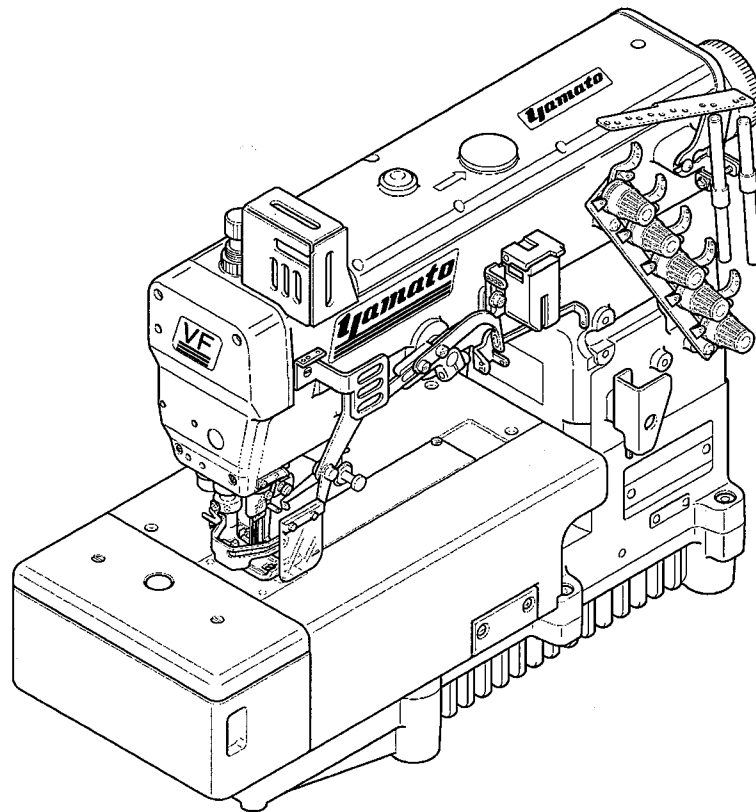


# ***Yamato***<sup>®</sup>

## Instruction Manual

HIGH SPEED FLAT BED INTERLOCK STITCH MACHINE

# VF2400 class



This instruction manual includes adjustments differed from VF2400.

Before using your machine mentioned above, please read both of the instruction manuals 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.



# Safety instructions



Keep them away from children.

- (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) Do not modify the sewing machine by the customer's judgment.
- (5) 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** indicates potentially hazardous situations which, if not heeded, could result in death or serious injury to you and others.

**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.



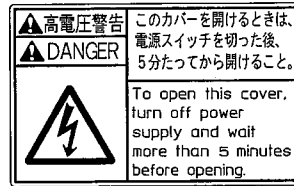
This mark indicates the warning which, if not heeded, could result in death or Serious injury.



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.

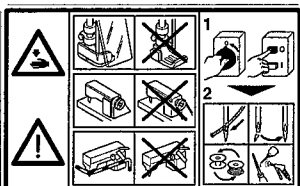


Stepping motor and solenoid may overheat if used continuously. To prevent a burn, take care not to touch.

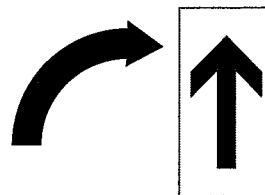


If not connected earth line, static electricity may be generated and inflict injury on person. In addition, the malfunction of electric system may cause injury to person.

## 5. Warning labels on sewing machines



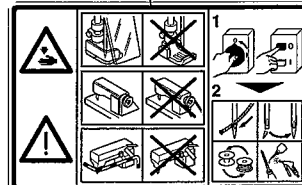
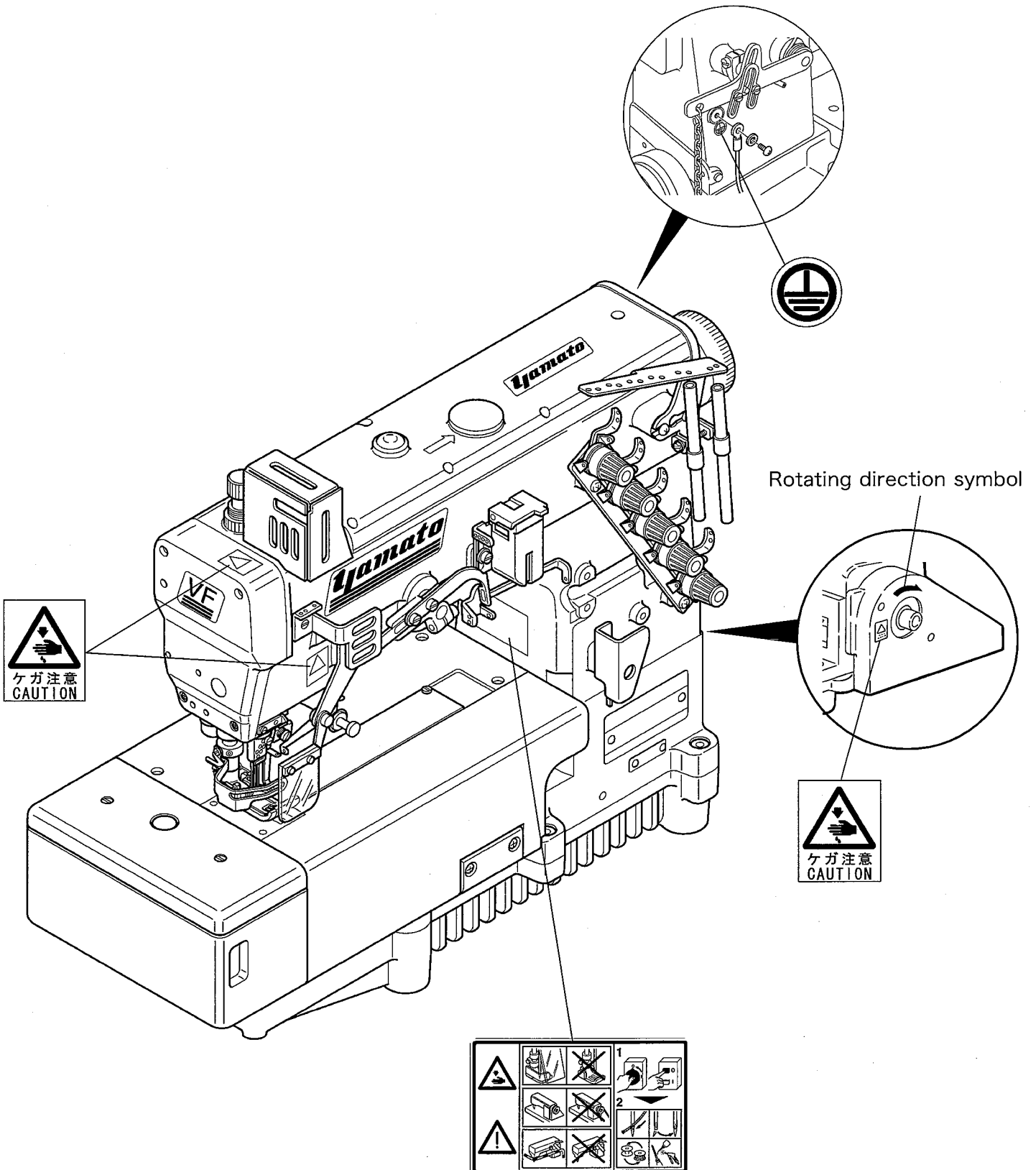
This label indicates that removal of the safeguards and works except for sewing performance while the power supply switch is on are prohibited. (For details, see the next page.)



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



# Safety instructions



# 1. Name of each part

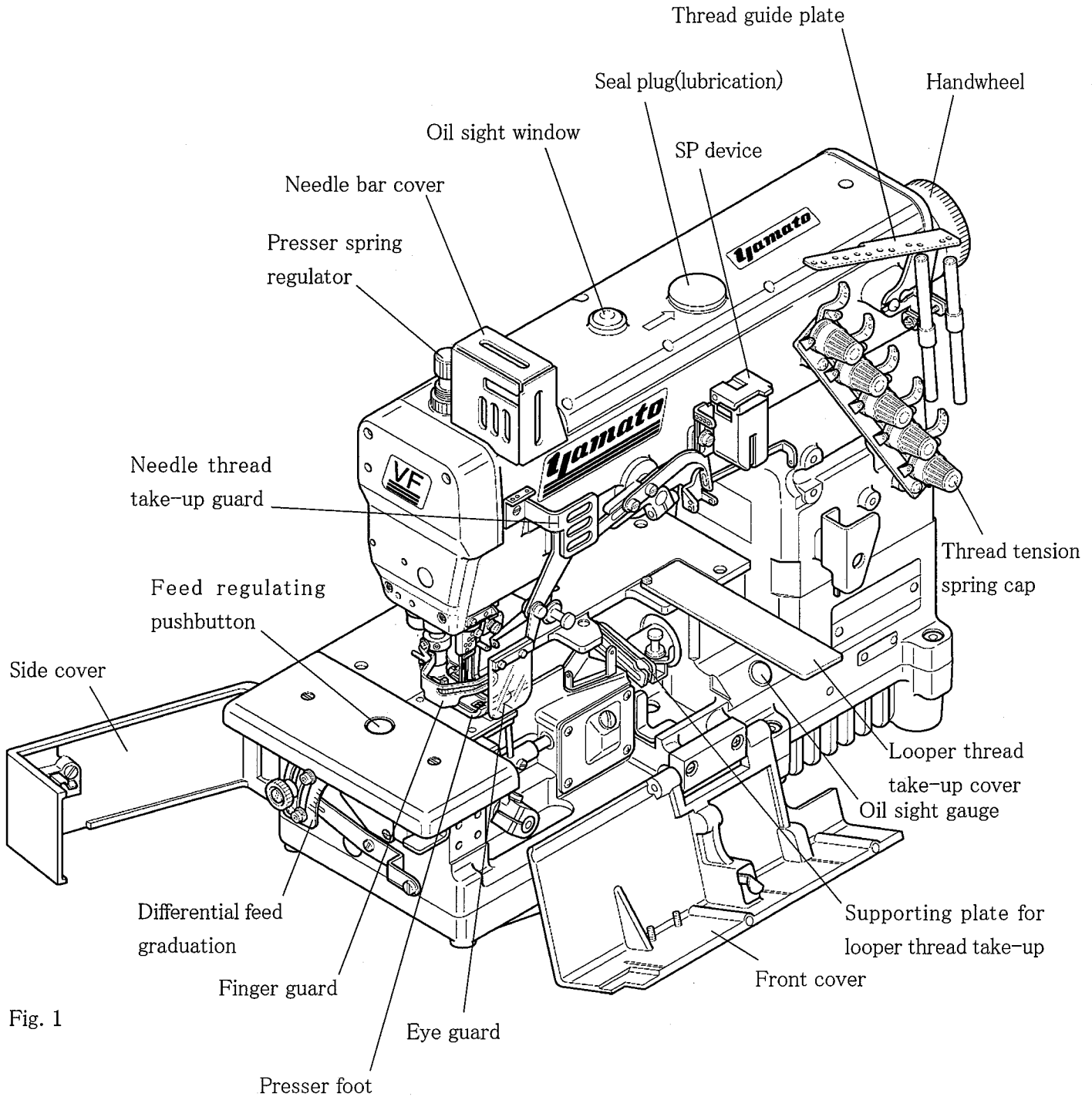


Fig. 1



# 2. Installation

## 2.1 semi-submerged type

### 2.1.1 Table cutting diagram

Standard

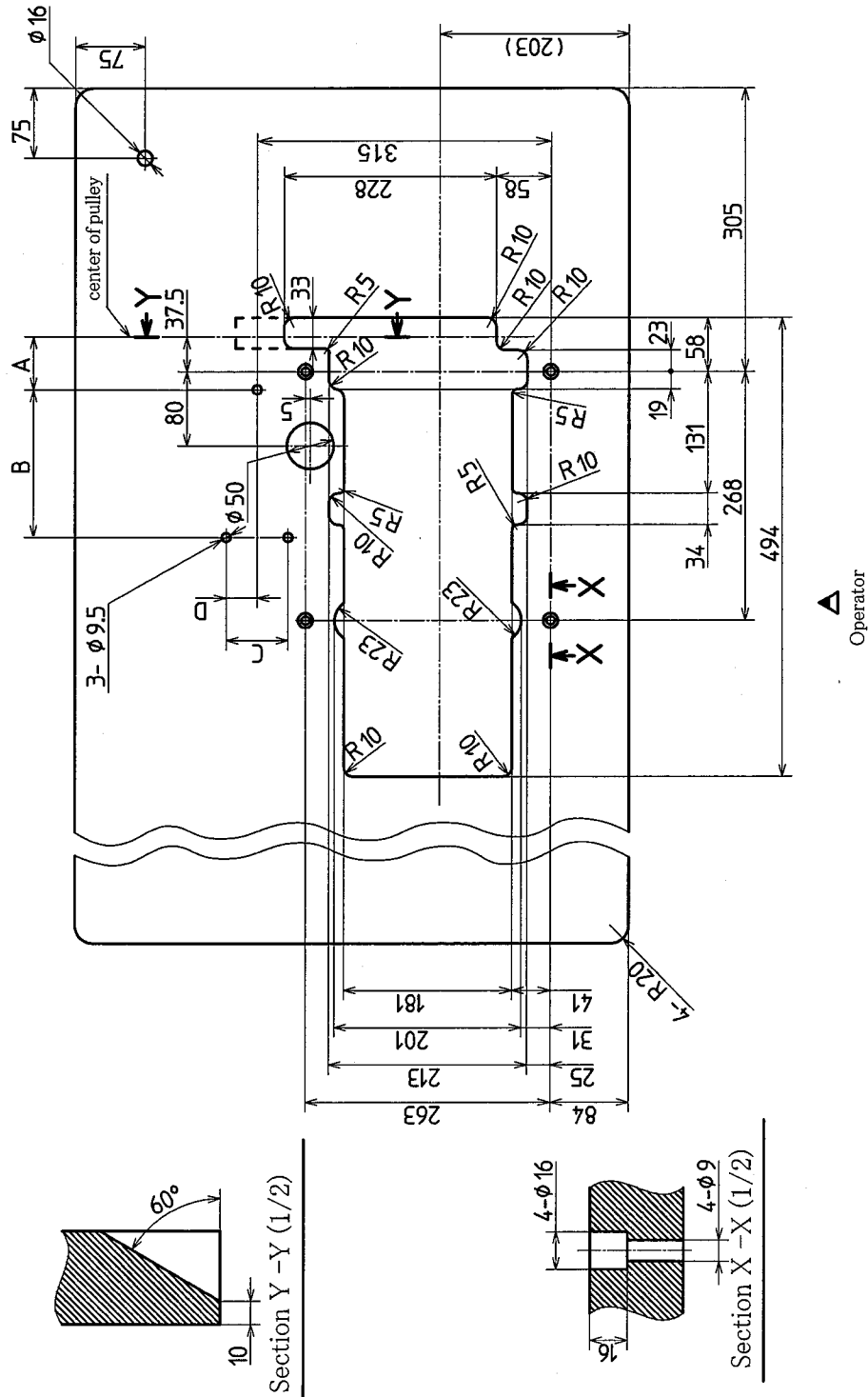


Table dimensions: 1200 × 595 × 40

Fig. 2



## 2. Installation

### 2.1.2 Installation

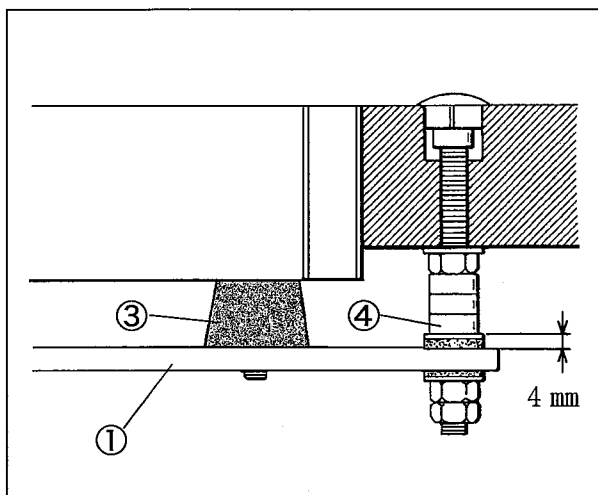


Fig. 4

Install a machine correctly referring to Figs. 4 and 5.  
Set the screws ② in the supporting board ① and cover the screws ② with the rubber cushions ③. Fix the the supporting board ① to the machine table and install a machine securely on the rubber cushions ③.

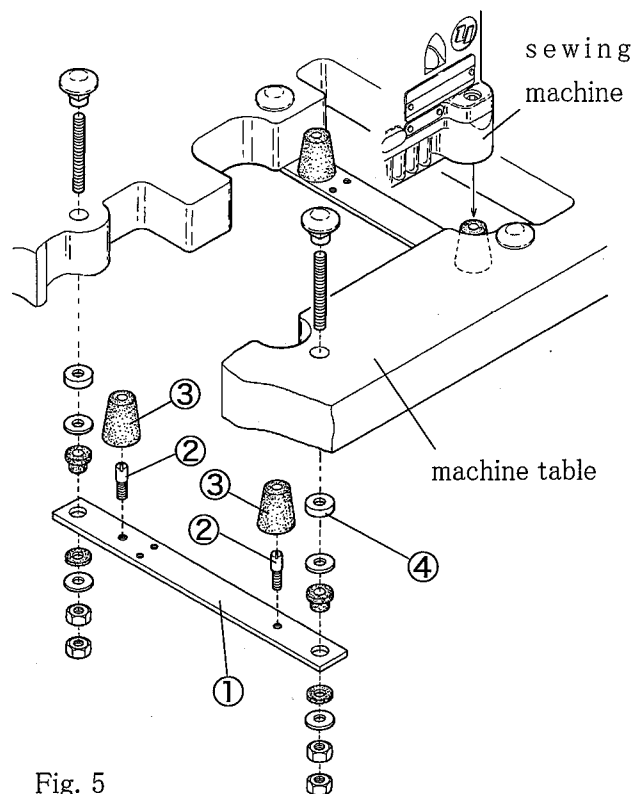


Fig. 5

☆ The number of spacers ④

VF2400 class

Thickness of table	The number of spacers ④
40 mm	3 pcs. × 4 = 12 pcs.
45 mm	2 pcs. × 4 = 8 pcs.
50 mm	1 pc. × 4 = 4 pcs.

## 2.2 Full-submerged type

### 2.2.1 Table cutting diagram

Standard

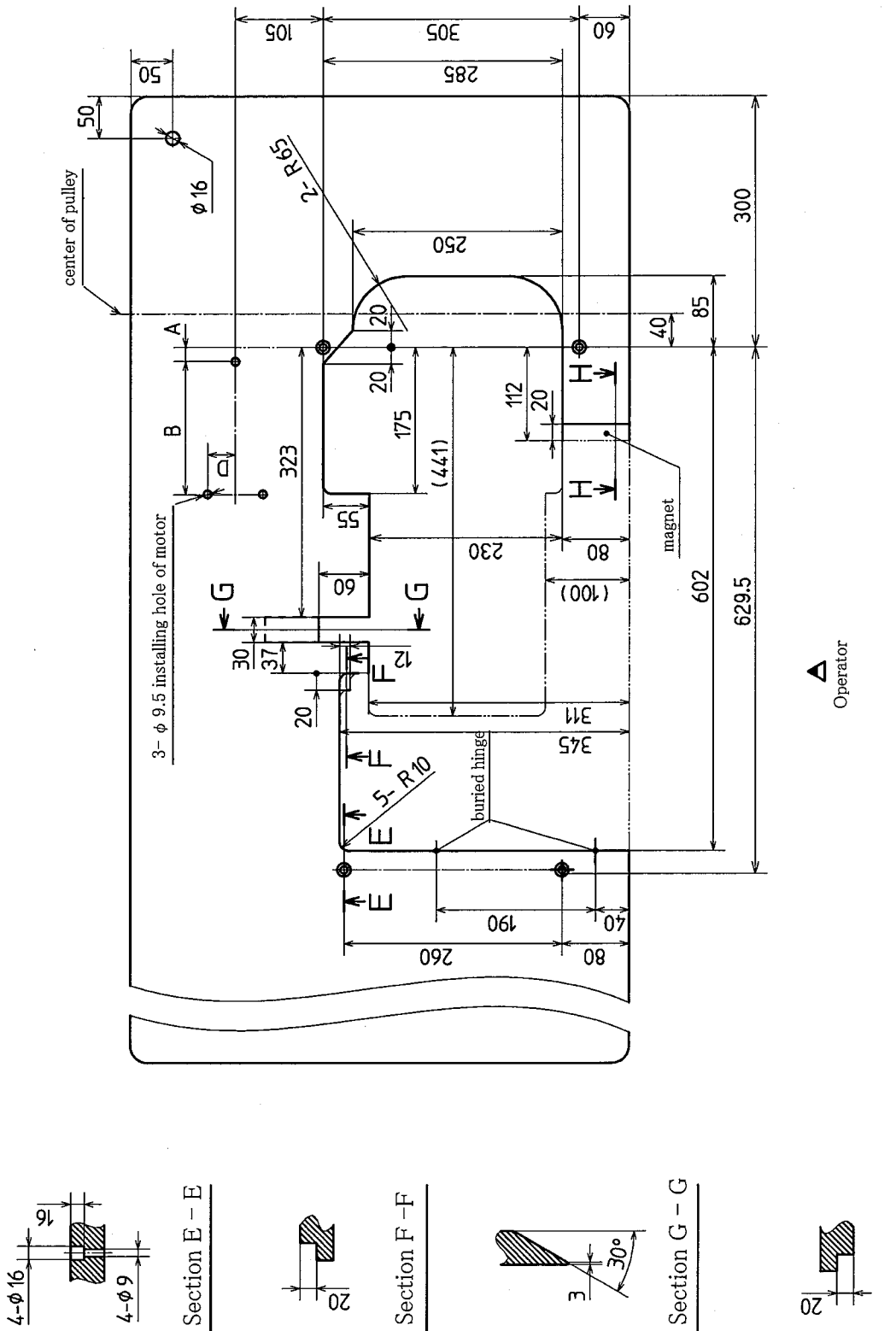
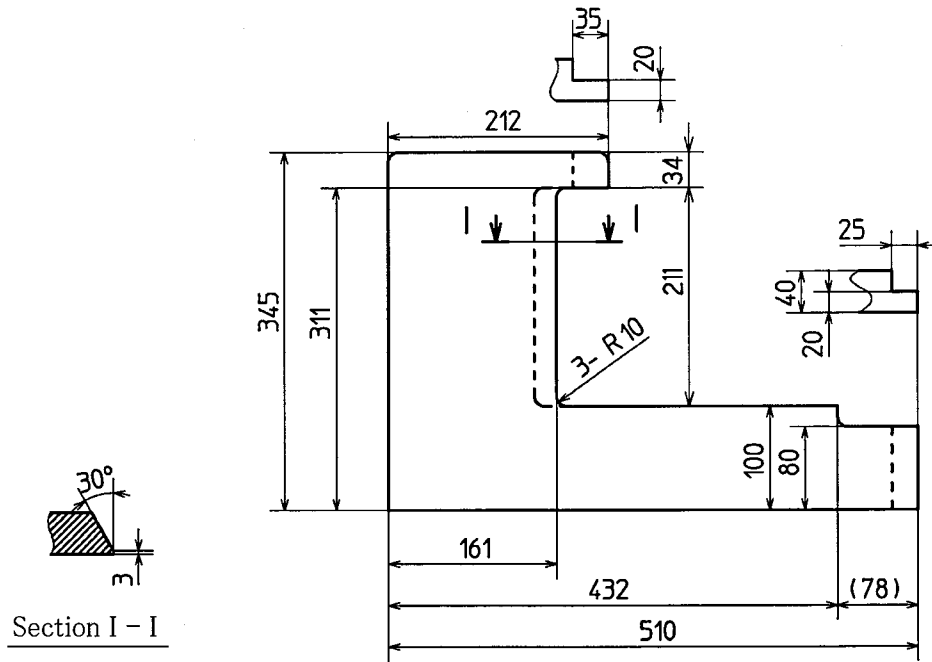


Table dimensions: 1200 × 595 × 40

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

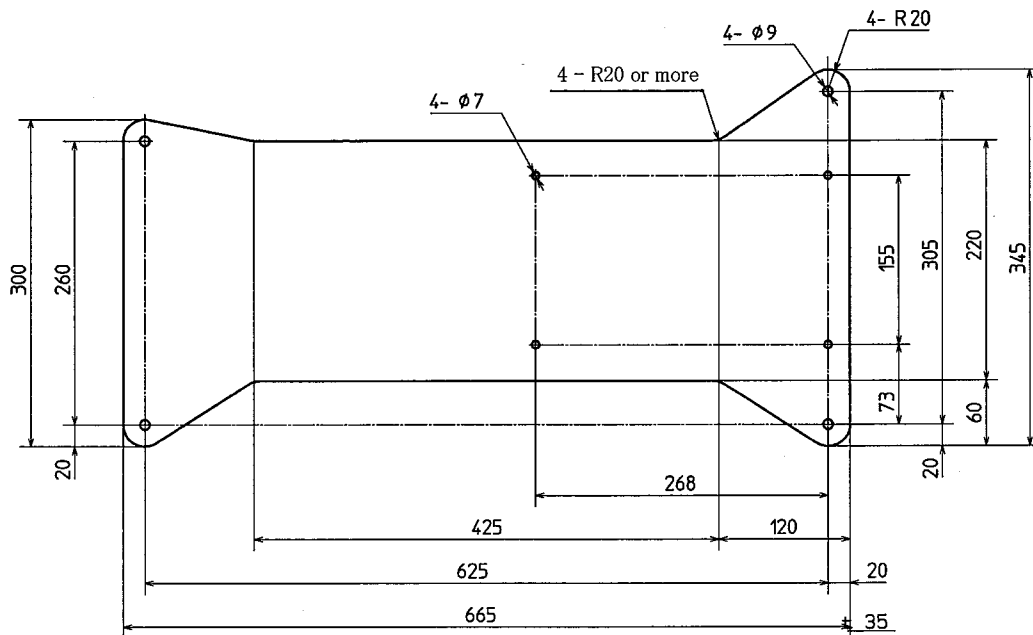
Fig. 6

## 2. Installation



Auxiliary table

Fig. 7



Supporting board

Fig. 8

With K1 device

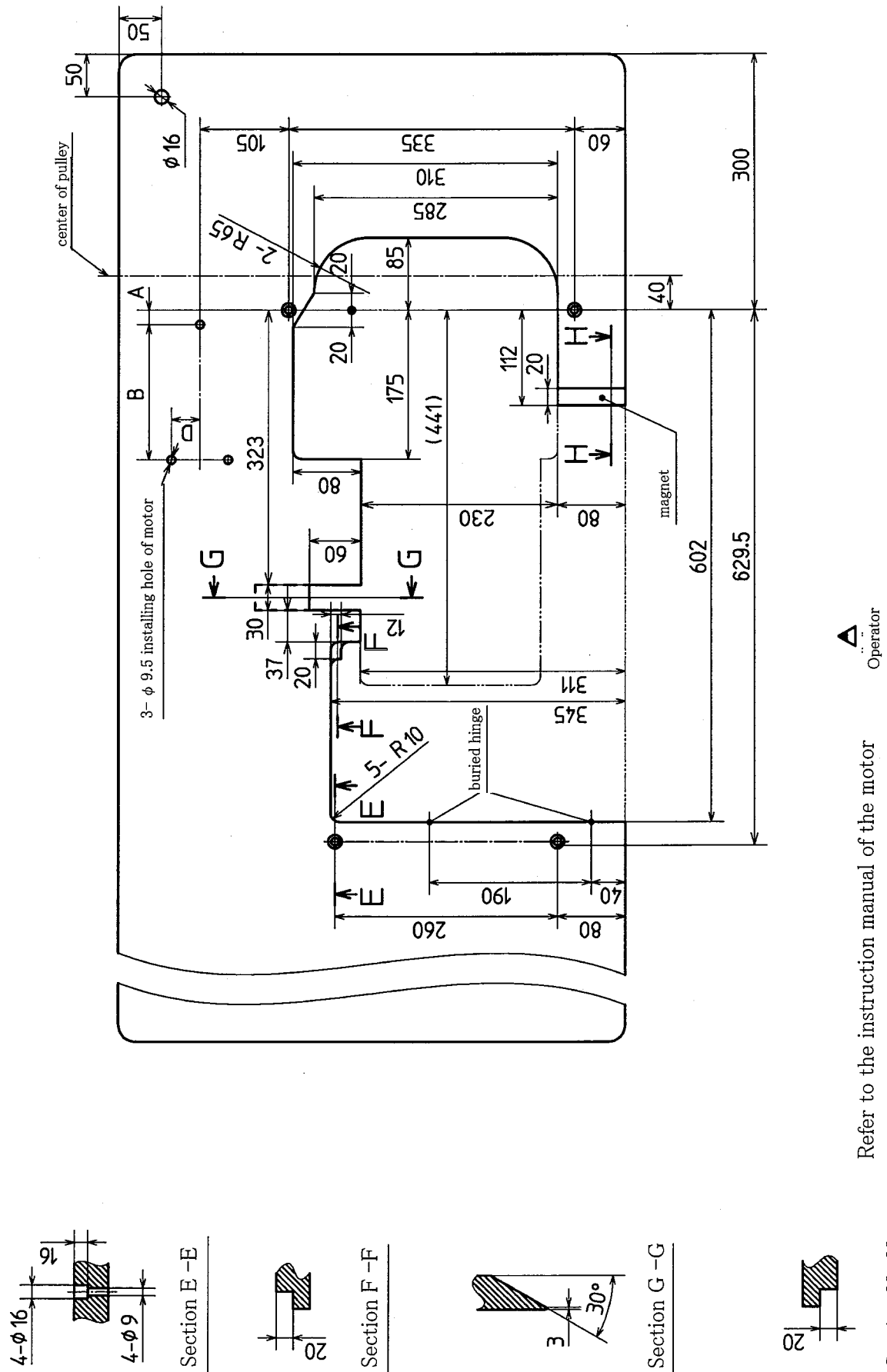
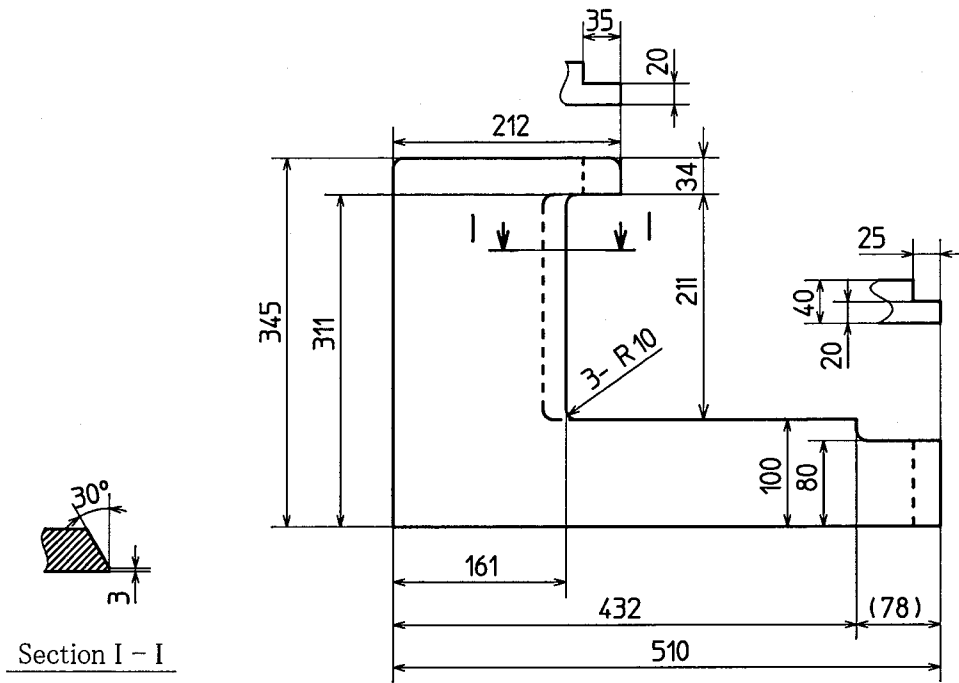


Table dimensions: 1200 × 595 × 40

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

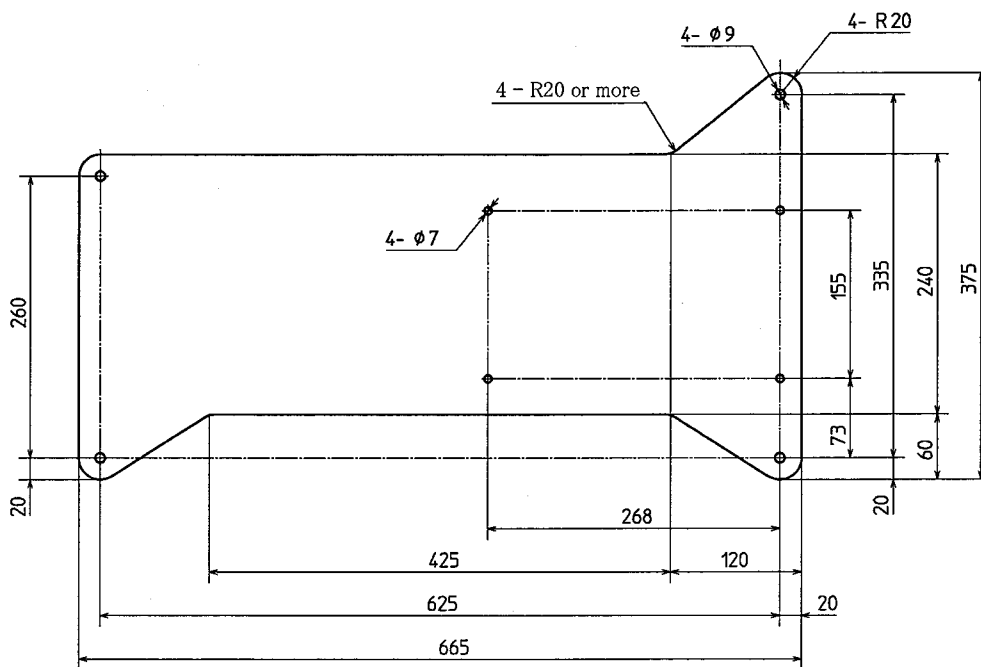
Fig. 9

## 2. Installation



Auxiliary table

Fig. 10



Supporting table

t 35

Fig. 11

## 2.2.2 Installation

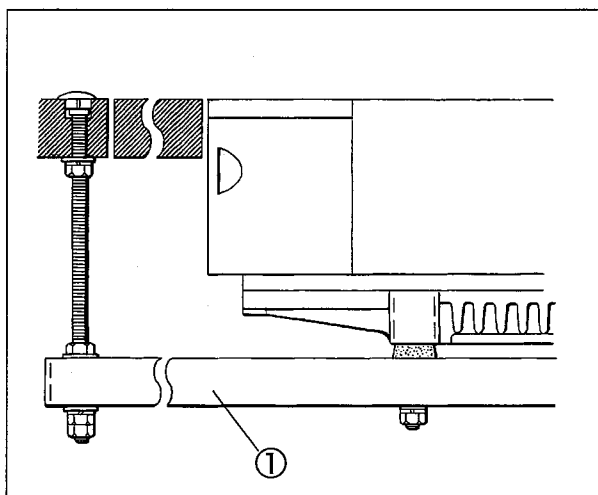


Fig. 12

Install a machine correctly referring to Figs. 12 and 13.  
Set the screws ② in the supporting board ① and cover the screws ② with the rubber cushions ③. Fix the supporting board ① to the machine table and install a machine securely on the rubber cushions ③.

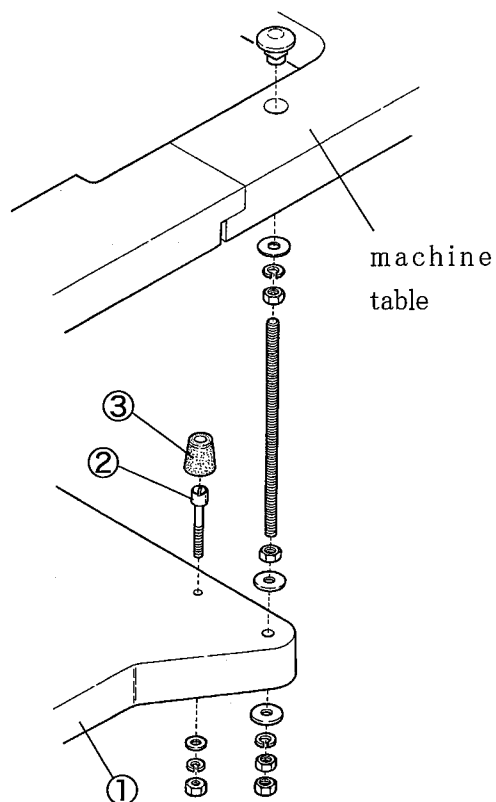


Fig. 13



## 2. Installation

### 2.3 Motor, pulley and belt

See the instruction manual for the motor used and install the motor properly.

#### Clutch motor:

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 while toeing down the pedal.

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

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 applicable, the sewing machine will be over maximum and it can cause the damage to the machine.

#### Servomotor:

Use a servomotor with 500 W or more.

Calculate the outside diameter of a motor pulley from the formula as below.

Or see Table 3 to select a proper motor pulley.

$$\text{Outside diameter of motor pulley} = \frac{\text{Usual sewing speed}}{\text{Servomotor speed}} \times 58 + 5 \text{ mm}$$

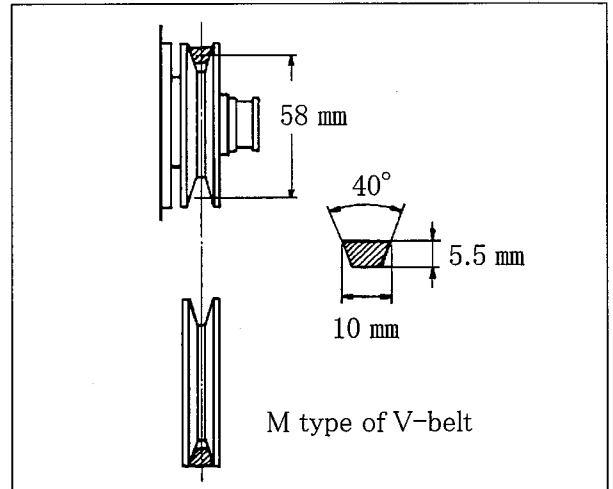


Fig. 14

Outside diameter of pulley (mm)	rpm of machine		Size of belt	
	50Hz	60Hz	Semi-submerged	Fully-submerged
80		4500	M33	M34
85		4800	M33	M34
90		5100	M34	M35
95	4500	5350	M34	M35
100	4800	5650	M34	M35
105	5000	5950	M35	M36
110	5250	6200	M35	M36
115	5500	6500	M35	M36
120	5750	6800	M36	M37
125	6000		M36	M37
130	6200		M36	M38
135	6450		M37	M38
140	6700		M37	M38
145	6950		M38	M39

Table 2

rpm of machine (rpm)	Outside diameter of motor pulley (mm)	
	rpm of servomotor	
	3000 rpm	3600 rpm
4200	86	73
4500	92	78
4700	96	81
5000	102	86
5200	106	89
5500	111	94
5800	117	98
6000	121	102
6200	125	105
6500	131	110
7000	140	118

Table 3

## 2.4 Hanging belt

### WARNING

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

Use the M-type of V-belt.

- (1) Hang the belt ① on the machine pulley ②, and then on the motor pulley ③ while rotating the machine pulley.
- (2) Adjust the belt tension so that the belt has a slack of 10 – 20 mm when its center is pushed with 10 N (1.02 kgf).
- (3) Lock the motor with the adjusting bar ④.

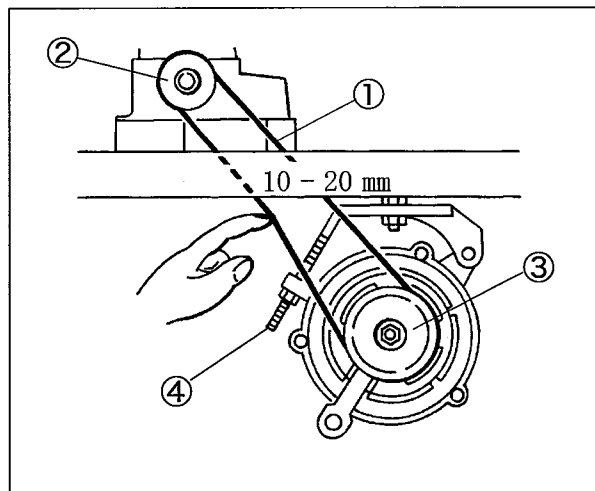


Fig. 15

## 2.5 Belt cover

Set the belt cover ⑤. (Fig. 16)

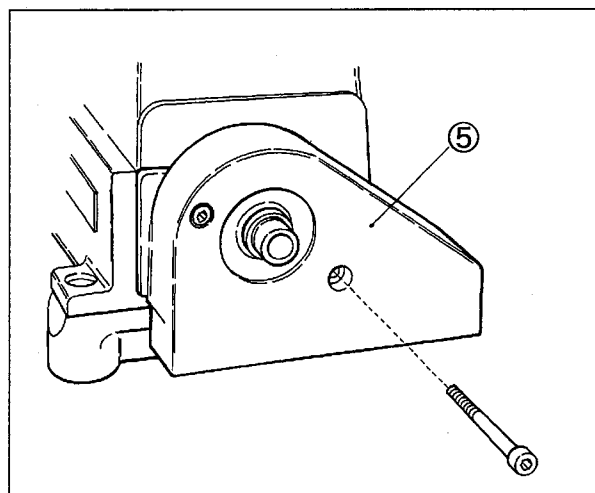


Fig. 16

## 2. Installation

### 2.6 Eye guard and finger guard

To ensure safe use, always install the eye guard ① and the finger guard ② on the prescribed position when operating.

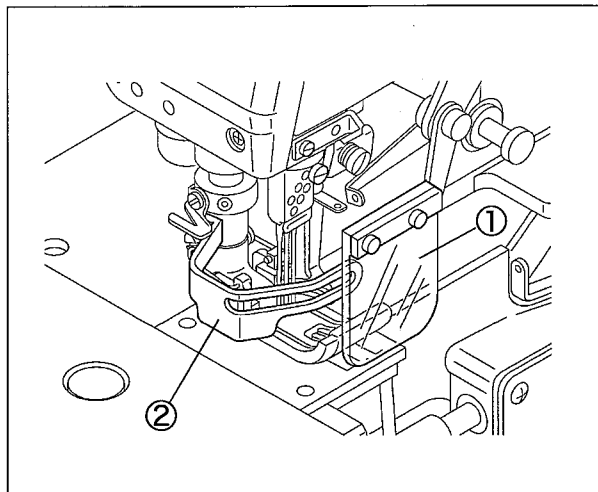



Fig. 17

### 2.7 Thread guide plate

- (1) Put the screws ③ into the hole  of the thread guide plate ④ and push it to the left.
- (2) Fix the thread guide plate ④ with the screws ③ securely.

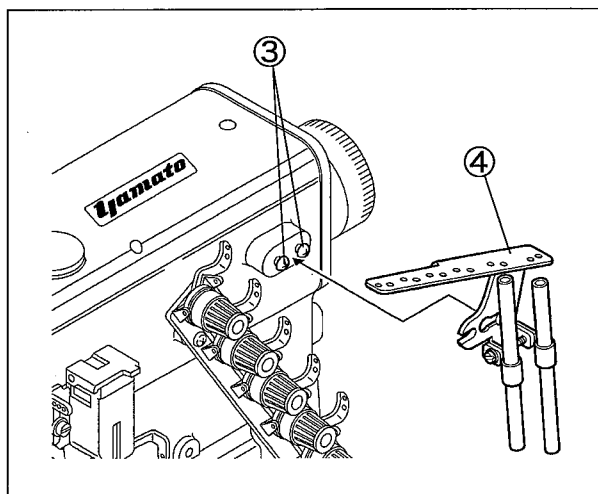


Fig. 18

## 2.8 Tape stand (VF2403, 2404, 2503, 2504)

- (1) Set the tape stand (Fig. 19).
- (2) Fix the tape stand on the machine table with the wood screws ① (Fig. 20).
- (3) Adjust the direction of the tape guide bar ③ to feed a tape into the folder ② smoothly.

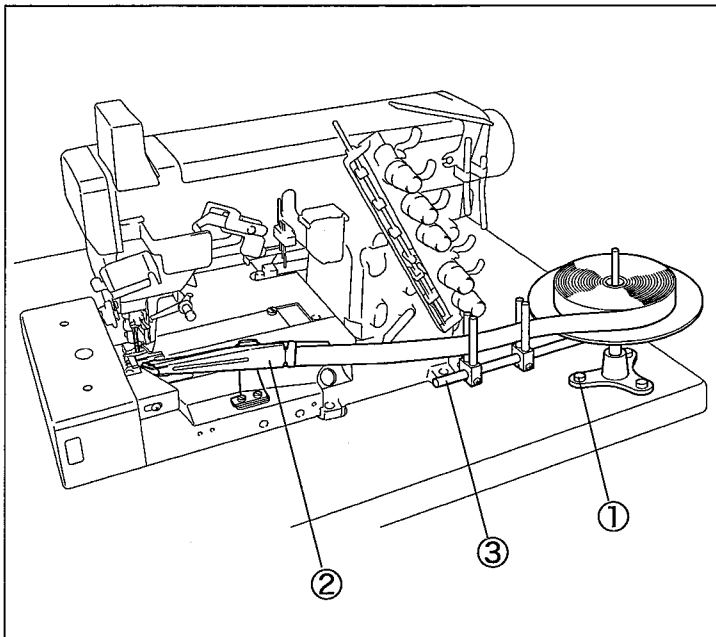


Fig. 20

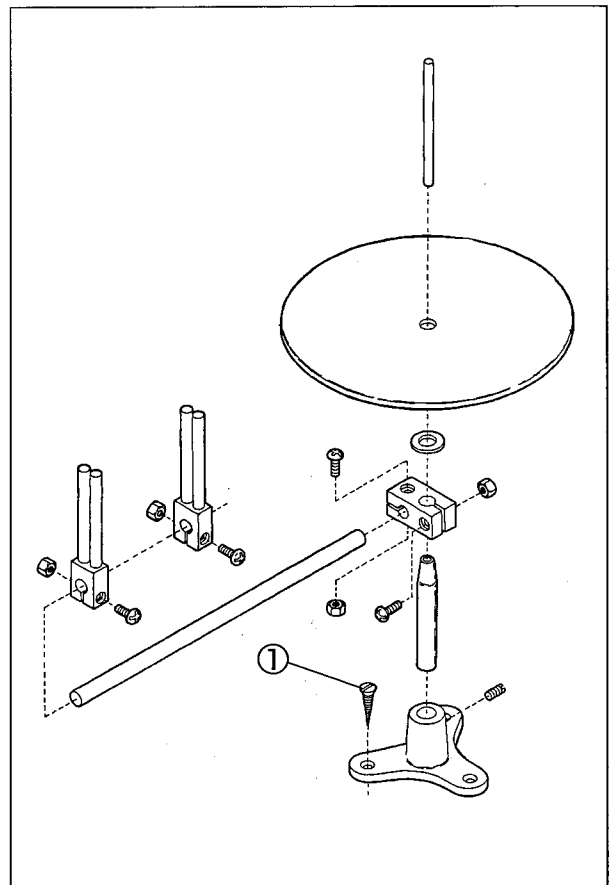


Fig. 19

## 2.9 Tape holder (VF2404, 2504)

Set the tape holder ④ on the screw ⑦ of the top cover and the screw ⑧ of the head cover with the screws ⑤⑥ respectively.

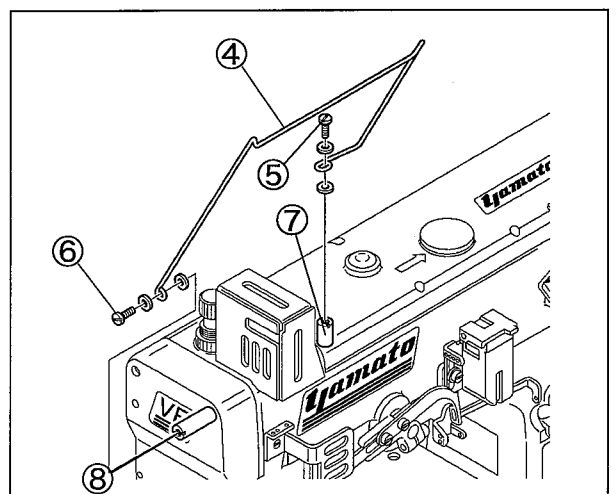


Fig. 21

# 3. Sewing speed and rotating direction of pulley

Table 4 shows maximum sewing speed and standard speed for each model.

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

The rotating directions of the machine pulley ① and the handwheel ② are clockwise as shown in the figure.

## ⚠ CAUTION

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

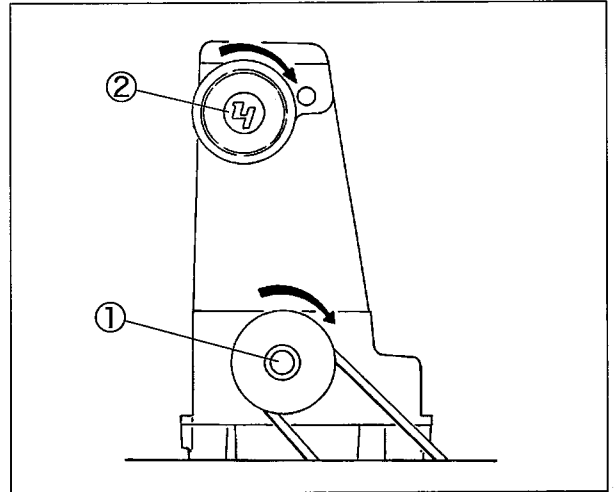


Fig. 22

Model	Max. speed (rpm)	Standard speed (rpm)
VF2400, 2500 (with spreader)	6500	6000
VF2403, 2503 (with spreader)	6000	5500
VF2404, 2504 (with spreader)	5000	4500
VF2411 (without spreader)	7000	6500
VF2530 (with spreader)	5500	5000

Table 4

# 4. Lubrication

## ⚠ WARNING

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.

Remove the seal plug ② indicated “OIL-IN” 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 ③ while running a machine.

If oil does not splash from the nozzle, see “4.4 Checking and replacing oil filter” on page 16.

## ⚠ 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 the oil scatter and material stain.

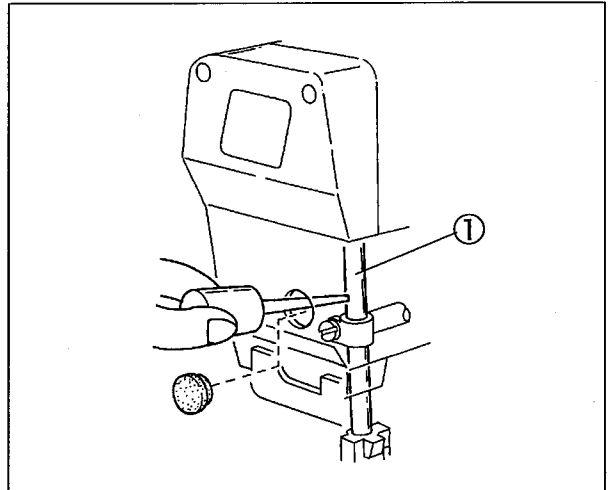


Fig. 23

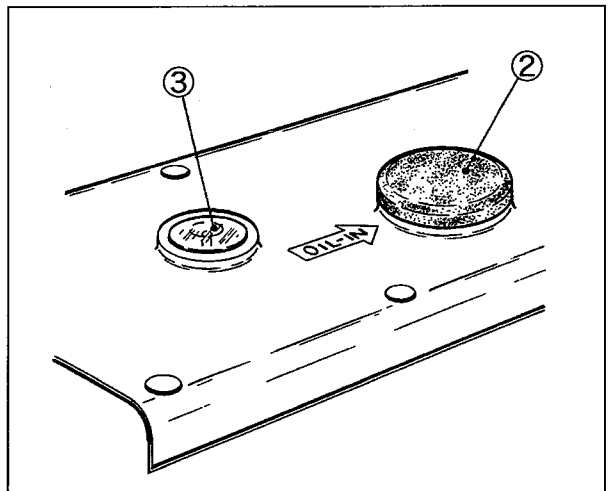


Fig. 24

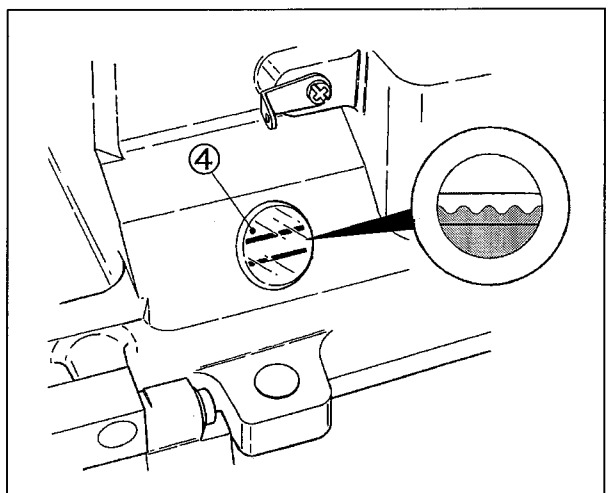


Fig. 25

## 4. Lubrication

### WARNING

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

## 4.3 Changing oil

### Period of changing:

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

### Procedure for changing:

- (1) Remove the belt cover. (page 11)
- (2) Remove V-belt from the motor pulley. (page 11)
- (3) Remove the machine from the machine table.
- (4) Set a container received the oil under the screw ①.
- (5) After removing screw ①, oil is drained.

### NOTE

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

- (6) Reset the screw ①.
- (7) Change the oil. (See “4.2 lubricating” on page 15)
- (8) Reset the machine on the machine table.
- (9) Hang V-belt on the motor pulley and reset the belt cover. (page 11)

## 4.4 Checking and replacing oil filter

- ◆ If the oil filter ② is clogged with dust, lubrication cannot 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 oil is splashed from the nozzle insufficiently or includes many bubbles though the oil is sufficiently kept, check or replace the oil filter.

### NOTE

Carefully check and replace them without spilling oil stagnant in the oil filter ② when loosening screw ④.

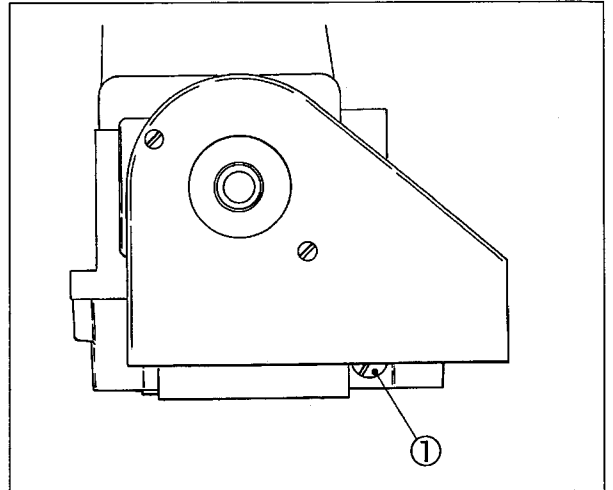


Fig. 26

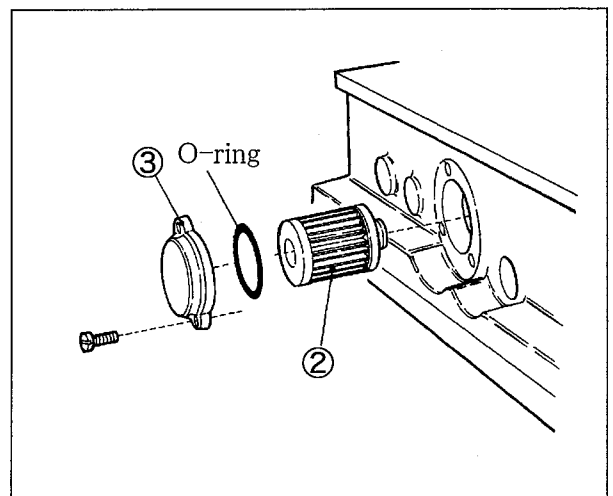


Fig. 27

# 5. Proper operation

## 5.1 Needle system

Use UY × 128GAS (UY128GAS).

Select a proper needle in size depending on the thickness and type of fabric.

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

Table 5

## 5.2 Installing needles



### ⚠ WARNING

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

- (1) Loosen the screws ① with a screwdriver. (Fig. 28)
- (2) Remove an old needle with a pair of tweezers.
- (3) Insert a new needle into the needle clamp ② as far as it will go with facing its scarf to the right back. (Figs. 29 and 30)
- (4) Tighten the screws ① with a screwdriver.

### NOTE

Tighten the screws ① with a tightening torque of 0.6 N·m (6 kgf·cm).

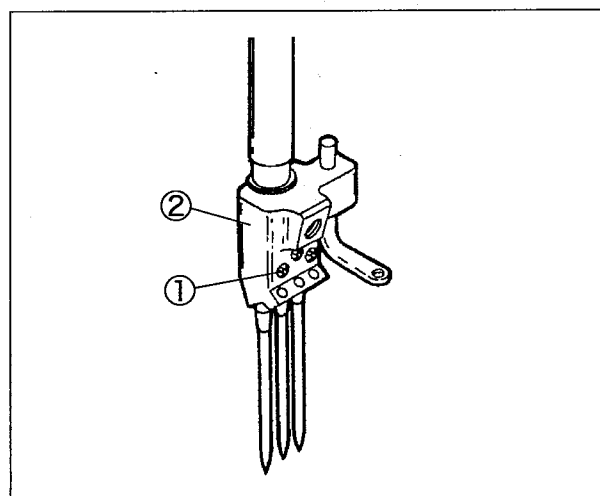


Fig. 28

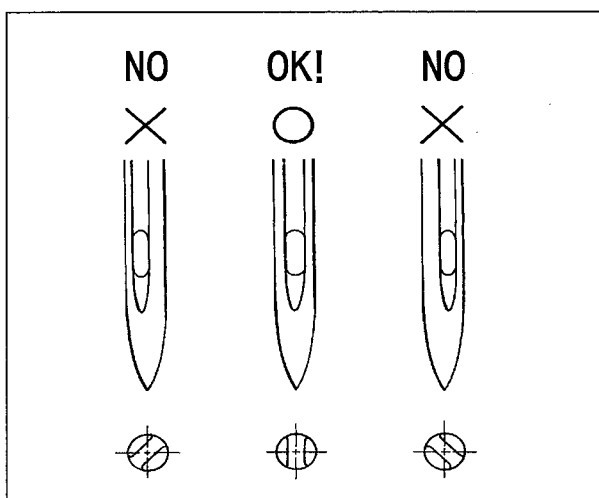


Fig. 29

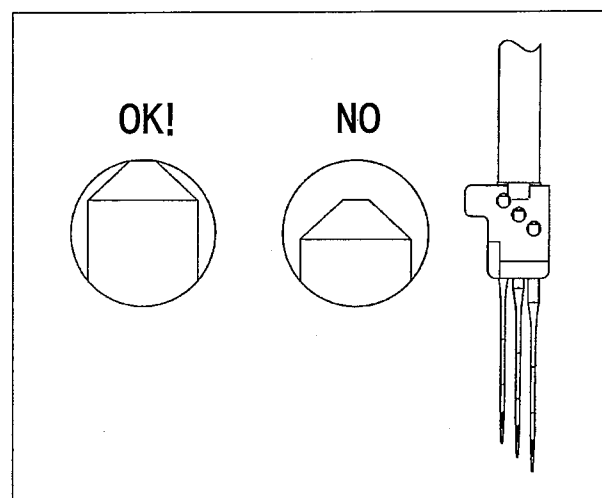


Fig. 30



## 5. Proper operation

### 5.3 Threading



When threaded, rethread after knotting preset threads.  
When not threaded, thread correctly as shown in Fig. 31.

Incorrect threading can cause skip stitch, thread breakage, or uneven seam.

A, B, C: Needle thread    D: Top cover thread    E: Loper thread

Fig. 31 shows threading for 3-needle machine. Two needle threads are used for 2-needle machine.

#### Needle thread

Pull out the thread until it is in front of the needles. Then, cut off the knots before needle eye to rethread.  
Thread correctly for the left needle in the inmost position as shown in the figure.

#### Looper thread

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

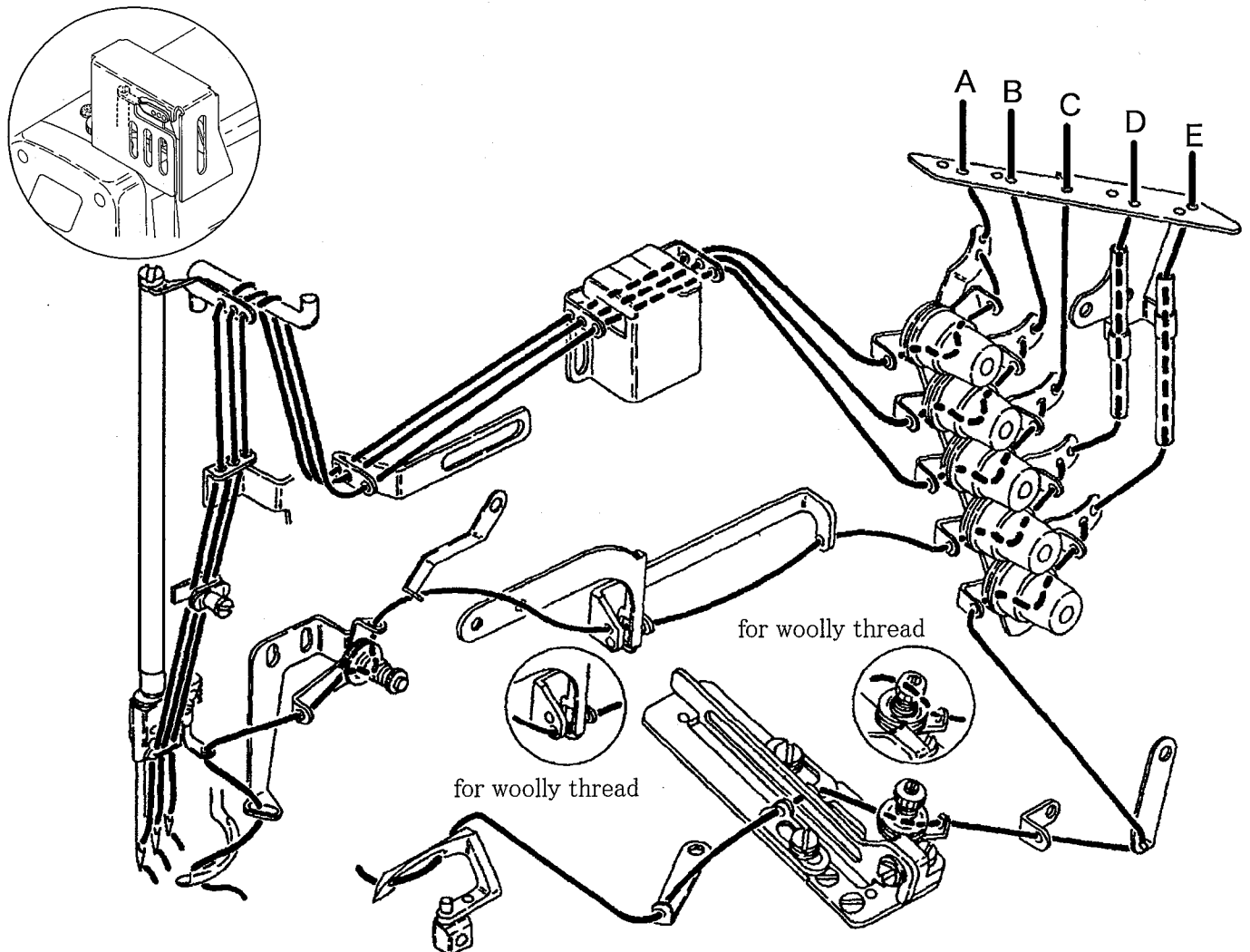


Fig. 31

## 5.4 Adjusting thread tension



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

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

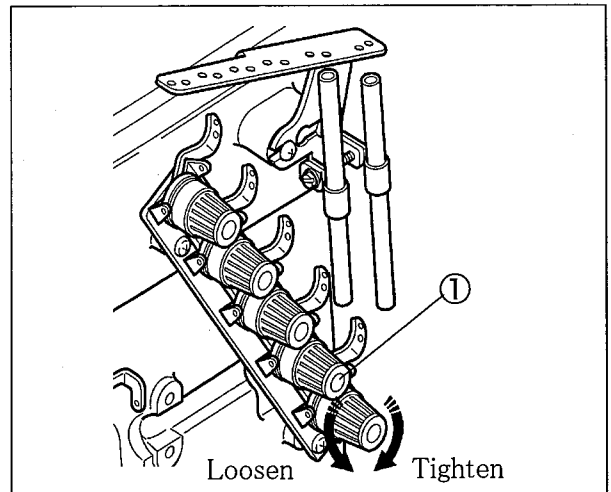


Fig. 32

## 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 as low as possible for stable sewing performance.

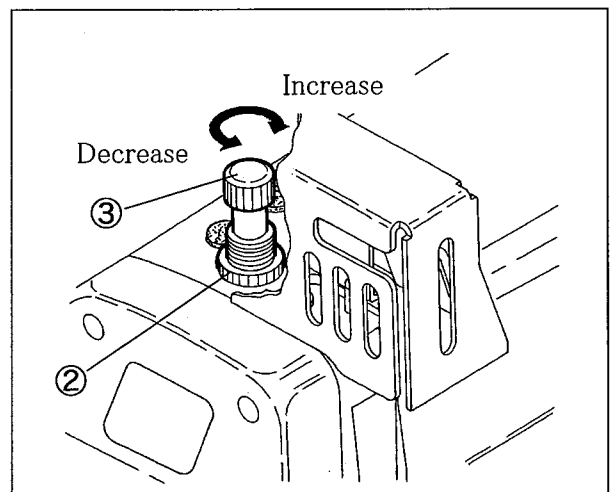


Fig. 33

## 5.6 Adjusting position of presser foot

### WARNING

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 needles drop in the centers of the needle drops respectively.

Then, tighten the screw ④ securely.

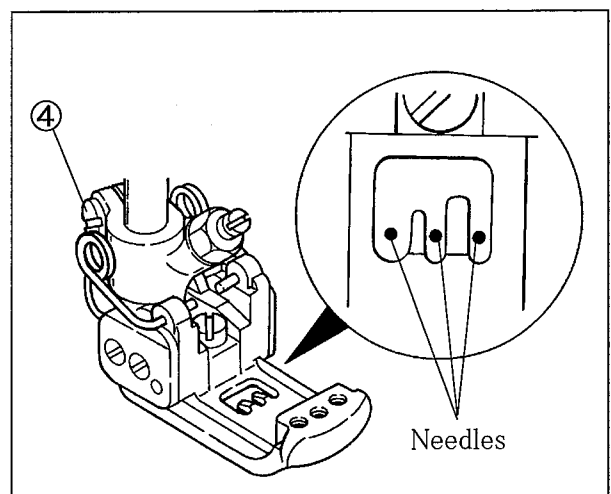


Fig. 34

## 5.7 Adjusting differential feed dog



(1) Normal differential feed (gathering)

Loosen the nut ① and move the differential lever(left) ② up or down to set it at the desired position. Tighten the nut ① securely.

When the differential lever(left) is set at graduation (Long) ③, the ratio of main feed to differential feed is 1 : 1.

To obtain normal differential feed, raise the differential lever(left) above the graduation ③. The maximum ratio of main feed to differential feed is 1 : 2.

(2) Reverse differential feed (stretching)

To obtain reverse differential feed, lower the differential lever(left) below the graduation ③.

When it is set at "S", the ratio of main feed to differential feed is 1 : 0.7.

(3) Adjustment of differential feed during operation

To adjust differential feed during operation, connect the chain to the differential lever(left).

Fix Stop ④(2pcs.) at the desired position to set upper and lower limits between which the differential lever(left) is moved up and down.

☆Table 6 shows the range of differential ratio depending on the stitch length.

Stitch length (mm)	Max. normal differential	Max. reverse differential
3.6	1:1.2	1:0.7
2.5	1:1.6	1:0.7
2.0	1:1.8	1:0.7
1.4	1:2	1:0.7

Table 6

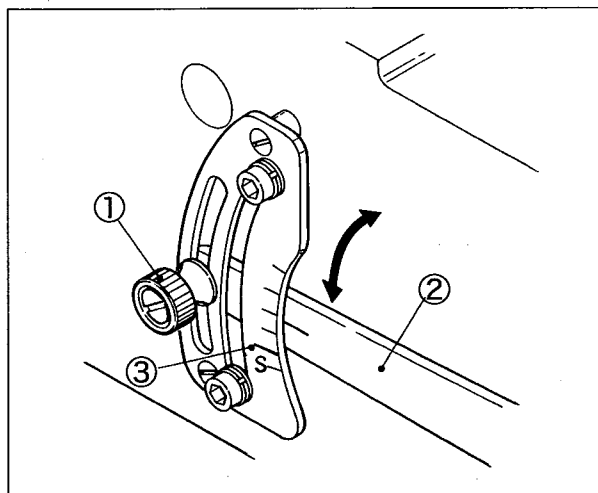


Fig. 35

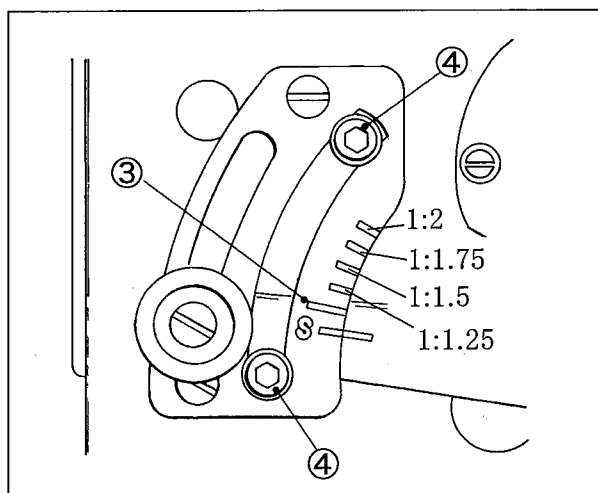


Fig. 36

## ⚠ WARNING

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

### 5.8 Adjusting stitch length



Stitch length can be adjustable from 1.4 to 3.6 mm.

Table 7 shows the number of stitches per inch (25.4 mm) and 30 mm converted to the stitch length.

Stitch length (mm)	Number of stitch (per 1 inch) (25.4 mm)	Number of stitch (per 30 mm)
1.4	18	21
2.0	13	15
3.0	8.5	10
3.6	7	8

Table 7

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

After sewing, the actual stitch length has difference from the length on graduation. It depends on the application, a type and a thickness of fabric, or the differential ratio.

- (1) Rotate the pulley while the pushing pushbutton ①. At the point as far as it will go, again push it securely.
- (2) With keeping that, align desired graduation of the pulley with the mark ② on the machine.
- (3) Release the pushbutton ①.

- To decrease stitch length, turn the pulley in the direction "S".
- To increase stitch length, turn the pulley in the direction "L".

## ⚠ CAUTION

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

### Pushbutton stop:

Use the pushbutton stop ④ to keep the stitch length to be set.

Loosen the screws ③ to raise the pushbutton stop ④.

After setting it under the pushbutton, tighten the screws ③ securely.

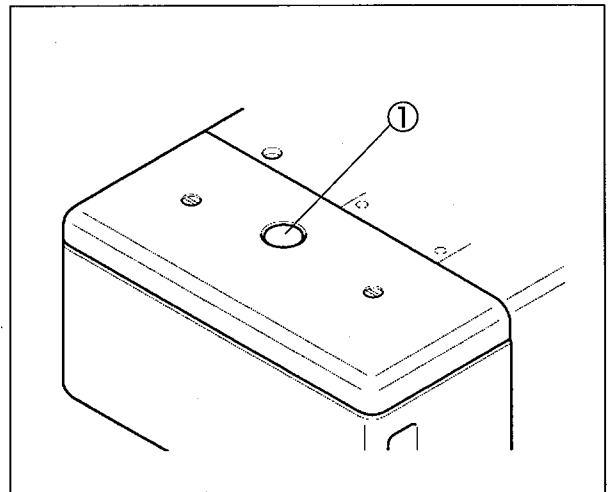


Fig. 37

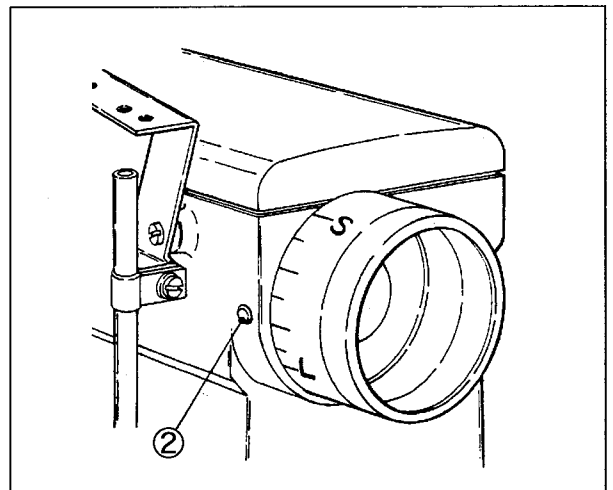


Fig. 38

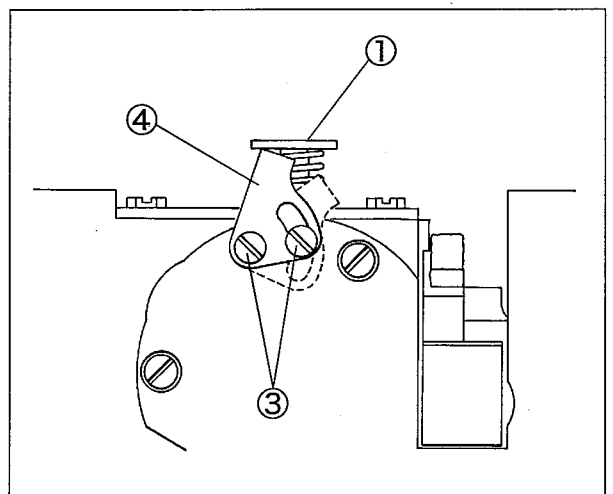


Fig. 39

## 5. Proper operation

### 5.9 HR device and SP device

Use SP device (needle thread oiling) and HR device (needle point cooling) as standard equipment to prevent thread breakage and skip stitch when running a machine at high speed or using synthetic thread and/or synthetic fabric.

Use dimethyl silicon oil.

Note: Open the seal plug ① of HR container and the lid ② of SP container to check the oil level. Supply oil if needed.

#### CAUTION

1. When not using SP or HR device, remove the felt ③ or ④. If attached, it may occur irregular condition during sewing.
2. If silicone oil is attached to the parts other than SP and HR devices, it can cause the machine trouble. Be sure to wipe it away.

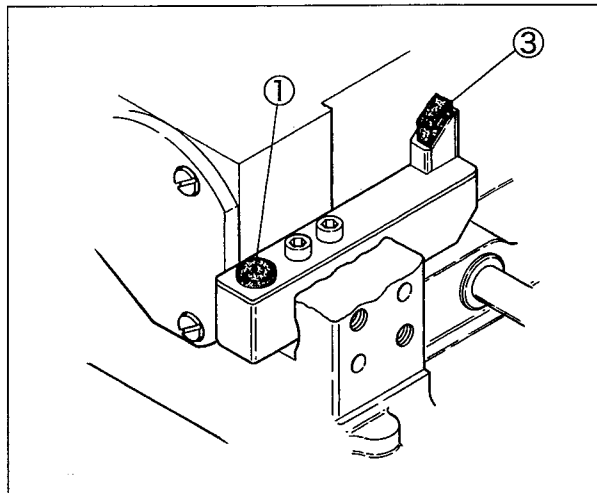


Fig. 40

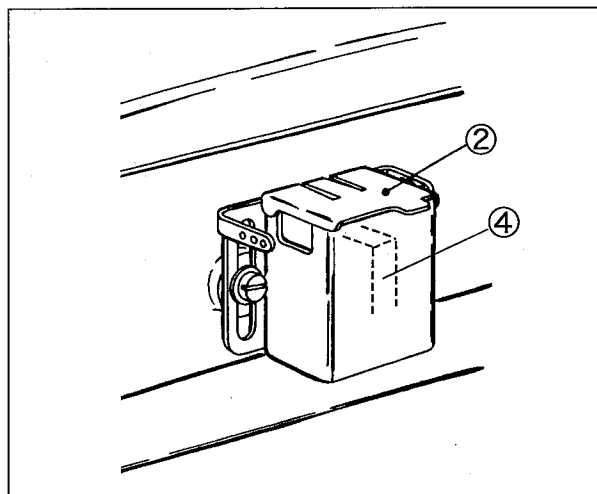


Fig. 41

## ⚠ WARNING

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

### 5.10 Setting tape (VF2403, 2503, 2404, 2504)

Set the tape role on the tape stand ① (Fig. 42).

Pull a tape forward through the folder ② and set it under the presser foot ③.

Unmatched folder width with tape width cannot be folded properly.

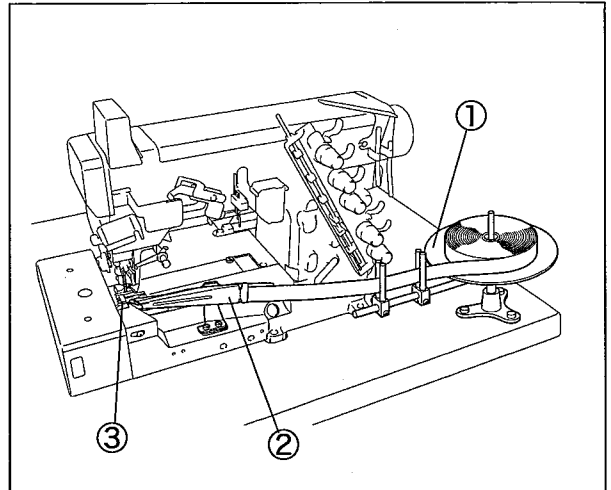


Fig. 42

### 5.11 Metering device (only for VF2404 and VF2504)

#### 5.11.1 Setting elastic tape



Set an elastic tape correctly (Fig. 43).

Pushing the roller lever ④ can make a clearance between the rollers.

Set an elastic tape under the presser foot ⑤ and pull it forward.

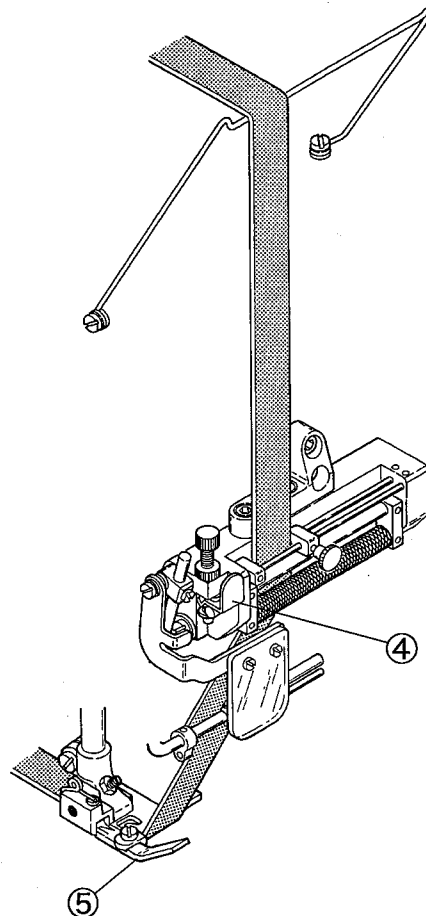


Fig. 43

## 5. Proper operation

### WARNING

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

#### 5.11.2 Feeding amount of elastic tape

Loosen the nut ① and adjust feeding amount while checking the pointer ② and the graduations of the clutch lever ③ as below.

- To increase feeding amount, turn the adjusting screw ④ clockwise and move the pointer ② in the direction "L".
- To decrease feeding amount, turn the adjusting screw ④ counterclockwise and move the pointer ② in the direction "S".

Tighten the nut ① securely after adjusting.

Note: After tightening the nut ①, turn the adjusting screw ④ clockwise to tighten it securely without play.

If required feeding amount cannot be obtained by above adjusting with the adjusting screw ④, loosen the screw ⑤ and adjust it as below.

- To decrease feeding amount, turn the adjusting screw ⑥ clockwise.
- To increase feeding amount, turn the adjusting screw ⑥ counterclockwise.

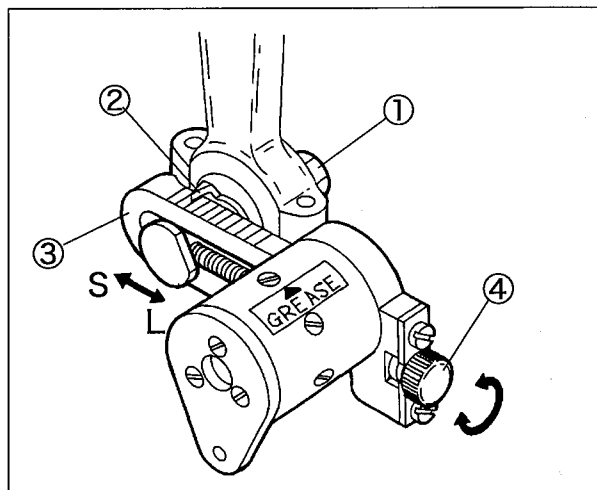


Fig. 44

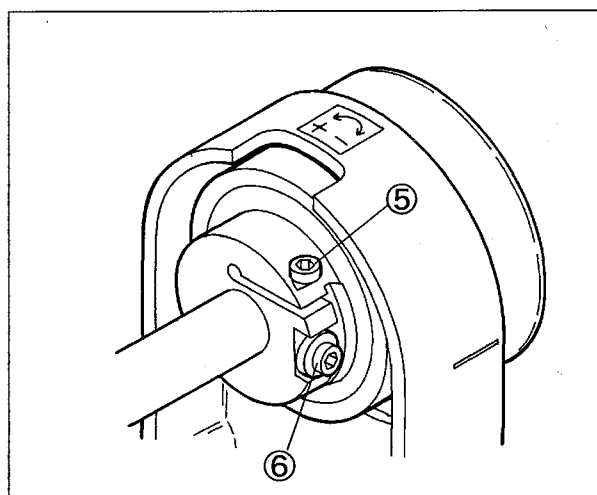


Fig. 45

## ⚠ WARNING

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

### 5.12 Adjusting hemming guide (VF2411)

#### Hemming guide(left):

- (1) Loosen the screw ② of the hemming guide(left)①.
- (2) Adjust right-and-left position to align the fabric end to the left needle.
- (3) Tighten the screw ② securely.

#### Hemming guide(right):

- (1) Loosen the screws ④ of the hemming guide(right)③.
- (2) Adjust right-and-left position to align the fabric end with hemming width.
- (3) Tighten the screws ④ securely.

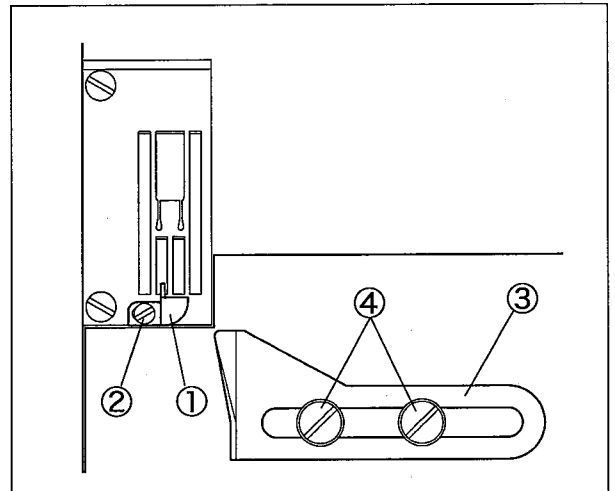


Fig. 46

### 5.13 Cleaning the machine

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

Clean the grooves in the stitch plate, feed dog area, and looper thread take-up area once a week.

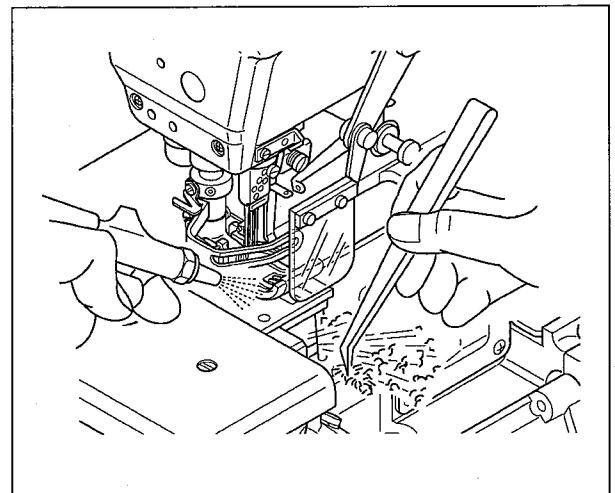


Fig. 47



# 6. Adjustments

## ⚠ WARNING

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

### 6.1 Needle thread tension

As standard, make the distance between the needle thread take-up ① and the center of the left screw ② to 52 mm, and set the part “a” horizontally when the needle bar is at the highest point.

#### Adjusting:

- (1) Loosen the screws ②.
- (2) Move the needle thread take-up ① to adjust it.
  - To tighten the needle thread tension, move the needle thread take-up ① in the direction “T” .
  - To loosen the needle thread tension, move the needle thread take-up ① in the direction “L” .
- (3) Tighten the screws ② securely.

If not enough for adjusting above, move the needle thread eyelet ③ to adjust it.

Make the distance between the top of the needle thread eyelet and the center of the screw ④ to 8 mm as standard.

#### Adjusting:

- (1) Loosen the screw ④ .
- (2) Move the needle thread eyelet ③ to adjust it.
  - To tighten the needle thread tension, move the needle thread eyelet ③ in the direction “T” .
  - To loosen the needle thread tension, move the needle thread eyelet ③ in the direction “L” .
- (3) Tighten the screw ④ securely.

☆ As the the needle thread loop is difficult to be formed depending on the thread used, the looper cannot catch the needle thread. It can cause skip stitch.  
Then thread the needle thread through the needle thread retainer dice.

Note: With UT device, do not use the needle thread retainer dice because it cannot form seams at the beginning of sewing.

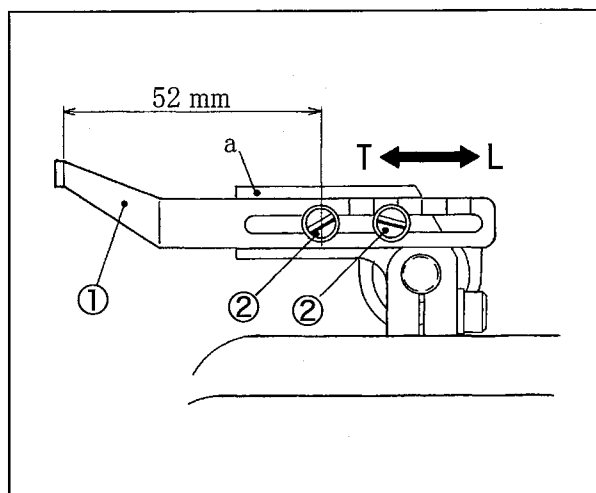


Fig.48

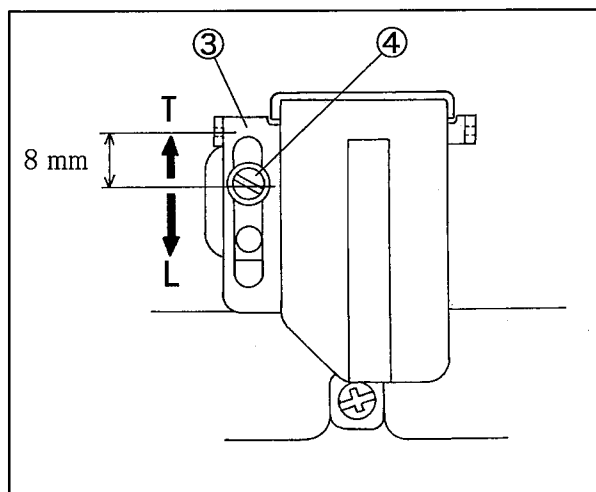


Fig. 49

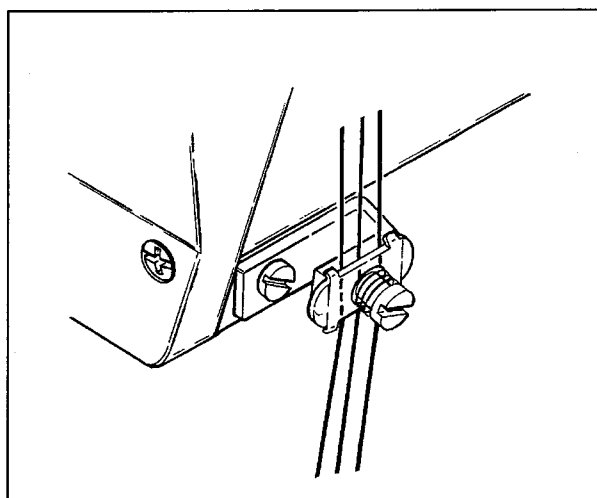


Fig. 50

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

As standard, align the center of the needle bar thread eyelet① eye even with the top of the needle thread guide ②, and they are parallel when the needle bar is at the lowest point.

Loosen the screw③ to adjust the height and right-and-left position of the needle thread guide ②.

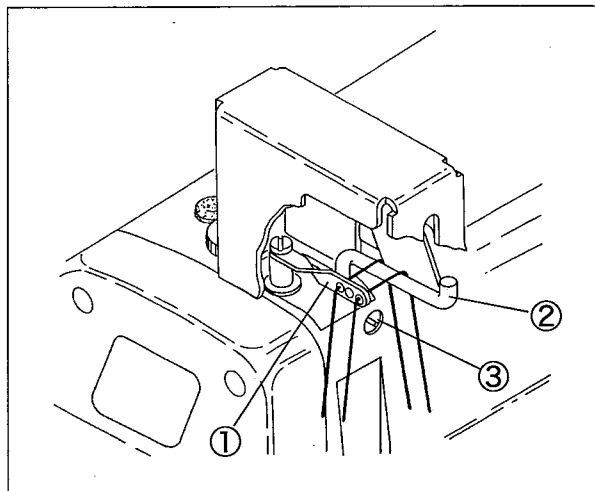


Fig. 51

## 6.2 Top cover thread tension

Loosen the screw ⑤ and move the top cover thread eyelet (right)④ to adjust it.

- To decrease take-up amount, move the top cover thread eyelet(right)④ in the direction "T" .
- To increase take-up amount, move the top cover thread eyelet(right)④ in the direction "L" .

When using stretchable thread like woolly, move the top cover thread eyelet(right)④ in the direction "L" .

Note: Thread woolly thread through the lower eye.

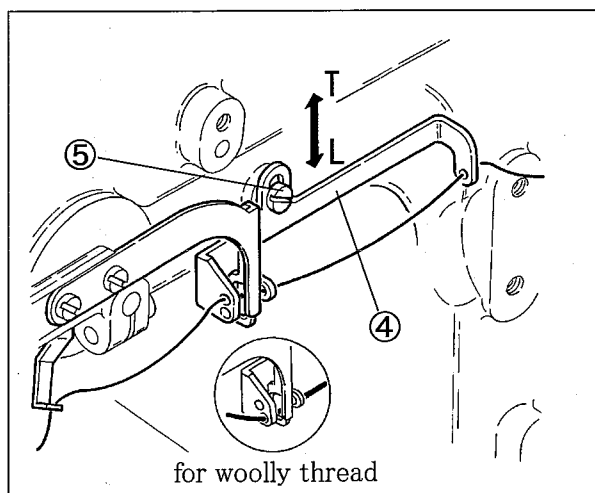


Fig. 52

## 6. Adjustments

### 6.3 Looper thread tension

#### 6.3.1 Looper thread tension

The figures show the supporting plate.

Align the eyes of the thread take-up eyelets ③④ with mark ○ ② of the cast-off plate ① as standard.

Loosen the screws ⑥ and move each eyelet to adjust it.

- To increase take-up amount, move the thread take-up eyelets forward.
- To decrease take-up amount, move the thread take-up eyelets forward.

#### NOTE

Too much take-up of the looper thread can cause skip stitch.

#### For woolly thread:

Move the thread take-up eyelets ③④ forward fully and never thread it through the supplementary tension disc ⑤.

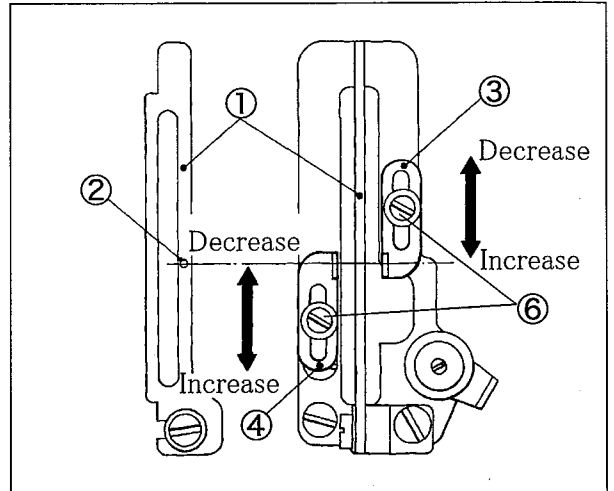


Fig. 53

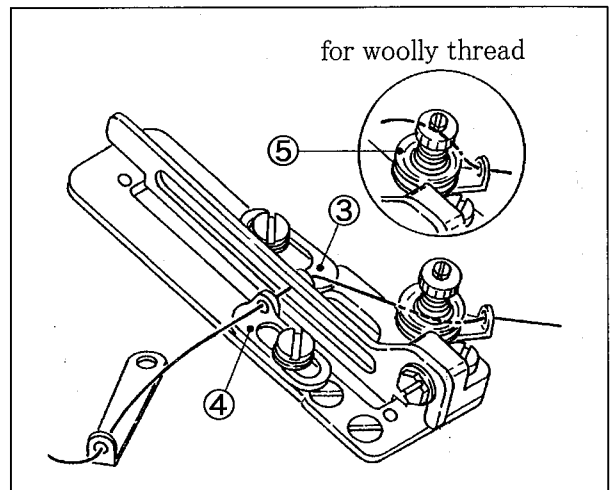


Fig. 54

#### 6.3.2 Position of looper thread take-up

Fig. 55 shows the looper thread take-up seen from the needle bar side.

When the left needle lowers from the highest point and meets a half of the looper, the thread comes off from the top of the looper thread take-up. Loosen the screws ⑦ to adjust it.

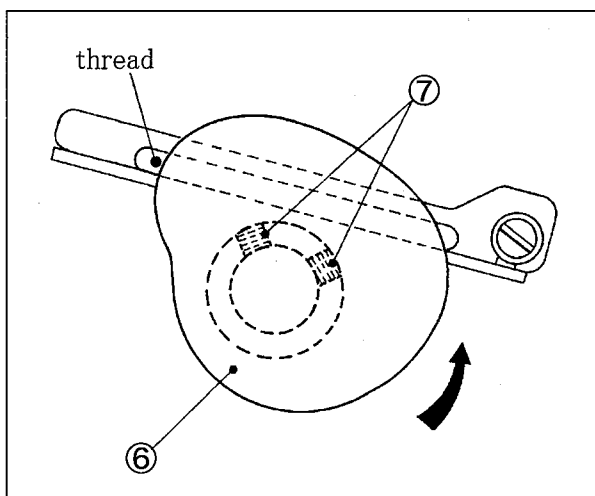


Fig. 55

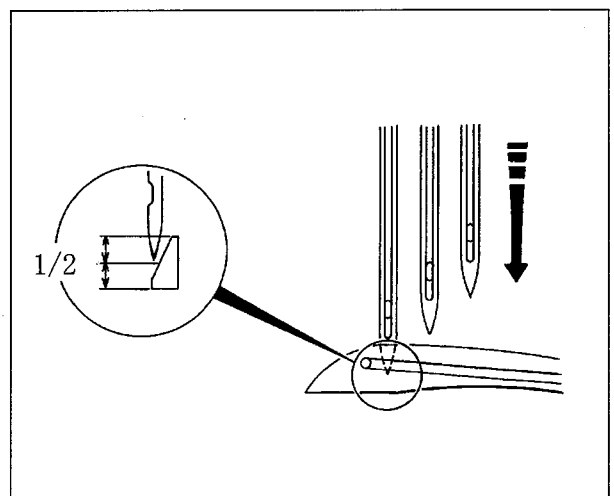


Fig. 56

## 6.4 Removing presser foot and presser foot lift

### Removing presser foot

- (1) Loosen the screws ② of the lifter lever stop ①, the screws ④ of the collar ③, and the screw ⑧ of the presser foot ⑦.
- (2) Push down the lifter lever ⑤ to remove the presser foot ⑦.

### Adjusting height of presser foot

- (1) Push down the lifter lever ⑤ to make the height from the top of the stitch plate to the bottom of the presser foot to 7.0 mm (with spreader, needle distance 5.6 mm on VF2500).
- (2) Tighten the screws ② securely.
- (3) With keeping that, make the clearance between the end of the presser bar bushing ⑥ and the top of the collar ③ to 0.2 mm.
- (4) Tighten the screws ④ securely.

After adjusting, push down the lifter lever ⑤ fully to check the height of the presser foot.

Presser foot lift depends on the machine model or needle distance.

See “7. Specifications” in detail.

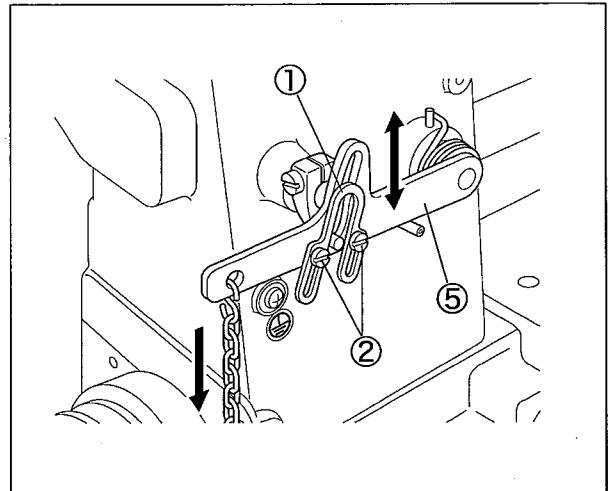


Fig. 57

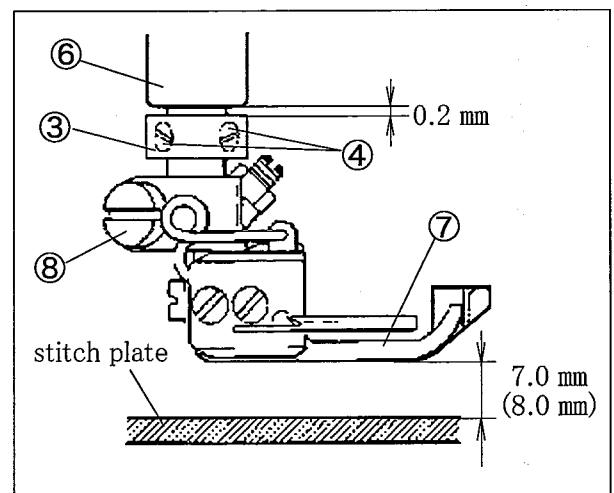


Fig. 58

## 6. Adjustments

### 6.5 Looper

#### 6.5.1 Installing angle and height of looper

Insert the looper ① into the looper holder ② fully and tighten the screw ③ securely.

It makes the height and installing angle (3° ).

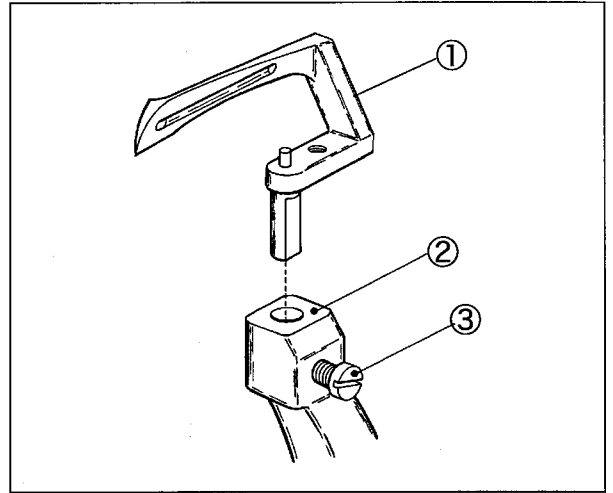


Fig. 59

#### 6.5.2 Distance between looper and needle

The distance “M” 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 7 and loosen the screw ④ of the looper holder to adjust the distance.

#### NOTE

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

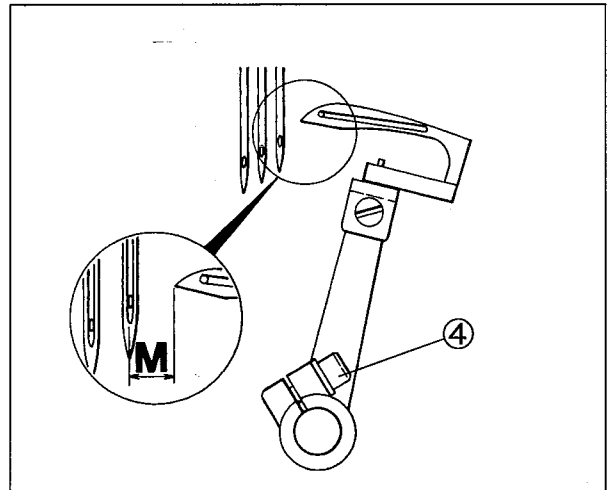


Fig. 60

needle distance	gauge mark	looper's distance “M”
3.2 mm	A	4.4 mm
4.0 mm	B	4.0 mm
4.8 mm	C	3.6 mm
5.6 mm	D	3.2 mm
6.4 mm	E	2.8 mm

Table 7

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

The gauge is an extra part. Place an order from our agents or directly from us.

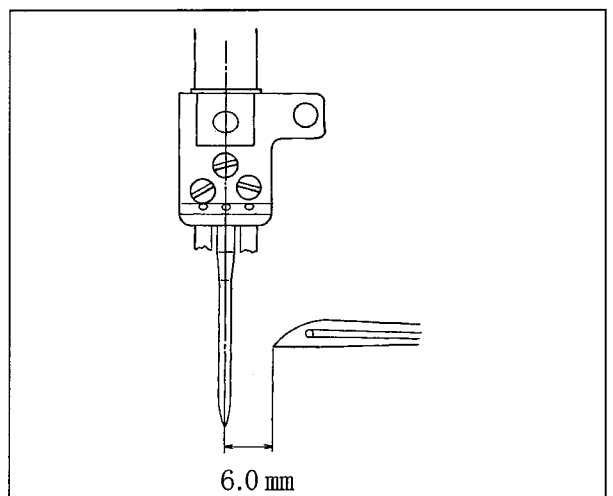


Fig. 61

### 6.5.3 Using timing gauge

A timing gauge has the marks (A, B, C, D, E) for each needle distance (Table 7).

Move the looper at 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 ④ securely. (Fig. 60)

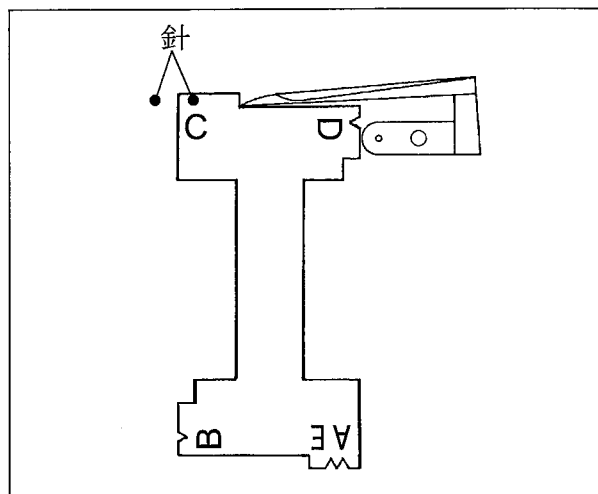


Fig. 62

### 6.6 Height of needle bar

#### Check points:

- ◇ Needles should be inserted fully into the needle holes of the needle clamp and fixed securely.
- ◇ Looper should be inserted fully into the looper holder and fixed securely.

#### Adjusting:

- (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. Move the needle bar up or down so that the looper tip passes 0.5 – 1.0 mm above the top of the needle eye.
- (5) Tighten the screw ① securely. Check that the needles drop in the centers of the needle holes of the stitch plate respectively.

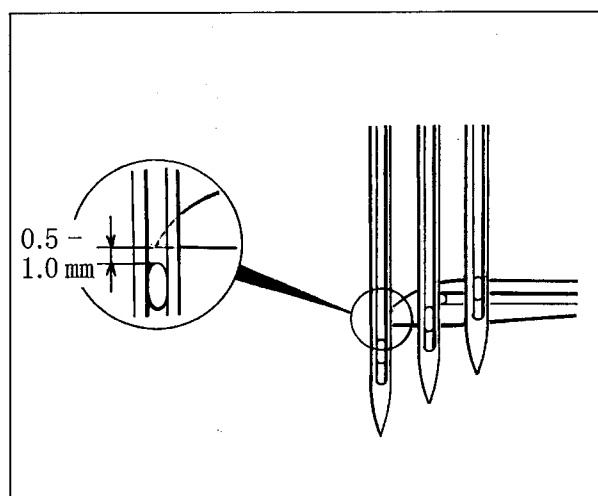


Fig. 63

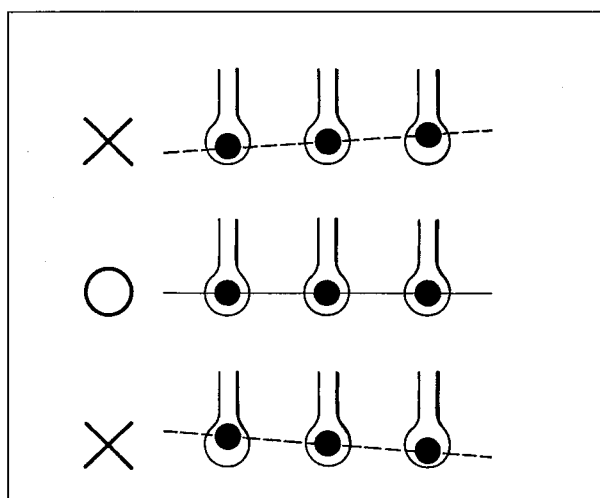


Fig. 64

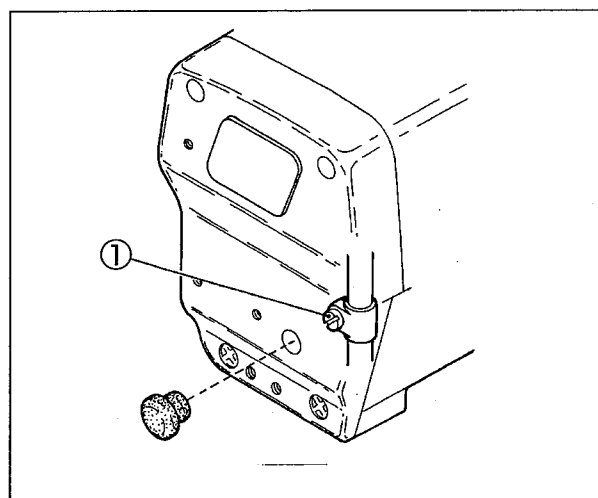


Fig. 65

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

### 3-needle:

- ◇ When the looper tip ① meets the left needle ②, make the clearance between them to 0.2 - 0.3 mm.
- ◇ When the looper tip ① meets the middle needle ③, make the clearance between them to 0.05 - 0.15 mm.
- ◇ When the looper tip ① meets the right needle ④, they touch slightly by 0.2 mm.  
Make the clearance between them to 0 - 0.05 mm to push the needle guard(rear) to the right needle ④.
- ◇ Loosen the screw ⑦ of the looper holder to adjust it.

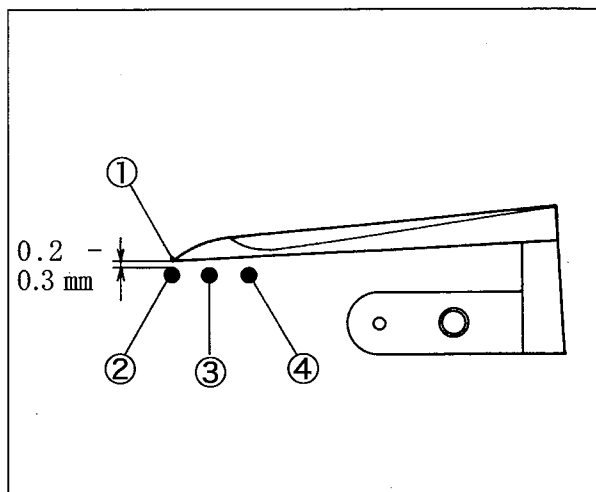


Fig. 66

### 2-needle:

- ◇ When the looper tip ① meets the left needle ⑤, make the clearance between them to 0.2 - 0.3 mm.
- ◇ When the looper tip ① meets the right needle ⑥, they touch slightly by 0.2 mm.  
Make the clearance between them to 0 - 0.05 mm to push the needle guard(rear) to the right needle ⑥.
- ◇ Loosen the screw ⑦ to adjust it.

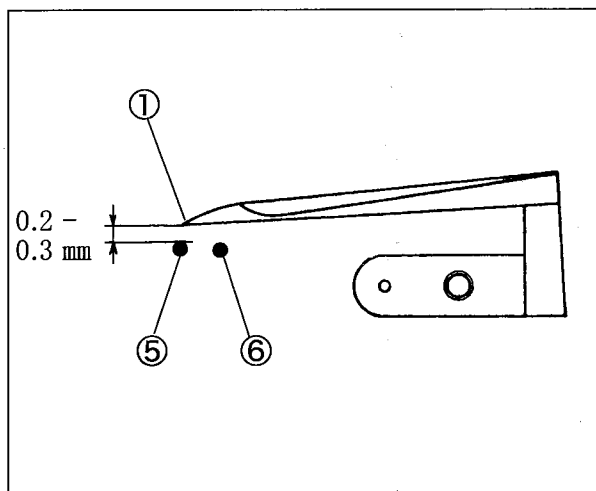


Fig. 67

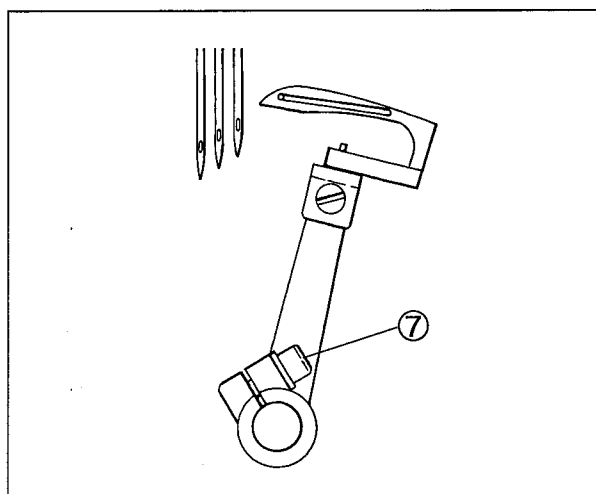


Fig. 68

## 6.8 Needle and needle guard

### 6.8.1 Needle guard(rear)

#### Height:

Align the line "a" on the needle guard(rear)① with the center of the needle eye at the lowest point.

#### Front-and-rear position:

When the looper tip meets the center of the right needle, make the clearance between them to 0 - 0.05 mm to push the needle guard(rear) to the right needle.

Make the clearance between the left needle and the needle guard(rear) to 0.05 - 0.1 mm.

Loosen the screws ②③ to adjust them.

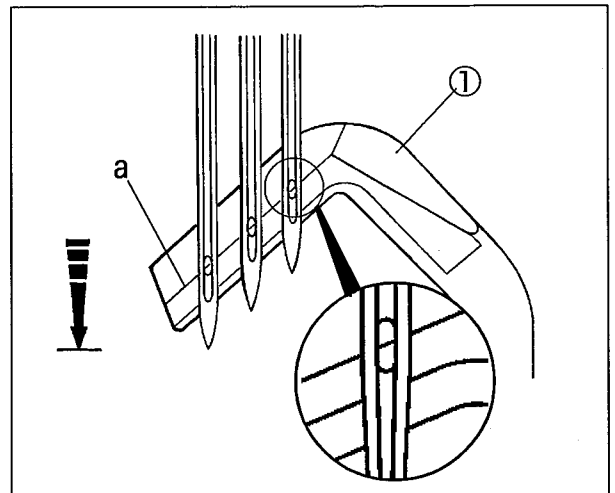


Fig. 69

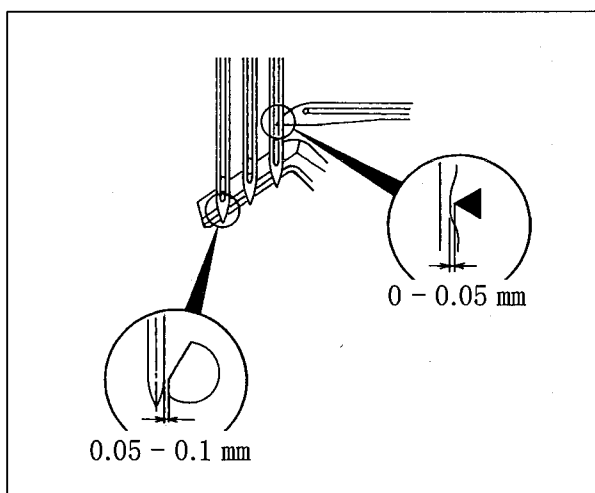


Fig. 70

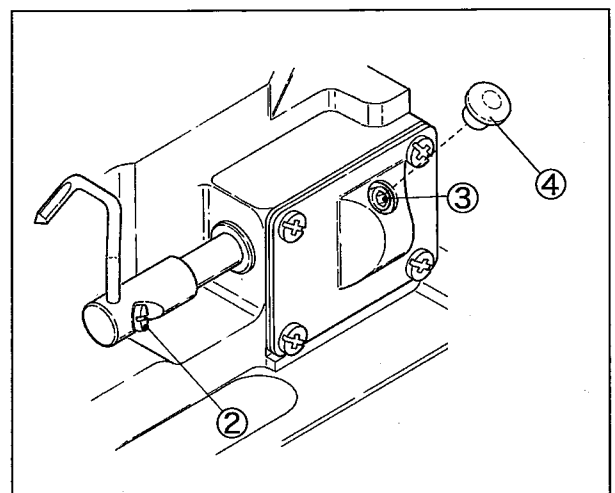


Fig. 71

### 6.8.2 Needle guard(front)

Make the clearance between each needle and the needle guard(front)⑤ to 0 - 0.3 mm respectively when the looper tip comes at the centers of the right and left needles.

Loosen the screw ⑥ to adjust it.

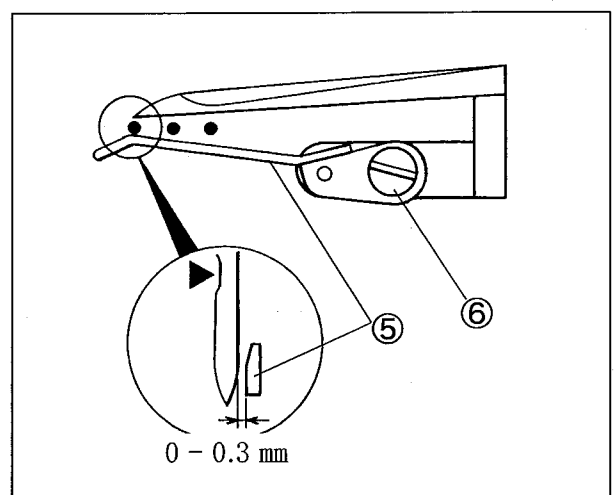


Fig. 72



## 6. Adjustments

### 6.9 Height of feed dog

When the feed dogs are at highest points, their tops are parallel to the top of the stitch plate. Make the even height of the differential feed dog ① and the main feed dog ②, and the height from the top of the stitch plate to their tops to 1.0 - 1.2 mm.

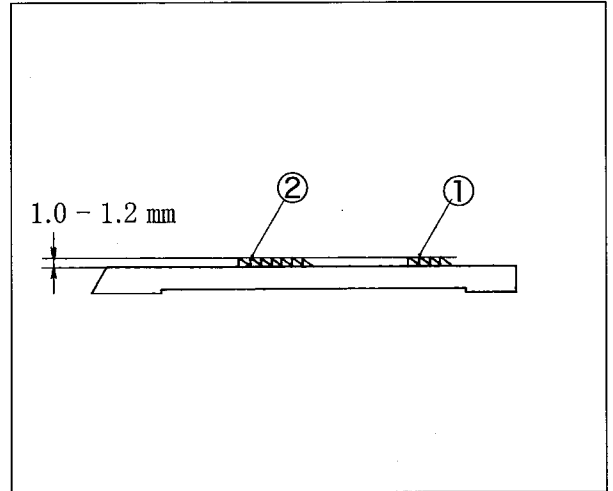


Fig. 73

### 6.10 Needle and spreader

#### 6.10.1 Spreader

Make the clearance between the left needle and the hook "a" to 0.5 - 0.8 mm when the spreader ③ moves from the right to the left.

Make the clearance between the center of the left needle and the hook "a" to 4.5 - 5.5 mm when the spreader moves at extreme left.

Make the height from the top of the stitch plate to the bottom of the spreader ③ to 9 - 11 mm.

Loosen the screw ④ of the spreader and the screw ⑤ of the spreader holder ⑤ to adjust it.

#### NOTE

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.

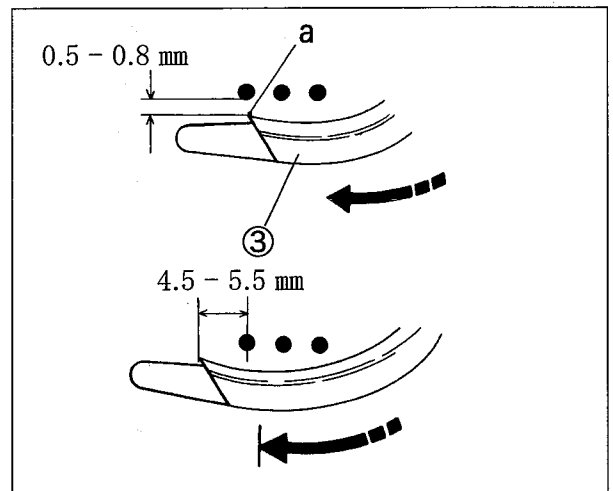


Fig. 74

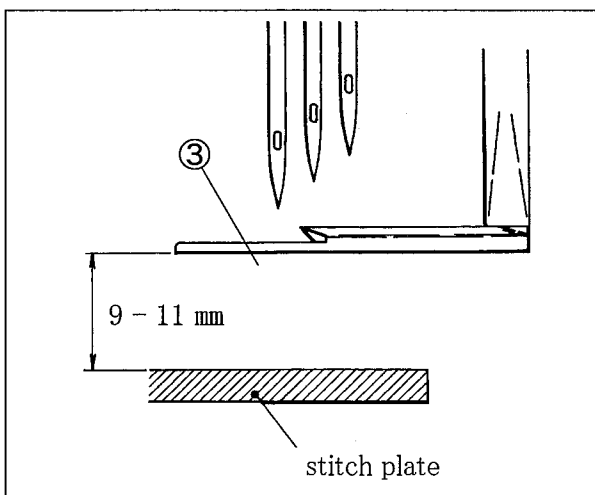


Fig. 75

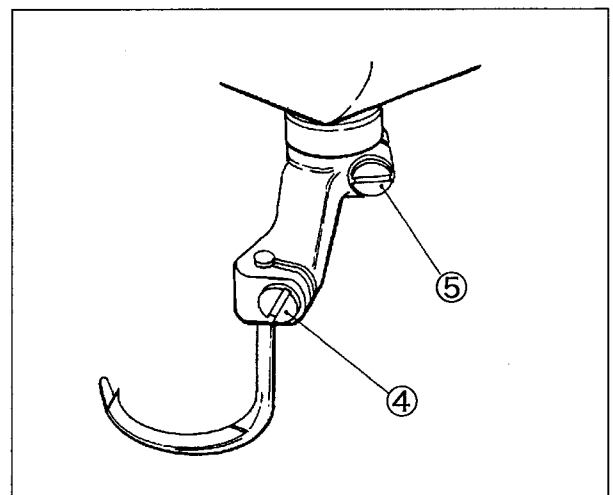


Fig. 76

### 6.10.2 Top cover thread guide

Make the clearance between the bottom of the top cover thread guide ① and the top of the spreader ③ to 0.5 mm. Tighten the screws ③ securely where the thread is hooked with the hook smoothly when the spreader ② comes at extreme right.

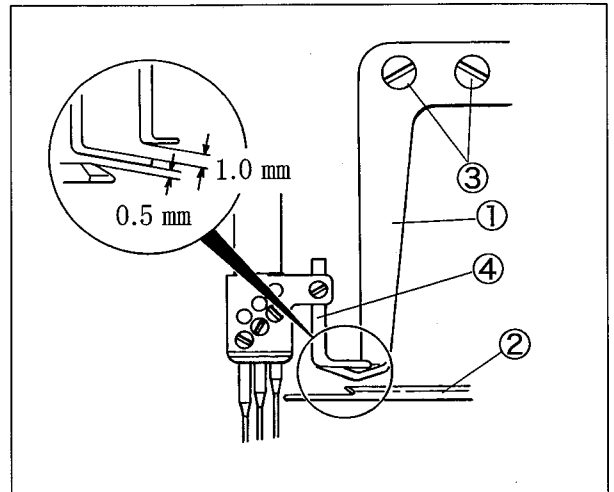


Fig. 77

### 6.10.3 Top cover thread eyelet

Make the clearance between the top of the top cover thread guide ① and the bottom of the top cover thread eyelet ④ to 1.0 mm when the needle bar is at the lowest point. Set the eye of the top cover thread eyelet along the extending line from the slot of the top cover thread guide ①. Tighten the screw ⑤ securely.

\* Adjust the spreader, the top cover thread guide, and the top cover thread eyelet properly depending on the thread to be used.

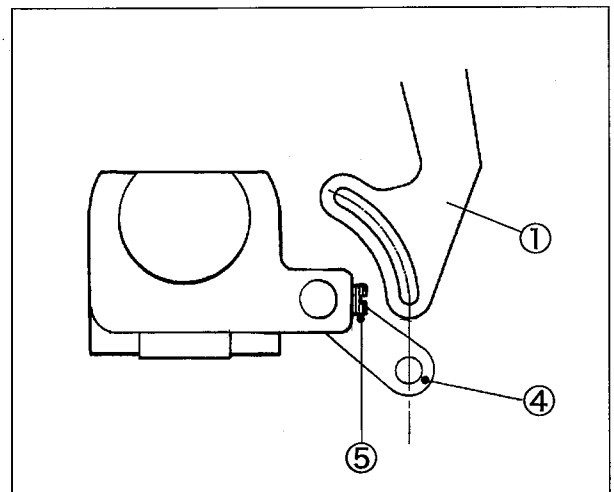


Fig. 78

## 6. Adjustments

### 6.11 Folder (VF2403, 2503, 2404, 2504)

#### Front-and-rear position

Loosen the screws ② to set the folder ① near the presser foot and the stitch plate without touching them.

#### Right-and-left position

Loosen the screws ② to set the folder to align the left end of a tape with the left needle depending on its specifications.

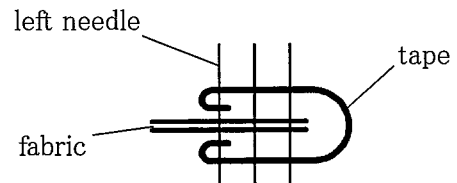


Fig. 79

#### Up-and-down position

Loosen the screw ③ to set the fabric slide plate ④ 1/3 up from the bottom of the folder exit.

Set right-and-left position of the fabric slide plate ④ to align its end with the right end of a fabric.

Loosen the screw ⑤ to adjust it.

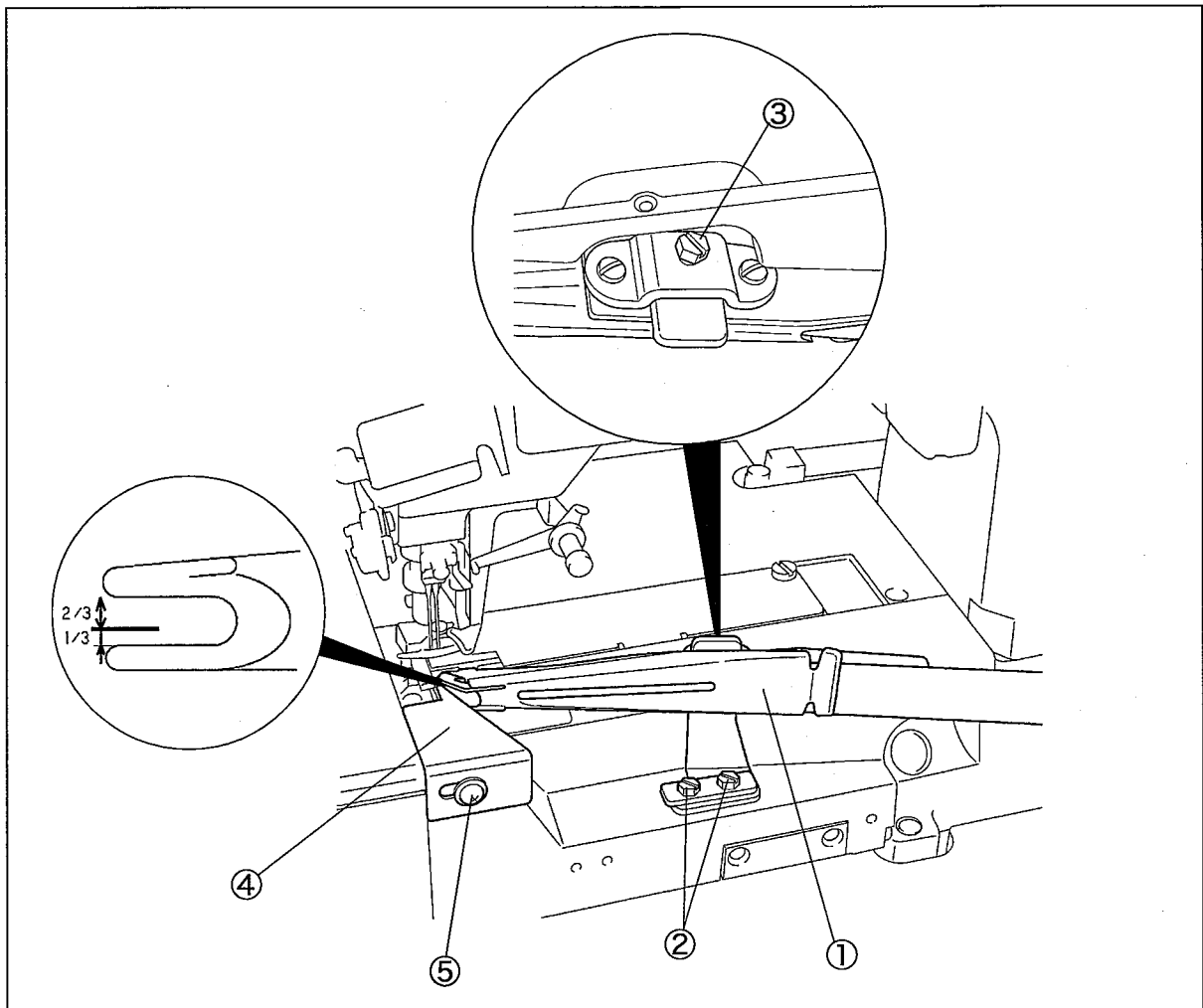


Fig. 80

## ⚠ WARNING

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

### 6.12 Metering device (VF2404, 2504)

#### 6.12.1 Presser foot tape guide

Set the presser foot tape guide ① depending on the needle distance and a part to be sewn on a tape.

Loosen the screw ② to adjust it.

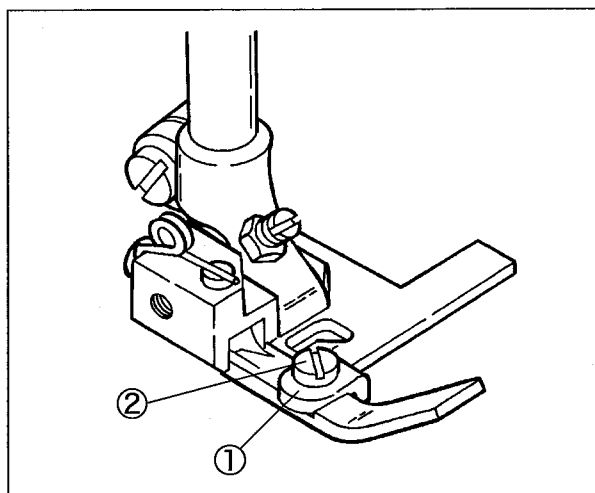


Fig. 81

#### 6.12.2 Setting tape guide

- (1) Set the tape guide bar(long)③ to a low position enough for sewing.
- (2) Set the inside of the tape guide, c. set④ along "A" on the presser foot tape guide ①. Set the tape guide ⑤ to guide a tape smoothly depending on a tape width.
- (3) After positioning the tape guide bar(long)③, loosen the screw⑥ to position the tape guide stopper⑦. It prevents the needle bar from touching the tape guide, c. set④ and makes the position of the tape guide bar (long)③.

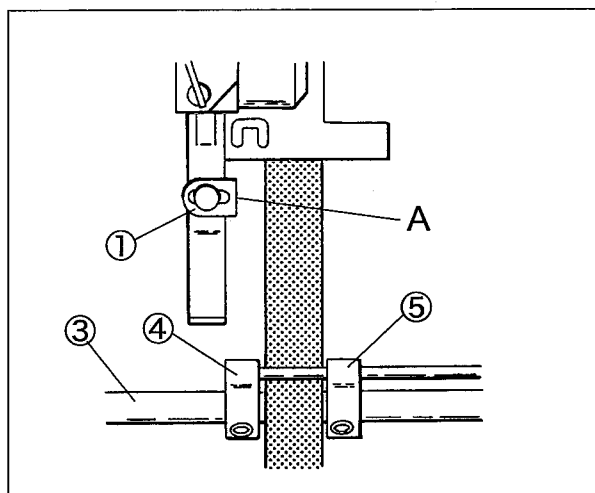


Fig. 82

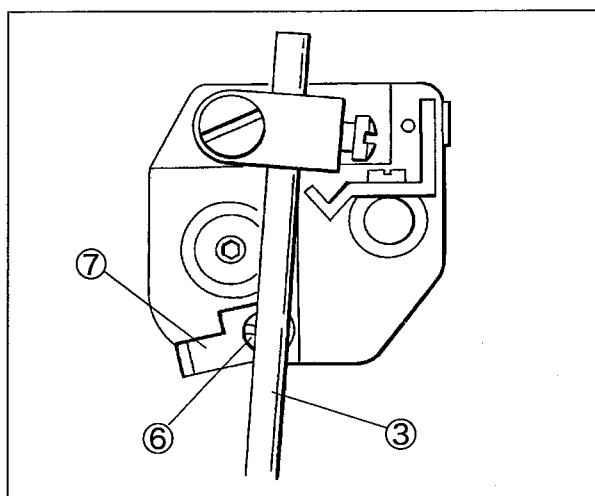


Fig. 83

## 6. Adjustments

### WARNING

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

#### 6.12.3 Pressure of elastic feed roller

To adjust the pressure of an elastic tape with tension roller (small) ①, loosen the lock nut ② and turn the adjusting screw ③.

- To increase the pressure, turn the adjusting screw ③ clockwise.
- To decrease the pressure, turn the adjusting screw ③ counterclockwise.

Keep the pressure as low as possible.

Too tight or loose pressure can cause uneven feeding of a tape.

### REFERENCE

Too much change in tension of a tape from the bobbin may occur uneven sewing finish size even if the tension roller (large) feeds an elastic tape correctly.

An automatic elastic feeder "AEF-31" can feed an elastic tape smoothly and constant sewing finish can be obtained.

#### 6.12.4 Maintenance of metering device

##### Replacement and repair:

Improper installation of the metering device can cause improper feeding of an elastic tape, skip stitch, needle breakage, bad sewing performance and others.

Carefully install the device as following points:

- (1) Check that the roller shaft turns smoothly after setting it. Loosen the screws ④ and ⑤ and make interlining to adjust it.
- (2) Set the tension roller (small) ① to turn smoothly like a top. Improper turning of it can cause irregular feeding of a tape.
- (3) Set the tension link ⑥ and its shaft to turn smoothly.
- (4) Set the tension spring pressure of the tension roller (small) ① as low as possible so that it can follow the rotation.

##### Lubrication:

Remove the screws ⑦ on the roller shaft to supply grease on each part several times a year.

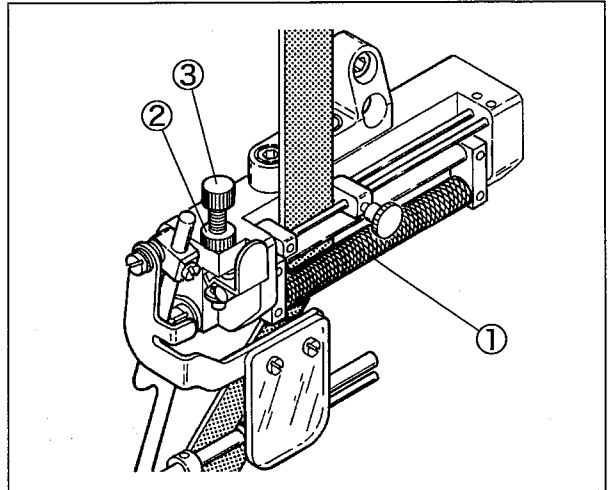


Fig. 84

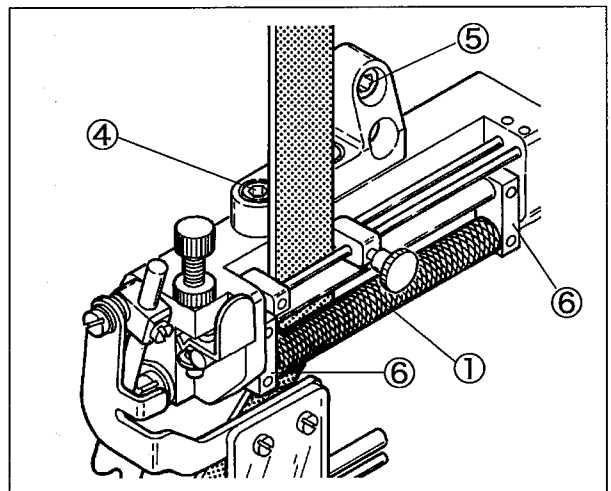


Fig. 85

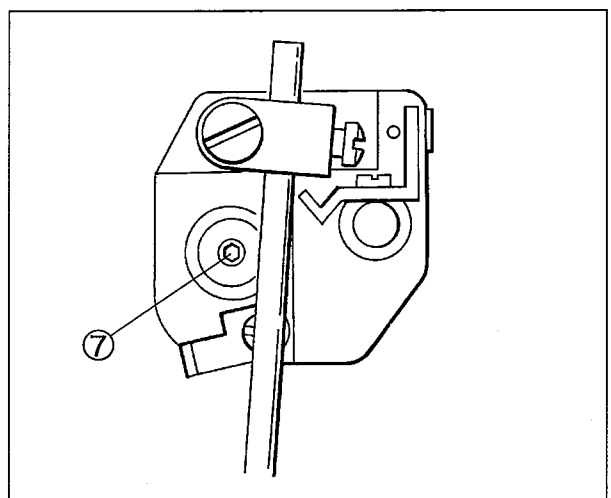


Fig. 86

# 7. Specifications

Model	VF2400, VF2500	VF2411	VF2403, VF2503
Description	High speed flat bed 2 or 3-needle interlock stitch machine	High speed flat bed 2 or 3-needle double chain stitch machine	High speed flat bed 2 or 3-needle interlock stitch machine
Dimensions	500 (L) × 250 (W) × 430 (H) mm		
Weight	41 kg		
Stitch Type	ISO 406, 407, 602, 605	ISO 406	ISO 406, 407, 602, 605
Application	Plain seam and covering for knitted fabric	Hemming operation	Attaching elastic lace
Sewing Speed	During intermittent operation		
	Max. 6500 rpm	Max. 7000 rpm	Max. 6000 rpm
Stitch Length	1.4 - 3.6 mm (at shipment) 1.4 - 4.5 mm (maximum) (The position of the screw on the feed dog regulating eccentric needs to be changed, and the main feed dog and the differential feed dog need to be ground.)		
	The number of stitches 7 - 18 stitches (at shipment); 6-18 stitches (maximum) / inch (25.4mm) 8 - 21 stitches (at shipment); 7-21 stitches (maximum) /30 mm		
Needle system	UY X 128GAS of Shumetz or Organ #65 - #90		
Needle Distance	3-needle: 4.8, 5.6, 6.0, 6.4 mm	2-needle: 4.0, 4.8, 6.4 mm	3-needle: 4.8, 5.6, 6.4 mm
	2-needle: 3.2, 4.0, 4.8, 6.4 mm		2-needle: 3.2, 4.0, 4.8, 6.4 mm
Needle Stroke	31 mm		
Presser Foot Lift	6.0 mm (needle distance: 6.4 mm) - 8.0 mm (3.2 mm): with spreader: 7.0 mm without spreader: 8.0 mm	without spreader: 8.0 mm	5.0 mm (needle distance: 6.4 mm) - 7.0 mm (3.2 mm): without spreader: 7.0 mm
Feed Regulation	Push button system		
Differential Ratio	1:0.7 - 1:2		
Differential Feed Regulation	External lever even during operation		
Lubrication	Lubrication automatically by pump		
Lubricating Oil	YAMATO SF OIL #28		
Capacity of Oil Reservoir	1100 cc		
Installation	Full-submerged type and semi-submerged type		

## 7. Specifications

Model	VF2404, VF2504	VF2530
Description	High speed flat bed 2 or 3-needle interlock stitch machine with metering device (clutch)	High speed flat bed 3-needle interlock stitch machine
Dimensions	500 (L) × 250 (W) × 430 (H) mm	
Weight	42.5 kg	41 kg
Stitch Type	ISO 406, 407, 602, 605	
Application	Attaching tape	Plain seam and covering
Sewing Speed	During intermittent operation	
	Max. 5000 rpm	Max. 5500 rpm
Stitch Length	1.4 – 3.6 mm (at shipment) 1.4 – 4.5 mm (maximum) (The position of the screw on the feed dog regulating eccentric needs to be changed, and the main feed dog and the differential feed dog need to be ground.) The number of stitches    7 – 18 stitches (at shipment), 6–18 stitches (maximum) / inch (25.4 mm) 8 – 21 stitches (at shipment), 7–21 stitches / 30 mm	
Needle system	UY X 128GAS of Shumetz or Organ #65 – #90	
Needle Distance	3-needle: 5.6 mm 2-needle: 3.2, 4.0, 4.8, 6.4 mm	3-needle: 5.6, 6.4 mm
Needle Stroke	31 mm	
Presser Foot Lift	5.0 mm (needle distance: 6.4 mm) – 7.0 mm (3.2 mm): without spreader: 7.0 mm	with spreader: 8.0 mm
Feed Regulation	Push button system	
Differential Ratio	1:0.7 – 1:2	
Differential Feed Regulation	External lever even during operation	
Lubrication	Lubrication automatically by pump	
Lubricating Oil	YAMATO SF OIL #28	
Capacity of Oil Reservoir	1100 cc	
Installation	Full-submerged type and semi-submerged type	

***Yamato***

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