

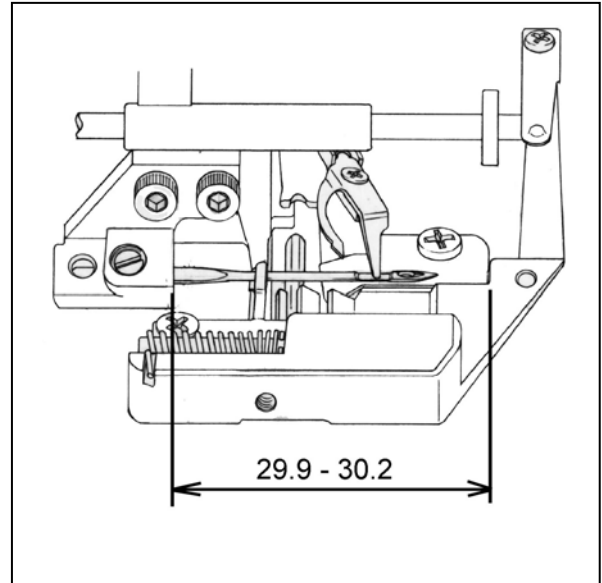
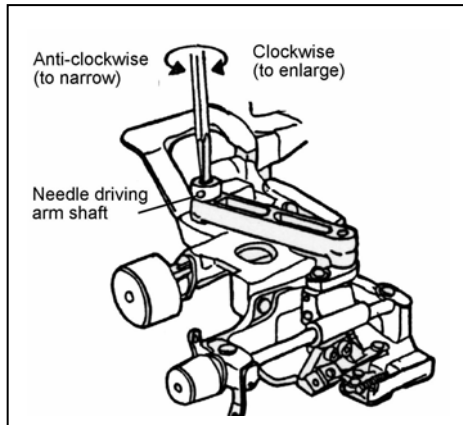
# SERVICE MANUAL

Model **BL-101**

**baby lock<sup>®</sup>**

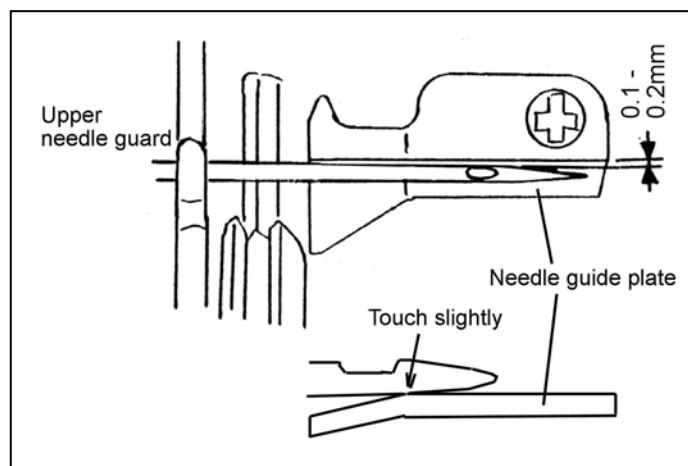
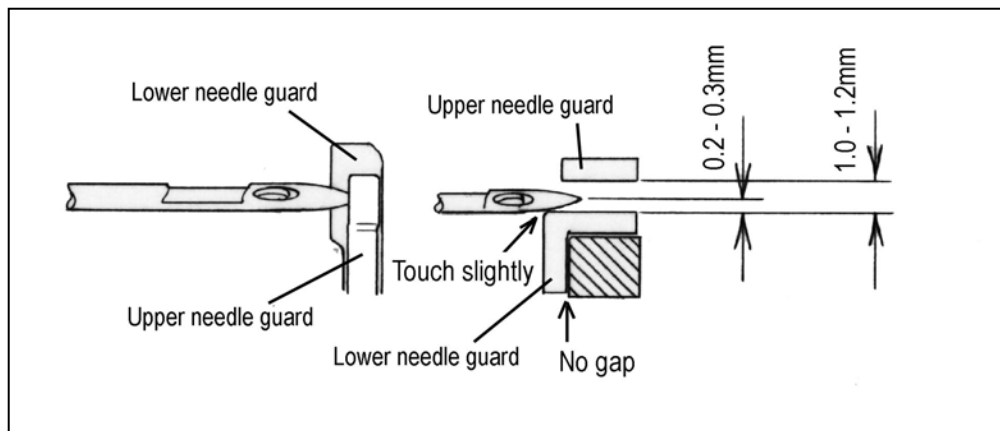
## 1. Position of needle

- a) Set needle holder to extreme right position.
- b) Adjust the distance of needle holder

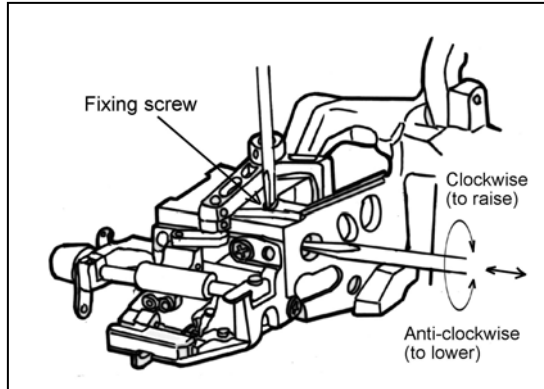


## 2. Adjustment of needle guards and needle guide plate

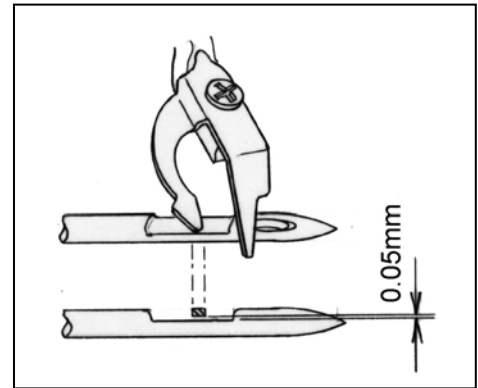
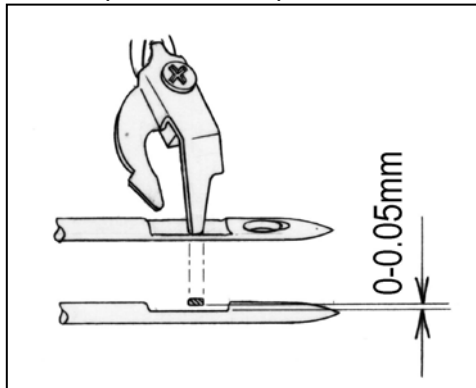
Set needle slightly right-down ward in order to make its penetration stronger.



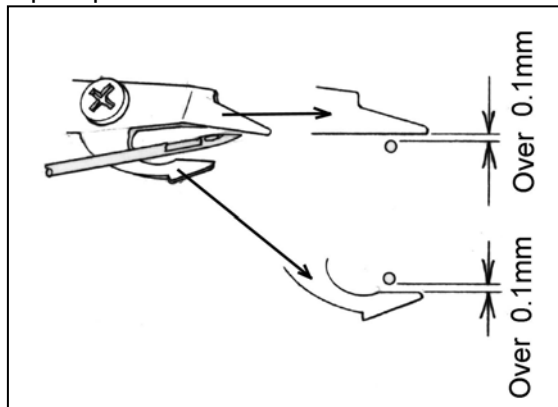
### 3. Adjustment of looper position



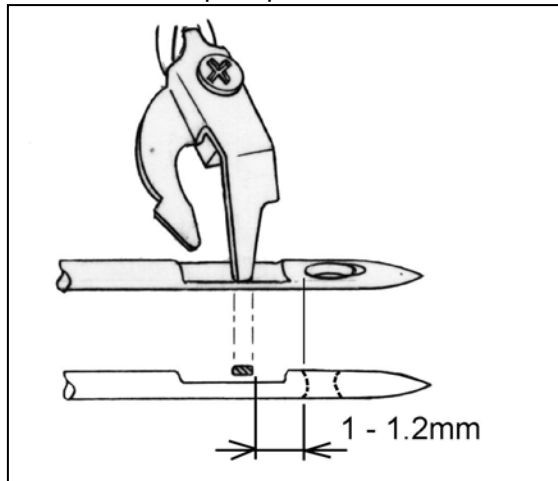
#### 3-1 Adjustment of top and bottom position



#### 3-2 Clearance between the looper tip and the needle

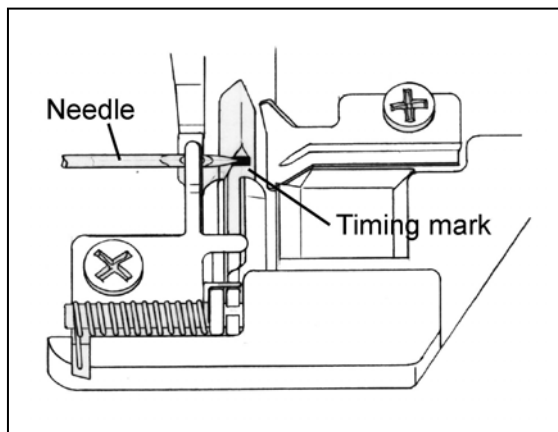


#### 3-3 Distance from the eye of needle to the looper tip



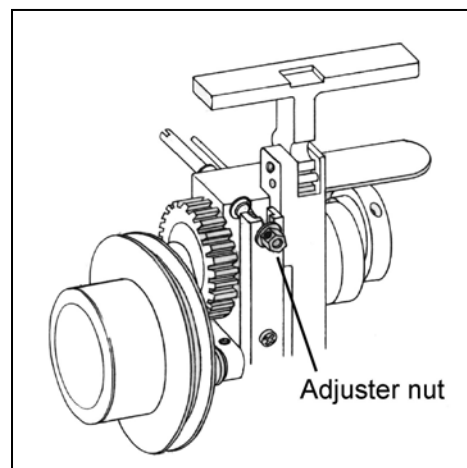
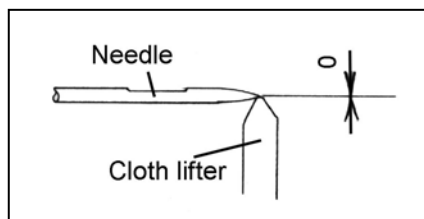
#### 4. Adjustment of timing of cloth lifter

Set skip-stitch dial at “skip” position when you adjust the timing.



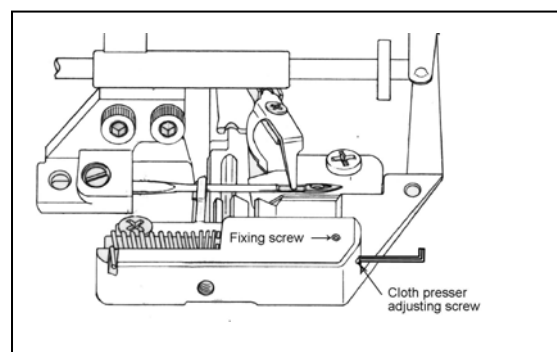
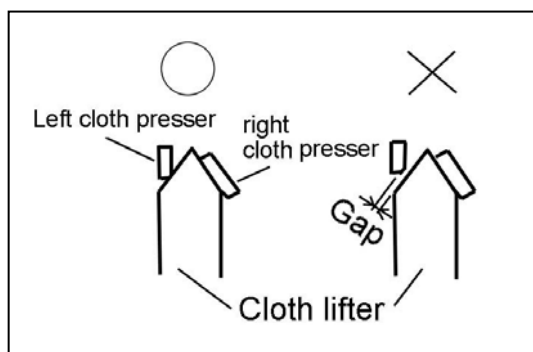
#### 6. Adjustment of the height of cloth lifter

Set stitch-depth dial at 3. (centre.)



#### 7. Adjustment of cloth presser

Make sure both left and right cloth pressers to hold the cloth lifter.



(No 005226 ~ )



**Service Manual**

**MODEL BL450**

5.18.99

HAPPY INDUSTRIAL CORP.

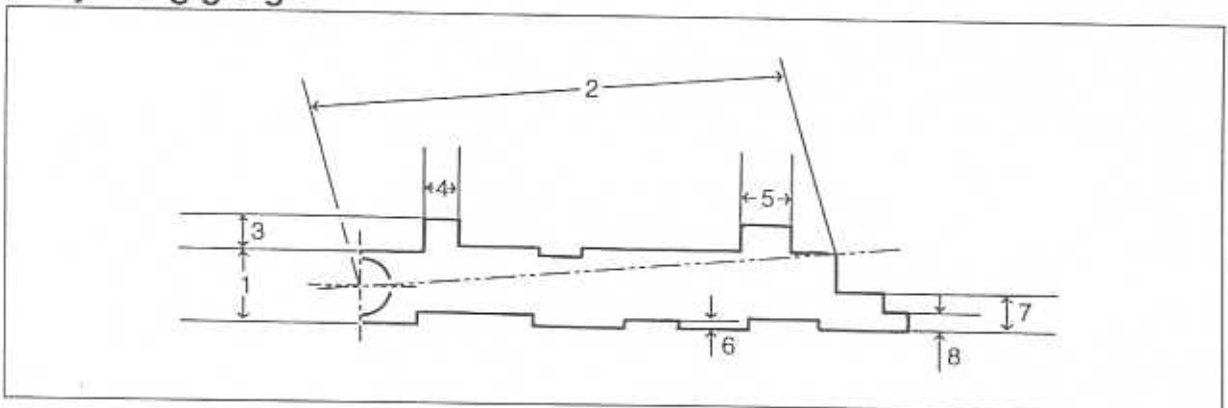


SM BL450

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## • Adjusting gauge

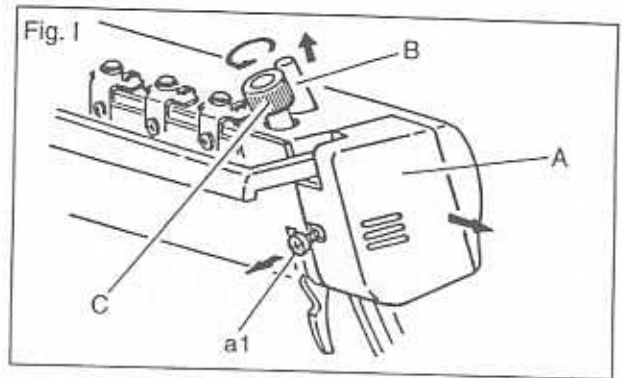


1. Height of the needle bar .....	10.8 mm - sec. 1
2. Radius of the lower looper .....	67.0 mm - sec. 3
3. Radius of the lower looper .....	4.05 mm sec. 3
4. Returning point of the lower looper .....	4.6 mm - sec. 3
5. Returning point of the upper looper .....	6.9 mm - sec. 4
Length of differential feed .....	6.9 mm - sec. 6
6. Height of the feed dog .....	1.0 mm - sec. 6
7. Height of the presser foot .....	5.0 mm - sec. 8
8. Positioning of the lower looper base thread guide -	2.6 mm - sec. 3

## • How to remove the exterior parts

### a) Light cover

Loosen the screw (a1) behind the light cover (A).  
Remove the light cover. (Fig. I)



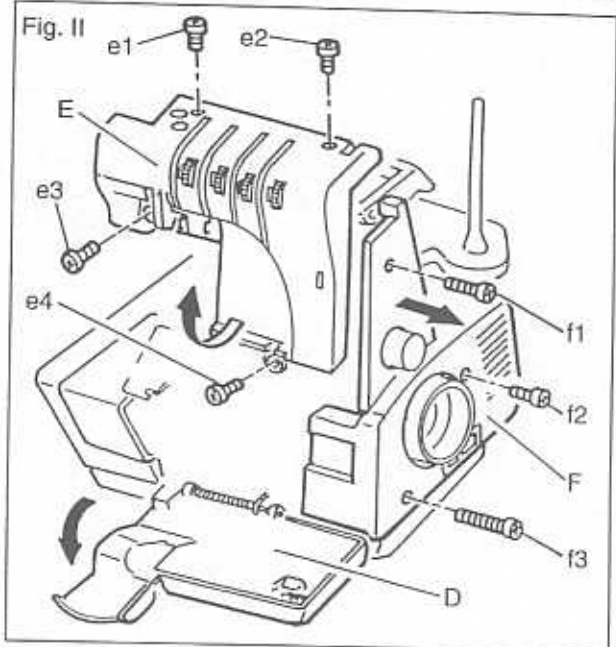
### b) Face Plate

Remove the light cover.

Remove the needle bar cap (B) by pulling it upward. Turn the presser bar bush (C) to counter-clockwise and remove it. (Fig. I)

Raise the needle bar to its highest point by turning the hand wheel towards you. Open the front cover (D).

Remove the 4-screws (e1-4) from face plate (E).  
Lift up the face plate towards you (Fig. II)



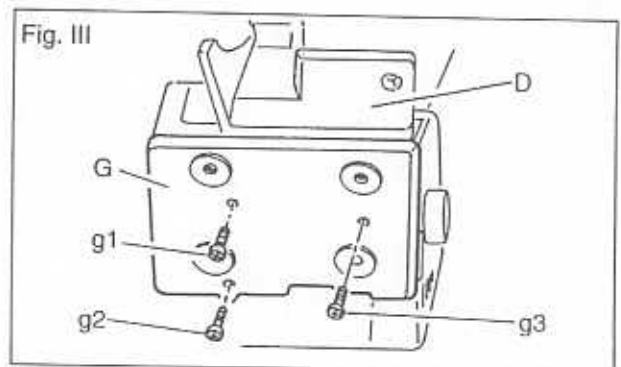
### c) Belt Cover

Remove the face plate (E).

Remove the 3-screws (f1-3) from the belt cover (F). Remove the belt cover. (Fig. II)

### d) Base

Tilt the machine backward and remove the 3-screws (g1-3) on the bottom of machine. Remove the base (G) with opening the front cover (D). (Fig. III)



## • Checking and adjustment

### 1. NEEDLE BAR, NEEDLE GUARD

#### a) Height and direction of the needle bar

Before you start this adjustment, see that the needle(s) should be inserted into the needle clamp correctly. (See Instruction Manual)

##### To check:

Turn the hand wheel towards you until the needle bar raises to its highest position.

Check that the height of right needle from the surface of throat plate should be 10.8 (+0.3, -0.1) mm as shown on Fig. 1-1.

Next, check the direction of needle bar as following.

The left and right needles should be falling into each slit of throat plate evenly as shown on Fig. 1-2.

##### To adjust:

Remove the light cover and light bulb.

Turn the hand wheel and lower the needle bar (A) until the needle bar clamp screw (a1) will appear. (Fig. 1-3)

Loosen the screw (a1) and adjust the height and direction of needle bar.

When correct height and direction are obtained, tighten the screw (a1) and replace the light bulb and light cover.

#### b) Positioning of the needle guard

The needle guard (B) is located under the throat plate.

When you start to this adjustment, the needle bar should be positioned correct height and direction.

##### To check:

Open the extension table. Remove the free arm cover.

Turn the hand wheel towards you until the needle comes to its lowest position.

The opening between needle and needle guard (B) should be 0.05-0.3 mm as shown on Fig. 1-4.

##### To adjust:

Loosen the 2 screws (b1, b2) and adjust the position correctly.

Fig. 1-1

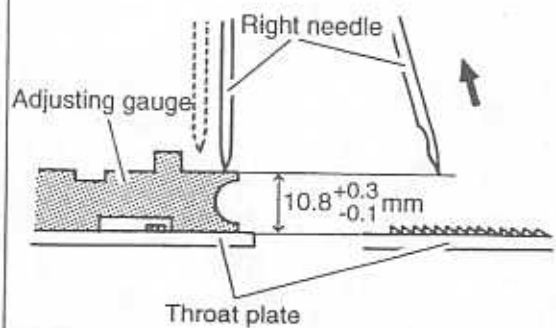


Fig. 1-2

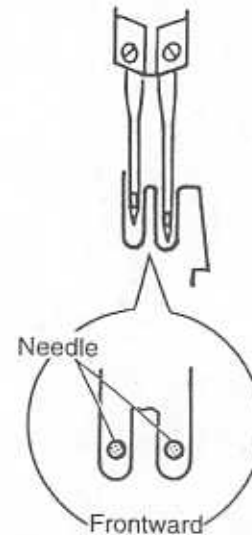


Fig. 1-3

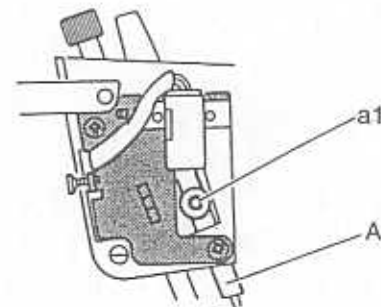
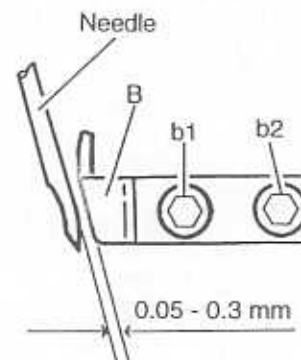


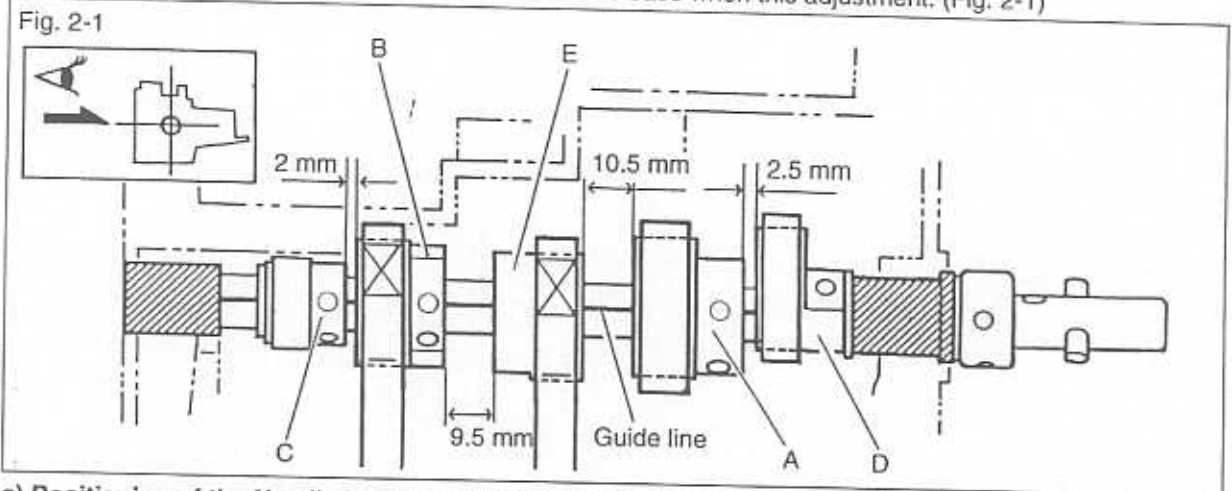
Fig. 1-4





## 2. POSITIONING OF THE ECCENTRIC CAMS

The positioning of the each eccentric cam on the hand wheel shaft will determine the timing of needle, loopers and feed. Check these positioning before you adjust about the upper and lower loopers or about the feed. Tilt the machine backward and remove the base when this adjustment. (Fig. 2-1)



### a) Positioning of the Needle bar eccentric cam, Lower looper rod eccentric cam and Slide block eccentric cam.

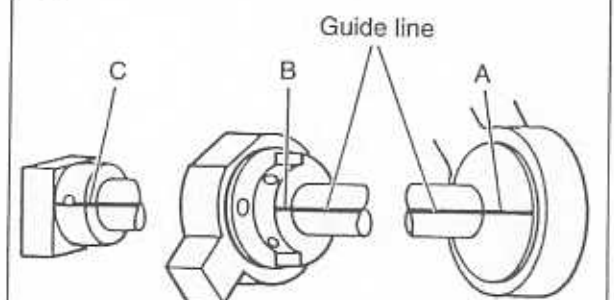
**To check:**

The guide lines on the Needle bar eccentric cam (A), Lower looper rod eccentric cam (B) and Slide block eccentric cam (C) should be aligned the line on the hand wheel shaft. (Fig. 2-2)

**To adjust:**

Loosen the 2 screws on each cam and adjust. When this adjustment, keep the openings between each cam as shown on Fig. 2-1.

Fig. 2-2



### b) Positioning of the Feed rock eccentric cam.

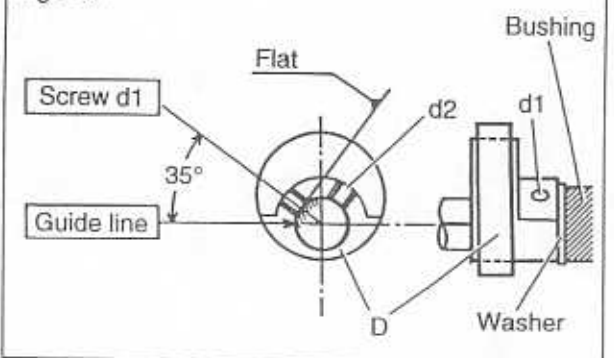
**To check:**

The screw (d1) on the Feed rock eccentric cam (D) should be tightening the flat side of the hand wheel shaft (35° upper from the guide line) as shown on Fig. 2-3.

**To adjust:**

Loosen the 2 screws (d1, d2) and adjust the correct position. Tighten the screw (d1) first, and tighten the other screw (d2). In this adjustment, do not open the space between the cam (D) and washer and bushing.

Fig. 2-3



### c) Positioning of the Upper looper rod eccentric cam.

**To check**

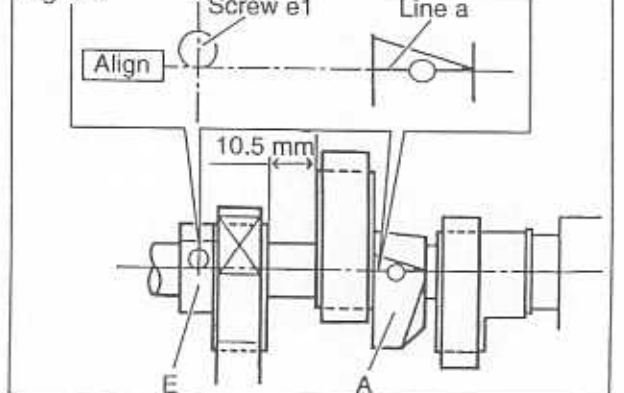
The bottom of screw hole (e1) on the Upper looper eccentric cam (E) should be tangent to the line extended from the line (a) on the Needle bar eccentric cam (A) as shown on Fig. 2-4.

**To adjust:**

Loosen the 2 screws on the cam (E) and adjust the correct position. Tighten the screw (e1) and tighten the other screw. In this adjustment, keep the opening between the Needle bar eccentric cam (A) and this cam (E).

The positioning of this cam (E) is temporary. For fine tuning, see the section 4-b) Timing of the upper looper.

Fig. 2-4



### 3. LOWER LOOPER

Before you check and adjust about the lower looper, see that the needle bar is positioned correct height and direction. (Section 1)

Checking and adjustments should be made in sequence from a) to f).

#### a) Radius of the lower looper

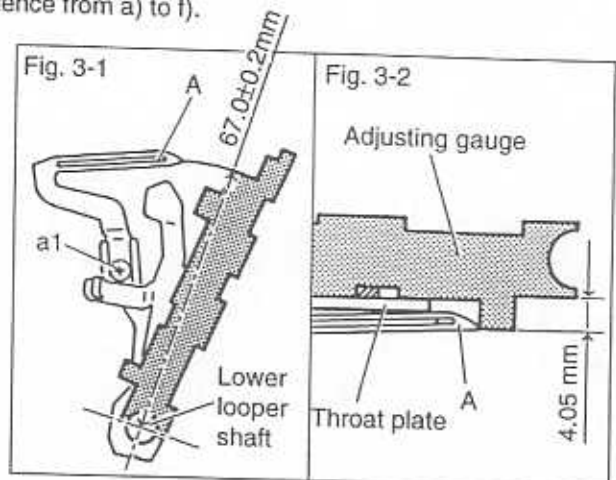
To check:

The radius between center of lower looper shaft to tip of lower looper (A) should be  $67.0 (\pm 0.2)$  mm as shown on Fig. 3-1.

And/or the distance between the surface of throat plate to tip of lower looper (A) should be 4.05 mm as shown on Fig. 3-2.

To adjust:

Loosen the screw (a1) and move the lower looper (A) up or down to correct position. (Fig. 3-1)



#### b) Timing of the lower looper

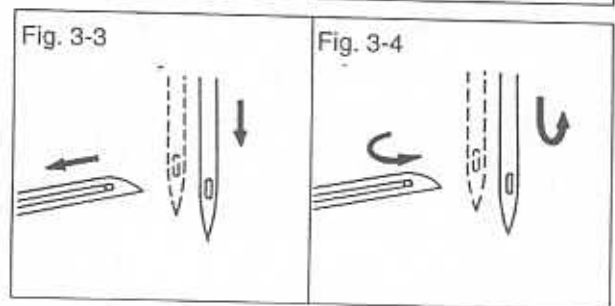
To check:

Turn the hand wheel towards you until the needle bar comes to its lowest point. At this time, the lower looper should be in extreme left side position. (Fig. 3-3)

And next, when the needle bar starts to raise from its lowest point, the lower looper should start to turn from its extreme left side position. (Fig. 3-4)

To adjust:

The timing of the lower looper is determined by the positioning of the Lower looper eccentric cam and Needle bar eccentric cam. See the section 2 "POSITIONING OF THE ECCENTRIC CAMS", if adjustment is needed.



#### c) Opening between the lower looper and needle

To check:

Open the extension table and remove the free arm cover. Remove the presser foot and throat plate. Turn the hand wheel towards you until the tip of lower looper crosses the needle.

At this time, the opening between the tip of lower looper (A) and needle should be 0-0.05 mm as shown on Fig. 3-5.

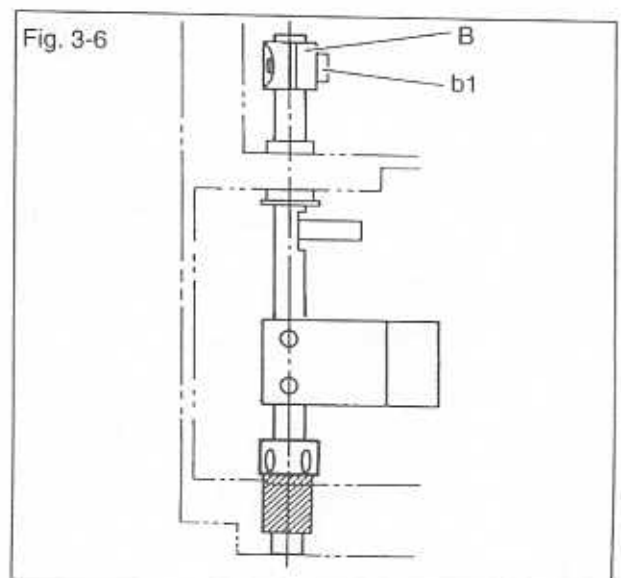
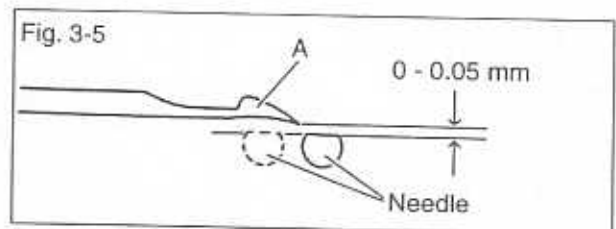
To adjust:

Tilt the machine backward and remove the base. (Fig. 3-6)

Loosen the screw (b1) tightening the lower looper shaft base (B).

Adjust the opening by sliding the lower looper shaft base. Tighten the screw (b1).

After this adjustment, check the returning point of the lower looper described as next page.



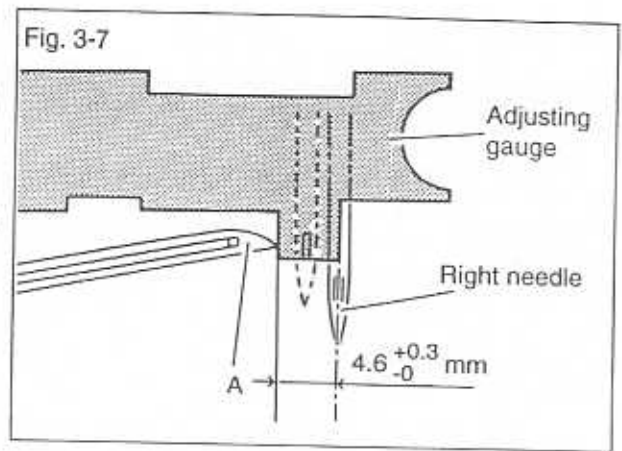
**d) Returning point of the lower looper**

To check:

Open the extension table and remove the free arm cover. Remove the presser foot and throat plate. Turn the hand wheel towards you until the lower looper (A) comes to its extreme left side position. In this position, check that the opening between tip of lower looper and center of right needle should be 4.6 (+0.3, -0) mm as shown on Fig. 3-7.

To adjust:

Tilt the machine backward and remove the base. (Fig. 3-6) Loosen the 2 screws (b1, b2) on the Lower looper rod arm (B). Turn the lower looper shaft (D) until correct point is obtained. Tighten the screws (b1, b2) carefully so that there is no opening between the arm (B) and bushing (E).



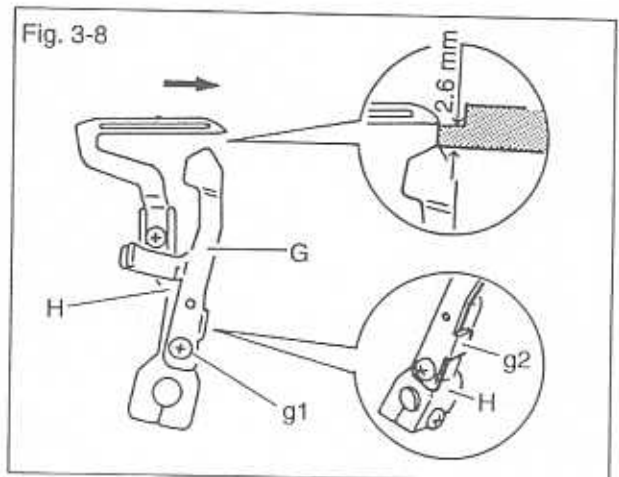
**e) Positioning of the lower looper base thread guide**

To check:

Open the front cover and turn the hand wheel towards you until the lower looper comes to its extreme right side position. The opening between the tip of lower looper and the top edge of the Lower looper base thread guide (G) should be 2.6 mm as shown on Fig. 3-8.

To adjust:

Loosen the screw (g1) on the base thread guide and move the guide up or down to adjust correct position. While this adjustment, the supporting plate (g2) should be touching to the side of the Lower looper base (H) always.



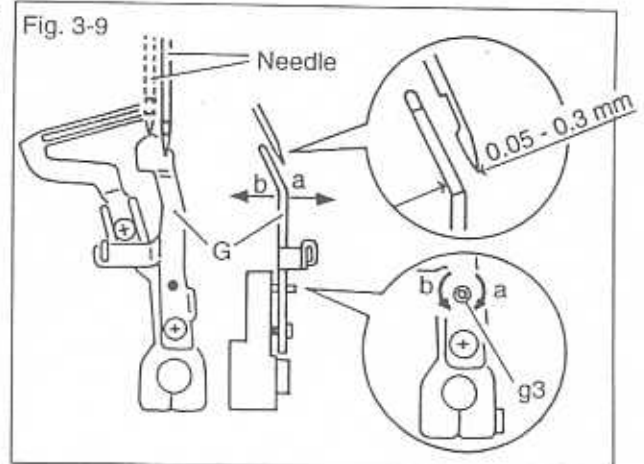
**f) Opening between base thread guide and needle**

To check:

Open the extension table and remove the free arm cover. Turn the hand wheel towards you until the needle bar comes to its lowest position. The opening between the Lower looper base thread guide (G) and needle should be 0.05 - 0.3 mm as shown on Fig. 3-9.

To adjust:

Open the front cover and turn the screw (g3) right or left to adjust the correct opening. (Turning the screw to the right, the opening will be smaller.)



#### 4. UPPER LOOPER

Prior to making adjustments of the upper looper, the lower looper and needle bar must be adjusted properly. (See section 1, 3)

Check the upper looper in sequence of a) to c)

##### a) Returning point of the upper looper

###### To check:

Turn the hand wheel towards you until the upper looper comes to its extreme left side position. In this position, check that the opening between the tip of upper looper and center of the right needle should be  $6.9 (\pm 0.15)$  mm as shown on Fig. 4-1.

###### To adjust:

Open the front cover. (Fig. 4-2)

Loosen the screw (a1) on the Upper looper shaft base (A). Turn the Upper looper shaft base to adjust correct upper looper position.

Retighten the screw (a1) and check that the upper looper moves smoothly.

Fig. 4-1

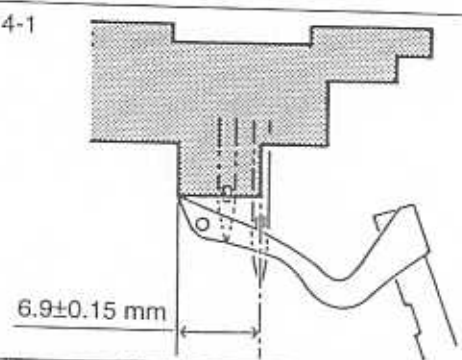
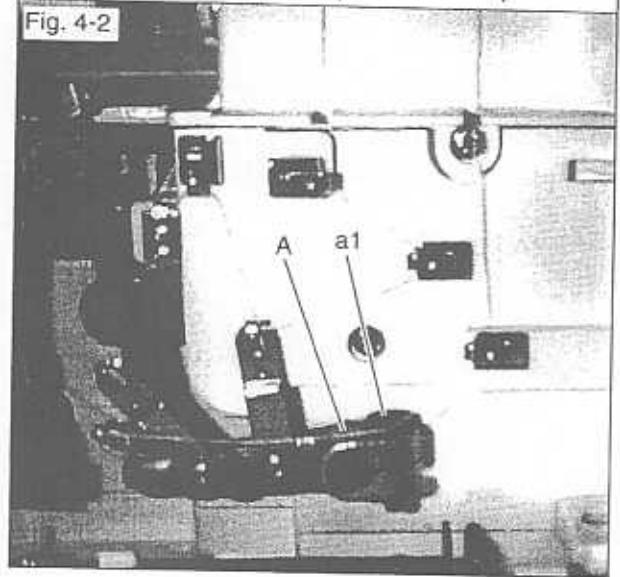


Fig. 4-2



##### b) Timing of the upper looper

###### To check:

Turn the hand wheel towards you to raise the upper looper until the tip of upper looper is aligned with the bottom side of lower looper as shown on Fig. 4-3.

At this time, the backside of lower looper eye should be positioned with the tip of upper looper as shown on Fig. 4-4.

Fig. 4-3

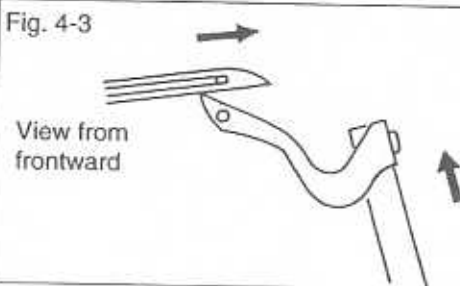
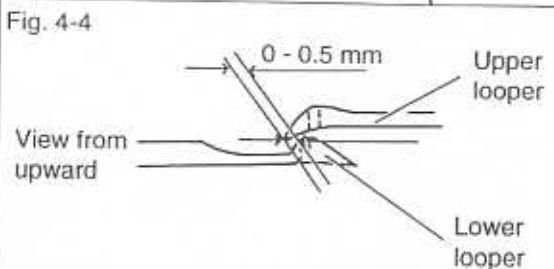


Fig. 4-4



**To adjust:**

The timing of the upper looper is determined by the positioning of the Upper looper eccentric cam. The temporary tuning is described in section 2 "POSITIONING OF THE ECCENTRIC CAMS".

For fine tuning, adjust as follows:

Tilt the machine backward and remove the base. (Fig. 4-5)

First, loosen the screw (e2) on the Upper looper eccentric cam and turn the hand wheel towards you until the screw (e1) is visible.

- If the rise timing of the upper looper is too fast as shown on Fig. 4-6, loosen the screw (e1) and turn the cam (E) slightly toward you (= direction (a) on Fig. 4-5)

- If the rise timing of the upper looper is too late as shown on Fig. 4-7, loosen the screw (e1) and turn the cam (E) slightly toward back (= direction (b) on Fig. 4-5)

Retighten the screws (e1, e2) when correct position is obtained.

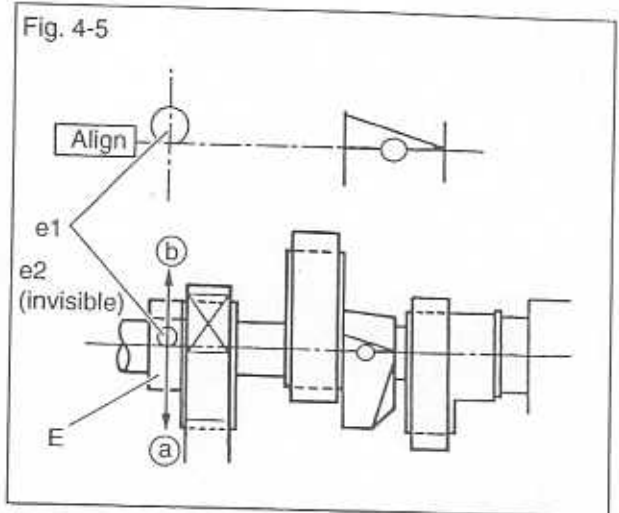


Fig. 4-6 Rise timing is too fast.

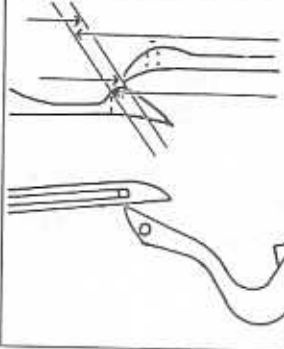
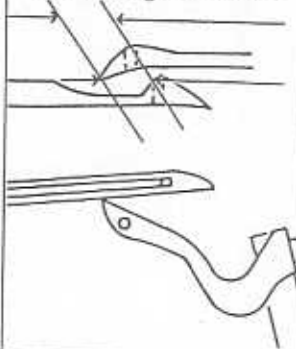


Fig. 4-7 Rise timing is too late.



**c) Installing the upper looper**

**To check:**

Turn the hand wheel towards you to raise the upper looper until the tip of the looper is aligned with the top side of the lower looper as shown on Fig. 4-8.

At which time, the opening between the tip of upper looper and backside of lower looper should be as shown on Fig. 4-9.

**To adjust:**

Loosen the screw (d) on the upper looper and adjust to correct position. (Fig. 4-10)

Fig. 4-8



Fig. 4-9

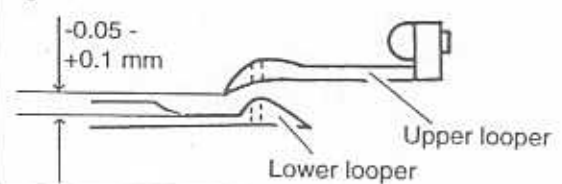
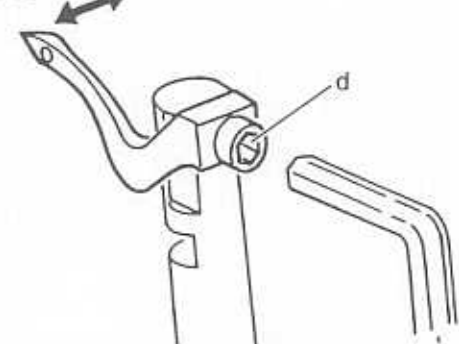


Fig. 4-10



## 5. POSITIONING OF THE THREAD TAKE-UP LEVER

### a) Needle thread take-up lever

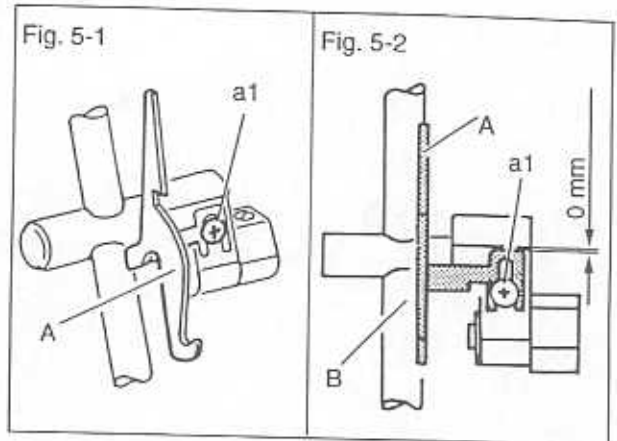
To check:

Remove the face plate.

The needle thread take-up lever (A) should be attached to the needle bar link as shown on Fig. 5-2. And the thread take-up lever should be aligned with the right side of the needle bar (B).

To adjust:

Loosen the screw (a1) and move lever to obtain correct position. (Fig. 5-1)



### b) Upper looper thread take-up lever

To check:

The upper looper thread take-up lever (C) should be positioned as shown on Fig. 5-3.

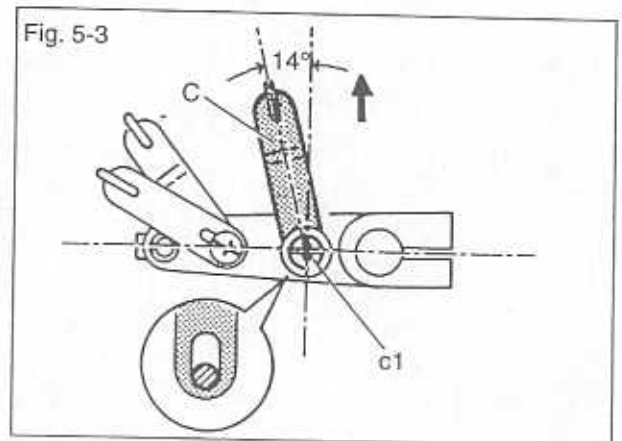
To adjust:

Loosen the screw (c1). Pulling up the lever (C) as far as it will go and adjust the lever to obtain correct degree.

Note:

The positioning of upper looper thread take-up lever will determine the amount of thread taken-up.

The wider the angle is, the more amount of thread is taken-up. It may be necessary to fine tune adjustment of the thread take-up lever after sewing a few stitches.



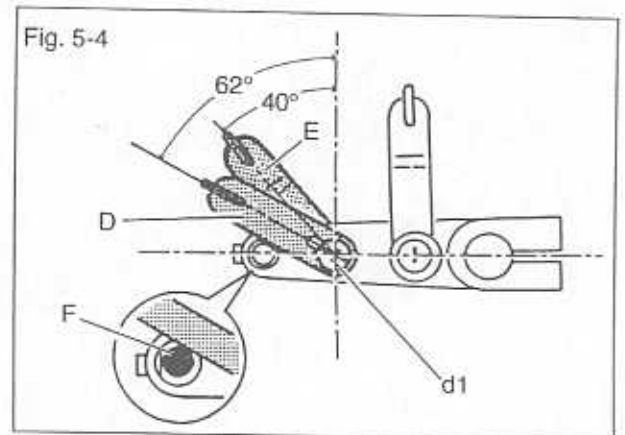
### c) Lower looper thread take-up levers

To check:

The lower looper thread take-up lever (D) and (E) should be positioned as shown on Fig. 5-4. (The bottom line of lever (D) is circumscribing on the hole of base shaft connecting pin(F).)

To adjust:

Loosen the screw (d1). Pulling up the lever (D) and (E) as far as it will go and adjust the lever to obtain correct degree.





## 6. FEED

The needle bar must be properly adjusted prior to attempting to adjust the feed. (See section 1)  
Make these adjustments in sequence of a) to e).

### a-1) Height of the Main feed dog

#### To check:

Set the stitch length dial to 1 and turn the hand wheel until the feed dogs raised to its highest position.

The front portion of the Main feed dog (A) should come up 1.0 (+0, -0.2) mm over the surface of throat plate as shown on Fig. 6-1.

#### To adjust:

Tilt the machine backward and remove the base. (Fig. 6-2) Loosen the screw (b1) on the main feed dog base. (This screw is tightening the feed rock cam follower eccentric pin (c).)

Open the extension table and turn the feed rock cam follower eccentric pin (c) right or left until the correct height is obtained. (Fig. 6-3) Tighten the screw (b1).

### a-2) Height of the Sub feed dog

#### To check:

Set the stitch length dial to 1 and set the differential feed dial to "N". Turn the hand wheel until the feed dogs raised to its highest position. At this time, the height of the Sub feed dog (D) should be even with the Main feed dog (A). (+0.1 to -0 mm) (Fig. 6-1)

#### To adjust:

Set the stitch length dial to 4 and set the differential feed dial to "2". Turn the hand wheel until the needle bar comes to its lowest position. Place the adjusting gauge under the presser foot and lower the lifter. Open the extension table and remove the free arm cover.

Loosen the screw (d1) on the Sub feed dog (D) and lower the Sub feed dog (D) to the direction (1). (Fig. 6-4)

Turn the hand wheel towards you until the teeth of Main feed dog (A) touch the surface of adjusting gauge. (= even with the surface of throat plate.)

Bring up the Sub feed dog to the direction (2) until the all teeth of Sub feed dog (D) touch the surface of adjusting gauge and tighten the screw (d1).

### b) Positioning of the feed dogs

#### To check:

Set the stitch length dial to 4 and set the differential feed dial to "2". Turn the hand wheel until the feed dogs come all the way forward.

Check that the openings between the each feed dog and throat plate should be as shown on Fig. 6-5.

Next, turn the hand wheel until the feed dogs come all the way backward and check the openings as shown on Fig 6-6.

Fig. 6-1

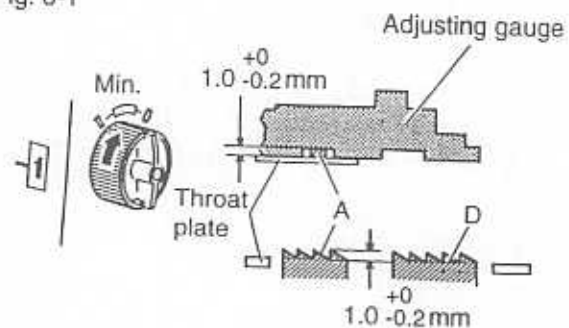


Fig. 6-2

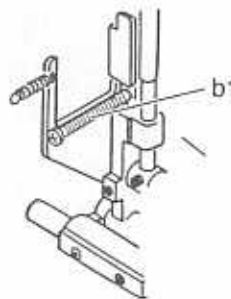


Fig. 6-3

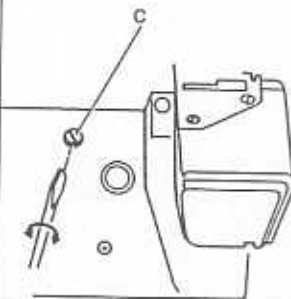


Fig. 6-4

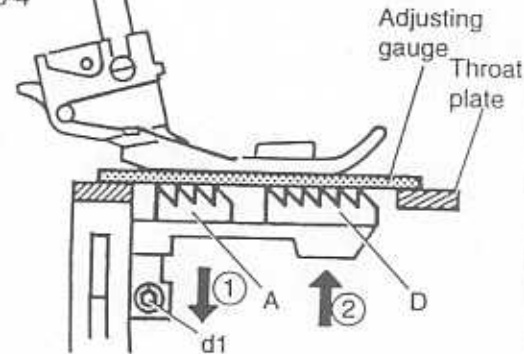


Fig. 6-5

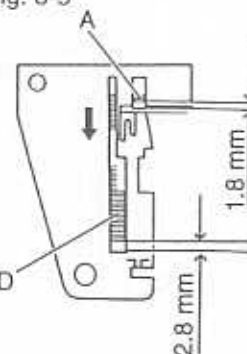
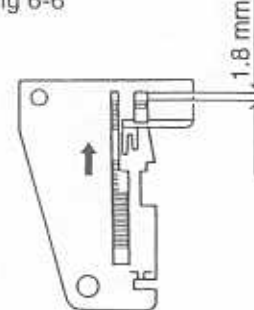


Fig 6-6



To adjust:

1. Main feed dog: (Fig. 6-7)

Tilt the machine backward and remove the base. Loosen the screw (e1) on the feed rock link arm (E). Move the Main feed dog to obtain correct positioning as shown on Fig. 6-5, 6-6. Retighten the screw (e1).

2. Sub feed dog: (Fig. 6-8)

Loosen the screw (g1) on the side of the sub feed dog base (G). Slide the base (G) front or backward to obtain correct position. Retighten the screw (g1).

Note:

If you have adjusted the Main feed dog, you should recheck the positioning of the sub feed dog.

Fig. 6-7

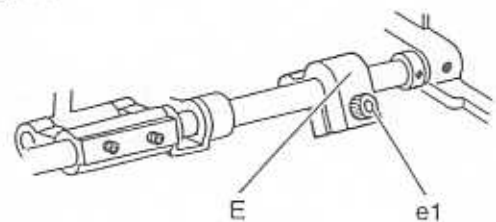


Fig. 6-8

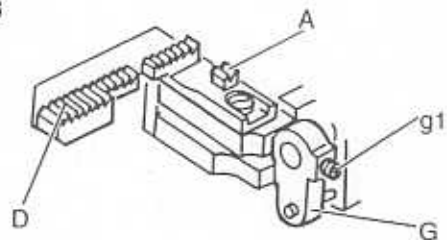
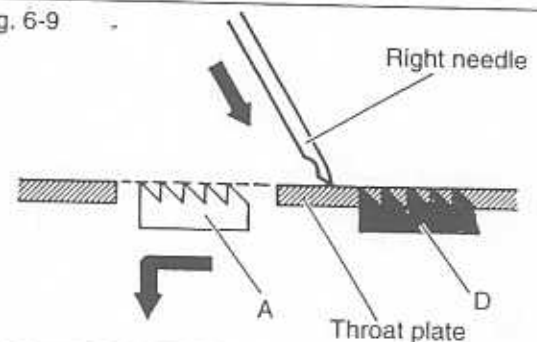


Fig. 6-9



c) **Timing of the feed**

To check:

Set the stitch length dial to 4.

Turn the hand wheel towards you until the point of right needle is even with the throat plate surface from its highest position. (Fig. 6-9)

At which time, the feed dogs should be positioned its extreme rear and level with the surface of throat plate.

To adjust:

The timing of feed is determined by the positioning of Slide block eccentric cam (up or downwards of feed dogs) and Feed rock eccentric cam (front or backward of feed dogs).

See the section 2 "POSITIONING OF THE ECCENTRIC CAMS" and adjust these cams. (and the Needle bar eccentric cam.)

d) **Adjusting the stitch length**

To check:

Set the stitch length dial to 4 and set the differential feed dial to "N".

Place a piece of paper under the presser foot and lower the foot.

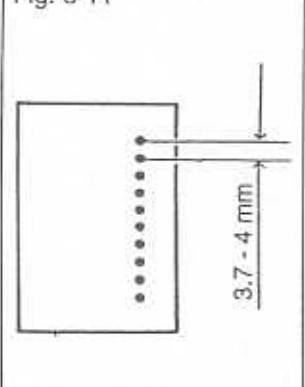
Turn the hand wheel towards you with your hand and open several holes into the paper. (Fig. 6-10)

The space between holes should be 3.7 to 4.0 mm as shown on Fig. 6-11.

Fig. 6-10



Fig. 6-11





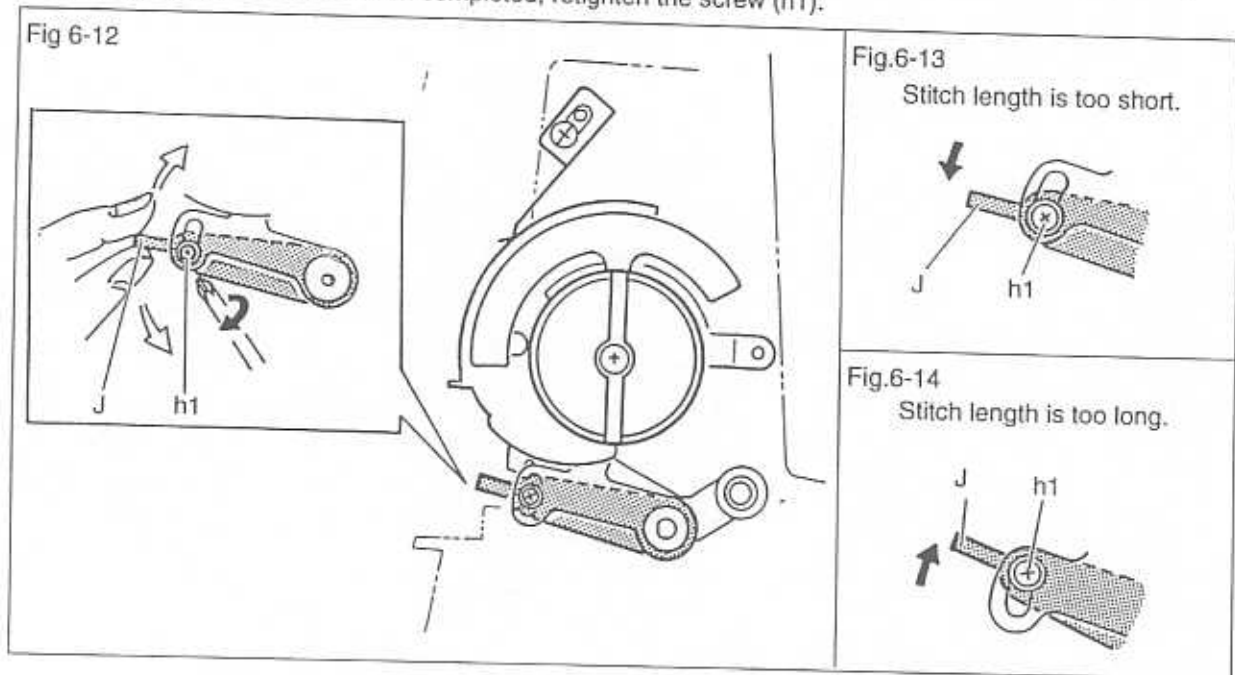
To adjust:

Remove the belt cover. (Fig 6-12)

If the stitch length is too short, loosen the screw (h1) and move the lever (J) slightly downward. (Fig.6-13)

If the stitch length is too long, loosen the screw (h1) and move the lever (J) slightly upward. (Fig.6-14)

When the adjustments has been completed, retighten the screw (h1).



#### e) Adjusting the length of differential feed

To check:

Set the stitch length dial to 4 and set the differential feed dial to "2".

Check that the front-back movement of the rear end of sub feed dog (D) is 6.9 (+0, -0.2) mm as shown on Fig. 6-15.

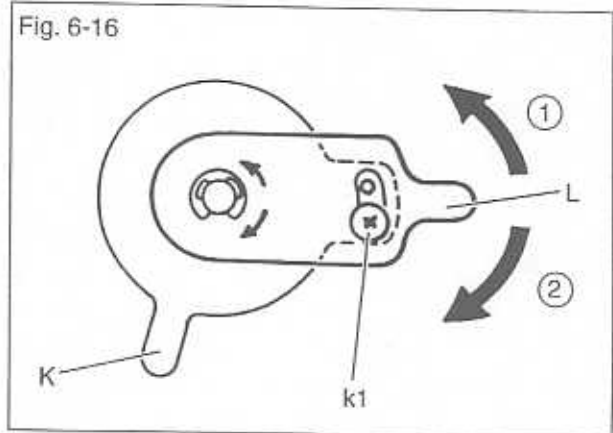
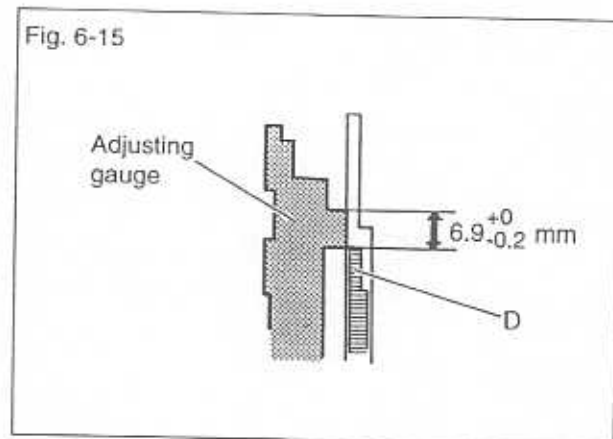
To adjust:

Remove the belt cover. Loosen the screw (k1) on the sub feed pulley (K). (Fig. 6-16)

- When the movement is too short, hold the pulley (K) and turn the sub feed regulating plate (L) downward (= direction (1))

- When the movement is too long, hold the pulley (K) and turn the sub feed regulating plate (L) upward (= direction (2))

Recheck the length of movement and tighten the screw (k1).



## 7. KNIVES

### a) Angle of the upper knife

#### To check:

Open the front cover. Open the extension table and remove the free arm cover.  
Set the seam width to 3.5 (1-needle type) or 4.0 (2-needle type) mm .

Turn the hand wheel towards you until the upper knife is in its lowest position. At which time, the upper knife should be on right angle with the throat plate approximately. (Fig. 7-1)

Also at this time, the opening between the left side of upper knife base collar (A) and the right side of upper knife arm (B) should be 1.5 mm as shown on Fig. 7-2.

#### To adjust:

Loosen the screw (a1) on the collar (A).

Turn the upper knife to correct angle as shown on Fig. 7-1.

Adjust the positioning of the collar (A) to obtain correct opening as shown on Fig. 7-2.

Tighten the screw (a1) when you have made the proper adjustments.

Fig. 7-1

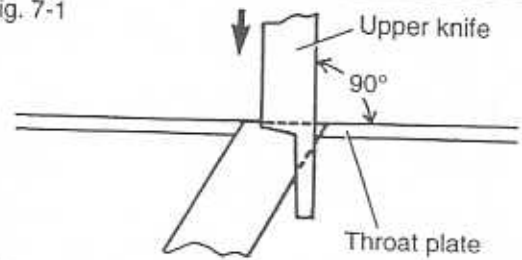


Fig. 7-2

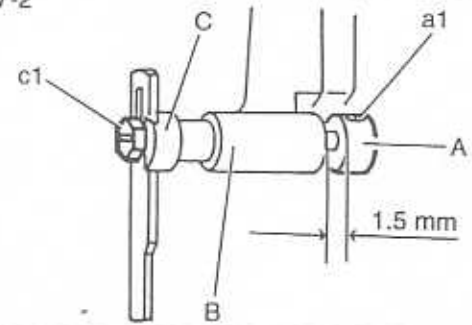
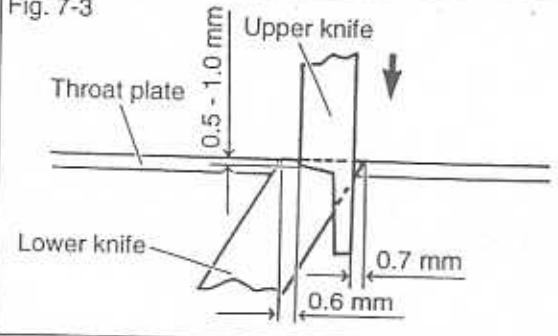


Fig. 7-3



### b) Positioning of the upper knife

The angle of upper knife must be correctly before attempting to this adjustment.

#### To check:

Turn the hand wheel towards you until the upper knife comes to its lowest position.

At this time, the front corner of the cutting edge should be coming under the throat plate surface 0.5 to 1.0 mm as shown on Fig. 7-3.

And also the front and rear edge of the upper knife should be positioned as shown on Fig. 7-3.

#### To adjust:

Loosen the screw (c1) on the upper knife base (C). (Fig. 7-2) and adjust the upper knife to obtain correct position.

#### To exchange the upper knife:

Remove the screw (c1) and exchange the upper knife. Adjust the new knife to obtain correct position.

#### Note:

Refer to instruction manual for exchanging and adjustments of the lower knife.

### c) Opening between upper knife arm and frame

#### To check:

Set the upper knife to no cutting position. (Refer to instruction manual.)

Move the upper knife arm (B) sideways to see that there is no play. (Fig. 7-4)

#### To adjust:

To make an opening between the upper knife arm (B) and the upper knife driving crank (D), loosen the screw (e1) on the frame (E) and slide crank (D) to the right.

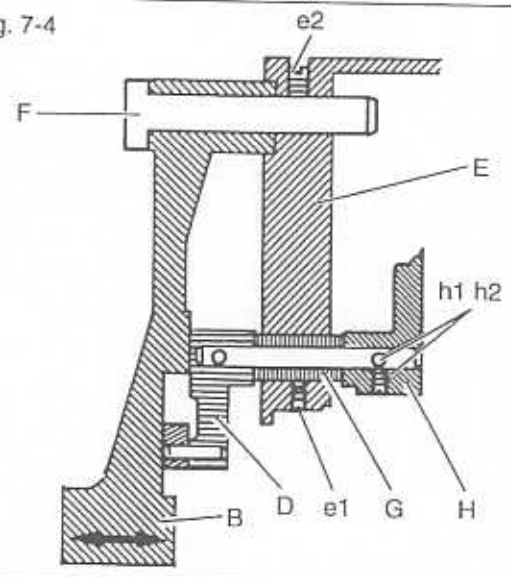
Loosen the screw (e2) on backside of frame.

Hold the upper knife arm shaft (F) and arm (B) and frame (E) tightly so that there are no opening between these parts. Then tighten the screw (e2). Make sure that there are no opening between crank (D), upper knife driving shaft bush (G) and driving fork rod (H).

If there are any opening, loosen the 2 screws (h1, h2) on the rod (H). Hold crank (D), bush (G) and rod (H) together and retighten the screws (h1, h2).

Next, hold the arm (B) and crank (D) together so that there are no opening and tighten the screw (e1). Turn the hand wheel towards you so check whether the torque and functions smoothly.

Fig. 7-4



## 8. PRESSER FOOT

### a) Height and direction of the presser foot

#### To check:

Turn the hand wheel until the feed dog is lower than the surface of throat plate.

Raise the presser foot lifter. At this time, the rear side of presser foot should be above the surface of throat plate as shown on Fig. 8-1

Next, lower the presser foot lifter and check that the presser foot is facing in the right direction. (Fig. 8-2)

#### To adjust:

Remove the light cover and face plate.

Attach the presser bar bush and raise the presser foot lifter.

Loosen the screw (a1) on the presser bar clamp (A) and adjust the height and direction correctly. (Fig. 8-3)

Retighten the screw (a1) securely.

Fig. 8-1

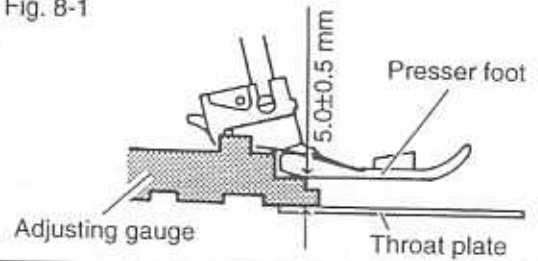


Fig. 8-2

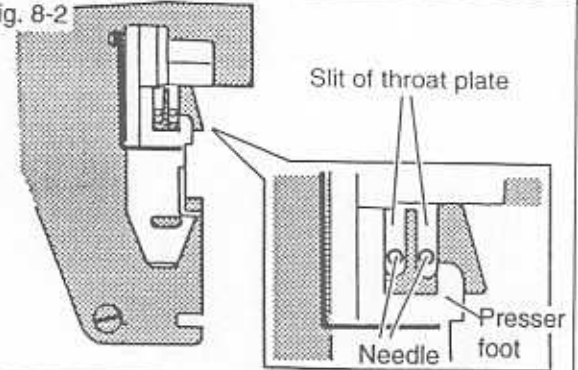
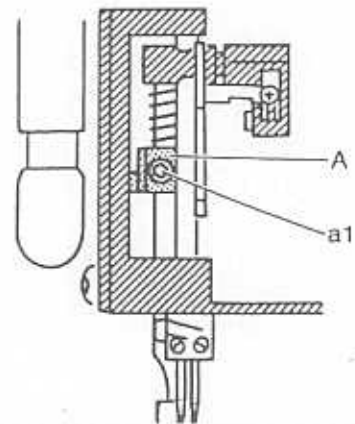


Fig. 8-3



## 9. MOTOR

### a) Belt tension

#### To check:

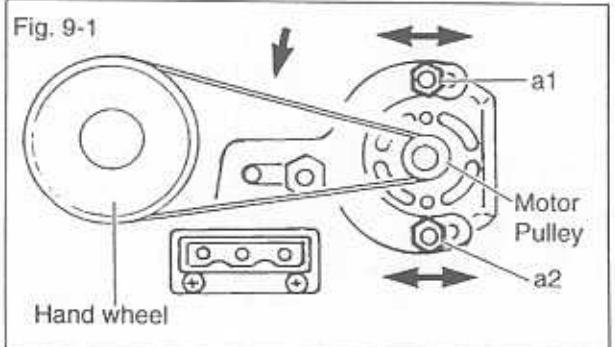
Remove the belt cover.

Push the belt between hand wheel and motor pulley with your forefinger. (Fig. 9-1) A slight slack on the belt would be the adequate amount of tension.

#### To adjust:

Loosen the motor nuts (a1, a2) and move motor sideways to adjust the belt tension.

Fig. 9-1



## 10. HAND WHEEL

### a) Opening between the hand wheel and frame

To check:

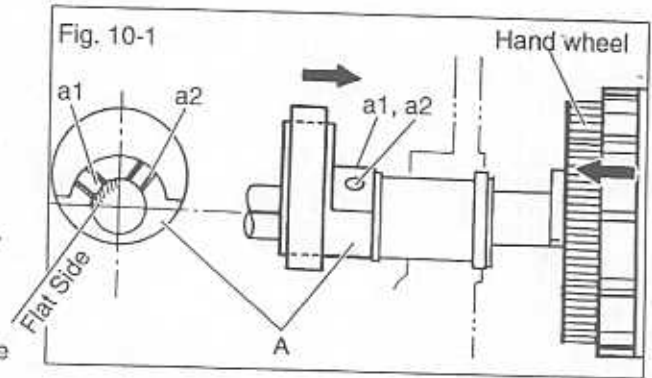
Move the hand wheel sideways to check for any play.

To adjust:

Tilt the machine backward and remove the base. (Fig. 10-1)

Loosen the screw (a1, a2) on the Feed rock eccentric cam (A).

Push the hand wheel to the left (frame side) while pushing the cam (A) towards the right and re-tighten the screws (a1, a2).



## 11. BALANCE WEIGHT

### a) Hand wheel shaft balance weight

To check:

Tilt the machine backward and remove the base and belt cover.

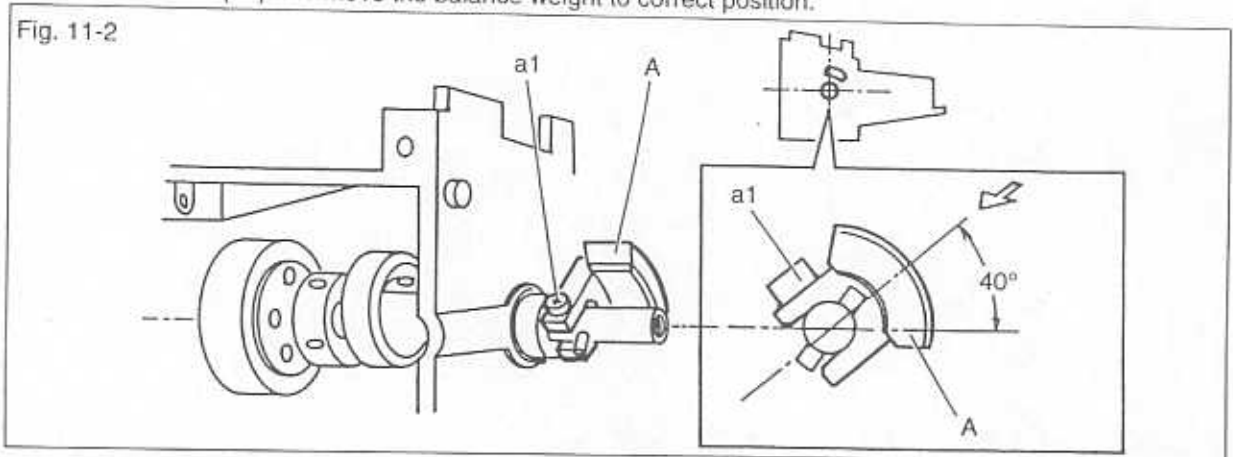
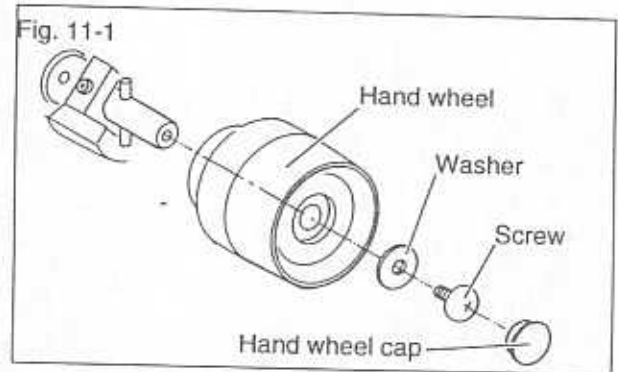
Raise the needle bar to its highest position by turning the hand wheel towards you.

Remove the hand wheel cap, screw, washer and hand wheel. (Fig. 11-1)

The balance weight (A) should be positioned as shown on Fig. 11-2.

To adjust:

Loosen the bolt (a1) and move the balance weight to correct position.



### b) Lower looper balance weight

To check:

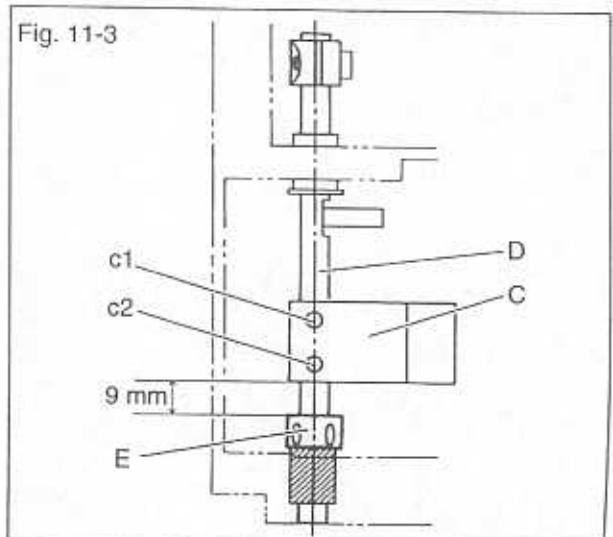
Tilt the machine backward and remove the base. (Fig. 11-3)

The screws (b1, b2) on the Lower looper rod arm and the screws (c1, c2) on the Lower looper balance weight (C) should be aligned.

To adjust:

Loosen the screws (c1, c2) and adjust the correct position.

At this time, keep the opening between the balance weight (C) and collar (D).



# SERVICE MANUAL

Model BL4-838D

SMBL4-838D

**NEEDLE HEIGHT - FOR ALL ADJUSTMENTS USE BABY LOCK GAUGE (BLG-1)**

Note: Before adjusting the needle height, make sure that the proper needles (DCX1F) are inserted COMPLETELY into the the needle holder.

**1. NEEDLE AND PRESSER FOOT HEIGHT**

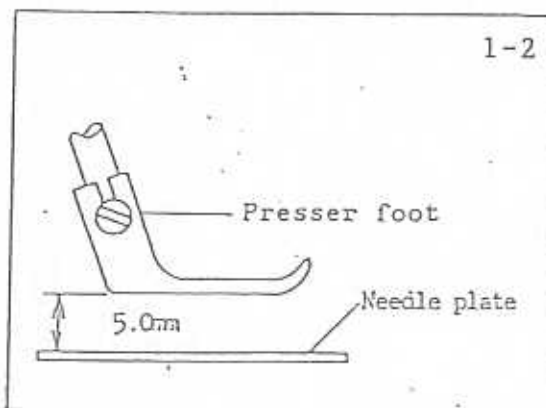
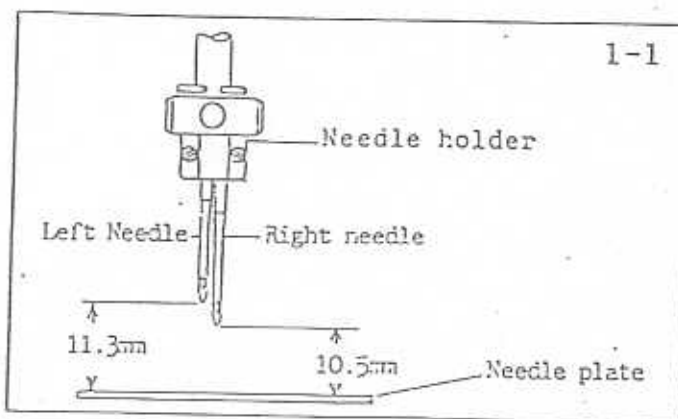
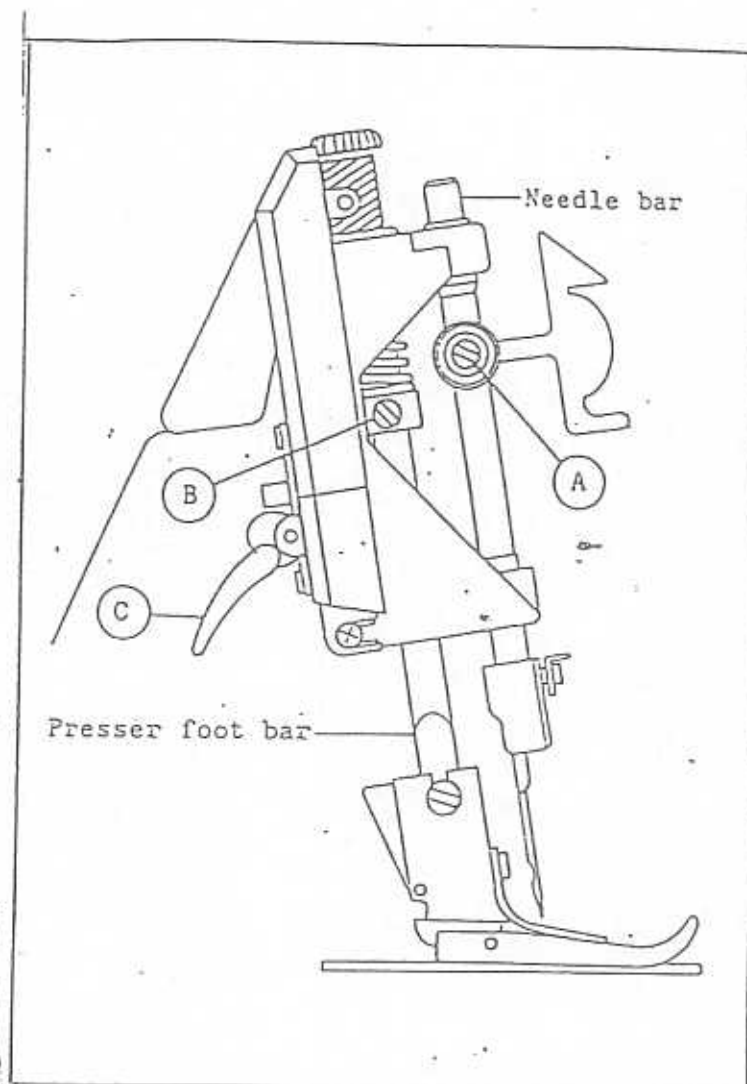
- a) Remove the face plate and lamp guard.
- b) Loosen the screw (A) and adjust the needle height by moving the needle bar up or down, being careful not to rotate the needle bar.

The right needle height is 10.5mm from the needle plate surface.

The left needle is 11.3mm.  
(See figure 1-1)

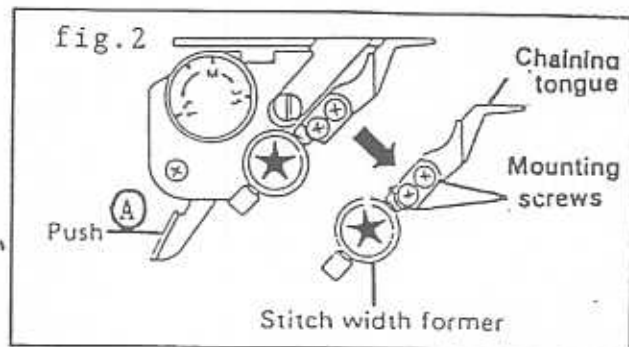
NOTE: Before adjusting the needle height, bring the needle bar to the highest position.

- c) Raise the presser foot lifter lever (C) to the up position.
- d) Loosen the screw (B), adjust the height to 5.0mm.  
(See figure 1-2)



## 2. REPLACEMENT OF ADJUSTABLE CHAINING TONGUE

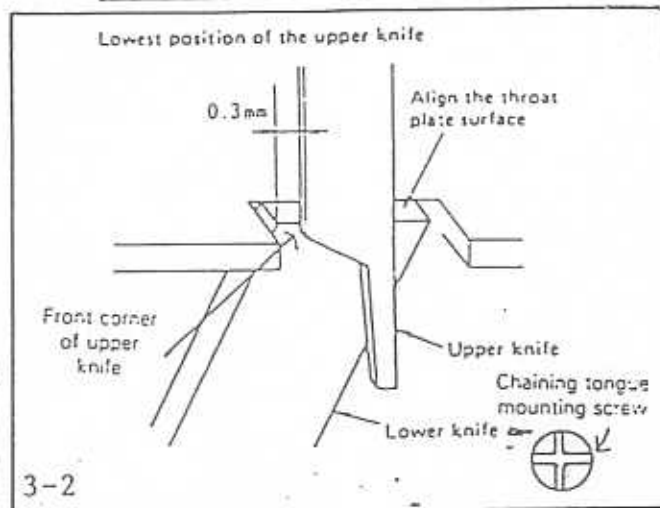
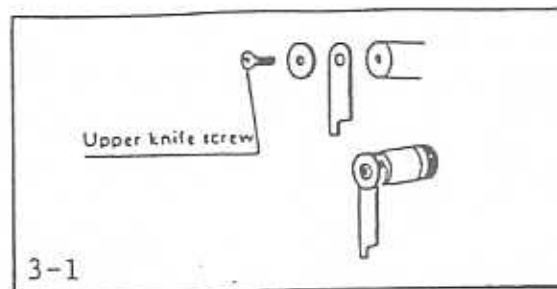
- a) Remove stitch width former by pushing lever. (A)
- b) A Using a "0" phillips screwdriver, remove the two mounting screws. (fig. 2) Remove the defective chaining tongue.
- c) Replace chaining tongue and screws but do not tighten screws completely at this point.
- d) Return the stitch width former to the lower knife holder.
- e) Adjust the chaining tongue so that the loopers pass freely above and below the chaining tongue. Check to see if the chaining tongue will move freely from 3.5mm to 7.5mm. Tighten mounting screws if no jam occurs.
- f) The chaining tongue should be flush with the needle plate finger.



## KNIFE ADJUSTMENTS

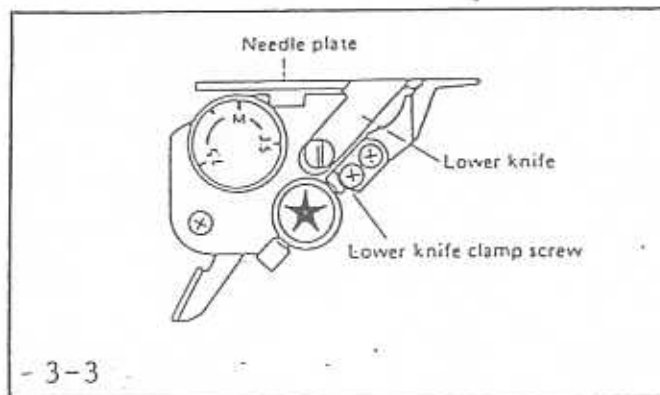
### HOW TO REPLACE THE UPPER KNIFE

- a) Turn the upper knife to the up position.
- b) Remove the upper knife clamp screw and the upper knife. (See figure 3-1)
- c) Put the new knife in place from above so the front corner of the cutting edge sinks just below the level of the lower knife cutting edge (as shown in fig. 3-2). Tighten the upper knife clamp screw. (Caution: Make sure upper knife is not striking chaining tongue mounting screw).



### LOWER KNIFE REPLACEMENT

- a) Open the front cover and move the upper knife to the "UP" position.
- b) Remove the lower knife clamp screw (See fig. 3-3) and the lower knife.
- c) Insert the new knife into the groove and move it up until the upper edge is flush with the top of the needle plate. Tighten the lower knife clamp screw.



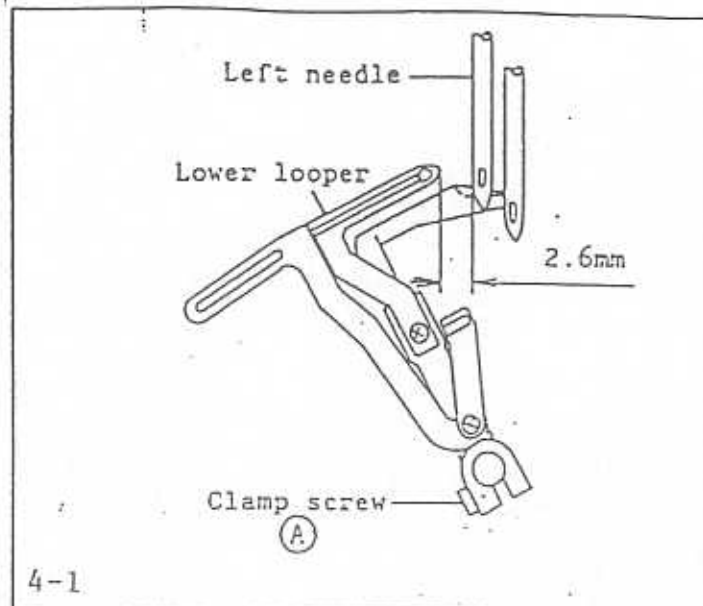


#### 4. LOWER LOOPER RETURN DISTANCE

##### Lower Looper

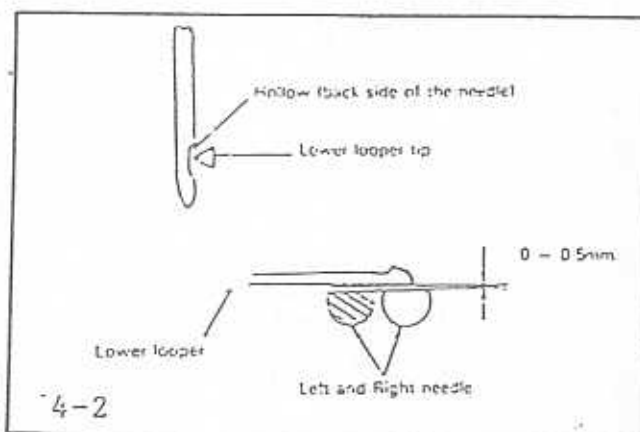
- a) Lower the needle bar to the lowest position by turning handwheel.
- b) Loosen the screw (A), move the lower looper arm to the left or right.

Distance between the left side of the left needle and tip of the lower looper is 2.6mm.  
(See figure 4-1)



#### ADJUSTING THE NEEDLE CLEARANCE

- a) Rotate the handwheel to bring the tip of the lower looper directly behind the left needle (See figure 4-2). The clearance between the back of the needle and the tip of the looper should be 0-0.5mm. (About the thickness of a piece of paper.)
- b) To adjust this clearance, loosen the lower looper arm clamp screw (A) (See fig. 4-1) and move the lower looper arm forward or backward to achieve the correct clearance. (Be careful not to rotate the looper arm on the shaft as this will disturb the return distance). Tighten the lower looper arm clamp screw.
- c) Rotate the handwheel to bring the tip of the lower looper directly behind the right needle (fig. 4-2). The clearance between the back of the needle and the tip of the looper should be 0-0.5mm. (about the thickness of a piece of paper.)
- d) If the clearance is different on the right needle then loosen the needle bar clamp screw. Rotate the needle bar to align the needles with equal needle to looper clearance on both needles, then tighten the needle bar clamp screw. (Be careful not to let the needle bar move up or down as this will change the needle height.)

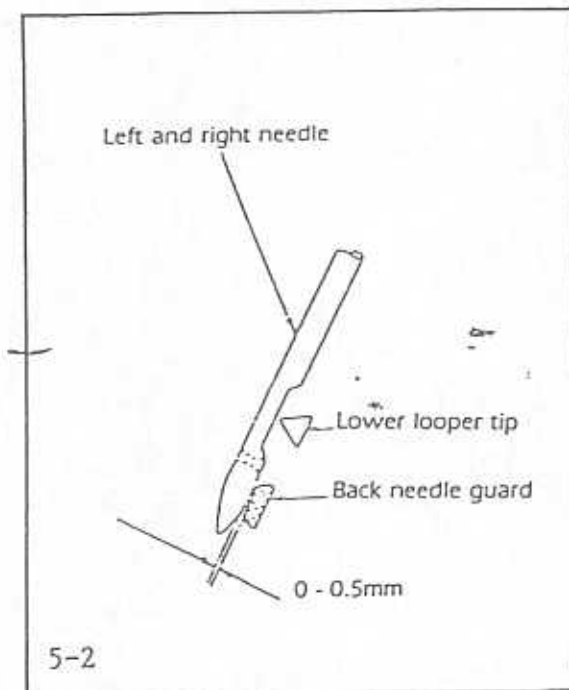
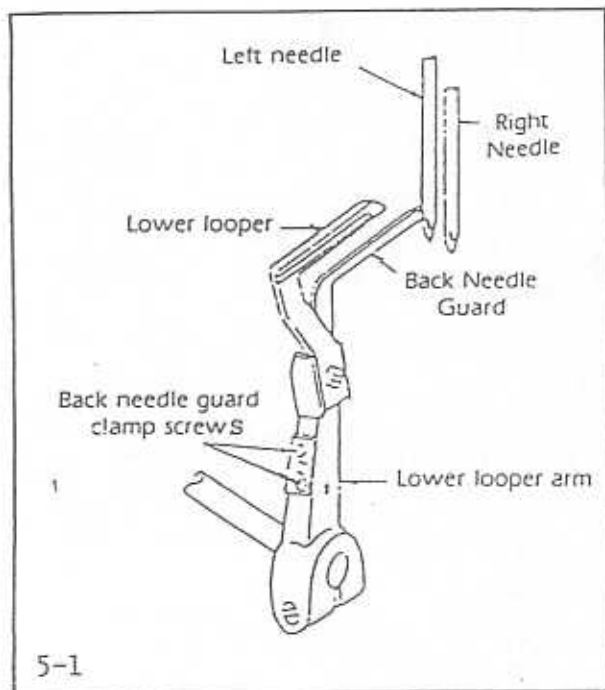


## ADJUSTING THE BACK NEEDLE GUARD

Remove the presser foot and the needle plate.

Loosen the back needle guard clamp screws. (See Fig. 5-1) Adjust the clearance and height while moving the back needle guard backward or forward, up or down. (See Fig. 5-2)

Replace the needle plate and presser foot.



## FRONT NEEDLE GUARD

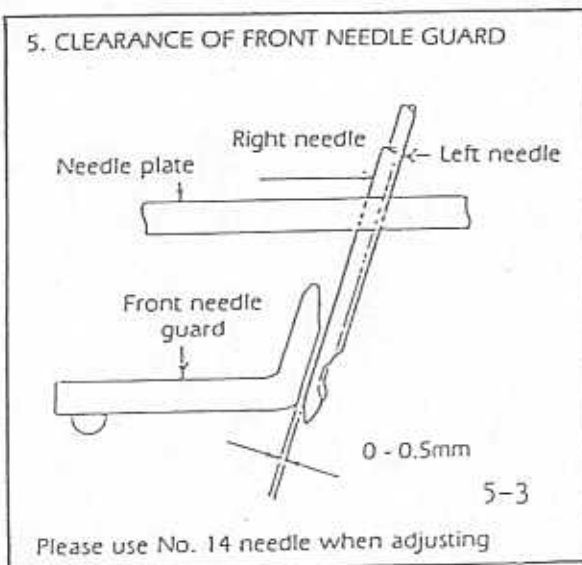
With presser foot and needle plate removed, rotate the handwheel and bring the needles to their lowest position.

Tilt the machine back and open the side door, exposing the front needle guard fixing screws.

Loosen the two fixing screws. Move the needle guard backward or forward and adjust the distance between both needles and the front needle guard. (See Fig. 5-3).

After adjusting, tighten both fixing screws, taking care not to move the needle guard.

Replace needle plate and presser foot.



## 6. UPPER LOOPER

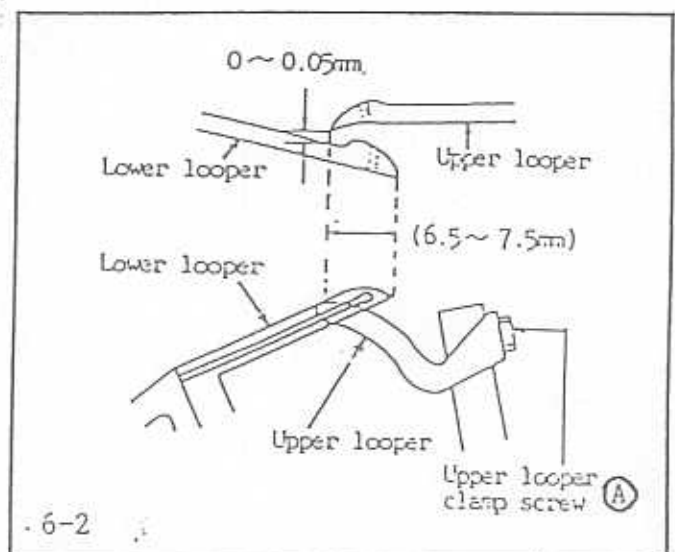
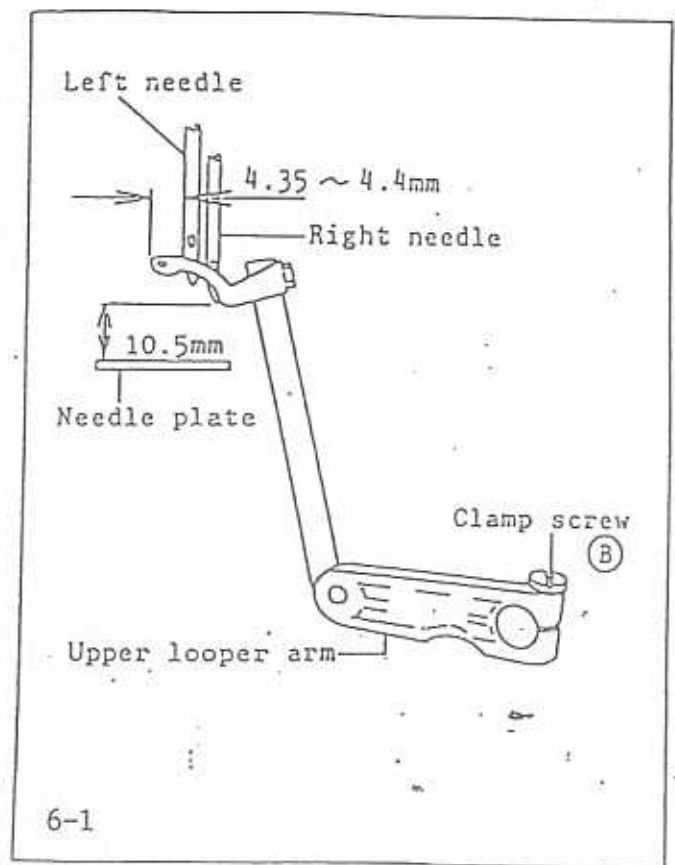
- a) Rotate handwheel so as to bring the upper looper to its highest and extreme left position.
- b) Loosen the screw (B), move the upper looper arm to go up or down.

Correct position is 4.35 4.4mm.

From the side of the left needle to the tip of the upper looper.  
(See figure 6-1)

### ADJUSTING THE CLEARANCE BETWEEN THE UPPER LOOPER AND THE LOWER LOOPER.

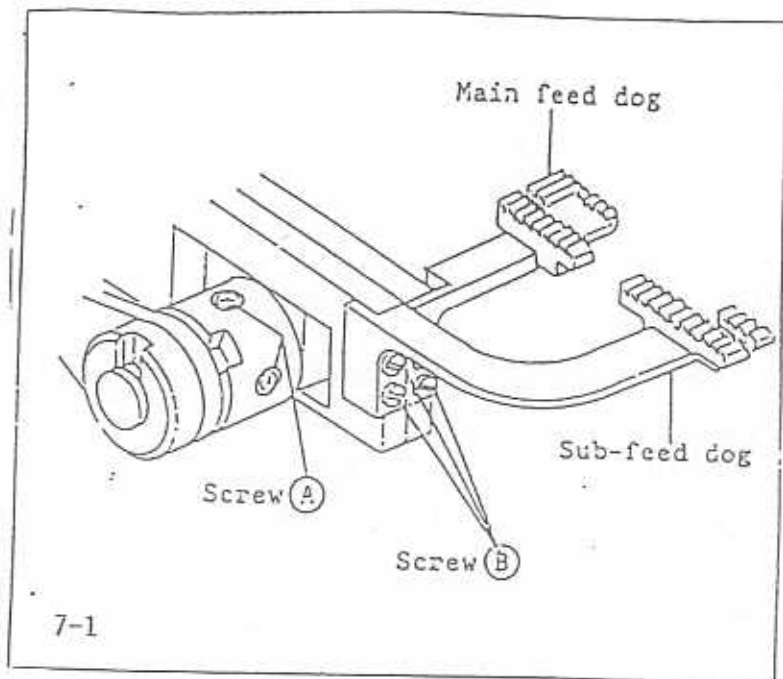
- a) Rotate the handwheel and bring the upper looper up from its lowest position until the tip of upper looper is flush with the top of the lower looper.
- b) Loosen the upper looper clamp screw (A) and adjust the clearance between the upper looper and lower looper.
- c) After adjusting, tighten the upper looper clamp screw while holding the upper looper to prevent it from moving.



## 7. FEED DOG HEIGHT AND TIMING

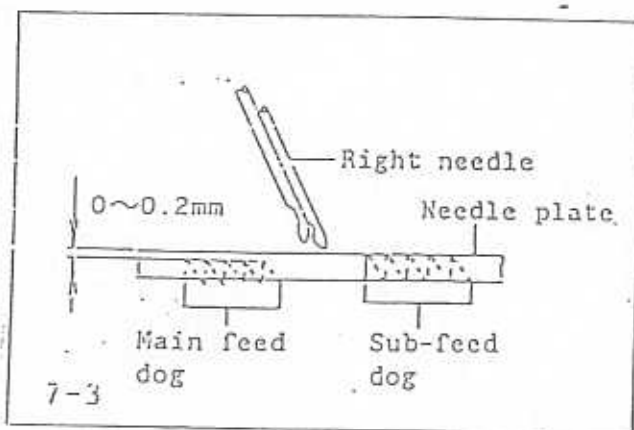
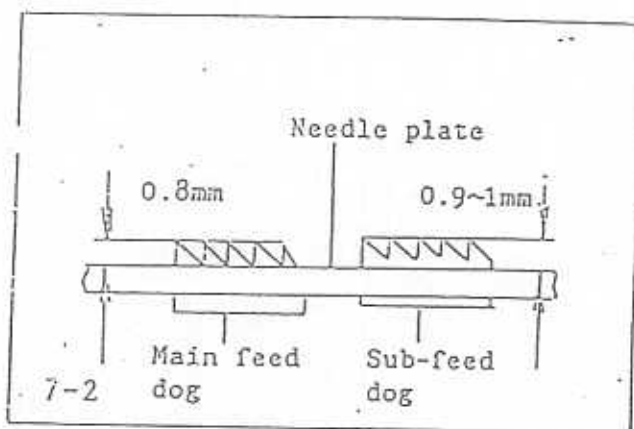
### FEED HEIGHT-DIFFERENTIAL FEED

- a) Remove presser foot.
- b) Bring feed dogs to their highest position.
- c) Top of feed dogs should measure .9-1.0mm from needle plate for sub-feed dog and 0.8mm for main feed dog. (See fig. 7-2)
- d) To adjust, loosen both feed dog fixing screws (A) & adjust to the proper height. (See fig. 7-1) Tighten both screws when feed dogs are properly positioned.



### FEED TIMING-DIFFERENTIAL FEED MODELS

- a) Remove presser foot.
- b) Adjust stitch length to the longest stitch length setting, and set the differential feed lever to "N".
- c) As the right needle is coming out of the throat plate the top of the sub-feed dog teeth should be level with the throat plate. (See figure 7-3)
- d) To adjust, loosen both feed regulator screws. (A) (See fig. 7-1)
- e) While holding onto the the feed regulator knob, turn the hand-wheel to position the needles. Tighten screws.



## REMOVAL OF NEEDLE THREADER SYSTEM

1. a) Remove face plate by removing the two polished metal philips screws; one located just above light assembly and the other just below thread guide towards bottom of face plate. No remove thread guide 428-3301-05A tension system (green) located on upper looper shaft guide holders.  
b) Turn hand wheel to stitch length No. 2 and remove face plate. Simply lift up and pull outward to clear thread take-up arm, then lift out.
2. Remove Needle Threader System - Start by turning hand wheel towards front of machine and at the same time, turn needle threader knob down as if to thread needles. When hand wheel is turned around to reach position 4 (green line), needle threader safety hook (note drawing) will lower into machine hand wheel pulley slot groove, allowing needle threader set to make contact with needles.
3. With threader set able to make contact with needles, begin removing system:
  - a) Loosen Allen screws on Threader Set.
  - b) Remove E clip from shaft located to left of Stopper.
  - c) Loose Allen screws on Stopper. Do not remove spring.
  - d) Loosen Allen screws on Safety Hook.
  - e) With one hand, hold Threader Set and use other hand to grasp Threader Knob. Rotate Knob back and forth while at the same time pulling outward and away from the machine.

## INSTALLATION OF NEEDLE (THREADER SET) SYSTEM

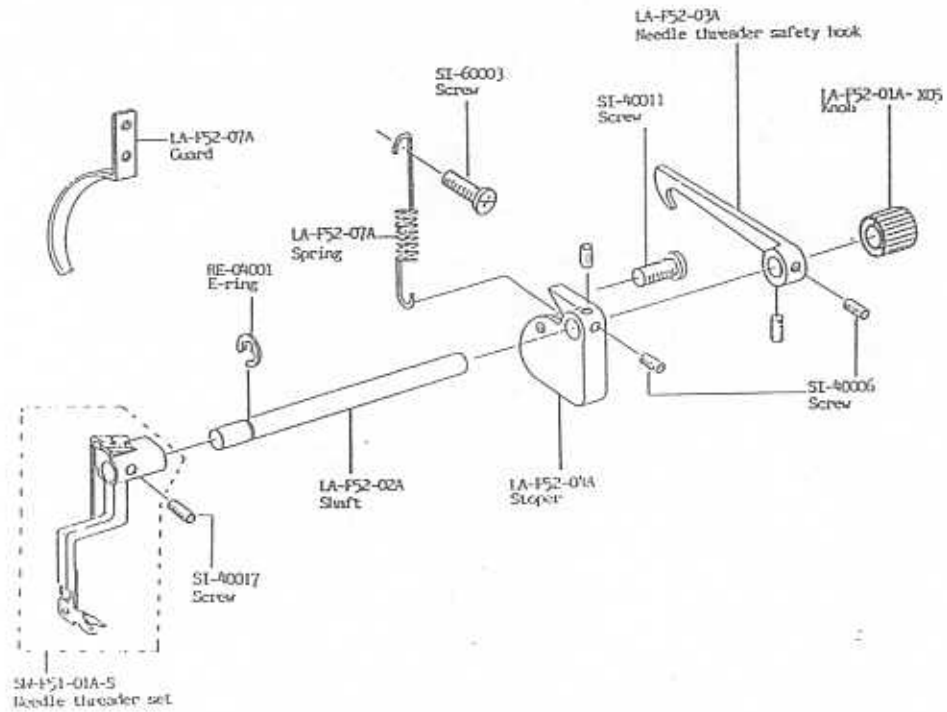
Note: Before installing shaft assembly, de-burr shaft of any scars. This will make alignment much easier.

1. Attach (Needle Threader Safety Hook) to shaft and set shaft through mounting hole.
2. With (Shaft) through first mounting hole, attach (Stopper) bracket to (Shaft), makins sure spring mounting hole faces to left towards needles. Spring should still be attached to (Stopper).
3. Slide (Shaft) on through to next mounting hole (about a quarter of an inch) then stop.
4. Attach (E Clip) to (Shaft) now.
5. Attache (Threader Set) to (Shaft). Simply push Shaft in towards Threader Set while at the same time rotating Shaft back and forth. Push (Shaft) through until (E Clip) comes into contact with casting.
6. With (Shaft), pushed through and (E Clip) in contact with casting, push (Stopper) in contact with casting and tighten Allen serews. After tightening screws, turn knob on (Shaft) to check for binds. (Shaft) should be free and able to return (Stopper) to up position.
7. Rotate knob down (or clockwise) towards back of machine, as if to thread needles, and hold. Now set (Safety Hook) back into position. Hook should be located on hand wheel and positioned into notch and centered, touching bottom of notch. Now tightn Allen screws on Safety Hook.
8. Install new needles.
9. Turn Threader Knob down and hold. Slide (Threader Set) into position. Alignment of Threader should start with right needle. When thread comes into contect with Needle, Needle should just be forced forward. Forward Needle movement should be in more than .5mm. Tighten Allen screw and check left Needle. If O.K., tighten both Allens. NOTE: (Threader Set) should be about 13.9mm from casting.
10. After alignment is complete, be sure to lube shaft at mounting holes.

## REMOVAL/INSTALLATION OF QTS

To remove Threader, loosen and remove Philips screws holding assembly on to looper arm and install new assembly.

### 14. Needle threader components



# SERVICE MANUAL

Model  
**BL 5180**

SM BL 5180



# 1. Needle

## Adjusting the needle height

1. Remove the two lamp cover clamp screws on the left side of the arm, and then cover itself.

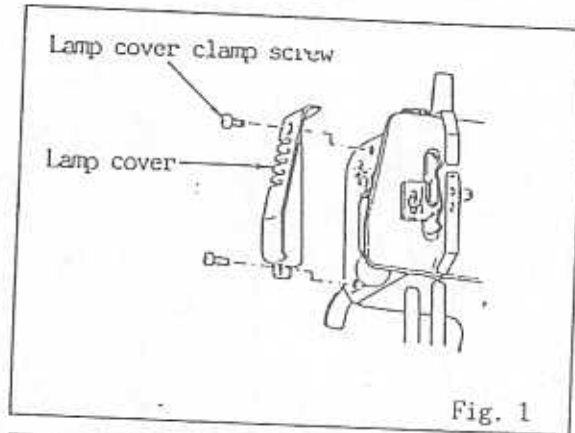


Fig. 1

2. Rotate the handwheel so as to bring the needle bar to the highest position where can find the needle bar clamp screw through hole on the left side of the arm.

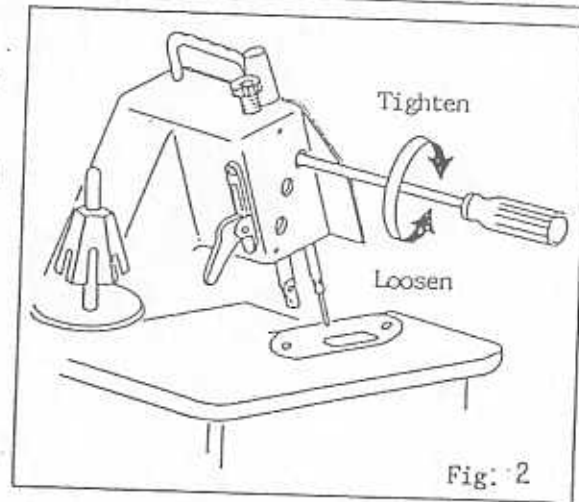


Fig. 2

3. Insert the screwdriver into the hole and loosen the needle bar clamp screw as shown in Fig. 2.

4. Adjust the needle bar height at the highest position from the needle plate surface while moving the needle bar up or down.

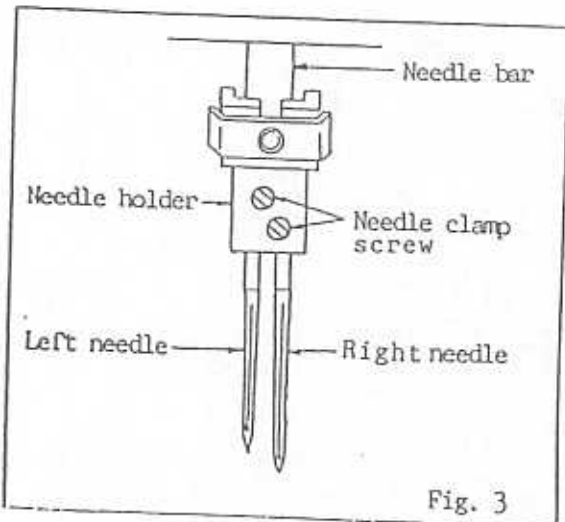


Fig. 3

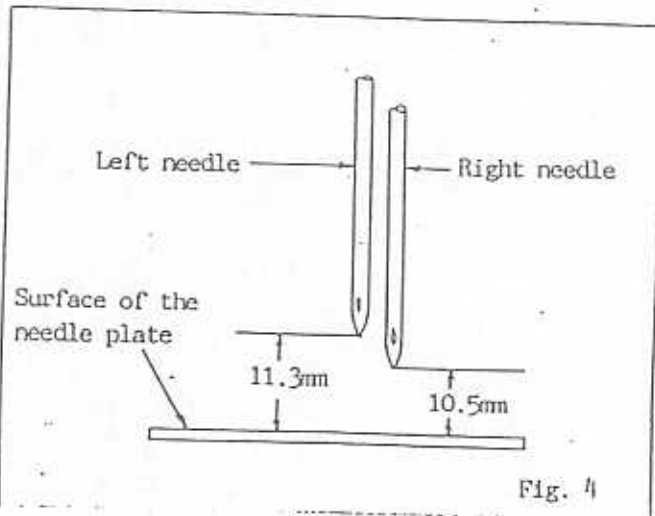


Fig. 4

## 2. Lower looper

### 2-1 Adjusting the lower looper return distance

1. Loosen the lower looper arm clamp screw and adjust the return distance between the lower looper tip and the left side of the left needle, when the lower looper is in the extreme left position.
2. After adjusting, tighten the lower looper arm clamp screw.

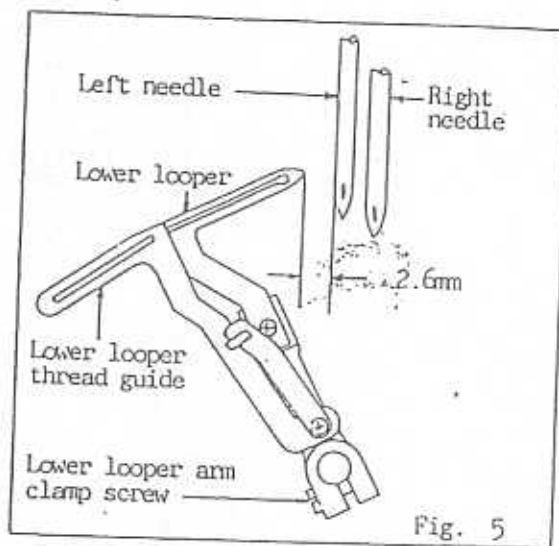


Fig. 5

### 2-2 Adjusting the clearance between the lower looper and the needle

1. Loosen the lower looper arm clamp screw.
2. Adjust the clearance the back of the left needle and the lower looper tip by moving the lower looper arm forward or backward in the direction of the lower looper shaft.
3. After adjusting the clearance between the lower looper tip and the left needle and the right needle hollow, tighten the lower looper arm clamp screw.

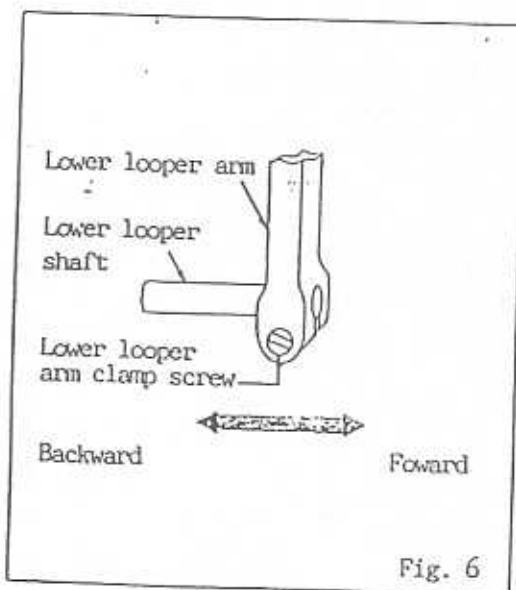


Fig. 6

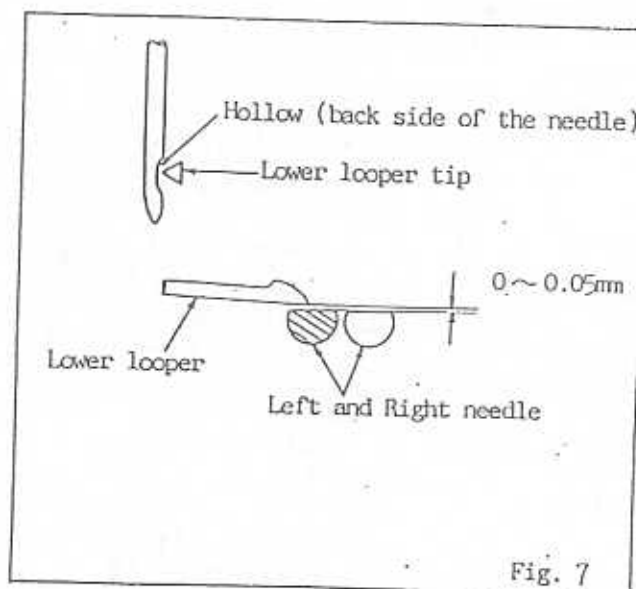
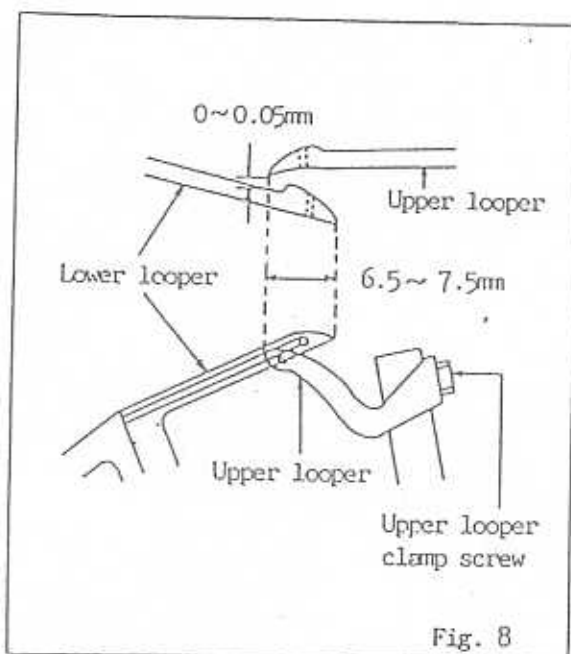


Fig. 7

### 3. Upper looper

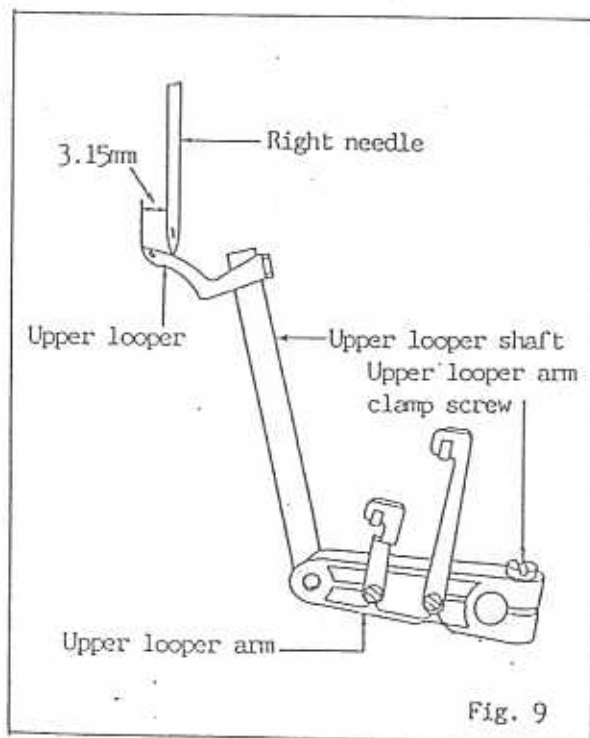
#### 3-1 Adjusting the clearance between the upper looper and the lower looper

1. Rotate the handwheel and bring each looper to adjust position where closed the upper looper tip and back side of the lower looper.
2. Loosen the upper looper clamp screw and adjust the clearance between the upper looper and the lower looper.
3. After adjusting, tighten the upper looper clamp screw while holding so as not to move.



#### 3-2 Adjusting the upper looper protrusion amount

1. Remove the left needle.
2. Rotate the handwheel so as to bring the needle and upper looper to the highest position.
3. Loosen the upper looper clamp screw and adjust the distance between the upper looper tip and left side of the left needle while moving upper looper arm up or down.
4. After adjusting, tighten upper looper arm clamp screw and replace the left needle.



## 4. Adjusting needle guard

### 4-1 Adjusting the front needle guard

1. Remove the presser foot and bring the upper knife to up position.
2. Remove the base plate.
3. Rotate the handwheel and bring the needle to the lowest position.
4. Loosen the needle guard fixing nut and screw. Move the needle guard backward or forward and adjust the distance between both needles and the front needle guard.
4. Loosen the needle guard fixing nut and screw. Move the needle guard backward or forward and adjust the distance between both needles and the front needle guard.
5. After adjusting, tighten the needle guard fixing screw and the needle guard fixing nut.
6. Replace the base plate and presser foot.

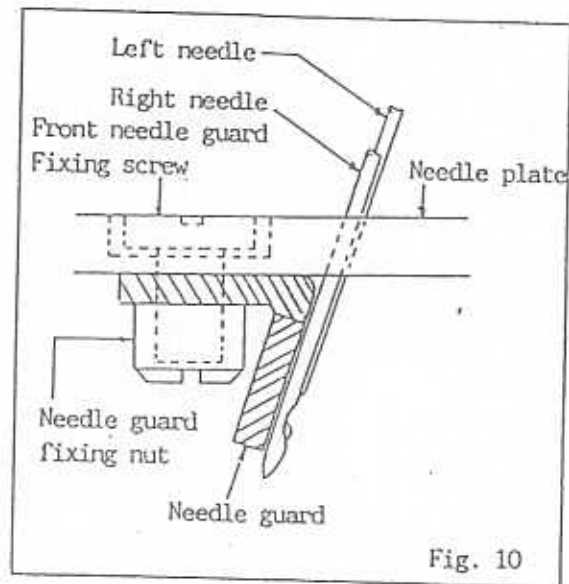


Fig. 10

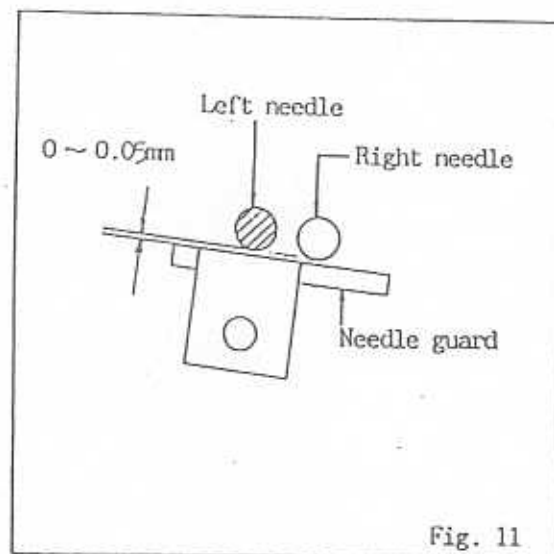
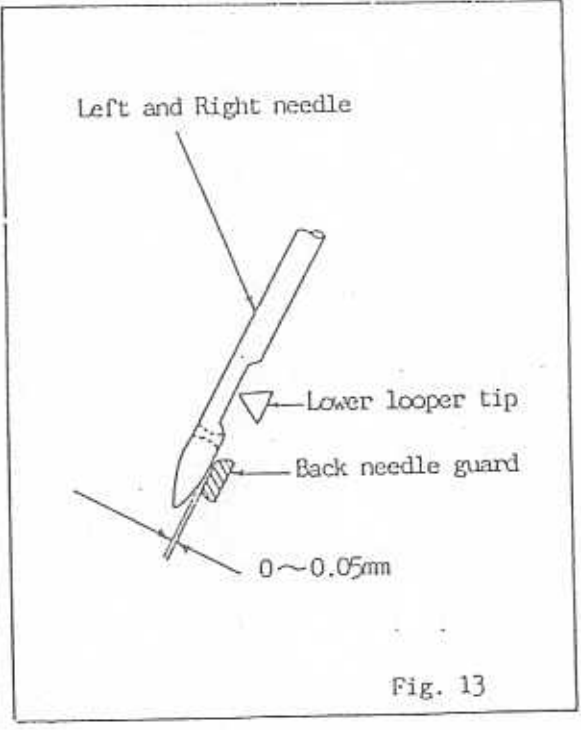
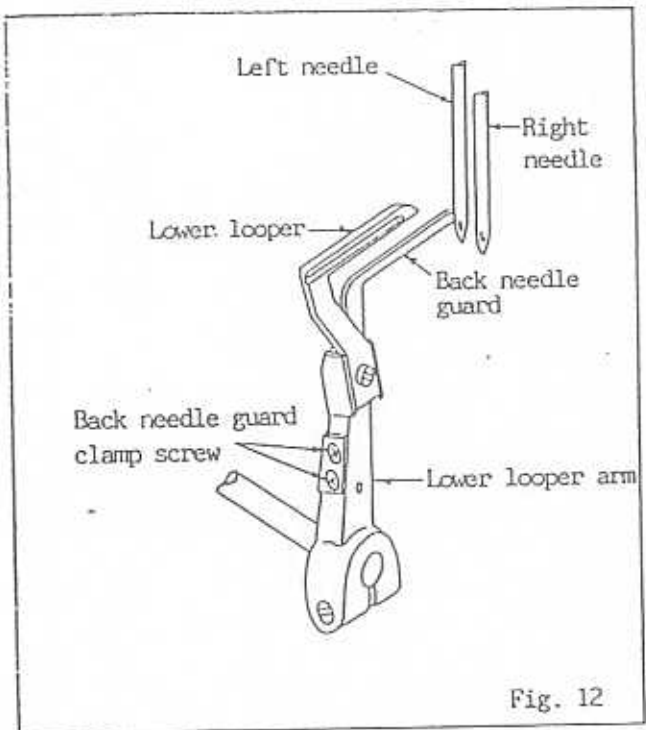


Fig. 11

4-2 Adjusting the back needle guard

1. Remove the presser foot and needle plate.
  2. Loosen the back needle guard clamp screw, adjust the clearance and height while moving the back needle guard backward or forward, up or down.
  3. After adjusting, tighten the back needle guard clamp screw.
- Replace the needle plate and presser foot.

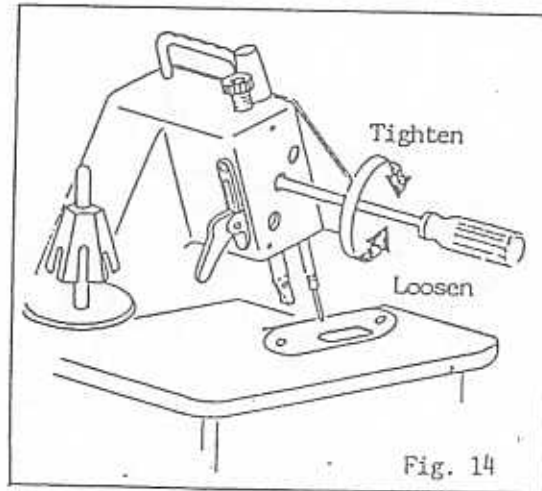


## Presser foot

Remove the lamp cover fixing screw and the lamp cover itself.

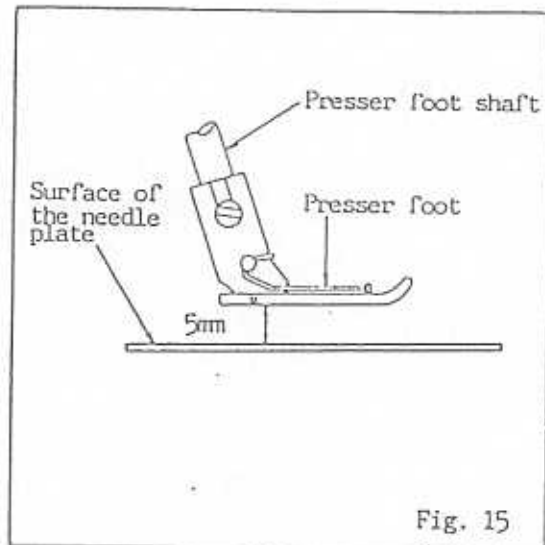
Lift the presser foot to bring the presser bar clamp screw to the screwdriver hole on the left side of the machine arm.

Insert a screwdriver into the hole on the left side of the arm and loosen the presser foot clamp screw.



Adjust the height of the presser foot by moving the presser foot bar up or down.

After adjusting, check to confirm that the presser foot does not contact the upper looper and needle, and tighten the presser bar clamp screw.



# **baby lock**

## **SERVICE MANUAL**

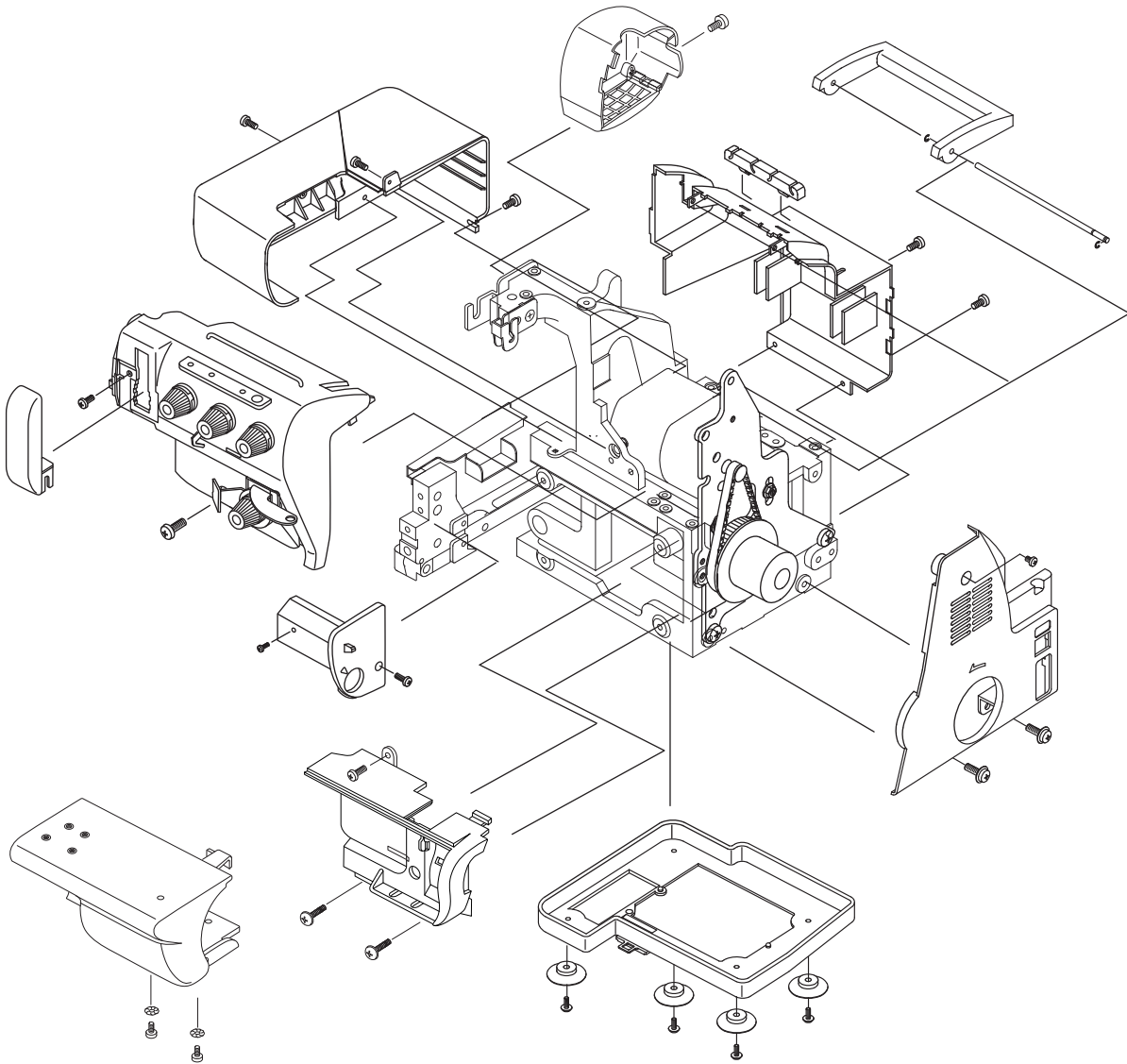
### **MODEL BLCS**

#### **Serial Numbers**

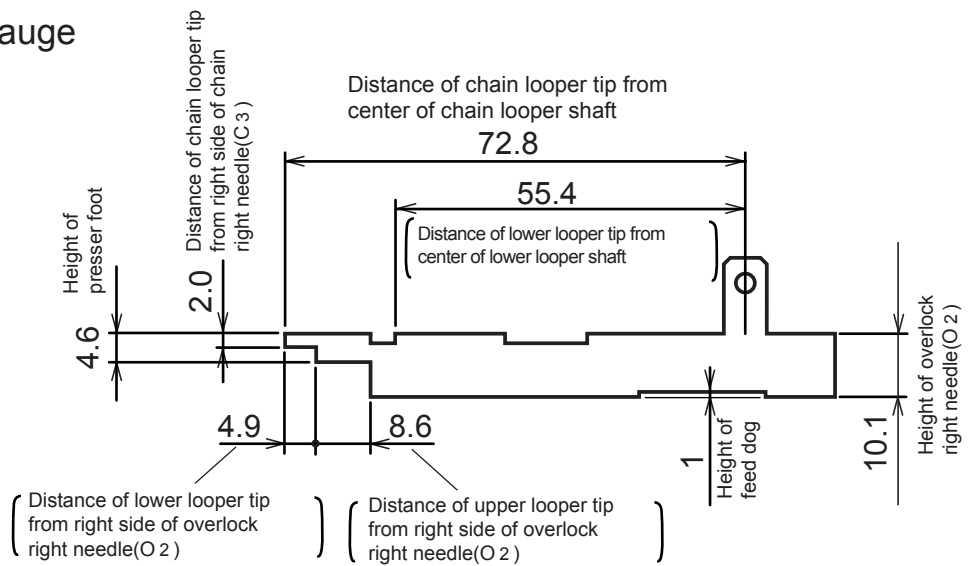
	For U.S.A.	For Canada	For Europe, Australia,NZ
From	100176	100051	100333
To	100389	100060	100382

**Vol 2.0**

# 1. Construction of Covers

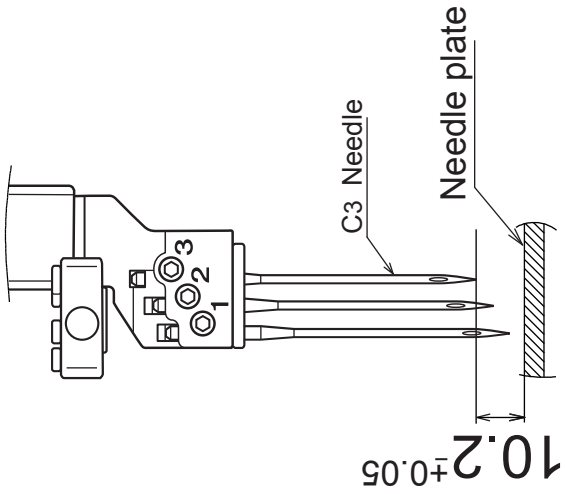
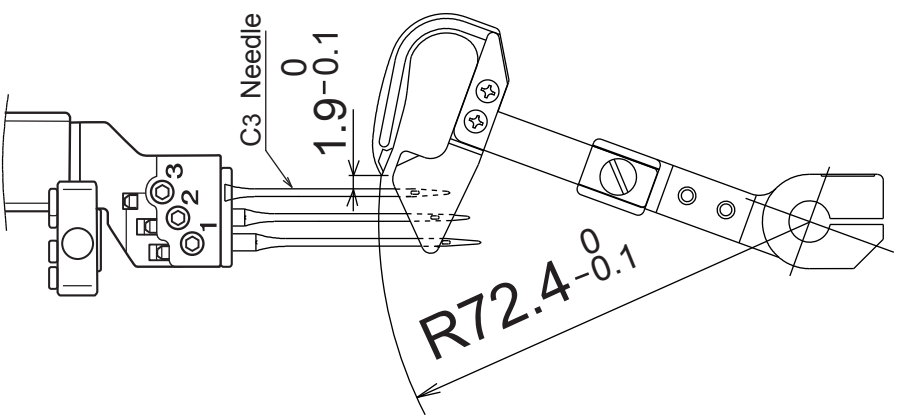
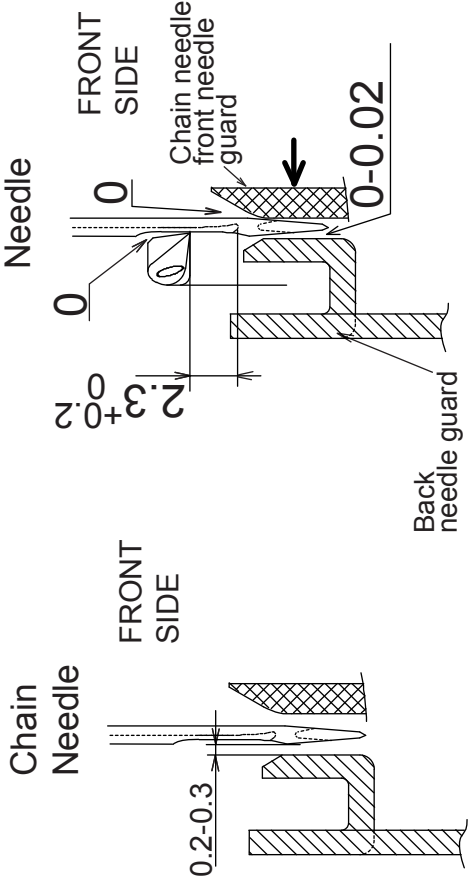
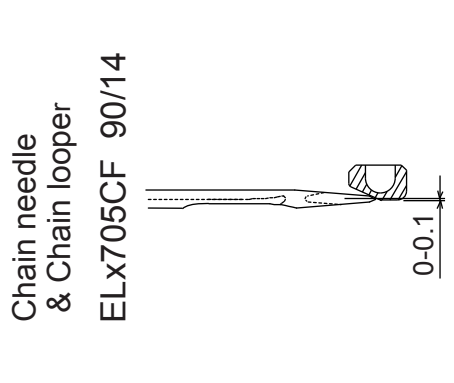
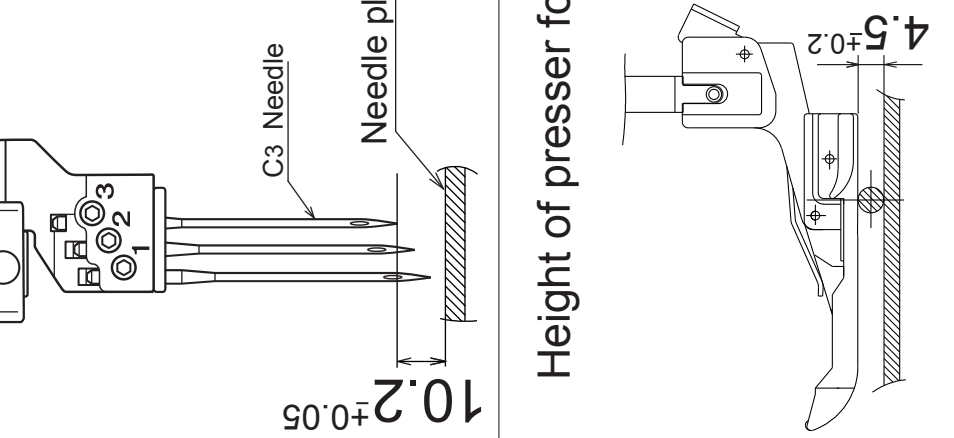
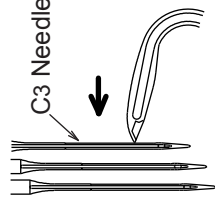


## Adjusting gauge For BLE8





## 2. Adjustment of Needle, Chain lopper & Presser foot

<p>Height of needle ELx705CF 90/14</p>  <p>10.2<math>\pm</math>0.05</p>	<p>Chain looper adjustment ELx705CF 90/14</p>  <p>R72.4<math>\overset{0}{-}</math>0.1</p> <p>1.9 - 0.1</p>	<p>Needle guard adjustment ELx705CF 90/14</p>  <p>FRONT SIDE</p> <p>0.2-0.3</p> <p>FRONT SIDE</p> <p>0-0.02</p>	<p>Chain needle &amp; Chain looper ELx705CF 90/14</p>  <p>0-0.1</p>
<p>Height of presser foot</p>  <p>4.5<math>\pm</math>0.2</p>	 <p>C3 Needle</p>		

### 3. Height of feed dog

CORRECT HEIGHT – When feed dogs are top position, make sure the clearance of 0.9mm between presser foot and needle plate.

### 4. Tension release & Dropped feed dog adjustment

#### 4-1. Tension release

a) In case you replace face cover, make sure the tension release lever catches the Tension release pin correctly (fig.A)

b) Double check disks are open perfectly when presser bar lifter is lifted.

#### 4-2. Dropped feed dog adjustment

Make sure feed dog height is correct, before you adjust following items.

a) Loosen adjusting screw (B).

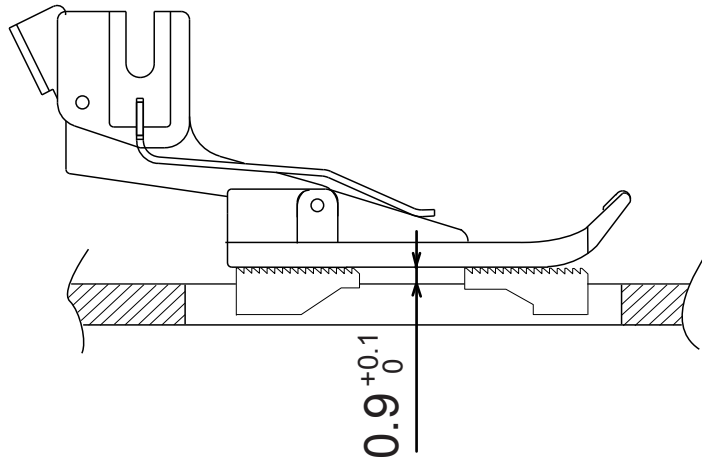
b) Lift the presser bar lifter and make sure feed dog is dropped position.

c) Rotate machine pulley, Make sure Feed dog crutch arm (E) swings up and down.

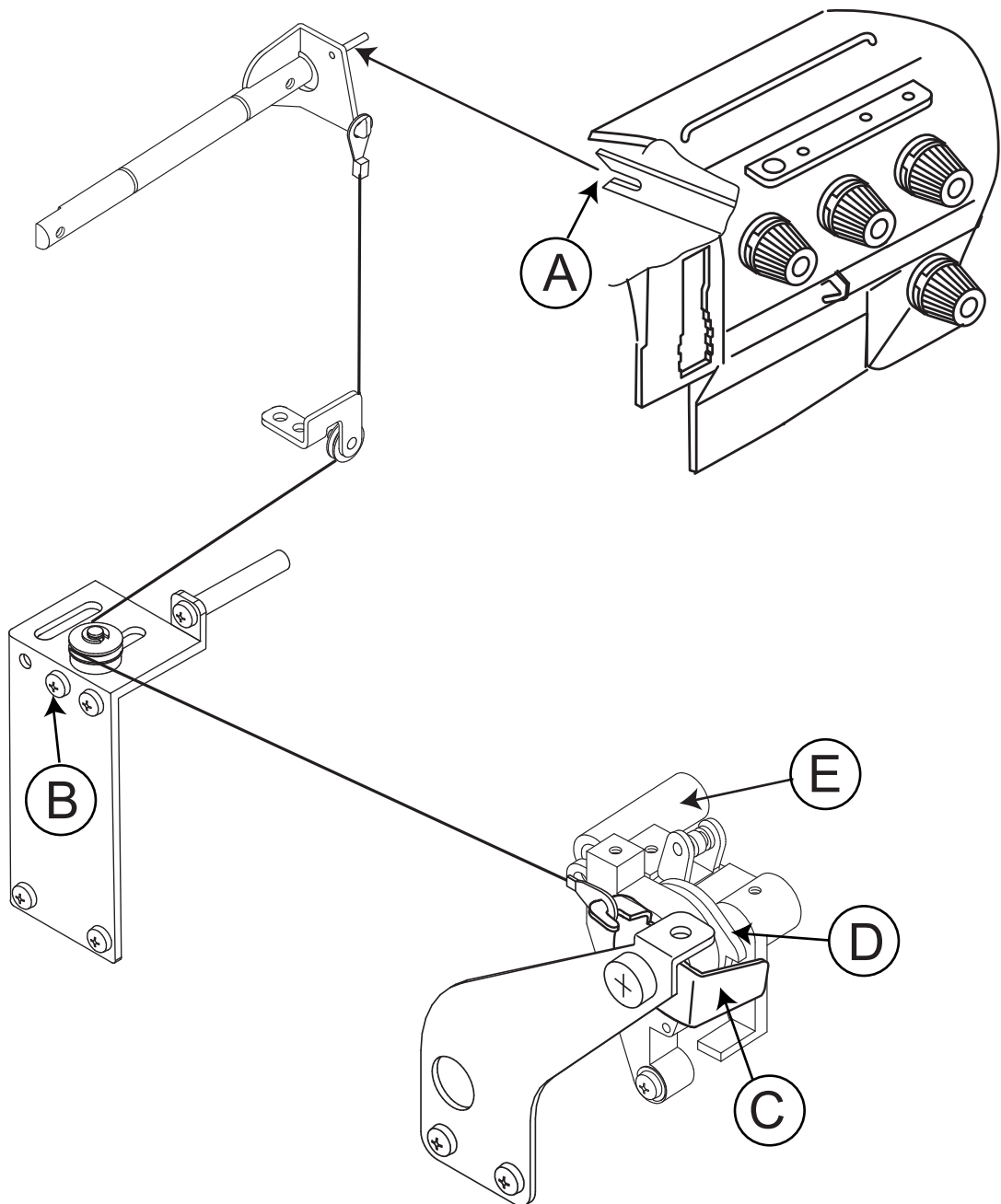
d) Tighten the screw (B) until Feed dog crutch arm does not swing.

e) Drop the presser bar lifter, make sure dropped feed dog mechanism does work correctly when presser bar lifter is lift position.

### 3.Height of feed dog



### 4.Tension release & Dropped feed dog adjustment



## 5. Checking threading steel pipe joint

- a) Set the machine for looper threading.
- b) Move the lock button release lever slightly to the right.
- c) Check the connecting point whether the looper threading pipe joint and threading steel pipe is fitted each other properly.

## 6. Checking pump

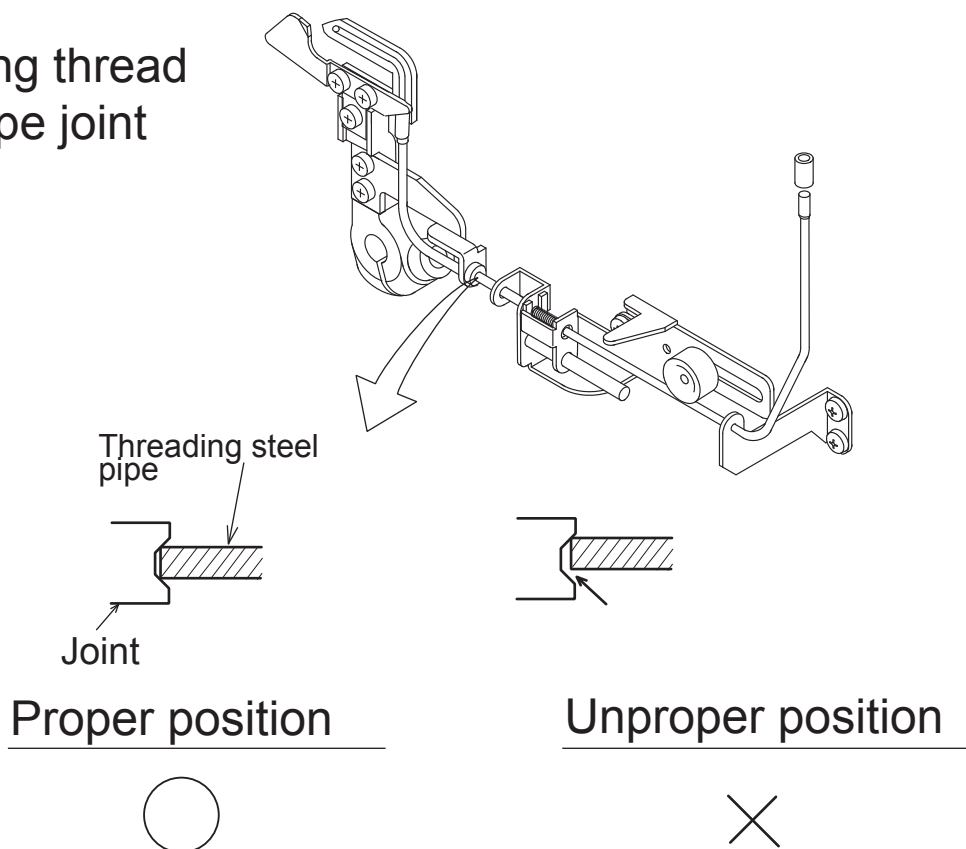
### 6-1 Checking deflate from pump

Holding the pump tube 6, push down the pump lever 15 and check if air is deflated from pump or not.

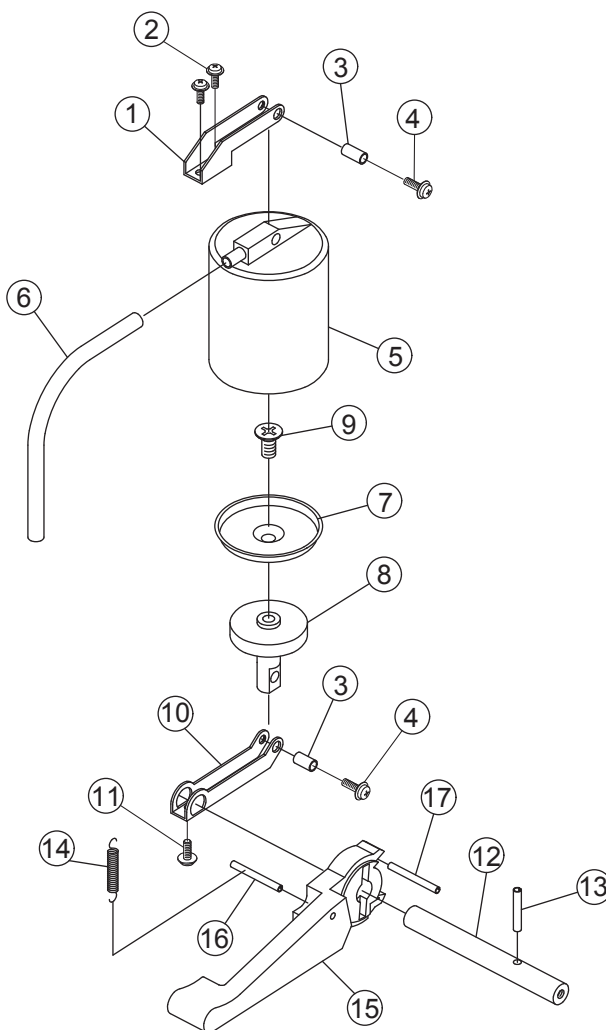
### 6-2 Replacement of Piston Cap

- a) Bring the pump lever to the lowest position and fix it with Scotch tape or something like that.
- b) Remove base plate.
- c) Remove piston driving arm fixing screw 11 (SM3005IK).
- d) Remove piston driving arm from piston driving shaft.  
(It will be easy to remove the arm from the shaft, if you push the shaft to the rightward direction.)
- e) Remove piston assembly from cylinder  
(It will be easy to remove piston assembly from cylinder, when the needle is in the lowest position.)
- f) Replace piston cap.
- g) Grease piston cap a little bit.(MOLYKOTE 1125)
- h) Return piston assembly to cylinder.
- i) Fit piston driving arm to piston driving shaft properly and tighten fixing screw SM3005IK firmly.  
(It will be easy to fit the arm to the shaft, if you push the shaft to the leftward direction.)
- j) Check and confirm whether the pump works properly or not.
- k) fix base plate.

## 5. Checking thread steel pipe joint



## 6. Checking pump



## 7. TROUBLE SHOOTING

### 7-1 NEEDLE THREADS ARE UN BALANCED ;

- \* Is the BLCS threaded correctly?      See Instruction Book P. 14,15.
- \* Are the threads snapped in the head guide?      See Instruction Book P. 15.
- \* Are the threads recommended high quality?      See Instruction Book P.7.

### 7-2 LOOPER THREADS ARE UNBALANCED ;

- \* Is the BLCS threaded correctly?      See Instruction Book P. 14,15.
- \* Are the threads snapped in the head guide?      See Instruction Book P. 15.
- \* Are the threads recommended high quality?      See Instruction Book P. 7.

### 7-3 THREAD BREAKS ;

- \* Is the BLCS threaded correctly?      See Instruction Book P. 14,15.
- \* Are the threads snapped in the head guide?      See Instruction Book P. 15.
- \* Are the threads recommended high quality?      See Instruction Book P.7.

### 7-4 JET AIR THREADER DOES NOT WORK

- \*Is air deflated from pump?      See P.13.
- \*Are pipes connected properly?      See P.13.
- \*Are there any lints or thread in pipes?

# baby lock

## SERVICE MANUAL Basic Adjustment

MODEL BLE1  
BLE1SX  
BLE1DX  
BLE1AT  
BLE3ATW  
BLE8  
BLE8W  
BLCS

### Serial Numbers

	U.S.A.	Canada	EU	Au. N.Z
From	8W: K6 104507 ATW: K6 148120 AT: K6 104551	8W: 100231 ATW: 103681 AT: 307467 DX: 300806	8W: 101484 ATW: 101141 AT: 705451 DX: 715850	8W: 101201 8: 501001 ATW: 101081 AT: 705771 DX: 715800

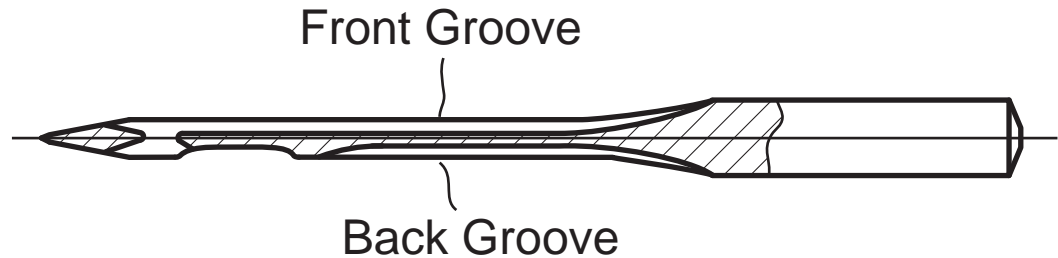
# 1.NEEDLE

NOTE: Before all adjustment,  
you are required to change all needles to new and correct ones.

Needle System : ELx705CF ORGAN (SCHMETZ)

Model : BLE8, BLE8W, BLE5, BLCS

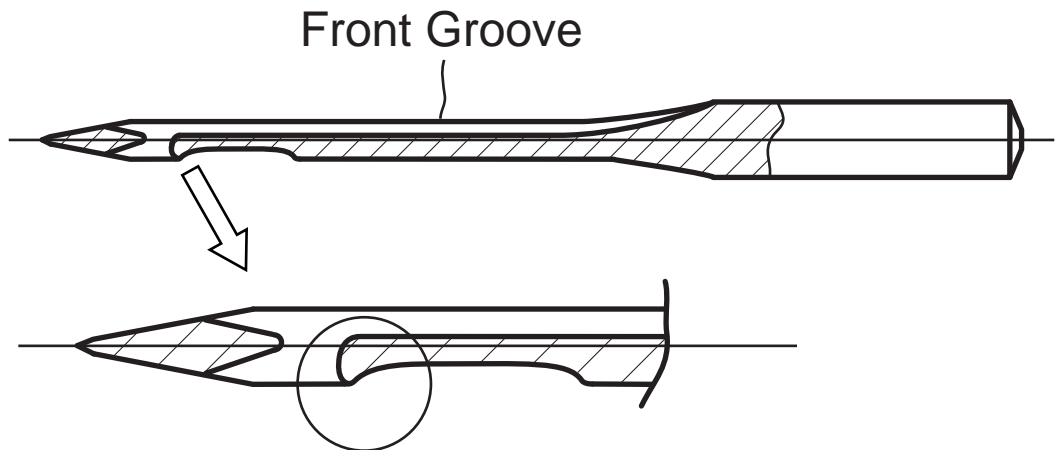
Plating : Chrome



Needle System : HAx1SP/CR ORGAN (SCHMETZ)

Model : BLE1SX, DX, LX, AT, ATW, BL101

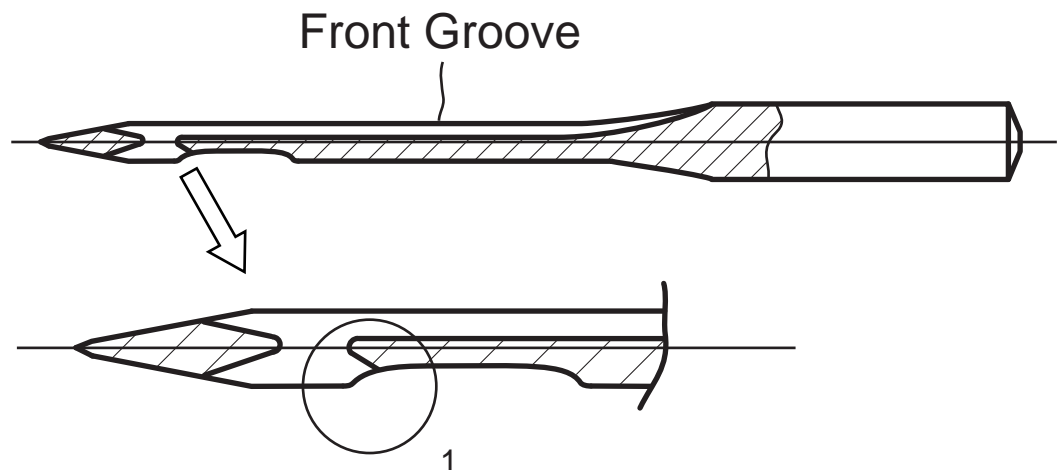
Plating : Chrome



Needle System : HAx1(130/705H) SCHMETZ,ORGAN

Model : Household Sewing Machine

Plating : Nickel





## 2. ADJUSTMENT OF NEEDLE AND PRESSER FOOT HEIGHT

### a) Height of needle

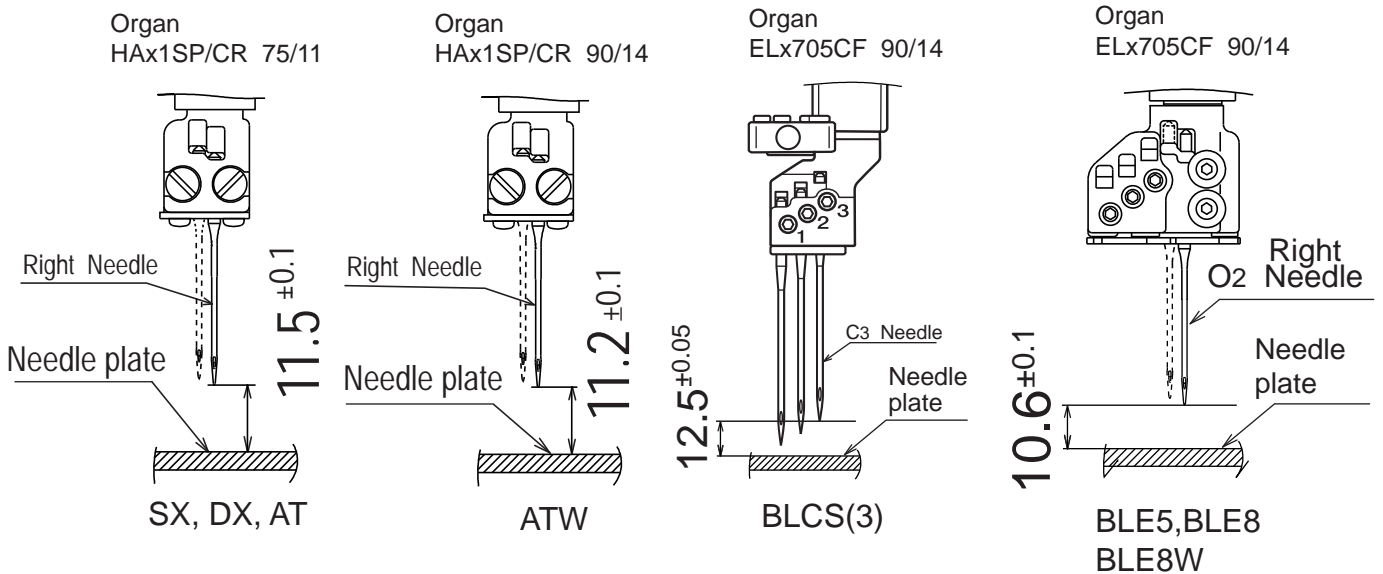
Turn handwheel, and bring the needle to the highest position.

Loosen screw "A", and turn the eccentric shaft to clockwise or counter-clockwise.

Clockwise ----- Lower needle

Counter-clockwise----- Raise needle

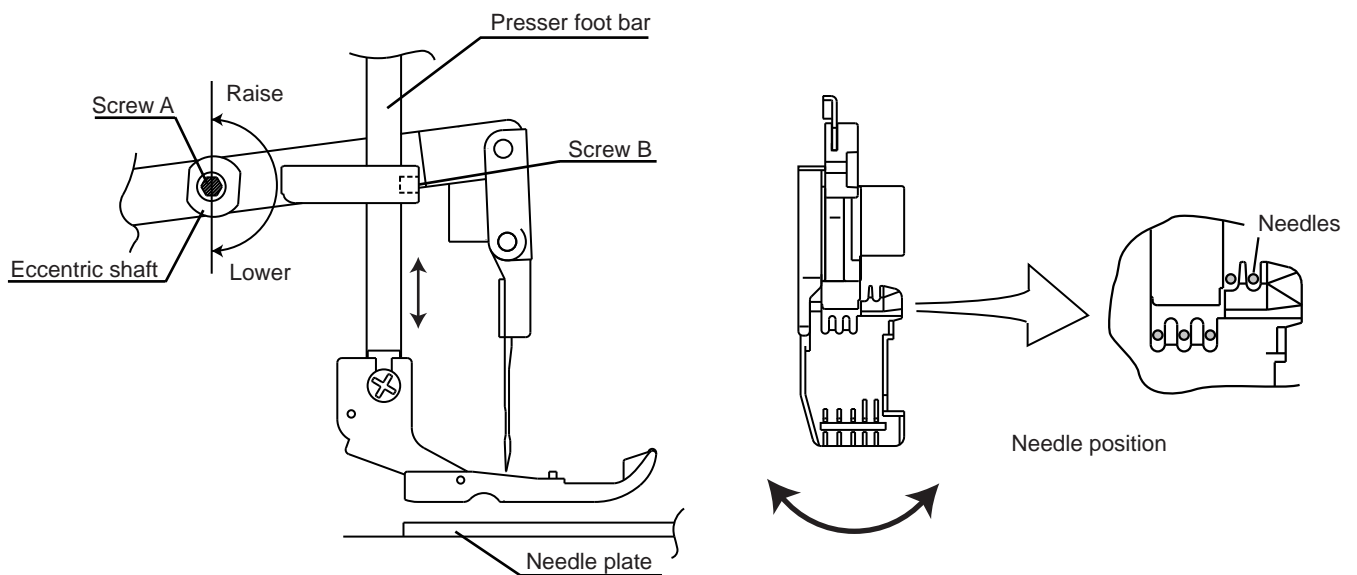
### Height of needle



### b) Height of presser foot

Raise the presser foot lifter. Loosen screw "B", and move the presser foot bar to raise or lower.

You are required to check the clearance between needle and presser foot.

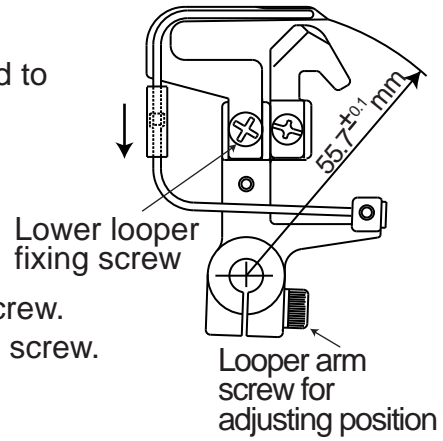


### 3. LOWER LOOPER ADJUSTMENT

NOTE: After adjusting lower looper, you are required to check JET AIR THREADING.

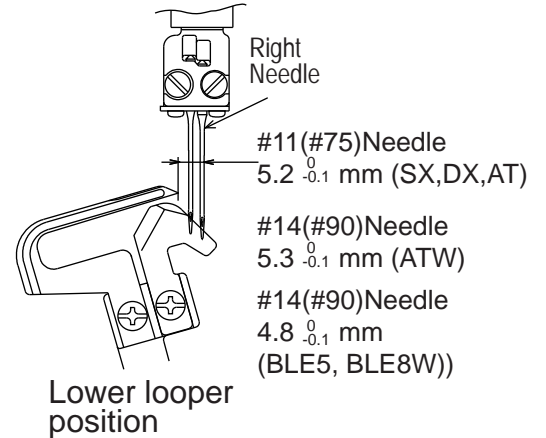
#### a) Replacement of lower looper

Slide the pipe rubber, and loosen the screw.  
 Replace new lower looper, and slightly tighten the screw.  
 Adjust the radius  $55.4\text{mm} \pm 0.1$ , and firmly tighten the screw.  
 Replace the pipe rubber.



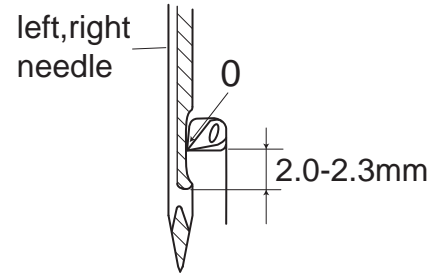
#### b) Lower looper position

Turn the handwheel, and bring lower looper to the far left.  
 Loosen looper arm screw, and adjust lower looper to the correct position.  
 You are required to check the distance of tip of lower looper and needle.



#### c) Distance between lower looper and needle

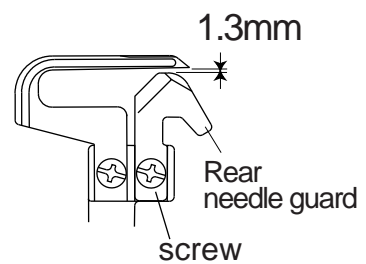
Turn the handwheel, and bring tip of lower looper to the center of left (right) needle.  
 Loosen looper arm screw, and adjust lower looper to the correct position.



### 4. NEEDLE GUARDS ADJUSTMENT

#### c) Rear needle guard position

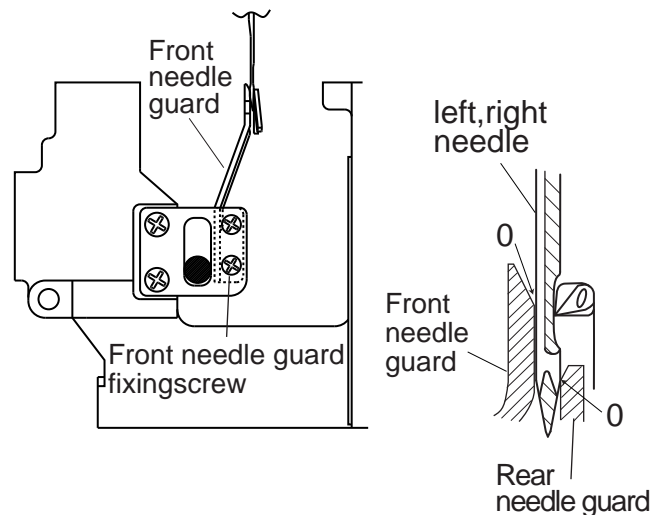
Loosen rear needle guard screw, and adjust rear needle guard to the correct position.



#### c) Adjusting needle guards

Loosen front needle guard screw, and adjust front needle guard to the correct position.

Rear needle guard can be adjusted by bending.

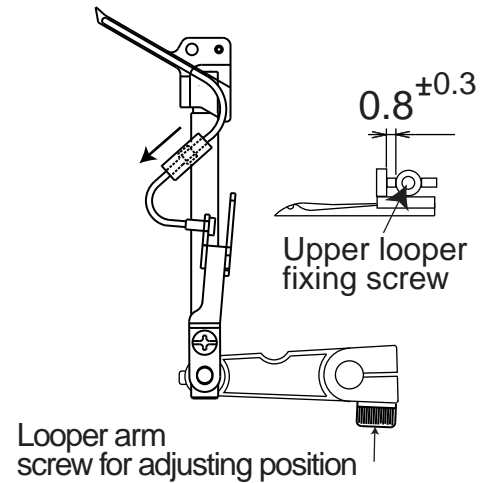


## 5 . UPPER LOOPER ADJUSTMENT

NOTE: After adjusting upper looper, you are required to check JET AIR THREADING.

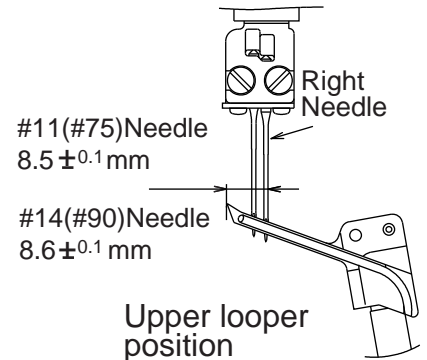
### a) Replacement of upper looper

Slide the pipe rubber, and loosen the screw.  
 Replace new lower looper, slightly tighten the screw.  
 The distance from looper from shaft is approx. 0.8mm,  
 and firmly tighten the screw.  
 Replace the pipe rubber.



### b) Upper looper position

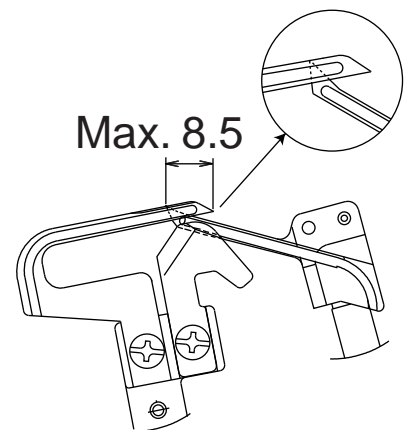
Turn the handwheel, and bring upper looper to the far left. (top position)  
 Loosen looper arm screw, and adjust upper looper to the correct position.



### c) Correspondence amount of lower and upper looper

Turn hand wheel and bring the loopers to the cross position as shown.

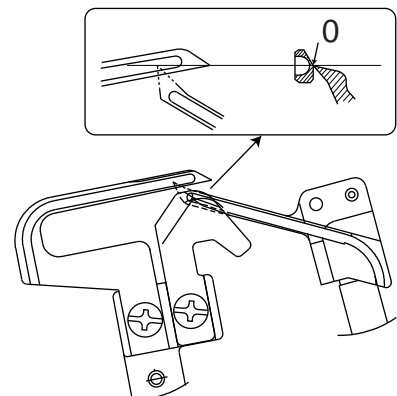
Make sure upper looper on the overlapping amount 8.3mm between both tip of loopers.



### d) The distance between upper looper and lower looper

Turn hand wheel and bring the loopers to the cross center position as shown.

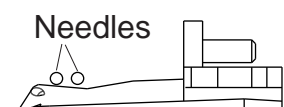
Loosen looper fixing screw, and adjust upper looper to the correct position.



### d) The distance between upper looper and needles

Turn hand wheel and bring the loopers to the far left (top position).

Make sure upper looper do not touch needles strongly,  
 and the distance between upper looper and needles is not big.



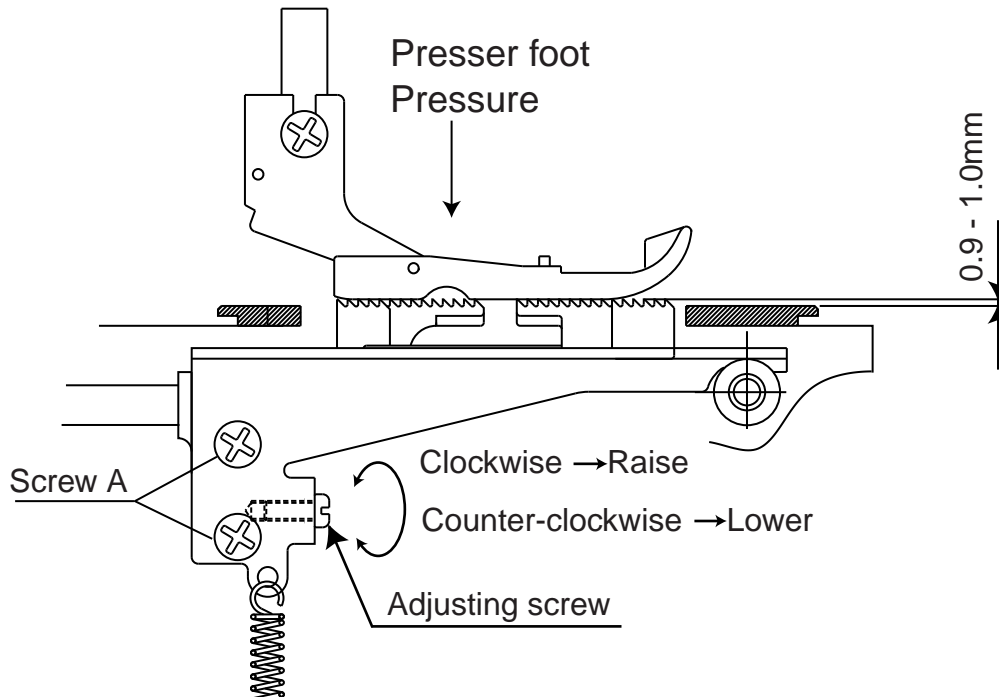
Repeat a) to e) until you get exact position.

## 6. FEED DOG ADJUSTMENT

### a) FEED DOG HEIGHT ADJUSTMENT

Loosen two screws "A", rotate adjusting screw clockwise or counter-clockwise.

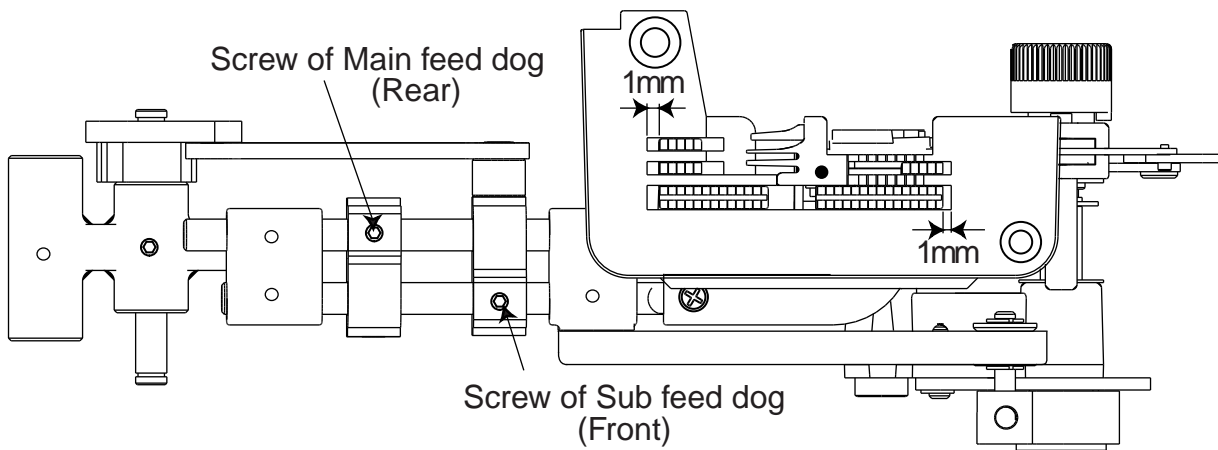
Clockwise-----Raise feed dog  
Counter-clockwise-----Lower feed dog



### a) FEED DOG POSITION ADJUSTMENT

Condition : Stitch Length 4  
Differential Feed N

The minimum distance between needle plate and main/sub feed dogs which are moved front and back, is 1mm.

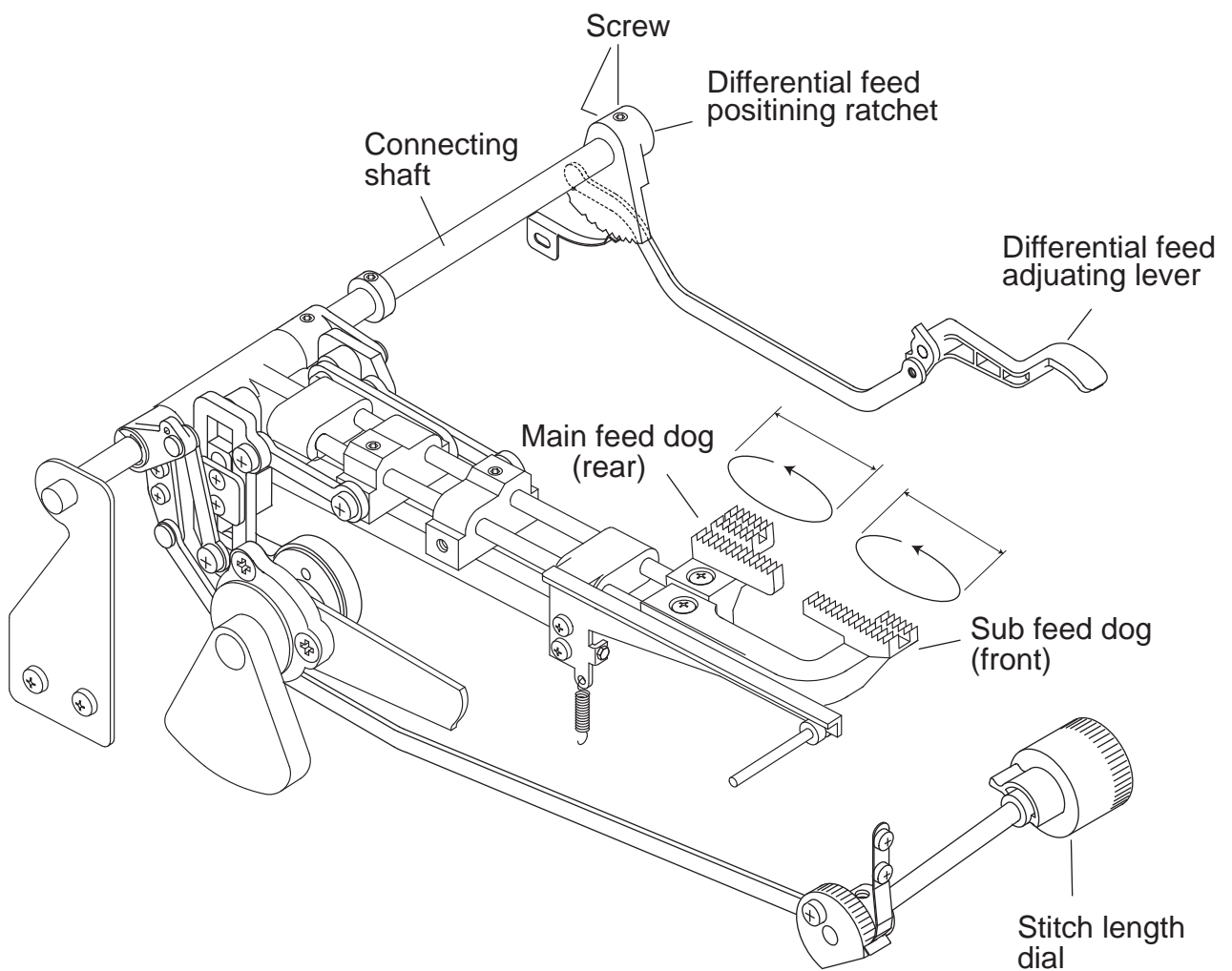


## 7. Differential feed adjustment

Correct position : On condition diff.lever "N" position and stitch length dial "4", main feed dog(rear) and sub feed dog (front) move same length.

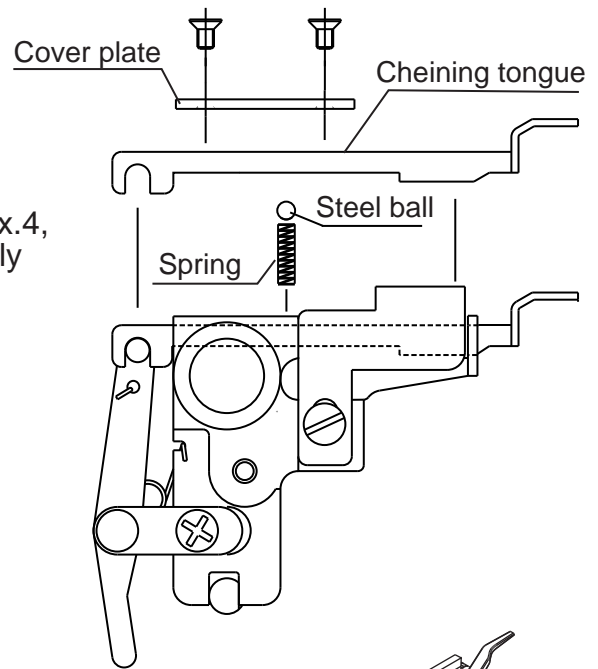
How to adjust

- Move differential feed adjusting lever to get same moving length of main and sub feed dog.
- Loosen two screws of differential feed positioning ratchet.
- Hold connecting shaft by finger, move differential feed adjusting lever to "N" position.
- Tighten two screws.



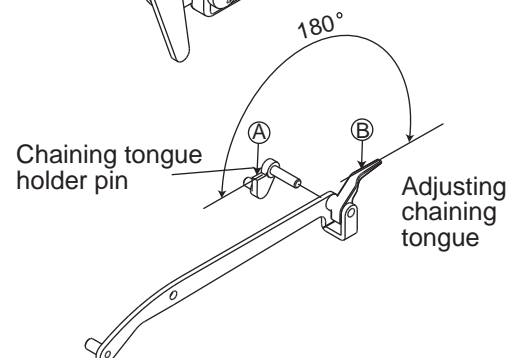
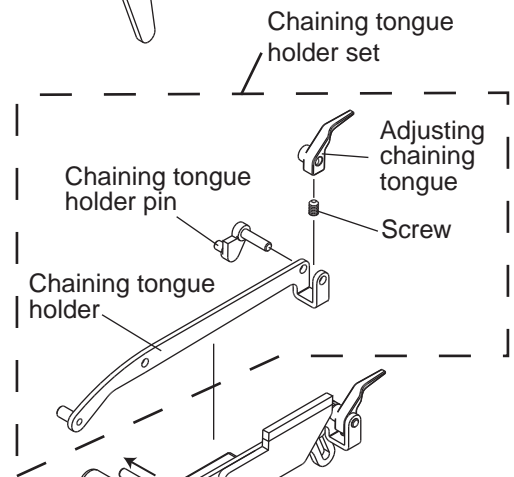
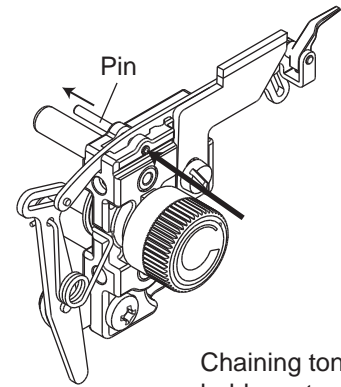
## 8-1. REPLACEMENT OF CHAINING TONGUE (EXCEPT BL3ATW)

- Remove needle plate.
- Loosen two screws of chaining tongue cover plate and remove it.
- Watching carefully not to jump out steel ball, remove chaining tongue and replace it.
- You are required to check the fixing position of the chaining tongue, after replacing it.
- Rotate stitch length dial max. 4 to rolled hem max.4, make sure the chaining tongue is moved smoothly to rolled hem position.



## 8-2. REPLACEMENT OF CHAINING TONGUE (BL3ATW)

- Move the pin to leftward.
- Remove chaining tongue holder set with adjusting chaining tongue.
- Loosen screw of adjusting chaining tongue and remove holder pin. Replace the adjusting chaining tongue with new one.
- Make parallel between "A" (flat side of chaining holder pin) and "B" (top surface of adjusting chaining tongue), and tighten the screw temporary.
- Replace chaining tongue holder set, and make sure that top of adjusting chaining tongue is parallel with needle plate.
- Remove chaining holder set again, tighten the screw firmly.
- Replace chaining holder set.



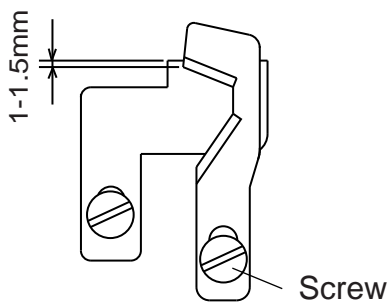
## 9. REPLACEMENT OF KNIVES

### UPPER KNIFE

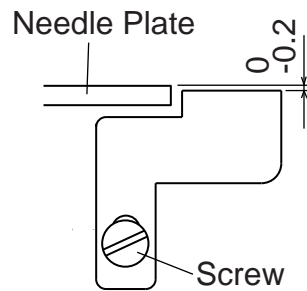
- Remove upper knife and replace it.
- Fixing screw temporarily, turn the hand pulley and bring the upper knife to the lowest position.
- Adjust upper knife to be 1-1.5mm overlapping with cutting face of lower knife.
- Tighten firmly fixing screw.

### LOWER KNIFE

- Remove both knives and replace it.
- Fix screw of lower knife temporarily.
- Adjust lower knife to be 0-0.2mm down from surface of needle plate.
- Tighten firmly fixing screw.
- Replace upper knife as same as above.



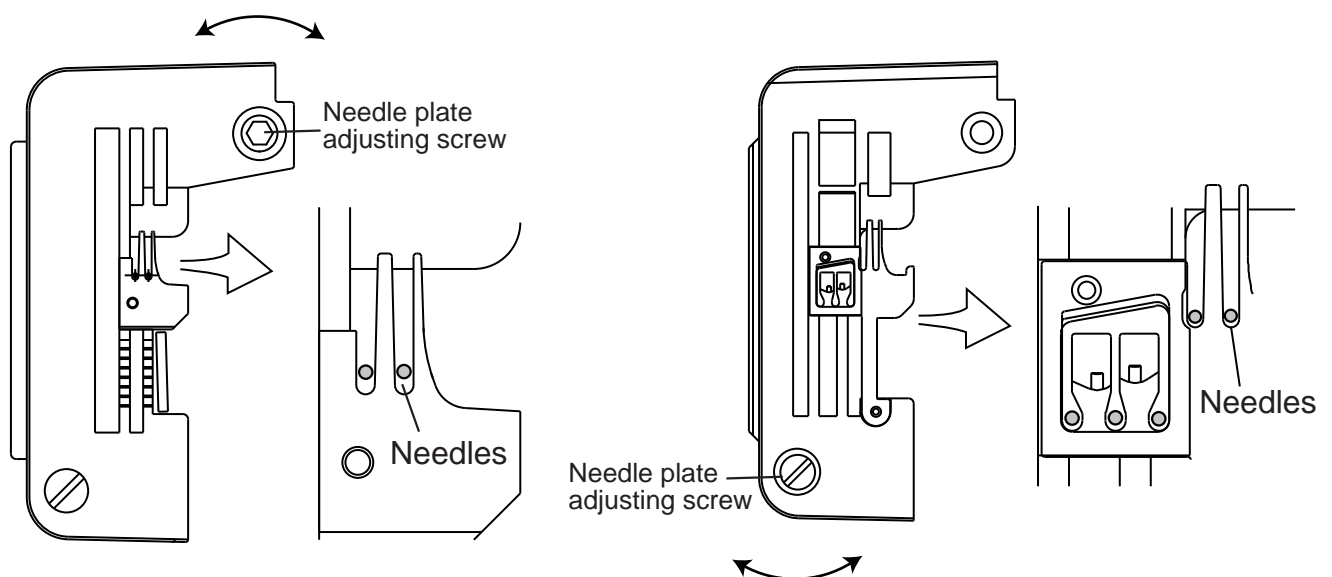
Upper Knife Adjustment



Lower Knife Adjustment

## 10. NEEDLE PLATE ADJUSTMENT

After replace Needle Plate, you are required to adjust position of needle.  
All needles do not touch needle plate.



Model: BLE1  
BLE1SX  
BLE1LX  
BLE1AT  
BL3ATW

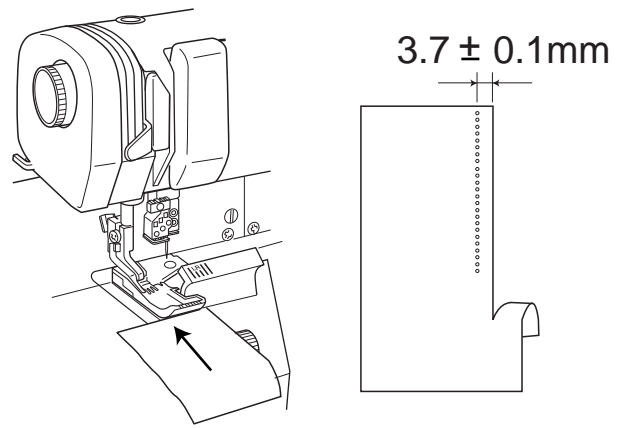
Model: BLE8  
BLE8W  
BLCS

# 11. CUTTING WIDTH ADJUSTMENT

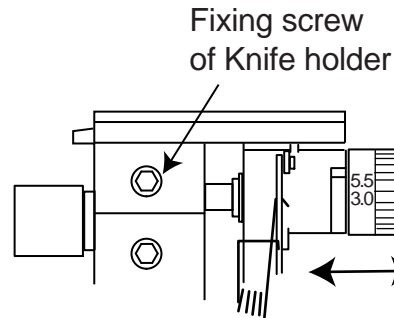
- a) Cut 1 layer cotton fabric and make a cutting width  $3.7 \pm 0.1\text{mm}$  between the eye of needle and the edge of fabric.

### Machine Settings

Needle : Right Needle(O2)  
 Thread : No Use  
 Stitch Width : M  
 Stitch Length: 2.5  
 Differential feed : N  
 Fabric : Cotton broad 1 layer



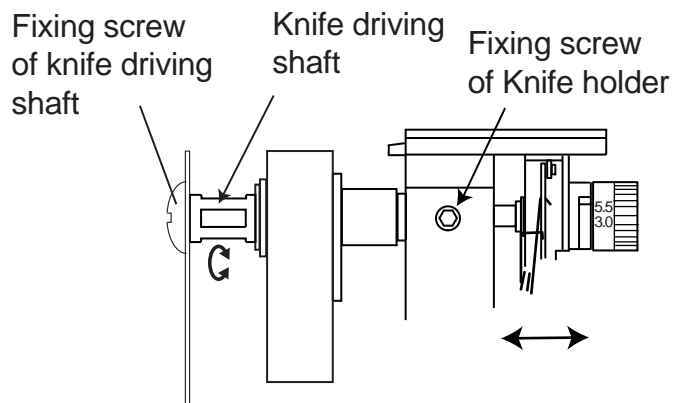
- b-1) Cutting width adjustment  
 Loosen fixing screw of knife holder, and adjust knife holder right or left. tighten the screw.  
 Make sure cutting width.



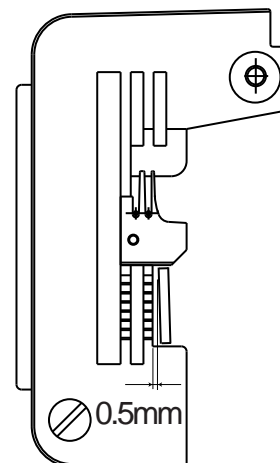
- b-2) Cutting width adjustment  
 Loosen fixing screws of knife holder, and knife driving shaft.

Turn Knife driving shaft clockwise or counter-clockwise.

Make sure cutting width.



- c) Rotate the stitch width dial to min. 3.0/5.5mm, distance between lower knife and needle plate is more than 0.5mm.





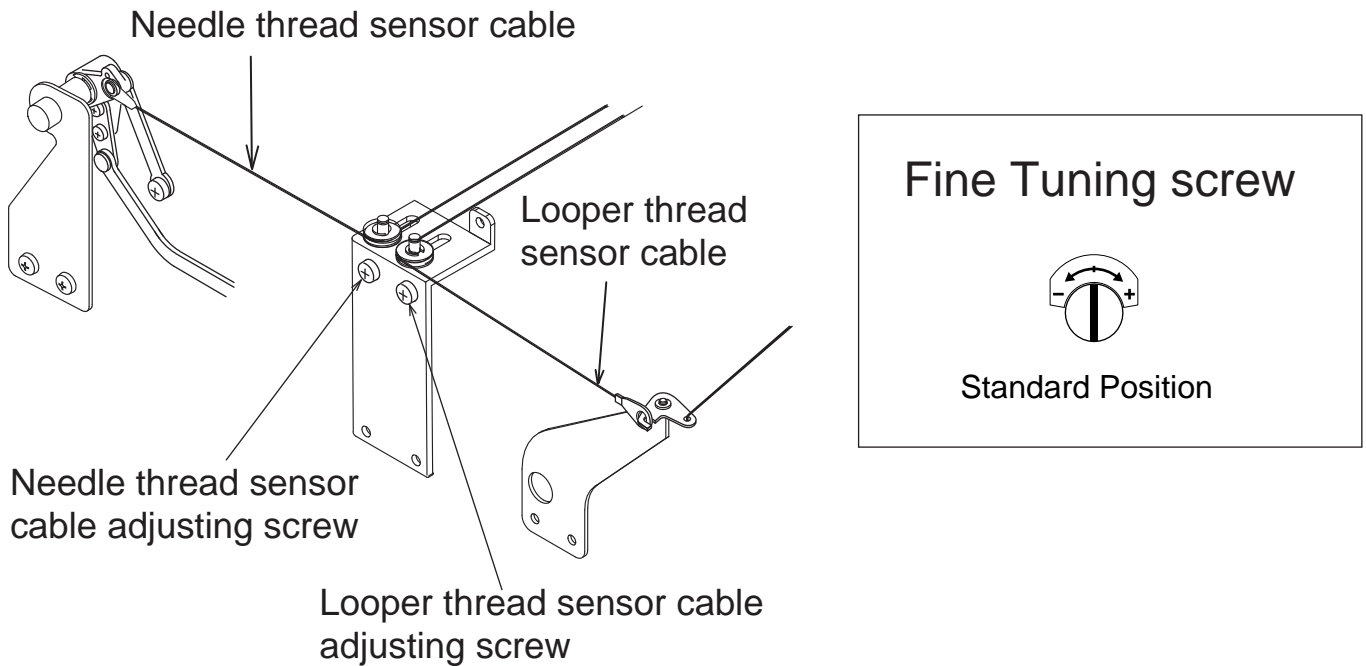
## 12.Adjustment of Thread sensor cable

The NEEDLE THREAD SENSOR CABLE effects the timing of  
Both NEEDLE THREAD and LOOPER THREAD.

The LOOPER THREAD SENSOR CABLE effects the timing of  
LOOPER THREAD.

You are required to adjust NEEDLE THREAD SENSOR CABLE first.

**Turn Clockwise**                   ⇒ **Become Loose**  
**Turn Counter-clockwise** ⇒ **Become Tight**



Sewing Test with long poli -span thread

a) 1 Needle 3-thread nomal sewing

Loose stitch formation of needle thread  
and looper thread are acceptable.

Needle : Right Needle (O2)  
Thread : Long poli-span thread #60  
          or short poli -span thread #60  
Stitch Width : 5.0mm(Max)  
Stitch Length : 4 mm  
Diff. : N  
Fabric : Cotton broad 1layer  
Stitch Selector : B

b) 1 Needle 3-thread nomal sewing

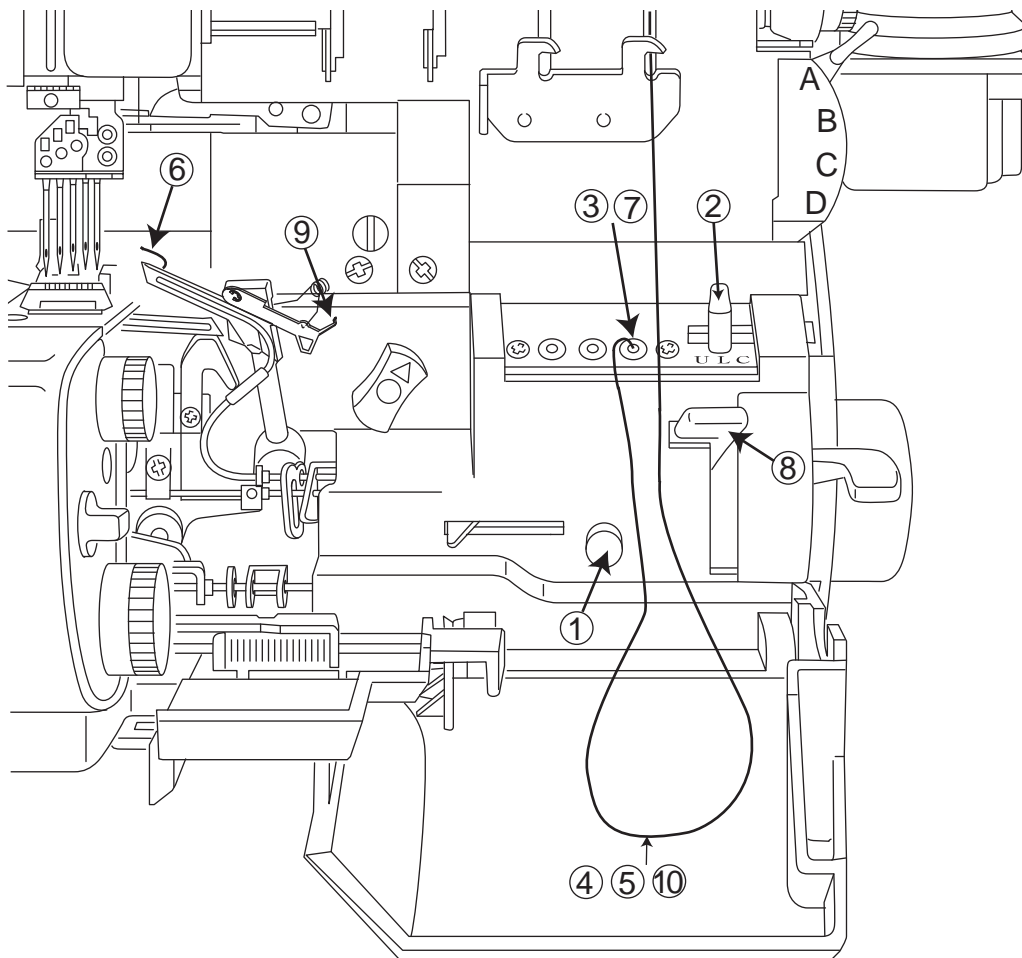
Make sure good stitch formation.

Needle : Right Needle (O2)  
Thread : Long poli -span thread #60  
          or short poli -span thread #60  
Stitch Width : 5.0mm(Max)  
Stitch Length : 2.0 mm  
Diff. : N  
Fabric : Cotton broad 1layer  
Stitch Selector : B

## 13. TROUBLESHOOTING GUIDE FOR JET-AIR THREADING (EXCEPT BLE1SX)

NOTE: Before adjustment of JET-AIR THREADING SYSTEM,  
please check the following items.

- ① Is the machine lock button engaged?
- ② Is the looper threader selector at the appropriate setting?  
"U" position for Upper Looper  
"L" position for Lower Looper  
"C" position for Chain Looper (BLE8, BLE8W, BLE5)
- ③ Is there at least 2cm of the thread end in the threading port?
- ④ Is there at least 40cm of loose thread beyond the threads guide above the threading port?
- ⑤ Is there a kink or twist in the 40cm of thread to restrict the blow into threading port?
- ⑥ Did you pull out old thread from loopers completely?
- ⑦ Is there any lint or dust in the threading port ?
- ⑧ Did you depress the looper threader lever strongly?
- ⑨ Is the machine for two thread sewing? (Is the subsidiary looper set?)
- ⑩ Did you use proper (regular) thread?  
Special decorative or thick threads are not threaded by JET-AIR.



# 13. TROUBLESHOOTING GUIDE FOR JET- AIR THREADING (EXCEPT BLE1SX)

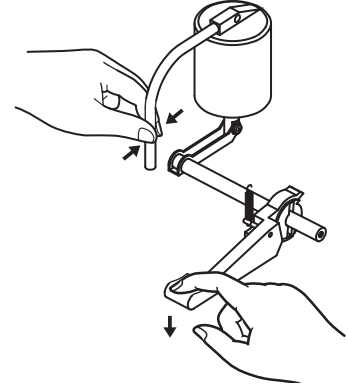
NOTE: In case that the looper threader does not work properly, please check and confirm the following points.

## Search the spot that has a problem

a) Check whether the pump works properly or not.

Depress the looper threading lever while pinching the cylinder tube between your thumb and fingers and check whether there is an air leak or not.

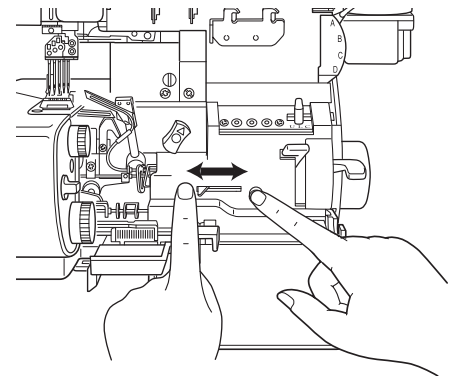
In case that you have an air leak, see 13-a). (p.11)



b) Check whether the joint pipes move smoothly or not.

Depress the machine lock button and bring the joint pipes to the far left position. (the locked position)  
Move the release lever right and left direction slowly and gently while pushing the machine lock button and check whether the joint pipes move smoothly or not.

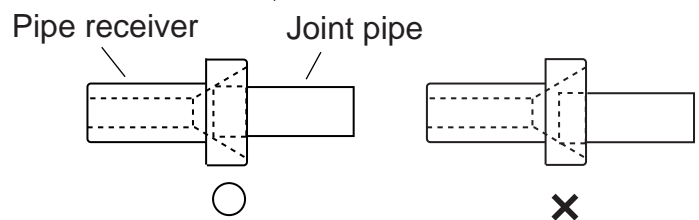
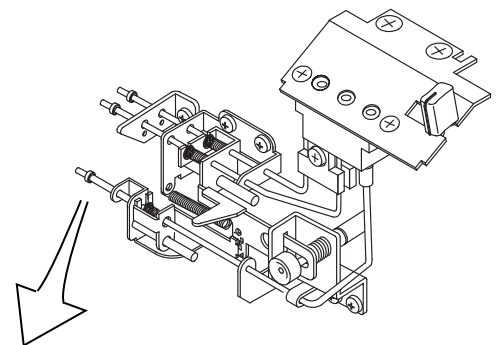
In case that the joint pipes do not move smoothly, see 13-b). (p.12)



c) Check whether end of the joint pipes are in the center of the joint pipe receivers or not.

By same method as mentioned a), check whether end of the joint pipe is in the center of the pipe receiver or not.

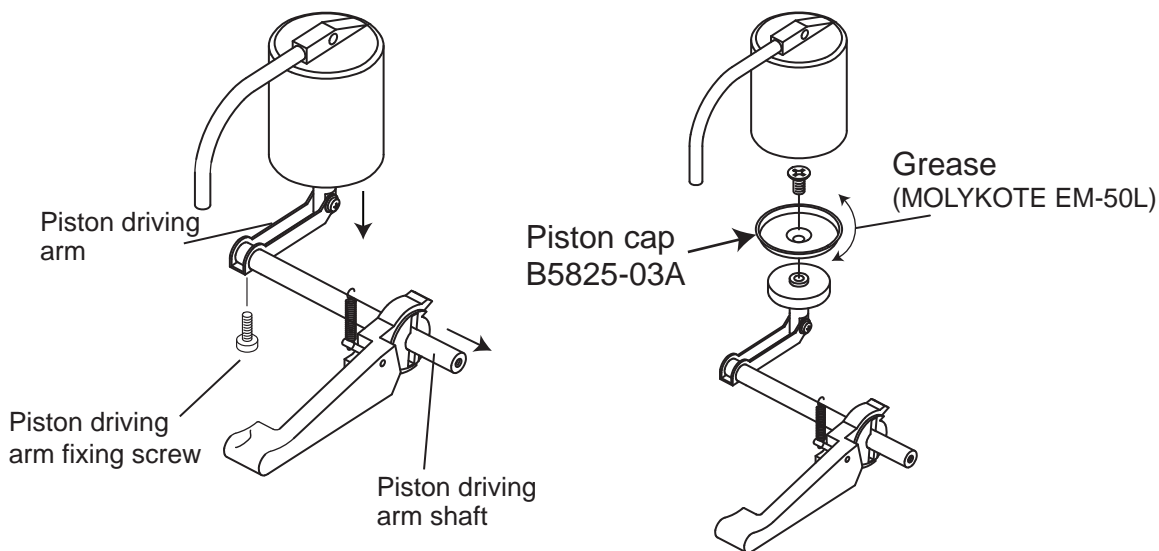
In case that the end of the joint pipes are incorrect position, see 13-b). (p.13)



## 14. ADJUSTING GUIDE FOR JET- AIR THREADING (EXCEPT BLE1SX)

### a) In case that there is an air leak in the pump

- 1) Remove piston driving arm fixing screw.
- 2) Remove piston driving arm from piston driving shaft and then draw out the piston assembly from cylinder.  
(It will be easy to take off piston driving arm from piston driving shaft, if you push the piston driving shaft to the rightward direction.)
- 3) Replace the piston cap to the new one.
- 4) Give a small amount of grease(MOLYKOTE EM-50L) around the piston cap and return the piston assembly to cylinder.
- 5) Fit the piston driving shaft to the piston driving arm and tighten the screw firmly.
- 6) Check and confirm whether the pump works properly or not.
- 7) Lastly check and confirm whether the thread come through the looper eye.



## 14. ADJUSTING GUIDE FOR JET- AIR THREADING (EXCEPT BLE1SX)

NOTE: In case that adjusting JET AIR THREADING, do not lay down the machine body on the side.

b) In case that the joint pipes do not move smoothly.

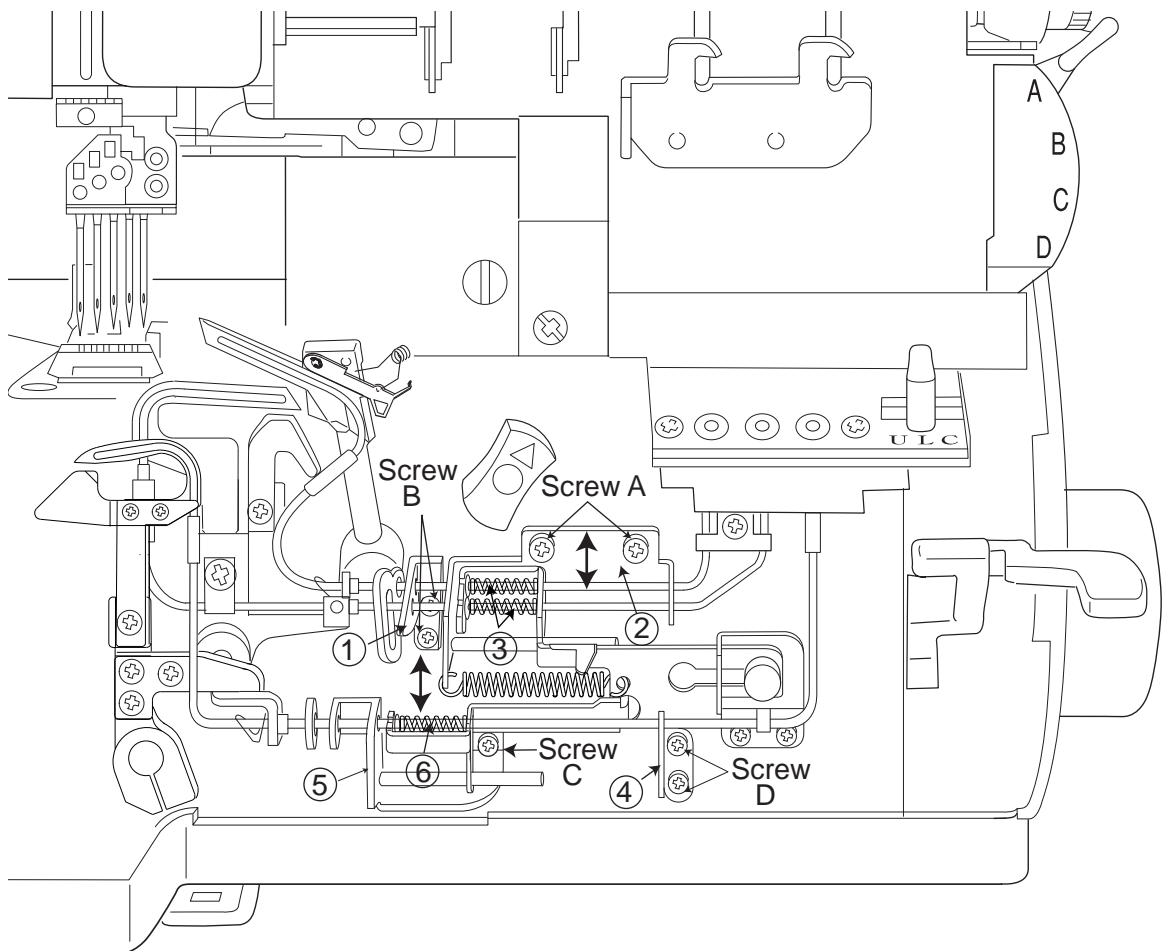
### UPPER LOOPER or LOWER LOOPER

Loosen the screw "A" and "B" , and adjust the position of looper thread take-up guide ① and overlock looper threading pipe holder set ②, so that joint pipes ③ may move smoothly.

### CHAIN LOOPER

Loosen the screw "C" and "D" , and adjust the position of threading pipe guide ④ and chain looper threading pipe holder set ⑤, so that joint pipe ⑥ may move smoothly.

- In case that you cannot adjust it properly, replace the upper, lower or chain looper threading pipes with new ones and re-adjust it so that joint pipes may move smoothly.



## 14. ADJUSTING GUIDE FOR JET- AIR THREADING (EXCEPT BLE1SX)

NOTE: In case that adjusting JET AIR THREADING, do not lay down the machine body on the side.

c) In case that the end of joint pipe is not in the center of joint pipe receiver.

### 1) Adjustment of upward and downward direction

Check and confirm whether upper, lower and chain looper are in the standard position (See P. 3 , P.4 and the service manual.)

Depress the machine lock button and bring the joint pipes to the far left position. (the locked position)

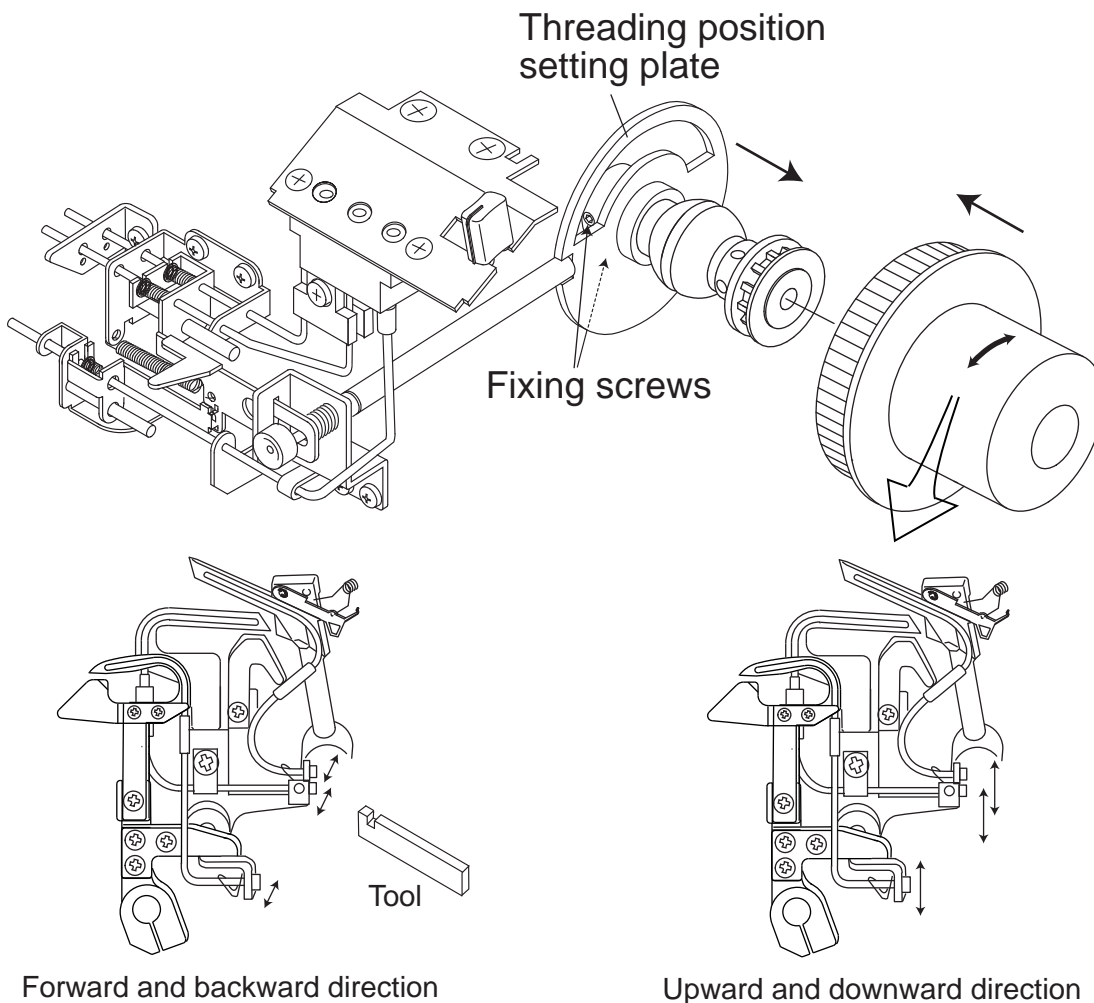
Loosen the 2 screws of threading position setting plate with hexagonal wrench. Slightly rotate handwheel with right hand (within the angle of 10 degrees) while pushing the lock button and moving the release lever right and left direction slowly, and gently with left hand, find out the best position that the end of joint pipes are in the center of looper joint pipe receivers.

When you tighten 2 screws, you push handwheel to the leftward direction with your right hand and push the threading position setting plate to the rightward direction with your left hand. You are required to check a play of handwheel rightward and leftward direction.

### 2) Adjustment of forward and backward direction

You can adjust the position of upper, lower and chain looper joint pipe receivers forward and backward direction by bending with tool.

(In our factory, we use the tool as shown below, to adjust it)



## 15. REPLACEMENT GUIDE FOR JET- AIR THREADING (EXCEPT BLE1SX)

### a) Replacement of Upper looper threading pipe and Joint pipe.

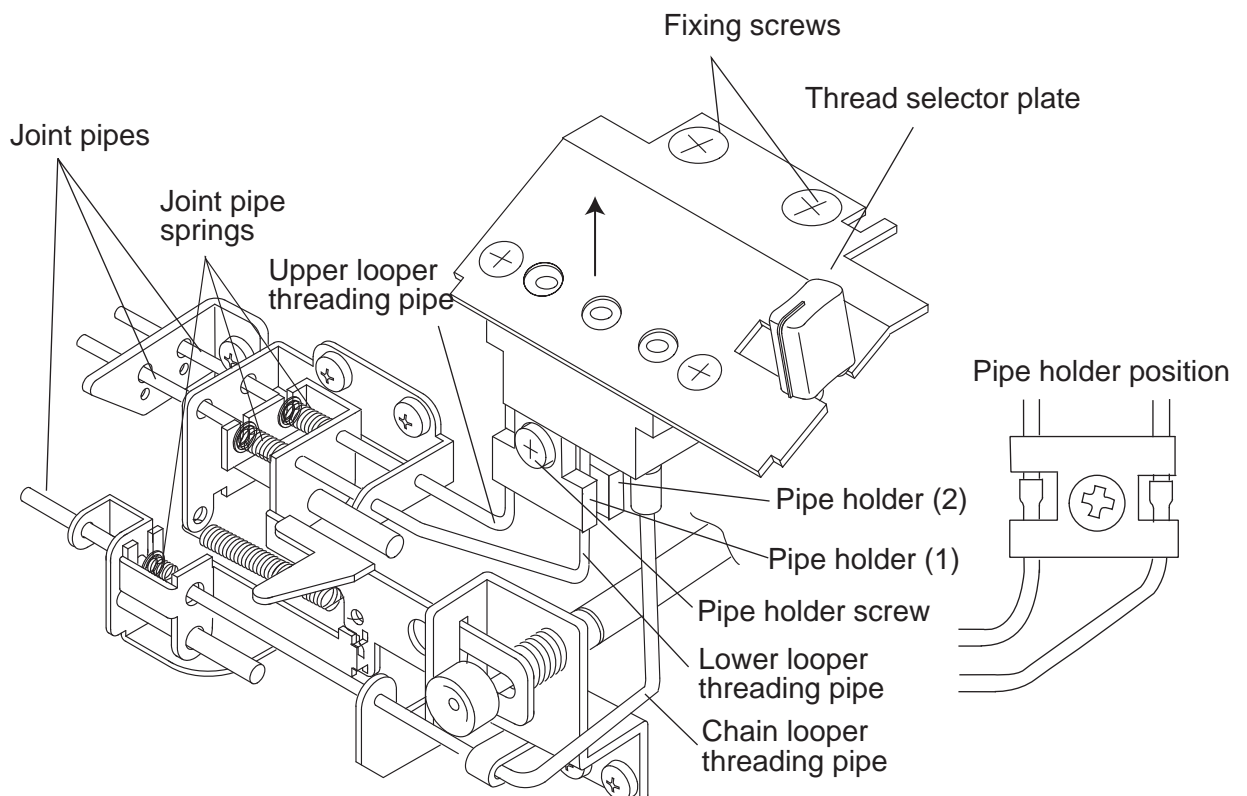
- 1) Loosen the fixing screw of Pipe holder, and remove Pipe holder(1) and (2).
- 2) Loosen 2 fixing screws of Threader selector plate.
- 3) Slightly lift Threader selector plate upward and remove Upper looper threading pipe downward and rightward.
- 4) In case of replacing Joint pipe with new one, remove it with Joint pipe spring very carefully.
- 5) Replace Upper looper threading pipe.
- 6) Tighten 2 screws of Threader selector plate.
- 7) Replace Pipe holder(1) and (2) and then tighten the screw of Pipe holder as shown below.
- 8) Finally you are required to check 12-a, b). (p.10)

### b) Replacement of Lower looper threading pipe and Joint pipe.

- 1) Loosen the fixing screw of Pipe holder, and remove Pipe holder(1) and (2).
- 2) Loosen 2 fixing screws of Threader selector plate.
- 3) Slightly lift Threader selector plate upward and remove lower looper threading pipe downward and rightward.
- 4) In case of replacing Joint pipe with new one, remove it with Joint pipe spring very carefully.
- 5) Replace Lower looper threading pipe.
- 6) Tighten 2 screws of Threader selector plate.
- 7) Replace Pipe holder(1) and (2) and then tighten the screw of Pipe holder as shown below.
- 8) Finally you are required to check 12-a, b). (p.10)

### c) Replacement of Chain looper threading pipe and Joint pipe.

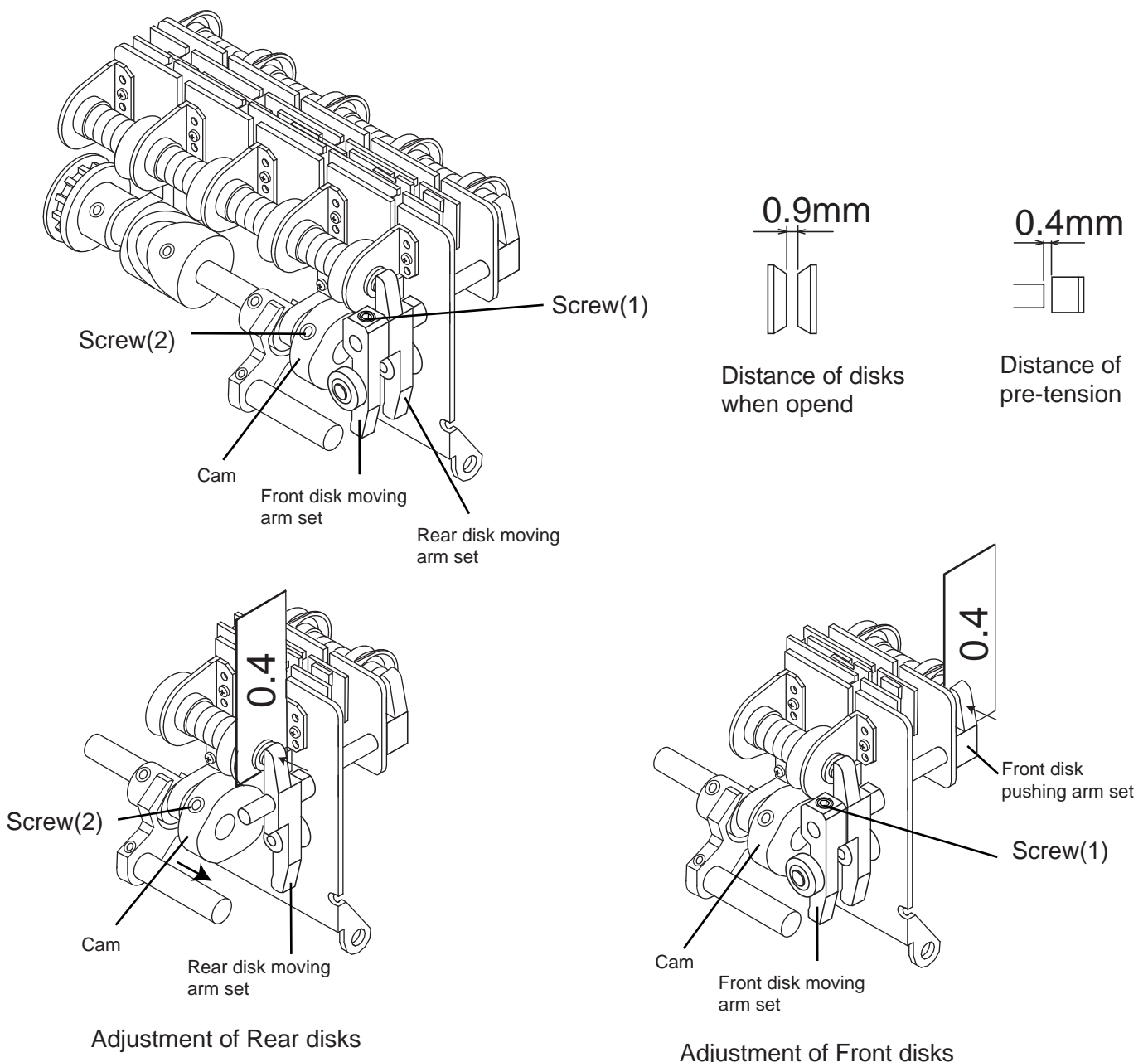
- 1) Slide the pipe rubber.
- 2) Loosen 2 fixing screws of Threader selector plate.
- 3) Slightly lift Threader selector plate upward and remove Chain looper threading pipe downward and rightward.
- 4) In case of replacing Joint pipe with new one, remove it with Joint pipe spring very carefully.
- 5) Replace Chain looper threading pipe.
- 6) Tighten 2 screws of Threader selector plate.
- 7) Replace the pipe rubber.
- 8) Finally you are required to check 12-a, b). (p.10)





## 16. REPLACEMENT OF ROLLERS OF A.T.D.

- 1) Loosen the screw (1) and remove Frontdisk moving arm set.
- 2) Remove Rear disk moving arm set.
- 3) Loosen the screw (2) and replace Cam. The screw should be placed at the flat of shaft.
- 4) Replace Rear disk moving arm set.
- 5) Turn handwheel and bring the roller of Rear disk moving arm set at the bottom position of Cam. Insert 0.4mm thickness gauge between disk pushing shaft and Rear pushing arm section. Push and keep Rear disk pushing arm section at bottom of pre-tension position, adjust Cam to the roller has just touched on the bottom of Cam. Tighten the Screw (2). Remove thickness gauge, make sure the distance of disks is 0.9mm when opened.
- 6) Replace Front disk moving arm set.
- 7) Turn handwheel and bring the roller of Front disk moving arm set at the bottom position of Cam. Insert 0.4mm thickness gauge between disk pushing shaft and front pushing arm set. Push and keep Front disk pushing arm set at bottom of pre-tension position, and adjust Cam to the roller has just touched on the bottom of Cam. Hold Front disk pushing arm set to leftward and Front disk moving arm set to rightward, and tighten the Screw (1). Remove thickness gauge, make sure the distance of disks is 0.9mm when opened. Make sure Front disk pushing arm set does not have a play.





## 17. REPLACEMENT OF LOOPER DRIVING CAM AND ROLLER

### To replace

Before remove the cams on the main shaft, you are required to check the distance of gap between rightside of right bush and left side of handwheel (A).

- 1) Remove Spool stand set, Base plate, Side cover, Face cover, Knife holder cover and Knife cover set.
- 2) Loosen all screws of Timing pulley (1), Machine engage plate set(2), Balancer (5), Lower looper driving cam (7), Chain looper driving cam (8), Feed dog driving cam (9) and Knife driving cam (10) on the main shaft.
- 3) Remove the main shaft with the handwheel to the rightward.

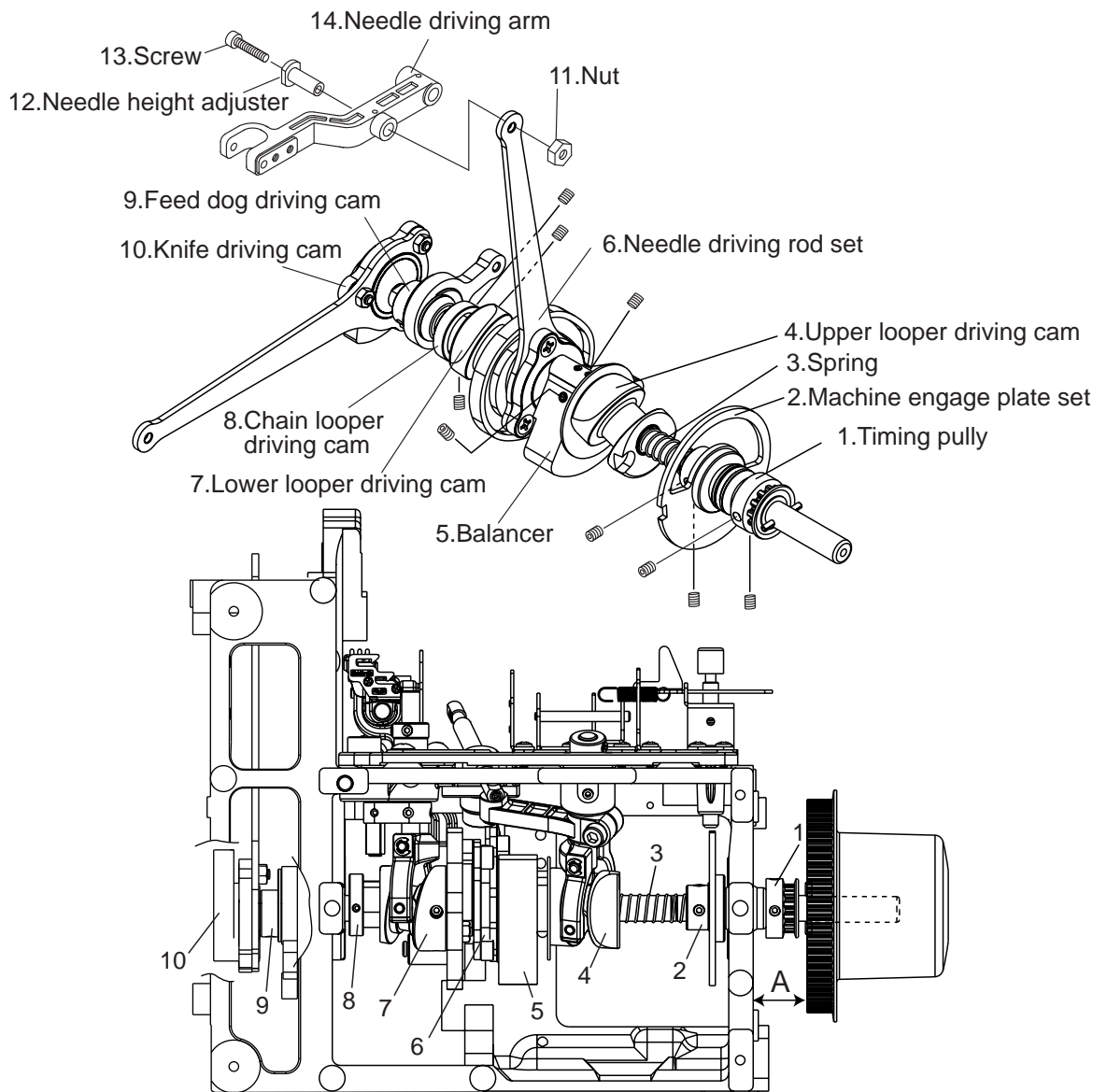
For Model BLE1,BLE1DX,BLE1AT, BLE1ATW,BLE1SX and BLE1LX:  
Replace Upper driving cam or Rollers .

For Model BLE8,BLE8W and BLCS:

In case of replasement of Upper looper driving cam or Rollers, it can be replaced.(Except BLCS)

In case of replasement of Lower looper driving cam or Rollers, you are required to do next steps.

- 4) Remove the nut (11) of Needle driving rod set (6) and loosen the screw (13).
- 5) Remove Needle driving rod set (6) from Lower looper driving cam (7).
- 6) Remove lower looper driving cam (7) with slightly twist from Chain looper thread take-up and Chain looper driving cam.
- 7) Replace Lower looper driving cam or Rollers.



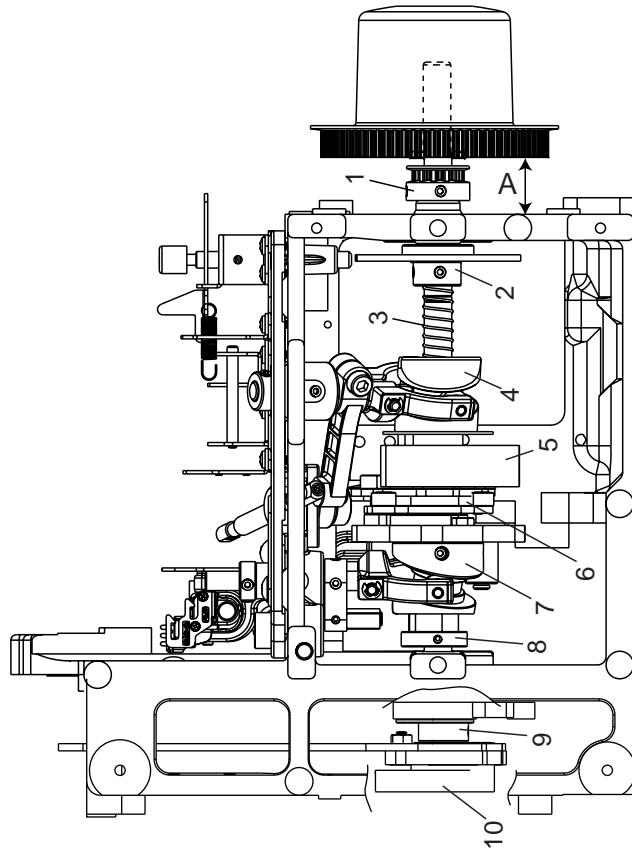
## 17. REPLACEMENT OF LOOPER DRIVING CAM AND ROLLER

### To reassemble

- 1) To easy reassemble, machine should be turned 90 degrees to left side.
- 2) Reassemble Chain looper driving cam (8), Lower looper driving cam (7), Needle driving rod set(6), Balancer (5), Upper looper driving cam (4), Spring(3) and Machine engage plate set(2).
- 3) Replace the main shaft with Timing pully (1).
- 4) Replace Feed dog driving cam (9) and Knife driving cam (10).
- 5) Set handwheel to the original position before replaced (A).
- 6) Tighten the screws of Machine engage plate set (2) and Timing pulley (1) without a play.
- 7) For Model BLE1, BLE1AT, BLE3ATW, BLE1SX and BLE1LX  
Adjust the distance of Lower driving looper cam to be 12mm between rightside of left bush and leftside of Lower looper driving cam.  
For Model BLE8, BLE8W and BLCS  
Adjust the distance of Chain looper driving looper cam to be 0.2mm between rightside of left bush and leftside of Chain looper driving cam.
- 8) Turn handwheel and align First Screw of Lower looper driving cam (7), tighten 2 screws.  
Note: The flat of Lower driving cam is 90 degrees different from others.
- 9) Turn handwheel and align First screws of Feed dog driving cam (9) and Knife driving cam (10).
- 10) Tighten 4 screws.
- 11) Replace Needle driving rod and Needle driving arm(14)
- 12) Make sure handwheel turns smoothly.

### To adjust and checkings

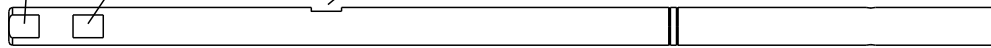
- 1) Needle height  
Turn hand wheel, and bring needle bar at highest position. Turn Needle height adjuster to correct position.  
See page 2 and 3.
- 2) Adjustment of engage position  
Loosen 2 screws of Machine engage plate set.  
Turn handwheel, and find out the end of joint pipes are in the center of looper joint pipes.  
Turn Machine engage plate set, and engage threading button.  
Keep Machine engage plate to rightward, and tighten 2 screws firmly.  
Make sure handwhell does not have a play rightward and leftward direction.  
Engage the lock button again, and make sure Jet-Air sistem does work well or not.  
See page 13.
- 3) Timing of A.T.D. system  
CORRECT TIMING- When Upper looper is lowest position, Front discs should be just shut perfectly.  
Loosen 2 screws of timing pully (1) (or upper position timing pully), Turn handwheel and lower the Upper looper at the bottom position.  
Turn timing pully at front discs have just shut position.  
Keep timing pully to leftward, tighten 2 screws firmly.  
Make sure handwhell does not have a play rightward and leftward direction.  
See Service manual.
- 3) Timing of Feed dog  
CORRECT TIMING- When tip of the Needle come down on the needle plate, top of feed dog should come down on the surface of needle plate.  
If you tighten first screw to screw flat of main shaft, the timing is correct automatically.
- 4) Timing of Knife  
CORRECT TIMING- When the Needle come down, the knife should come down on same timing.  
If you tighten first screw to screw flat, timing is correct automatically.
- 5) Position of Upper looper and Lower looper  
Make sure Upper looper and lower looper are correct position.  
See 3 and 4.
- 6) Position of Chain looper  
Make sure Chain looper is correct position.  
See Service manual.



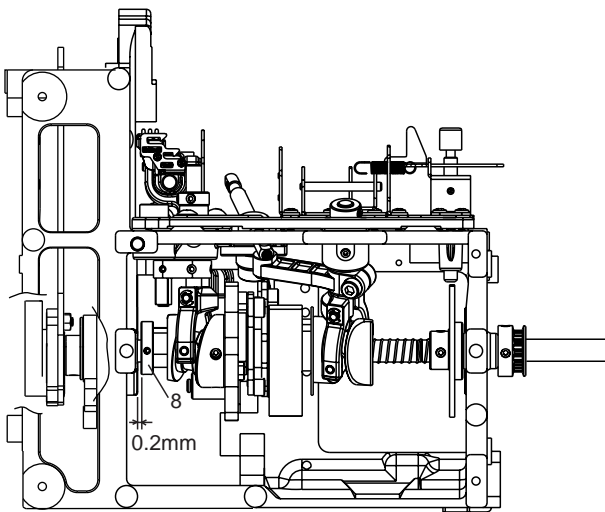
For Knife driving cam

For Feed dog driving cam

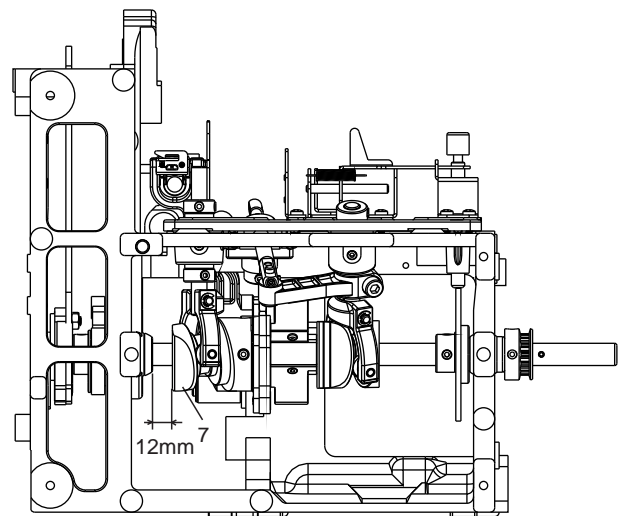
For Lower looper driving cam



Main shaft



For BLE8, BLE8W, BLCS



For BLE1SX, BLE1, BLE1DX, BLE1LX, BLE1AT, BLE3ATW

# 18. Adjusting Gauge

