

# **TM625** *Series Technical Manual*

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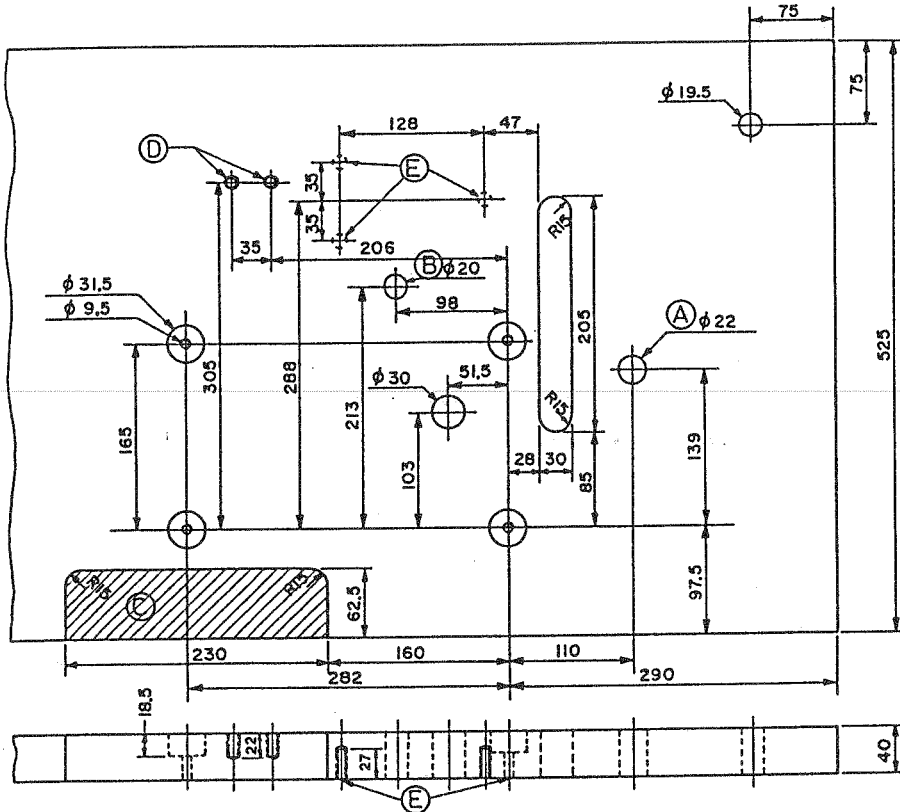
# Table of contents

■ Sewing machine installation .....	1
[1] Schematic diagram of the sewing table .....	1
[2] To install the machine head .....	4
[3] To place the V belt .....	5
[4] To install the belt cover .....	5
[5] To check for the rotating direction of the machine pulley .....	5
■ Timing adjustment .....	6
[1] To adjust the timing of each eccentric for the loopers, feed dog, retainers...	6
To adjust the timing of each eccentric for the loopers, feed dog, retainers (for high-lift machines) .....	8
[2] To adjust the timing of the front-to-back feed eccentric and the position of the needle drive crank .....	10
■ Adjustment/maintenance .....	11
[1] Adjusting the feed dog .....	11
1. To adjust the feed dog left to right in the needle plate slots .....	11
2. To adjust the feed dog front to back in the needle plate slots .....	11
3. To adjust the height of the feed dog .....	12
[2] Positioning the needles in the needle drops .....	14
1. To adjust the needles left to right in the needle drops (standard).....	14
2. To adjust the needles front to back in the needle drops (standard).....	15
3. To adjust the needles left to right in the needle drops (equipped with the UT) .....	16
4. To adjust the needles front to back in the needle drops (equipped with the UT) .....	16
[3] Adjusting the loopers .....	17
1. To adjust the timing of the loopers .....	17
2. To adjust the clearance between the loopers and the needles .....	18
[4] Adjusting the height of the needles .....	19
[5] Adjusting the retainers .....	20
1. To adjust the retainers front to back .....	20
2. To adjust the retainers left to right .....	21
[6] Adjusting the needle guards .....	22
[7] Adjusting the looper thread take-up .....	23
[8] Adjusting the thread guides .....	24
[9] Adjusting the pressure of the presser foot .....	25
[10] Adjusting the presser foot lift knee switch .....	26
[11] Adjusting the thread releaser .....	27
[12] Relationship between the measure plate and the feeding amount .....	28
[13] Adjusting the feeding amount limitation stopper .....	29

# Sewing machine installation

## II Schematic diagram of the sewing table

Models	Mounting methods	
TM625	Table mounting .....	Figs.1, 1A
TM625B	Raised mounting .....	Figs.1B, 1C
TM625F	Fully-submerged mounting ..	Fig. 1D



【Table mounting】

Fig.1

Note)

- Hole (A) is ready for the needle positioner.
- Hole (B) is ready for the PL device.
- Cut (C) and nut (D) (fitted in the hole) are ready for the FR device.
- Hole (E) is ready for the EFKA motor.

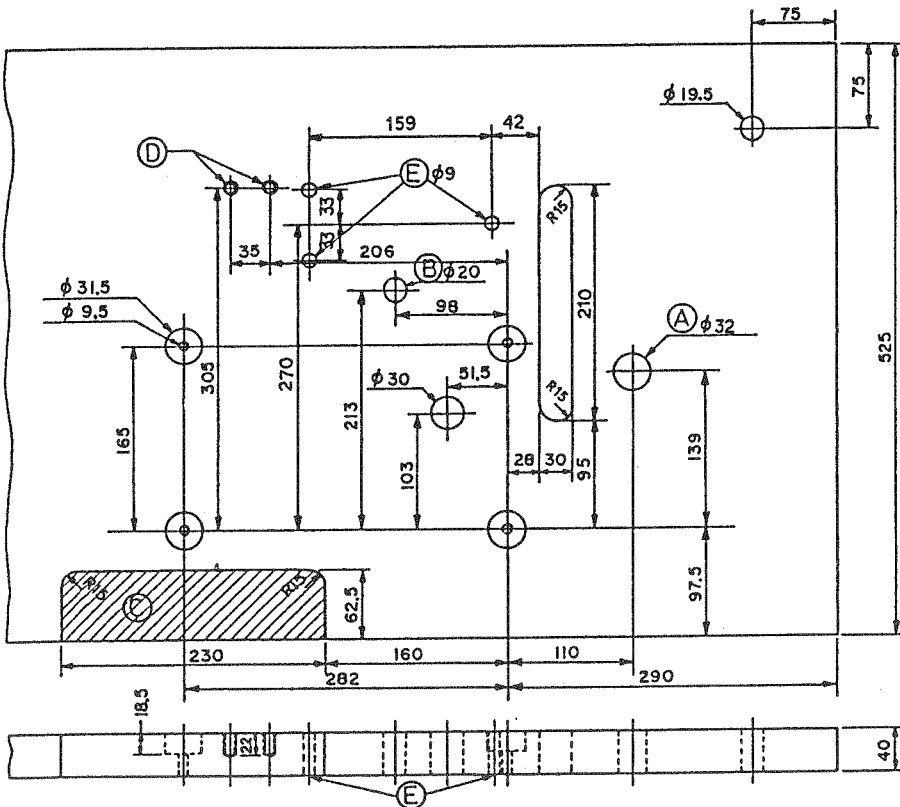


Fig.1A

Note)

- Hole (A) is ready for the needle positioner.
- Hole (B) is ready for the PL device.
- Cut (C) and nut (D) (fitted in the hole) are ready for the FR device.
- Hole (E) is ready for the MITSUBISHI or NATIONAL motor.



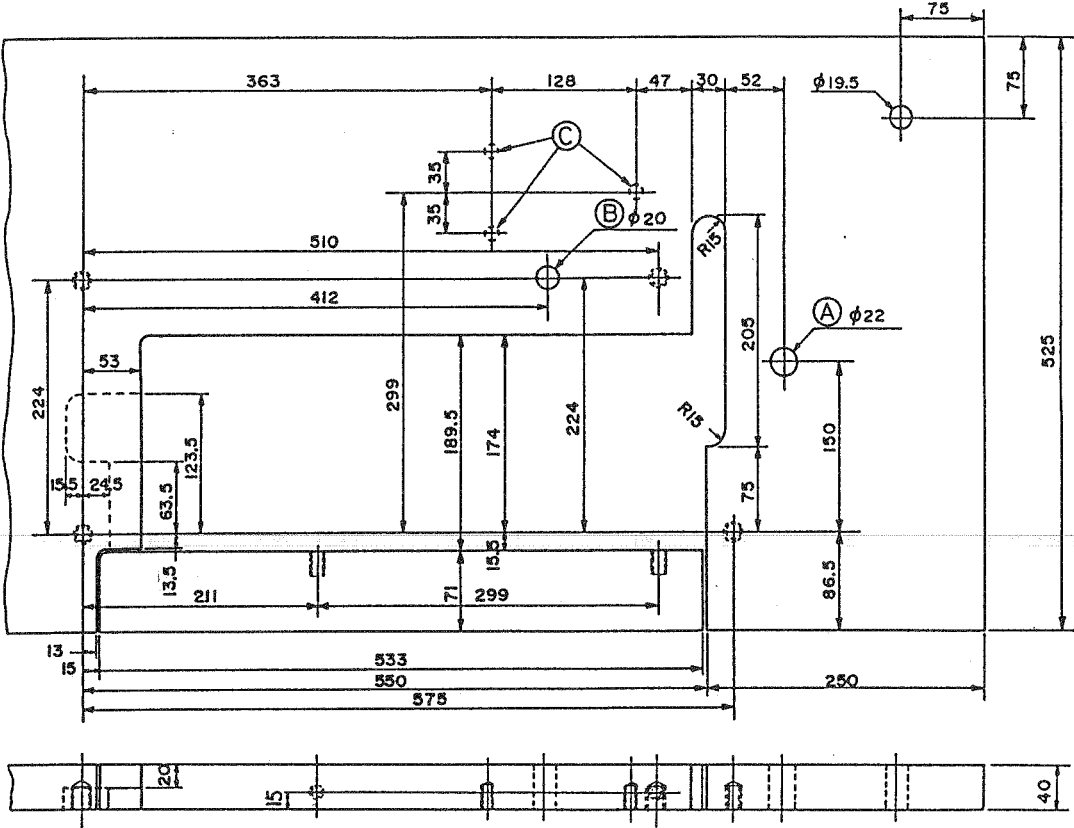
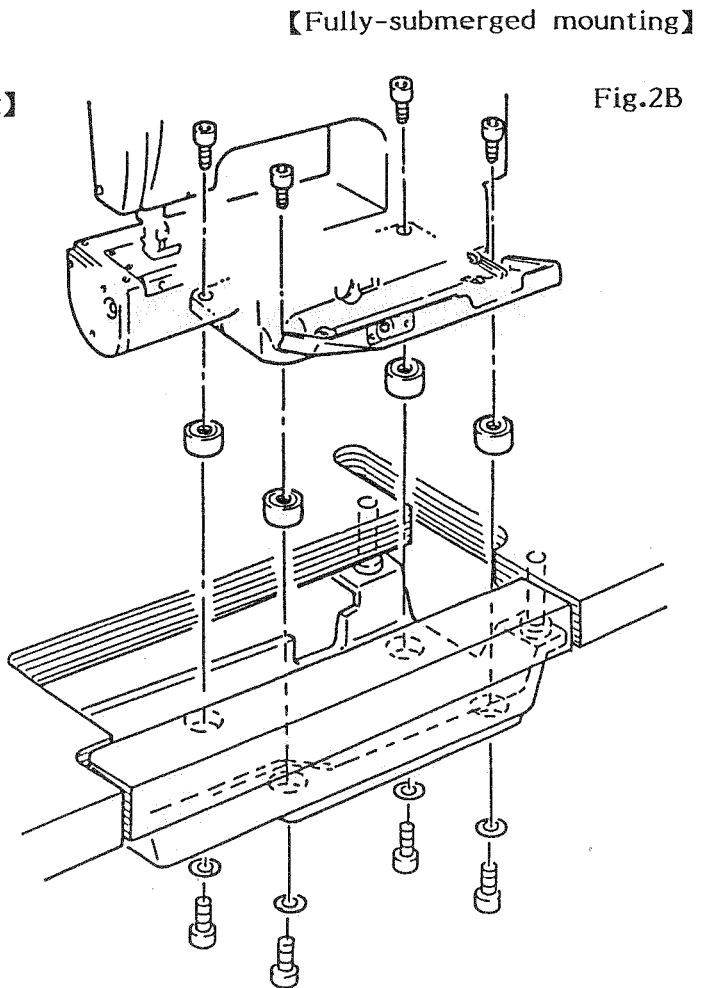
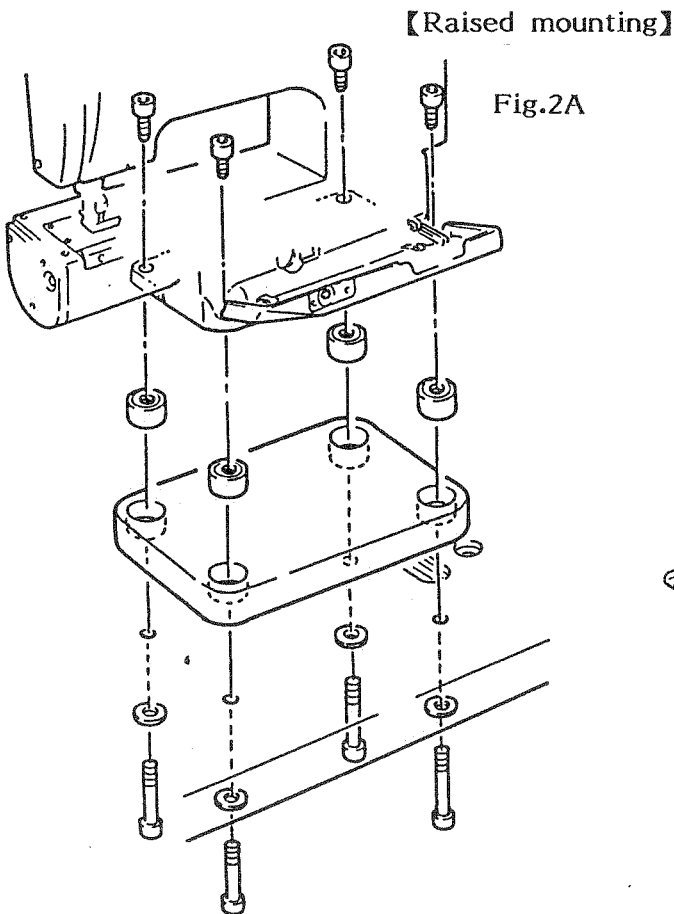
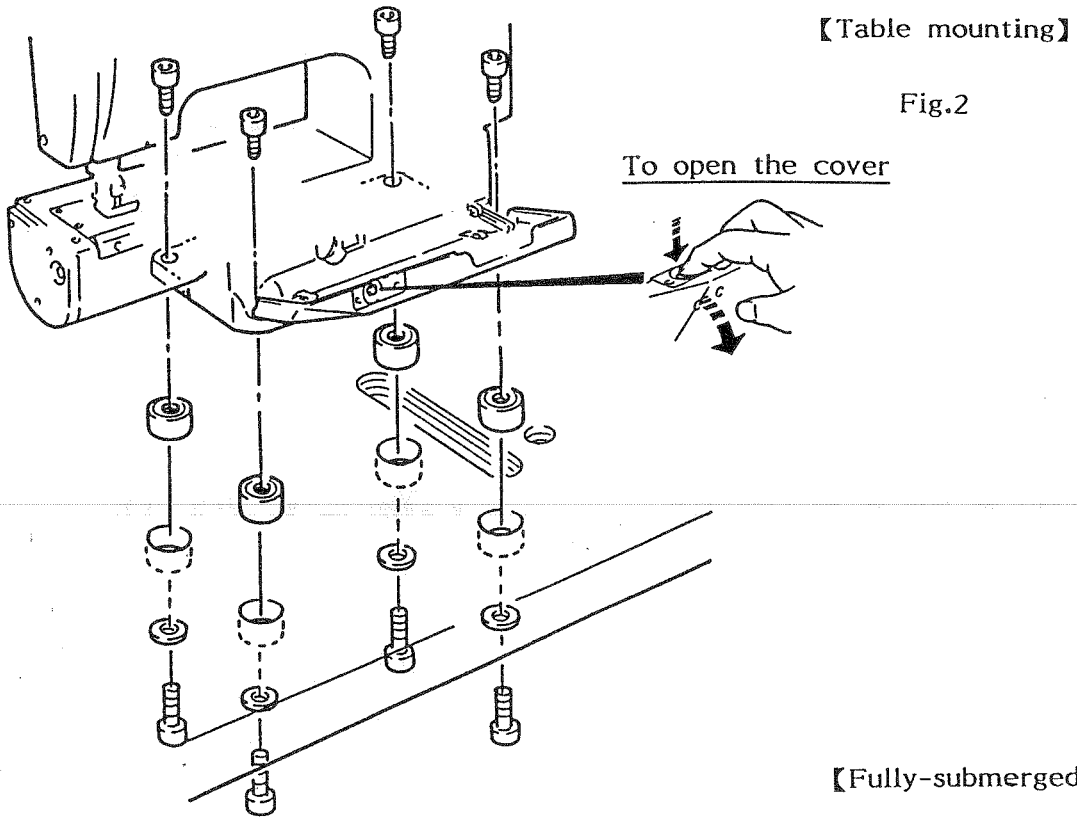


Fig.1D

- Note)
- Hole (A) is ready for the needle positioner.
  - Hole (B) is ready for the PL device.
  - Hole (C) is ready for the EFKA motor.

**[2] To install the machine head**

Install the machine head by referring to Figs 2, 2A and 2B.  
Secure the machine head firmly with no shake.



### [3] To place the V belt

Install the machine head and then place the V belt.

Position the machine motor so that the V belt can be deflected approximately 3 cm by pressing the mid point of the V belt (see Fig.3).

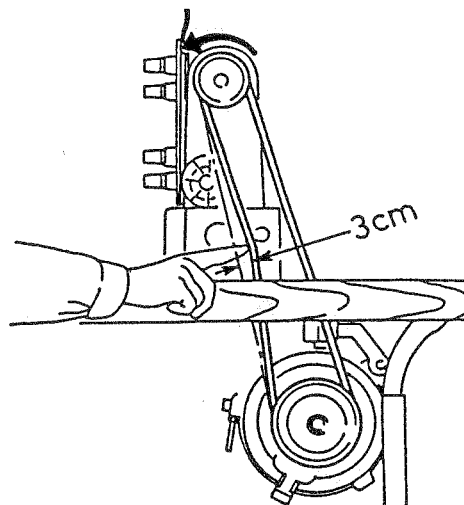


Fig.3

**Note:**

Always turn off the power first and then perform the above procedure.

### [4] To install the belt cover

Install the belt cover (①, ② and ③) with screws ④, ⑤ and ⑥ by referring to Fig.4.

Make sure the belt cover does not touch the pulley and/or the V belt.

\* Belt cover ③ is not needed for the fully-submerged installation.

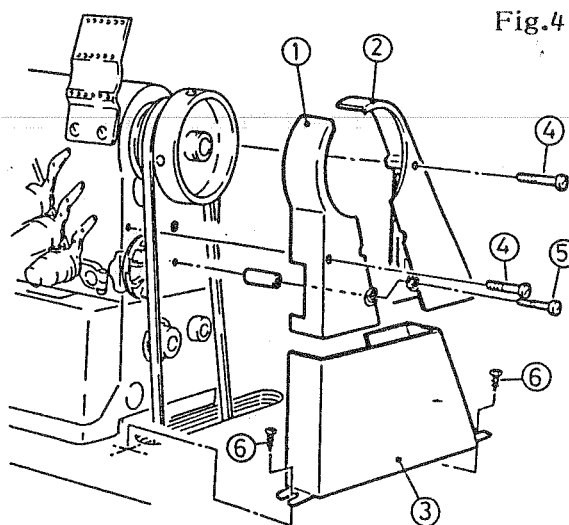


Fig.4

**Note:**

Always turn off the power first and then perform the above procedure.

### [5] To check for the rotating direction of the machine pulley

The machine pulley should rotate counter-clockwise as seen from the end of the machine pulley.

If the machine rotates clockwise, turn off the power first, remove connector ①, turn connector ① in an angle of 180° as shown below and then plug in the motor.

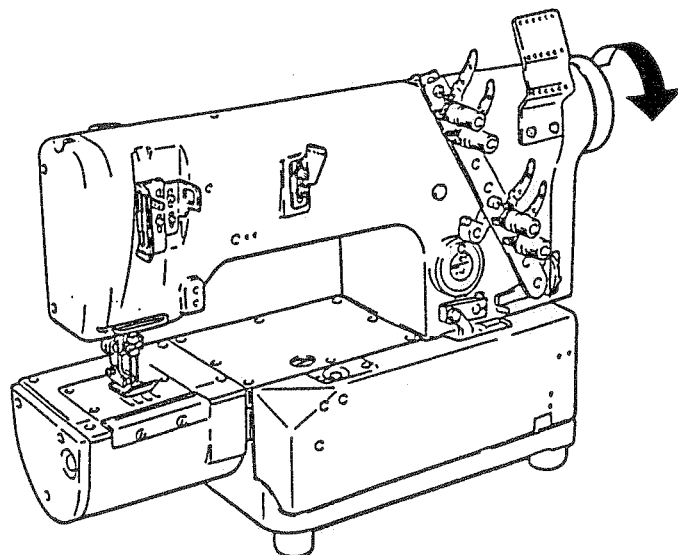
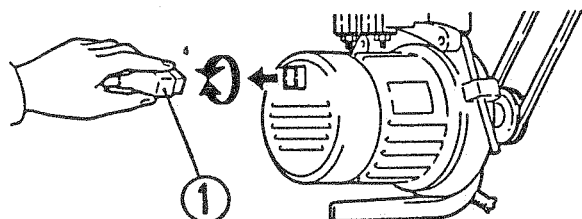


Fig.5



# Timing adjustment

## [1] To adjust the timing of each eccentric for the loopers, feed dog, retainers

- (1) Remove the needles and the presser foot.
- (2) Remove needle plate bracket ① together with the needle plate.
- (3) Remove cover ②.
- (4) Loosen screws ⑨, ⑩ and ⑪ (two screws each) so that eccentrics ③, ④ and ⑤ can be turned by hand.
- (5) Turn the pulley until the needle bar is at the bottom of its stroke.
- (6) Insert 5mm pin ⑫ into hole ⑬ in order to lock the upper shaft.

Fig. 6

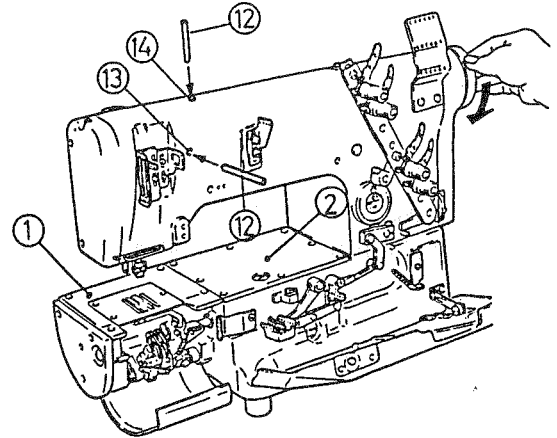
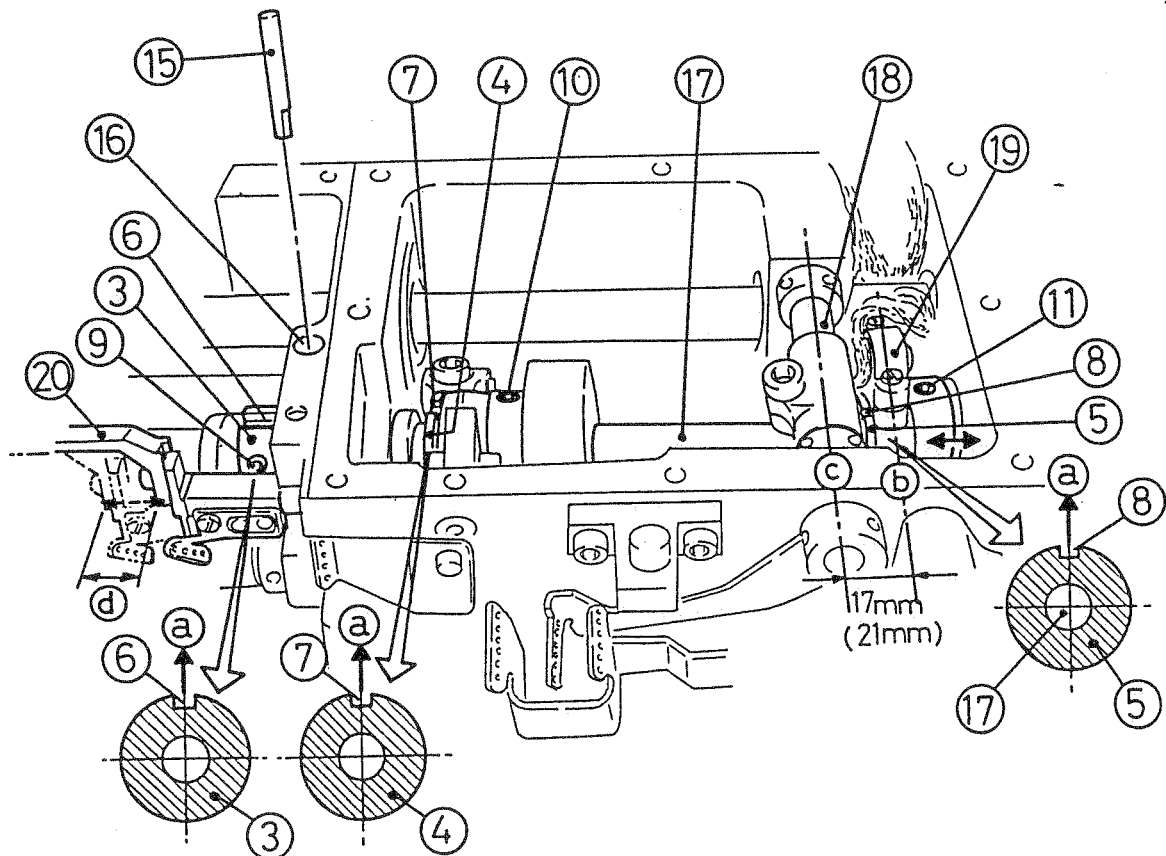


Fig. 7

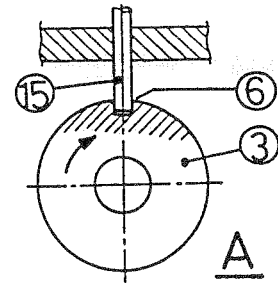


- (7) Insert 3mm pin ⑮ into hole ⑯. The relationship between pin ⑮ and groove ⑥ of eccentric ③ varies according to a maximum feeding amount of each machine. Turn eccentric ③ so that the relationship shown in the illustrations (as seen from the arm cover) on the next page can be made.

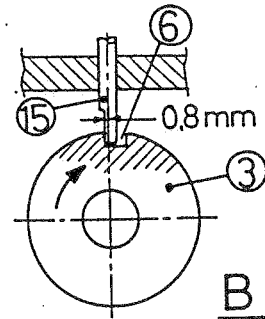
Note)

The way to insert 3mm pin ⑮ varies according to a maximum feeding amount.

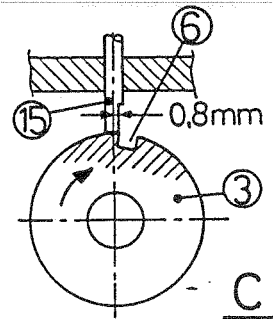
- For the machines which have a maximum feeding amount of 6mm, turn eccentric ③ so that pin ⑮ can fit tightly into groove ⑥ (see Fig. A).



- For the machines which have a maximum feeding amount of 4.5mm, turn eccentric ③ so that the relationship between groove ⑥ and pin ⑮ is as shown in Fig.B.



- When you set the feeding amount at 2 - 3mm on the machines which have a maximum feeding amount of 4.5mm, turn eccentric ③ so that the relationship between groove ⑥ and pin ⑮ is as shown in Fig.C.



- (8) With the eccentric at this position (A, B or C), tighten one of screws ⑨ of eccentric ③, which can be easily tightened.
- (9) Turn eccentrics ④ and ⑤ so that grooves ⑦ and ⑧ are positioned in the direction of arrow (a) (at 12 o'clock of lower shaft ⑰).
- (10) With eccentrics ④ and ⑤ locked, move eccentric ⑤ to the left or right so that the distance between center line (b) of rod ⑱ and center line (c) of thread take-up shaft ⑰ is 17mm.  
On the machines of a 4.8mm needle space, this distance should be 21mm.
- (11) Tighten each one of screws ⑩, ⑪ of eccentrics ④, ⑤, which can be easily tightened.
- (12) Remove pin ⑮ from hole ⑯.
- (13) Remove pin ⑫ from hole ⑬.
- (14) Check for the movement amount of retainer holder ⑳ by turning the machine pulley by hand. Movement amount (d) of the retainer holder of the standard machines is 5.5mm regardless of the maximum feeding amount. On the machines of a 4.8mm needle space, movement amount (d) of the retainer holder should be 4.5mm. If (d) is neither 5.5mm nor 4.5mm, repeat procedure ⑩.
- (15) Tighten the others of screws ⑨, ⑩, ⑪ of eccentrics ③, ④, ⑤, which have been left loosened.

**[1] To adjust the timing of each eccentric for the loopers, feed dog, retainers (for high-lift machines)**

- (1) Remove the needle and the presser foot.
- (2) Remove needle bracket ① together with the needle plate.
- (3) Remove cover ②.
- (4) Loosen screws ⑨, ⑩ and ⑪ (two screws each) so that eccentrics ③, ④ and ⑤ can be turned by hand.
- (5) Turn the machine pulley until the needle bar is at the bottom of its stroke.
- (6) Insert 5mm pin ⑫ into hole ⑬ in order to lock the upper shaft.

Fig.6

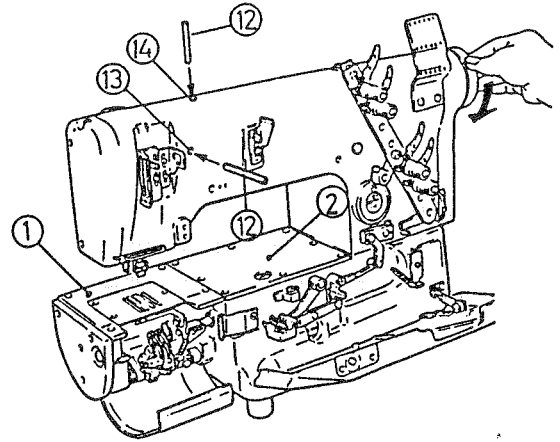
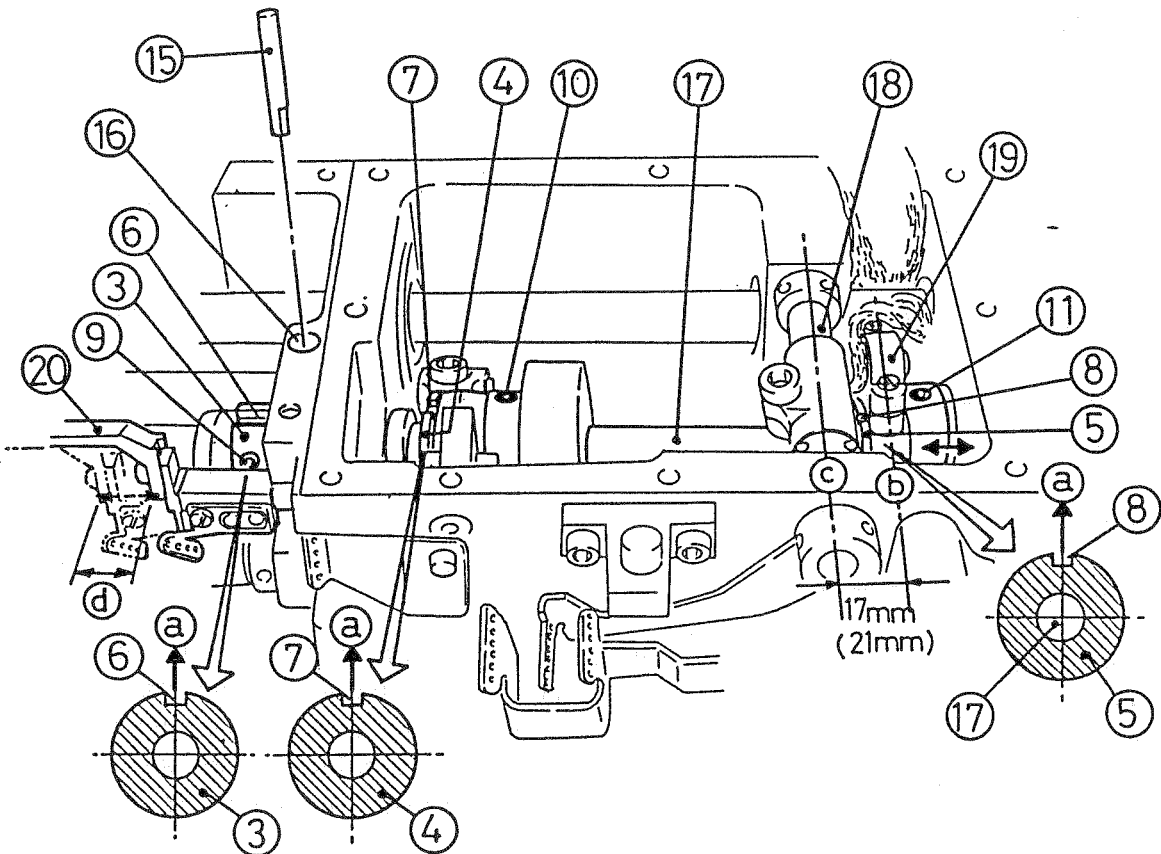


Fig.7

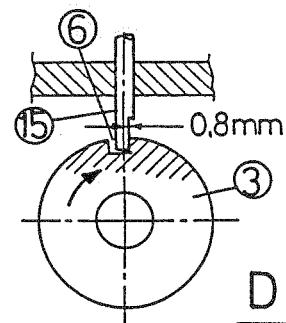


- (7) Insert 3mm pin ⑮ into hole ⑯. The relationship between pin ⑮ and groove ⑥ of eccentric ③ varies according to the maximum feeding amount of each machine. Turn eccentric ③ so that the relationship shown in the illustrations (as seen from the arm cover) on the next page can be made.

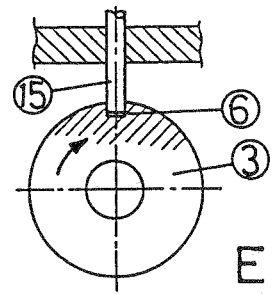
Note)

The way to insert 3mm pin ⑮ varies according to the maximum feeding amount.

- For the machines which have a maximum feeding amount of 6mm, turn eccentric ③ so that the relationship between groove ⑥ and pin ⑮ is as shown in Fig.D.



- When you set the feeding amount at 4.5 - 3mm, turn eccentric ③ so that pin ⑮ can fit tightly into groove ⑥ (see Fig. E).



- (8) In this condition (see D or E), tighten one of screws ⑨ of eccentric ③, which can be easily tightened.
- (9) Turn eccentric ⑤ so that groove ⑧ is positioned in the direction of arrow (a) (at 12 o'clock of lower shaft ⑰).
- (10) With eccentrics ④ and ⑤ locked, move eccentric ⑤ to the left or right so that the distance between center line (b) of rod ⑱ and center line (c) of thread take-up shaft ⑲ is 17mm.  
On the machines of a 4.8mm needle space, this distance should be 21mm.
- (11) Tighten each one of screws ⑩, ⑪ of eccentrics ④, ⑤, which can be easily tightened.
- (12) Remove pin ⑮ from hole ⑯.
- (13) Remove pin ⑫ from hole ⑬.
- (14) Check for the movement amount of retainer holder ⑳ by turning the machine pulley by hand. Movement amount (d) of the retainer holder of the standard machines is 5.5mm regardless of the maximum feeding amount. On the machines of a 4.8mm needle space, movement amount (d) of the retainer holder should be 4.5mm. If neither 5.5mm nor 4.5mm is obtained, repeat procedure ⑩.
- (15) Insert 5mm pin ⑫ into hole ⑭ in order to lock the upper shaft just before the needle bar reaches the bottom of its stroke (when the needle bar is 0.9mm above the bottom of its stroke).
- (16) Turn eccentric ④ so that groove ⑦ is positioned in the direction of arrow (a) (at 12 o'clock of lower shaft ⑰).
- (17) Tighten the others of screws ⑨, ⑩, ⑪ of eccentrics ③, ④, ⑤, which have been left loosened.

**[2] To adjust the timing of the front-to-back feed eccentric and the position of the needle drive crank**

- (1) Turn measure plate ② while pressing stopper ① and then set the feeding amount at 6mm.

Note)

For the machines which have a maximum feeding amount of 4.5mm, also set the maximum feeding amount limitation stopper at 6mm. (see [13] "To adjust the feeding amount limitation stopper" on page 29.) After this adjustment, be sure to return the limitation stopper home.

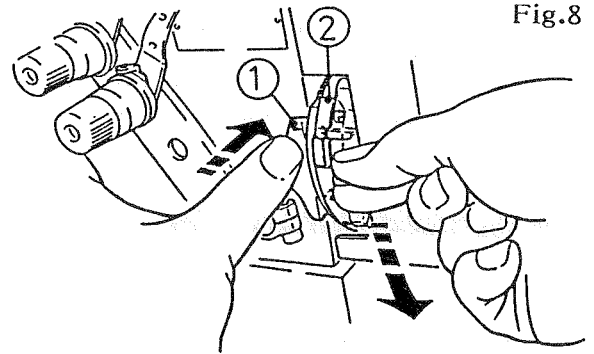


Fig.8

- (2) Remove oil pan ③ from the bottom of the machine head.

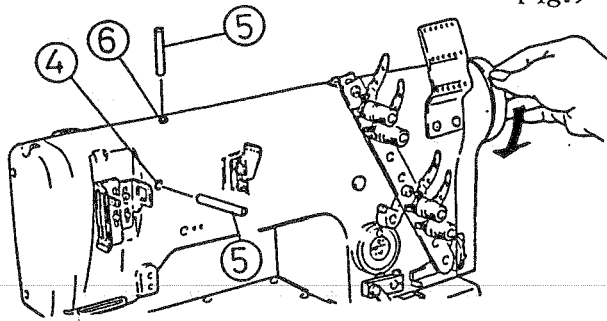


Fig.9

Tilt back the machine.

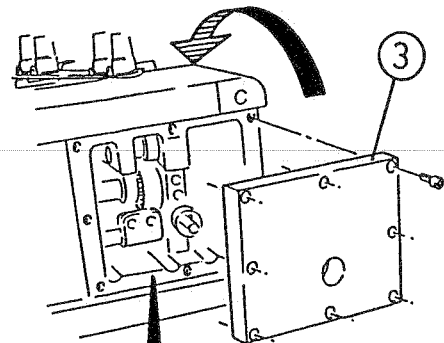


Fig.10

- (3) Loosen two screws ⑦.
- (4) Turn the machine pulley by hand until the needle bar is at the bottom of its stroke.

Note)

For high-lift machines, stop turning the machine pulley just before the needle bar reaches the bottom of its stroke (when the needle bar is 0.9mm above the bottom of its stroke).

- (5) Insert 5mm pin ⑤ into hole ④ in order to lock the upper shaft.

Note)

For high-lift machines, insert 5mm pin ⑤ into hole ⑥.

- (6) Turn front-to-back feed eccentric ⑧ so that groove ⑨ is positioned at 6 o'clock of the shaft (if the machine is laid down as shown in Fig.10, groove ⑨ should be turned straight toward your side.)

- (7) In this condition, tighten either one of screws ⑦ of front-to-back feed eccentric ⑧.

- (8) Loosen two screws ⑩.

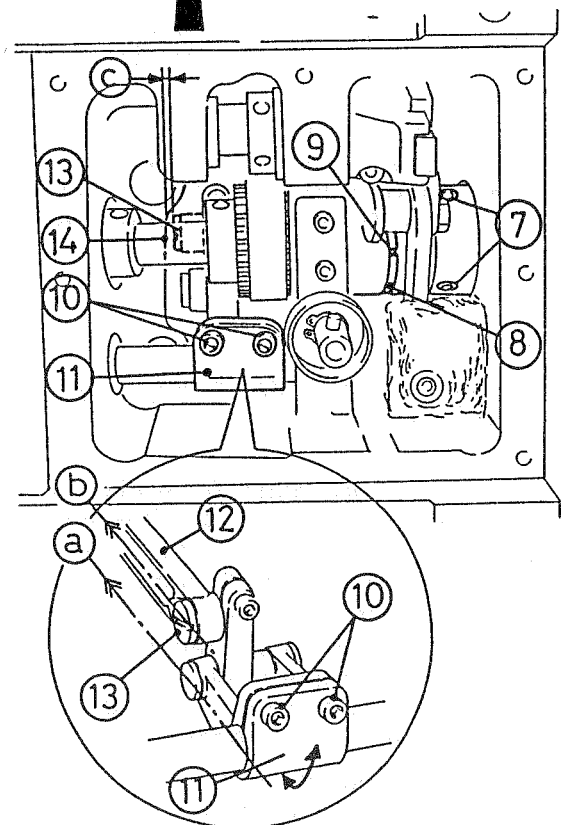
- (9) Turn crank ⑪ so that center line (a) of crank ⑪ is parallel with center line (b) of crank ⑫. Then tighten two screws ⑩.

- (10) Remove pin ⑤ from hole ④ (for high-lift machines, from hole ⑥).

- (11) Tighten the other screw ⑦ of front-to-back feed eccentric ⑧, which has been left loosened.

- (12) Make sure that there is clearance (c) of approximately 0.5mm between the end of pin ⑬ and bed ⑭.

- (13) Replace oil pan ③ to the bottom of the machine bed.



# Adjustment/maintenance

## Notes

1. Perform [1] "Adjusting the feed dog" to [6] "Adjusting the needle guard" in sequence.
2. If you start from any number of the procedures except No.1, perform the procedures thereafter in sequence.

## [1] Adjusting the feed dog

The feed dog should be centered left to right and front to back in the needle plate slots. Then the feed dog moves in the needle plate slots without touching any part of the needle plate slots even when the machine pulley is turned at the maximum feeding amount.

### 1.To adjust the feed dog left to right in the needle plate slots

- (1) Remove rear bed cover ①.
- (2) Loosen screws ② and ③ with a 5mm key wrench.
- (3) Loosen two screws ⑤ of left and right collars ④.
- (4) Install needle plate bracket ⑥ and needle plate ⑦.
- (5) Move crank ⑧ to the left or right and position the feed dog in the center of the needle plate slots.
- (6) With the feed dog in this position, move collars ④ on the left and right respectively to the left and right ends of crank ⑧ and then tighten screws ⑤.

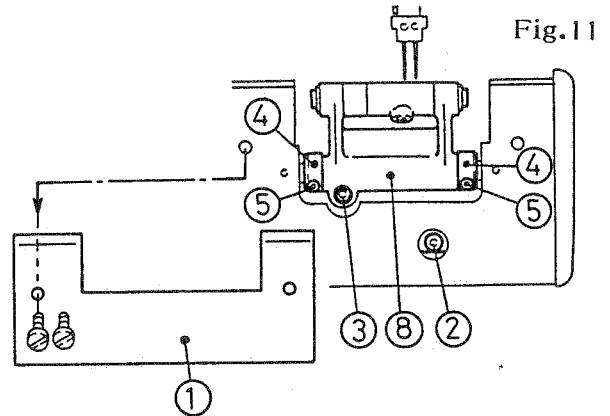


Fig.11

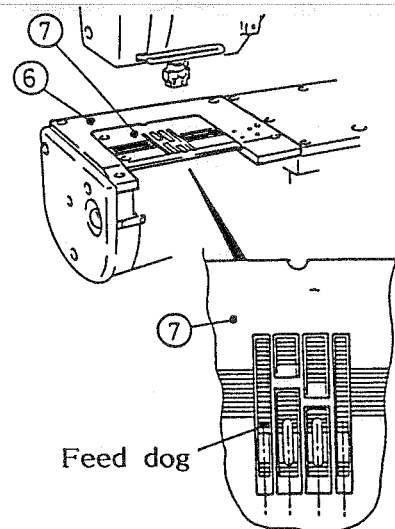


Fig.12

### 2.To adjust the feed dog front to back in the needle plate slots

- (1) Turn measure plate ② while pressing stopper ① and then set the feeding amount at 6mm.  
Note) For the machine which has a maximum feeding amount of 4.5mm, also set the maximum feeding amount limitation stopper at 6mm. (see [13] "To adjust the feeding amount limitation stopper" on page 29.)  
After this adjustment, be sure to return the limitation stopper home.
- (2) Turn the pulley by hand until the needle bar is at the bottom of its stroke.
- (3) Insert 5mm pin ③ into hole ④ in order to lock the upper shaft.  
Note) For high-lift machines, insert 5mm pin ③ into hole ⑤ in order to lock the upper shaft.

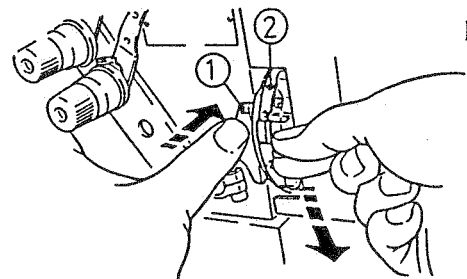


Fig.13

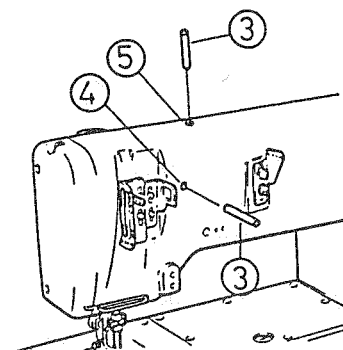


Fig.14

(4) Remove the needle plate bracket together with the needle plate.

(5) Insert 6mm pin ⑦ into hole ⑥ and move link ⑧ so that the end of 6mm pin ⑦ can fit into joint pin hole (a) indicated by the arrow.

(6) With a 6mm pin in this position, tighten screws ⑨ and ⑩.

(7) Remove pins ⑦ and ③ respectively from hole ⑥ and ④.

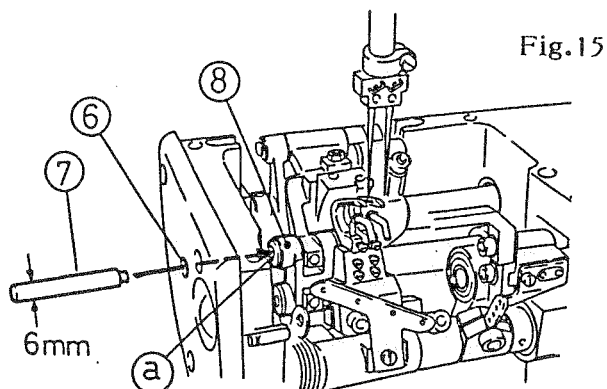


Fig.15

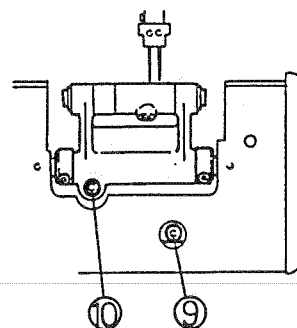


Fig.16

### 3. To adjust the height of the feed dog

When the needle bar is at the bottom of its stroke, the front teeth of the feed dog should be 1.3mm above the top surface of the needle plate.

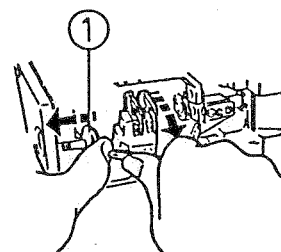


Fig.17

(1) Remove the needle plate bracket together with the needle plate.

(2) Turn the machine pulley by hand until the needle bar is at the top of its stroke.

(3) Press lever ① to the left and let the looper unit come out down toward you while holding it with your thumb.

(4) Loosen screw ② and nut ③. Then install the needle plate bracket together with the needle plate on the machine bed.

(5) Turn measure plate ⑤ while pressing stopper ④ and then set the feeding amount at 6mm.

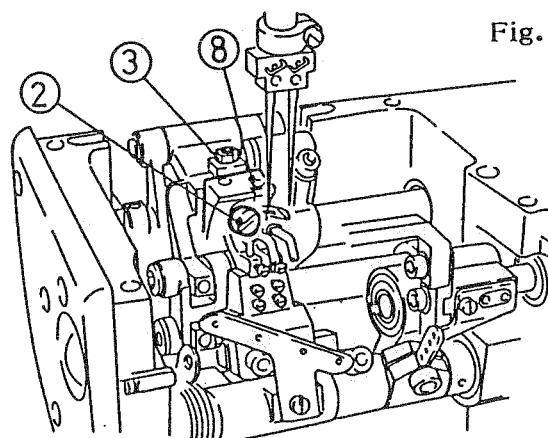


Fig.18

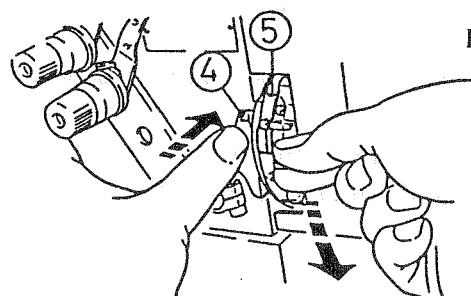
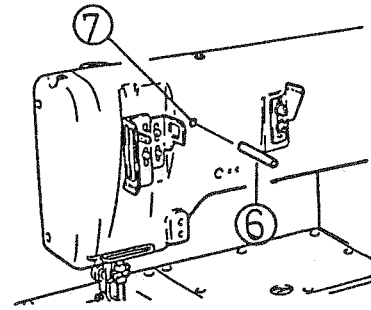


Fig.19

Note) For the machines which have a maximum feeding amount of 4.5mm, also set the maximum feeding amount limitation stopper at 6mm. (see [13] "To adjust the feeding amount limitation stopper" on page 29.) After this adjustment, be sure to return the limitation stopper home.

- (6) Turn the machine pulley by hand until the needle bar is at the bottom of its stroke.
  - (7) Insert 5mm pin ⑥ into hole ⑦ in order to lock the upper shaft.
  - (8) Adjust the feed dog by moving feed dog bracket ⑧ up or down. The feed dog teeth should be 0.5mm above the top surface of the needle plate.
- Then slightly tighten screw ②.

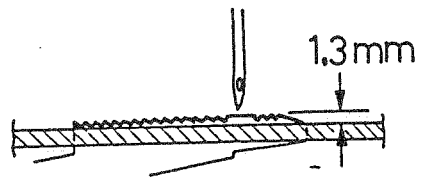
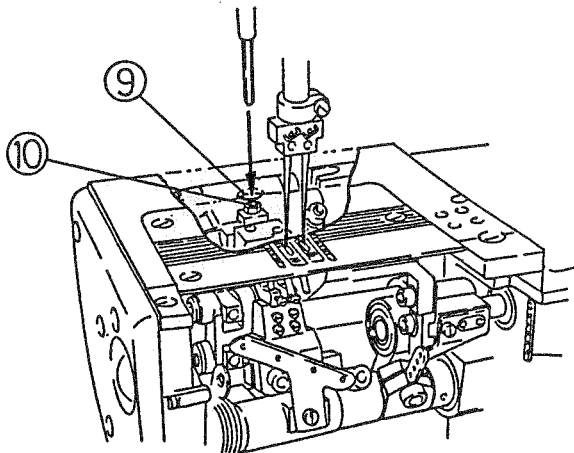
Fig.20



- (9) The front teeth of the feed dog should be set 1.3mm above the top surface of the needle plate. To make this adjustment, insert 2mm key wrench into hole ⑨ on the rear end of the needle plate and then turn adjusting screw ⑩.

Fig.21

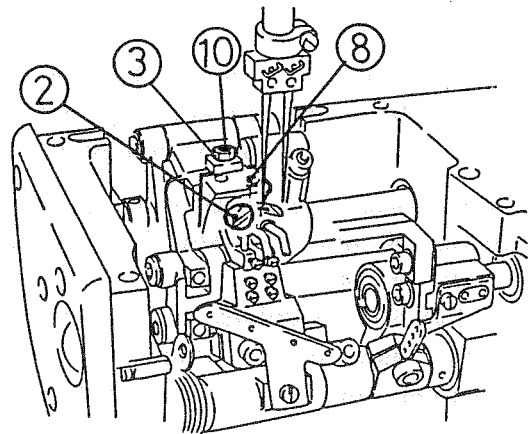
Fig.22



- (10) With the feed dog at this position, remove the needle plate bracket together with the needle plate. Tighten nut ③ to secure adjusting screw ⑩ and then tighten screw ② securely.

Fig.23

- (11) Remove pin ⑥ from hole ⑦.
- (12) Install the needle plate bracket and needle plate. Then check for the height of the feed dog (1.3mm in Fig.22) again.





## 2 Positioning the needles in the needle drops

### 1. To adjust the needles left to right in the needle drops (standard)

The needles should be centered left to right in the needle drops.

(1) Remove the needle plate bracket together with the needle plate. Before installing new needles, check them carefully to see that the scarfs are turned to the left.

(2) Loosen two screws ①.

(3) Turn the machine pulley by hand to let the needles go into needle drops ②.

(4) Distance ③ between the right needle and the front end of the right slot should be equal to distance a between the left needle and the front end of the left slot. If distances of two arrows are different, loosen screw ④ and turn needle holder ⑤ to adjust these distances.

(5) To center the needles left to right in the needle drops, move needle drive shaft ⑥ in the directions of the arrows as required.

(6) After the above adjustment, make sure needle bar thread guide ⑦ does not touch groove ⑧. If the thread guide touches the groove, slightly loosen screw ⑨ and adjust needle bar thread guide ⑦ by moving in the directions of the arrows as required.

Note) To make this adjustment, do not change the height of the needle bar thread guide.

(7) In this condition, tighten two screws ①.

Fig.24

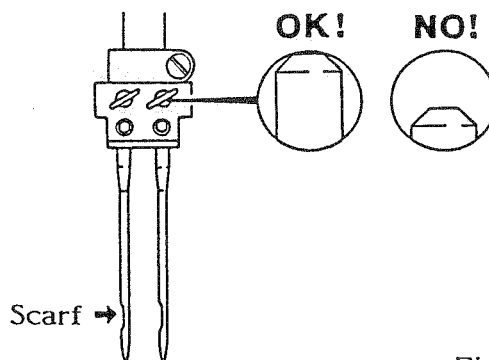


Fig.25

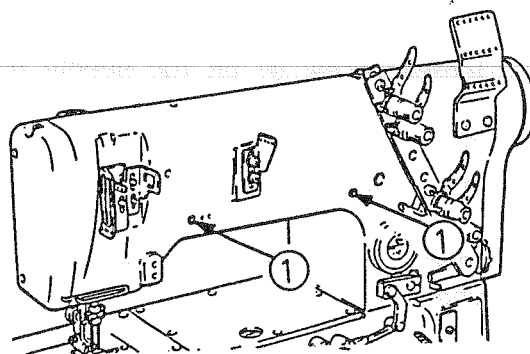


Fig.26

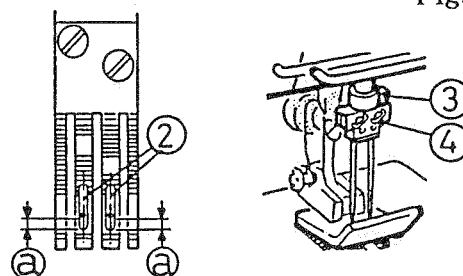


Fig.28

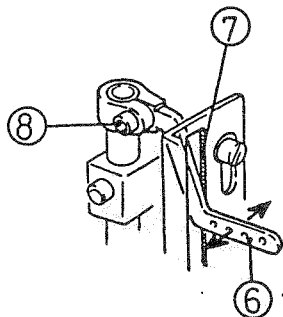
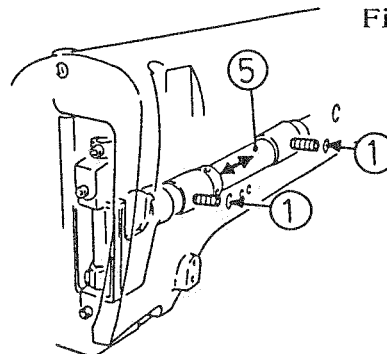


Fig.27



## 2. To adjust the needles front to back in the needle drops (standard)

When the needle bar is at the bottom of its stroke, the distance between the needles and the front ends of the needle drops should be 0.8mm.

- (1) Turn measure plate ② while pressing stopper ① and then set the feeding amount at 6.0mm.  
Note) For the machines which have a maximum feeding amount of 4.5mm, also set the maximum feeding amount limitation stopper at 6mm. (see [13] "To adjust the feeding amount limitation stopper" on page 29.)

After this adjustment, be sure to return the limitation stopper home.

- (2) Insert a 5mm key wrench into hole ③ and then loosen screw ④ on the needle drive crank.
- (3) Turn the machine pulley until the needle bar is at the bottom of its stroke.
- (4) Insert 5mm pin ⑤ into hole ⑥ to lock the upper shaft.
- (5) Move needle bar ⑦ front or back (in the directions of the arrows) as required and then set distance ⑧ between the needles and the front ends of the needle drops at 0.8mm.
- (6) In the above condition, make sure there is no shake on needle drive shaft ⑧ and then tighten screw ④.
- (7) Remove pin ⑤ from hole ⑥.

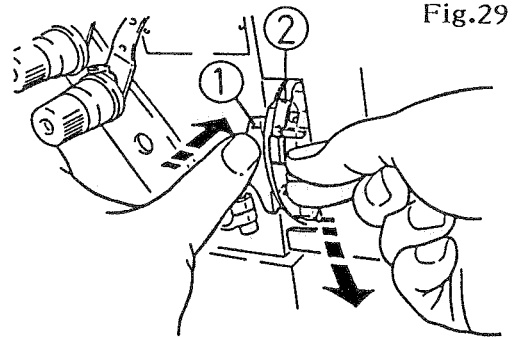


Fig.29

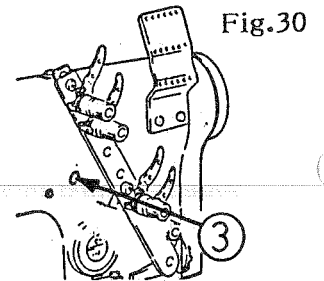


Fig.30

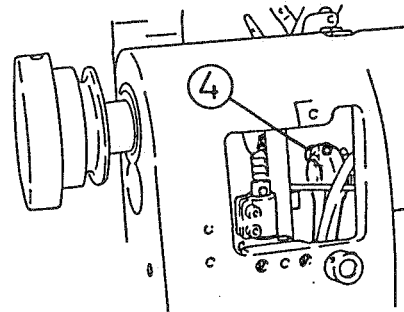


Fig.31

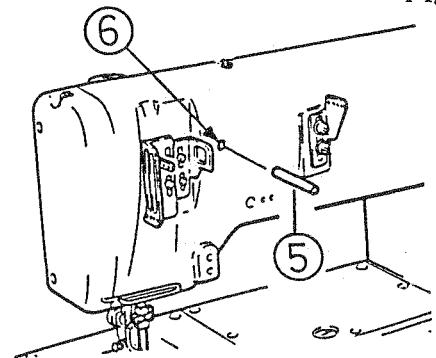


Fig.32

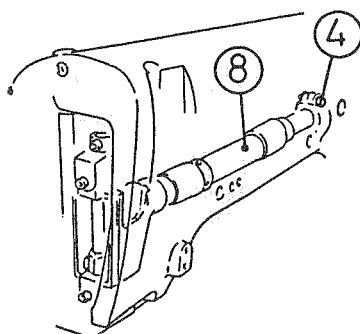
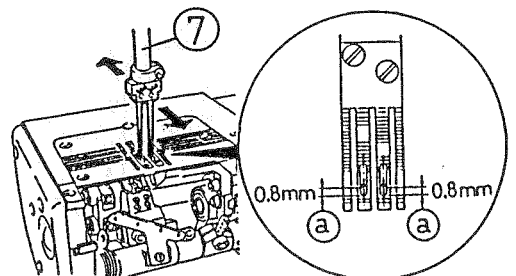


Fig.33



3. To adjust the needles left to right in the needle drops (equipped with the UT)

The needles should be centered left to right in the needle drops.  
To make this adjustment, refer to the adjustment for "standard".

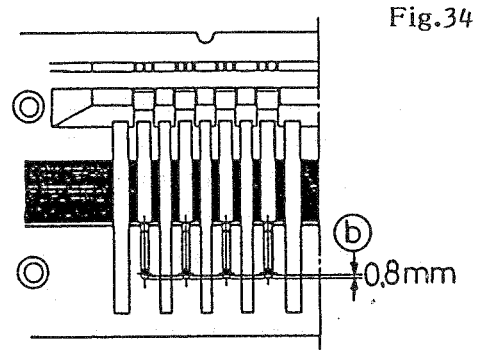


Fig.34

4. To adjust the needles front to back in the needle drops (equipped with the UT)

When the needles are the closest to the fronts (when the needles are descending from the top of their stroke and the needle points are approximately 2.3mm below the top surface of the needle plate), distance (b) between the needles and the front ends of the needle drops should be 0.8mm.

- (1) Turn measure plate ② while pressing stopper ① and then set the feeding amount at 4mm.
- (2) Insert a 5mm key wrench into hole ③ and then loosen screw (4) on the needle drive crank.
- (3) Turn the machine pulley by hand until the needles are the closest to the fronts (the needle points are approximately 2.3mm below the top surface of the needle plate when the needles are descending from the top of their stroke).
- (4) Distance (b) between the needles and the front ends of the needle drops should be 0.8mm. To make this adjustment, move needle bar ⑤ front to back (in the directions of the arrows) as required.
- (5) In the above condition, make sure there is no shake on needle drive shaft ⑥ and then tighten screw ④.

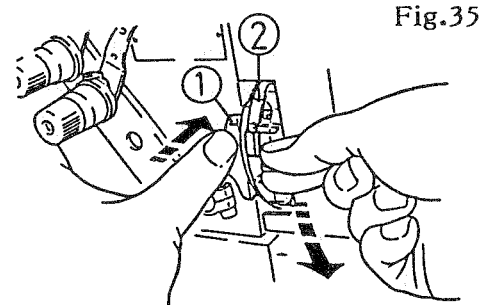


Fig.35

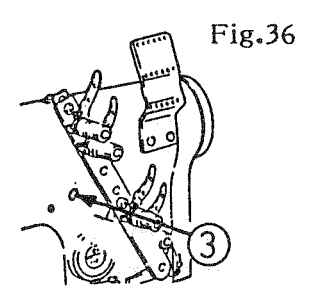


Fig.36

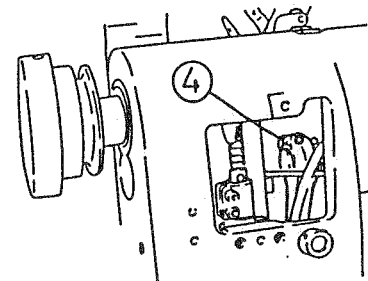


Fig.37

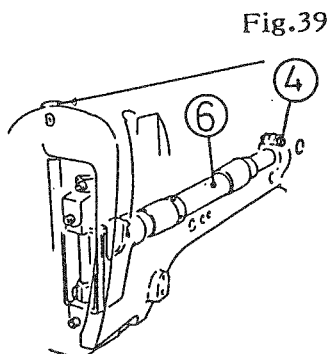


Fig.39

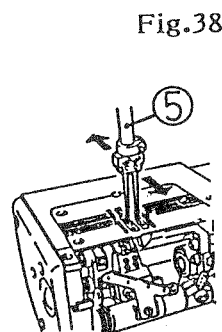
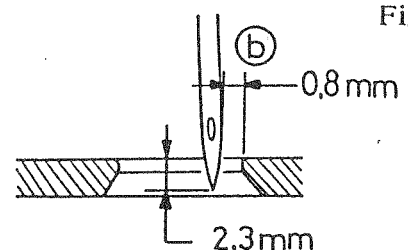


Fig.38



### [3] Adjusting the loopers

#### 1. To adjust the timing of the loopers

Turn the machine pulley in the operating direction in order to bring the points of the loopers to the center lines of the needles when the needle points are 5mm above the bottom of their stroke.

- (1) Return measure plate ② all the way in the direction of the arrow while pressing stopper ①. (Set the maximum feeding amount on each model.)

Note) When you use the machines of a maximum feeding amount of 4.5mm with 3 - 2mm, set the feeding amount at 3mm.

- (2) Remove the needle plate bracket together with the needle plate, feed dog, thread guide ③ and arm cover ④.

- (3) Turn the machine pulley by hand in the operating direction until the needle bar is at the top of its stroke.

- (4) Loosen screw ⑤.

- (5) Turn the machine pulley by hand in the operating direction until the needle bar is 5mm above the bottom of its stroke.

- (6) With the needle bar at this position, turn looper holder ⑥ until the points of the loopers reach the center lines of the needles.

- (7) Tighten screw ⑤.

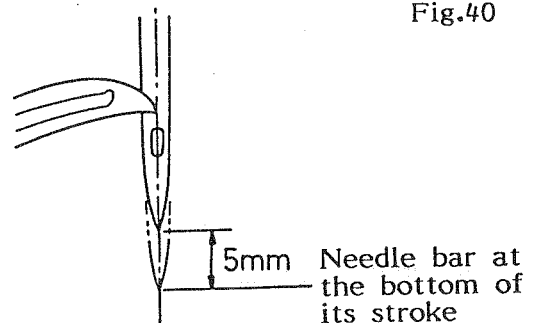


Fig.40

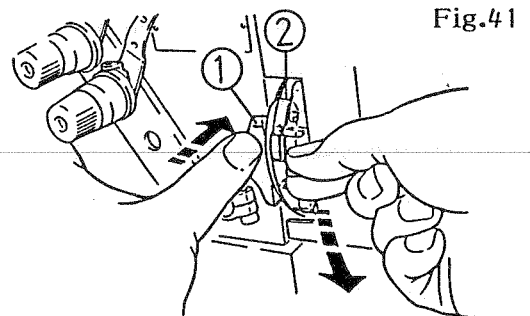


Fig.41

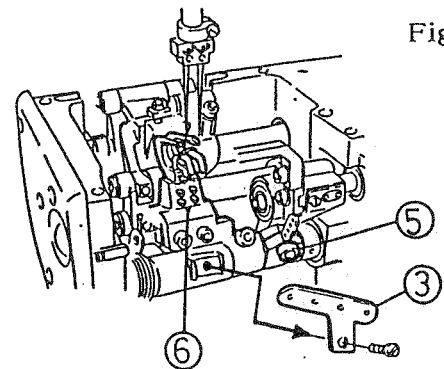


Fig.42

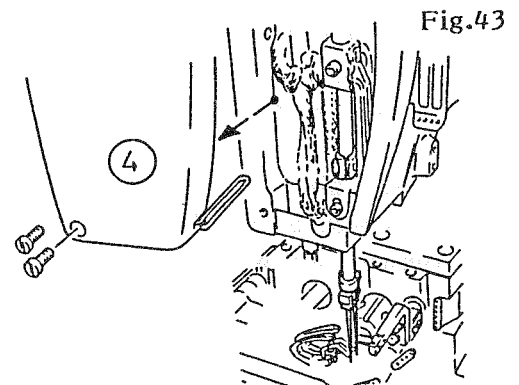
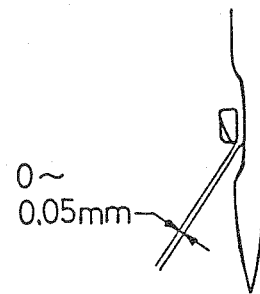


Fig.43

## 2. To adjust the clearance between the loopers and the needles

When the points of the loopers are on the center lines of the needles, the distance between the points of the loopers and the needles should be 0 - 0.05mm.

Fig.44



- (1) Return measure plate ② all the way in the direction of the arrow while pressing stopper ①.  
(Set the maximum feeding amount on each model.)

Note)

When you use the machines of a maximum feeding amount of 4.5mm with 3 - 2mm, set the feeding amount at 3mm.

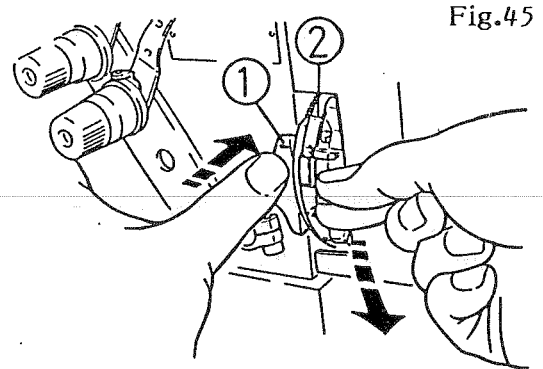
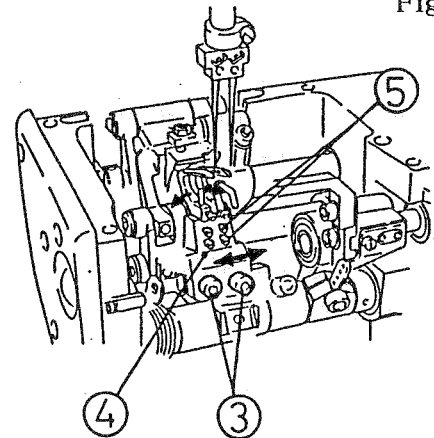


Fig.45

- (2) Make sure the points of the loopers are accurately on the center lines of the needles and then loosen screws ③.
- (3) Move looper holder ④ to the left or right and then let the points of the loopers slightly touch the needles.

Fig.46



- (4) Tighten screws ③.
- (5) Slightly loosen screws ⑤.
- (6) Adjust the looper holder so that the distances between the points of the loopers and the needles are 0 - 0.05mm.
- (7) With the looper holder at this position, tighten screws ⑤.

#### [4] Adjusting the height of the needles

When the loopers are advancing from the extreme left end of their travel and the points of the loopers have reached the right ends of the needles (on the front), the distance between the points of the loopers and the top of the needles' eyes should be 1 - 1.2mm.

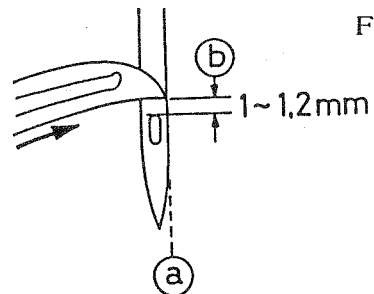


Fig.47

- (1) Turn measure plate ② all the way in the direction of the arrow while pressing stopper ①. (Set the maximum feeding amount on each machine.)

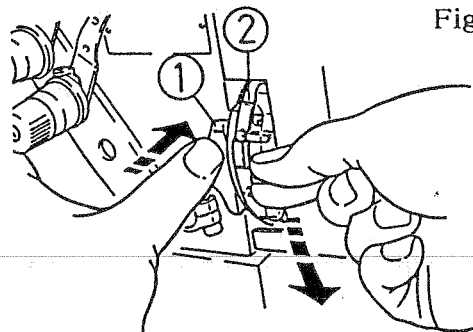


Fig.48

Note)

When you use the machines of a maximum feeding amount of 4.5mm with 3 - 2mm, set the feeding amount at 3mm.

- (2) Remove arm cover ③ and needle plate bracket ④.
- (3) Turn the machine pulley by hand until the points of the advancing loopers reach the right ends of the needles (on the front) ①.
- (4) Loosen screw ⑤ and move needle bar ⑥ up or down as required in order to set distance ② at 1 - 1.2mm.

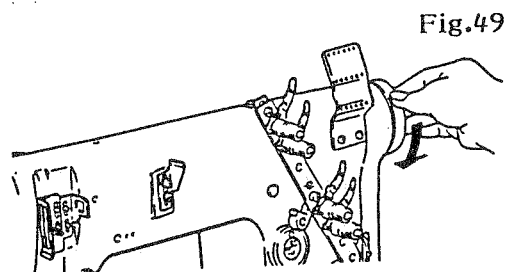


Fig.49

Note)

When making this adjustment, do not turn the needle bar.

- (5) Tighten screw ⑤.
- (6) Replace arm cover ③ and needle plate bracket ④.

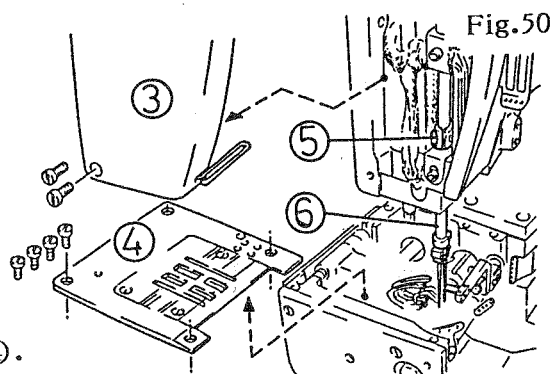


Fig.50

Note)

After the above adjustment, the distance between the top surface of the needle plate and the needle points should be approximately 11mm. On high-lift machines, this distance should be 14mm.

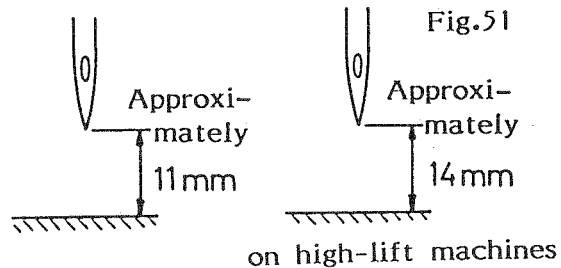


Fig.51

## 1.5 Adjusting the retainers

### 1. To adjust the retainers front to back

The points of the retainers should be turned at  $45^\circ$  as seen from (A).

There should be a distance of 13.5mm between retainer holder (3) and the points of the retainers.

When the needle bar is at the bottom of its stroke at the maximum feeding amount, a distance of 2 - 3mm should be obtained between the points of the retainers and the center lines of the needles.

- (1) Turn measure plate (8) all the way in the direction of the arrow while pressing stopper (7).  
(Set the maximum feeding amount on each model.)

Note)

When you use the machines of a maximum feeding amount of 4.5mm with 3 - 2mm, set the feeding amount at 3mm.

- (2) Remove the feed dog and the needle plate bracket with the needle plate.
- (3) Loosen screws (1).
- (4) Set distance (a) between retainer holder (3) and the points of the retainers at 13.5mm by moving retainers (2) front to back.
- (5) Turn the points of the retainers at an angle of  $45^\circ$ . When making this adjustment, be careful not to change the front-to-back position of retainers (2).
- (6) With the retainers at this position, tighten screws (1).
- (7) Loosen screw (4).
- (8) Turn the machine pulley until the needle bar is at the bottom of its stroke.
- (9) Set clearance (b) between the points of the retainer and the centers of the needles at 2 - 3mm by moving retainer holder (3) front to back.
- (10) With the points of the retainers and the centers of the needles at this position, tighten screw (4).

Fig.52

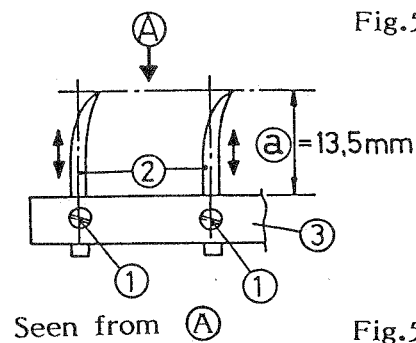


Fig.53

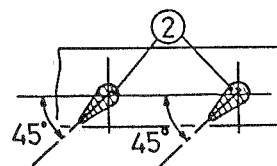


Fig.54

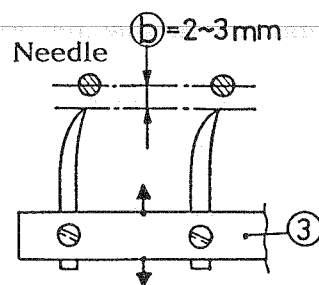


Fig.55

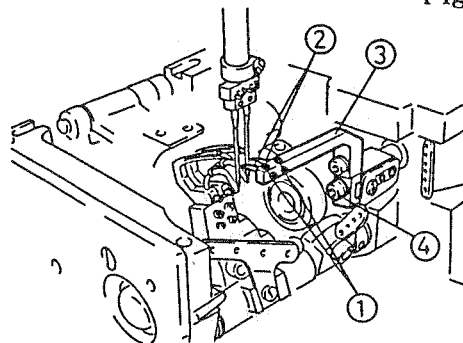
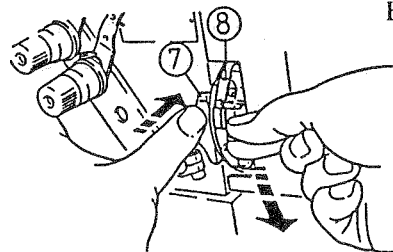


Fig.56



## 2. To adjust the retainers left to right

With the points of the retainers at any position, the points should not touch the loopers.

(1) Turn the machine pulley by hand until retainer holder ③ is at the extreme left end of its travel.

(2) Then slightly turn the machine pulley until loopers' eyes ④ are aligned with the points of the retainers.

(3) Loosen two screws ⑤.

(4) Adjust retainer holder ③ so that there is a clearance of 0.5mm between the points of retainers ② and the loopers.

(5) With the retainer holder at this position, tighten two screws ⑤.

(6) Loosen screw ⑥.

(7) Turn the machine pulley by hand until the points of retainers ② are right above the loopers on their back sides ④.

(8) Adjust retainer holder ③ up or down so that there is a clearance of 0.1 - 0.5mm between the points of the retainers and the back sides of the loopers.

(9) With the retainer holder at this position, tighten screw ⑥.

(10) After adjusting the retainers front to back and left to right, turn the machine pulley by hand to make sure carefully that there are the required clearance between the retainers and the loopers.

Fig.57

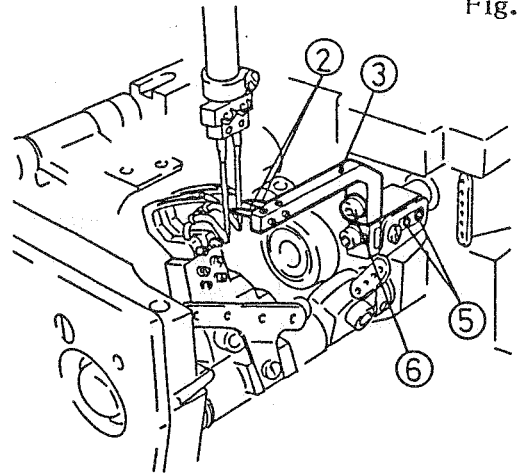


Fig.58

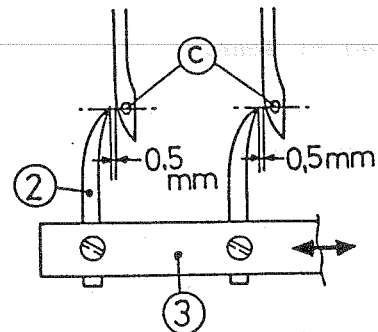
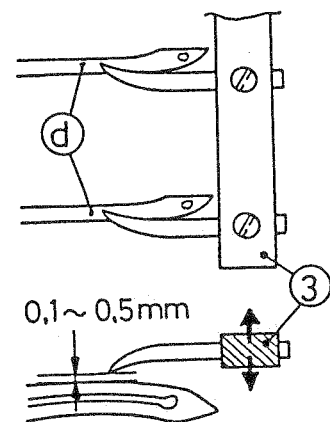


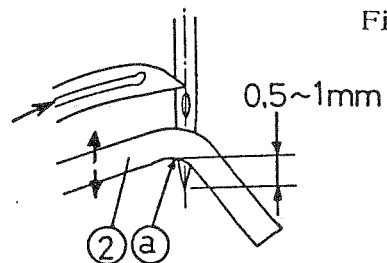
Fig.59





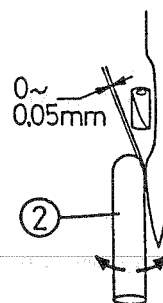
## [6] Adjusting the needle guards

When the points of the loopers reach the center lines of the needles from the extreme rear end of their travel, needle guards ② should slightly touch the needles with the points of the needles protruding 0.5 - 1mm from the undersides of the needle guards ②.



- (1) Turn measure plate ④ all the way in the direction of the arrow while pressing stopper ③.

(Set the maximum feeding amount on each model.)



- (2) Remove the feed dog and the needle plate bracket with the needle plate.

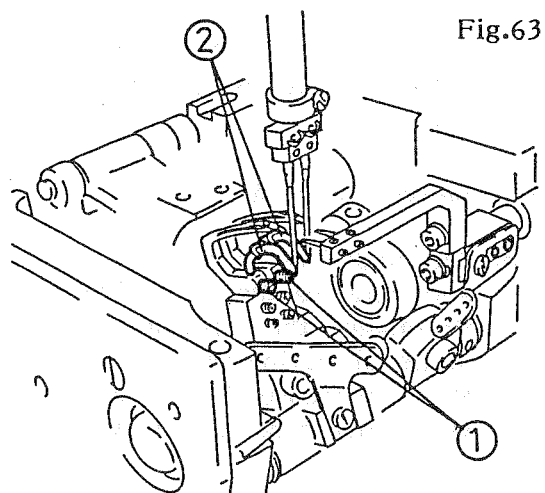
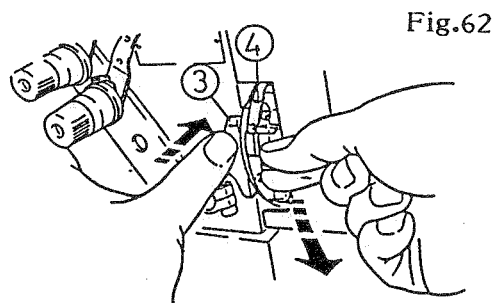
- (3) Loosen screws ①.

- (4) Turn the machine pulley by hand until the points of the loopers reach the center lines of the needles from the extreme rear end of their travel.

- (5) Adjust needle guards ② up and down so that the points of the needles protrude approximately 0.5 - 1mm from undersides (a) of the needle guards.

- (6) Turn needle guards ② clockwise or counter-clockwise as required so that the needle guards slightly touch the needles. (There should be a clearance of 0 - 0.05mm between needle guards ② and the needles.) However, the needles should not be deflected by needle guards ②.

- (7) Then tighten screws ①.



## [7] Adjusting the looper thread take-up

When looper thread take-up is at the top of its stroke, adjust looper thread take-up ① so that there is a distance of 30mm between top surface ① of looper thread take-up ① and top surface ② of the base plate. (Fig.64)

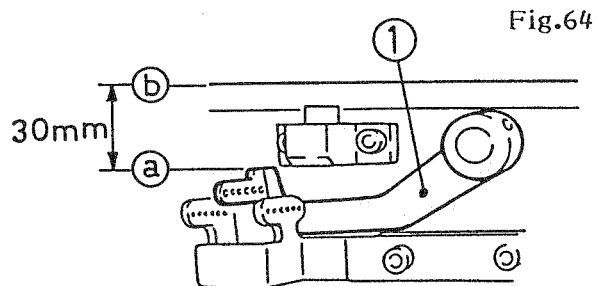


Fig.64

The height of thread guide ② varies according to each model.

- For the machines that have a maximum feeding amount of 4.5mm:

There should be a distance of 6mm between top surface ③ of thread guide ② and top surface ④ of looper thread take-up ①. (Fig.65)

- For the machines that have a maximum feeding amount of 6mm:

The eyes of thread guide ② should be aligned with those of looper thread take-up ①. (Fig.66)

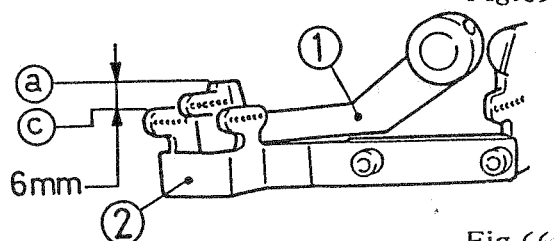


Fig.65

Fig.66

- (1) Turn measure plate ④ all the way in the direction of the arrow while pressing stopper ③. (Set the maximum feeding amount on each model.)

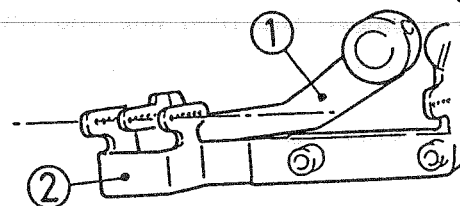
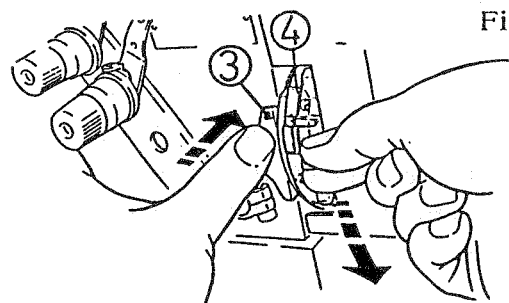


Fig.66

Fig.67

- (2) Turn the machine pulley by hand until looper thread take-up ① is at the top of its stroke.
- (3) Loosen screws ⑤. Move looper thread take-up ① to obtain a distance of 30mm between top surface ① and top surface ② of the base plate.
- (4) Tighten screws ⑤.
- (5) Loosen screw ⑥. Adjust the height of thread guide ② according to each model (see Fig.65 or 66).
- (6) Tighten screw ⑥.



Note) The height of thread guide ② stated above is standard. This height varies according to the stitch length and/or the fabric to be used.

To change the furnishing amount of the looper thread, move thread guide ② in the direction of ⊕ or ⊖.

- To increase the amount, move in the direction of ⊕.
- To decrease the amount, move in the direction of ⊖.

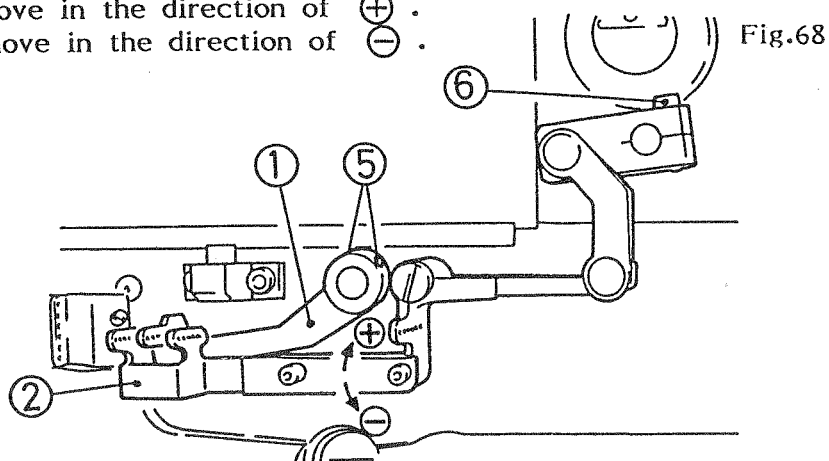


Fig.68

## 8 Adjusting the thread guides

Set needle bar thread guide guard ① at the lowest position.

When the needles are at the top of their stroke (needle bar thread guide ③ is at the top of its stroke), the needle threads must slightly touch part ① of thread guide ②.

On thread guide ④, distances ⑥ must be equal.

- (1) Loosen screws ⑤.
- (2) Lower needle bar thread guide guard ① in the direction of the arrow. Then tighten screw ⑤ with guard ① at the lowest position.

Fig.69

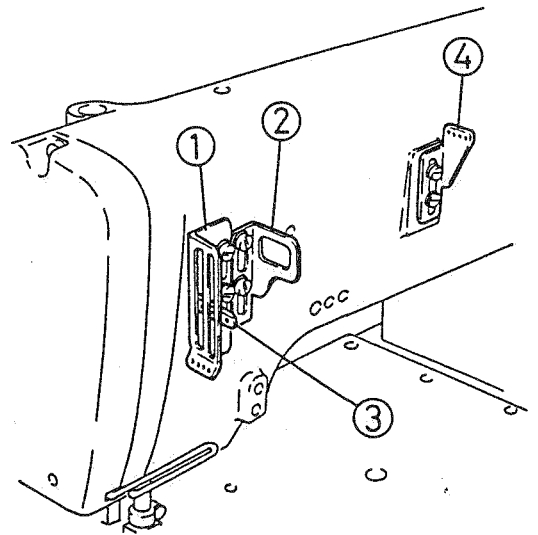


Fig.70

Note)

The size of the needle thread loops change according to the position of needle bar thread guide guard ①.

- To increase the size of the loops, move the needle bar thread guide guard in the direction of ⊕.
- To decrease the size of the loops, move the needle bar thread guide guard in the direction of ⊖.

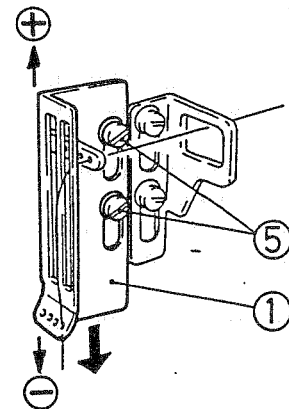
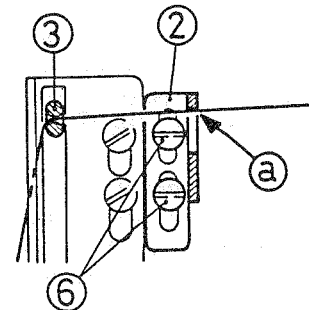


Fig.71



- (3) Loosen screws ⑥.
- (4) Tighten screws ⑥ when the needle threads slightly touch part ① of thread guide ② with needle bar thread guide ③ at the top of its stroke.
- (5) Loosen screws ⑦.
- (6) Secure thread guide ④ with screws ⑦ when distances ⑥ are equal.

Note)

The position of each thread guide stated above is standard. Change the position according to the stitch length or the fabric to be used.

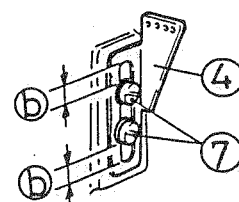


Fig.72

## [9] Adjusting the pressure of the presser foot

The pressure of the presser foot should be as light as possible, yet be sufficient to feed the fabric accurately and obtain the proper stitch formation.

- (1) Turn the machine pulley by hand until the needle bar is at the top of its stroke.
- (2) To decrease the pressure to presser bar ②, loosen pressure adjusting screw ① by turning it in the direction of the arrow.
- (3) Turn nut ③ until rear surface (a) of nut ③ is aligned with end surface (b) of screw ④.
- (4) Loosen two screws ⑤ on the presser bar holder.
- (5) Adjust presser foot ⑥ by turning it clockwise or counterclockwise as required. Side (c) of the presser foot should be parallel with feed slot (d) of the needle plate and the needles should be centered in needle drops (e) of the presser foot.
- (6) Press presser foot ⑥ slightly onto the needle plate so that the bottom surface of the presser foot touches tightly the needle plate.
- (7) Move presser foot holder ⑦ so that there is a clearance of 1mm between the underside of presser foot holder ⑦ and the bottom of presser bar guide ⑧.

Note)

When making the above adjustment, do not move presser bar ②.

- (8) After the above adjustment, tighten two screws ⑤.
- (9) Lower the presser foot. Then make sure that the bottom surface of the presser foot tightly touches the needle plate and feed slot (d) is aligned with side (c) of the presser foot.
- (10) With the presser foot at this position, loosen screw ⑨ and move collar ⑩ until it tightly touches presser bar bush ⑪. Then tighten screw ⑨.
- (11) When the feed dog is raised by turning the machine pulley by hand, presser bar ② should not be raised with presser foot ⑥ raised. To make this adjustment, increase the presser foot pressure by turning presser foot pressure adjusting screw ① clockwise slowly.
- (12) Adjust presser foot pressure adjusting screw ① so that the fabric can be fed accurately even when the machine runs at the maximum machine speed.

Fig.73

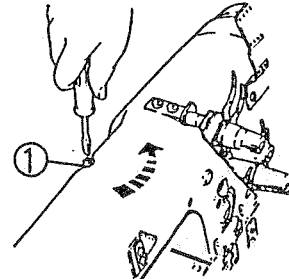


Fig.74

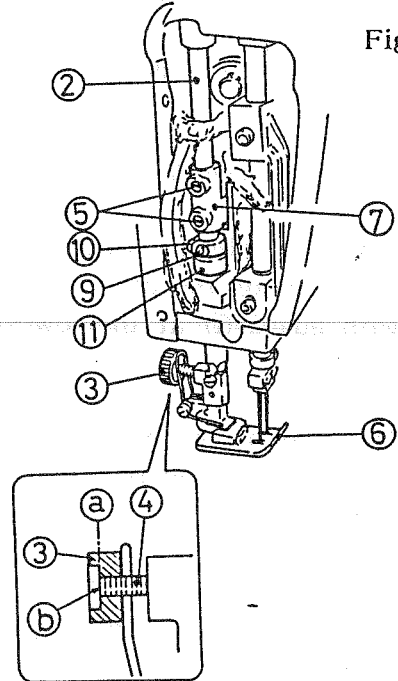


Fig.75

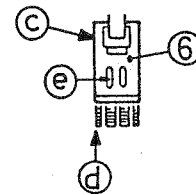
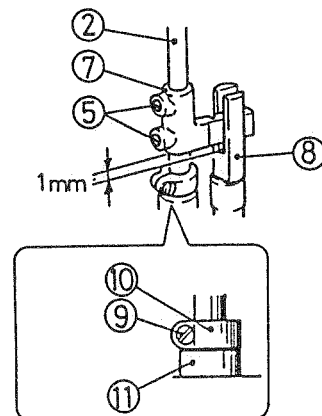


Fig.76



## 10] Adjusting the presser foot lift knee switch

When the presser foot lift knee switch is pressed all the way to the right, the presser foot is 10mm above the top surface of the needle plate.

- (1) Fit presser foot lift knee switch ① to the joint and then lower the presser foot onto the needle plate.
- (2) Loosen nut ③ on stopper screw ② on the right. Then loosen screw ② slightly.
- (3) Tighten stopper screw ②, but stop tightening just before the presser foot starts lifting from the needle plate.
- (4) Loosen screw ② by giving it about half a turn and then tighten nut ③. The above adjustment provides a little play from when the knee switch is pressed to when the presser foot is raised.
- (5) Loosen nut ⑤ on stopper screw ④ on the left. Then loosen screw ④ slightly.
- (6) Press presser foot lift knee switch ① to the right until the presser foot is 10mm above the top surface of the needle plate.
- (7) With the presser foot at this position, tighten stopper screw ④ until it touches crank ⑥.
- (8) Release presser foot lift knee switch ①, loosen stopper screw ④ by giving it about half a turn and then tighten nut ⑤.

Fig.77

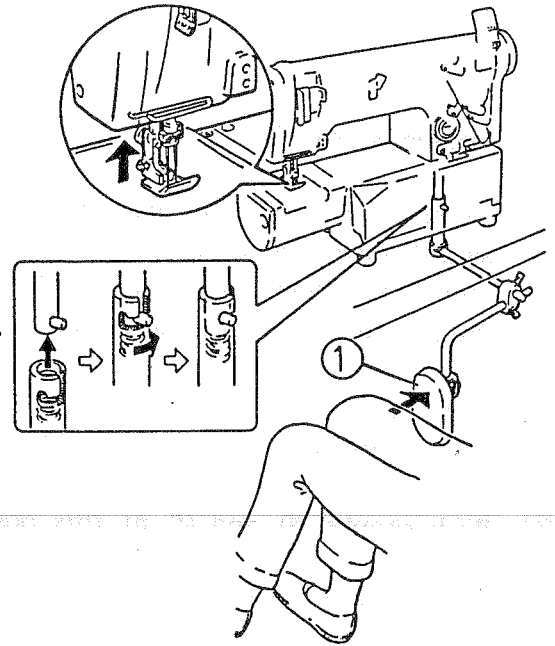


Fig.78

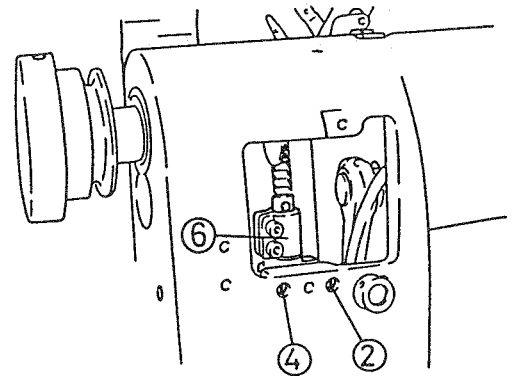
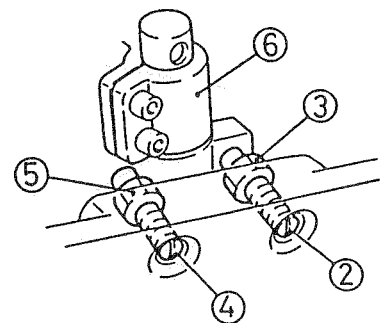


Fig.79



## [11] Adjusting the thread releaser

The thread releaser gets activated while the presser foot is raised with the presser foot lift switch.

Fig.80

- (1) Loosen screw ①.
- (2) Keep on pressing the presser foot lift knee switch until the presser foot is raised approximately 10mm above the needle plate and then maintain the presser foot at this position.
- (3) Turn collar ② in the direction of the arrow until crank ③ touches crank ④.
- (4) With cranks ③ and ④ at this position, lower thread releaser ⑤ to the lowest position and then raise releaser ⑤ approximately 1mm up.
- (5) With releaser ⑤ at this position, crank ③ should fit tightly crank ④ and there should be no shake on shaft ⑥.  
Then tighten screw ①.

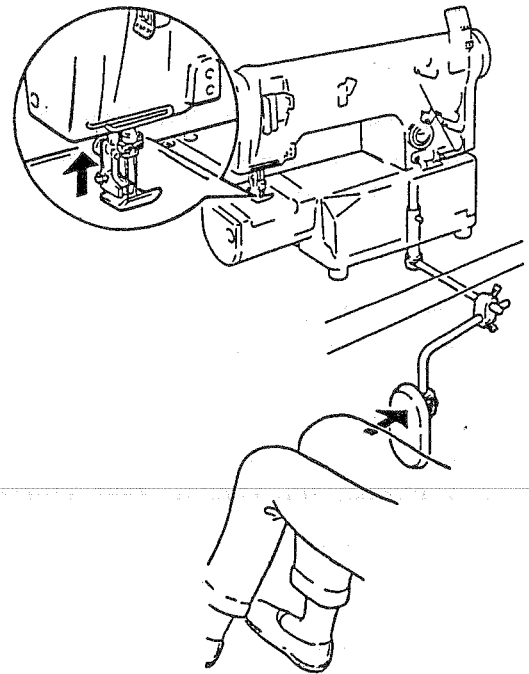
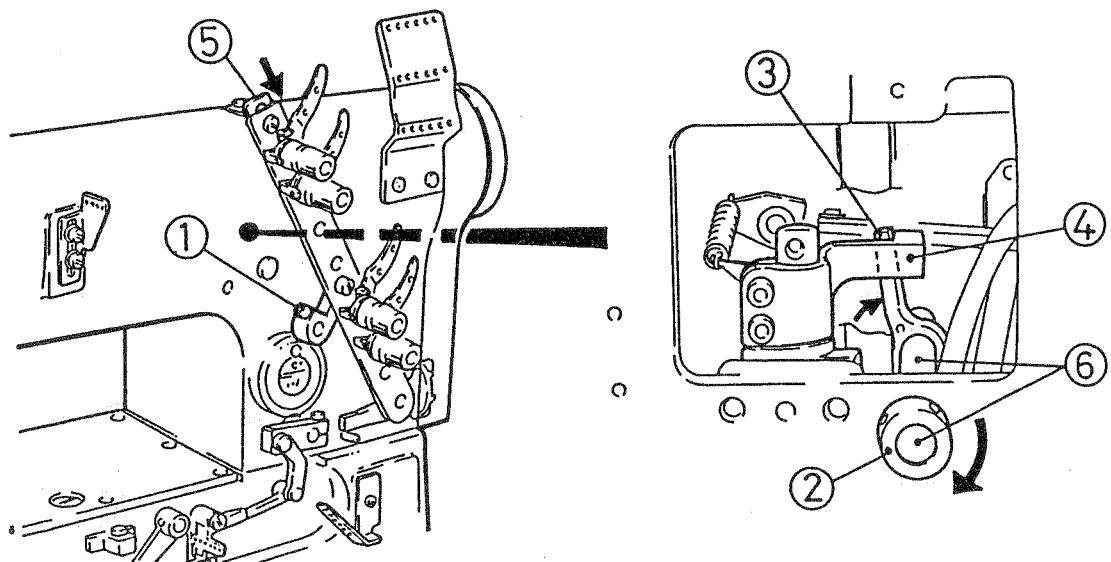


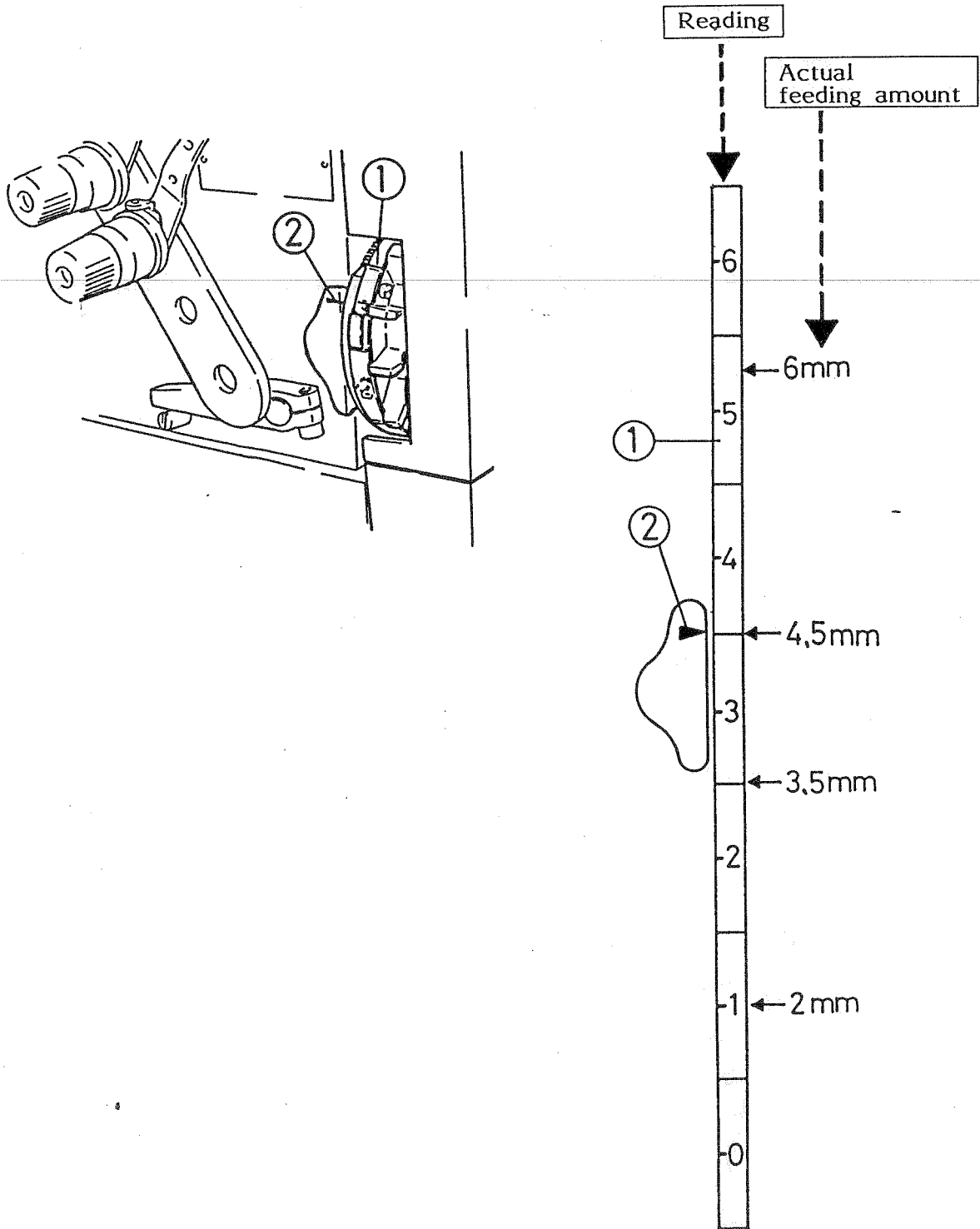
Fig.81



**[12] Relationship between the measure plate and the feeding amount**

The relationship between readings on feeding amount adjusting measure plate ① indicated by indicator ② and the actual feeding amounts (stitch lengths) is as shown in Fig.82.

Fig.82



### [13] Adjusting the feeding amount limitation stopper

Feeding amount limitation stopper ① is pre-adjusted in the factory before shipment.

- On the machines which have a maximum feeding amount of 6mm, stopper ① is available in 6 - 3mm.
- On the machines which have a maximum feeding amount of 4.5mm, stopper ① is available in 4.5 - 2mm.

#### Note

1. If you use the machines which have a maximum feeding amount of 6mm with the feeding amount of 4.5 - 3mm, re-adjust the machines by referring to the standard adjustment specifications for the machines which a maximum feeding amount of 4.5mm. Re-adjust the timing of the front-to-back feed eccentric (P.10), feed dog (P.11), needles in the needle drops (P.14), loopers (P.17), height of the needles (P.19), retainers (P.20), and needle guards (P.22).
2. If you use the machines which have a maximum feeding amount of 4.5mm with the feeding amount of 3 - 2mm, re-adjust the timing of the front-to-back feed eccentric (P.10), feed dog (P.11), needles in the needle drops (P.14), loopers (P.17), height of the needles (P.19), retainers (P.20), and needle guards (P.22).

#### 1. To limit the maximum feeding amount

Never move maximum feeding amount limitation stopper ① except when adjusting "the timing of the front-to-back feed eccentric" and "the feed dog". To move stopper ①, loosen two screws ②.

- On the machines that have a maximum feeding amount of 6mm, set stopper ① at position a.
- On the machines that have a maximum feeding amount of 4.5mm, set stopper ① at position b.

#### Note)

Do not set stopper ① at more than the maximum feeding amount of each model. Otherwise the feed dog and/or the needle plate, etc. will be damaged.

#### 2. To adjust the minimum feeding amount

- (1) Loosen screw ⑤ on lever ④.
- (2) Turn measure plate ③ while pressing stopper ⑥ and then set the minimum feeding amount at (3mm for the machines of a maximum feeding amount of 6mm, 2mm for the machines of a maximum feeding amount of 4.5mm).
- (3) With lever ④ touching stopper pin ⑦, tighten screw ⑤. Then there should be no shake on shaft ⑧.

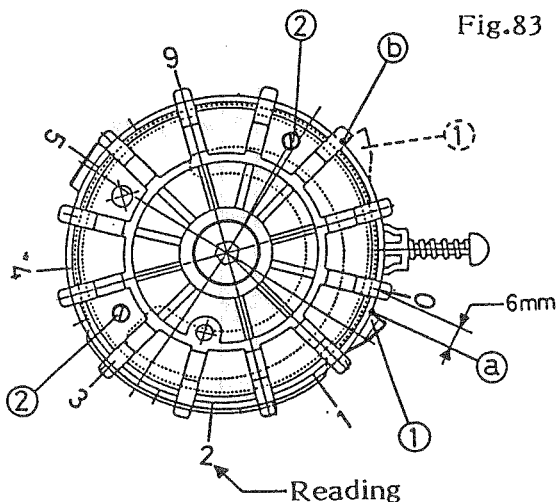


Fig.83

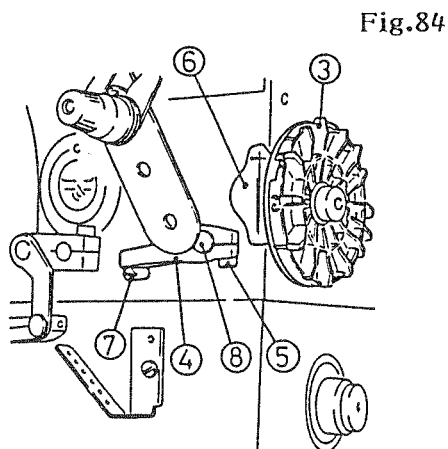


Fig.84