

# **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

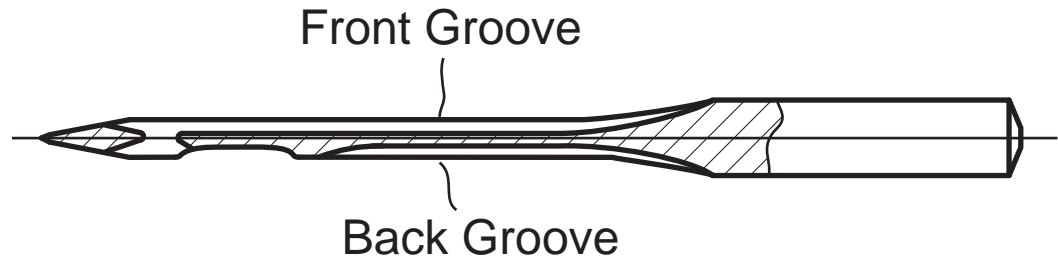
# 1.NEEDLE

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

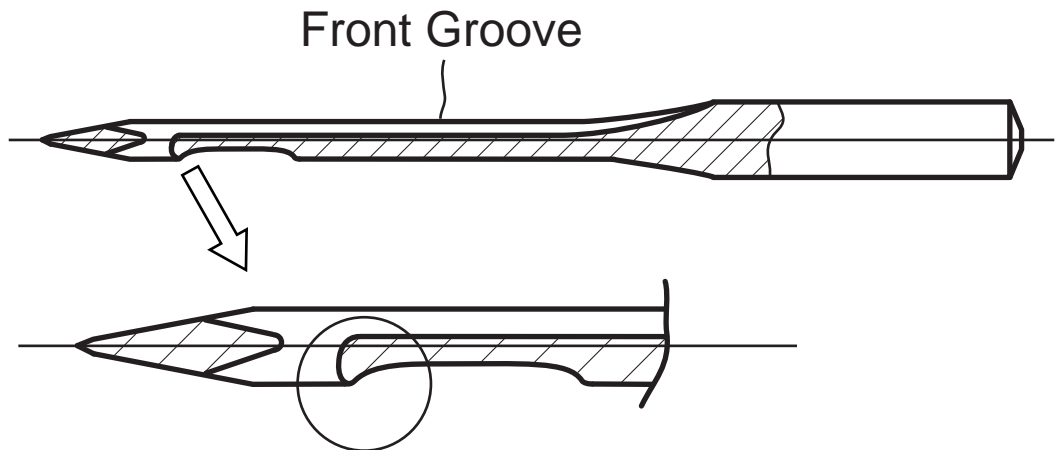
Plating : Chrome



Needle System : HAx1SP/CR ORGAN (SCHMETZ)

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

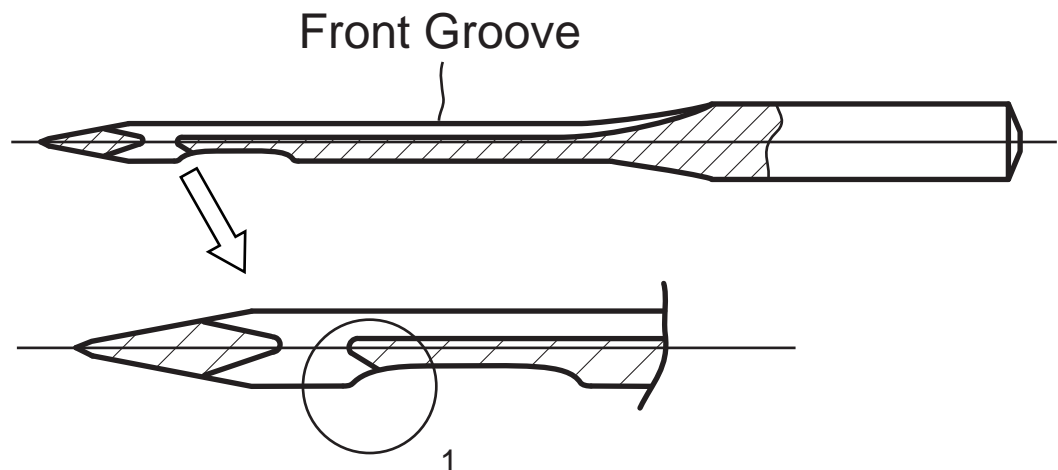
Plating : Chrome



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

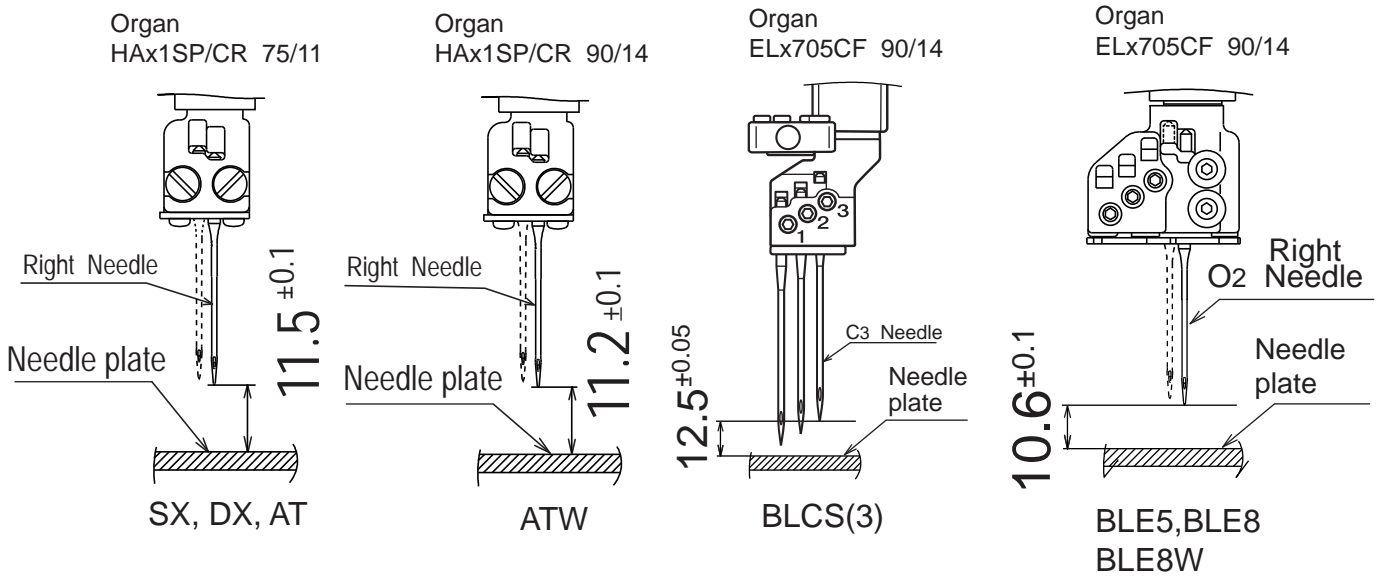
Turn handwheel, and bring the needle to the highest position.

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

Clockwise ----- Lower needle

Counter-clockwise----- Raise needle

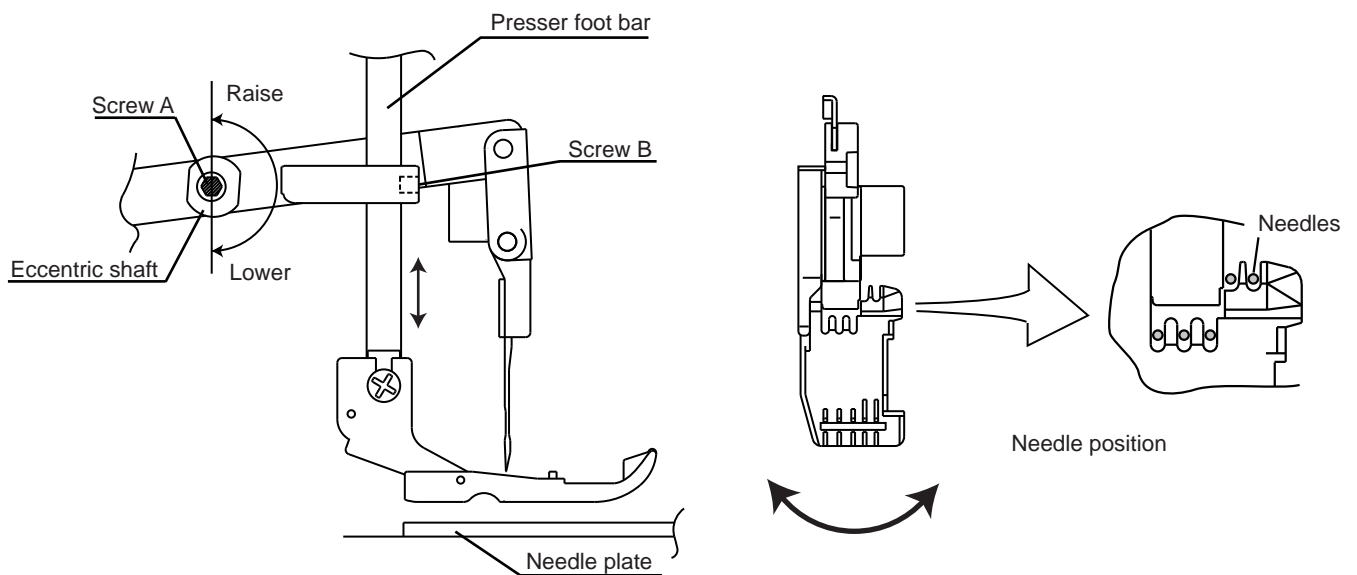
### Height of needle



### 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.

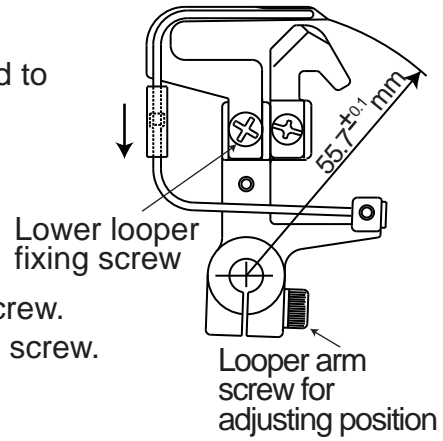


### 3. LOWER LOOPER ADJUSTMENT

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

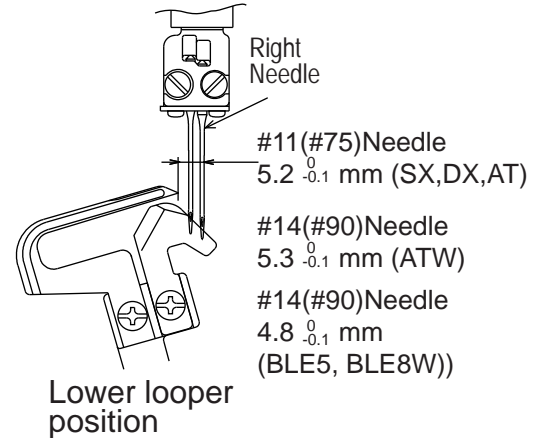
#### a) Replacement of lower looper

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.



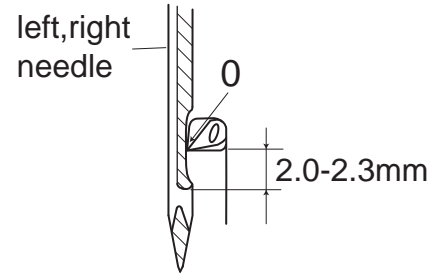
#### b) Lower looper position

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

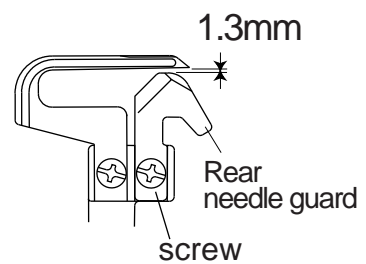
Turn the handwheel, and bring tip of lower looper to the center of left (right) needle.  
 Loosen looper arm screw, and adjust lower looper to the correct position.



### 4. NEEDLE GUARDS ADJUSTMENT

#### c) Rear needle guard position

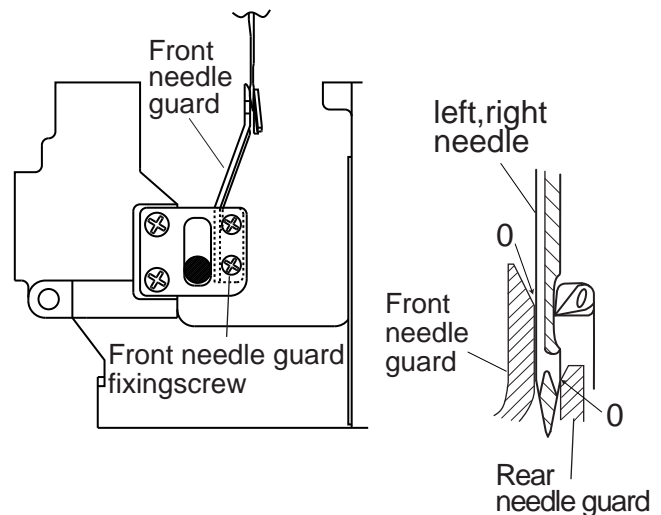
Loosen rear needle guard screw, and adjust rear needle guard to the correct position.



#### 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.

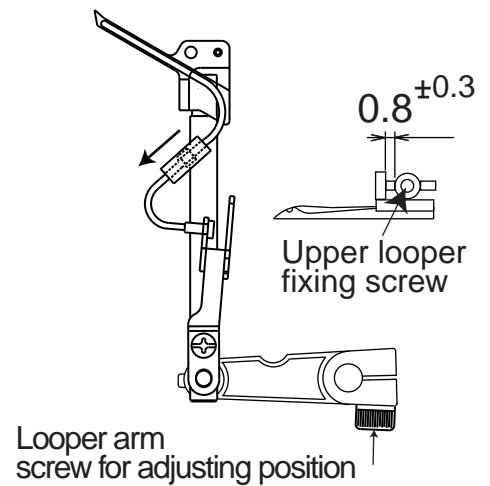


## 5 . UPPER LOOPER ADJUSTMENT

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

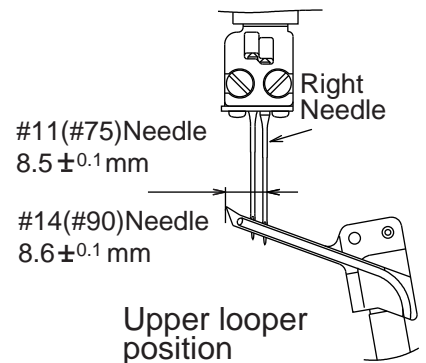
### a) Replacement of upper looper

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

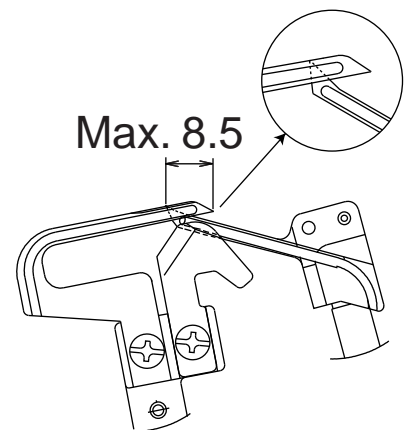
Turn the handwheel, and bring upper looper to the far left. (top position)  
 Loosen looper arm screw, and adjust upper looper to the correct position.



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

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

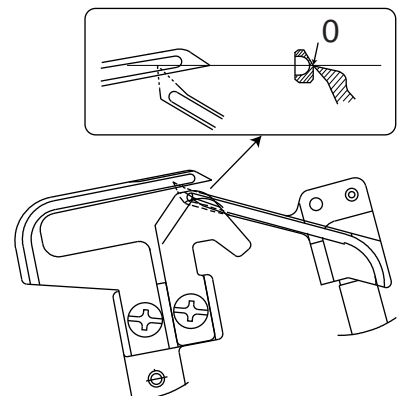
Make sure upper looper on the overlapping amount 8.3mm between both tip of loopers.



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

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

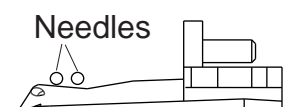
Loosen looper fixing screw, and adjust upper looper to the correct position.



### 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.



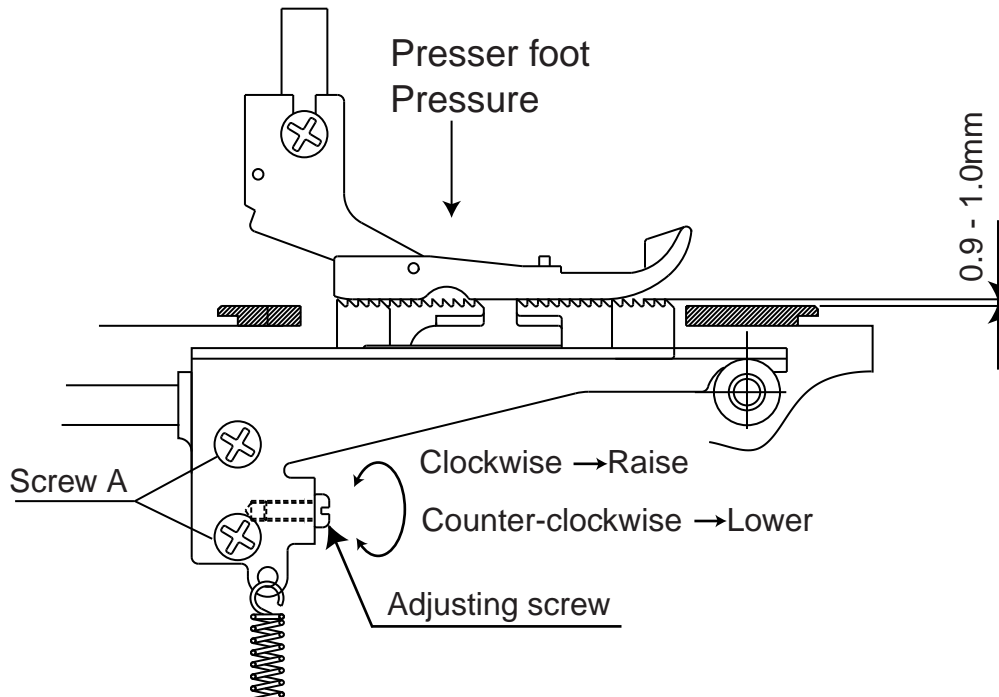
Repeat a) to e) until you get exact position.

## 6. FEED DOG ADJUSTMENT

### a) FEED DOG HEIGHT ADJUSTMENT

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

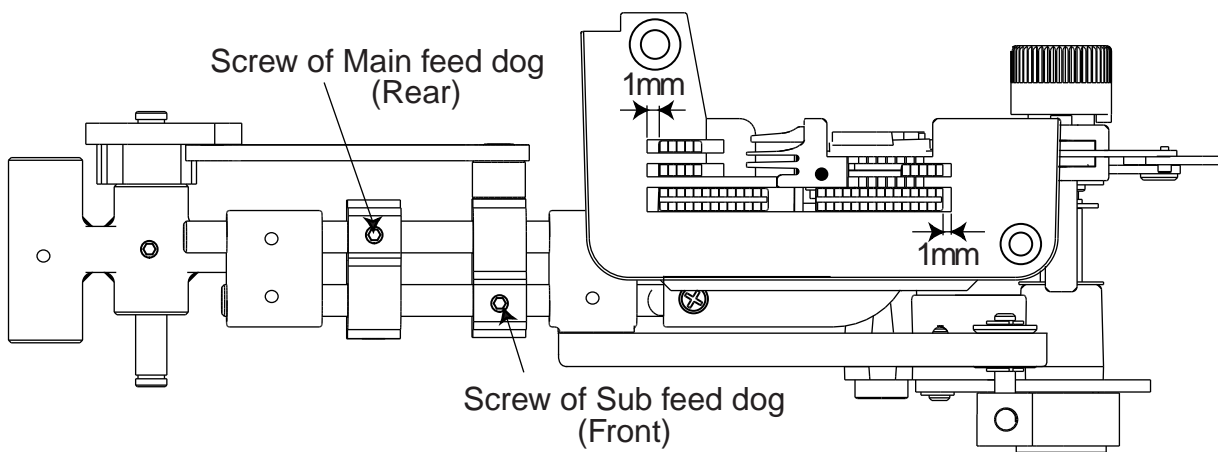
Clockwise-----Raise feed dog  
Counter-clockwise-----Lower feed dog



### 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.

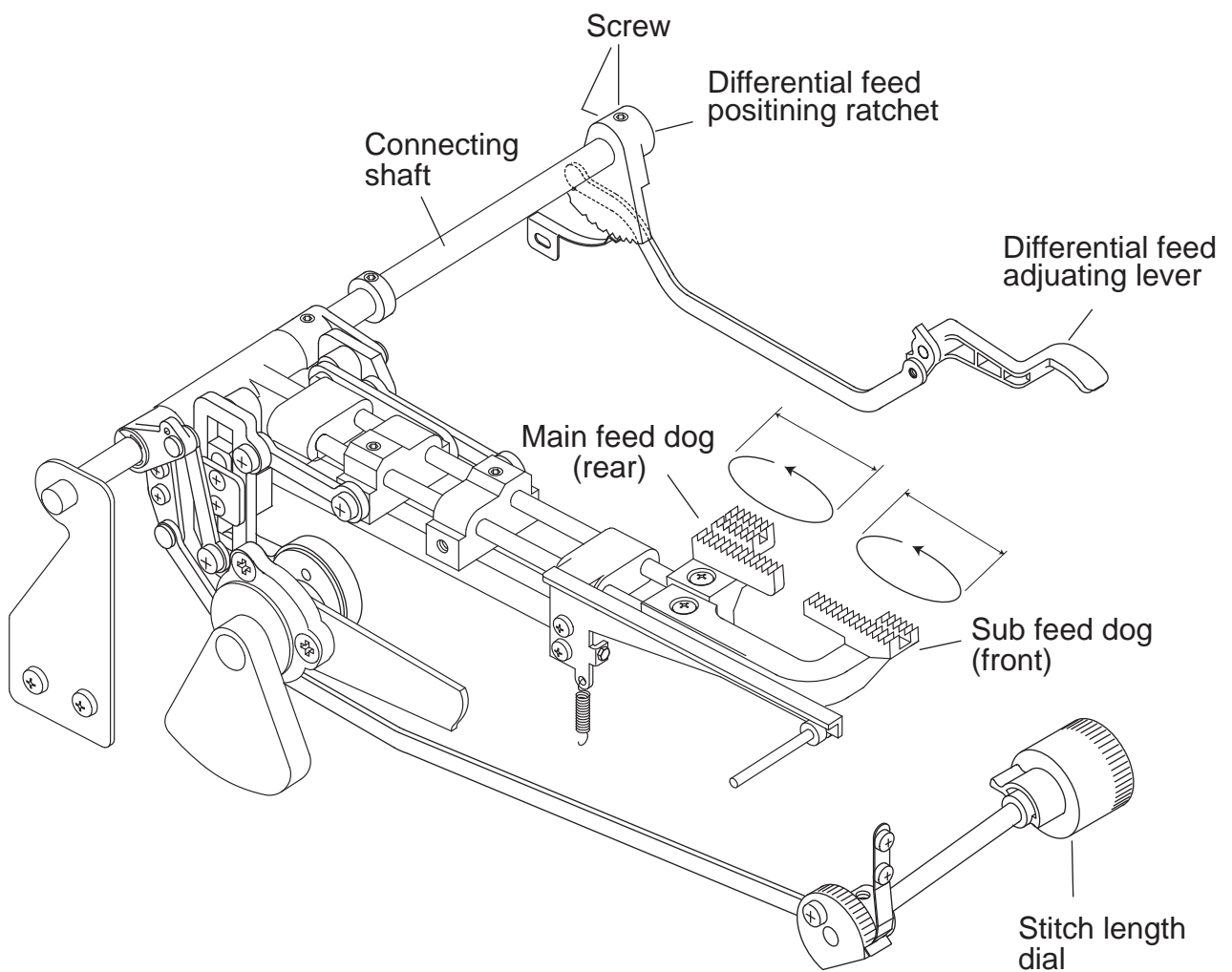


## 7. Differential feed adjustment

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.

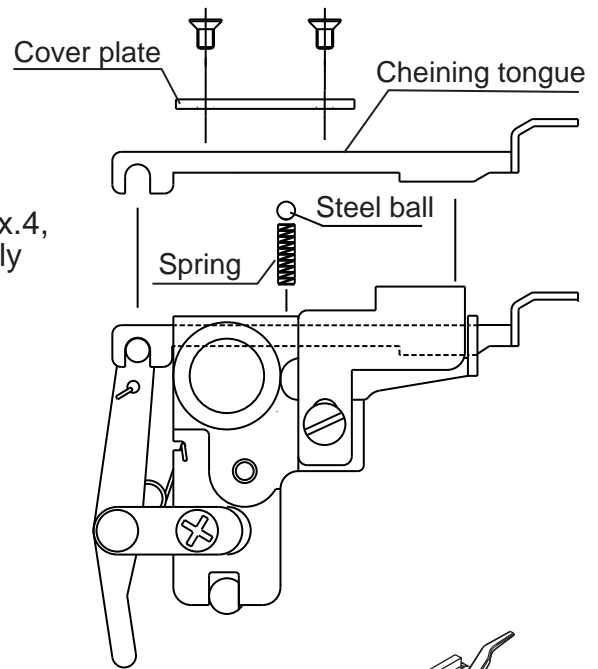
How to adjust

- 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.



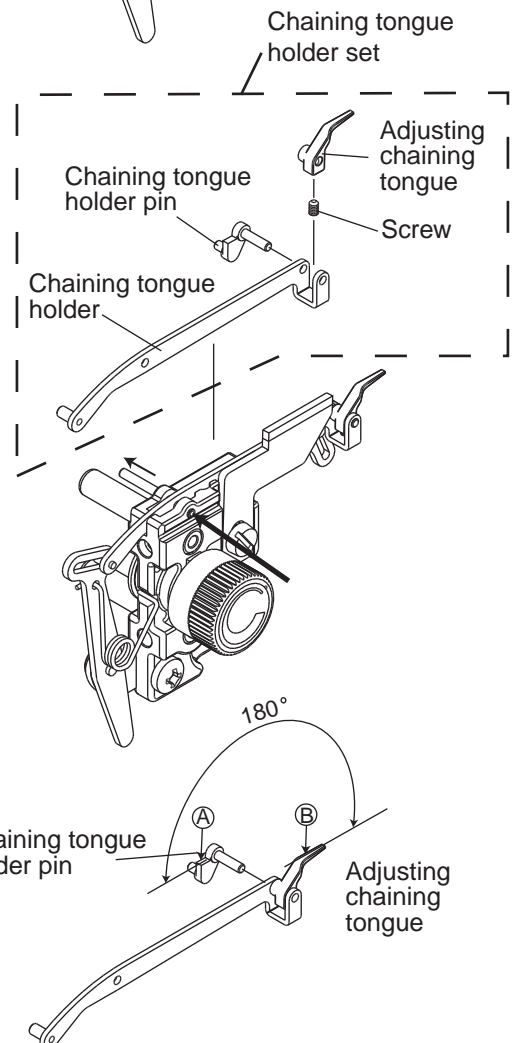
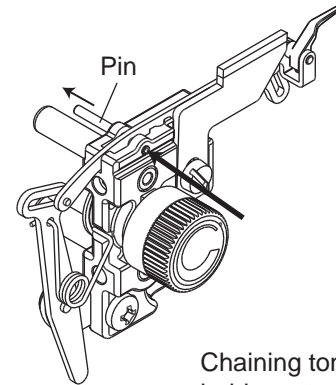
## 8-1. REPLACEMENT OF CHAINING TONGUE (EXCEPT BL3ATW)

- 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.





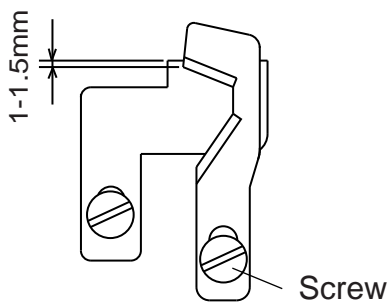
## 9. REPLACEMENT OF KNIVES

### UPPER KNIFE

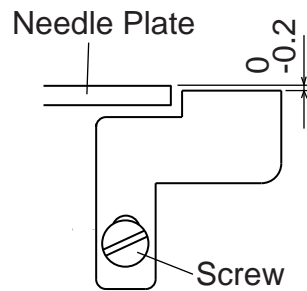
- Remove upper knife and replace it.
- Fixing screw temporarily, turn the hand pulley and bring the upper knife to the lowest position.
- Adjust upper knife to be 1-1.5mm overlapping with cutting face of lower knife.
- Tighten firmly fixing screw.

### 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.



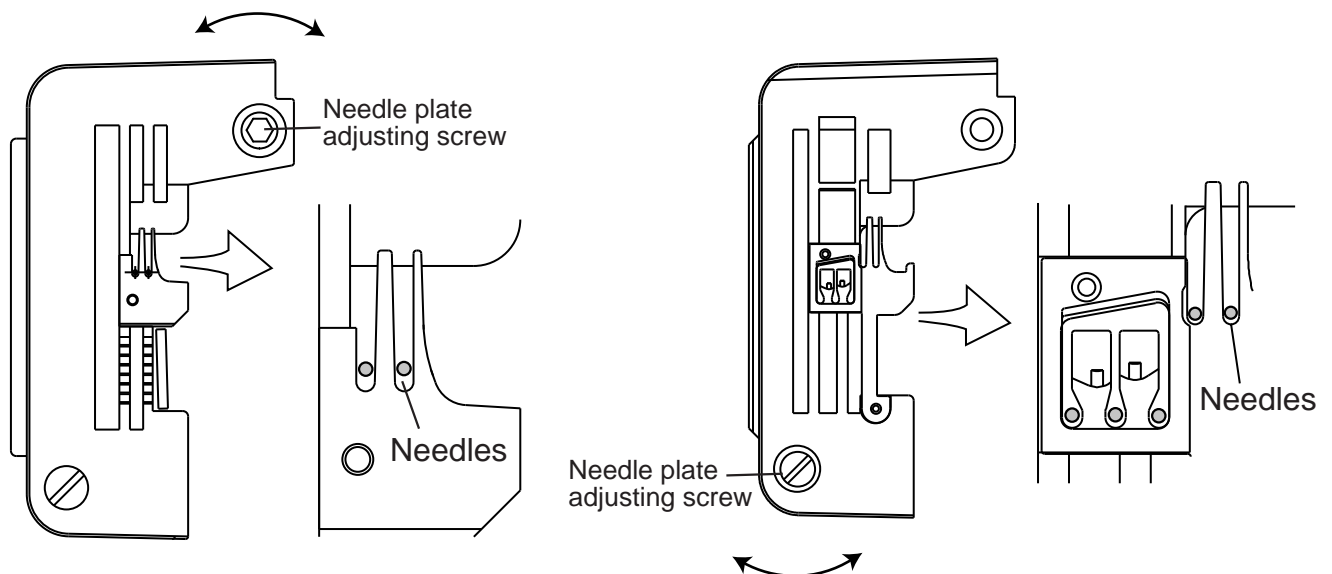
Upper Knife Adjustment



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

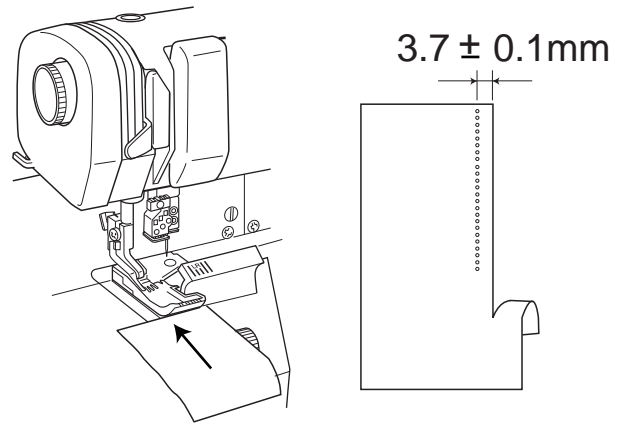
Model: BLE8  
BLE8W  
BLCS

## 11. CUTTING WIDTH ADJUSTMENT

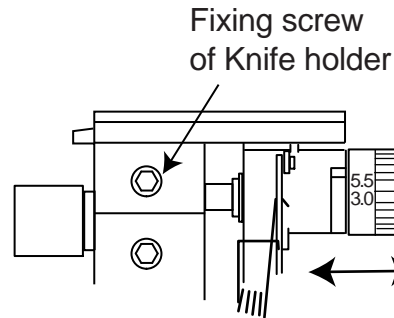
- a) Cut 1 layer cotton fabric and make a cutting width  $3.7 \pm 0.1\text{mm}$  between the eye of needle and the edge of fabric.

### Machine Settings

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



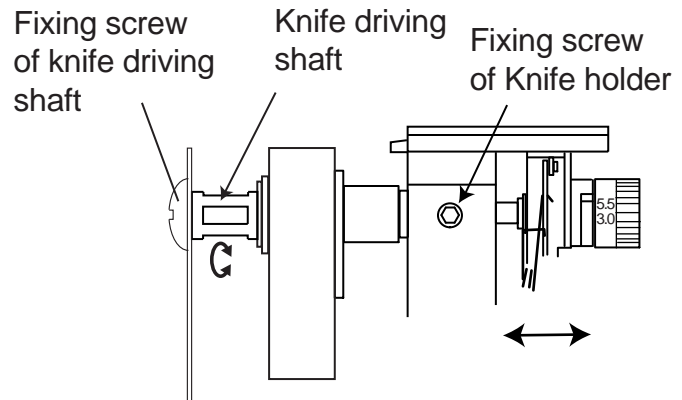
- b-1) Cutting width adjustment  
 Loosen fixing screw of knife holder, and adjust knife holder right or left. tighten the screw.  
 Make sure cutting width.



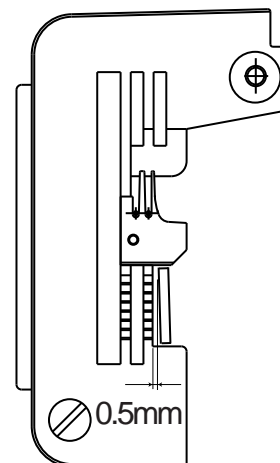
- b-2) Cutting width adjustment  
 Loosen fixing screws of knife holder, and knife driving shaft.

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.



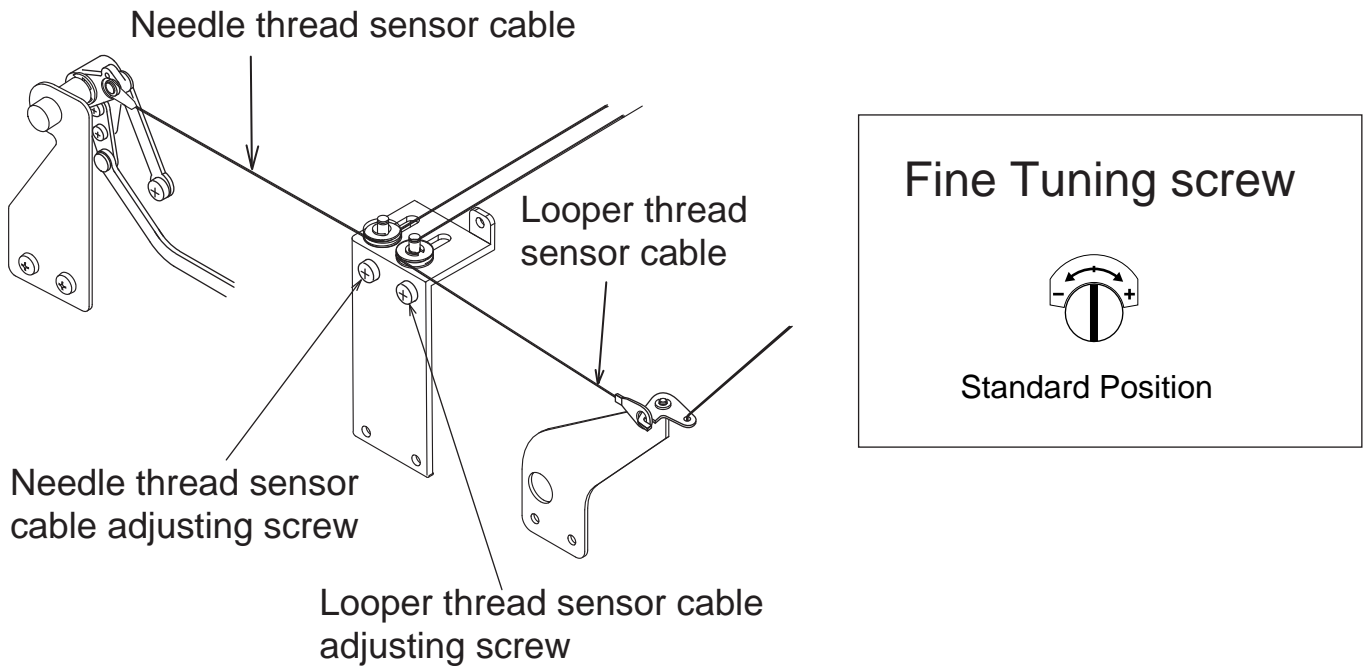
## 12.Adjustment of Thread sensor cable

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

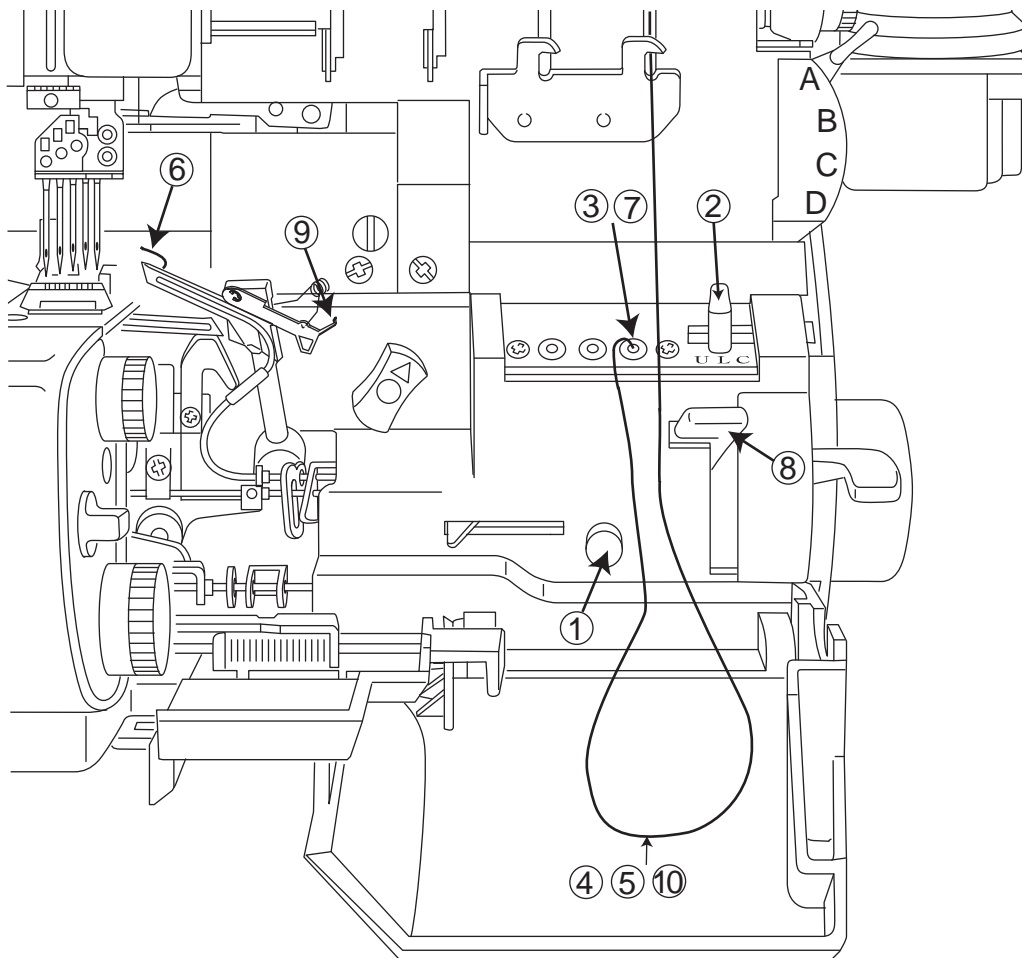
Make sure good stitch formation.

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)

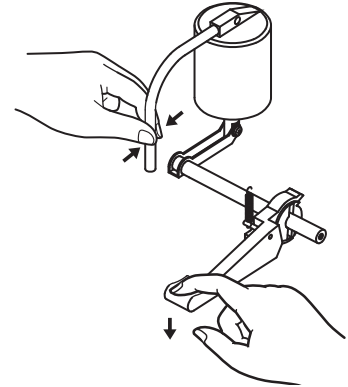
NOTE: In case that the looper threader does not work properly, please check and confirm the following points.

## 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.

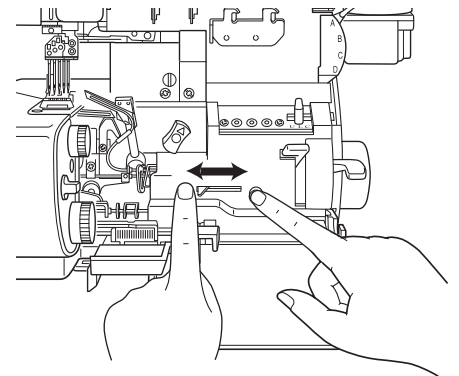
In case that you have an air leak, see 13-a). (p.11)



- 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.

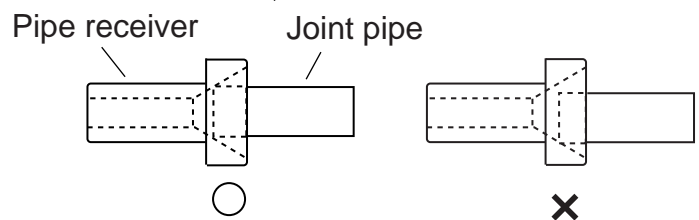
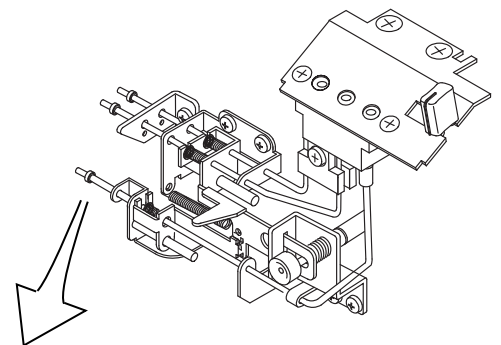
In case that the joint pipes do not move smoothly, see 13-b). (p.12)



- 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.

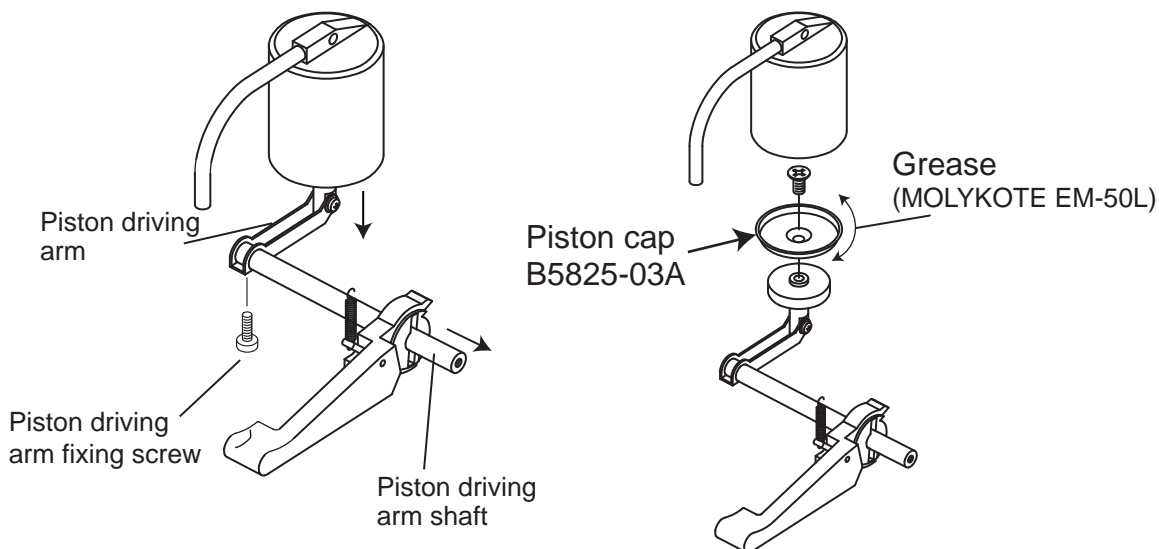
In case that the end of the joint pipes are incorrect position, see 13-b). (p.13)



## 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.

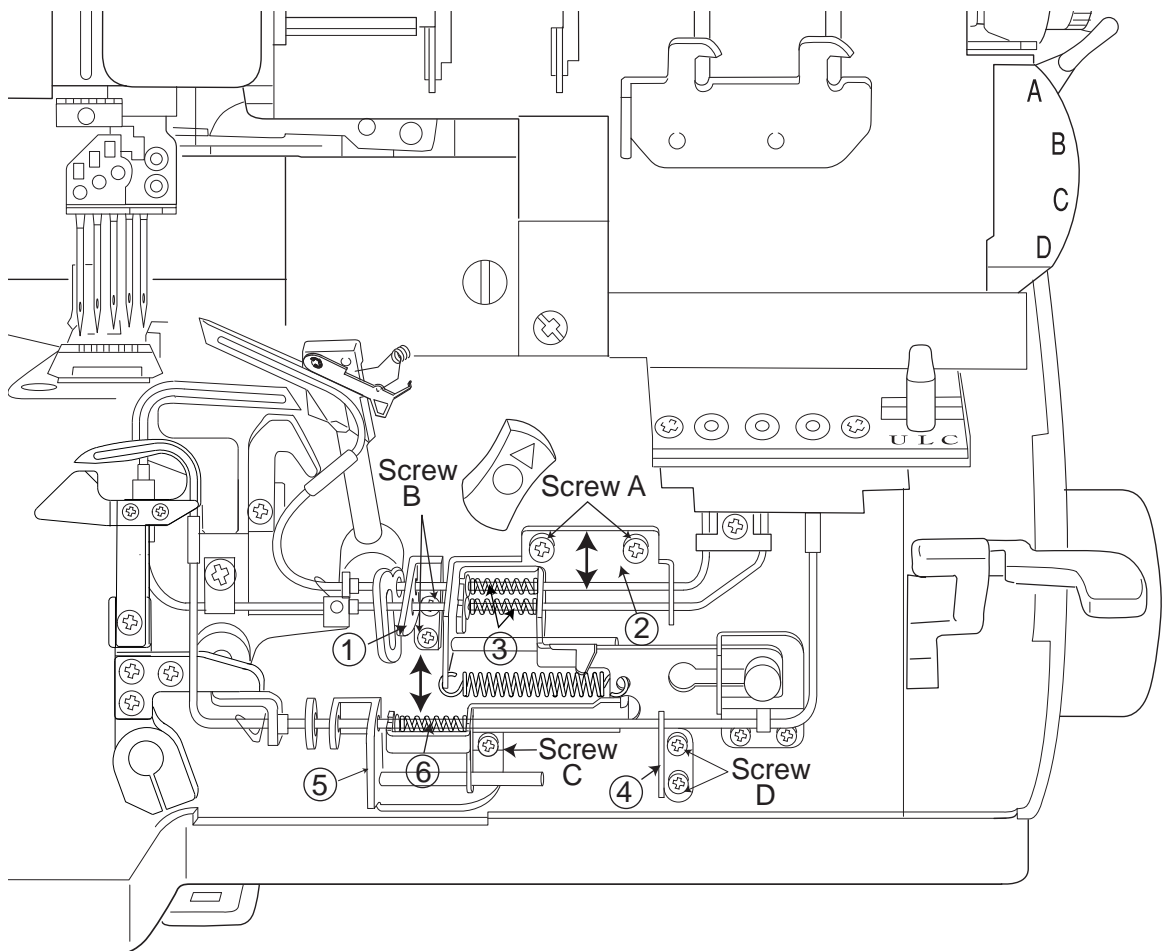
### UPPER LOOPER or LOWER LOOPER

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)

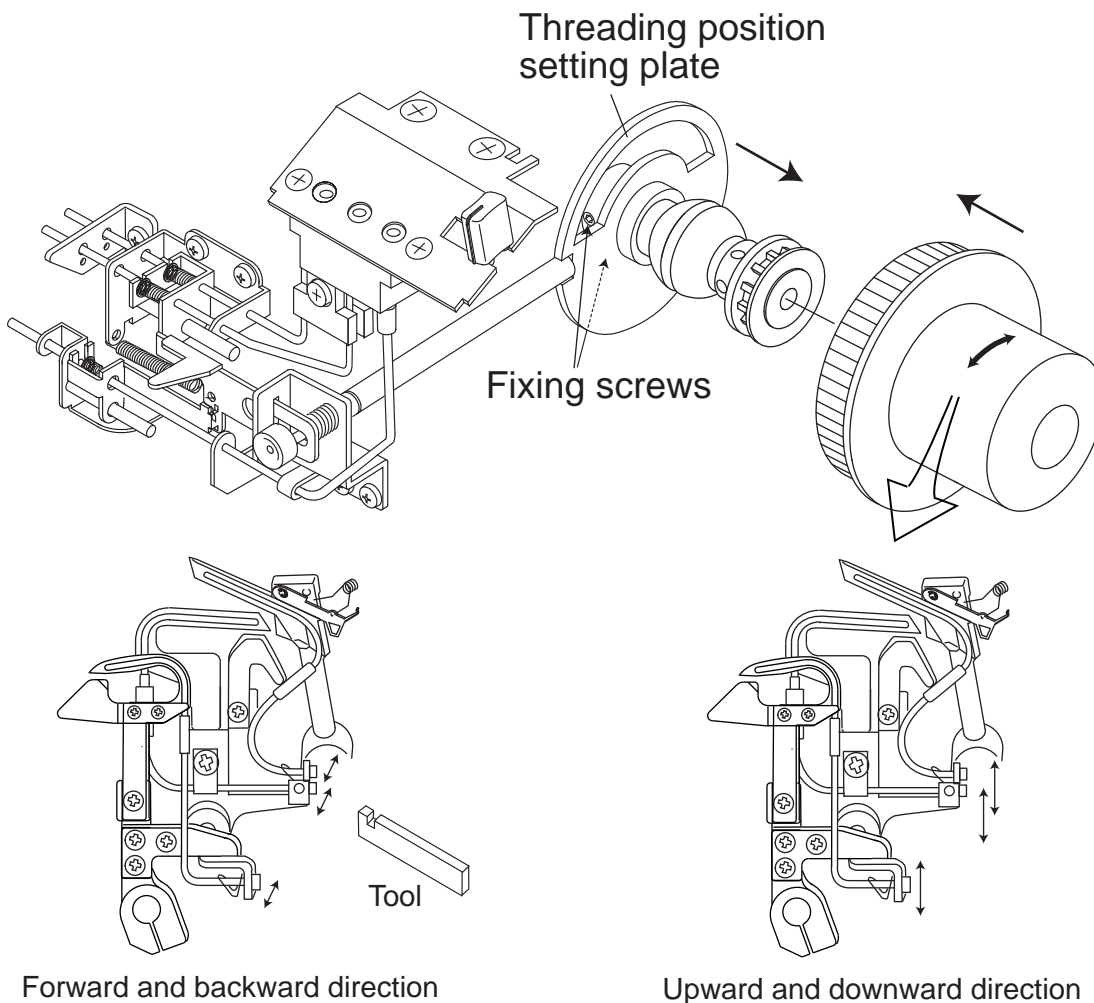
Loosen the 2 screws of threading position setting plate with hexagonal wrench. Slightly rotate handwheel with right hand (within the angle of 10 degrees) while pushing the lock button and moving the release lever right and left direction slowly, and gently with left hand, find out the best position that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

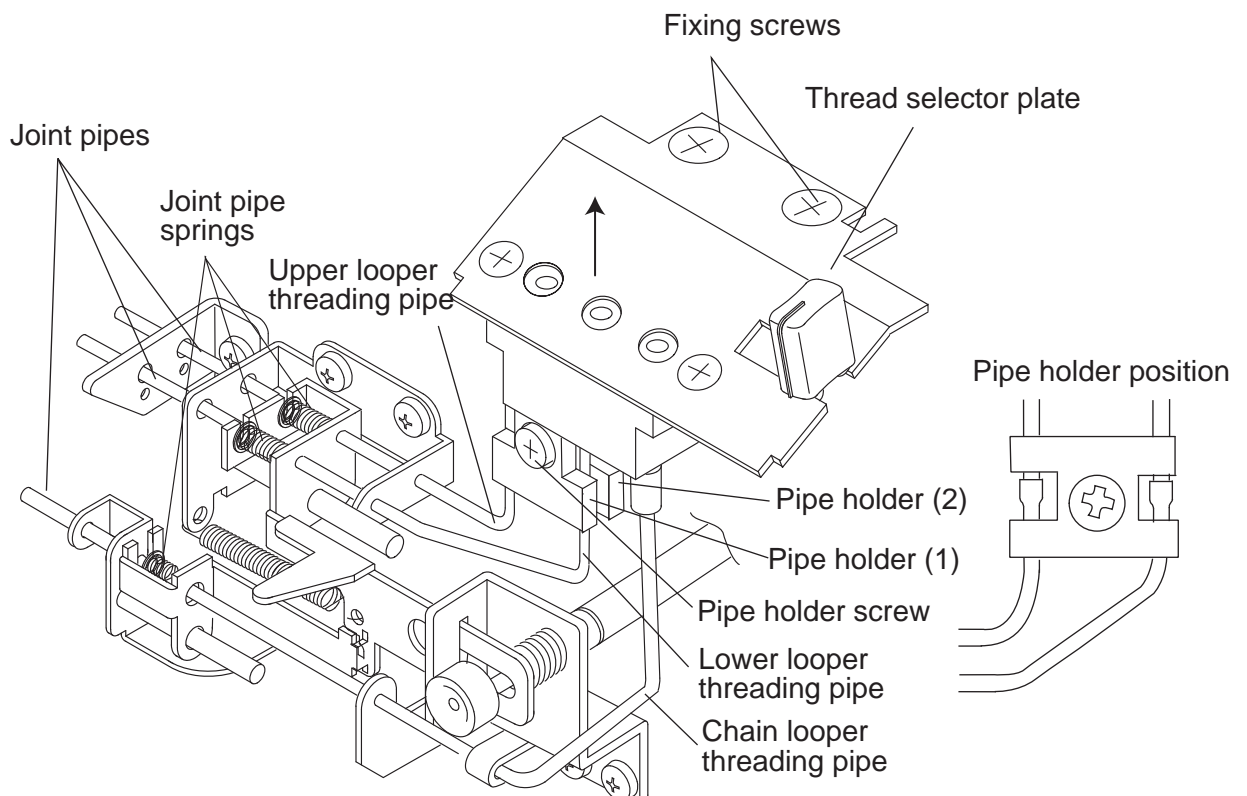
- 1) Loosen the fixing screw of Pipe holder, and remove Pipe holder(1) and (2).
- 2) Loosen 2 fixing screws of Threader selector plate.
- 3) Slightly lift Threader selector plate upward and remove Upper looper threading pipe downward and rightward.
- 4) In case of replacing Joint pipe with new one, remove 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)

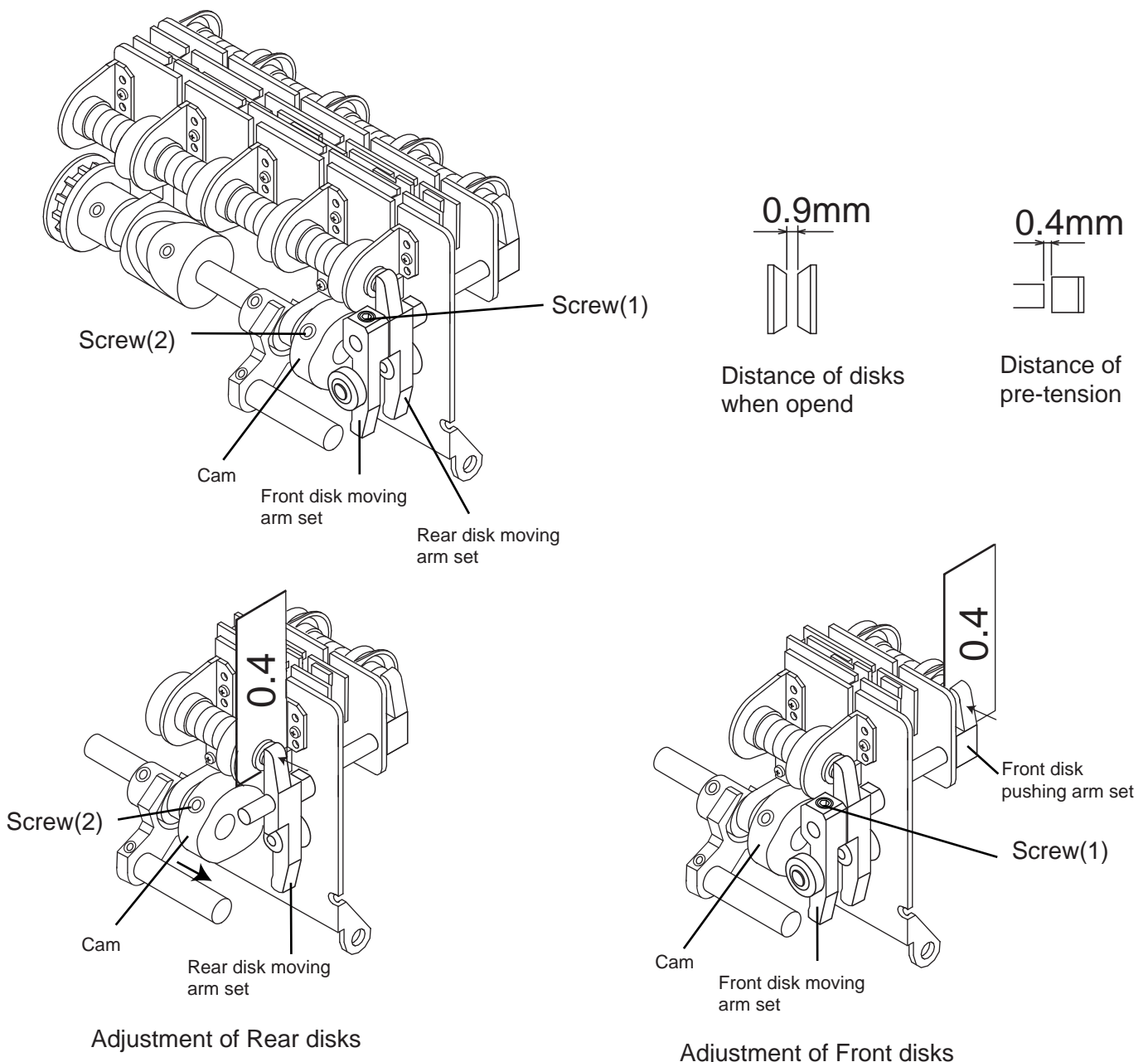
### c) Replacement of Chain looper threading pipe and Joint pipe.

- 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, Bace 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.

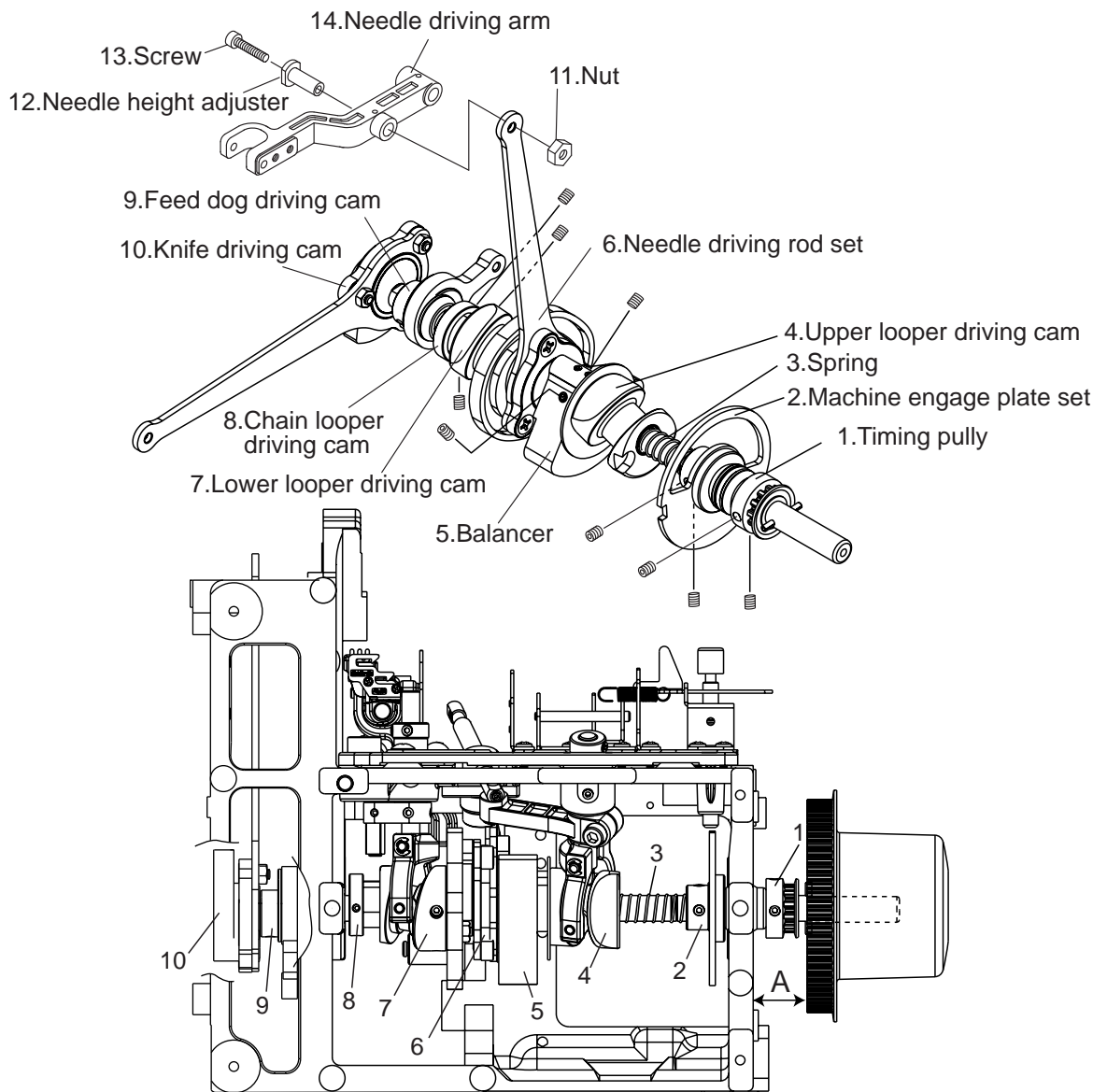
For Model BLE1, BLE1DX, BLE1AT, BLE1ATW, BLE1SX and BLE1LX:  
Replace Upper driving cam or Rollers .

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.



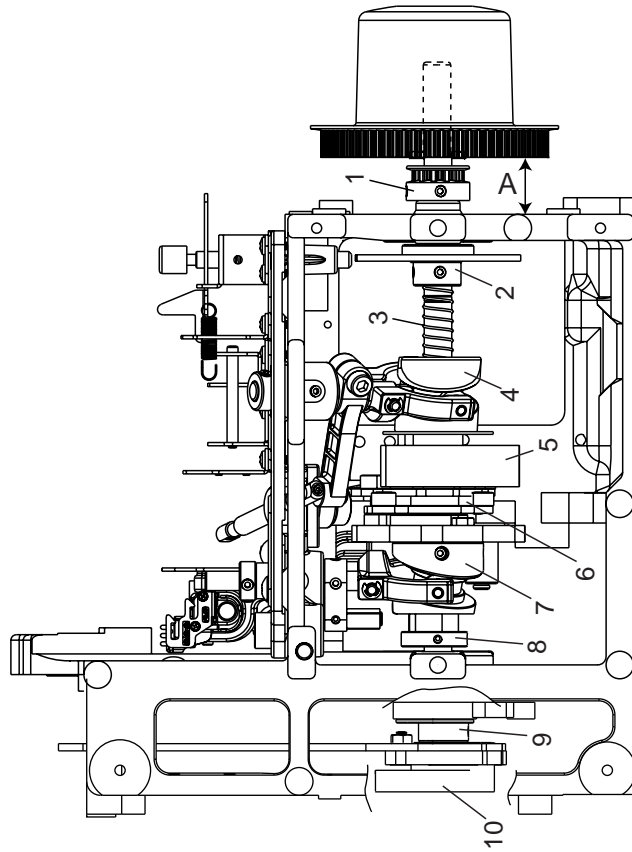
## 17. REPLACEMENT OF LOOPER DRIVING CAM AND ROLLER

### 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

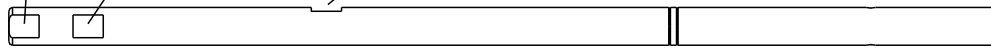
- 1) Needle height  
Turn hand wheel, and bring needle bar at highest position. Turn Needle height adjuster to correct position.  
See page 2 and 3.
- 2) Adjustment of engage position  
Loosen 2 screws of Machine engage plate set.  
Turn handwheel, and find out the end of joint pipes are in the center 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.



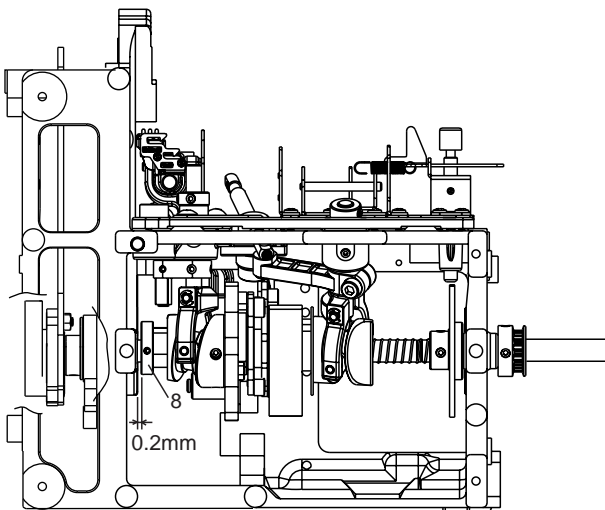
For Knife driving cam

For Feed dog driving cam

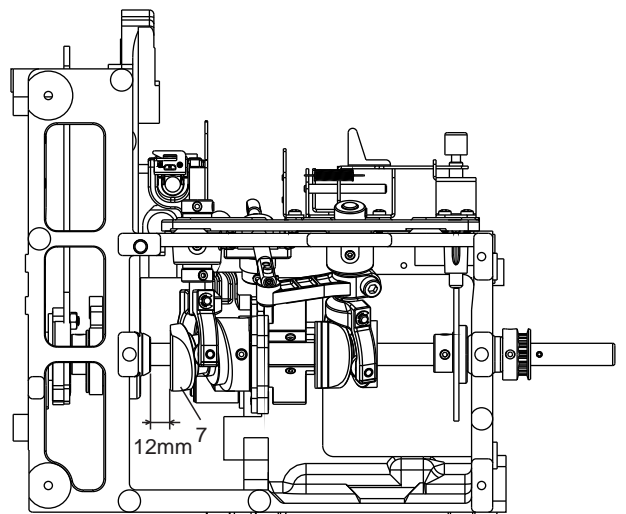
For Lower looper driving cam



Main shaft



For BLE8, BLE8W, BLCS



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

# 18. Adjusting Gauge

