

SERVICE MANUAL

MODEL: eXcellence 792PRO

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P9: whole page modified.

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Changing external parts

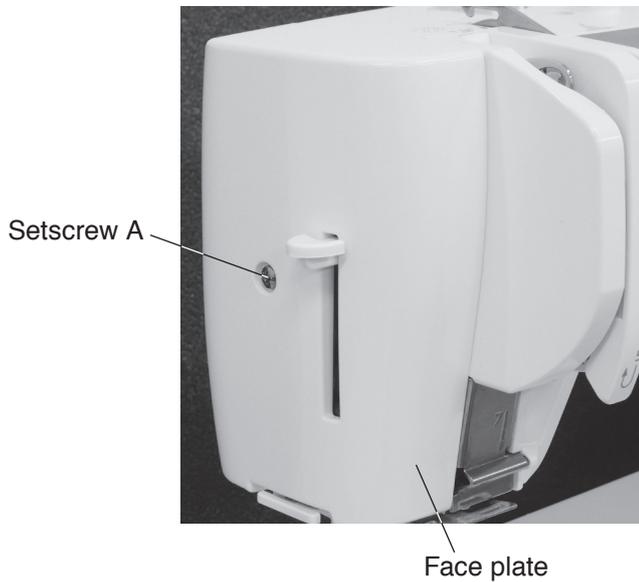
Face plate

To remove:

1. Remove the setscrew A and remove the face plate.

To attach:

2. Attach the face plate with the setscrew A.



Top cover

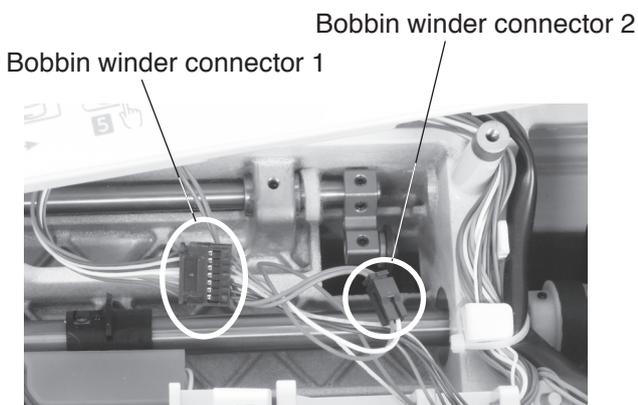
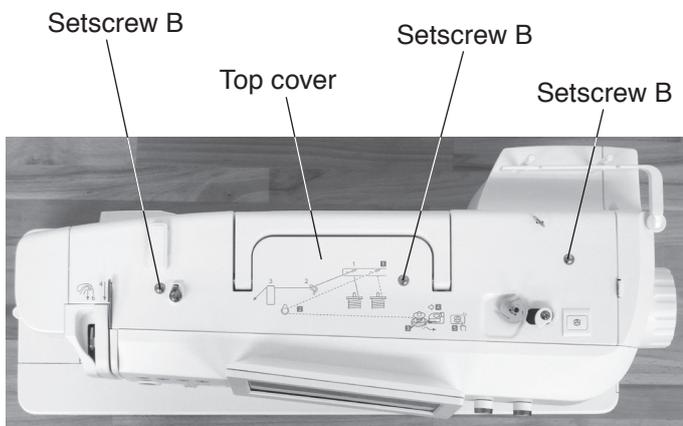
To remove:

1. Remove the setscrews B (3 pcs.).
2. Remove the bobbin winder connector 1, bobbin winder connector 2.
3. Remove the top cover.

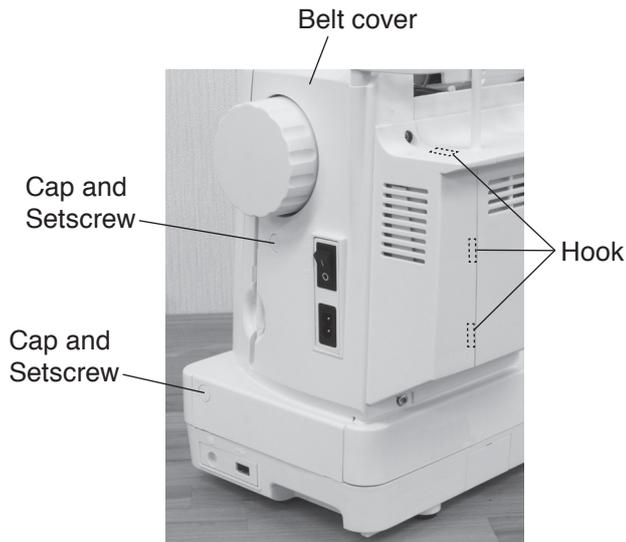
* Bobbin winder connector 1 and 2 are located rear side of the touch panel (LCD screen).

To attach:

4. Insert the bobbin winder connector 1, bobbin winder connector 2 and fix the top cover with setscrews B (3 pcs.).



Changing external parts



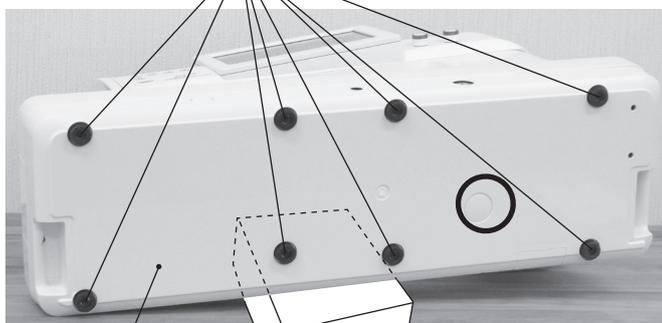
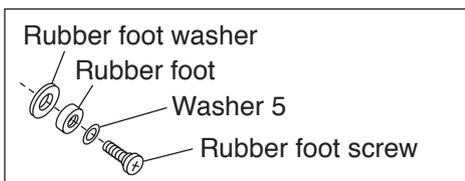
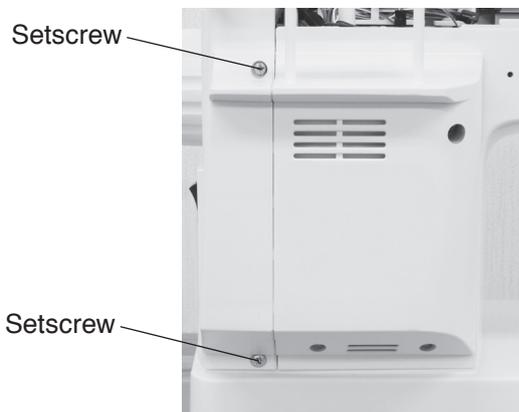
Belt cover

To remove:

1. Remove the top cover (refer to page 1).
2. Remove the caps (2 pcs.) and setscrews (4 pcs.).
3. Unhook the hooks from the machine and remove the belt cover.

To attach:

4. Follow the steps of the removal procedure in reverse.



Base

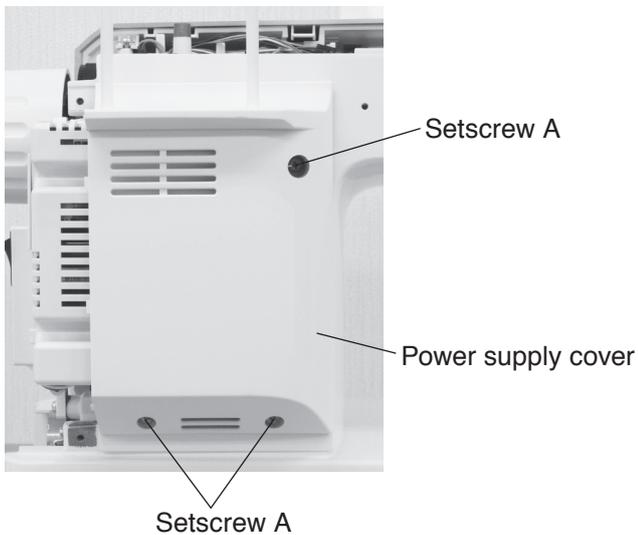
To remove:

1. Remove the rubber foot screws (8 pcs.), washers 5 (8 pcs.), rubber feet (8 pcs.) and rubber foot washers (8 pcs.).
2. Remove the base.

To attach:

4. Follow the steps of the removal procedure in reverse.

Changing external parts



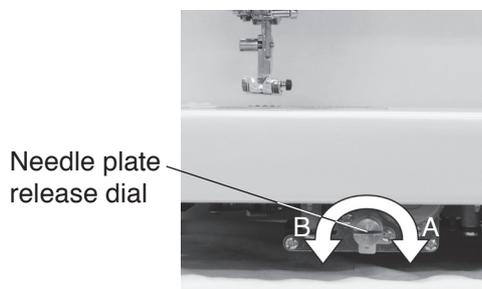
Power supply cover

To remove:

1. Remove the belt cover (refer to page 2).
2. Remove the setscrews A (3 pcs) and remove the power supply cover.

To attach:

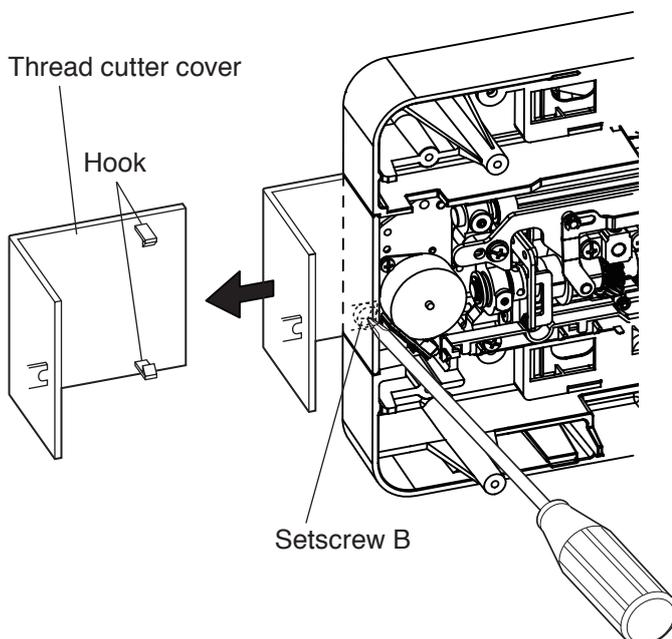
3. Follow the steps of the removal procedure in reverse.



Thread cutter cover

To remove:

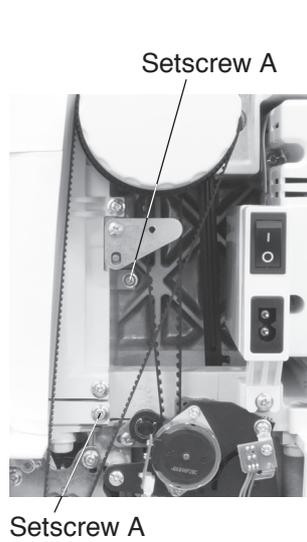
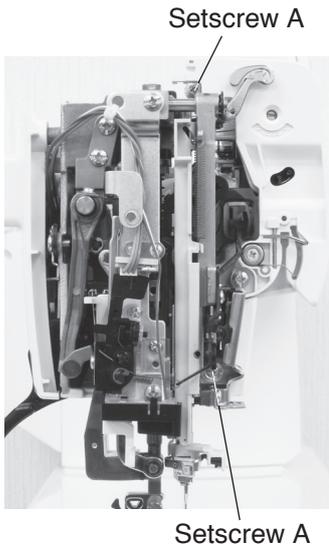
1. Remove the base (refer to page 2).
2. Push and turn the needle plate release dial in direction A with the screwdriver. Remove the needle plate and bobbin holder.
3. Loosen the setscrew B.
4. Unhook the hooks from the machine and remove the thread cutter cover.



To attach:

5. Follow the steps of the removal procedure in reverse.

Changing external parts



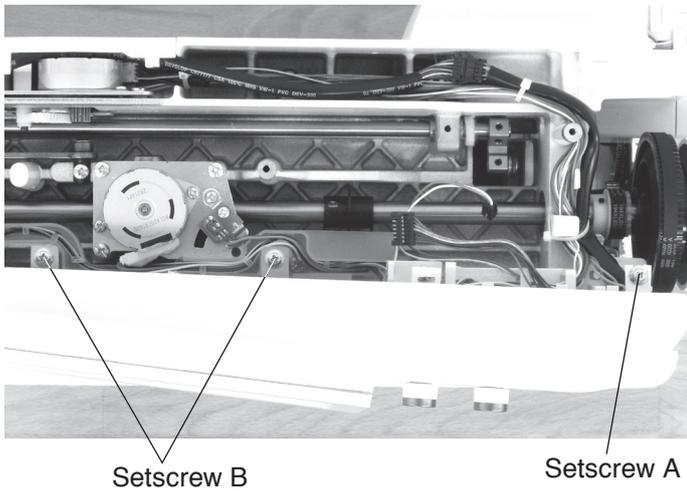
Front cover

To remove:

1. Remove the face plate, top cover and belt cover (refer to pages 1 and 2).
2. Loosen the setscrews A (5 pcs.).
3. Remove the setscrews B (2 pcs.).
4. Disconnect the printed circuit board B connector and sensor/communications (printed circuit board S) connector.
Remove the front cover.

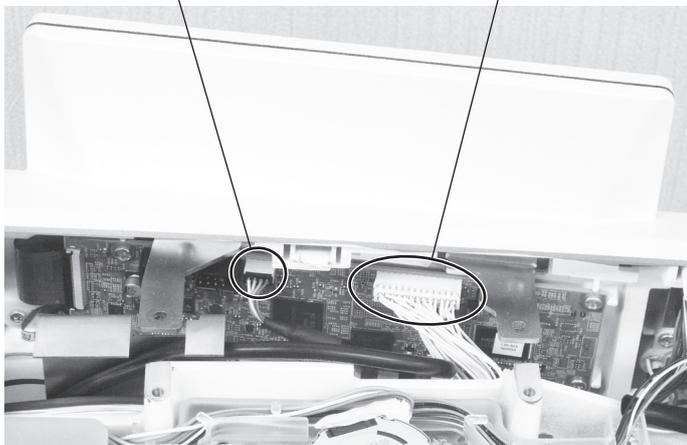
To attach:

5. Follow the steps of the removal procedure in reverse.



Printed circuit board B connector

Sensor/communications
(printed circuit board S) connector



Changing external parts

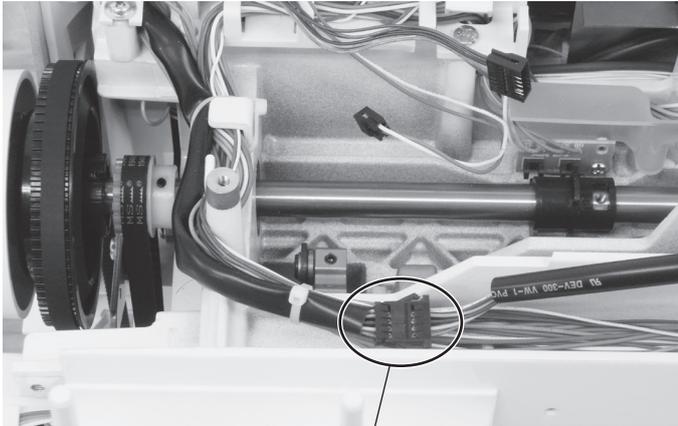
Rear cover

To remove:

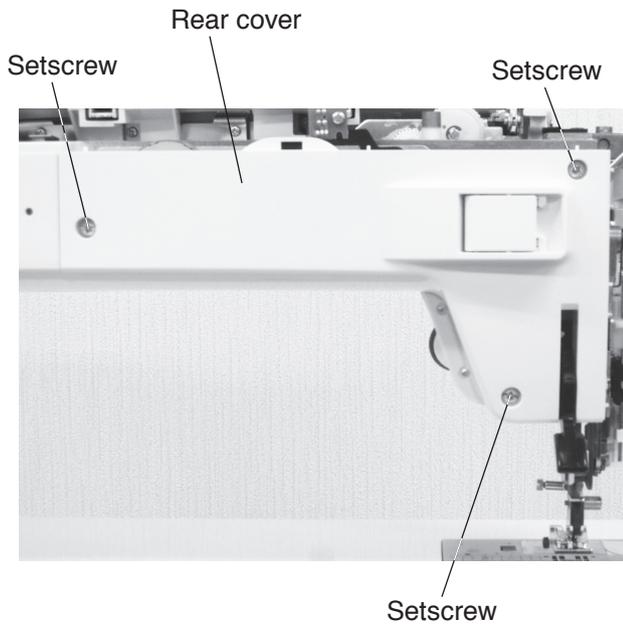
1. Remove the face plate and top cover (refer to page 1).
2. Disconnect the relay harness.
3. Remove the setscrews (3 pcs.) and remove the rear cover.

To attach:

4. Attach the rear cover with the setscrews (3 pcs.).



Relay harness



Changing external parts

Arm thread guide unit

To remove:

1. Remove the face plate and top cover (refer to page 1).
2. Remove the setscrews (2 pcs.), and remove the arm thread guide unit.

To attach:

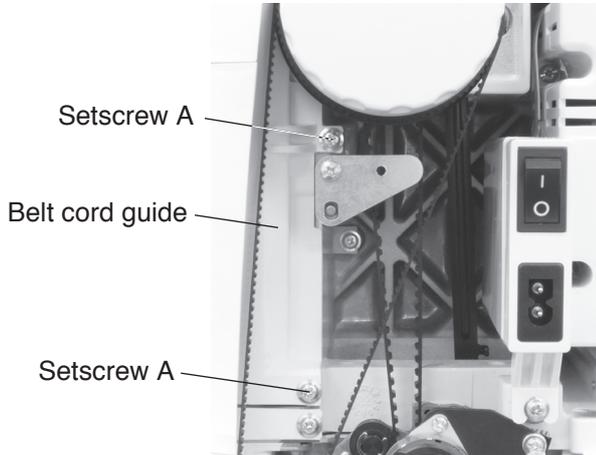
3. Follow the steps of the removal procedure in reverse.



Changing the printed circuit board S

Before replacing the printed circuit board A, copy the data in the board to a USB flash drive.

* Check the clear set mode (refer to page 55).

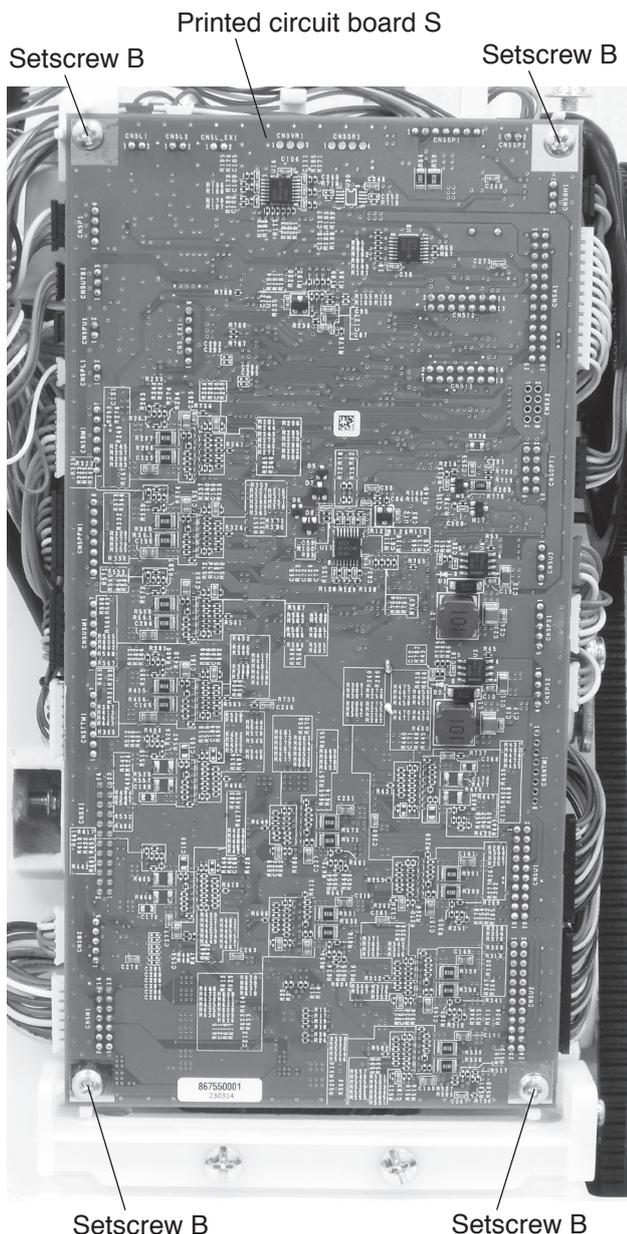


To remove:

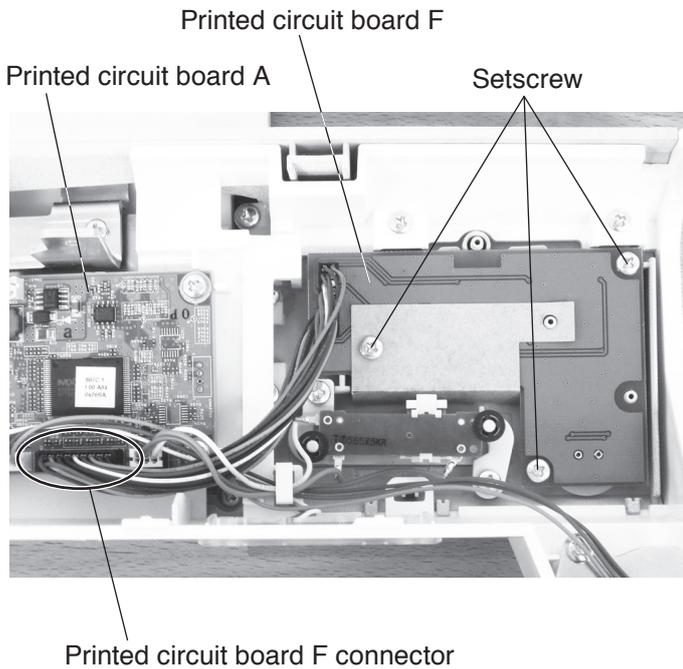
1. Remove the face plate, top cover, belt cover and front cover (refer to pages 1, 2 and 4).
2. Remove the setscrews A (2 pcs.) and remove the belt cord guide.
3. Remove the setscrews B (4 pcs.) and disconnect all the connectors from the printed circuit board S. Remove the printed circuit board S.

To attach:

4. Follow the steps of the removal procedure in reverse.
- * Refer to page 12 for how to connect/ disconnect the connectors to the printed circuit board S.



Changing the printed circuit board F and slide volume



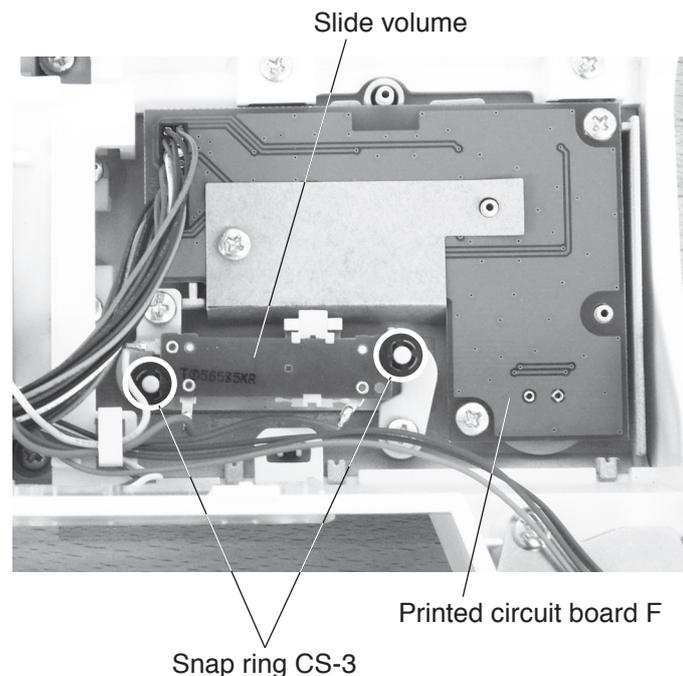
Printed circuit board F

To remove:

1. Remove the front cover (refer to page 4).
2. Disconnect the printed circuit board F connector from the circuit board A.
3. Remove the setscrews (3 pcs.) and remove the printed circuit board F.

To attach:

4. Follow the steps of the removal procedure in reverse.



Slide volume

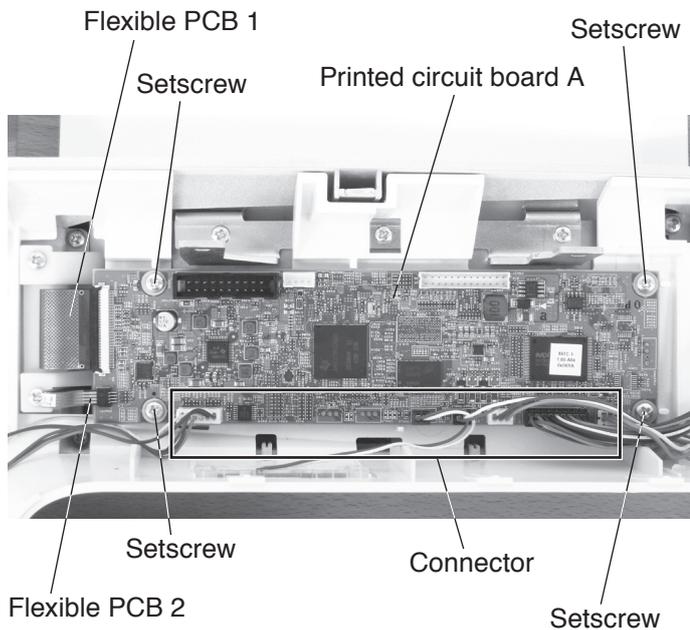
To remove:

1. Remove the front cover (refer to page 4).
2. Remove the snap rings CS-3 (2 pcs.) and remove the slide volume.

To attach:

3. Follow the steps of the removal procedure in reverse.
 - * Insert the projection of slide volume into the convex of speed control slider and fix it with the snap rings CS-3 (2 pcs.).

Changing the printed circuit board A

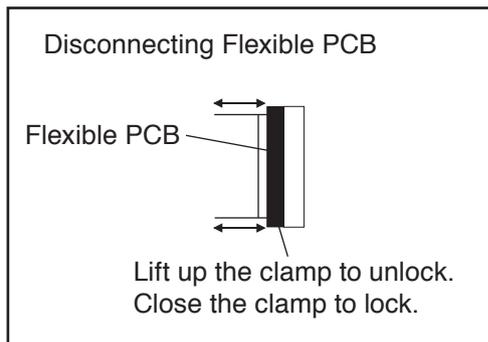


To remove:

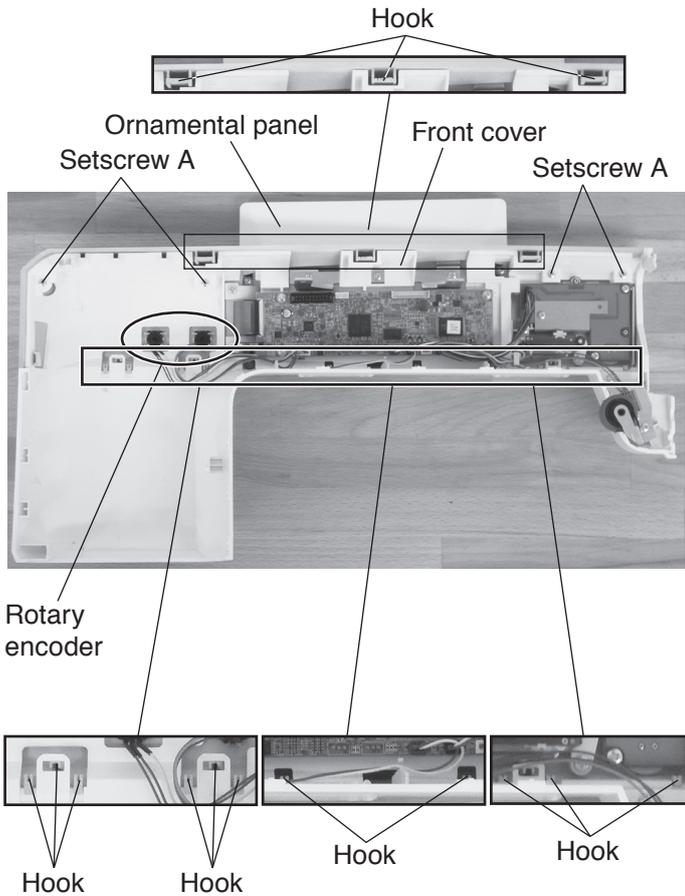
1. Remove the front cover (refer to page 4).
2. Disconnect all the connectors from the printed circuit board A.
3. Disconnect the flexible PCB 1, flexible PCB 2 from the printed circuit board A.
4. Remove the setscrews (4 pcs.) and remove the printed circuit board A.

To attach:

5. Follow the steps of the removal procedure in reverse.



Changing the ornamental panel

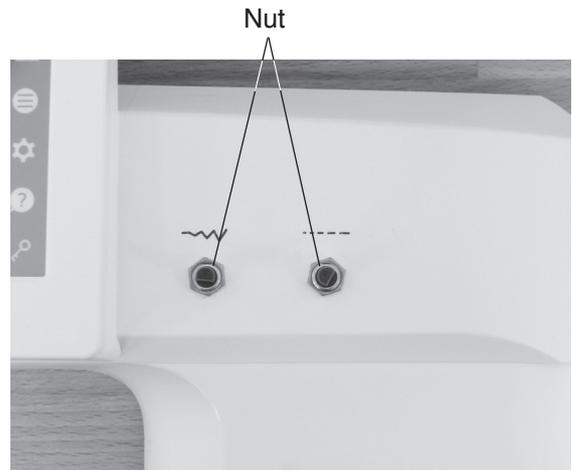
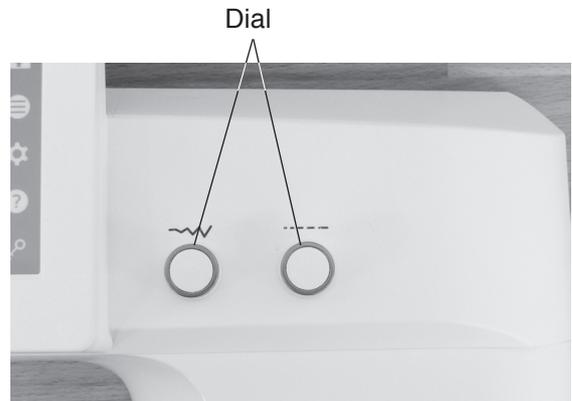
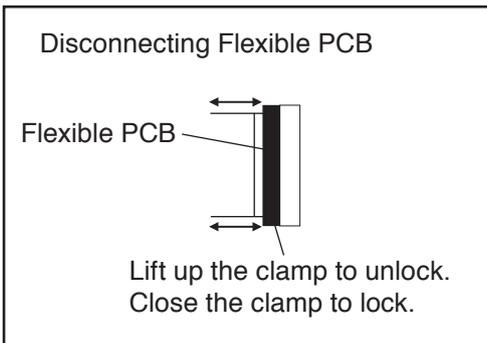


To remove:

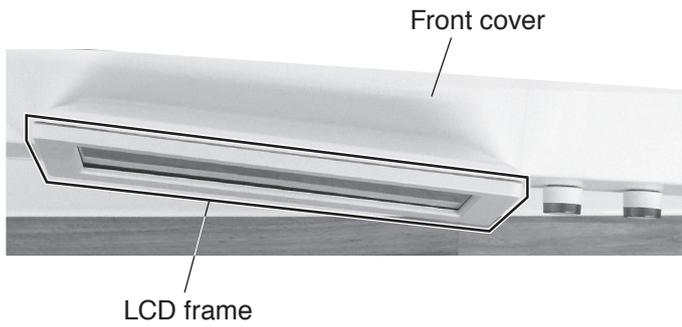
1. Remove the front cover, printed circuit board F and slide volume (refer to pages 4 and 8).
2. Remove the dials (2 pcs.), the nuts (2 pcs.), rotary encoders (2 pcs.).
3. Disconnect the flexible PCB 1 and flexible PCB 2 from the printed circuit board A.
4. Remove the setscrews A (4 pcs.). Unhook the ornamental panel from the front panel and remove the ornamental panel.

To attach:

5. Follow the steps of the removal procedure in reverse.



Changing the LCD frame and LCD case

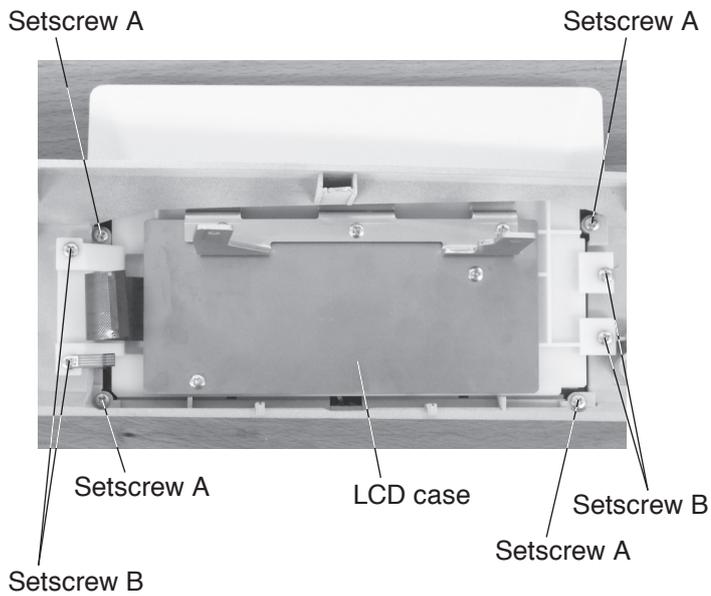


To remove:

1. Remove the front cover and ornamental panel (refer to pages 4 and 10).
2. Remove the setscrews A (4 pcs.) and LCD frame.
3. Remove the setscrews B (4 pcs.) and LCD case.

To attach:

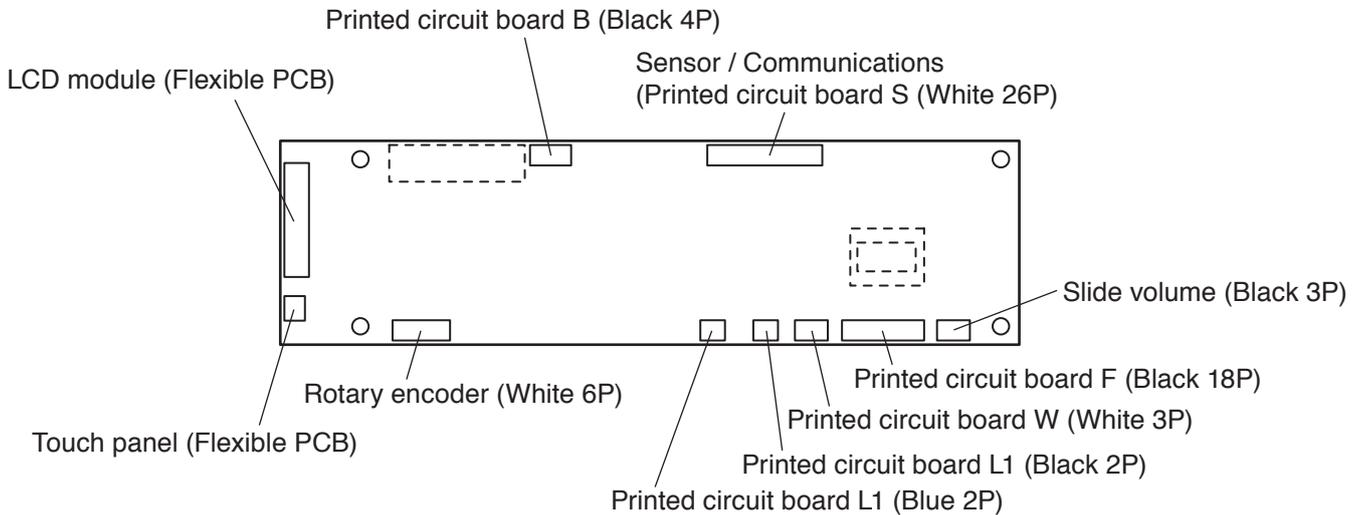
4. Follow the steps of the removal procedure in reverse.



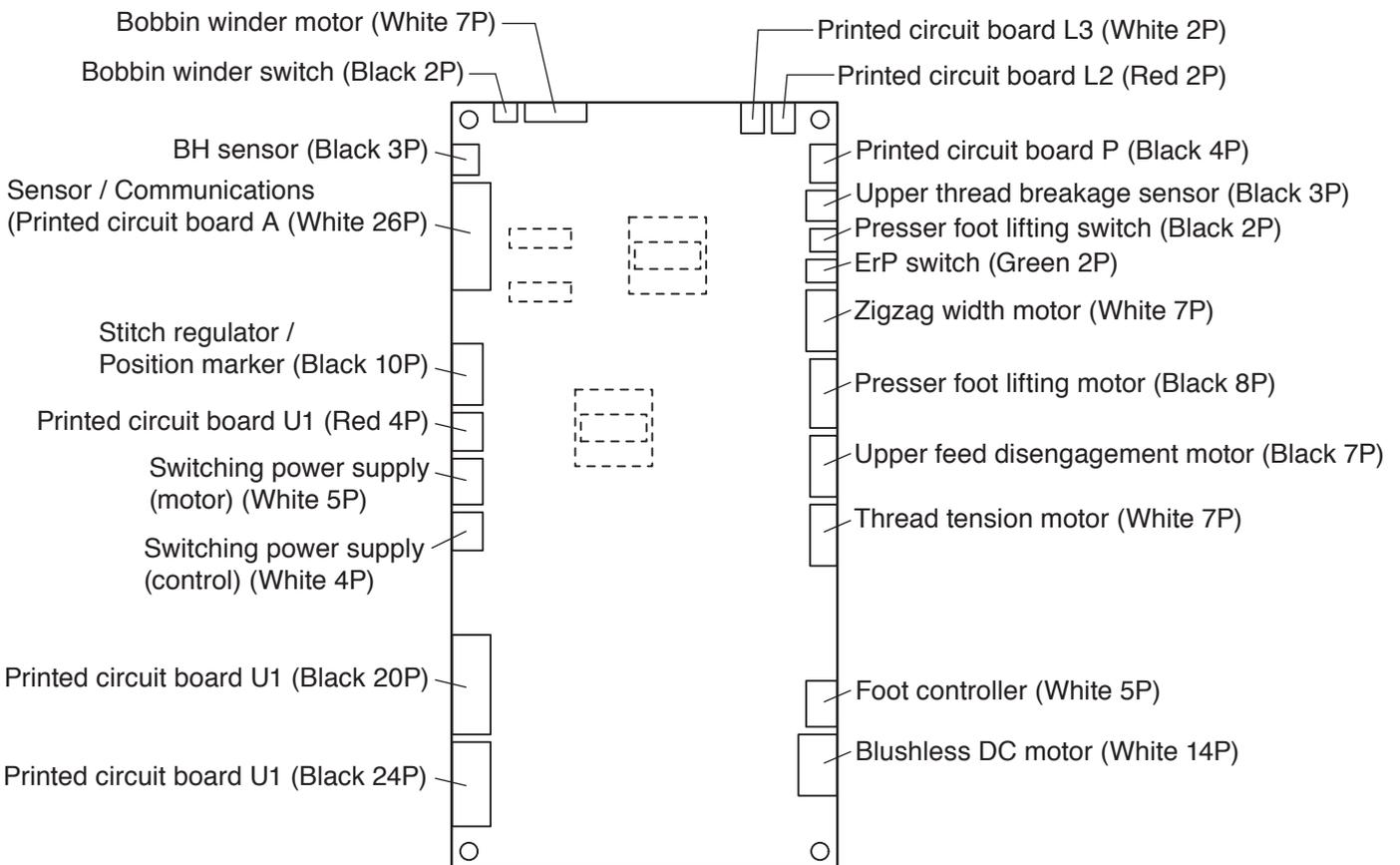
Wiring diagram

Refer to this wiring diagram for locating the connectors on the printed circuit board A and the printed circuit board S.

Printed circuit board A



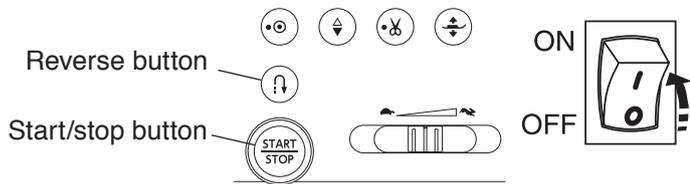
Printed circuit board S



Needle drop position adjustment

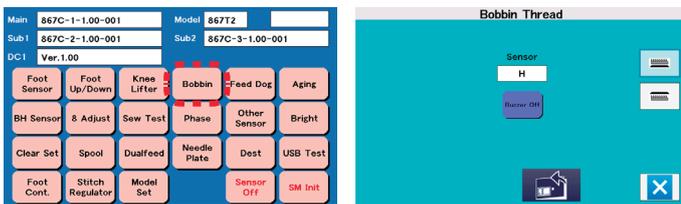
When you enter the factory setting mode, the needle should be positioned in the center of the needle plate hole.

When the “Bobbin” key is pressed, the clearance between the side of the needle and needle hole should be 0.2 mm or more.

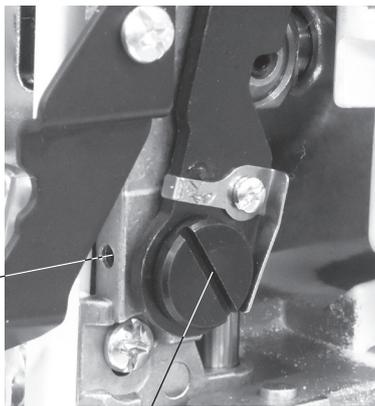


1. Remove the face plate and arm thread guide unit (refer to pages 1 and 6).
Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode.

2. Press the “Bobbin” key.
When you press “Bobbin” key in the factory setting mode, the maximum stitch width will be set at 9.0 automatically.
Check the needle drop position.

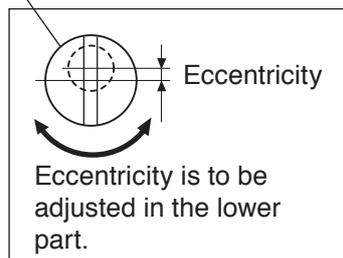


3. If this is not the case, adjust as follows;
Loosen the hexagonal socket screw and turn the eccentric pin.
(The direction of eccentricity should be in the upper part.)

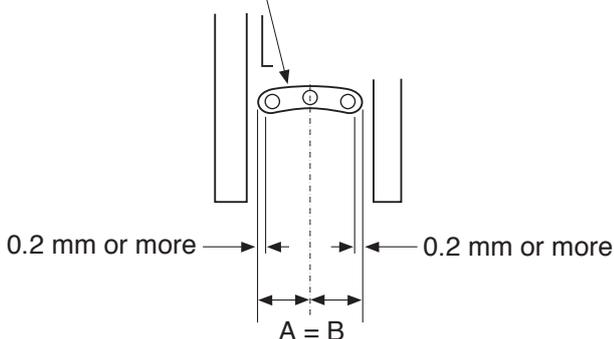


Hexagonal socket screw

Eccentric pin



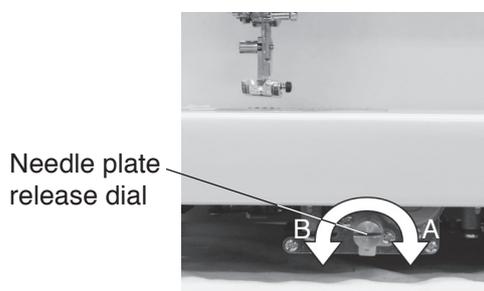
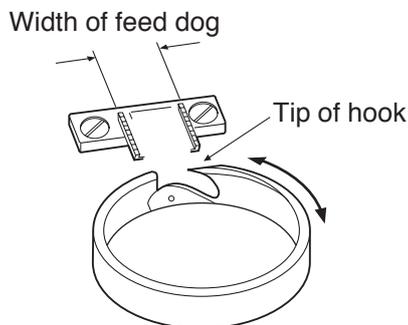
Needle hole



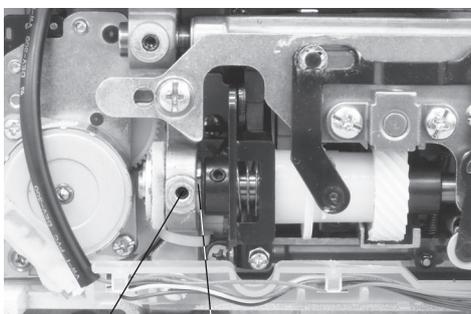
4. Tighten the hexagonal socket screw.
5. Attach the arm thread guide unit and face plate.

Backlash between hook drive gear and lower shaft gear

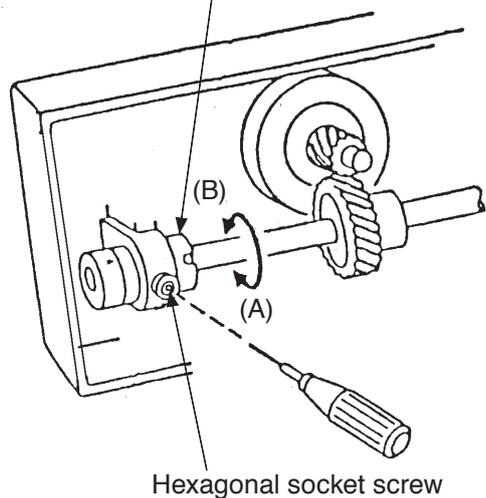
The gears should turn smoothly and rotary play of the hook should be 0.8 mm or less when the tip of hook is within the width of the feed dog as shown below.



Lower shaft bushing of the front side



Hexagonal socket screw Lower shaft bushing (front)



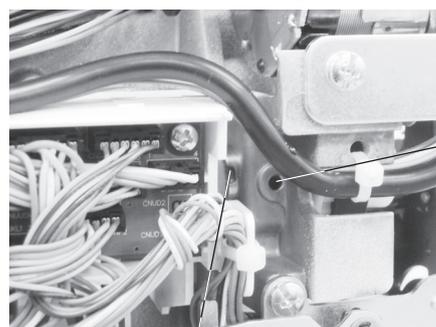
Hexagonal socket screw

1. Remove the base (refer to page 2).
2. Remove the needle and presser foot.
3. Push and turn the needle plate release dial in direction A with the screwdriver.
Remove the needle plate and bobbin holder.
* LED light can be too bright when the machine lay on its side.
4. Turn the handwheel toward you so that the tip of the rotary hook is within the width of feed dog.
Turn the rotary hook and check the clearance.
5. If the backlash is too much or too little, loosen the hexagonal socket screws (2 pcs.) of lower shaft bushings (both front and rear) and adjust the backlash following the adjustment procedure in step 6.
* Turn the lower shaft bushings (front and rear) in the same direction simultaneously and evenly.
6. If the backlash is too much, turn the lower shaft bushings (front and rear) in direction A.

If the backlash is too little, turn the lower shaft bushings (front and rear) in direction B.
7. Tighten the hexagonal socket screws (2 pcs.).
* After adjusting the backlash, check the hook timing (refer to page 15) and needle bar height (refer to page 16). Adjust if necessary.

8. Attach the bobbin holder, needle plate, presser foot and needle.
9. Attach the base.

Lower shaft bushing on the rear side

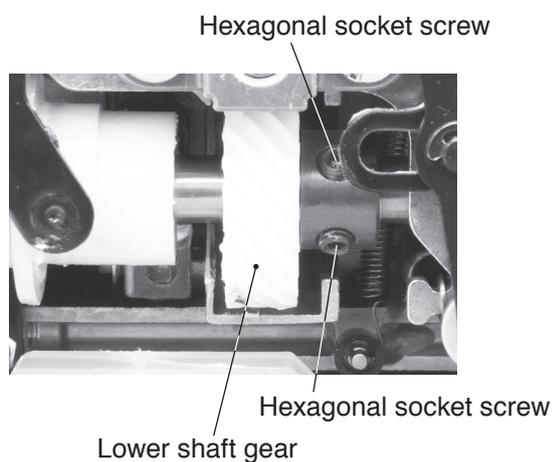
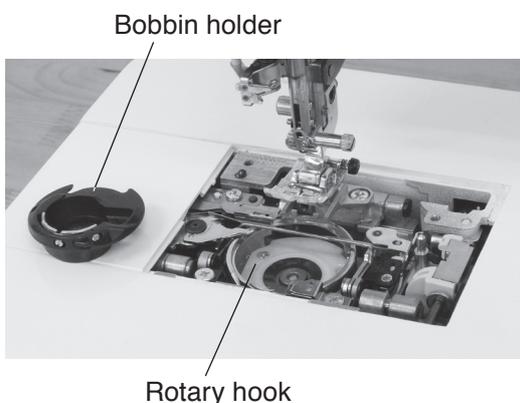
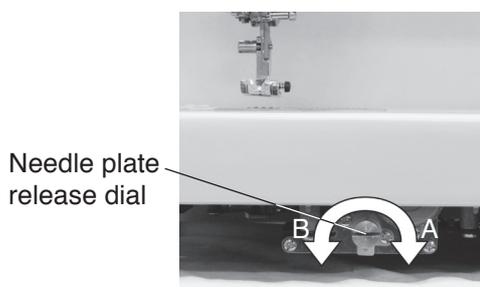
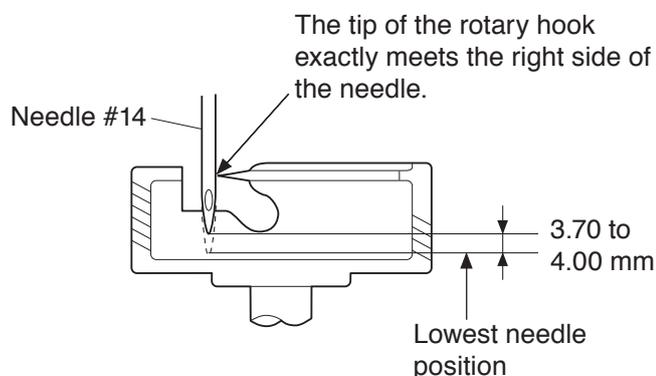


Hexagonal socket screw

Lower shaft bushing (rear)

Hook timing adjustment

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

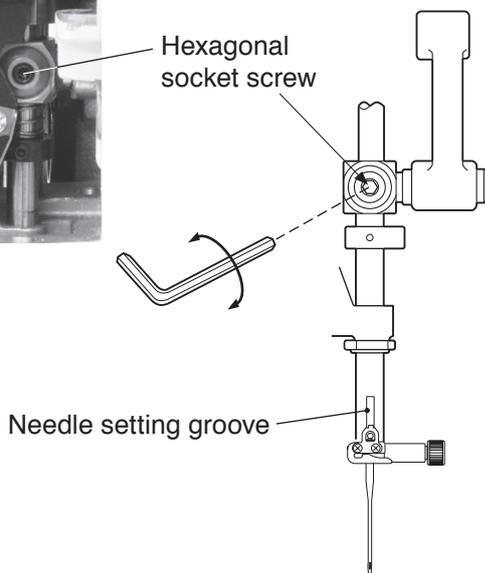
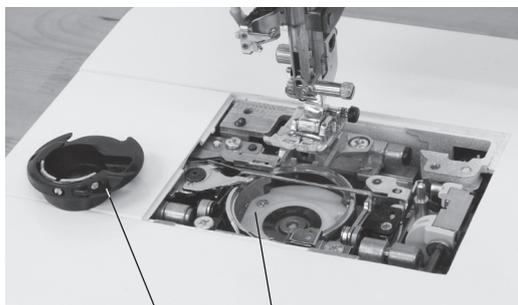
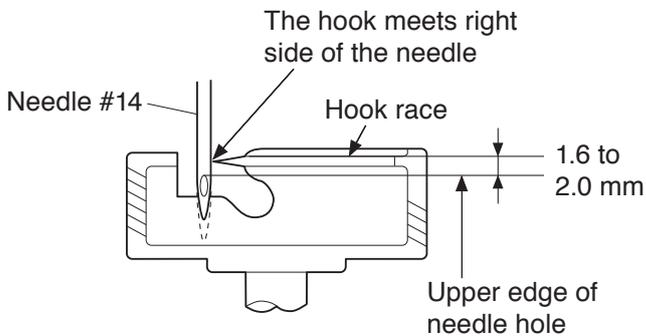


1. Remove the base (refer to page 2).
2. Attach the #14 needle.
Turn the power switch ON and select the straight stitch #4 (↔). Set the zigzag width at "0.0" (left needle position) and turn the power switch off. Remove the presser foot.
3. Push and turn the needle plate release dial in direction A with the screwdriver.
Remove the needle plate and bobbin holder.
4. Lower the needle bar to the lowest position by turning the handwheel toward you.
5. Loosen the hexagonal socket screws (2 pcs.) of the lower shaft gear.
6. Move the needle bar 3.85 mm up from the lowest position by turning the handwheel toward you.
7. Turn the lower shaft gear until the tip of the hook meets the right side of the needle, and then tighten the hexagonal socket screws (2 pcs.).
* After adjusting the hook timing, check the needle bar height (refer to page 16).
8. Attach the bobbin holder, needle plate and presser foot.
9. Attach the base.

Needle bar height adjustment

Before proceeding with this adjustment, check the hook timing (refer to page 15).

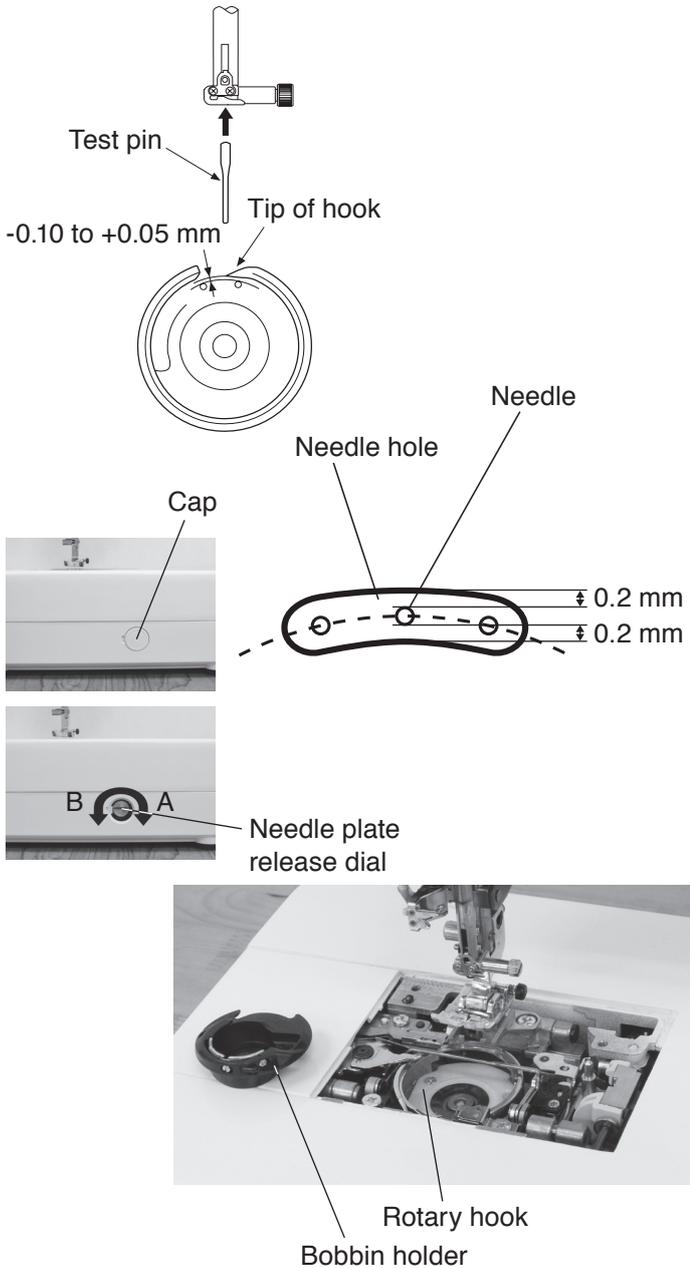
The distance between the upper edge of the needle eye and the tip of the hook should be in the range of 1.6 to 2.0 mm when the tip of the hook meets right side of the needle in the left needle position ("0.0") as the needle ascends from its lowest position.



1. Attach the #14 needle.
2. Turn the power switch ON and select the straight stitch #4 (↕). Set the zigzag width at "0.0" (left needle position).
 - * Do not turn the power switch off.
3. Remove the presser foot. Remove the cap. Push and turn the needle plate release dial in direction A with the screwdriver. Remove the needle plate and bobbin holder.
 - * LED light can be too bright when the machine lay on its side.
4. Remove the face plate and arm thread guide (unit) (refer to pages 1 and 6).
5. Turn the handwheel toward you until the tip of the hook meets right side of the needle.
6. Loosen the hexagonal socket screws with an allen wrench. Move the needle bar and adjust needle bar height to 1.8 mm.
7. Tighten the hexagonal socket screws with the needle setting groove to the front.
8. Attach the arm thread guide (unit) and face plate.
9. Attach the bobbin holder, needle plate and presser foot.

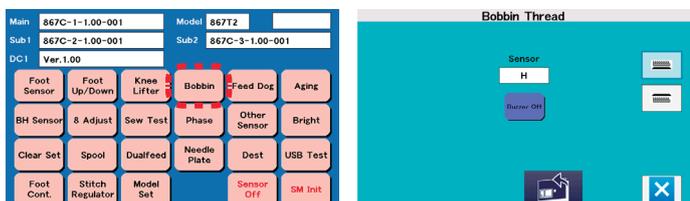
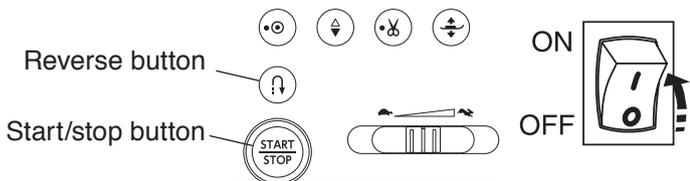
Clearance between needle and tip of the rotary hook adjustment (1)

The clearance between the needle and the tip of the rotary hook should be between -0.10 to +0.05 mm.

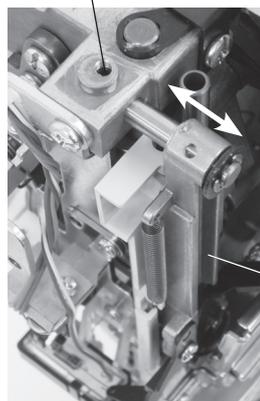


Clearance adjustment 1

1. Remove the face plate and top cover (refer to page 1).
2. Remove the presser foot.
3. Remove the cap.
Push and turn the needle plate release dial in direction A with the screwdriver.
Remove the needle plate and bobbin holder.
* LED light can be too bright when the machine lay on its side.
4. Attach the test pin.
5. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode.
Press the "Bobbin" key.
When you press "Bobbin" key in the factory setting mode, the maximum stitch width will be set at 9.0 automatically.
6. Loosen the hexagonal socket screw and adjust the clearance between the needle and the tip of the rotary hook as -0.10 to +0.05 mm, by moving the needle bar supporter in the directions of arrows.
7. Tighten the hexagonal socket screw.
8. Attach the needle plate.
Be sure that the clearance between the needle and the upper edge of the needle plate hole and the clearance between the needle and the lower edge of the needle hole are more than 0.2 mm.
* If the clearance is less than 0.2 mm, adjust the clearance between needle and tip of the rotary hook adjustment (2) on the next page.



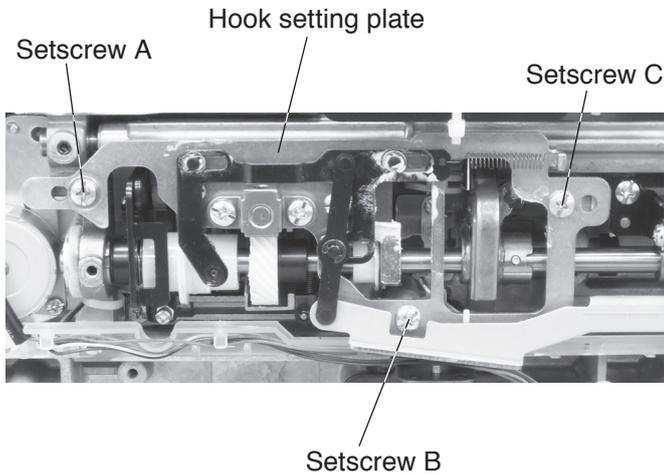
Hexagonal socket screw



Needle bar supporter

Clearance between needle and tip of the rotary hook adjustment (2)

The clearance between the needle and the tip of the rotary hook should be between -0.10 to $+0.05$ mm.



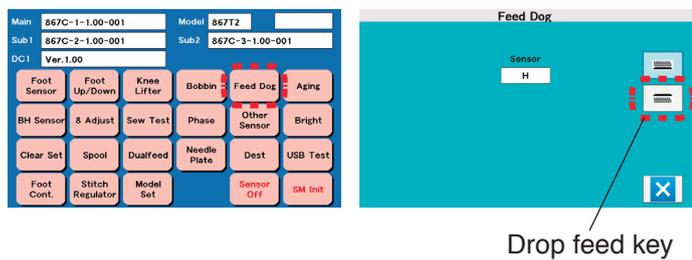
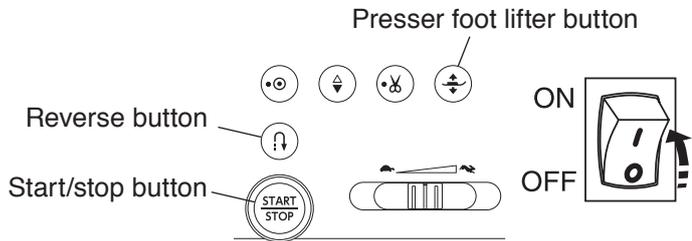
Clearance adjustment 2

1. Remove the base (refer to page 2).
2. Loosen the setscrews A, B and C. Tighten setscrew C lightly.
3. Adjust the clearance by moving the hook setting plate. Turn the handwheel and make sure that the clearance between the needle and the tip of the rotary hook is -0.10 to $+0.05$ mm.
4. Tighten the setscrews A, B and C firmly.
 - * After adjusting the clearance between the needle and the tip of the rotary hook, check the backlash between hook drive gear and lower shaft gear (refer to page 14), hook timing (refer to page 15) and needle bar height (refer to page 16). Adjust if necessary.
 - * Check the backlash between hook drive gear and lower shaft gear, hook timing and needle bar height. Adjust, if necessary after the adjustment.
5. Attach the base, bobbin holder, needle plate, presser foot and #14 needle.

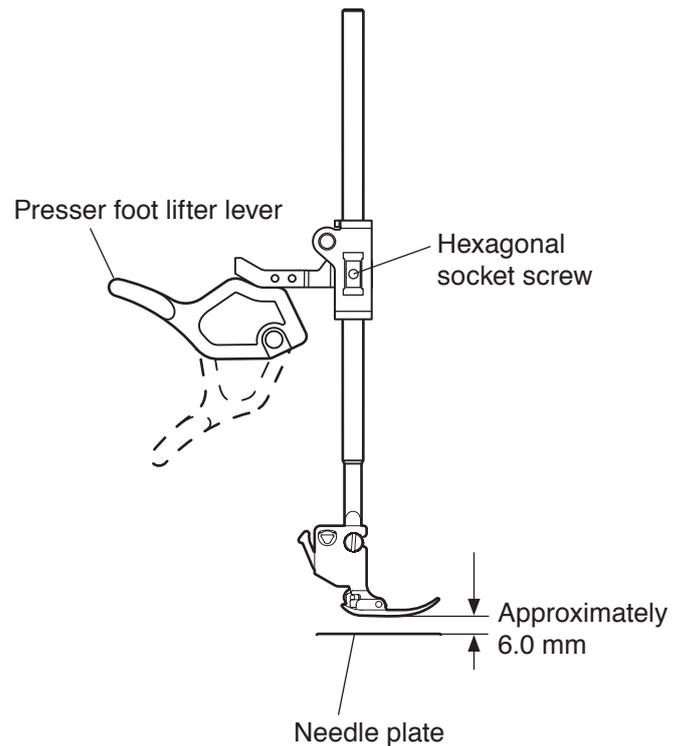
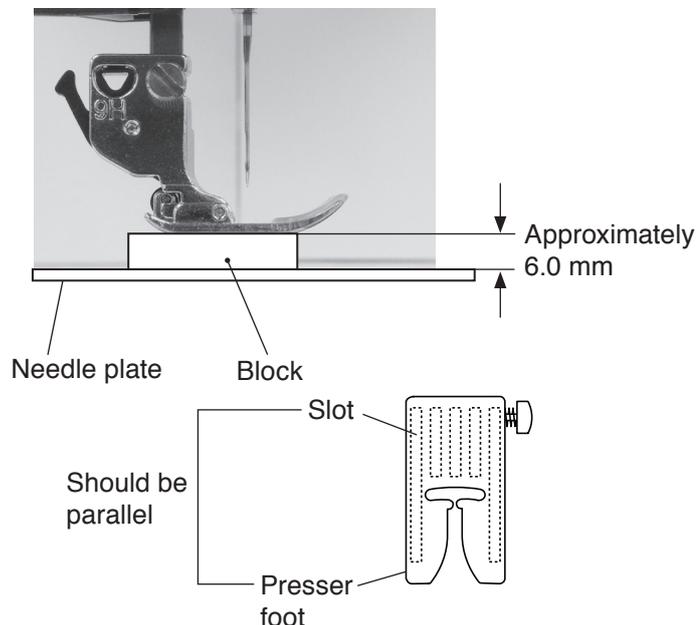
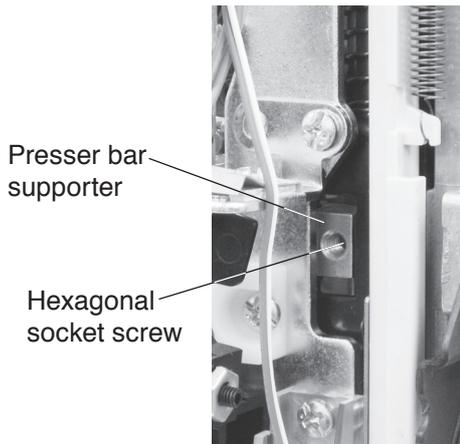
Presser bar height adjustment

The clearance between the presser foot and the surface of the needle plate should be 6.0 mm when the presser foot is raised with the presser foot lifter.

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

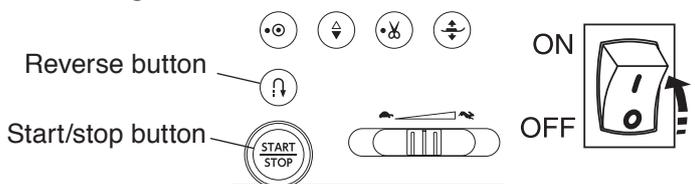


1. Attach the zigzag foot A.
2. Remove the face plate (refer to page 1).
3. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode. Press the “Feed Dog” key to select the feed dog adjusting mode.
4. Press the drop feed key to drop the feed dog. Press the presser foot lifter button to lower the presser foot.
5. Raise the presser foot lifter lever.
6. Loosen the hexagonal socket screw on the presser bar supporter to adjust the presser foot direction so that the slot for the feed dog teeth and the zigzag foot should be parallel.
7. Place a 6 mm block between the presser foot and the needle plate. Tighten the hexagonal socket screw holding the presser foot against the block.



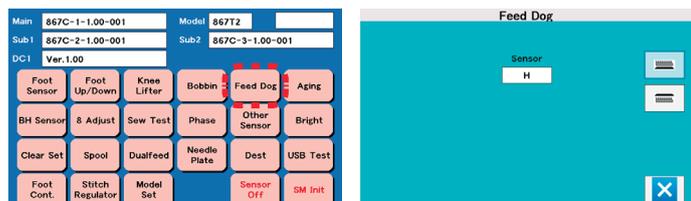
Feed dog height adjustment

When the presser foot is lowered in the factory setting mode, the highest position of the feed dog should be 0.90 to 1.00 mm from the surface of the needle plate.



To adjust:

1. Remove the base and thread cutter cover (refer to pages 2 and 3).
2. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode. Press the "Feed Dog" key to select the feed dog adjusting mode.
3. Lower the presser foot.
4. Turn the handwheel toward you to raise the feed dog to its highest position.
5. Loosen the setscrew A.
6. Loosen the nut. Adjust the feed dog height by turning the setscrew B.
7. Tighten the nut.
8. Tighten the setscrew A.

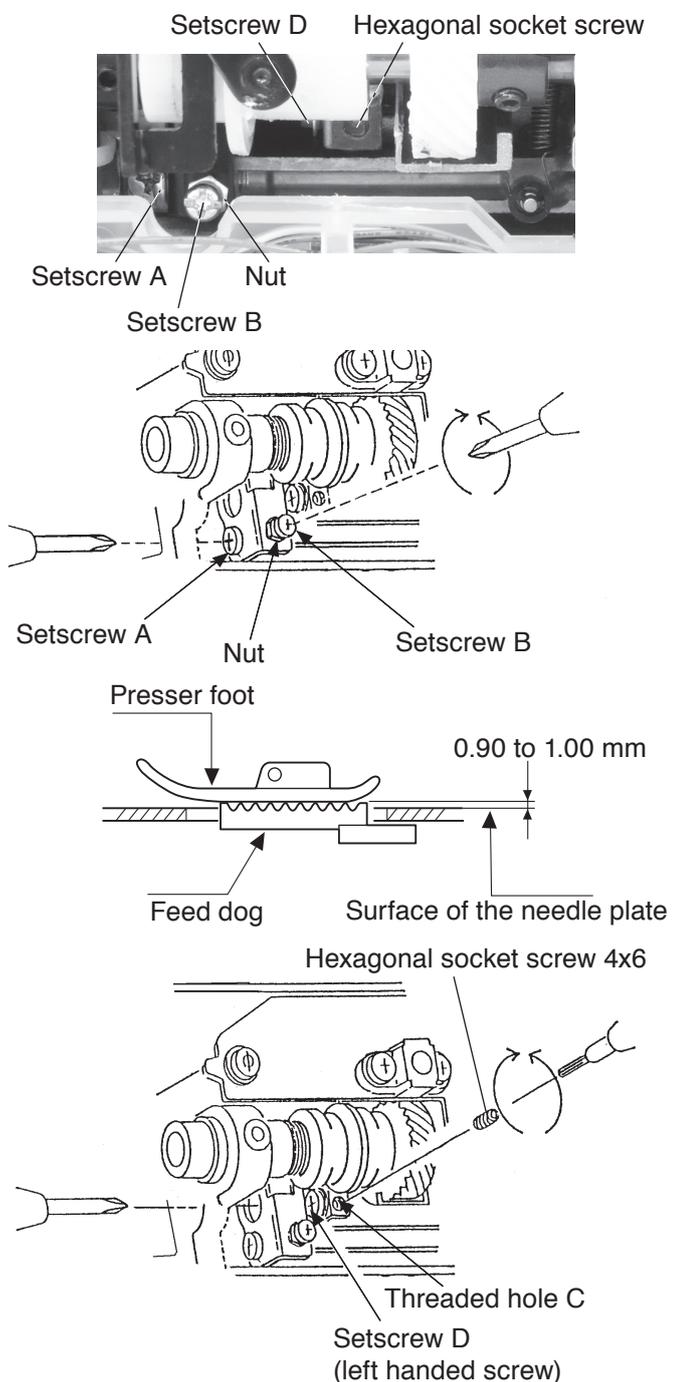


Follow the adjustment procedure below.

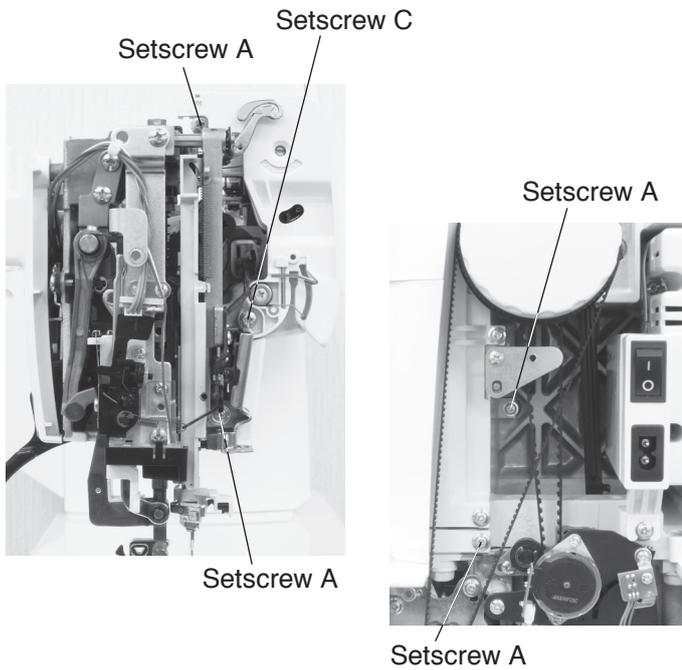
Feed dog parallel adjustment:

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

1. For this adjustment, a hexagonal socket screw 4x6 is required. Insert the hexagonal socket screw into threaded hole C until it stops.
2. Loosen the setscrew D (left handed screw).
3. Turn the hexagonal socket screw 4x6 and make sure that the feed dog is parallel.
4. Tighten the setscrew D (left handed screw).
5. Loosen the hexagonal socket screw and remove it.
6. Attach the thread cutter cover and base.



To replace needle thread tension unit

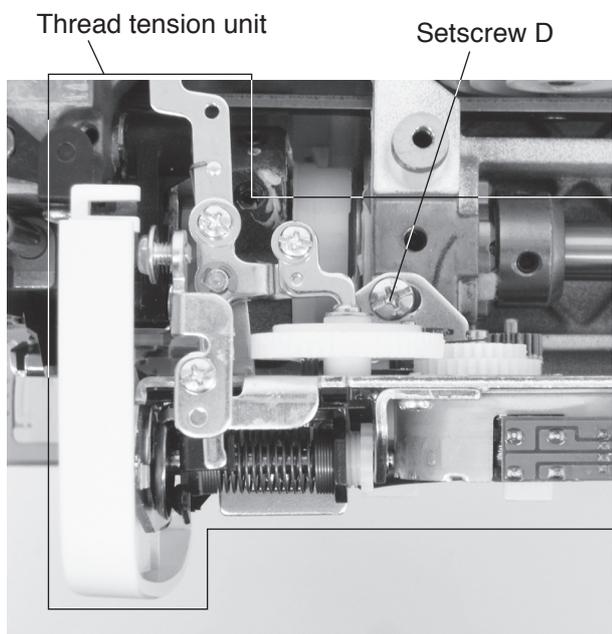
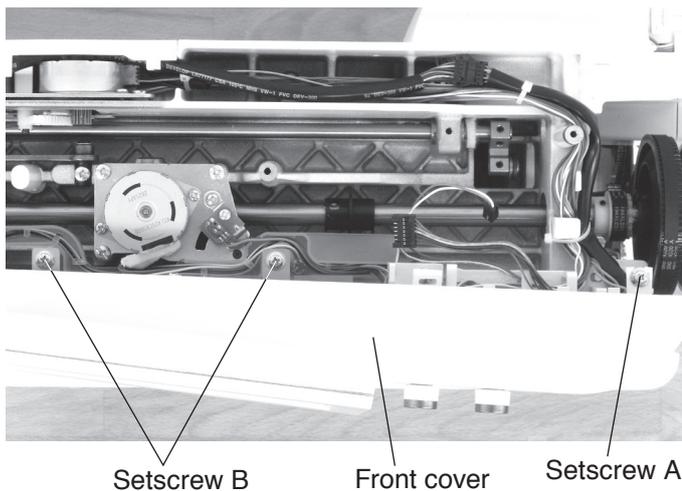


To remove:

1. Remove the face plate, top cover, thread cutter cover, front cover and arm thread guide (refer to pages 1, 3, 4 and 6).
2. Loosen the setscrews A (5 pcs.).
3. Remove the setscrews B (2 pcs.) and slide the front cover toward you slightly.
4. Remove the setscrew C and setscrew D.
5. Remove the thread tension unit.

To attach:

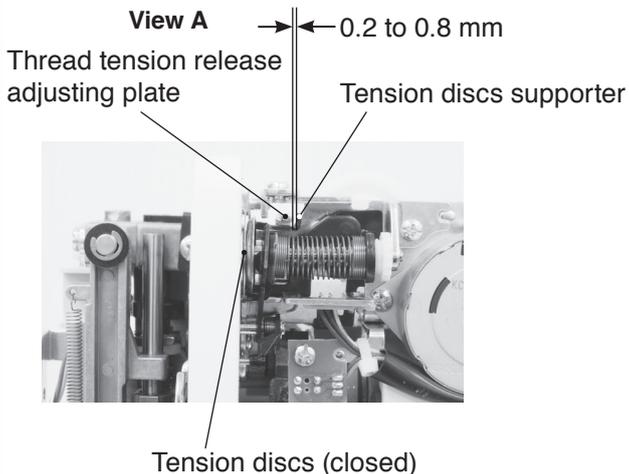
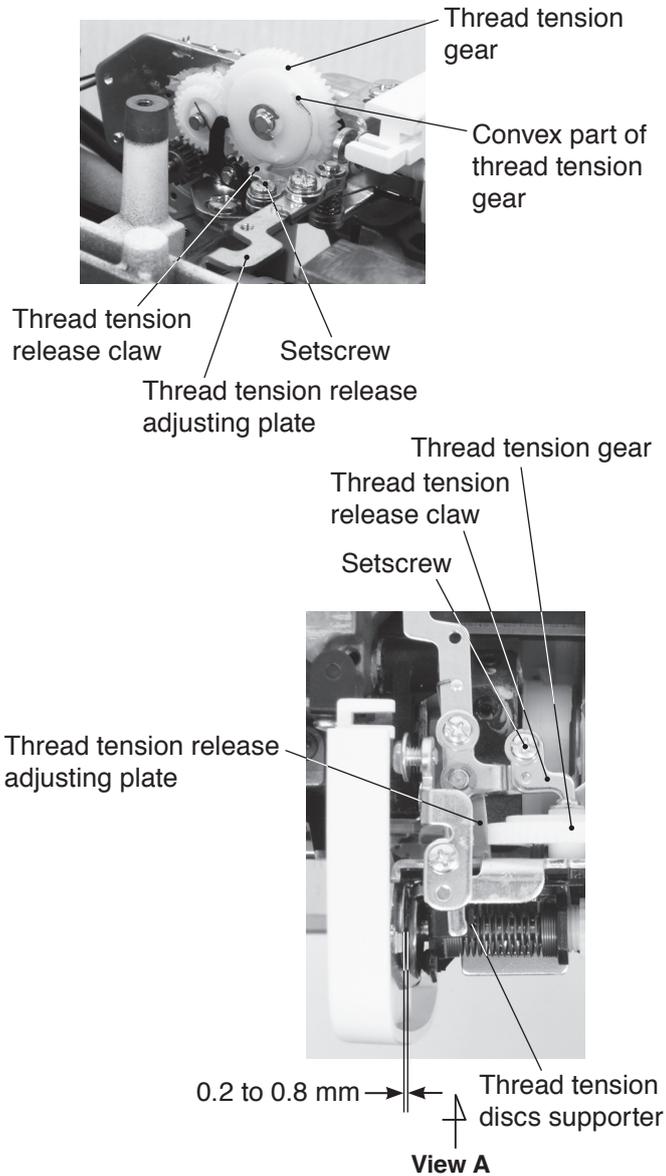
6. Follow the steps of the removal procedure in reverse.



Tension release mechanism adjustment

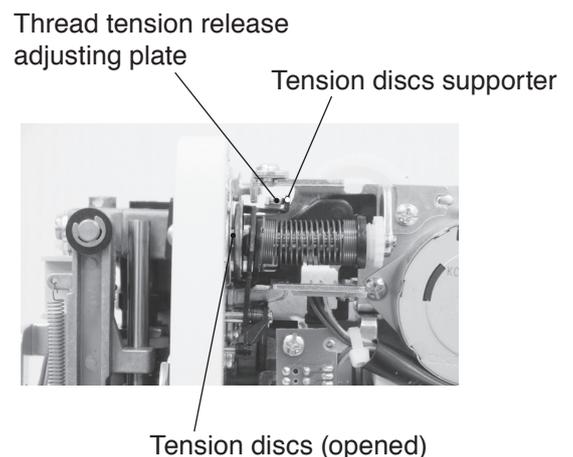
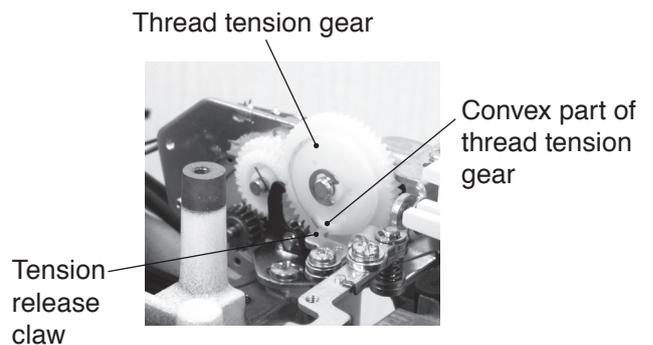
When the presser foot lifter is raised, the tension release mechanism should work correctly.

Convex is NOT set at tension release claw



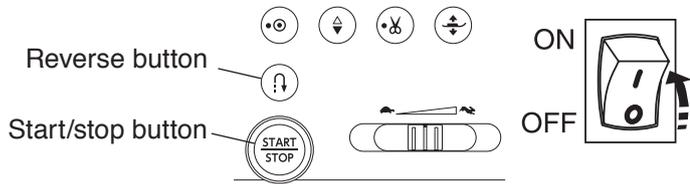
1. Remove the face plate, top cover and front cover (refer to pages 1 and 4).
2. Turn the power switch off. Turn the thread tension gear until the convex part of tension gear is NOT set at the tension release claw.
3. Loosen the setscrew.
4. Adjust the clearance between the thread tension release adjusting plate and the tension disc supporter to 0.2 mm to 0.8 mm.
5. Turn the thread tension gear until the convex part of tension gear is set at the thread tension release claw. Be sure that the tension release adjusting plate touches the thread tension discs supporter and the tension discs opened slightly.

Convex is set at tension release claw

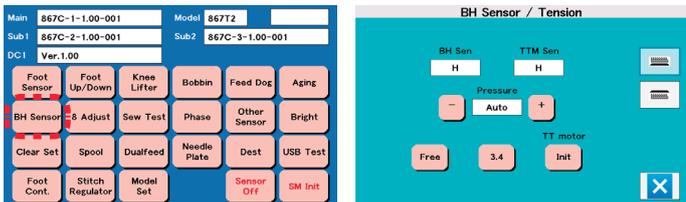


Upper thread tension adjustment

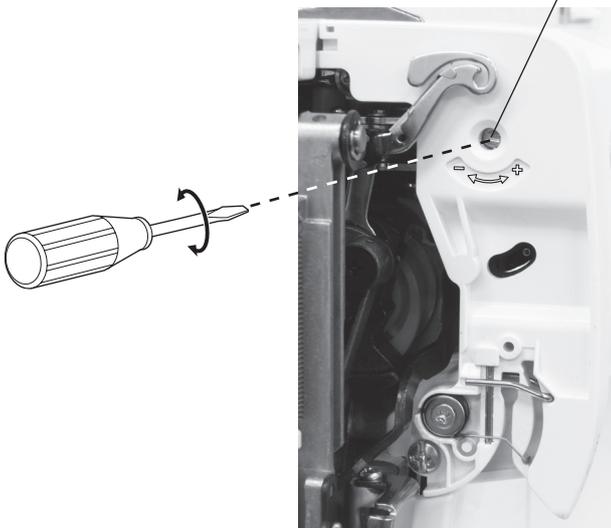
The standard upper thread tension should be 59 to 67 grams-force when the thread tension is set at “3.4”, measured with a #50 polyester thread being pulled at approximately 110 mm/sec. in the direction of arrow.



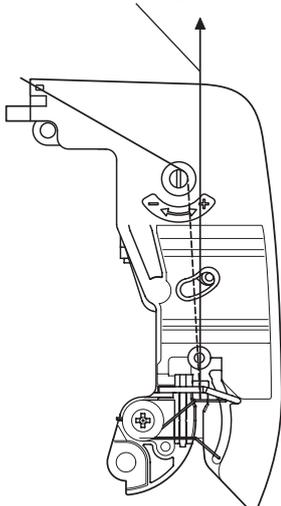
1. Remove the face plate (refer to page 1).
2. Turn the power switch ON while pressing the start/stop button and the reverse button. Press the “BH Sensor” key to select the BH sensor and tension adjusting mode.
3. Thread #50 polyester thread to the machine.
4. Set the thread tension “3.4” by pressing “3.4” key.
 - (A) If the thread tension is less than 59 gf, turn the adjusting screw in the direction of “+”.
 - (B) If the thread tension is more than 67 gf, turn the adjusting screw in the direction of “-”.



Adjusting screw

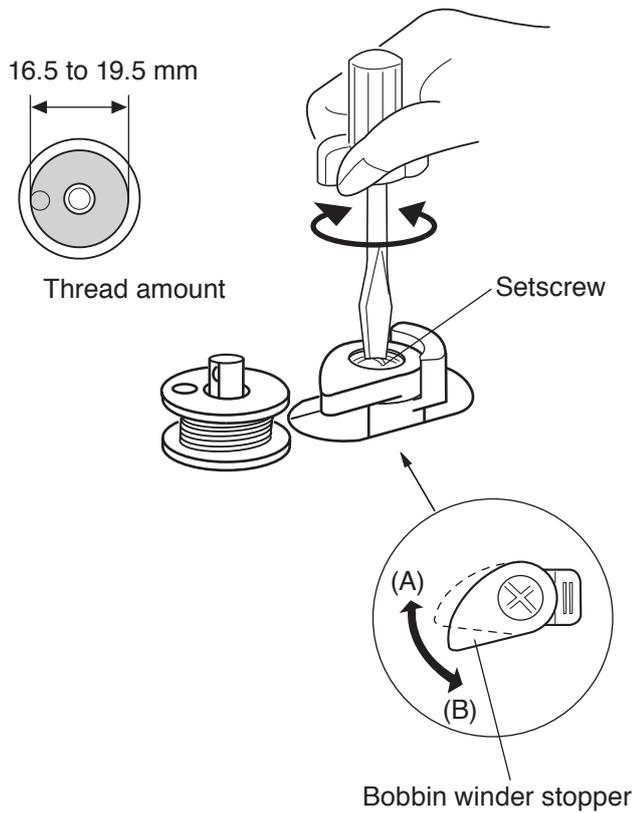


Pulling direction: (pulling speed 110 mm/sec.)



Bobbin winder stopper adjustment

The diameter of thread wound on a bobbin should be 16.5 to 19.5 mm.



1. To adjust the thread amount for bobbin, loosen the setscrew and turn the bobbin winder stopper.

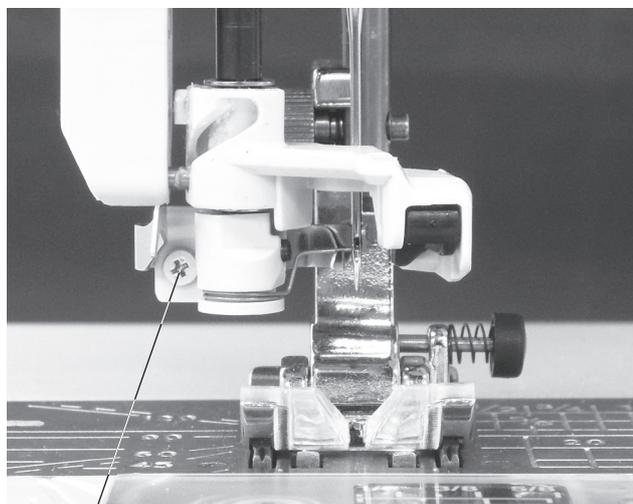
Turn the bobbin winder stopper in the direction of (A) when the thread amount for bobbin is too large.

Turn the bobbin winder stopper in the direction of (B) when the thread amount for bobbin is too small.

2. Tighten the setscrew.

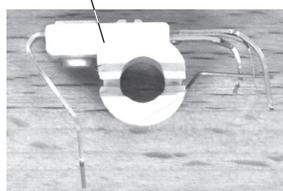
Needle threader hook position

If the hook of the hook holder unit is damaged, replace or adjust the part as follows:



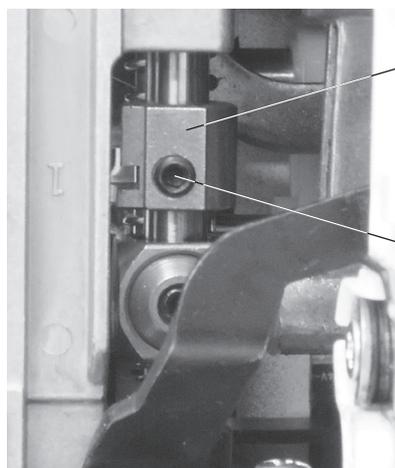
Setscrew

Hook holder unit



To replace:

1. Push down the needle threader lever and pull the hook holder unit down to remove it.
2. Replace the hook holder unit.



Rotation pin stopper

Hexagonal socket screw

To adjust:

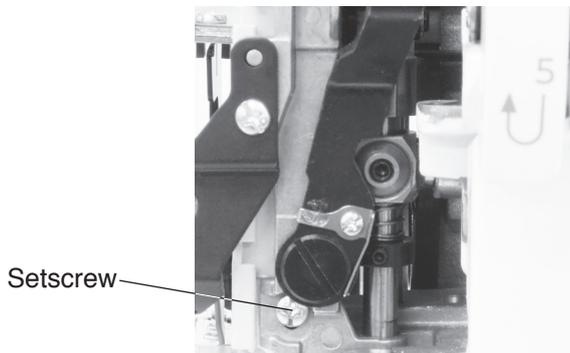
1. Push down the threader lever and hold it just before the threader hook enters into the needle eye.
2. If the threader hook is not aligned vertically with the needle eye, loosen the hexagonal socket screw. Adjust the rotation pin stopper position so that the hook enters into the needle eye. Tighten the hexagonal socket screw.

If the threader hook is not aligned laterally with the needle eye, loosen the setscrew. Adjust the lateral position so that the hook enters into the needle eye. Tighten the setscrew.

* Check the needle threader release amount for the wire of the hook holder after this adjustment (refer to page 26).

Release amount for the wire of the hook holder adjustment

If the hook of the hook holder unit is damaged, replace or adjust the part as follows:



The clearance between the wire and the tip of the hook barb should be 0.5 mm or more.

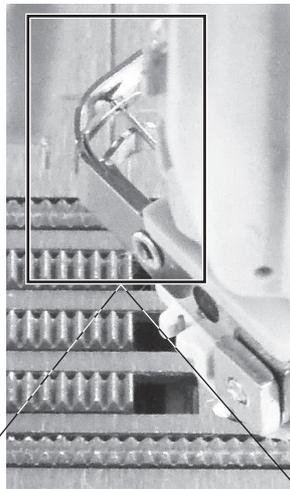
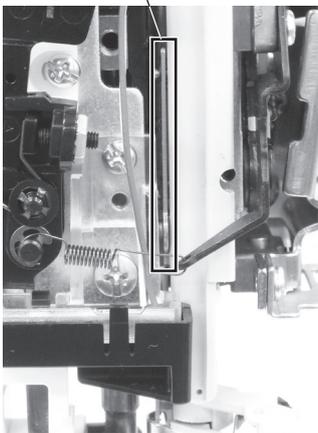
If the clearance is less than 0.5 mm, adjust it as follows.

1. Loosen the setscrew.
2. Adjust the thread release plate position up or down so that the clearance between the wire and the hook barb is 0.5 mm or more.

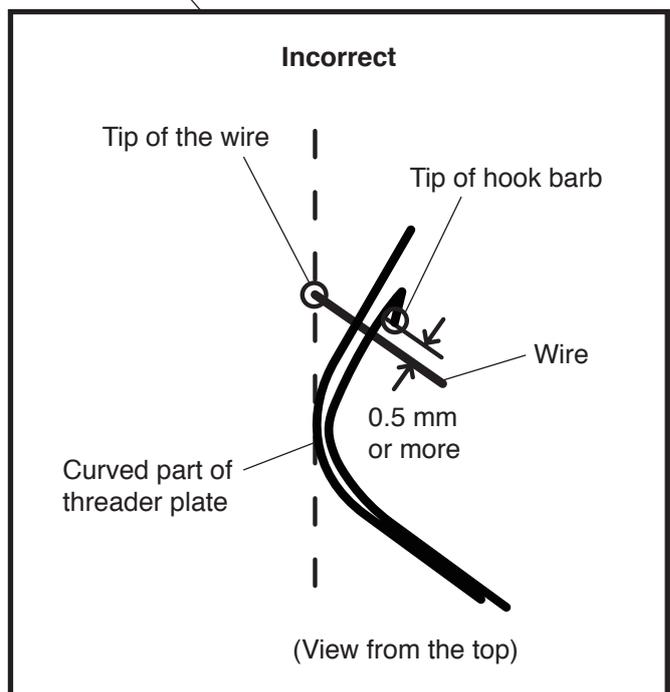
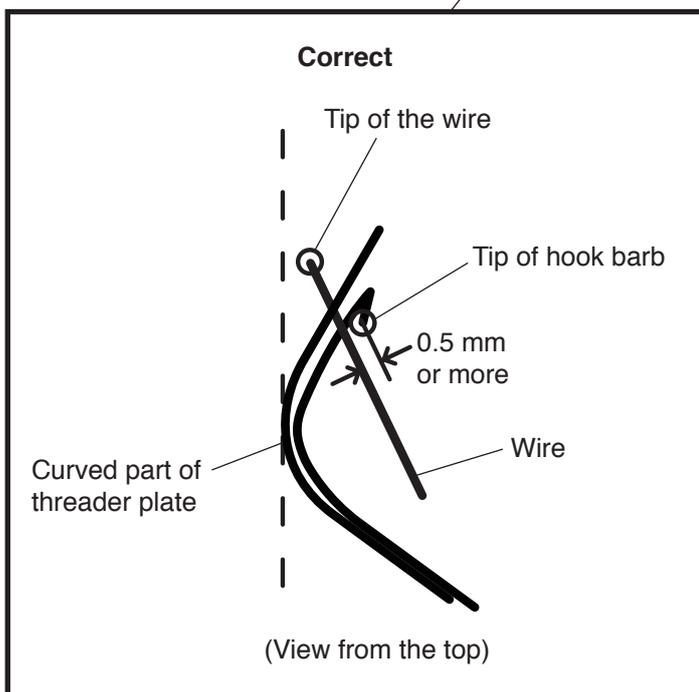
* Check if the thread drops from the hook when the threading is finished.

* The tip of the wire should not be on the left side of the curved part of the threader plate.

Thread release plate

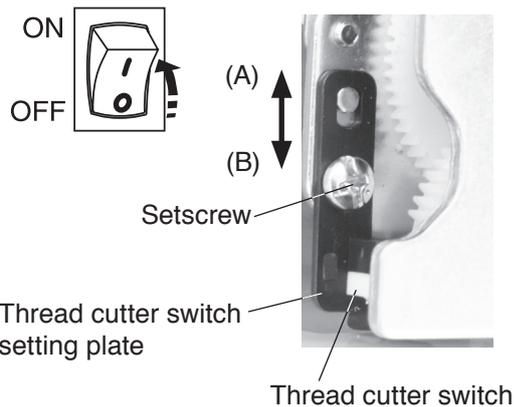
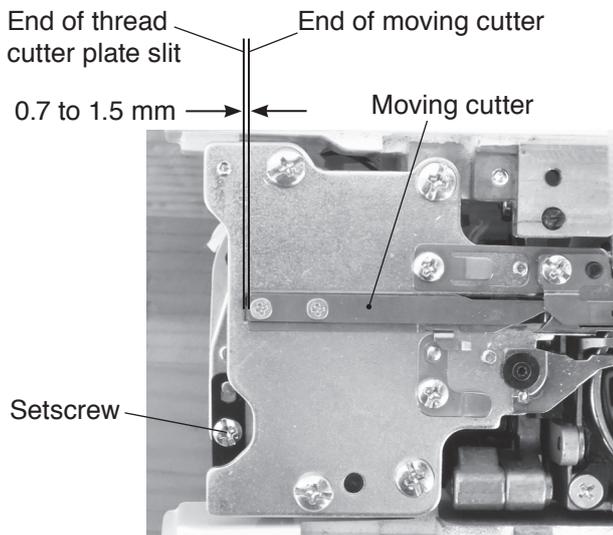


(View from the top)



Thread cutter switch adjustment

The distance between the left end of thread cutter plate slit and the left end of moving cutter should be in the range of 0.7 to 1.5 mm.



To check:

1. Turn the power switch off.
Remove the needle plate.
Remove the base and thread cutter cover.
2. Slide the moving cutter to the right with your finger.
3. Turn the power switch ON.
The moving cutter motor is initialized, and the moving cutter moves to its home position automatically.
4. The distance between the left end of moving cutter and the left end of thread cutter plate slit should be 0.7 to 1.5 mm.
* If not, adjust as follows.

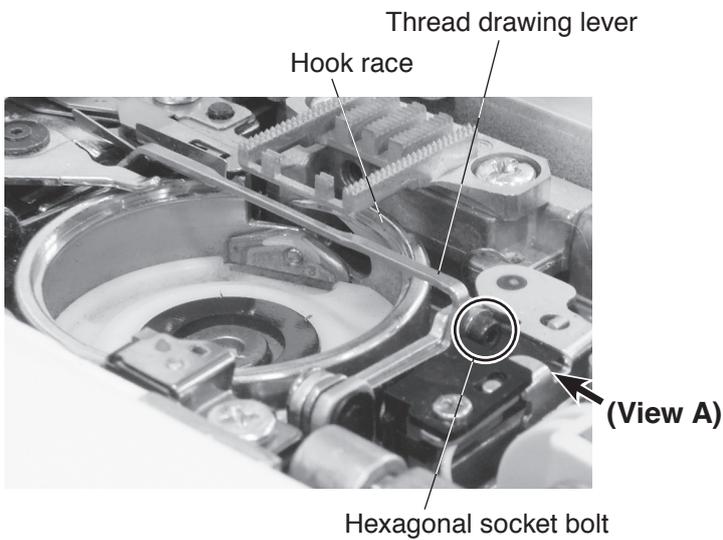
To adjust:

1. Loosen the setscrew on the thread cutter switch setting plate.
2. If the distance is smaller than 0.7 mm, move the plate in the direction of (A).

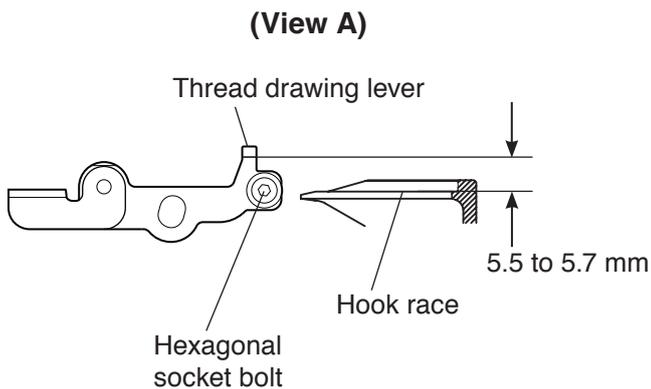
If the distance is larger than 1.5 mm, move the plate in the direction of (B).

Thread drawing lever height adjustment

The maximum height of the thread drawing lever should be between 5.5 to 5.7 mm from the hook race.

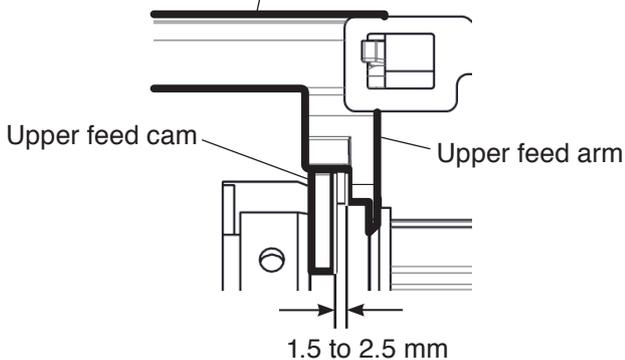
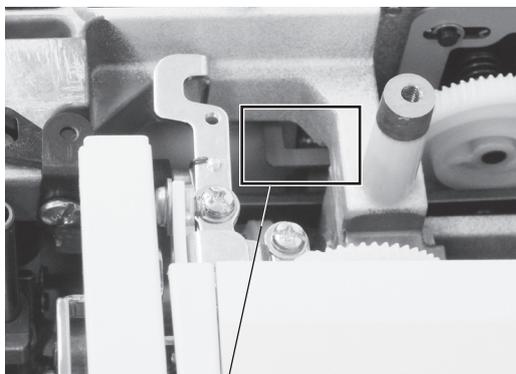
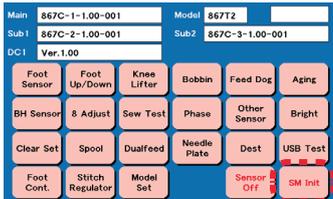
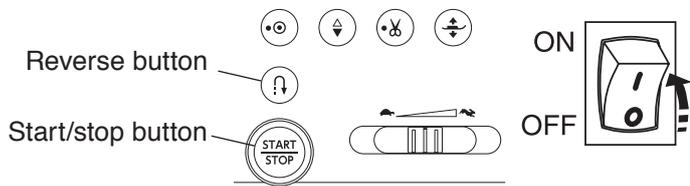


1. Remove the needle plate.
2. Loosen the hexagonal socket screw. When the thread drawing lever is at the highest position, adjust the drawing lever so that the distance between the hook race and the drawing lever is 5.5 to 5.7 mm.
3. Tighten the hexagonal socket bolt.
4. Attach the needle plate.

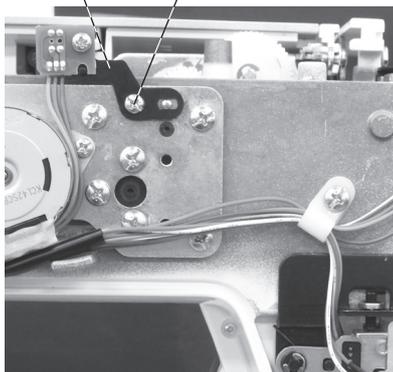


Automatic upper feed withdrawal rod adjustment

The clearance between the upper feed arm and upper feed cam should be 1.5 mm to 2.5 mm when “SM Init” key is pressed in the factory setting mode.



Withdrawal rod sensor set plate
Setscrew



1. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode.
2. Press the “SM Init” key to initialize the machine.
3. Check if the clearance between the upper feed arm and upper feed cam is 1.5 mm to 2.5 mm. If not, follow the procedure below.

If the clearance is too large:

Loosen the setscrew.

Move the withdrawal rod sensor set plate to the left to adjust the clearance.

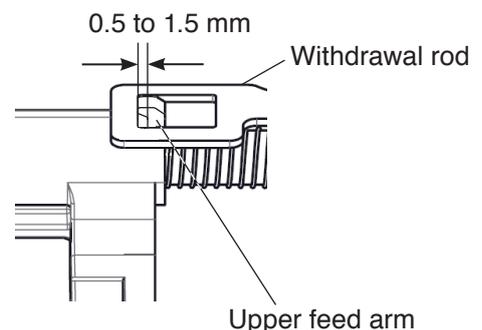
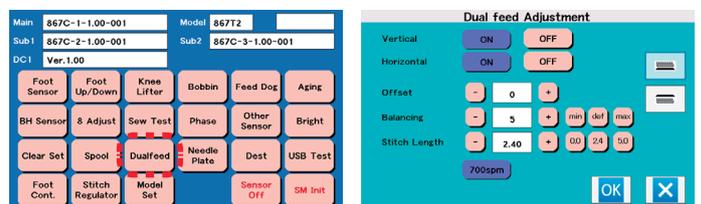
If the clearance is too small:

Loosen the setscrew.

Move the withdrawal rod sensor set plate to the right to adjust the clearance.

4. Press the “Dualfeed” key to select the dual feed adjusting mode. Press the “OFF” key at “Vertical” to move the withdrawal rod to the right. Press “ON” key at “Vertical” to move the withdrawal rod to the left. Press the needle up/down button twice. Check if the upper feed arm returns smoothly.
5. Check if the clearance between the upper feed arm and the withdrawal rod is 0.5 mm to 1.5 mm. If not, adjust the withdrawal rod sensor set plate again.

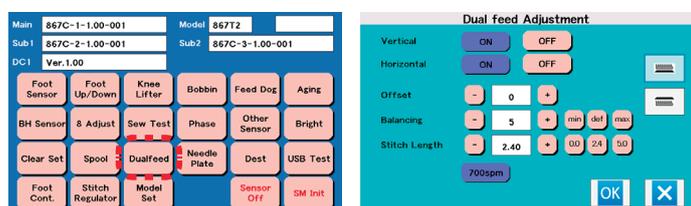
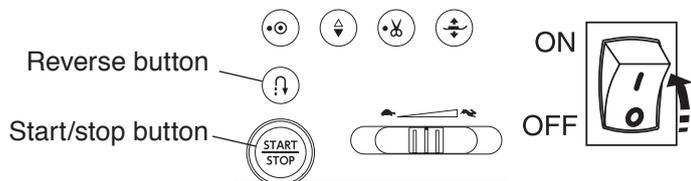
* Adjust the automatic upper feed adjustment on next page after this adjustment.



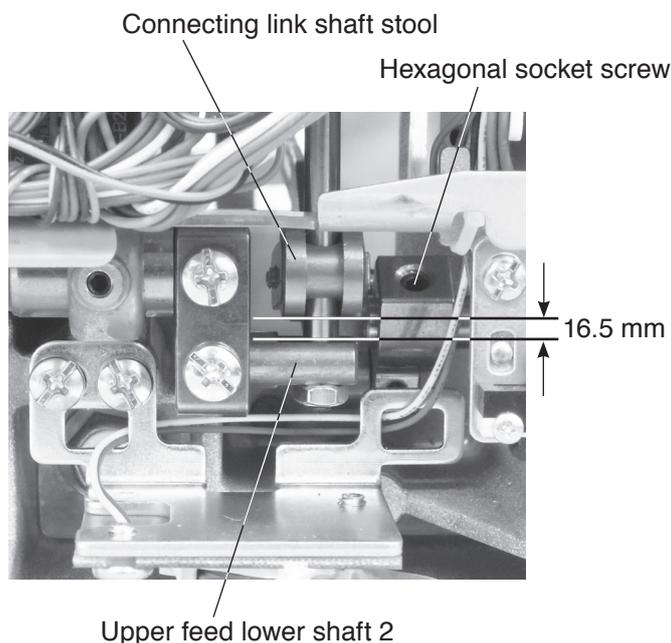
Automatic upper feed adjustment (1)

Adjust this part after adjusting the automatic upper feed withdrawal.

The clearance between the upper feed lower shaft 2 and connecting link shaft stool should be 16.5 mm when “Dualfeed” key is pressed in the factory setting mode and the offset value is set at “0”, the balancing value is set at “5”, the stitch length value is set at “2.40”.

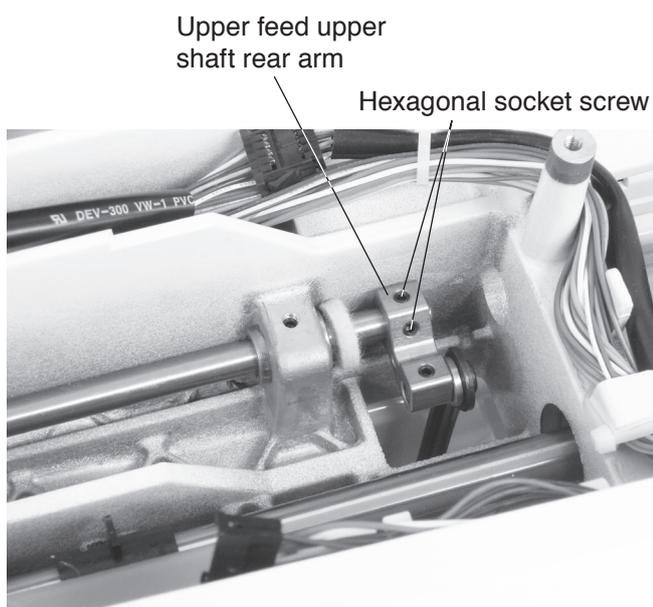
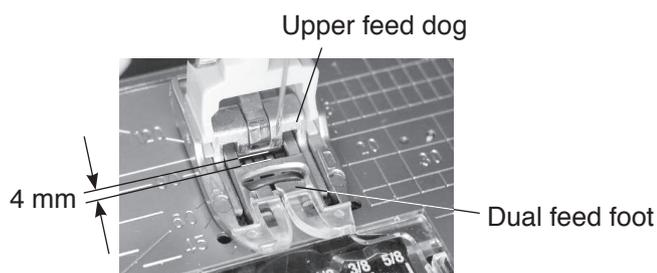
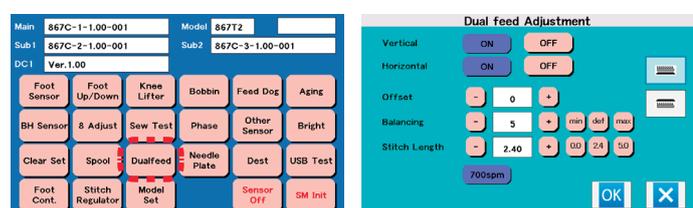
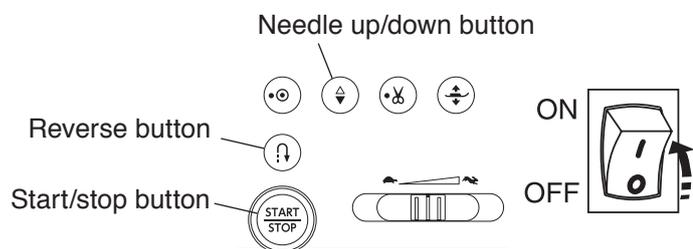


1. Remove the base (refer to page 2).
2. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode.
3. Press the “Dualfeed” key to select the dual feed adjusting mode. Set the offset value at “0”, the balancing value at “5”, the stitch length value at “2.40”.
4. Check if the clearance between the upper feed lower shaft 2 and connecting link shaft stool is 16.5 mm. If not, follow the procedure below.
5. Loosen the hexagonal socket screw. Adjust the clearance between the upper feed lower shaft 2 and connecting link shaft stool to 16.5 mm. Tighten the hexagonal socket screw
* Adjust the upper feed dog on next page after this adjustment.



Automatic upper feed adjustment (2)

Adjust this part after Adjusting the automatic upper feed adjustment (1).



To check:

1. Attach the dual feed foot.
 2. Remove the top cover (refer to page 1).
 3. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode.
 4. Press the “Dualfeed” key to select the dual feed adjusting mode.
Set the offset value at “0”, the balancing value at “5”, the stitch length value at “2.40”.
 5. Lower the feed dog and press the needle up/down button twice to raise the needle. Turn the power switch off.
- * To initialize the feed dog position, be sure to press the needle up/down button twice to raise the needle.
6. Lower the presser foot lifter and check the clearance. The clearance between the dual feed foot and upper feed dog should be 4 mm.

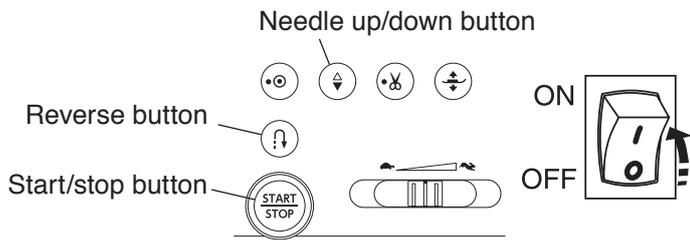
To adjust:

If the clearance is not 4 mm, adjust as follows,

1. Remove the top cover.
2. Loosen the hexagonal socket screws (2 pcs.) on upper feed rear arm.
3. Insert a 4 mm spacer between the upper feed foot and upper feed dog (center). Tighten the hexagonal socket screw (2 pcs.).
4. Attach the top cover.

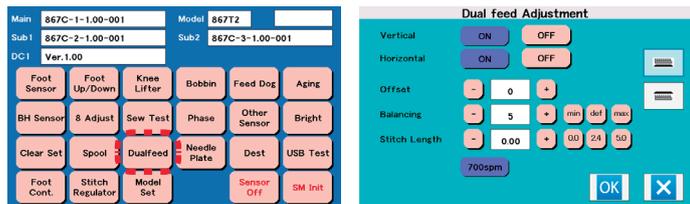
Upper feed dog (1)

The needle tip should be 0 to 1 mm above the surface of the needle plate when the toe of the dual feed foot touches the needle plate.



To check:

1. Attach the dual feed foot and needle #14.
2. Remove the face plate (refer to page 1).
3. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode.



4. Press the "Dualfeed" key to select the dual feed adjusting mode.
Set the offset value at "0", the balancing value at "5", and the stitch length value at "0".

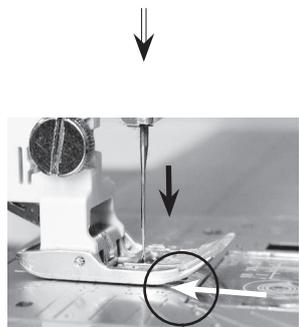
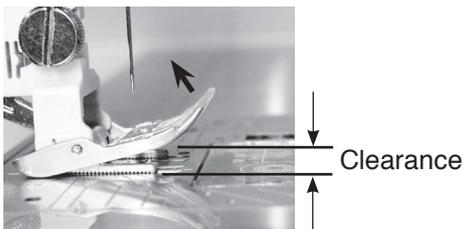
5. Lower the feed dog and press the needle up/down button twice to raise the needle. Turn the power switch off.

* To initialize the feed dog position, be sure to press the needle up/down button twice to raise the needle.

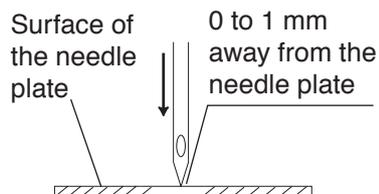
6. Lower the presser foot lifter.

7. Raise the toe of the dual feed foot and leave it as it is.

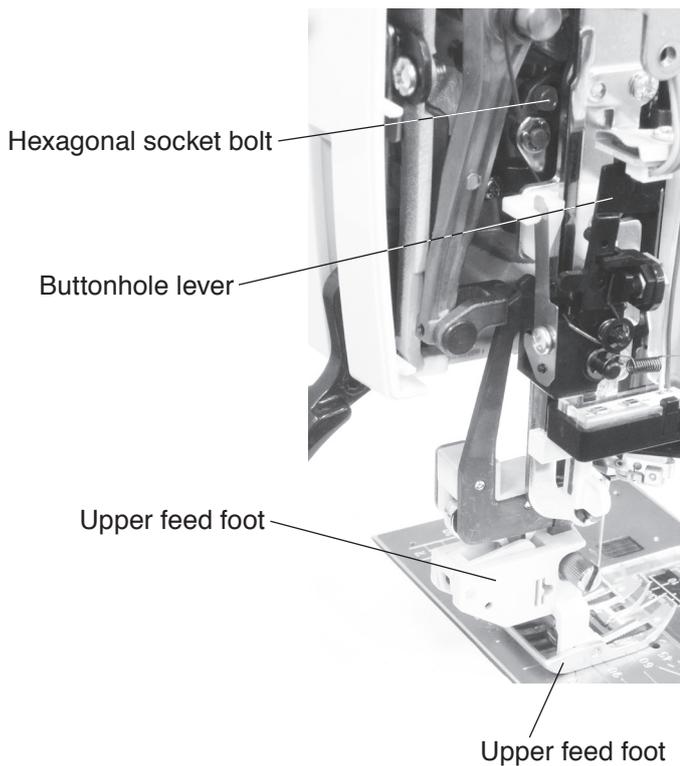
8. Turn the handwheel toward you to lower the needle until the needle tip comes 1 mm or less above the needle plate. The toe of the foot lands on the needle plate and there should be no gap to allow the foot flapping.
If not, adjust it as next page.



No clearance

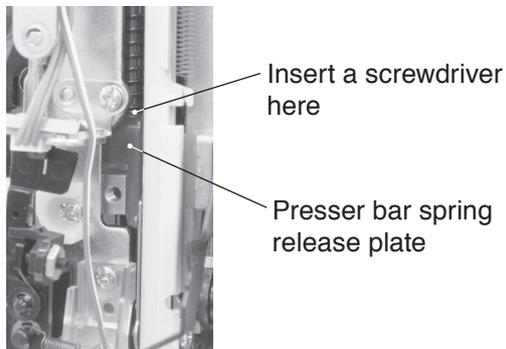


Upper feed dog (2)



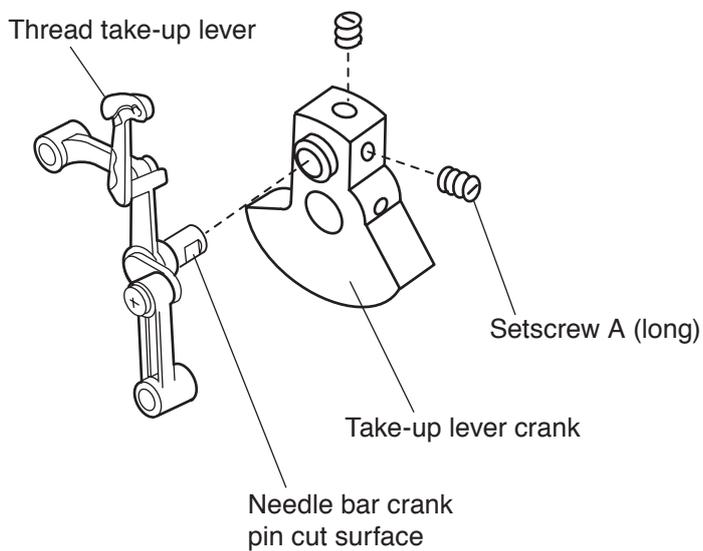
To adjust:

1. Follow steps 3 to 5 of “To check” procedure on page 32 and turn the handwheel toward you to raise the needle.
2. Remove the top cover and face plate (refer to page 1).
3. Loosen the hexagonal socket bolt.
 - * If the buttonhole lever is obstructive for this adjustment, lower the buttonhole lever half-way. If you cannot loosen the hexagonal socket bolt because the hexagonal socket bolt position is not fixed, push the presser bar spring release plate with a screwdriver to fix the setscrew position.
4. Turn the handwheel toward you to lower the needle until the needle tip matches with the surface of the needle plate.
5. Tighten the hexagonal socket bolt while pressing the dual feed foot against the needle plate.
6. Check if there is no gap (see “To check” procedure).
7. Attach the face plate and top cover.



To replace the thread take-up lever

When you replace the thread take-up lever, insert the needle bar crank pin into the take-up lever crank as illustrated. The setscrew A (long) must hold the needle bar crank pin cut surface.

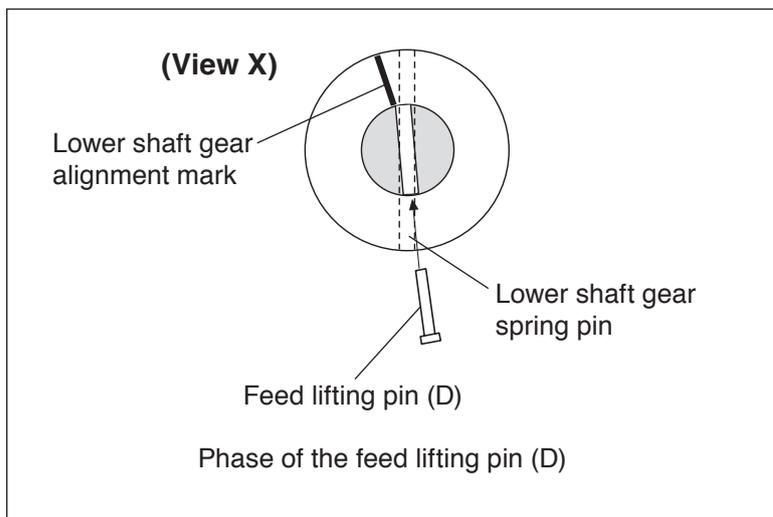
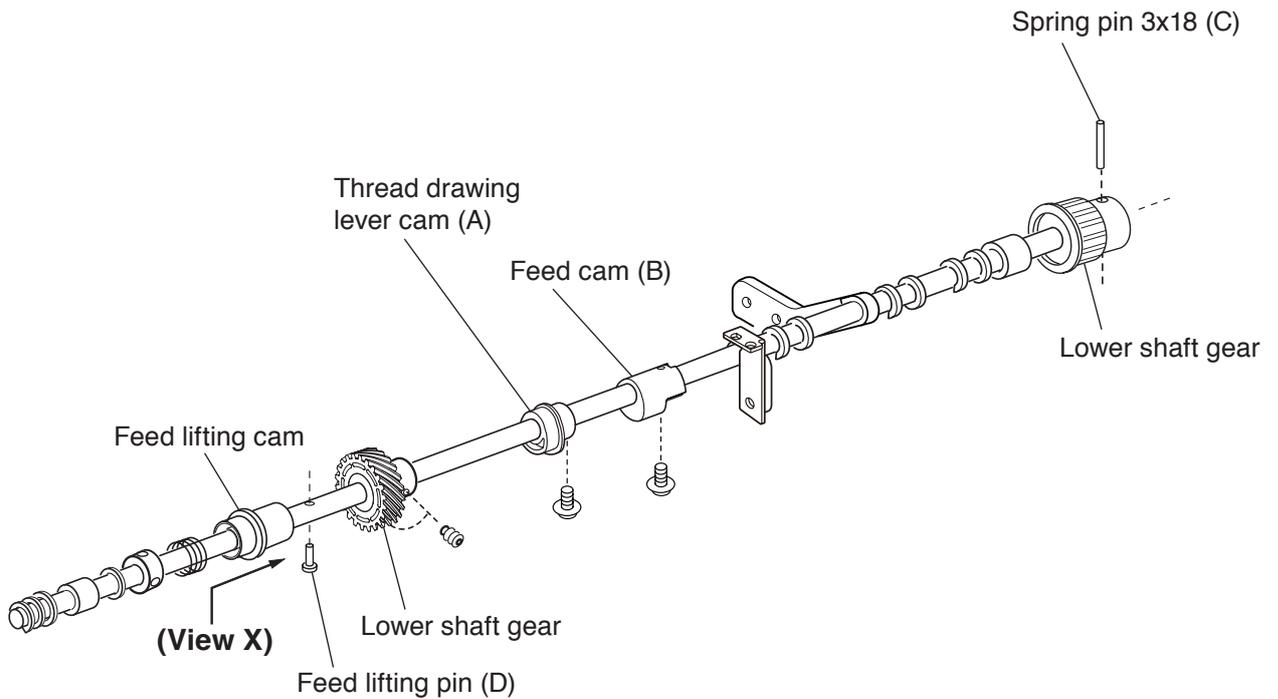


To attach lower shaft

When you replace the lower shaft or the lower shaft parts, adjust the phases as shown below.

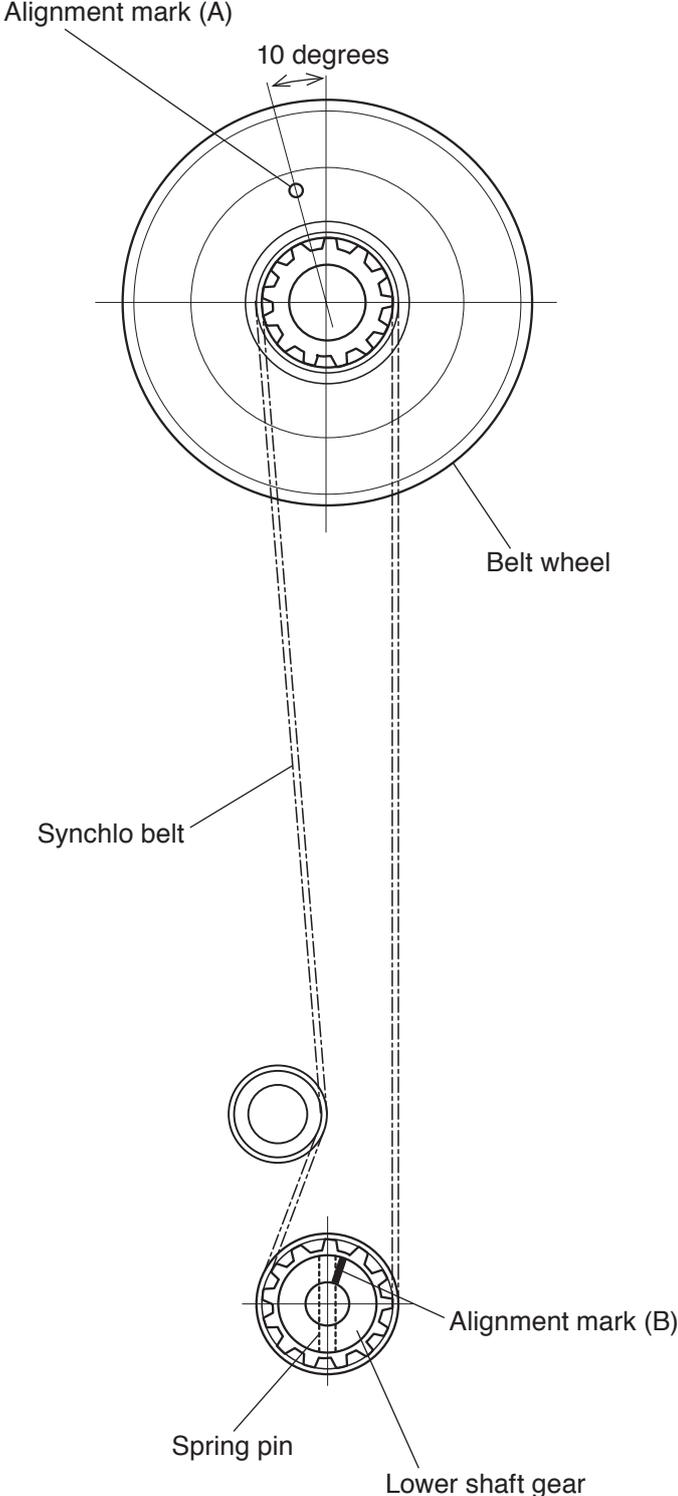
The phases of the thread drawing lever cam (A) and the feed cam (B) are the same as that of the spring pin 3x18 (C).

The phase of feed lifting pin (D) is shown below.

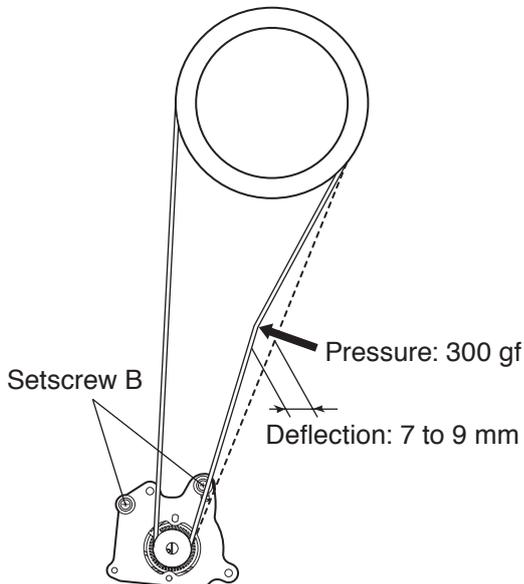
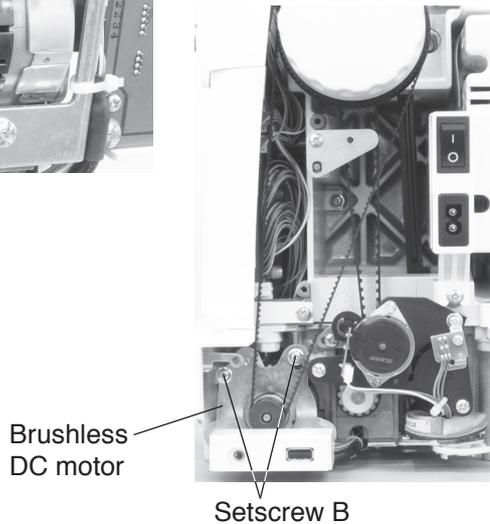
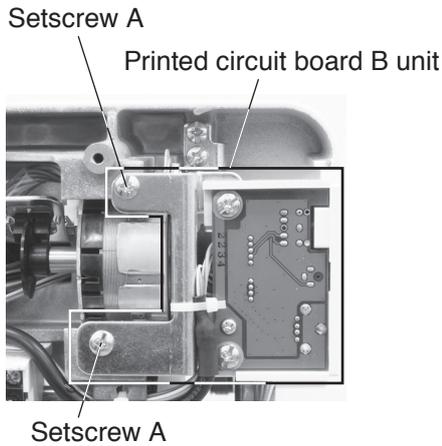


Synchlo belt

When you replace the synchlo belt, set the alignment mark (A) on the belt wheel at upper left (10 degrees), the alignment mark (B) on the lower shaft gear at upper right as shown.



To replace the brushless DC motor and belt tension adjustment



To remove:

1. Remove the face plate, top cover, belt cover, base and front cover (refer to pages 1, 2 and 4).
2. Remove the motor belt.
3. Remove the setscrews A (2 pcs.) and printed circuit board B unit.
4. Remove the setscrews B (2 pcs.).
5. Disconnect the motor harness from the brushless DC motor.
6. Replace the brushless DC motor.

To attach:

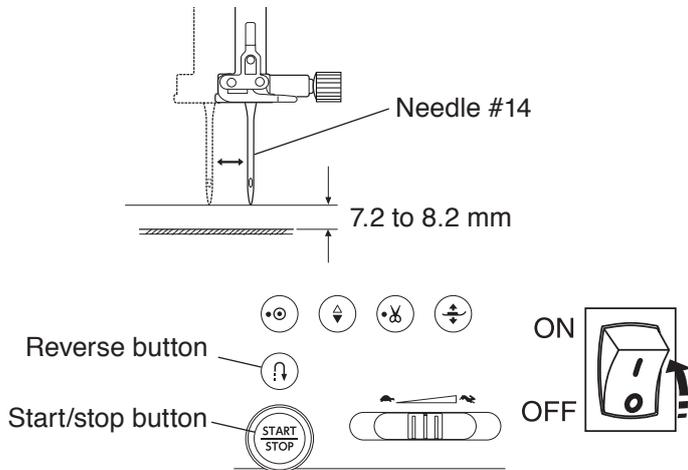
7. Connect the motor harness to the brushless DC motor.
Fix the brushless DC motor by tightening the setscrews B (2 pcs.) lightly.
8. Adjust the belt tension and tighten the setscrews B (2 pcs.) securely.
9. Fix the printed circuit board B unit by tightening the setscrews A (2 pcs.).

Adjust motor belt tension:

Adjust the motor belt deflection to about 7 to 9 mm by pressing the middle of the motor belt with approximately 300 grams-force of pressure.

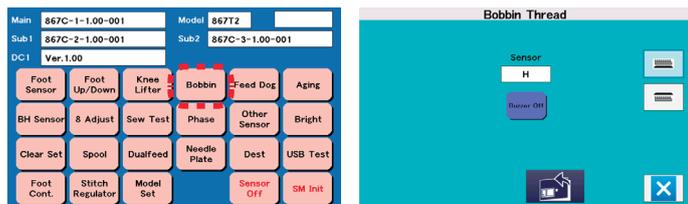
Upper shaft shield plate position

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.



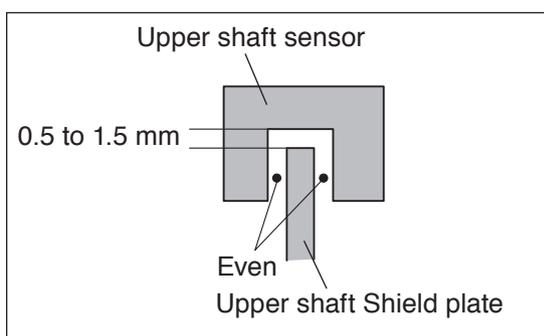
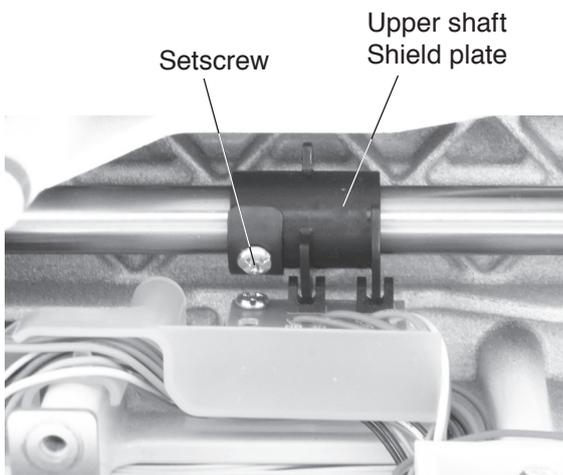
To check:

1. Attach the #14 needle.
2. Turn the power switch ON while pressing the start/stop button and reverse button to enter the factory setting mode.
3. Press the "Bobbin" key to select the bobbin thread sensor adjusting mode.
4. Turn the handwheel toward you slowly to bring the needle up from its lowest position until the indication below "Sensor" changes from "L" to "H".
5. The needle height should be 7.2 to 8.2 mm above from the surface of the needle plate.
If not, adjust as follows;



To adjust:

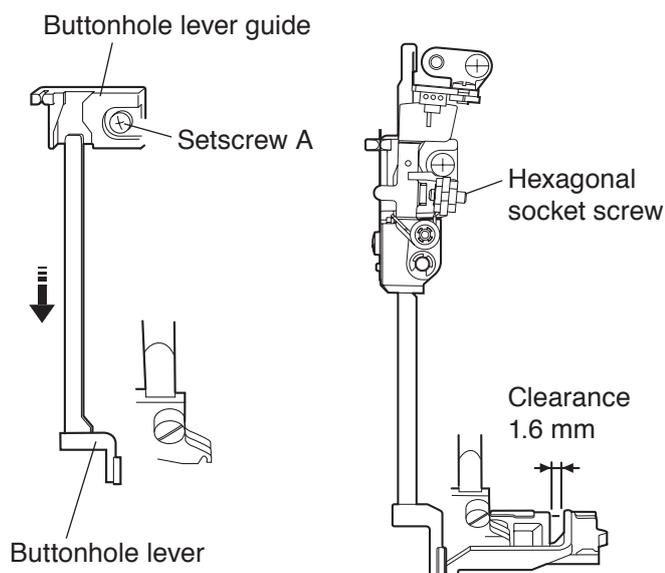
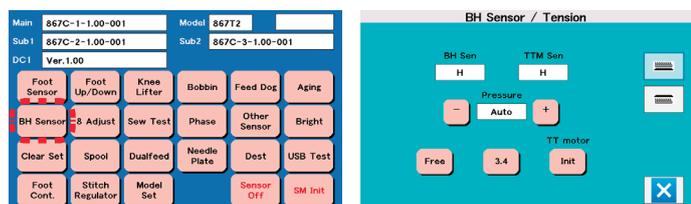
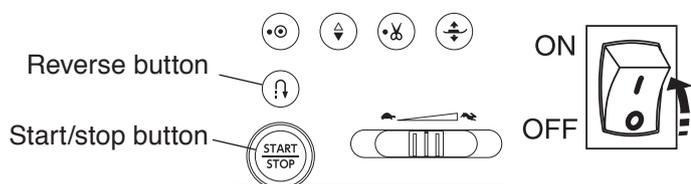
1. Remove the top cover (refer to page 1).
2. Turn the handwheel toward you slowly to bring the needle up from its lowest position to 7.7 mm above the surface of the needle plate.
3. Loosen the setscrew of the upper shaft shield plate. Turn the upper shaft shield plate away from you until the indication below "Sensor" changes from "L" to "H". Tighten the setscrew.
* The position of the upper shaft shield plate should be in the center of the upper shaft sensor.
4. Attach the top cover.



Buttonhole lever position adjustment

If the buttonhole stitches are distorted or not balanced, refer to the troubleshooting of the instruction book.

If the problem still persists, adjust as follows;

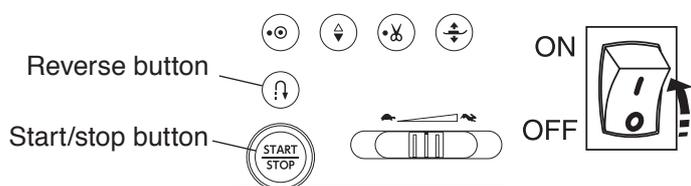
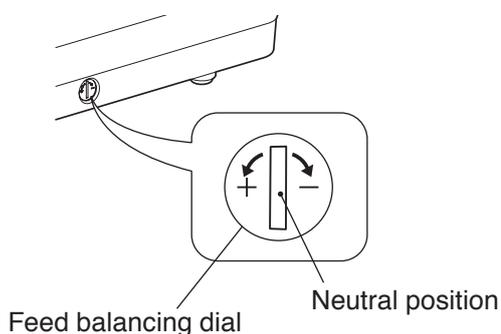


To check:

1. Turn the power switch ON while pressing the start/stop button and reverse button to enter the factory setting mode.
2. Press the "BH Sensor" key to select the BH sensor and tension adjusting mode.
3. Remove the face plate and lower the feed dog.
4. Without attaching the buttonhole foot R, lower the buttonhole lever. Loosen the setscrew A of the buttonhole lever guide and move the buttonhole lever guide to the front or to the rear until the indication below "BH Sen" changes to "L". Tighten the setscrew A.
5. Attach the buttonhole foot R and lower the buttonhole lever.
6. Place a piece of paper under the presser foot to adjust the clearance of buttonhole foot. Lower the buttonhole R. Adjust the clearance between the stopper and the presser foot slider to 1.6 mm.
7. Loosen the hexagon socket screw until the indication below "BH Sen" changes to "H". Tighten the hexagon socket screw slowly until the indication below "BH Sen" changes from "H" to "L".
8. Turn the power switch off.
9. Raise the feed dog and attach the face plate.

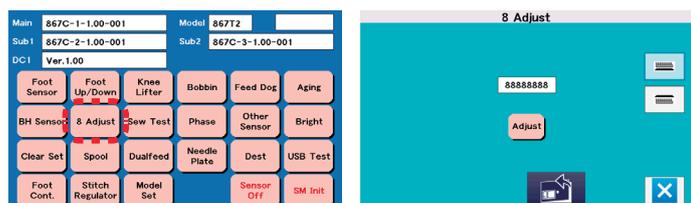
Stretch stitch feed balance adjustment

Stretch stitch balance dial position



To check:

1. Attach the satin stitch foot F.
2. Set the feed balancing dial to the neutral position.
3. Turn the power switch ON while pressing the start/stop button and reverse button to enter the factory setting mode.
4. Press the "8 Adjust" key to select the "8 Adjust" mode.
5. Start the machine and sew at the maximum speed until it stops automatically. The machine sews 8 of number 8 and stops automatically. Measure the length of 5 (from the third to the seventh) of 8. (The length 5 of 8 should be 33 mm to 39 mm.)

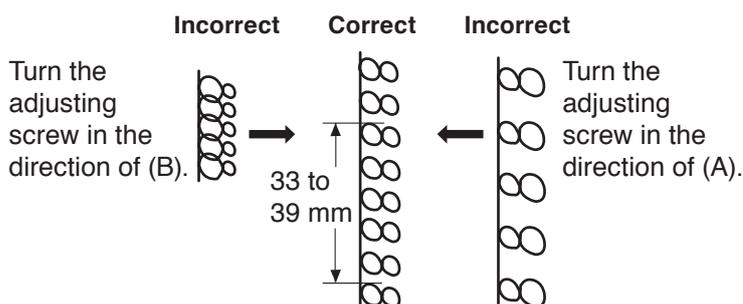
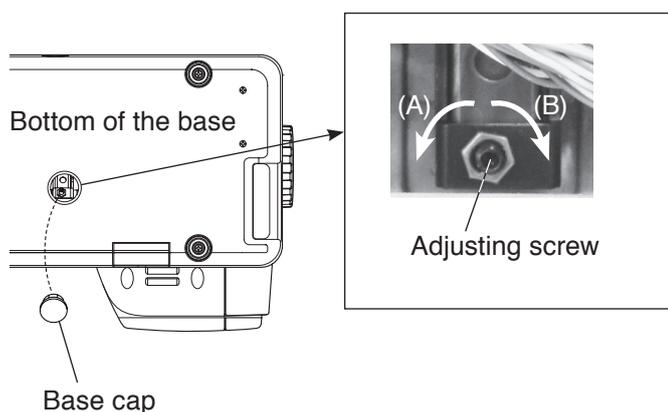


Stretch stitch balance adjustment:

1. Remove the base cap.
2. Sew 8 of number 8.
3. If the length is longer than 39 mm, turn the adjusting screw in the direction of (A).

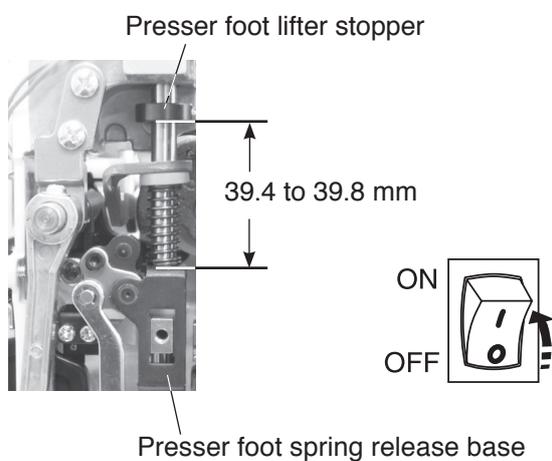
If the length is shorter than 33 mm, turn the adjusting screw in the direction of (B).

4. Sew 8 of number 8.
5. Attach the base cap.



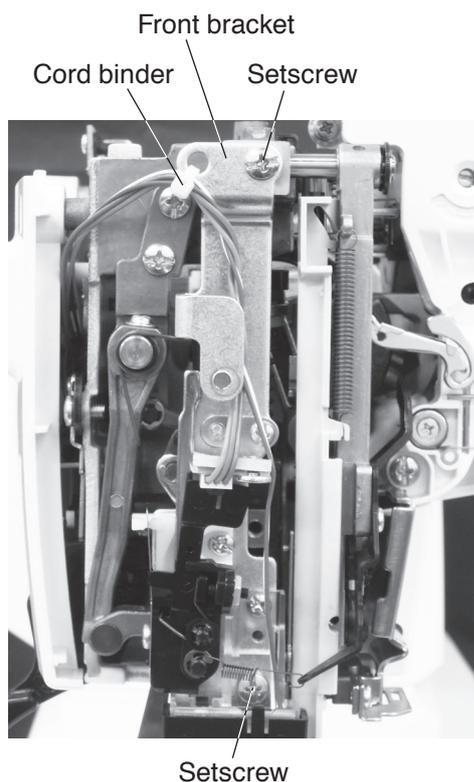
Presser foot lifter stopper position (1)

The distance between the presser foot spring release base and the presser foot lifter stopper should be in the range of 39.4 mm to 39.8 mm when the presser foot is raised with the presser foot lifter.



Preparation:

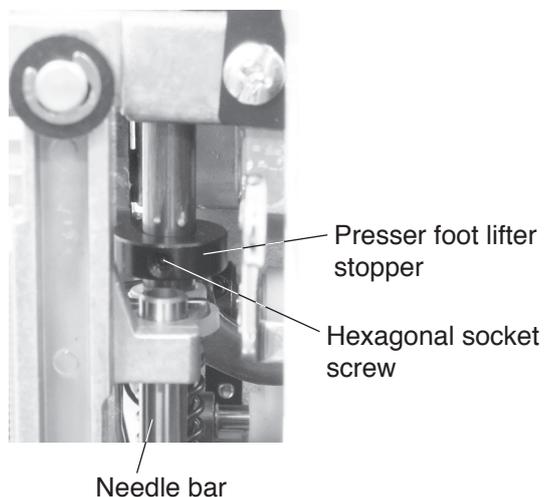
1. Turn the power switch ON. Press the presser foot lifter button to lower the presser foot. Turn the power switch off.
2. Raise the presser foot with the presser foot lifter.
3. Remove the face plate and top cover (refer to page 1).
4. Cut the cord binder.
5. Remove the setscrews (2 pcs.) of the front bracket.



Presser foot lifter stopper position (2)

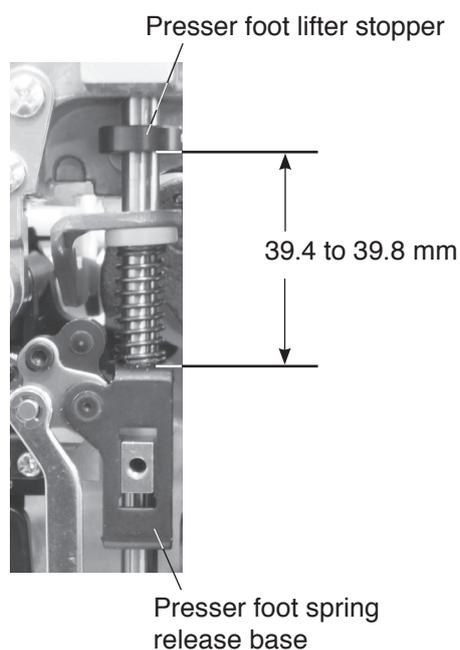
The distance between the presser foot spring release base and the presser foot lifter stopper should be in the range of 39.4 mm to 39.8 mm when the presser foot is raised with the presser foot lifter.

Front side of the machine



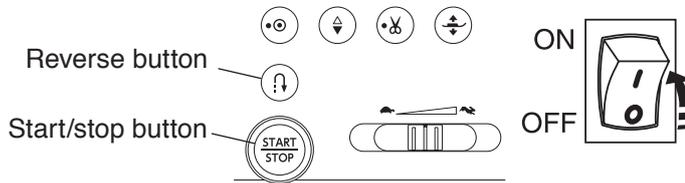
To adjust:

1. Turn the handwheel toward you to lower the needle. Raise the presser foot lifter. Loosen the hexagonal socket screw of the presser foot lifter stopper from the front side of the machine.
2. Adjust the distance between the presser foot spring release base and the presser foot lifter stopper to 39.6 mm. Tighten the hexagonal socket screw.
3. Check the needle threader hook position (refer to pages 25 and 26).



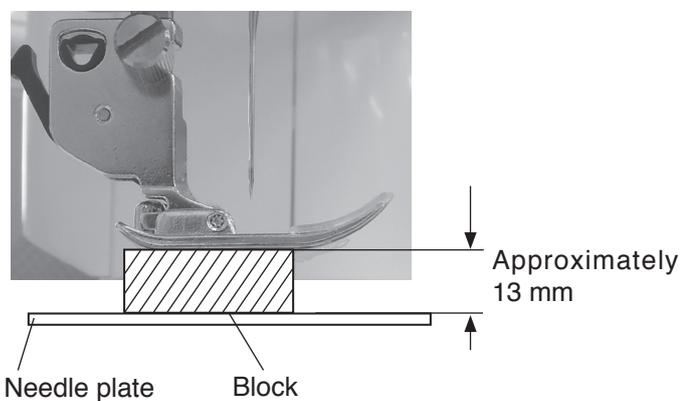
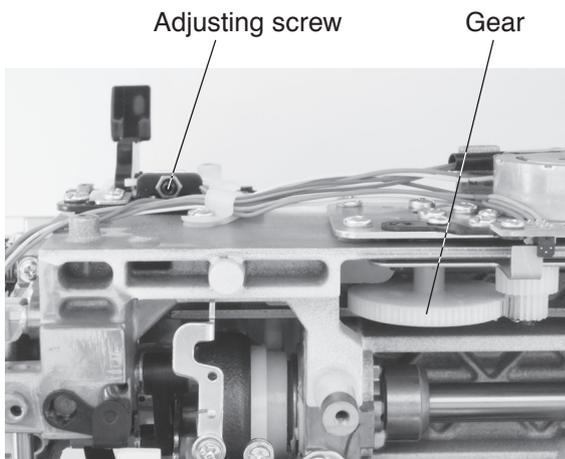
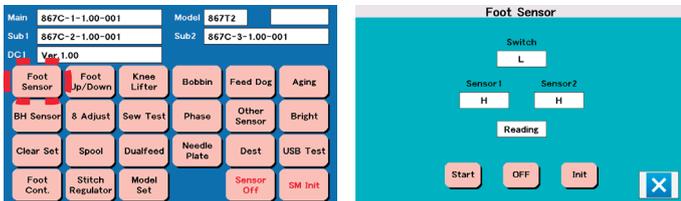
Automatic presser foot lifter initializing sensor position

Adjust the automatic presser foot lifter initializing sensor position when the presser foot lifter motor unit is replaced.

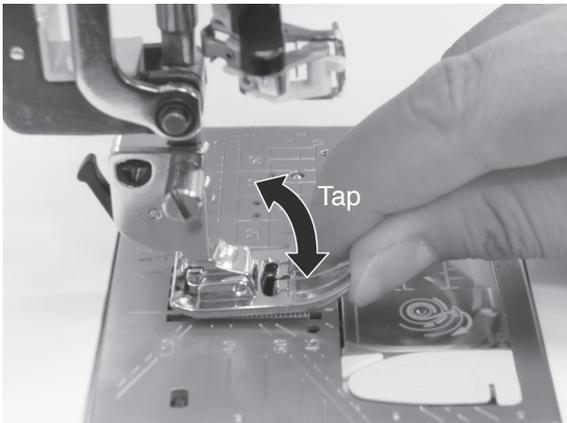
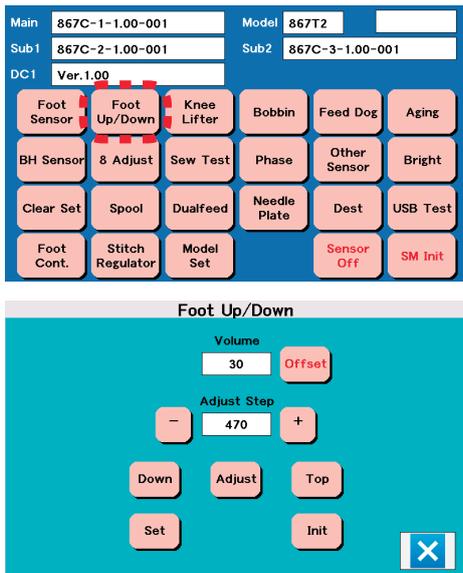
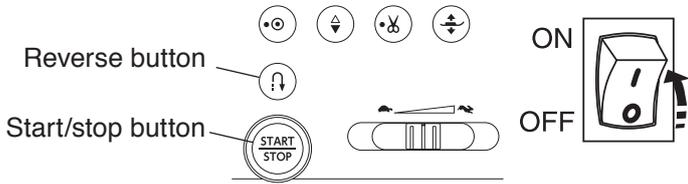


To adjust:

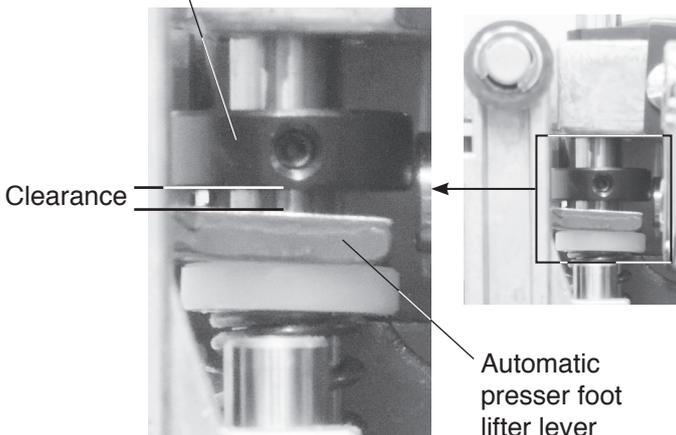
1. Remove the face plate, top cover and rear cover (refer to pages 1 and 5).
 2. Turn the power switch ON while pressing the start/stop button and reverse button to enter the factory setting mode. Press the “Foot Sensor” key to select the foot sensor adjusting mode.
 3. Press the “OFF” key to release the gear. Turn the gear with your hand to raise the presser foot.
 4. Place the 13 mm spacer between the presser foot and the needle plate. Lower the presser foot on the spacer firmly.
 5. Be sure that the both sensors 1 and 2 are “H”. Press “Start” on the touch panel. Turn the adjusting screw counterclockwise until the “OK” message shown on the touch panel with beep sounds.
- * In case either of sensor 1 and 2 are not “H”, turn the adjusting screw clockwise to change the both sensors to “H”.



Presser foot height on needle plate adjustment



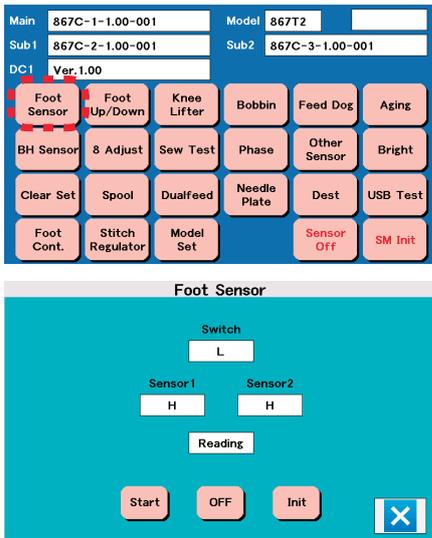
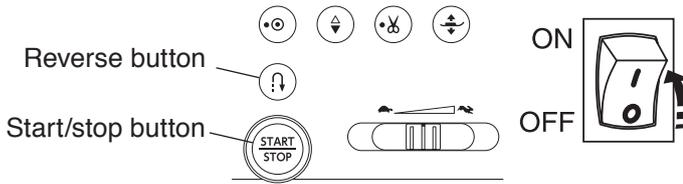
Presser foot lifter stopper



To adjust:

1. Turn the power switch ON while pressing the start/stop button and reverse button to enter the factory setting mode. Press the “Foot Up/Down” key to select the Foot Up/Down adjusting mode.
 2. Attach the foot holder lightly (Do not tighten the thumbscrew firmly).
 3. Press the “Down” key. The presser bar will be lowered. Tighten the thumbscrew firmly.
 4. Press the “Init” key to initialize the settings. Press the “Adjust” key to lower the foot. Check if there is a space between the foot and needle plate by tapping the foot tip with fingers as shown. If there is not enough space to tap the foot tip, press “-” few times to raise the presser bar, giving a enough space between the needle plate and the presser foot.
 5. Press the “+” once and tap the foot to check the space. Repeat this step until the tapping sound is gone.
 6. Press the “+” again to apply foot pressure, then press the “set” to register the presser bar height.
- * Adjust the presser bar height always by pressing “+” key. Do not press “-” at the end of this adjustment. In case “+” button was pressed too many times, press “-” few times and start over the adjustment from the step 4 above.
 - * The value of “Adjust Step” should be within the range of 970 to 1030. If the value is far out of the range, check automatic presser foot lifter initializing sensor position adjustment (refer to page 43).
 - * Turn the power switch ON again to enter the ordinary sewing mode, and set the presser foot pressure to “Auto-5”. Press the presser foot lifter button to lower the presser foot. Be sure that there is a clearance between the presser foot lifter stopper and the automatic presser foot lifter lever as shown in the picture. If there is no clearance between them, adjust the presser bar height again (refer to page 19).

Presser bar lifter switch position

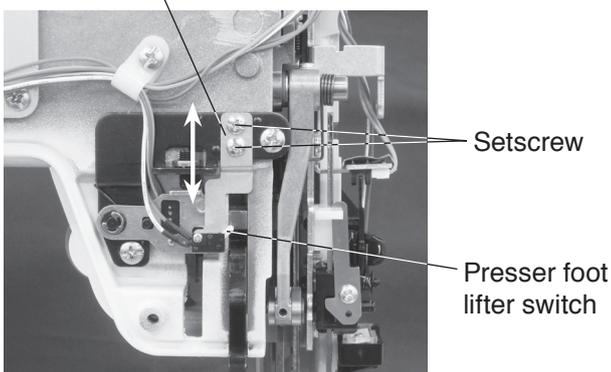
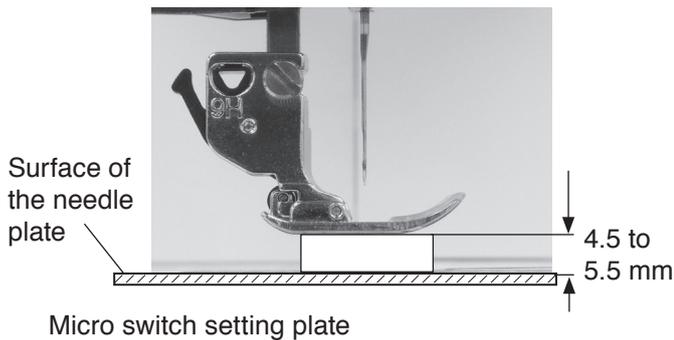
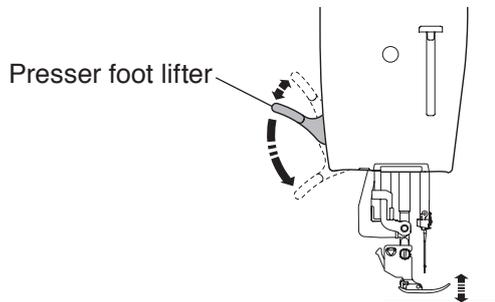


To check:

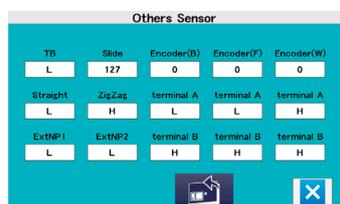
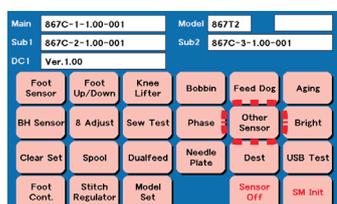
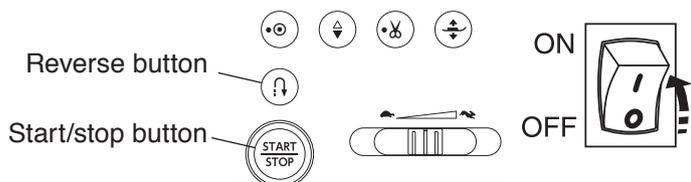
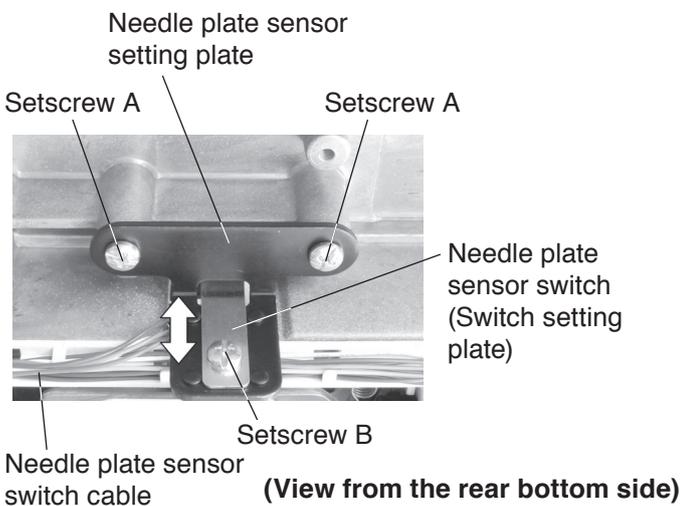
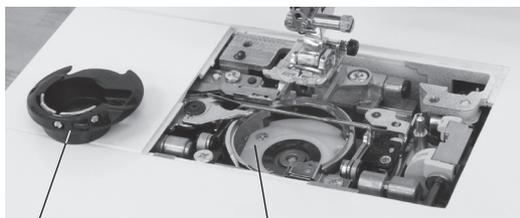
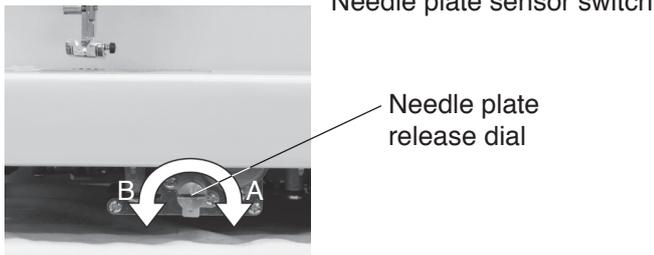
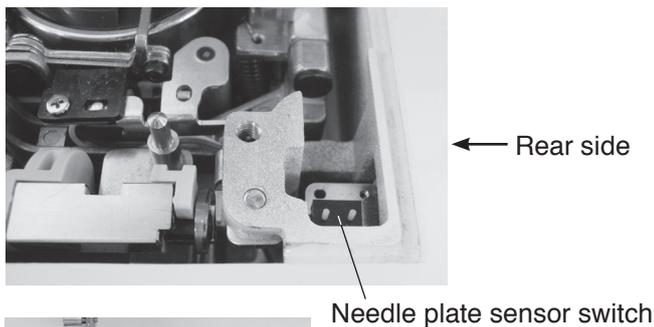
1. Attach the zigzag foot (A).
2. Turn the power switch ON while pressing the start/stop button and reverse button to enter the factory setting mode. Press "Foot Sensor" key to select the foot sensor adjusting mode.
3. Press the presser foot lifter button to lower the presser foot. Raise the presser foot slowly by raising the presser foot lifter. The distance between the lower part of the presser foot and the surface of needle plate should be 4.5 mm to 5.5 mm when the indication below "Switch" changes to "H" from "L". If not, adjust as follows;

To adjust:

1. Remove the face plate and rear cover (refer to pages 1 and 5).
2. Loosen the setscrews (2 pcs.) of micro switch set plate.
3. Place the 5 mm block (spacer) between the presser foot and the needle plate, and lower the presser foot.
4. Raise the presser foot lifter lightly as possible from its lowest position. Stop the presser foot lifter at the point where the lifter start to raise the presser foot. Fix the presser foot lifter with a sticky tape at that position.
5. Lower the presser foot lifter switch little by little, and stop it when the "Switch" changes to "L" from "H". Tighten the setscrews (2 pcs.).
6. Remove the 5 mm block (spacer). Remove the sticky tape and lower the presser foot lifter. Raise the presser foot lifter slowly. "Switch" changes to "H" from "L" when the distance between the lower part of the presser foot and the surface of the needle plate is 4.5 to 5.5 mm.



To replace and adjust the needle plate sensor switch



To replace:

To remove:

1. Remove the base (refer to page 2).
2. Push and turn the needle plate release dial in direction A with the screwdriver.
Remove the needle plate and bobbin holder.
* LED light can be too bright when the machine lay on its side.
3. Disconnect the needle plate sensor switch connector from the printed circuit board U.
4. Remove the setscrews A (2 pcs) and remove the needle plate sensor setting plate.
5. Remove the setscrew B and remove the needle plate sensor switch.

To attach:

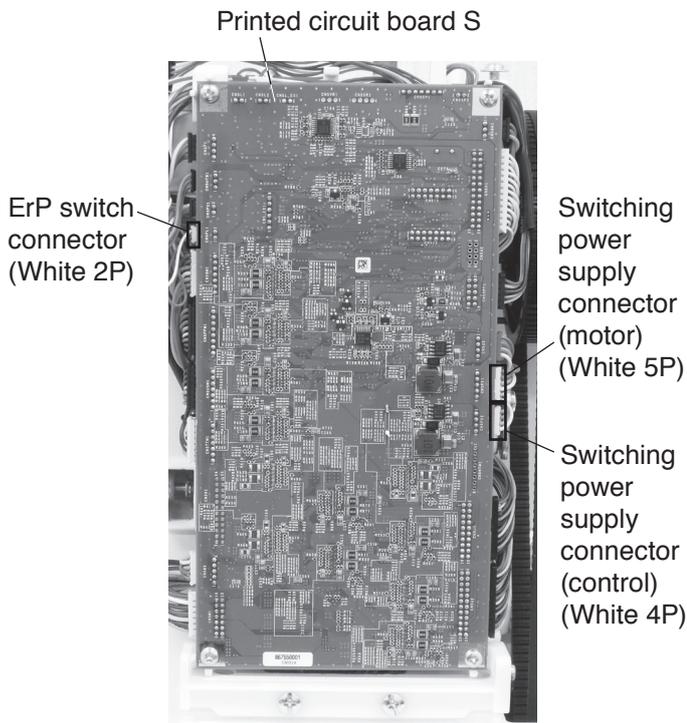
1. Attach the needle plate sensor switch to the needle plate sensor setting plate and tighten the setscrew B lightly.
2. Tighten the setscrews A (2 pcs) to fix the needle plate sensor setting plate.
3. Connect the needle plate sensor switch connector to the printed circuit board U.
4. After the "To adjust and check" procedure below, tighten the setscrew B securely.

To adjust and check:

1. Prepare the standard needle plate and the straight stitch needle plate.
2. Turn the power switch ON while pressing the start/stop button and reverse button to enter the factory setting mode.
3. Press the "Other Sensor" key to select the sensor/adjusting mode.
4. Check if the indication of "Straight" is "L" and the indication of "ZigZag" is "H" when the standard needle plate is attached.
5. Check if the indication of "Straight" is "H" and the indication of "ZigZag" is "L" when the straight stitch needle plate is attached.

If the indication of "Straight" or "ZigZag" is not correct, move the switch setting plate up or down to adjust the needle plate sensor switch position until the indication shows the correct results.

To replace the switching power supply unit

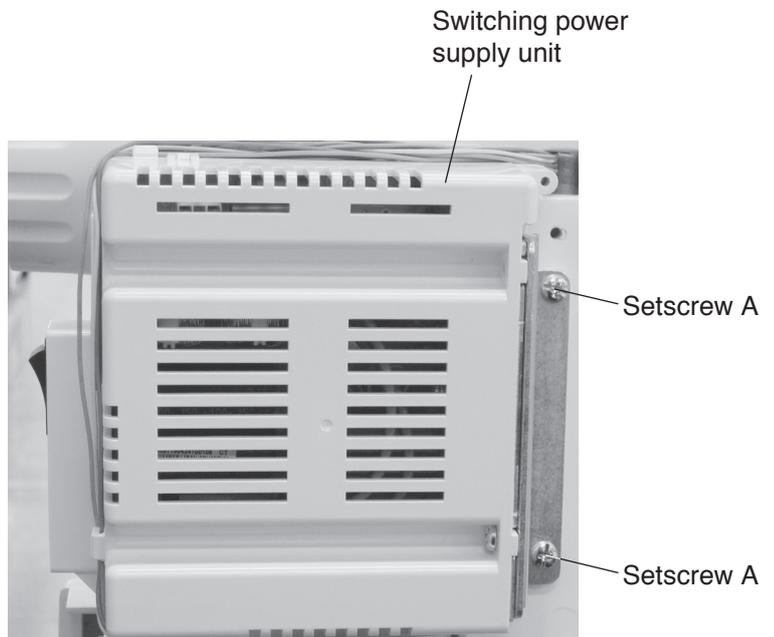


To remove:

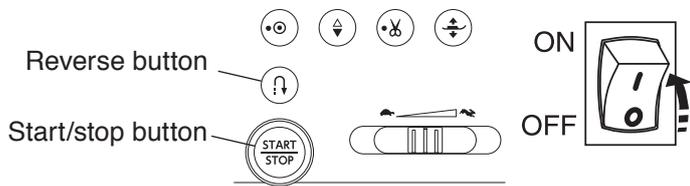
1. Remove the belt cover, power supply cover and front cover (refer to pages 2 to 4).
2. Disconnect the switching power supply connector (motor) (white 5P), switching power supply connector (control) (white 4P) and ErP switch connector (white 2P) from the printed circuit board S.
3. Remove the setscrews A (4 pcs.), setscrew B and remove the switching power supply.

To attach:

4. Follow the steps of the removal procedure in reverse.

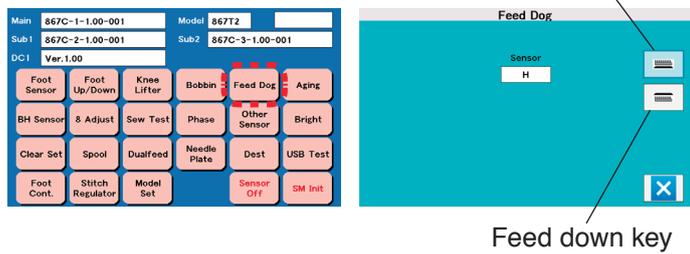


Drop down switch adjustment

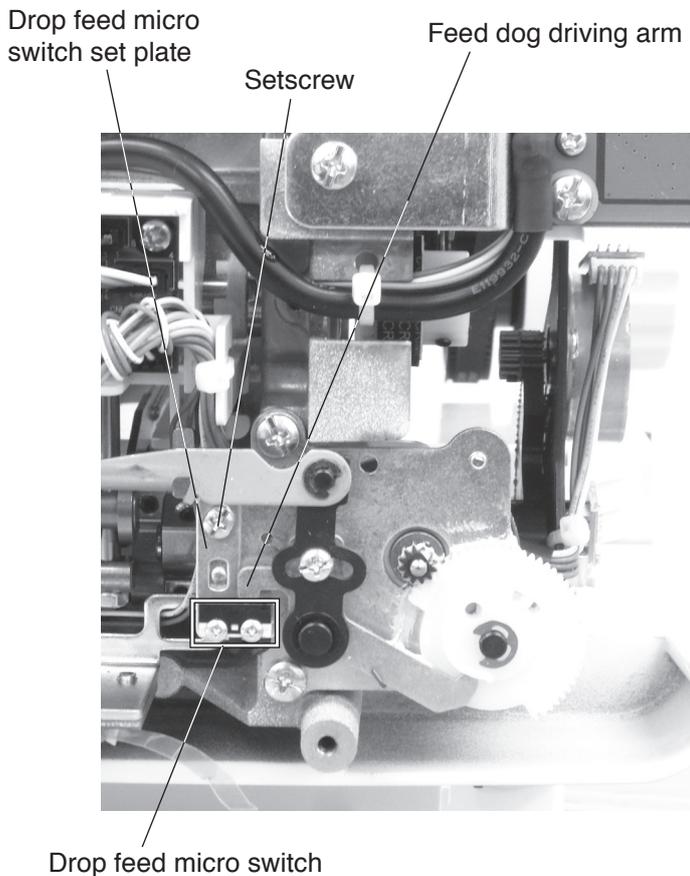


To check:

1. Remove the base (refer to page 2).
2. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode.
3. Press the “Feed Dog” key to select the feed dog adjusting mode.
Press the feed up key.
Check if the feed dog driving arm presses the drop feed micro switch.
Press the feed down key.
Check if the feed dog driving arm does not press the drop feed micro switch.
If not, follow the procedure below.



(View from the belt cover side)

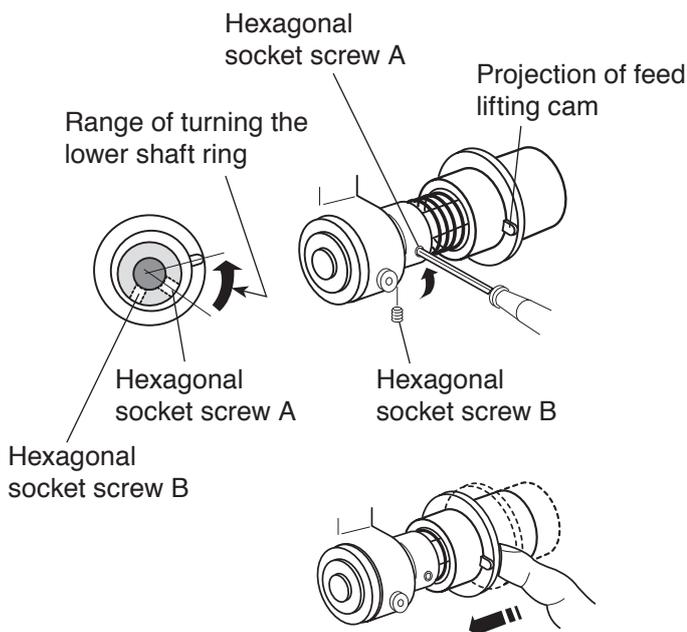
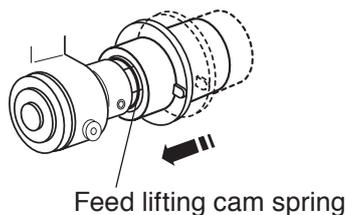
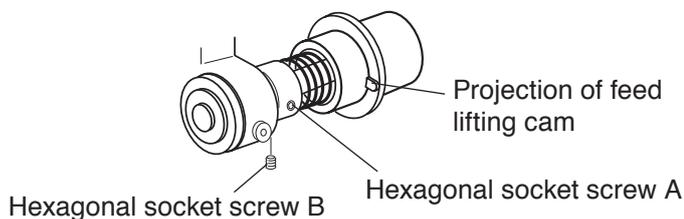
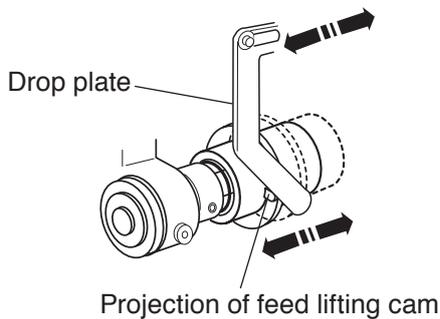


To adjust:

1. Turn the power switch ON.
Raise the feed dog.
Turn the power switch OFF.
2. Loosen the setscrew.
3. Adjust the drop feed micro switch position so the feed dog driving arm can press the drop feed micro switch.
4. Tighten the setscrew.
5. Check if the feed dog driving arm does not press the drop feed micro switch (refer to the step 3 at “To check” on this page above).

Feed dog troubleshooting

When the feed dog does not return to “Up” position and the machine do not feed a fabric, check and adjust the feed lifting cam.



Projection of feed lifting cam

1. Check the drop feed lever

- 1) Remove the base (refer to page 2).
- 2) Bring the needle bar at the lowest position.
(The projection of the feed lifting cam is visible at this position.)
- 3) When the drop plate is moved left and right, the feed lifting cam should move accordingly.

2. Check the position of the hexagonal socket screw on the lower shaft ring

Check if the hexagonal socket screw A on the lower shaft ring is in line with the projection of the feed lifting cam.

The hexagonal socket screw B should be at the position as shown.

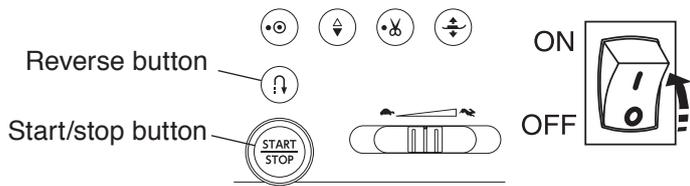
3. Check the clearance between the feed lifting cam and feed lifting cam spring

When the feed lifting cam is pushed to the left, the feed lifting cam spring should be covered with the feed lifting cam completely.

If the feed lifting cam does not move smoothly, adjust as follows:

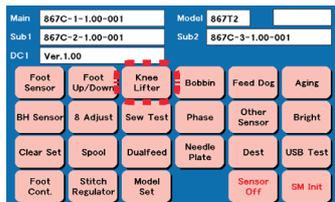
1. Loosen the hexagonal socket screws A and B.
2. Bring the needle bar at the lowest position and turn the lower shaft ring slightly to twist the coil spring lightly. Set the hexagonal socket screw A in line with the projection on the feed lifting cam and tighten it.
3. Tighten the hexagonal socket screw B.
4. Check the drop feed lever, the position of the hexagonal socket screw on the lower shaft ring and the clearance between the feed lifting cam and feed lifting cam spring (refer to the “Projection of lifting cam” 1 to 3 above).
5. Make sure that the lower shaft does not have a play. Attach the base.

Knee lifter adjustment



To adjust:

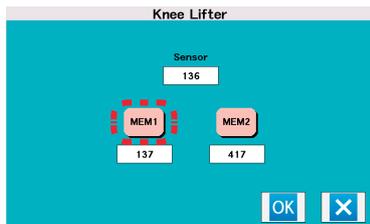
1. Attach the knee lifter.
2. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode. Press the "Knee Lifter" key to select the knee lifter adjusting mode.
3. Attach the knee lifter. Press the "MEM1" when the knee lifter is free.
4. Push the knee lifter to the right as far as it goes and hold it. Press the "MEM2" key.
5. Press the "OK" key.



Knee lifter attached to the machine



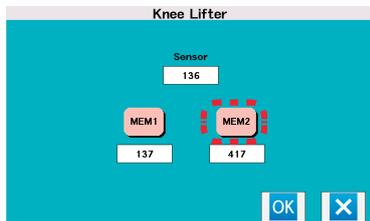
Knee lifter lever



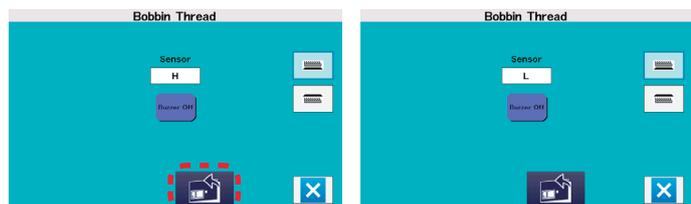
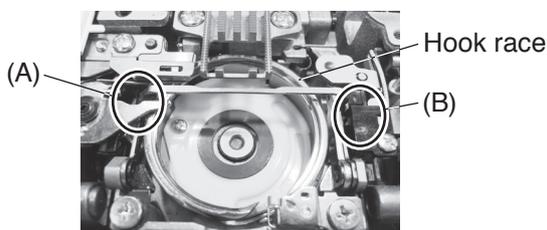
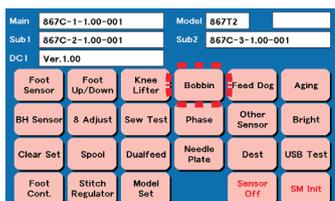
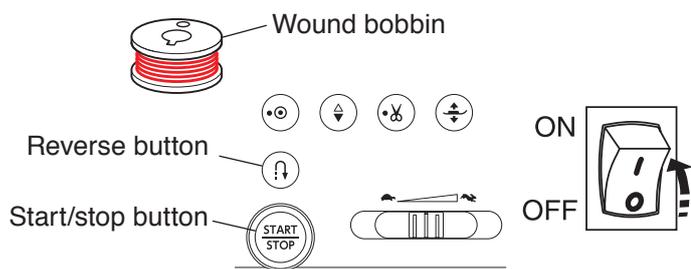
Knee lifter is moved to the right



Knee lifter lever

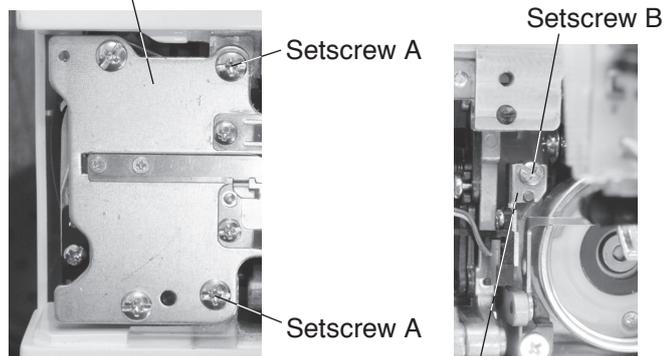


Optical bottom thread sensor adjustment

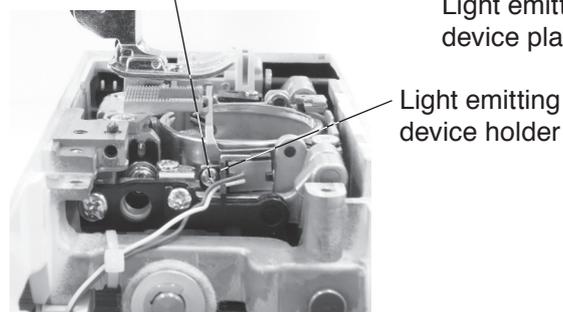


Needle plate release key

Thread cutter unit



Light emitting device plate



To check:

1. Prepare the wound bobbin.
2. Turn the power switch ON while pressing the start/stop button and the reverse button to enter the factory setting mode. Press the "Bobbin" key to select the bobbin thread sensor adjusting mode.
3. Be sure that "Sensor" indicates "H" when the wound bobbin is inserted. When the bobbin is not inserted, turn the handwheel and be sure that "Sensor" indicates "L" when the light passes from A to B. Be sure that "Sensor" indicates "H" when the light is blocked by the hook and does not pass from A to B. If not, follow the adjustment procedure below.

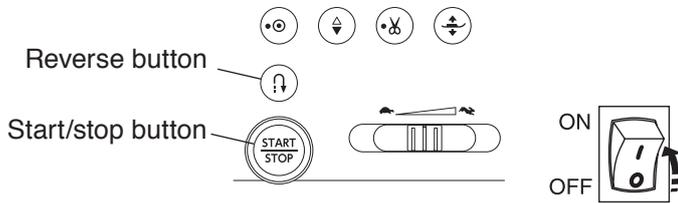
To adjust:

1. Press the needle plate release key and remove the needle plate.
2. Remove the thread cutter cover (refer to page 3).
3. Remove the setscrews A (2 pcs.) and thread cutter unit.
4. Loosen the setscrews B. Move the light emitting device plate forward and backward to adjust the position of the plate.
5. Loosen the setscrews C. Move the light emitting device holder up and down to adjust the position of the holder.

After this adjustment, check if the "Sensor" indicates correct sign at the step 3 at "To check" on this page.

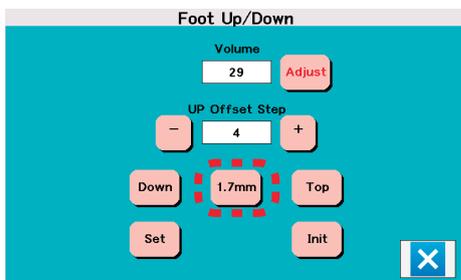
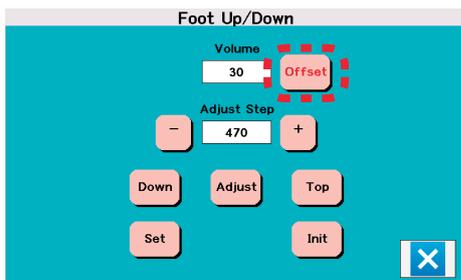
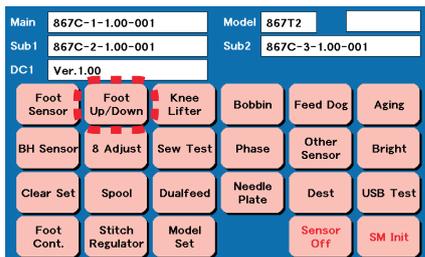
Embroidery foot height adjustment

The distance between the embroidery foot and the surface of the needle plate should be in the range of 1.7 mm to 1.9 mm when the presser bar is lowered.

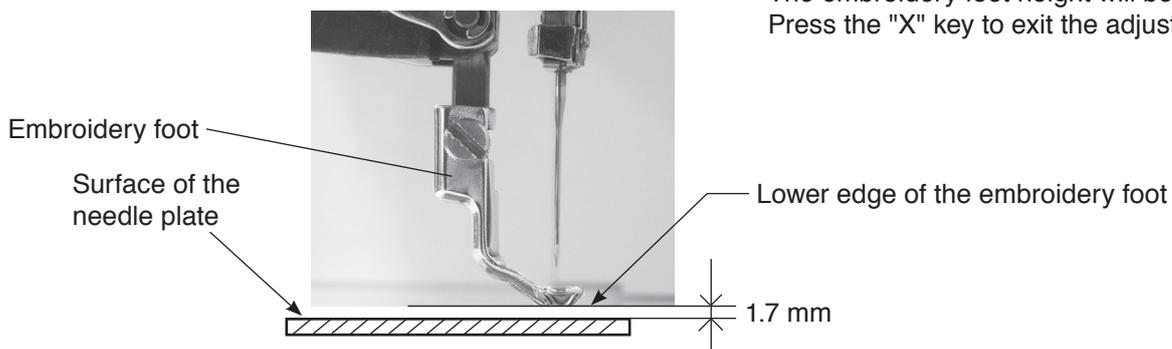


To adjust:

1. Attach the embroidery foot (P).
2. Turn the power switch ON while pressing the Start/ Stop button and the reverse button to enter the factory setting mode. Press the "Foot Up/Down" key.
* The presser foot will rise if it is lowered.

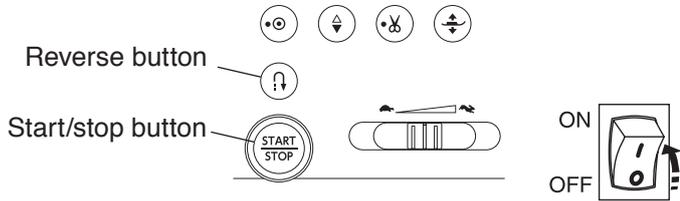


3. Press the "Offset" key.
The "Offset" key changes to "Adjust".
4. Press the "1.7 mm"
The embroidery foot will be lowered.
5. Press the "+" or "-" to adjust the distance between the lower edge of the embroidery foot and the surface of the needle plate to 1.7 mm. Adjust the embroidery foot height slightly higher than 1.7 mm so the adjustment can be finished by pressing "-" key at the end.
* This adjustment must be completed by pressing "-".
* Press the "-" to raise the presser foot bar.
* Press the "+" to lower the presser foot bar.
6. Press the "Set" key.
The embroidery foot height will be registered.
Press the "X" key to exit the adjusting mode.



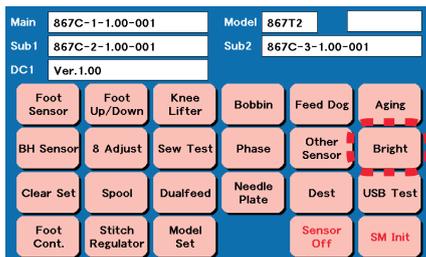
Brightness adjustment

Adjust the screen brightness if the screen is too dark or too bright.

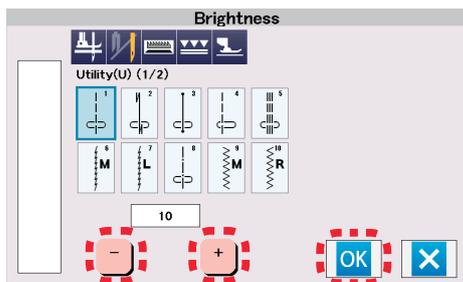


To adjust:

1. Turn the power switch ON while pressing the Start/ Stop button and the reverse button to enter the factory setting mode. Press the "Bright" key.



2. Press the "+" key to increase the screen brightness. Press the "-" key to decrease the screen brightness.
 - * The brightness value can be adjusted from 0 to 17.



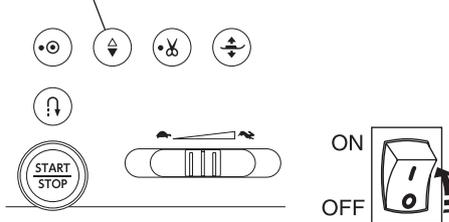
3. Press the "OK" key.

Touch panel key position adjustment

Calibrate the key positions of the touch screen if you feel the touch screen key is not responding properly. Refer to the page 138 of the instruction book of this model for the touch screen calibration.

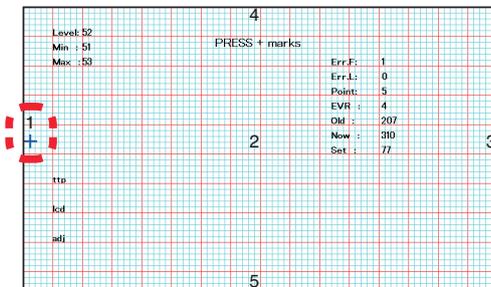
If the problem persists, make the key position adjustment as follows.

Needle up/down button



To adjust:

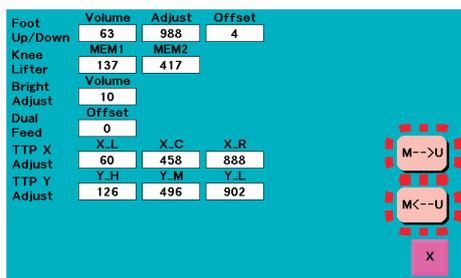
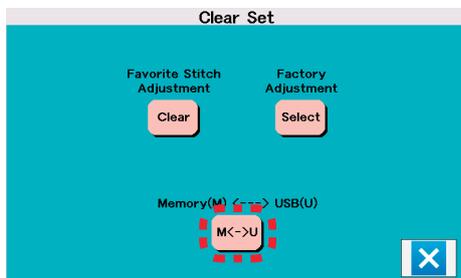
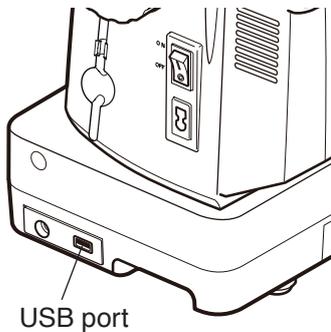
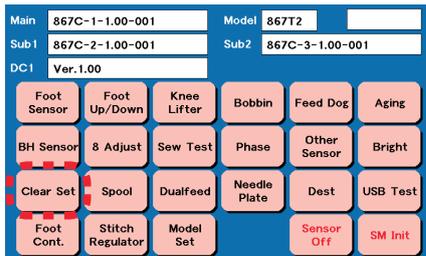
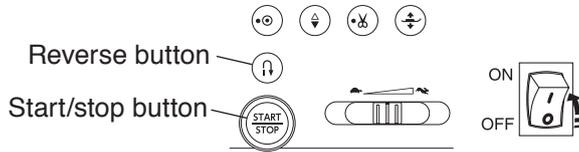
1. Turn the power switch ON while pressing the needle up/down button to enter the touch panel key position adjustment mode.



2. Press the "+" sign as it appears on the touch screen in order of 1 to 5.
3. Be sure that the message "PRESS + marks" changes to "OK". Repeat the adjustment procedure from step 1 above if the message changes to "NG".

Clear set mode

Before replacing the printed circuit board S, copy the data in the board to a USB flash drive. Some of the machine adjustment may not be required when the saved data is imported to the new printed circuit board A (Refer to the following.)



[Following adjustments are not necessary if the data is imported to the new board]

- * If the machine will not turn on, or the touch screen is blacked out, perform the above adjustments.
- Presser foot height on needle plate adjustment (refer to page 44)
- Knee lifter adjustment (refer to page 50)
- Embroidery foot height adjustment (refer to page 52)
- Brightness adjustment (refer to page 53)
- Touch panel key position adjustment (refer to page 54)

1. Turn the power switch ON while pressing the Start/ Stop button and the reverse button to enter the factory setting mode.
Press the "Clear set" key.
2. Insert a USB flash drive to the USB port. Be sure to format the USB flash drive to "FAT" or "FAT32" before saving the data.
3. Press the "M<->U" key.
4. Press the "M->U" key to save the board data to the USB flash drive (It may take approximately 10 seconds).
Turn the power switch OFF. Remove the USB flash drive from the machine.
5. Replace the printed circuit board A (Refer to page 7 and 12).
6. Repeat the steps above 1 to 3.
7. Press the "M<->U" key to import the previous board A data to the new board (It may take approximately 10 seconds).
The values in the boxes on the screen will change when importing is completed.
8. Turn the power switch OFF. Remove the USB flash drive from the machine.