



**MC9900**

**JANOME**

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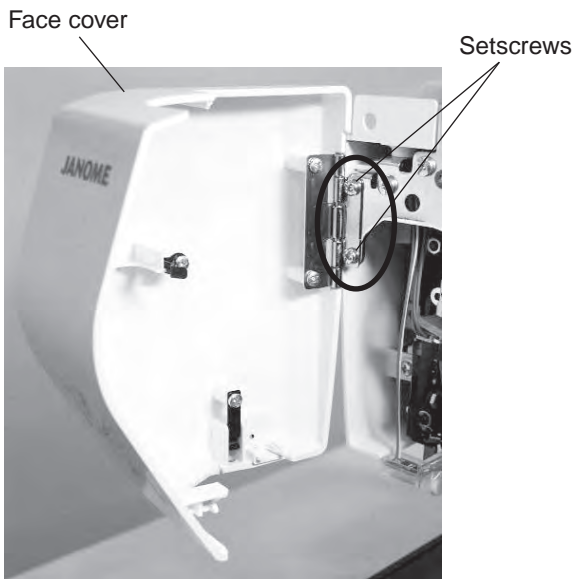
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# Changing External Parts (1)



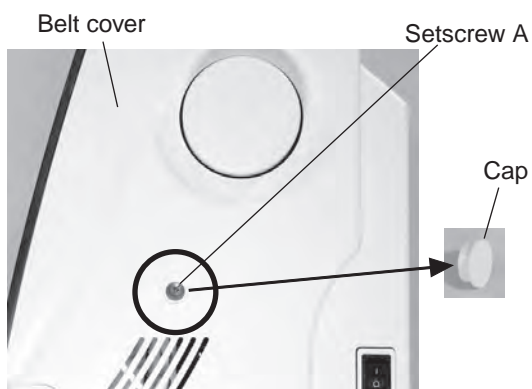
## Face cover

### To remove:

1. Remove the setscrews (2 pcs.).  
Remove the face cover.

### To attach:

1. Follow the above procedure in reverse.



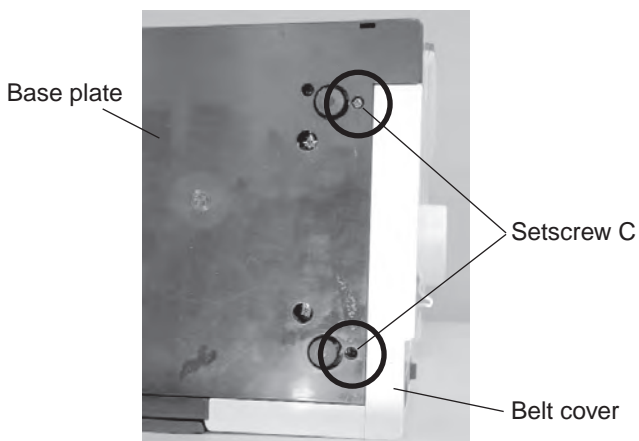
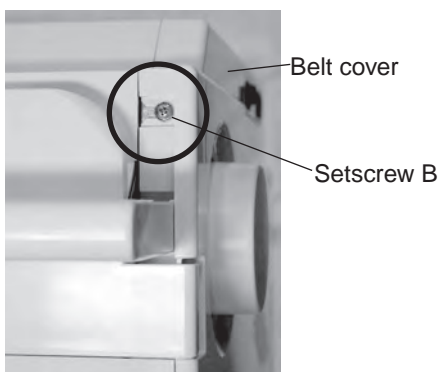
## Belt cover

### To remove:

1. Remove the cap and setscrew A.
2. Loosen the setscrews B and C.  
Remove the belt cover.

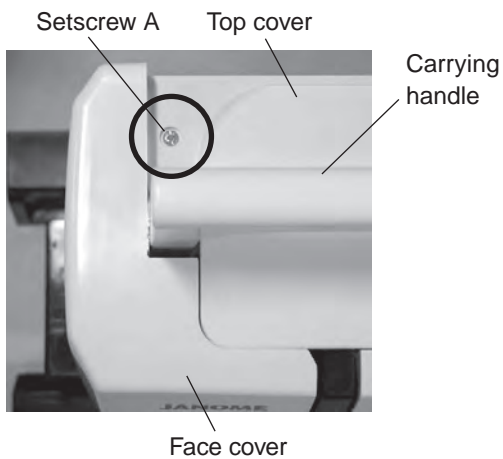
### To attach:

1. Follow the above procedure in reverse.



## Changing External Parts (2)

Fig. 1



### Top cover

#### To remove:

1. Raise the carrying handle and remove the setscrew A.
2. Open the top cover. Pull out the flange plate from the bobbin winder spindle (see fig. 2).
3. Remove the setscrew B and C.
3. Open the face cover. Close the top cover. Raise the carrying handle and remove the top cover.

#### To attach:

1. Follow the above procedure in reverse. To attach the flange plate, align the spring and mark A of the flange plate, and push the flange plate down until it snaps to the machine (see fig 4).

Fig. 2

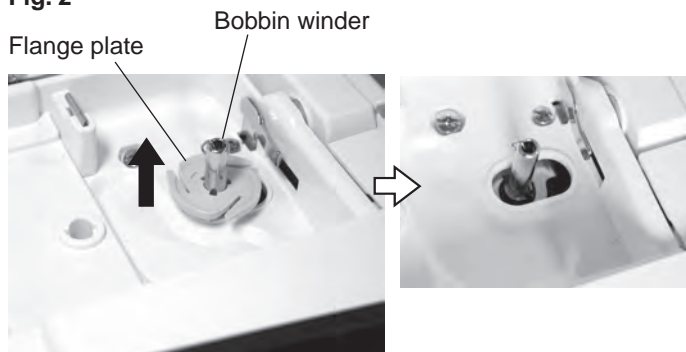


Fig. 3

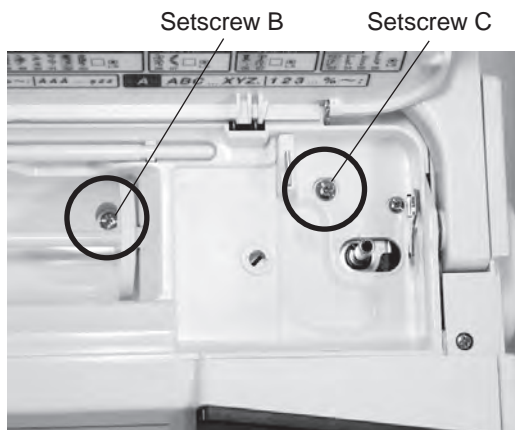
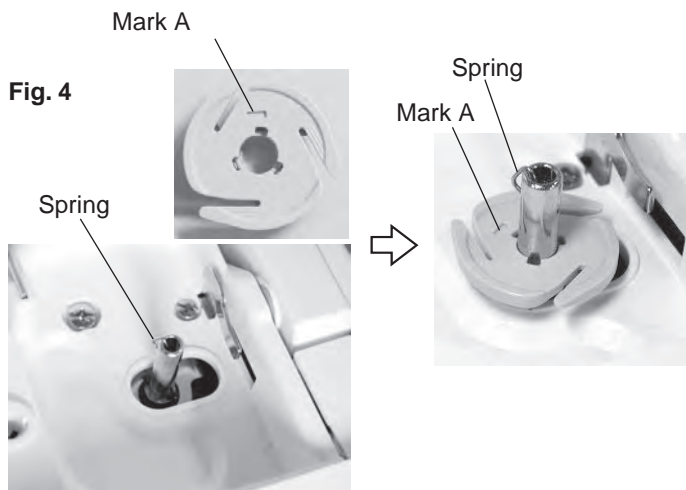


Fig. 4



## Changing External Parts (3)

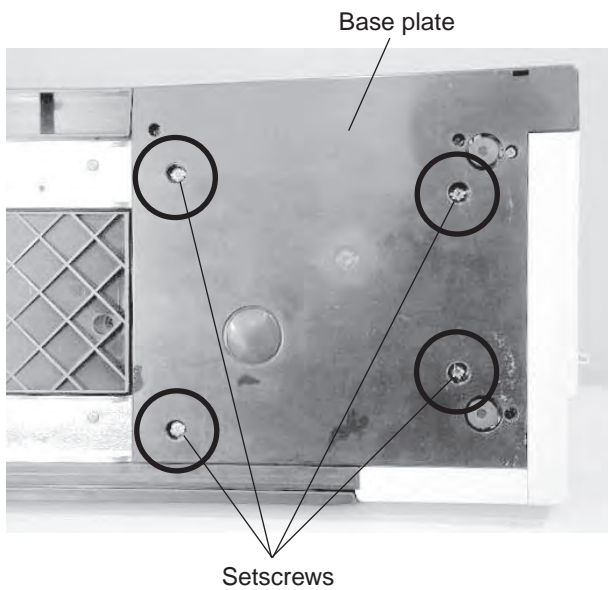


Fig. 1

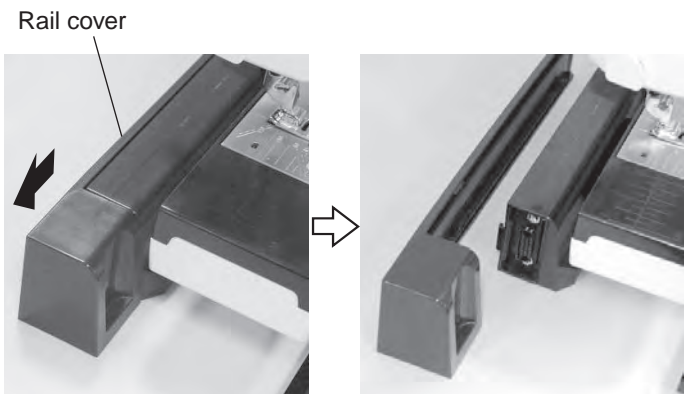
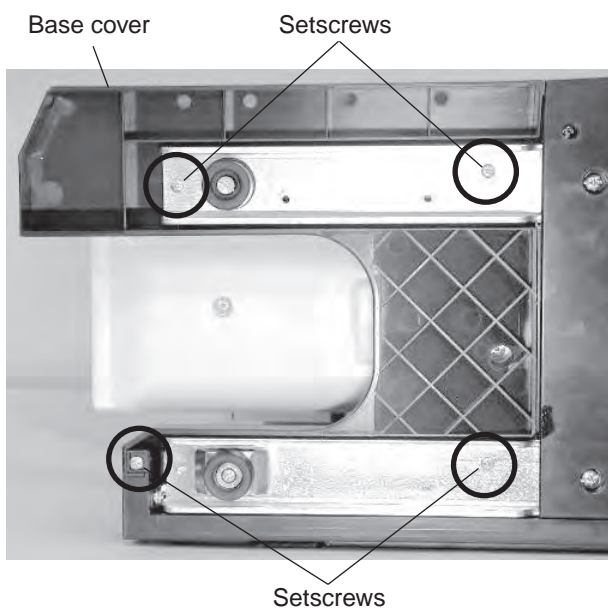


Fig. 2



### Base plate

#### To remove:

1. Remove the setscrews (x 4).
2. Remove the base plate.

#### To attach:

1. Follow the above procedure in reverse.

### Base cover

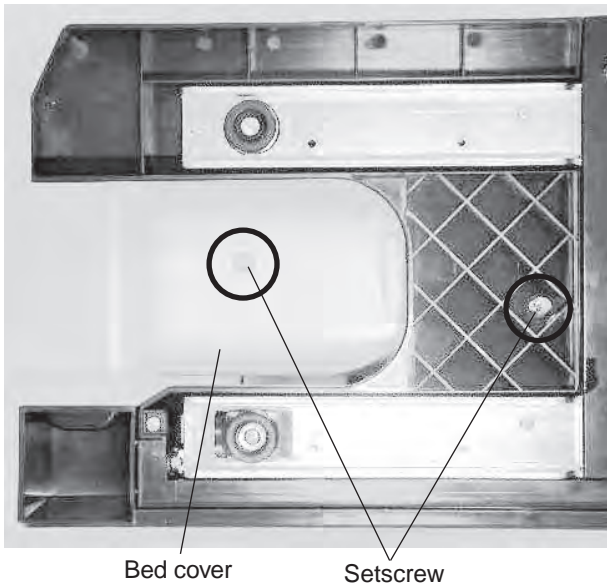
#### To remove:

1. Slide the rail cover in the direction of arrow to remove the rail cover (see fig 1).
2. Remove the setscrews (X4) (see fig 2).  
Remove the base cover.

#### To attach:

1. Follow the above procedure in reverse.

## Changing External Parts (4)



### Bed cover

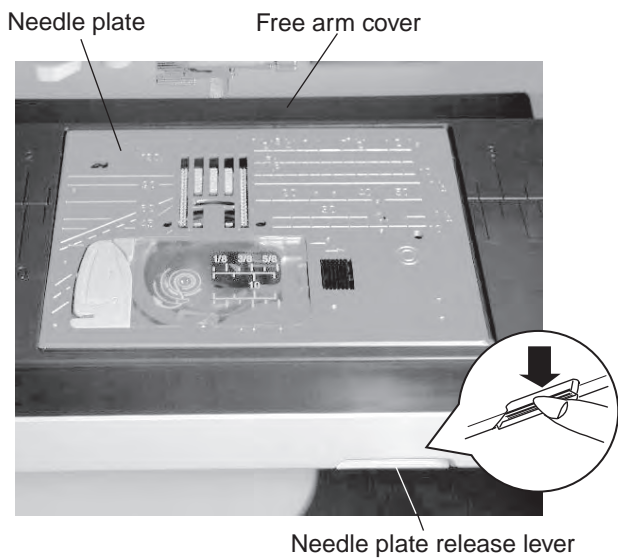
#### To remove:

1. Remove the setscrews (x 2).
2. Remove the bed cover.

#### To attach:

1. Follow the above procedure in reverse.

Fig. 1

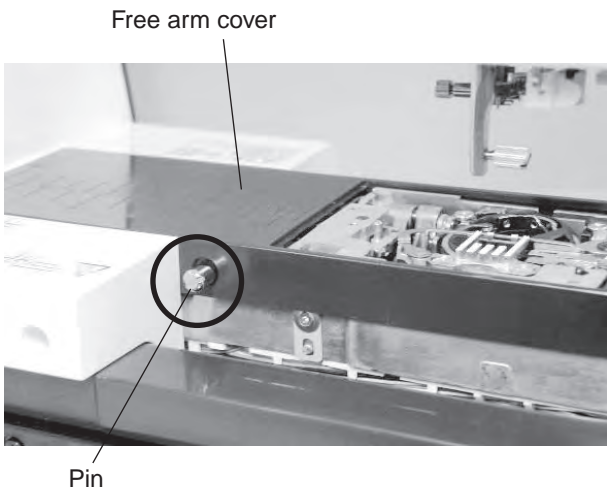


### Free arm cover

#### To remove:

1. Remove the needle and presser foot holder.
2. Press down the needle plate release lever to release the needle plate (see fig. 1).
3. Remove the bed cover.

Fig. 2

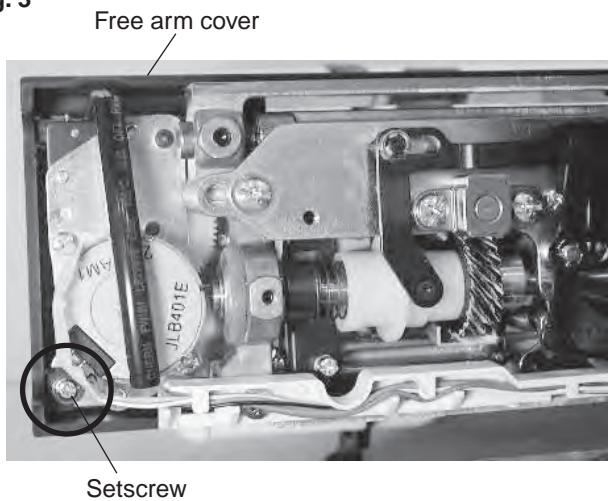


4. Remove the pin (see fig. 2).



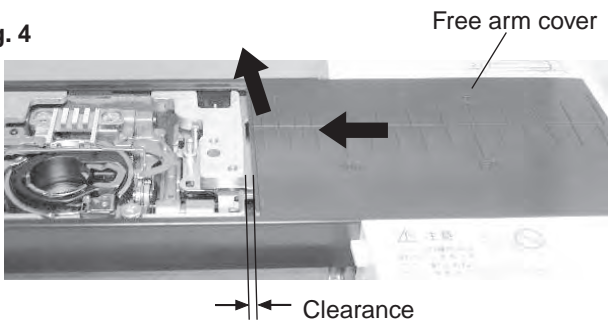
## Changing External Parts (5)

Fig. 3



5. Loosen the setscrew (see fig. 3).

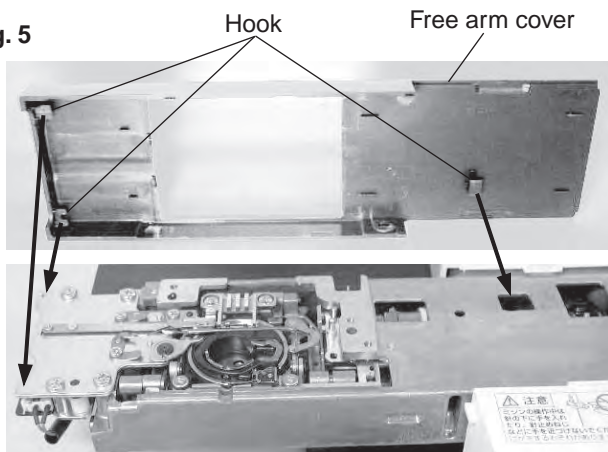
Fig. 4



6. Slide the free arm cover in the direction of arrow until there is no clearance between the free arm cover and the free arm (see fig. 4).

7. Lift up the free arm cover and slide it to the left while removing the hooks from the machine. Remove the free arm cover.

Fig. 5



### To attach:

1. Follow the above procedure in reverse. Match the hooks and holes of the machine. Press down the free arm cover firmly and slide it to the right (see fig. 5). Slide the free arm cover to the right while pulling the front cover to the front when the front right edge of the free arm cover touched to the projection (see fig. 6).

2. Tighten the setscrew and pin (see fig. 2 and 3).

3. Slide the guides of the needle plate to the machine, and press it down until it snaps to the machine (see fig. 7).

Fig. 6

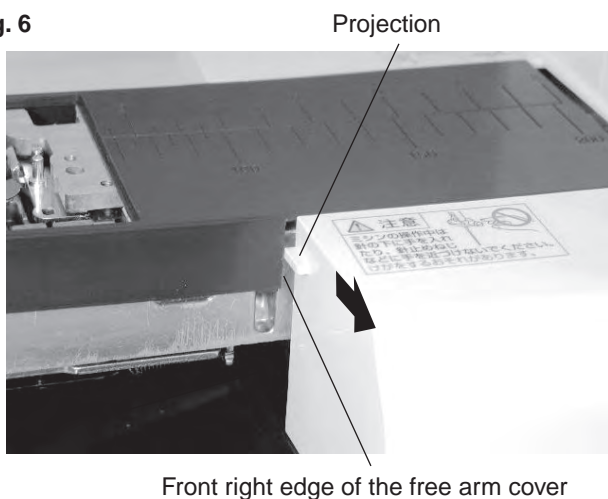
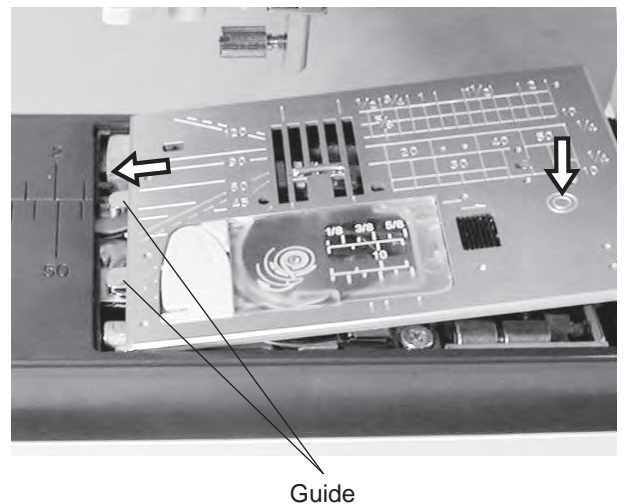
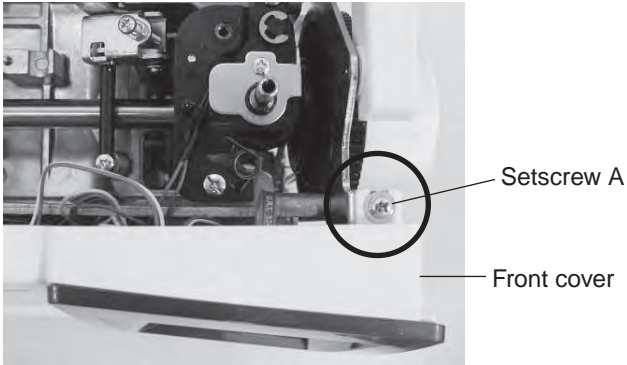


Fig. 7



# Changing External Parts (6)

Fig. 1



## Front cover

### To remove:

1. Remove the belt cover, top cover and base plate (see pages 1, 2 and 3).
2. Loosen the setscrews A, B, C, D and E (see fig. 1-5).
3. Push the rear cover through the holes F and G with a screwdriver to remove the hook of rear cover.
4. Remove the front cover.

### To attach:

1. Follow the above procedure in reverse.

Fig. 2

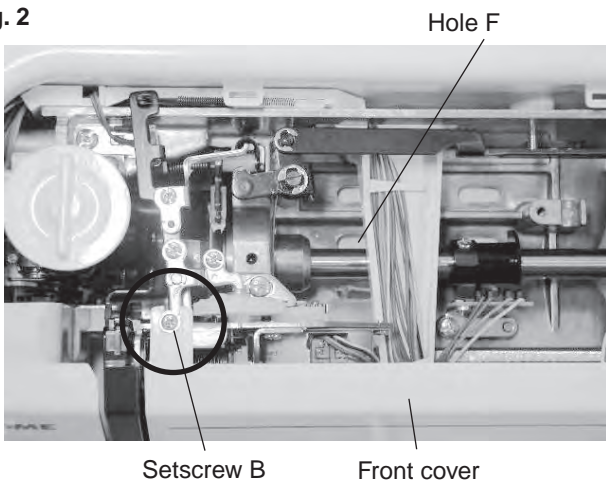


Fig. 3



Fig. 4

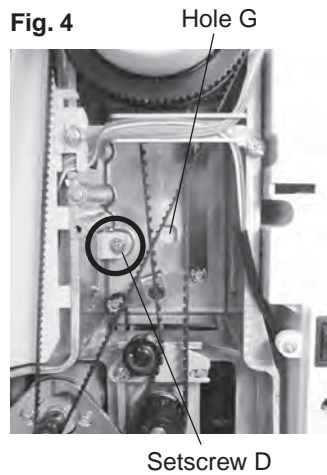
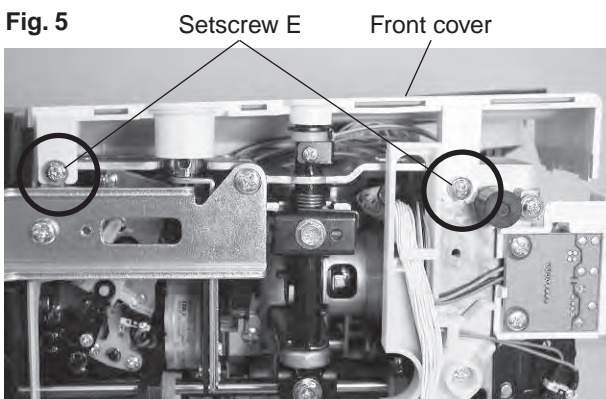


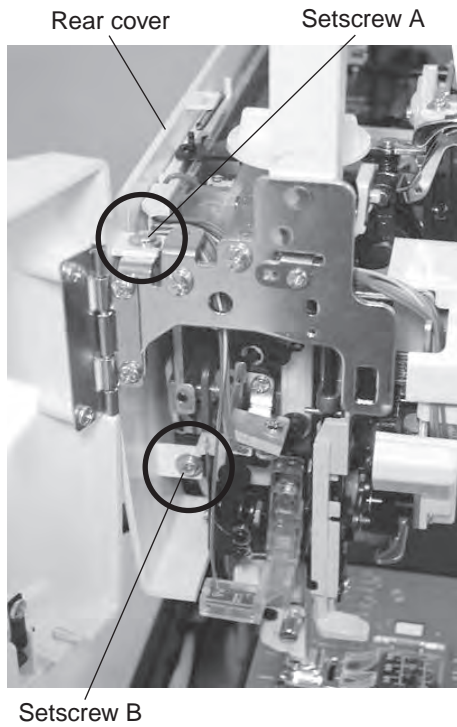
Fig. 5





# Changing External Parts (7)

Fig. 1



## Rear cover

### To remove:

1. Lower the presser foot.
2. Remove the belt cover, top cover and base cover (see pages 1, 2 and 3).
3. Loosen the setscrews A and B (see fig. 1). Remove the setscrews C (see fig. 2)
4. Push the rear cover from the holes D and E with a screwdriver to remove the hook of rear cover.
5. Remove the rear cover.

### To attach:

1. Follow the above procedure in reverse.

Fig. 2

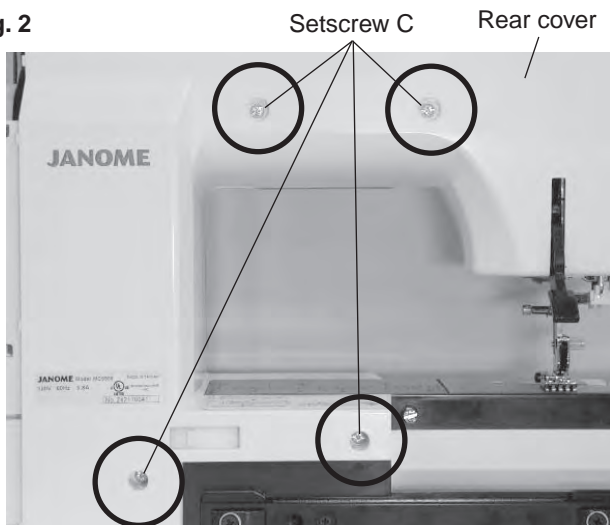


Fig. 3

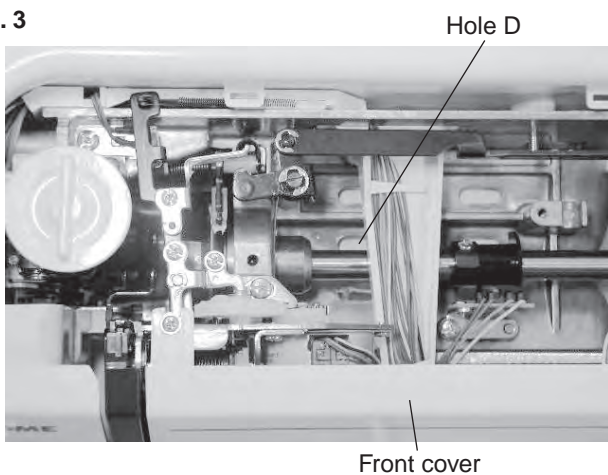
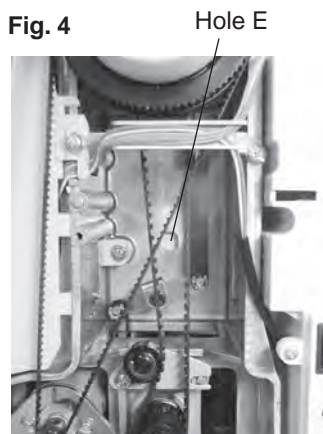


Fig. 4



# Replacing electronic components

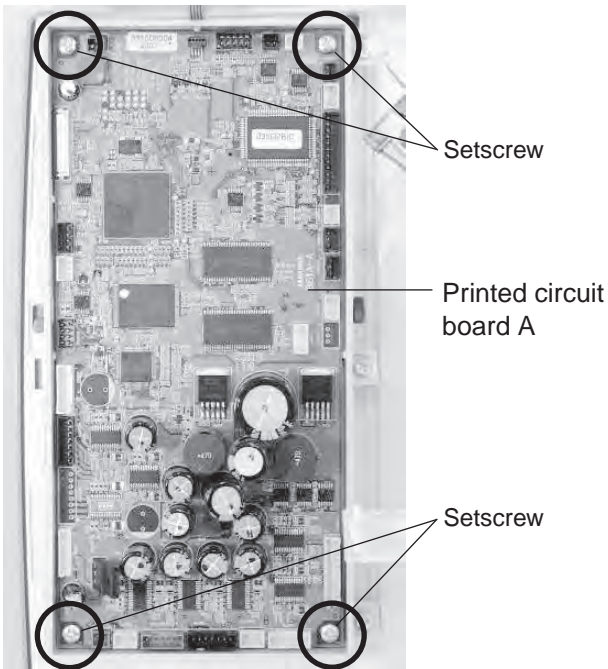
## Printed circuit board A

### To remove:

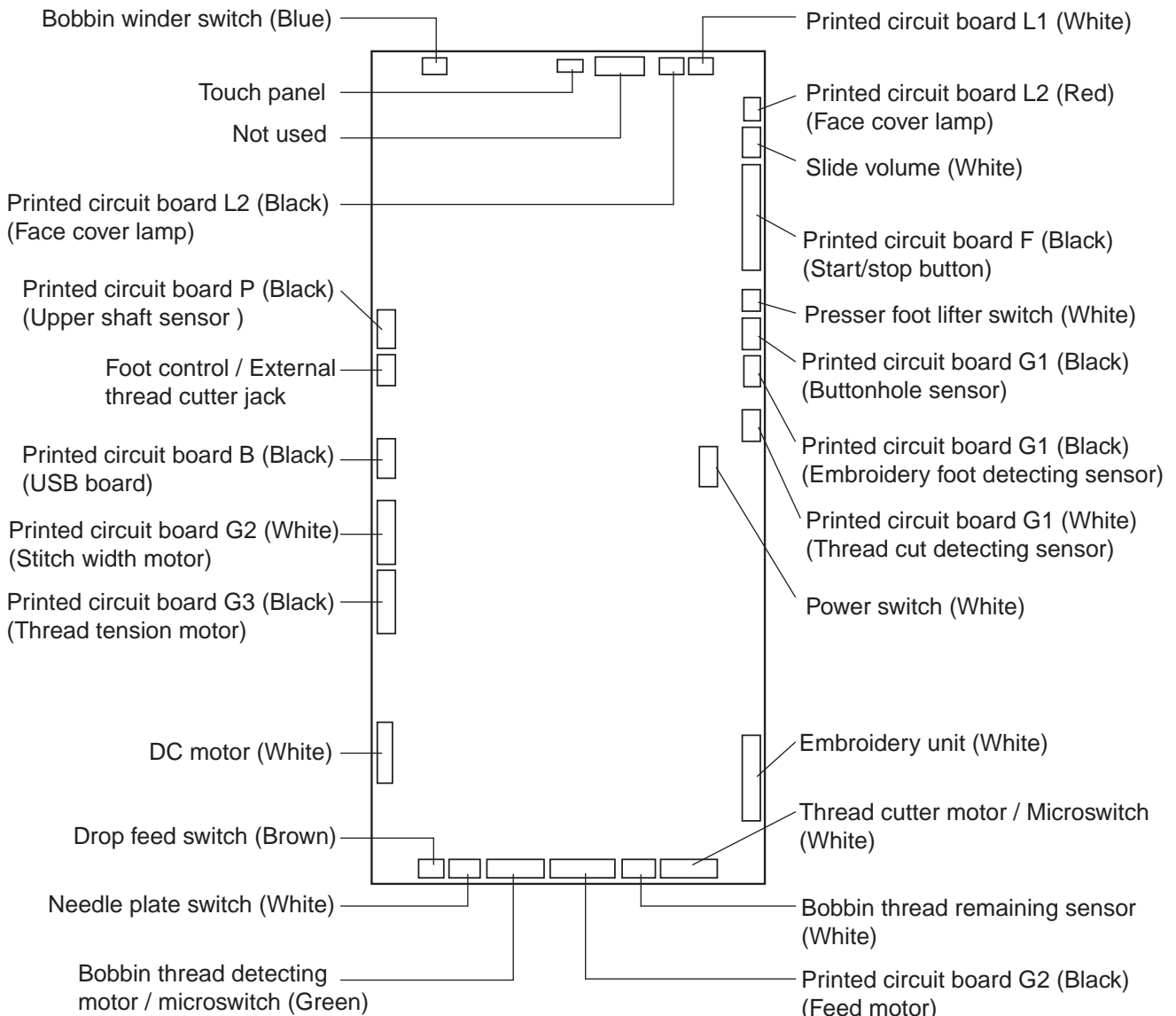
1. Remove the front cover (see page 6).
  2. Grasp the connector directly with your fingers and pull. Do not pull the lead wire, as this may damage the contact sleeve inside the connector. Remove the setscrews. Remove the printed circuit board A.
- \* Pull out the flexible cable behind the printed circuit board A after removing the setscrews.

### To attach:

1. Follow the above procedure in reverse. Be sure that the connector post on the printed circuit board to which it is connected. Position the connector correctly, then push it straight down until it locks in place.



## Printed circuit board A connection



# Replacing electronic components

## Printed circuit board F

### To remove:

1. Remove the front cover (see page 6).
2. Disconnect the connector from the circuit board A (see page 8).
3. Remove the CS rings.
4. Remove the setscrews and the circuit board F.

### To attach:

1. Follow the above procedure in reverse.

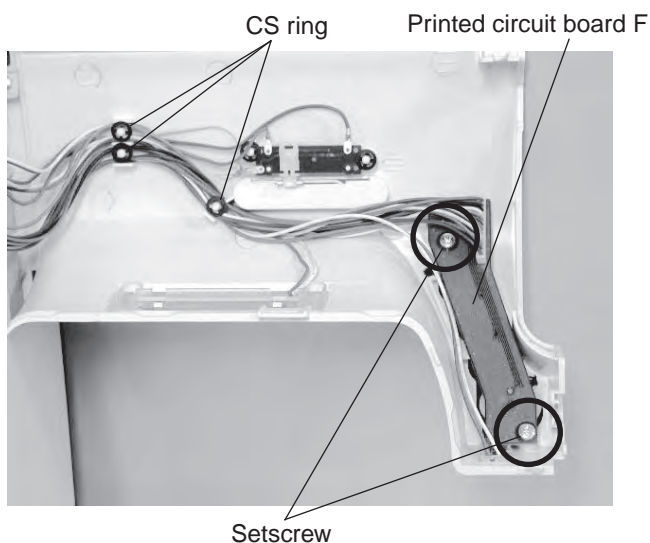


Figure 1

Figure 2



Cord guide plate

Connector of printed circuit board B

## Printed circuit board B (USB board)

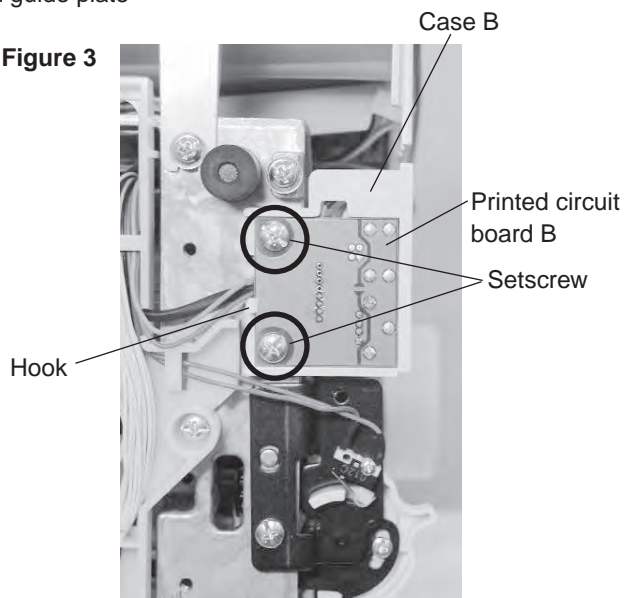
### To remove:

1. Remove the belt cover and base plate (see pages 1 and 3).
2. Loosen the setscrew. Remove the cord guide plate (see fig. 1).
3. Pull out the connector of printed circuit board B from printed circuit board A.
4. Remove the setscrews, and the printed circuit board B with the case B. (see fig. 3)
5. Remove the hook from the printed circuit board B.

### To attach:

1. Follow the above procedure in reverse.

Figure 3



# Replacing electronic components

Switching power supply unit



## Switching power supply unit

### To remove:

1. Remove the belt cover (see page 1).
2. Loosen the setscrew A. Remove the cord guide plate. (see fig. 1)
3. Disconnect the relay connector between the printed circuit board A and the switching power supply unit (see fig. 2).
4. Disconnect the power supply connector from the switching power supply unit (see fig. 3).
5. Remove the setscrews B, C and D (see fig. 3). Remove the switching power supply.

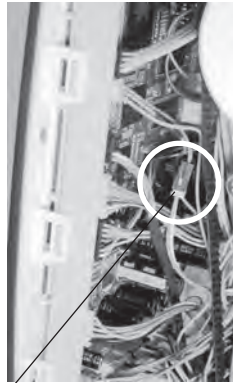
### To attach:

1. Follow the above procedure in reverse.

Fig. 1

Setscrew A

Fig. 2



Relay connector

Cord guide plate

Fig. 3

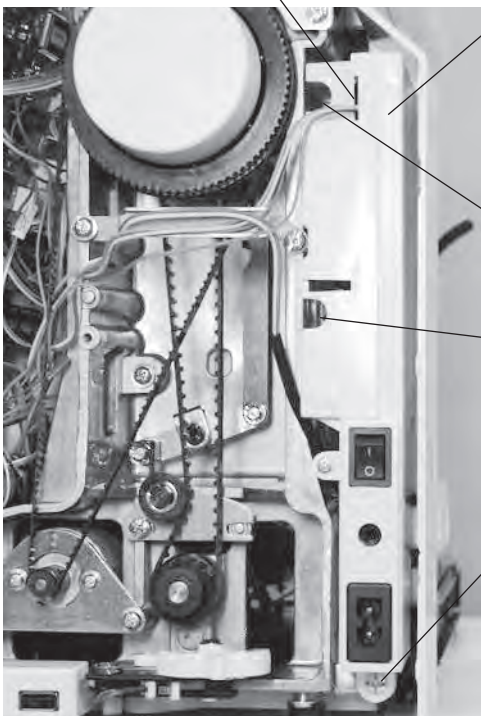
Power supply connector

Switching power supply unit

Setscrew B

Setscrew C

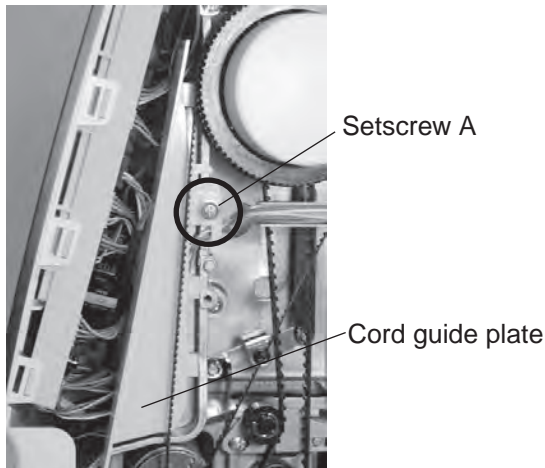
Setscrew D





# Replacing electronic components

Fig. 1

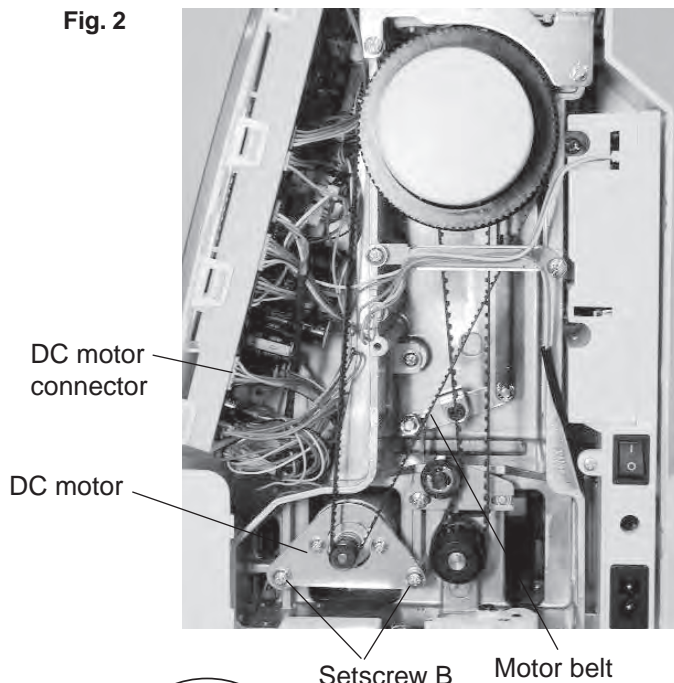


## Driving motor

### To remove:

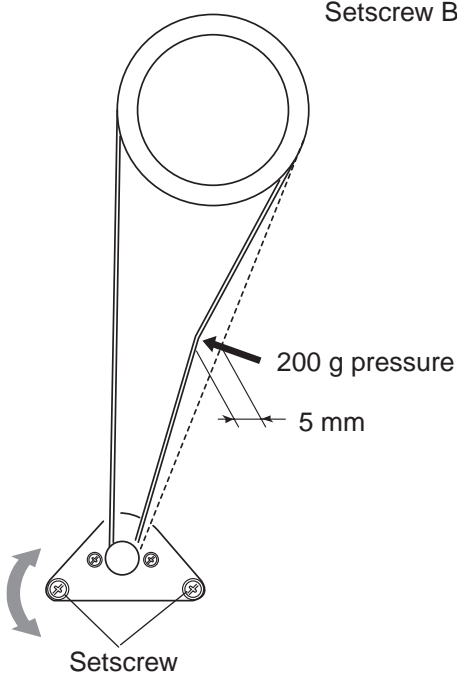
1. Remove the belt cover and the base plate (see pages 1 and 3).
2. Loosen the setscrew A and remove the cord guide plate (see fig. 1).
3. Disconnect the DC motor connector from the printed circuit board A (see page 8).
4. Remove the setscrews B, and the DC motor (see fig. 2).

Fig. 2



### To attach:

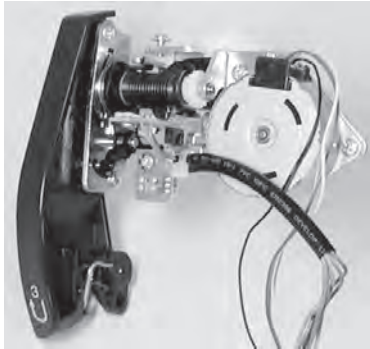
1. Attach the driving motor. Tighten the setscrews temporarily.
2. Adjust the motor belt deflection to about 5 mm by pressing the middle of the motor belt with approximately 200 grams of pressure.
3. Tighten the setscrews B securely.
4. Plug the driving motor connector to the printed circuit board A.
5. Attach the base plate and the belt cover (see pages 1, 2 and 6).





# Replacing electronic components

Thread tension unit



## Thread tension unit

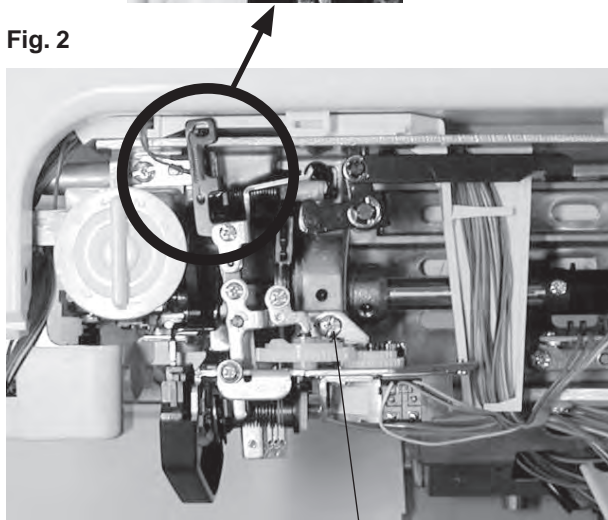
### To remove:

1. Remove the belt cover, top cover, base plate and front cover (see pages 1, 2, 3 and 6).
2. Disconnect the printed circuit board G3 (thread tension motor) connector and printed circuit board G1 (thread cut detecting sensor) connector (see page 8).
3. Remove the spring on the thread tension release lever (see fig. 1).
4. Remove the setscrews A and B (see fig. 2 and 3). Remove the thread tension unit.

Fig. 1



Fig. 2



Setscrew A

Fig. 3



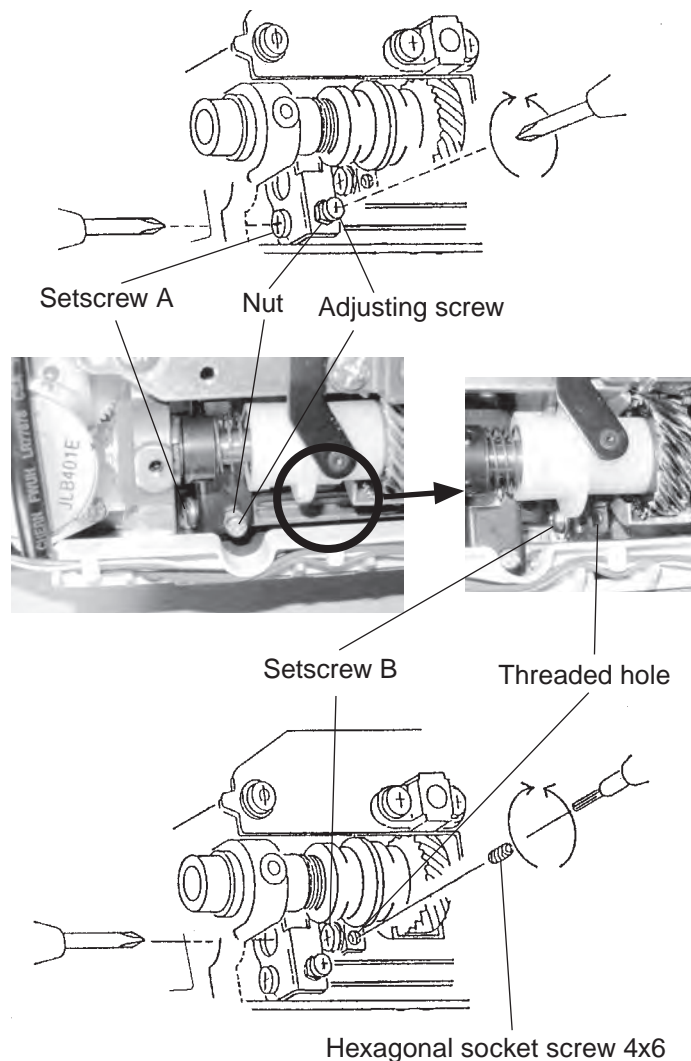
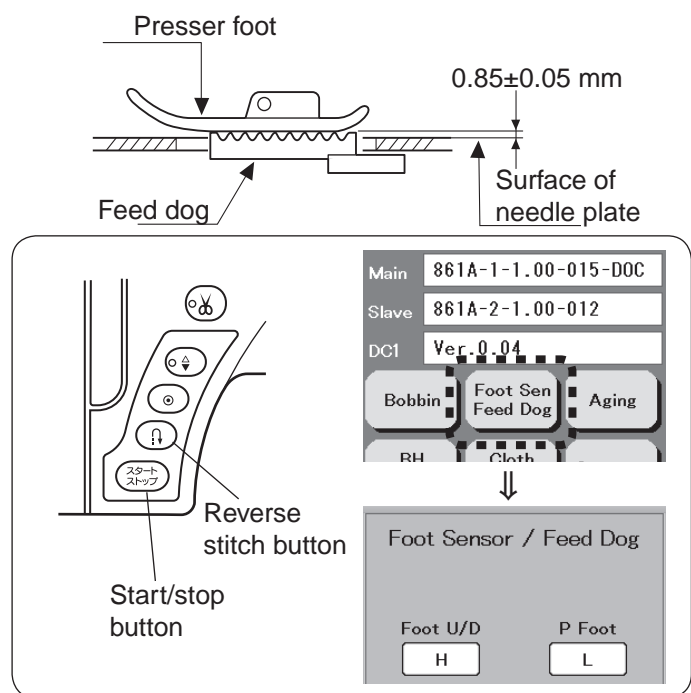
### To attach:

1. Follow the above procedure in reverse. Check the following parts after this adjustment.
  - Check the upper thread tension (see page 21).
  - Check the thread tension release mechanism (see page 22).
  - Check the presser foot lifter detecting switch (see page 29).
  - Check the knee lifter position (see page 30).

# Mechanical adjustment

## Feed dog height

When the foot pressure dial is at “5” and the presser foot A is lowered, the highest position of the feed dog should be 0.80 to 0.90 mm from the surface of the needle plate.



### Adjustment 1:

1. Attach the presser foot A. Remove the bed cover (see page 4).
2. Turn the power switch on while pressing start/stop button to enter the factory setting mode. Press “Foot Sen/Feed Dog” key. The stitch length will be set at “5.0”.
3. Set the pressure adjusting dial at “5” with the presser foot lowered. Turn the handwheel toward you to raise the feed dog at its highest position.
4. Loosen the setscrew A.
5. Loosen the nut. Adjust the feed dog height to 0.85 mm by turning the adjusting screw.
6. Tighten the nut and setscrew A.
7. Attach the bed cover.
8. Check if the feed dog is parallel to the surface of the needle plate at its highest position. If not, make the adjustment as follows:

### Adjustment 2:

If the feed dog is not parallel to the surface of the needle plate at its highest position, make the adjustment as follows:

\* For this adjustment, a hexagonal socket screw 4x6, part no. 000111108 is required.

1. Remove the bed cover. Insert a hexagonal socket screw I, part no. 000111108 into the threaded hole until it stops.
2. Turn the setscrew B clockwise to loosen it.
3. Turn the hexagonal socket screw 4x6 until the feed dog is parallel with the surface of the needle plate.
4. Tighten the setscrew B.
5. Remove the hexagonal socket screw 4x6.
6. Check the feed dog height again.

# Mechanical adjustment

## Clearance between needle and tip of the rotary hook

The clearance between the needle and the point of hook should be  $-0.1$  to  $+0.05$  mm.

Fig. 1

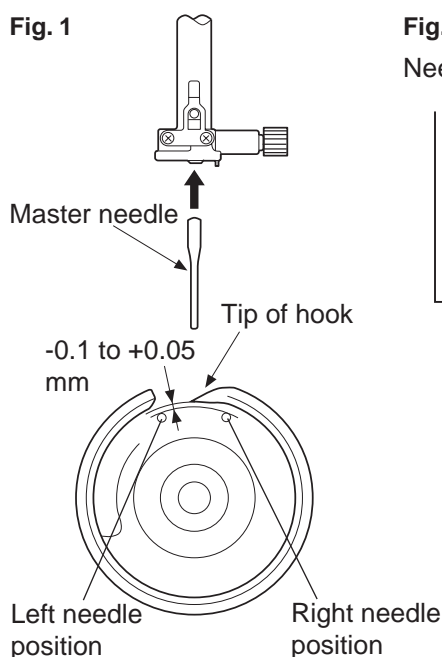
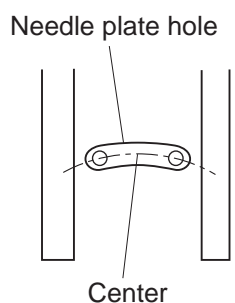


Fig. 2



## Adjustment 1

1. Remove the top cover (see page 2).
2. Remove the presser foot pressure dial, presser foot, the needle plate and the bobbin holder. (see page 4 and 5)  
\* Cover the needle plate with the fabric to prevent damaging the needle plate when removing.
3. Attach the master needle (see fig.1).
4. Turn the power switch ON while pressing start/stop button and reverse stitch button to enter the factory setting mode. Press "Bobbin" key. The stitch width will be set at 9.0.
5. Turn the handwheel toward you. Adjust the clearance between the needle and the tip of the rotary hook, by moving the needle bar supporter in the direction of arrow (see fig.3).
6. Check the clearances A and B between the needle and the edge of needle plate hole (see fig. 4). If the clearances are not even, follow the procedure in the next page.

Fig. 3 Presser foot pressure adjusting dial

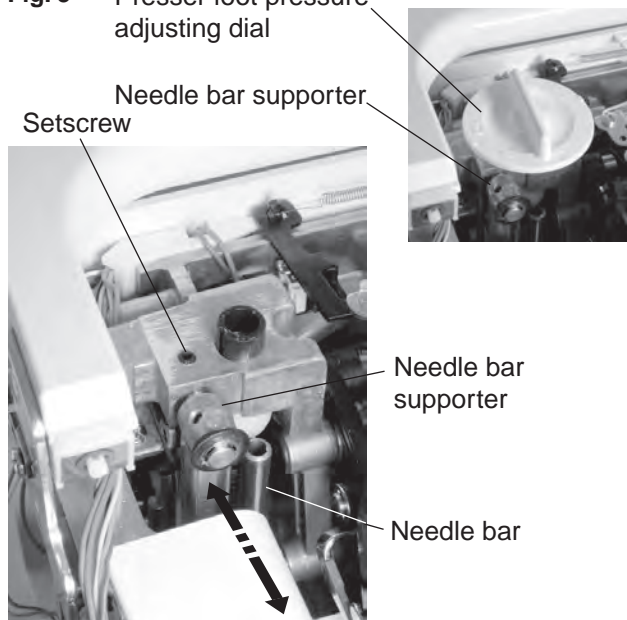
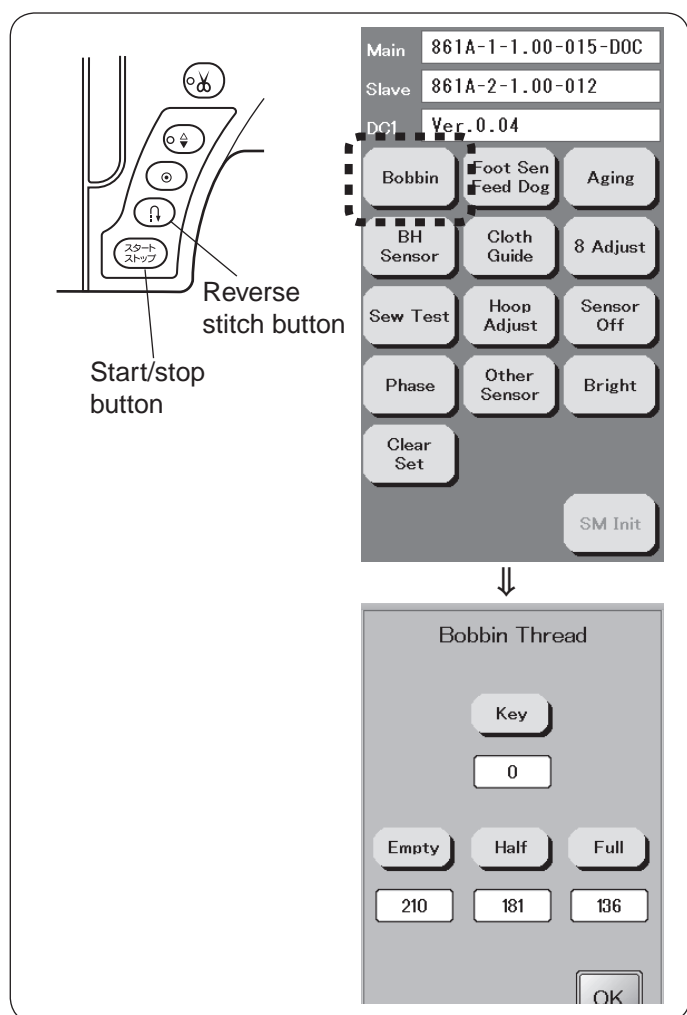
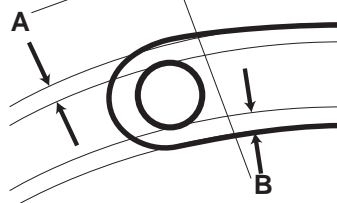
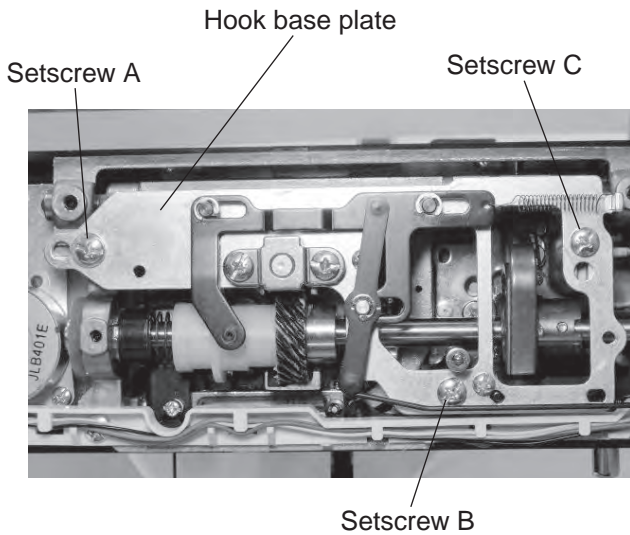


Fig. 4

Clearances must be even



**Fig. 5**



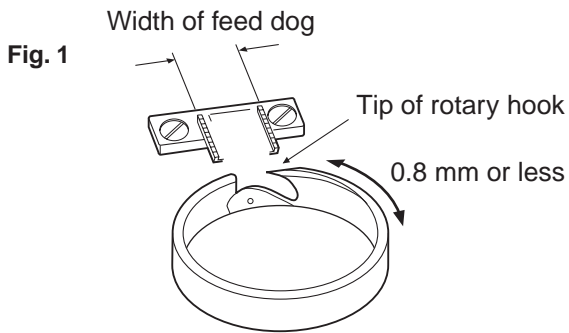
## **Adjustment 2**

1. Remove the base cover and bed cover (see page 3 and 4).
2. Loosen the setscrews A and B.  
Loosen the setscrew C just enough to move the hook base plate (see fig. 5).
3. Turn the handwheel toward you.  
Adjust the clearance between the needle and the tip of the rotary hook by moving the hook base plate up or down between -0.1 and +0.05 mm at the both left and right needle position (see page 14).
4. Tighten the setscrews A, B and C.  
Check the following parts after this adjustment.
  - Check the backlash between the lower shaft gear and the hook drive gear. If the backlash is too great or the engagement of the gears is too tight, adjust the backlash (see page 16).
  - Check the hook adjustment and needle bar height after this adjustment (see page 18 and 19)

# Mechanical adjustment

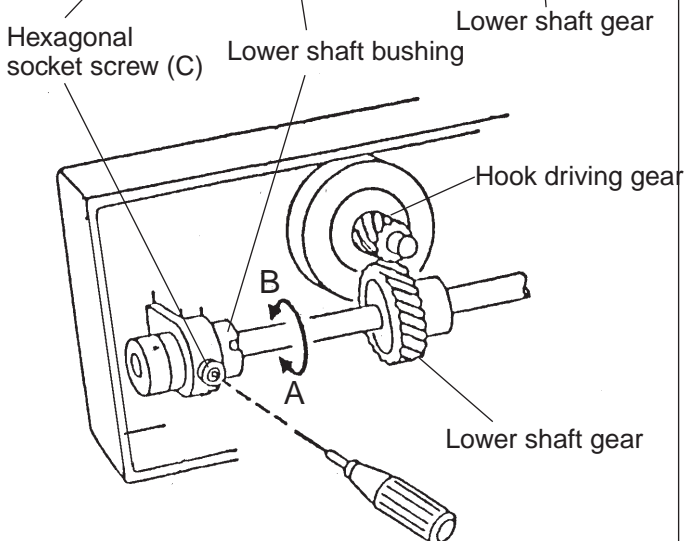
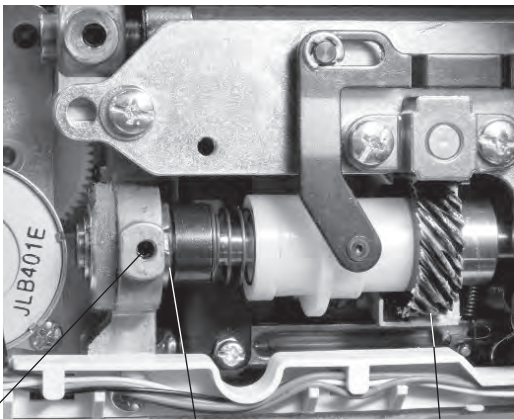
## Backlash between hook drive gear and lower shaft gear

The rotary play of the hook should be 0.8 mm or less when the tip of rotary hook is within the width of feed dog.

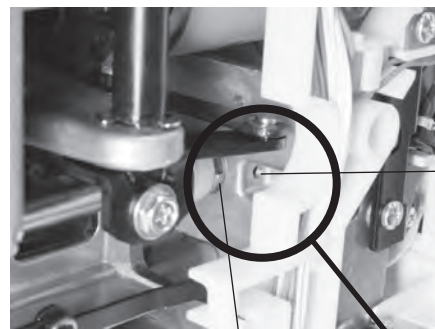


1. Remove the presser foot, the needle plate and the bobbin holder. (see page 4 and 5)
  - \* Cover the needle plate with the fabric to prevent damaging the needle plate when removing.
2. Remove the base cover and bed cover (see page 3 and 4).
3. Turn the handwheel toward you so the the tip of the rotary hook is within the width of feed dog as shown in figure 1. Check the rotary play of the hook.
4. If the backlash is too much or too little, loosen the hexagonal socket screw (C) and (D) and following the adjustment procedure.
  - If the backlash is too great (more than 0.8 mm), turn the both lower shaft bushings in direction A. If the engagement of gear is too tight, and the machine does not turn smoothly, turn the both lower shaft bushings in direction B. Adjust the grooves of the lower shaft bushing as well.
5. Tighten the hexagonal socket screws.
  - Check the hook adjustment and needle bar height after this adjustment (see page 18 and 19)

Lower bushing of the front side



Lower bushing of the belt cover



Lower shaft bushing

Hexagonal socket screw (D)





# Mechanical adjustment

## Needle drop position

When the straight stitch is selected, the needle should be positioned in the center of the needle plate hole. When the needle drop position is set at "0.0" and "9.0", the clearance between the side of the needle and the needle hole should be 0.2 mm or more.

Fig. 1

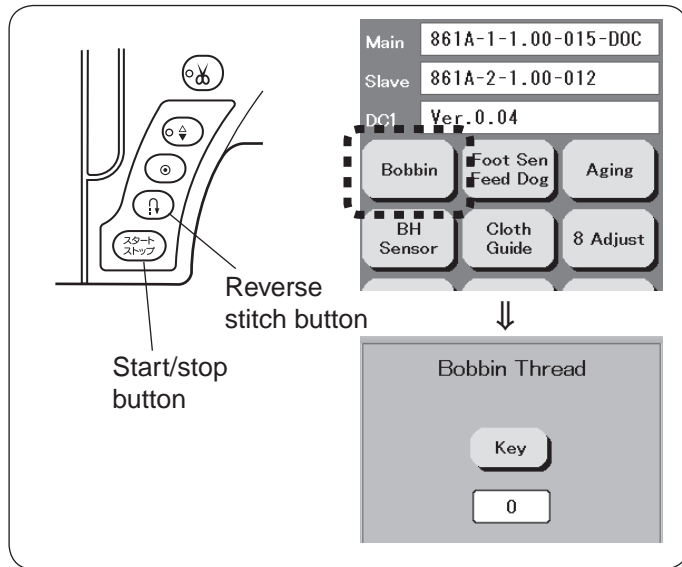
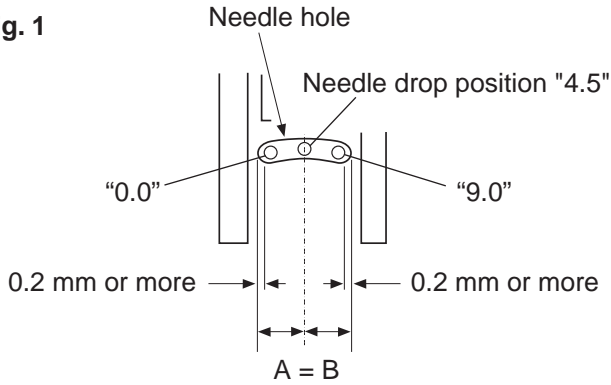
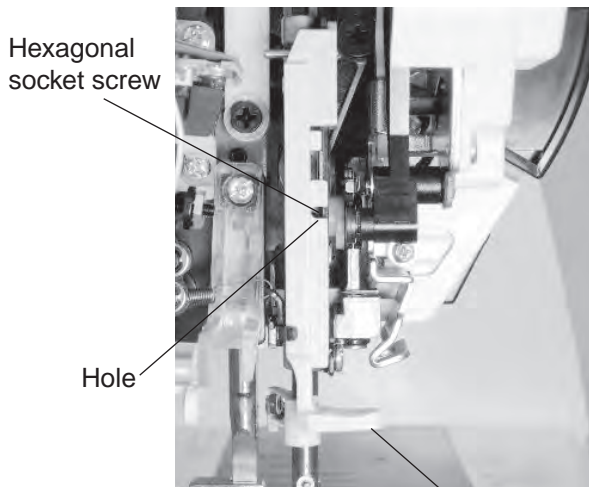
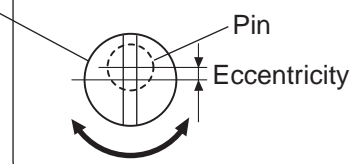


Fig. 2



Eccentric pin

Fig. 3



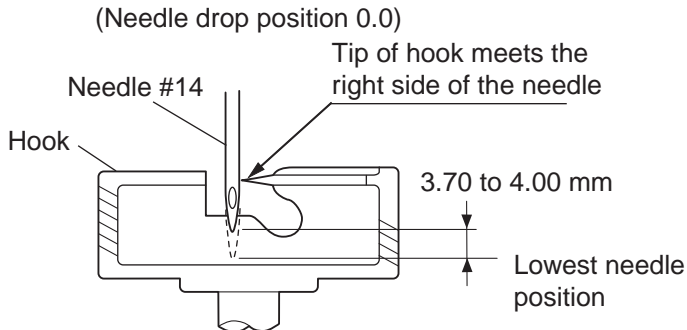
## To adjust:

1. Attach the needle #14.
2. Turn the power switch ON while pressing start/stop button and reverse stitch button to enter the factory setting mode. Press "Bobbin" key. The stitch width will be set at 9.0.
3. Turn the handwheel toward you. Check that the needle drop position is centered when the drop position is set at "4.5", and the clearance between the side of the needle and the needle hole is 0.2 mm or more when the needle position is set at "0.0" and "9.0" (see fig. 1). If this is not the case, adjust as follows;
3. Lower the needle threader until the hexagonal socket screw shows up (see fig. 2). Loosen the hexagonal socket screw. Turn the eccentric pin to adjust the needle drop position. The direction of eccentric pin should be as shown as fig. 3.
4. Tighten the hexagonal socket screw. Check the hook timing and the needle bar height after this adjustment (see page 15 and 16).


# Mechanical adjustment

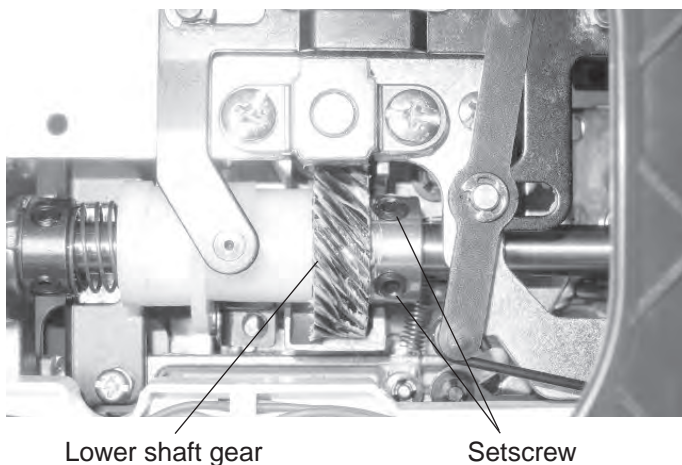
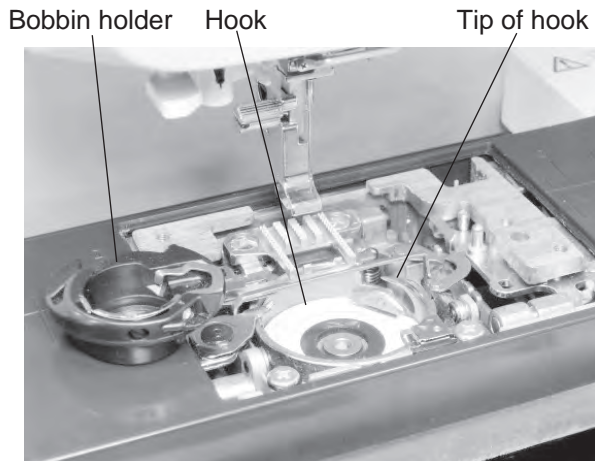
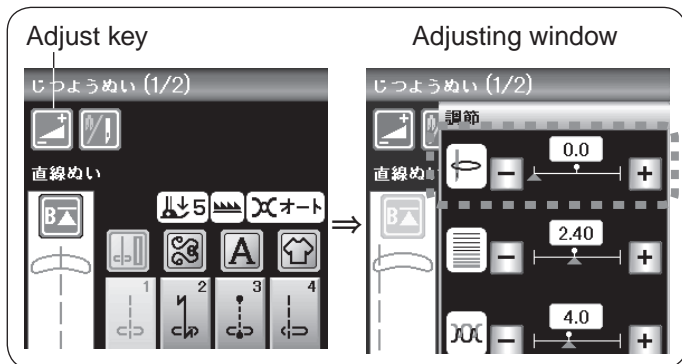
## Hook timing

The amount of ascending travel of the needle bar from its lowest position to the position (Needle drop position 0.0) where the tip of the rotary hook exactly meets the right side of the needle should be 3.70 to 4.00 mm



### To adjust:

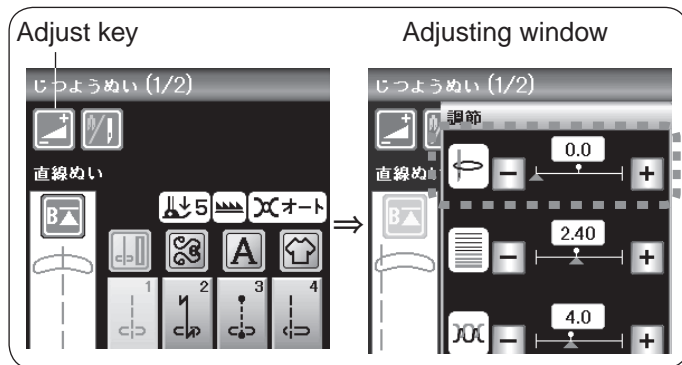
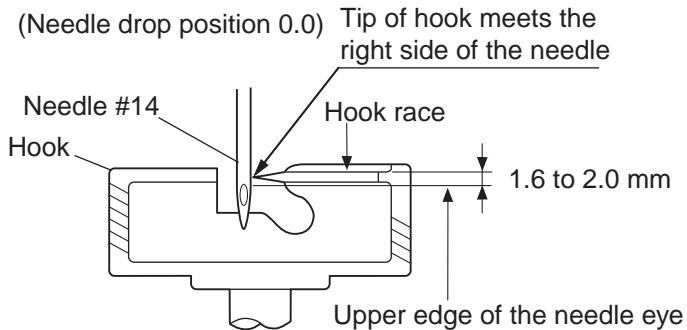
1. Attach the needle #14.
2. Turn the power switch ON. Select straight stitch . Set the needle drop position at "0.0". Turn the power switch OFF.
3. Remove the presser foot, the needle plate and the bobbin holder. (see page 4 to 5)  
\* Cover the needle plate with the fabric to prevent damaging the needle plate when removing.
4. Remove the bed cover (see page 4).
5. Turn the handwheel toward you to lower the needle at its lowest position.
6. Loosen the setscrews of the lower shaft gear.
7. Turn the handwheel toward you to raise the needle bar further 3.85 mm from its lowest position.
8. Turn the lower shaft gear until the tip of rotary hook meets with the right side of the needle. Tighten the setscrews of the lower shaft gear.
  - Check the needle bar height after this adjustment (see page 19).




# Mechanical adjustment

## Needle bar height

The distance between the upper edge of the needle eye and the hook race should be in the range of 1.6 to 2.0 mm when the tip of the hook meets right side of the needle in the needle drop position "0.0" as the needle ascends from its lowest position.



1. Attach the needle #14.
2. Turn the power switch ON. Select straight stitch . Set the needle drop position at "0.0".  
\* Do not turn the switch OFF.

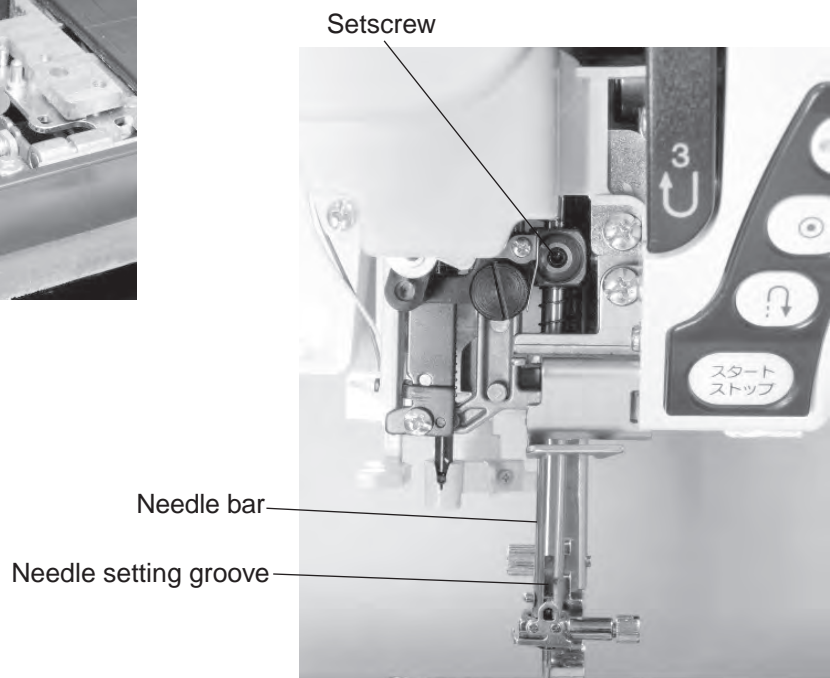
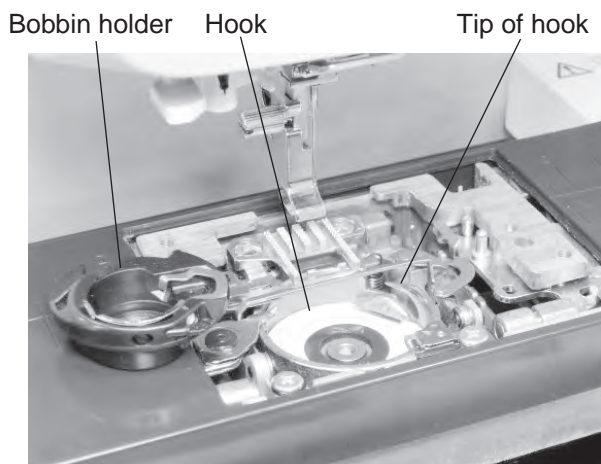
3. Remove the presser foot, the needle plate and the bobbin holder (see page 4 and 5).  
\* Cover the needle plate with the fabric to prevent damaging the needle plate when removing.

4. Turn the handwheel toward you until the tip of hook meets the right side of the needle.

5. Loosen the hexagonal socket screw.  
The distance between the upper edge of the needle eye and the hook race should be in the range of 1.8 mm.  
Move the needle bar up or down to adjust the the needle bar height.

6. Tighten the hexagonal socket screw.  
Be sure that the needle setting groove is facing the front.  
Be careful not to turn the needle bar when tightening the screw.

7. Attach the bobbin holder, needle plate.  
• Check the upper shaft shield position (see page 20).

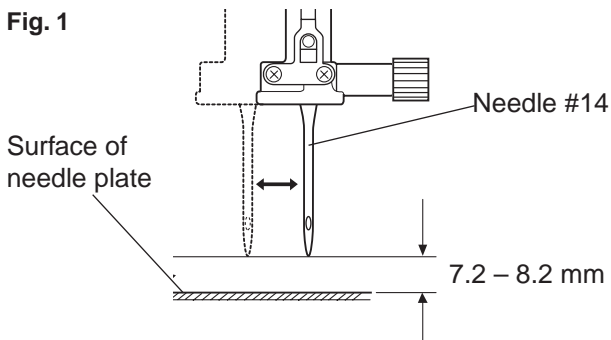


# Mechanical adjustment

## Upper shaft shield plate position

When the machine is set for zigzag stitch, the needle should start to swing 7.2 to 8.2 mm above the surface of the needle plate.

Fig. 1



### To check:

1. Attach the needle #14.
2. Remove the top cover (see page 2)
3. Turn the power switch ON while pressing start/stop button and reverse stitch button to enter the factory setting mode. Press "Phase" key.
4. Turn the handwheel toward you to raise the needle at 7.7 mm above the surface of the needle.
5. Loosen the setscrew A of the lower shaft shield plate. Turn the upper shaft shield plate away from you slightly, then turn upper shaft shield plate toward you slowly until the "Bight" window changes from "H" to "L".
6. Position the lower shaft shield plate in the center of slit of the lower shaft sensor (see Figure. 1). Tighten the setscrew A.

Fig. 2

Main	861A-1-1.00-015-DOC	
Slave	861A-2-1.00-012	
DC1	Ver.0.04	
Bobbin	Foot Sen Feed Dog	Aging
BH Sensor	Cloth Guide	8 Adjust
Sew Test	Hoop Adjust	Sensor Off
Phase	Other Sensor	Bright
Clear Set		

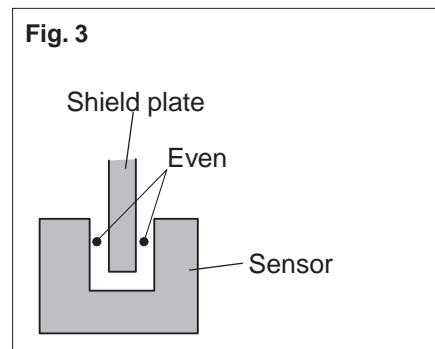
  

PH Sensor	
Bight H	Feed L
Phase 287	

PH Sensor	
Bight L	Feed H
Phase 180	

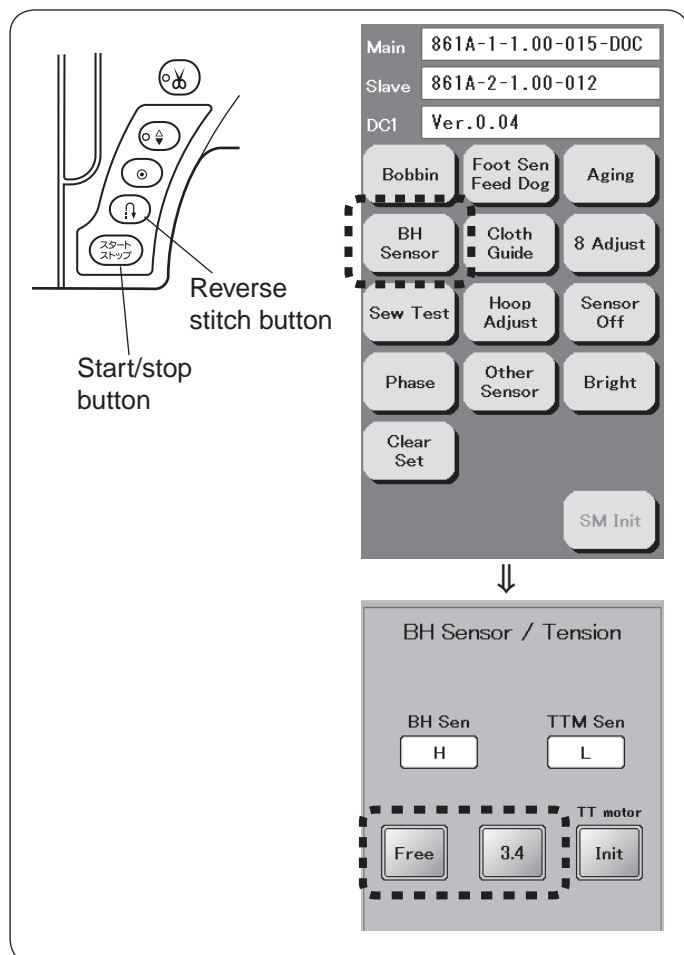
Fig. 3



# Mechanical adjustment

## Upper thread tension

The standard upper thread tension should be 59 to 67 grams when pulling the thread (white polyester thread size 50) at the speed of 110 mm/sec with the tension at "3.4" (Be sure the presser foot is lowered).

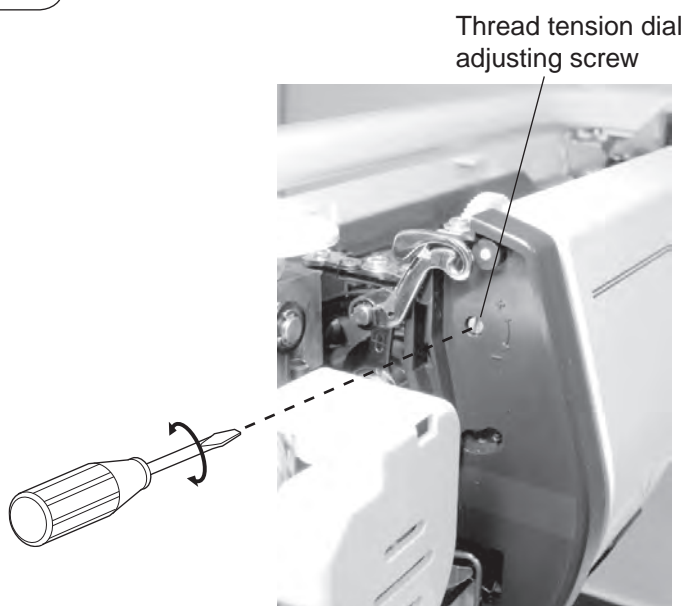
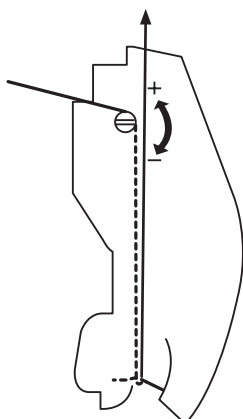


1. Lower the presser foot.
2. Turn the power switch ON while pressing the start/stop button and reverse stitch button. Press "BH sensor" key.
3. Press "Free" key. The tension disc will be opened with the presser foot lowered.
4. Thread white polyester thread (size 50) to the machine.
5. Press "3.4" key. The tension discs will be closed and the thread tension will be set at "3.4".
6. Open the face cover. Adjust the tension by turning the thread tension adjusting screw.

To loosen the tension, turn it clockwise (in the direction of "-").

To tighten the tension, turn it counter clockwise (in the direction of "+").

Pulling direction: (pulling speed 110 mm/sec.)





# Mechanical adjustment

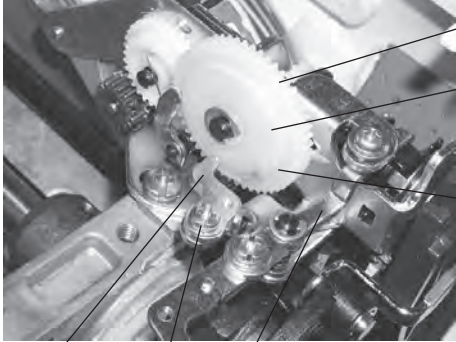
## Tension release mechanism

When the presser foot is lowered, the thread tension discs will be closed and pull the thread.

When the thread tension will be released, the tension disc will be opened and release the thread correctly.

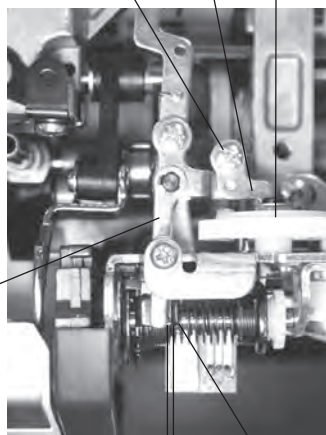
**Fig. 1**

**Convex is NOT set at tension release claw**



Thread tension gear  
Flat part of tension gear  
Convex part of tension gear  
Tension release claw  
Setscrew  
Thread tension release adjusting plate  
Thread tension dial

**Fig. 2**

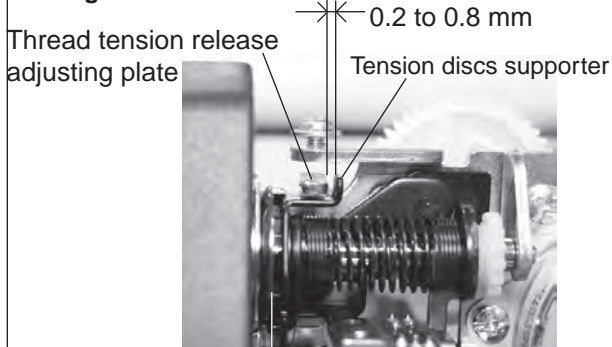


Thread tension release adjusting plate

0.2 to 0.8 mm  
Tension discs supporter

**View A**

**Fig. 3**

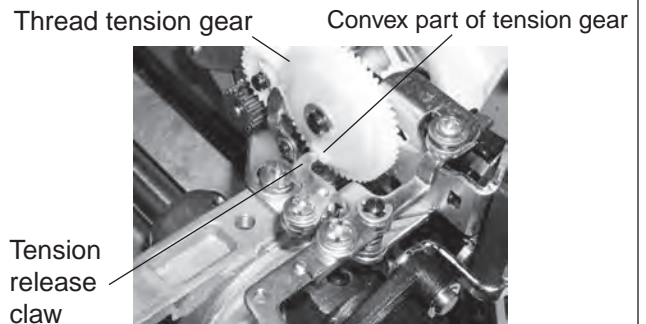


Tension discs (closed)

- 1 Remove the belt cover, top cover, front cover and base cover (see page 1, 2, 3 and 6).
2. Attach the presser foot A. Lower the presser foot.
3. Turn the power switch off. Turn the thread tension gear until the convex part of tension gear is NOT engaged with the tension release claw (see figure 1).
4. Loosen the setscrew (see fig. 1 and 2).
5. Adjust the clearance between the tension release adjusting plate and the tension disc supporter to 0.8 mm – 0.2 mm. Tighten the setscrew (see fig. 2 and 3).
6. Turn the thread tension gear until the convex part of tension gear is engaged with the tension release claw. Be sure that the tension release adjusting plate touches to the tension discs supporter and the tension discs are opened slightly (see fig. 4 and 5).

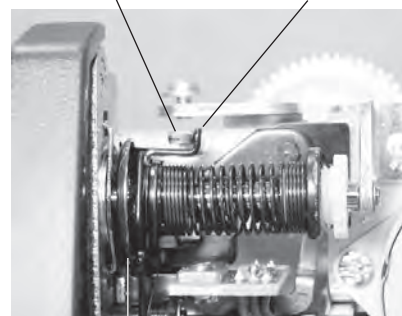
## Convex is engaged with tension release claw

**Fig. 4**



Thread tension release adjusting plate  
Tension discs supporter

**Fig. 5**



Tension discs (opened)

# Mechanical adjustment

## Needle threader plate

If the hook of the threader plate is damaged, change or adjust the part as follows:

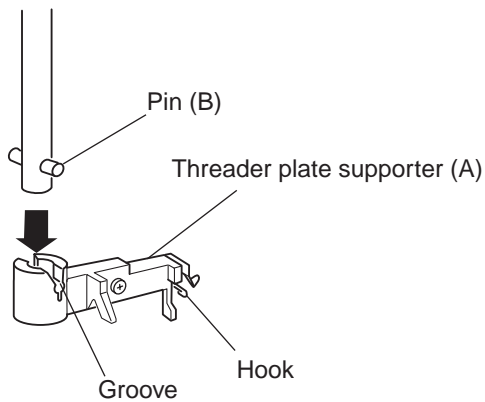


Fig. 1

### To remove:

- 1 Push down the needle threader knob and pull the needle threader plate (A) down to remove it (see Fig. 1).

### To attach:

1. To install the needle threader plate, line the groove up with the pin (B) and push it up to snap it.

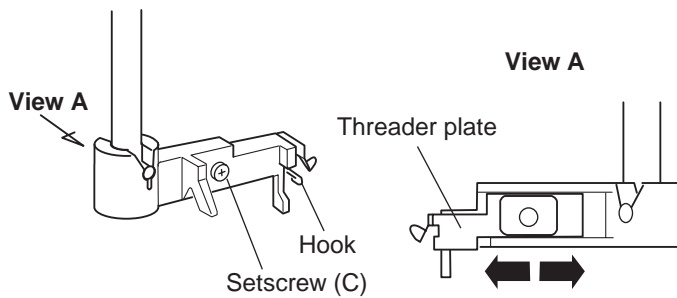


Fig. 2

### To adjust:

1. If the hook on the threader plate touches the left or right side of the needle eye, loosen setscrew (C) and adjust the hook position (Fig. 2).

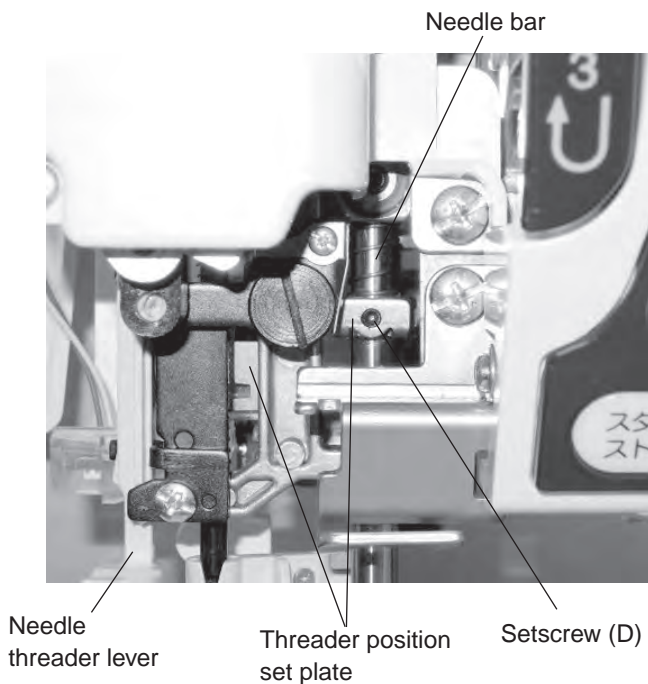


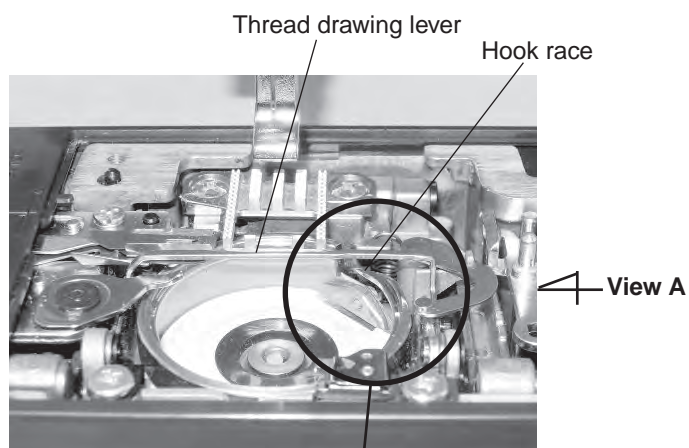
Fig. 3

2. If the hook on the threader plate touches the top or bottom side of the needle eye, loosen setscrew (D) and adjust the hook position (Fig. 3).

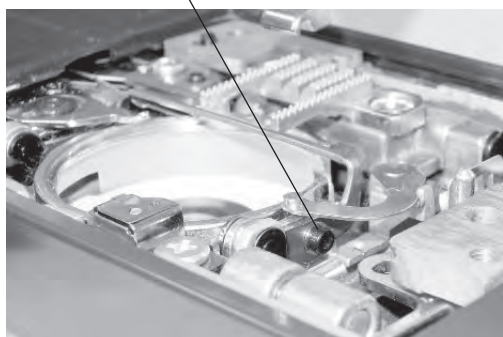
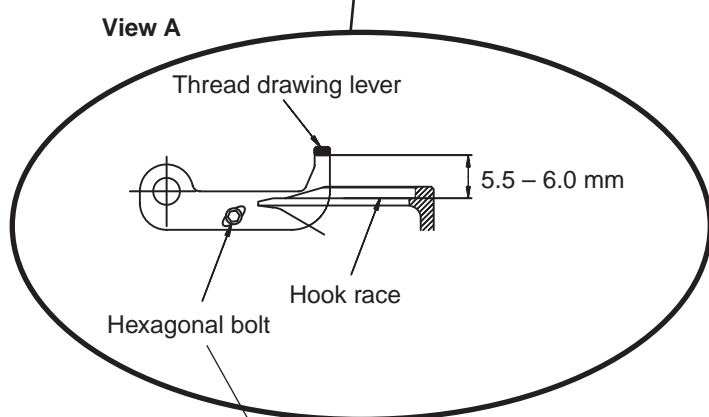
# Mechanical adjustment

## Thread drawing lever

The standard height of the thread drawing lever from the surface of bobbin holder should be in the range of 5.5 to 6.0 mm.

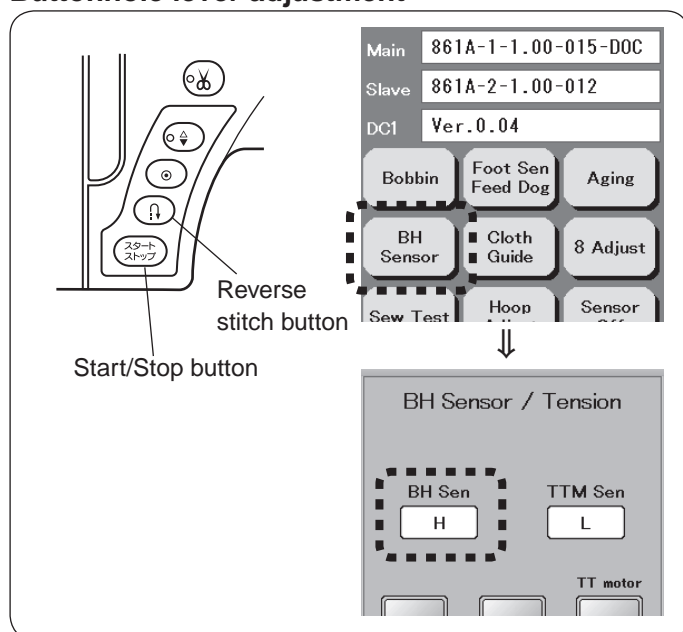


1. Remove the presser foot, the needle plate and the bobbin holder. (see page 4-5)  
\* You may use a fabric to prevent damaging the needle or the presser foot holder when removing the needle plate.
2. Loosen the hexagonal bolt. Adjust the distance between the lower part of thread drawing lever and the hook race to 5.6 mm by moving the thread drawing lever up or down.
3. Tighten the hexagonal bolt.



# Mechanical adjustment

## Buttonhole lever adjustment



- 1 Turn the power switch ON while pressing the Start/Stop button and the Reverse stitch button to enter the factory setting mode.  
Press "BH Sensor" key.
2. Attach the automatic buttonhole foot (R).  
Open the face cover. Lower the Buttonhole lever.  
Lower the drop feed dog.  
Bind a piece of paper between the stopper and presser foot slider for easier adjustment.

### Sensor position adjustment

1. Adjust the clearance between the stopper and the presser foot slider to 1.6 mm.
2. Loosen the hexagonal socket screw until the "BH Sen" shows "H", then tighten the setscrew slowly until the "BH Sen" shows "L".

### BH lever guide adjustment

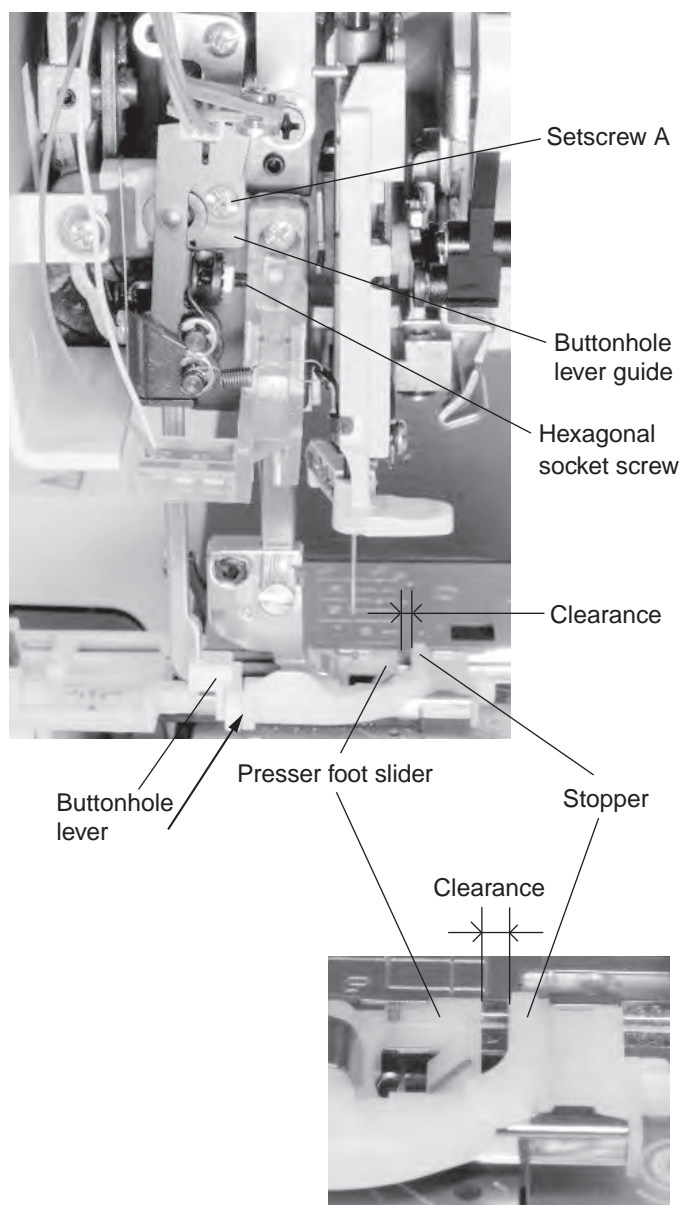
1. Adjust the clearance between the stopper and the presser foot slider to 2.6 mm.  
Lower the presser foot.
2. Lower the BH lever.  
Loosen the setscrew A.  
Move the buttonhole lever left and right.  
Tighten the setscrew when the buttonhole lever slightly touches to the presser foot.

### To check sensor position

1. "BH Sen" shows "H" when the clearance is 1.4 mm.  
"BH Sen" shows "L" when the clearance is 1.8 mm.  
If not, adjust the sensor position again.

### To check BH lever guide position

1. After checking the sensor position mentioned above, slide the automatic buttonhole foot (R) until the buttonhole lever does not touch to the the buttonhole foot R. (Free the buttonhole lever.)  
Be sure that the "BH sensor" shows "L".  
Move the Buttonhole lever back and forth slightly, and "BH sensor" should still indicates "L".  
If not, adjust the BH lever guide again.

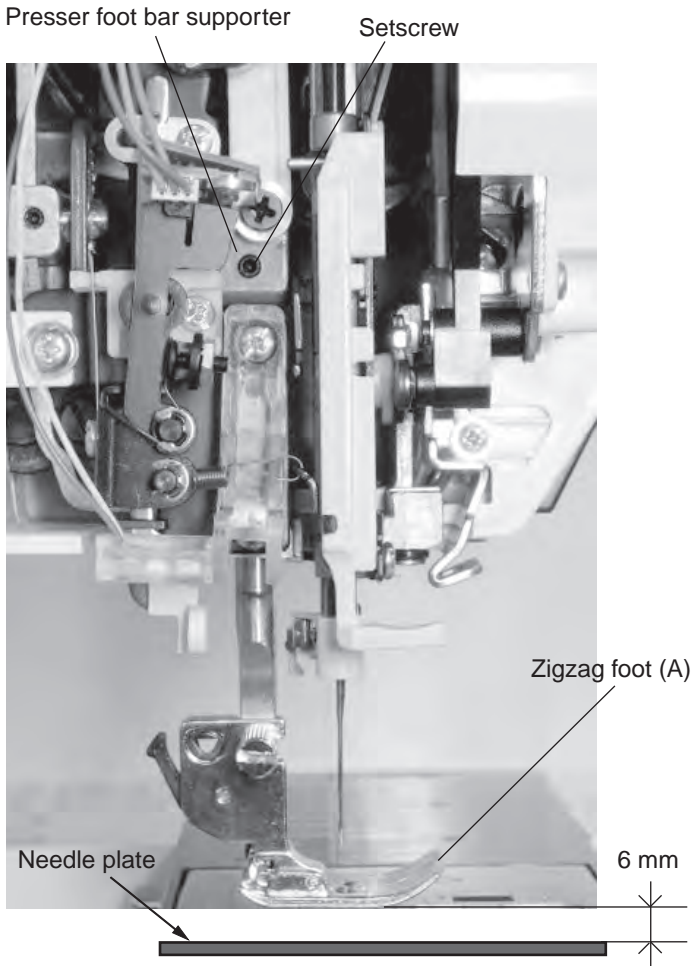


# Mechanical adjustment

## Presser bar lifter position

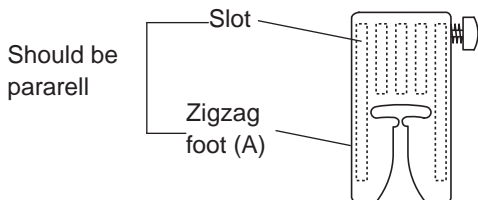
The clearance between the presser foot and the surface of the needle plate should be 5.7 to 6.3 mm when the presser foot is raised.

The presser foot (zigzag foot A) should be parallel to the slot of the feed dog teeth when attached.



### To adjust:

1. Turn the power switch off.  
Attach the zigzag foot (A).
2. Turn the drop feed lever to lower the feed dogs.
3. Raise the presser foot with the presser foot lifter.  
\* You must use the presser foot lifter to raise the presser foot for this adjustment, otherwise you cannot adjust the presser foot height correctly.
4. Open the face cover. Loosen the setscrew on the presser bar supporter to adjust the presser foot direction as illustrated in Fig. 2 so the slot for the feed dog teeth and the zigzag foot should be parallel.
5. Place the 6 mm spacer (block) between the presser foot and the needle plate. Tighten the setscrew while depressing the foot against the spacer.
6. Check "Embroidery foot height" (see page 27).  
Check "Embroidery foot detecting sensor" (see page 28).



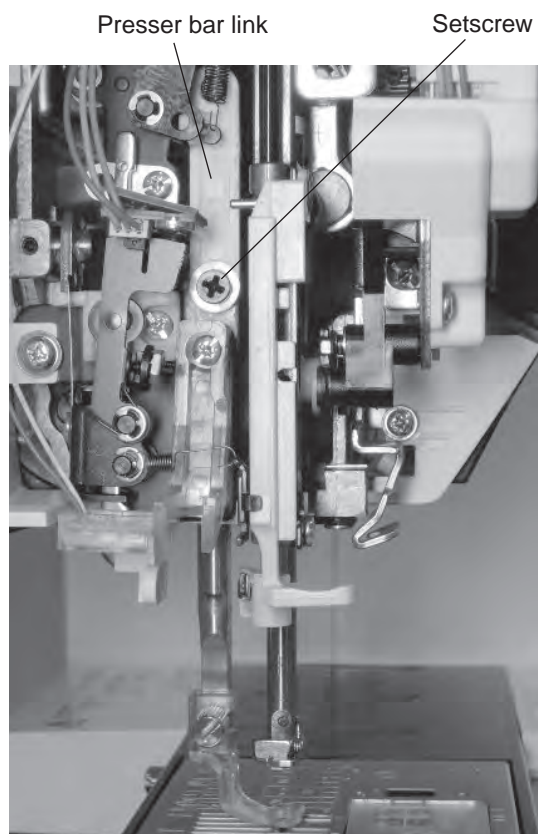


# Mechanical adjustment

## Embroidery foot height

The distance between the embroidery foot and the surface of the needle plate should be in the range of 0.9 to 1.5 mm when the presser bar is at its lowest position.

Fig. 1



### To adjust:

1. Remove the top cover (see page 2)
2. Remove the needle.  
Attach the embroidery foot (P).
3. Adjust the presser foot pressure dial to "3".
4. Lower the presser foot. Turn the handwheel toward you to lower the embroidery foot P at its lowest position.
5. Loosen setscrew of presser bar link (see fig. 1).
6. Place the 1.2 mm spacer (block) between the presser foot and the needle plate (see fig. 2).
7. Fix the presser bar link by tightening the setscrew with holding the presser foot actuator arm against the cam. (see fig.3).
8. Check "Embroidery foot detecting sensor" (see page 28).

Fig. 2

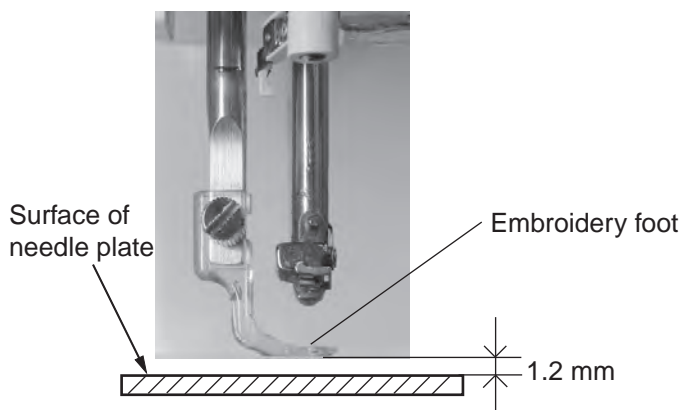
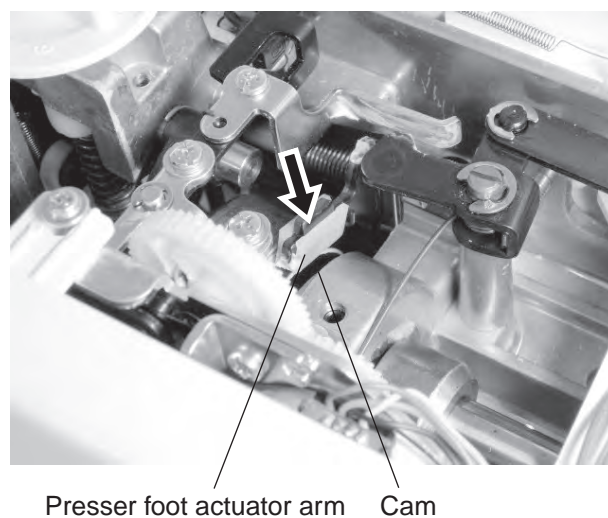
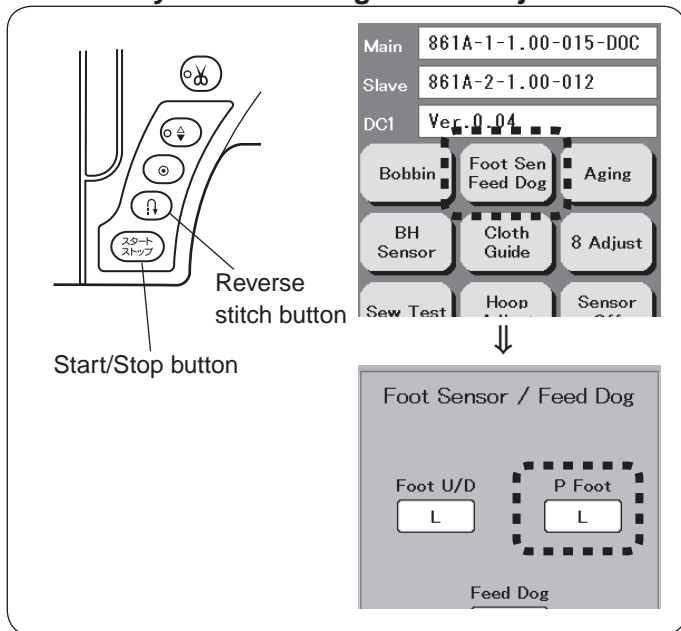


Fig. 3



# Mechanical adjustment

## Embroidery foot detecting sensor adjustment



### To adjust:

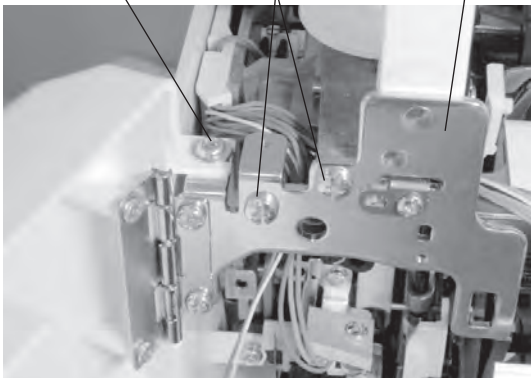
Adjust the presser foot height and embroidery foot height before this adjustment (see page 26 and 27).

1. Remove the top cover (see page 2).  
Remove the setscrews (see fig. 1).  
Remove the carrying handle with the carrying handle base plate.
2. Attach the embroidery foot P.  
Turn the presser foot pressure dial to "1".
3. Turn the drop feed lever to lower the feed dogs.  
Place the 4.2 mm spacer (block) between the presser foot and the needle plate.
4. Turn the power switch ON while pressing the Start/Stop button and the Reverse stitch button to enter the factory setting mode.  
Press "Foot Sen/Feed Dog" key.
5. Loosen the setscrew C.  
Move the printed circuit board G1 slowly left or right until the P Foot changes from "H" to "L" or "L" to "H".  
Tighten the setscrews (see fig.3).

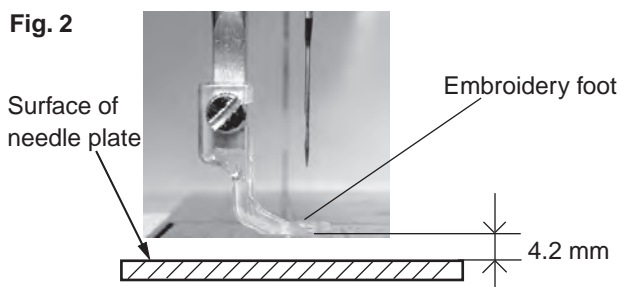
### To check:

1. Lower the drop feed dogs.
2. Attach the embroidery foot P.  
Turn the presser foot pressure dial to "1".
3. Lower the presser foot lifter.  
Turn the handwheel toward you to raise the embroidery foot P to its highest position (near the highest needle position).
4. Raise the presser foot lifter, and lower it slowly.  
Be sure that "P Foot" changes from "L" to "H".
5. Attach the presser foot A.  
Turn the presser foot pressure dial to "7".
6. Raise the presser foot lifter.  
Lower the presser foot lifter rapidly.  
Be sure that "P Foot" indicates "L".

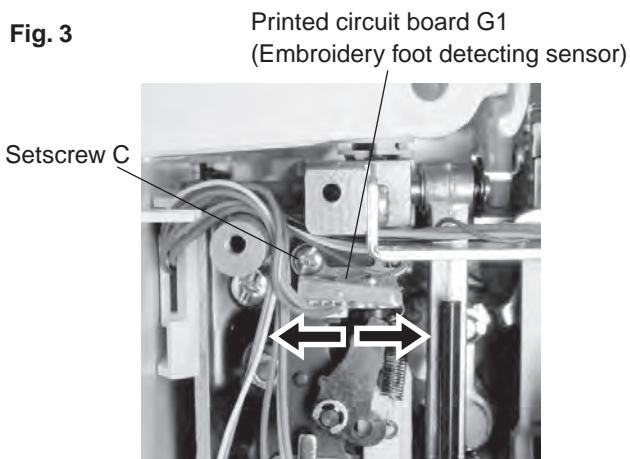
**Fig. 1** Setscrew B Setscrew A Carrying handle base plate



**Fig. 2**

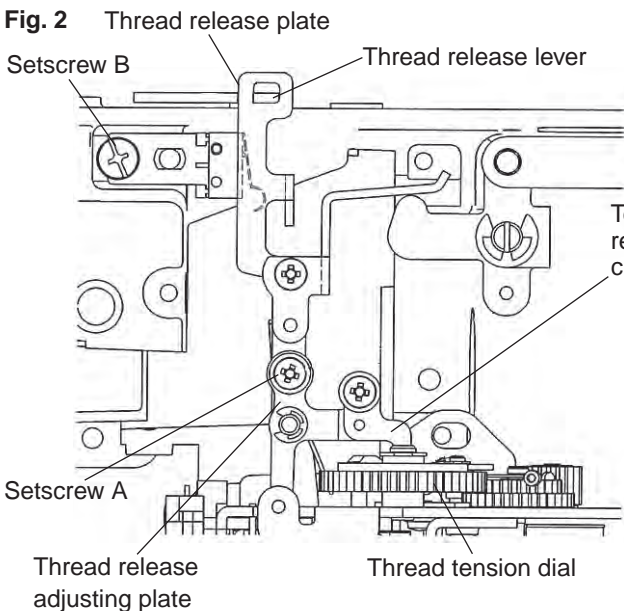
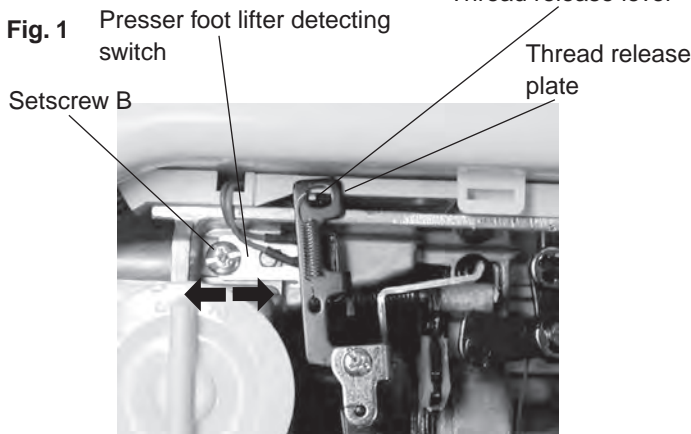
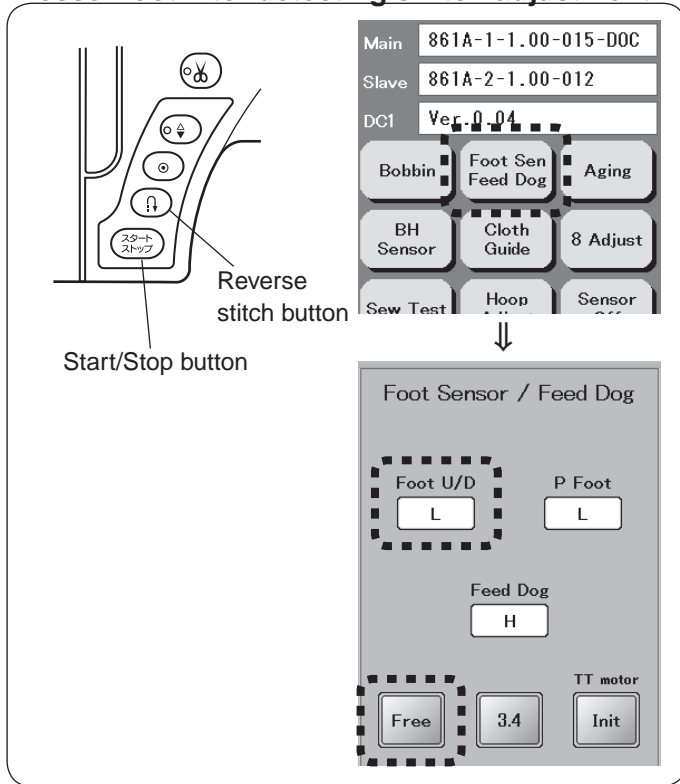


**Fig. 3**



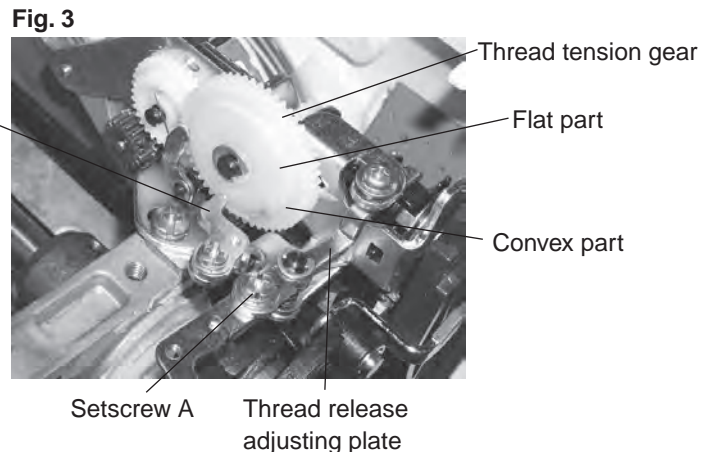
# Mechanical adjustment

## Presser foot lifter detecting switch adjustment



### To adjust:

1. Remove the top cover (see page 2).
  2. Turn the power switch ON while pressing the Start/Stop button and the Reverse stitch button to enter the factory setting mode. Press "Foot Sen/Feed Dog" key.
  3. Lower the presser foot lifter.
  4. Loosen the setscrew A. Press the tension release claw against the flat part of thread tension gear. Move the thread release plate to the right so that the thread release plate touches to the thread release lever lightly. Tighten the setscrew A (see fig. 1, 2 and 3).
  5. Press "Free" key. Engage the release hook with the convex part of the thread tension dial.  
 \* Press "3.4" key to disengage the release hook from the convex part.
  6. Lower the presser foot lifter. Loosen the setscrew B. Adjust the presser foot detecting switch position so the "Foot U/D" should change from "L" to "H" when the presser foot is in the middle of the lowered and raised position (see fig. 1).
- "Foot U/D" should indicate "L" when the presser foot is lowered, and the release hook is engaged with convex part of thread tension dial.
  - "Foot U/D" should indicate "H" when the presser foot is raised.
- \* Check "Knee lifter position adjustment" after this adjustment.



# Mechanical adjustment

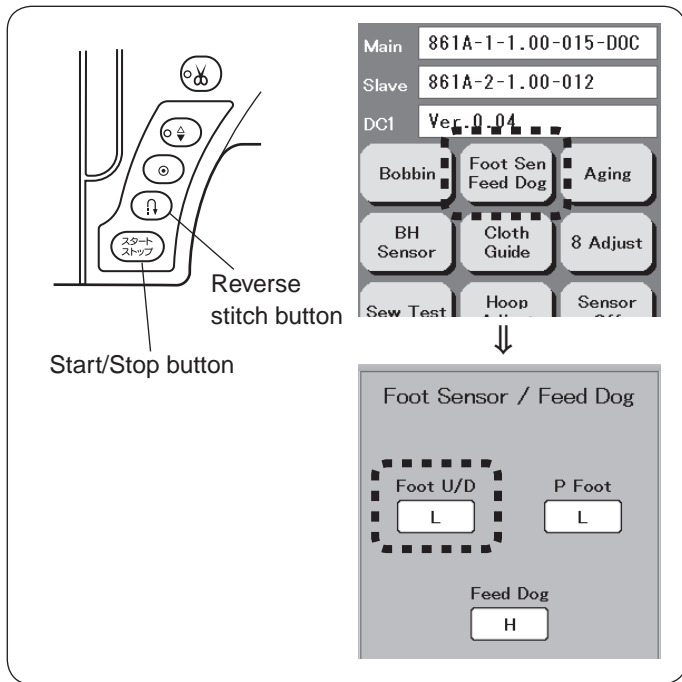
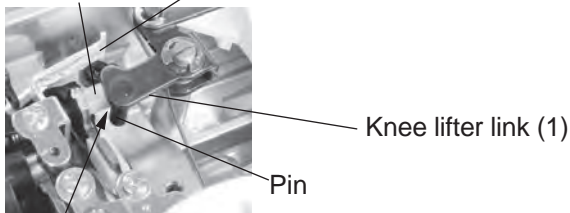


Fig. 1

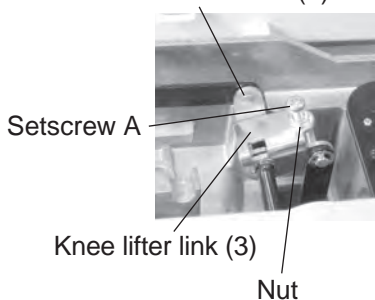


Fig. 2  
Presser foot actuator arm bush  
Thread release plate (for knee lifter)



The distance between the bush and pin should be in the range of 0.2 to 0.5 mm.

Fig. 3  
Knee lifter link (2)



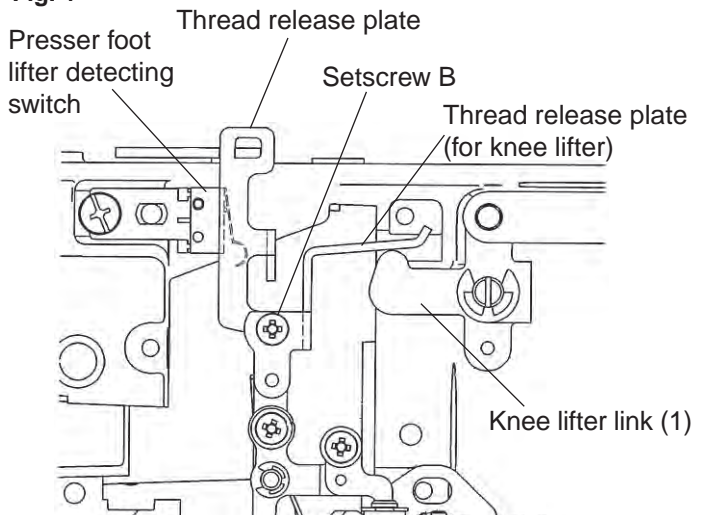
## Knee lifter

### To adjust:

1. Remove the top cover (see page 2)
2. Remove the presser foot holder.
3. Lower the presser foot lifter.
4. Turn the handwheel toward you to lower the presser foot bar at its lowest position.
5. Loosen the nut. Adjust the distance between the bush and pin in the range of 0.2 to 0.5 mm by loosening or tightening the setscrew A. After this adjustment, tighten the nut (see fig. 2 and 3).
6. Turn the power switch ON while pressing the Start/Stop button and the Reverse stitch button to enter the factory setting mode. Press "Foot Sen/Feed Dog" key.
7. Attach the knee lifter.
8. Push the knee lifter to the right as far as it goes and hold it. Loosen the setscrew B and adjust the thread release plate (for knee lifter) position so that the thread release plate pushes the presser foot detecting switch, and "Foot U/D" indicates "H" (see fig. 4).

\* The presser lifter detecting switch should not be closed completely in case of the procedure 8.

Fig. 4

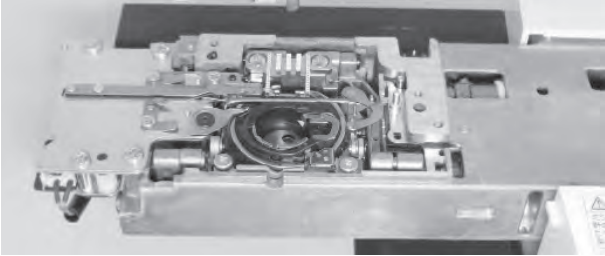




# Mechanical adjustment

## Thread cutter

The distance between the end of thread cutter plate slit and the edge of moving cutter should be in the range of 0.8 to 1.6 mm.

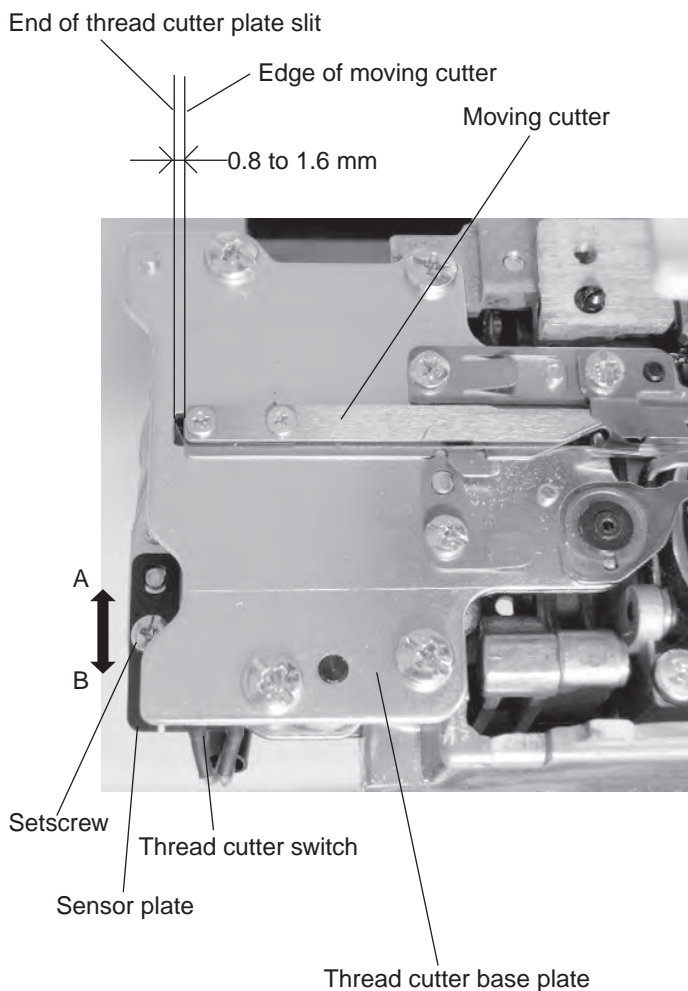


### To check:

1. Remove the bed cover and free arm cover (see page 4 and 5).
2. Turn the power switch off. Slide the moving cutter to the right with your finger.
3. Turn the power switch on. The moving cutter motor is initialized, and moving cutter moves to its home position automatically.
4. The distance between the edge of moving cutter and the end of thread cutter plate slit should be 0.8 to 1.6 mm. If not, follow the procedure below.

### To adjust:

1. Loosen the setscrew on the sensor plate.
2. Adjust the distance between the end of thread cutter plate slit and the edge of moving cutter to 1.2 mm by moving the sensor plate in the direction of A or B.





# Mechanical adjustment

## Remaining bobbin thread sensor

The diagram illustrates the steps to enter factory setting mode and adjust the bobbin thread sensor. It shows the physical buttons on the control panel and the corresponding LCD menu screens.

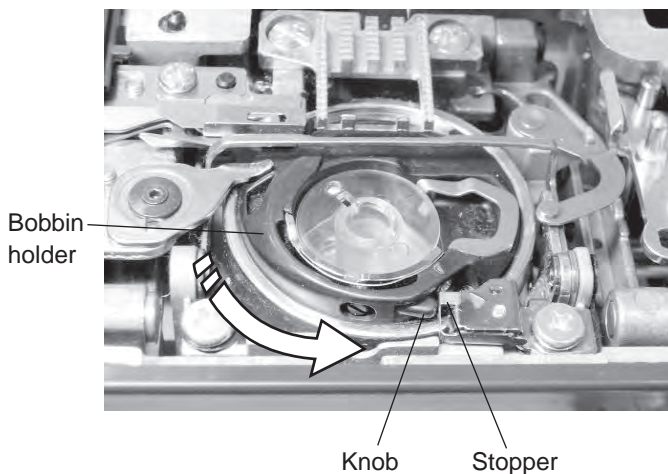
**Physical Buttons:** Reverse stitch button, Start/Stop button.

**Menu Screens:**

- Screen 1:** Main: 861A-1-1.00-015-DOC, Slave: 861A-2-1.00-012, DC1: Ver. 0.04. Buttons: Bobbin, Foot Sen, Aging, BH Sensor, Cloth Guide, 8 Adjust.
- Screen 2:** Bobbin Thread. Key: 0. Buttons: Empty, Half, Full. Values: 210, 181, 136.
- Screen 3:** Bobbin Thread. Key: 210 (circled). Buttons: Empty, Half, Full. Values: 210, 181, 136. Buttons: OK, X, FeedDog UP, FeedDog DOWN.

Labels in the diagram: "Key" value (pointing to 210), "Empty" value (pointing to 210).

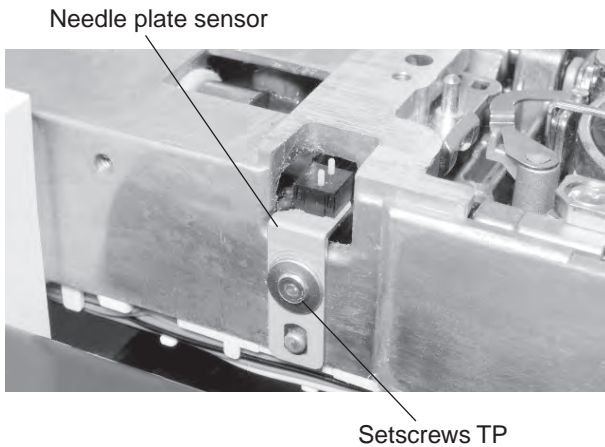
1. Prepare the empty bobbin (diameter: 8.4 mm) and the gauge bobbins (diameter: 12.5 mm and diameter: 18.9 mm).
2. Remove the presser foot and needle plate. (see page 4 and 5)  
\* You may use a fabric to prevent damaging the needle plate.
3. Turn the power switch ON while pressing the Start/Stop button and the Reverse stitch button to enter the factory setting mode. Press "Bobbin" key.
4. Insert the empty bobbin in the bobbin holder (diameter: 8.4 mm).
5. Rotate the bobbin holder counterclockwise so that the knob fits to the stopper in the hook race.
6. Press "Key" and read "Key" value.
7. Repeat the procedure 5 to 6 above few times. Press "Empty" when the same "Key" value is indicated. This value is memorized as "Empty" value.
8. Repeat the procedure 5 to 7 with the gauge bobbins (diameter 12.5 mm and 18.9 mm)  
  
When 12.5 mm gauge bobbin is inserted, press "Half" key to memorize the value.  
  
When 18.9 mm gauge bobbin is inserted, press "Full" key to memorize the value.
9. Press "OK" key.



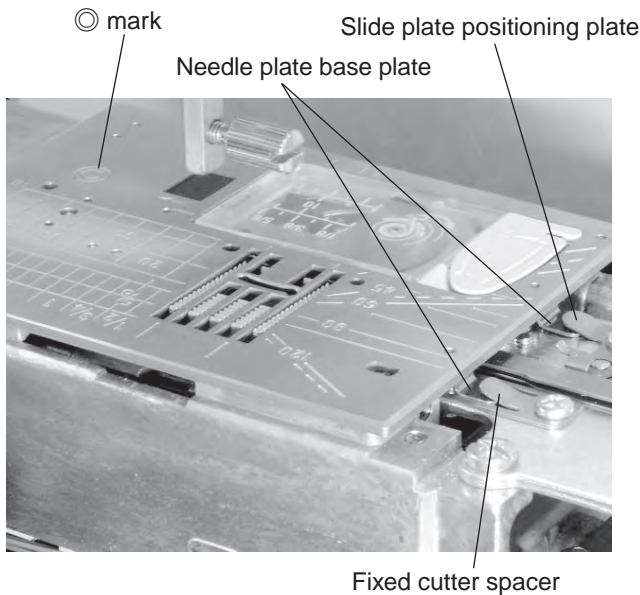
# Mechanical adjustment

## Needle plate sensor

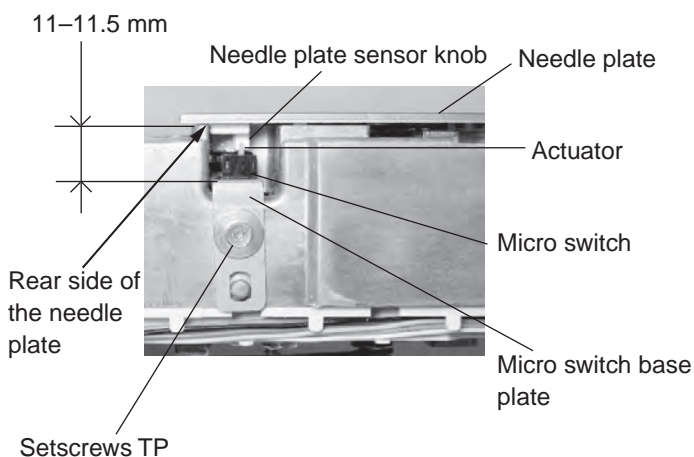
**Fig. 1**



**Fig. 2**



**Fig. 3**



### To remove:

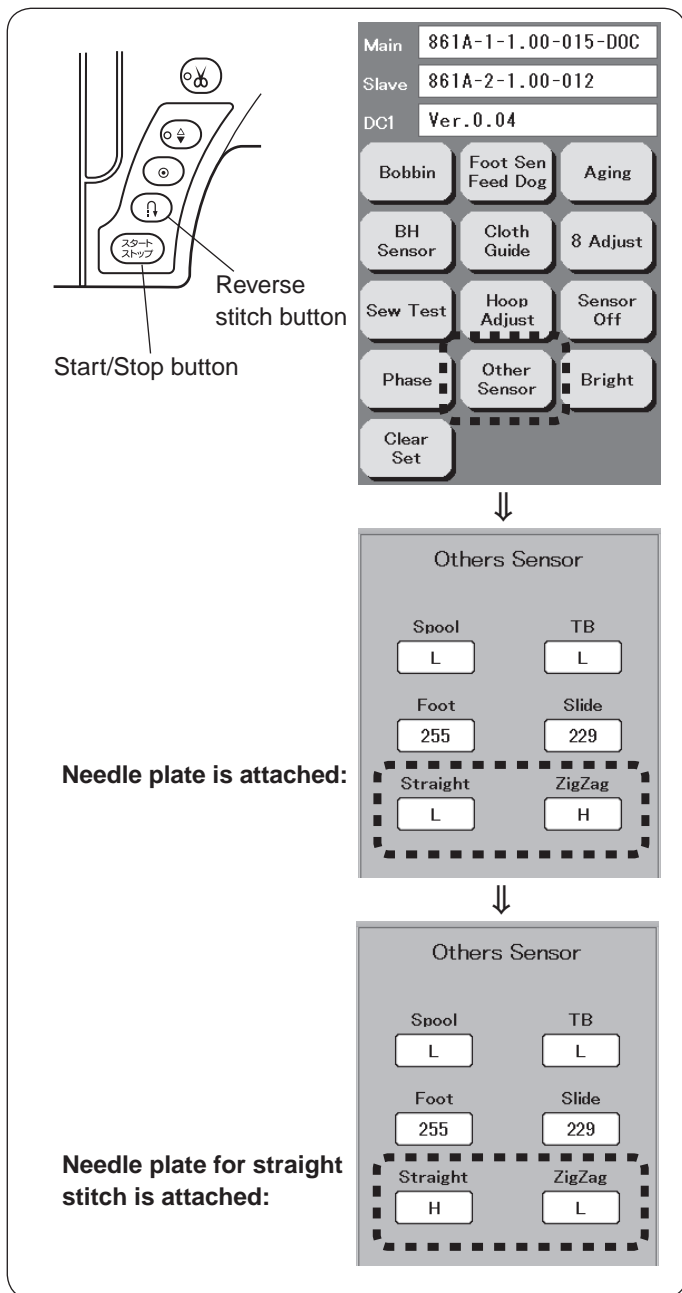
1. Remove the belt cover, top cover, base cover, bed cover, free-arm cover and the front cover (see pages 1 to 4 and 6).
2. Disconnect the connector from the needle plate sensor switch from the printed circuit board A (see page 8).
3. Remove the setscrews TP and the needle plate sensor

### To attach:

1. Attach the needle plate sensor switch with the setscrews TP. Tighten the setscrews TP lightly.
2. Connect the needle plate sensor switch connector to the printed circuit board A.
3. Check the needle plate sensor and adjust as necessary (see the adjustment procedure below).
4. Tighten the setscrews TP firmly.
5. Attach the front cover, free-arm cover, bed cover, base cover, top cover and the belt cover.

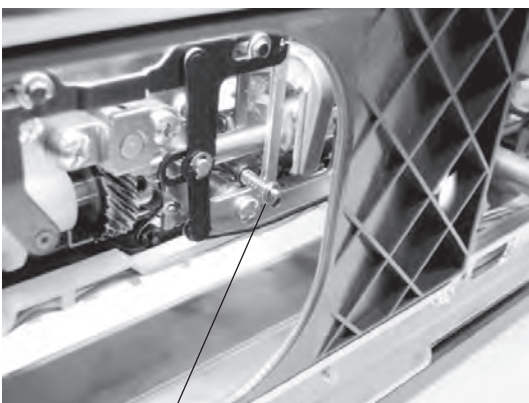
### To check and adjust:

1. Prepare the needle plate and the needle plate for straight stitch.
2. Insert the needle plate base plate under the fixed cutter spacer and the slide plate positioning plate. Press the © mark to attach the needle plate.
3. The distance between the bottom side of the needle plate and the micro switch base plate should be in the range of 11 to 11.5 mm. If not, loosen the setscrews TP and move the base plate up or down to adjust it. Tighten the setscrews TP firmly after the adjustment. The actuator of the micro switch should be aligned with the needle plate sensor knob as shown in fig 3.



- Turn the power switch ON while pressing the Start/ Stop button and the Reverse stitch button to enter the factory setting mode. Press "Other sensor" key.
- Be sure that "Straight" indicates "L", and "ZigZag" indicates "H" when the needle plate is attached.
- Replace the needle plate with the needle plate for straight stitch. Be sure that "Straight" indicates "H", and "Zigzag" indicates "L".  
If not, adjust the micro switch base plate position (see page 33).  
\* To remove the needle plate, press the needle plate replacing bar in the direction of arrow with a screwdriver.

Fig. 4

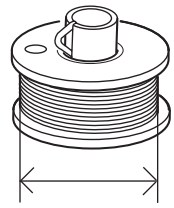


Needle plate replacing bar

# Mechanical adjustment

## Bobbin winder

The amount of thread wound on the bobbin should be 16.5 to 19.5 mm in diameter.



16.5 to 19.5 mm

Fig. 1

Setscrew  
Bobbin winder stopper

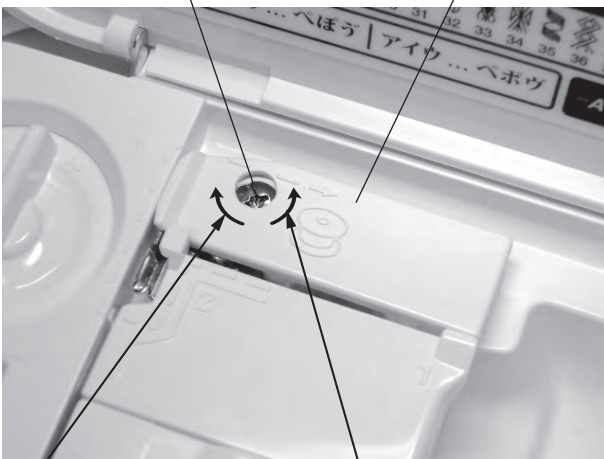


### To adjust bobbin thread amount:

1. Loosen the setscrew A.  
Adjust the stopper position to determine the thread amount of bobbin.

Fig. 2

Thread guide screw  
Bobbin winder thread guide cover



### To adjust evenness of thread amount:

1. Turn the thread guide screw to adjust the evenness of thread amount (see fig. 2).

If the thread amount of the lower part of bobbin is smaller than its upper part, turn the guide screw to the right (see fig. 3).

If the thread amount of the upper part of bobbin is smaller than its lower part, turn the guide screw to the left (see fig. 4).

The upper part thread amount is bigger than its lower part.

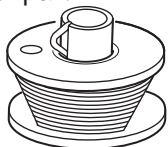


Fig. 3

The upper part thread amount is smaller than its lower part

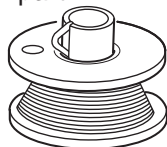


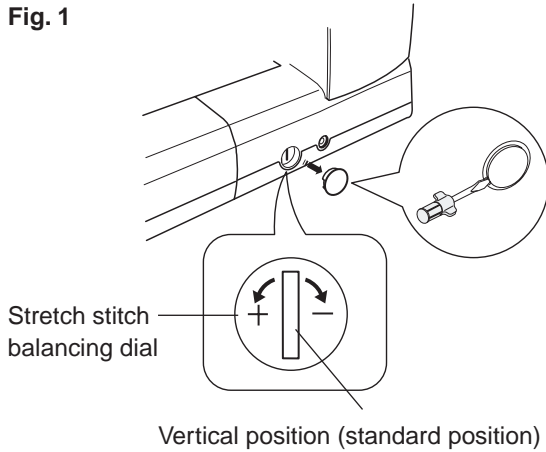
Fig. 4

# Mechanical adjustment

## Stretch stitch feed balance

When the stretch pattern "8" is sewn 8 times with the stretch stitch balancing dial at the standard setting mark, the length of five of stretch patterns should be in the range of 33 to 39 mm.

Fig. 1



### To check:

1. Attach the satin stitch foot (F).
2. Turn the stretch stitch balance dial at the vertical position as illustrated in Fig. 1.
3. Turn the power switch ON while pressing the Start/Stop button and the Reverse stitch button to enter the factory setting mode. Press "8 Adjust" key.
4. Sew the patterns at the maximum speed until the machine stops automatically. The machine will sew "8" eight times. Check the length between the 3rd "8" and 7th "8" (Five "8" patterns). The length should be in the range of 33 to 39 mm (see Fig. 3).

### To adjust:

1. Remove the cap on the base cover (see Fig. 2).
2. If the length is more than 39 mm, turn the adjusting screw in the direction of A. If the length is less than 33 mm, turn the adjusting screw in the direction of B.

Fig. 2

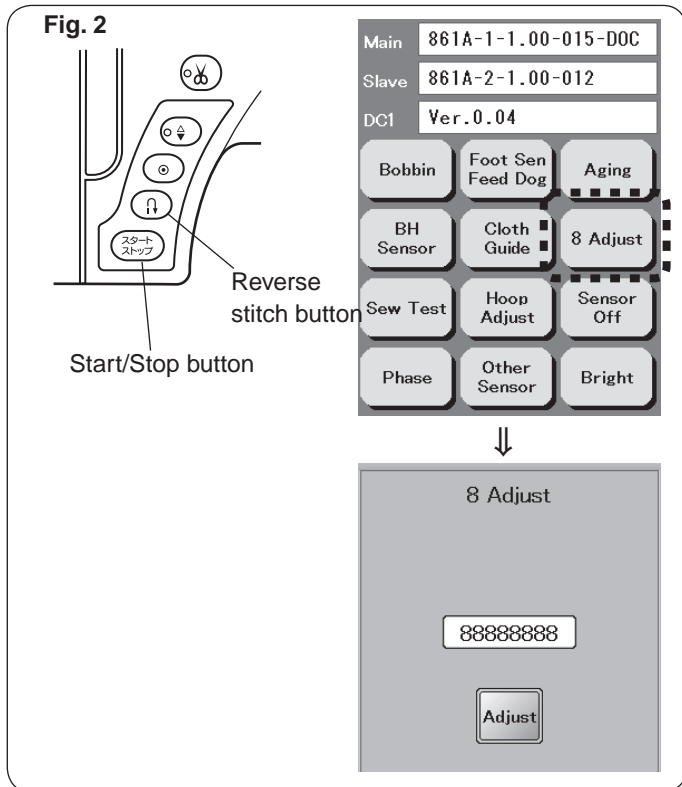


Fig. 2

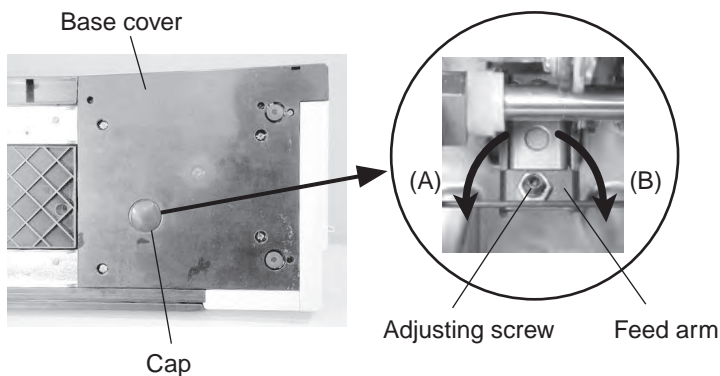
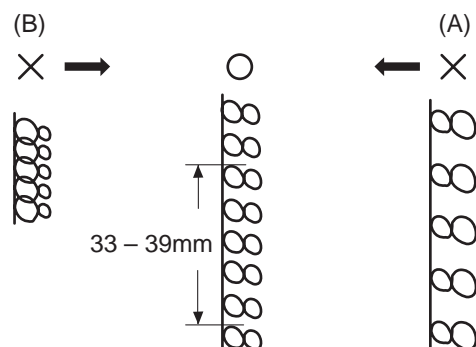


Fig. 3

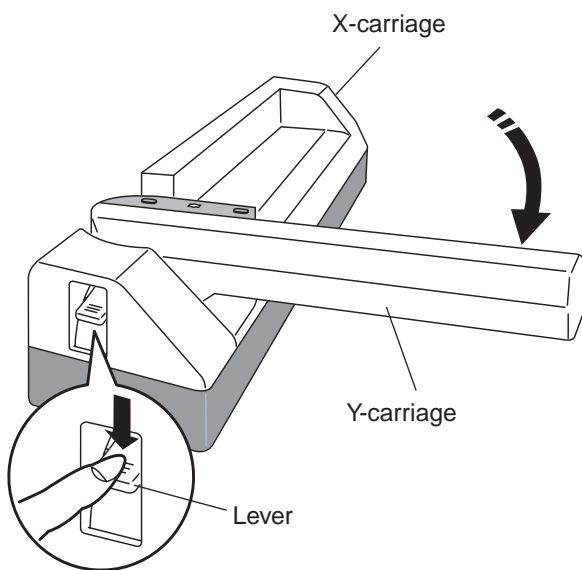




# Mechanical adjustment

## Y-carriage play adjustment

There should be no play in the direction of arrow A (see fig. 1).



1. Push down the lever to open the Y-carriage.
2. Remove the cap under the embroidery unit (see fig. 2).
3. Move the X-carriage to the point where you can access the Y fixing plate from the inspection hole.
4. Loosen the setscrew.
5. Tighten the setscrew while pushing the Y fixing plate in the direction of arrow (see fig. 3).
6. Be sure that there is no play in the Y-carriage in the direction of arrow A (see fig. 1).

Attach the cap and return the X-carriage to the home position. Close the Y-carriage.

Fig. 2

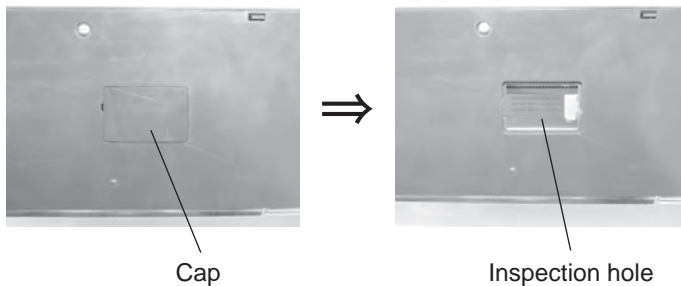
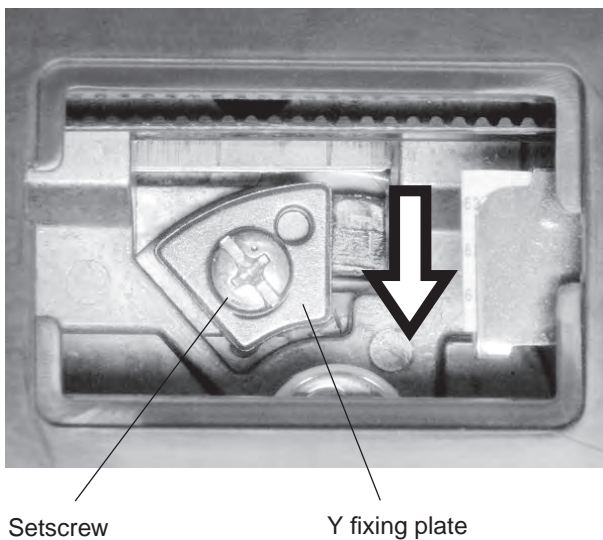


Fig. 3



# Mechanical adjustment

## Adjusting X and Y sensors (simple adjustment)

The diagram illustrates the steps for adjusting the X and Y sensors. It shows the control panel with the 'Hoop Adjust' menu selected. The initial values are X=850 and Y=1000. The user adjusts these values to X=872 and Y=1018. A physical diagram shows the needle and template alignment, with the instruction: 'Match the needle drop position and the center of the template hole'.

**Control Panel Buttons:**

Bobbin	Foot Sen Feed Dog	Aging
BH Sensor	Cloth Guide	8 Adjust
Sew Test	Hoop Adjust	Sensor Off
Phase	Other Sensor	Bright

**Hoop Adjust Menu (Initial):**

X	Y
850	1000
LEFT	RIGHT
UP	DOWN
DEF	MEM

**Hoop Adjust Menu (Adjusted):**

X	Y
872	1018
LEFT	RIGHT
UP	DOWN
DEF	MEM
OK	X

**Physical Diagram Labels:** Needle, Template, Match the needle drop position and the center of the template hole.

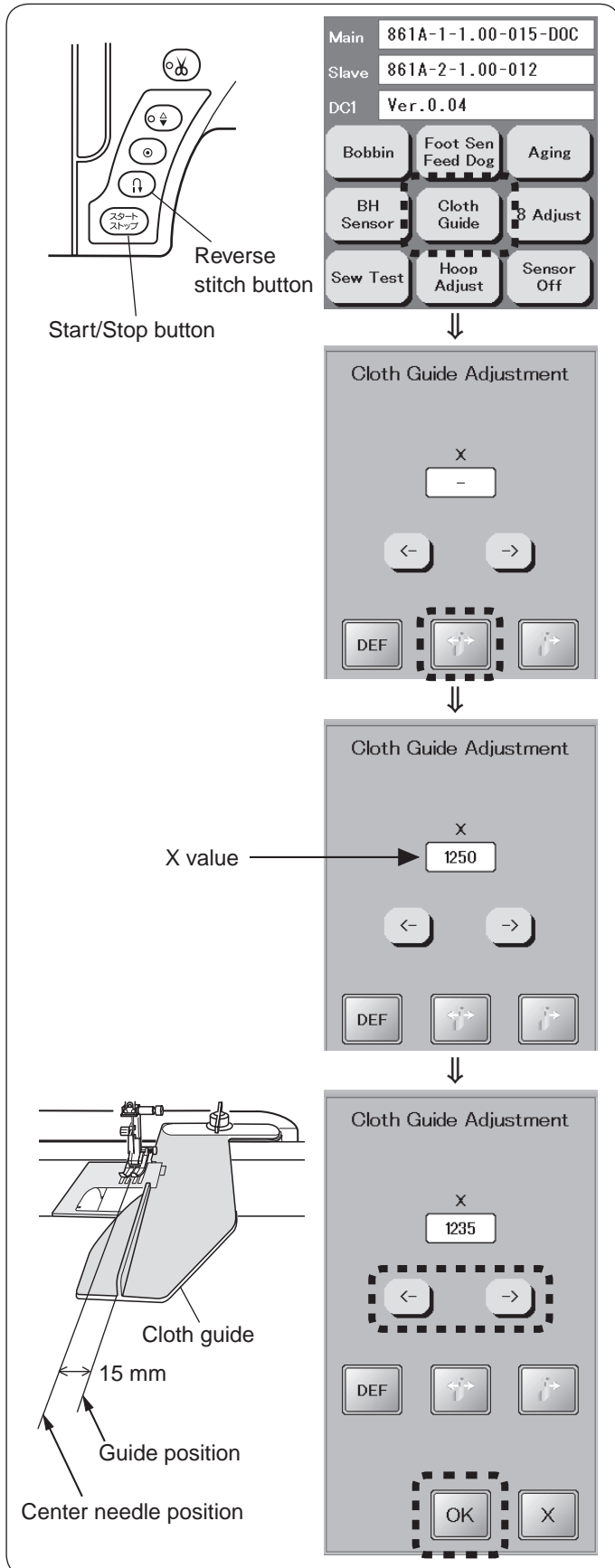
### To adjust:

1. Remove the foot holder.
2. Turn the power switch OFF.  
Attach the embroidery unit.  
Extend the carriage arm.
3. Attach the embroidery hoop and the template.
4. Turn the power switch ON while pressing the Start/Stop button and the Reverse stitch button to enter the factory setting mode.  
Press "Hoop Adjust" key (see Fig. 2).
5. The needle moves to the left needle position, and the hoop moves to its starting position.  
(Default position: X=850 Y=1000)
6. Adjust the hoop position so that the needle drops to the center of the template hole.  
Press **LEFT** or **RIGHT** key to adjust the horizontal hoop position (X value).  
Press **UP** or **DOWN** key to adjust the vertical hoop position (Y value).
7. Press OK key.

# Mechanical adjustment

## Cloth guide start position

The distance between the cloth guide and center needle position should be 15 mm when the cloth guide is at the start position.



1. Turn the power switch off. Attach the embroidery hoop. (Do not open the Y-carriage.)
2. Attach the cloth guide to the embroidery carriage.
3. Turn the power switch ON while pressing the Start/ Stop button and the Reverse stitch button to enter the factory setting mode. Press "Cloth Guide" key.
4. Press "OK" key. The cloth guide moves to the start position, and the initial X value 1250 is indicated. The initial X value is "1250".
5. Press "<->" key or "<->" to move the cloth guide to the position 15 mm away from the center needle position. \* Adjust the X value in the range of 1200 to 1300.
6. Press "OK" key.