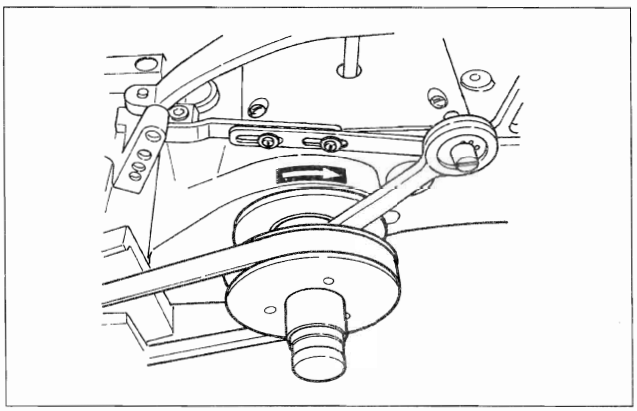
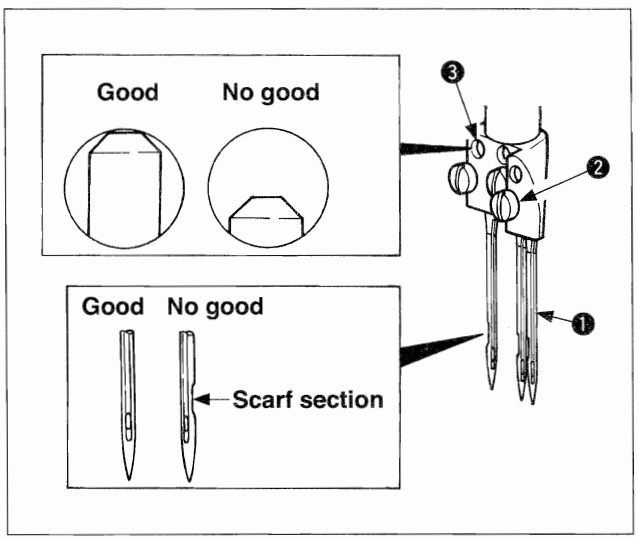
3. Checking the direction of rotation



Direction of rotation of the sewing machine is the same as that of the hand of watch as viewed from the handwheel side.
It is counterclockwise as viewed from the working position of the operator.

Caution
Never rotate it in the reverse direction. Lubricating pump fails to work and seizure will be caused.

4. Attaching the needles

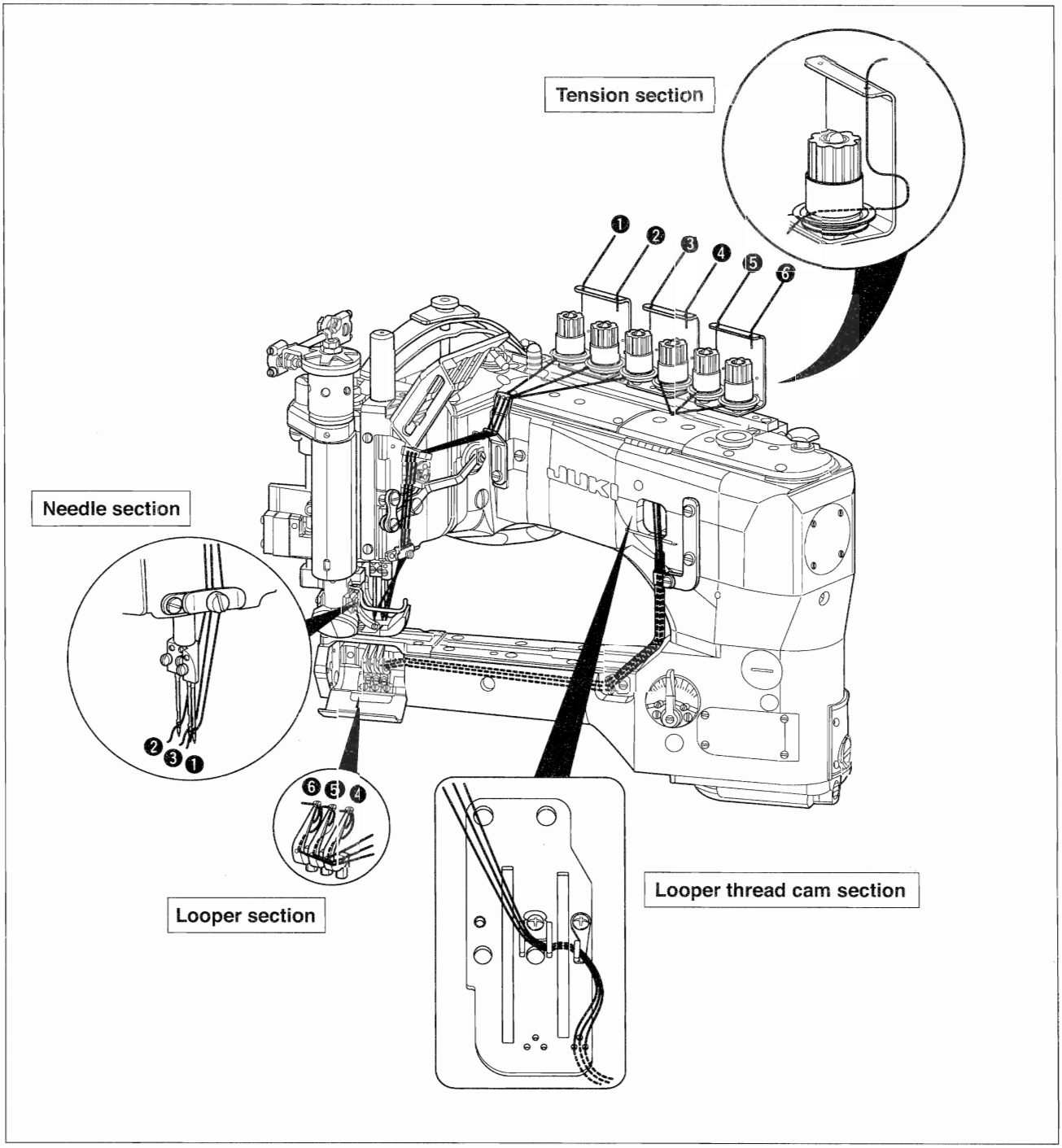


1) Loosen setscrew ❷ of needle ❶ with a screwdriver.
2) Insert new needles until they go up to the rear of the hole of needle clamp ❸ in the way that the scarf is facing rearward as viewed from the operator's direction.
3) Tighten setscrew ❷ of needle.

5. How to pass the threads

(1) With differential feed (MS-3580SF/1SN)

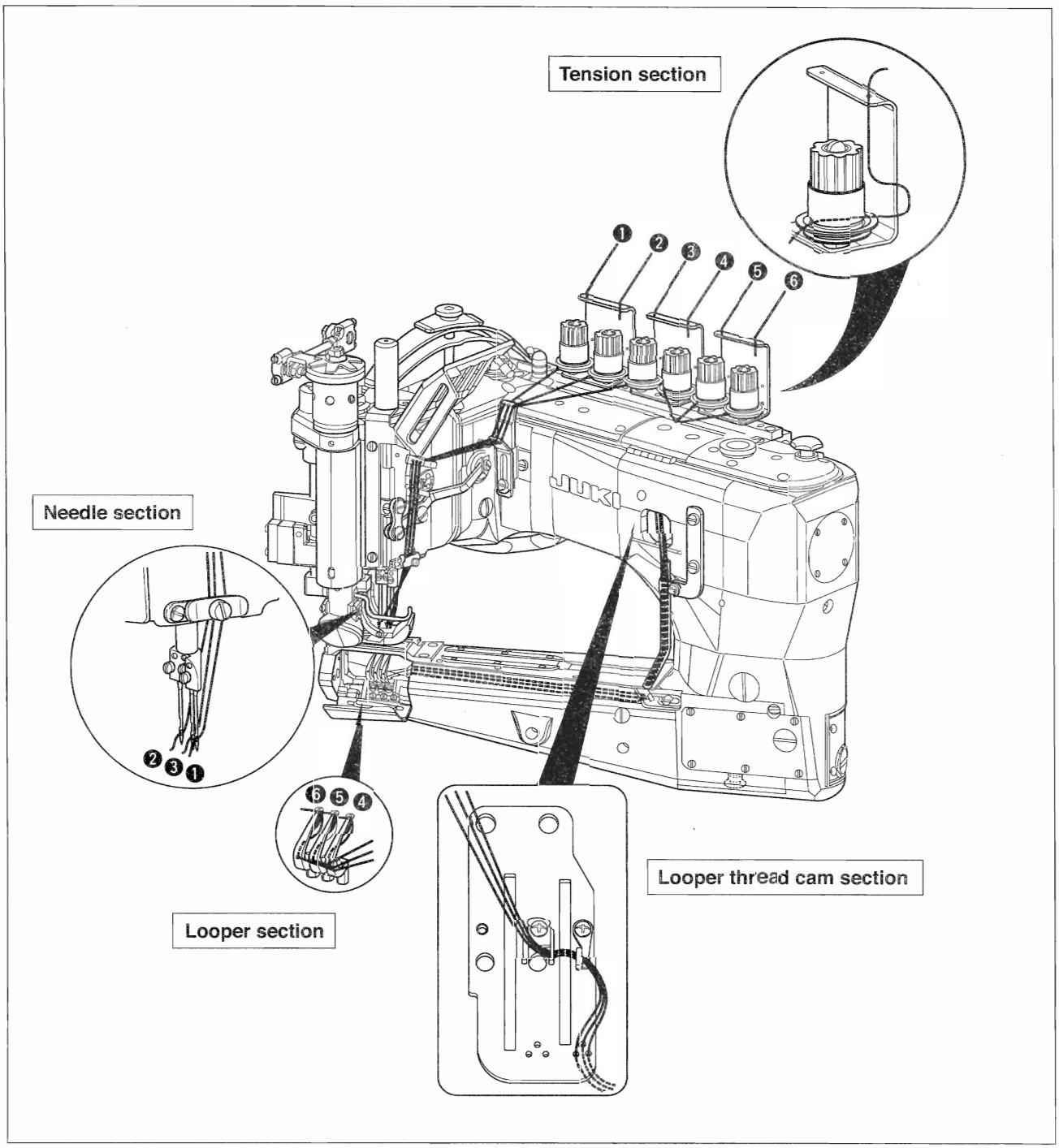
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.



1) Threading diagram for the machine with differential feed
Needle thread : ❶ for left needle thread, ❷ for middle needle thread, ❸ for right needle thread
Looper : ❹ for front looper, ❺ for middle looper, ❻ for rear looper
Perform threading in accordance with the threading diagram.

(2) Without differential feed (MS-3580SF/0SN)

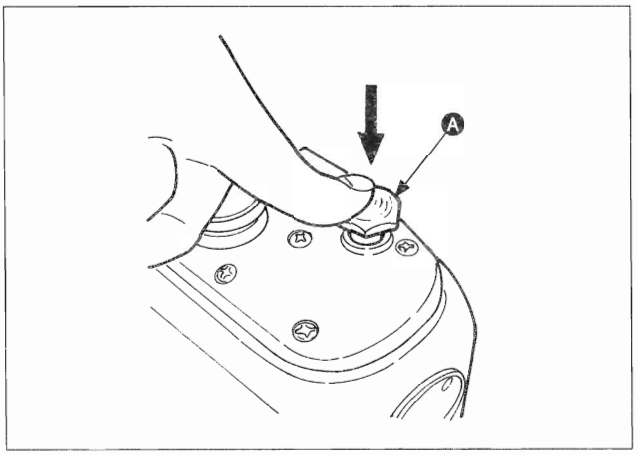
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.



1) Threading diagram for the machine without differential feed
Needle thread : ❶ for left needle thread, ❷ for middle needle thread, ❸ for right needle thread
Looper : ❹ for front looper, ❺ for middle looper, ❻ for rear looper
Perform threading in accordance with the threading diagram.

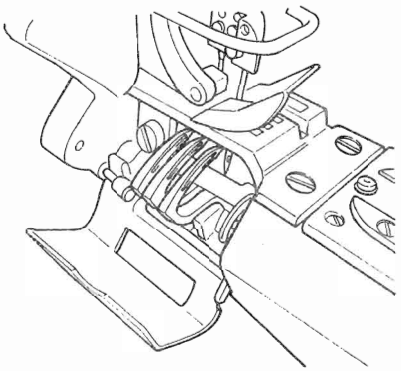
(3) looper

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

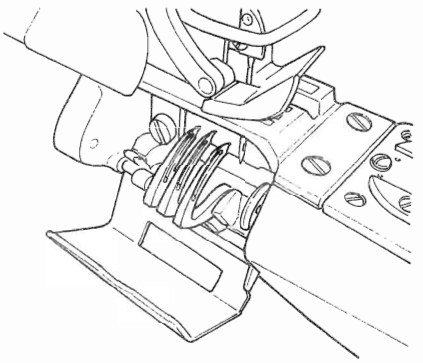


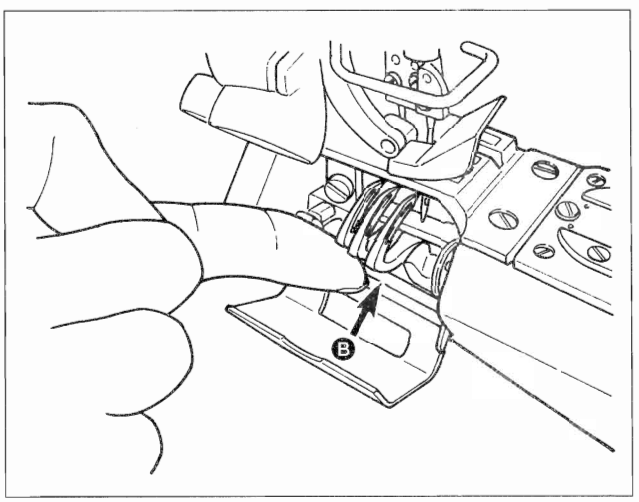
1) When passing the looper threads, press knob Ⓐ near the lower dead point of needle bar and the loopers tilt front to facilitate to pass the threads.
Accordingly, perform threading with the loopers tilted front.

State before loopers tilt



State loopers tilted





2) After threading, press loopers of Ⓑ and they return to their home positions as shown in the figure.

When rotating the sewing machine with loopers tilted front, be sure to return them to their home positions since they may come in contact with the cover or fingers may be caught in them.

6. Presser adjustment

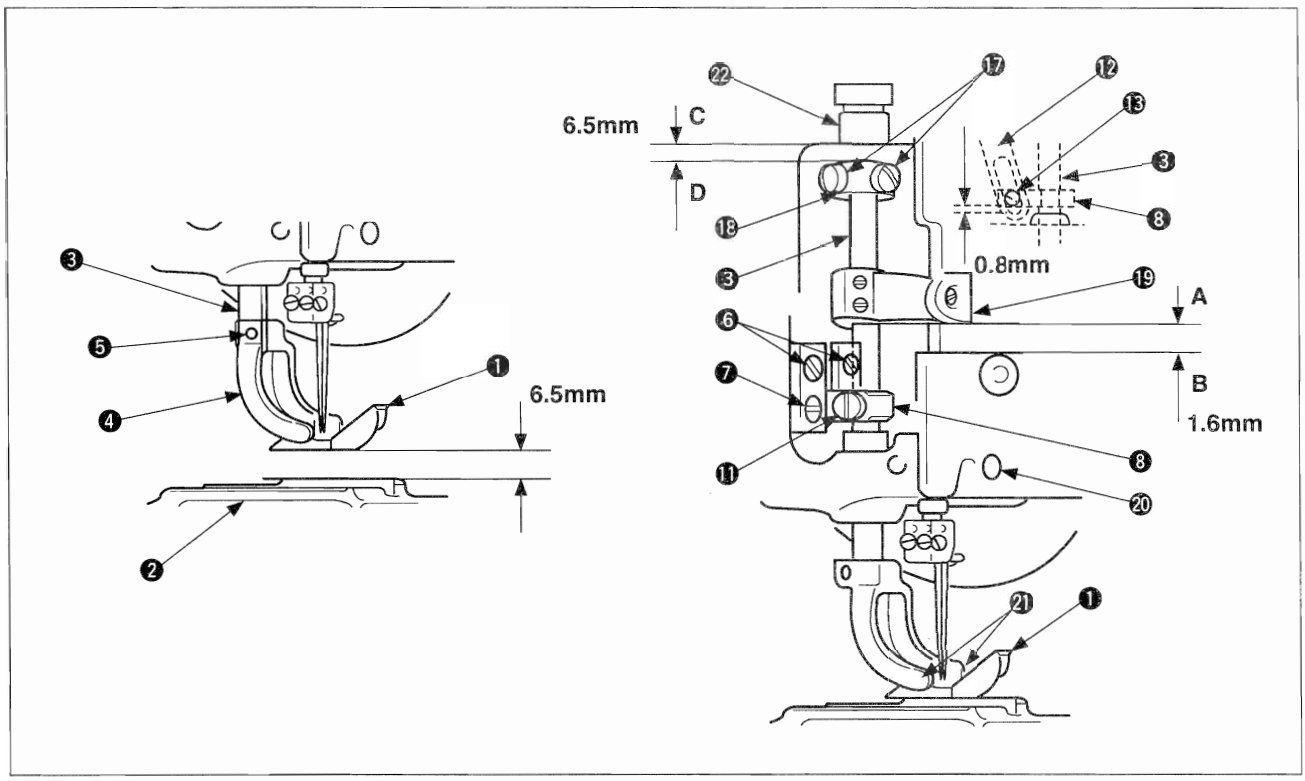
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

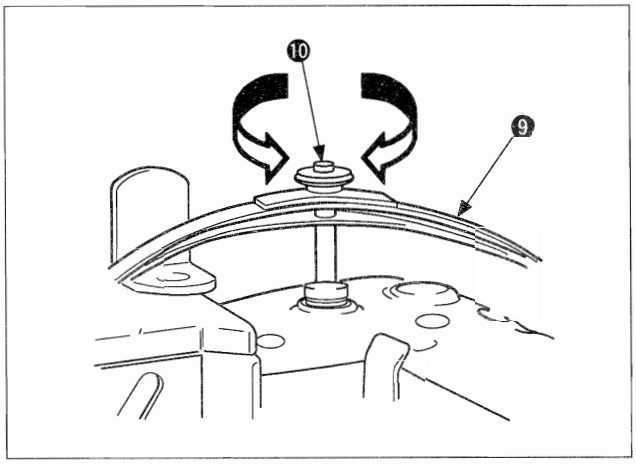
(1) Adjustment of amount of rise of presser

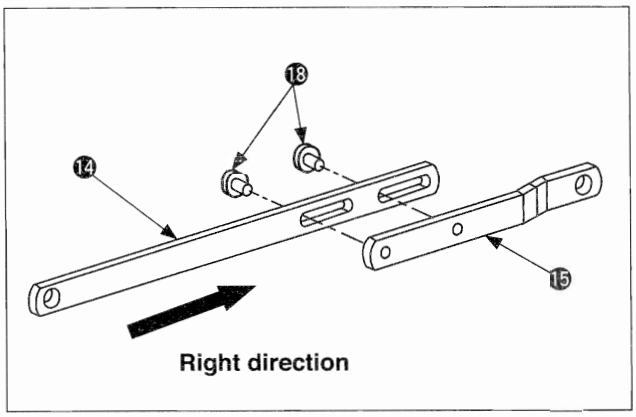
The standard amount of rise is 6.5mm for the standard class of the presser ❶ . (Maximum amount of rise : 9 mm)
In standard positioning, the presser ❶ begins to rise faster by 3.2mm above the upper face of the throat plate ❷ before the upper feed roller begins to rise.

(2) Adjustment of presser bar pressure

Proper pressure of the presser ❶ shall be applied to the material while it is sewn.
Turn the pressure adjusting nut ⓾ clockwise and counterclockwise to adjust pressure.







Right direction

(3) Installation and pressure adjustment of presser and presser yoke

1) Raise the presser shaft ❸ , mount the presser yoke ❹ on the presser shaft ❸ , and tighten the setscrew ❺ .

2) Confirm whether the presser shaft ❸ smoothly moves up and down, being free from rattling on the right and left.
If there is rattling on the right and left, loosen four setscrews ❻ to set up the presser shaft guide ❽ to eliminate right and left rattling by means of the right/left holding guide plate ❼ . Make adjustments to permit the presser shaft to perform light movement up and down.
Since then, tighten the setscrew ❻ .

3) Install the pressure adjusting leaf spring set ❾ and turn the pressure adjusting nut ❿ until pressure of the presser ❶ is duly adjusted.
   - ○ Turning the pressure adjusting nut ❿ clockwise causes the pressure to increase.
   - ○ Turning the pressure adjusting nut ❿ counterclockwise causes the pressure to decrease.

4) In order to make the presser ❶ rise by 3.2mm faster than the upper feed roller, loosen the setscrew ⓫ of the presser shaft guide ❸ and move the presser shaft guide ❽ up and down until a clearance of 0.8mm is secured between the lower hole face of the lever link ⓬ and the bottom face of the lever link hanger setscrew ⓭ . (Lower dead point of the needle bar)

Caution

When the above-mentioned adjustments are made, the connecting positions shall be secured for the lifter lever ⓮ with slide hole and the lifter lever ⓯ by moving the lifter lever ⓬ with slide hole in the right direction. When proper positioning has been secured, tighten the setscrew ⓰ .

5) To secure the standard amount of rise of 6.5mm for the presser ❶ , loosen the setscrew ⓱ and move the stop collar ⓲ up and down until a clearance of 6.5mm is secured between the lower face "C" of the mounting position of the presser shaft guide bush ㉒ and the upper face "D" of the stop collar ⓲ . Since then, tighten the setscrew ⓱ .

Caution

1. **At the same time, check the mounting position of the needle thread rocking thread take-up lever connecting base ⓳ .**
2. **At the lower dead point of the needle bar, a clearance of 1.6mm shall be secured between the bottom face A of the needle thread rocking thread take-up lever connecting base ⓳ and the upper face B of the cut section of the front cover ⓴ .**
3. **If the amount of presser rise is too excessive than required, the presser will touch the needle clamp, thus causing needle breakage or stitch skipping.**
4. **If pressure of the presser is too insufficient or excessive than required, the material cloth will advance awkwardly.**

(4) Removal and installation of presser only

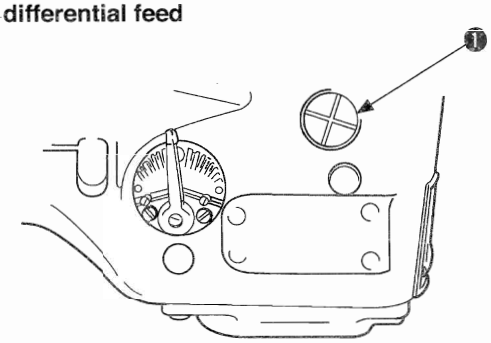
To replace presser ❶ only, loosen the right and left setscrews ㉑ and change the presser ❶ .
Then, tighten the right and left setscrews ㉑ .

7. Adjustment of feed mechanisms

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

(1) Adjustment of stitch length (standard: 8 stitches/inch interval))

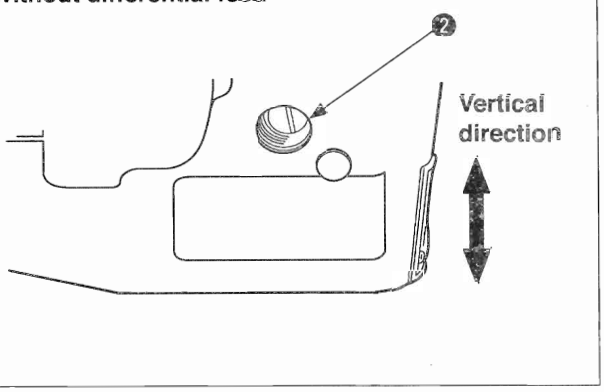
With differential feed



The stitch length can be adjusted within the range of 2.1 to 3.6 mm. Standard adjustment is 3.2 mm.
For the adjustment of the stitch length, loosen the lever setscrew ❷ and move the lever upwards or downwards until the required length is secured.

If the stitch length has been changed, check "Ⅳ-7. Adjustment of rear needle guard" and make a proper readjustment. Set the stitch length within the range of 2.1 to 3.6 mm. If the stitch length is set to 3.6 mm or more, Do not set the stitch length to 3.6 mm or more since the interference of components may be caused.

Without differential feed

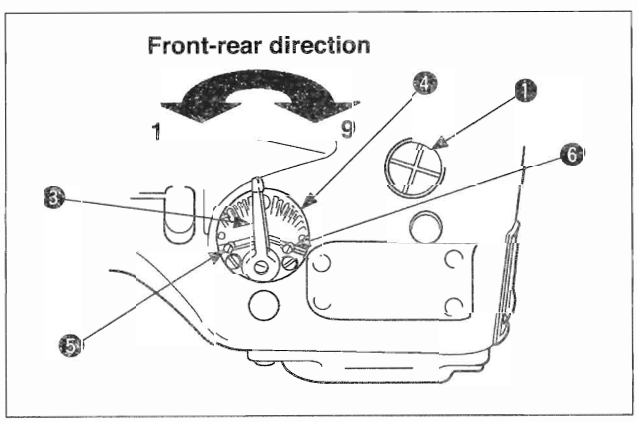


When the stitch length adjusting window screw ❶ is removed, the lever setscrew ❷ can be seen.

- Loosen the lever setscrew ❷ to move the lever upwards and fasten the lever setscrew ❷ there. This action increases the stitch length.
- Loosen the lever setscrew ❷ to move the lever downwards and fasten the lever setscrew ❷ there. This action decreases the stitch length.

1. No graduation is available for the adjustment of the stitch length.
2. When the stitch length is changed
If the forward or backward movement of the main feed dog is changed, the contact amount is also changed between each needle and the rear needle holder.
Since this can be a cause of stitch skipping, the rear needle holder should be readjusted.

(2) Adjustment of differential feed amount



The amount of differential feed can be adjusted by moving the differential feed adjusting lever ❸ forward or backward. Gauge plate ❹ is inscribed with numbers 1 through 9. At the inscription numbers 1 to 4, the differential feed ratio is small. At 5, the differential feed is not performed. At 6 to 9, the differential feed ratio is large.

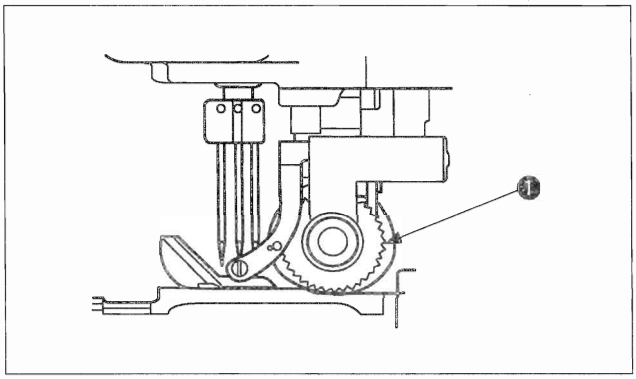
No differential function is provided to the mechanism without differential feed.

- When differential feed adjusting lever ❸ is moved to 1 to 4, the differential feed ratio is decreased the finished material is stretched.
- When differential feed adjusting lever ❸ is moved to 6 to 9, the differential feed ratio is increased the finished material is gathered.

※ **When fixing the differential feed adjusting lever ❸ , pinch it with two setscrews ❺ and ❻ .**

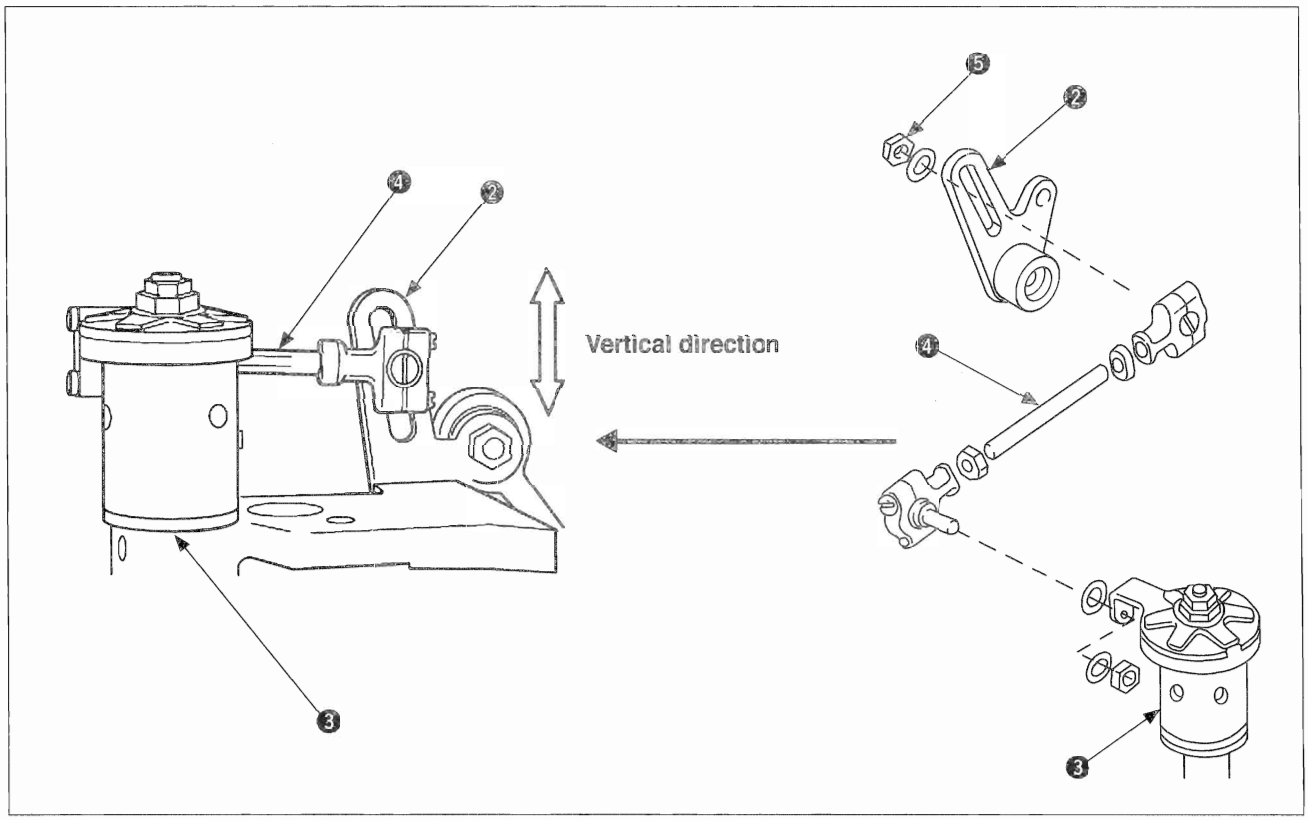
8. Adjustment of drawing amount of upper feed roller

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.



(1) Drawing amount of upper feed roller

The standard amount of draw for the upper feed roller ❶ is defined to cause a slight pulling force for the sewing length (8 stitches/inch) of the feed dog.
The clutch connecting lever ❷ and the clutch set ❸ are connected. The amount of draw for the material cloth can be changed by moving the clutch connecting rod ❹ vertically.



Loosen the nut ❺, tighten the nut ❺ after adjusting the clutch connecting rod ❹ vertically.

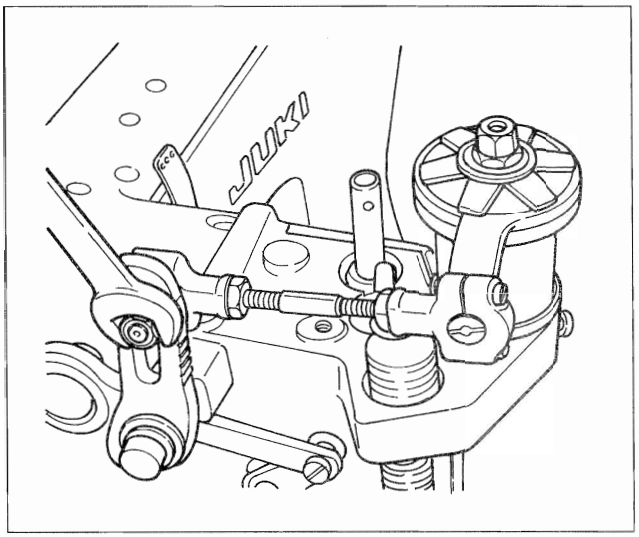
- ○ When the clutch connecting rod ❹ is raised, the amount of draw for the material cloth is increased.
- ○ When the clutch connecting rod ❹ is lowered, the amount of draw for the material cloth is decreased.

Caution

1. **If the amount of draw for the upper feed roller ❶ is too much in conjunction with the sewing feed amount, the number of stitches is increased.**
2. **If the amount of draw for the upper feed roller ❶ is too less, sewing problem occurs and this is a cause of feed error. In particular, this problem occurs around the hinged section.**

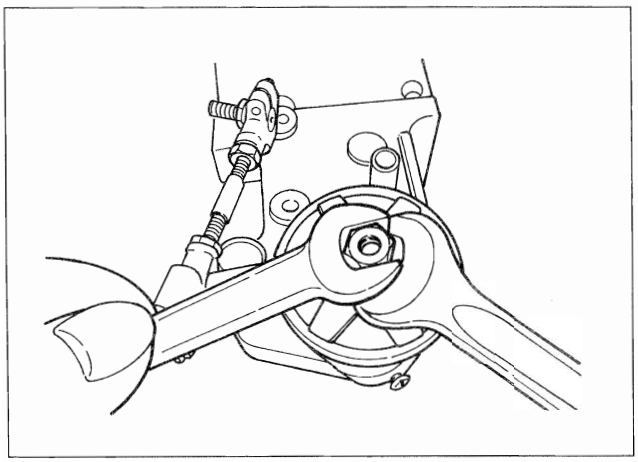
ENGLISH

(2) How to fill grease into the upper feed roller and to adjust the brake spring

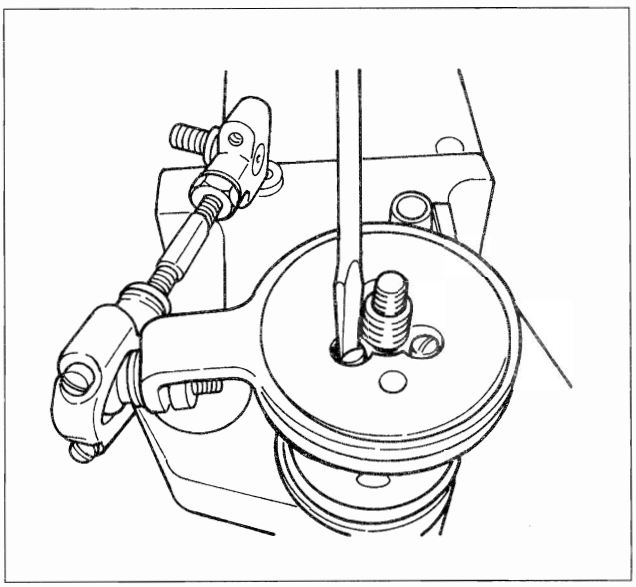


When the grease inside the upper feed roller has reduced, the amount of feed may be inconsistent or large noise may be generated. In such a case, carry out the following steps of procedure.

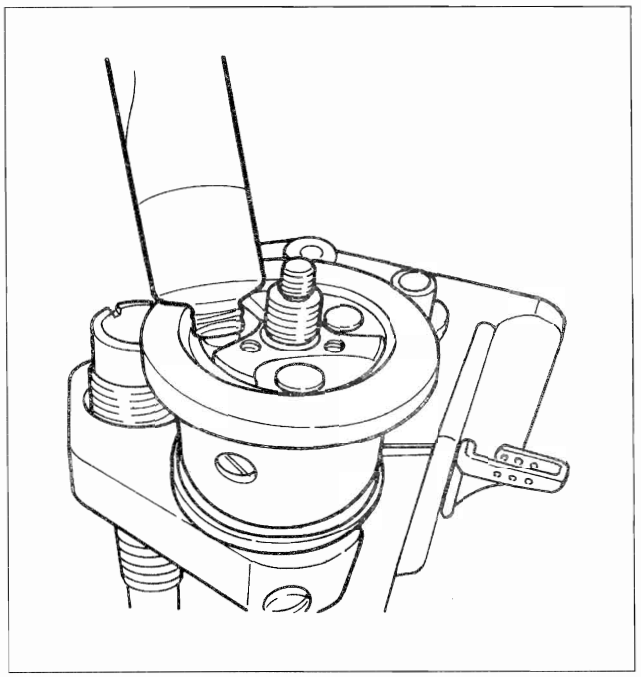
1) Remove the nut which secures the clutch lever with a spanner.



2) Loosen two nuts with two spanners to remove the washer and brake spring from under the nuts.

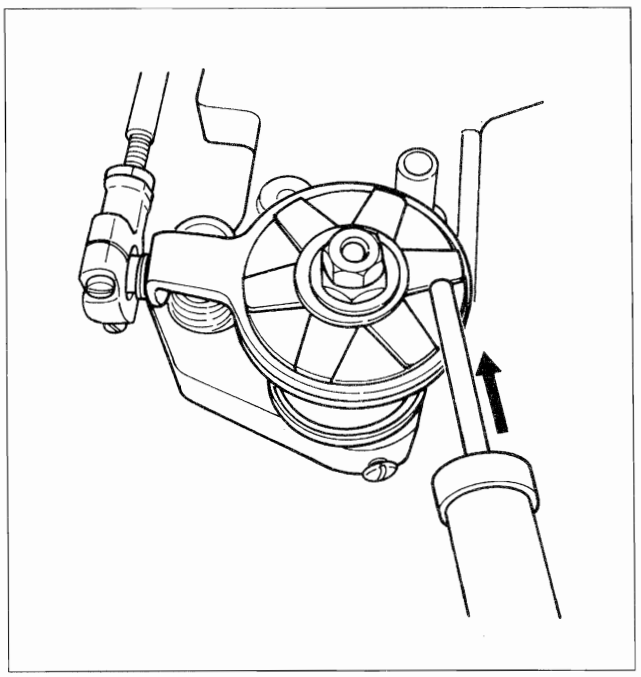


3) Remove three setscrews to remove the clutch driving lever.



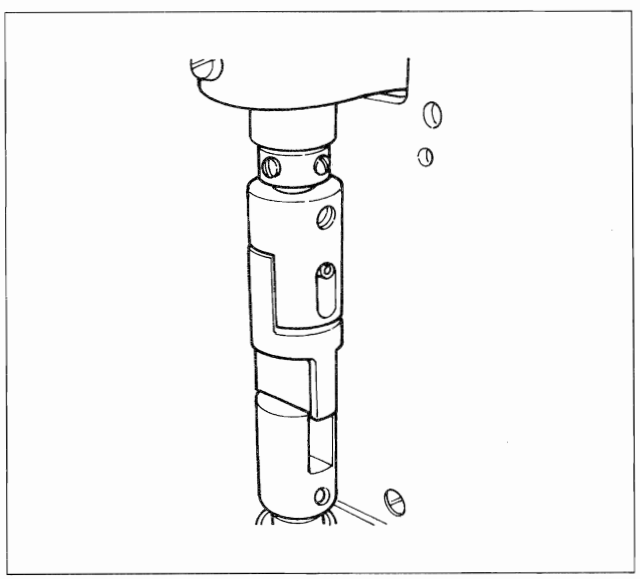
4) Fill the grease (Part No.: 40013640) supplied with the unit to the entire periphery of the clutch roller.

The clutch roller has two layers, upper and lower. For the sake of maintenance, only the upper layer should be filled with grease since the grease will gradually flows down to the lower layer.



5) Reassemble the removed parts back to their former state. Finally, adjust the brake spring pressure by the tightening amount of the two nuts.
For the standard adjustment, the upper feed roller rotates by pressing the spring balance as shown in the figure at left against the roller to apply a pressure of 10N to 30N.

The efficiency of feed may need to be increased in accordance with sewing conditions.
In such a case, increase the pressure.



6) When filling grease into the upper feed roller, the grease should be applied to the sliding part of the roller for increased smoothness of the roller connector.

If the upper feed roller loses its smoothness, the rotational resistance which causes the entire upper feed roller unit to feed smoothly will deviate.

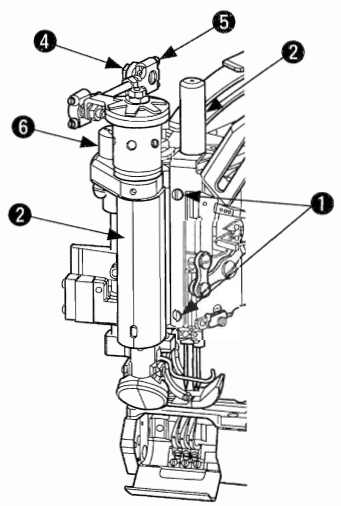
Ⅳ. STANDARD ADJUSTMENT

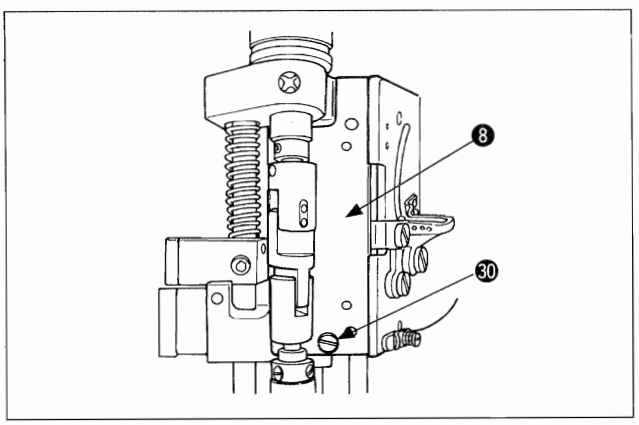
1. How to remove the gauge components and upper feed roller (mechanism with differential feed and mechanism without differential feed)

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

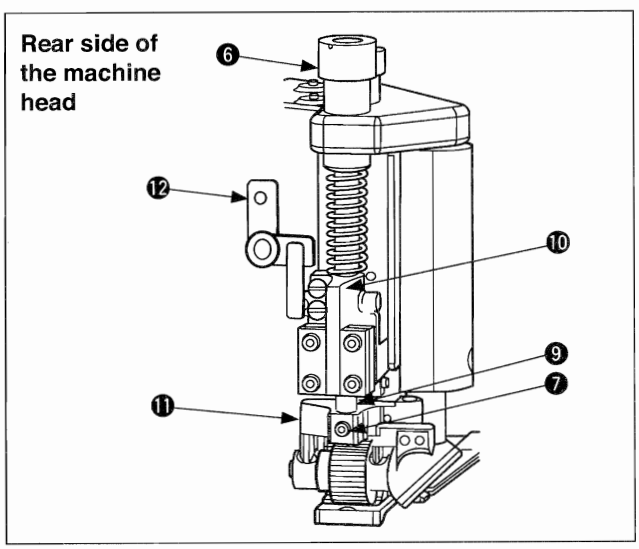
To perform the standard adjustment, remove the gauge components " needle ⑯, presser yoke ⑲, throat plate ㉔, differential feed dog ㉖, and main feed dog ㉘ ", the cover components " needle bar roller cover ❷, and looper cover ㉑ ", upper feed roller frame ⓫ components, roller pressure regulating screw ❻, and pressure regulating plate spring ssembly ⓮ before adjustment.

Left side of the machine head





Rear side of the machine head

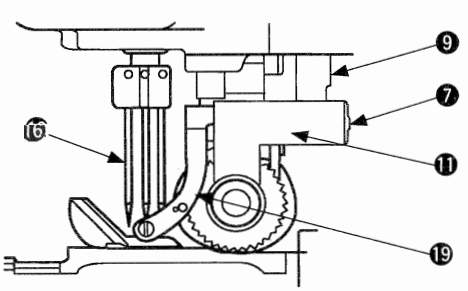


The directions of front, rear, right, and left during standard adjustment are based on the operator working position. Therefore, the forward rotation of the pulley is counterclockwise.

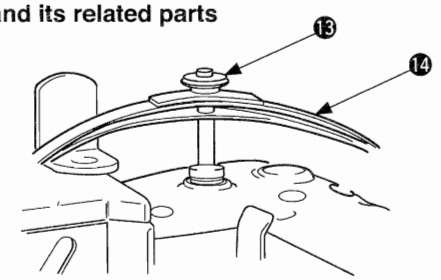
1) Loosen setscrews ❶ and remove the needle bar and roller cover ❷.
2) Loosen setscrew ❸❵ and simultaneously remove side cover ❸ and the packing.
3) Loosen nut ❹ and remove the washer and clutch connection rod ❺.
4) Remove roller pressure regulating screw ❻.
5) Loosen setscrew ❼ in the upper feed roller shaft, lift upper feed roller shaft ❾ and roller bar guide plate ❿ and remove roller frame ⓫.

When the upper feed roller shaft ❾ is lifted, the guide finger ❿ interferes with the lift lever crank ⓬ . Therefore, remove the upper feed roller assembly ⓫ after lifting the lift lever crank ⓬ slightly.

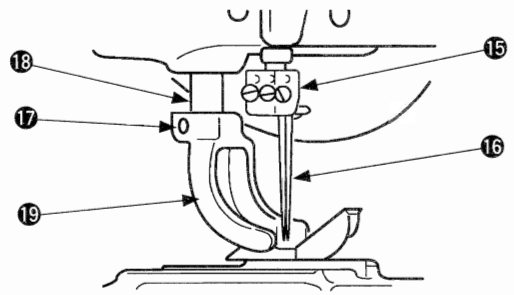
Right side of the machine head



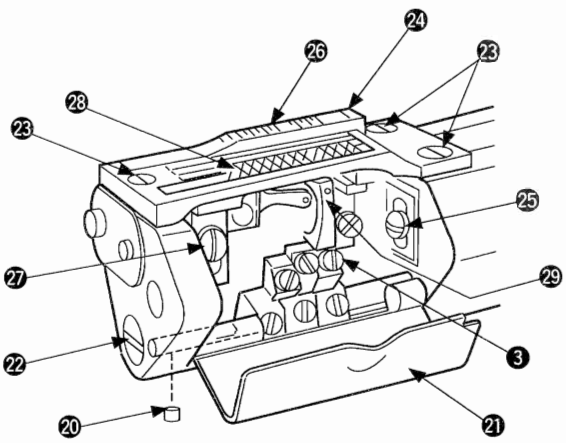
Pressure regulating plate spring and its related parts



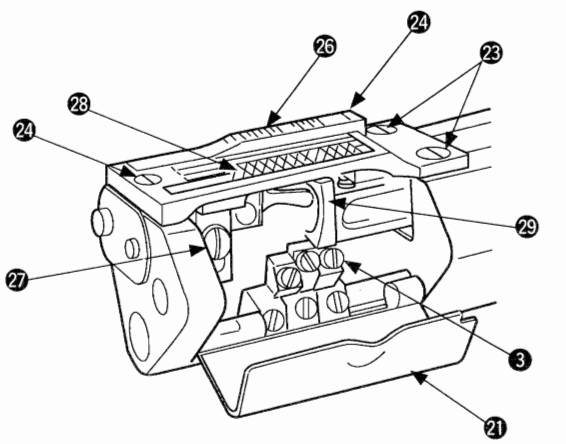
Left side of the machine head



Gauge components (Mechanism with differential feed)



Gauge components (Mechanism without differential feed)



6) Loosen the pressure regulating nut ⓭ and remove the pressure regulating plate spring assembly ⓮ .
7) Loosen each setscrew ⓯ that securing corresponding needles and remove three of each needle ⓰ .
8) Loosen the setscrew ⓱ securing the presser yoke and remove the presser yoke ⓳ after lifting the presser shaft ⓲ .
9) Loosen the setscrew ⓴ and remove the setscrew ㉑ securing the cover.
   Removal of the setscrew allows you to remove the looper cover ㉒ and spring stud.
10) Loosen three setscrews ㉓ securing the throat plate and remove the throat plate ㉔.
11) Loosen the setscrew ㉕ and remove the differential feed dog ㉖ .
12) Loosen the setscrew ㉗ and remove the main feed dog ㉘ .
13) Loosen the setscrews ❸ securing the loopers ㉙ and remove the loopers ㉙ .

The disassembly procedure mentioned above mainly describes about the mechanism with differential feed.
For the mechanism without differential feed, differential feed ㉖ and setscrew ㉕ are not provided.

ENGLISH

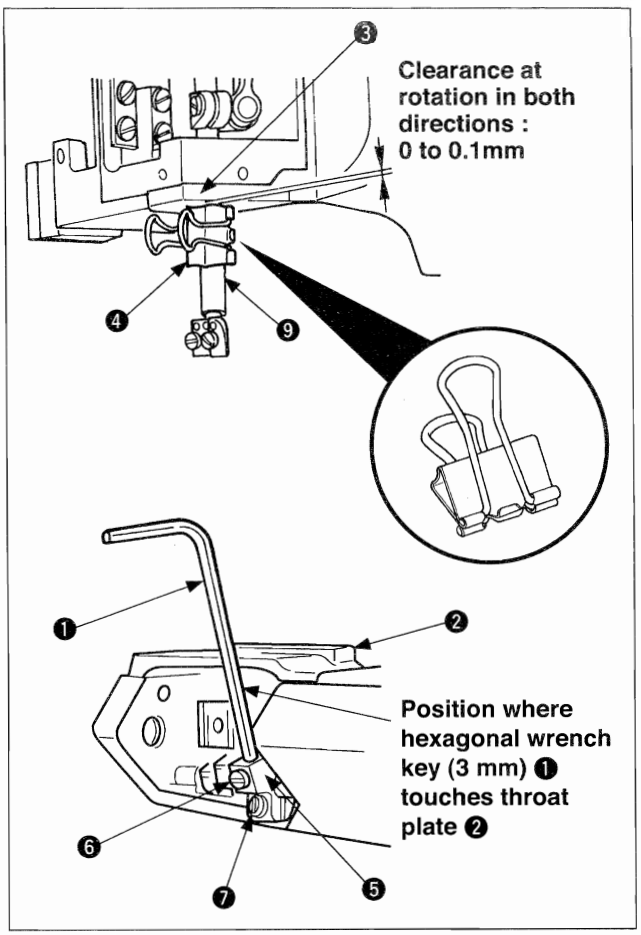
2. Timing between the looper and needle bar

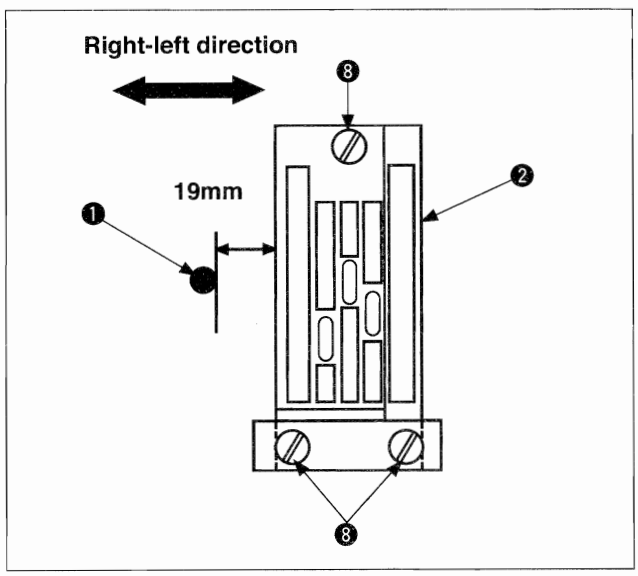
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

(1) Timing between the looper and needle bar (synchronization)

Gauge components are mounted to perform synchronization adjustment.
The standard position is that there is no clearance between the bottom surface of lower needle bar bushing ❸ and the top surface of clip ❹ when hexagonal wrench key (3 mm) ❶ touches throat plate ❷ by rotating the handwheel in the normal and reverse directions, (Be sure to rotate the handwheel in both directions to check the clearance.) The allowable clearance range is from 0 to 0.1 mm.

The allowable clearance between the hexagonal wrench key (3 mm) ❶ and the throat plate ❷ ranges from 0 to 0.1mm when the bottom surface of the lower needle bar bushing ❸ touches the top surface of the timing gauge ❹ ahead of the other touch by rotating the pulley in both directions.





(2) Installing and adjustment procedure of the hexagonal wrench key and clip

1) Insert hexagonal wrench key (3 mm) ❶ into front looper base ❺ and tighten setscrew ❻.
2) Slightly loosen setscrew ❼ and move front looper base ❺ with hexagonal wrench key (3 mm) ❶ integrated to the most left position.
3) Install throat plate ❷ and tighten setscrew ❽.
4) Turn the pulley to bring hexagonal wrench key (3 mm) ❶ to the leftmost point. Adjust the clearance measured from the right side face of the pulley to the left side face of throat plate ❷ to 19 mm. Then, temporarily tighten setscrew ❼ in front looper base ❺ (middle, rear and front). Further adjust the base to the correct position and securely tighten the setscrew.
5) Rotate the handwheel counterclockwise and stop it at the position where hexagonal wrench key (3 mm) ❶ touches the left surface of throat plate ❷.
6) Attach clip ❹ to needle bar ❾.

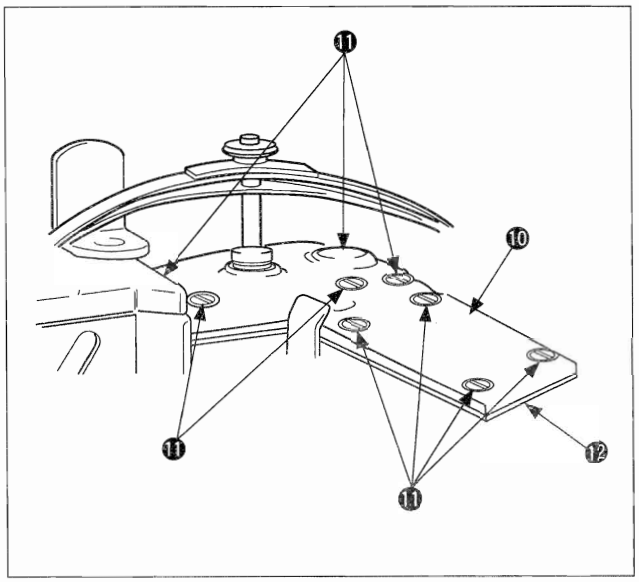
* **Attach a commercially-available alligator clip (small) with its upper face aligned with the mark-off line.**
Attach clip ❹ so that the top surface of clip ❹ touches the bottom surface of lower needle bar bushing ❸.

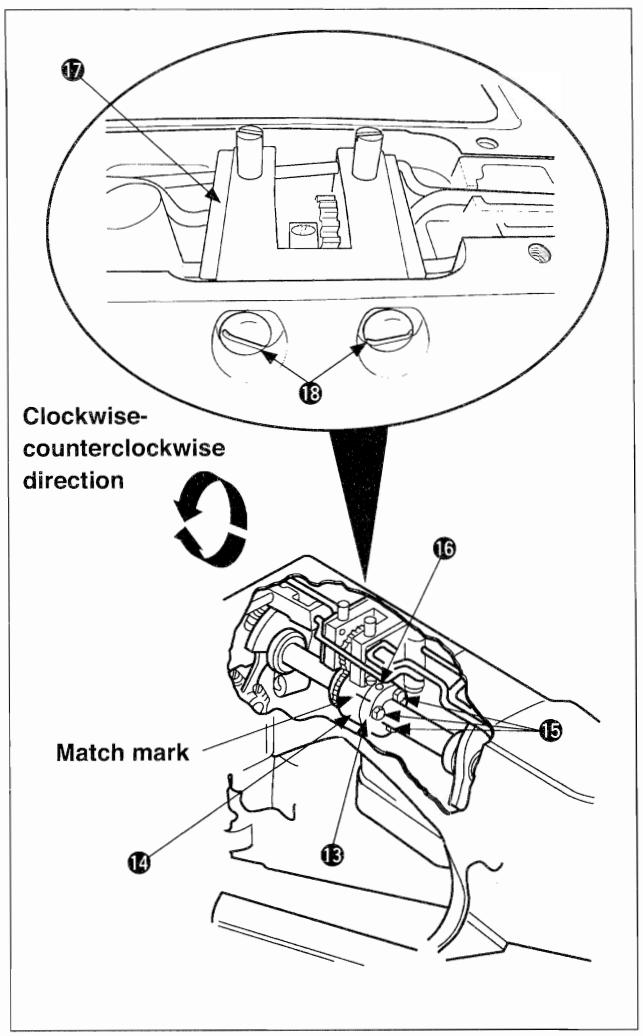
7) When the handwheel is rotated clockwise, hexagonal wrench key (3 mm) ❶ moves to the right and left. Touch the hexagonal wrench key with the left surface of throat plate ❷ again.
At this moment, make sure that the clearance between the bottom surface of lower needle bar bushing ❸ and the top surface of clip ❹ is within the allowable range.

The bottom surface of lower needle bar bushing ❸ may touch the top surface of clip ❹ ahead of the other touch, in such a case, make sure that the clearance of the touching position between hexagonal wrench key (3 mm) ❶ and throat plate ❷ is within the allowable range.

8) If the timing between the looper (hexagonal wrench key (3 mm) ❶ and needle bar ❾ is inappropriate, follow the procedure below.

Improper synchronization position adjustment may cause stitch skipping or thread breakage.





(3) Corrective points and corrective measures

1) For adjusting the timing between the looper (hexagonal wrench key (3 mm) ❶) and needle bar ❾, loosen 9 setscrews ⓫ of rear top cover ⓪ and remove rear top cover ⓪ and packing ⓬.
2) Remove oil pump asm. ⓱ (which is fixed with two screws ⓲). Loosen three screws ⓯ in front and rear couplings ⓭ and ⓮ of the main shaft. Engage a key wrench with setscrew ⓰ in main-shaft front coupling ⓭ to turn the setscrew clockwise or counterclockwise for adjustment while keeping main-shaft rear coupling ⓮ from moving. Then reassemble the oil pump asm adjusting the backlash.

<Backlash>

0.1 to 0.3 mm

* **Loosen setscrews ⓲. The backlash is increased by raising the oil pump or decreased by lowering it.**

Caution

1. **Align the match marks.**
2. **For moving the front main shaft coupling ⓭ , temporarily tighten one of the fixing nuts ⓯ , which is close to the match mark, and make an adjustment.**

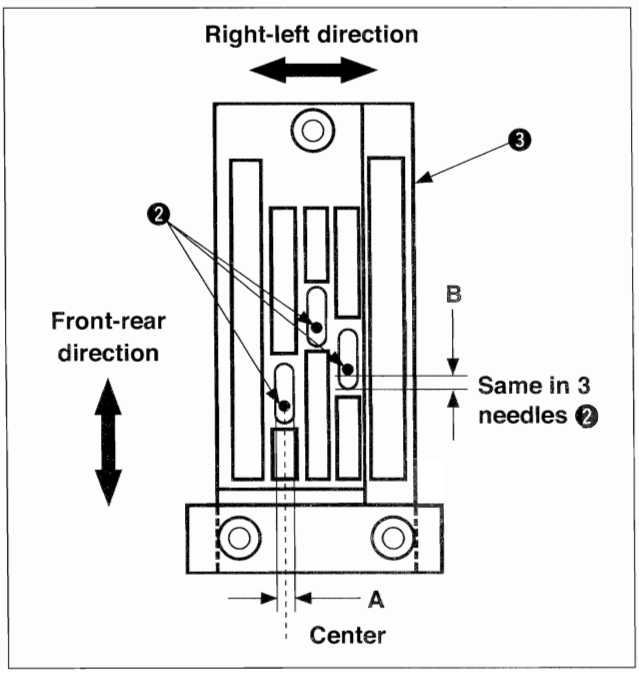
- To increase the clearance between hexagonal wrench key (3 mm) ❶ and throat plate ❷, rotate front main shaft coupling ⓭ clockwise.
- To decrease the clearance between hexagonal wrench key (3 mm) ❶ and throat plate ❷, rotate front main shaft coupling ⓭ counterclockwise.

3) After adjustment, put the rear top cover ⓪ and packing ⓬ back on and tighten the setscrew ⓫ .

ENGLISH

3. Adjustment of the needle entry positions in the right-left and front-rear directions

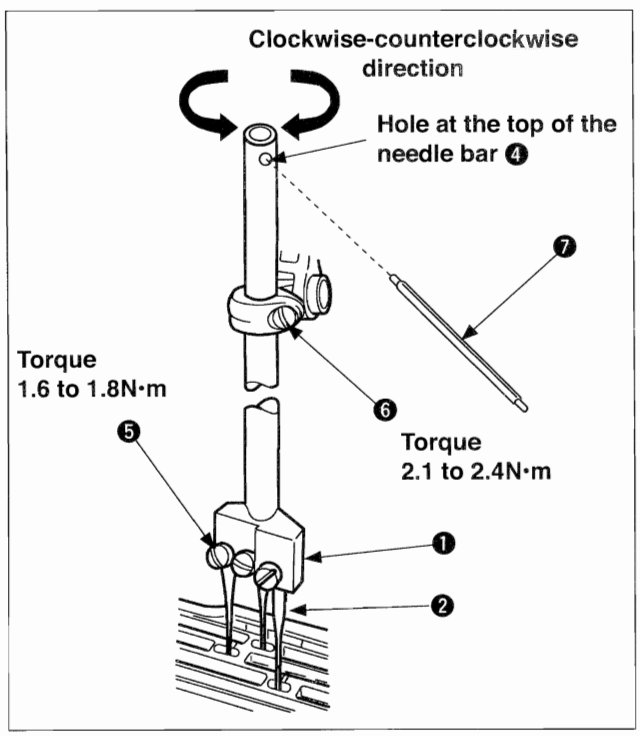
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.



(1) Needle entry

1) Needle entry position in the right-left direction
Mount 3 needles ❶ to the needle clamp ❷ . The standard needle entry position "A" in the right-left direction is the center of the needle hole of the throat plate ❸ .
2) Needle entry position in the front-rear direction
The standard needle entry position in the front-rear direction is decided under the condition that the clearance between the needle ❷ and needle hole of the throat plate ❸ , "B", is the same for all of 3 positions.

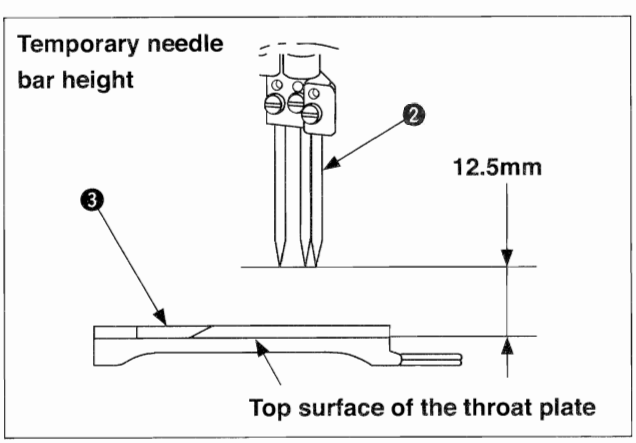
Adjust the needle entry position in accordance with the temporary needle bar ❹ height of 12.5 mm.
Refer to "Ⅳ-5. Adjustment of the needle bar height".



(2) Checking procedure of needle entry

1) Mount 3 needles ❶ to the needle clamp ❷ and tighten the setscrew ❺ .
2) Loosen the needle bar holding screw ❻ set the temporary needle bar ❹ height (12.5 mm), and tighten the needle bar holding screw ❻ temporarily (approximately needle bar ❹ it turns).
3) Insert the torque rod ❼ into the hole at the top of the needle bar ❹ and rotate the needle bar ❹ in the right-left direction to adjust the needle entry position in the front-rear and right-left directions.

1. **Improper needle entry position adjustment may cause stitch skipping, needle breakage, or thread breakage.**
2. **Needle entry adjustment is performed in accordance with the temporary needle bar height.**
When the needle bar is at the upper dead point, the temporary clearance between the top surface of the throat plate ❸ and the tips of the needles ❷ is 12.5 mm.
3. **The needle bar height is temporarily adjusted for needle entry adjustment. If there is no problem with the needle bar height, readjustment of the needle bar height is not required.**
Advance to the next step.



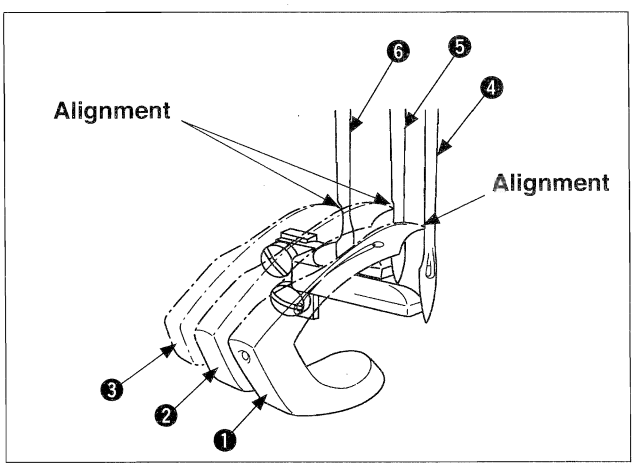
4. Looper adjustment

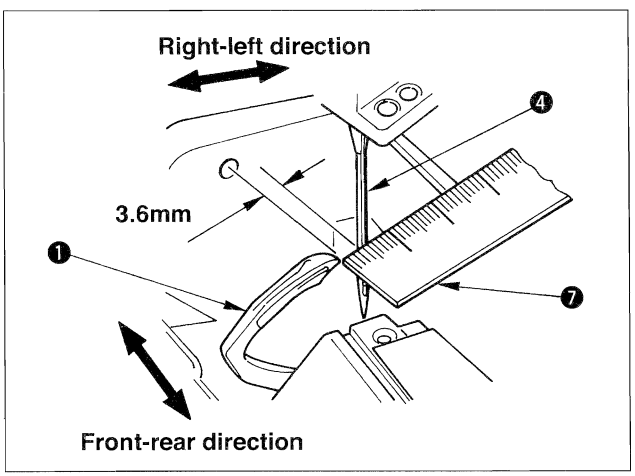
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

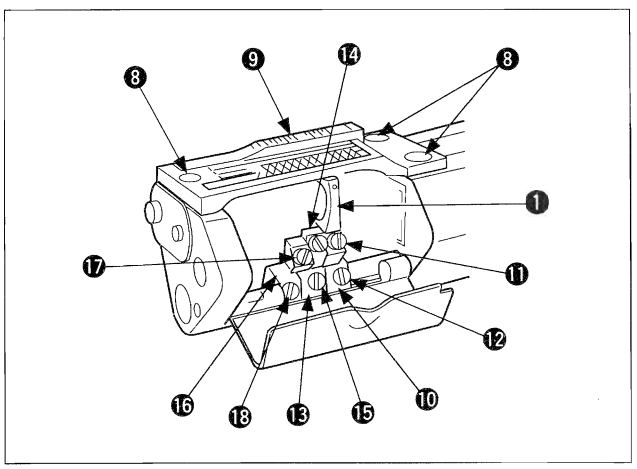
(1) Looper return

When each looper (❶, ❷ and ❸) is at the most left position, the standard distance from the tip of each looper (❶, ❷ and ❸) to the center of each needle (❹, ❺ and ❻) is 3.6 mm.

1) Standardization of the front looper
   When front looper ❶ is at the most left position, measure the distance from the tip of front looper ❶ to the center of left needle ❹ with scale ❼ and adjust the distance to the standard value, i,e, 3.6 mm.
2) Standardization of middle and rear loopers
   When the tips of the middle and rear loopers (❷ and ❸) are simultaneously aligned with each left surface of the middle and right needles as well as the tip of the front looper ❶ with the left surface of the left needle ❹ , the middle and rear loopers are in the standard positions.







For the front looper ❶ , the looper return is adjusted with the gauge ❼ and a scale, and for the middle and rear loopers (❷ and ❸) , the looper return is adjusted by aligning the tips of the middle and rear loopers (❷ and ❸) with the left surfaces of the needles (❺ and ❻), respectively.

(2) Front looper

1) Loosen the setscrews ❽ to remove the throat plate ❾ .
2) Mount the front looper ❶ on the front looper base ❿ and tighten the setscrew ⓫ .
3) Rotate the handwheel in the direction of reverse rotation, move front looper ❶ to the most left position, and measure the clearance from the tip of front looper ❶ to left needle ❹ with scale ❼.
4) For adjusting the clearance to the standard distance, loosen the setscrew ⓬ securing the front looper base to adjust the position of the front looper base ❿ in the right-left direction.
5) After adjustment, tighten the setscrew to secure the front looper base setscrew ⓬ .

(3) Middle looper

1) Rotate the pulley counterclockwise and align the tip of the front looper ❶ with the left surface of the left needle ❹ .
2) Mount the middle looper ❷ on the middle looper base ⓭ and tighten the setscrew ⓮ .
3) Loosen the setscrew ⓯ securing the middle looper base and move the middle looper base ⓭ in the right-left direction to align the tip of the middle looper ❷ with the left surface of the right needle ❺ .
4) After adjustment, tighten the setscrew ⓯ to secure the middle looper base.

(4) Rear looper

1) Rotate the pulley counterclockwise and align the tip of the front looper ❶ with the left surface of the left needle ❹ .
2) Mount the rear looper ❸ on the rear looper base ⓰ and tighten the setscrew ⓱ .
3) Loosen the setscrew ⓲ securing the rear looper base and move the rear looper base ⓰ in the right-left direction to align the tip of the rear looper ❸ with the left surface of the middle needle ❻ .
4) After adjustment, tighten the setscrew ⓲ to secure the rear looper base.

Caution

1. **When the positions of each looper base (⓾ , ⓭ and ⓲) are adjusted in the right-left direction, adjust the clearances from the tips of the loopers (❶ , ❷ and ❸) to the needles (❹ , ❺ , and ❻) as well.**
2. **Insufficient or excessive looper return may cause stitch skipping, needle breakage, or thread breakage.**

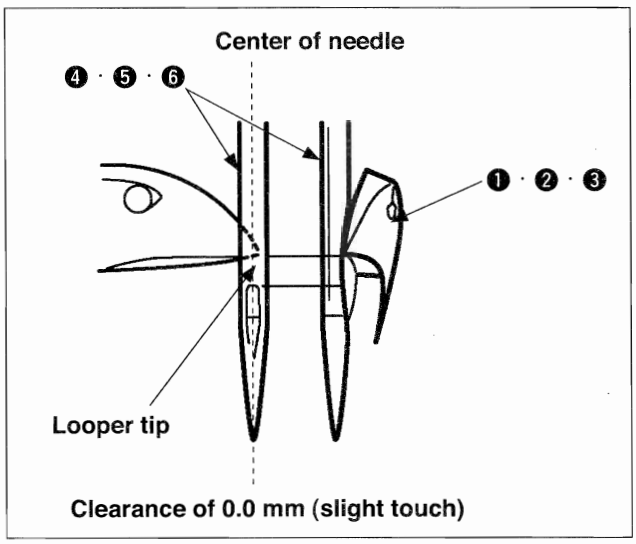
(5) Adjustment of the clearance between the looper and needle

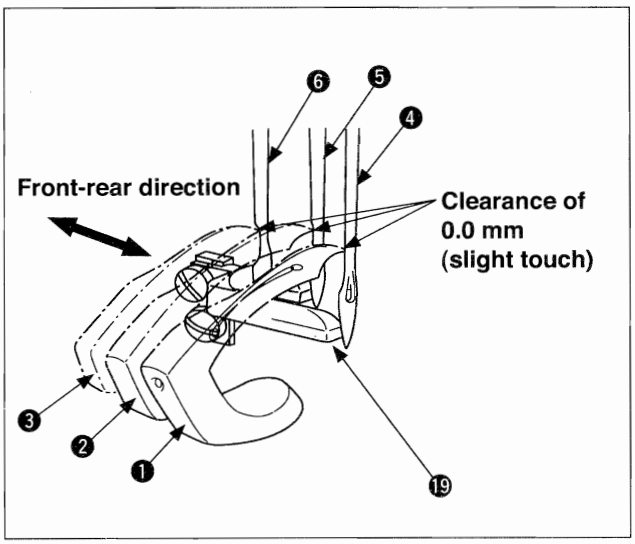
When the tips of each looper (❶ , ❷ and ❸) are at the center of each needle (❹ , ❺ and ❻), the standard clearance is 0.0mm (slight touch).

After adjusting the rear needle guide ⓳ , make sure again that the clearance between the loopers (❶ , ❷ and ❸) to the center of each needle (❹ , ❺ and ❻) is 0.0 mm respectively, and perform final adjustment of the clearance after threading.

Caution

If clearance adjustment is performed without the rear needle guide ⓳ , a little strongly touch the tips of the loopers (❹ , ❺ and ❻) with the needles (❶ , ❷ and ❸) , respectively.





1) Loosen the setscrews (⓬ , ⓯ and ⓰) securing the looper bases to adjust the positions of the looper bases (⓾ , ⓭ and ⓲) in the front-rear direction.
2) After adjustments, tighten the setscrews (⓬ , ⓯ and ⓰) to secure the looper bases.

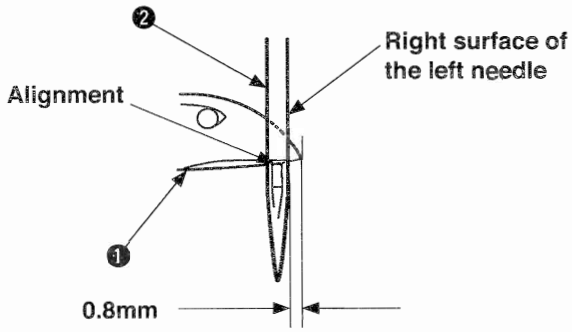
Caution

1. **When the positions of respective looper bases (⓾ , ⓭ and ⓲) are adjusted in the right and left directions, adjust the clearance from the tips of the respective loopers (❶ , ❷ and ❸) to the respective needles (❹ , ❺ and ❻) as well.**
2. **When each looper base (⓾ , ⓭ and ⓲) is moved leftward, each tip of loopers (❶ , ❷ and ❸) is detached from each needle (❹ , ❺ and ❻).**
3. **When each looper base (⓾ , ⓭ and ⓲) is moved rightward, each tip of loopers (❶ , ❷ and ❸) touches each needle (❹ , ❺ and ❻).**

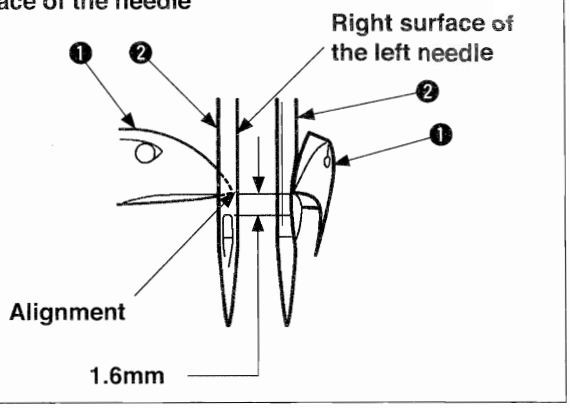
5. Adjusting the height of the needle bar

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

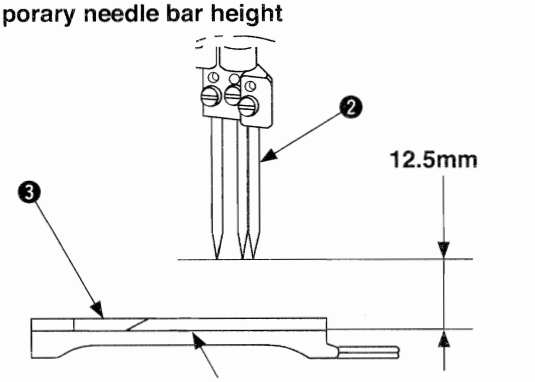
Alignment between the bottom surface of the looper and the top hole end of the needle

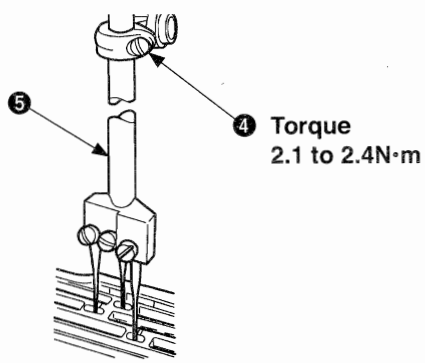


Alignment between the tip of the looper and the right surface of the needle



Temporary needle bar height





(1) Height of the needle bar

1) Alignment between the bottom surface of the front looper and the top hole end of the left needle
When the pulley is rotated counterclockwise and the bottom surface of the front looper ❶ is aligned with the top hole end of the left needle ❷ , the standard needle bar height is achieved by adjusting the distance from the tip of the front looper ❶ the right surface of the left needle ❷ to 0.8 mm.

2) Alignment between the tip of the front looper and the left surface of the left needle
When the pulley is rotated counterclockwise and the tip of the front looper ❶ is aligned with the right surface of the left needle ❷ , the standard needle bar height is achieved by adjusting the distance from the bottom surface of the front looper ❶ to the top hole end of the left needle ❷ to 1.6mm .

Caution
For adjusting the needle bar height, select an easier-to-adjust one from either 1) or 2) mentioned above.

3) Checking of the middle and rear looper heights shall be also checking of each looper return.

Caution
1. **Needle entry adjustment is performed in accordance with the temporary needle bar height.**
When the needle bar is at the upper dead point, the temporary clearance between the top surface of the throat plate ❸ and the tips of the needles ❷ is 12.5 mm.
2. **The needle bar height is temporarily adjusted for needle entry adjustment. If there is no problem with the needle bar height, readjustment of the needle bar height is not required.**
Advance to the next step.

(2) Adjustment of the needle bar height

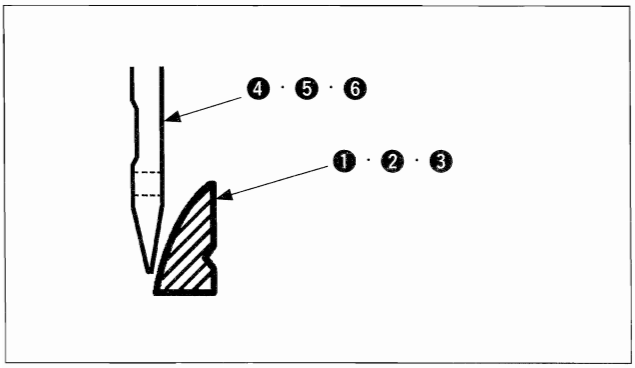
1) Remove the needle bar, roller cover, surface cover, and packing.
2) Loosen the setscrew ❹ and adjust the needle bar ❺ position vertically.
3) After adjustment, tighten the setscrew ❹ .

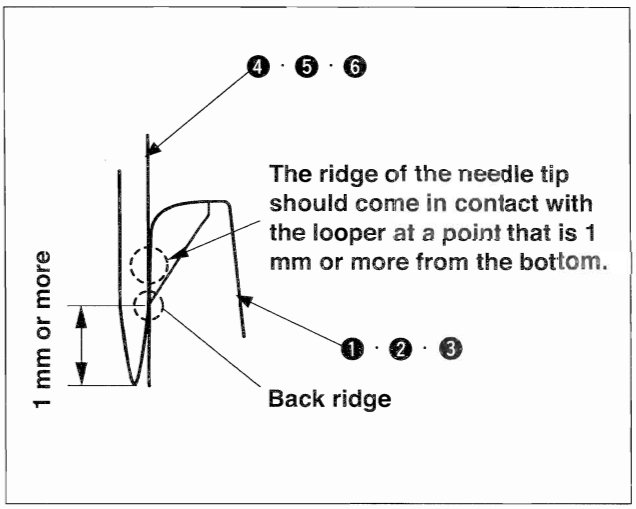
Caution
1. **Use caution not to rotate the needle bar ❺ at adjustment of needle bar height. Failure to observe this changes needle entry positions.**
2. **Remarkably improper needle bar height adjustment may cause stitch skipping, needle breakage, or thread breakage.**

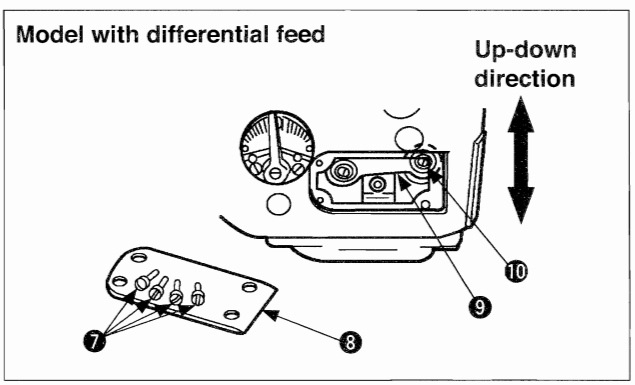
ENGLISH

6. Adjustment of the looper motion paths

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.







(1) Looper momentum in the front-rear direction

1) The standard position of the front looper ❶ is decided under the condition that the tip of the needle ❹ touches the rear of the front looper ❶ at 1/3 from the bottom surface when the pulley is rotated counterclockwise and the front looper ❶ is moved from right to left after mounting the front looper ❶ in a standard manner.
2) While the looper is moving backward, the side face of the needle should comes in contact with the back side of the looper when the needle tip is 1 mm or more away from the middle of the back ridge of the looper. (Front, middle and rear loopers)

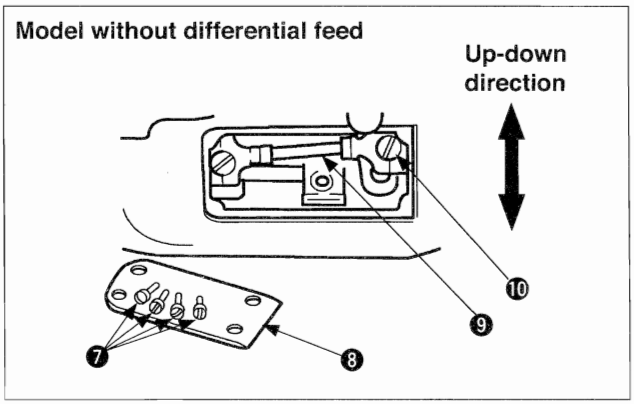
When the material has a section which has a large difference in height, the depth of back-to-back contact between the needle tips and loopers (❷ and ❸) has to be decreased. (In order to prevent the needle tip from being crushed.)

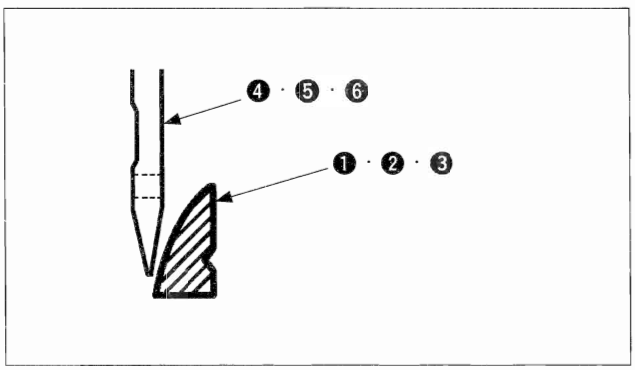
(2) Adjustment of longitudinal movement of the looper with differential feed

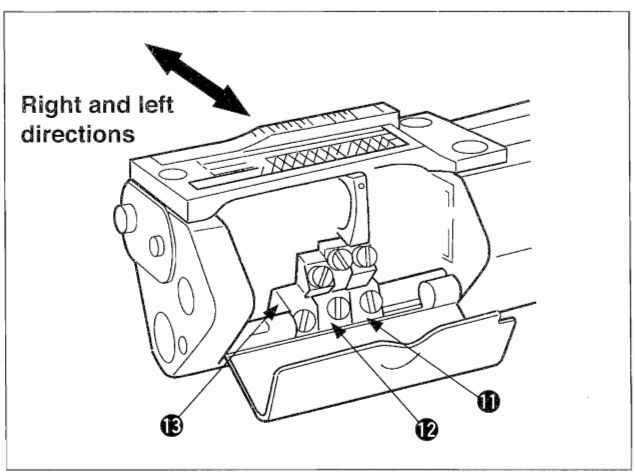
1) Loosen the setscrews ❼ (4 pcs.) and remove the cylinder side cover ❽ .
2) Loosen the setscrew ❿ of the ball joint ❾ with a spanner wrench, and adjust the forward/reverse movement by moving the setscrew ❿ forward or backward.
3) After adjustments, mount the cylinder side cover ❽ , and tighten the setscrews ❼ .

- ○ When reducing the front and rear momentum amount of the looper, move the ball joints ❾ upwards.
- ○ When increasing the front and rear momentum amount of the looper, move the ball joints ❾ downwards.

1. **When the front and rear momentum of the looper has been adjusted, move the respective looper bases ⓫, ⓬ and ⓭, and readjust the front/rear positions of the needles (❹ , ❺ and ❻) and the loopers (❶ , ❷ and ❸).**
2. **When the above-mentioned adjustments are carried out, the throat plate ⓮ should be removed.**
3. **When the front and rear momentum amount of the looper is small :**
   The amount of contact becomes large between tips of the needles (❹ , ❺ and ❻) and rear parts of the loopers (❶ , ❷ and ❸) and this can be a cause of needle tip being blunt.
4. **When the front and rear momentum amount of the looper is large :**
   The clearance becomes large between tips of the needles (❹ , ❺ and ❻) and rear parts of the loopers (❶ , ❷ and ❸) and this can be a cause of stitch skipping.







(3) Adjustment of longitudinal movement of the looper without differential feed

1) Loosen the setscrews ❼ (4 pcs.) and remove the cylinder side cover ❽.
2) Loosen the setscrew ❿ of the ball joint ❾ with a screwdriver, and adjust the forward/reverse movement by moving the setscrew ❿ forward or backward.
3) After adjustments, mount the cylinder side cover ❽, and tighten the setscrews ❼.

- ○ When reducing the front and rear momentum amount of the looper, move the ball joints ❾ upwards.
- ○ When increasing the front and rear momentum amount of the looper, move the ball joints ❾ downwards.

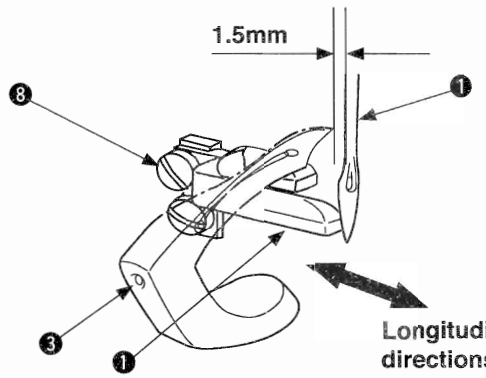
1. **When the front and rear momentum of the looper has been adjusted, move the respective looper bases ⓫, ⓬ and ⓭, and readjust the front/rear positions of the needles (❹, ❺ and ❻) and the loopers (❶, ❷ and ❸).**
2. **When the above-mentioned adjustments are carried out, the throat plate ⓮ should be removed.**
3. **When the front and rear momentum amount of the looper is small : The amount of contact becomes large between tips of the needles (❹, ❺ and ❻) and rear parts of the loopers (❶, ❷ and ❸) and this can be a cause of needle tip being blunt.**
4. **When the front and rear momentum amount of the looper is large : The clearance becomes large between tips of the needles (❹, ❺ and ❻) and rear parts of the loopers (❶, ❷ and ❸) and this can be a cause of stitch skipping.**

ENGLISH

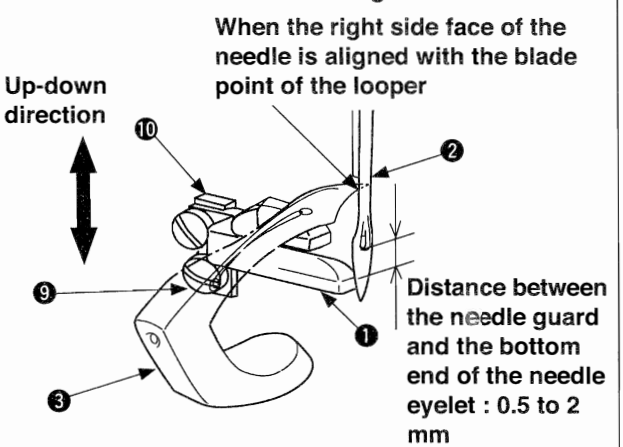
7. Adjustment of rear needle guard

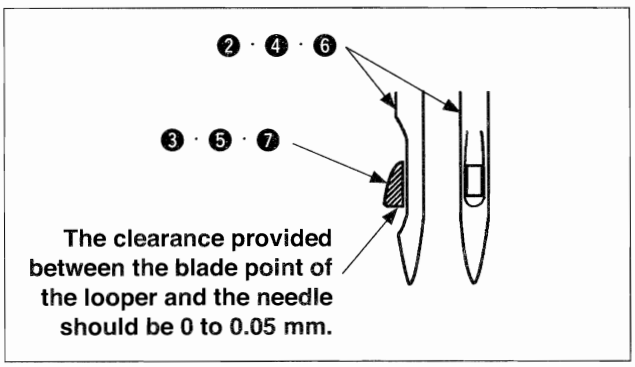
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

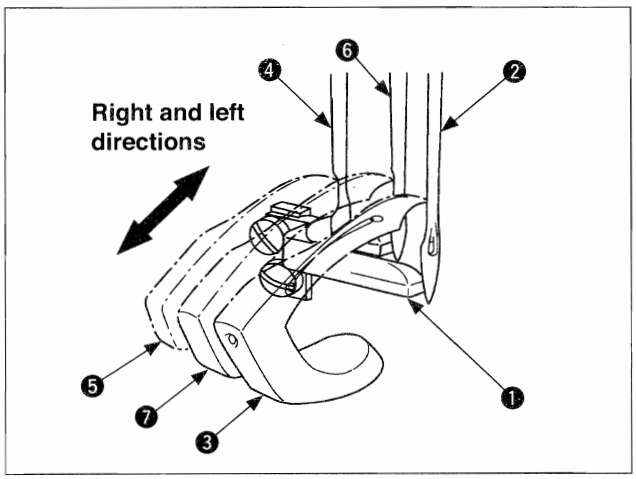
Longitudinal directions of rear needle guard



Vertical direction of rear needle guard







(1) Longitudinal adjustment of the rear needle guard

1) When the pulley is turned counterclockwise and the rear needle guard ❶ advances to the most front position, it lightly touches the left needle ❷ (If necessary, press it lightly so that all the needles can be guarded.) and then tip of the front looper ❸ passes.
   When tip of the front looper ❸ reaches the position 1.5mm apart from the left side of the left needle ❷ while this front looper ❸ moves in right direction, the standard position is that the needle tip comes in contact with the rear needle guard ❶ .
2) The relationship between the middle needle ❹ and the rear looper ❺ and between the right needle ❻ and the middle looper ❼ is also required to assume the same conditions as (1) -1). above in standard positioning.
3) Loosen the setscrew ❽ and move the rear needle guard ❶ forward or backward to adjust.
4) After adjustments, tighten the setscrew ❽ .

1. To change the stitch length, readjustment of the front and rear positions is also needed for rear needle guard ❶.
2. When the rear needle guard is adjusted, recheck the non-presence of a clearance between the respective needles (❷ , ❹ and ❻) and the respective loopers (❸ , ❺ and ❼). If any clearance is perceived, readjust the related conditions.
3. Is a clearance is actually developed between the respective needles (❷ , ❹ and ❻) and rear needle guard ❶, this can be a cause of needle breakage or stitch skipping.
4. When rear needle guard ❶ presses the respective needles (❷ , ❹ and ❻) too much, this can be a cause of needle tip being blunt.

(2) Height adjustment of rear needle guard

1) The relationship between the middle needle ❹ and the rear looper ❺ and between the right needle ❻ and the middle looper ❼ is also required to assume the same conditions as (1) -1) above in standard positioning.
2) Loosen the setscrew ❾ and move the rear needle guard base ❿ vertically to adjust the height.
3) After adjustments, tighten the setscrew ❾ .

8. Adjustment of feed dog height and longitudinal movement (mechanism with differential feed)

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

(1) Height of main feed dog

The standard height is defined when the main feed dog ❶ attains the highest level and the root section of the main feed dog ❶ coincides with the upper face of the main feed dog throat plate ❷.

(2) Height of differential feed dog

The standard height of the differential feed dog ❸ is defined when the main feed dog ❶ attains the highest level and bottom face "B" of differential feed dog ❸ lightly touch upper face "A" of main feed dog ❶.

Check for No bind.

(3) Adjustment of longitudinal movement of main feed dog

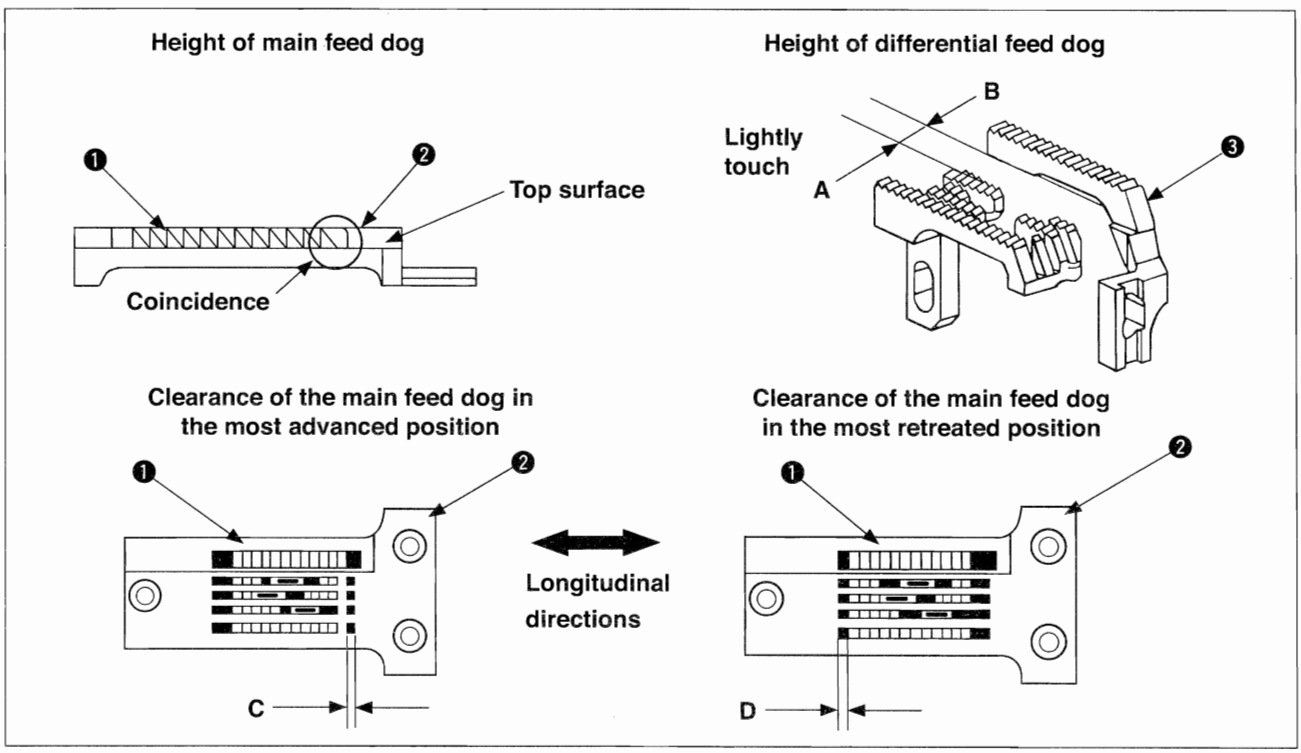
The maximum amount of feed of the main feed dog ❶ is 3.6 mm. (Standard : 3.2 mm)
When the main feed dog ❶ attains its maximum feeding amount, the standard positioning is secured when Clearance "C" and Clearance "D" are equalized. Clearance "C" is defined as the distance from the feed groove front section of the throat plate ❷ to the front section of the main feed dog ❶ in position where the main feed dog ❷ stays in the most advanced position. Clearance "D" is defined as the distance from the feed groove rear section of the throat plate ❷ to the rear section of the main feed dog ❶ in position where the main feed dog ❶ has attained the most retreated position.

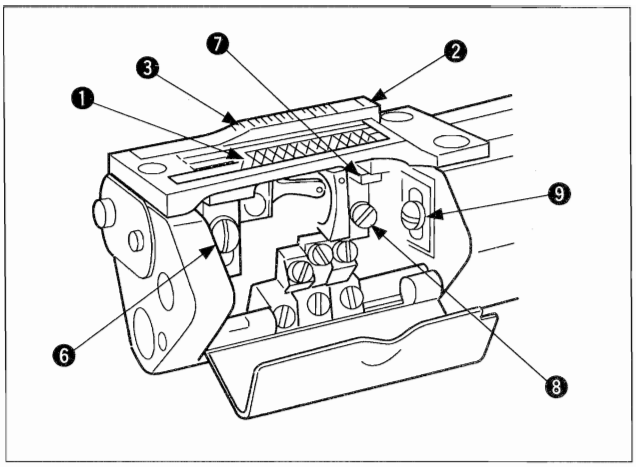
(4) Adjustment of vertical height of main feed dog and differential feed dog

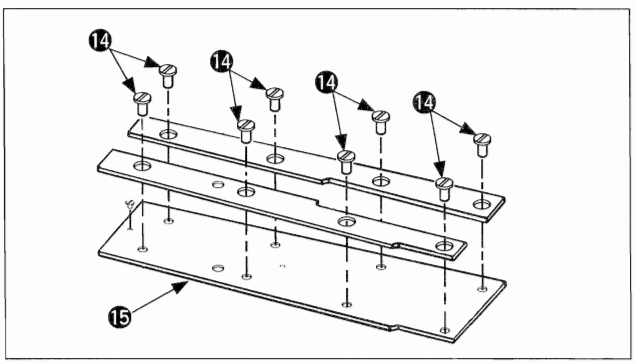
For the feed rocking lever eccentric pin ❹ of the feed dog, the standard positioning of the groove is horizontal.
The vertical height of the main and differential feed dogs (❶ and ❸) can be simultaneously adjusted by turning the feed rocking lever eccentric pin ❹. Basically, however, this function should be used in standard position.

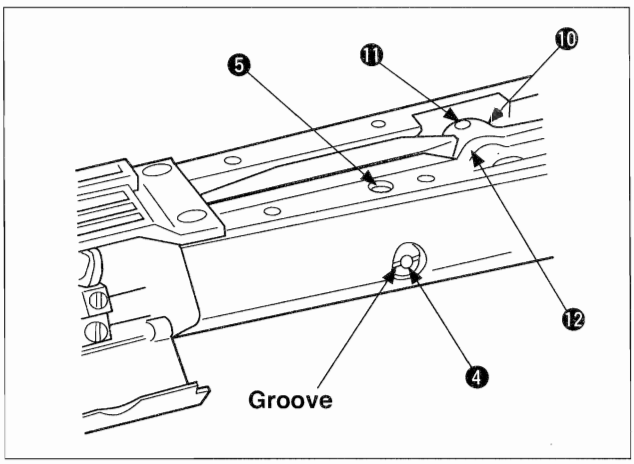
(5) Gradient of main feed dog and differential feed dog

Front lowering condition is standard.









(6) Adjustment of main feed dog and differential feed dog

1) For the feed rocking lever eccentric pin ❹ of the feed dog, the standard positioning of the groove is horizontal.
If the groove seems to be inclined deviating from the standard positioning, loosen the setscrew ❺ and adjust the feed rocking lever eccentric pin ❹ of the feed dog until it assumes its horizontal posture. Since then, tighten the setscrew ❺ .
2) Mount the main feed dog ❶ , differential feed dog ❸ and throat plate ❷ and fix the throat plate ❷ .
3) In the first place, adjust the height of the main feed dog ❶ to the standard position. Then fix it by tightening the setscrew ❻ .
4) Apply the feed dog support ❼ to the bottom of the front section of the main feed dog ❶ and tighten the setscrew ❽ .
5) Then, adjust the height of the differential feed dog ❸ to the standard position. After that, fix it by tightening the setscrew ❾ .
6) According to **"Ⅲ-7. Feed adjustments, (1) Adjustment of stitch length"**, adjust the maximum feed amount of the main feed dog ❶ to 3.6mm. (Apply a ruler to the side of the main feed dog ❶ and confirm the result by turning the pulley counterclockwise.)
7) Turn the pulley counterclockwise and confirm that there is no contact between the main feed dog ❶ and the feed groove front/rear section of the throat plate ❷ .
If there is any contact, loosen the setscrew ⓫ of the main feed rocking lever link ⓾ and turn the main feed rocking eccentric drive stud ⓬ to adjust the throat plate ❷ not to contact the feed groove front/rear section. After adjustments, tighten the setscrew ⓫ .
8) After the adjustment of the amount of forward and back movement of main feed dog ❶, adjust the feed amount to the stitch length to be used (for sewing).

1. In the case of front and rear adjustments of the mechanism with differential feed, specific attention should be paid to the fine feed dog section of main feed dog ❶ .

2. To make front and rear adjustments of the main feed dog ❶ , loosen eight setscrews ⓮ of the cylinder cover and remove the cylinder cover set ⓯ . After adjustments, mount the cylinder cover set ⓯ and tighten the setscrews ⓮ .

Caution

3. For the main feed dog ❶ and the differential feed dog ❸, the longitudinal gradients and the horizontality are kept constant and cannot be adjusted.

4. After any adjustment of feed dog (❶ , ❸) or this page recheck adjustment of rear needle guard or [Ⅳ-7. Adjustment of rear needle guard] and readjust as necessary.

5. When the height of feed dogs ❶ , ❸ is insufficient
- **The amount of feed is decreased and uneven feeding can occur.**
- **When the height of the rear needle guide is lowered, this will cause breakage of a needle or stitch skipping.**

6. When the height of feed dogs ❶ , ❸ is excessive
- **This can be a cause of the materials pushed back to the front side, or of giving rise to feed flaws.**
- **When the height of the rear needle holder is raised and the margin of the needle contact position is increased, this will cause failure in producing loops and stitch skipping.**

9. Adjustment of feed dog height and longitudinal movement (mechanism without differential feed)

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

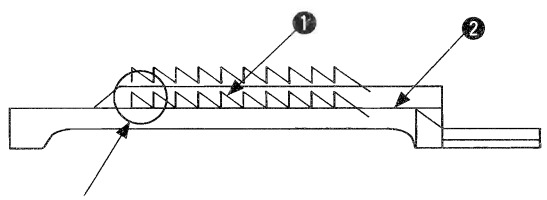
(1) Height of main feed dog

The standard height is defined when the main feed dog ❶ attains the highest level and the rear root section of the main feed dog ❶ coincides with the upper face of the throat plate ❷ of the main feed dog ❶ .

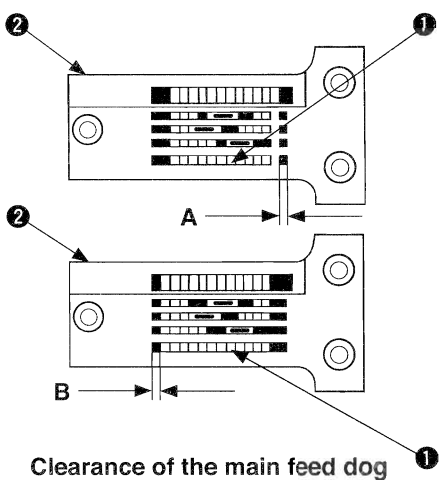
(2) Adjustment of longitudinal movement of main feed dog

The maximum amount of feed of the main feed dog ❶ is 3.6 mm. (Standard : 3.2 mm)
When the main feed dog ❶ attains its maximum feeding amount, the standard positioning is secured when Clearance "A" and Clearance "B" are equalized. Clearance "A" is defined as the distance from the feed groove front section of the throat plate ❷ to the front section of the main feed dog ❶ in position where the main feed dog ❶ stays in the most advanced position. Clearance "B" is defined as the distance from the feed groove rear section of the throat plate ❷ to the rear section of the main feed dog ❶ in position where the main feed dog ❶ has attained the most retreated position. (A = B)

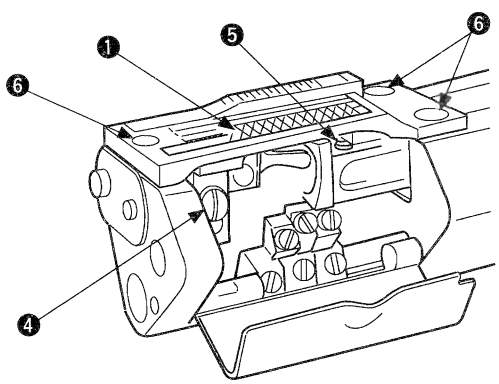
Height of main feed dog



Clearance of the main feed dog in the most advanced position



Clearance of the main feed dog in the most retreated position



(3) Adjustment of the vertical height of main feed dog

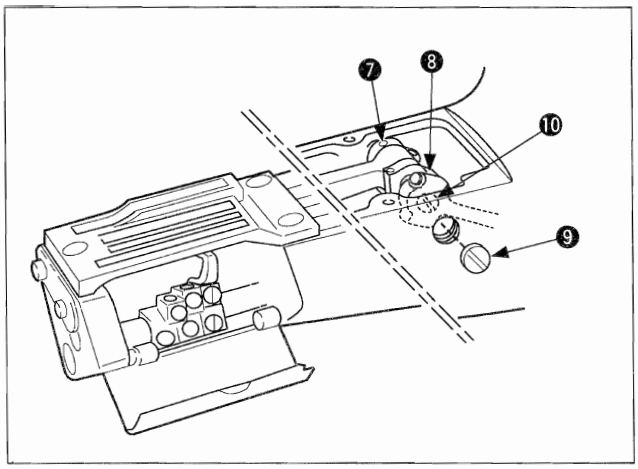
1) Apply the rear support screw ❸ to the bottom right of the main feed dog ❶ , tighten the setscrew ❹ , and mount the throat plate ❷ .
2) Check the standard height of the main feed dog ❶ .
   - ○ If the main feed dog ❶ is low, raise the rear support screw ❸ .
   - ○ If the main feed dog ❶ is high, raise the rear support screw ❸ .
3) Remove the throat plate ❷ , loosen the setscrew ❹ to remove the main feed dog ❶ , and adjust height of the front support screw ❺ .
4) After adjustments, mount the main feed dog ❶ , tighten the setscrew ❹ , mount the throat plate ❷ , and tighten the setscrew ❻ .

Caution

When the height of main feed dog ❶ is insufficient
- ○ **The amount of feed is decreased and uneven feeding can occur.**
- ○ **When the height of the rear needle guide is lowered, this will cause breakage of a needle or stitch skipping.**

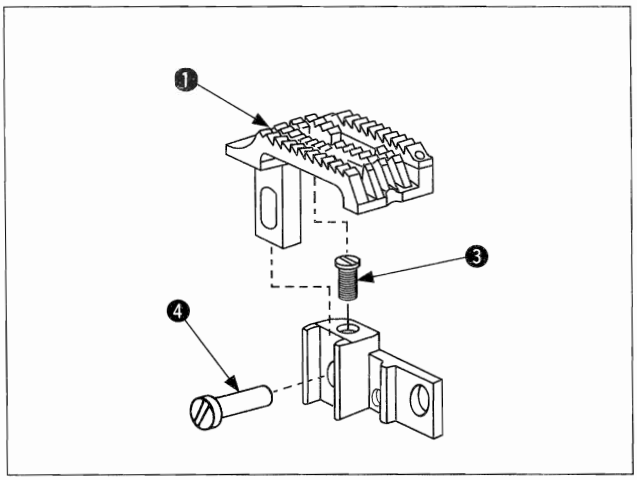
When the height of main feed dog ❶ is excessive
- ○ **This can be a cause of the materials pushed back to the front side, or of giving rise to feed flaws.**
- ○ **When the height of the rear needle holder is raised and the margin of the needle contact position is increased, this will cause failure in producing loops and stitch skipping.**

ENGLISH



(4) Adjustment of longitudinal movement of main feed dog

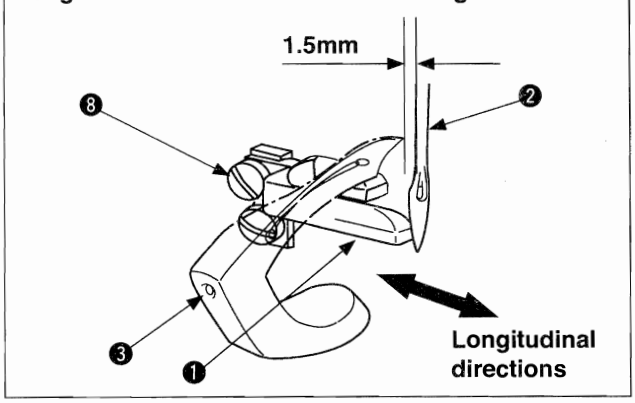
1) Loosen the setscrews (❼ and ❽) and remove the plug female screw ❾ .
2) Using a screwdriver, turn the eccentric pin ❿ clockwise and counterclockwise until the front and rear positions of the main feed dog ❶ are properly adjusted.



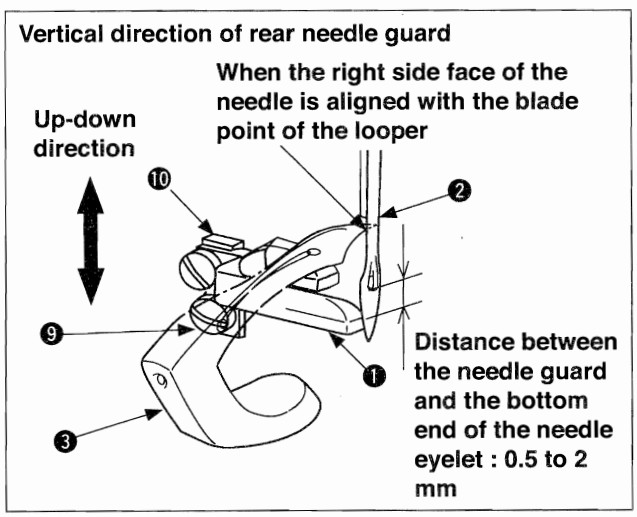
(5) Longitudinal adjustment of the rear needle guard

1) When the pulley is turned counterclockwise and the rear needle guard ❶ advances to the most front position, it lightly touches the left needle ❷ (If necessary, press it lightly so that all the needles can be guarded.) and then tip of the front looper ❸ passes.
   When tip of the front looper ❸ reaches the position 1.5mm apart from the left side of the left needle ❷ while this front looper ❸ moves in right direction, the standard position is that the needle tip comes in contact with the rear needle guard ❶ .
2) The relationship between the middle needle ❹ and the rear looper ❺ and between the right needle ❻ and the middle looper ❼ is also required to assume the same conditions as (5) -1). above in standard positioning.
3) Loosen the setscrew ❽ and move the rear needle guard ❶ forward or backward to adjust.
4) After adjustments, tighten the setscrew ❽ .

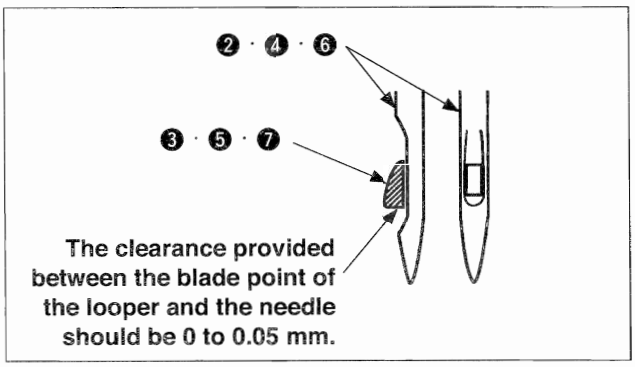
Longitudinal directions of rear needle guard

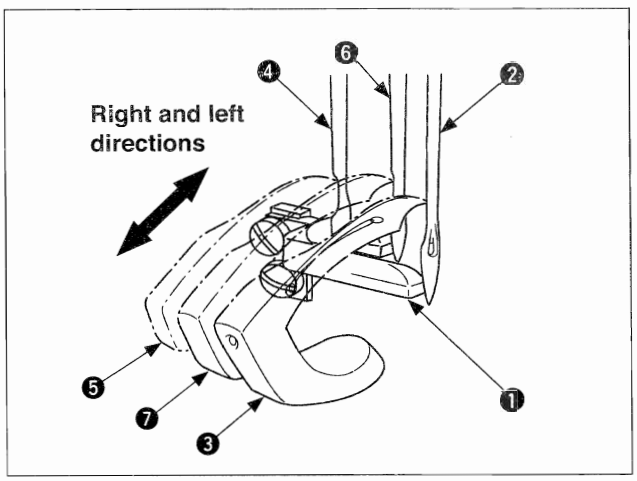


Vertical direction of rear needle guard



1. To change the stitch length, readjustment of the front and rear positions is also needed for rear needle guard ❶.
2. When the rear needle guard is adjusted, recheck the non-presence of a clearance between the respective needles (❷ , ❹ and ❻) and the respective loopers (❸ , ❺ and ❼). If any clearance is perceived, readjust the related conditions.
3. Is a clearance is actually developed between the respective needles (❷ , ❹ and ❻) and rear needle guard ❶, this can be a cause of needle breakage or stitch skipping.
4. When rear needle guard ❶ presses the respective needles (❷ , ❹ and ❻) too much, this can be a cause of needle tip being blunt.





(6) Height adjustment of rear needle guard

1) The relationship between the middle needle ❹ and the rear looper ❺ and between the right needle ❻ and the middle looper ❼ is also required to assume the same conditions as (5) -1) in standard positioning.
2) Loosen the setscrew ❾ and move the rear needle guard base ⓾ vertically to adjust the height.
3) After adjustments, tighten the setscrew ❾ .

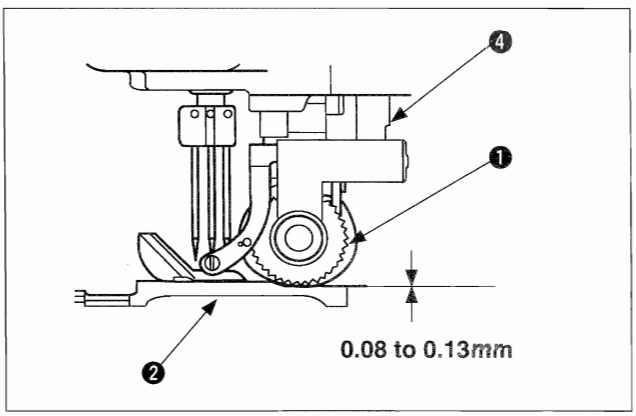
ENGLISH

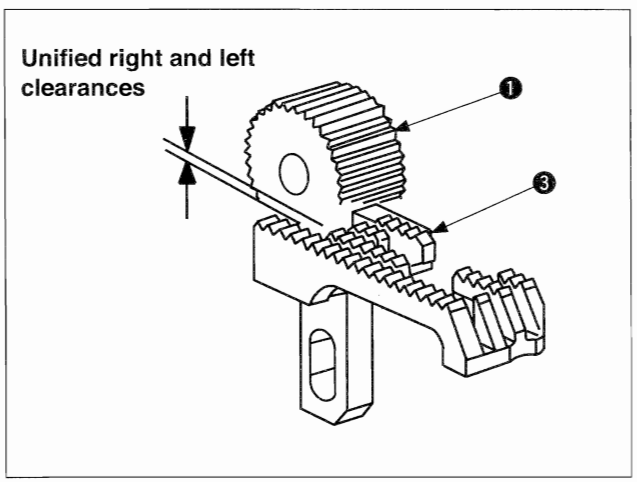
10. Adjustment of upper feed roller

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

(1) Adjustment of upper feed roller

1) The standard clearance is 0.08mm minimum to 0.13mm maximum between the lower position of the upper feed roller ❶ and the upper face of the throat plate ❷ .
2) The standard front/rear and right/left clearances shall be uniform between the upper feed roller ❶ and the feed dog ❸ .
3) The standard positioning of the upper feed roller ❶ shall be free from right and left rattling, permitting smooth movement up and down.

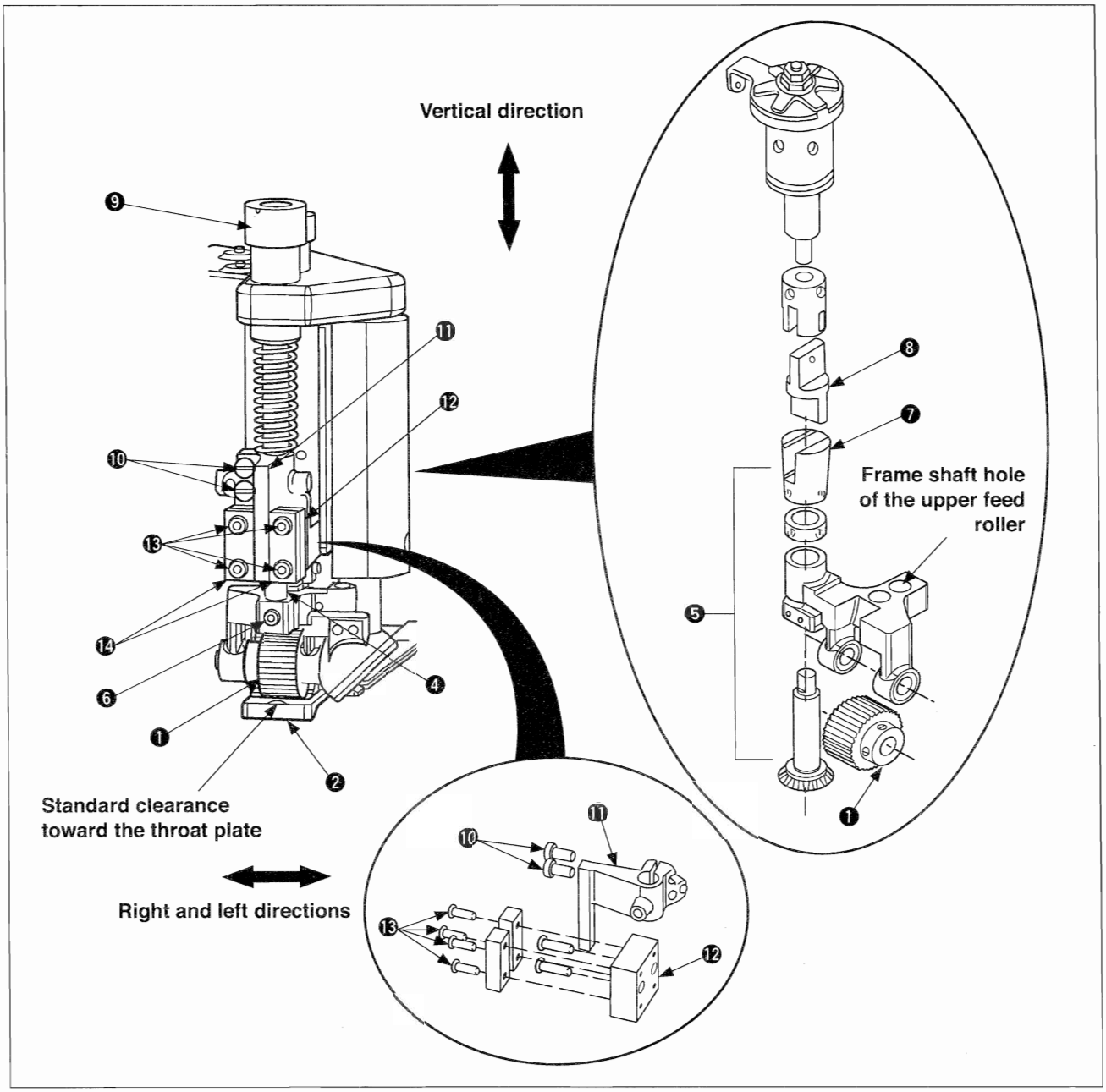




(2) Installation of upper feed roller

1) Raise the upper feed roller pressing shaft ❹ and insert the upper feed roller pressing shaft ❹ in the frame shaft hole of the upper feed roller frame set ❺ . Then, tighten the setscrew ❻ .
   Simultaneously at that time, insert the lever connecting section ❽ in between the roller connecting section ❼ to join it.
2) Install the roller pressure adjusting screw ❾ .
3) Confirm that a standard clearance (Clearance gauge: 0.08mm to 0.13mm) is secured between the upper feed roller ❶ and the upper face of the throat plate ❷.
4) Confirm that there is proper pressure at the upper feed roller ❶ , enough to feed the material cloth.
   ☆ Pressure adjustment
   - ○ Turning the roller pressure adjusting screw ❾ clockwise causes the pressure to increase.
   - ○ Turning the roller pressure adjusting screw ❾ counterclockwise causes the pressure to decrease.

1. Confirm that the upper feed roller pressing shaft ❹ can be raised by both hands when installing the roller pressure adjusting screw ❾ .
2. If the upper feed roller ❶ touches the throat plate ❷ and there is too much pressure, this will be a cause of cutting off the chain-off thread.
3. If the clearance is too much between the upper feed roller ❶ and the throat plate ❷ , this will be a cause of failure in supplying the chain-off thread.
4. If pressure of the upper feed roller ❶ is too weak for the material cloth, uneven feeding may arise.



(3) Clearance adjustment between upper feed roller and throat plate

1) If the adjusted standard clearance is not correct, loosen two setscrews ⑩. Raise pressing shaft ❹ to place a clearance gauge between the top face of throat plate ❷ and the bottom of upper feeder roller ❶. Then, lower pressing shaft ❹.
2) Tighten two setscrews ⑩ while keeping the bottom face of roller bar guide plate ⑪ rest on the top face of lateral guide plate ⑫.
3) In the state as seen from behind, confirm that the vertical clearance of the upper feed roller ❶ is maintained at the standard level in conjunction with the throat plate ❷ .
4) In the state as seen from behind, confirm that the front and rear right/left clearances on the right side of the upper feed roller ❶ are uniformly maintained in conjunction with the feed dog ❸ .

Caution **The right/left clearance between the upper feed roller ❶ and the feed dog ❸ shall be confirmed while the feed dog ❸ is positioned at the highest level.**

(4) Adjustment of parallelism between upper feed roller and feed dog

Loosen setscrews ⑩. Turning pressing shaft ❹ clockwise or counterclockwise, check to be sure that an equal clearance is provided between upper feed roller ❶ and the front, rear, right and left sides of feed dog ❸. Then, tighten setscrews ⑩.

(5) Adjustment to eliminate right and left rattling in the upper feed roller

If there is a lateral play in upper feed roller ❶, loosen setscrews ⑬ and adjust so that roller bar guide plate ⑪ is securely held with right and left guide plates ⑭, while eliminating the lateral play. Then, tighten setscrews ⑬.

11. Adjustment of needle thread path

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

(1) Adjustment of needle thread path

The needle thread adjusting thread path ❶ is installed just under the needle thread guide ❸ so that there is no sag of the needle thread that passes through the lever thread path ❷ from the needle thread adjusting thread path ❶ when the needle bar is positioned at the upper dead point.

(2) Height of needle thread adjusting path

The standard dimension from point "A" under the hole in needle thread path guide ❸ to point "B" under the hole in needle thread adjusting path ❶ is 27 mm.

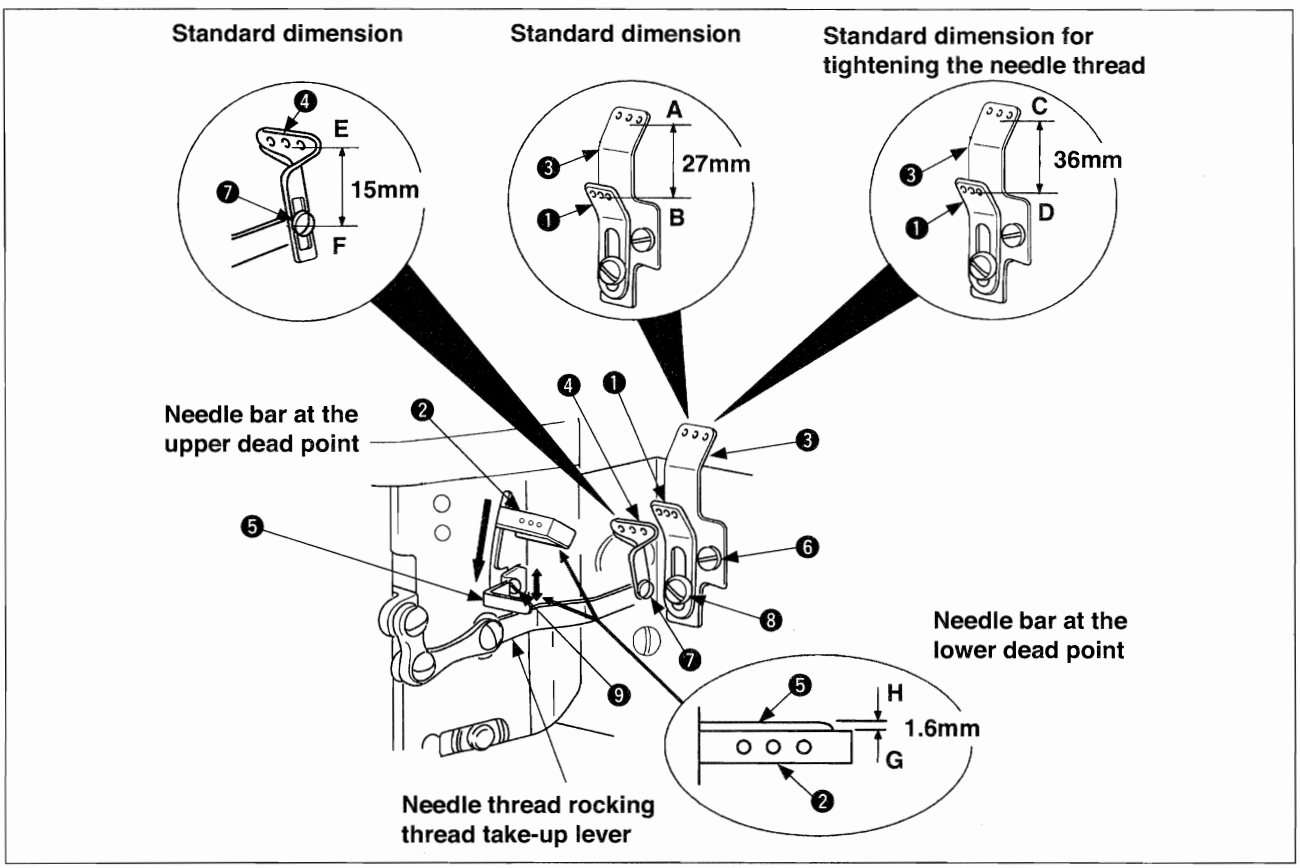
To especially tense the needle thread, adjust the distance from point "C" under the hole in needle thread path guide ❸ to point "D" under the hole in needle thread adjusting path ❶ to approximately 36 mm.

(3) Height of needle thread rocking thread take-up lever thread path

The standard dimension is 15mm from the hole bottom "E" of the needle thread rocking thread take-up lever thread path ❹ to the center "F" of the setscrew ❼ .

(4) Height of needle thread support adjust plate

When the needle bar rests at its lower dead point, the standard dimension from the upper end "G" of needle thread lever thread path ❷ to the upper end "H" of needle thread support adjust plate ❺ is 1.6 mm.



(5) Mounting position of needle thread adjusting path

1) Mount the needle thread path guide ❸ , and tighten the setscrew ❻ .
2) Mount the needle thread adjusting path ❶ in the needle thread path guide ❸.
   Measure the standard dimension (27mm) and tighten the setscrew ❽ .
   - ○ Raising the needle thread adjusting path ❶ causes the needle thread to be loosened.
   - ○ Lowering the needle thread adjusting path ❶ causes the needle thread to be tightened.

(6) Mounting position for the rocking thread take-up lever thread path

When the needle bar is positioned at the upper dead point, vertically hold the rocking thread take-up lever thread path ❹ and measure the standard dimension (15mm). Tighten the setscrew ❼ .

(7) Mounting position of needle thread support adjust plate

1) Let the lever thread path ❷ stay at the lower dead point.
2) Loosen two setscrews ❾ of the needle thread support adjust plate ❺ and move the needle thread support adjust plate ❺ vertically. Measure the standard dimension (1.6mm) and fasten two setscrews ❾ .
   - ○ Raising the needle thread support adjust plate ❺ causes the needle thread loop to be enlarged.
   - ○ Lowering the needle thread support adjust plate ❺ causes the needle thread loop to be diminished.

1. When the two setscrews ❾ are loosened and the needle thread support adjust plate ❺ is moved vertically, it is possible to change the height of "G" and that of "H."
2. If there is no coincidence between position of each thread path ❶ / ❹ and that of the needle thread support adjust plate ❺ , this can be a cause of problems such as stitch skipping, thread breakage, and worse tightening of the needle thread.

ENGLISH

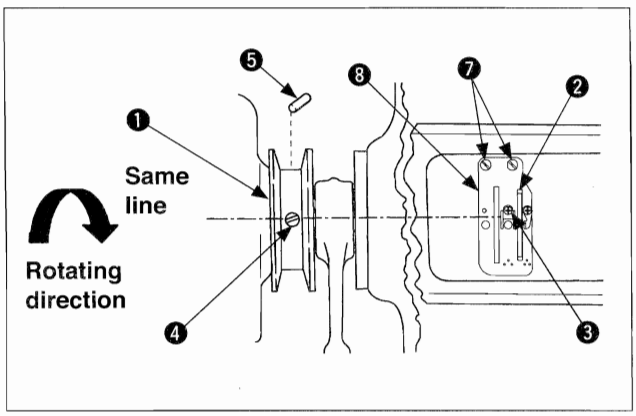
12. Adjustment of looper thread cam

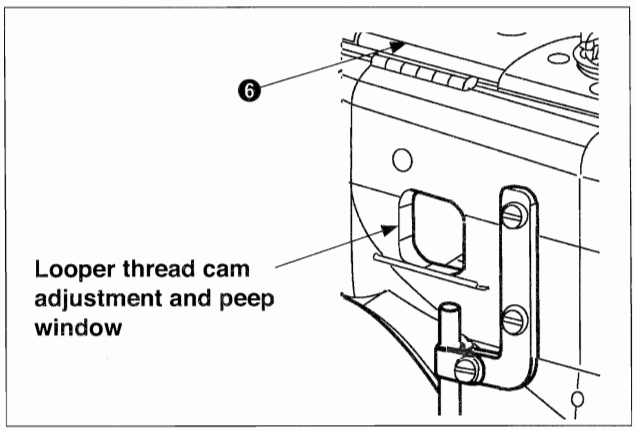
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

(1) Adjustment of looper thread cam

The standard positioning is secured when the pulley ❶ is turned counterclockwise and the first setscrew ❸ of the looper thread cam ❷ and another first setscrew ❹ of the pulley ❶ are aligned to the same line.

When two main shaft setscrews ❹ and ❺ of the pulley ❶ are turned counterclockwise, the first screw functions as the main shaft contact setscrew ❹ .





(2) Adjustment of looper thread cam

1) Open the center top cover ❻ , loosen the setscrew ❼ , and remove the cam thread path base ❽ .
2) Turn the pulley ❶ counterclockwise and confirm whether the first looper thread cam setscrew ❸ stays on the same line with the first setscrew ❹ of the pulley ❶ .
   If the looper thread cam setscrew ❸ seems to be displaced, loosen two setscrews ❹ and ❺ and turn the looper thread cam ❷ forward and backward for adjustment. Then, tighten the setscrew ❹ .
   Subsequently, tighten another setscrew ❺ .

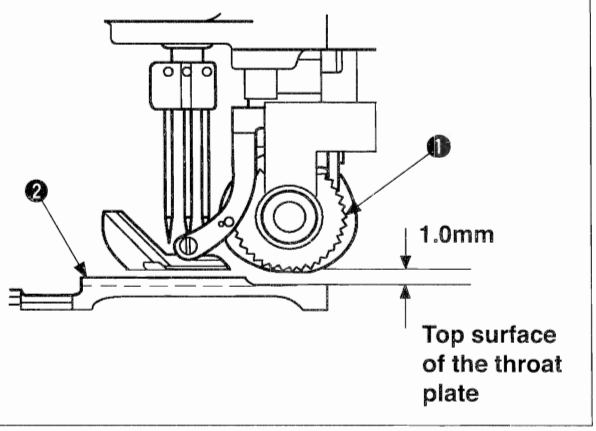
At the time of looper thread cam ❷ adjustments, do not move the looper thread cam ❷ to the right and left.
If it is moved to the right and left, the looper thread cam ❷ may come in contact with the right/left side face of the cam thread path base ❽ groove.

3) Install the cam thread path base ❽ so that it does not touch the right and left faces of the looper thread cam ❷ . Then, tighten the setscrew ❼ .

1. **The looper thread cam ❷ can be adjusted through the peep window. However, since the inside is dark, a proper light (pen light or the like) should be used during adjustments.**
2. **If the standard position is not secured for the looper thread cam ❷ , this can be a cause of stitch skipping.**

13. Adjustment of tension disk floating

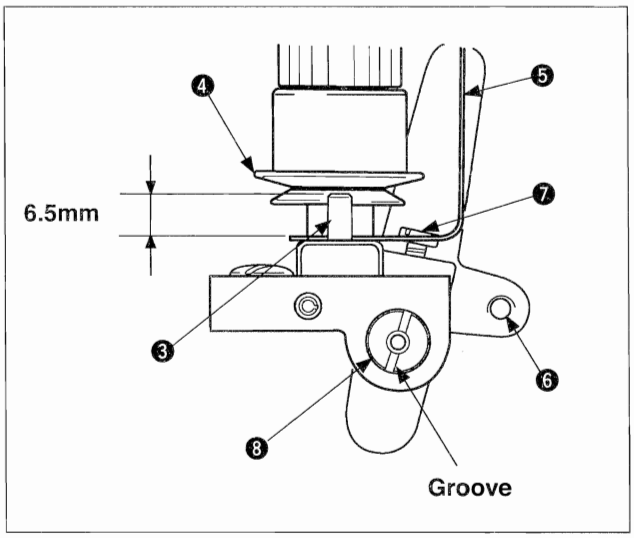
WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.



(1) Adjustment of tension disk floating

The standard positioning is such that tip of the disk floating pin ❸ comes in contact with the upper tension disk ❹ when the upper feed roller ❶ rises by 1.0mm above the upper face of the throat plate ❷ and that the upper tension disk ❹ keeps floating when the upper feed roller ❶ rises further.

The standard size is 6.5mm between the tip of the disk floating pin ❸ and the upper face of the thread guide ❺ .



(2) Adjustment of tension disk floating

1) Insert a screwdriver in the groove of the tension floating shaft ❽ and loosen the setscrew ❼ of the lift lever ❻ . Then, turn the tension floating shaft ❽ clockwise.
2) Adjust height of the disk floating pin ❸ to 6.5mm and tighten the setscrew ❼ .

If proper positioning is not secured for the disk floating pin ❸ , the needle thread and/or the looper thread cannot be pulled out when this action is needed.

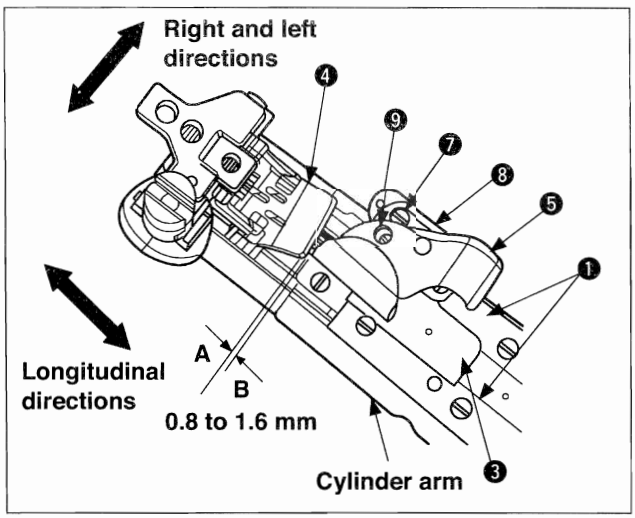
14. Adjustment of folder

WARNING :
Perform the work after turning OFF the power to prevent accidents caused by the abrupt start of the sewing machine.

(1) Folder mounting position

Insert the slide base ❸ of the folder set ❷ in the center of the slide plate ❶ of the right and left cylinder arms, and slide the presser ❹ in forward direction. At that time, a standard clearance of 0.8mm to 1.6mm should be secured between the front section "A" of the presser ❹ and the outlet section "B" of the upper folder ❺ .

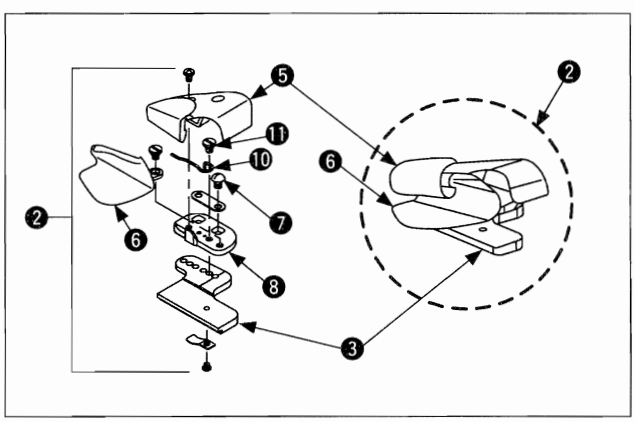
If Section "B" of the upper folder ❺ is installed as closer as possible to Section "A" of the presser ❹ , the result of sewing tends to be more stabilized for the material to be sewn. In such a case, however, it is necessary to make sure not to let the upper folder ❺ come in contact with the presser ❹ in the middle of sewing.



(2) Adjustment of folder mounting position

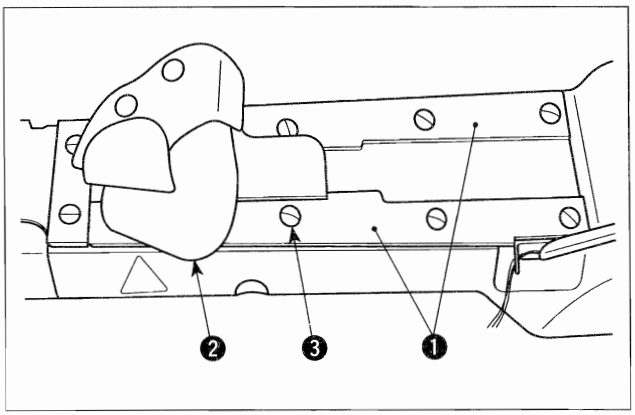
1) When the folder set ❷ is installed, confirm whether a standard clearance is secured between the front section "A" of the presser ❹ and the outlet section "B" of the upper folder ❺ .
If the conditions seem to be awkward in regard to the front and rear contact between the front section "A" of the presser ❹ and the outlet section "B" of the upper folder ❺ and right and left positioning of the upper and lower folders (❺ and ❻), loosen two setscrews ❼ and adjust front/rear and right/left positioning of the folder base ❽ .

2) If it is necessary to adjust the outlet at the tips of the upper and lower folders (❺ and ❻), loosen two setscrews ❾ and make adjustments by moving the tip of the upper folder ❺ to the right and left.
   - ○ To widen the outlets of the upper and lower folders (❺ and ❻), move the tip of the upper folder ❺ to the left.
   - ○ To narrow the outlets of the upper and lower folders (❺ and ❻), move the tip of the upper folder ❺ to the right.

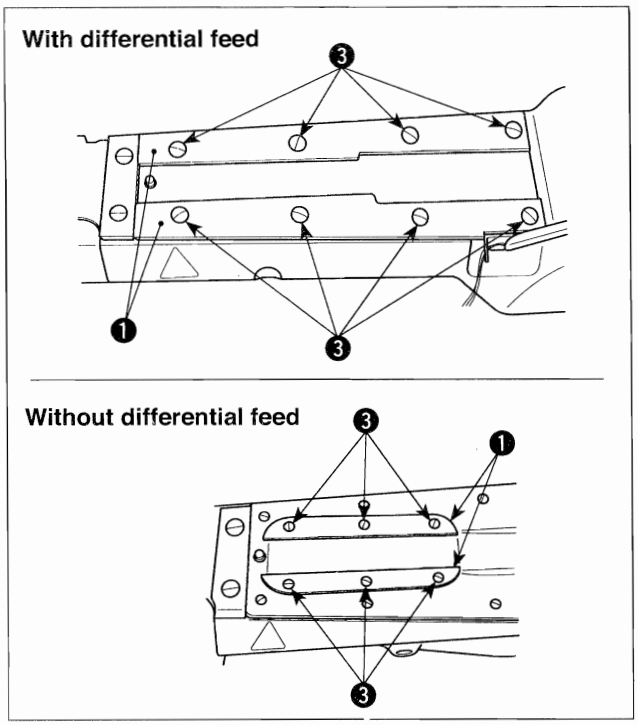


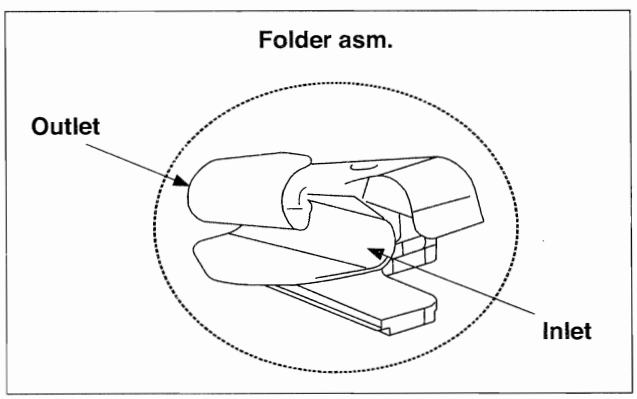
3) The spring ❿ is fastened to the right side section of the lower folder ❻ by means of the setscrew ⓫ .
The tip section of the lower folder ❻ is devised to have an escape recess somewhat to the right so that an extra-heavyweight material can be duly handled.

1. According to the thickness of a material to be sewn, adjust the upper and lower folders (❺ and ❻).
In addition, for the kinds of folder sets ❷, there are folder sets ❷ other than the standard folder.
Refer to "14. (3) Folder types".
2. If positioning of the folder set ❷ is inaccurate, the quality of the sewn product will be lowered.



Insert folder ❷ into folder support ❶. After insertion, loosen setscrews ❸ (eight setscrews for sewing with the differential feed or six ones for sewing without the differential feed) to adjust so that the folder slides smoothly with no play.





(3) Folder types

Select an optimal folder according to nature, thinness, and thickness of the material cloth.

No.	JUKI part No. :	US part No. :	Outlet dimensions	Folder features
1	40066942	24502502 (23420AY18-1/8)	3.2mm	A standard type provided with a spring, suitable for a product that has step sections in the material cloth. (Stanadard)
2	40072322	24517104 (23420AY18-3/22)	2.4mm	Same as the standard type. The outlet section at the folder tip is narrow, and suitable for medium-weight materials.
3	40072324	24620205 (23420AY18-5/32)	4.0mm	Same as the standard type. The outlet section at the folder tip is wide, and suitable for extraheavyweight materials.
4	40072328	24503005 (23420Z-9-1/8)	3.2mm	The folder tip section is shorter than that of the standard type. Functionally same. A shorter type assures easier control of materials.

V. TROUBLES AND CORRECTIVE MEASURES

Trouble	Cause (1)	Cause (2)	Check and corrective measures
1. Thread breakage	1-1) Threading	1-A) Thread jamming at thread guide, threading error	Refer to "Ⅲ- 5. How to conduct threading".
	1-2) Thread path	2-A) Flaws, burrs, rust generation, and the like can be a cause of resistance in operation if they are present in needles, throat plate, small thread tension, needle thread rocking thread path, needle thread guide thread path, lower looper, looper thread guide pipe, looper thread cam, lower thread path guide, and thread tension disc.	Take measures to remove flaws, burrs, etc., and finish the thread path neatly. In this case, however, the lower looper, throat plate, looper thread cam, and such important parts should be replaced if their shapes seem to have changed.
	1-3) Rear needle guard	3-A) If contact between the needle and rear needle guard is excessive, needle grooves are created on he rear needle guard, resulting in thread cut.	Replace the needle, and replace the part if the rear needle guard is worn.
	1-4) Needle	4-A) The needle is too thin for the thread that is now used.	Use an appropriate needle.
	1-5) Needle heat	5-A) Thread cut occurs because of heated needle depen ding on the material type, the number of superimposed materials, and sewing speed.	Reduce the needle size. Reduce the sewing speed. Use needle cooling air.
	1-6) Thread	6-A) Poor quality of the thread	Use a high-quality thread.
	1-7) Thread tension	7-A) Excessive thread tension	Reduce the thread tension. Thread tension is excessive because the needle thread adjusting thread path has been lowered too much.
	1-8) Contact	8-A) The lower looper touches the feed dog or throat plate because of an improper lower looper position. The looper touches the rear needle guard because of insufficient looper return.	Set the lower looper in the proper position.
	1-9) Idle loop error	9-A) Coordination is awkward between needle and looper timing. Position of the looper thread cam is inadequate. Clearance is too much between the upper feed roller and the upper face of the throat plate.	Set the lower looper in the proper position.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
2. Thread cut at bobbin thread looper	2-1) Thread path	1-A) Resistance is developed when there is a scratch, a burr, or rust on the throat plate, lower looper, looper thread cam, looper thread path pipe, looper thread path guide, or thread tension disc.	Take measures to remove flaws, burrs, etc., and finish the thread path neatly. In this case, however, the throat plate, lower looper, looper thread cam, and such important parts should be replaced if their shapes seem to have changed.
	2-2) Adjustment of looper thread cam	2-A) Excessive tension is provided because of improper timing of the looper thread cam.	Refer to the standard adjustment values.
	2-3) Thread tension	3-A) Excessive thread tension	Reduce the tension in consideration of the tension balance with the needle thread.
	2-4) Thread	4-A) Poor quality of the thread	Use a high-quality thread.
	2-5) Needle heat	5-A) Thread cut occurs when the thread touches the right needle at sewing stop due to needle heat.	Reduce the sewing speed.
3. Needle breakage	3-1) Needle entry	1-A) Front/rear and right/left needle entry seems to be awkward in conjunction with the needle hole of the throat plate.	Refer to the standard adjustment values.
	3-2) Interference between lower looper and blin dstitch of needle	2-A) The needle breaks because of the interference between the tip of the lower looper and the needle.	Adjust the lower looper to prevent the interference. Refer to the standard adjustment values.
	3-3) Interference between rear of lower looper and needle tip	3-A) The needle breaks because of the strong interference between the rear of the lower looper and the needle tip.	Ⅳ- 6. Adjust the looper movement locus. Refer to the standard adjustment values.
	3-4) Rear needle guard	4-A) Excessive clearance between the needle and rear needle guard causes needle shaking and then interference between the needle and the lower looper tip resulting in needle breakage.	Adjust the clearance between the needle and rear needle guard. Refer to the standard adjustment values.
	3-5) Needle size	5-A) For the case that the needle is too thin for the material that is now used	Use a thicker needle.
	3-6) Thread tension	6-A) Excessive needle thread tension	Reduce the needle thread tension.
	3-7) Feed dog height	7-A) Too high feed tooth causes needle sidewise movement resulting in needle breakage.	Refer to the standard adjustment values.

Trouble	Cause (1)	Cause (2)	Check and corrective measures
4. Needle edge blunting	4-1) Needle entry	1-A) Front/rear and right/left needle entry seems to be awkward in conjunction with the needle hole of the throat plate.	Refer to the standard adjustment values.
	4-2) Rear needle guard	2-A) Improper position of the front-to-rear direction	Clearance check between rear needle guard and needle Refer to the standard adjustment values.
	4-3) Contact with the rear of the looper	3-A) Too often contact between the rear of the lower looper and the needle tip	Ⅳ- 6. Adjust the looper movement locus to make the contact level appropriate when the lower looper moves backward. Refer to the standard adjustment values.

Trouble (1)	Trouble (2)	Cause (1)	Cause (2)	Check and corrective measures
5. Stitch skipping	5-1) The looper does not scoop the needle thread.	1-A) Looper	A-1) The blade shape is not proper.	Regular parts are used
		1-B) Needle	B-1) Needle bent or wrong mounting direction	Replacement of needles and installation of the needle hole section in the front shall be carried out correctly. UY130GS
		1-C) Needle thread holder	C-1) Improper loop timing due to no use of the needle thread holder	Use the needle thread support plate to adjust the height properly. Refer to the adjustment values.
		1-D) Needle thread adjusting path	D-1) Height of the thread path is insufficient.	Adjust the height properly. Refer to the adjustment values.
		1-E) Needle height	E-1) Improper needle bar height	Adjust the height properly. Refer to the adjustment values.
		1-F) Threading	F-1) Threading error	Refer to "Ⅲ- 5. How to conduct threading".
		1-G) Needle heat	G-1) This problem occurs in a thick area of the denim material cloth.	Use needle cooling air. Refer to the adjustment values.
		1-H) Lower looper adjustment	H-1) Improper clearance or excessive looper return	Reduce the looper return. Refer to the adjustment values.
		1-I) Rear needle guard	I-1) Improper height or contact level	Height of main feed dog and longitudinal position check Refer to the adjustment values.

To the next page

Trouble (1)	Trouble (2)	Cause (1)	Cause (2)	Check and corrective measures
From the previous page				
	5-2) Chain stitch unthr eading	2-A) Needle	A-1) Needle bent or mounting error	Replace the needle, or mount the needle hole in the front correctly. Then, insert the needle to the up end of the needle mounting hole of the needle stopper. UY130GS
	(Chain stitch) The needle thread caught on the looper is unthreaded before the needle lowers and enters the needle thread loop.	2-B) Needle height	B-1) Improper needle bar height	Needle bar height and looper drawing amount check Refer to the adjustment values.
		2-C) Threading	C-1) Threading error	Refer to "Ⅲ- 5. How to conduct threading".
	(unthreading) The needle thread loop caught on the looper is fully unthreaded before the needle lowers.	2-D) Lower looper	D-1) Improper lower looper mounting angle Insufficient lower looper drawing amount	Make the lower looper mounting angle proper or increase the drawing amount (in the flat mounting range).
		2-E) Lower looper adjustment	E-1) Insufficient contact level between the needle and the rear of the lower looper	Adjustment of looper movement locus Refer to the adjustment values.
		2-F) Thread tension	F-1) Insufficient thread tension	Increase the tension.
		2-G) Needle thread holder	G-1) Excessive height of thread holder position	Refer to the adjustment values
	5-3) Poorly tense stitches for needle thread	3-A) Needle	A-1) Needle top blunting, needle bent, check the needle in use.	Replace the needle. UY130GS
		3-B) Lower looper	B-1) Lower looper brade point blunting or insufficient polishing	Replace any item if it has been modified or its shape has changed.
		3-C) Needle height	C-1) Improper needle bar height	Refer to the adjustment values.
		3-D) Threading	D-1) Threading error	Refer to "Ⅲ- 5. How to conduct threading".
		3-E) Needle thread tension	E-1) Insufficient thread tension	Increase the thread tension.
		3-F) Lower looper thread tension	F-1) Excessive thread tension	Reduce the thread tension.
		3-G) Bobbin thread guide path	G-1) Insufficient take-up amount of the bobbin thread	Increase the take-up amount of the bobbin thread.
		3-H) Looper thread cam	H-1) Delayed looper thread cam position	Advance the looper thread cam position to the proper level.
To the next page				

Trouble (1)	Trouble (2)	Cause (1)	Cause (2)	Check and corrective measures

From the previous page

	5-4) Sewing jam	4-A) Regulating spring of presser bar pressure	A-1) Insufficient presser bar pressure	Adjust the presser bar pressure properly.
		4-B) Feeder height	B-1) Extremely low feeder	Make the feeder height proper. Refer to the standard adjustment values.
		4-C) Pressure regulating spring of upper feed roller	C-1) Insufficient pressure adjustment	Adjust it to an appropriate value. Refer to "Adjustment of drawing amount of upper feed roller."
			C-2) The brake spring is permanently set in fatigue.	Change the brake spring (Part No.: 40068599) with a new one.
		4-D) Upper feed roller	D-1) Insufficient drawing amount	Adjust the drawing amount properly.
			D-2) The gear and key have worn out.	Change the gear (Part No.: 40068562/40068563) with a new one.
				Change the key (Part No.: 40068560) with a new one.
		4-E) Play in the presser foot	E-1) The cap screw has deformed, causing an inconsistent pressure of the presser foot.	Change the cap screw (Part No.: 40070193) with a new one.
	5-5) Problems with chain-off thread	5-A) Throat plate	A-1) Not smooth thread running due to blunt throat needle hole	Perform modification or replace the deformed part.
		5-B) Lower looper adjustment	B-1) Lower fancy stitch skipping due to insufficient lower looper adjustment	Refer to the adjustment values.
		5-C) Needle thread tension	C-1) Insufficient needle thread tension	Increase the thread tension.
		5-D) Threading	D-1) Threading error	Refer to "Ⅲ- 5. How to conduct threading".
		5-E) Drawing amount of upper feed roller	E-1) The thread drawing amount is insufficient.	Increase the thread drawing amount. Refer to the adjustment values.
		5-F) Clearance toward the upper feed roller	F-1) Clearance is too much between the upper feed roller and the upper face of the throat plate.	Adjust the clearance to a standard level. Refer to the adjustment values.
		5-G) Pressure regulating spring of upper feed roller	G-1) Insufficient pressure adjustment	Adjust the presser bar presspring sure properly.

Ⅵ. DRAWING OF THE TABLE

JUKI Part No. : 40071755 (separately available)