

**SERVICING MANUAL**  
**&**  
**PARTS LIST**

**(MODEL BL9)**

**BABYLOCK**

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## TROUBLESHOOTING

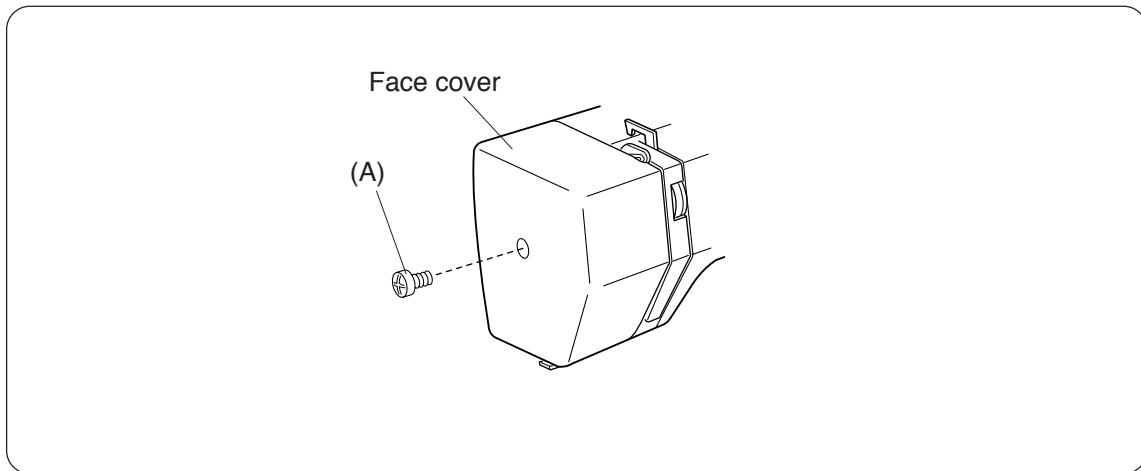
PROBLEM	CAUSE	REMEDY	REFERENCE
1. Skipping stitches	1. Needle is not inserted properly.	Insert the needle properly.	
	2. Needle is bent or worn.	Change the needle.	
	3. Incorrectly threaded	Rethread.	
	4. Needle or thread are inappropriate for fabric being sewn.	Use the recommended sewing needle and thread.	
	5. Sewing on stretch fabric	Use A #11 blue tip needle.	
	6. Inappropriate needle bar height	See mechanical adjustment "Needle bar height."	P. 16
	7. Inappropriate needle to hook timing	See mechanical adjustment "Needle timing to shuttle."	P. 17
	8. Inappropriate needle to hook clearance	See mechanical adjustment "Clearance between needle and hook."	P. 13, 14
2. Fabric not moving	1. Incorrect feed dog height	See mechanical adjustment "Feed dog height."	P. 15
	2. Thread on bottom side of fabric is jammed up.	Make sure to bring both needle and bobbin thread under the foot when starting sewing.	
	3. Feed dog teeth are worn.	Change the feed dog.	

PROBLEM	CAUSE	REMEDY	REFERENCE
3. Breaking upper thread	<ol style="list-style-type: none"> <li>1. Initial sewing speed is too fast.</li> <li>2. Thread path is incorrect.</li> <li>3. Needle is bent or dull.</li> <li>4. Upper thread tension is too strong.</li> <li>5. Needle size is inappropriate for fabric.</li> <li>6. Needle eye is worn.</li> <li>7. Needle hole in needle plate is worn or burred.</li> </ol>	<p>Start with medium speed.</p> <p>Use the proper thread path.</p> <p>Replace with a new needle.</p> <p>Adjust upper thread tension correctly.</p> <p>Use appropriate needle and thread for fabric in use.</p> <p>Change the needle.</p> <p>Repair the hole or replace the needle plate.</p>	P. 8
4. Breaking bobbin thread	<ol style="list-style-type: none"> <li>1. Incorrectly thread bobbin case.</li> <li>2. Too much thread is around on the bobbin.</li> <li>3. Lint is stuck inside the hook race.</li> <li>4. Thread quality is too low.</li> <li>5. Thread is jamming around the bobbin.</li> <li>6. Bobbin thread tension is too strong.</li> </ol>	<p>Thread bobbin case correctly.</p> <p>Adjust the position of stopper.</p> <p>Clean the hook race.</p> <p>Change to a high quality sewing thread.</p> <p>Clear out the jamming thread.</p> <p>Adjust bobbin thread tension correctly.</p>	P. 9
5. NEEDLE BREAKS	<ol style="list-style-type: none"> <li>1. Needle is hitting the needle plate.</li> <li>2. Needle is bent or worn.</li> <li>3. Needle is hitting the hook race.</li> <li>4. The fabric moves while the needle is piercing it, or the needle zigzags while in fabric.</li> <li>5. Fabric is being pulled too strongly while sewing.</li> </ol>	<p>See mechanical adjustment "Needle drop ."</p> <p>Change the needle.</p> <p>See mechanical adjustment "Clearance between needle and hook ."</p> <p>See mechanical adjustment "Needle swing."</p> <p>Guide the fabric gently while sewing.</p>	<p>P. 12</p> <p>P. 13, 14</p> <p>P. 11</p>

PROBLEM	CAUSE	REMEDY	REFERENCE
6. Noisy operation	1. Backlash between shuttle hook gear and lower shaft gear is too great.	See mechanical adjustment "Clearance between needle and hook (NO. 2)."	P. 14
	2. Lower shaft gear is loose.	Eliminate the looseness.	
	3. Inappropriate belt tension.	See mechanical adjustment "Motor belt tension."	P. 22
	4. Upper shaft gear is loose.	Eliminate the looseness.	
	5. Not enough oil.	Oil all moving parts.	
7. Deformation of pattern	1. Inappropriate zigzag synchronization.	See mechanical adjustment "Needle swing."	P. 11
	2. Inappropriate disengagement of cam follower.	See mechanical adjustment "disengagement of cam follower."	P. 21
	3. Upper thread tension is too strong.	Adjust upper thread tension correctly.	P. 8
	4. Inappropriate feed balance BALANCE	See mechanical adjustment "Feed balance on stretch stitch."	P. 19

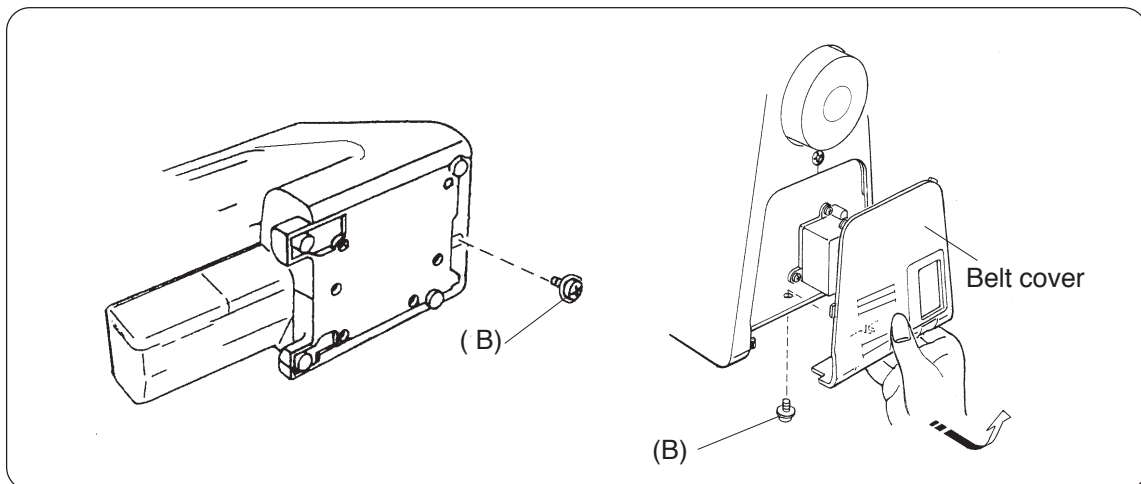
# SERVICE ACCESS

## FACE COVER



1. Remove the face cover by removing the setscrew (A).

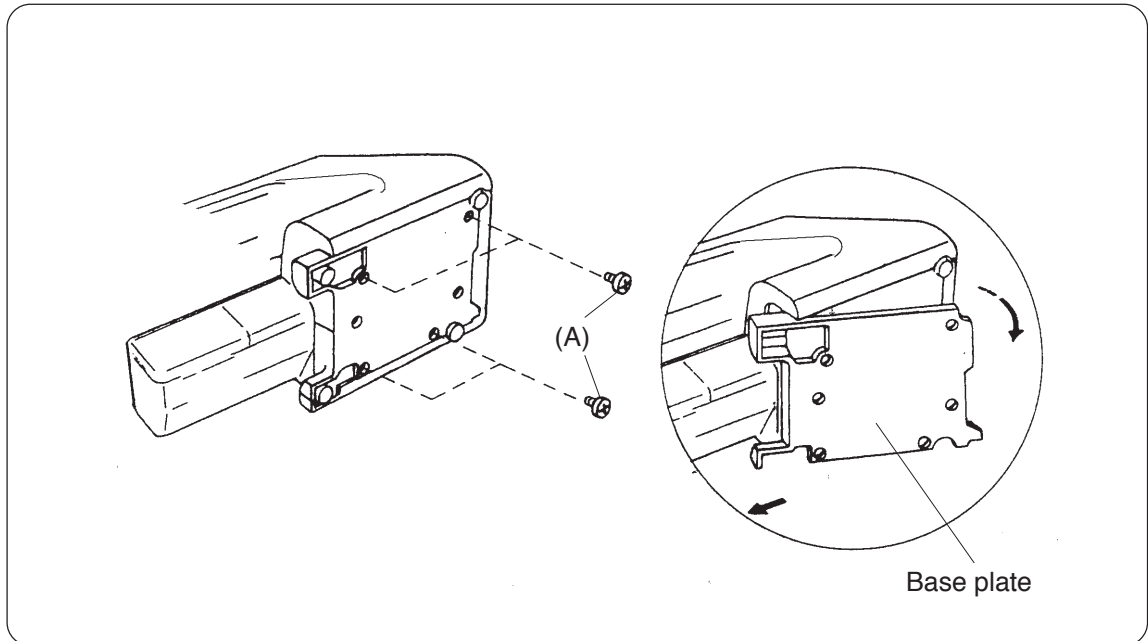
## BELT COVER



1. Loosen setscrew (B).
2. Take the belt cover out.

# SERVICE ACCESS

## BASE PLATE



(To remove)

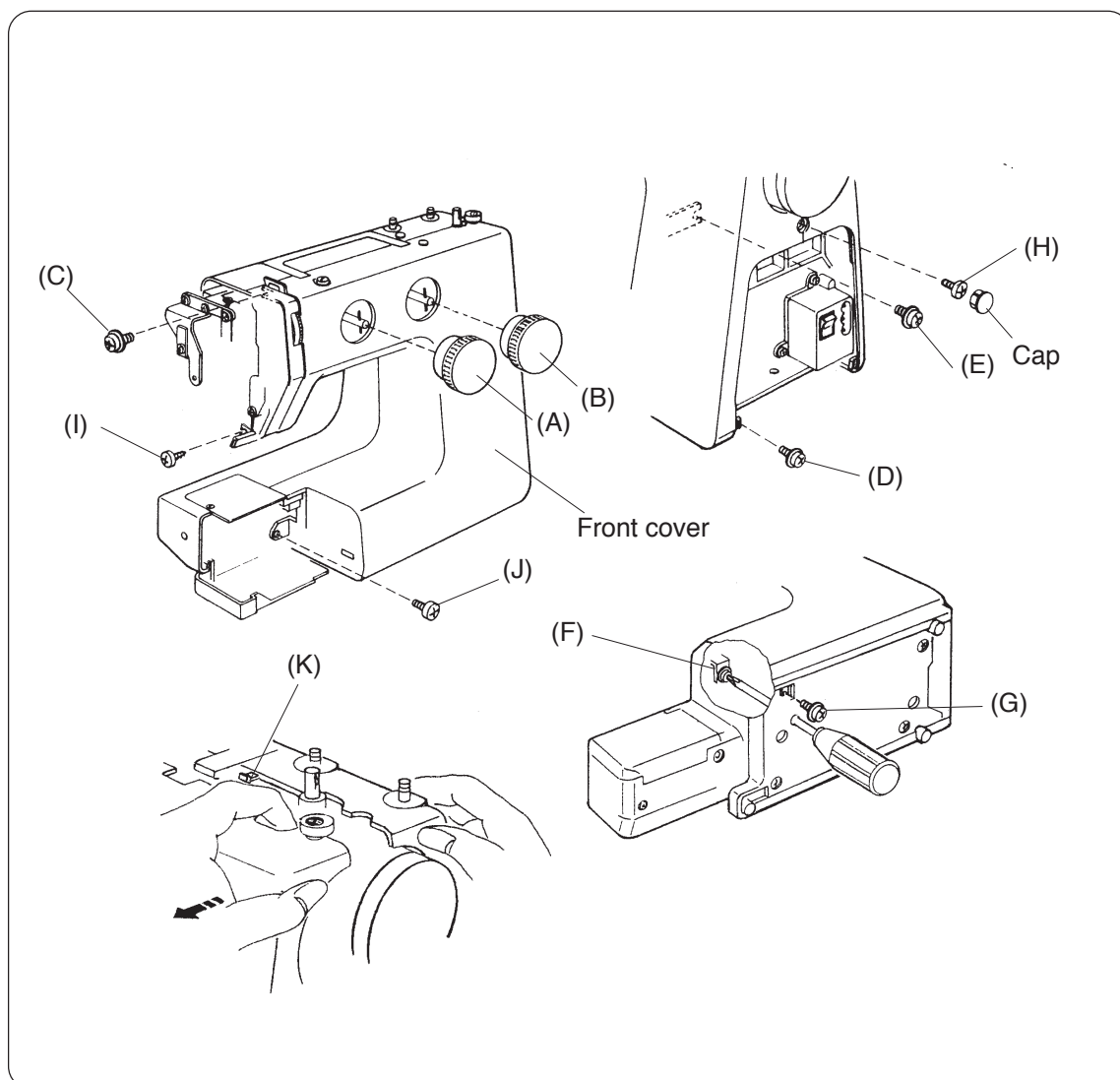
1. Loosen the setscrews (A).
2. Remove the base plate.

(To attach)

3. Mount the base plate by four setscrews.

# SERVICE ACCESS

## FRONT COVER



(To remove)

1. Remove the face cover, and remove the belt cover (See page 4).
2. Remove dials (A) and (B).
3. Loosen setscrews (C), (D), (E), (F), and (G) and then, remove the front cover by removing setscrews (H), (I), AND (J).

NOTE: Remove the front cover in the order of (K).

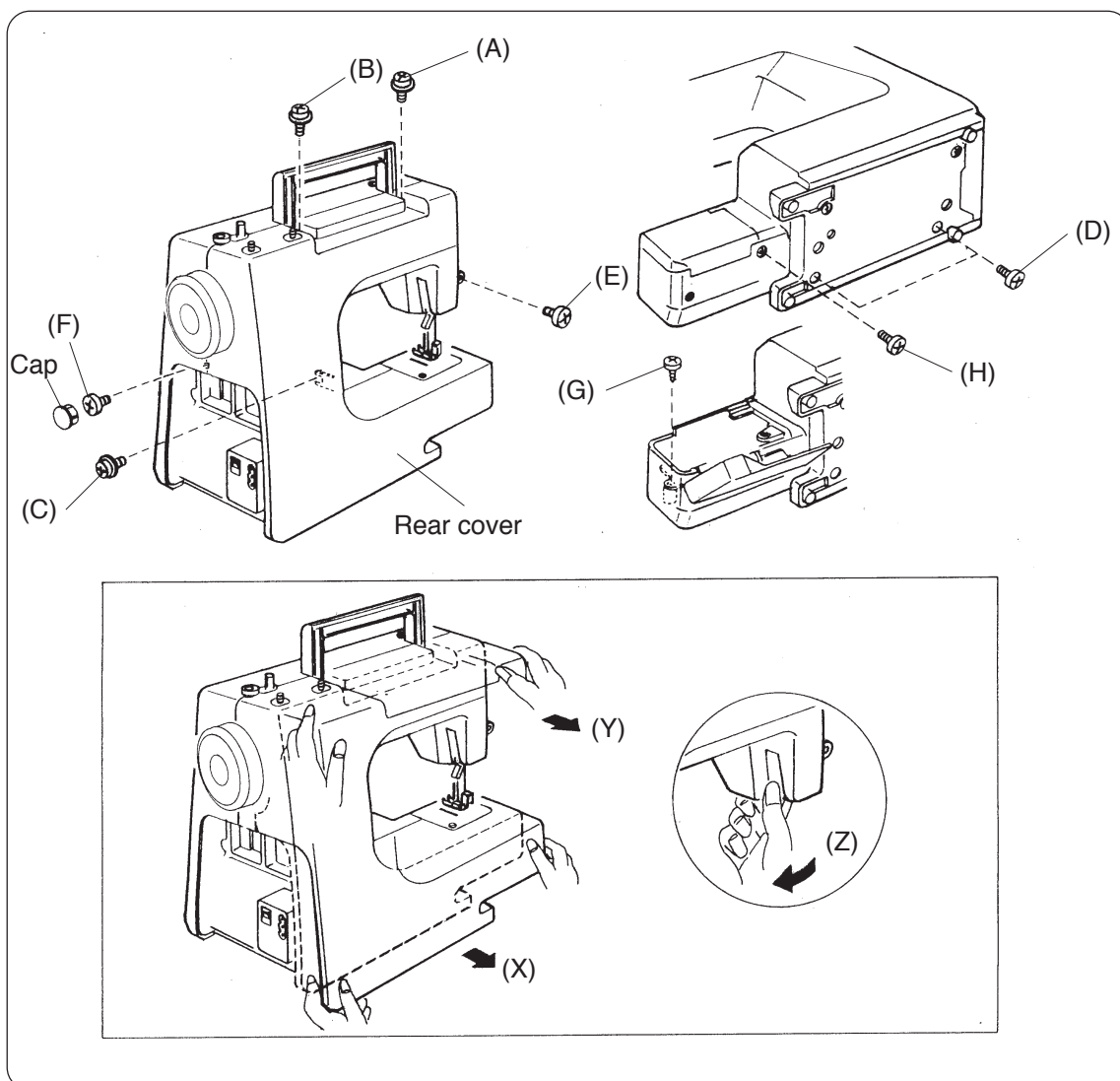
(To attach)

4. Mount the front cover in reverse procedure of the removing.



# SERVICE ACCESS

## REAR COVER



(To remove)

1. Remove the face cover and belt cover (See page 4).  
NOTE: Pull up the spool pins.
2. Loosen setscrews (A), (B), (C) and (D) (2 pcs.), and then, remove the rear cover by removing setscrews (E), (F), (G) and (H).  
NOTE: Remove the rear cover in the order of (X) (lower part) → (Y) (upper part) → (Z) (presser foot lifter part). (remove the bed cover together.)

(To attach)

3. Mount the rear cover in reverse procedure of the removing.

# MECHANICAL ADJUSTMENT

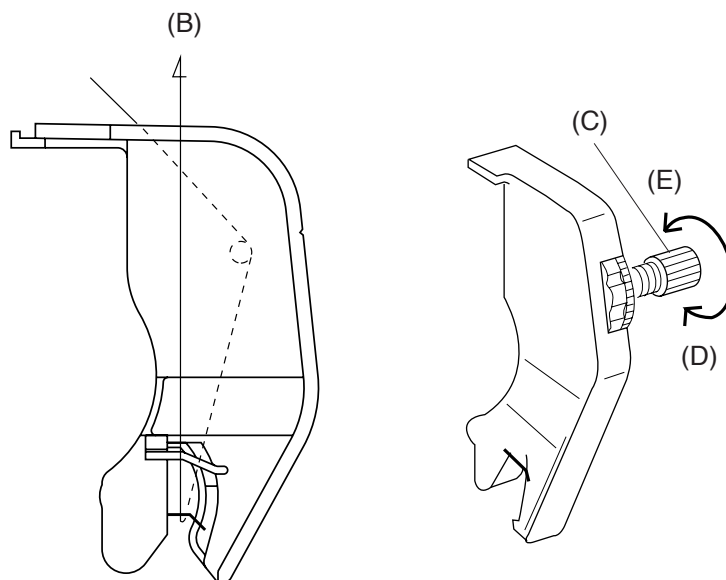
## TOP TENSION

### To check:

The standard upper thread tension should be 65–95 g when pulling the thread (cotton thread #50) in the direction of (B) with setting the tension dial at “3.” (make sure the foot should be lowered.) If the tension is out of the standard range, adjust it as follows:

### Adjustment procedure:

1. Remove the front cover unit (See page 6).
2. Turn the adjusting nut (C) in the direction of (D) when the upper thread tension is too tight. Turn the adjusting nut (C) in the direction of (E) when the upper thread tension is too loose.
3. Attach the front cover unit.



# MECHANICAL ADJUSTMENT

## BOBBIN TENSION

### To check:

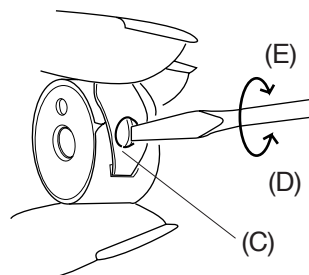
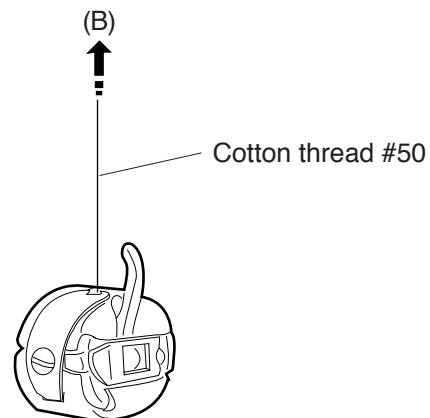
Set the bobbin in the bobbin case and pass the thread (cotton #50) through the tension spring.

The bobbin thread tension should be 45–55g when pulling the thread in the direction of (B).

If the tension is out of the range, adjust it as follows:

### Adjustment procedure:

1. Turn the adjusting screw (C) in the direction of (D) when the bobbin thread tension is too tight.
2. Turn the adjusting screw (C) in the direction of (E) when the bobbin thread tension is too loose.



# MECHANICAL ADJUSTMENT

## PRESSER BAR HEIGHT AND ALIGNMENT

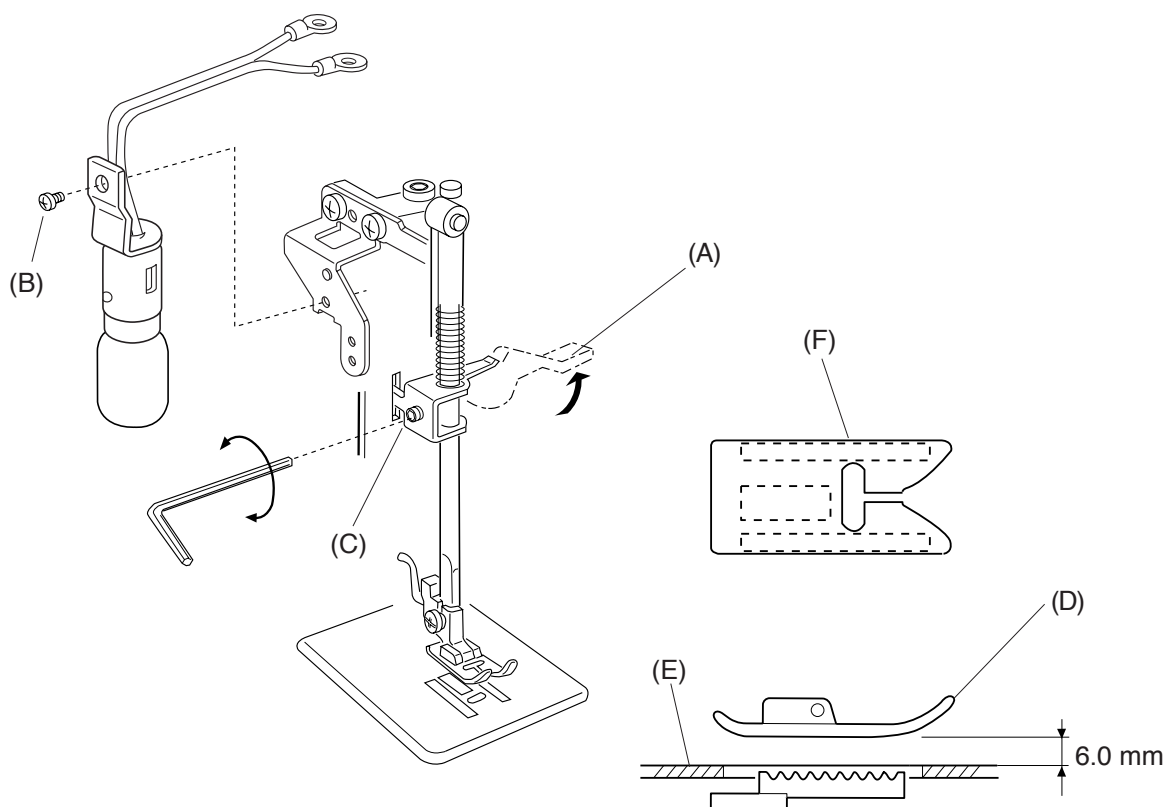
### To check:

1. Raise the presser foot lever (A).
2. The distance between the presser foot (D) and the needle plate (E) should be 6.0 mm (0.24").

### Adjustment procedure:

1. Remove the face cover (See page 4).
2. Remove the presser foot lever and loosen the screw (C) on the presser bar holder.  
Adjust the distance between the presser foot (D) and the needle plate (D) to 6.0 mm (0.24").
3. Tighten the screw (C) securely.
4. Tighten the screw (B) to secure the lamp socket.
5. Attach the face cover.

NOTE: When you tighten the screw (B), make sure that both sides of the presser foot are parallel to the feed dog slots (F) on the needle plate.



# MECHANICAL ADJUSTMENT

## NEEDLE SWING

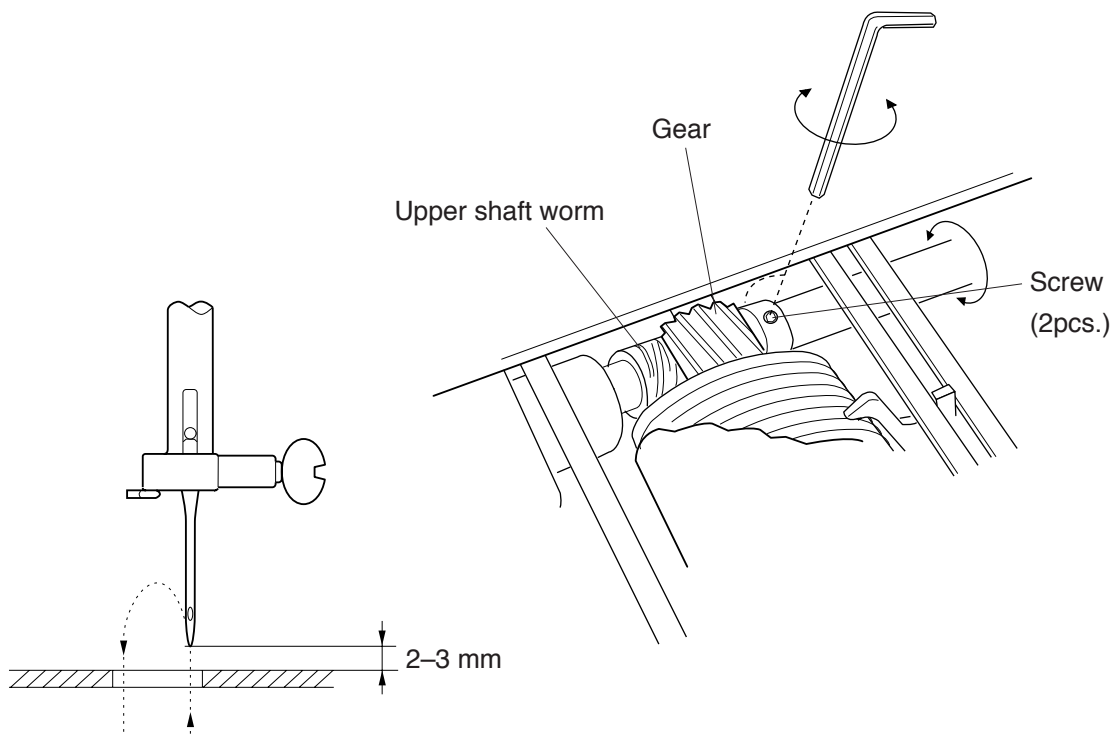
### To check:

Adjust the needle swing according to the following procedure, If the needle bar starts moving sideways while the needle is in the fabric at sewing the zigzag pattern (with maximum zigzag width).

### Adjustment procedure:

1. Set the pattern selector dial with maximum zigzag width, and remove the front cover (See page 6).
2. Loosen two screws.
3. Adjust the needle swing by turning the handwheel, while holding the worm so as not to rotate it, until the needle swing starts at 2–3 mm on the needle plate after the needle has come out of the right side of the needle hole.
4. Tighten two screws.
5. Mount the front cover.

NOTE: After adjusting the needle swing, check that the upper shaft worm and gear rotate smoothly without any backlash between them.



# MECHANICAL ADJUSTMENT

## NEEDLE DROP

### To check:

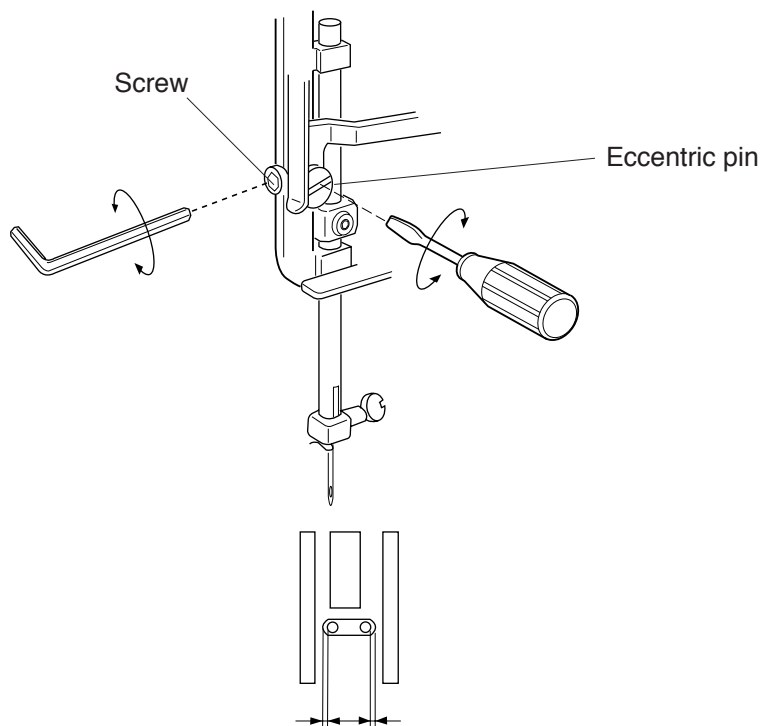
When the needle swings in maximum zigzag width, the distance between both ends of the needle hole on the needle plate and the needle drop positions should be equal.

If not, adjust as follows:

### Adjustment procedure:

1. Remove the face cover (See page 4).
2. Set the pattern selector dial at maximum zigzag width.
3. Loosen the screw.
4. Turn the eccentric pin to adjust the needle drop.
5. Tighten the screw.
6. Attach the face cover.

NOTE: Check the hook timing after this adjustment.



Both clearances should be equal

# MECHANICAL ADJUSTMENT


## CLEARANCE BETWEEN NEEDLE AND HOOK (ADJUSTMENT METHOD NO. 1)

### To check:

The clearance between the needle and shuttle race should be  $-0.05$  to  $+0.10$  mm.

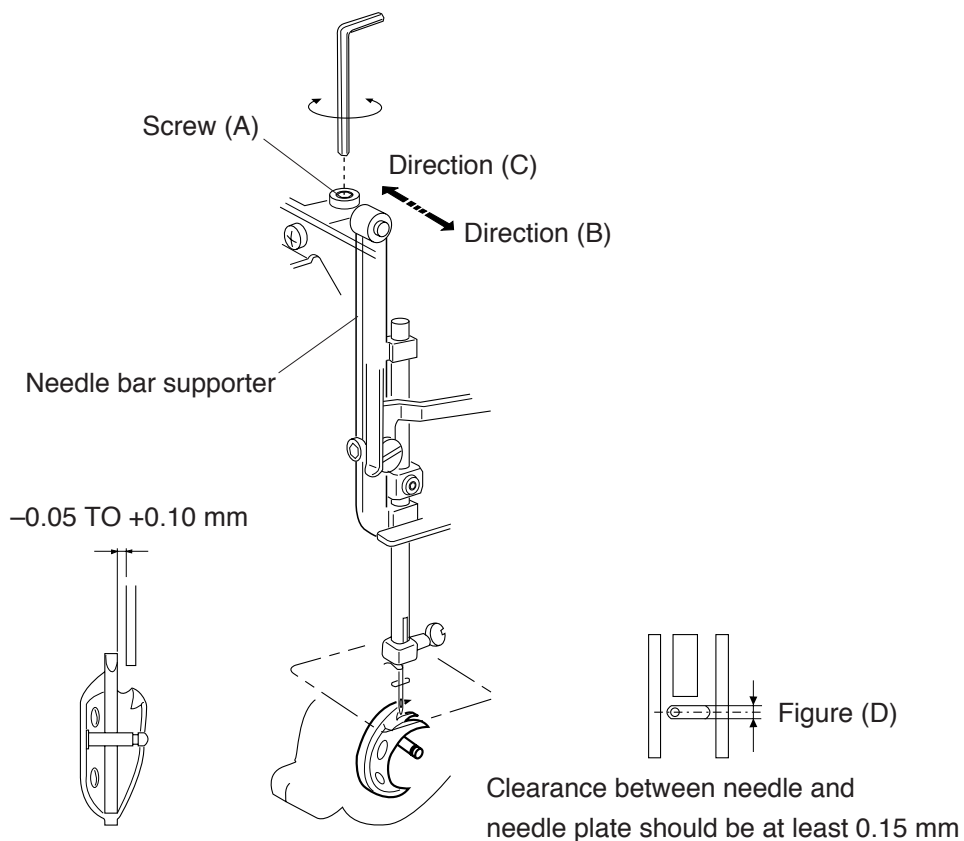
If not, adjust as follows:

### Adjustment procedure:

1. Remove the face cover (See page 4).
2. Set the pattern select dial at "  ".
3. Loosen screw (A), and move the needle bar supporter in the direction of the arrows to get a clearance between  $-0.05$  to  $+0.10$  mm.
  - \* If clearance is too wide, move the needle bar supporter to direction (B).
  - \* If clearance is too narrow, move the needle bar supporter to direction (C).

NOTE: After this adjustment, check that the clearance between the needle and needle plate is more than  $0.15$  mm as shown in figure (D). If not, adjust the clearance between needle and shuttle race by using adjustment method, above after readjust the clearance between needle and needle plate more than  $0.15$  mm.

4. Attach the face cover.



# MECHANICAL ADJUSTMENT

## CLEARANCE BETWEEN NEEDLE AND HOOK (ADJUSTMENT METHOD NO.2)

### To check:

Use this adjustment method NO. 2 when method NO.1 cannot be used.

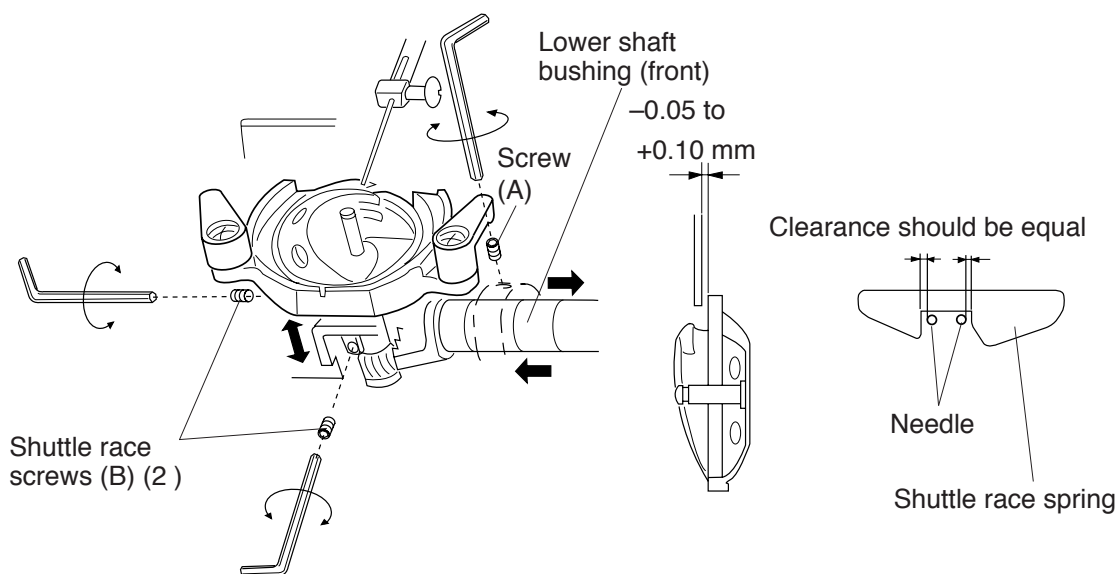
The clearance between the needle and shuttle race should be  $-0.05$  to  $+0.10$  mm.

### Adjustment procedure:

1. Set the pattern selector dial at "C:D".
2. Remove the rear cover (See page 7).
3. Loosen the screw (A) on the lower shaft bushing and slide the gear about 0.5 mm to the right to create some slack between the gears.
4. Lower the needle and loosen the two shuttle race screws (B).  
Move the shuttle race unit axially either forward or backward to adjust the clearance between the needle and the shuttle race in the range of  $-0.05$  to  $+0.10$  mm.
5. Set the pattern select dial at "Σ", turn the handwheel to check if the clearance between the needle and inner edges of the shuttle race spring at the left and right needle drops are equal.  
If not, adjust by turning the shuttle race unit.
6. Tighten the two shuttle race screws (B).
7. Loosen the set screw on the lower shaft bushing and slide the gear back to the original position while adjusting the backlash.
8. Tighten screw (A) firmly.
9. Attach the rear cover.

NOTE: The backlash play should be less than 0.3 mm and the lower shaft should turn smoothly.

After the adjustment, check the hook timing.





# MECHANICAL ADJUSTMENT

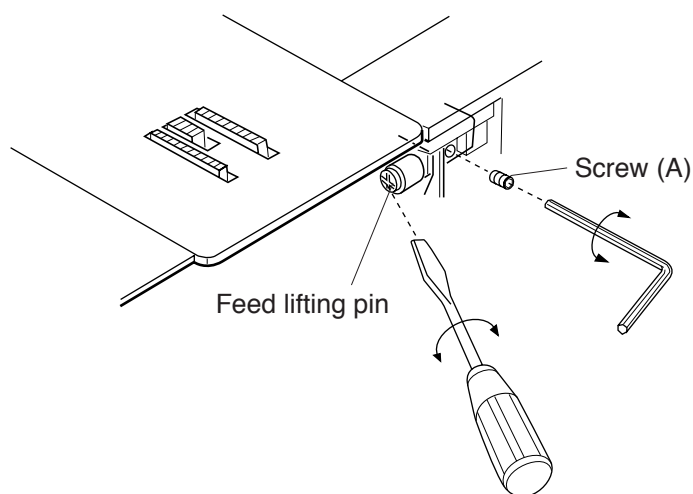
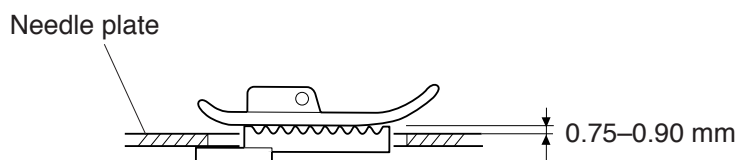
## FEED DOG HEIGHT

### To check:

1. Lower the presser foot.
2. Turn the handwheel toward you until the needle bar comes to the feed dog above the needle plate should be 0.75–0.90 mm.  
If it is not in the range, adjust as follows.

### Adjustment procedure:

1. Open the shuttle cover.
2. Lower the presser foot and turn the handwheel toward you until the feed dog comes to its highest point.
3. Loosen the screw (A) .
4. Turn the feed lifting pin to adjust the height of feed dog (0.75–0.90 mm).
5. Tighten the screw (A).
6. Turn the handwheel toward you to recheck the height of feed dog.




# MECHANICAL ADJUSTMENT

## NEEDLE BAR HEIGHT

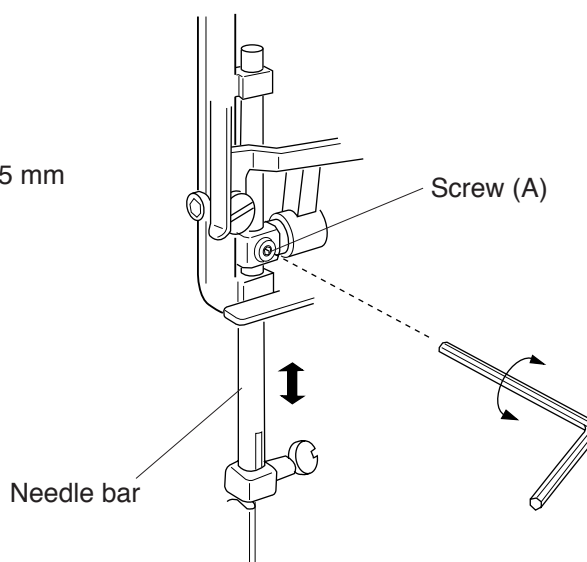
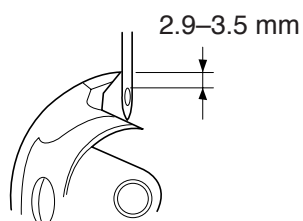
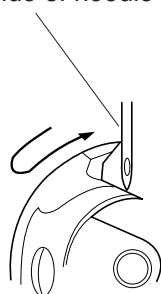
### To check:

When the tip of shuttle hook meets the left side of the needle in ascending travel of the needle from its left and lowest position, The distance between the top of the needle eye and the tip of the shuttle hook should be in the range of 2.9-3.5 mm.

### Adjustment procedure:

1. Open the face cover.
2. Set the pattern selector dial at "  ".
3. Open the shuttle cover.
4. Remove the shuttle race ring.
5. Turn the handwheel toward you until the tip of the shuttle hook meets the left side of the needle.
6. Loosen the lower shaft crank arm screw (A).
7. Adjust the height of the needle bar by moving the needle bar upward or downward without turning it.
8. Tighten the screw (A).
9. Attach the shuttle race ring.

Tip of shuttle hook meets  
left side of needle



# MECHANICAL ADJUSTMENT

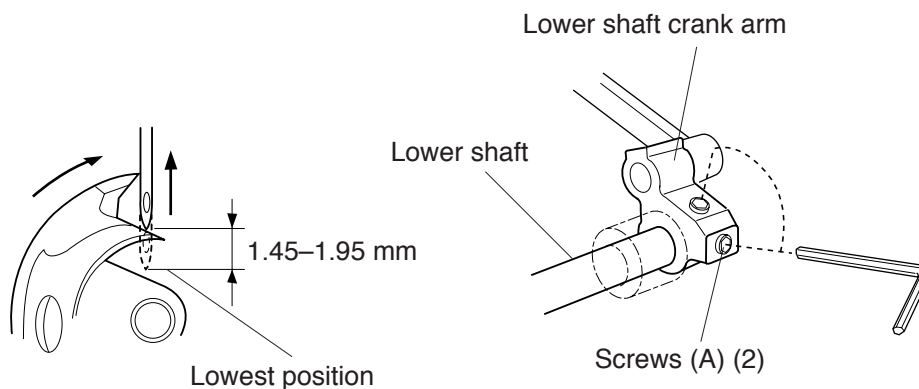
## NEEDLE TIMING TO SHUTTLE

### To check:

The height of the needle point from its lowest point of travel should be in the range of 1.45-1.95 mm when the tip of the shuttle hook just meets the left side of the needle at the left needle position.

### Adjustment procedure:

1. Set the pattern selector dial at “C: D”.
2. Remove the base (See page 5).
3. Open the shuttle cover.
4. Remove the shuttle race ring.
5. Turn the handwheel toward you until the tip of the shuttle hook meets the left side of the needle.
6. Loosen the lower shaft crank arm screws (A).
7. While holding the shuttle hook so it doesn't turn, turn the handwheel toward you until the needle comes to its lowest position.  
Then, further turn the handwheel to raise the needle about 1.7 mm from its lowest position.
8. Tighten the screws (A).
9. Turn the handwheel toward you to check if the height is in the range of 1.45-1.95 mm.  
If it is not in this range, repeat the above procedure.
10. Attach the shuttle race ring.
11. Attach the base.



# MECHANICAL ADJUSTMENT

## BUTTONHOLE FEED BALANCE

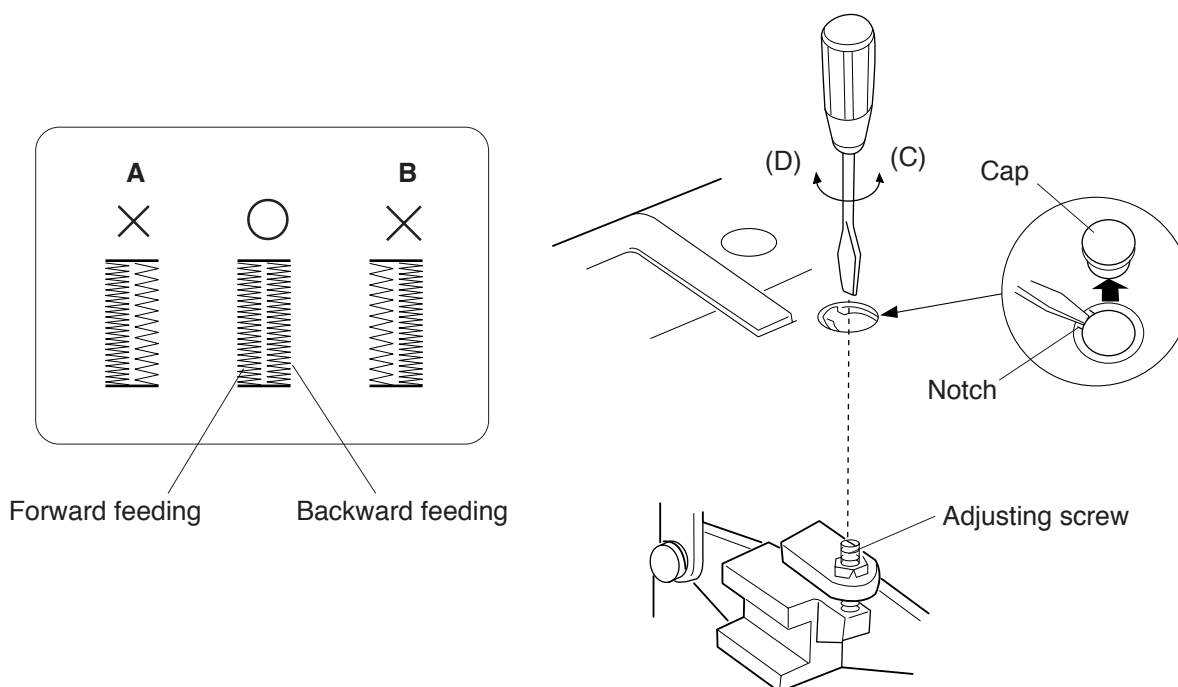
### To check:

When sewing buttonhole, the stitches on each side of buttonhole should be the same stitch density.

The range of 9-12 stitches in the right side row "backward feeding" against 10 stitches in the left side row "forward feeding" is considered acceptable.

### Adjustment procedure:

1. Confirm the stitches by sewing buttonholes, and remove the cap.
2. Turn the adjusting screw in the direction of (C) in case of (A) (right stitches are rough), or in the direction of (D) in case of (B) (left stitches are rough).
3. Mount the cap.



# MECHANICAL ADJUSTMENT


## FEED BALANCE ON STRETCH STITCH

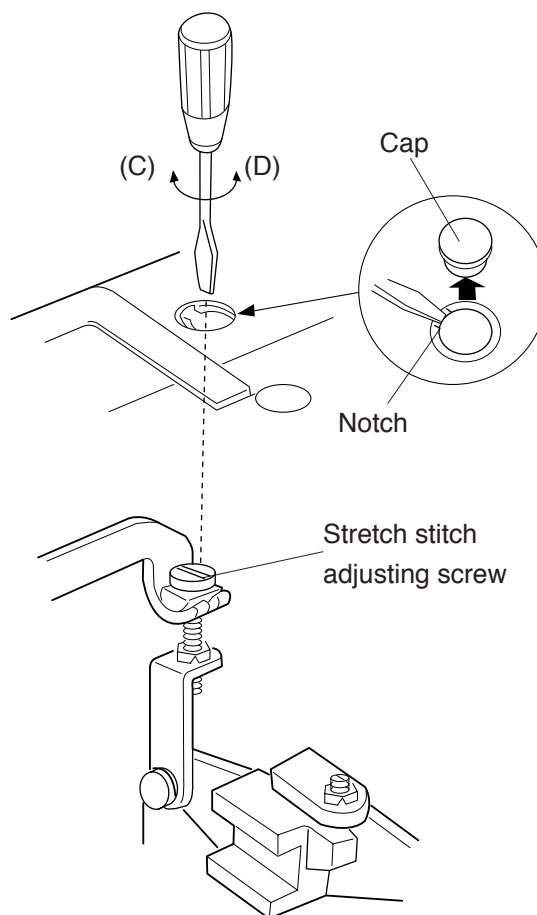
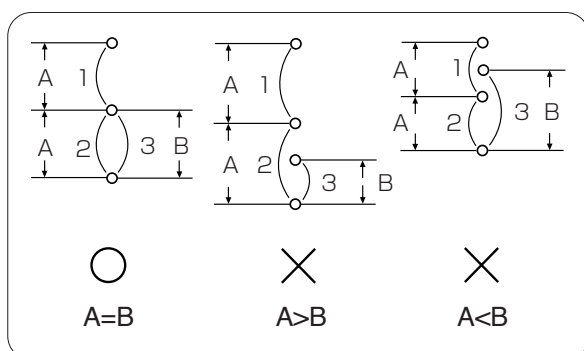
### To check:

If the stretch stitch patterns are distorted with setting the stitch length dial at " S.S. ".

(In case of being a difference between forward feeding and backward feeding during stretch stitch patterns), make an adjustment as follows:

### Adjustment procedure:

1. Remove the cap.
2. Set the pattern selector dial at "  ", and the stitch length dial at "S.S.".
3. Turn the stretch stitch adjusting screw in the direction of (C) when  $A > B$ , or in the direction of (D) when  $A < B$ .
4. Attach the cap.



# MECHANICAL ADJUSTMENT

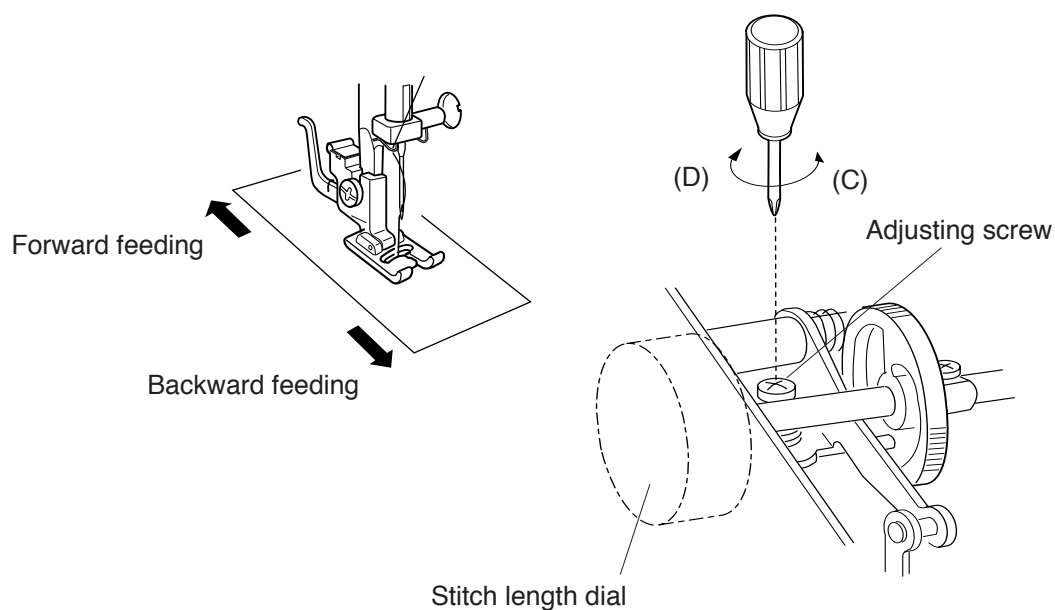
## BARTACK FEED OF BUTTONHOLE

### To check:

If the material is feed forward or backward when sewing bartack on buttonhole, make an adjustment as follows:

### Adjustment procedure:

1. Set the pattern selector dial at " $\frac{4}{2}$ ", and the stitch length dial at "4".
2. Remove the front cover (See page 6).
3. Place a piece of paper under the foot and turn the handwheel.  
If the paper is feed forward, turn the adjusting screw in the direction of (C).  
If the paper is feed backward, turn the adjusting screw in the direction of (D).
4. Attach the front cover.



# MECHANICAL ADJUSTMENT

## DISENGAGEMENT OF CAM FOLLOWER

### To check:

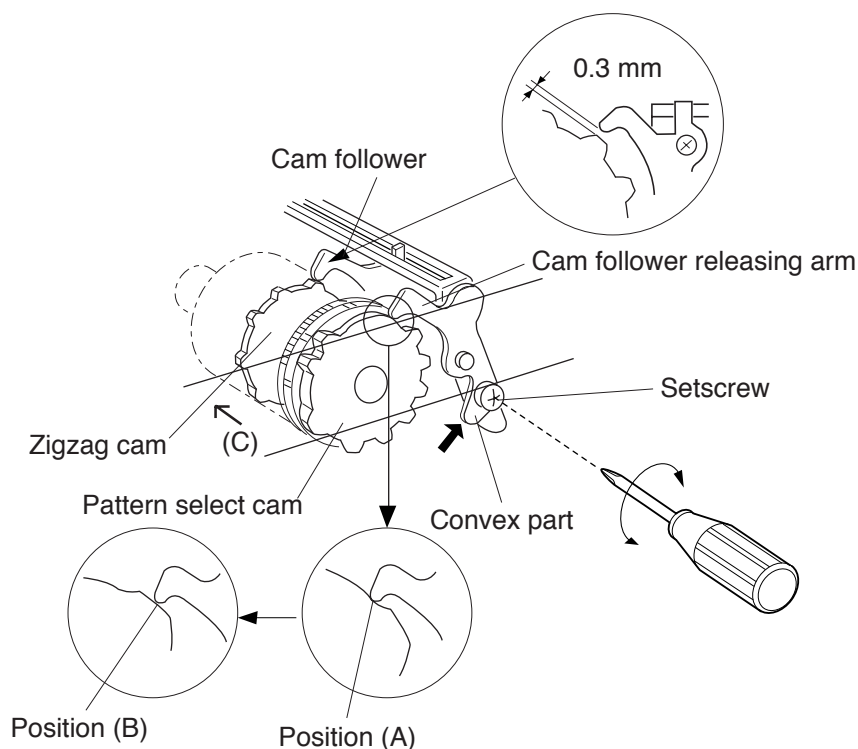
Too narrow clearance between the cam follower and the top convex of zigzag cam may often cause difficulty in turning of the pattern selector dial, this can also cause unintended patterns to become selected or make zigzag stitch in straight stitch setting.

### Adjustment procedure:

1. Remove the front cover (See page 6).
2. Mount the pattern selector dial, and set it at pattern "  $\text{C} \text{ } \text{D}$ ". (5th cam as viewed from (C))
3. Turn the handwheel to put the cam follower onto the top convex of the zigzag cam.
4. Loosen the setscrew.
5. Push the convex part of the cam follower releasing arm in the direction of arrow until the cam follower releasing arm touches to position (A) of the pattern select cam, and then, tighten the setscrew.

NOTE: After this adjustment, check that the clearance between the zigzag cam and the cam follower is 0.3mm when the cam follower releasing arm has removed to position (B) by turning the pattern selector dial counterclockwise, and also the clearance between the cam follower and the zigzag cam should be 0.3mm.

6. Remove the pattern selector dial, and mount the front cover.



# MECHANICAL ADJUSTMENT

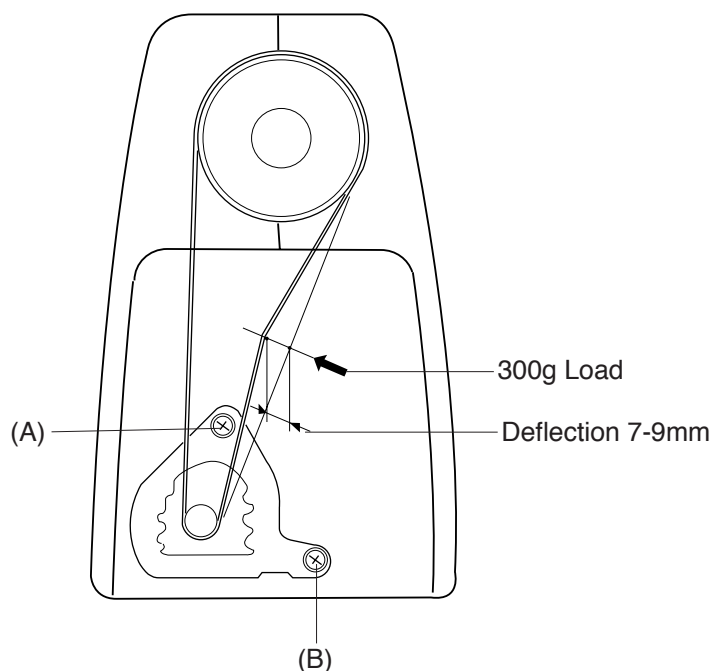
## MOTOR BELT TENSION

### To check:

1. Too tight or too loose motor belt tension may create belt noise and also too tight motor belt tension can cause the machine to run slow and will overload the motor.  
Too loose motor belt tension may cause jumping of the belt teeth on the motor pulley.
2. The correct motor belt tension is that the deflection of motor belt is about 7mm (0.28") - 9mm (0.36") when pushing the motor belt by finger at about 300 grams load.

### Adjustment procedure:

1. Remove the belt cover (See page 4).
2. Loosen the screws (A) and (B).
3. Move the motor up or down to adjust the deflection about 7mm (0.28") - 9mm (0.36").
4. Tighten the screws (A) and (B).





# WIRING

