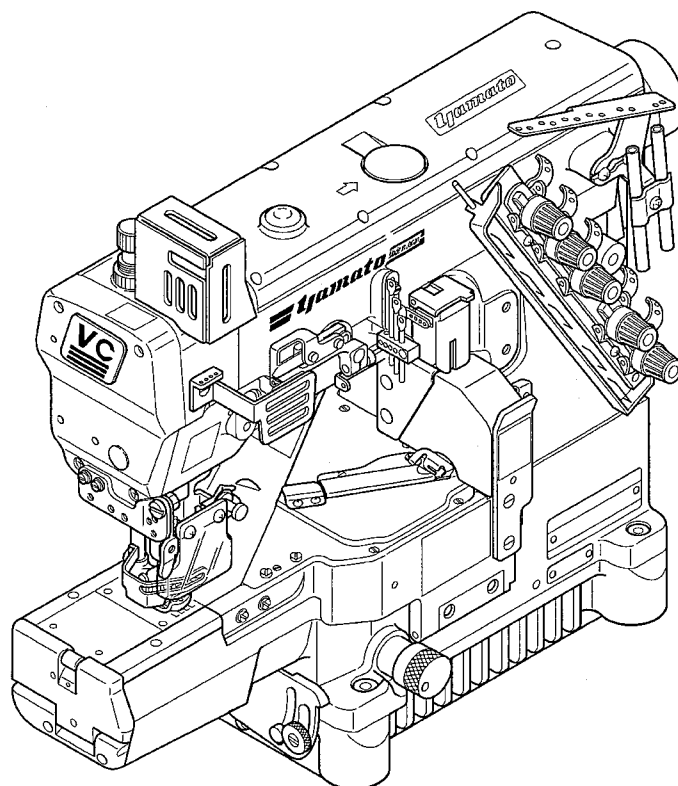


# ***Yamato***<sup>®</sup>

## **Instruction Manual**

SUPER HIGH SPEED CYLINDER BED 3-NEEDLE  
INTERLOCK STITCH MACHINE

# **VC2700G-8F class**













Thank you for purchasing the VC2700G-8F class. Before using your VC2700G-8F class, please read the instruction manual and understand the contents well.

After reading the instruction manual, please keep it in a location where it is easily accessible to the operator.

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## Attention

◇ This instruction manual is designed mainly for technicians, but it is advisable that also operators read the instructions with  mark to use the machine properly.

◇ The numbers in lower left corners of figures are figure numbers. We use them in texts as needed for your reference.

## Attention

The description in this instruction manual is subject to change for improvements of the commodity without notice.



# Safety instructions



## 1. To ensure safe use

Always observe the following instructions to ensure the safe use of the industrial sewing machines and devices.

### 1-1 Application and purpose

The sewing machine is designed to improve productivity in the sewing industry and must not be used for other applications and purposes. Do not use this sewing machine until it can be confirmed that safety measures for the drive units have been taken.

### 1-2 Before use

Read all instruction manuals thoroughly before starting the use of this machine and follow them.

Also, read the instruction manual for the installed drive unit.

### 1-3 Working environment

DO NOT WORK IN THE FOLLOWING ENVIRONMENTS:

- Place where atmosphere temperature and humidity give a bad influence the performance of sewing machines.
- Outdoors and place where the sewing machines are exposed to sunlight directly.
- Atmosphere containing dust, corrosive gases or flammable gases.
- Place where voltage fluctuation exceeds  $\pm 10\%$  of the rated voltage.
- Place where power capacity necessary for the used motor specifications cannot be secured.
- Place where strong electric or magnetic fields are generated such as near large-output high frequency transmitters or high frequency welding machines.

### 1-4 Unpacking and transportation

- (1) Unpack from the top.
- (2) Never hold the parts near the needle or threading parts when removing the sewing machine head from the buffer of box.
- (3) When carrying the sewing machine head, have an assistant.
- (4) Pay attention not to get excessive impact or shock when moving the sewing machine head with a pushcart.

## 2. Installation and preparation

### 2-1 Instruction and training

Operators and workers, who supervise, repair or maintain the machine head and machine unit, are required to have the adequate knowledge and operation skills to do the job safely. In order to establish such necessary conditions, it needs for the employer to plan and enforce the safety education and training to those workers.

### 2-2 Sewing table and motor

- (1) Prepare a machine table that has enough strength to withstand the weight of the sewing head and any reaction while operating.
- (2) Maintain a comfortable working environment with considering the lighting and the arrangement of sewing machine so that the operators can work smoothly.
- (3) When installing the control box and the related parts on the sewing machine, take care about the posture of the worker.
- (4) Install the drive unit correctly according to the instruction manual.

### 2-3 Wiring

- (1) Never connect the plug for power supply until assembly is finished.
- (2) Fix the connectors securely to the sewing machine head, motor, and electric apparatus.
- (3) Do not apply excessive force to the connection cords.
- (4) Connect the cords away from the driving parts.
- (5) Place the ground wire securely to the designated position on the machine head.

### 2-4 Before operation

- (1) Take care not to attach lubricant, silicone oil, and grease on the eyes or skin.  
Keep them away from children.



# Safety instructions



- (2) Be sure to fill or drop lubrication oil before operating the sewing machine. Use the Yamato SF oil as specified.
- (3) Never put your hand under the needle or near the moving parts of the machine when turning on power supply switch.
- (4) When operating a new sewing machine, make sure the rotating direction of pulley agrees with the rotating-direction mark.

## 2-5 During operation

- (1) Be sure to operate the sewing machine with the safeguards such as belt cover, finger guard, and eye guard.
- (2) Never place the finger, hair or objects under the needle or close to the moving parts while operating the sewing machine.
- (3) Be sure to turn off the power supply switch when threading or replacing the needles.
- (4) Never place your hands close to the knives when operating the sewing machine with the trimming devices.
- (5) Be sure to turn off the power supply switch when terminating the sewing work or leaving the sewing machine.
- (6) If the sewing machine malfunctions, abnormal sound or smell something unusual while operating, be sure to turn off the power supply switch.

## 2-6 Removal

- (1) Turn off the power supply switch if removed or replaced any parts or during adjustment of sewing machine.
- (2) Do not pull the cord when removing the plug. Be sure to hold the plug itself.
- (3) A high voltage is applied inside the control box. Turn off the power supply switch and wait more than 5 minutes before opening the cover.

## 3. Maintenance, inspection, and repair

- (1) Follow the instruction manuals for maintenance, inspection, and repair.
- (2) Entrust the maintenance, inspection, and repair to specially trained personnel.
- (3) Be sure to turn off the power supply switch and make sure the sewing machine and motor completely stop before the maintenance, inspection, and repair. (If using a clutch motor, take care that the motor keeps turning for a while even after turning off the power supply switch.)
- (4) Be sure to remove the gasket too, when the cover removed at the maintenance, inspection, and repair. If not removed, may be injured at the edge of gasket.
- (5) Do not modify the sewing machine by the customer's judgment.
- (6) Be sure to use original replacement parts for repairs or maintenance.

## 4. Caution signs and alert pictorial markings

This instruction manual contains the following caution signs and alert pictorial markings to prevent you from injuring yourself or the sewing machine from being damaged.

Please follow the instructions.

### 4-1 Meanings of caution signs

#### **WARNING**

WARNING indicates potentially hazardous situations which, if not heeded, could result in death or serious injury to you and others.

#### **CAUTION**

Caution indicates hazardous situations which, if not heeded, may result in minor or moderate injury to you and others, or may result in machine damage.

NOTE is used to emphasize essential information.



# Safety instructions



## 4-2 Alert pictorial markings



This mark indicates the warning which, if not heeded, could result in death or Serious injury.



This mark indicates the caution for high temperature.



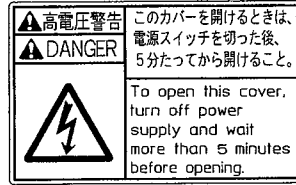
This mark indicates the warning which, if not heeded, could result in death or Serious injury.



High-voltage applies in the control box. This label indicates that electric shock may be caused.



This mark indicates the caution which, if not grounded, the machine or device could malfunction and could result in personal injury.



High-voltage applies in the control box. This label indicates that electric shock may be caused.



This label is affixed on the safeguards. Considering the operation, it is not affixed on the finger guard and eye guard. Be sure to operate with the finger guard and eye guard in position.

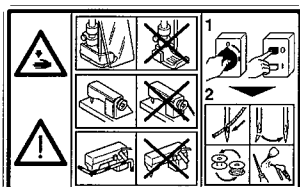


Stepping motor and solenoid may overheat if used continuously. To prevent a burn, take care not to touch.

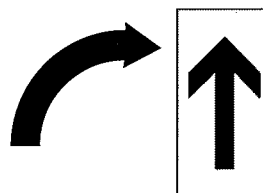


If not connected earth line, static electricity may be generated and inflict injury on person. In addition, the malfunction of electric system may cause injury to person.

## 5. Warning labels on sewing machines



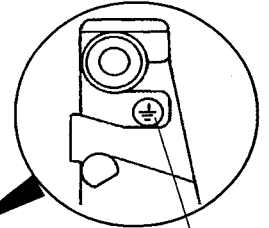
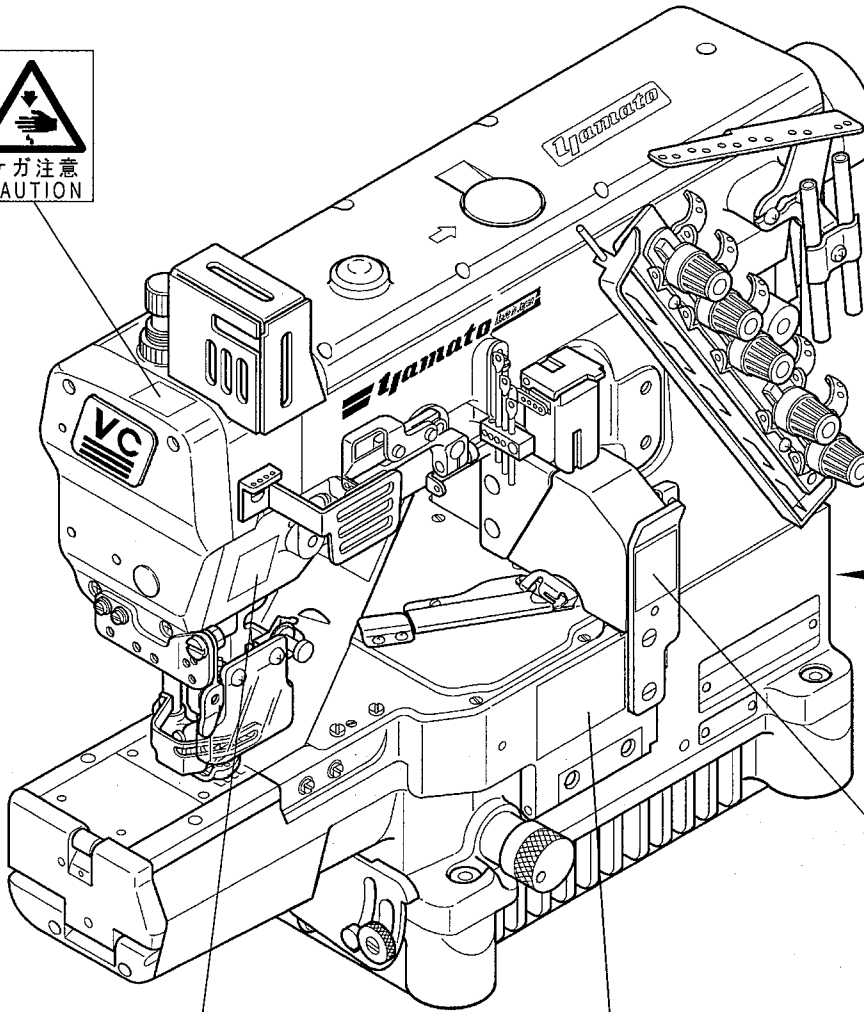
This label indicates that removal of the safeguards and works except for sewing performance while the power supply switch is on are prohibited. (For details, see the next page.)



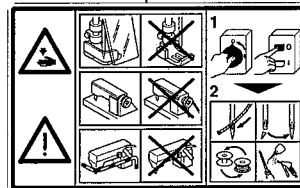
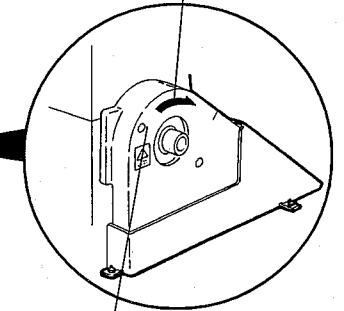
Check the rotating direction of machine pulley agrees with 'ROTATING-DIRECTION SYMBOL'.



# Safety instructions



Rotating direction symbol



# 1. Name of each part

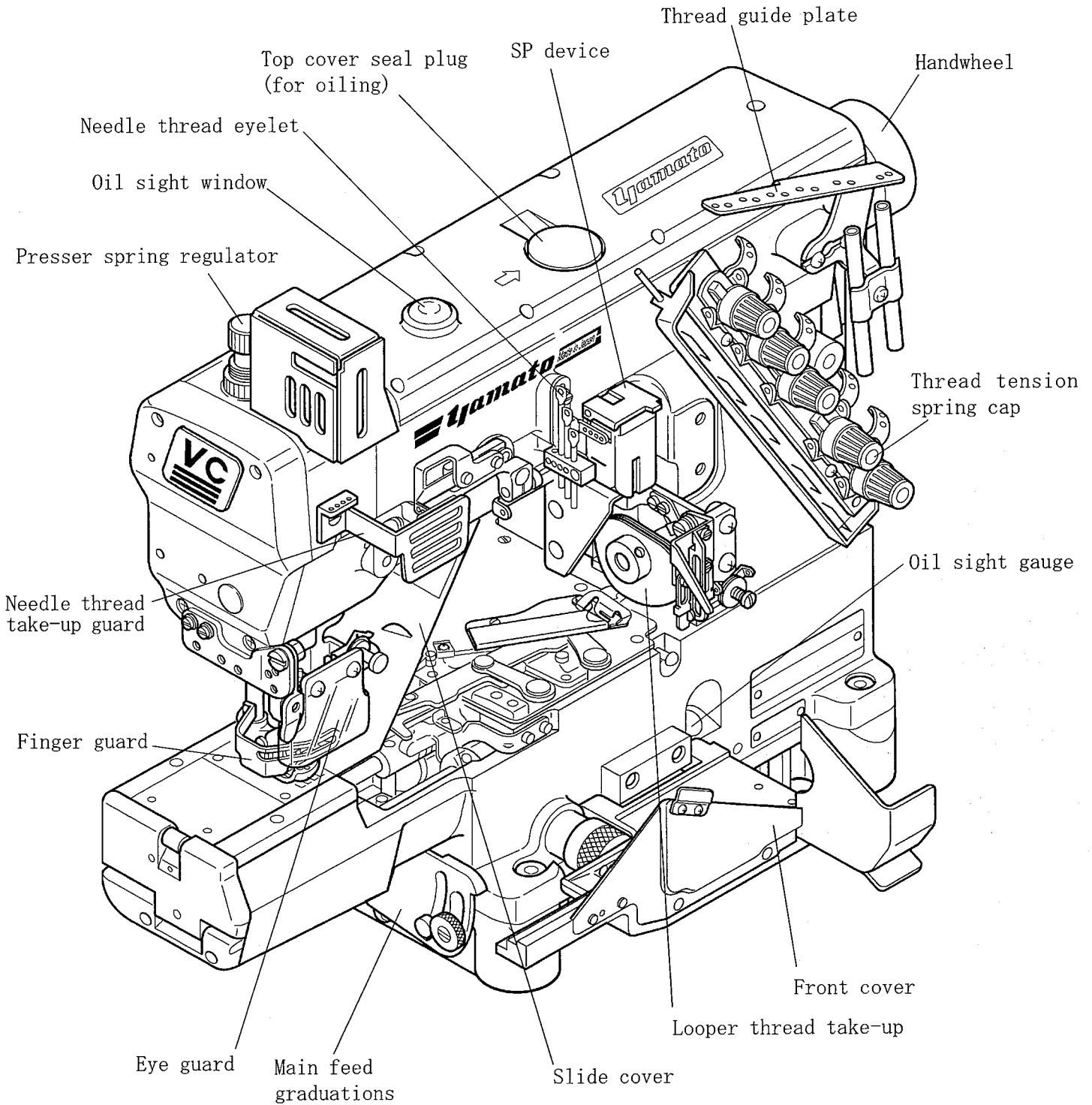


Fig. 1-1



# 2. Installation

## 2.1 Table cutting diagram

### 2.1.1 Table top type (Type A: standard)

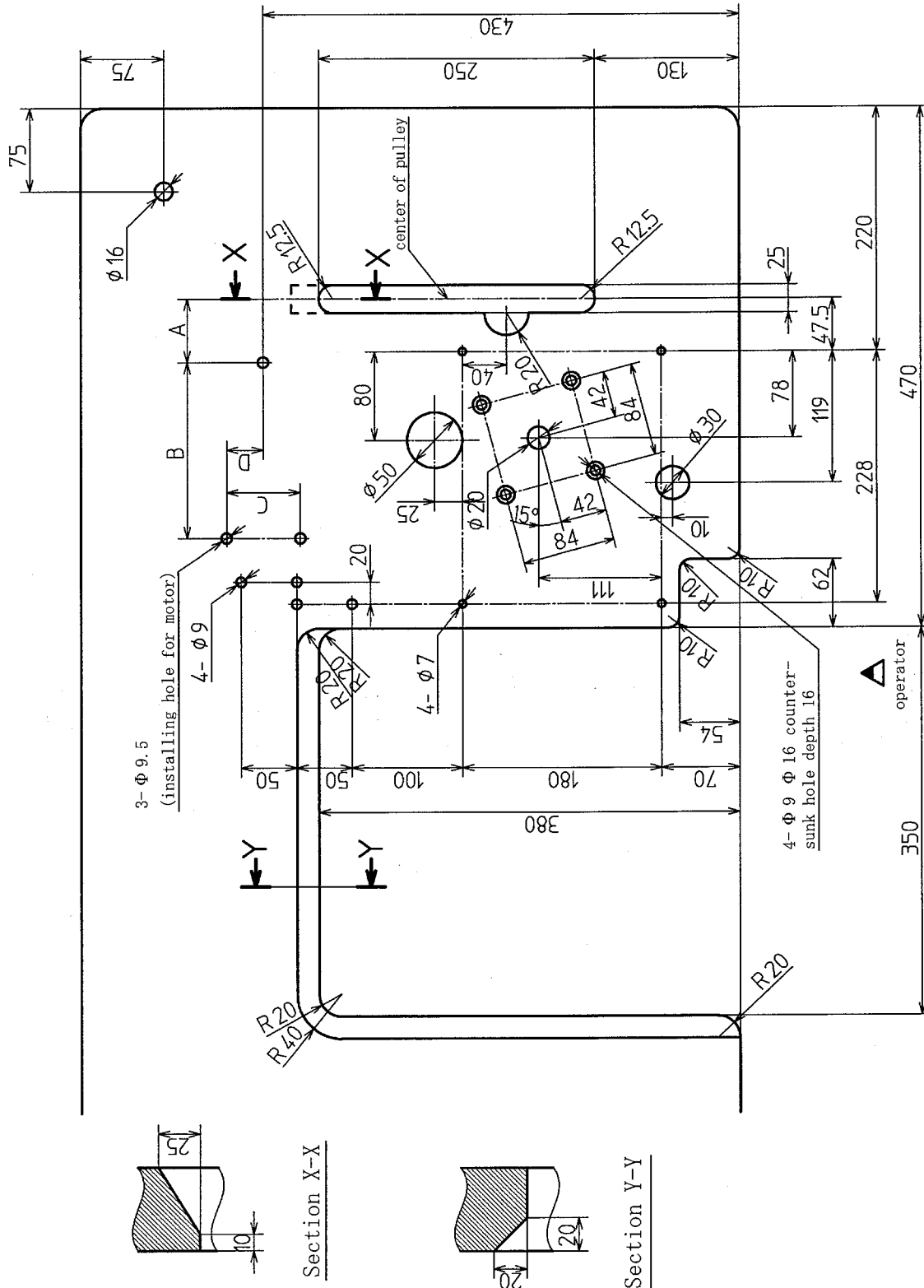


Fig. 2-1

Refer to the instruction of the motor for dimensions A, B, C, and D.



2.1.3 Semi-submerged type

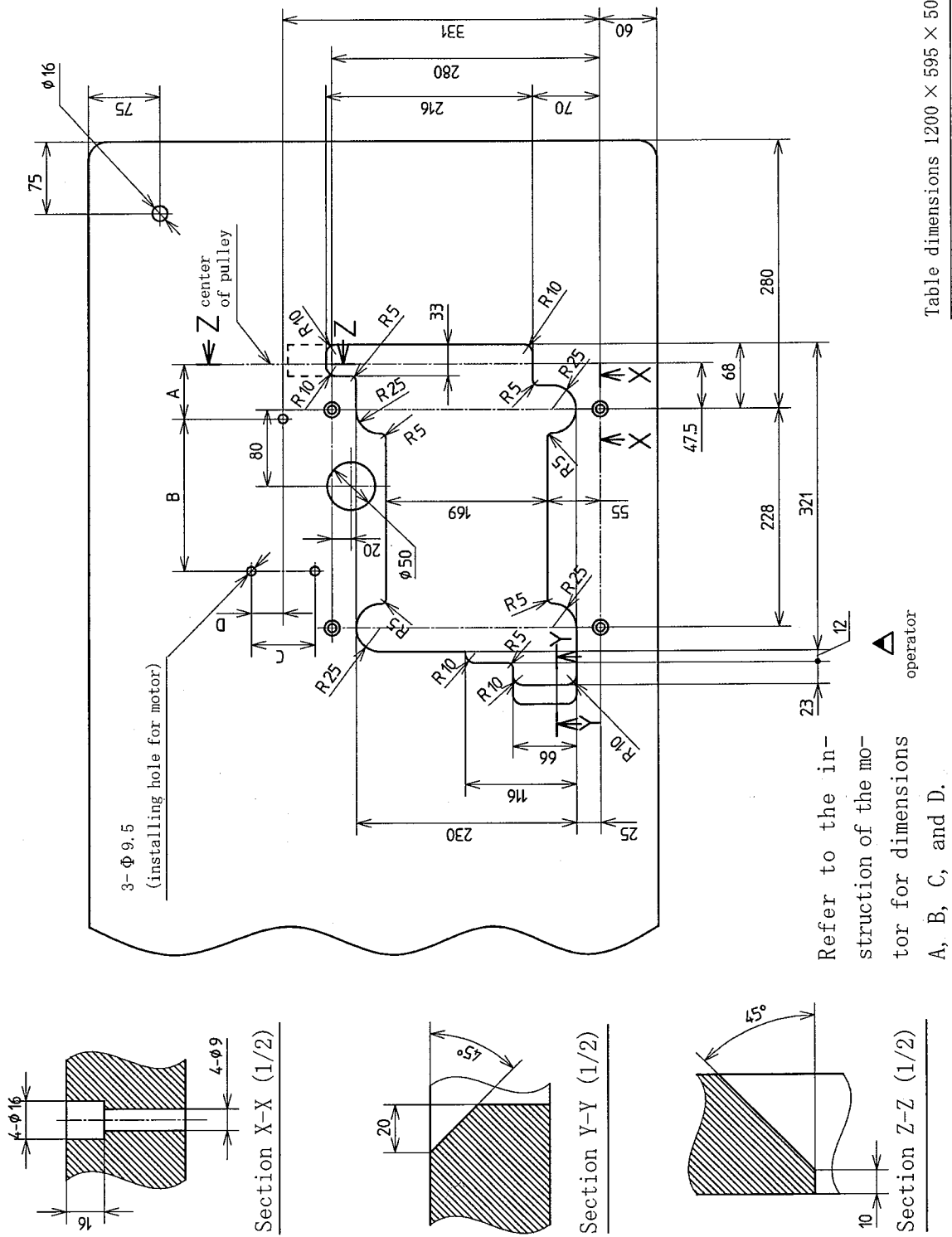


Table dimensions 1200 × 595 × 50

Fig. 2-3

## 2.2 Table top type

Install the machine correctly by referring to Fig. 2-4, 2-5.

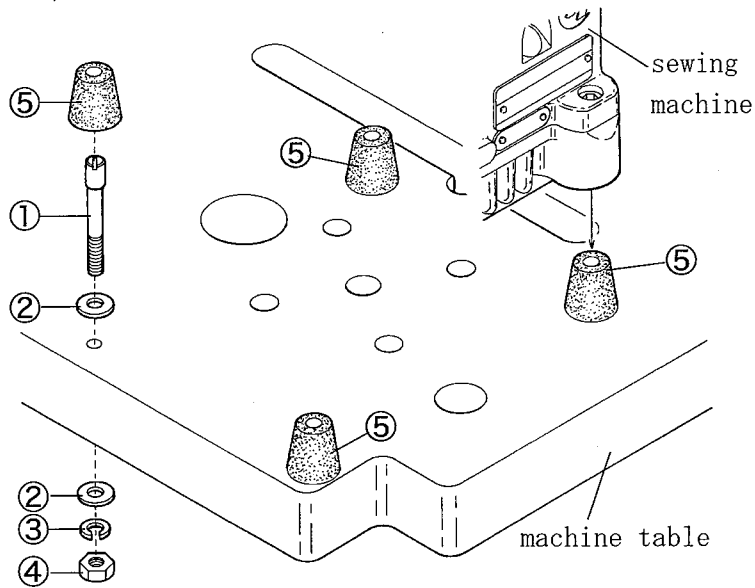


Fig. 2-4

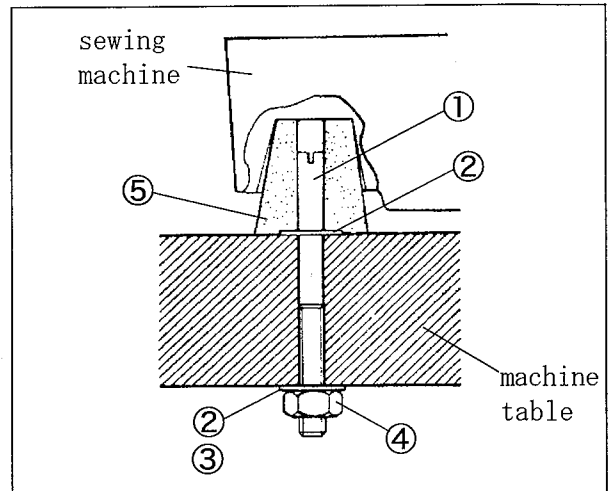


Fig. 2-5

## 2.3 Semi-submerged type

Install the machine correctly referring to Fig. 2-6, 2-7.

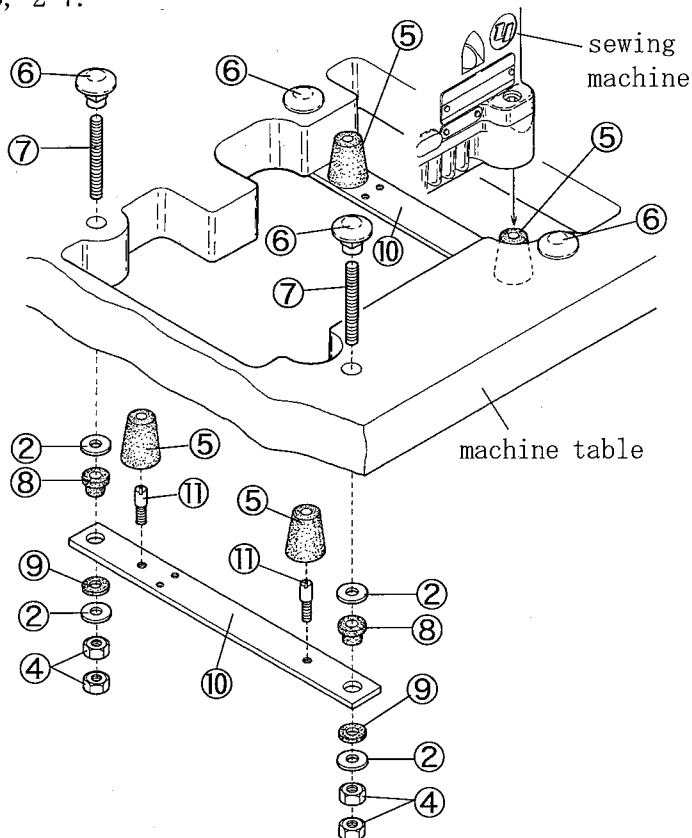


Fig. 2-6

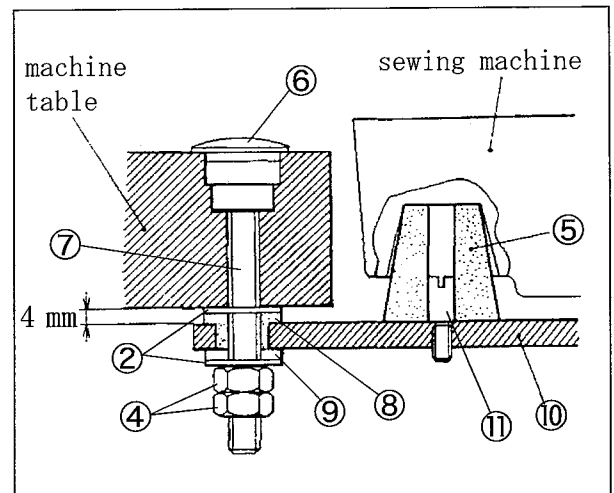


Fig. 2-7

## 2. Installation

### 2.4 Motor, pulley and belt

Refer to the instruction manual for the motor to use and install the motor properly.

To install the clutch motor, align the center of the machine pulley with that of the motor pulley when the motor pulley shifts to the left with toeing down the pedal.

Note: Table 1 shows the outside diameter of the motor pulley, sewing speed of the machine, and size of the belt when using the clutch motor of 3-phase, 2-pole, 550W (3/4HP).

The outside diameter on the table shows the nearest size to the calculated values based on the commercial available pulleys at intervals of 5 mm.

#### ⚠ CAUTION

Use only those motor pulleys applicable to the machine. If not, the machine can over the speed limit and be damaged.

#### Servomotor

Calculate the outside diameter of a motor pulley from the following formula.

Or see Table 2 to select a proper motor pulley.

$$\text{Outside diameter of motor pulley} = \frac{\text{Usual sewing speed}}{\text{Servomotor speed}} \times 61 + 5 \text{ mm}$$

#### Belt

Use a V-belt of M type.

For belt size, refer to Table 1.

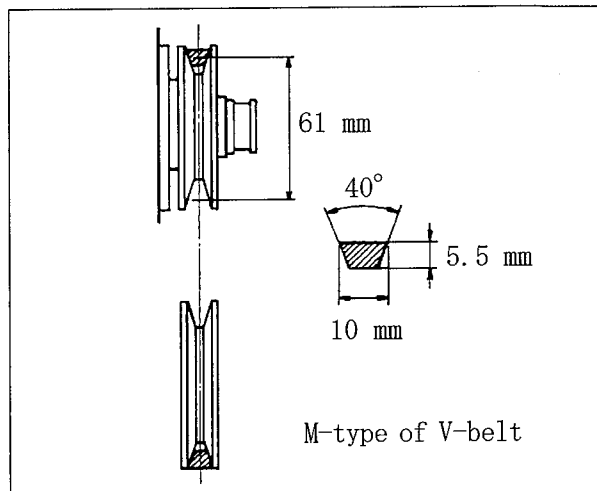


Fig. 2-8

Outside diameter of pulley (mm)	Sewing speed of machine (sti/min)		Belt size	
	50H z	60H z	Table top	Semi-submerged
80	/	4150	M39	M33
85	/	4400	M40	M33
90	/	4650	M40	M33
95	4000	4900	M40	M34
100	4250	5150	M41	M34
105	4500	5400	M41	M34
110	4700	5700	M41	M35
115	4900	6000	M42	M35
120	5100	/	M42	M35
125	5350	/	M42	M36
130	5550	/	M43	M36
135	5750	/	M43	M36
140	6000	/	M43	M37

Table 1

Sewing speed of machine (sti/min)	Outside diameter of motor pulley (mm)	
	rpm of servomotor	
	3000 rpm	3600 rpm
4000	86	73
4200	90	76
4500	97	81
4700	101	85
5000	107	90
5200	111	93
5500	117	98
5700	121	102
6000	127	107

Table 2

## 2.5 Hanging belt

### ⚠ CAUTION

Before hanging belt, ALWAYS turn the power switch OFF and check that the machine has already stopped.

Use the V-belt of M type.

- (1) Hang the belt① on the machine pulley②, and then on the motor pulley③ while rotating the machine pulley.
- (2) Adjust the belt tension so that the belt has 10 - 20 mm slack when its center is pushed with about 10N.
- (3) Lock the pulley with the nut④.

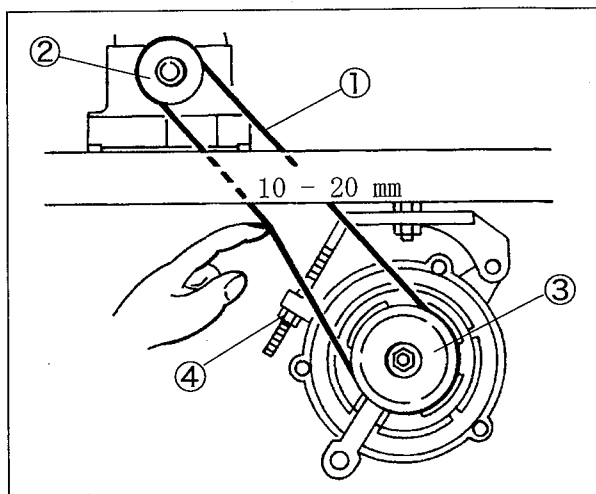


Fig. 2-9

## 2.6 Belt cover

### ⚠ CAUTION

Be sure to install belt cover to prevent you from injury and a material from being caught by the belt.

- (1) Install the belt cover⑤. (See Fig. 2-10)
- (2) Fix the belt cover(lower)⑥ on the machine table only for table top type. (See Fig. 2-11)

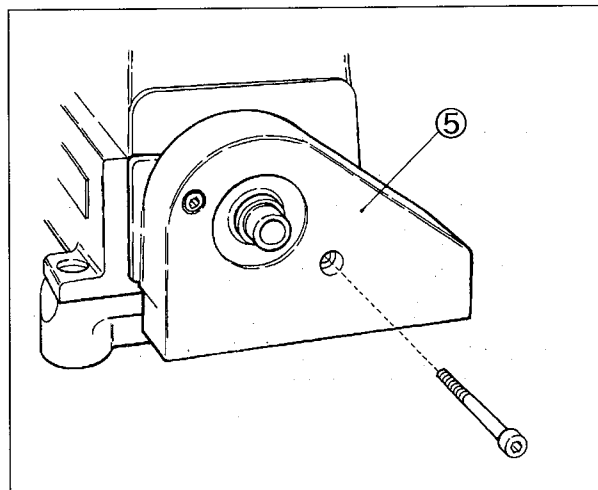


Fig. 2-10

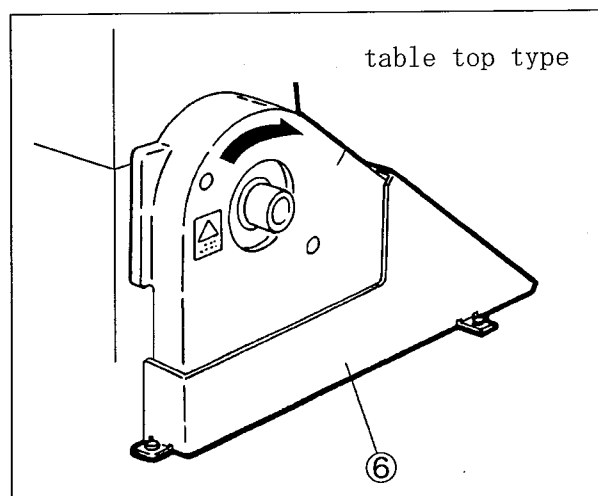


Fig. 2-11

## 2. Installation

### 2.7 Eye guard and finger guard

To ensure the safe use, always install the eye guard① and the finger guard② onto the prescribed position during operation.

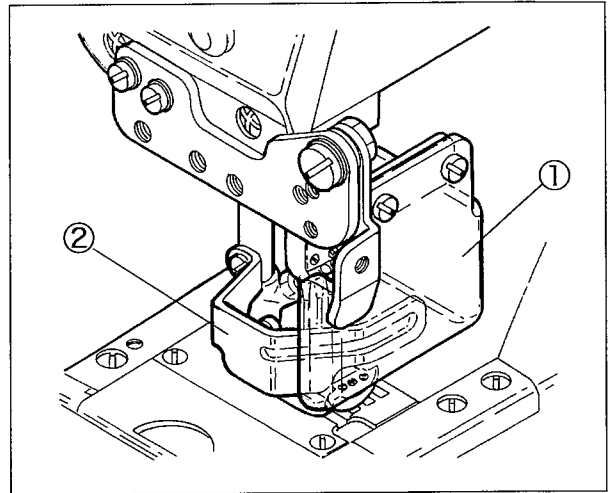


Fig. 2-12

# 3. Sewing speed and rotating direction of pulley

The maximum sewing speed is 6000 sti/min (during inter-mittent operation) (the models with puller is 4500 sti/min).

Run a new machine at 15-20% lower sewing speed of its maximum sewing speed during the first 200 hours (for about one month) so that the machine can offer a long service life in good condition.

The rotating directions of the machine pulley① and the handwheel② are clockwise as shown in the figure.

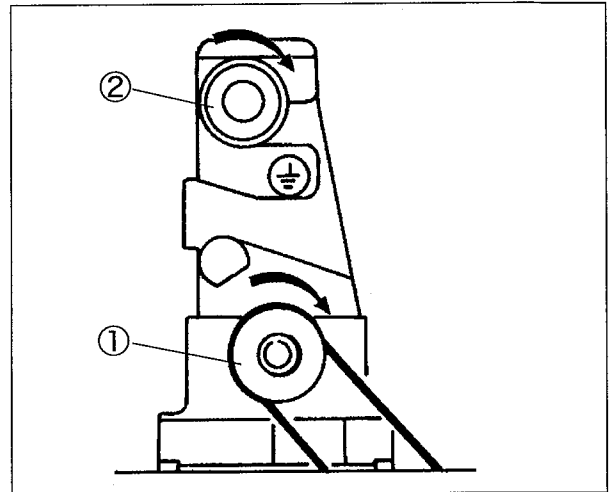


Fig. 3-1

## **⚠ CAUTION**

If rotating in reverse direction, oil cannot be supplied properly. It can cause the damage to the machine.



# 4. Lubrication

## ⚠ CAUTION

Before lubricating, ALWAYS turn the power switch OFF and check that the machine has already stopped.

### 4.1 Lubricating oil

Use YAMATO SF OIL No. 28.

## ⚠ CAUTION

Never add additives to the oil.  
If added, it can cause the deterioration of the oil and the damage to the machine.

### 4.2 Lubricating

When using a new machine, or a machine which has not been run for a while, supply a few drops of oil to the needle bar ① and the looper bar ②.

Remove the seal plug ③ indicated "OIL" and supply oil to the upper line of the oil sight gauge ④.

Check that oil splashes from the nozzle inside the oil sight window ⑤ with running the machine.

If oil does not splash from the nozzle, see "4.4 Checking and replacing oil filter" on page 11.

## ⚠ CAUTION

Too much or insufficient oil can cause oil leakage and machine trouble. Be sure to keep the oil level between the lines. Also too much lubrication can cause oil scatter and material stain.

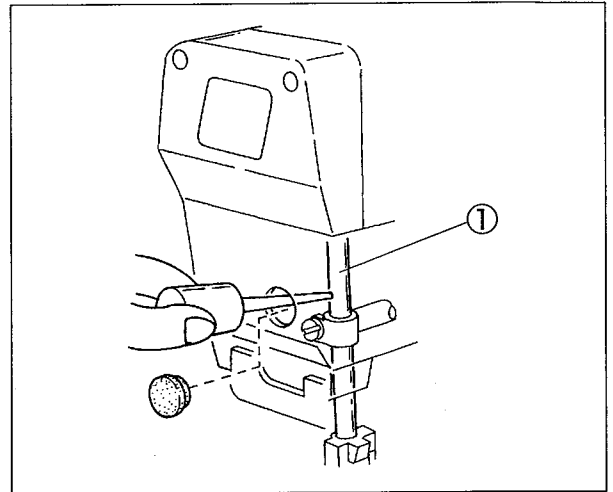


Fig. 4-1

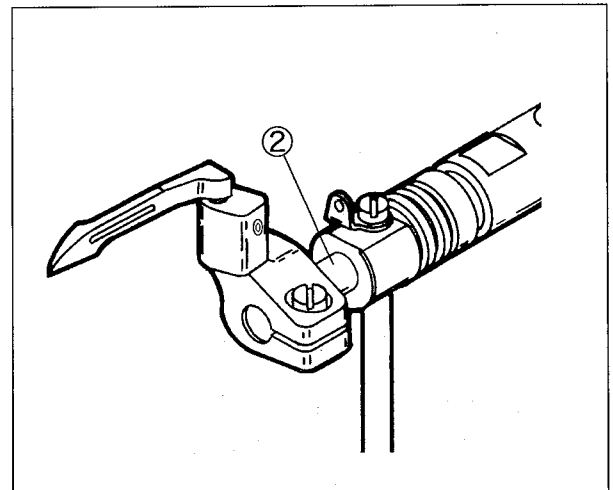


Fig. 4-2

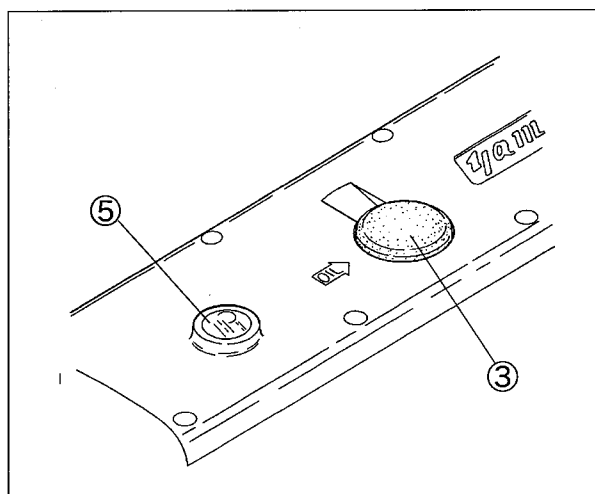


Fig. 4-3

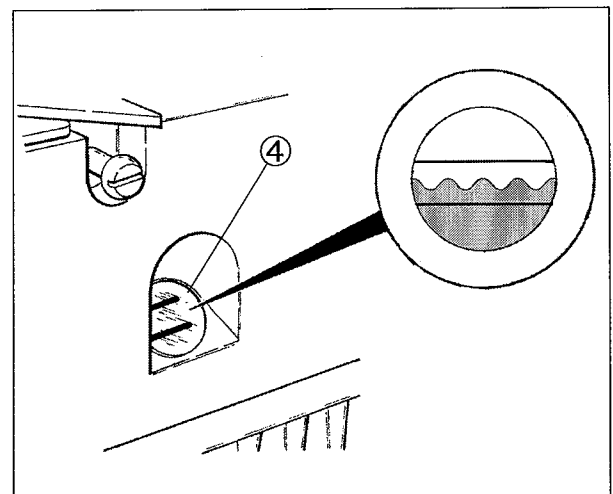


Fig. 4-4

**⚠ CAUTION**

Before lubricating, ALWAYS turn the power switch OFF and check that the machine has already stopped.

**4.3 Changing oil****Period:**

When using a new machine, change the lubricating oil after running the machine for 200 hours (for about one month). After that, change the oil once or twice a year.

**Procedure:**

- (1) Remove the belt cover. (See page 7.)
- (2) Remove V-belt from the motor pulley. (See page 7.)
- (3) Remove the machine from the machine table.
- (4) Set a container to receive the oil under the screw ①.
- (5) After removing screw ①, the oil will drain out.

**⚠ ATTENTION**

Be careful not to soil the V-belt and the machine pulley with the oil.

- (6) Screw back the screw ①.
- (7) Change the oil. (See “4.2 lubricating” on page 10.)
- (8) Reinstall the machine on the machine table.
- (9) Hang V-belt on the motor pulley and reinstall the belt cover. (See pages 7.)

**4.4 Checking and replacing oil filter**

- ◆ If the oil filter ② is clogged with dust, lubrication can not be done properly.
- ◆ Remove the oil filter cap ③ and the oil filter ② to check them every six months. If clogged or cracked, clean or replace the oil filter.
- ◆ If the oil splashes from the nozzle insufficiently or includes many bubbles though the oil is sufficiently kept, check or replace the oil filter.

**ⓘ NOTICE**

When removing the screw ④, be careful as the lubricating oil remaining in the oil filter ② may leak.

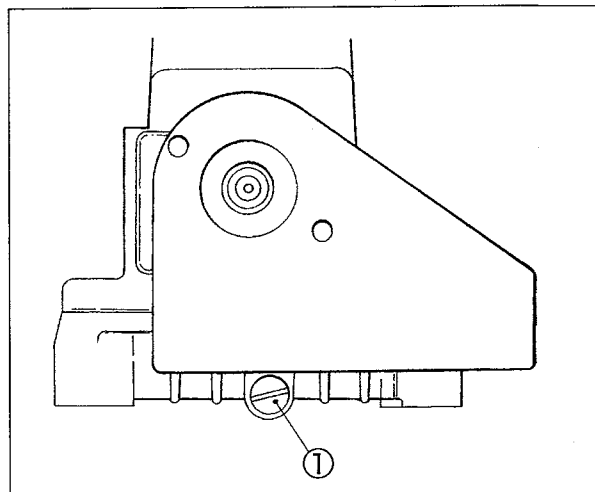


Fig. 4-5

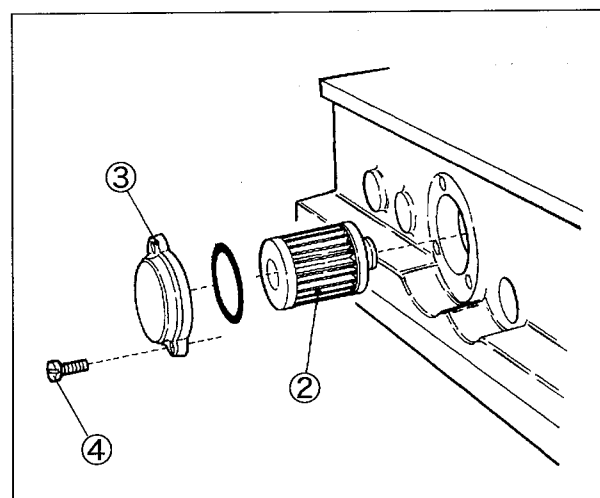


Fig. 4-6

# 5. Proper operation

## 5.1 Needle system

Use UY × 128GAS (UY128GAS).

Select a proper needle in size according to thickness and type of fabric.

Japanese standard	9	10	11	12	13	14
Metric standard	65	70	75	80	85	90

Table 3

## 5.2 Installing needles



### ⚠ CAUTION

Before installation, ALWAYS turn the power switch OFF and check that the machine has already stopped.

- (1) Loosen the screws ① with a screwdriver. (Fig. 5-1)
- (2) Remove the old needle with a pair of tweezers.
- (3) Insert a new needle into the needle clamp ② as far as it goes with facing its scarf to the right back. (Fig. 5-2, 5-3)
- (4) Tighten the screws ① with the screwdriver.

### ⚠ ATTENTION

Tighten the screws ① with a tightening torque of 0.6N·m.

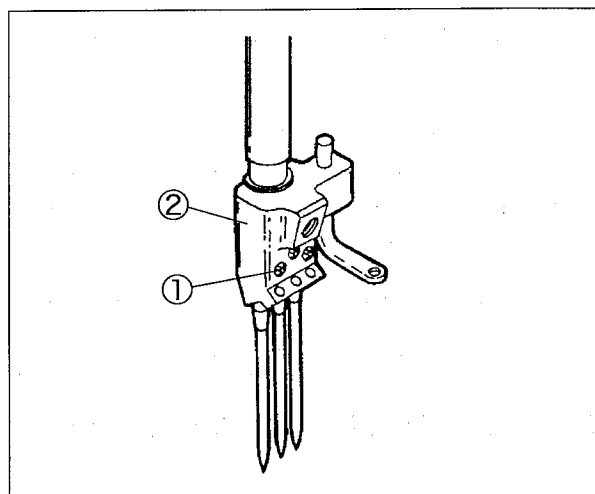


Fig. 5-1

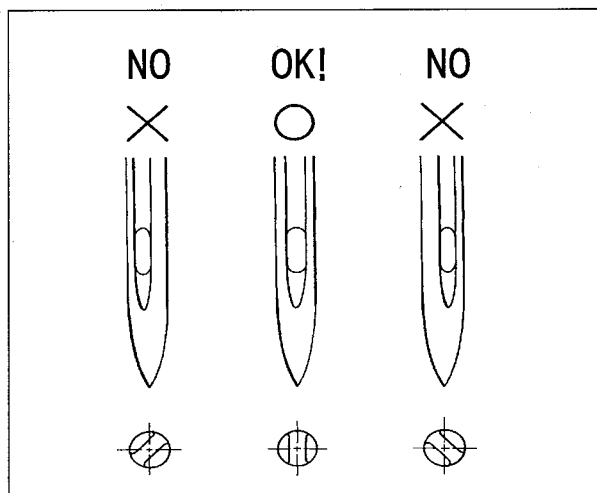


Fig. 5-2

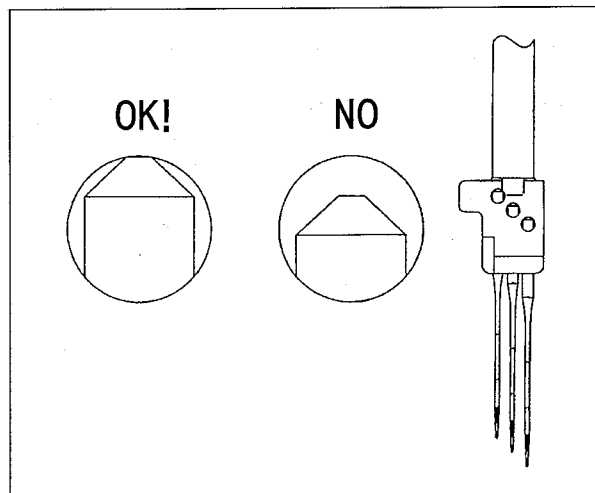


Fig. 5-3

## 5.3 Threading



When threaded, rethread by tying new threads with the preset threads.

When not threaded, thread correctly as shown in Fig. 5-4.

A: Needle thread

Pull out the threads until they come to the front of the needles. Then, cut off the knots before passing them through the needle eyes.

Thread correctly for the left needle which is in the inmost position as shown in the figure.

B: Looper thread

Pull the thread until the knot comes out. Then, cut off the knot.

C: Spreader thread

Pull the thread until the knot comes out.

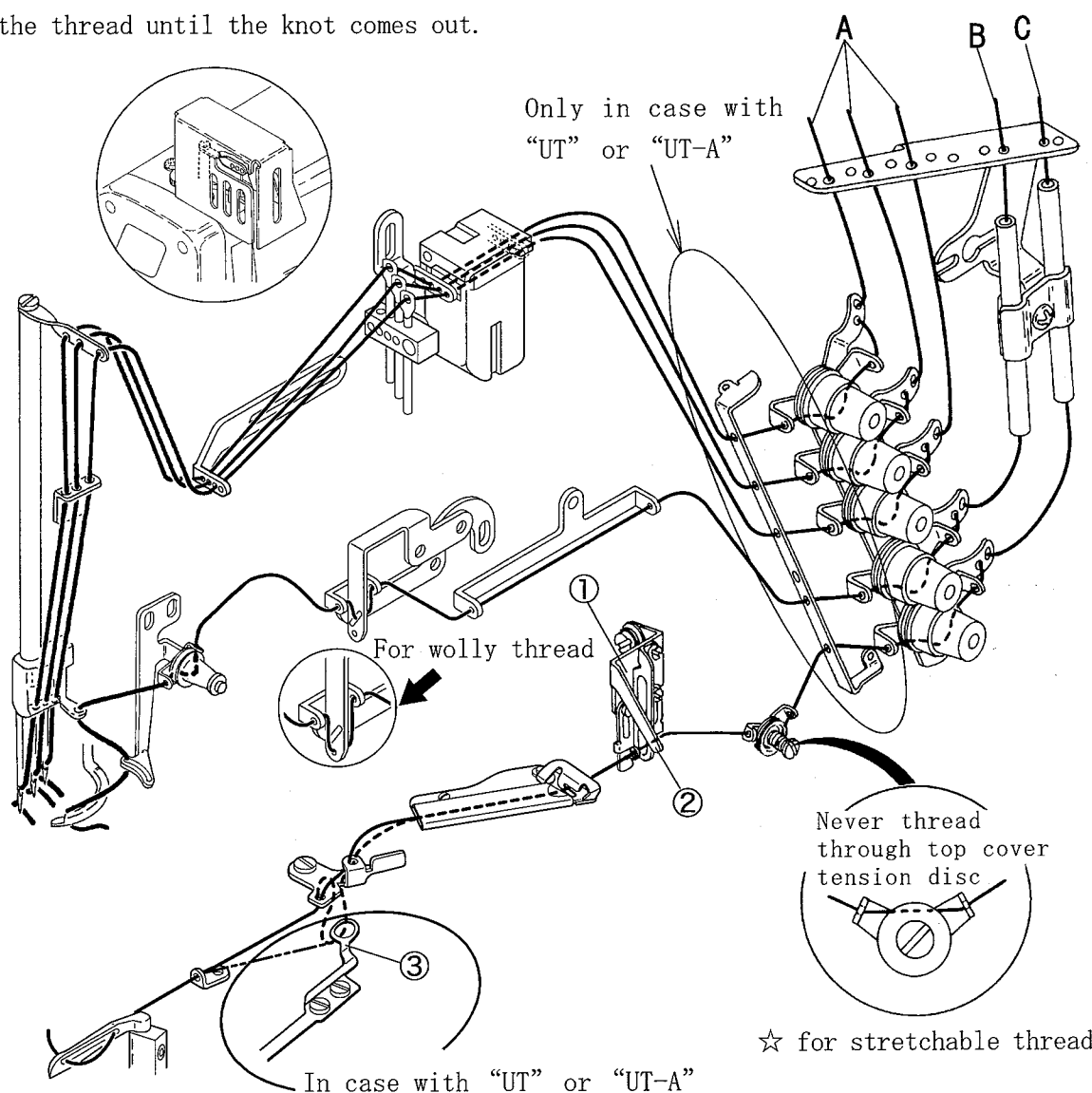


Fig. 5-4

Note: For easy threading, pull up the lever ② of the thread take-up eyelet holder ①.

After threading, press the lever ② to return the thread take-up eyelet holder ① to the original position.

Note: Threading for sewing machines with UT or UT-A device

\* Thread through the looper thread eyelet (left) ④ by the looper thread release ③.

## 5. Proper operation

### 5.4 Adjusting thread tension



Adjust the thread tension with the thread tension spring caps ① according to fabric type, thread type, seam width, stitch length, and other sewing conditions.

- To tighten the thread tension, turn the caps clockwise.
- To loosen the thread tension, turn the caps counterclockwise.

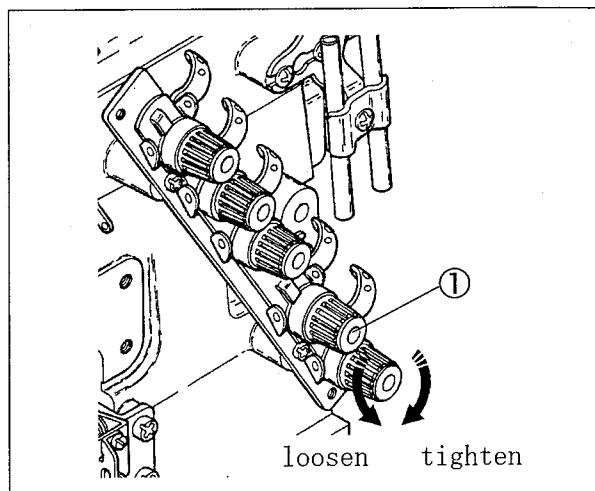


Fig. 5-5

### 5.5 Pressure of presser foot



Loosen the lock nut ② and turn the presser spring regulator ③ to adjust the pressure.

- To increase the pressure, turn it clockwise.
- To decrease the pressure, turn it counterclockwise.

Keep the pressure to a minimum for stable sewing performance.

#### Supplement

With walking presser foot, do not adjust the pressure with the presser spring regulator ③. See “5.11 Pressure of walking presser foot”.

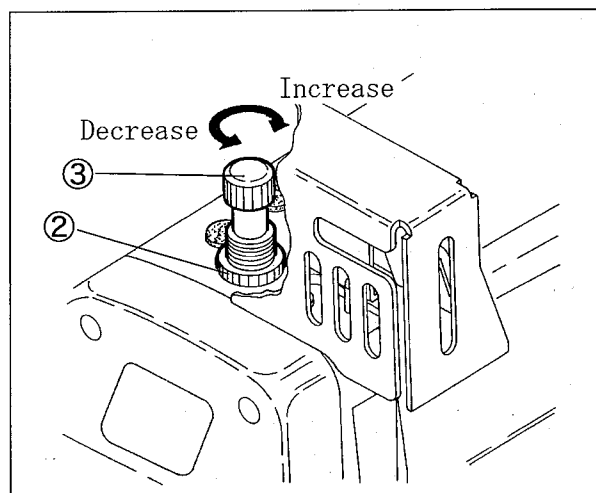


Fig. 5-6

### 5.6 Adjusting position of presser foot

#### CAUTION

Before adjusting, ALWAYS turn the power switch OFF and check that the machine has already stopped.

Adjust left-and-right position of the needle holes of the presser foot.

Loosen the screw ④. Move the front of the presser foot right or left so that the needle drops in the center of the needle drop.

Then, tighten the screw ④ securely.

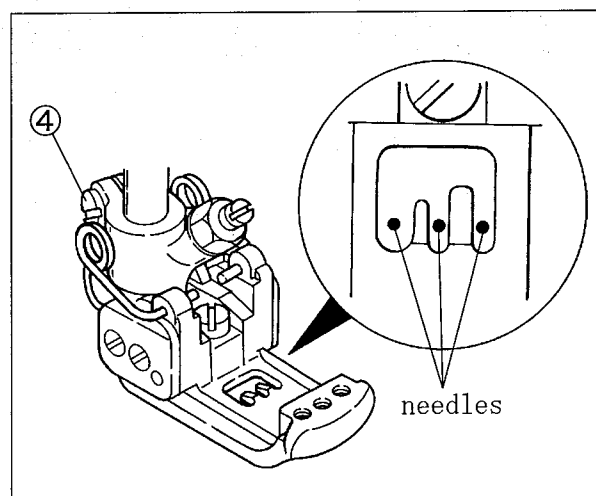


Fig. 5-7

## 5.7 Adjusting movement of differential feed dog (differential feed)



The differential and the main feed dogs move independently.

The desired normal or reverse differential feed ratios can be obtained by changing the movement of each feed dog.

Be sure to readjust differential ratio after adjusting the stitch length.

◆ Example: “2” for the main feed dog

Align “2” on the graduations by turning the adjusting knob ① clockwise, resulting in differential ratio 1:1.

● more than “2” - normal differential

● less than “2” - reverse differential

The movement of the differential feed dog is adjustable up to “4”.

◆ Using differential feed control lever

The lever can be fixed to a position between the line indicated on the graduations when turning the adjusting knob ① and the stopper screw ② with the nut ③.

Tie a chain with the differential feed control lever when want to adjust the movement during sewing performance.

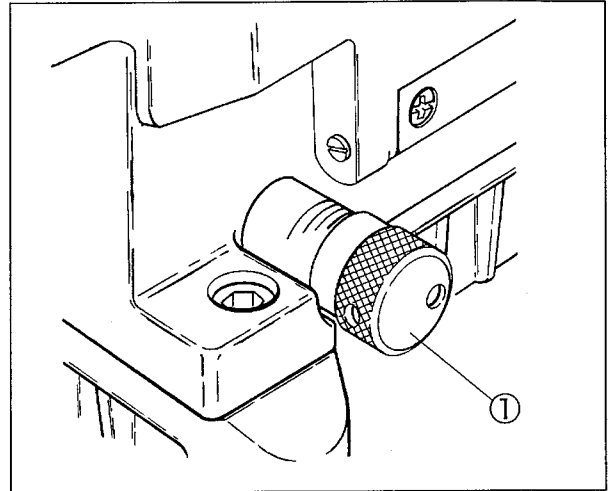


Fig. 5-8

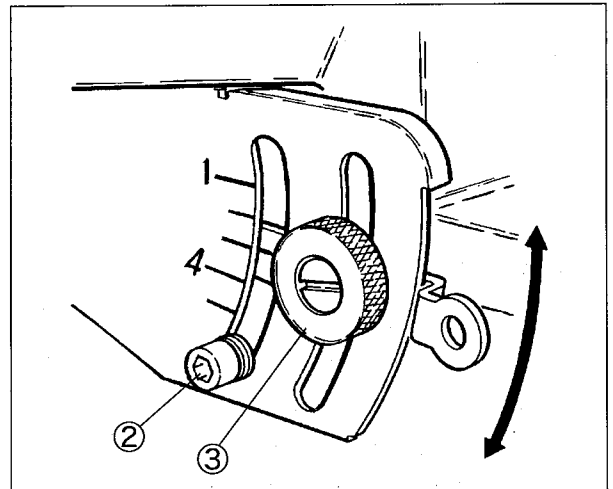


Fig. 5-9

Table 4 shows the differential ratios based on the stitch length.

Stitch length (mm)	Max. normal differential	Max. reverse differential
3.6	1:1.1	1:0.3
2.5	1:1.6	1:0.4
2.0	1:2	1:0.5
1.4	1:2.9	1:0.7

Table 4

## 5. Proper operation

### ⚠ CAUTION

Before operation, ALWAYS turn the power switch OFF and check that the machine has already stopped.

## 5.8 Adjusting stitch length



Each graduation on the machine pulley indicates the length (mm) for one stitch.

After sewing, the actual stitch length might be different from the length on graduation. It depends on the application, type and thickness of fabric, or the differential ratio.

### Procedure:

- (1) Press the push button ① lightly, it will be felt that the button head touches the parts inside the machine.
  - (2) Rotate the pulley while pressing the push button ①. At the point the push button goes far, press it again securely.
- To decrease stitch length, turn the pulley clockwise.
  - To increase it, turn it counterclockwise.
- (3) Under these conditions, align the desired graduation of the pulley with the hole ② on the machine arm. (Fig. 5-11)
  - (4) Release the push button ①.

### ⚠ CAUTION

Check that push button is released completely and the pulley rotates smoothly.

Stitch length is adjustable from 1.4 to 3.6 mm. Table 5 shows the number of stitches per inch (25.4 mm) and every 30 mm.

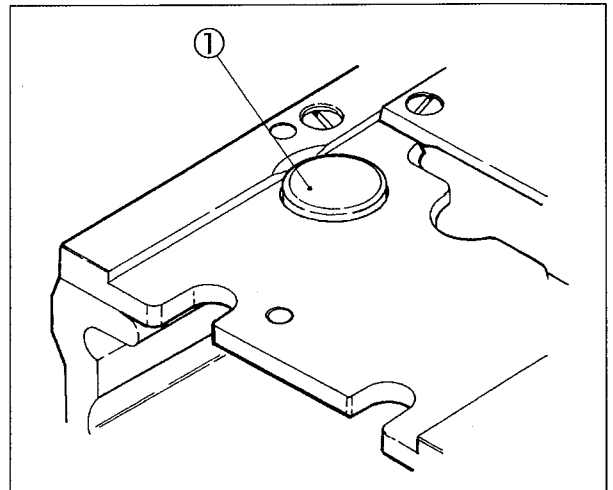


Fig. 5-10

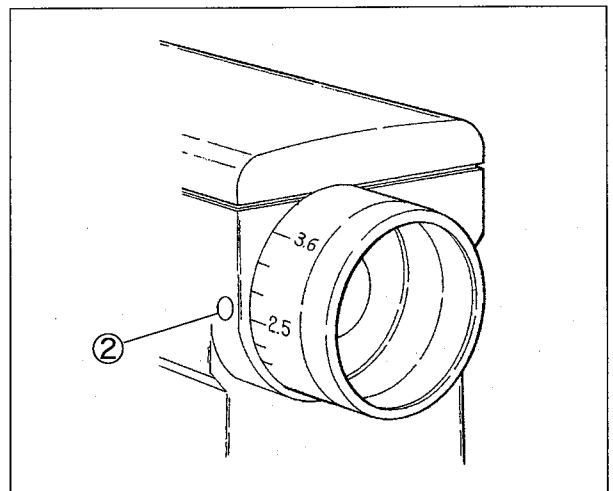


Fig. 5-11

Stitch length (mm)	Number of stitch (per 1 inch) (25.4 mm)	Number of stitch (per 30 mm)
3.6	7	8
2.5	10	12
2.0	12.7	15
1.4	18	21

Table 5

## 5.9 Fabric edge guide adjustment



### For tip over covering seam

- (1) Loosen the screws ① of the fabric guide.
- (2) Insert the seam between the fabric guide (right) ② and fabric guide (left) ③.
- (3) Position the seam at the center of the right needle and adjust the clearance between the fabric guide (right) ② and fabric guide (left) ③ to feed the fabric smoothly.
- (4) Once the clearance has been adjusted, tighten the screws ①.

### ① SUPPLEMENT

The positional relationship between the aligned fabric edges and the right needle varies depending on the design of the garment.

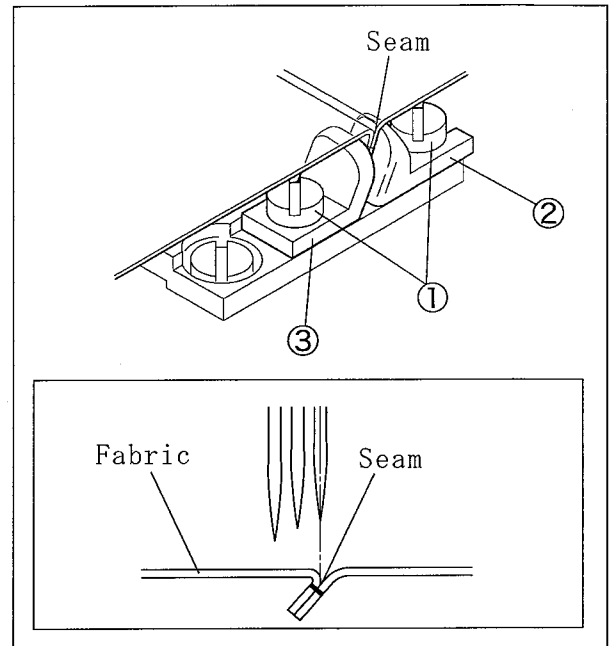


Fig. 5-12

### For Covering Seam

- (1) Loosen the screw ④ of the fabric guide.
- (2) Spread open the fabric seam and position it, and then adjust the clearance between the fabric guide (right) ⑤ and fabric guide (left) ⑥ to feed the fabric smoothly.
- (3) Tighten the screw ④.
- (4) Loosen the screws ⑦.
- (5) Spread open the fabric seam, and then adjust the fabric guide (left) ⑥ to position the seam at the center of the needle distance.
- (6) Tighten the screws ⑦.

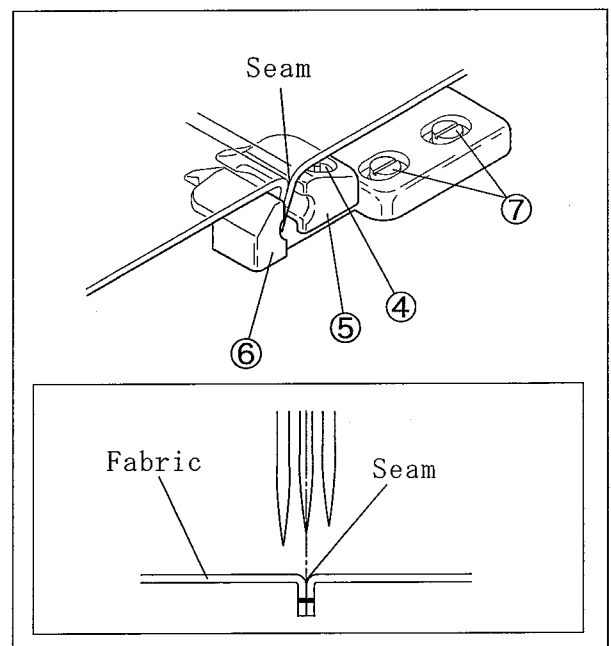


Fig. 5-13



## 5. Proper operation

### ⚠ CAUTION

Before operation, ALWAYS turn the power switch OFF and check that the machine has already stopped.

## 5.10 Raising upper feed roller (for models with puller mechanism)



Move the upper feed roller lifting lever ② up or down to raise the upper feed roller ① when pulling out a fabric due to fabric jam.

The upper feed roller ① is up during the upper feed roller lifting lever ② is raised up.

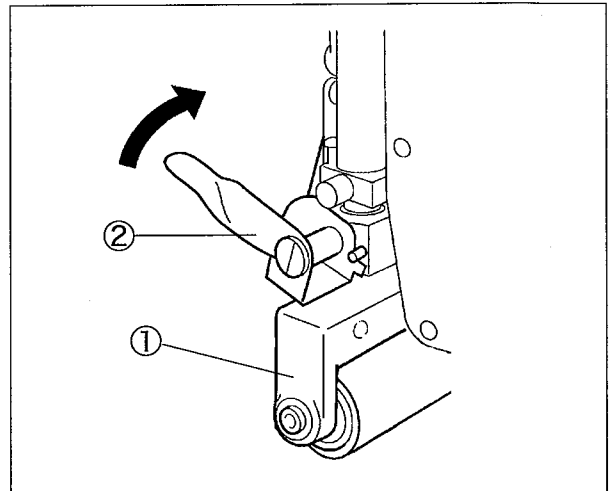


Fig. 5-14

## 5.11 Pressure of upper feed roller (for models with puller mechanism)



Adjust the pressure of the upper feed roller as low as possible to feed a fabric while putting it between the upper and lower feed rollers.

Turn the adjusting screw ③ to make adjustment.

- To increase the pressure, turn it clockwise.
- To decrease the pressure, turn it counterclockwise.

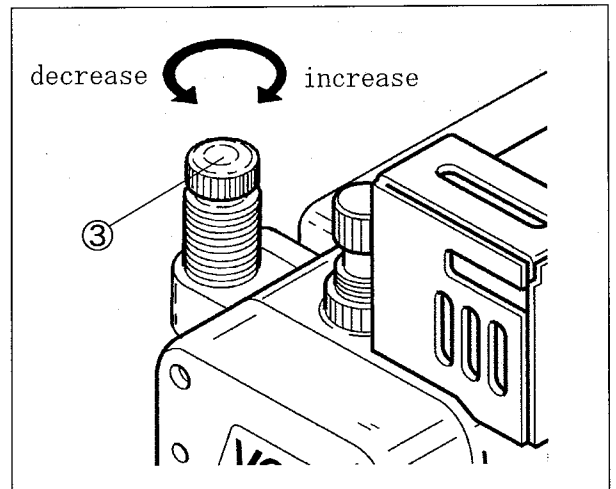


Fig. 5-15

## 5.12 Pressure of walking presser foot

The walking presser foot can effect on prevention of ply shift between upper and lower fabrics for hemming operation, also can feed fabrics smoothly even if running at high speed of 5500 rpm or over.

Loosen the screw ① and turn the nut ② to adjust the pressure.

- To increase the pressure, turn it clockwise.
- To decrease the pressure, turn it counterclockwise.

After adjusting, turn the screw ① clockwise and tighten the nut ② securely.

### ① Supplement

1. Increase the pressure if the lower fabric is fed too much and decrease the pressure if the upper fabric is fed too much.
2. Too high pressure of the walking presser foot ③ reduces ply shift prevention.

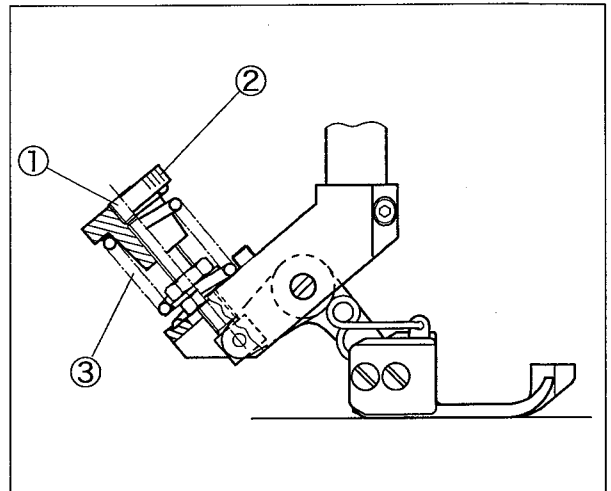


Fig. 5-16

## 5. Proper operation

### ⚠ CAUTION

Before operation, ALWAYS turn the power switch OFF and check that the machine has already stopped.

### 5.13 SP device and HR device

The SP device (needle thread oiling) has been equipped as standard to prevent thread breakage and skip stitch when running a machine at high speed or using synthetic thread and/or synthetic fabric.

And, the HR device (needle point cooling) can be used as a special order device.

Use dimethyl silicon oil.

Open the lid① of SP container and the lid② of HR container to check the oil level.

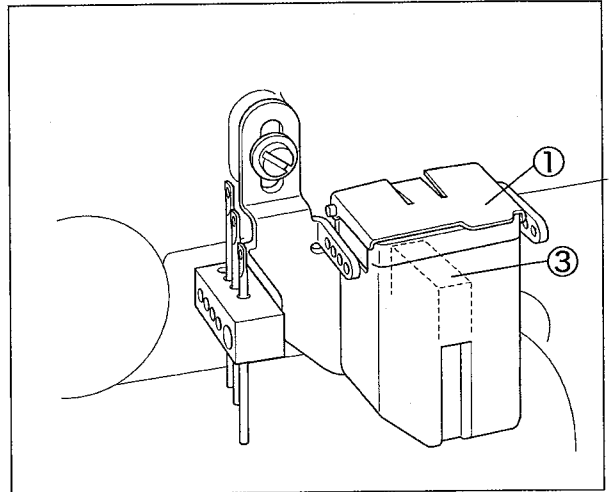


Fig. 5-17

### ⚠ CAUTION

1. When not using SP device and HR device, remove the felt③. If not removed, it may occur irregular condition during sewing.
2. If silicone oil is stuck to the parts other than SP and HR devices, it can cause the machine trouble. Be sure to wipe it away.

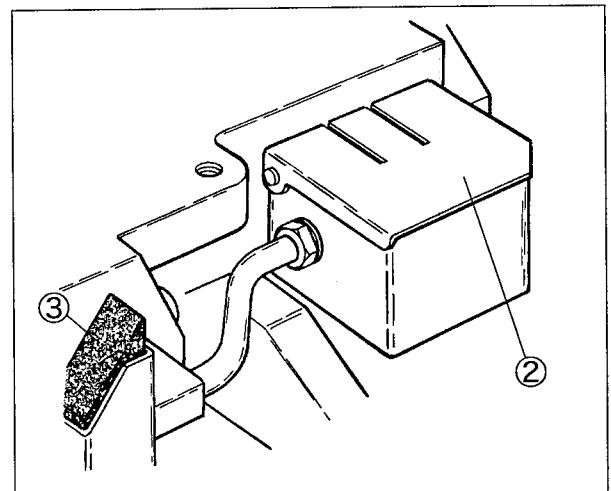


Fig. 5-18

### 5.14 Cleaning the machine



Clean waste thread and dust inside the machine at the end of work a day.

Remove the seal plug④ at the back of the machine and clean the grooves on the stitch plate, feed dog area, and oil filter screen area once a week.

### ⓘ NOTICE

If the oil filter screen is clogged with dust, oil in the cylinder does not return to the oil reservoir. It can cause oil leakage.

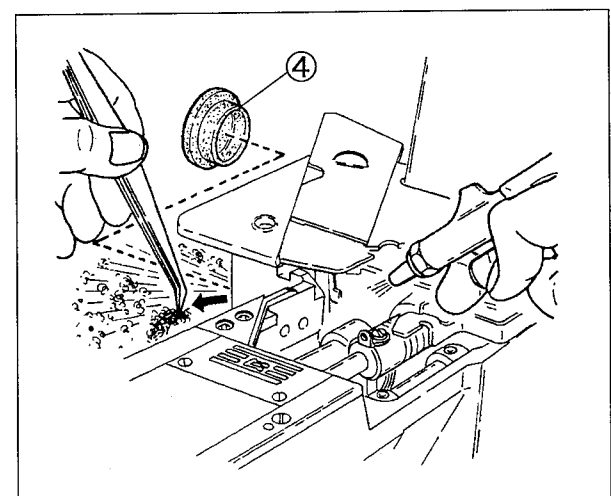


Fig. 5-19

# 6. Adjustments

## ⚠ CAUTION

Before adjustment, ALWAYS turn the power switch OFF and check that the machine has already stopped.

### 6.1 Needle thread tension

#### Needle thread take-up

Procedure:

- (1) Loosen the screws ② and ③.
  - To tighten the needle thread, move the needle thread take-up ① in the direction T.
  - To loosen the needle thread, move the needle thread take-up ① in the direction L.
- (2) Tighten the screws ② and ③ securely.

As standard, set the part "a" horizontally, and make the distance between the screw ② the needle thread take-up ① tip to 34.5 mm when the needle bar is at the highest point.

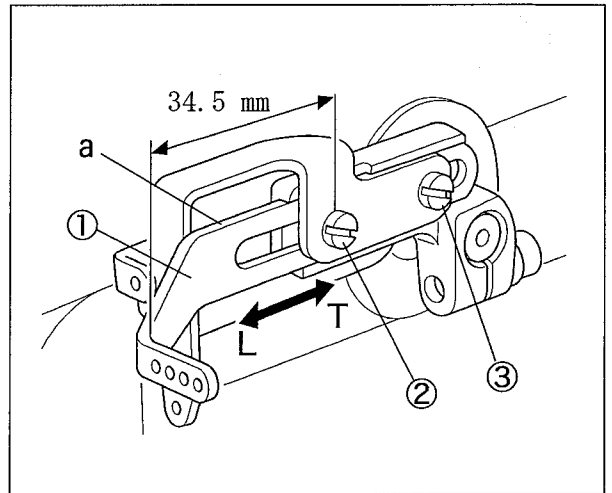


Fig. 6-1

#### Needle thread eyelet

If the above mentioned adjustments are not enough or want to make adjustment for each needle thread, perform the following steps.

Procedure:

- (1) Loosen the screws ⑤.
  - To tighten the needle thread, move each eyelet ④ in the direction T.
  - To loosen the needle thread, move each eyelet ④ in the direction L.
- (2) Tighten the screws ⑤ securely.

As standard, make the distance between the needle thread eyelet holder ⑥ and each eye of the needle thread eyelet ④ as below.

Left needle: 25 mm  
Middle needle: 17.5 mm  
Right needle: 10 mm

Adjusting all eyelets together:

- (1) Loosen the screw ⑦ of the SP device.
  - To tighten the needle thread, move the SP device ⑧ in the direction T.
  - To loosen the needle thread, move the SP device ⑧ in the direction L.
- (2) Tighten the screw ⑦ securely.

As standard, set the SP device at the highest point.

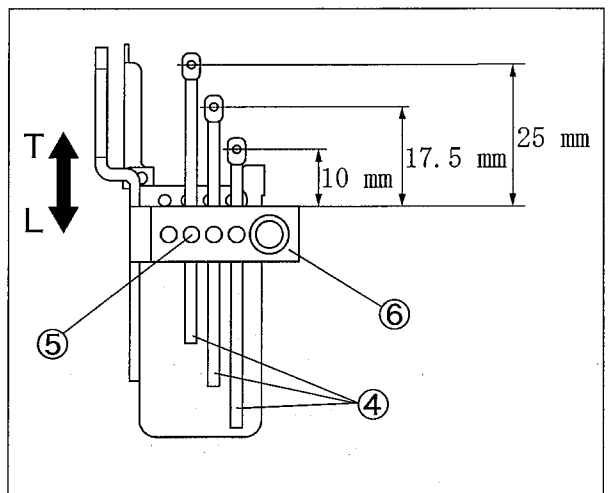


Fig. 6-2

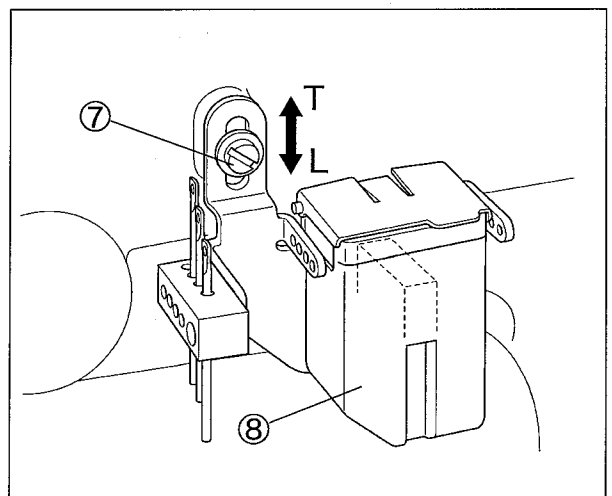


Fig. 6-3

## 6. Adjustments

### CAUTION

Before adjustment, ALWAYS turn the motor switch OFF and check that the motor has already stopped.

As the needle thread loop may difficult to be formed depending on the type of thread, the looper can not catch the needle thread. This can cause skip stitch.

In this case, thread the needle thread through the needle thread retainer disc① and the needle thread retainer support which has been attached with the machine as accessories.

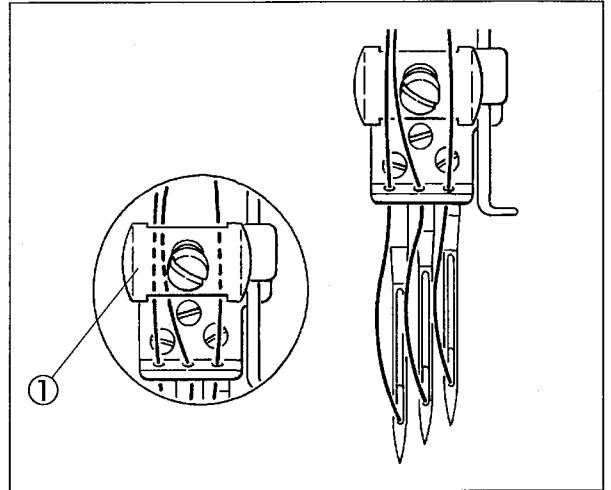


Fig. 6-4

Use the needle thread guide when the needle thread forms loop unstably with stretchable thread like synthetic thread.

As standard, align the center of the eye of the needle bar thread eyelet② with the top of the needle thread guide③, and make them parallel when the needle bar is at the lowest point.

Loosen the screw④ to adjust the height and right-and-left position of the needle thread guide③.

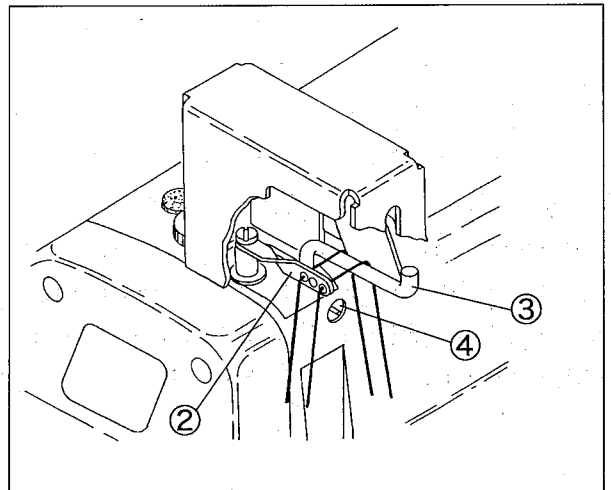


Fig. 6-5

## 6.2 Top cover thread tension

Loosen the screws② and move the top cover thread eyelet(left)① to adjust it.

- To decrease take-up amount, turn the eyelet (left)① in the direction T.
- To increase take-up amount, turn the eyelet (left)① in the direction L.

The part “a” on the top cover thread eyelet(left)① is horizontal as standard.

When using stretchable thread like woolly thread, turn the top cover thread eyelet(left)① in the direction L.

### ⓘ ADVICE

Thread woolly thread through the lower eye.

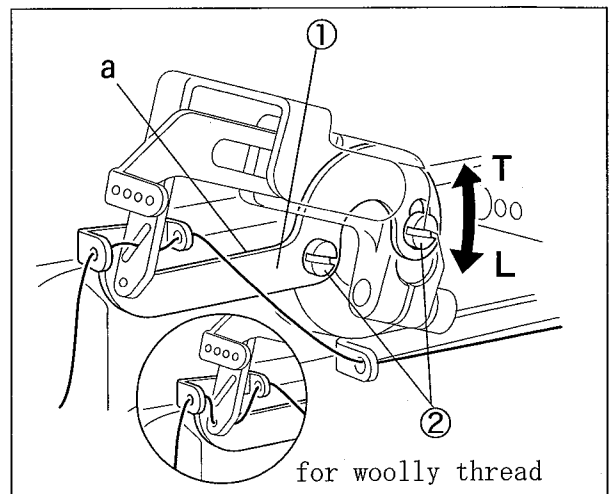


Fig. 6-6

## 6.3 Looper thread tension

Align the eyes of the thread take-up eyelets(left)④ and (right)⑤ with the lines③ on the thread take-up eyelet holder as standard.

Loosen the screws of both thread take-up eyelets to adjust them.

- To tighten the looper thread tension, raise both eyelets.
- To loosen the looper thread tension, lower both eyelets.

### ⓘ ADVICE

When using stretchable thread, move the thread take-up eyelets④ and ⑤ to the lowest points. Do not thread through the top cover tension disc⑥.

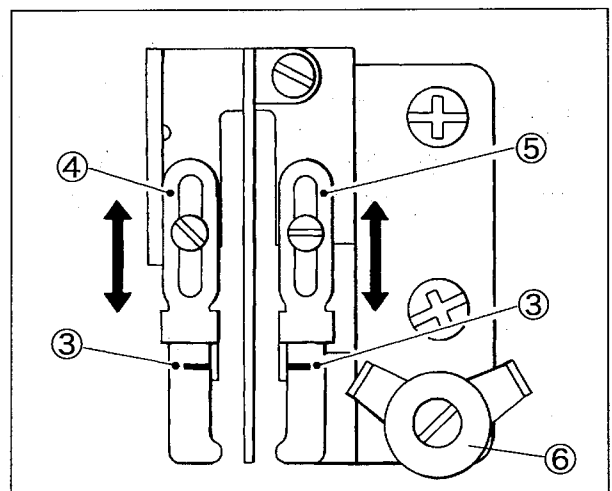


Fig. 6-7

## 6.4 Needle and spreader

### 6.4.1 Spreader

- (1) Loosen the screws ③ and ④ of the spreader holder. (Fig. 6-10)
- (2) Make the clearance between the left needle and the hook ② of the spreader ① to 0.5 - 0.8 mm. (Fig. 6-8)
- (3) Make the distance between the center of the left needle and the hook ② to 4.5 - 5.5 mm when the spreader ① is at the extreme left. Then tighten the screw ④ securely. (Fig. 6-8 and 6-10)
- (4) Make the height from the top of the stitch plate to the bottom of the spreader ① to 8.5 - 9.5 mm. Then tighten the screw ③ securely. (Fig. 6-9 and 6-10)

### **i** HINTS

Adjust the height of the spreader so that the top cover thread passes behind the right needle and be caught by the left needle within adjustable range based on the needle distance.

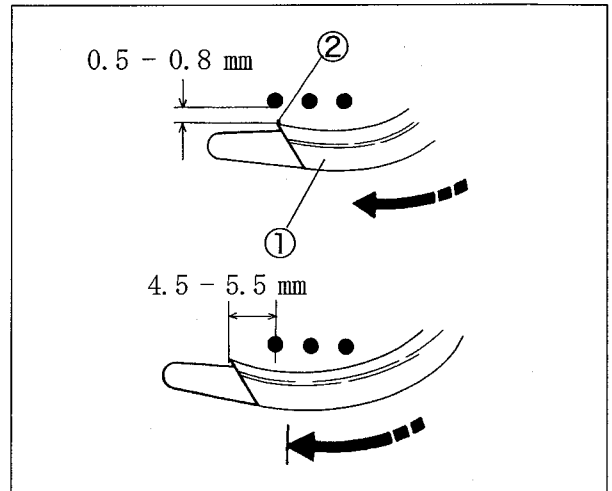


Fig. 6-8

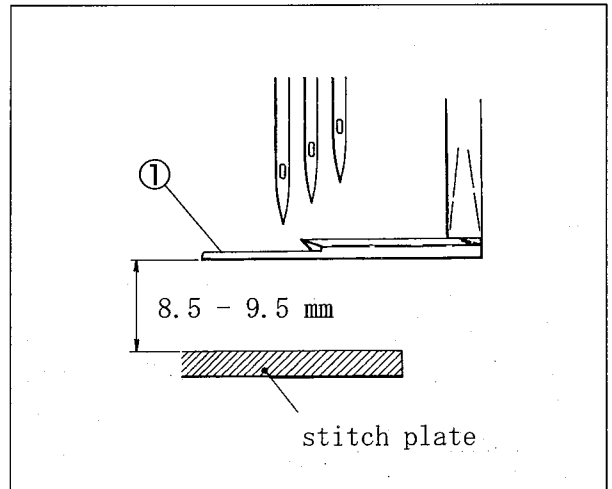


Fig. 6-9

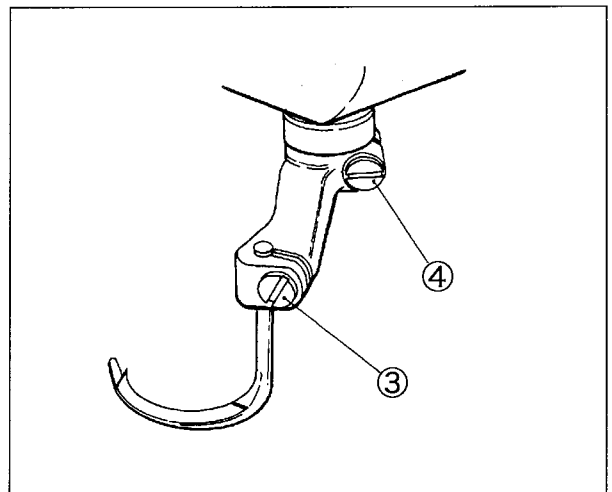


Fig. 6-10

### 6.4.2 Top cover thread guide

- (1) Loosen the screws ② of the top cover thread guide ①. (Fig. 6-11)
- (2) Make the clearance between the top of the spreader ③ and the bottom of the top cover thread guide ① to 0.5 mm. (Fig. 6-11)
- (3) Set the hook ④ in the center of the slot of the top cover thread guide ① when the spreader ③ is at the extreme right. Then, tighten the screws ② securely. (Fig. 6-11 and 6-12)

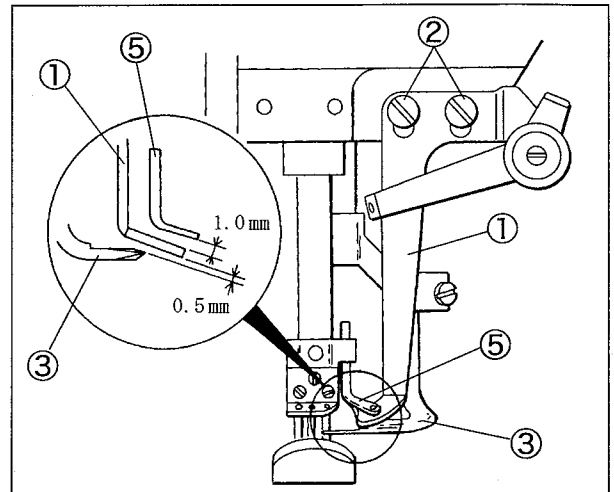


Fig. 6-11

### 6.4.3 Top cover thread eyelet

- (1) Loosen the screw ⑥ of the top cover thread eyelet ⑤. (Fig. 6-12)
- (2) Make the clearance between the top of the top cover thread guide ① and the top cover thread eyelet ⑤ to 1.0 mm when the needle bar is at the lowest point. (Fig. 6-11)
- (3) Set the eye of the top cover thread eyelet ⑤ along the extending line from the slot of the top cover thread guide ①. (Fig. 6-12)
- (4) Tighten the screw ⑥ securely. (Fig. 6-12)

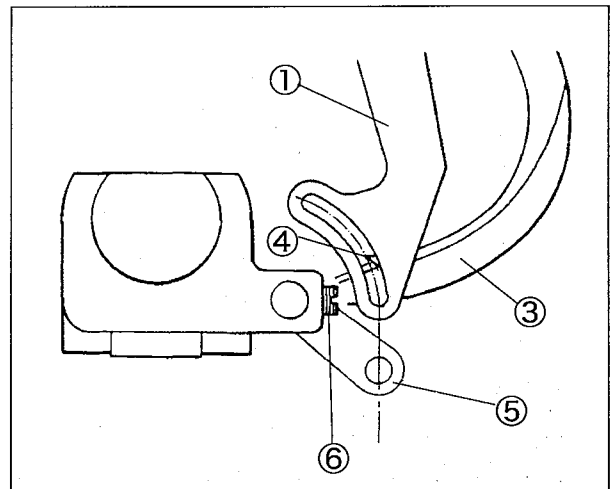


Fig. 6-12



## 6. Adjustments

### 6.5 Distance between needle and looper

The distance between the looper tip and the center of the right needle depends on the needle distance when the needles are at the lowest points and the looper ① is at the extreme right.

See Table 6 and loosen the screw ② of the looper holder to adjust the distance.

#### ① SUPPLEMENT

The distance between the center of the needle bar and the looper ① tip is 6.0 mm even if the needle distance changes.

needle distance (mark)	gauge mark	looper's distance
3.2 mm (32)	A	4.4 mm
4.0 " (40)	B	4.0 "
4.8 " (48)	C	3.6 "
5.6 " (56)	D	3.2 "
6.4 " (64)	E	2.8 "

Table 6

The timing gauge (No. 95220) makes it possible to adjust the distance easily.

A timing gauge is an extra part. Place an order with our agents or directly with us, if needed.

### 6.6 Using timing gauge

The timing gauge has the marks (A, B, C, D, E) for each needle distance.

Move the looper to the extreme right. Keep fitting the right needle into the groove "V" corresponding needle distance, and fit the looper tip to the gauge.

Then, tighten the screw ② securely.

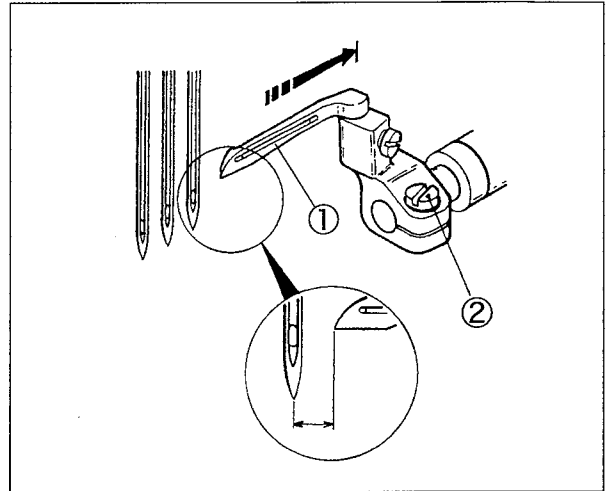


Fig. 6-13

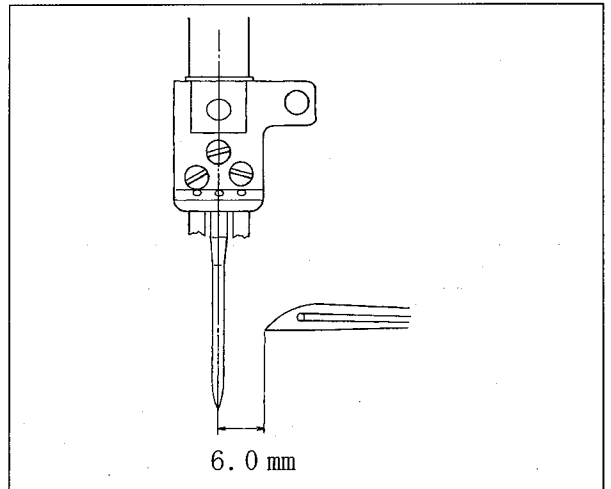


Fig. 6-14

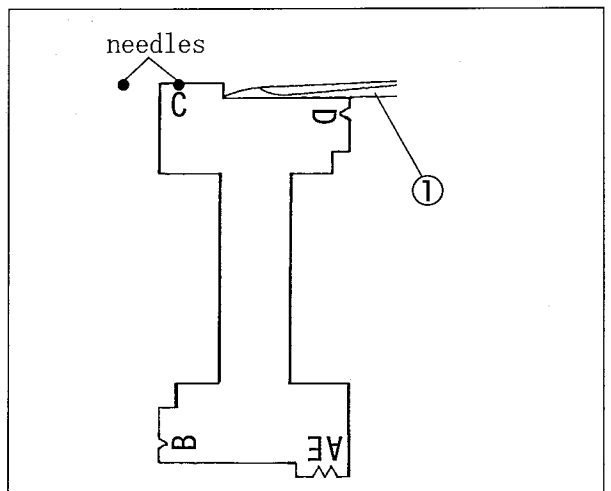


Fig. 6-15

## 6.7 Height of needle

- (1) Install the needle to the left hole in the needle clamp.
- (2) Check the looper is inserted into the looper holder fully.
- (3) Turn the handwheel until the looper tip meets the center of the left needle.
- (4) Loosen the screw ① of the needle bar bracket and move the needle bar up or down. Adjust the looper tip to pass 0.8 - 1.3 mm above the top of the needle eye.
- (5) Tighten the screw ① securely. Check that the needle drops in the center of the needle hole of the stitch plate.

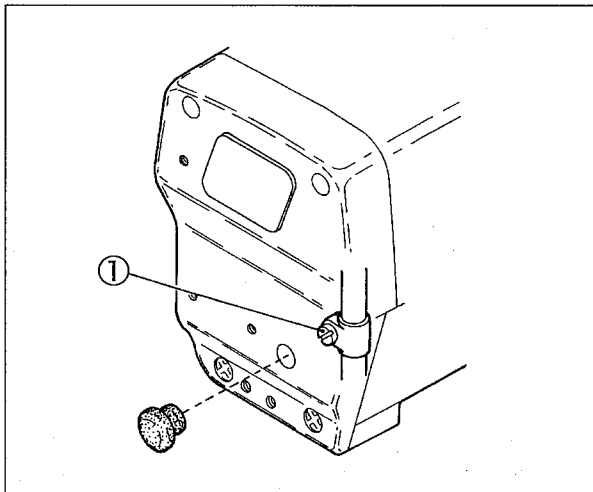


Fig. 6-17

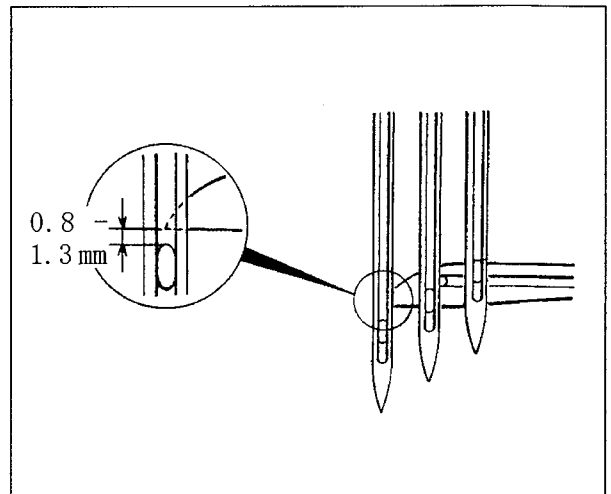


Fig. 6-16

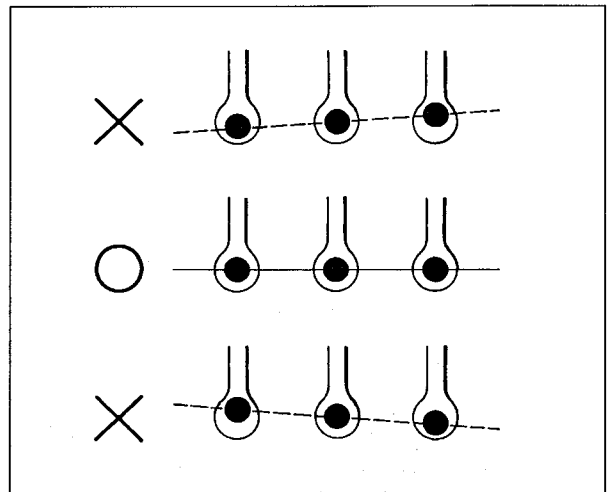


Fig. 6-18

## 6.8 Front-and-rear position of needle and looper

- (1) Turn the handwheel until the looper tip ④ meets the center of the left needle ⑤.
- (2) Loosen the screw ③ and move the looper holder back or forth. Make the clearance between the back of the left needle ⑤ and the looper tip to 0.2 - 0.3 mm. Then, tighten the screw ③ securely.

### ! ATTENTION

When tightening the screw ③, front-and-rear position of the looper may be shifted. Recheck the position after tightening it.

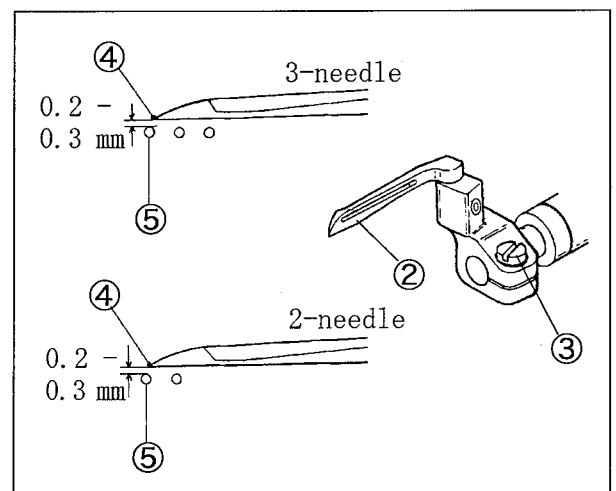


Fig. 6-19

### 6.9 Needle and needle guard (rear)

#### Height of needle guard(rear):

- (1) Rotate the handwheel until the needle is raised and the looper<sup>①</sup> tip comes to the center of the left needle<sup>②</sup>.
- (2) Loosen the screw<sup>③</sup>.
- (3) Adjust the needle guard(rear)<sup>④</sup> so that the left needle<sup>②</sup> is held by the flat part "b" with a distance of 0.1 - 0.3 mm.
- (4) Tighten the screw<sup>③</sup> temporarily.

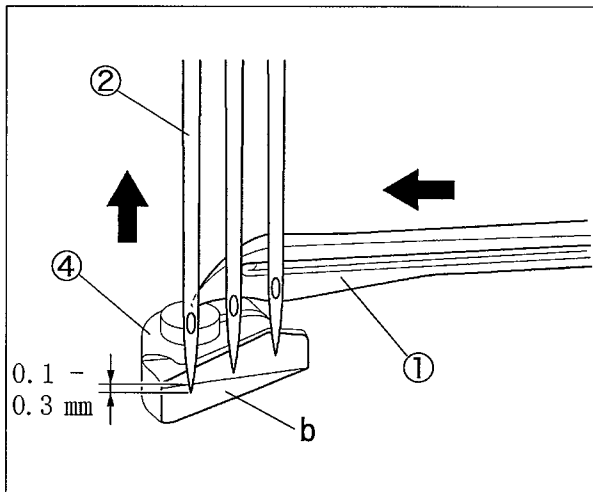


Fig. 6-20

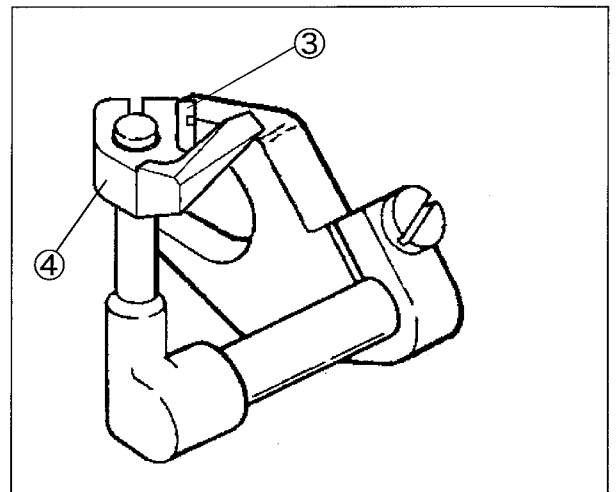


Fig. 6-21

### Front-and-rear position and angle between needle guard (rear) and needle:

Loosen and adjust the screws ③ and ⑤ to make them meet the following three conditions.

- (1) When the looper ① moves from the right to the left, and the looper ① tip meets the right needle, let the needle guard(rear)④ push the right needle so that the clearance between the right needle and the looper ① is 0.
- (2) When the looper ① tip meets the middle needle, adjust the angle of the needle guard (rear)④ so that the clearance between the middle needle and the looper ① is 0.
- (3) When the looper ① tip meets the left needle ②, even if the left needle ② is pressed, the needle guard(rear)④ holds the left needle ② without touching the looper ① tip. (Fig. 6-23)

### 2-needle machine:

Loosen and adjust the screws ③ and ⑤ to make them meet the conditions (1) and (3).

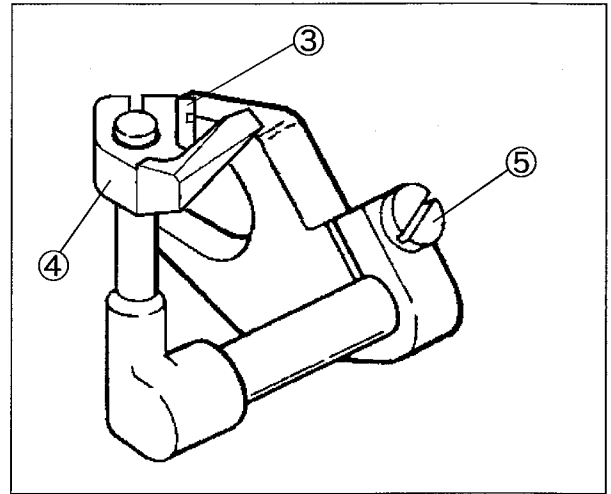


Fig. 6-22

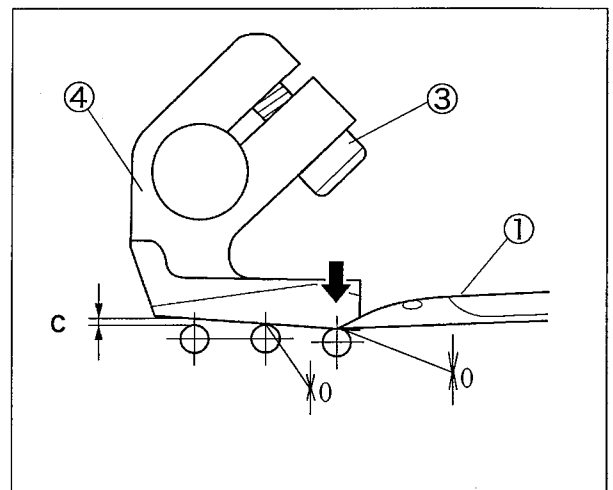


Fig. 6-23

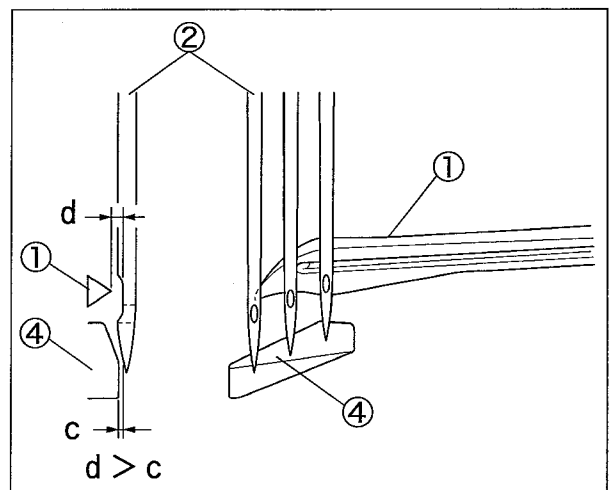


Fig. 6-24

## 6.10 Needle and needle guard (front)

- (1) Turn the handwheel clockwise until the looper tip comes to the center of the left needle. (Fig. 6-25)
- (2) Loosen the screw①. Adjust the height from the needle tip to the angular part of the needle guard(front)② to 1.5 - 2.0 mm.
- (3) Tighten the screw① securely. (Fig. 6-26)
- (4) Loosen the screws① and ③. Adjust the clearance between the needle guard(front)② and the left or right needle to 0 - 0.3 mm respectively. (Fig. 6-27)
- (5) Tighten the screws① and ③ securely. (Fig. 6-26)

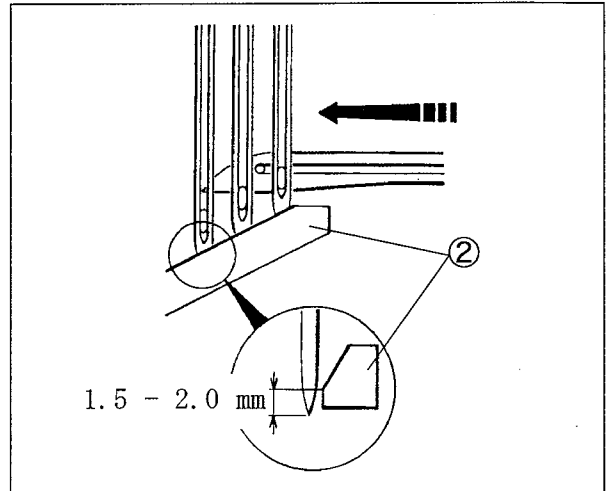


Fig. 6-25

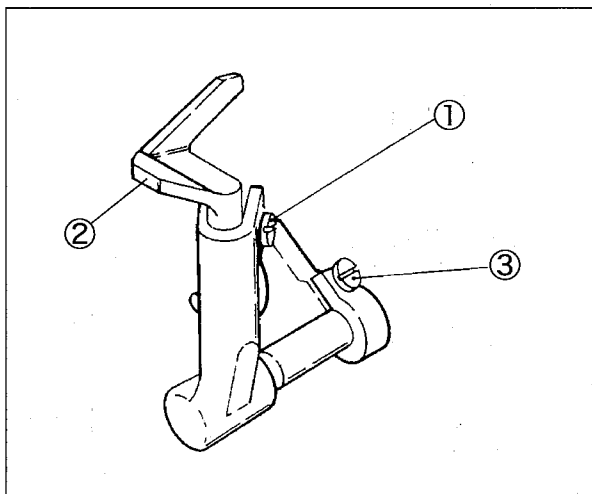


Fig. 6-26

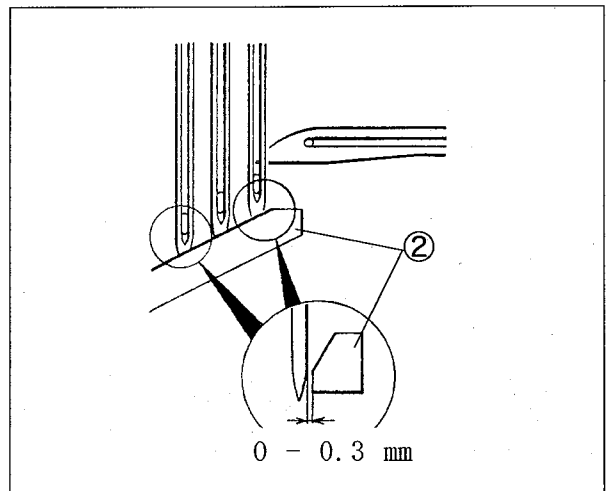


Fig. 6-27

## 6.11 Height of feed dog

As standard, adjust the height from the top surface of the stitch plate to the tops of the differential feed dog⑤ and the main feed dog④ to 1.0 - 1.2 mm, and make the feed dogs parallel to the top surface of the stitch plate when they are at the highest points.

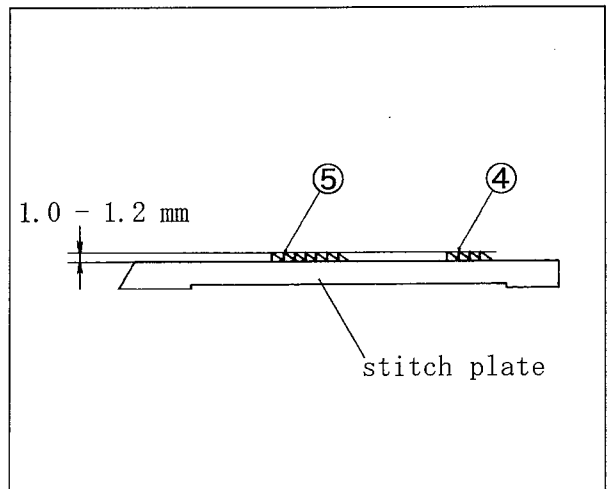


Fig. 6-28

## 6.12 Presser foot lift

The presser foot lift for the needle distance 5.6 mm is as follows:

- with spreader: 6.0 mm
- without spreader: 7.5 mm

- (1) Loosen the lock nut ①.
- (2) Lower the lifter lever ② to make the clearance between the top of the stitch plate and the bottom of the presser foot to 6.0 mm (7.5 mm).
- (3) Adjust the screw ③ to make it touch the lifter lever ② when the presser foot is raised 6.0 mm (7.5 mm).
- (4) Tighten the lock nut ① securely.
- (5) Loosen the screws ⑤ of the collar ④.
- (6) Make the clearance between the presser bar bushing ⑥ and the collar ④ to 0.2 mm when the presser foot is raised 6.0 mm (7.5 mm).
- (7) Tighten the screws ⑤ securely.

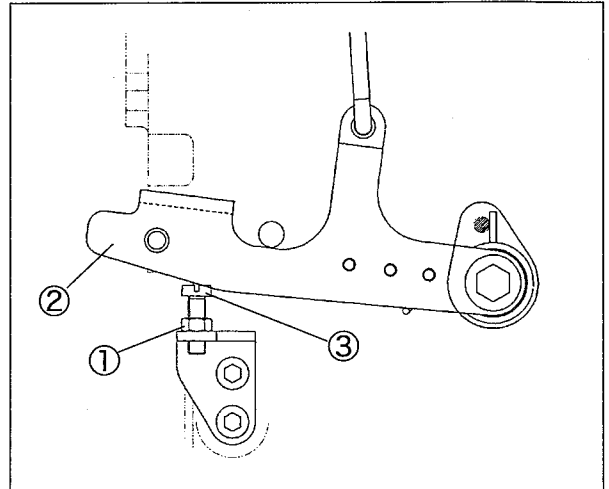


Fig. 6-29

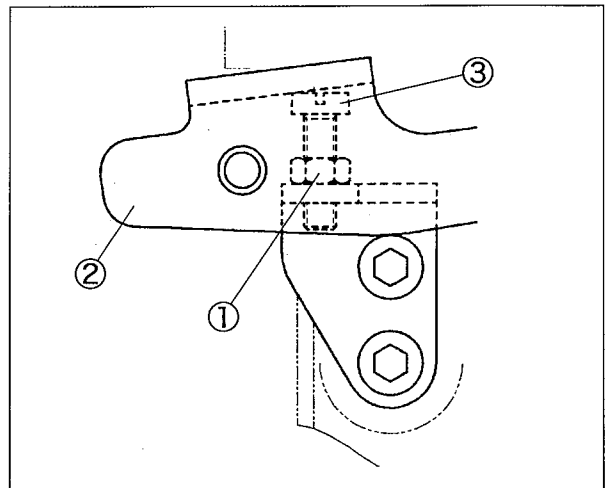


Fig. 6-30

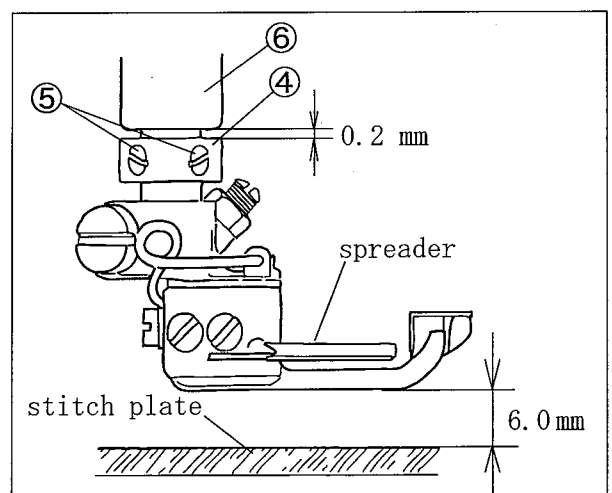


Fig. 6-31

### 6.13 Feeding amount of puller (for models with puller mechanism)

- (1) Remove the top cover seal plug ①.
- (2) Rotate the handwheel until the screw ② of the upper feed roller regulator comes to the top position.  
Loosen the screw ② with a hexagon socket screwdriver.
- (3) Rotate the handwheel until the adjusting screw ③ comes to the top position. (Fig. 6-32)
- (4) Turn the adjusting screw ③ to adjust the feeding amount.
  - To decrease the amount, turn it clockwise.
  - To increase the amount, turn it counter-clockwise.
- (5) Tighten the screw ② with a tightening torque of 2.5 N·m securely.

To make fine adjustment, loosen the nut ⑥ of the upper feed roller lever rod ⑤ for the upper feed roller lever ④, and move it up and down.

- To decrease the amount, move it up.
- To increase the amount, move it down.

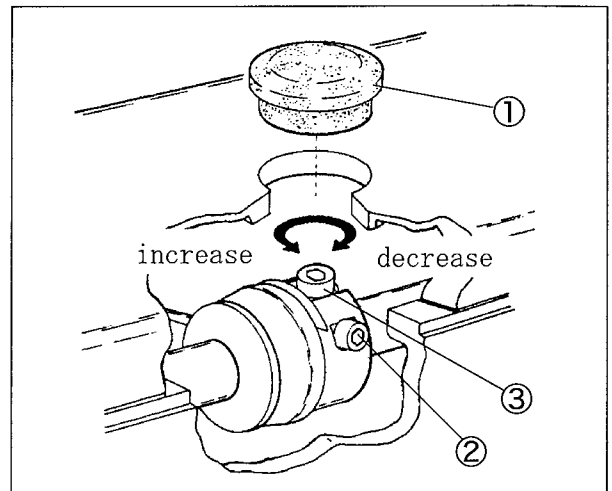


Fig. 6-32

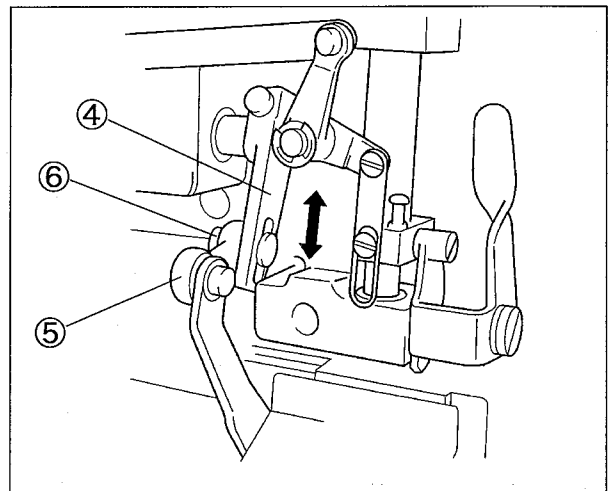


Fig. 6-33

### 6.14 Pressure of clutch tension spring (for models with puller mechanism)

- (1) Loosen the screw ⑧ (two pcs.) of the adjusting collar ⑦ and tighten the adjusting collar ⑦ slightly.
- (2) Turn the adjusting screw ⑨ to adjust the pressure of the clutch tension spring ⑩.
  - To increase the pressure, turn it clockwise.
  - To decrease the pressure, turn it counter-clockwise.
 Keep the pressure to the level that the clutch tension spring ⑩ can be turned smoothly by a finger.
- (3) Tighten the screw ⑧ (two pcs.) securely.

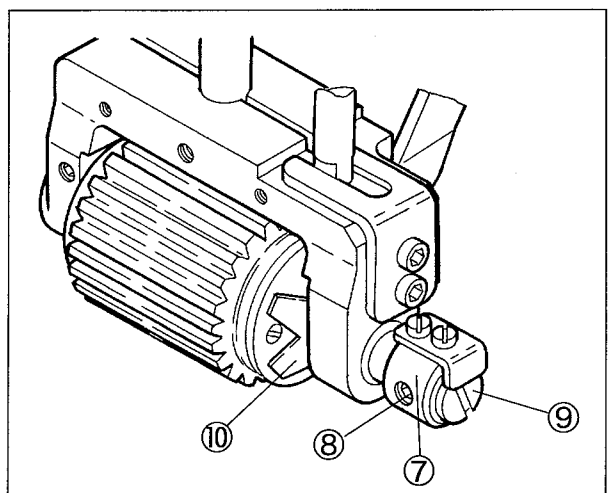


Fig. 6-34

## 6.15 Walking presser foot

Correct balance between the presser bar spring ① and the walking presser foot spring ② is required to operate the walking presser foot properly.

- (1) Make the height of the walking presser foot spring ② to 20 mm. See "5.11 Pressure of walking presser foot".
- (2) Remove the head cover.
- (3) Loosen the adjusting screw ⑤ to set the presser bar connecting bracket ③ 2.7 mm below the top of the presser bar ④.
- (4) Tighten the screw ⑦ of the presser bar stopper ⑥ in the center of the slot slightly.
- (5) Make the height from the top of the arm to the top of the presser spring regulator ⑧ to 11 mm. (In case of standard presser spring regulator ⑬ # 77270: 33 mm)
- (6) Check the bottom of the presser foot touches the stitch plate closely when the feed dog lowers under the stitch plate.  
If not closely, readjust (3) - (5).
- (7) Rotate the handwheel clockwise to raise the needle to the highest point. Place two fabrics to be sewn under the presser foot.
- (8) Lower the needle tip to the front of the fabric.  
Loosen the screw ⑦ to adjust the height of the presser bar stopper ⑥ so that the center of the needle is aligned with that of the mark "a".
- (9) Check only bottom ⑩ of the presser foot synchronized with the feed dog up and down.  
If not synchronized or whole presser foot moves, readjust it.
- (10) Raise the needle to the highest point. Set the bottom of the presser foot to move about 1 mm backward when raising the presser foot.  
Turn the adjusting screw ⑨ to adjust it.

- To move forward, turn it clockwise.
- To move backward, turn it counterclockwise.

Reference: For screw ⑨, make the distance from the bottom of the washer ⑪ to the hinge pin ⑫ to 9.7 mm as standard.

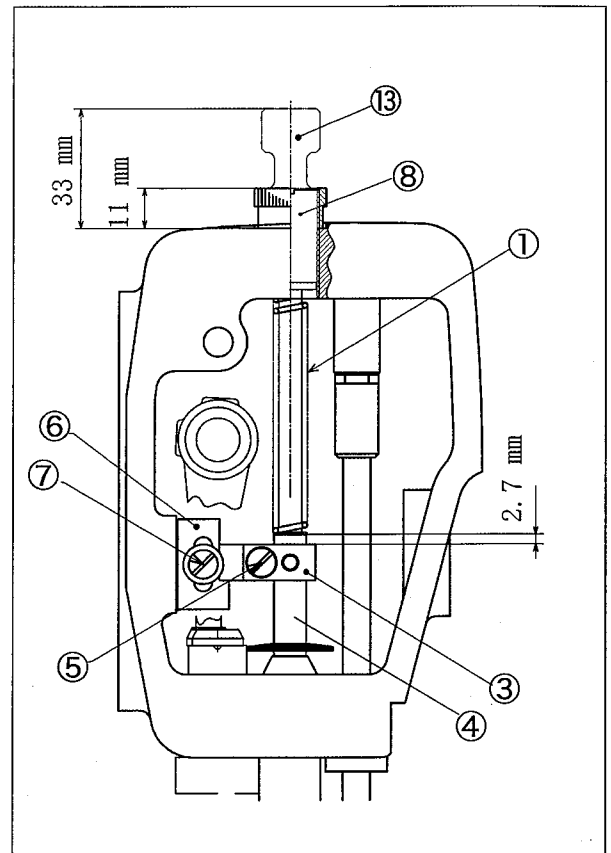


Fig. 6-35

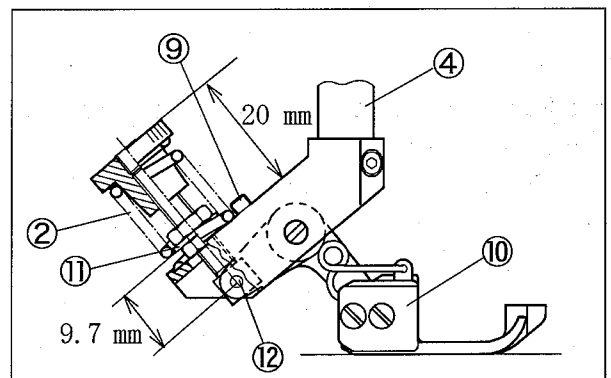


Fig. 6-36

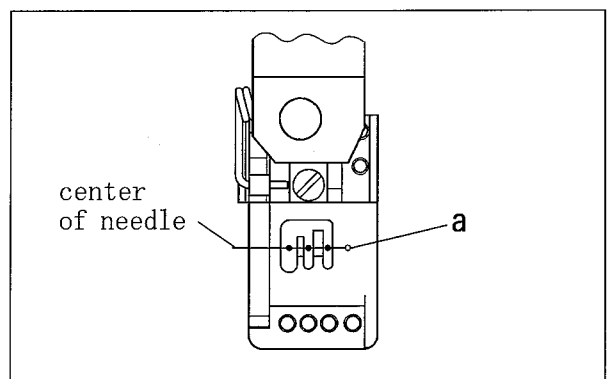


Fig. 6-37







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