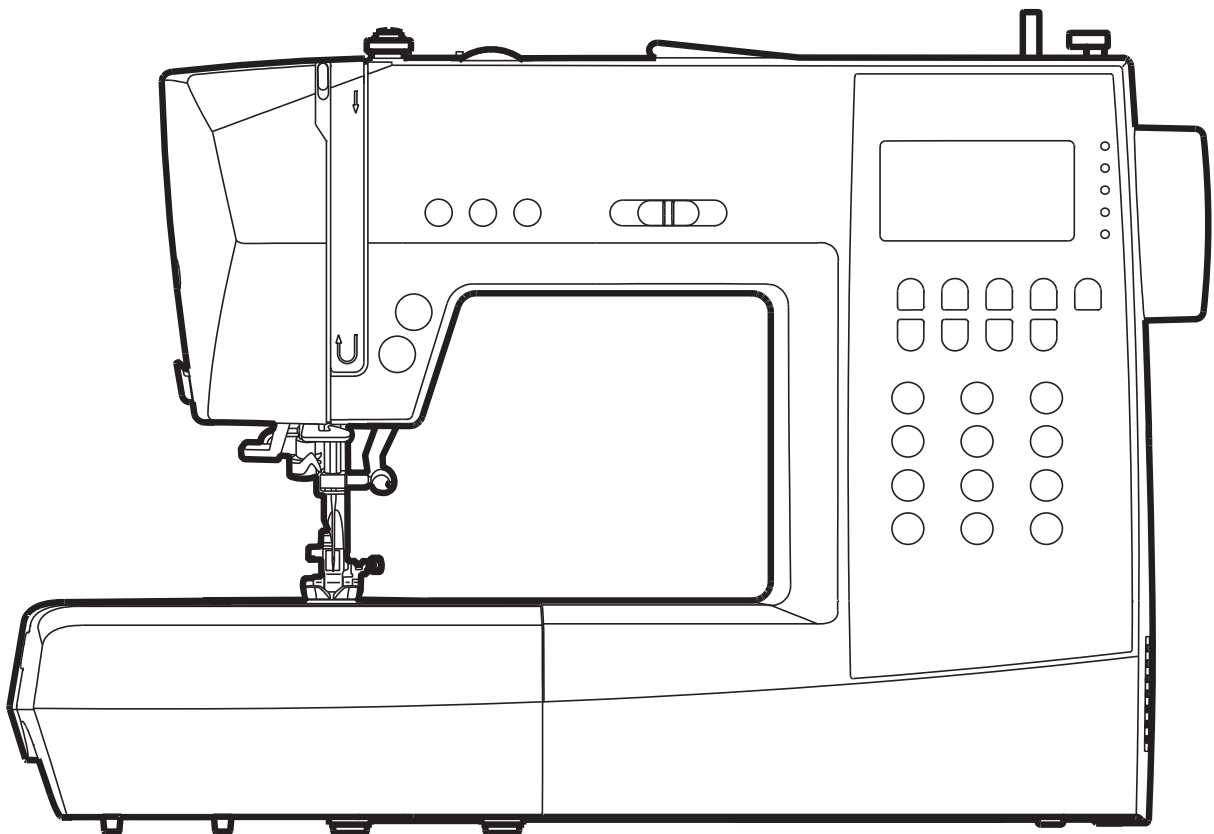
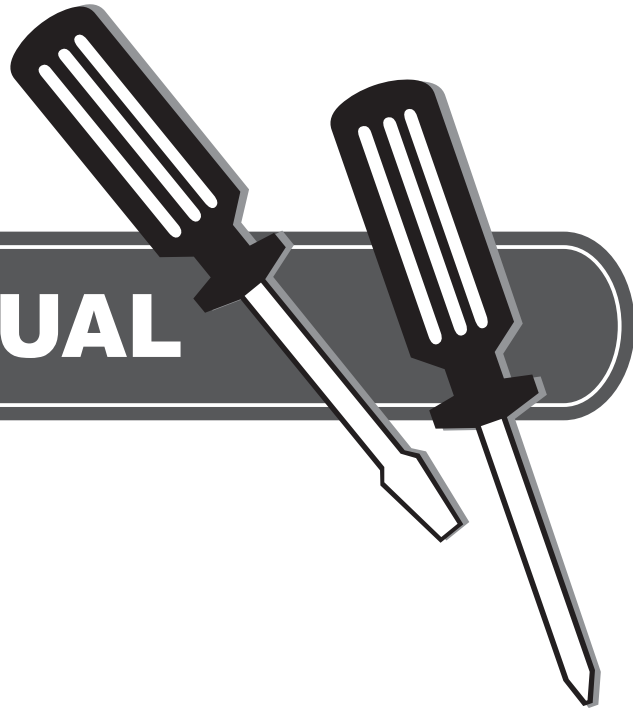


# REPAIR MANUAL



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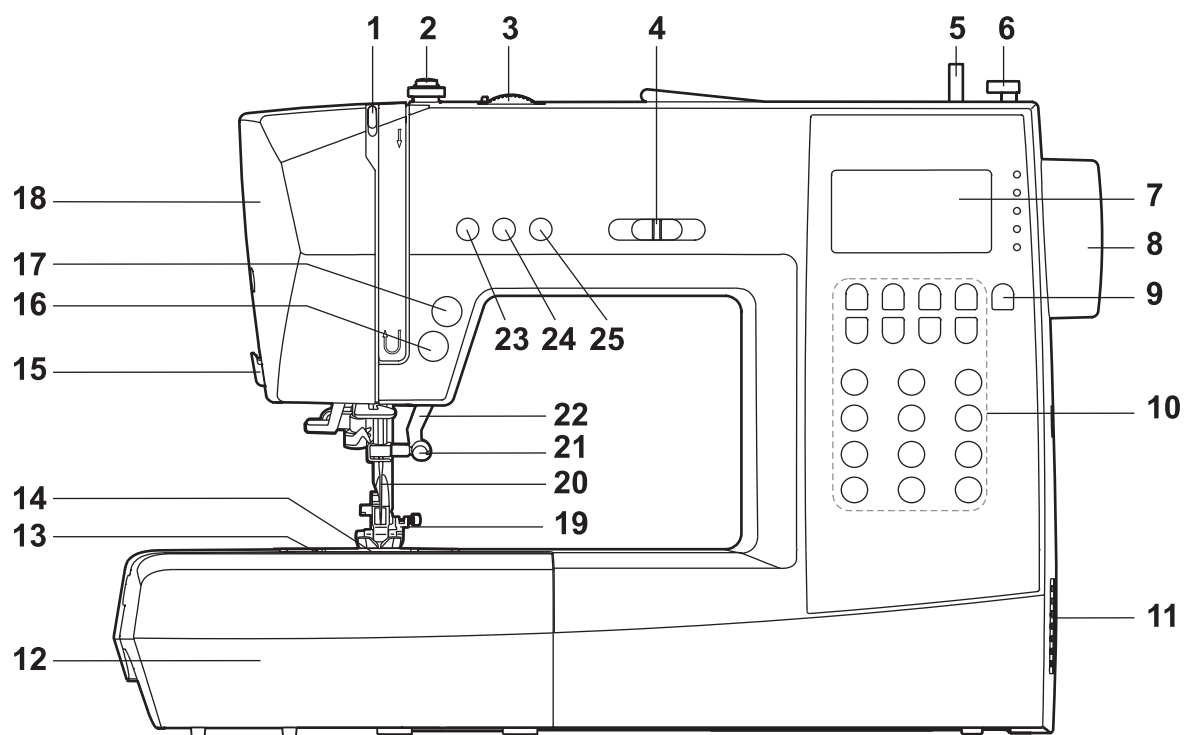
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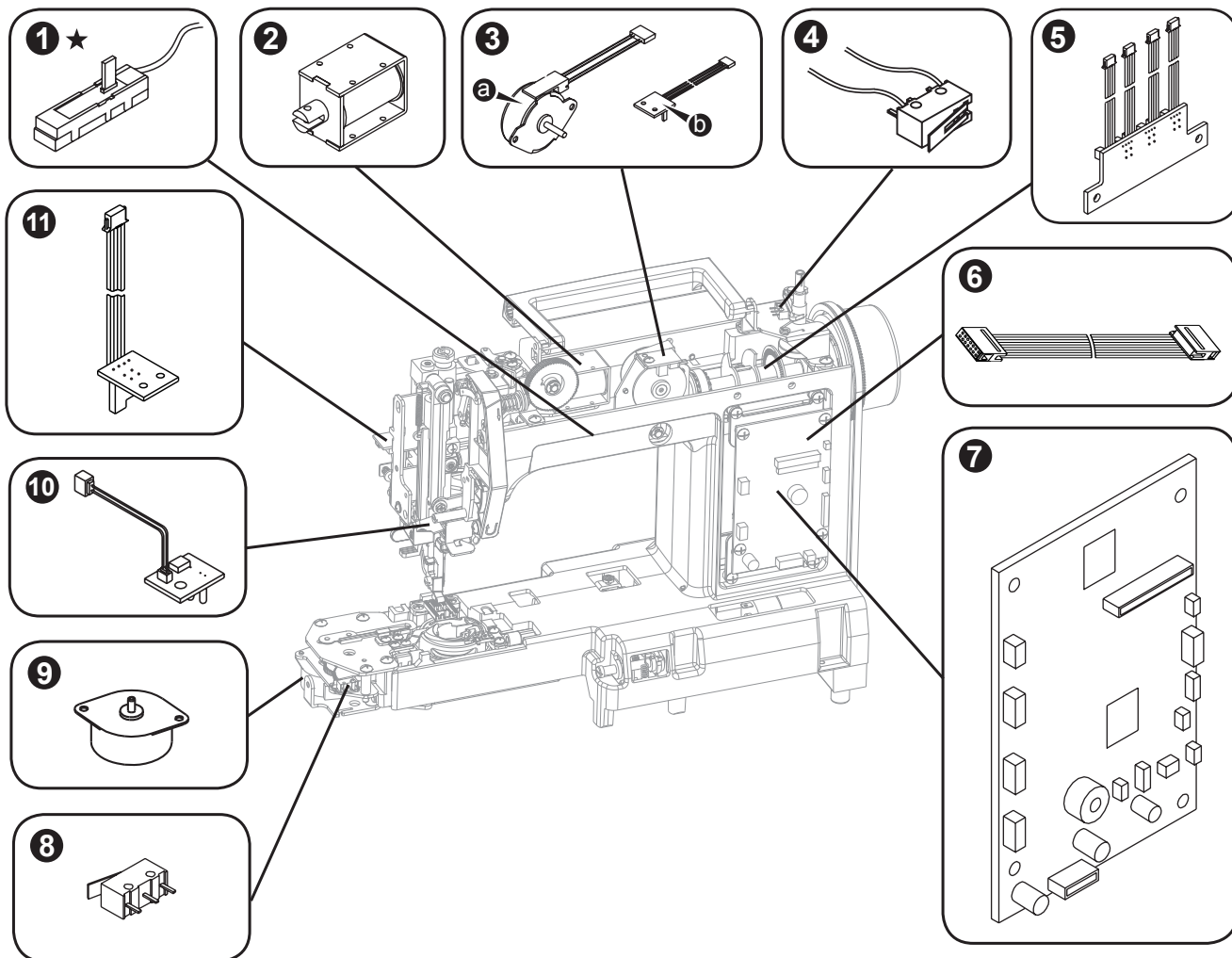
# Names of principal parts

---



- |   |                                    |
|---|------------------------------------|
| 1. Thread take-up lever   | 13. Needle plate                   |
| 2. Bobbin thread guide  | 14. Bobbin cover plate             |
| 3. Tension dial   | 15. Thread cutter                  |
| 4. Speed limiting adjustment lever  | 16. Start/ Stop button             |
| 5. Bobbin winder spindle  | 17. Thread cutter button           |
| 6. Bobbin winder stopper  | 18. Face plate                     |
| 7. LCD screen   | 19. Presser foot                   |
| 8. Handwheel  | 20. Needle                         |
| 9. Mode selection button  | 21. Needle clamp screw             |
| 10. Function buttons  | 22. Presser foot lever             |
| 11. Main power switch, connection to power supply and foot control connection | 23. Reverse button                 |
| 12. Sewing table and accessory box  | 24. Auto-lock button               |
|   | 25. Needle up/down position button |

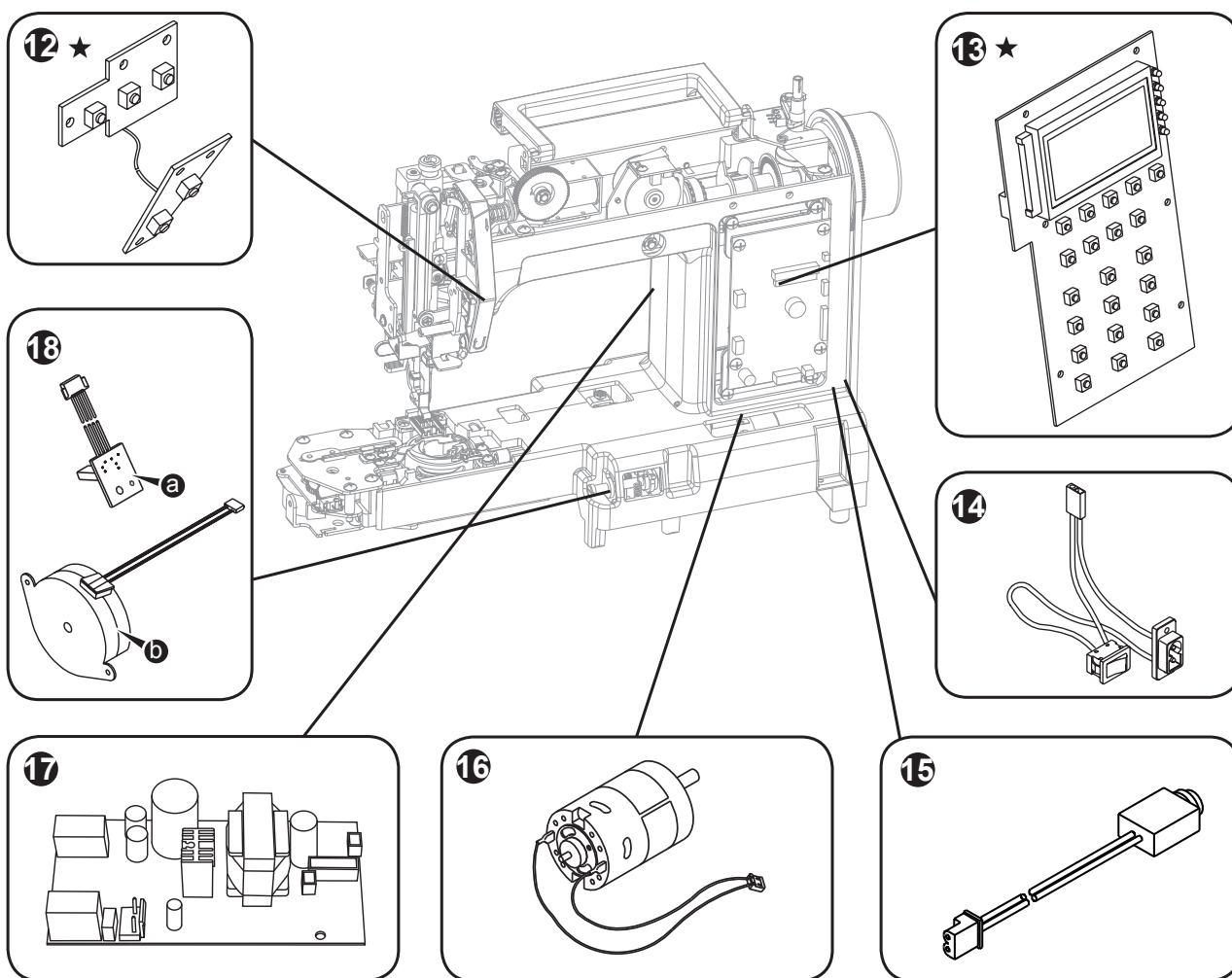
# Names of electronic parts



1. Slide resister complete
2. Solenoid valve
- 3-a. Step motor complete (zigzag)
- 3-b. Photo sensor board (zigzag)
4. Bobbin winder micro switch
5. Photo sensor complete
6. Flat cable
7. Main circuit board
8. Micro switch (Tangent homing )
9. Step motor complete (Lower thread cutter)
10. LED light lamp board
11. Photo sensor board (B/H)

★ : Set on the front cover





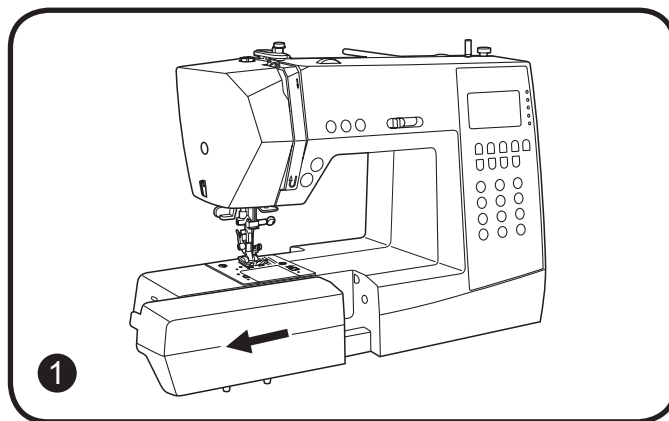
- 12. Key plate
- 13. LCD control board
- 14. Switch receptacle ass'y
- 15. Foot controller receptacle
- 16. DC Motor
- 17. HF transformer complete
- 18-a.Photo sensor board (stitch length)
- 18-b.Step motor complete (stitch length)

★ : Set on the front cover

# Removing the Covers

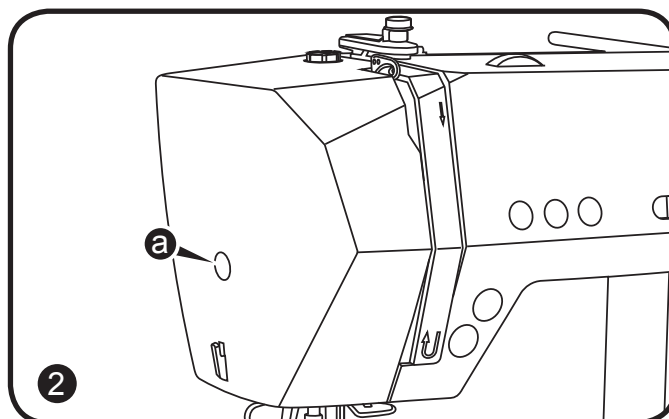
## Accessory box

Keep the snap-in accessory box horizontal, and pull it in the direction of the arrow. (1)



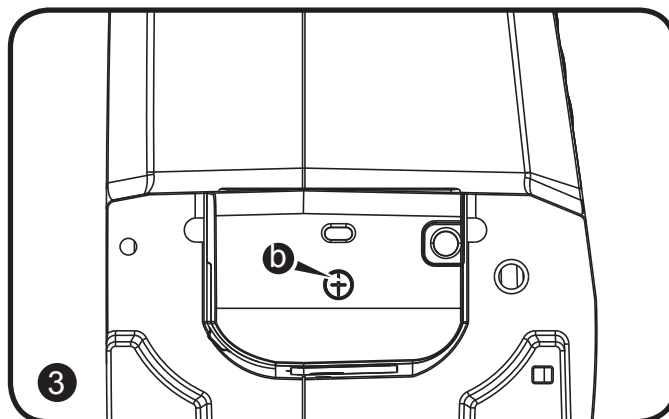
## Face plate

Remove screw (a) and remove the face plate. (2)



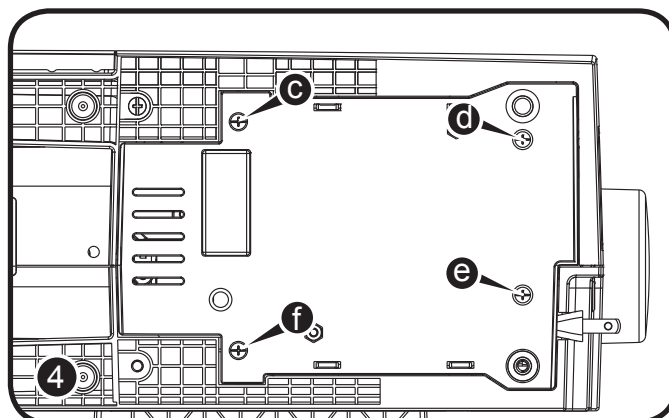
## Moter cover

Remove screw (b) and remove the moter cover. (3)



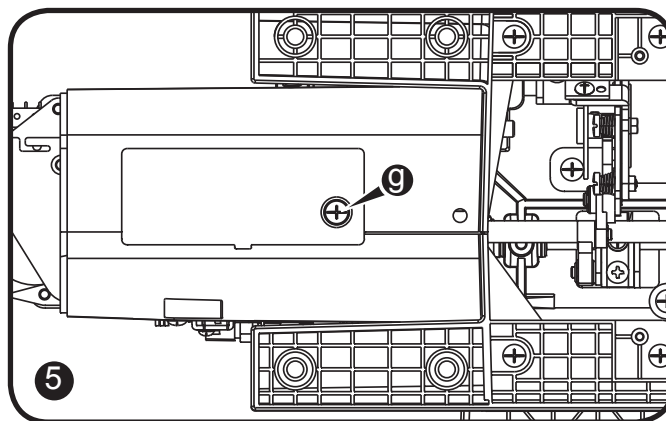
## Base cover

Lay down machine.  
Remove 4 screws (c, d, e, f). (4)  
Remove cord reel cover.



### Free arm cover

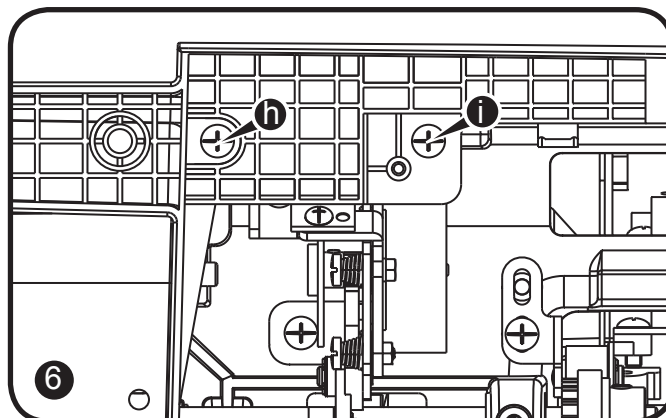
Remove screw (g) and remove the free arm cover. (5)



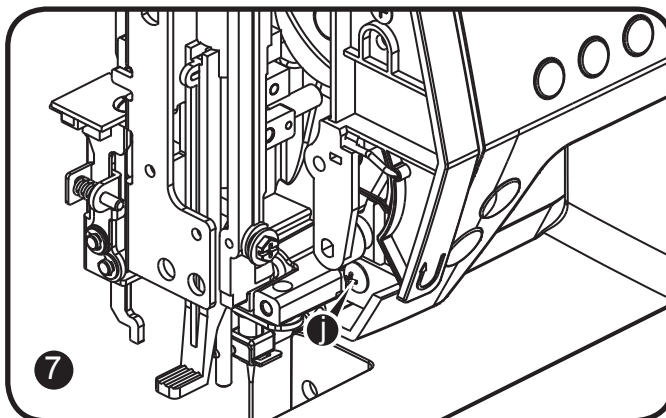
### Front cover

Remove face plate, sewing box complete, motor cover, cord reel cover, free arm cover first.

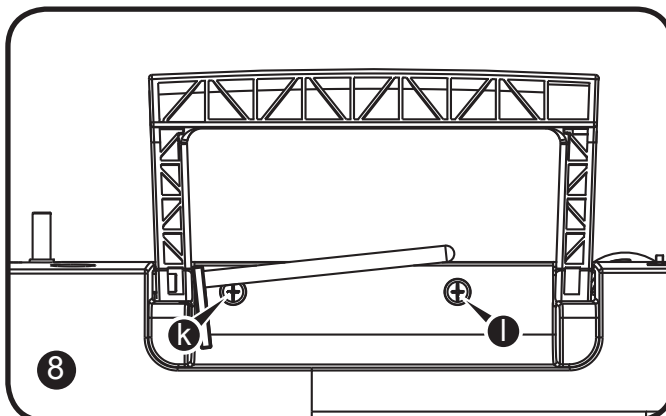
Remove 2 screws (h, i). (6)



Lift handle and loosen screw (j) about 3 mm. (7)



Face the back cover.  
Remove screws (k, l). (8)

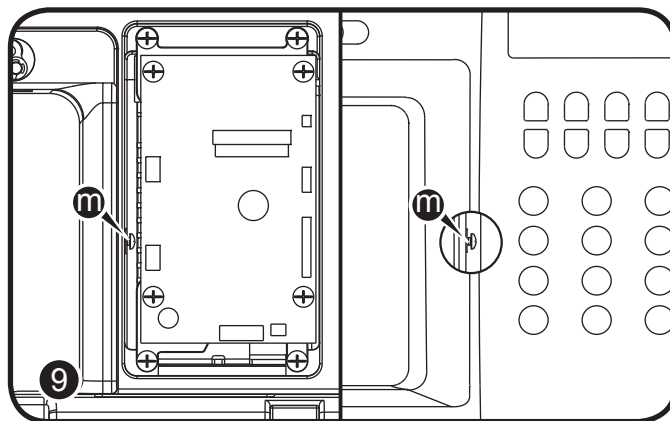


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Loosen screw (m) about 3 mm. (9)

**Note!**

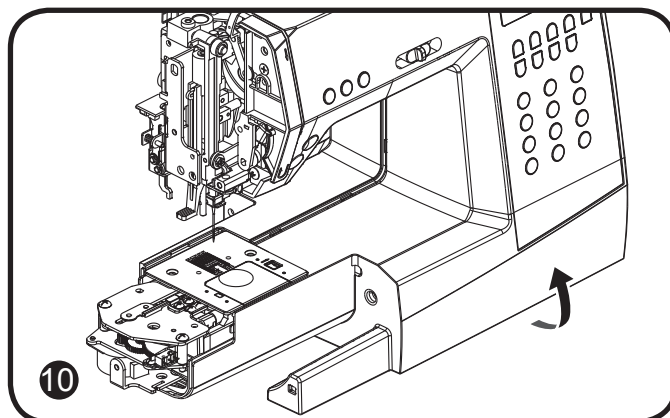
Use an electric torch (flash light) to locate screw (m) positioned inside the machine.



Remove front cover by pulling it towards you. (10)

**Note!**

Be sure to remove the front cover carefully, because there is a cable connected between the body and the front cover.

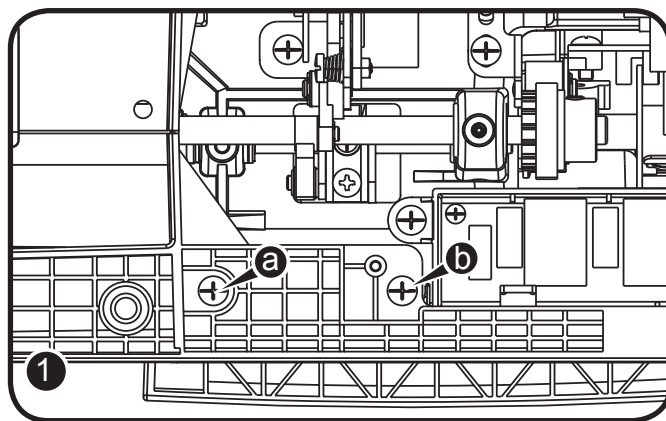


## Back cover

---

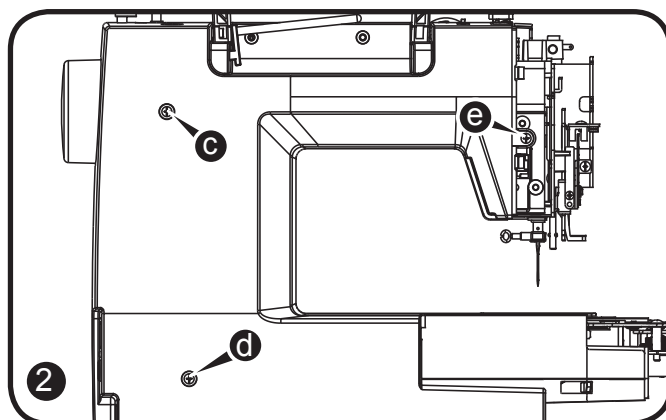
Remove front cover first.

Remove 2 screws (a, b). (1)



Remove 3 screws (c, d, e). (2)

Remove the back cover. (2)



# Play of arm shaft

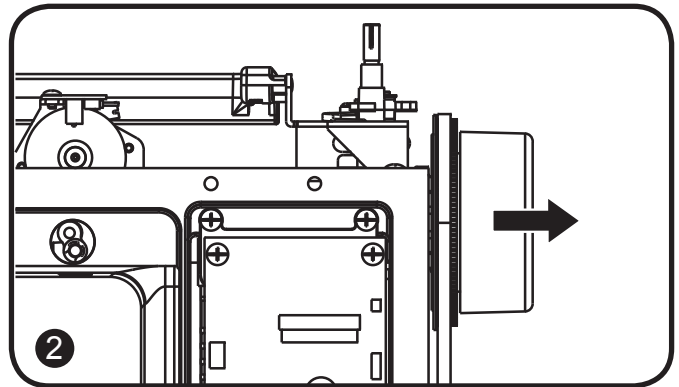
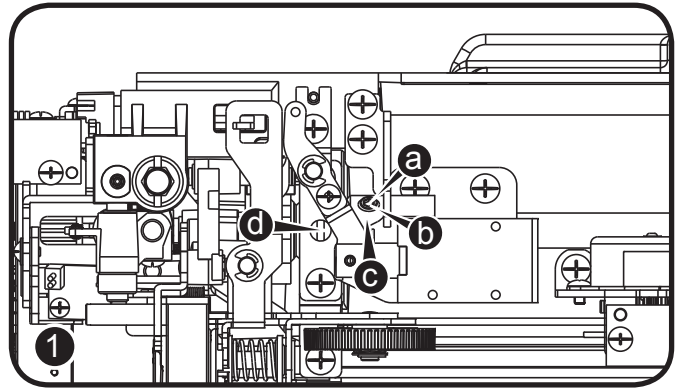
## Adjustment

1. Remove the face plate, front cover and back cover.
2. Loosen the screw (a) of arm shaft collar (c). Turn around hand wheel, loosen the screw (b) of arm shaft collar (c). (1)
3. Pull hand wheel to the right. (2)
4. Push arm shaft collar (c) tightly to the left against the arm shaft bushing (d), then fasten and secure the screws (a, b).
5. Re-check the distance between arm shaft collar and arm shaft bushing.

## Note!

Be sure arm shaft operates smoothly after adjustment.

Arm shaft collar and arm shaft bushing being too tightly closed might cause insufficient operation of arm shaft.



# Take up lever adjustment

## Check

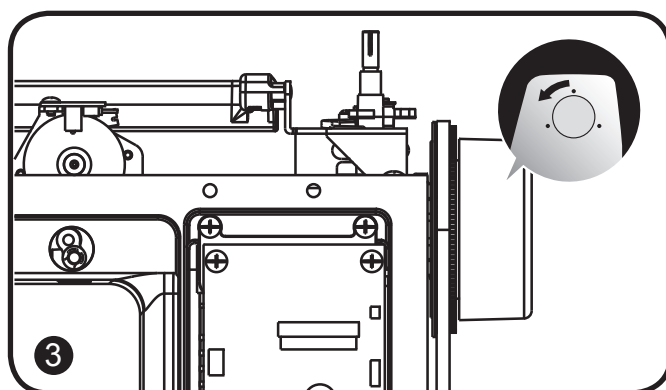
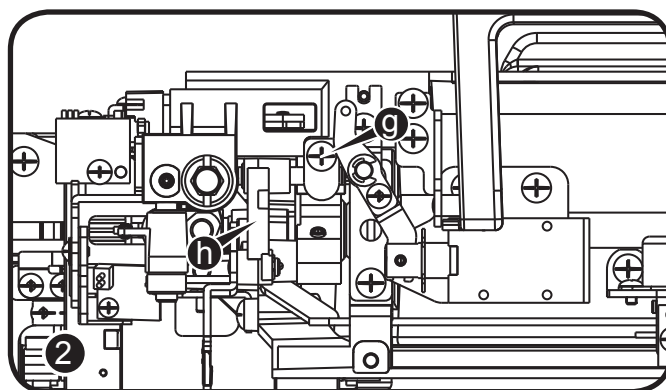
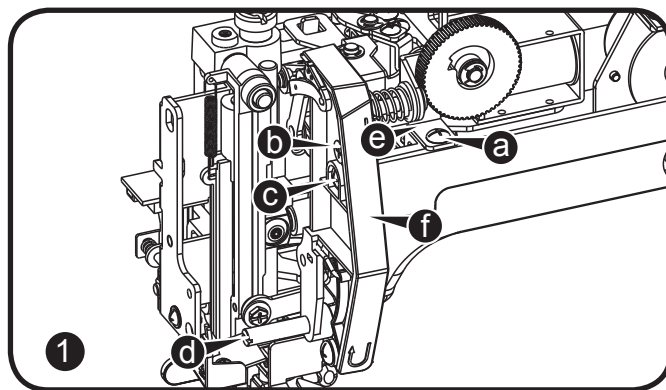
When turning the hand wheel no noise should appear in the thread take up lever.

## Adjustment

1. Remove the face plate, front cover and back cover.
2. Remove screws (a, b, c, d) and remove the tension dial supporter plate (e) and tension dial supporter plate cover (f). (1)
3. Remove screw (g).
4. Push take up lever supporter (h) right to proper location.
5. Tighten screw (g).
6. Turn around hand wheel, check noisy and movement.

If adjustment is too tight, it will be difficult to turn the handwheel.

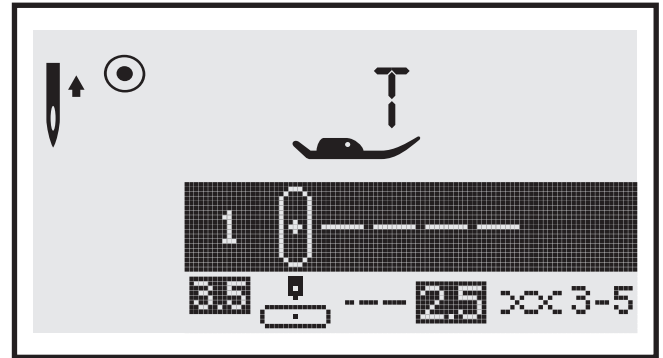
If adjustment is too loose, it will make noise while turning the hand wheel.



# The centre position of the needle in the feeding direction

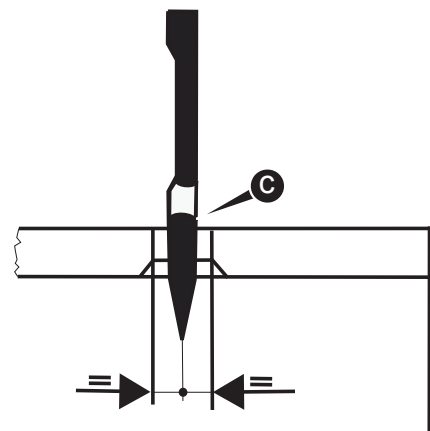
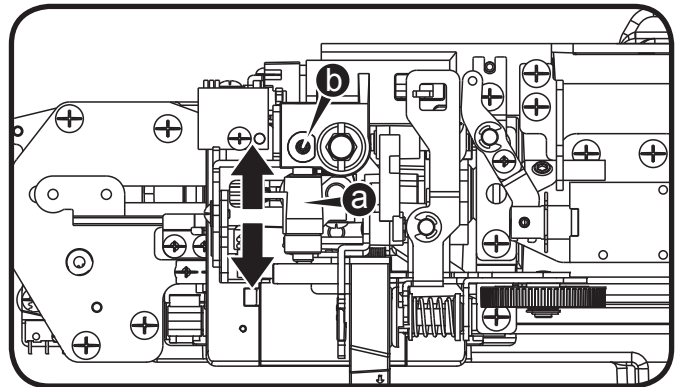
## Check

1. Press MODE selection button to direct pattern mode "⌘", and choose direct pattern # 1.
2. Insert a new 90 needle.
3. Set the needle so the needle eye is just above the needle plate.
4. The needle shall in the feeding direction pass through the centre of the needle hole (c) in the needle plate.



## Adjustment

1. Remove the face plate.
2. Press MODE selection button to direct pattern mode "⌘", and choose direct pattern # 1.
3. Set the needle so the eye of the needle is just above the needle plate.
4. Loosen the 2 mm allen screw (b) of needle bar supporter (a).
5. Turn needle bar supporter (a) forward / backward to adjust needle.  
Backward - to move needle forward  
Forward - to move needle backward
6. Set the point of needle so it passes through the centre of the needle hole in the needle plate.
7. Tighten the 2 mm allen screw (b) of needle bar supporter (a).



## Note!

This Adjustment affects the "Needle to hook adjustment".



## Presser bar height

---

Remove face plate, back cover and lift up presser bar lifter lever (a). (1)

Loosen screw (b) of presser bar bracket. (2)

Place the gauge (c) (6.0~6.2 mm) on top of needle plate. (3)

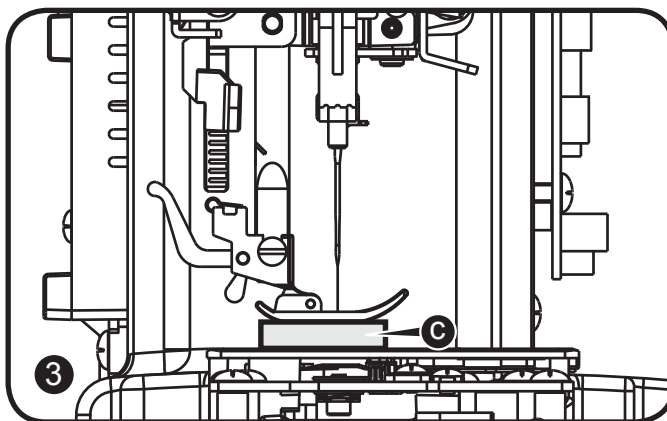
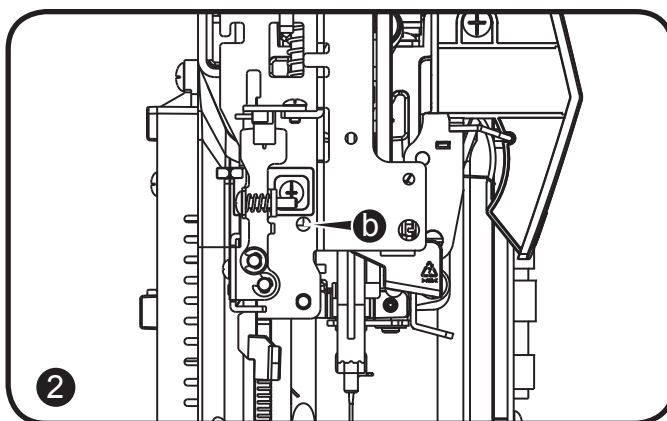
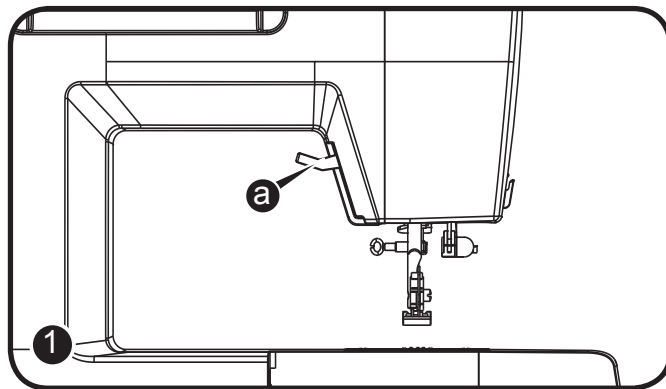
Pull down the presser bar lifter lever so bottom of presser foot and top surface of gauge would meet.

Tighten the screw (b) securely.


The correct setting of gauge should be 6.0~6.2 mm.

### **Note!**

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



# Zigzag movement of the needle adjustment

Press MODE selection button to direct pattern mode "  ".

Choose direct pattern # 5, zigzag 7 mm.

Remove the face plate, front cover and back cover.

Set needle bar at its lowest point when it swings to left. Turn the hand wheel to move the needle bar upward.

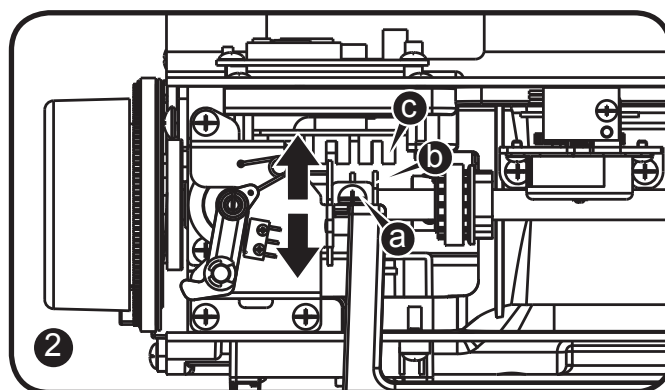
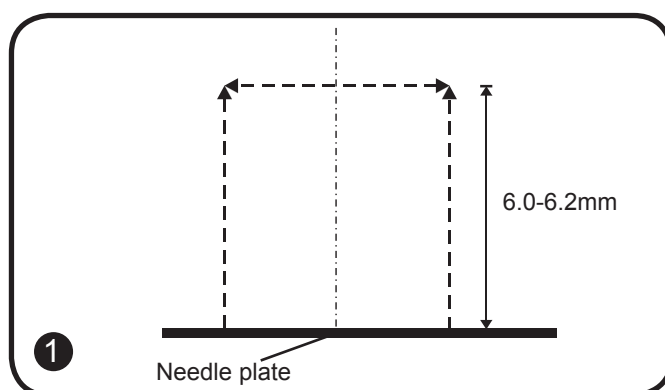
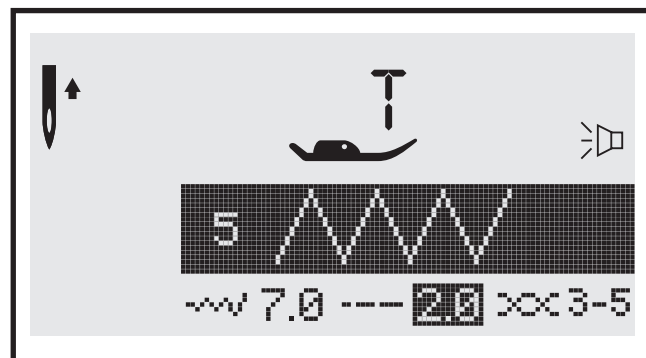
The vertical distance in which the needle point goes up until it swings over to the right side should be 6.0~6.2mm. (1)

**If needle flow is less than 6.0 mm,**  
loosen the screw of rotary sensor collar (a), and turn rotary sensor collar (b) toward back. (2)

**If needle flow is more than 6.2 mm,**  
turn rotary sensor collar (b) toward front. (2)

Tighten the screw (a) after making sure the needle flow is between 6.0 mm to 6.2 mm.

Check that the rotary sensor collar (a) not is touching photo sensor's (c).



## Needle position on zigzag

Press MODE selection button to direct pattern mode "Z".

Choose direct pattern # 5, zigzag 7 mm.

Remove face plate.

Loosen screw (a) and remove the LED holder (b). (1)

Loosen screw (c) of needle bar driving rod pin (d). (1)

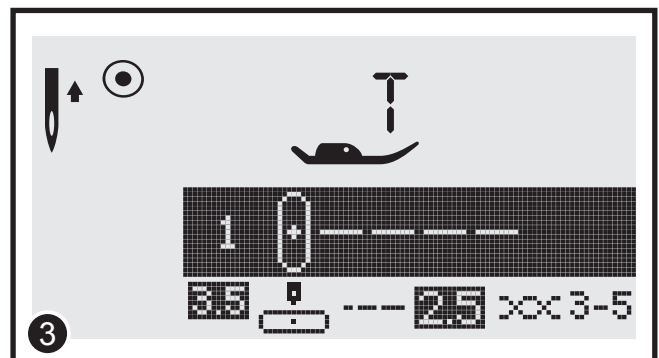
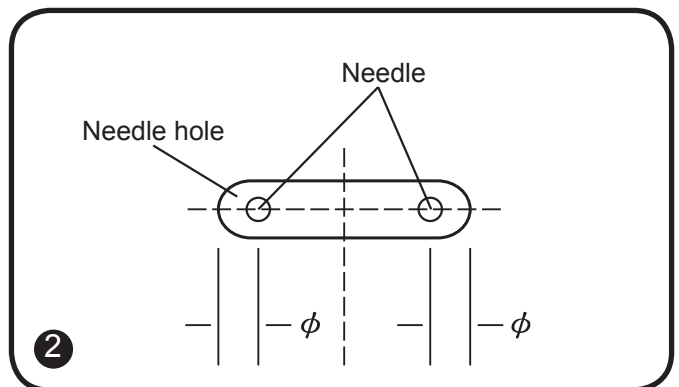
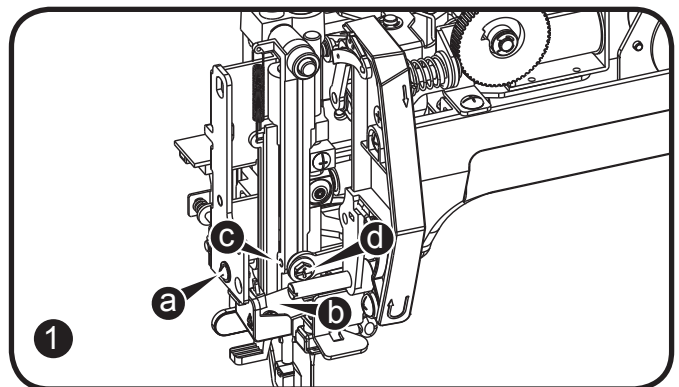
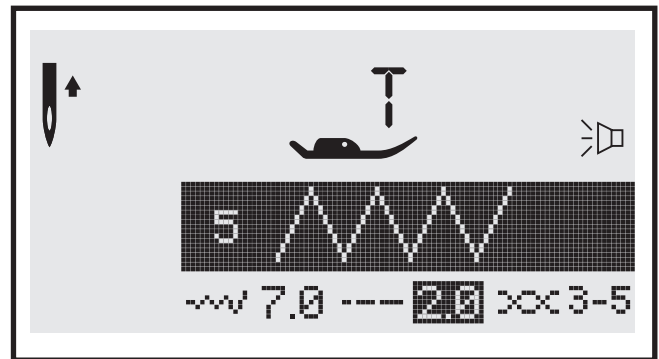
Adjust needle bar driving rod pin (d) position, clockwise needle will turn left, counter clockwise needle will turn right.

### Check

The distance from the needle to the needle plate should be equal on both sides (2) when the needle is in it's most left respective most right position.

### Note!

Also check the needle in centre position by choosing direct pattern # 1. (3)



# Automatic needle threader adjustment

Check the threader hook. (d)

If it is damaged, change to a new.

If it is inclined, adjust the threader hook properly.

If the threader hook can not enter needle (c) hole freely, please adjust the threader stopper. (1)

Adjust the stopper: (2)

Remove face plate and turn hand wheel to raise needle bar to its highest position.

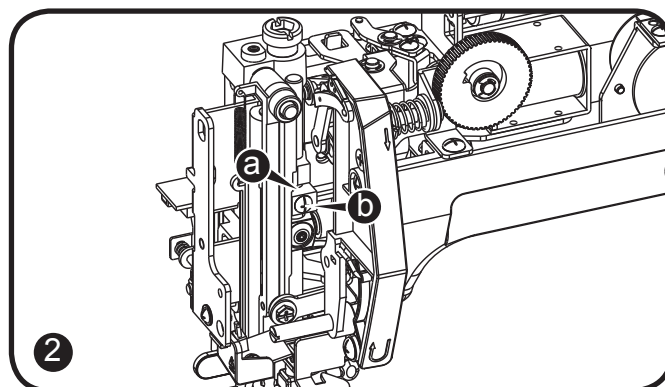
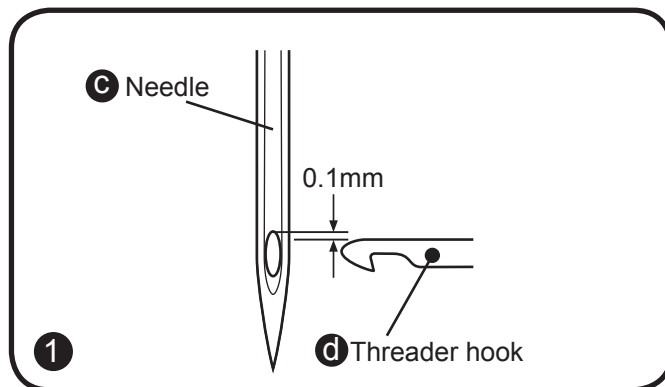
Loosen screw (b) of the threader stopper (a).

Move the stopper (a) upward and the threader hook will become higher.

Move the stopper (a) downward and the threader hook will become lower.

Adjust the stopper to the proper position for entering needle hole freely.

Fasten the screw (b).

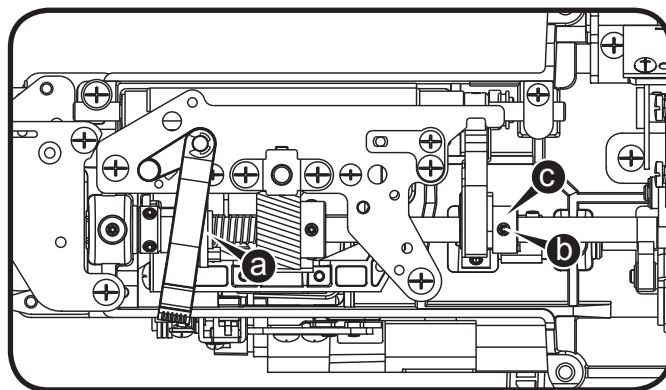


## Adjustment of feed rock shaft and feed lifting rock cam


---

- 1) Remove moter cover, cord reel cover and free arm base.
- 2) Turn the hand wheel to make the needle rise to its highest point.
- 4) Check if the feed lifting rock cam (a) and the screw (b) of feed rock cam (c) are parallel.
- 5) If the screw of feed rock cam are not parallel:

Loosen the screw (b) of feed rock cam (c)  
adjust the screw and front gauge correction  
to the middle.



## Height of needle bar

Press MODE selection button to direct pattern mode "  ".

Choose direct pattern # 1.

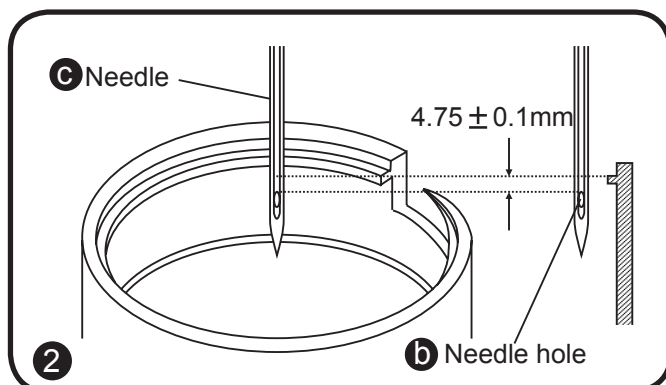
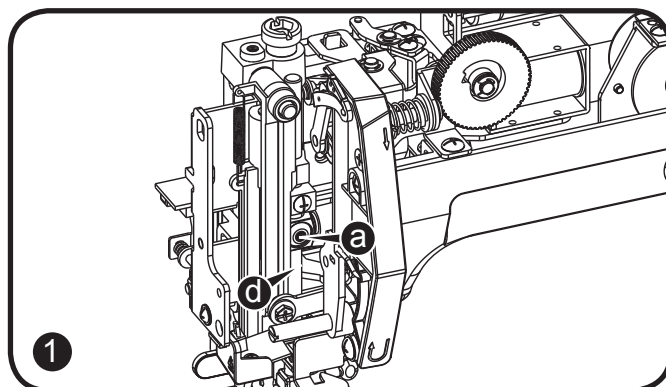
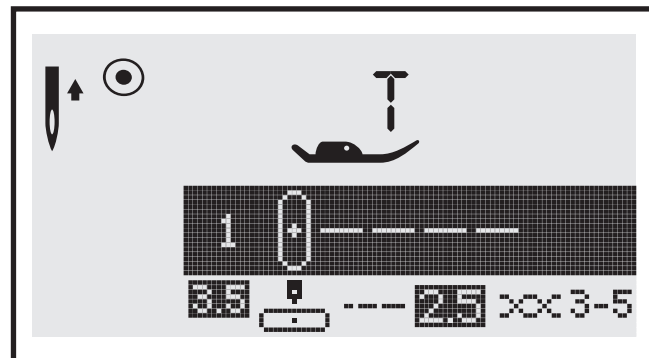
Remove face plate, needle plate and bobbincase.

When the needle is in it's lowest position, the distance between the top of needle hole (b) and the path of shuttle hookholder should be  $4.75 \pm 0.1\text{mm}$ , refer to picture 2.

If the height is incorrect  
loosen the needle bar bracket (a) to adjust the  
needle bar (d) height.

Move the needle bar up or down to obtain the  
correct height.

Check that the needlebar is not twisted.  
Fasten the screw (a) after confirming the  
height of needle bar.



# Timing of needle and hook

## Check:

Press MODE selection button to direct pattern mode "Z".

Choose direct pattern # 5, zigzag 7 mm with needle in left position.

Set the needle bar at its lowest point. Place a clamp (a) around the needle bar, slightly tighten its screw (b). (1)

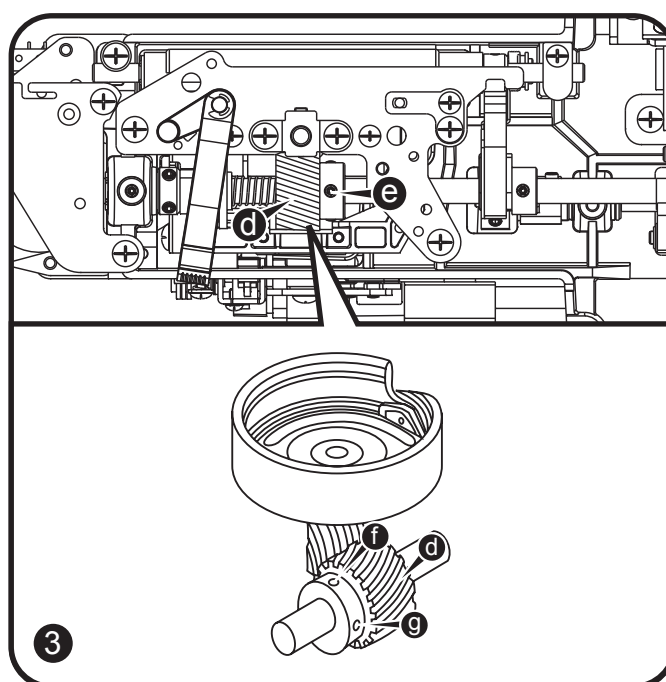
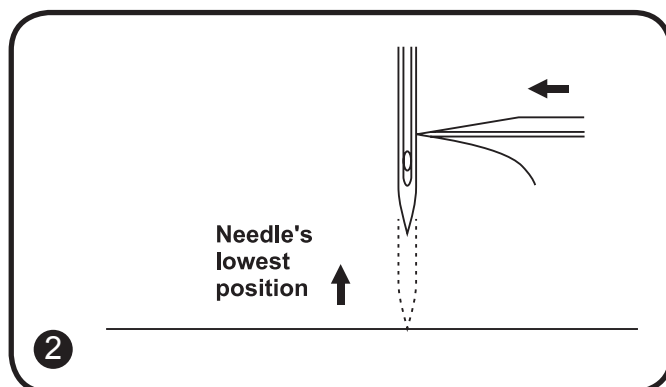
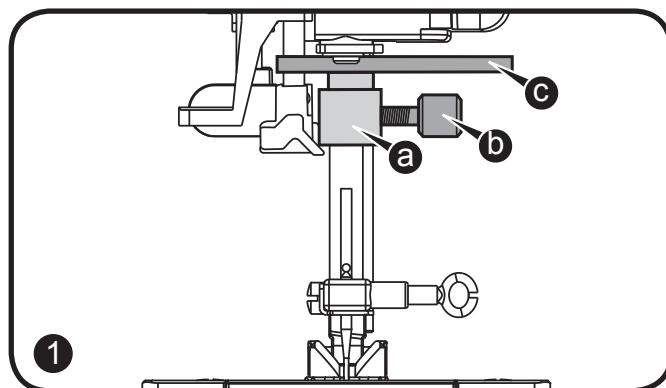
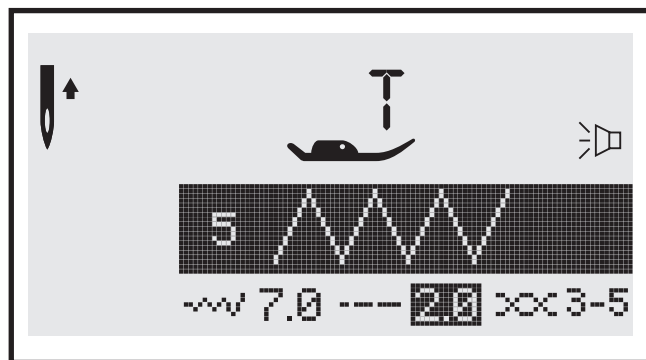
Place a 3.5 mm gauge (c) between the needle bar support and clamp (a), tighten the needle clamp screw and remove the 3.5 mm gauge (c).

Turn the hand wheel so that the needle moves upwards and the needle clamp stops against the needle bar support.

The tip of the hook should now be exactly behind the centre of the needle.

## Adjustment:

If the distance is incorrect, loosen the screws (e, f, g) of lower shaft gear (d), and adjust shuttle hook to correct timing, and tighten the screw. (3)



## Distance-needle-hook

Press MODE selection button to direct pattern mode "Z".

Choose direct pattern # 5, zigzag 7 mm.

Remove face plate, front cover, back cover and needle plate.

Remove the bobbin case.

The distance should be 0,05~0,1mm inbetween the tip of the hook and the needle when the needle is on the right side of it's zigzag movement.

If the distance is incorrect:

Loosen the screw (a) of the needle bar supporter.

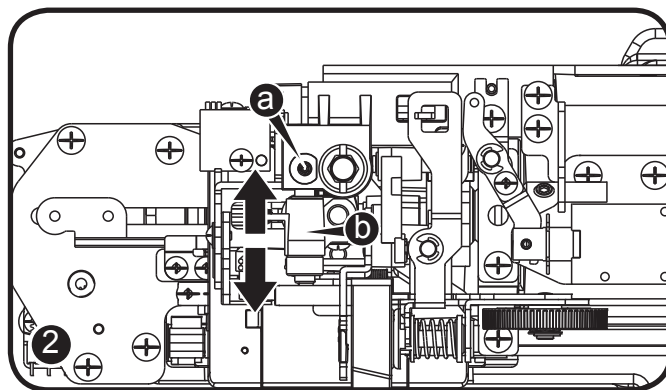
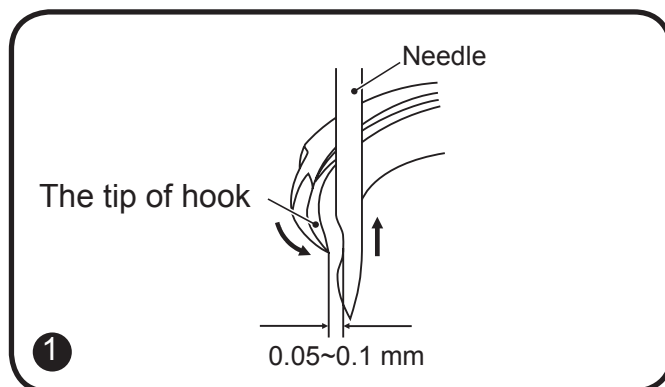
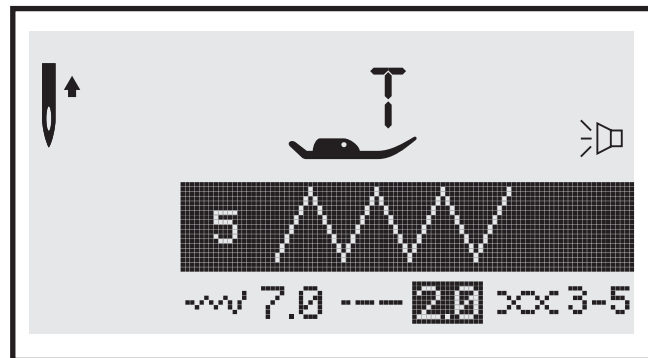
Push the needle bar supporter (b).

Backward, the space will become larger.

Frontward, the space will become smaller. (2)

### Note!

This adjustment affects the setting: The centre position of the needle in the feeding direction.





## Play between shuttle driver shaft gear and lower shaft gear

Remove free arm cover and needle plate.

Remove the bobbin case.

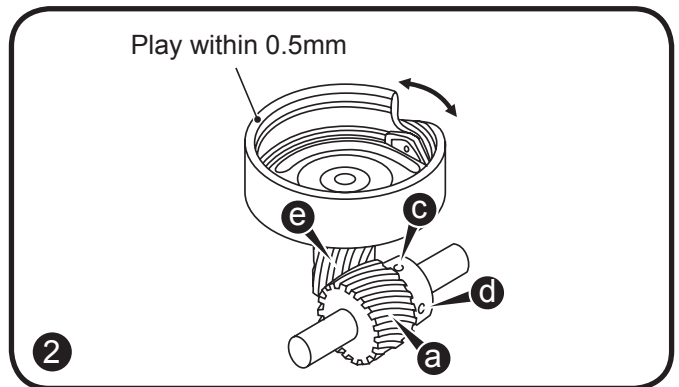
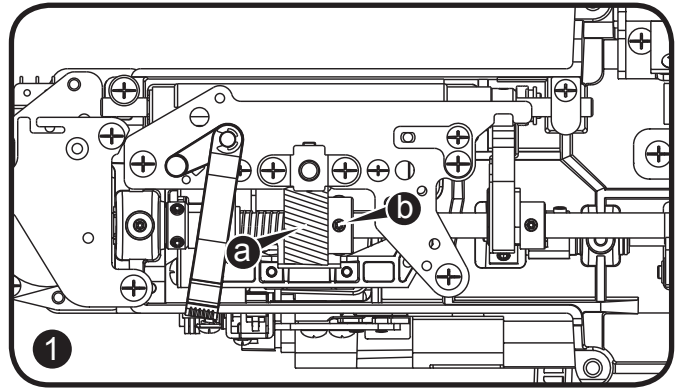
Loosen the 3 screws (b, c, d) on the lower shaft gear (a), move the lower shaft gear right or left to change the axial play.

The axial play of the hook should be within 0.5 mm.

When a good play is obtained, tighten the three screws (b, c, d).

### **Note!**

This adjustment may affect the setting:  
Timing of needle and hook.



## Play of shuttle driver shaft

Remove the needle plate.

1:

Use a distance gauge to check the play of shuttle driver shaft.

Turn the hand wheel counter-clockwise, the shuttle hook (c) will move towards rotary hook plate (d), and generate a play between the shuttle hook (c) and the rotary hook plate (e).

Using the distance gauge to test the play, the play should be 0.3-0.5 mm.

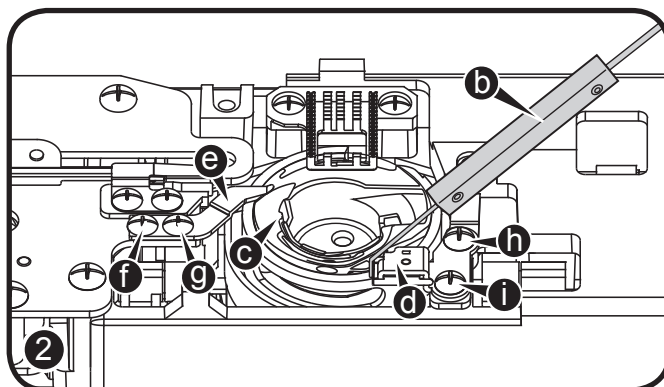
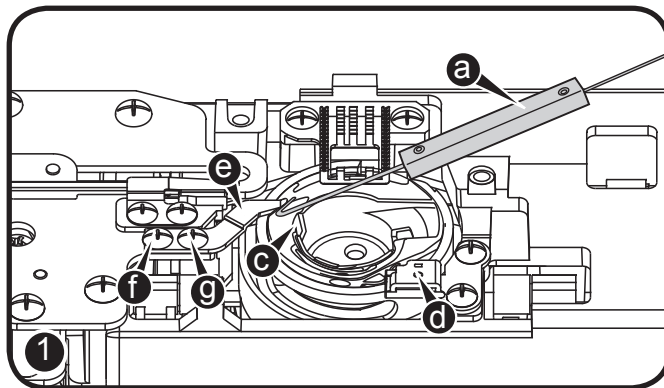
If the play is incorrect, loosen 2 screws (f, g) and adjust the plate to the proper position. Re-tighten the screws.

2:

Turn the hand wheel clockwise, the shuttle hook (c) will move towards rotary hook plate (e), and generate the play between the shuttle hook and the rotary hook plate (d).

Use the distance gauge to check the play, the play should be 0.6-1.0 mm.

If the play is incorrect, loosen the 2 screws (h, i) of rotary hook plate (d) and adjust the plate to the proper position. Re-tighten the screws (h, i).

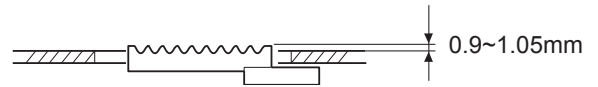


# Feed dog height

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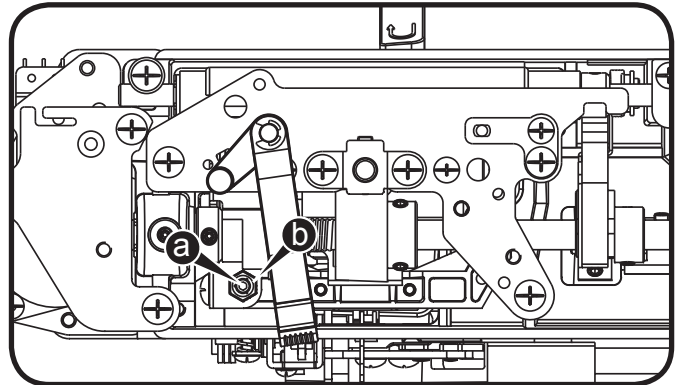
## Check

When the feed dog is in its highest position it should be 0.9 to 1.05 mm above the surface of the needle plate.



## Adjustment

1. Turn the hand wheel until the feed dog comes to its highest position.
2. Remove the lower free arm cover.
3. Loosen the nut (b).
4. Turn the adjusting screw (a) so that the feed dog becomes between 0,9 mm to 1.05 mm above the needle plate.  
Clockwise = the feed dog will be raised.  
Counter-clockwise = the feed dog will be lowered.
5. Tighten the nut (b).
6. Attach the lower free arm cover.



## Position of feed-dog in relation to the needle plate (left to right)

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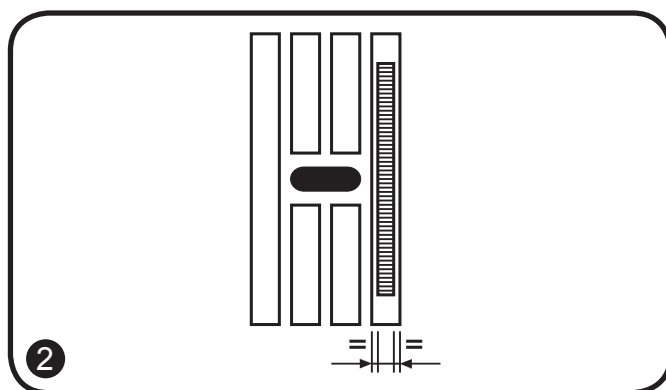
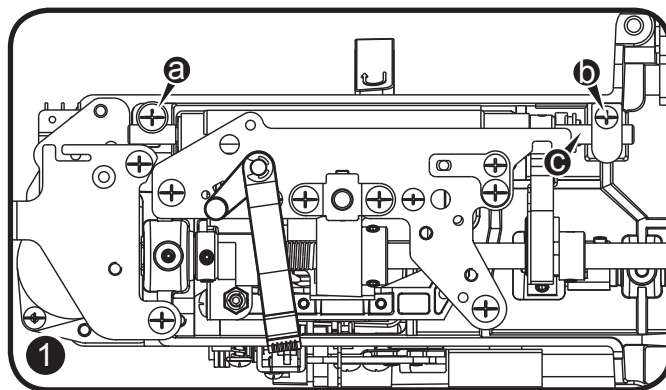
Remove the free arm cover and base plate extension cover.

Loosen the screws (a, b).

Adjust feed dog to center position by moving feed crank shaft (c) left / right.

Tighten screw (a) to fix the left side of feed crank shaft.

Push right side feed crank shaft to the left and fasten the screw (b).



# Upper thread tension

## Check

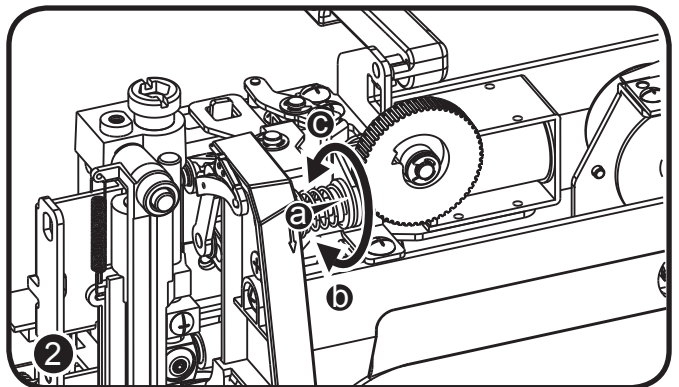
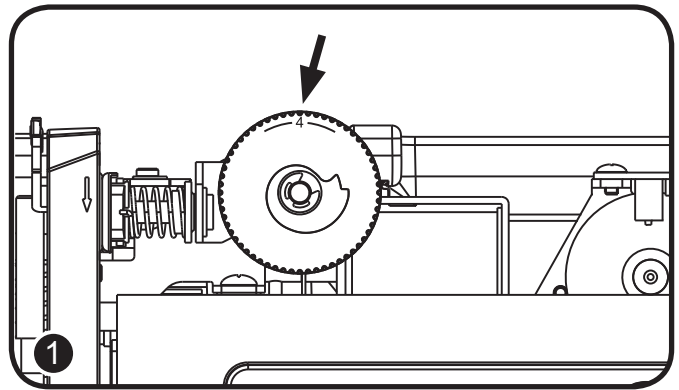
A correct interlacing of the upper thread and the bobbin thread (cotton thread 50/2 or synthetic fiber thread 100/35) must take place approximately in the middle of the fabric at straight and zigzag stitch setting with the tension dial at "4". (1)

## Alt. Check

The standard upper thread tension should be between 60-70 grams when pulling a cotton thread 50/2 or synthetic fiber thread 100/35 with the tension dial at "4". The presser foot should be lowered when checking the upper thread tension.

## Adjustment

1. Remove the face cover and the front cover.
2. Turn the plastic screw (a) in the direction of (b) when the upper thread tension is too tight. (2)  
Turn the plastic screw (a) in the direction of (c) when the upper thread tension is too loose. (2)



## Lower thread tension (thread tension of the bobbin case)

---

### Check

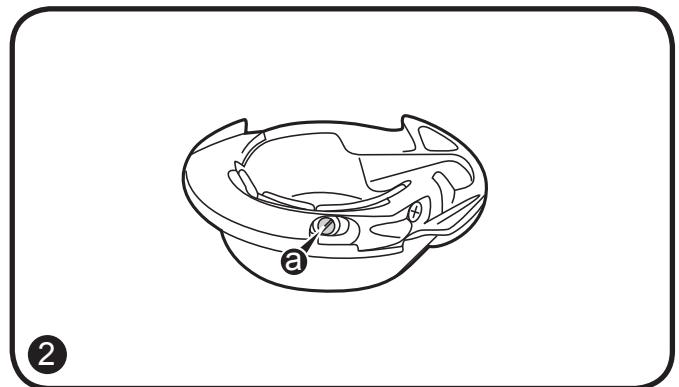
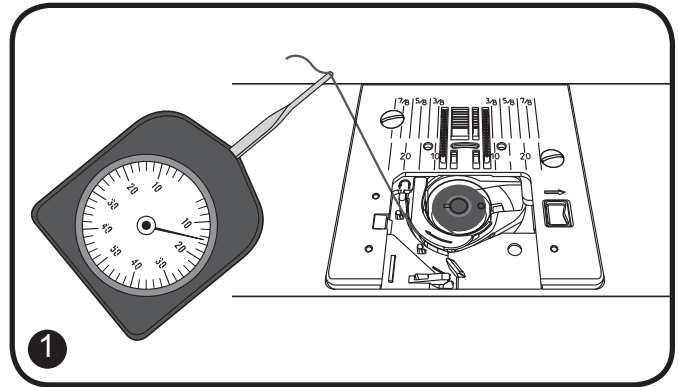
1. Insert a full bobbin into the bobbin case.
2. The thread tension spring of the bobbin case shall give a resistance of 13-17g when pulling the thread slowly.

### Adjustment

1. Turn screw (a) until the correct thread tension is obtained.

### Note!

Before any adjustment is made remove any loose pieces of thread or fluff from the thread tension discs.



# Motor belt tension

Too tight or too loose motor belt tension can cause belt noise.

Too tight motor belt tension can make the machine to run slow and overload the motor.

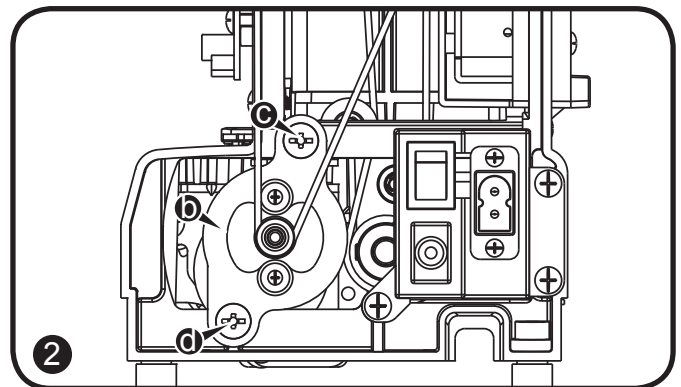
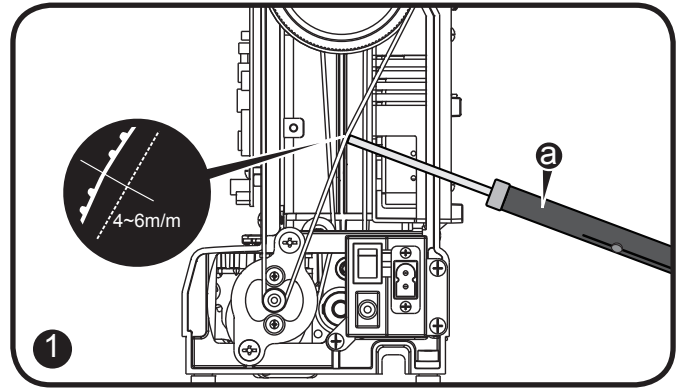
Too loose motor belt tension may cause jumping of the belt teeth on the motor pulley.

## Check

When pushing the motor belt with 200 grams load the deflection of the motor belt should be 4~6 mm.


## Adjustment

1. Remove the face cover, free arm covers, front cover and back cover.
2. Loosen the screws (c, d) of adjusting plate (b).
3. Move the motor (↑) up, the belt will become loosen; move the motor (↓) down, it will become more tighter.
4. Tighten the set screw (c).



# Stretch stitch balance

## Check


Press MODE selection button to utility and satin pattern mode "  ", choose pattern #14.

When a stretch stitch is sewn the forward feeding and backward feeding should be equal.

## Adjustment

### Note!

Before any adjustment are done check if the feed rock crank (a), feed rock rod (b) and feed crank (c, d) are working smoothly. (1)

1. Press MODE selection button to utility and satin pattern mode "  ", choose pattern # 14.

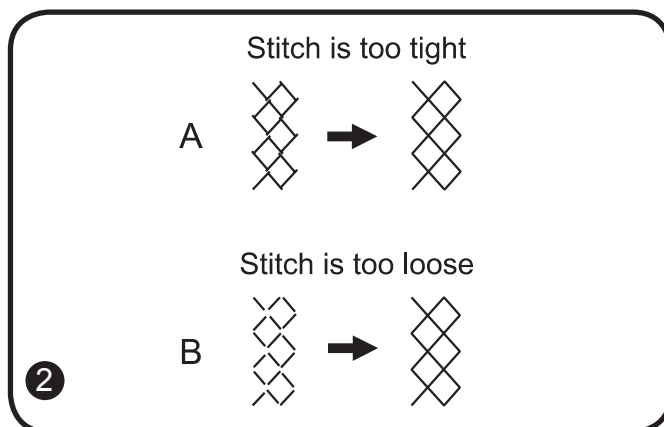
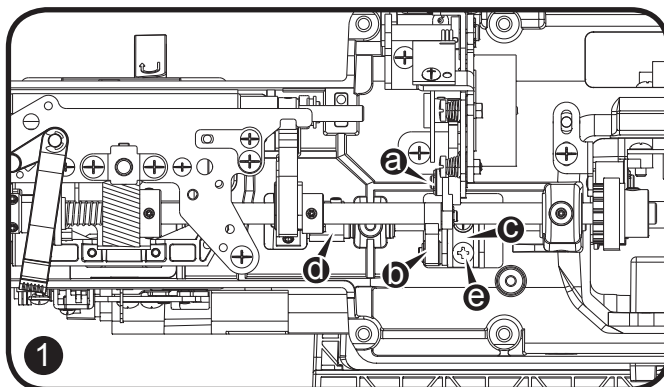
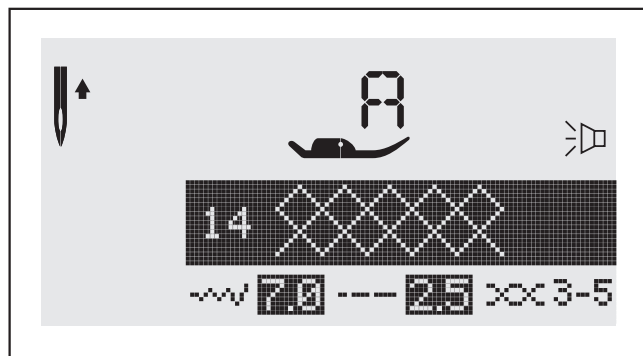
2. Put a piece of paper under the presser foot, and turn the hand wheel to check the needle drop.

position in forward and backward feeding.

3. Remove free arm cover.


If the stitch is too loose (B), adjust the screw (e) of feed crank counter-clockwise, and the needle will go backward (↑). (2)

If the stitch is too tight (A), adjust the screw (e) of feed crank clockwise, and the needle will go forward (↓). (2)





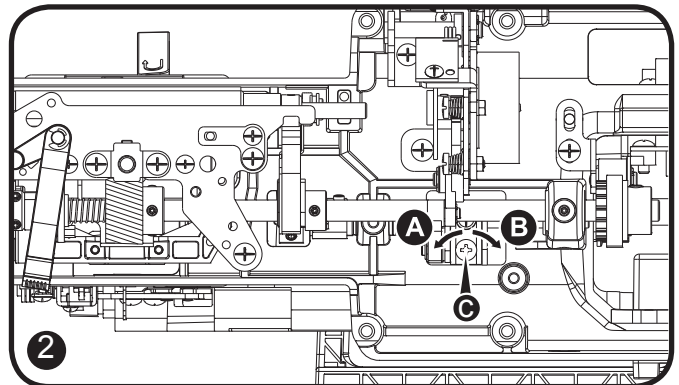
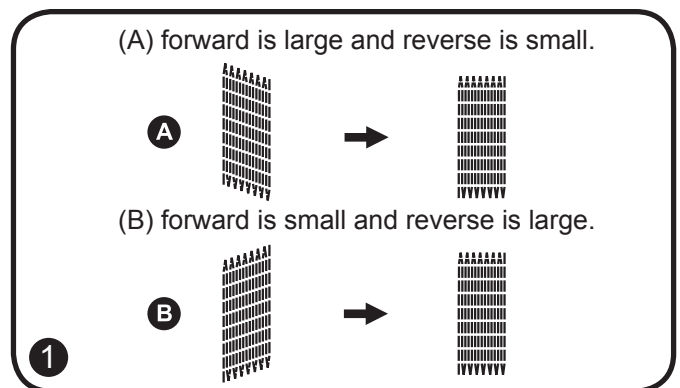
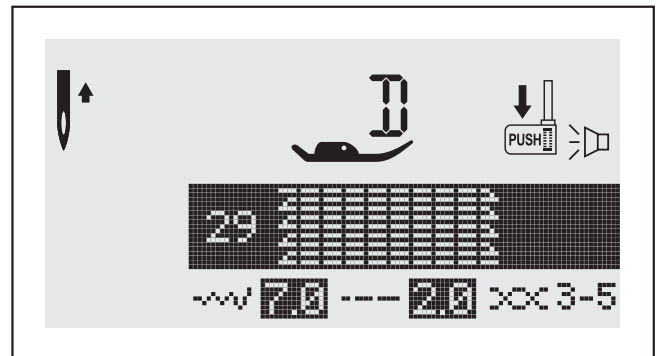
# Darning stitch position adjustment

Press MODE selection button to utility and satin pattern mode " ".

Choose pattern # 29.

## Adjustment

1. Sew one complete darning stitch.
2. Remove the base cover.
3. Turn screw (c) until the machine sews a mending stitch according to the illustration.
  - To adjust the mending stitch in the (A) direction, turn the screw (c) to the left.
  - To adjust the mending stitch in the (B) direction, turn the screw (c) to the right.



# BH photo sensor position adjustment

Remove the face plate.

Pull the BH lever (a) down. (1)

To check if the BH lever crank (b) and the photo sensor's (c) blocking movement are set in the middle. (2)

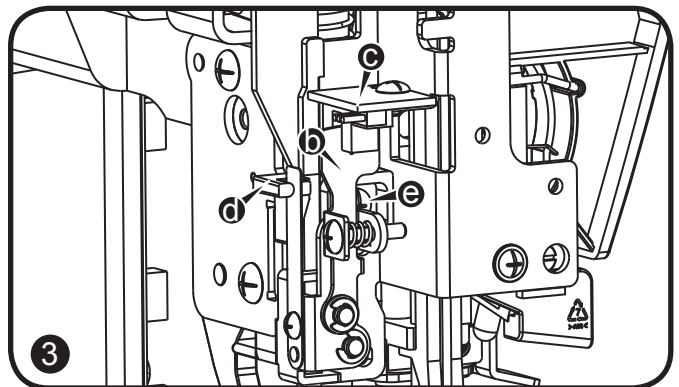
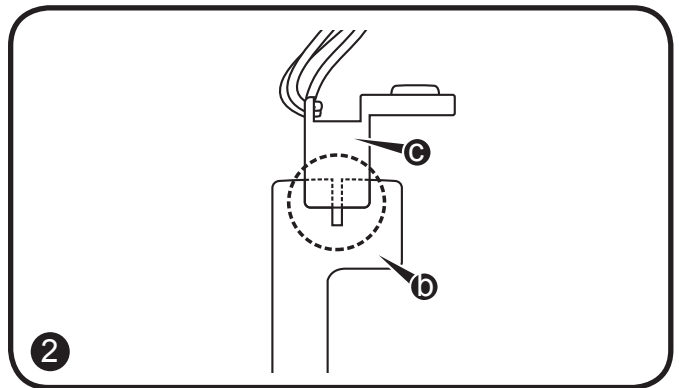
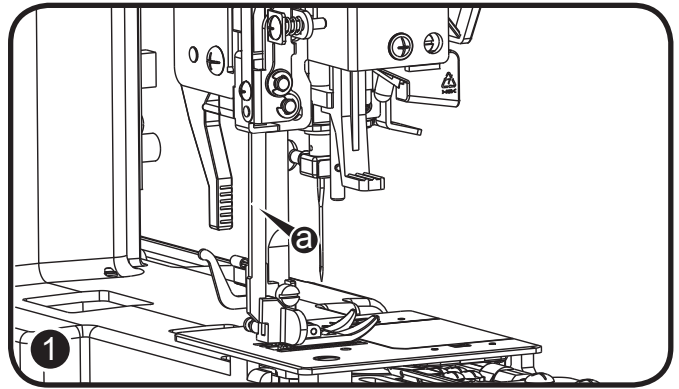
If not set in the middle place:

Loosen screw (e) of BH movement crank (d). (2)

Adjust the BH movement crank (d) to the right, and the lever crank (b) will follow.

Adjust the BH movement crank (d) to left, and the lever crank (b) will also follow it. (3)

Set the BH lever crank (b) top in back of the middle of photo sensor (c), and then re-tighten the screw (e).



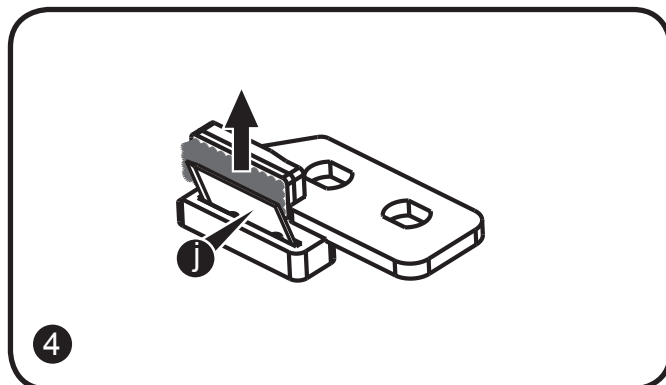
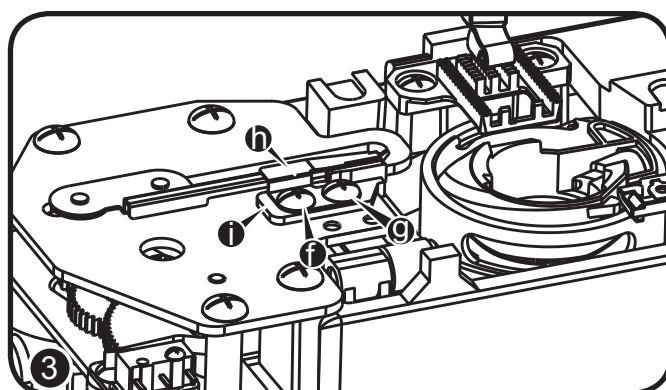
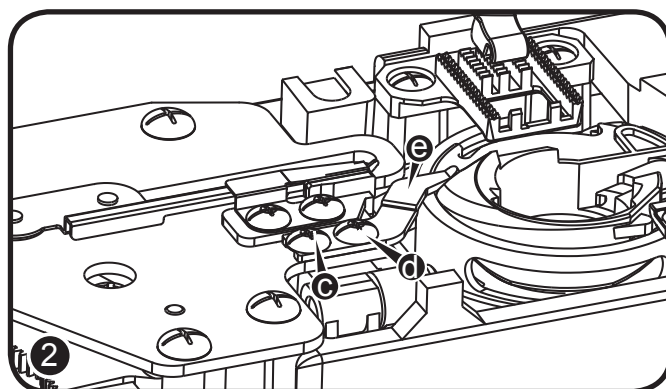
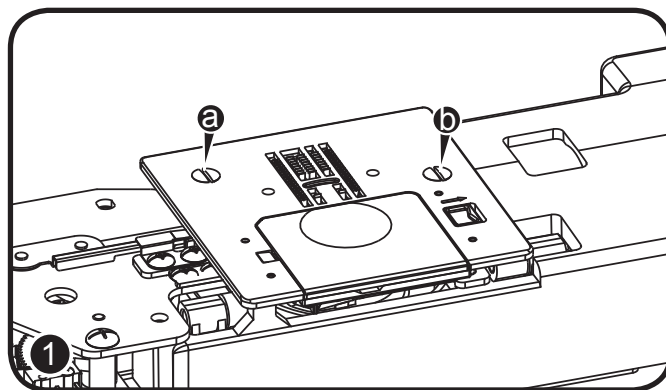
## Replace thread cutter

Remove screws (a, b) and remove the needle plate. (1)

Remove screws (c, d) and remove the rotary hook plate (e). (2)

Remove screws (f, g) and remove the movable knife plate (h) and fixed bracket (i). (3)

Replace the lower thread cutter (j). (4)



# Bobbin winding

Place empty bobbin on spindle and push it to the right.

Put the thread into the spool rod, and put the spool rod cover on it.

Lead thread from spool to back side of thread guide (a) by following the indication.

Wind thread clockwise around bobbin winder tension disc. (1)

Turn on the power switch and step on the foot controller to run the machine.

Observe the shape of bobbin winding:

When the lower part of bobbin winding is thicker, turn the screw (b) of threader guide counter-clockwise. (2)

When the upper part of bobbin is thicker, turn the screw (a) of threader guide clockwise.

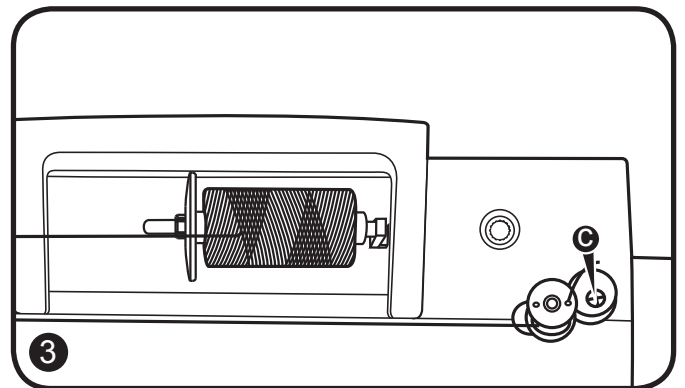
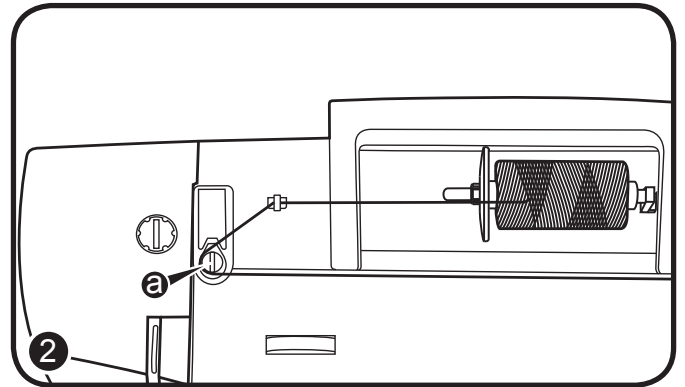
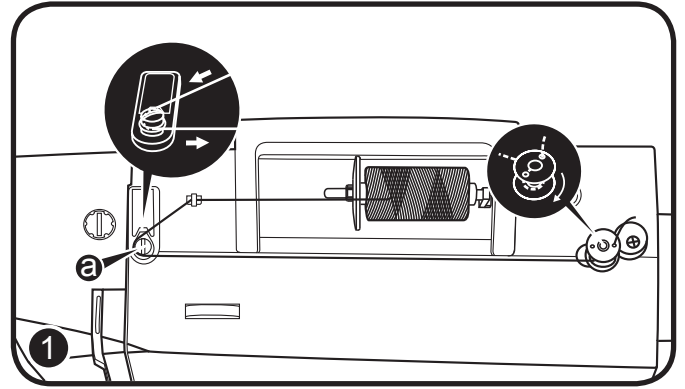
Observe the intensity:

If bobbin winding is not 80 percent full, adjust by turning the screw (c) of bobbin winder bracket shaft clockwise. (3)

If bobbin is over 80 percent full, adjust by turning the screw (c) of bobbin winder bracket shaft counter-clockwise.

Bobbin should be 80 percent full and evenly filled after adjustment.

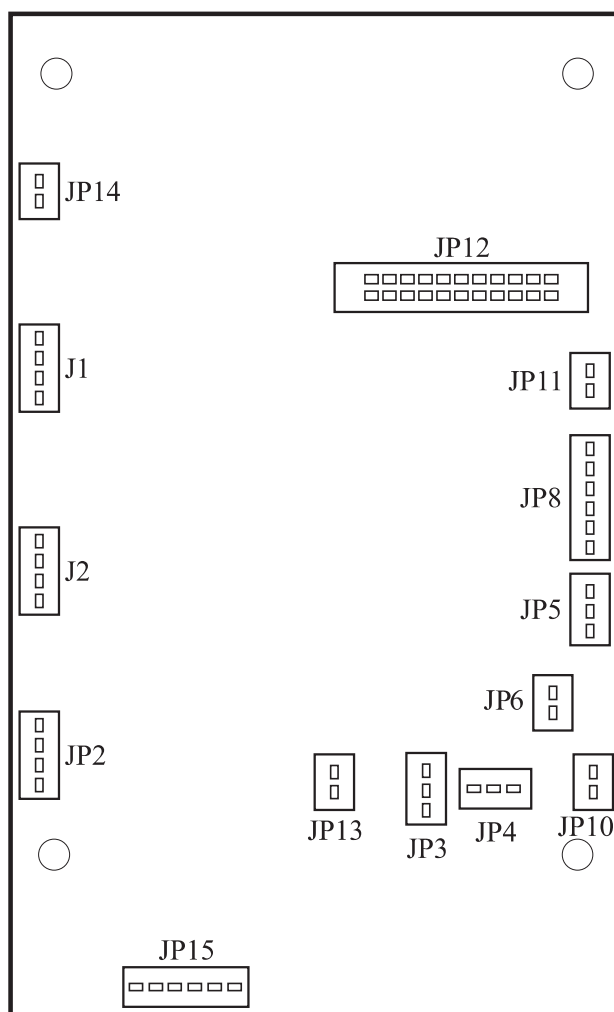
Push bobbin to left after adjustment before sewing.



# Circuit board

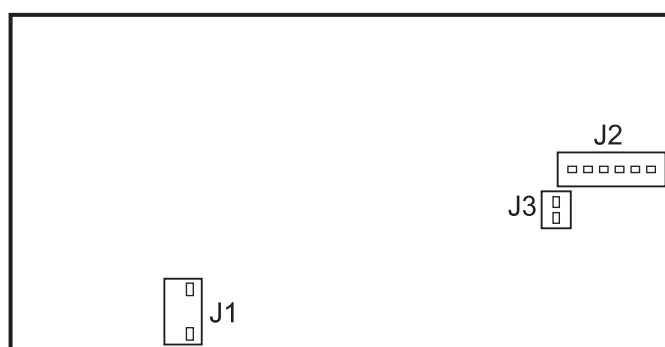
## Main board

- J1. Step motor complete (zigzag)
- J2. Step motor complete (stitch length)
- JP2. Step motor complete (Lower thread cutter)
- JP3. Photo sensor plate (zigzag)
- JP4. Photo sensor board (stitch length)
- JP5. Photo sensor board (B/ H)
- JP6. Tangent homing (Lower thread cutter)
- JP8. Photo sensor complete (Needle clamp / Needle flow / Speed / Tangent)
- JP10. Foot controller receptacle
- JP11. Bobbin winder micro switch
- JP12. Flat cable
- JP13. LED light lamp board
- JP14. Solenoid valve
- JP15. HF transformer complete



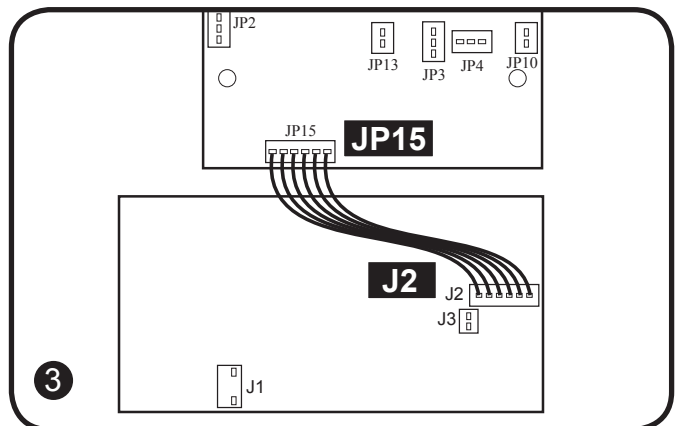
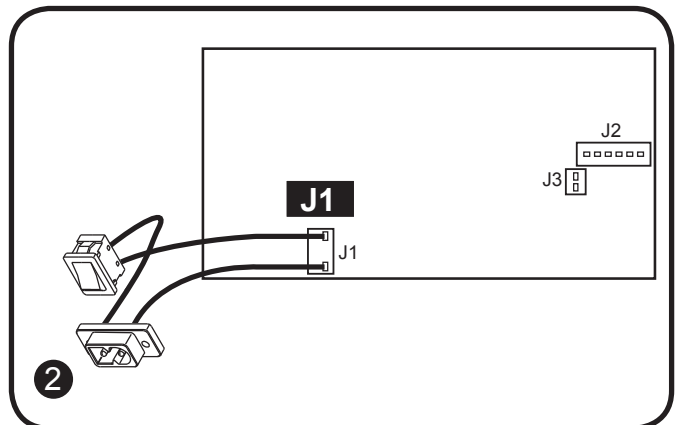
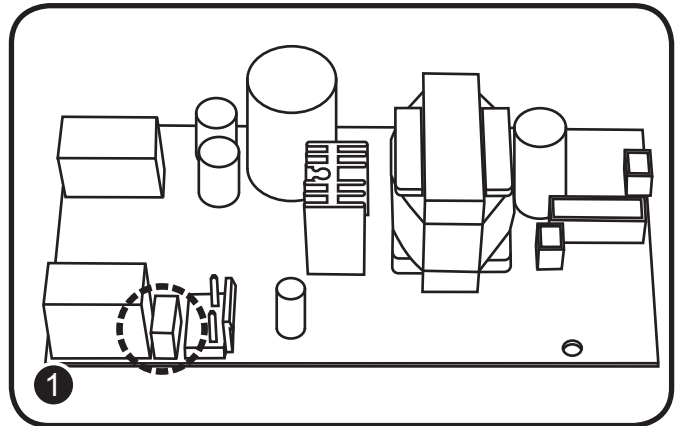
## HF transformer board

- J1. To Switch receptacle ass' y
- J2. To Main board
- J3. To DC motor



# Sewing machine malfunction

- 1) Check if fuse in HF transformer board is blown. (1)
- 2) Make sure plug J1 in HF transformer board and switch receptacle are properly connected. (2)
- 3) Make sure plug JP15 in main board and J2 in HF transformer board are properly connected. (3)
- 4) Replace HF transformer board or main board if items (1-3) do not have problem.



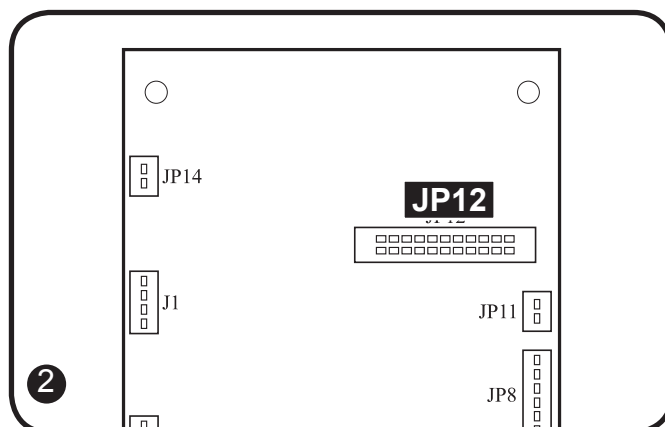
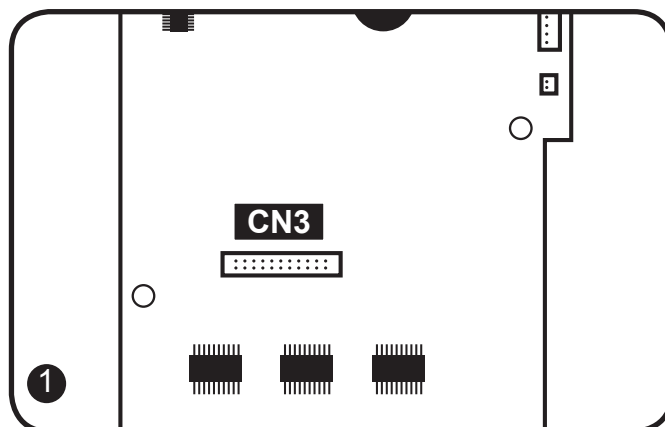
## LCD no display

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Check if LCD control board CN3 and the main board JP12 cable are properly connected.

Replace LCD control board.

Replace the main board.

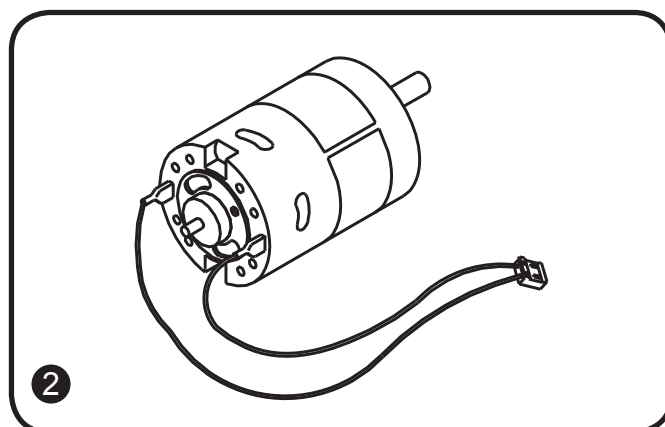
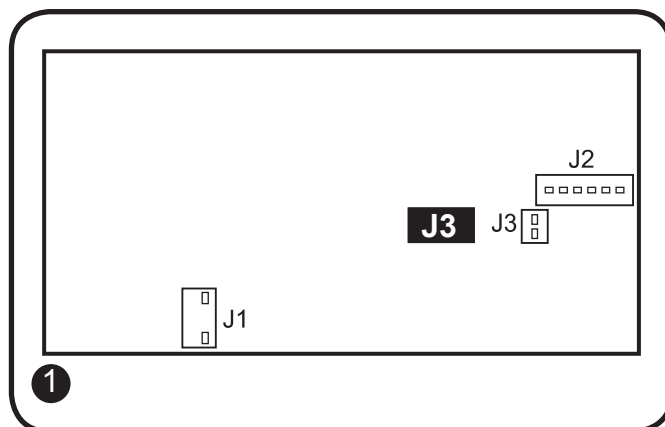


## No operation DC motor

---

Check if plug J3 in HF transformer board is properly connected.

Replace the DC motor (2) or the main board (1) if the problem continues.





## No operation/function of the pushbutton

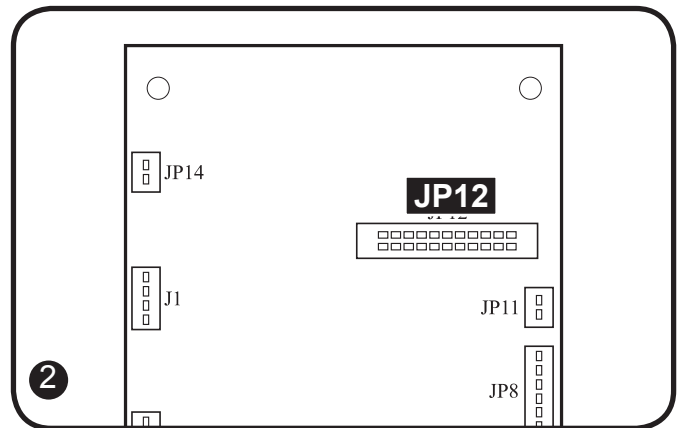
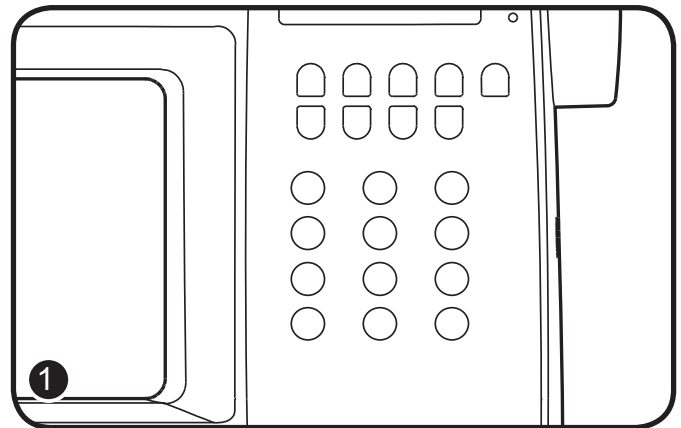
---

Make sure all buttons are correctly working without any problem. (1)

Check that the cable is properly connected to the LCD control board JP12. (2)

Replace the LCD control board.

Replace the main board.



## No operation Start/ Stop, Thread cutter, Needle up-down, Reverse & Autolock

---

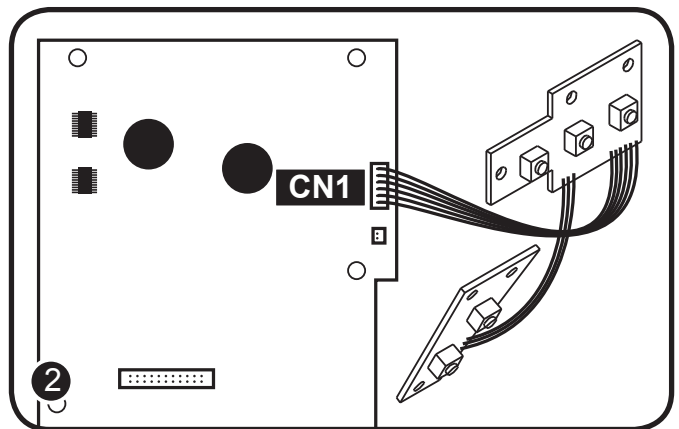
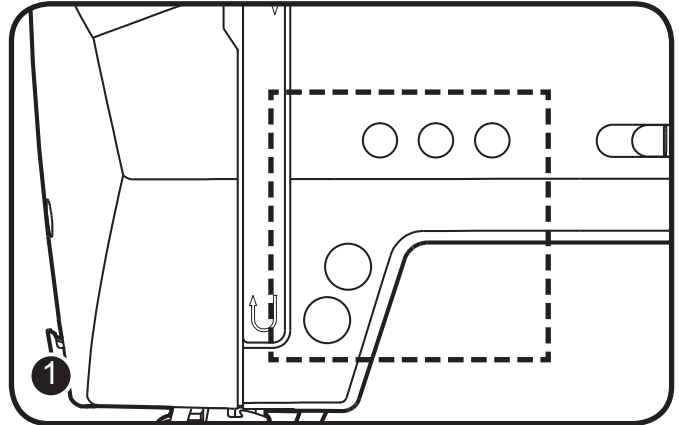
Make sure all buttons are correctly working without any problem. (1)

Check if the cable from Start/ Stop, Thread cutter, Needle up-down, Reverse & Autolock is properly connected to the LCD control board CN1. (2)

Replace the function button board.

Replace the LCD control board.

Replace the main board.



## Speed adjustment no operation

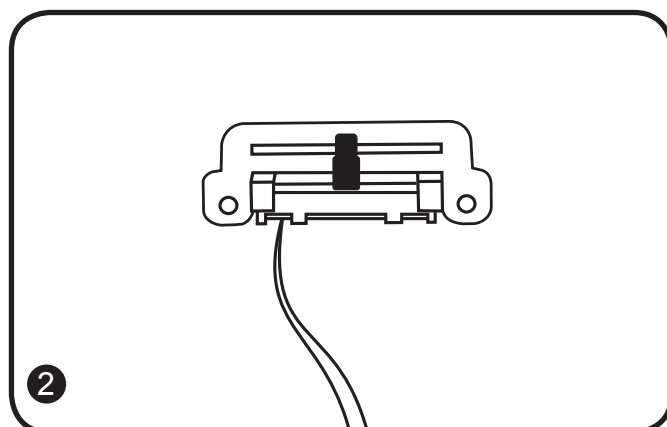
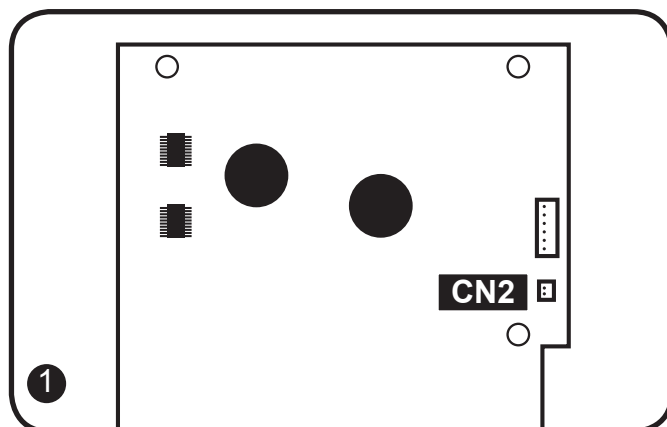
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Check if the connector from the speed regulator is properly connected to the LCD control board CN2. (1)

Replace slide resistor. (2)

Replace the LCD control board.

Replace the main board.



## No operation of feed stepper motor

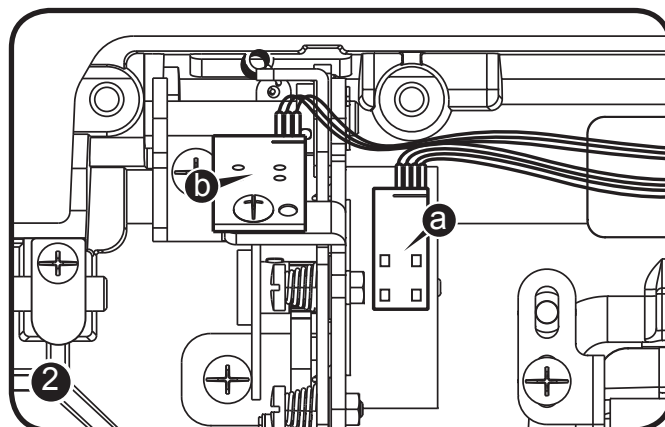
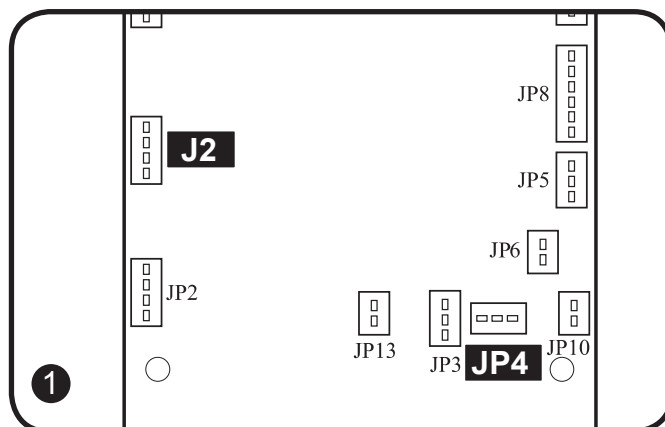
Check if the connectors J2 & JP4 are properly connected to the main board.

If the problem still remains.

Replace photo-sensor (b).

Replace the feed stepper motor (a).

Replace the main board.



## No operation of the Zig-zag step motor

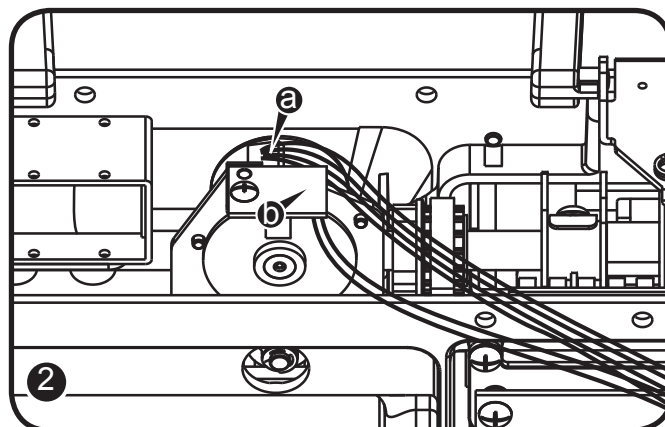
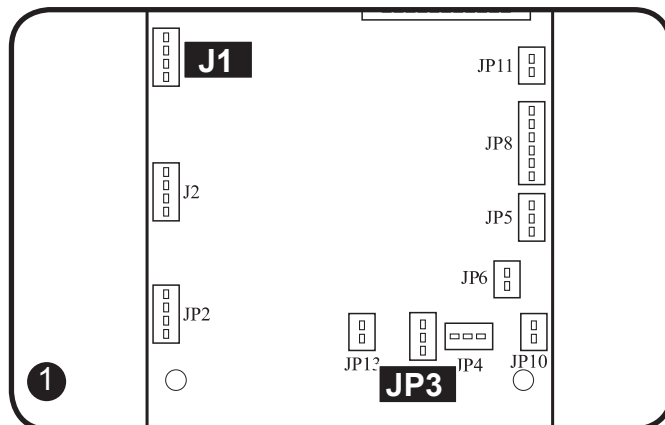
Check if the plugs J1 and JP3 are properly connected to the main board.

If the problem remains.

Replace photo-sensor (b).

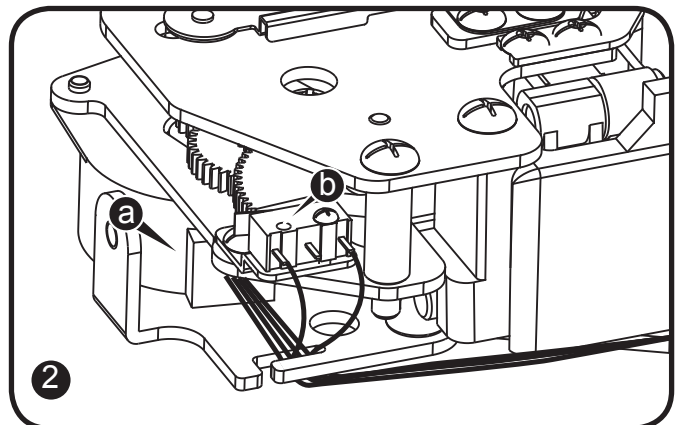
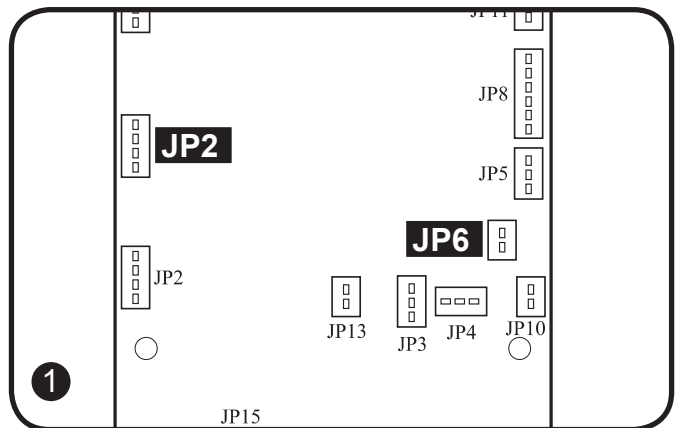
Replace the zig-zag step motor (a).

Replace the main board.



## Lower thread cutter stepping motor malfunction

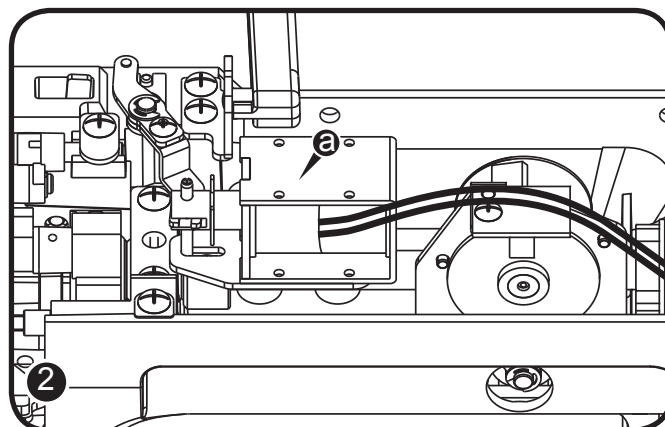
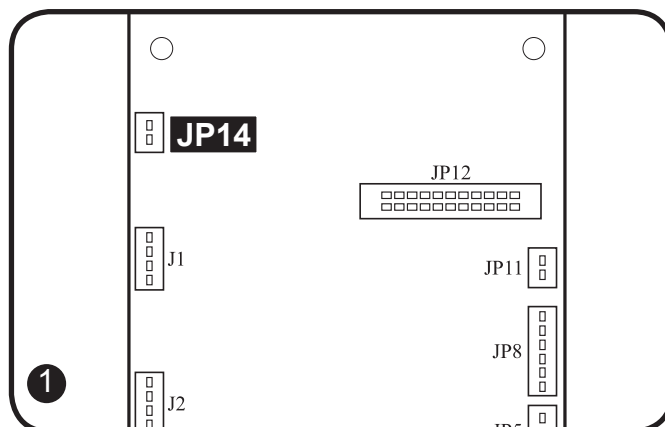
- 1) Check if the connectors JP2 & JP6 are properly connected to the main board. (1)
- 2) Replace the Lower thread cutter stepping motor (a) if item (1) does not have problem. (2)
- 3) Replace the Micro switch (Lower thread cutter) (b) or main board if items (1-2) do not have problem. (2)



## No operation of solenoid valve

---

- 1) Check if the connector JP14 is properly connected to the main board. (1)
- 2) Replace the solenoid valve (a) or main board if item (1) does not have problem. (2)



## The bobbin winder spindle is in "off" position, but LCD shows its available

Check if plug JP11 is properly connected to the main board. (1)

Check if bobbin winder spindle and micro-switch are making proper contact (a). (2)

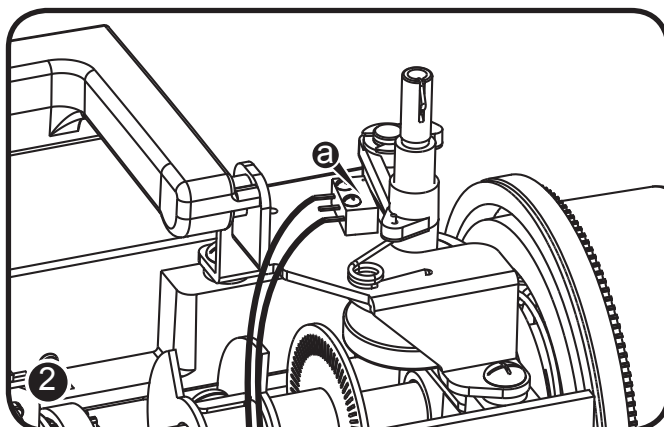
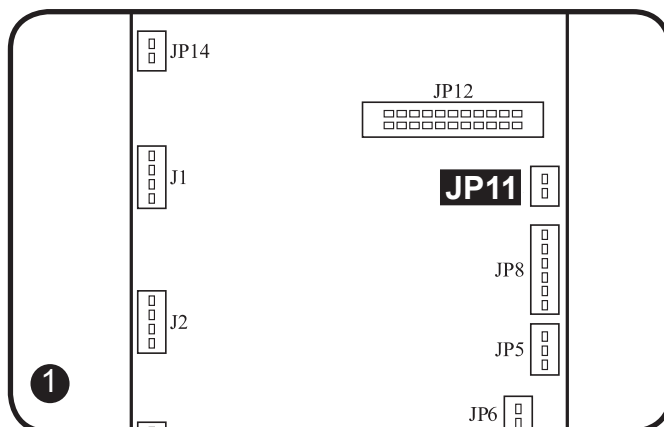
### Adjust

Loosen the two screws that holds the micro-switch in place, reposition the micro-switch until it is positioned in such a way that the bobbin spindle is pressing fully against the switch, tighten the two screws.

If the problem remains.

Replace micro-switch.

Replace main board.





## No operation of BH

Check if the connector JP5 is properly connected to the main board.

Check if the indentation on the top of the BH arm is positioned in the center of Photo-sensor switch.

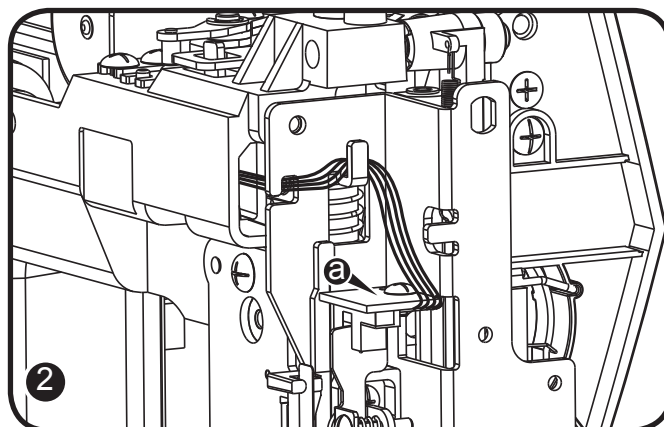
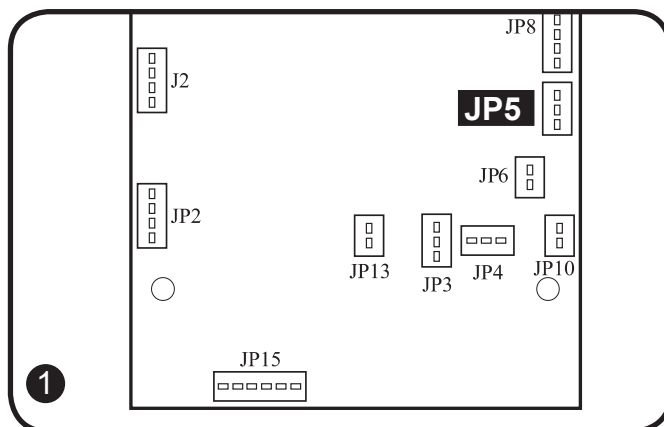
### Adjust

See adjustment: Button hole sensor position.

If the problem remains.

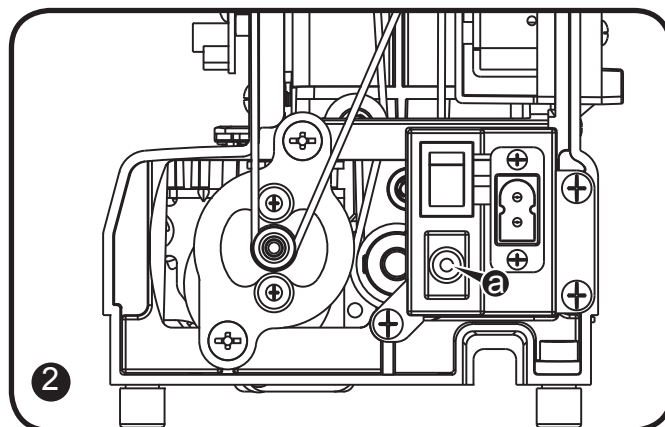
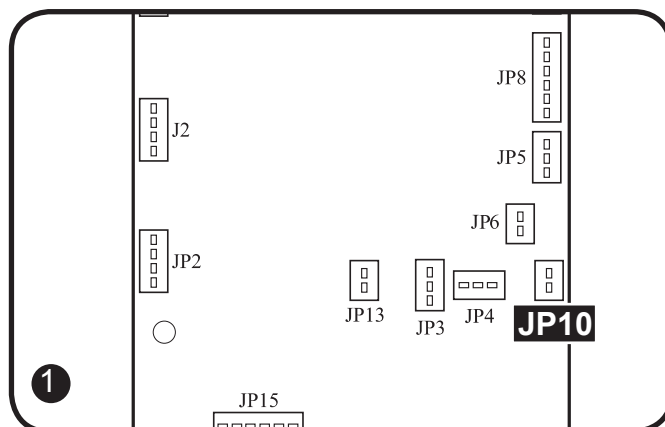
Replace the sensor board (a). (2)

Replace the main board.



## No operation of Foot controller

- 1) Check if connector JP10 is properly connected to the main board. (1)
- 2) Make sure connection on foot control jack (a) is correctly in contact with the foot control plug. If connection is bad replace lead wire foot control jack. (2)
- 3) Replace foot controller or main board if items (1-2) do not have problem.



## No function of LED lamp

- 1) Make sure plug JP13 in main board and plug (a) in LED light lamp board are properly connected. (1 / 2)
- 2) Replace LED light lamp board or main board if item (1) does not have problem.

