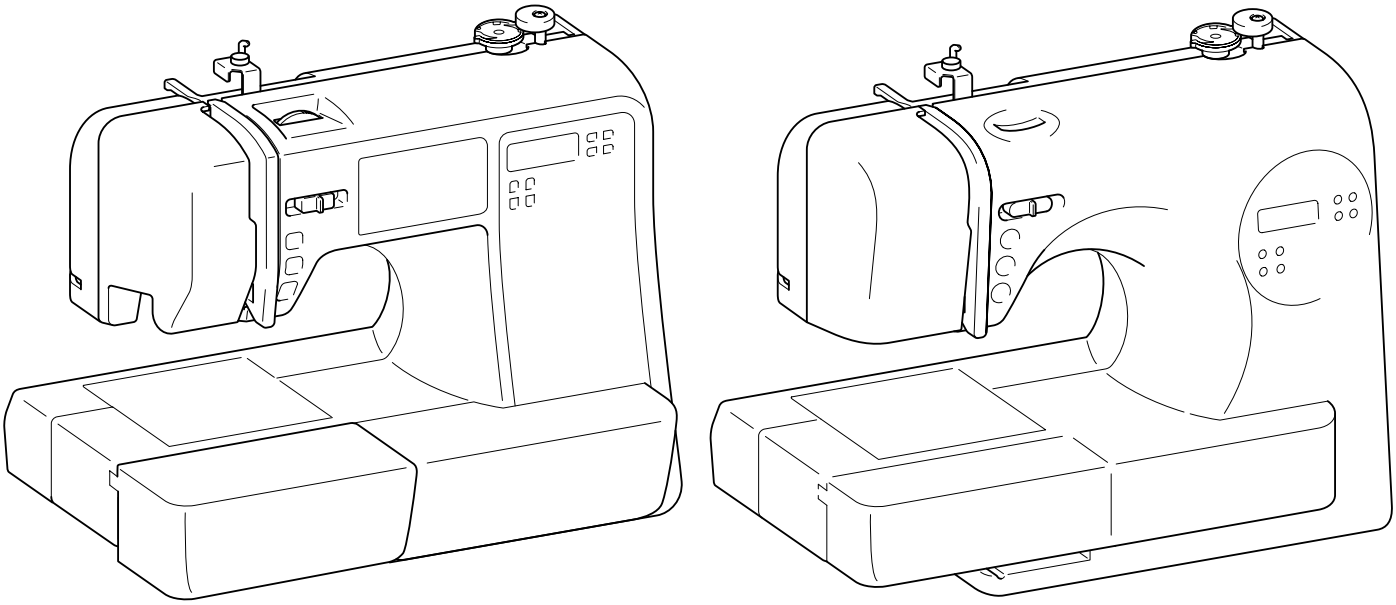
brother

SERVICE MANUAL FOR COMPUTERIZED SEWING MACHINE



CE-5500PRW/CE-5500/HS-2500
CP6500/CP7500/CE5500T
DS-120/DS-140/FS-20/FS-40/FS-40WT/AS40
XR4040/SC6600/CE-8080PRW/CE-8080
ModerN40E/ModerN50E/ModerN60E
CS5055PRW/XR6060/XR1300
Style-40e/Style-50e/Style-60e
CE7070PRW

CONFIDENTIAL

1.2010
9.2012

GENERAL INFORMATION

This service manual has been compiled for explaining repair procedures of this MODEL.
This was produced based on up-to-date product specifications at the time of issue, but there may have been changes of specifications for the purpose of improvements.
Contact manufacturer or local sales company for information concerning such changes.

Brother Industries, Ltd.
Nagoya, Japan

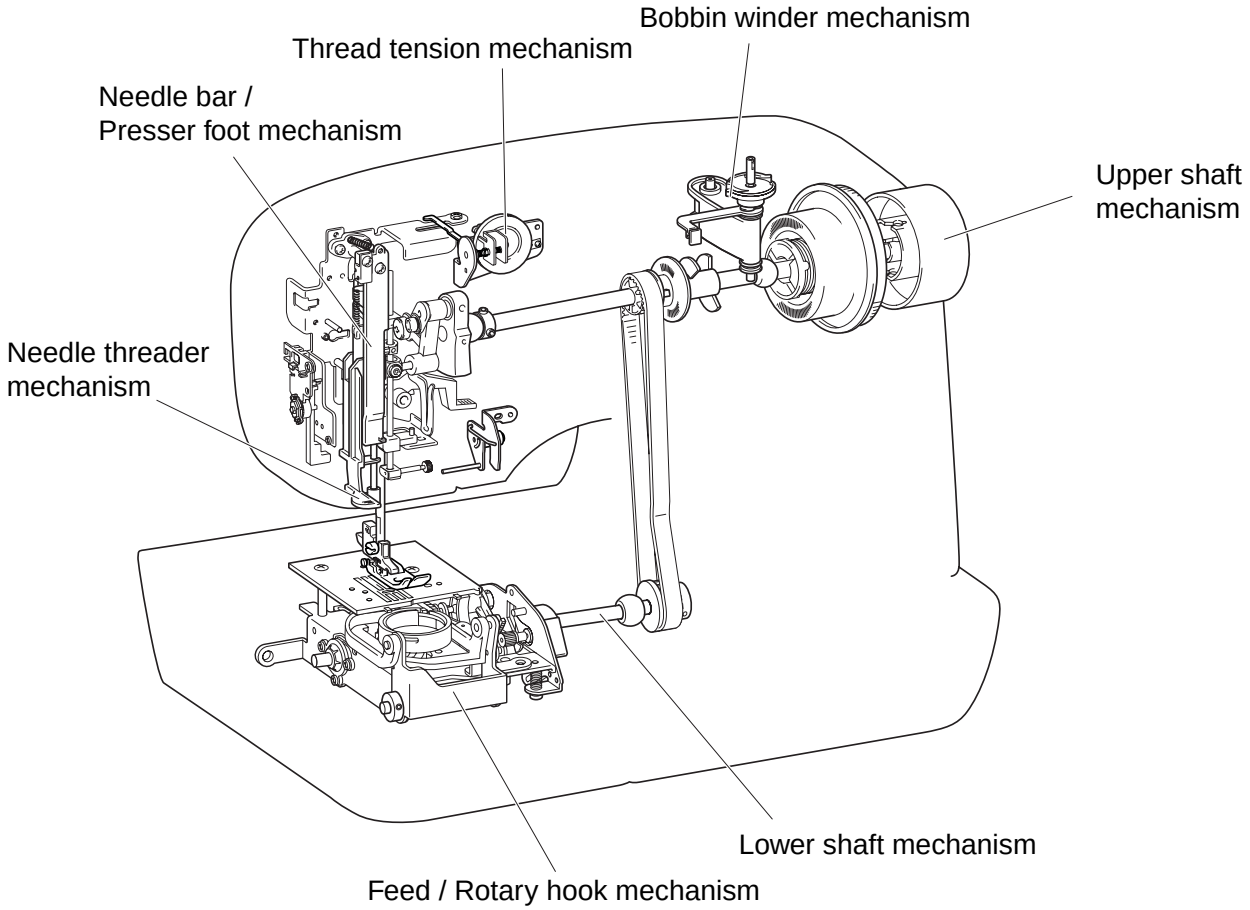
CAUTION <To do the adjustment and the repair safely and surely, follow the instructions below. >

1. Do the adjustment and the repair according to operation procedure of this service manual.
2. When you attach or remove parts, turn off a power switch and then pull out a power supply plug from outlet.
3. When you replace parts, use regular parts.
4. Do not remodel a sewing machine.
5. Always use earth band when handling printed circuit boards to exclude damage of printed circuit boards by static electricity.
6. Pack printed circuit boards in antistatic packaging and avoid subjecting them to any from of impact during storage or transportation.
7. Do not touch or damage the metal portion of a printed circuit board with a screwdriver or any other tool while making repairs or the like.
8. Insert removed connectors into the proper position according to special instructions of wiring for this service manual at the repair, the adjustment and replace printed circuit boards.
9. When you remove a connector from printed circuit boards, remove it while having a connector part. (When you pull out a connector while having a lead wire part, there is a risk that a lead wire get broken.)
10. Do not damage lead wires, when you cut a band that bind up lead wires.

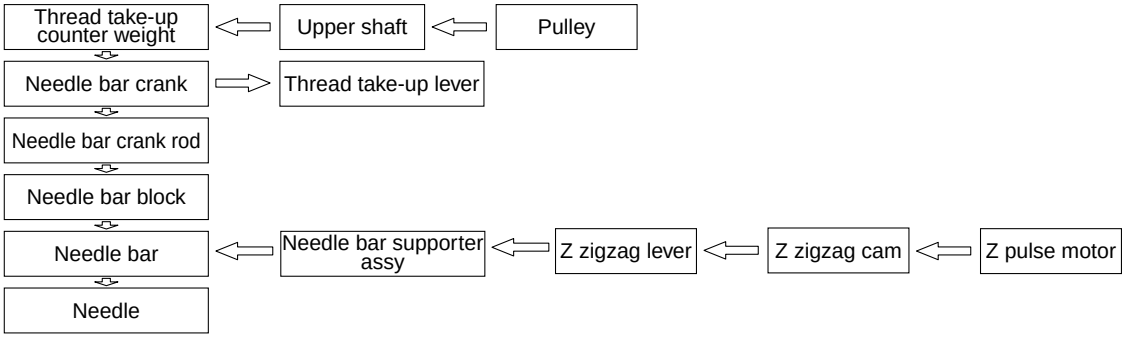
LIST of UPDATE RECORD

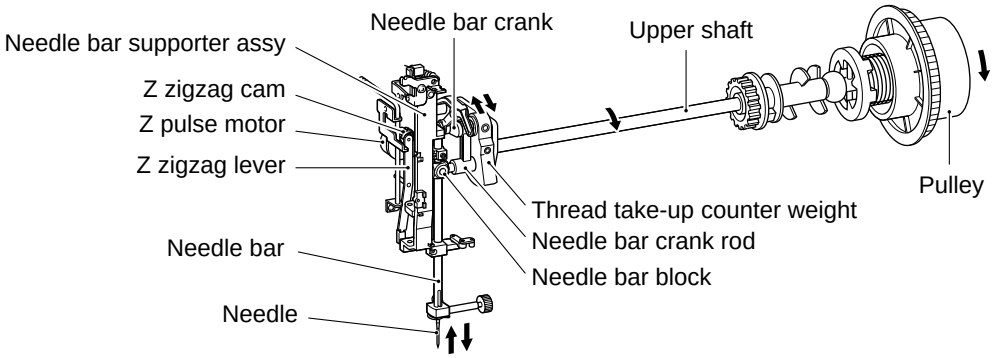
Date	Added Models	Contents
6.2010	DS120, DS140, FS20, FS40	–
8.2010	XR4040	–
9.2010	FS-40WT	–
12.2010	SC6600	–
1.2011	SC6600	–
3.2011	CE-8080PRW	–
6.2011	CE-8080	–
6.2011	ModerN40E, ModerN50E, ModerN60E	–
6.2011	CS5055PRW	–
7.2011	XR6060	–
9.2011	Style-40e, Style-50e, Style-60e	–
5.2012	CE5500T	–
6.2012	XR1300	–
9.2012	CE7070PRW	–

1 Outline of Mechanism

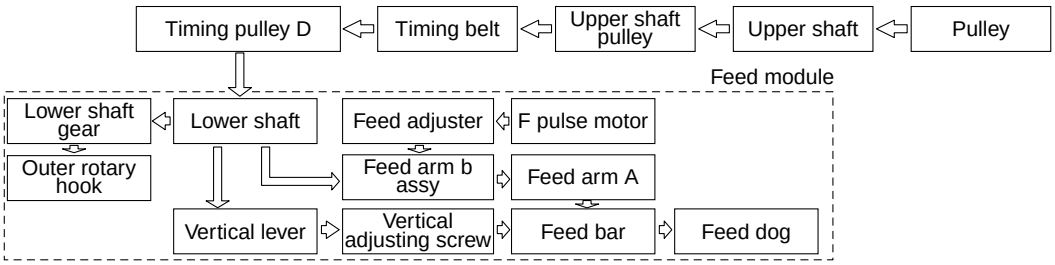

Bobbin winder mechanism
Thread tension mechanism
Needle bar /
Presser foot mechanism
Upper shaft
mechanism
Needle threader
mechanism
Lower shaft mechanism
Feed / Rotary hook mechanism

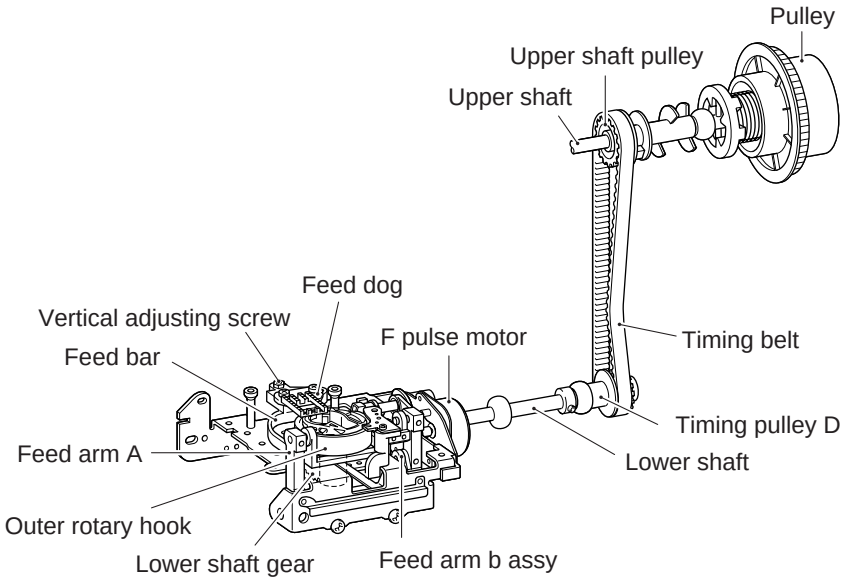
A) Up and down movement of needle bar, movement of thread take-up lever and zigzag movement of needle bar mechanism



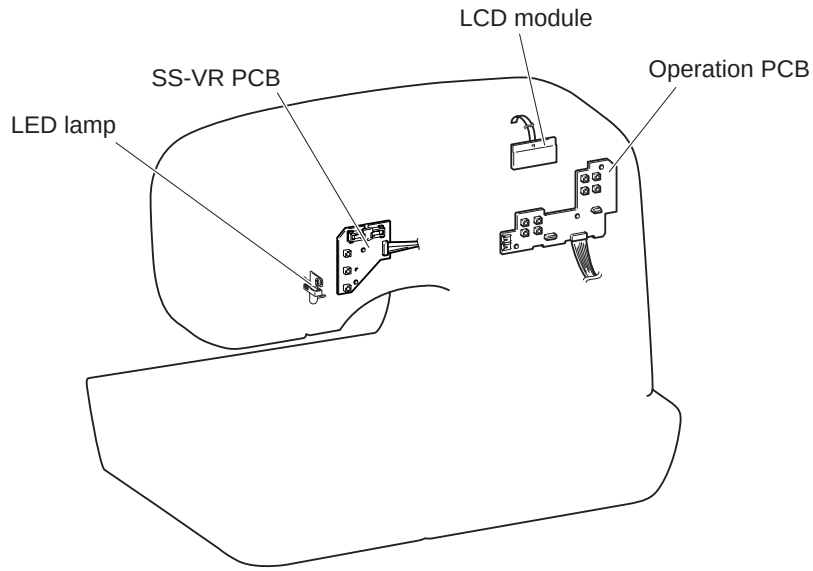


B) Movement of feed dog and rotary hook

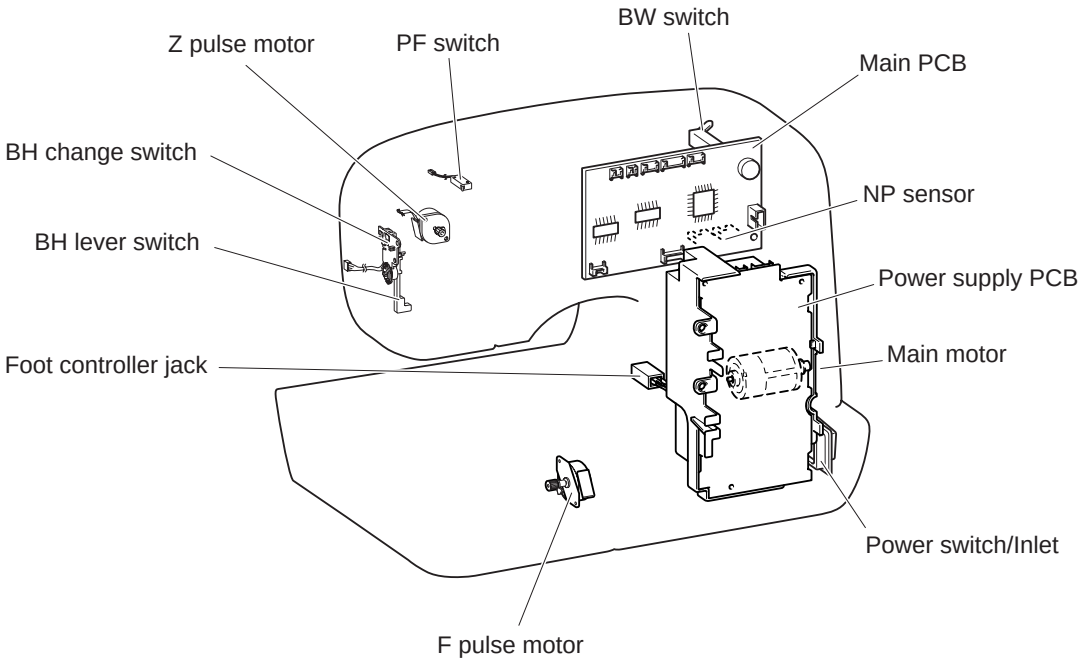


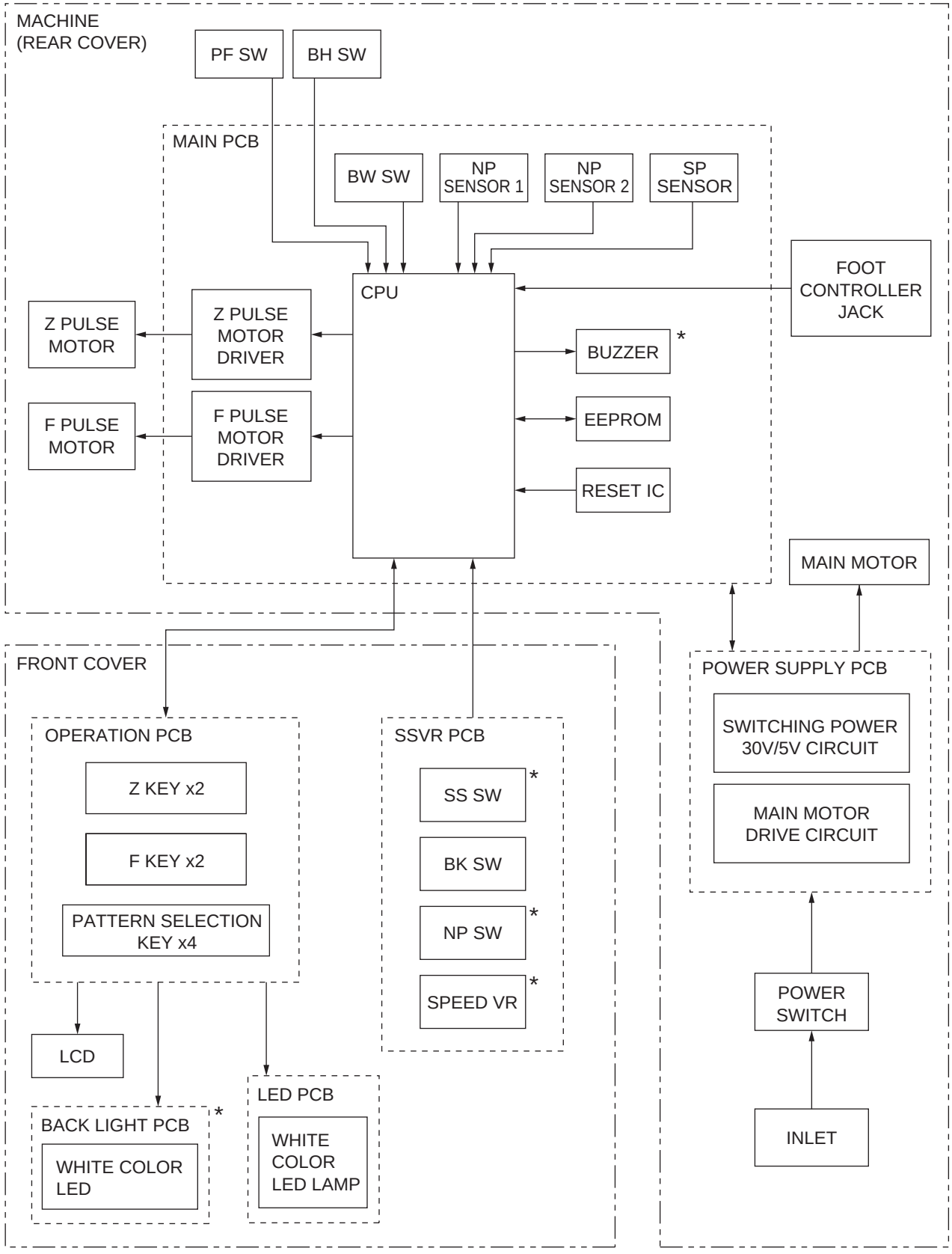


Front cover side



Machine (rear cover) side





NOTE
* There may be no parts by specification.

Start/Stop (SS) button	Button for starting and stopping the sewing machine. The machine operates at a slow speed while the button is being held down.
Reverse/Reinforcement stitch button	This button is for reverse stitching or ending a seam. If the button is pushed, it makes three to four stitches in that place and stops automatically. It sews in the reverse with slow speed while the button is held down.
Needle position button	This button toggles the needle between the up and down positions.
Operation panel keys	Input for pattern selection and conditions necessary for sewing.
Speed control lever	This lever controls the speed of sewing.
BH (button hole) switch	This switch is for detecting the forward and rear ends of the button hole according to the BH presser foot and lever.
BH (button hole) lever switch	This switch detects whether the BH lever is up or down.
Needle position (NP) sensor	This sensor detects the drive timing of each pulse motor and the vertical stop of the needle position. It detects the upper shaft angle of rotation by using a shutter attached to the upper shaft and an opitical sensor.
Speed sensor	This sensor detects the rotational speed of the main motor. It detects the upper shaft rotational speed by using a shutter attached to the upper shaft and an optical sensor.
PF (Presser foot) switch	This switch detects the vertical position of the presser foot lever.
BW (bobbin winder) switch	This switch detects whether the bobbin is set for winding or not, when the bobbin thread is wound.
Foot controller jack	This is the jack for plugging in the foot controller in use.
LED lamp	White LED lamps for illuminating the work space.

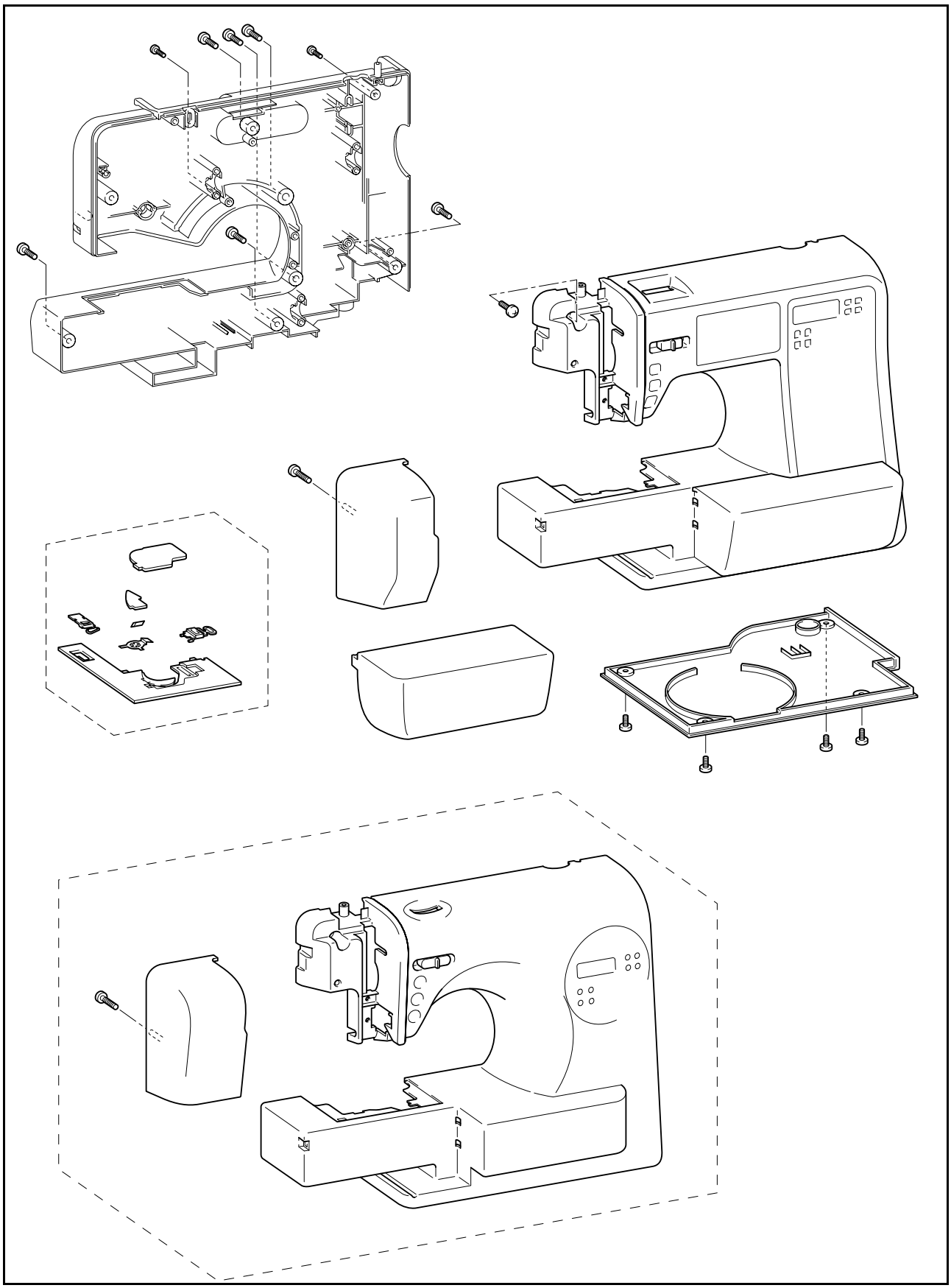
2 Basics of Disassembly/Assembly

In this chapter, explains the disassembly and assembly of the each module. When fix by a unity of the module, use this chapter.

* When fix and replace the part of the module, refer to “CHAPTER 3 Applications of Disassembly/assembly.

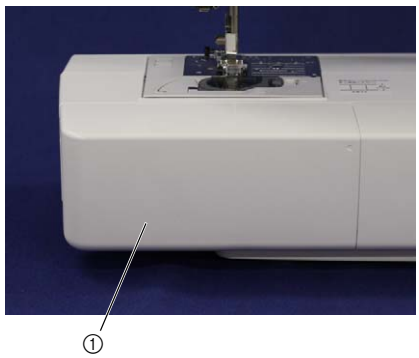
NOTE: The posting pictures are the “Square shape model”. The shape is different from the “Curvy shape model”, but the basic configuration is the same.

Main parts location diagram



1 Removal of Accessory table

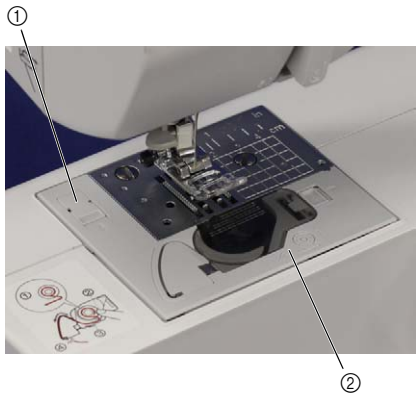
1. Remove the accessory table ①.



2 Removal of Needle plate B assy

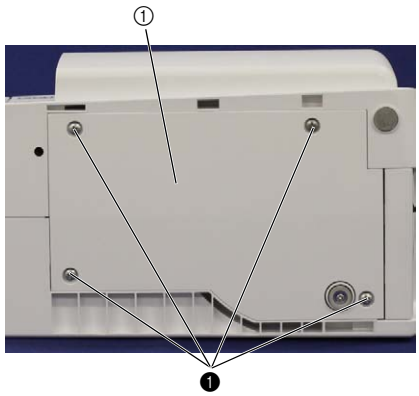
1. Slide the slide button B ①, and then remove the needle plate B assy. ②.

→ Refer to 3 - 3 "Disassembly of Needle plate B assy".



3 Removal of Base cover

1. Remove the 4 screws ❶, and then remove the base cover ①.



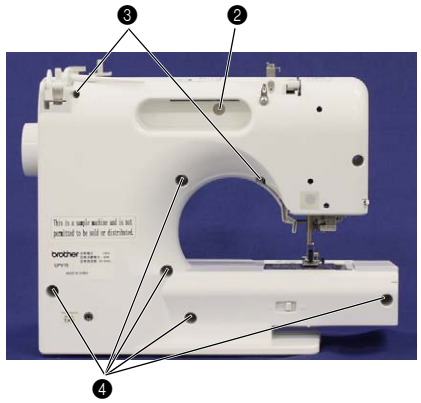
4 Removal of Face plate

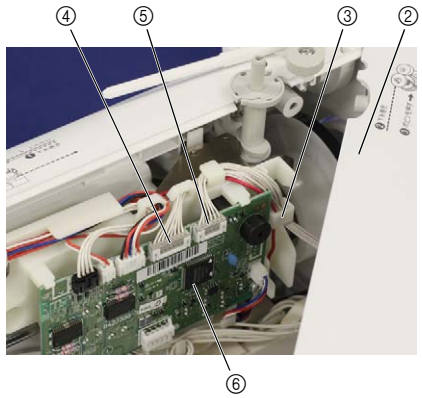
1. Remove the screw ❶.
2. Remove the face plate ①.

5 Removal of Front cover assy

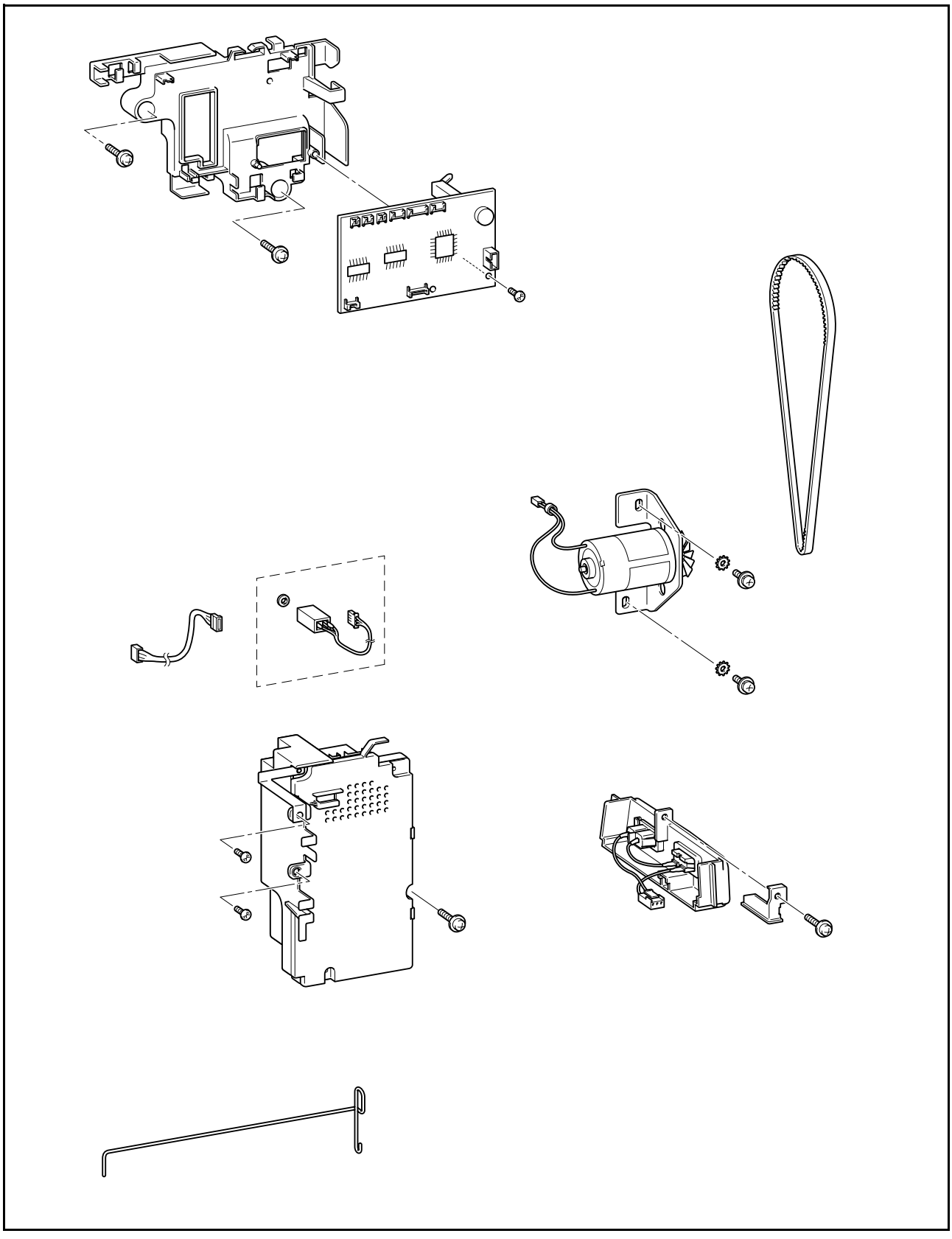
1. Lower the presser lever ①.
2. Remove the screw ❶ from the side of the front cover and remove the screw ❷, 2 screws ❸ and 5 screws ❹ from the side of the rear cover, and then remove the front cover assy. ②.
3. Remove the lead wires from the guide parts of the shutter cover ③.
4. Remove the connector of the operation PCB sub assy. ④ and the connector of the SSVR PCB assy. ⑤ from the main PCB ⑥.

→ Refer to 3 - 4 "Disassembly of Front cover assy".



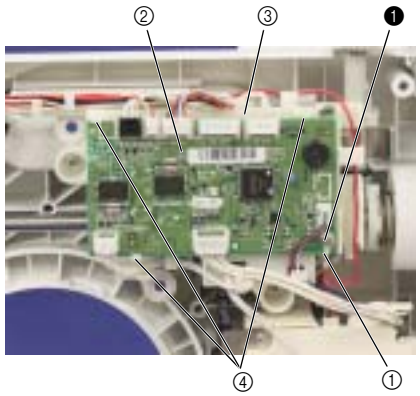


Electrical parts and motors location diagram



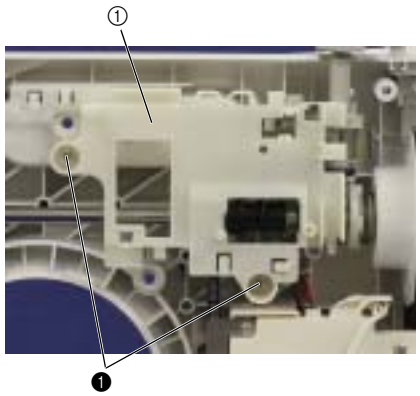
1 Removal of Main PCB assy

1. Remove the screw ❶, and then remove the lead wire assy: ground ①.
2. Remove the all connectors of the main PCB assy. ②, and then remove the all lead wires from the guide parts of the shutter cover ③.
3. Remove the 3 hooks ④, and then remove the main PCB assy. ②.



2 Removal of Shutter cover

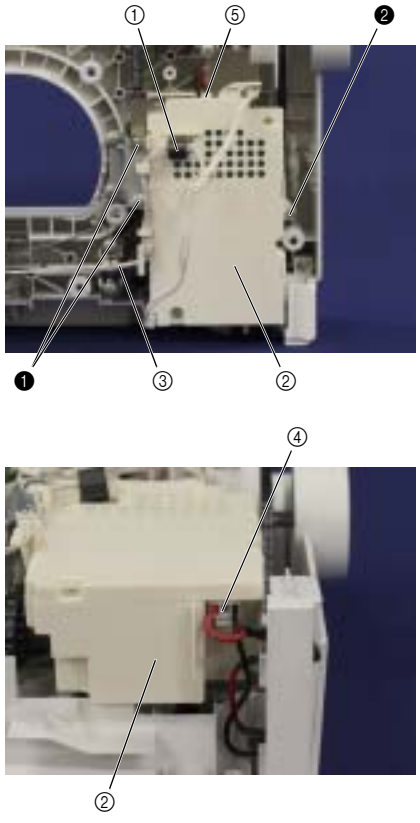
1. Remove the 2 screws ❶, and then remove the shutter cover ①.



3 Removal of Power supply unit

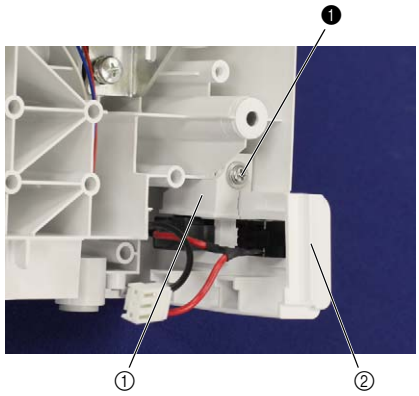
1. Remove the ferrite core ① from the hook of the power supply unit ②, and then remove the lead wire of the FPM ③ from the guide parts of the power supply unit ②.
2. Remove the connectors of the inlet assy. ④ and the main motor assy. ⑤.
3. Remove the 2 screws ❶ and the screw ❷, and then remove the power supply unit ②.

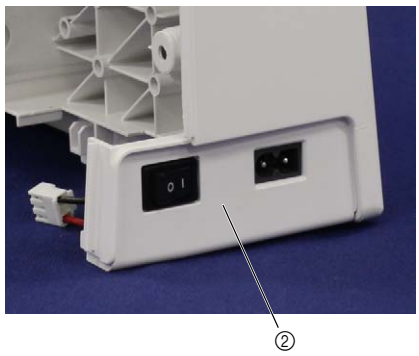
→ Refer to 3 - 18 "Disassembly of Power supply unit".



4 Removal of Inlet assy

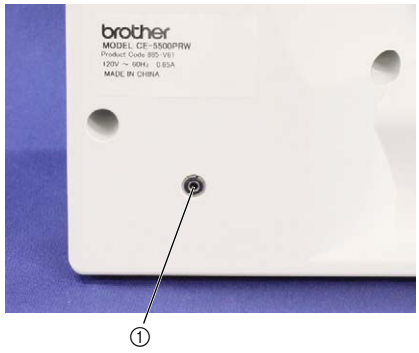
1. Remove the screw ❶, and then remove the inlet presser ① and the inlet assy. ②.

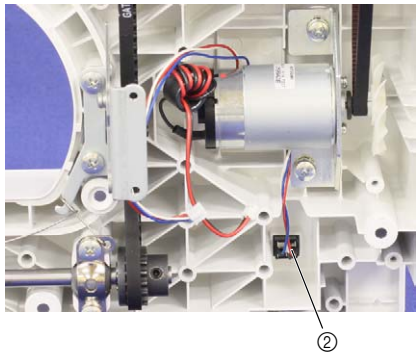




5 Removal of Foot controller jack assy

1. Remove the nut F ①, and then remove the foot controller jack assy. ②.

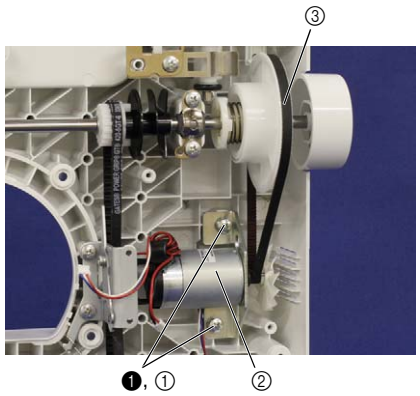




6 Removal of Main motor assy

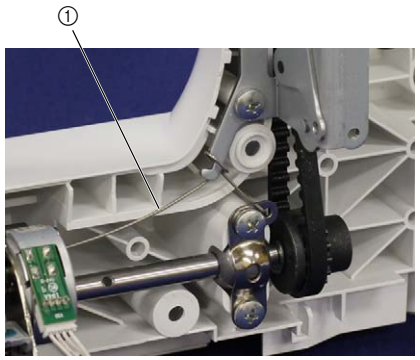
1. Remove the 2 screws ❶, and then remove the 2 washer EX tooth 5 ① and the main motor assy. ②.
2. Remove the timing belt 372-2GT-6 (motor belt) ③ from the gear part of the main motor assy. ②.

→ Refer to 3 - 18 "Disassembly of Main motor assy".

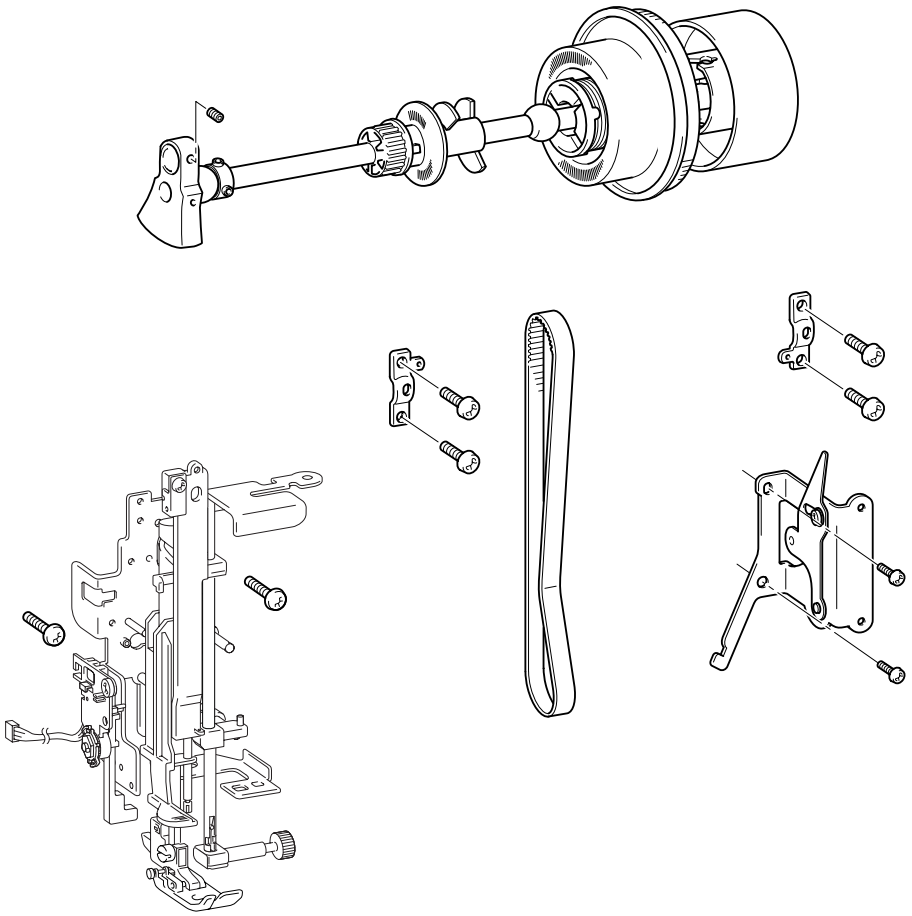


7 Removal of Spring

1. Remove the spring ①.



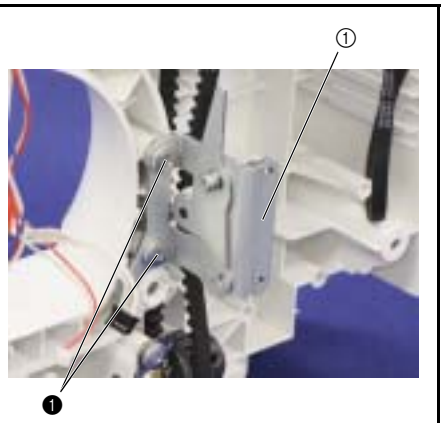
Needle bar, presser mechanism / Upper shaft mechanism location diagram



1 Removal of Tension pulley assy

1. Remove the 2 screws ❶, and then remove the tension pulley assy. ①.

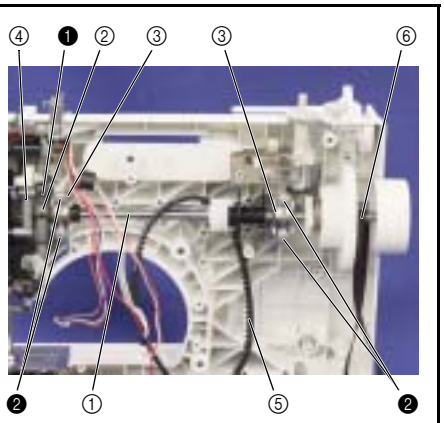
→ Refer to 3 - 20 "Disassembly of Tension pulley assy".



2 Removal of Upper shaft assy

1. Remove the screw ❶ from the thread take-up counter weight ② of the upper shaft asssy. ①.
2. Remove the 4 screws ❷, and then remove the 2 upper shaft bearing pressers ③.
3. Remove the upper shaft asssy. ① from the needle bar crank rod assy. ④, and then remove the T belt 420-5GT-6 (timing belt) ⑤ and the timing belt 372-2GT-6 (motor belt) ⑥.

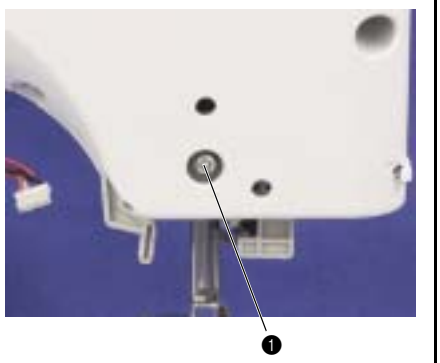
→ Refer to 3 - 20 "Disassembly of Upper shaft assy".

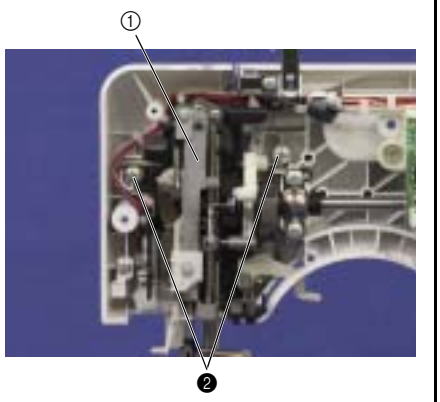


3 Removal of Needle presser unit

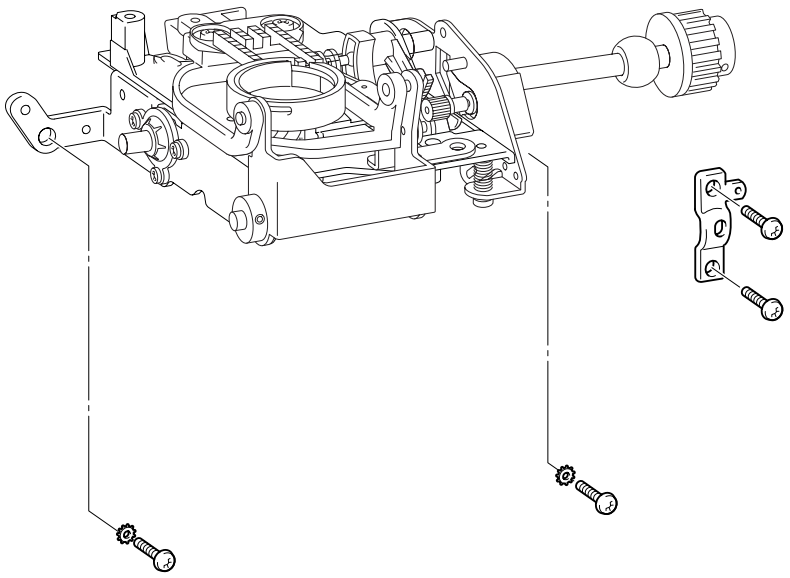
1. Remove the label, and then remove the screw ❶.
2. Remove the 2 screws ❷, and then remove the needle presser unit ①.

→ Refer to 3 - 33 "Needle-presser module".





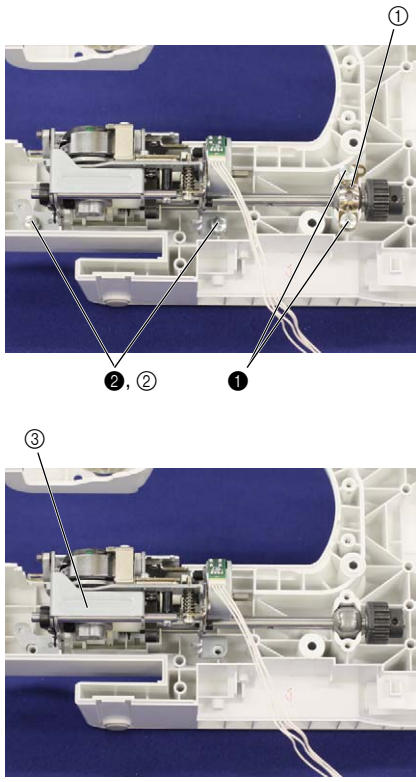
Feed mechanism location diagram



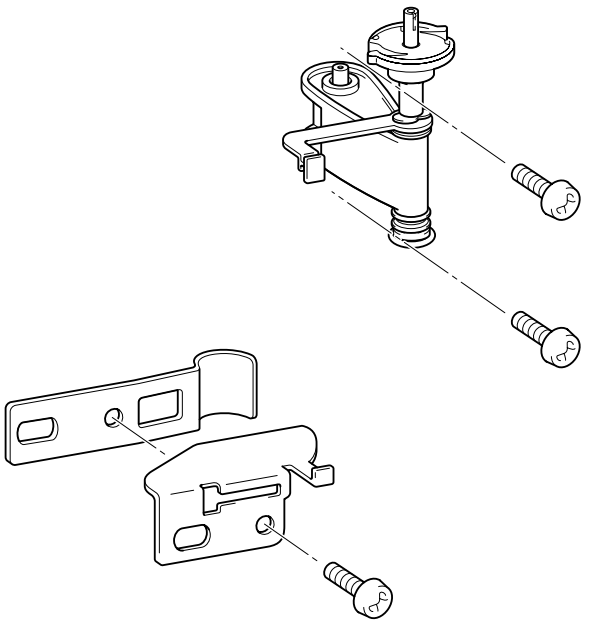
1 Removal of Feed module

1. Remove the 2 screws ❶, and then remove the upper shaft bearing presser ①.
2. Remove the 2 screws ❷, and then remove the 2 washer EX tooth 5 ② and the feed module ③.

→ Refer to 3 - 23 "Feed and rotary module".



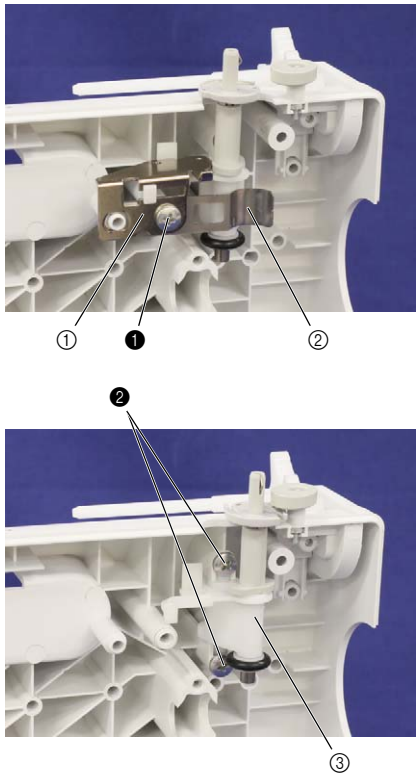
Bobbin winder mechanism location diagram



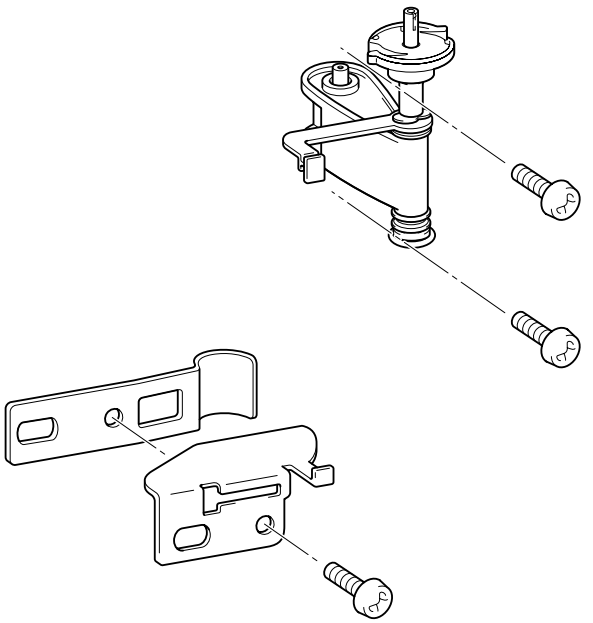
1 Removal of Bobbin winder assy

1. Remove the screw ❶, and then remove the bobbin winder shaft stopper ① and the bobbin winder shaft spring ②.
2. Remove the 2 screws ❷, and then remove the bobbin winder assy. ③.

→ Refer to 3 - 21 "Bobbin winder mechanism".



Bobbin winder mechanism location diagram



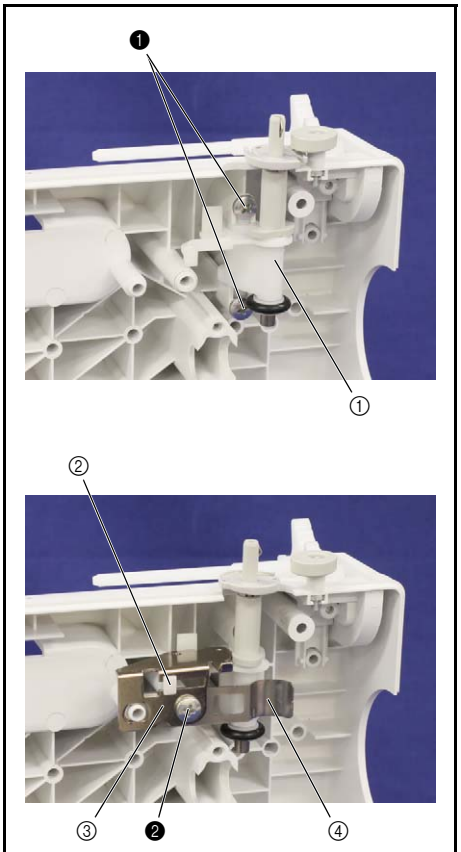
1 Attachment of Bobbin winder assy

1. Set the shaft of the bobbin winder assy. ① to the positioning part of the rear cover assy. with the 2 screws ❶.
2. Insert the BW switch lever ② into the positioning hole of the bobbin winder shaft stopper ③.
3. Place the bobbin winder shaft spring ④ and the bobbin winder shaft stopper ③, and secure it with the screw ❷.

***Key point**

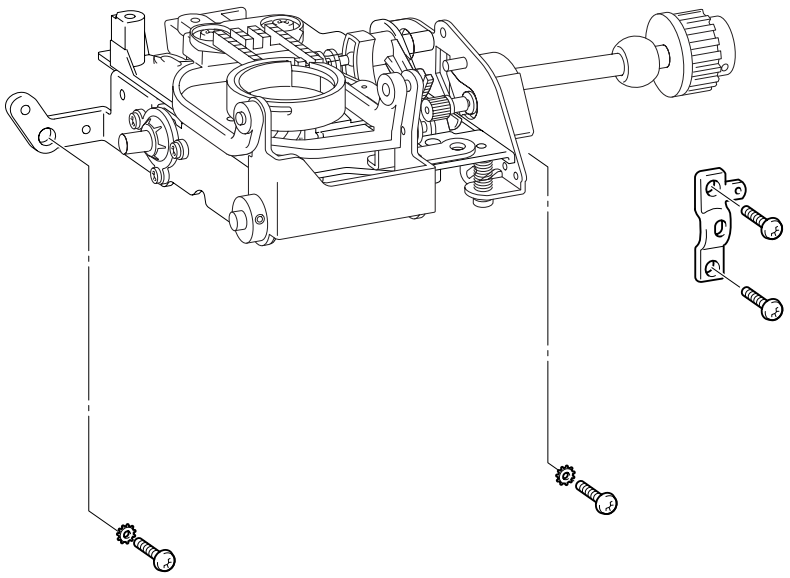
- Check that the bobbin winder assy. ① pass over the bobbin winder shaft spring ④ when the bobbin winder is switched.
- Check that the bobbin winder spring ④ return to the original position when the bobbin winder is switched.

→ Refer to 3 - 64 "Bobbin winder mechanism".



❶ ❷	Giza Tite M5X16	Torque 1.18 – 1.57 N·m

Feed mechanism location diagram



1 Attachment of Feed module

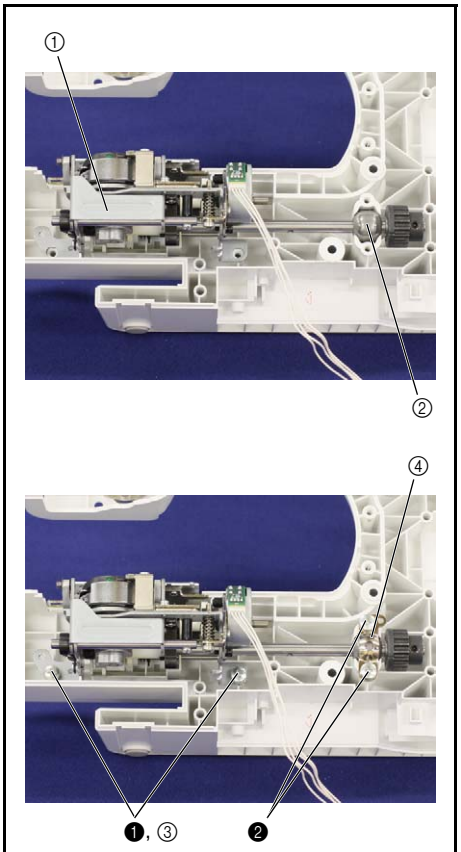
1. Set the feed module ① and the upper shaft bushing ② to the positioning part of the rear cover assy. with the 2 washer EX tooth 5 ③ and the 2 screws ❶.
2. Set the upper shaft bearing presser ④ to the rear cover assy. with the 2 screws ❷.

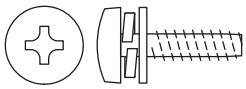
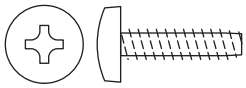
***Key point**

- Attach the upper shaft bearing presser ④ so that the projecting part is positioned at the upper right.

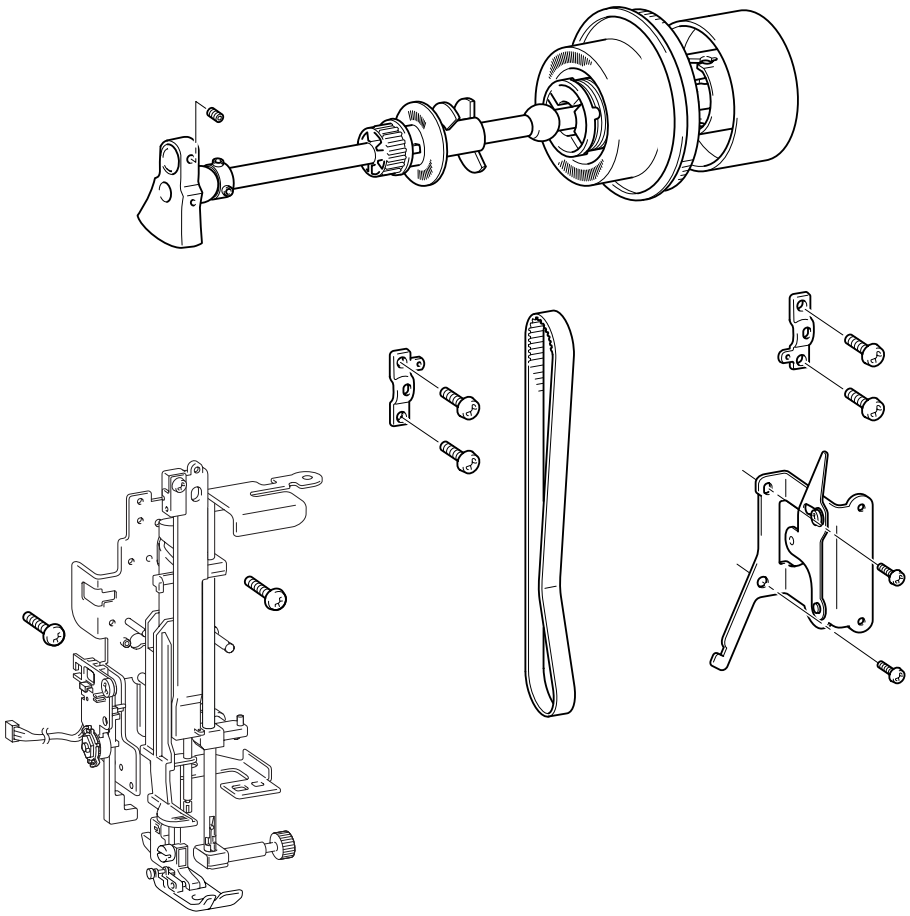
Apply OILER to the matching section of the lower shaft and the lower shaft bushing.	1 - 2 drops XZ0206***

→ Refer to 3 - 66 "Feed and rotary module".



❶		Giza Tite M5X16	Torque 1.18 – 1.57 N·m
❷		Giza Tite M5X16	Torque 1.18 – 1.57 N·m

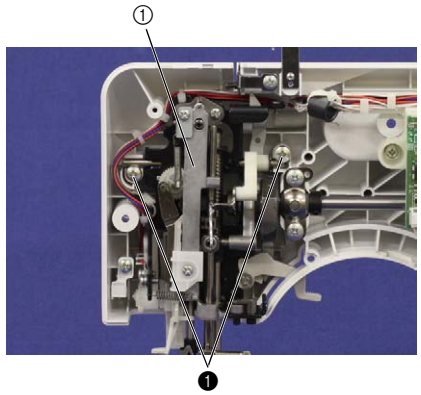
Needle bar, presser mechanism / Upper shaft mechanism location diagram

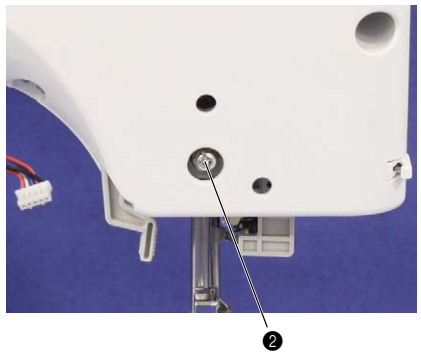


1 Attachment of Needle presser unit

1. Set the needle presser unit ① to the positioning part of the inside of the rear cover with the 2 screws ❶.
2. Tighten the screw ❷ from the outside of the rear cover assy..
3. Attach the label.

→ Refer to 3 - 80 "Needle-presser module".





❶	Giza Tite M5X20	Torque 1.18 – 1.57 N·m
❷	Screw, Bind M3X25	Torque Hand start

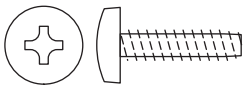
2 Attachment of Upper shaft assy

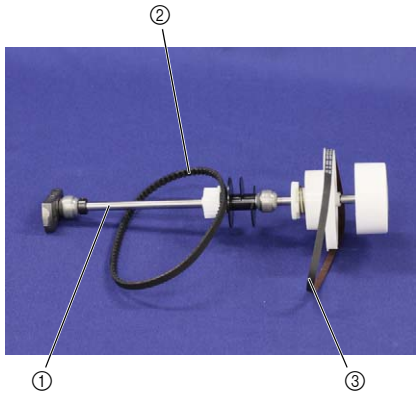
1. Pass the T belt 420-5GT-6 (timing belt) ② and timing belt 372-2GT-6 (motor belt) ③ to the upper shaft assy. ①.
2. Set the thread take-up counter weight ⑤ to the needle bar crank rod assy. ④.
3. Set the upper shaft bushing ⑥ to the positioning part of the rear cover assy..
4. Set the 2 upper shaft bearing pressers ⑦⑧ to the rear cover assy. with the 4 screws ❶.

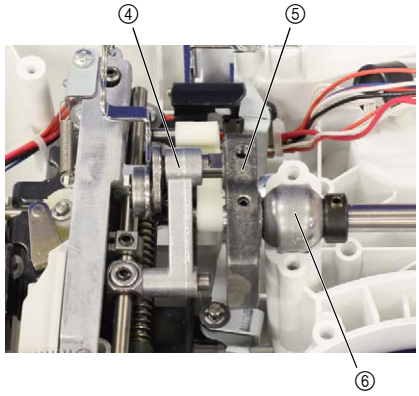
   ***Key point**
   - Check that the bobbin winder assy. ⑨ is on the left side.
   - Attach the left upper shaft bearing presser ⑦ so that the projecting part of ⑦ is positioned at the upper right. And attach the right upper shaft bearing presser ⑧ so that the projecting part of ⑧ is positioned at the lower shaft.
5. Align the D-cut face of the needle bar crank rod assy. ④ with the screw hole on the thread take-up counter weight ⑤, and tighten the screw ❷.

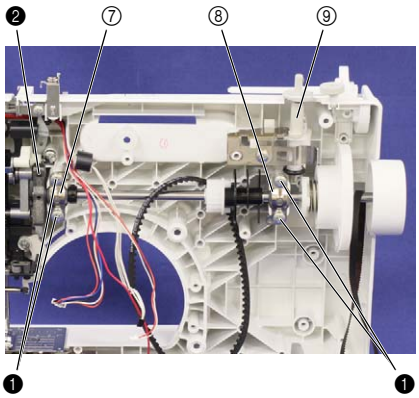
Apply OILER to the matching section of the upper shaft and the upper shaft bushing.	1 - 2 drops XZ0206***

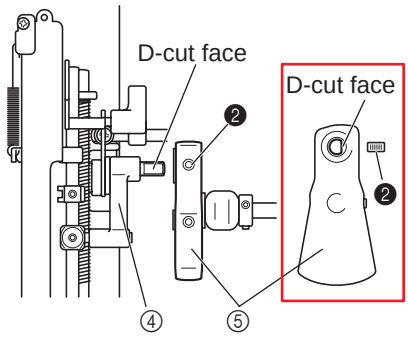
→ Refer to 3 - 63 "Assembly of Upper shaft assy".

❶		Giza Tite M5X16	Torque 1.18 – 1.57 N·m
❷		Set Screw, Socket (FT) M5X5	Torque 1.18 – 1.57 N·m



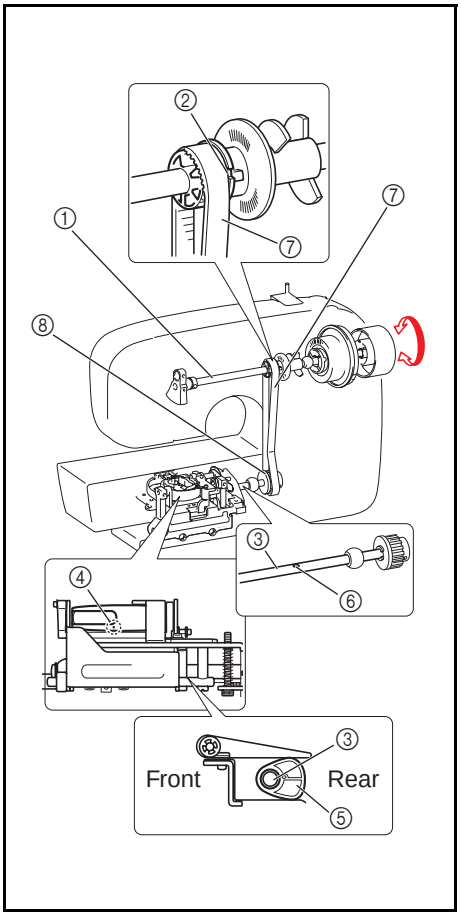






3 Phase matching of Upper shaft and lower shaft

1. Rotate the upper shaft ① until the trench on the upper shaft pulley ② is at the front.
2. Turn the lower shaft ③ to the point where the mark on the outer rotary hook ④ is at the front, the larger feed cam ⑤ is at the rear, and the hole on the lower shaft ⑥ is at the vertical.
3. Pull the timing belt ⑦ and hang it on the timing pulley D ⑧.



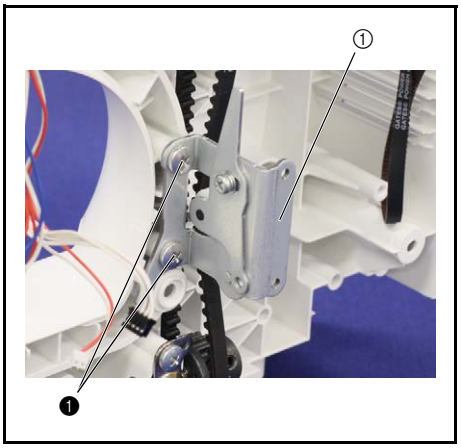
4 Attachment of Tension pulley assy

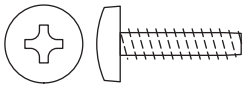
1. Set the tension pulley assy. ① to the rear cover assy., and then temporarily tighten the 2 screws ❶.

   ***Key point**

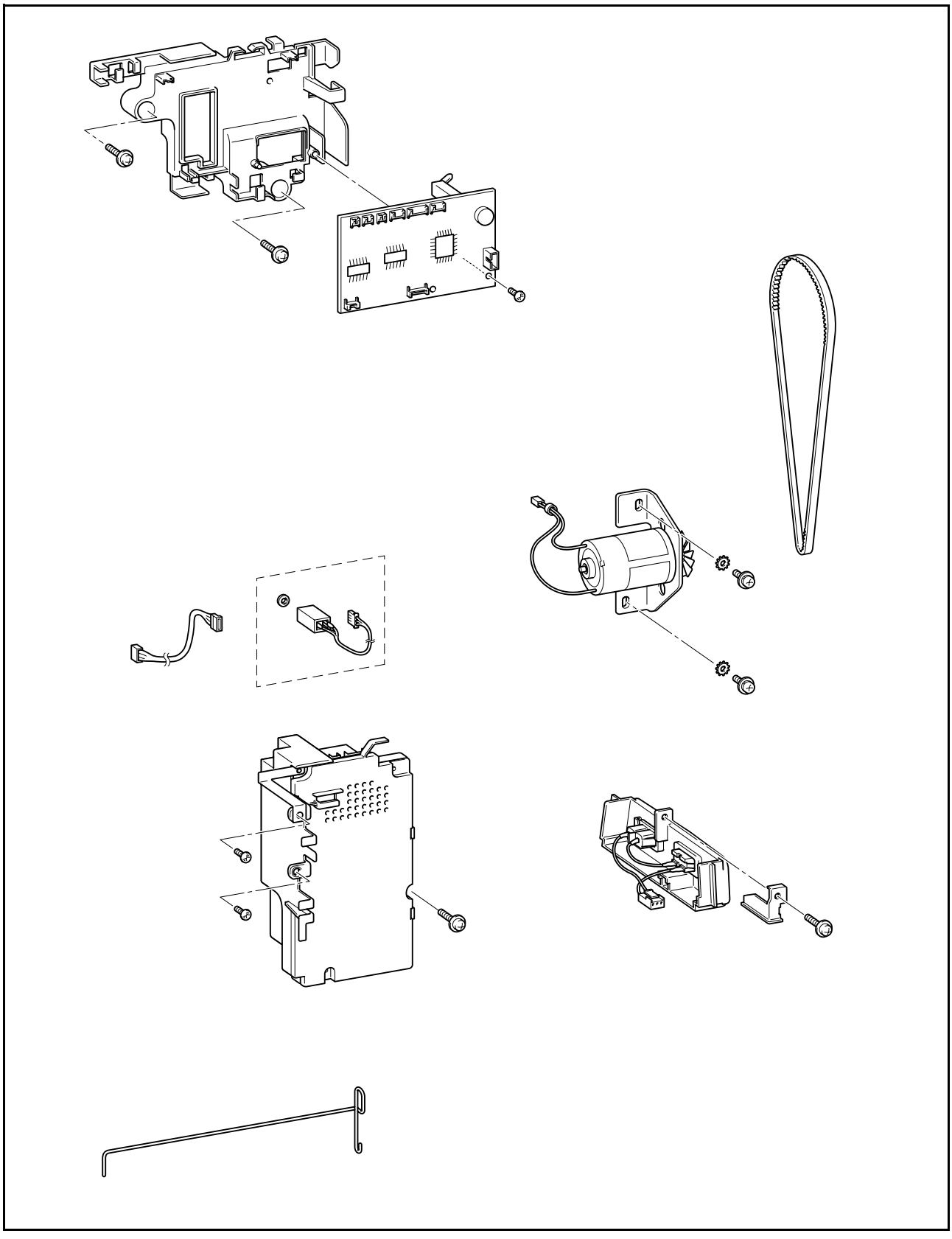
   - Fully tighten the screw ❶ after performing "4 - 4 Adjustment : Timing belt tension".

→ Refer to 3 - 63 "Assembly of Tension pulley assy".



❶		Giza Tite M5X16	Torque 1.18 – 1.57 N·m

Electrical parts and motors location diagram

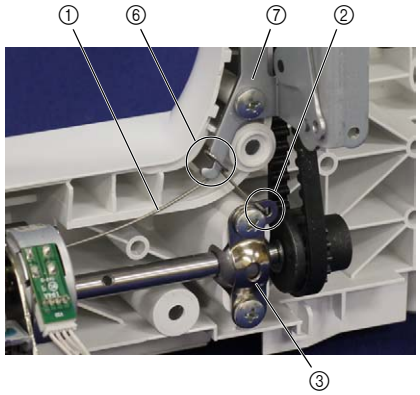


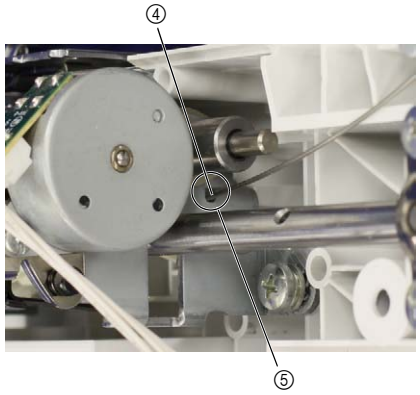
1 Attachment of Spring

1. Attach the spring ①.

***Key point**

- Hang the section ② of the spring ① on the positioning hole of the upper shaft bearing presser ③, and hang the section ④ on the notch part ⑤ of the base plate assy. and hang the section ⑥ on the tension pulley holder ⑦.





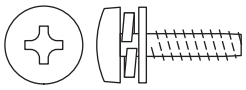
2 Attachment of Main motor assy

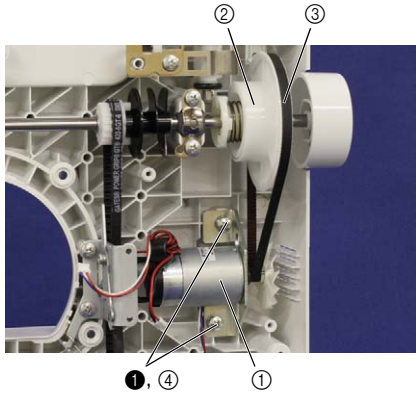
1. Hang the motor belt ③ on the gear part of the main motor assy. ① and the T pulley ②.
2. Set the main motor assy. ① to the rear cover assy., and then temporarily tighten the 2 screws ❶ and the 2 washer EX tooth 5 ④.

***Key point**

- Fully tighten the screw ❶ after performing "4-5 Adjustment : Motor belt tension".

→ Refer to 3 - 61 "Assembly of Main motor assy".

❶		Giza Tite M5X16	Torque Hand start

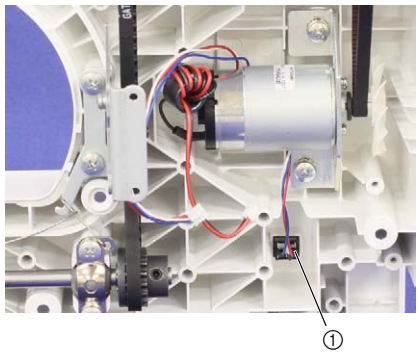


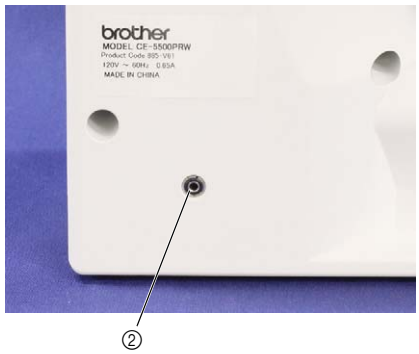
3 Attachment of Foot controller jack assy

1. Insert the foot controller jack assy. ① from the inside of the rear cover assy..
2. Attach the jack nut ② from the outside of the rear cover assy., and secure the foot controller jack assy. ①.

***Key point**

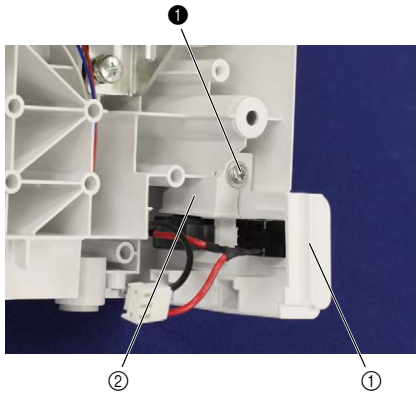
- Pass the lead wire of the foot controller jack assy. ① between the main motor sub assy. and the rear cover assy..

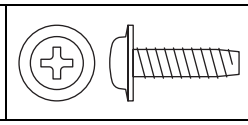




4 Attachment of Inlet assy

1. Set the inlet assy. ① and the inlet presser ② to the rear cover assy. with the screw ❶.



❶		Taptite, Cup B M4X14	Torque 0.78 – 1.18 N·m

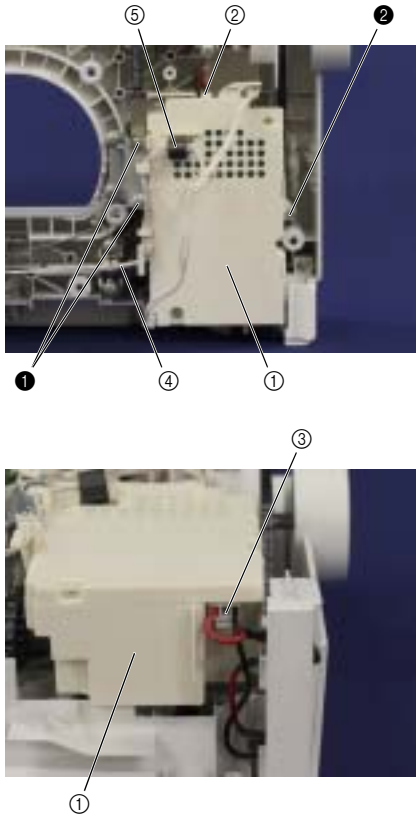
5 Attachment of Power supply unit

1. Set the power supply unit ① to the rear cover assy. with the 2 screws ❶ and the screw ❷.
2. Connect the connector of the main motor assy. ② to the power supply unit ①.
3. Connect the connector of the inlet assy. ③ to the power supply unit ①.
4. Hang the lead wire of the FPM ④ on the guide part of the power supply unit ①, and then set the ferrite core ⑤ to the hook of the power supply unit ①.

***Key point**

- Refer to "Special Instructions of Wiring".

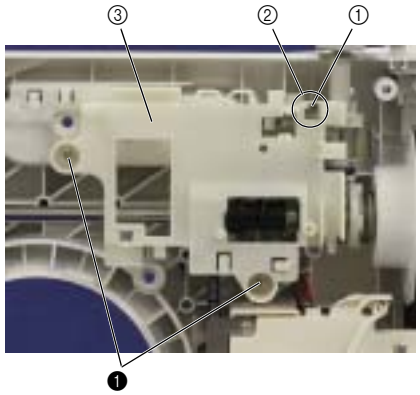
→ Refer to 3 - 61 "Assembly of Power supply unit".



❶	Screw, Bind M4X8	Torque 1.18 – 1.57 N·m
❷	Taptite, Cup B M4X14	Torque 0.78 – 1.18 N·m

6 Attachment of Shutter cover

1. Hang the hook part of the bobbin winder shaft stopper ① on the square hole ② of the shutter cover ③, and then set the shutter cover ③ to the rear cover assy. with the 2 screws ❶.



❶	Taptite, Cup B M4X14	Torque 0.78 – 1.18 N·m

7 Attachment of Main PCB assy

1. Set the main PCB assy. ① to the shutter cover ②, and then hang on the 3 hooks ③.

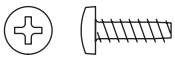
   ***Key point**
   - Check that the boss of the shutter cover ② engaged with the positioning hole of the main PCB assy. ①. (A)

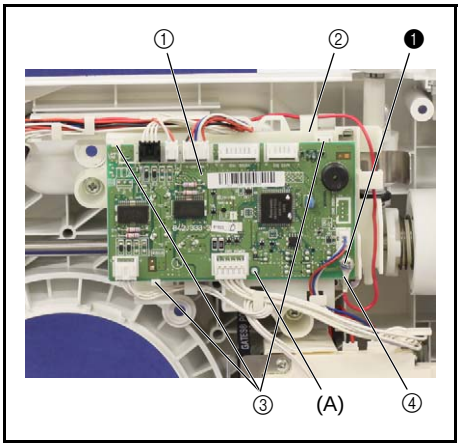
2. Hang the each lead wire on the guide part of the shutter cover ②, and then connect the each connector to the main PCB assy ①.

   ***Key point**
   - Refer to "Special Instructions of Wiring".

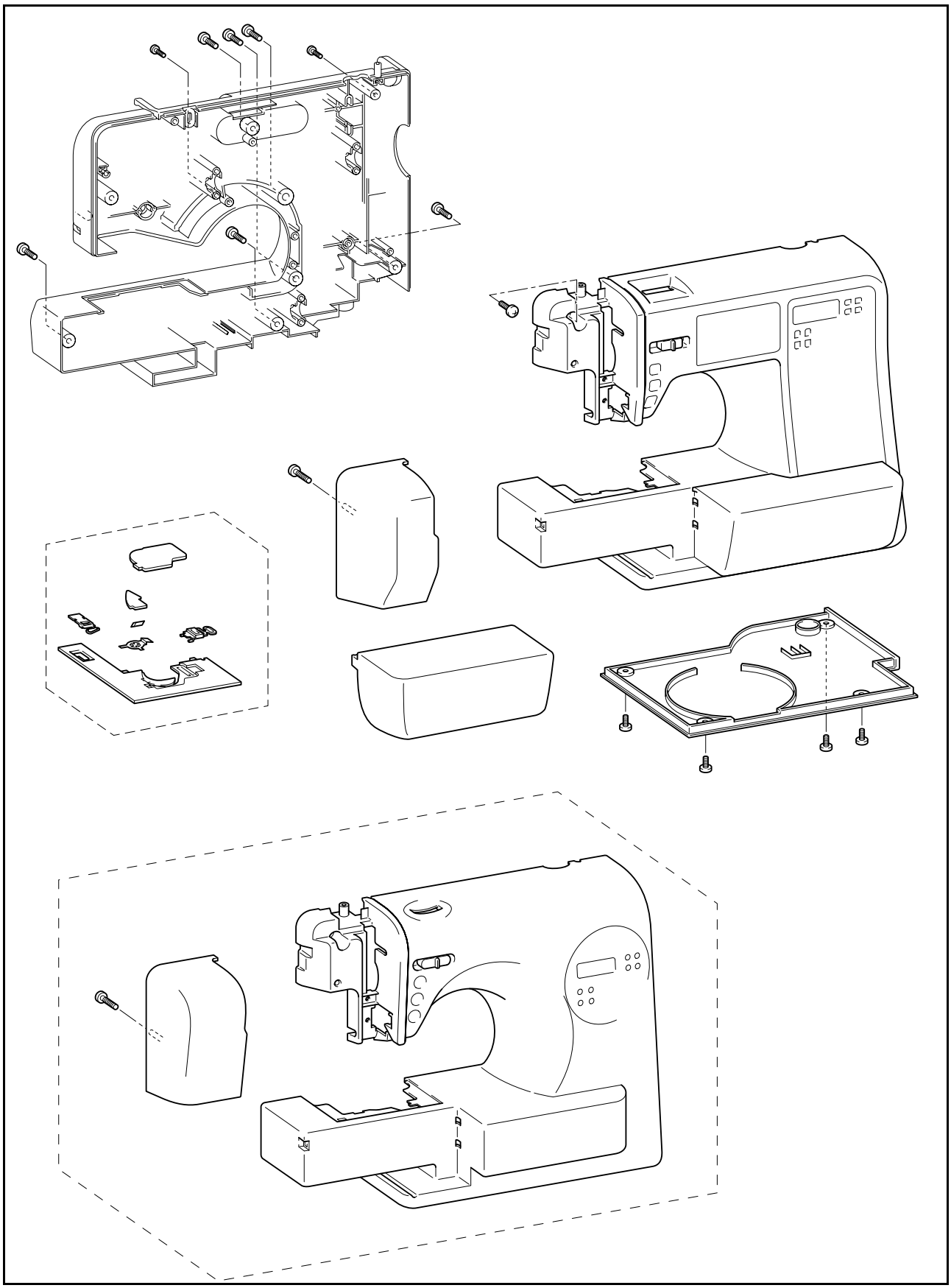
3. Secure the lead wire assy: ground ④ and the main PCB assy. ① to the shutter cover ② with the screw ❶.

   ***Key point**
   - Refer to "Special Instructions of Wiring".
   - Check that the bobbin winder switch of the back side of the main PCB assy. moves surely when the bobbin winder is switched.

❶		Taptite, Bind B M3X10	Torque 0.39 – 0.78 N·m



Main parts location diagram

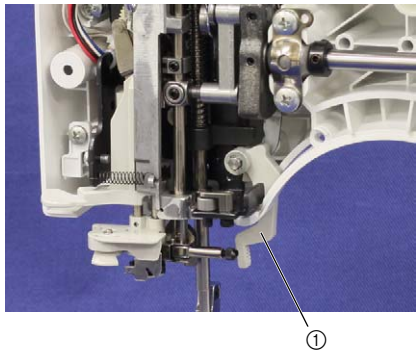


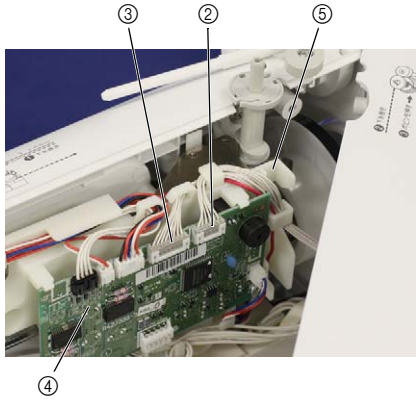
1 Attachment of Front cover assy

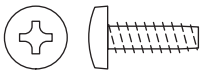
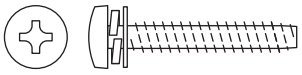
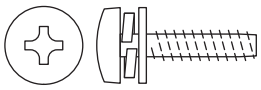
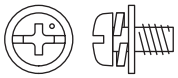
1. Lower the presser lever ①.
2. Connect the connectors of the SSVR PCB assy. ② and the operation PCB sub assy. ③ to the main PCB assy. ④, and hang the lead wire on the guide part of the shutter cover ⑤.

   ***Key point**
   - Refer to "Special Instructions of Wiring".
3. Set the front cover assy. to the rear cover assy., and then secure them with the screw ❶ (from the front cover side) and the 2 screws ❷, the 5 screws ❸ and the screw ❹ (from the rear cover side).

→ Refer to 3 - 47 "Assembly of Front cover assy".

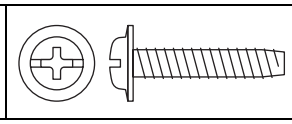




❶		Giza Tite M4X12	Torque 0.78 – 1.18 N·m
❷		Giza Tite M4X25	Torque 0.78 – 1.18 N·m
❸		Giza Tite M5X18	Torque 1.18 – 1.57 N·m
❹		Screw, Pan (S/P washer) M4X8	Torque 0.78 – 1.18 N·m

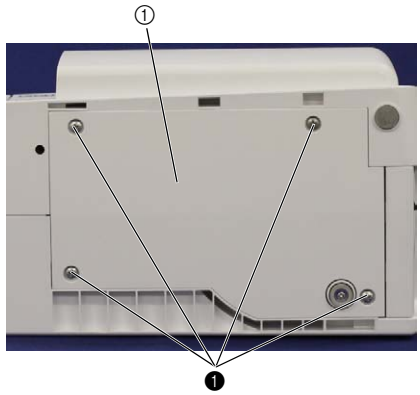
2 Attachment of Face plate

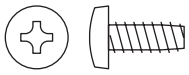
1. Set the face plate ① to the rear cover assy. with the screw ❶.

❶		Taptite, Cup P M4X20	Torque 0.78 – 1.18 N·m

3 Attachment of Base cover

1. Set the base cover ① to the machine with the 4 screws ❶.



❶		Taptite, Bind B M4X10	Torque 0.59 – 0.78 N·m

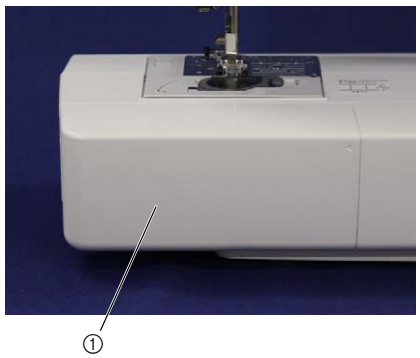
4 Attachment of Needle plate B assy

1. Attach the needle plate B assy ① to the machine.

→ Refer to 3 - 59 "Assembly of Needle plate B assy".

5 Attachment of Accessory table

1. Attach the accessory table ① to the machine.

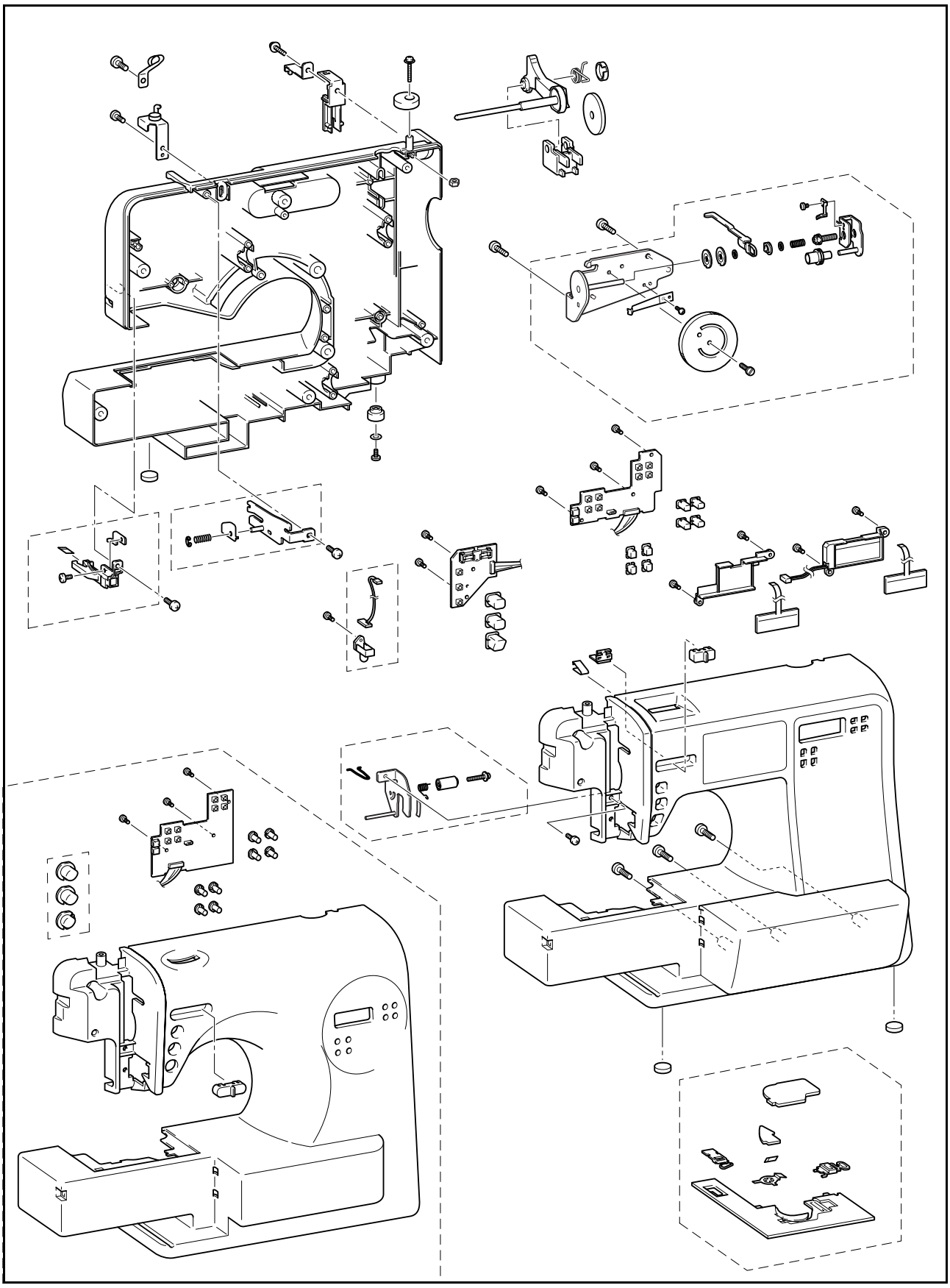


3 Application of Disassembly/Assembly

In this chapter, explains the disassembly and assembly of the each module. When fix and replace the each module, use this chapter.

NOTE: The posting pictures are the “Square shape model”. The shape is different from the “Curvy shape model”, but the basic configuration is the same.

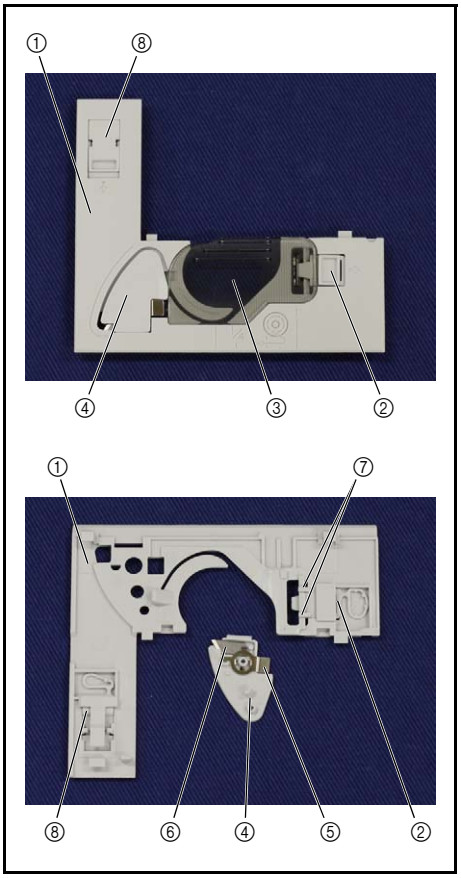
Main parts location diagram



1 Disassembly of Needle plate B assy

1. Slide the slide button ② to remove the needle plate cover ③ from the needle plate B assy. ①.
2. Remove the cutter cover ④ from the needle plate B assy. ①.
3. Remove the spring plate ⑤ from the cutter cover ④, and then remove the NT lower thread cutter ⑥.
4. Remove the slide button ② from the needle plate B assy. ①.

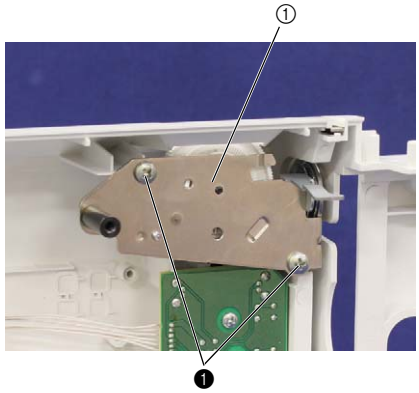
   ***Key point**
   - Remove the 2 hooks ⑦ from the rear side of the needle plate B assy. ①.
5. Remove the slide button B ⑧ from the needle plate B assy. ①.



2 Disassembly of Front cover assy

2-1 Removal of Thread tension holder A assy

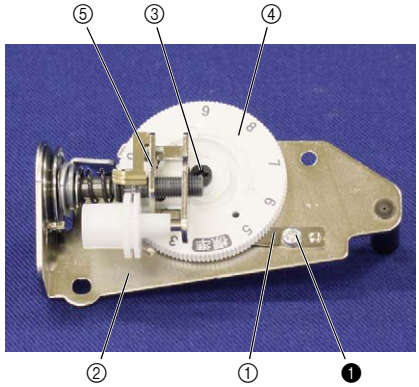
1. Remove the 2 screws ❶, and then remove the thread tension holder A assy. ①.

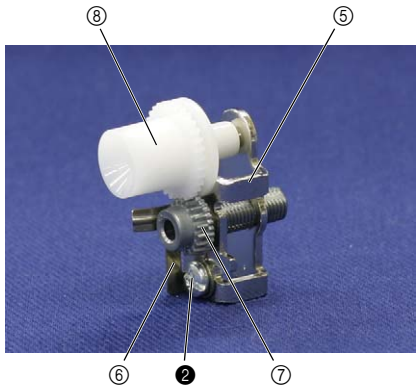


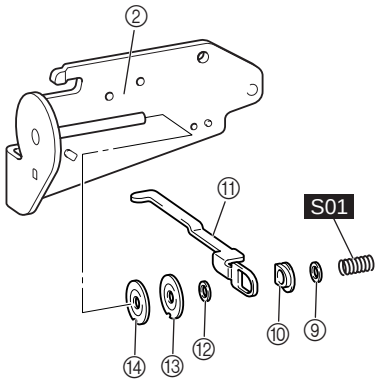
2-1-1 Disassembly of Thread tension holder A assy

1. Remove the screw ❶, and then remove the notch spring ① from the thread tension holder A assy. ②.
2. Remove the thread dial shaft ③, and then remove the thread tension dial ④ and the thread tension plate assy. ⑤ from the thread tension holder A assy. ②.

   ***Key point**
   - Turn the thread tension dial ④ until see the thread dial shaft ③ by feeding the thread tension plate assy. ⑤ to the left side.
3. Remove the screw ❷, and then remove the adjusting screw spring plate ⑥ from the thread tension plate assy. ⑤.
4. Remove the thread tension adjusting screw ⑦, and then remove the thread tension adjusting gear ⑧ from the thread tension plate assy. ⑤.
5. Remove the spring S01, washer ⑨, tension disc washer ⑩, thread release plate ⑪, washer ⑫, tension disc B ⑬, and then tension disc A ⑭ in this order from the thread tension holder A assy. ②.

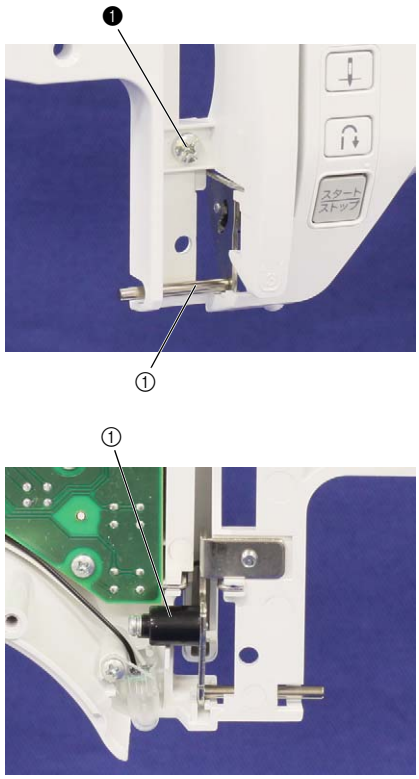






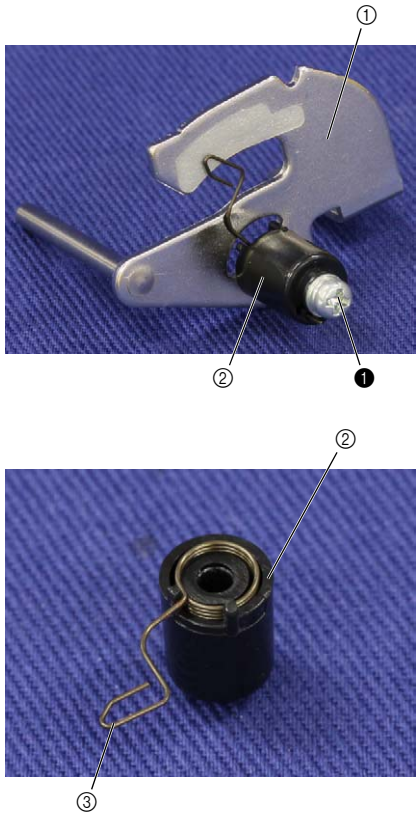
2-2 Removal of Thread take-up holder B

1. Remove the screws ❶, and then remove the thread take-up holder B ①.



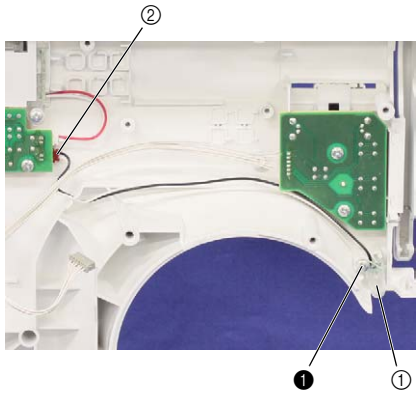
2-2-1 Disassembly of Thread take-up holder B

1. Remove the screw ❶, and then remove the thread catching spring case ② from the thread take-up holder B ①.
2. Remove the thread take up spring ③ from the thread catching spring case ②.



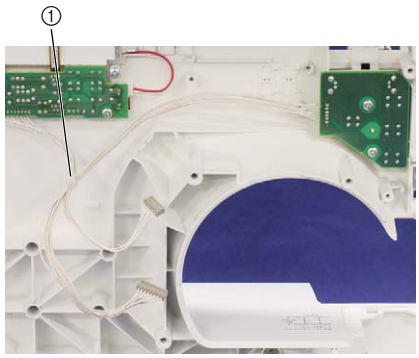
2-3 Removal of LED lamp assy

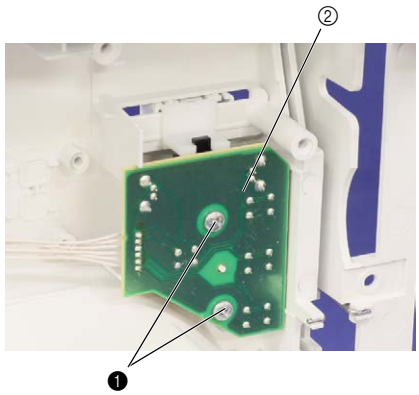
1. Disconnect the connector ② of the LED lamp assy. ① from the operation PCB sub assy..
2. Remove the screw ❶, and then remove the LED lamp assy. ①.



2-4 Removal of SSVR PCB assy

1. Cut the band ①.
2. Remove the 2 screws ❶, and then remove the SSVR PCB assy. ②.



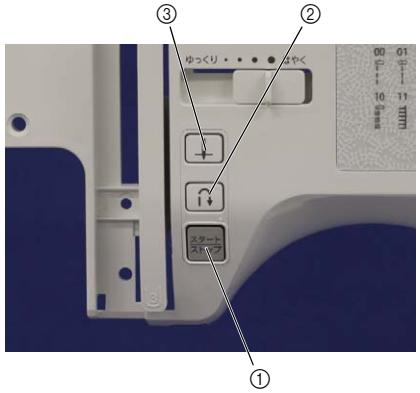


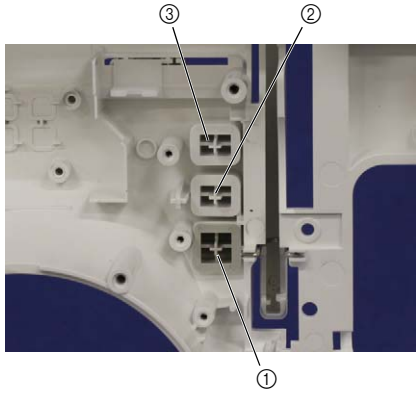
2-5 Removal of SS/Reverse/NP buttons

1. Remove the SS button ①, the reverse button ② and the NP button ③.

***Note**

- As for the SS button ① and the NP button ③, it is not mounted by the model.



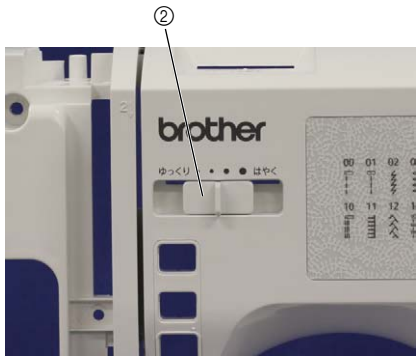


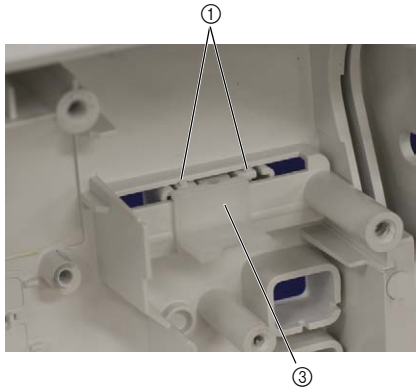
2-6 Removal of SV keytop

1. Remove the 2 hooks ①, and then remove the SV keytop ②.
2. Remove the SV joint plate ③.

***Note**

- As for the SV keytop ② and SV joint plate ③, it is not mounted by the model.

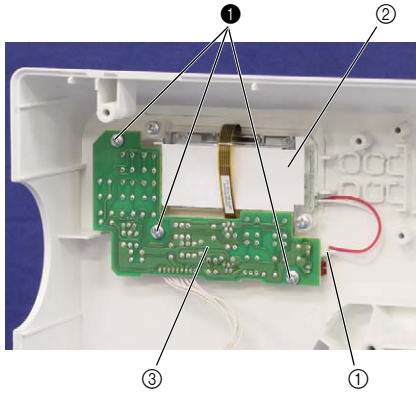


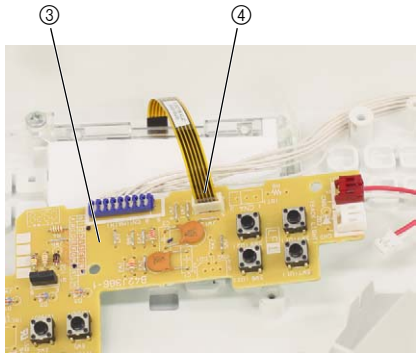


2-7 Removal of Operation PCB assy

2-7-A "Square shape model" equipped with LCD backlight

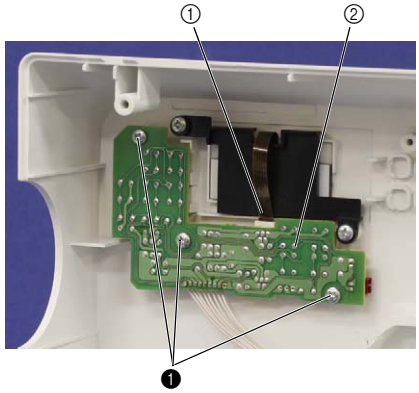
1. Disconnect the connector ① of the single light guide assy. ② from the operation PCB assy. ③.
2. Remove the 3 screws ❶, and then remove the operation PCB assy. ③.
3. Disconnect the flat cable ④ of the LCD from the operation PCB assy. ③.





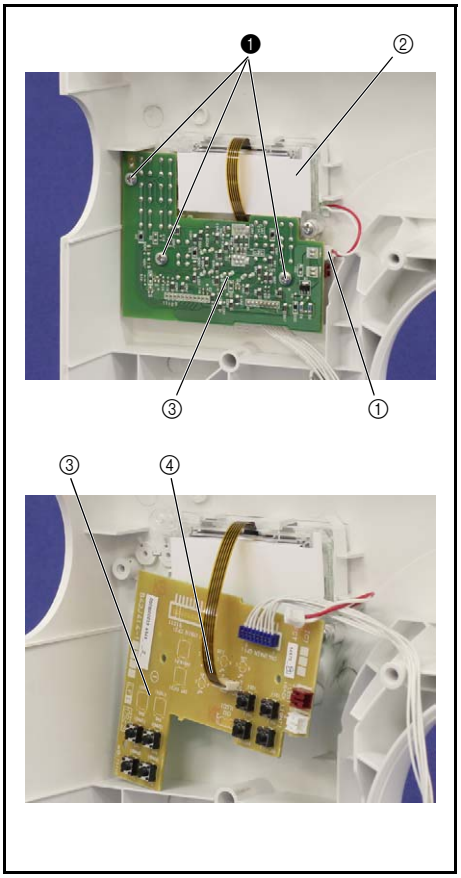
2-7-B "Square shape model" not equipped with LCD backlight

1. Disconnect the flat cable ① of the LCD from the operation PCB assy. ②.
2. Remove the 3 screws ❶, and then remove the operation PCB assy. ②.



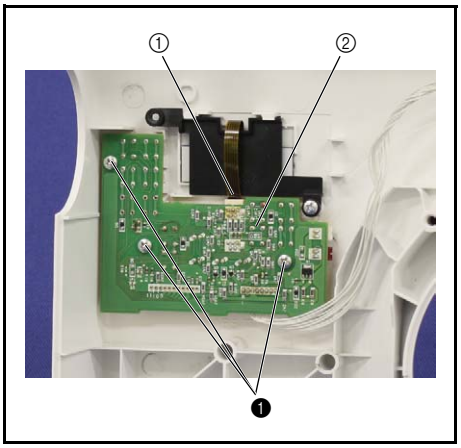
2-7-C “Curvy shape model” equipped with LCD backlight

1. Disconnect the connector ① of the single light guide assy. ② from the operation PCB assy. ③.
2. Remove the 3 screws ❶, and then remove the operation PCB assy. ③.
3. Disconnect the flat cable ④ of the LCD from the operation PCB assy. ③.



2-7-D “Curvy shape model” not equipped with LCD backlight

1. Disconnect the flat cable ① of the LCD from the operation PCB assy. ②.
2. Remove the 3 screws ❶, and then remove the operation PCB assy. ②.

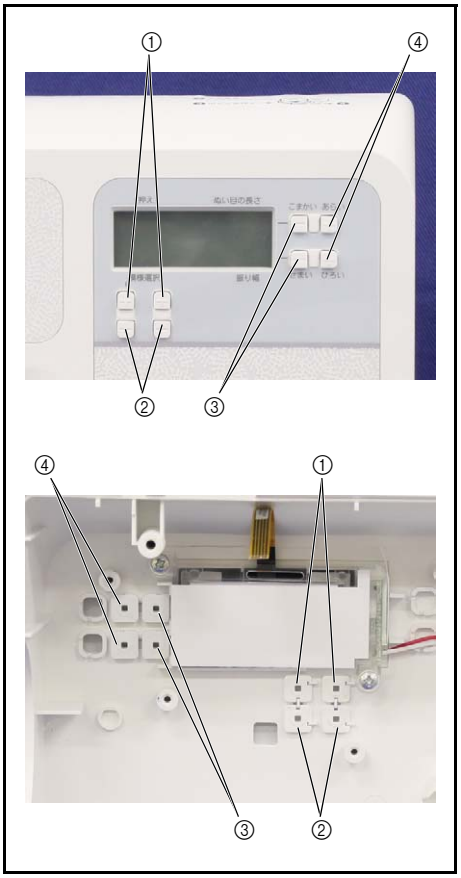


2-8 Removal of Selecting/Manual buttons

1. Remove the 2 selecting button A ①, the 2 selecting button B ②, the 2 manual button A ③ and the 2 manual button B ④.

***Note**

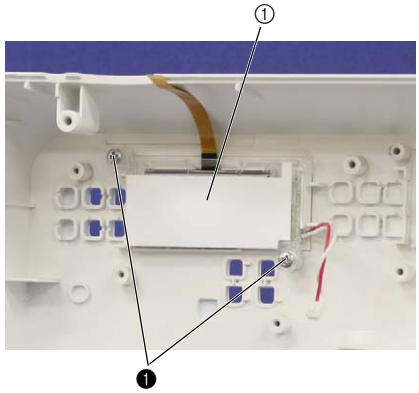
- As for the LCD backlight PCB assy., it is not mounted by the model.

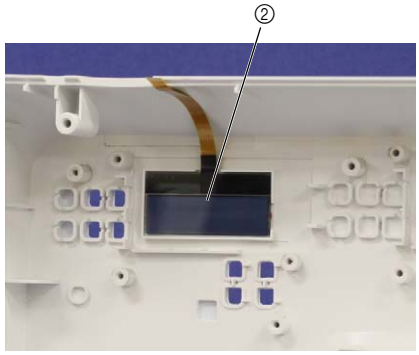


2-9 Removal of LCD

2-9-A "Square shape model" equipped with LCD backlight

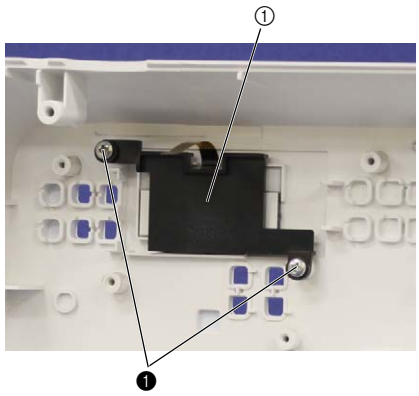
1. Remove the 2 screws ❶, and then remove the single light guide assy. ①.
2. Remove the LCD ②.

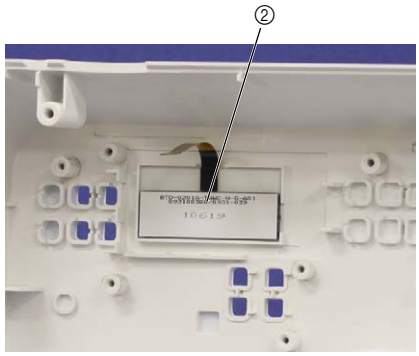




2-9-B "Square shape model" not equipped with LCD backlight

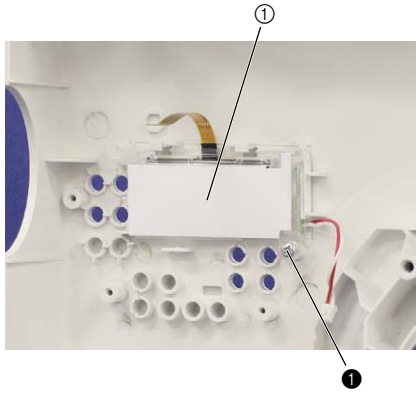
1. Remove the 2 screws ❶, and then remove the LCD holder ①.
2. Remove the LCD ②.

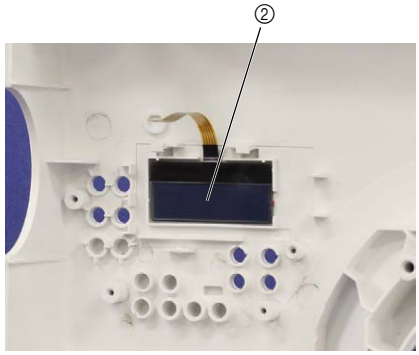




2-9-C “Curvy shape model” equipped with LCD backlight

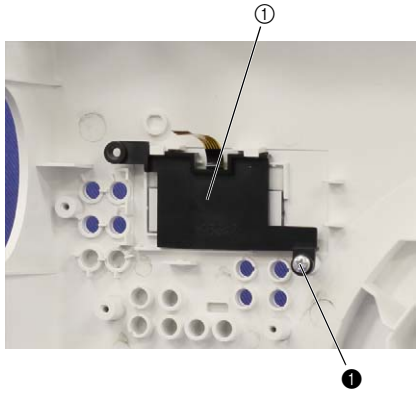
1. Remove the screw ❶, and then remove the single light guide assy. ①.
2. Remove the LCD ②.

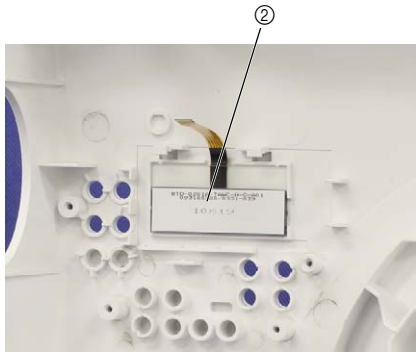




2-9-D “Curvy shape model” not equipped with LCD backlight

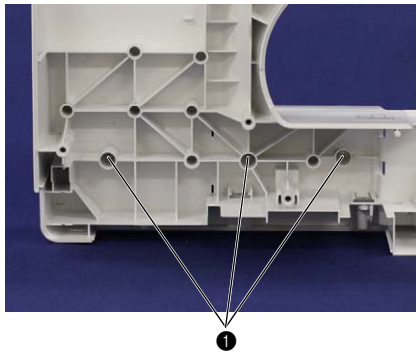
1. Remove the screw ❶, and then remove the LCD holder ①.
2. Remove the LCD ②.

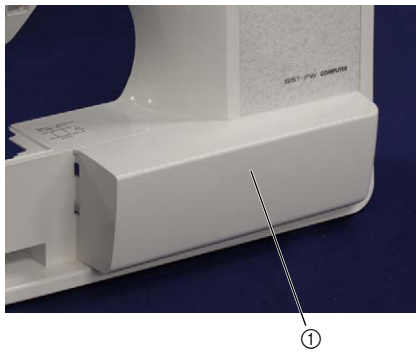




2-10 Removal of Decoration cover

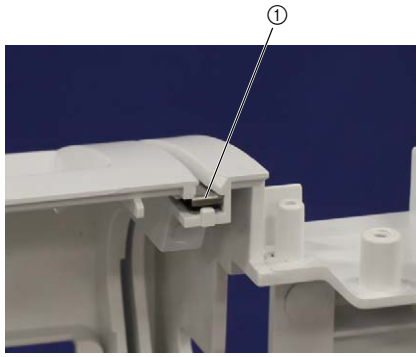
1. Remove the 3 screws ❶, and then remove the decoration cover ①.





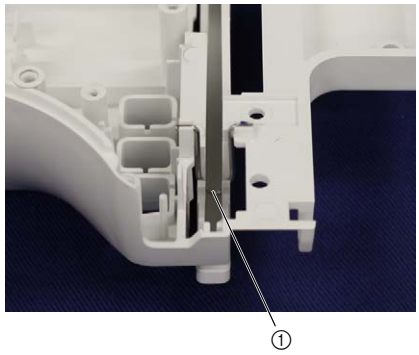
2-11 Removal of Front cover thread guard

1. Remove the front cover thread guard ①.



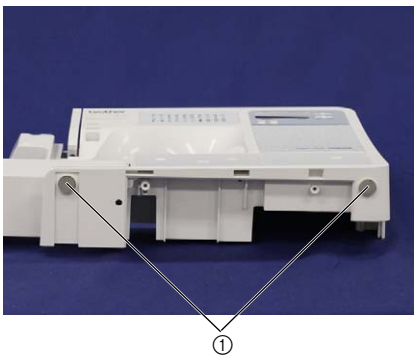
2-12 Removal of Thread guide wire

1. Remove the thread guide wire ①.



2-13 Removal of Base plate rubber (Front cover side)

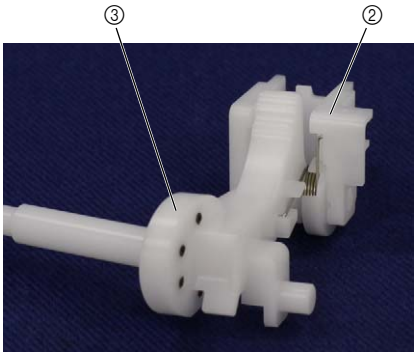
14. Remove the 2 base plate rubbers ①.

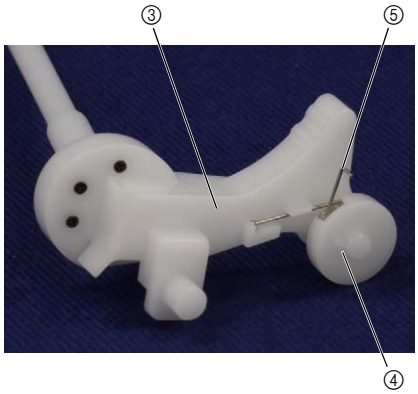


3 Disassembly of Rear cover assy

3-1 Removal of Spool pin

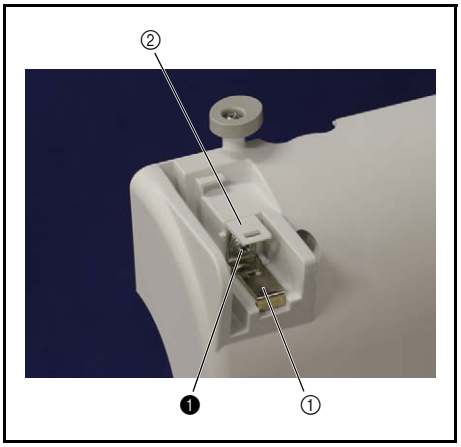
1. Remove the hook ①, and then remove the spool pin supporter ②.
2. Remove the spool pin ③ from the spool pin supporter ②.
3. Remove the spool pin spring cover ④ and the spool pin spring ⑤ from the spool pin ③.





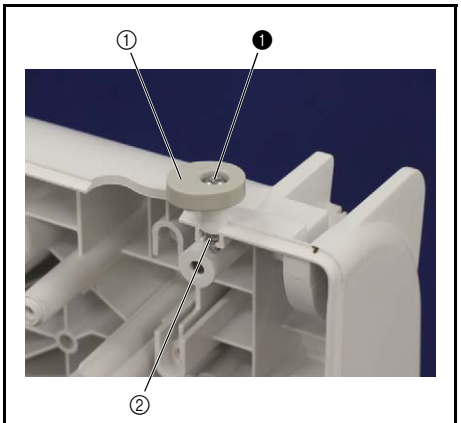
3-2 Removal of Spool pin holder

1. Remove the screw ❶, and then remove the spool pin stop plate ① and the spool holder ②.



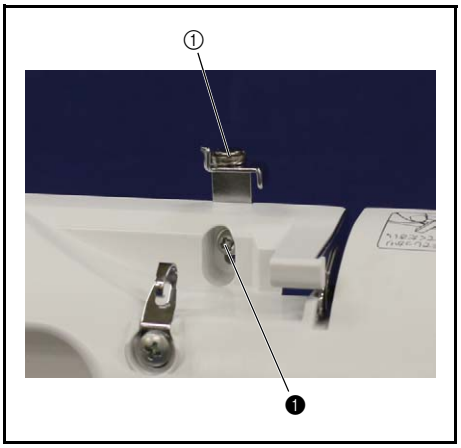
3-3 Removal of Bobbin presser

1. Remove the screw ❶, and then remove the bobbin presser ①.
2. Remove the Nut 1 M3 ②.



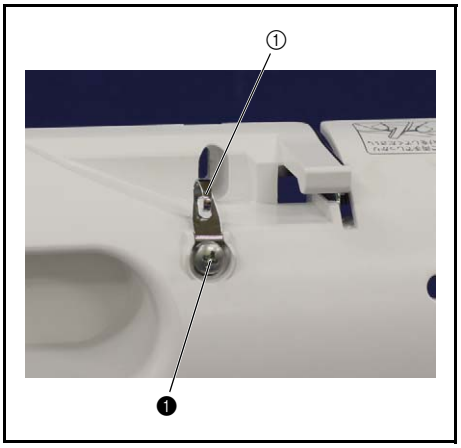
3-4 Removal of Bobbin winder guide assy

1. Remove the screw ❶, and then remove the bobbin winder guide assy. ①.



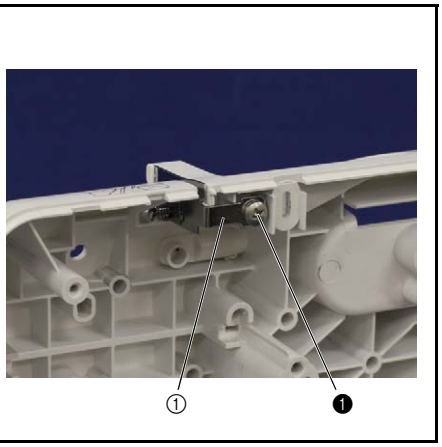
3-5 Removal of Thread guide supporting plate

1. Remove the screw ❶, and then remove the thread guide supporting plate ①.



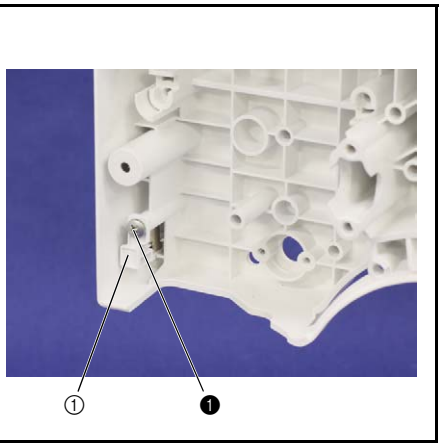
3-6 Removal of Thread guide plate assy

1. Remove the screw ❶, and then remove the thread guide plate assy. ①.



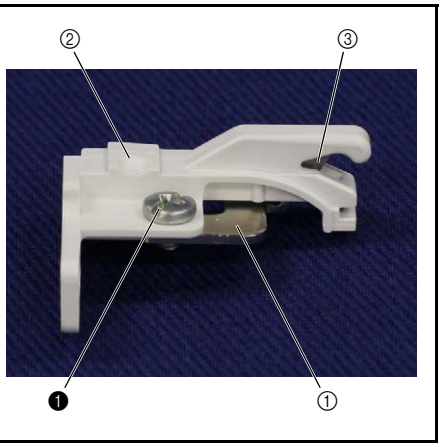
3-7 Removal of Cutter cover assy

1. Remove the screw ❶, and then remove the cutter cover assy. ①.



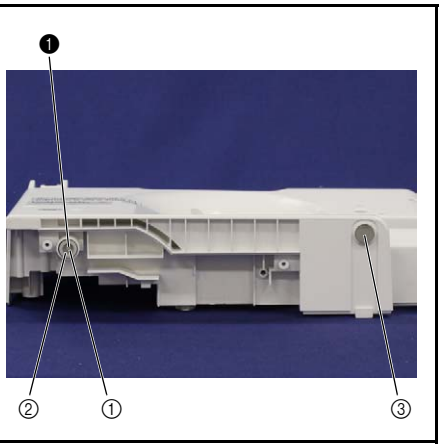
3-7-1 Disassembly of Cutter cover assy

1. Remove the screw ❶, and then remove the cutter holder plate ① from the cutter cover ②.
2. Remove the NT lower thread cutter ③ from the cutter cover ②.

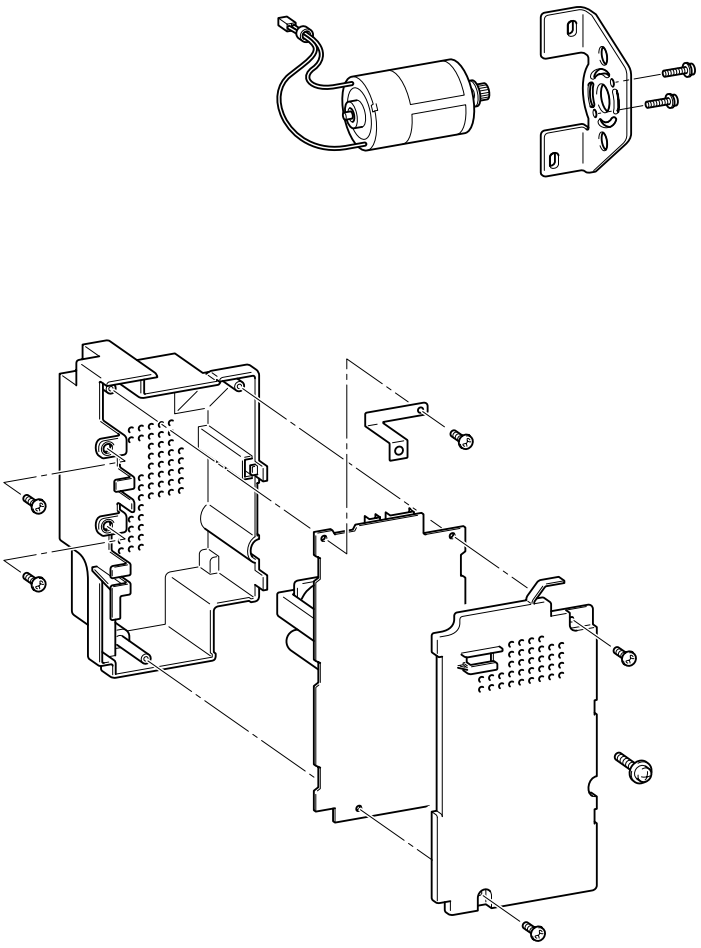


3-8 Removal of Base plate rubber (Rear cover side)

1. Remove the screw ❶, and then remove the washer plain M 3.5 ① and the rubber cushion A ②.
2. Remove the base plate rubber ③.

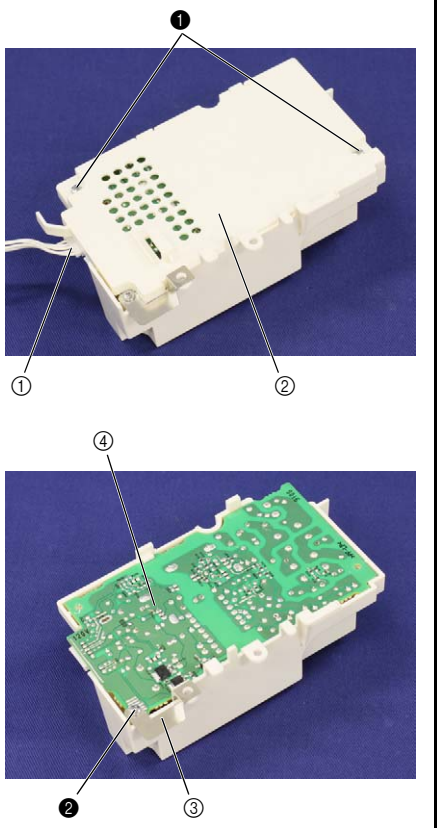


Electrical parts and motors location diagram



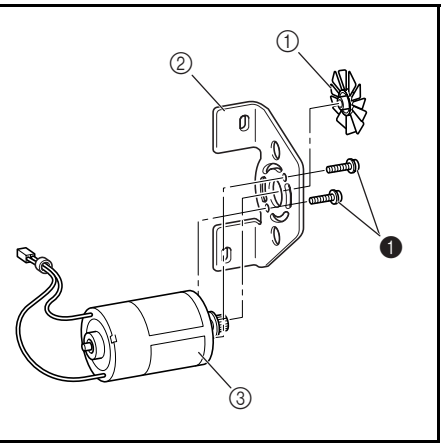
1 Disassembly of Power supply unit

1. Remove the power lead wire assy . ①.
2. Remove the 2 screws ❶, and then remove the insulation plate ②.
3. Remove the screw ❷, and then remove the power plate spring ③ and the power supply PCB assy. ④.

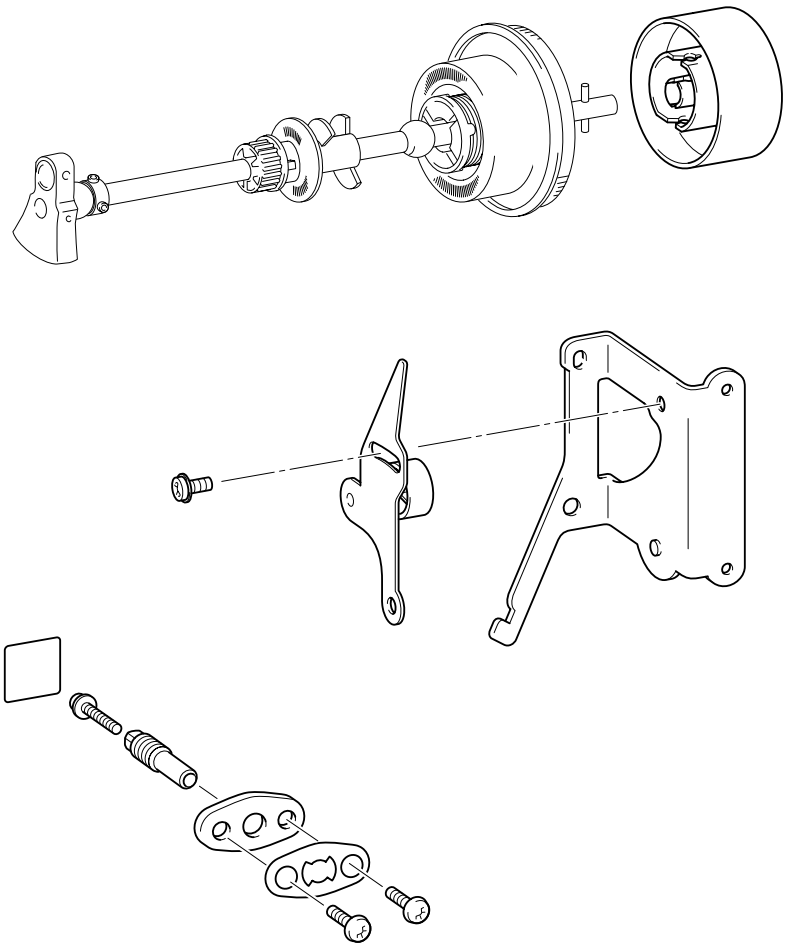


2 Disassembly of Main motor assy

1. Remove the motor fan ①.
2. Remove the 2 screws ❶, and then remove the main motor ③ from the motor holder ②.

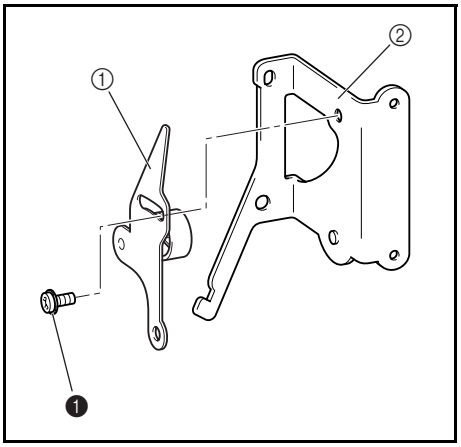


Needle bar, presser mechanism / Upper shaft mechanism location diagram



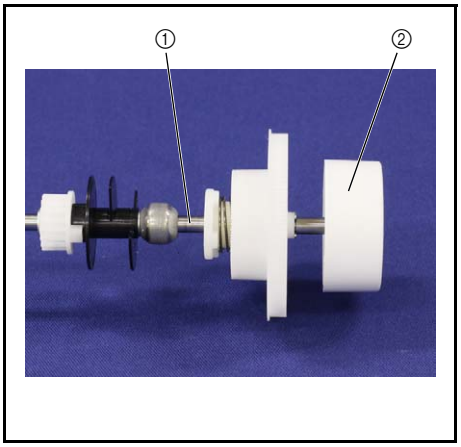
1 Disassembly of Tension pulley assy

1. Remove the screw ❶, and then remove the tension pulley holder ② from the tension pulley assy. ①.



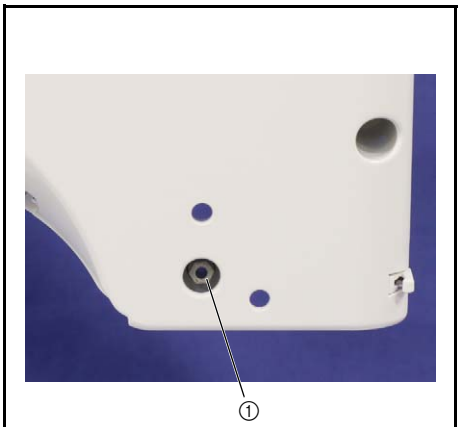
2 Disassembly of Upper shaft assy

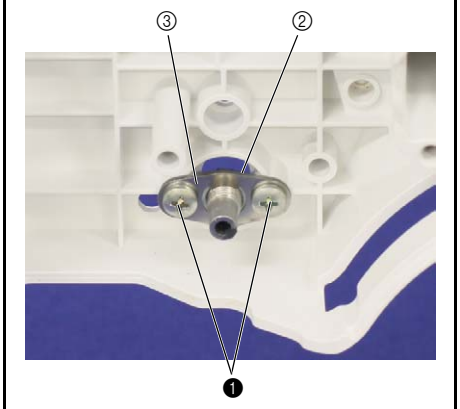
1. Remove the pulley ② from the upper shaft assy. ①.



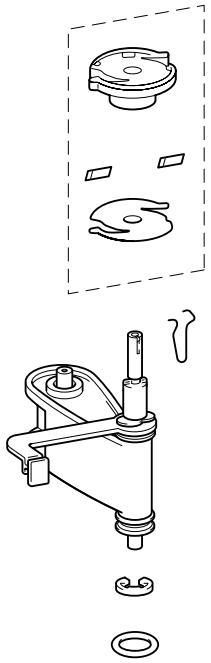
3 Removal of Plate spring

1. Remove the adjusting screw ①.
2. Remove the 2 screws ❶, and then remove the adjusting plate ② and the plate spring ③.



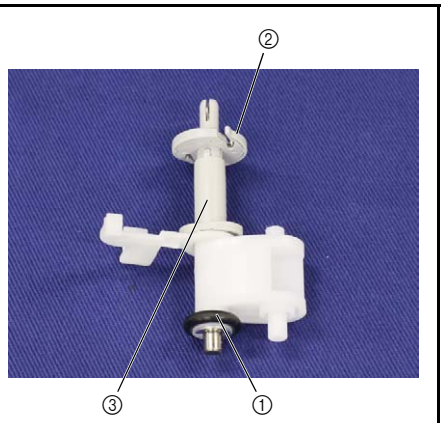


Bobbin winder mechanism location diagram



1 Removal of Bobbin base assy

1. Remove the rubber ring ① from the bobbin winder wheel.
2. Remove the bobbin base assy. ② from the bobbin winder assy. ③.



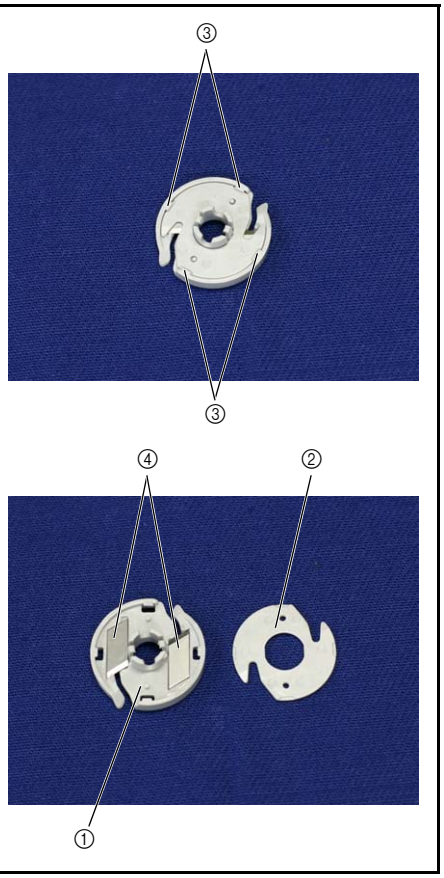
1-1 Disassembly of Bobbin base assy

1. Remove the bobbin thread cutter holder ② from the bobbin base assy. ①.

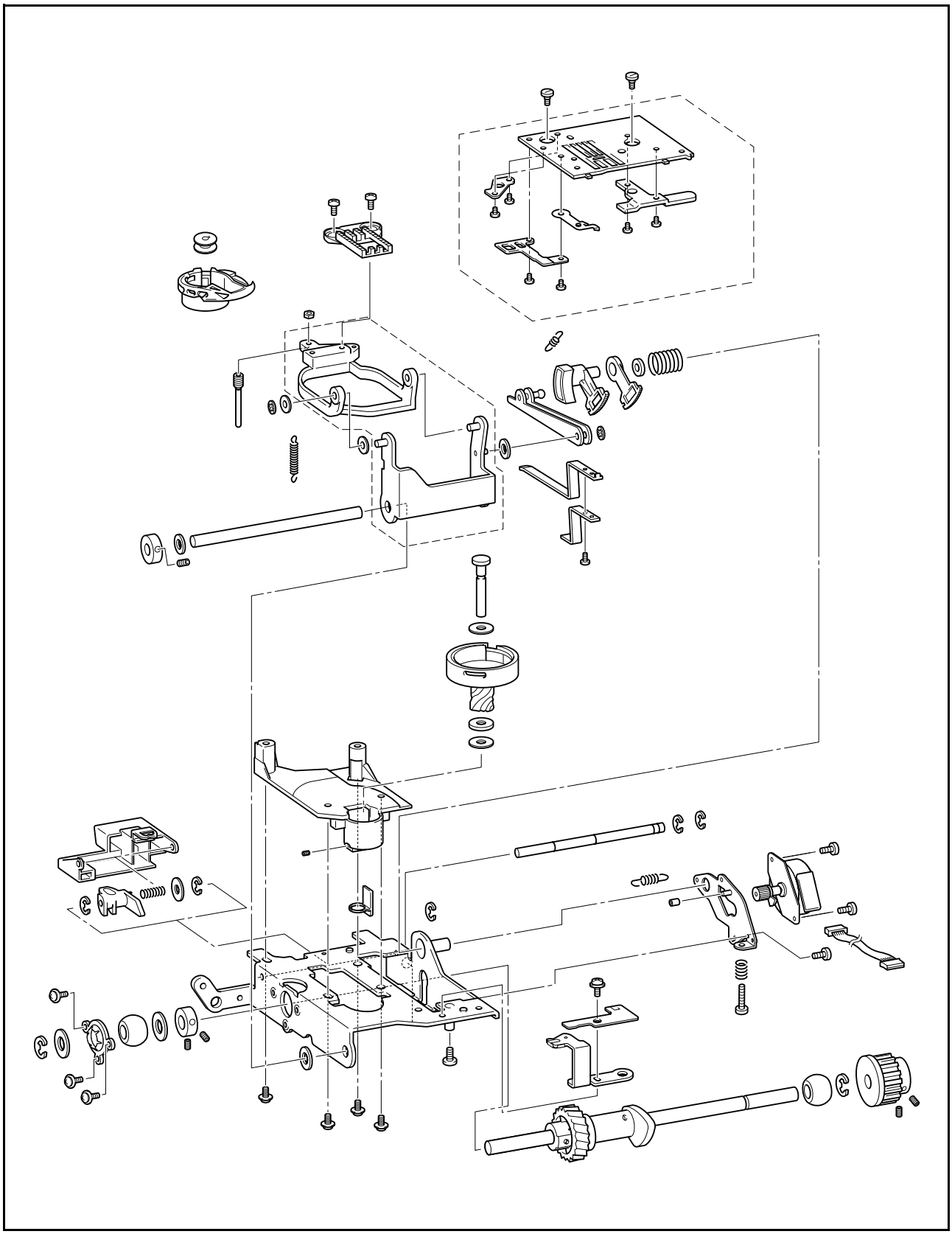
***Key point**

- Be careful not to damage the 4 hooks ③.

3. Remove the NT lower thread cutter ④ from the bobbin base assy. ①.

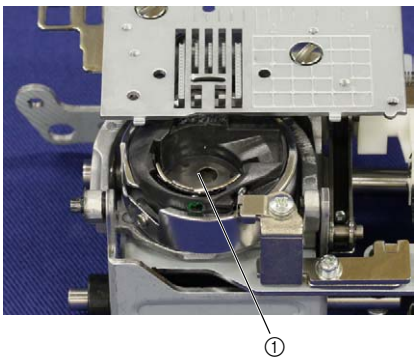


Feed and rotary module location diagram



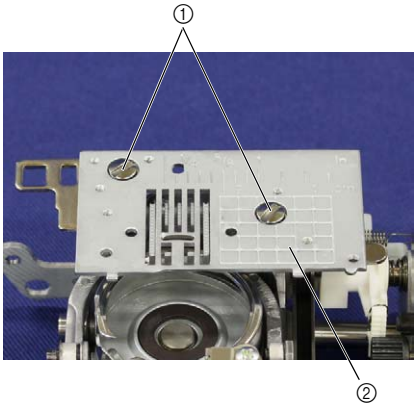
1 Removal of Inner rotary hook assy

1. Remove the inner rotary hook assy. ①.



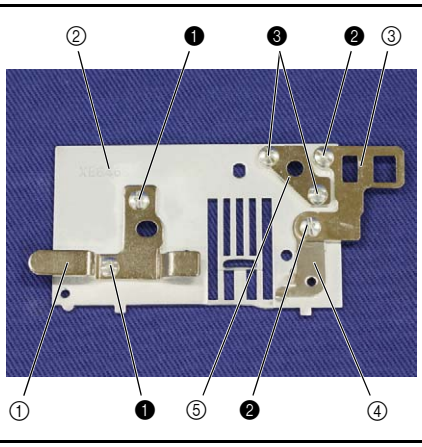
2 Removal of Needle plate A assy

1. Remove the 2 screw needle plates ①, and then remove the needle plate A assy. ②.



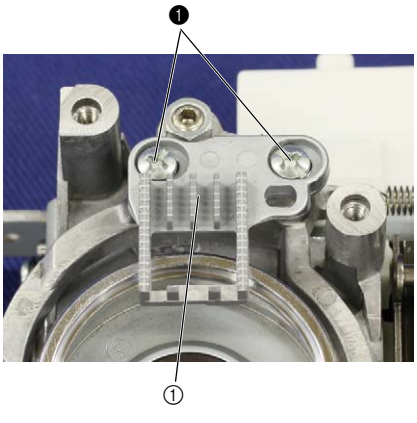
2-1 Disassembly of Needle plate A assy

1. Remove the 2 screws ❶, and then remove the F gear stopper plate ① from the needle plate A ②.
2. Remove the 2 screws ❷, and then remove the needle plate B support plate ③ and the stopper plate ④ from the needle plate A ②.
3. Remove the 2 screws ❸, and then remove the needle plate holder ⑤ from the needle plate A ②.



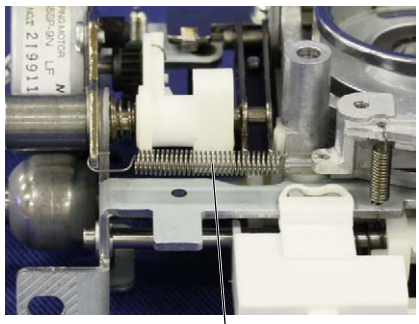
3 Removal of Feed dog

1. Remove the 2 screws ❶, and then remove the Feed dog ①.



4 Removal of Spring

1. Remove the spring S07 .

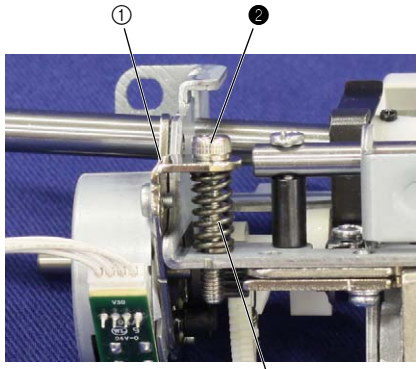


S07

5 Removal of FPM holder sub assy

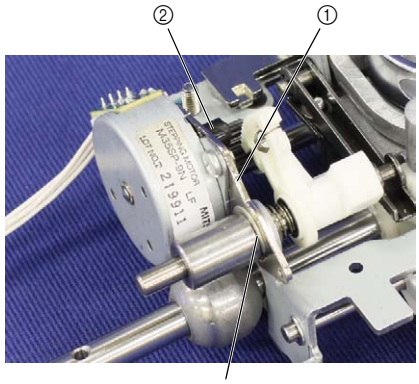
1. Remove the screw ❶.
2. Remove the screw ❷, and then remove spring S06.
3. Remove the retaining ring 10, and then remove the FPM holder sub assy. ① from the base plate assy..
4. Remove the rubber ② from the FPM holder sub assy. ①.

❶



① ❷

S06

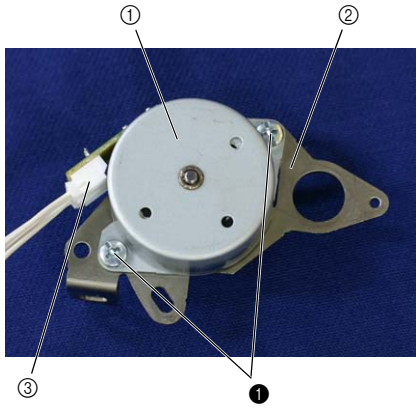


② ①

Retaining ring 10

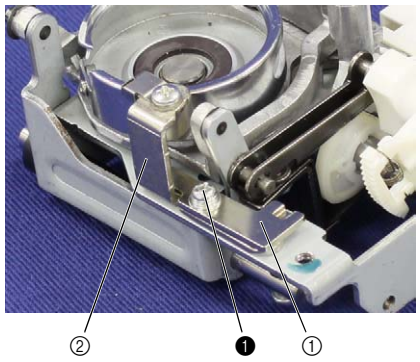
6 Removal of Z pulse motor

1. Remove the 2 screws ❶, and then remove the Z pulse motor ① from the FPM holder assy. ②.
2. Remove the “lead wire assy, FPM-LE ③” from the Z pulse motor ①.



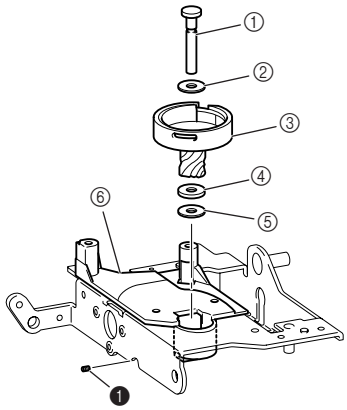
7 Removal of Inner rotary hook bracket assy

1. Remove the screw ❶, and then remove the IRH bracket support plate ① and the inner rotary hook bracket assy. ② from the base plate assy..



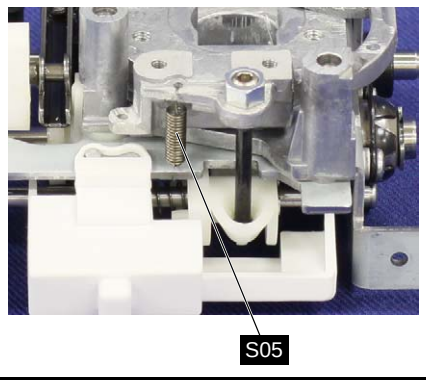
8 Removal of Outer rotary hook assy

1. Remove the screw ❶, and then pull the outer rotary hook shaft ①, and remove the spacer ②, outer rotary hook assy. ③, washer 6 ④ and spacer ⑤ from the shaft supporter ⑥.



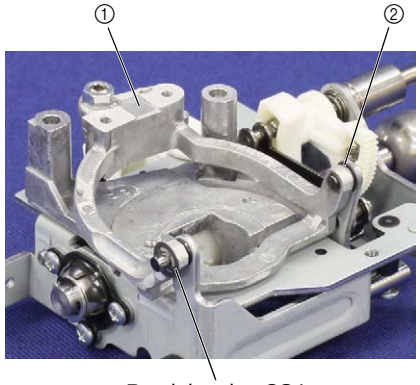
9 Removal of Spring

1. Remove the spring S05 .



10 Removal of Feed bar

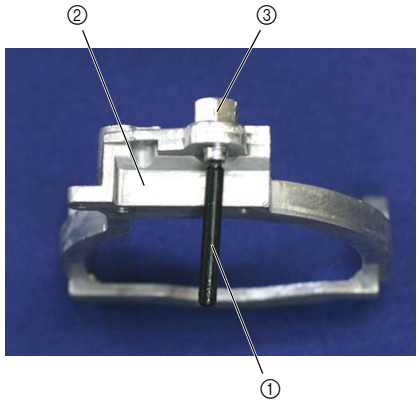
1. Remove the retaining ring CS4, and then remove the feed bar ① and the polyester slider ② from the feed arm A assy..



Retaining ring CS4

11 Removal of Vertical adjuster screw assy

1. Remove the vertical adjuster screw assy. ① from the feed bar ②.
2. Remove the M5 nut ③ from the vertical adjuster screw assy. ①.

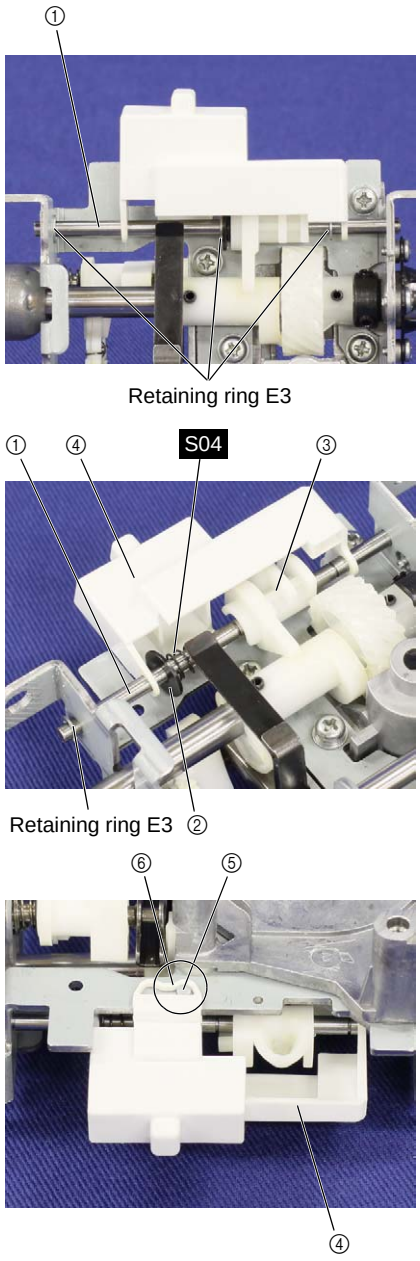


12 Removal of Drop knob

1. Remove the 3 retaining rings E3.
2. Pull the vertical feed shaft ①, and then remove the washer plain ②, the spring S04 and the vertical lever ③.
3. Remove the retaining ring E3 from the vertical feed shaft ①.
4. Remove the drop knob ④ from the base plate assy..

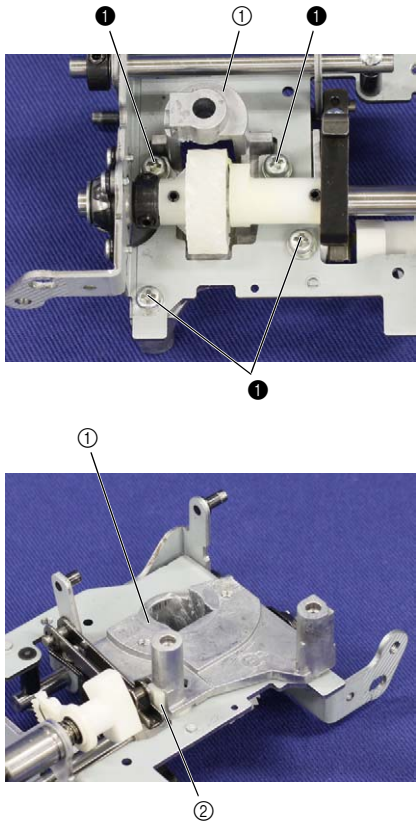
***Key point**

- Remove it while lifting the section ⑥ of the drop knob ④ to get over the boss part ⑤ of the base plate assy..



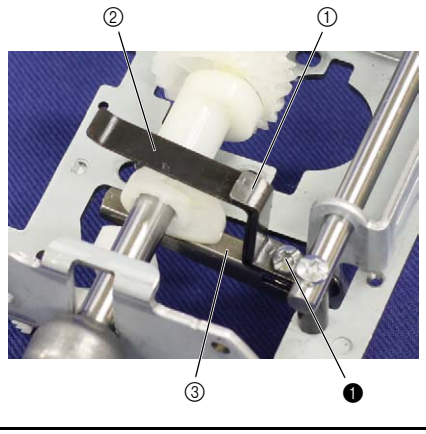
13 Removal of Shaft supporter

1. Remove the 4 screws ❶, and then remove the shaft supporter ① and the feed arm supporter ② from the base plate assy..



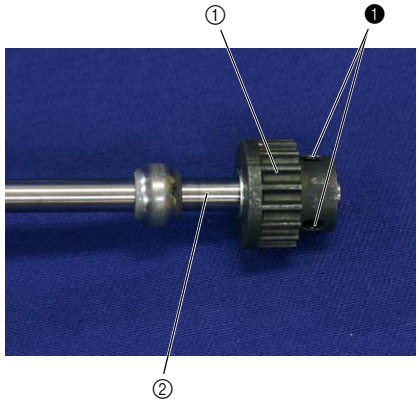
14 Removal of Feed supporting plate

1. Remove the screw ❶, and then remove the feed supporting plate B ① and the feed supporting plate ② from the feed arm assy. ③.



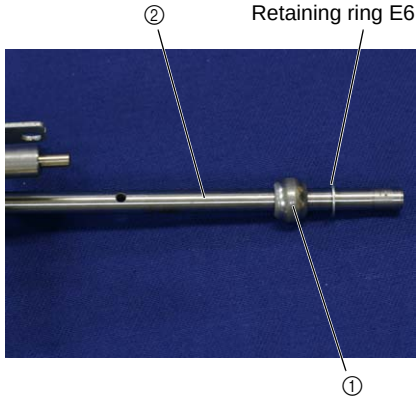
15 Removal of Timing pulley D

1. Remove the 2 screws ❶, and then remove the timing pulley D ① from the lower shaft assy. ②.



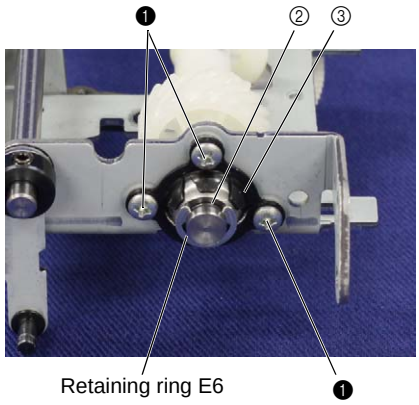
16 Removal of Upper shaft bushing

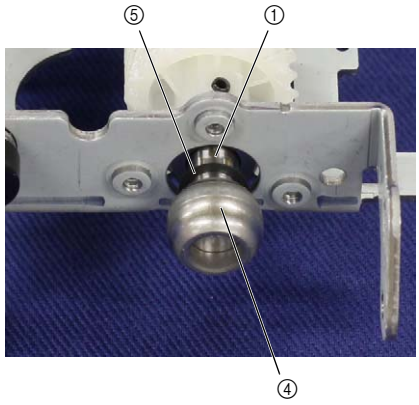
1. Remove the retaining ring E6, and then remove the upper shaft bushing ① from the lower shaft assy. ②.



17 Removal of Bushing presser B

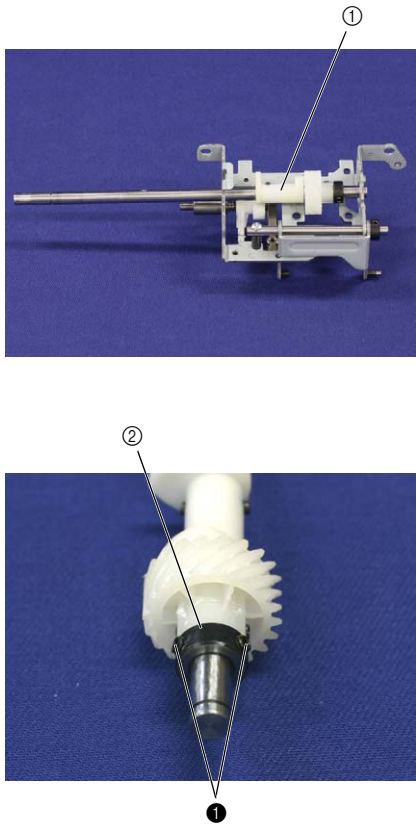
1. Remove the retaining ring E6, and then remove the “washer, thrust ②” from the lower shaft assy. ①.
2. Remove the 3 screws ❶, and then remove the bushing presser B ③ from the base plate assy..
3. Remove the lower shaft bushing ④ and the “washer, thrust ⑤” from the lower shaft assy. ①.





18 Removal of Lower shaft assy

1. Remove the lower shaft assy. ① from the base plate assy..
2. Remove the 2 screws ❶, and then remove the set collar ②.

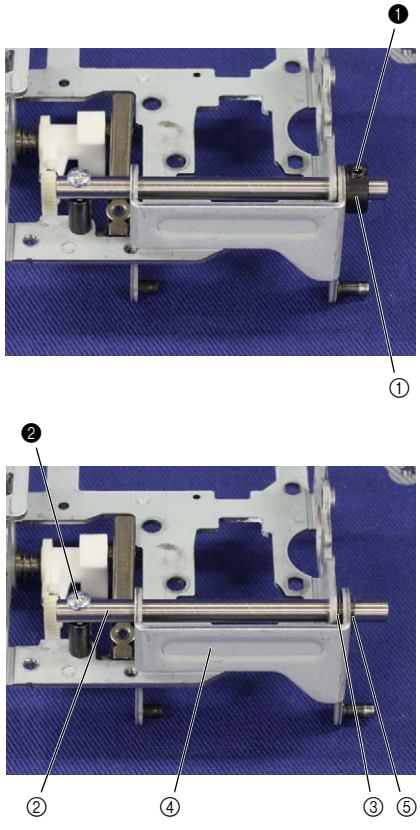


19 Removal of Feed arm A assy

1. Remove the screw ❶, and then remove the set collar ①.
2. Remove the screws ❷, and then pull the horizontal feed shaft ②, and then remove the "washer, thrust ③", the feed arm A assy. ④ and the "washer, thrust ⑤".

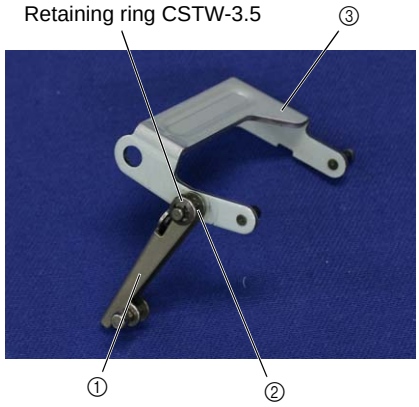
***Key point**

- Remove the feed regulator slide shaft of the feed arm B assy. from the feed adjuster.



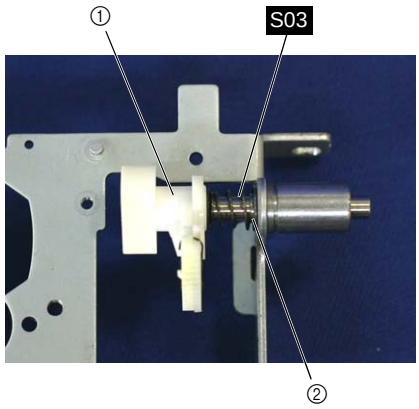
20 Removal of Feed arm B assy

1. Remove the retaining ring CSTW-3.5, and then remove the feed arm B assy. ① and the polyester slider ② from the feed arm A assy. ③.



21 Removal of Feed adjuster assy

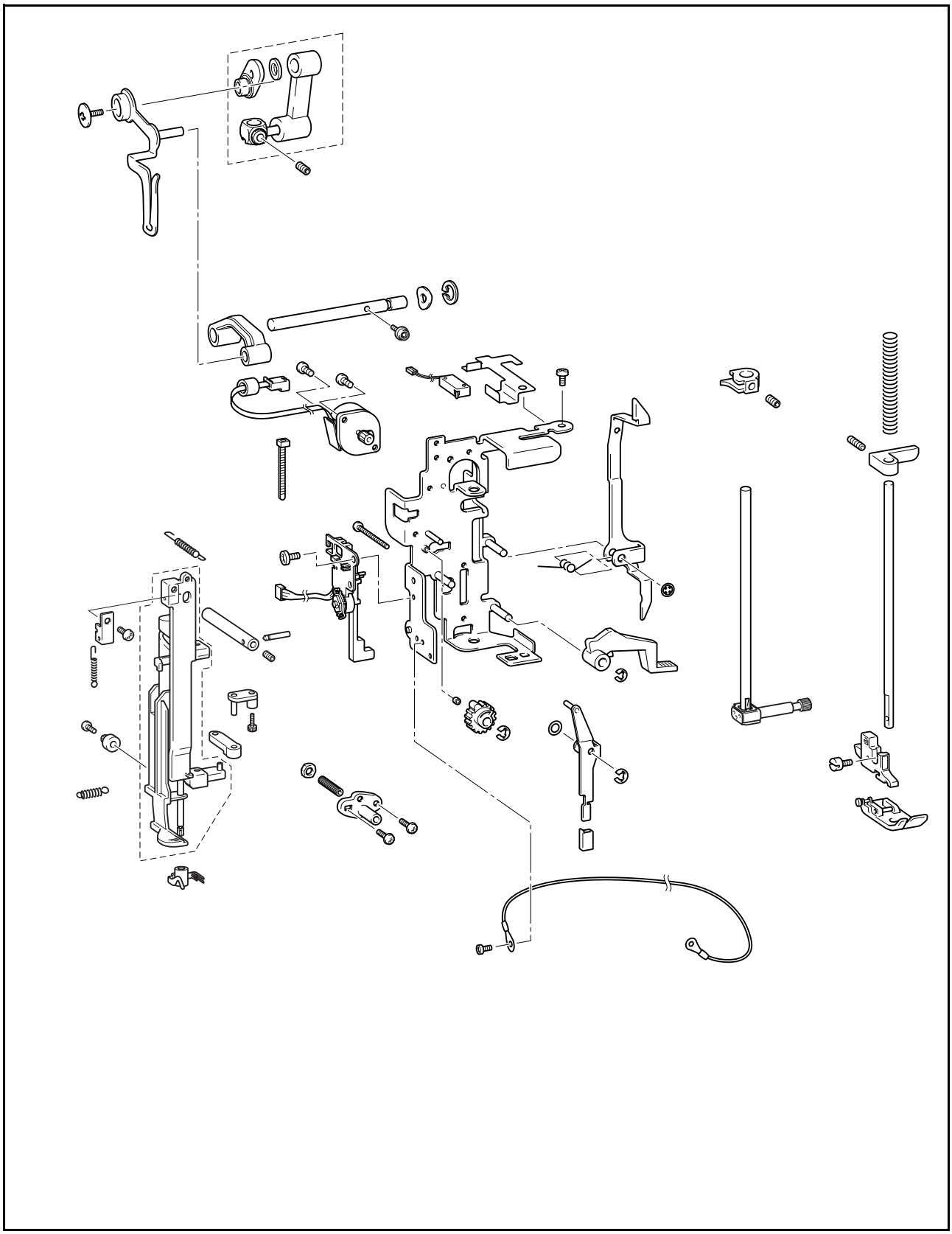
1. Pull the feed adjuster ① from the base plate assy. and then remove the spring S03 and the polyester slider ②.



21-1 Disassembly of Feed adjuster assy

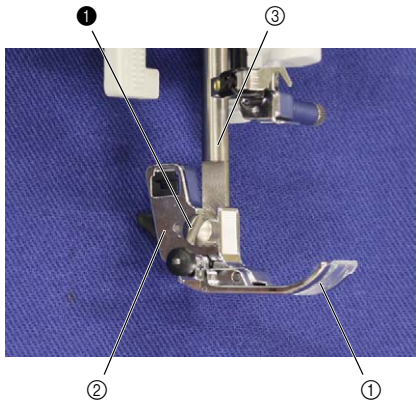
1. Remove the spring S02, and then remove the F gear ② from the feed adjuster ①.

Needle-presser module location diagram



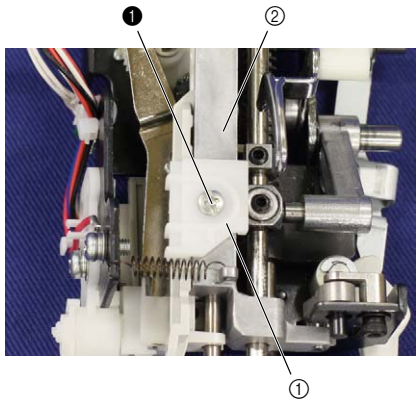
1 Removal of Presser feed holder assy

1. Remove the Z foot ①.
2. Remove the screw ❶, and then remove the presser feed holder assy. ② from the presser bar ③.



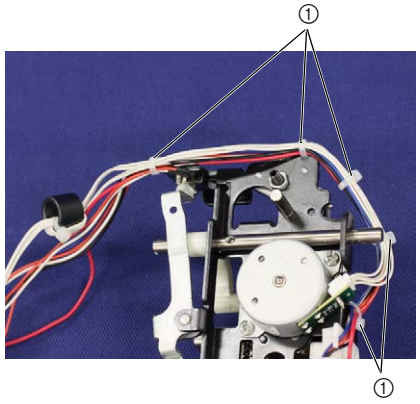
2 Removal of Thread slider guide

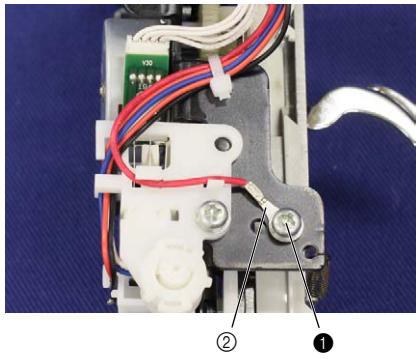
1. Remove the screw ❶, and then remove the thread slider guide ① from the needle bar supporter assy. ②.



3 Removal of Lead wire assy: ground

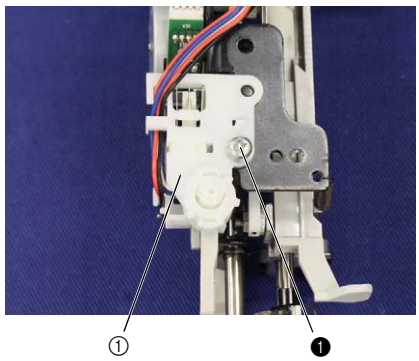
1. Cut the 5 bands ①.
2. Remove the screw ❶, and then remove the lead wire assy: ground ②.





4 Removal of BH switch assy

1. Remove the screw ❶, and then remove the BH switch assy. ①.

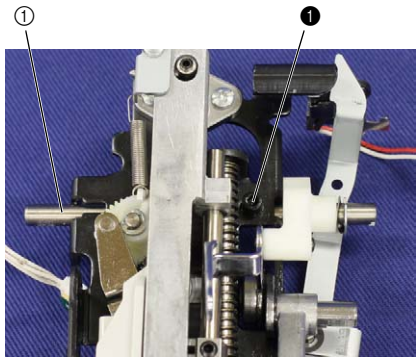


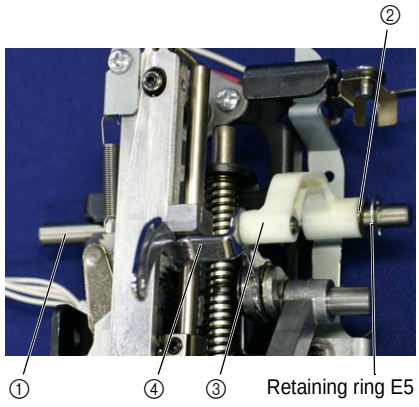
5 Removal of Thread take-up lever link

1. Remove the screw ❶, and then pull the take-up support shaft ①, and then remove the washer, spring ② and the thread take-up lever link ③.

   ***Key point**
   - Pull the thread take-up lever link ③ from the shaft of the thread take-up lever ④.

2. Remove the retaining ring E5 from the take-up support shaft ①.



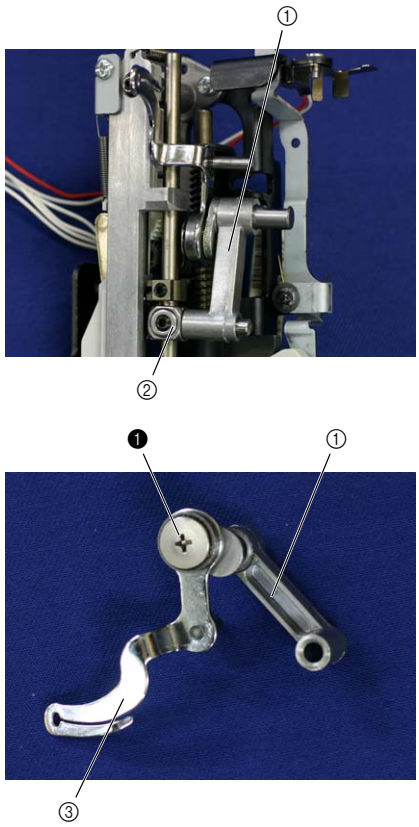


6 Removal of Needle bar crank rod assy

1. Remove the needle bar crank rod assy. ① from the needle bar block ②.
2. Remove the screw ❶, and then remove the thread take-up lever ③ from the needle bar crank rod assy. ①.

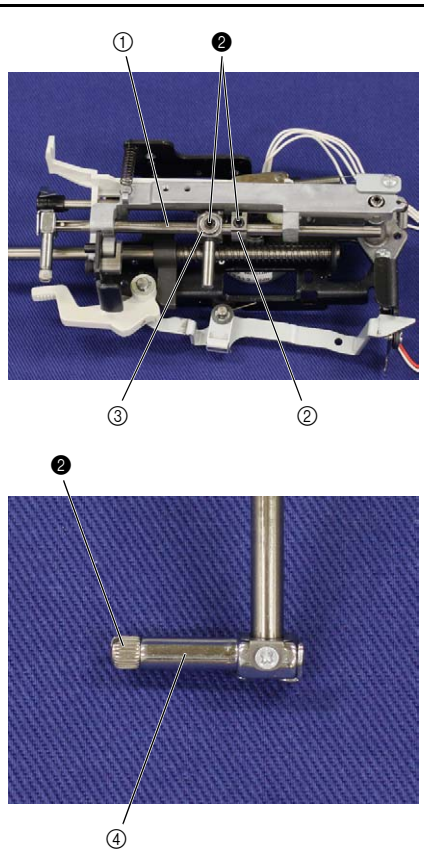
***Key point**

- The screw ❶ is reverse threaded.



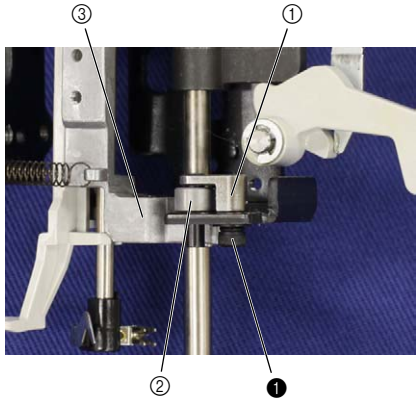
7 Removal of Needle bar assy. N

1. Remove the 2 screws ❶, and then pull the needle bar assy. N ① from the needle bar supporter assy., and then remove the needle thread block ② and the needle bar block ③.
2. Remove the screw ❷ from the needle block ④.



8 Removal of Shaft assy

1. Remove the screw ❶, and then remove the shaft assy. ① from the base holder assy..
2. Remove the needle holder block ② from the shaft of the needle bar supporter assy. ③.

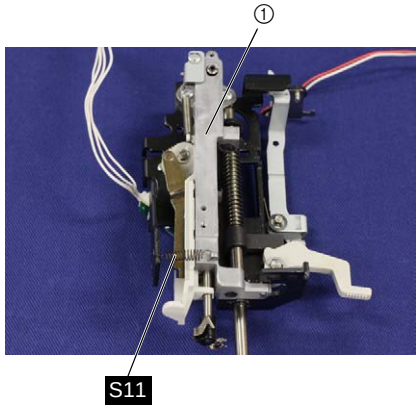


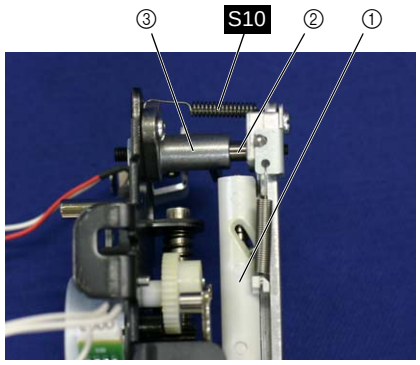
9 Removal of Needle bar supporter assy

1. Remove the spring S11 and the spring S10, and then remove the needle bar supporter assy. ① from the base holder assy..

***Key point**

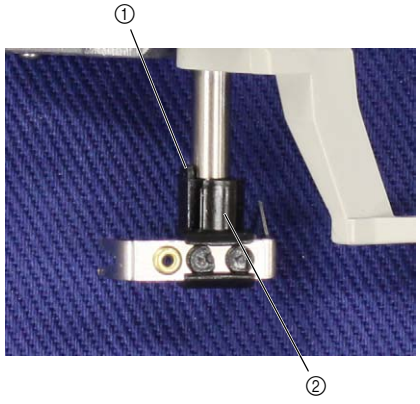
- Pull the shaft ② of the needle bar supporter assy. ① from the shaft bushing ③, and then remove it from the upper side.





10 Removal of Threader hook assembly

1. Release the hook ①, and then remove the threader hook assembly ②.

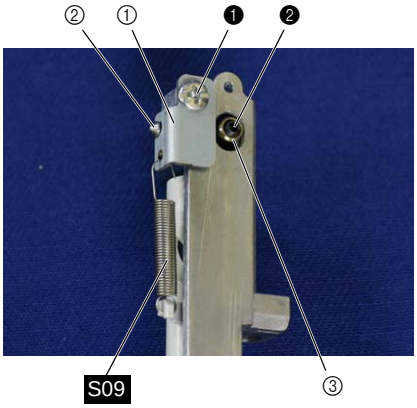


11 Removal of Zigzag adjusting nut

1. Remove the screw ❶, and then remove the zigzag adjusting nut ① from the needle bar supporter assy..

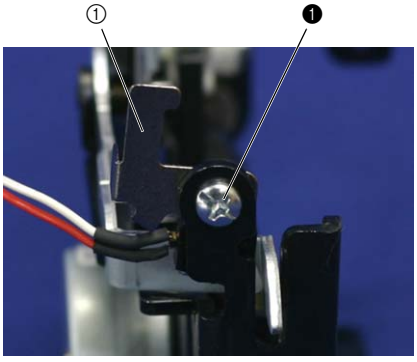
12 Removal of Needle holder shaft A

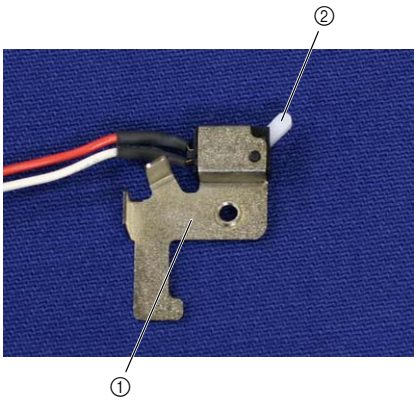
1. Remove the spring S09.
2. Remove the screw ❶, and then remove the plate ① from the needle bar supporter assy..
3. Remove the screw ❷, and then pull the shaft ②, and then remove the needle holder shaft A ③ from the needle bar supporter assy.



13 Removal of PF switch assy

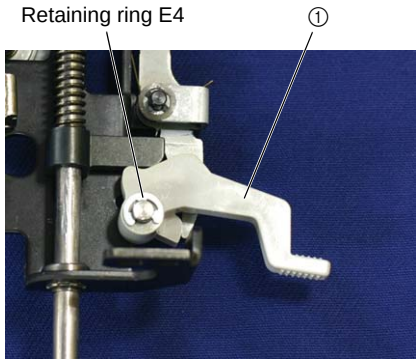
1. Remove the screw ❶, and then remove the presser switch holder ① from the base holder assy..
2. Remove the PF switch assy. ② from the presser switch holder ①.





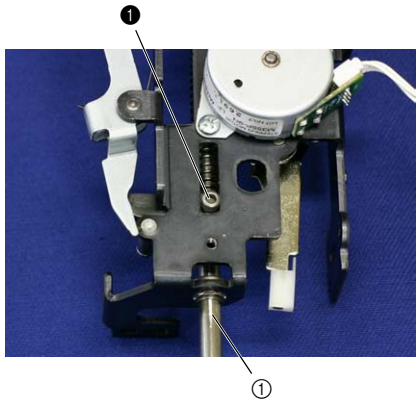
14 Removal of Presser foot lifter

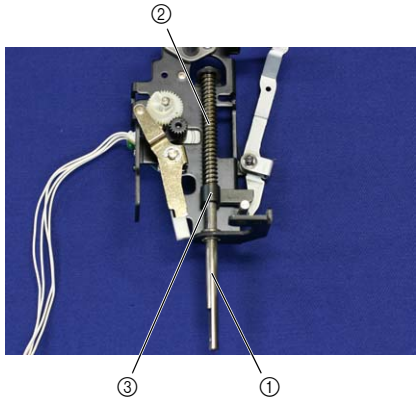
1. Remove the retaining ring E4, and then remove the presser foot lifter ①.



15 Removal of Presser bar

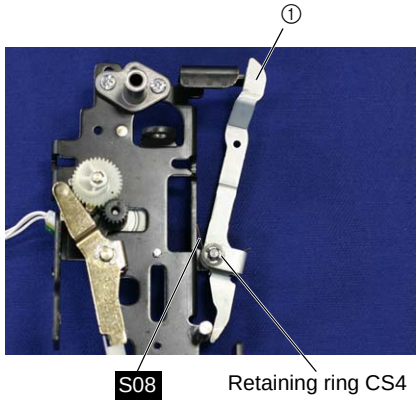
1. Remove the screw ❶, and then pull the presser bar ① from the base holder assy., and then remove the spring ② and the presser bar clamp ③.





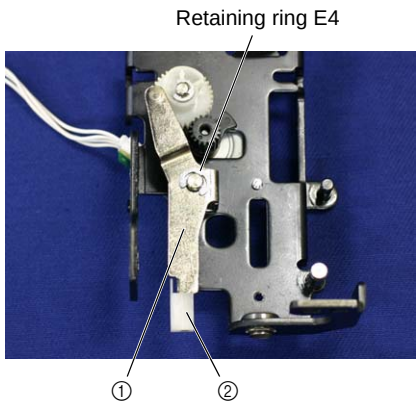
16 Removal of Thread release lever

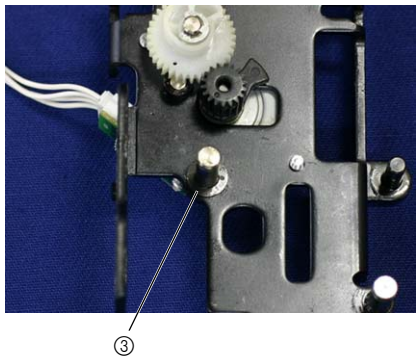
1. Remove the retaining ring CS4, and then remove the thread release lever ① and the spring S08 from the base holder assy..



17 Removal of Z zigzag lever assy

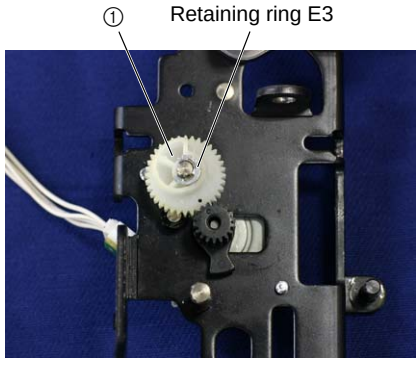
1. Remove the Z lever cap ② from the Z zigzag lever assy. ①.
2. Remove the retaining ring E4, and then remove the Z zigzag lever assy. ① and the polyester slider ③.





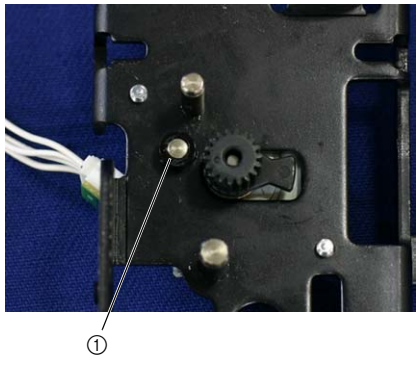
18 Removal of Z zigzag cam

1. Remove the retaining ring E3, and then remove the Z zigzag cam ①.



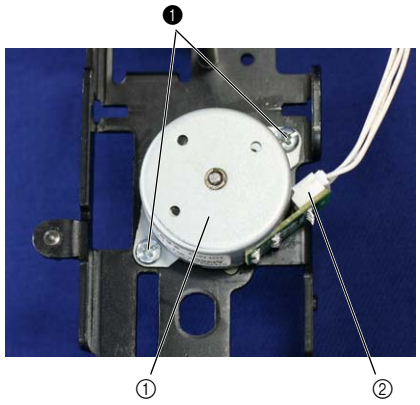
19 Removal of Rubber

1. Remove the rubber ①.



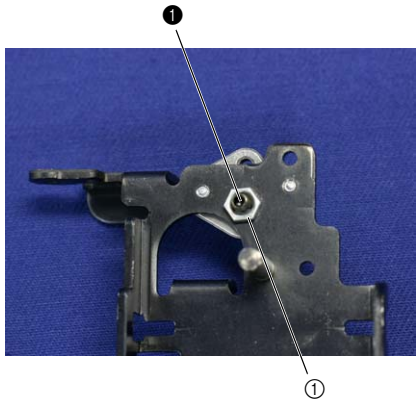
20 Removal of Z pulse motor

1. Remove the 2 screws ❶, and then remove the Z pulse motor ① from the base holder assy..
2. Remove the lead wire sub assy. ② from the Z pulse motor ①.



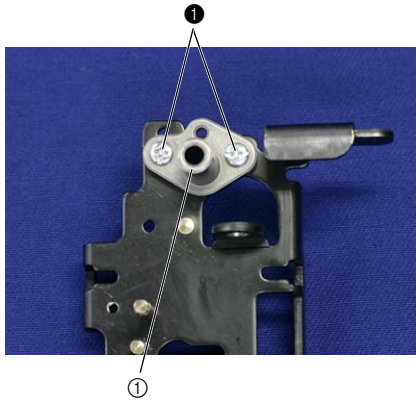
21 Removal of Lock nut

1. Remove the lock nut ① from the base holder assy..
2. Remove the screw ❶.

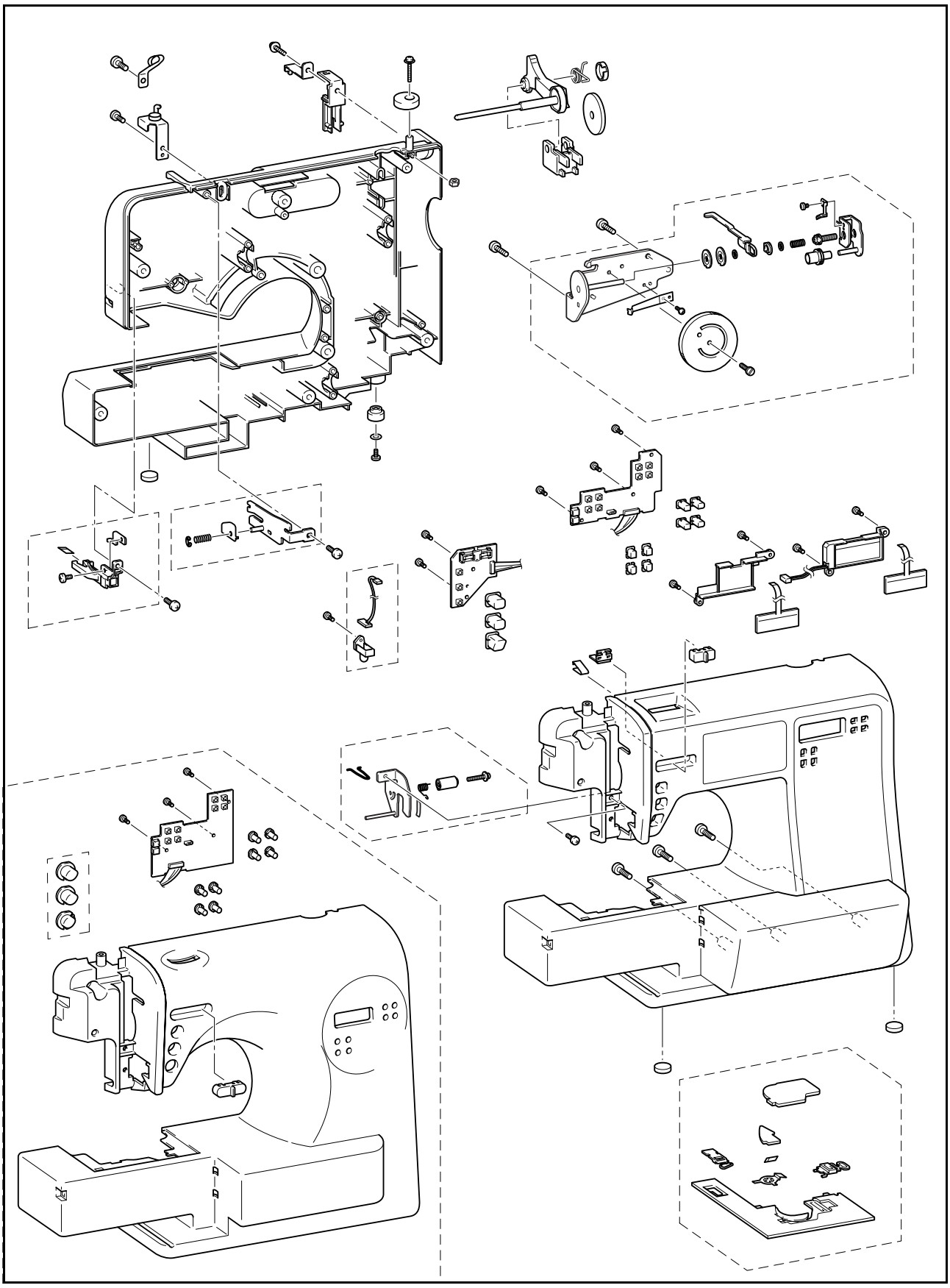


22 Removal of Shaft bushing

1. Remove the 2 screws ❶, and then remove the shaft bushing ① from the base holder assy..



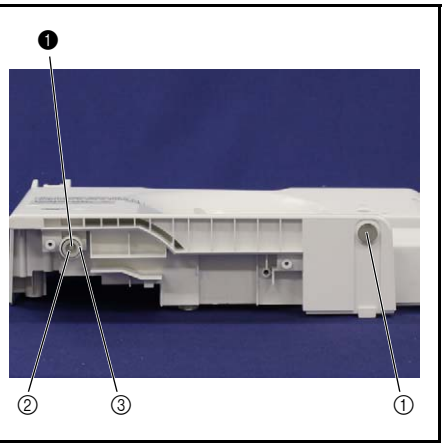
Main parts location diagram



1 Assembly of Rear cover assy

1-1 Attachment of Base plate rubber (Rear cover side)

1. Attach the base plate rubber ① to the rear cover assy..
2. Set the rubber cushion A ② and the washer plain M 3.5 ③ to the rear cover assy. with the screw ❶.



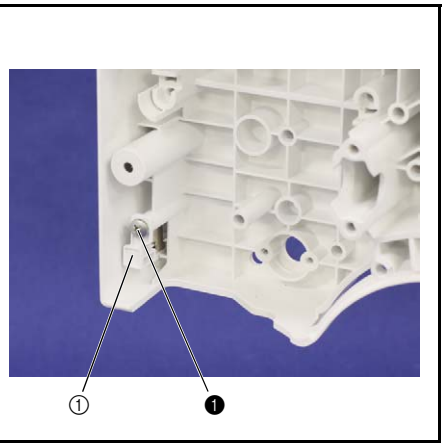
❶		Taptite, Pan B M3.5X12	Torque 0.39 – 0.78 N·m

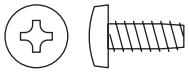
1-2 Attachment of Cutter cover assy

1. Set the cutter cover assy. ① to the rear cover assy. with the screw ❶.

***Key point**

- Check that the rib of the cutter cover assy. ① engaged with the groove of the rear cover assy..



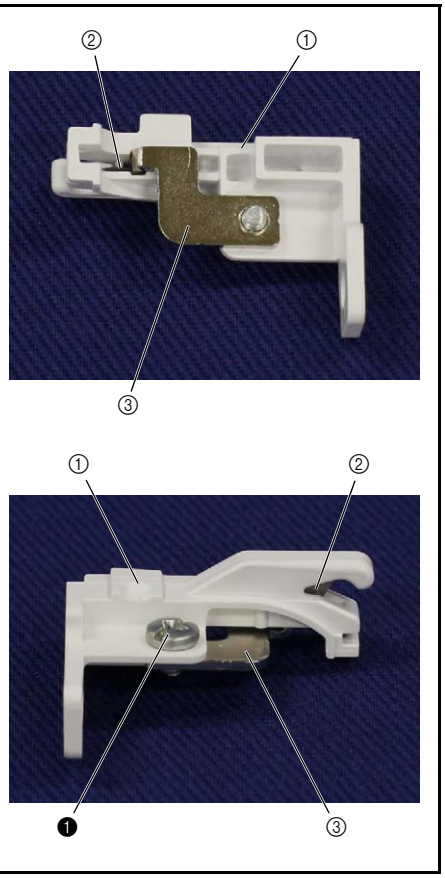
❶		Taptite, Bind B M4X10	Torque 0.78 – 1.18 N·m

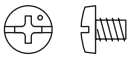
1-2-1 Assembly of Cutter cover assy

1. Set the NT lower thread cutter ② to the cutter cover ①.
2. Set the cutter holder plate ③ to the cutter cover ① with the screw ❶.

***Key point**

- Check that the end of the cutter holder plate ③ engaged with the positioning groove of the cutter cover ①.



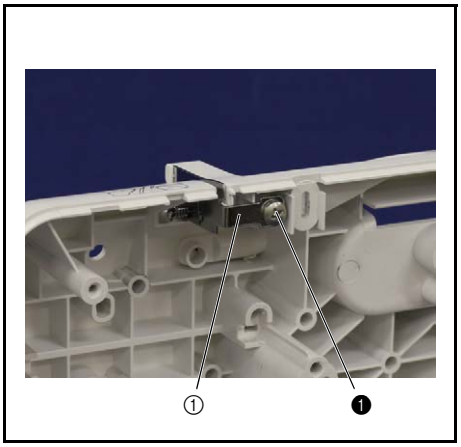
❶		Screw, Bind M3X4	Torque 0.59 – 0.78 N·m

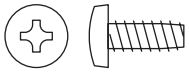
1-3 Attachment of Thread guide plate assy

1. Set the thread guide plate assy. ① to the rear cover assy. with the screw ❶.

***Key point**

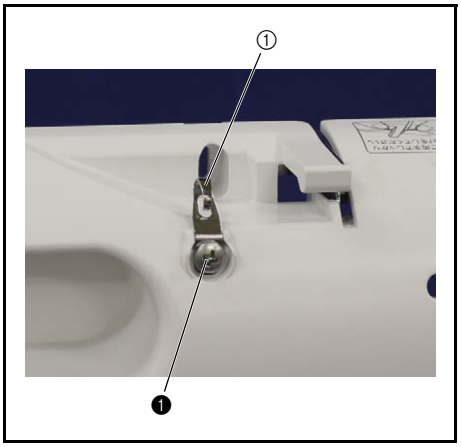
- Check that the align the notch part of the thread guide plate assy. ① with the rib of the rear cover assy..

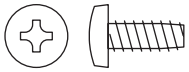


❶		Taptite, Bind B M4X10	Torque 0.78 – 1.18 N·m

1-4 Attachment of Thread guide supporting plate assy

1. Set the thread guide supporting plate assy. ① to the rear cover assy. with the screw ❶.



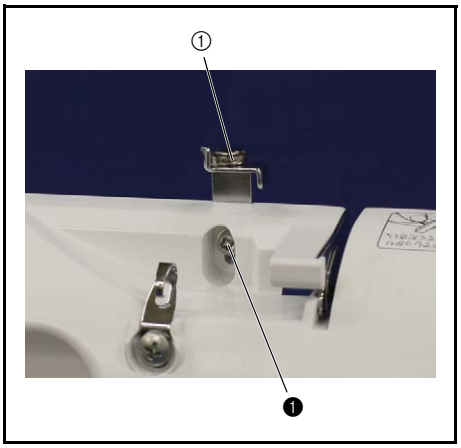
❶		Taptite, Bind B M4X10	Torque 0.78 – 1.18 N·m

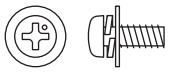
1-5 Attachment of Bobbin winder guide assy

1. Set the bobbin winder guide assy. ① to the rear cover assy. and then temporarily tighten the screws ❶.

***Key point**

- Fully tighten the screw ❶ after performing "4-16 Adjustment : Bobbin winder".



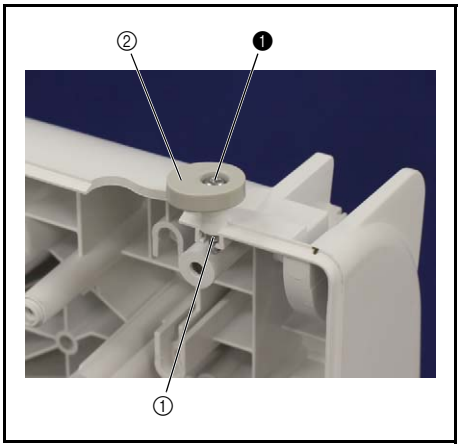
❶		Screw, Pan (S/P washer) M3X8DB	Torque Hand start

1-6 Attachment of Bobbin presser

1. Set the Nut 1 M3 ① to the rear cover assy..
2. Set the bobbin presser ② to the rear cover assy., and then temporarily tighten the screws ❶.

***Key point**

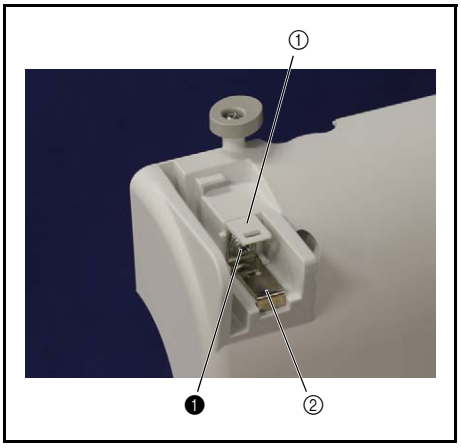
- Place the bobbin presser ② with the smaller end facing the rear.
- Fully tighten the screw ❶ after performing "4-16 Adjustment : Bobbin winder".

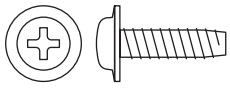


❶		Screw, Pan (S/P washer) M3X20	Torque Hand start

1-7 Attachment of Spool pin holder

1. Set the spool holder ① and spool pin stop plate ② to the rear cover assy. with the screw ❶.



❶		Taptite, Cup B M4X14	Torque 0.78 – 1.18 N·m

1-8 Attachment of Spool pin

1. Set the spool pin spring ① to the spool pin ②.

   ***Key point**
   - Insert the hook part ③ of long side of the straight section of the spool pin spring ① into the hole ④ of the spool pin ②.

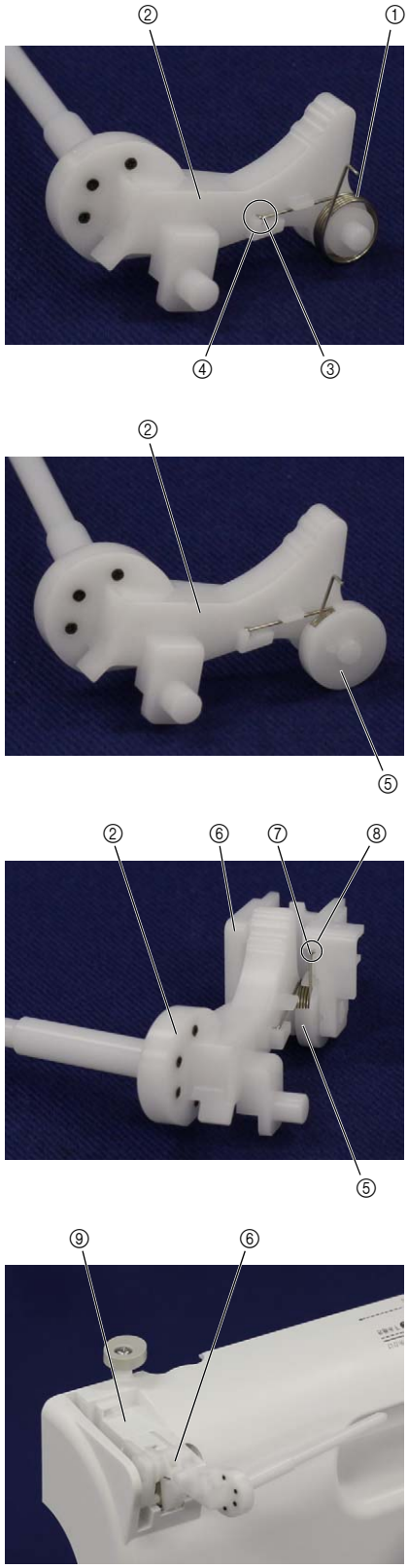
2. Set the spool pin spring cover ⑤ to the spool pin ②.

   ***Key point**
   - Check that there is the short side of the straight section of the spool pin spring ① in between the groove part of the spool pin spring cover ⑤.

3. Set the spool pin ② to the spool pin supporter ⑥.

   ***Key point**
   - Check that the protrusion of the spool pin spring cover ⑤ engaged with the groove part of the spool pin supporter ⑥.
   - Insert the hook part ⑦ of long side of the straight section of the spool pin spring ① into the hole ⑧ of the spool pin supporter ⑥.

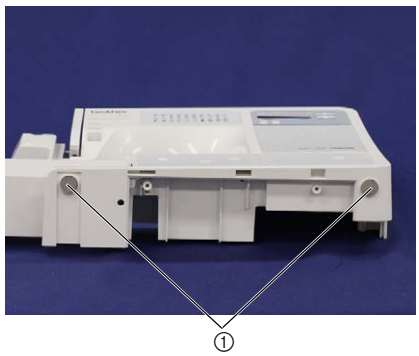
4. Hang the rib of the spool pin supporter ⑥ on the spool pin holder ⑨, and then push it to the lower side and secure it rear cover assy..



2 Assembly of Front cover assy

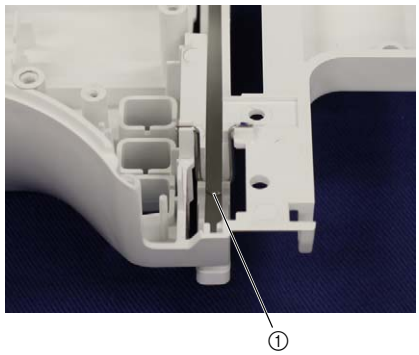
2-1 Attachment of Base plate rubber (Front cover side)

2. Attach the 2 base plate rubbers ① to the front cover assy..



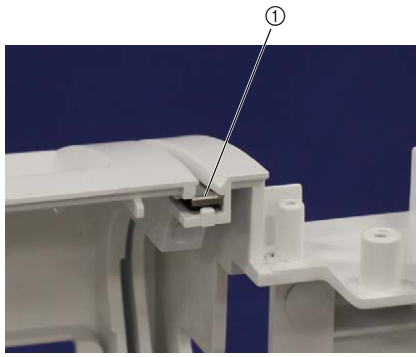
2-3 Attachment of Thread guide wire

1. Attach the thread guide wire ① to the front cover assy..



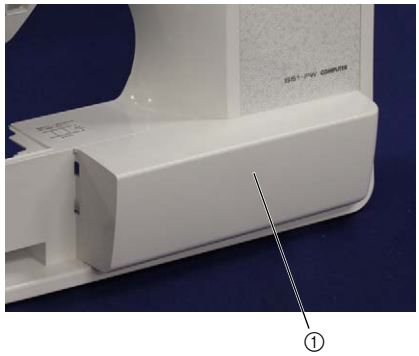
2-4 Attachment of Front cover thread guard

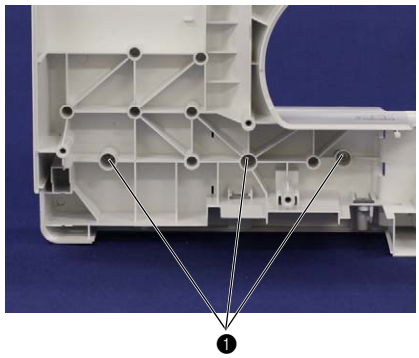
1. Attach the front cover thread guard ① to the front cover assy..

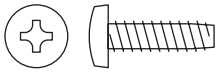


2-5 Attachment of Decoration cover

1. Set the decoration cover ① to the front cover assy. with the 3 screws ❶.



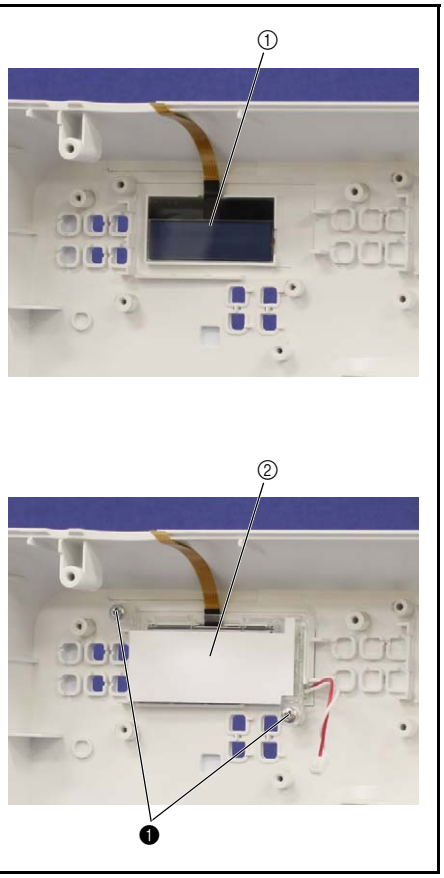


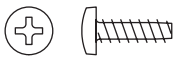
❶		Taptite, Bind B M4X14	Torque 0.78 – 1.18 N·m

2-6 Attachment of LCD

2-6-A "Square shape model" equipped with LCD backlight

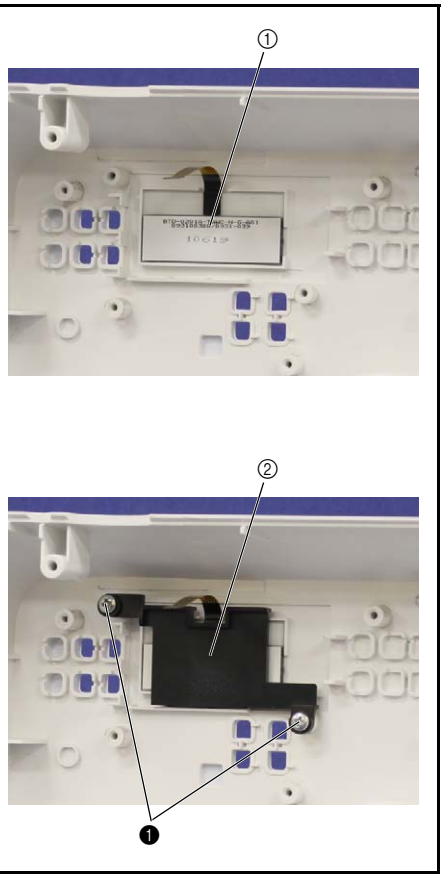
1. Set the LCD ① to the front cover assy..
2. Set the single light guide assy. ② to the front cover assy. with the 2 screws ❶.

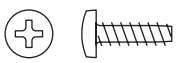


❶		Taptite, Bind B M3X10	Torque 0.39 – 0.78 N·m

2-6-B "Square shape model" not equipped with LCD backlight

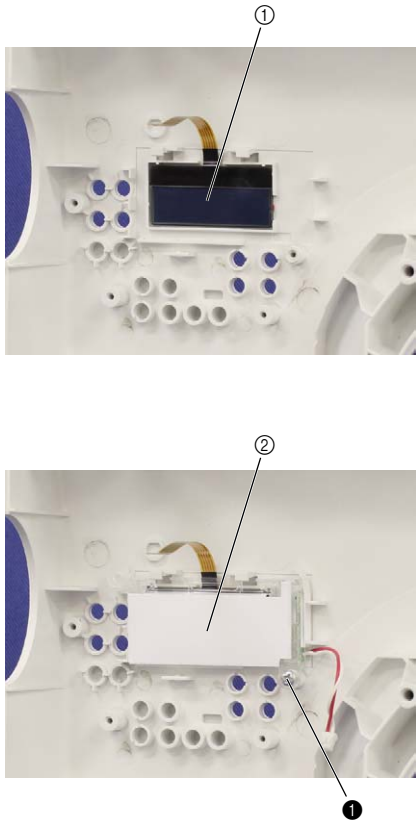
1. Set the LCD ① to the front cover assy..
2. Set the LCD holder ② to the front cover assy. with the 2 screws ❶.

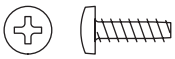


❶		Taptite, Bind B M3X10	Torque 0.39 – 0.78 N·m

2-6-C “Curvy shape model” equipped with LCD backlight

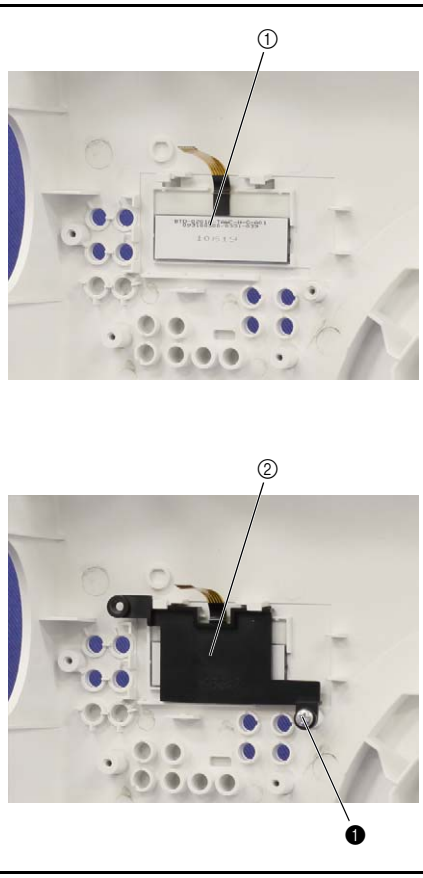
1. Set the LCD ① to the front cover assy..
2. Set the single light guide assy. ② to the front cover assy. with the screw ❶.

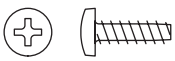


❶		Taptite, Bind B M3X10	Torque 0.39 – 0.78 N·m

2-6-D “Curvy shape model” not equipped with LCD backlight

1. Set the LCD ① to the front cover assy..
2. Set the LCD holder ② to the front cover assy. with the screw ❶.



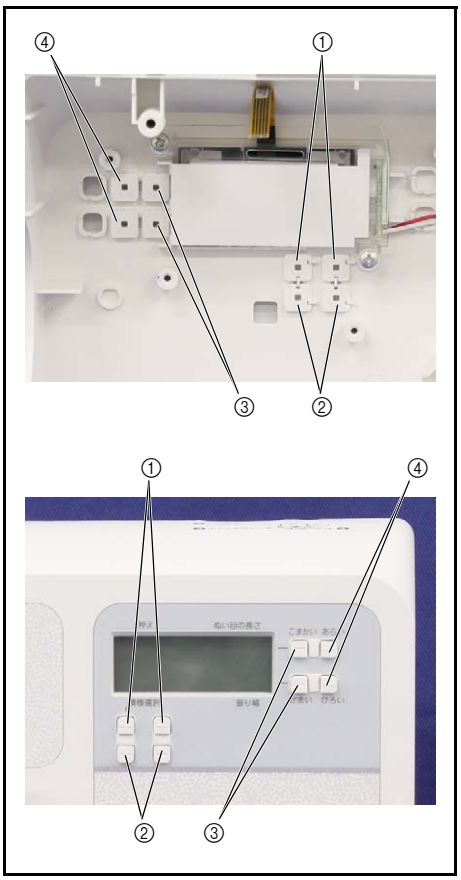
❶		Taptite, Bind B M3X10	Torque 0.39 – 0.78 N·m

2-7 Attachment of Selecting/Manual buttons

1. Set the 2 selecting button A ①, the 2 selecting button B ②, the 2 manual button A ③ and the 2 manual button B ④ to the front cover assy..

***Note**

- As for the LCD backlight PCB assy., it is not mounted by the model.

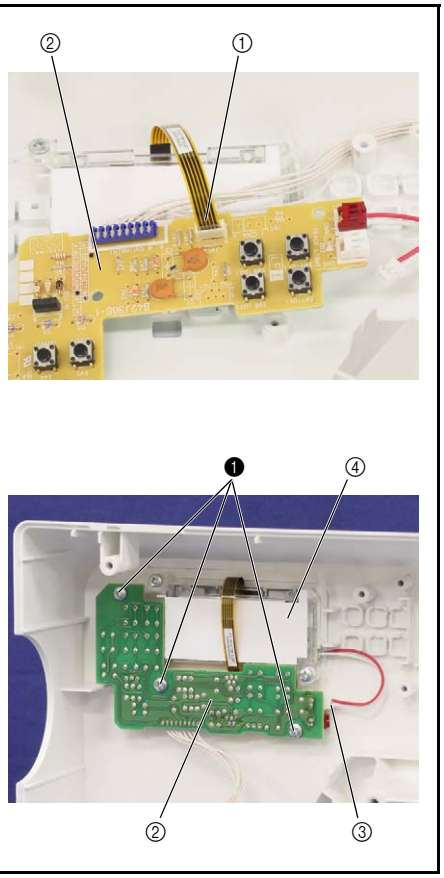


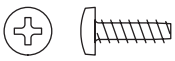
2-8 Attachment of Operation PCB assy

2-8-A “Square shape model” equipped with LCD backlight

1. Connect the flat cable ① of the LCD to the operation PCB assy. ②.
2. Set the operation PCB assy. ② to the front cover assy. with the 3 screws ❶.

   ***Key point**
   - Check that contact the selecting/manual buttons to each switch of the operation PCB assy. ②.
3. Connect the connector ③ of the single light guide assy. ④ to the operation PCB assy. ②.

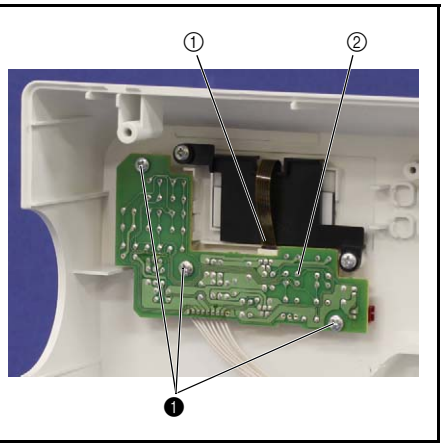


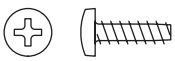
❶		Taptite, Bind B M3X10	Torque 0.59 – 0.78 N·m

2-8-B “Square shape model” not equipped with LCD backlight

1. Connect the flat cable ① of the LCD to the operation PCB assy. ②.
2. Set the operation PCB assy. ② to the front cover assy. with the 3 screws ❶.

   ***Key point**
   - Check that contact the selecting/manual buttons to each switch of the operation PCB assy. ②.

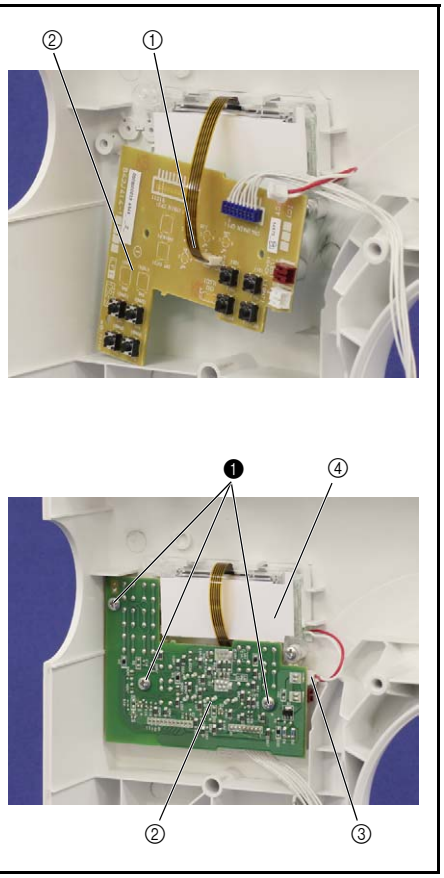


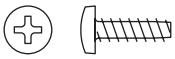
❶		Taptite, Bind B M3X10	Torque 0.59 – 0.78 N·m

2-8-C “Curvy shape model” equipped with LCD backlight

1. Connect the flat cable ① of the LCD to the operation PCB assy. ②.
2. Set the operation PCB assy. ② to the front cover assy. with the 3 screws ❶.

   ***Key point**
   - Check that contact the selecting/manual buttons to each switch of the operation PCB assy. ②.
3. Connect the connector ③ of the single light guide assy. ④ to the operation PCB assy. ②.

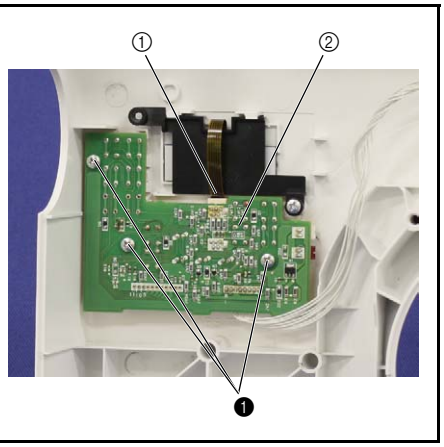


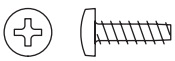
❶		Taptite, Bind B M3X10	Torque 0.59 – 0.78 N·m

2-8-D “Curvy shape model” not equipped with LCD backlight

1. Connect the flat cable ① of the LCD to the operation PCB assy. ②.
2. Set the operation PCB assy. ② to the front cover assy. with the 3 screws ❶.

   ***Key point**
   - Check that contact the selecting/manual buttons to each switch of the operation PCB assy. ②.



❶		Taptite, Bind B M3X10	Torque 0.59 – 0.78 N·m

2-9 Attachment of SV keytop

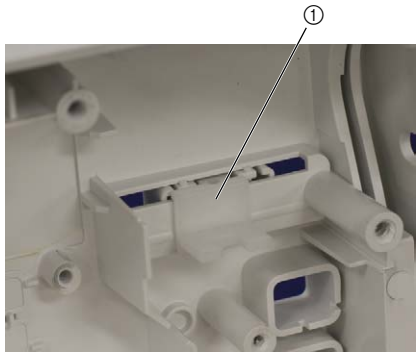
1. Set the SV joint plate ① to the front cover assy..
2. Set the SV keytop ② to the front cover assy..

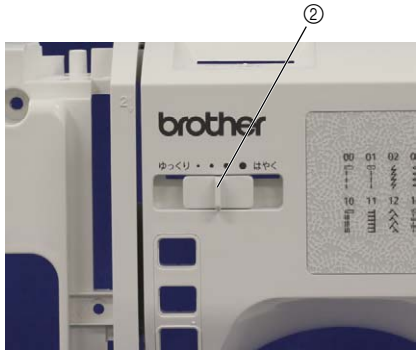
***Key point**

- Check that the 2 ribs of the SV keytop ② engaged with the 2 positioning holes of the SV joint plate ①.

***Note**

- As for the SV keytop ②, it is not mounted by the model.



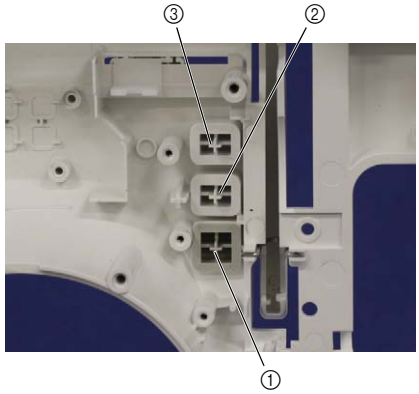


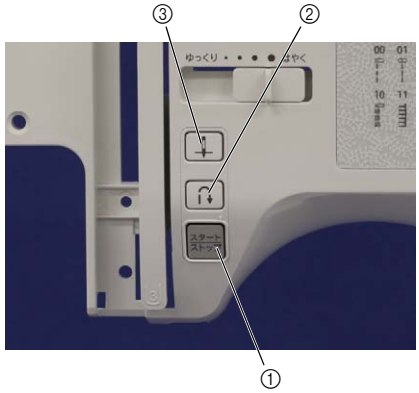
2-10 Attachment of SS/Reverse/NP buttons

1. Set the SS button ①, the reverse button ② and the NP button ③ to the front cover assy..

***Note**

- As for the SS button ① and the NP button ③, it is not mounted by the model.





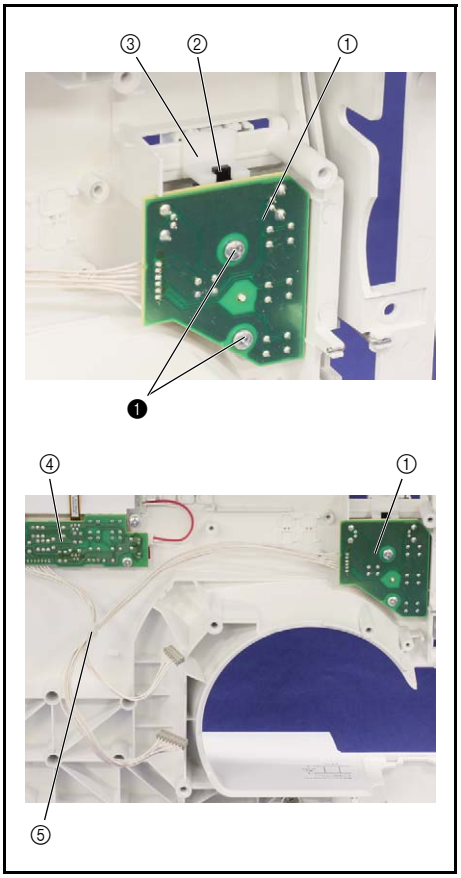
2-11 Attachment of SSVR PCB assy

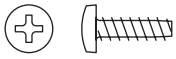
1. Set the SSVR PCB assy. ① to the front cover assy. with the 2 screws ❶.

   ***Key point**
   - Check that the speed volume ② engaged with the groove of the SV joint plate ③.
   - Check that the contact each button to each switch of the SSVR PCB assy. ①.

2. Bind the lead wires of the SSVR PCB assy. ① and the operation PCB assy. ④ with the band ⑤.

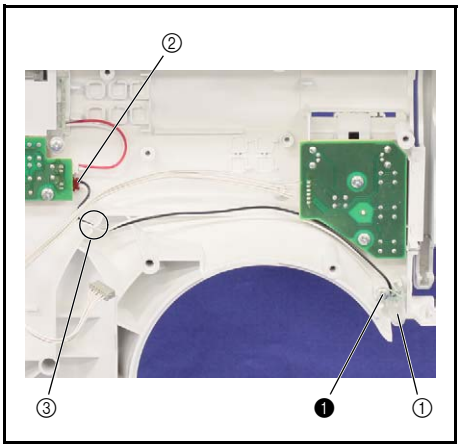
   ***Key point**
   - Refer to "Special Instructions of Wiring".

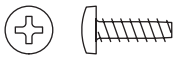


❶		Taptite, Bind B M3X10	Torque 0.59 – 0.78 N·m

2-12 Attachment of LED lamp assy

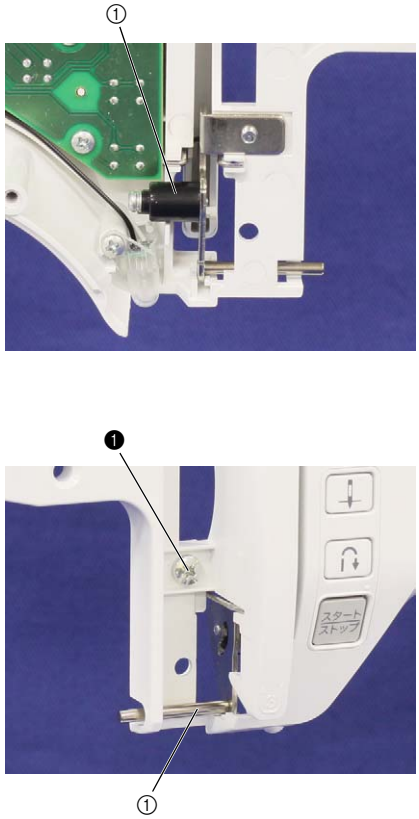
1. Set the LED lamp assy. ① to the front cover assy. with the screw ❶.
2. Connect the connector ② of the LED lamp assy. ① to the operation PCB sub assy..
3. Hang the lead wire of the LED lamp assy. ① on the slit ③ of the front cover assy..



❶		Taptite, Bind B M3X10	Torque 0.39 – 0.78 N·m

2-13 Attachment of Thread take-up holder B

1. Set the thread take-up holder B ① to the front cover assy. with the screw ❶.



❶		Screw, Bind M4X6	Torque 0.78 – 1.18 N·m

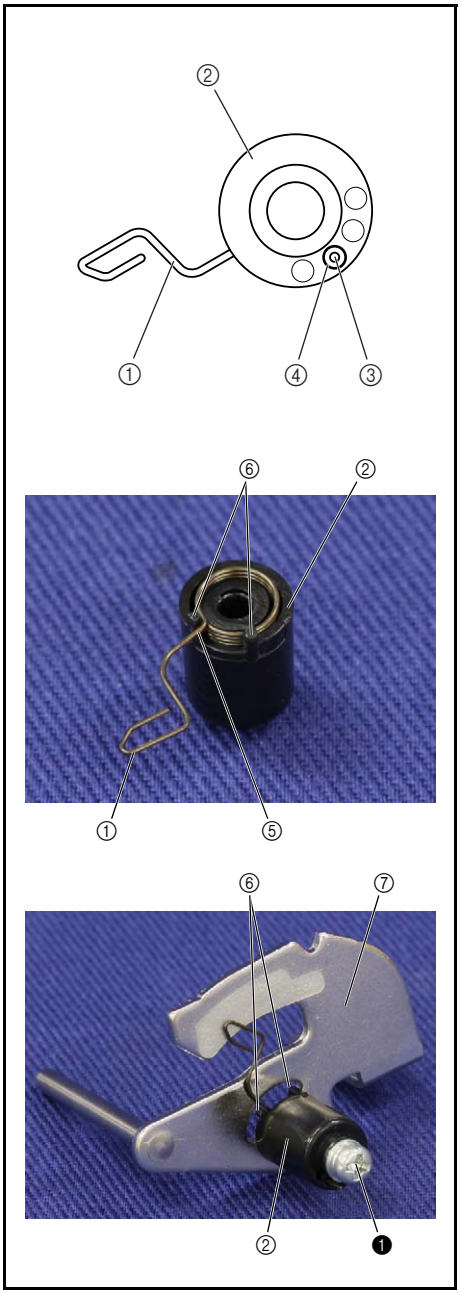
2-13-1Assembly of Thread take-up holder B

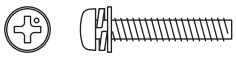
1. Set the thread take up spring ① to the thread catching spring case ②.

   ***Key point**
   - Insert the section ③ of the thread take up spring ① into the hole ④ of the thread catching spring case ②.
   - Check that there is the section ⑤ of the thread take up spring ① in between the 2 ribs ⑥ of the thread catching spring case ②.

2. Set the thread catching spring case ② to the thread take-up holder B ⑦ with the screw ❶.

   ***Key point**
   - Check that align the 2 ribs ⑥ of the thread catching spring case ② with the elongate hole of the thread take-up holder B ⑦.

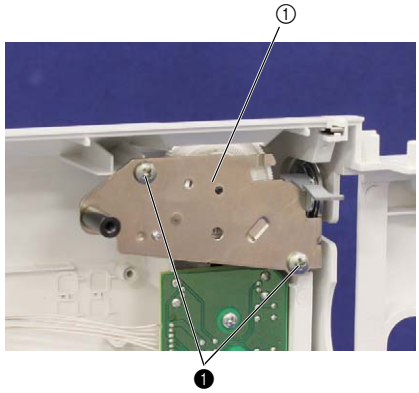


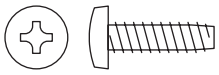
❶		Screw, Pan (S/P washer) M3X18	Torque 0.29 – 0.49 N·m

Application

2-14 Attachment of Thread tension holder A assy

1. Set the thread guide A assy. ① to the front cover assy. with the 2 screws ❶.



❶		Taptite, Bind B M4X14	Torque 0.78 – 1.18 N·m

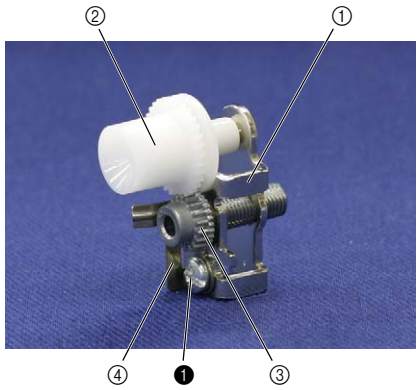
2-14-1 Assembly of Thread tension holder A assy

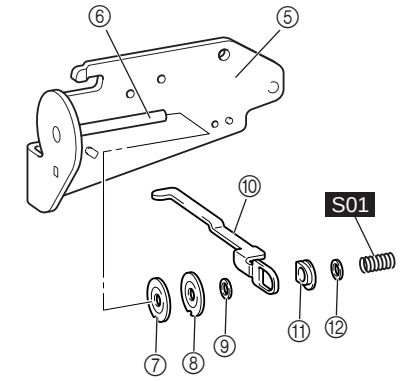
1. Insert the thread tension adjusting gear ② into the shaft of the thread tension plate assy. ①, and then set the thread tension adjusting screw ③.
2. Set the adjusting screw spring plate ④ to the thread tension plate assy. ① with the screw ❶.
3. Insert the tension disc A ⑦, the tension disc B ⑧, the washer ⑨, the thread release plate ⑩, the tension disc washer ⑪, the washer ⑫ and the spring S01 in this order into the shaft ⑥ of the thread tension holder A assy. ⑤.

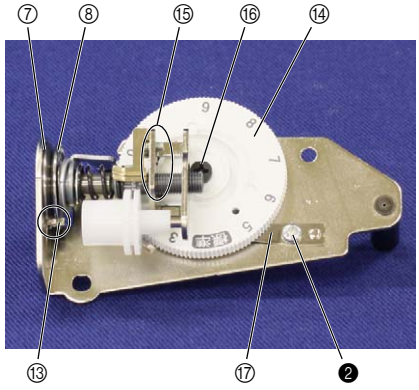
   ***Key point**
   - Check that align the notch part of the tension disc A ⑦ and the tension disc B ⑧ with the protrusion ⑬ of the thread tension holder A assy..
4. Engage the groove part ⑮ of the thread tension dial ⑭ with the protrusion of the thread tension plate assy. ①, and insert the thread tension adjusting screw ③ into the shaft, and then set the thread tension dial ⑭ to the thread tension holder A assy. with the tension dial shaft ⑯.

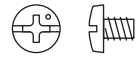
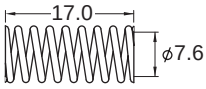
   ***Key point**
   - Set the tension dial shaft ⑯ to the thread tension dial ⑭ in the state that the [9] of the thread tension dial ⑭ is the upper side.
5. Set the notch spring ⑰ to the thread tension holder A assy. ⑤ with the screw ❷.

   ***Key point**
   - Attach the end of the notch spring ⑰ to the lower side of the thread tension dial ⑭.
   - Check that the boss part of the thread tension holder A assy. engaged with the positioning hole of the notch spring ⑰.







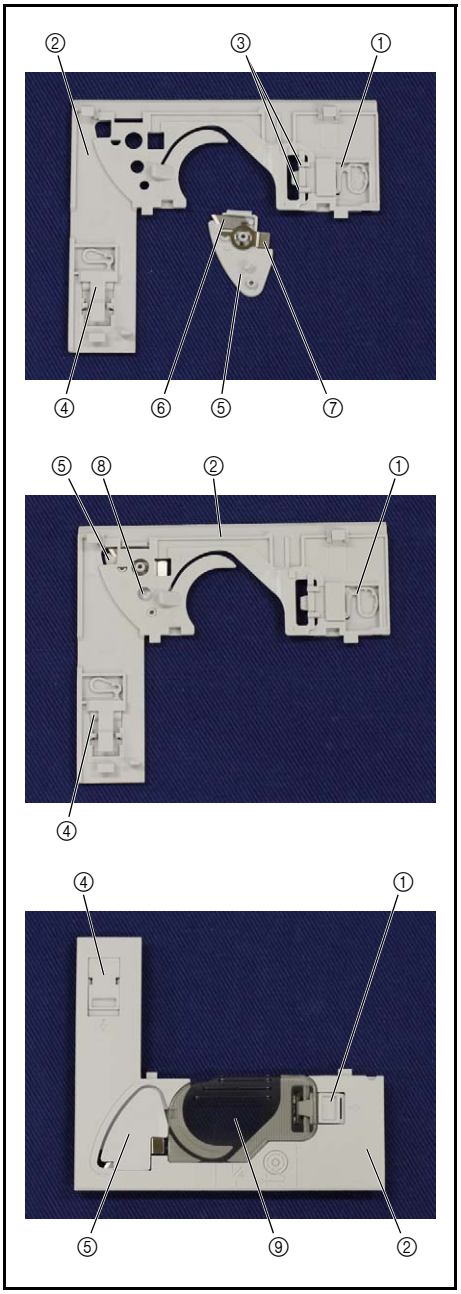
❶		Screw, Bind M3X4	Torque 0.78 – 1.18 N·m
❷		Screw, Pan M3X4	Torque 0.78 – 1.18 N·m
S01			Spring XE3014***

3 Assembly of Needle plate B assy

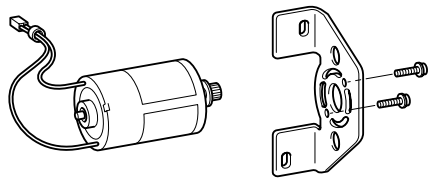
1. Remove the slide button ① to the needle plate B assy. ②.

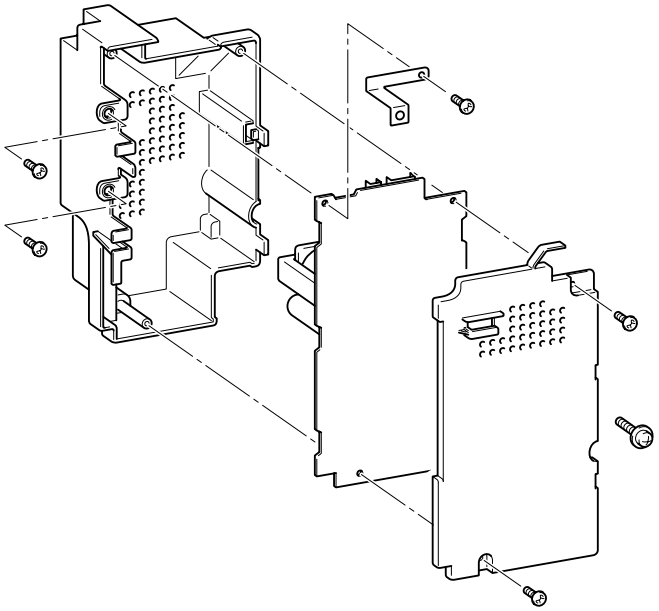
   ***Key point**
   - Check that hang the 2 hooks ③ on the needle plate B assy. ②.
2. Attach the slide button B ④ to the needle plate B assy. ②.
3. Attach the NT lower thread cutter ⑥ and the spring plate ⑦ to the cutter cover ⑤.
4. Attach the cutter cover ⑤ to the needle plate B assy. ②

   ***Key point**.
   - Check that hang the hook ⑧ on the needle plate B assy. ②.
5. Attach the needle plate cover ⑨ to the needle plate B assy. ②.



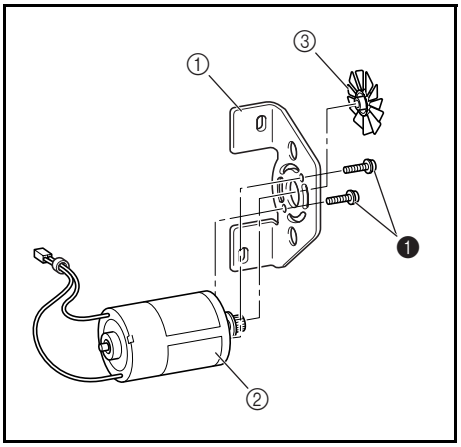
Electrical parts and motors location diagram





1 Assembly of Main motor assy

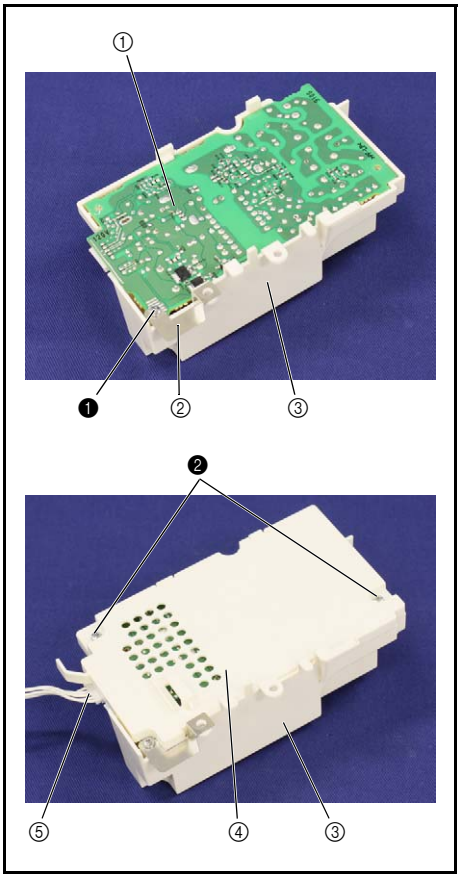
1. Attach the main motor ② to the motor holder ① with the 2 screws ❶
1. Attach the motor fan ③.



❶	Screw, Pan (S/P washer) M3X8DB	Torque 0.59 – 0.78 N·m

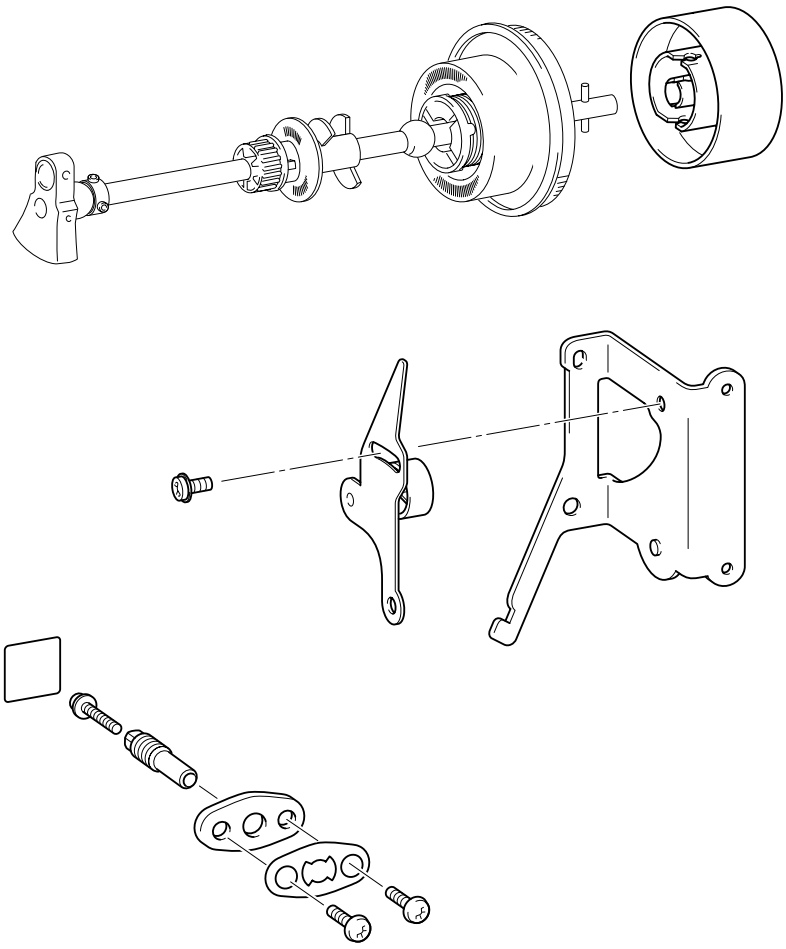
2 Assembly of Power supply unit

1. Set the power supply PCB assy. ① and the power plate spring ② to the insulation cover ③ with the screw ❶.
2. Set the insulation plate ④ to the insulation cover ③ with the 2 screws ❷.
3. Connect the power lead wire assy . ⑤ to the power supply PCB assy. ①.



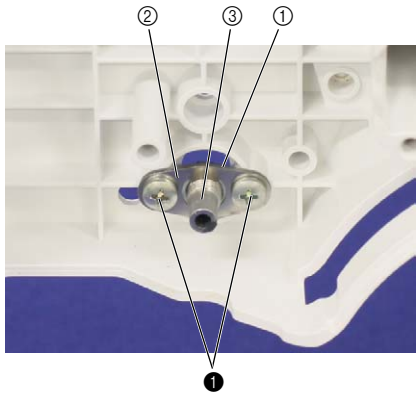
❶ ❷	Taptite, Bind B M3X10	Torque 0.39 – 0.78 N·m

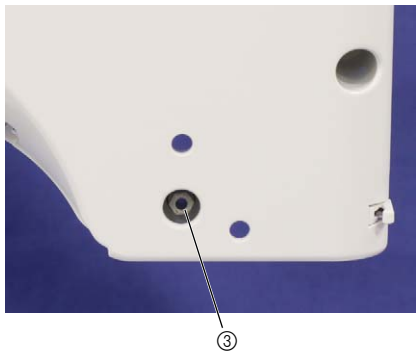
Needle bar, presser mechanism / Upper shaft mechanism location diagram



1 Attachment of Plate spring

1. Set the adjusting plate ① and the plate spring ② in this order from the inside of the rear cover assy. with the 2 screws ❶.
2. Fully tighten the adjusting screw ③ to the plate spring ②.

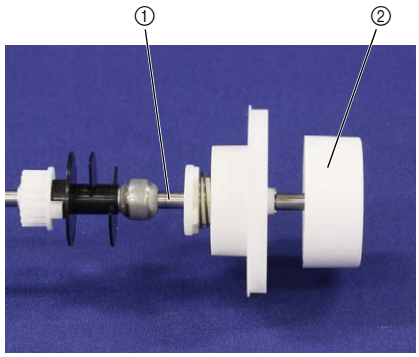




❶	Taptite, Bind B M4X10	Torque 0.78 – 1.18 N·m

2 Assembly of Upper shaft assy

1. Attach the pulley ② to the upper shaft assy. ①.

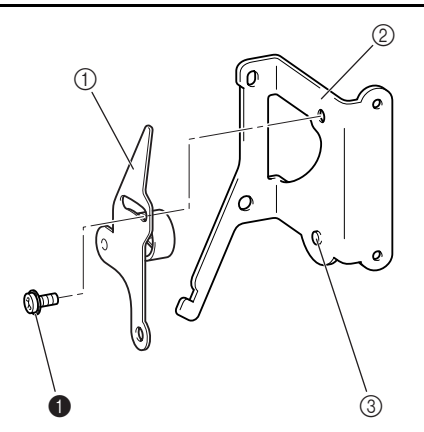


3 Assembly of Tension pulley assy

1. Align the boss ③ of the tension pulley holder ② with the hole of the tension pulley assy. ①, and then temporarily tighten the screw ❶.

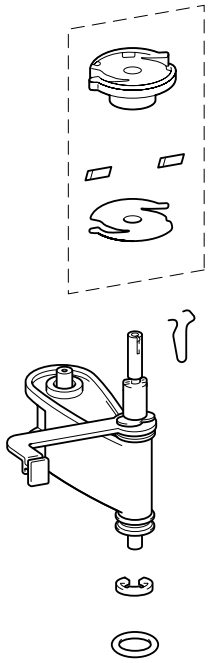
***Key point**

- Fully tighten the screw ❶ after performing "4 - 4 Adjustment : Timing belt tension".



❶	Screw, Pan (S/P washer) M4X8	Torque Hand start

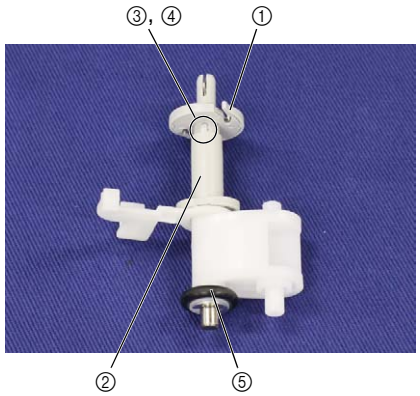
Bobbin winder mechanism location diagram



1 Attachment of Bobbin base assy

1. Attach the bobbin base assy. ① to the bobbin winder assy. ②.

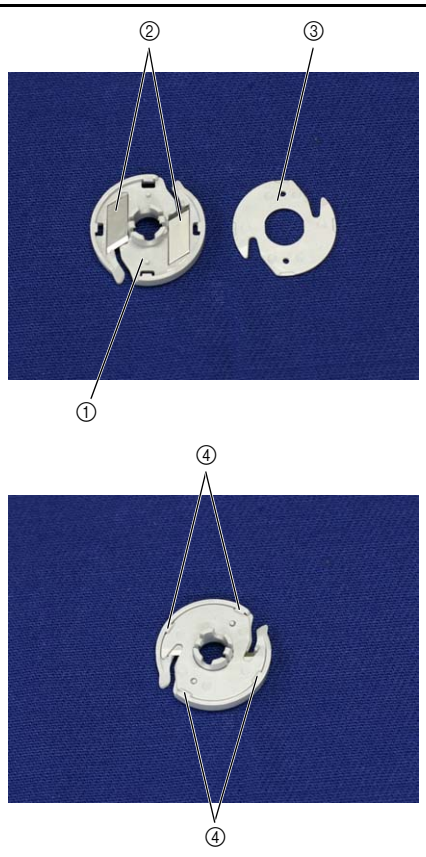
   ***Key point**
   - Check that the 2 gullets ③ of the bobbin base assy. ① engage with the 2 protrusions ④ of the bobbin winder.
2. Attach the rubber ring ⑤ to the bobbin winder wheel.



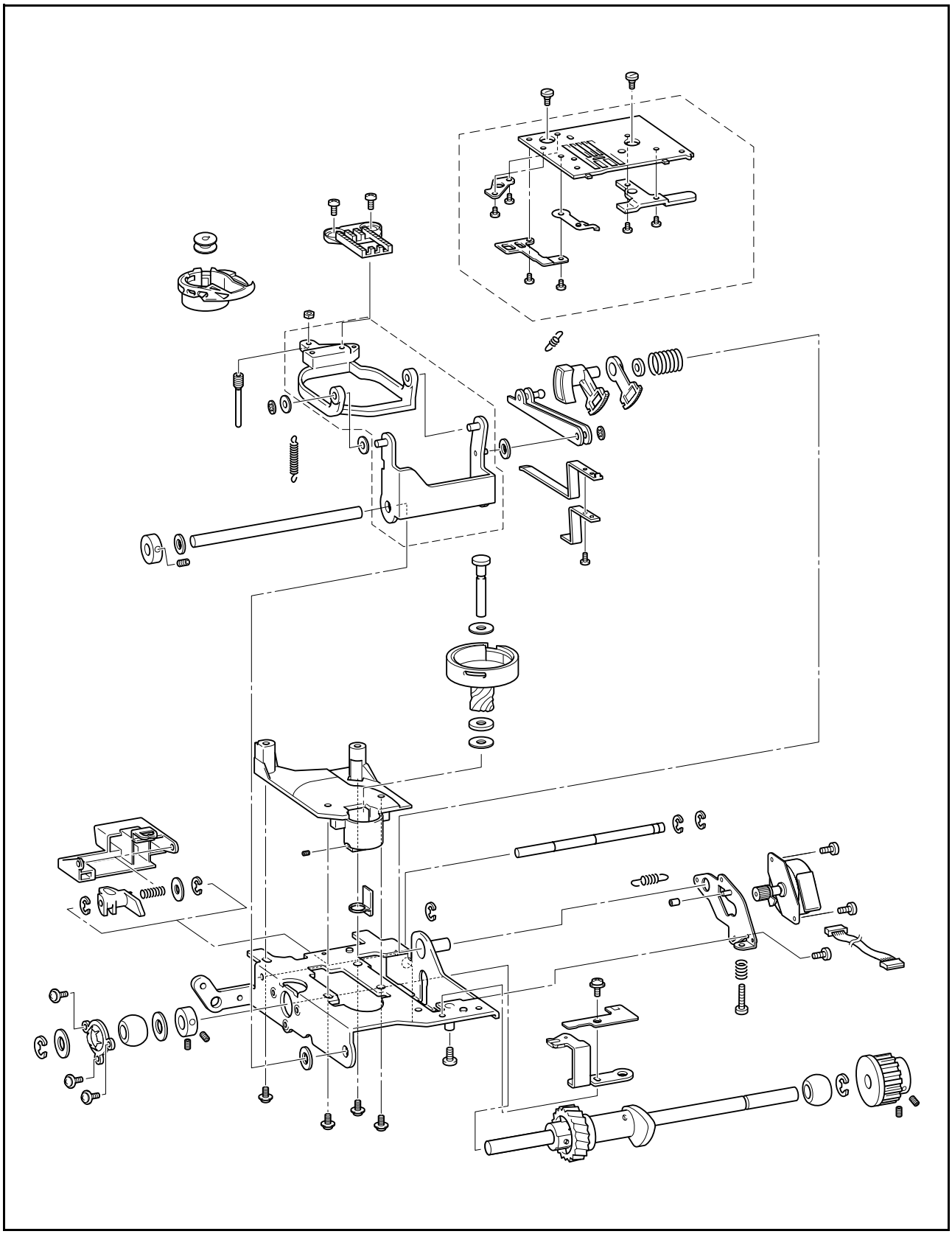
1-1 Assembly of Bobbin base assy

1. Attach the NT lower thread cutter ② to the bobbin base assy. ①.
2. Attach the bobbin thread cutter holder ③ to the bobbin base assy. ①.

   ***Key point**
   - Be careful not to damage the hooks ④ (4 locations).



Feed and rotary module location diagram



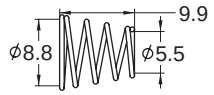
1 Attachment of Feed adjuster assy

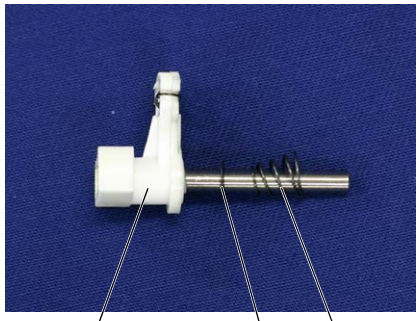
1. Insert the polyester slider ② and the spring S02 into the shaft of the feed adjuster assy. ①.

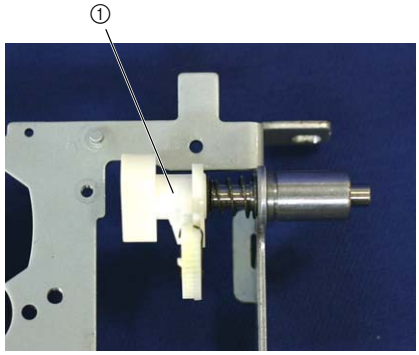
   ***Key point**
   - Insert the spring starting with the side having the smaller spring diameter.

2. Set the feed adjuster assy. ① to the base plate assy.

Lubricate the feed adjuster shaft with FBK OIL RO 100.	1-2 drops XC8388***
Apply EPNOC AP (N) 0 to the entire operating part of the feed adjuster feed regulator slide block.	Bead XC8387***

S02		Spring XC2531***





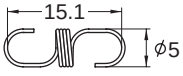
1-1 Assembly of Feed adjuster assy

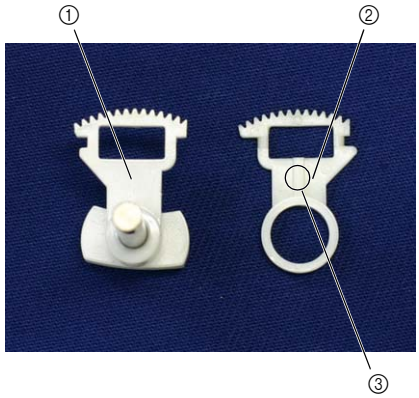
1. Set the F gear ② to the feed adjuster ①.

   ***Key point**
   - When set it as shown in the right figure, check that the protrusion ③ of the F gear ② is the upper side.

2. Attach the spring S03.

Apply EPNOC AP (N) 0 to the entire operating surface of the feed adjuster and F gear.	Small amount XC8387***

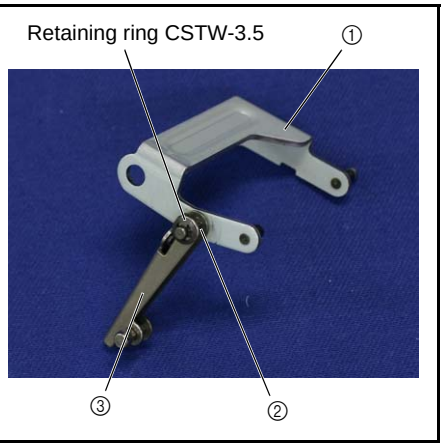
S03		Spring XC2530***



2 Attachment of Feed arm B assy

1. Set the polyester slider ② and the feed arm B assy. ③ to the shaft of the feed arm A assy. ①, and then attach the retaining ring CSTW-3.5.

Lubricate the feed arm A assy. shaft with FBK OIL RO 100.	1-2 drops XC8388***
Lubricate the feed arm B assy. shaft with FBK OIL RO 100.	1-2 drops XC8388***



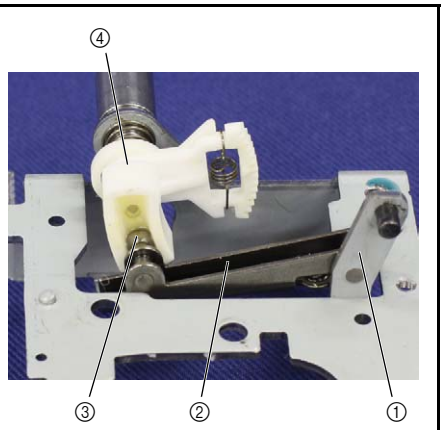
3 Attachment of Feed arm A assy

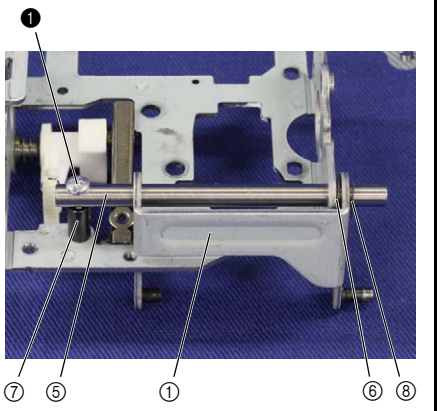
1. Insert the feed arm A assy. ① from the back side of the base plate assy., and then set the feed regulator slide shaft ③ of the feed arm B assy. ② to the groove of the feed adjuster ④.
2. Insert the horizontal feed shaft ⑤ into the feed arm A assy. ①, the "washer, thrust ⑥" and the base plate assy. from the right side, and then align the screw hole on the feed arm supporter shaft ⑦, and then attach it with the screw ❶.
3. Insert the "washer, thrust ⑧" and the set collar ⑨ into the horizontal feed shaft ⑤, and then attach it with the screw ❷.

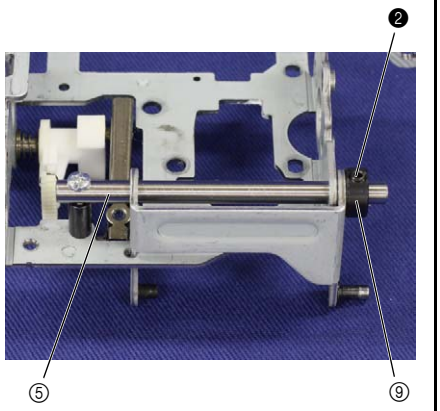
***Key point**

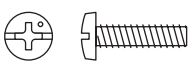
- Attach the feed arm A assy. ①, the "washer, thrust ⑥" and the "washer, thrust ⑧" so that it can sandwich with the base plate assy. and the set collar ⑨.
- Check that it is not a wobble, and it moves smoothly.

Apply OILER to the 2 sections where the horizontal feed shaft is inserted in feed arm A.	Each 1-2 drops XZ0206***







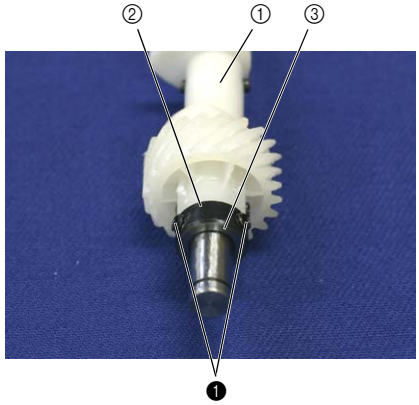
❶		Screw, Bind M3X12	Torque 0.78 – 1.18 N·m
❷		Set Screw, Socket (CP) M4X4	Torque 0.78 – 1.18 N·m

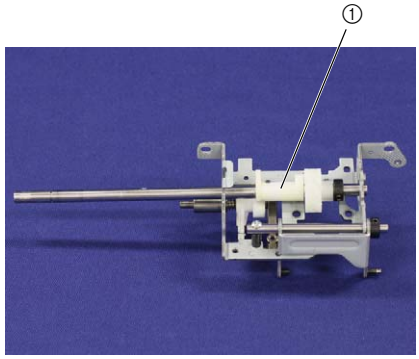
4 Attachment of Lower shaft assy

1. Insert the set collar ② to the lower shaft assy. ①, and then tighten the 2 screws ❶ temporarily.

   ***Key point**
   - Check that the cut surface ③ of the set collar ② is the out side.
   - Fully tighten the screw ❶ after performing "3-70 Attachment of Bushing presser B"".

2. Set the lower shaft assy. ① to the base plate assy.





❶		Set Screw, Socket (CP) M4X4	Torque 0.78 – 1.18 N·m

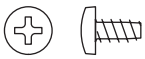
5 Attachment of Bushing presser B

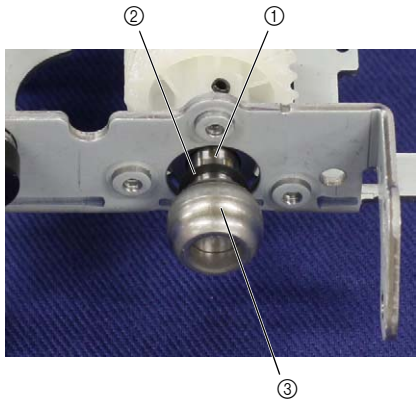
1. Insert the “washer, thrust ②” and the lower shaft bushing ③ into the lower shaft assy. ①.
2. Set the bushing presser B ④ to the base plate assy. with the 3 screws ❶.
3. Insert the “washer, thrust ⑤” into the lower shaft assy. ①, and then attach the retaining ring E6.
4. Sandwich the lower shaft bushing ③ with the retaining ring E6 and the set collar ⑥ and then tighten the 2 screws ❷.

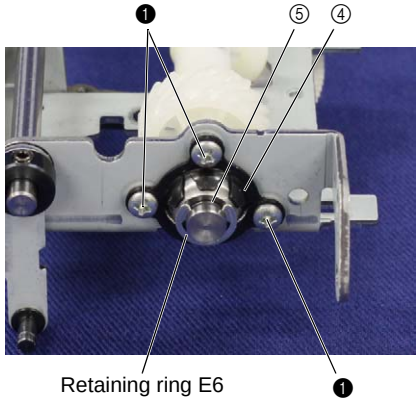
***Key point**

- Check that the lower shaft assy. ① is not a wobble, and it moves smoothly.

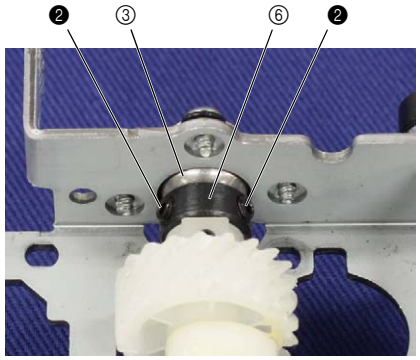
Lubricate the lower shaft bushing round surface with FBK OIL RO 100.	1-2 drops XC8388***
Apply MOLYKOTE EM30L to all of the teeth around the lower shaft gear.	Small amount XC8385***

❶		Taptite, Bind B M3X6	Torque 0.39 – 0.78 N·m
❷		Set Screw, Socket (CP) M4X4	Torque 0.78 – 1.18 N·m





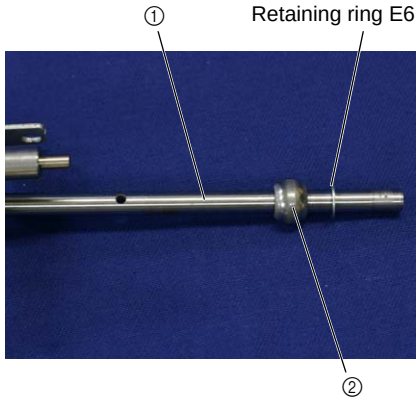
Retaining ring E6 ❶



6 Attachment of Upper shaft bushing

1. Insert the upper shaft bushing ② into the lower shaft assy. ①, and then attach the retaining ring E6.

Lubricate the upper shaft bushing with the OILER.	1-2 drops XZ0206***



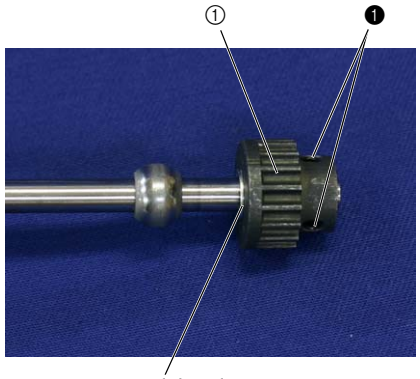
7 Attachment of Timing pulley D

1. Insert the timing pulley D ① into the lower shaft assy. and then tighten the 2 screws ❶ temporarily.

***Key point**

- Insert it until the timing pulley D ① hits the retaining ring E6.
- Fully tighten the screw ❶ after performing "4 - 10 Adjustment : Needle bar rising".

❶		Set Screw, Socket (CP) M5X5	Torque Hand start



Retaining ring E6

8 Attachment of Feed supporting plate

1. Set the feed supporting plate ① to the feed arm B assy. ②.

***Key point**

- Check that the protrusion ③ of the feed supporting plate ① engaged with the groove ④ of the feed arm B assy. ②.

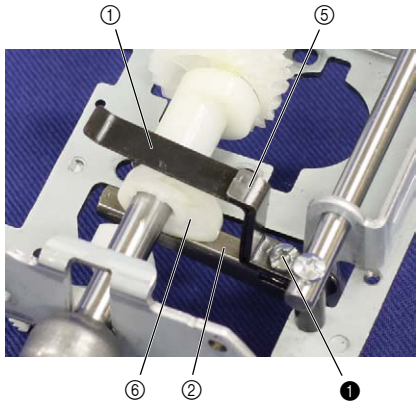
2. Set the feed supporting plate B ⑤ to the feed supporting plate ①, attach the feed arm B assy. ② with the screw ❶.

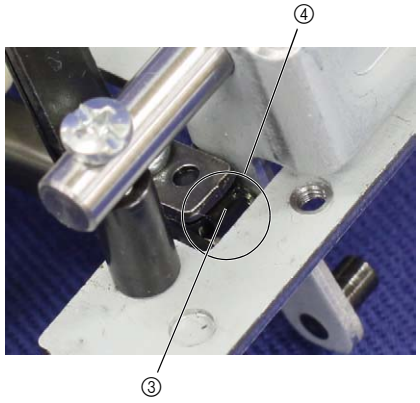
***Key point**

- Check that the boss of the feed supporting plate B ⑤ engaged with the positioning hole of the feed supporting plate ①.
- Check that sandwich the feed cam ⑥ with the feed supporting plate ① and the feed arm B assy. ②.

Apply EPNOC AP (N) 0 to the horizontal feed cam surface.	Small amount XC8387***

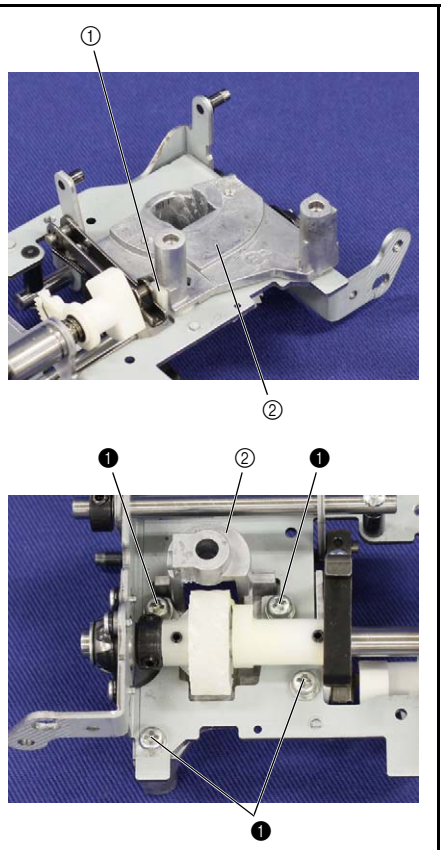
❶		Screw, Bind M3X6	Torque 0.78 – 1.18 N·m





9 Attachment of Shaft supporter

1. Set the feed arm supporter ① and the shaft supporter ② to the base plate assy. with the 4 screws ❶.



❶		Screw, Pan (S/P washer) M4X8	Torque 1.37 – 1.57 N·m

10 Attachment of Drop knob

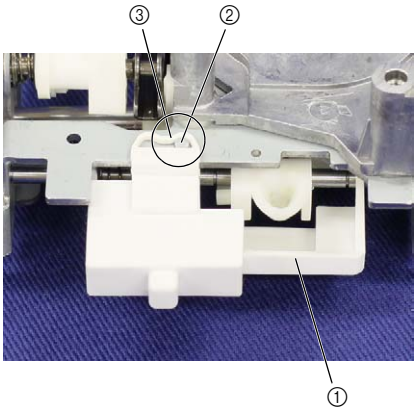
1. Set the drop knob ① to the base plate assy.

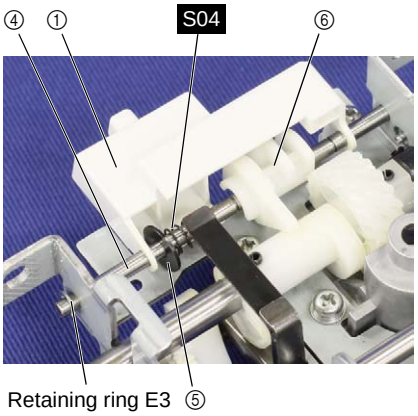
   ***Key point**
   - Attach it while lifting the section ③ of the drop knob ① to get over the boss part ② of the base plate assy.
2. Attach the retaining ring E3 to the vertical feed shaft ④.
3. Set the base plate assy. as shown in the right figure, and then insert the vertical feed shaft ④ into the base plate assy., the drop knob ①, the washer plain ⑤, the spring S04, the vertical lever ⑥, the drop knob ① and the base plate from the left side.

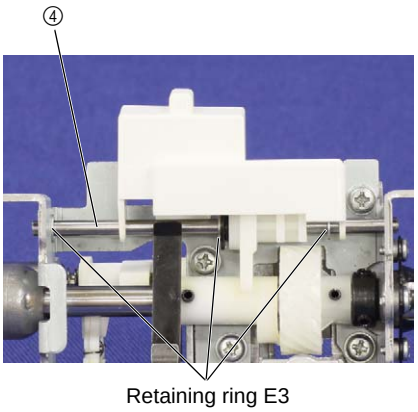
   ***Key point**
   - Insert it until the retaining ring hit the base plate assy.
4. Attach the 3 retaining rings E3 to the grooves (3 locations) of the vertical feed shaft ④.

Apply EPNOC AP (N) 0 to the sliding parts of the drop knob and the base plate assy.	Bead XC8387***
Lubricate the vertical feed shaft with the OILER.	1-2 drops XZ0206***
Apply EPNOC AP (N) 0 to the vertical feed cam surface Ⓐ.	Small amount XC8387***

S04		SPRING XC2550***



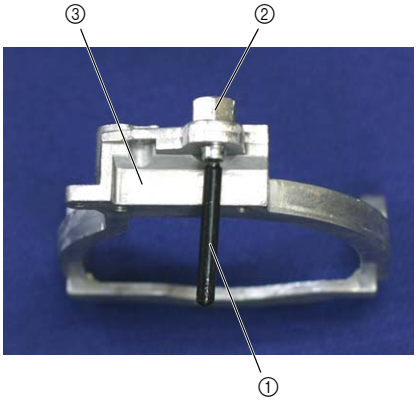




11 Attachment of Vertical adjuster screw assy

1. Attach the M5 nut ② to the vertical adjuster screw assy. ①.
2. Attach the vertical adjuster screw assy. ① to the feed bar ③.

   ***Key point**
   - Refer to "4 - 11 Adjustment : Needle bar height".



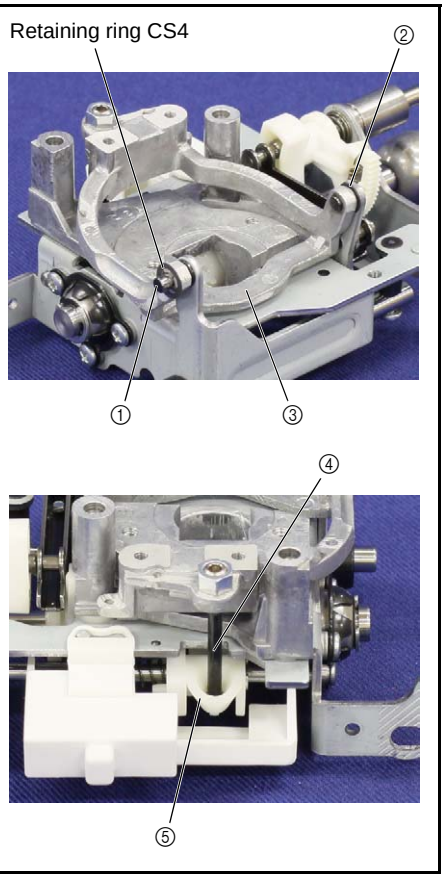
12 Attachment of Feed bar

1. Insert the polyester slider ② and the feed bar ③ into the shaft of the feed arm A assy. ①, and then attach the retaining ring CS4.

***Key point**

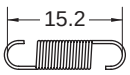
- Check that the vertical adjusting screw ④ engaged with the groove of the vertical lever ⑤.
- Check that there should no gap between the retaining ring CS4 and the feed bar ③.

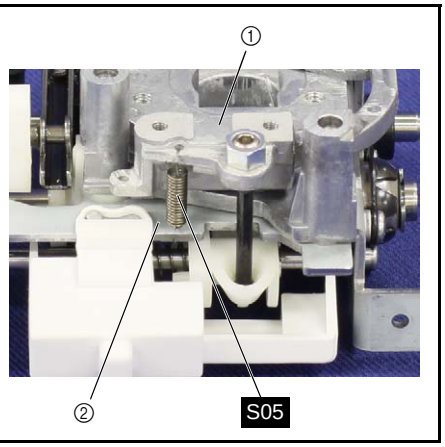
Apply EPNOC AP (N) 0 to the feed shaft hole in the feed bar.	Bead XC8387***
Apply EPNOC AP (N) 0 to the feed arm A assy.	Bead XC8387***
Apply EPNOC AP (N) 0 to the groove of the vertical lever.	Small amount XC8387***



13 Attachment of Spring

1. Attach the spring S05 to the feed bar ① and the base plate assy. ②.

S05		SPRING XE1940***

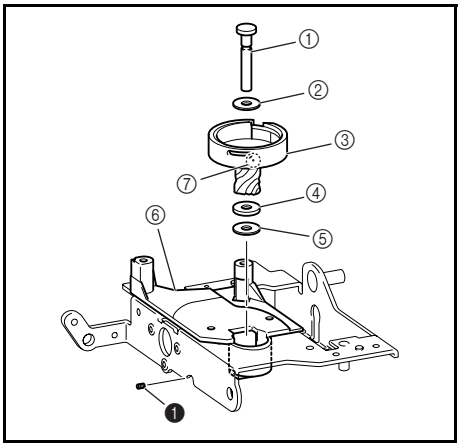


14 Attachment of Outer rotary hook assy

1. Insert the outer rotary hook shaft ① into the spacer ②, the outer rotary hook assy. ③, the washer 6 ④, the spacer ⑤ and the shaft supporter ⑥, and then attach it with the screw ❶.

***Key point**

- Turn the lower shaft so that the larger feed cam is at the rear and the hole on the lower shaft is at the vertical, and then attach so that the mark ⑦ on the outer rotary hook is at the front.



Apply MOLYKOTE EM30L to the shaft supporter surface.	Small amount XC8385***
Lubricate the outer rotary hook shaft with the OILER.	Apply liberally XZ0206***

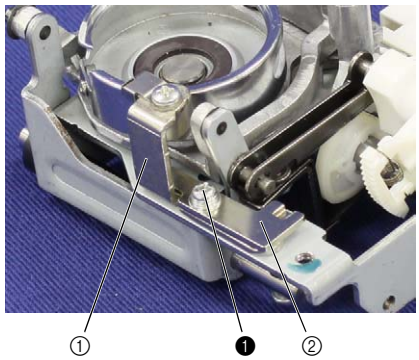
❶		Set Screw, Socket (CP) M4X6	Torque 0.78 – 1.18 N·m

15 Attachment of Inner rotary hook bracket assy

1. Set the inner rotary hook bracket assy. ① and the IRH bracket support plate ② to the base plate assy., and then temporarily tighten the screw ❶.

***Key point**

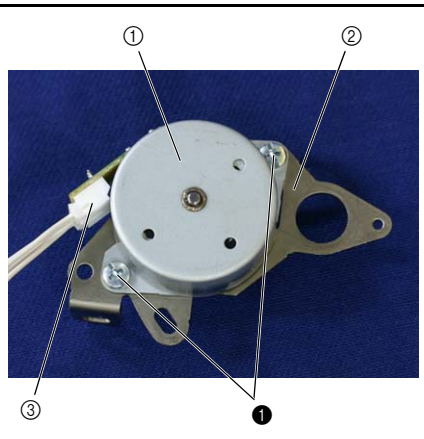
- Check that align the positioning hole of the inner rotary hook bracket assy. ① with the boss of the base plate assy..
- Refer to "4 - 21 Adjustment : Inner rotary hook bracket position".



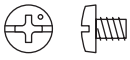
❶		Screw, Pan (S/P washer) M3X8DB	Torque Hand start

16 Attachment of F pulse motor

1. Set the F pulse motor ① to the FPM holder sub assy. ② with the 2 screws ❶.
2. Attach the “lead wire assy, FPM-LE ③” to the F pulse motor ①.



Lubricate the FPM bearing with FBK OIL RO 100.	1-2 drops XC8388***

❶		Screw, Bind M3X4	Torque 0.78 – 1.18 N·m

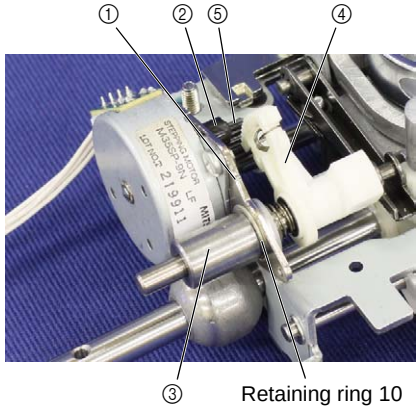
17 Attachment of FPM holder sub assy

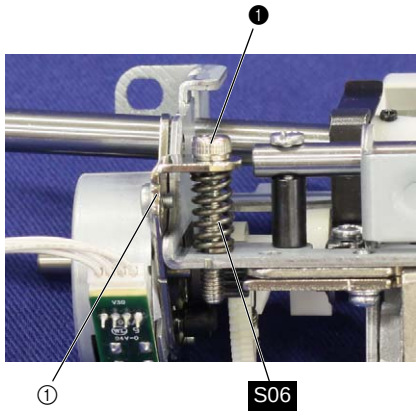
1. Attach the rubber ② from the FPM holder sub assy. ①.
2. Set the FPM holder sub assy. ① to the shaft ③ of the base plate assy., and then attach the retaining ring 10.

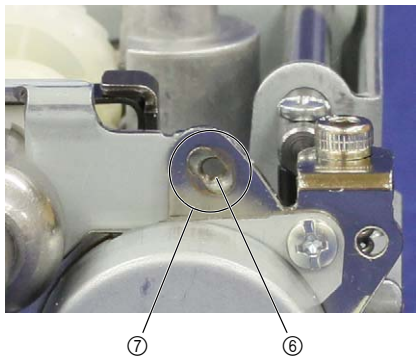
   ***Key point**
   - Check that the feed adjusting ④ is the upper side of the FPM gear ⑤.
3. Sandwich the spring S06 between the FPM holder sub assy. ① and the base plate assy., and then tighten the screw ❶.

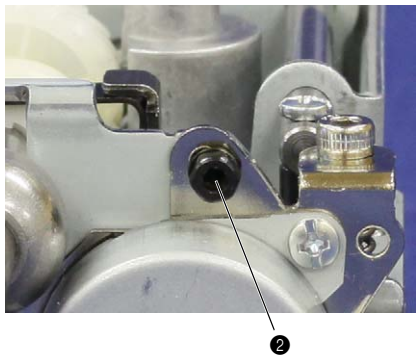
   ***Key point**
   - Tighten the screw ❶ until the screw hole ⑥ in the base plate assy. comes approximately to the center of the positioning hole ⑦ in the FPM holder sub assy. ①.
4. Tighten the screw ❷ temporarily.

   ***Key point**
   - Fully tighten the screw ❷ after performing "4 - 15 Adjustment : Feed forward/backward".









❶	Bolt, Socket M4X25	Torque —
❷	Screw 3X8	Torque Hand start
S06	21, ø5	SPRING XC2537***

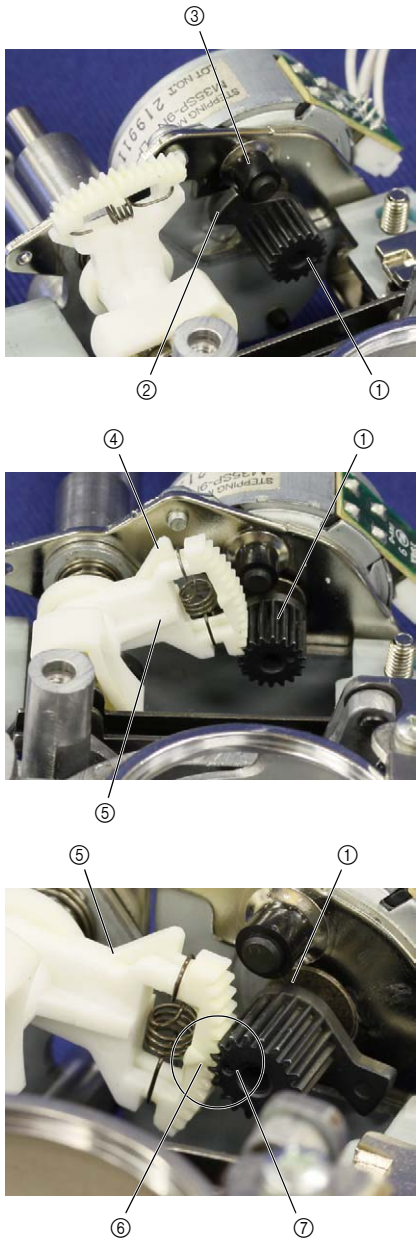
18 Alignment of F gear teeth

1. Turn the F pulse motor gear ① clockwise until the stopper ② of the F pulse motor gear ① on it touches the rubber ③.
2. Align the teeth of the feed adjusting assy. ④ with the teeth of the F gear ⑤, and then mesh it and the F pulse motor gear ①.

***Key point**

- Check that the match mark ⑥ of the F gear ⑤ and the match mark ⑦ of the F pulse motor gear ① are together.

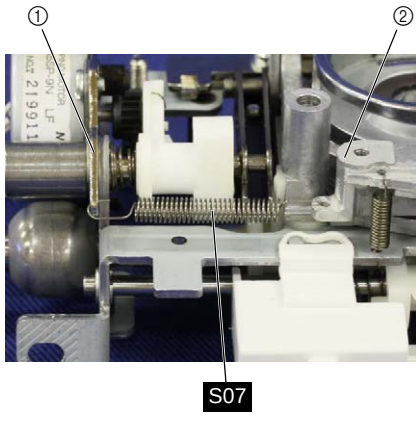
Apply EPNOC AP (N) 0 to the all of the teeth on the feed adjusting assy. F gear.	Bead XC8387***



19 Attachment of Spring

1. Attach the spring S07 to the FPM holder assy. ① and the feed bar ②.

S07	28.0 A decided hook form is same	SPRING XE1478***



Application

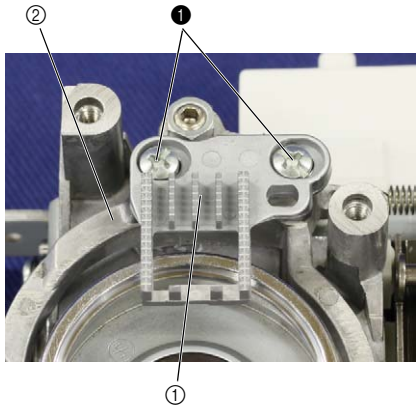
20 Attachment of Feed dog

1. Set the feed dog ① to the feed bar ②, and then tighten the 2 screws ❶ temporarily.

***Key point**

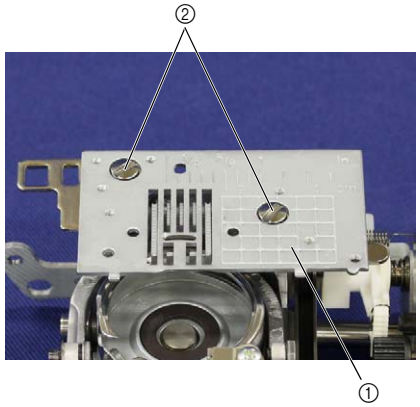
- Fully tighten the screw ❶ after performing "4 - 19 Adjustment : Front/back and left/right position of feed dog".

❶		Screw, Bind M3X6	Torque Hand start



21 Attachment of Needle plate A assy

1. Set the needle plate A assy. ① to the feed and rotary module with the 2 screw needle plates ②.



21-1 Assembly of Needle plate A assy

1. Set the F gear stopper plate ① to the needle plate A ② with the 2 screws ❶.

***Key point**

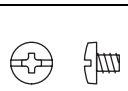
- Check that the boss part of the F gear stopper plate ① engaged with the positioning hole of the needle plate A ②.

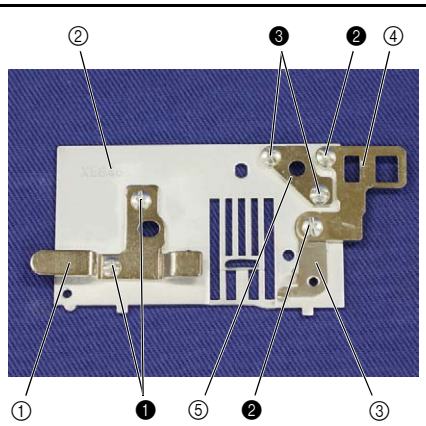
2. Set the stopper plate ③ and the needle plate B support plate ④ to the needle plate A assy. ② with the 2 screws ❷.

***Key point**

- Check that the boss of the stopper plate ③ engaged with the positioning hole of the needle plate A ②.

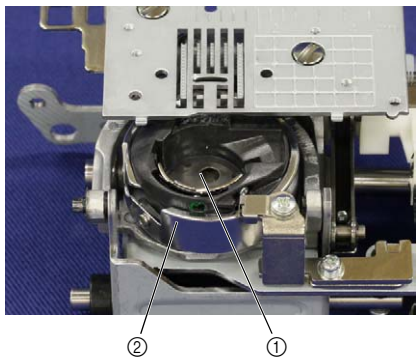
3. Set the needle plate holder ⑤ to the needle plate A assy. ② with the 2 screws ❸.

❶ ❷ ❸		Screw, Bind M2.6X3	Torque 0.59 – 0.78 N·m

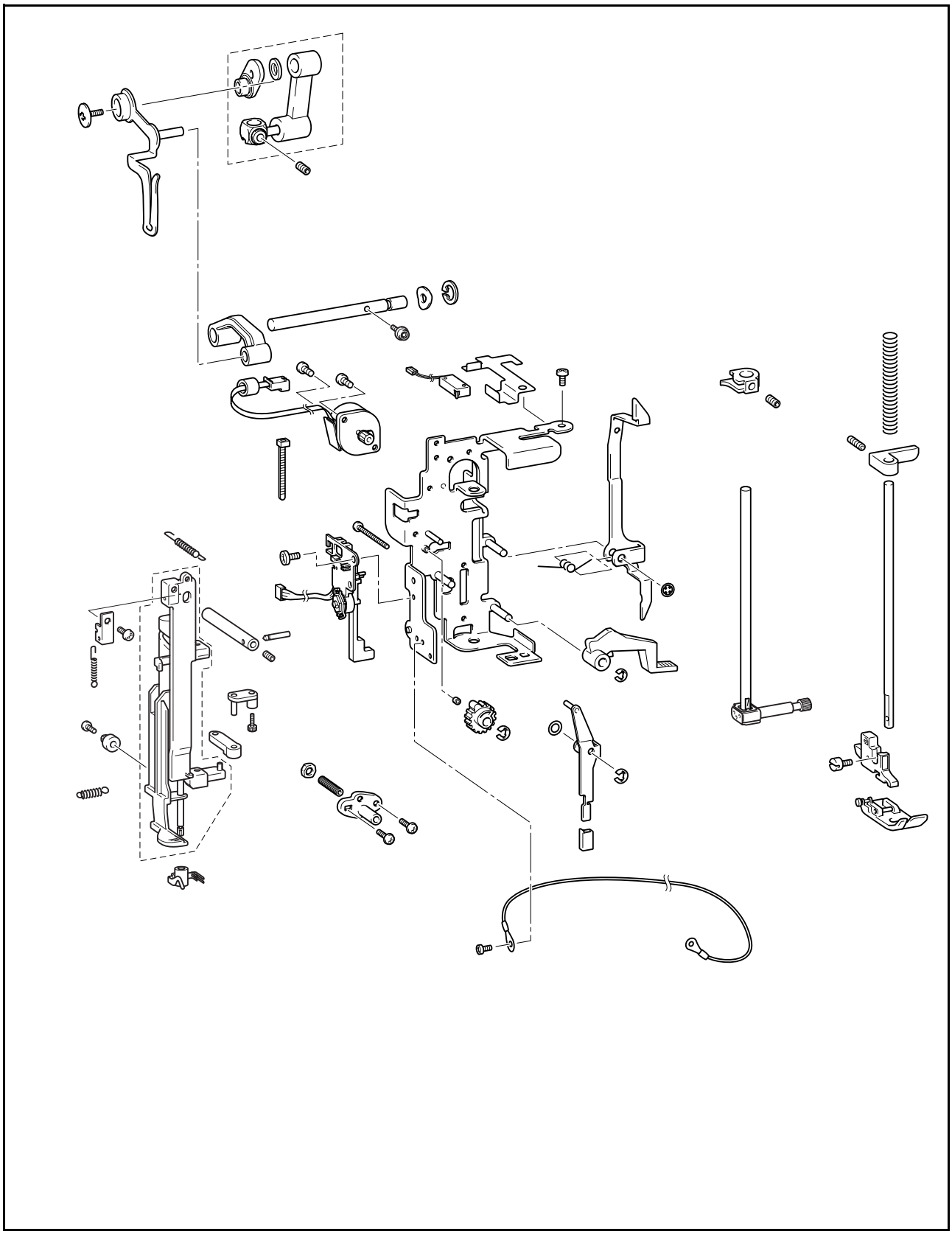


22 Attachment of Inner rotary hook assy

1. Set the inner rotary hook assy. ① to the outer rotary hook assy. ②.

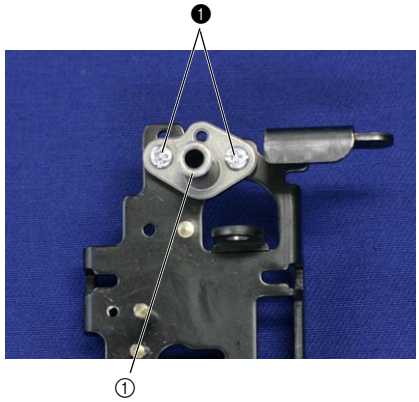


Needle-presser module location diagram



1 Attachment of Shaft bushing

1. Set the shaft bushing ① to the base holder assy. with the 2 screws ❶.



❶		Screw, Bind M3X6	Torque 0.78 – 1.18 N·m

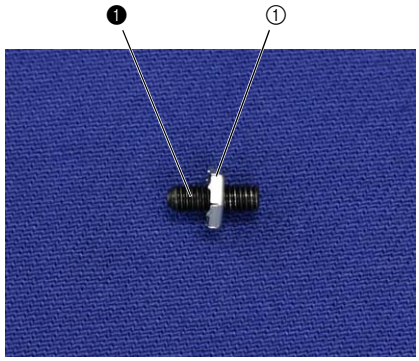
2 Attachment of Lock nut

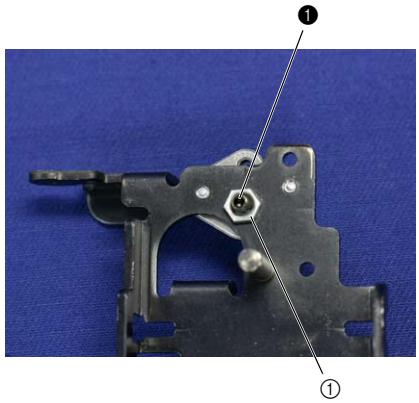
1. Attach the lock nut ① with the screw ❶.

   ***Key point**
   - Tighten the lock nut ① to about half of the screw ❶.

2. Attach the screw ❶ to the base holder assy..

   ***Key point**
   - Tighten it until the lock nut ① hit the base holder assy..
   - Refer to "4-18 Adjustment : Needle and presser foot front/back position".

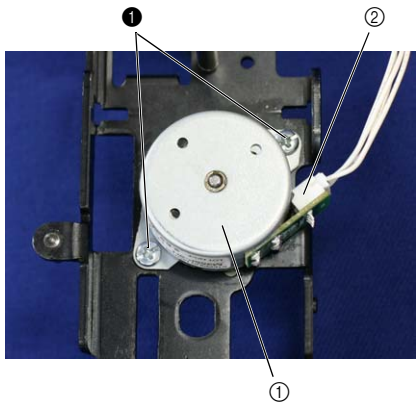




❶		Set Screw, Socket (CP) M4X12	Torque 0.39 – 0.49 N·m

3 Attachment of Z pulse motor

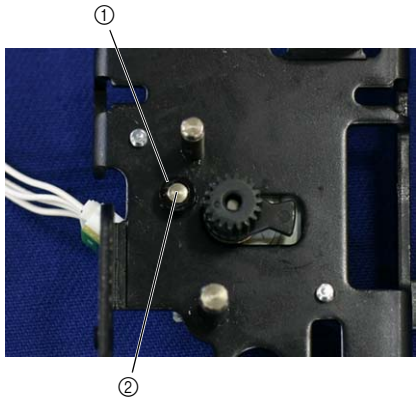
1. Attach the Z pulse motor ① to the base holder assy. with the 2 screws ❶.
2. Attach the lead wire sub assy. ② to the Z pulse motor ①.



❶		Screw, Bind M3X6	Torque 0.78 – 1.18 N·m

4 Attachment of Rubber

1. Attach the rubber ① to the shaft ② of the base holder assy..

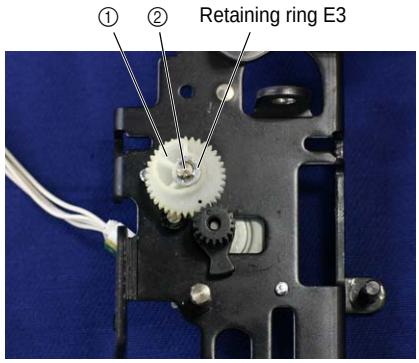


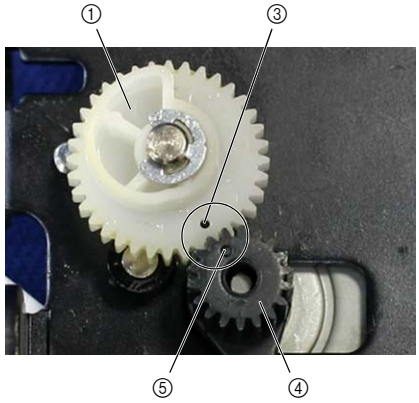
5 Attachment of Z zigzag cam

1. Set the Z zigzag cam ① to the shaft ② of the base holder assy..

   ***Key point**
   - Check that the match mark ③ on the Z zigzag cam ① Align the match mark ⑤ on the Z pulse motor gear ④.
2. Attach the retaining ring E3 to the shaft ② of the base holder assy..

Apply EPNOC AP (N) 0 to all of the sliding part of the Z zigzag cam pin.	Bead XC8387***
Apply EPNOC AP (N) 0 to all of the Z zigzag cam.	Bead XC8387***
Apply EPNOC AP (N) 0 to the teeth around the Z zigzag cam gear.	Bead XC8387***





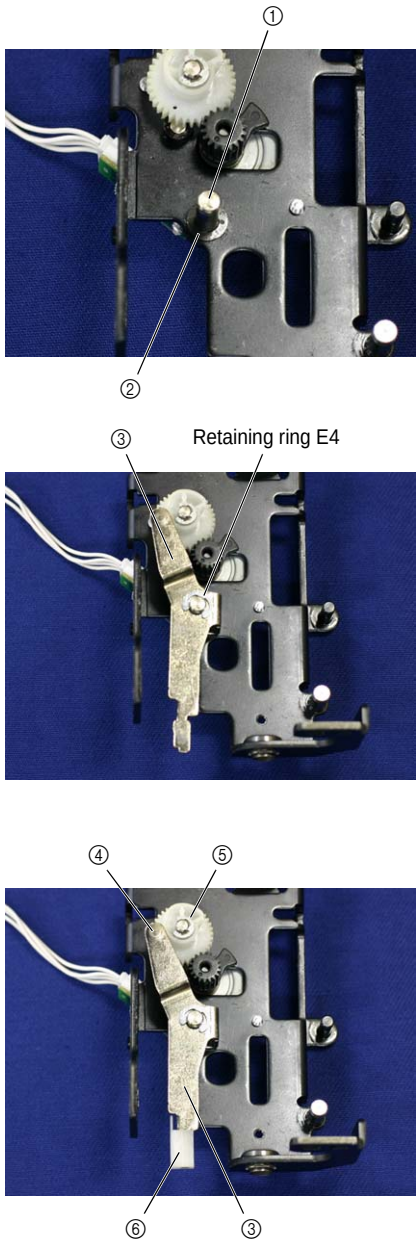
6 Attachment of Z zigzag lever assy

1. Attach the polyester slider ② and the Z zigzag lever assy. ③ to the shaft ① of the base holder assy., and then attach the retaining ring E4.

   ***Key point**
   - Check that the shaft ④ of the Z zigzag lever assy. ③ is at the left of the Z zigzag cam ⑤.

2. Attach the Z lever cap ⑥ to the Z zigzag lever assy. ③.

Apply EPNOC AP (N) 0 to the shaft of the base holder assy.	Bead XC8387***
Apply EPNOC AP (N) 0 to the shaft of the Z zigzag lever.	Bead XC8387***



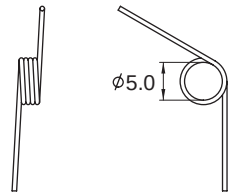
7 Attachment of Thread release lever

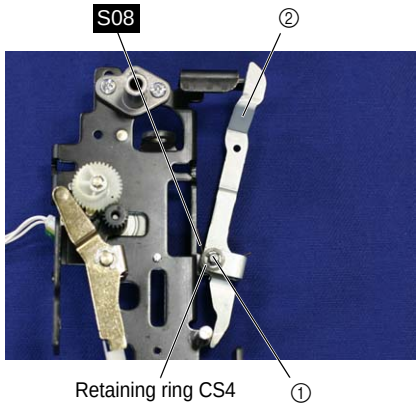
1. Set the thread release lever ② and the spring S08 to the shaft ① of the base holder assy., and then attach the retaining ring CS4.

***Key point**

- Check that the hook of the spring is the upper side, when set it as shown in the right figure.

Apply EPNOC AP (N) 0 to the shaft of the base holder assy.	Small amount XC8387***

S08		SPRING XC4904***



8 Attachment of Presser bar

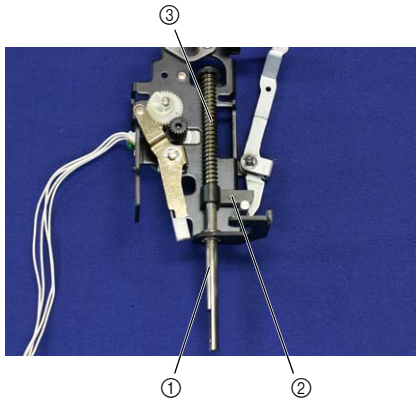
1. Insert the base holder assy., the presser bar clamp ②, the spring ③, and the base holder assy. from the bottom of the presser bar ①, and then tighten the screw ❶ temporarily.

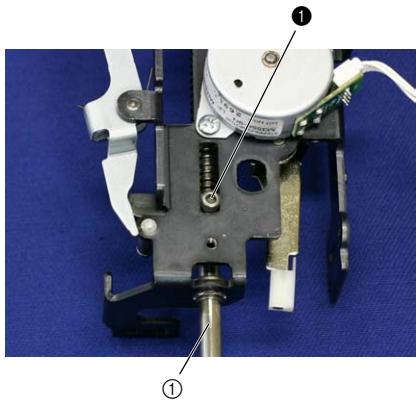
***Key point**

- Fully tighten the screw ❶ after performing "4-14 Adjustment : Presser bar height and parallelism".

Apply FBK OIL RO 100 to the tip of the presser bar.	Apply liberally XC8388***

❶		Screw stud M5	Torque Hand start





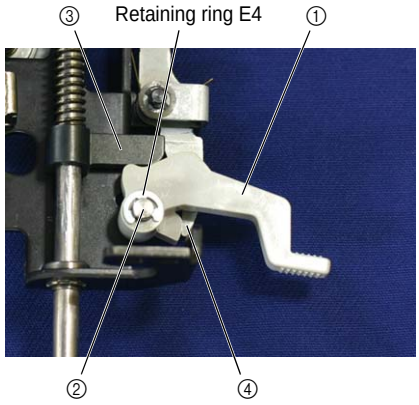
9 Attachment of Presser foot lifter

1. Set the presser foot lifter ① to the shaft ② of the base holder assy., and then attach the retaining ring E4.

***Key point**

- Push the presser bar clamp ③ to the upper side, and then attach it while pushing the bottom side of the thread release lever ④.

Apply EPNOC AP (N) 0 to the shaft of the base holder assy.	Small amount XC8387***
Apply EPNOC AP (N) 0 to the operating surface of the presser bar lifter presser bar clamp.	Small amount XC8387***



10 Attachment of PF switch assy

1. Set the PF switch assy. ① to the presser switch holder ②.

***Key point**

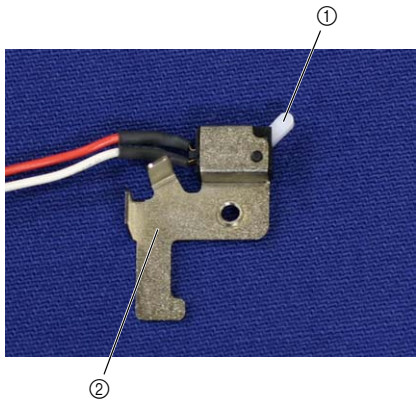
- Check that the boss part of the PF switch assy. ① align the positioning hole of the presser switch holder ②.

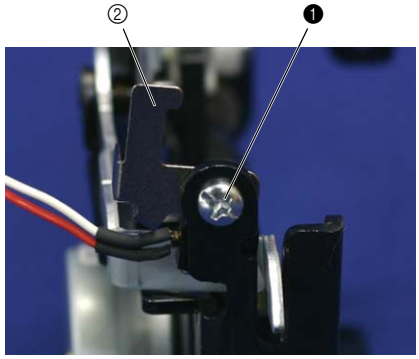
2. Set the presser switch holder ② to the base holder assy. with the screw ❶.

***Key point**

- Check that the boss part of the PF switch assy. ① align the notch part of the base holder assy.

❶		Screw, Bind M3X6	Torque 0.59 – 0.78 N·m





11 Attachment of Needle holder shaft A

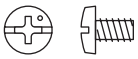
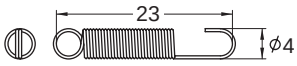
1. Insert the needle holder shaft A ① to the upper side hole of the needle bar supporter assy., and then insert the shaft ② into the needle bar supporter assy., the needle holder shaft A ① and the needle bar supporter assy..

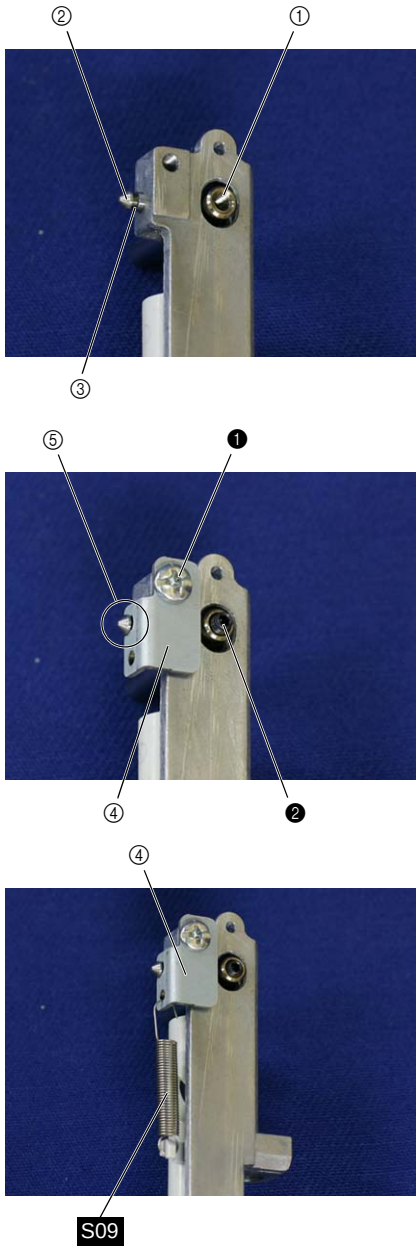
   ***Key point**
   - Check that the groove ③ of the shaft ② is the left side, when set the needle bar supporter assy. as shown in the right figure.
2. Set the plate ④ to the needle bar supporter assy. with the screw ❶.

   ***Key point**
   - Check that the groove ③ of the shaft ② engaged with the notch part ⑤ of the plate ④.
3. Attach the screw ❷ to the needle holder shaft A ①.
4. Attach the spring S09 to the plate ④ and the needle bar supporter assy..

   ***Key point**
   - Attach the hook side of the spring to the plate ④.

Apply FBK OIL RO 100 to the needle holder shaft A.	1-2 drops XC8388***

❶		Screw, Bind M3X5	Torque 0.59 – 0.78 N·m
❷		Set Screw, Socket (CP) M3X5	Torque 0.59 – 0.78 N·m
S09			SPRING X50476***



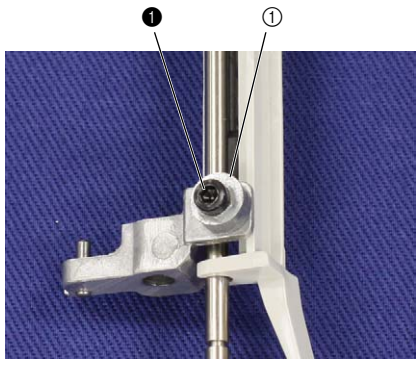
12 Attachment of Z zigzag adjusting nut

1. Set the Z zigzag adjusting nut ① to the needle bar supporter assy., and then tighten the screw ❶ temporarily.

   ***Key point**
   - Check that the side of the zigzag adjusting nut ① with the greatest eccentricity toward the top (see figure at the right).
   - Fully tighten the screw ❶ after performing "4-7 Adjustment : Left base line needle drop".

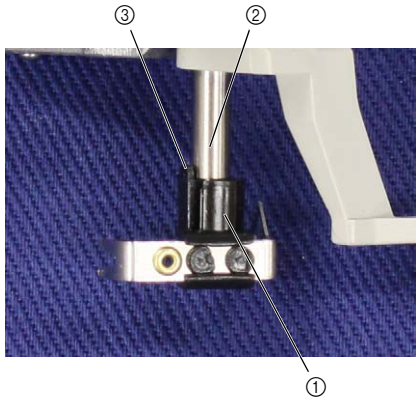
Apply EPNOC AP (N) 0 to the zigzag adjusting nut Z zigzag lever contact surface.	Bead XC8387***

❶		Bolt, Socket M3X10	Torque Hand start



13 Attachment of Threader hook assembly

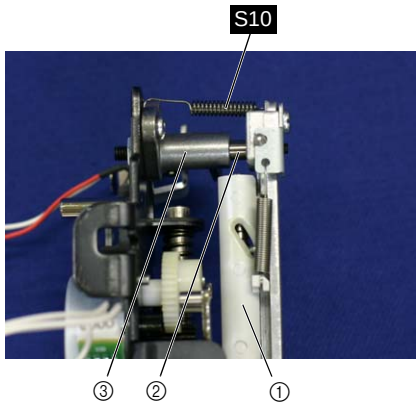
1. Insert the threader hook assembly ① into the shaft of the needle bar supporter assy. ②, and then hang on the hook ③.

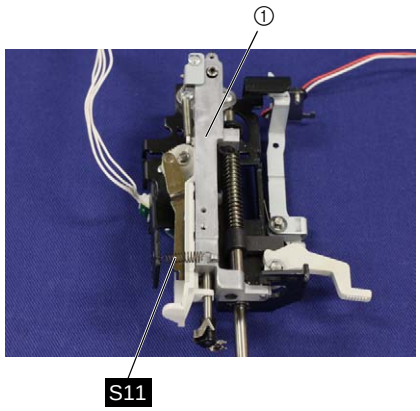


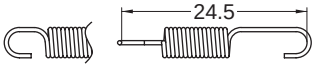
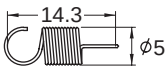
14 Attachment of Needle bar supporter assy

1. Insert the needle holder shaft A ② of the needle bar supporter assy. ① into the shaft bushing ③ of the base holder assy., and then attach the needle bar supporter assy. ① to the base holder assy..
2. Attach the spring S10 to the needle bar supporter assy. ① and the shaft bushing ③.

   ***Key point**
   - Attach the long side of the hook of the spring to the shaft bushing.
3. Attach the spring S11 to the needle bar supporter assy. ① and the base holder assy..





S10		SPRING XC2429***
S11	 A decided hook form is same	SPRING-Z XC2748***

15 Attachment of Shaft assy

1. Attach the needle holder block ① to the needle roller ② of the needle bar supporter assy..

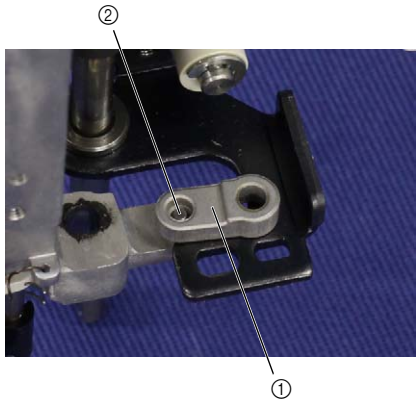
   ***Key point**
   - Flat surface of the needle holder block ① is the upper side.

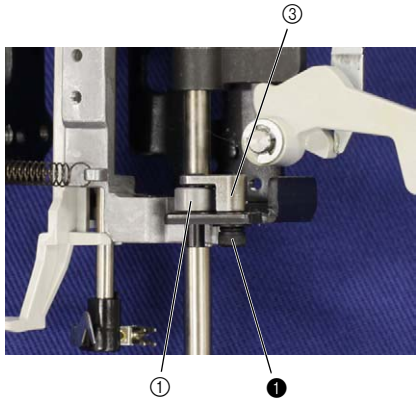
2. Attach the shaft assy. ③ to the needle holder block ① and the base holder assy., and then tighten the screw ❶ temporarily.

   ***Key point**
   - Fully tighten the screw ❶ after performing "4-9 Adjustment : Needle clearance left/right".

Apply EPNOC AP (N) 0 to the needle roller.	Bead XC8387***
Apply EPNOC AP (N) 0 to the shaft of the shaft assy.	Bead XC8387***

❶		Screw M3X10	Torque Hand start





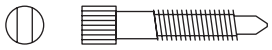
16 Attachment of Needle bar assy. N

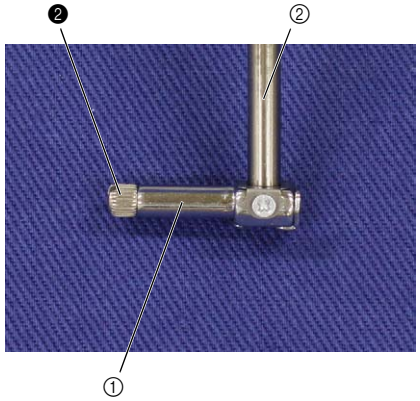
1. Attach the screw ❶ to the needle bar block ①.
2. Insert the needle bar assy. N ② into the needle bar supporter assy., the needle bar block ③, the needle thread block ④ and the needle bar supporter assy. from the lower side, and then tighten the 2 screws ❷ temporarily.

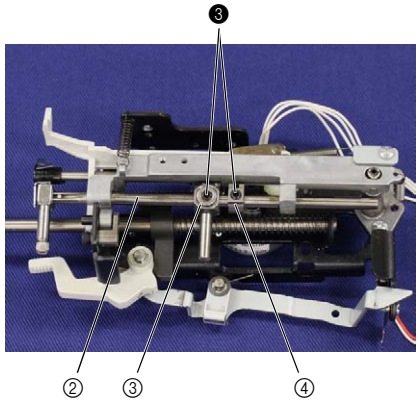
***Key point**

- When the needle thread block ④ is viewed from the front, it is secured in a position turned slightly counterclockwise.
- Fully tighten the screw ❷ after performing "4-11 Adjustment : Needle bar height" and "4-13 Adjustment : Needle threader".

Lubricate the needle bar crank joint area with MOLYKOTE (OILER 90% + MOLYKOTE M DISPERSION).	1-2 drops
Apply EPNOC AP (N) 0 to the sliding pin part of the needle thread block.	Bead
Lubricate the needle bar supporter assy. needle operating area with OILER.	1-2 drops

❶		Needle Clamp Screw	—
❸		Set Screw, Socket (FT) M4X4	Torque Hand start





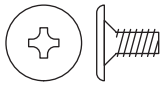
Application

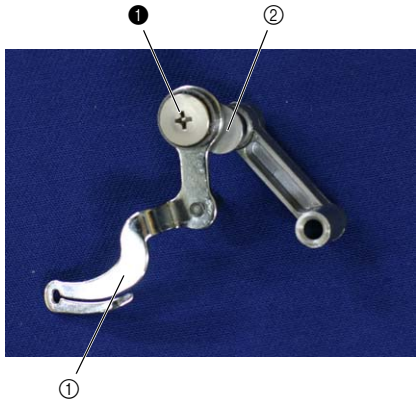
17 Attachment of Needle bar crank rod assy

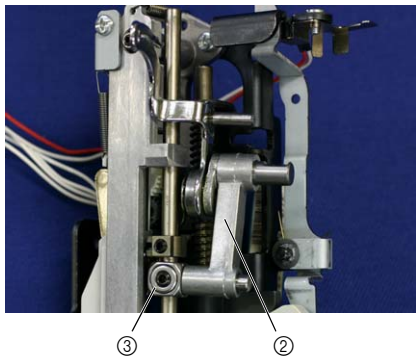
1. Set the thread take-up lever ① to the needle bar crank rod assy. ② with the screw ❶.

   ***Key point**
   - The screw ❶ is reverse threaded.
2. Set the needle bar crank rod assy. ② to the needle bar block ③.

Apply EPNOC AP (N) 0 to the shaft of the needle bar crank.	Small amount XC8387***
Apply EPNOC AP (N) 0 to the shaft of the thread take-up lever.	Small amount XC8387***
Apply EPNOC AP (N) 0 to the thread take-up lever attachment face (left screw attachment face) of the needle bar crank.	Small amount XC8387***

❶		Screw, Flat SM3.57L	Torque 1.18 – 1.57 N·m





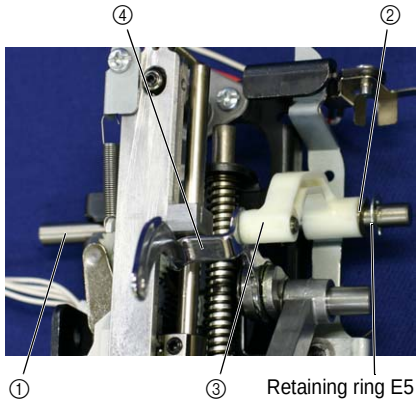
18 Attachment of Thread take-up lever link

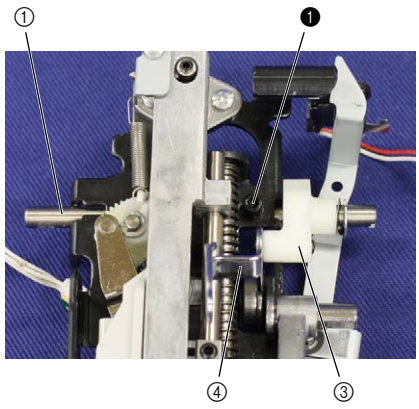
1. Attach the retaining ring E5 to the take-up support shaft ①.
2. Set the base holder assy. as shown in the right figure, and then insert the take-up support shaft ① into the washer, spring ②, the thread take-up lever link ③ and the base holder assy. from the right side, and then attach it with the screw ❶.

   ***Key point**
   - Insert the shaft of the thread take-up lever ④ into the thread take-up lever link ③.

Apply EPNOC AP (N) 0 to the all around the take-up support shaft hole.	Small amount XC8387***

❶		Screw 3X8	Torque 1.18 – 1.57 N·m





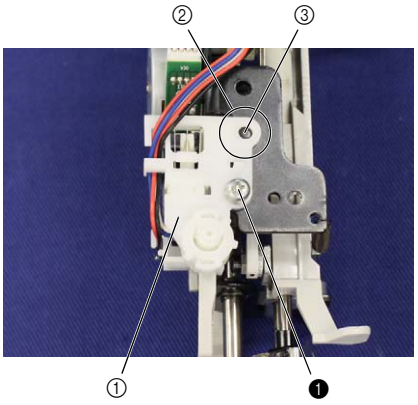
19 Attachment of BH switch assy

1. Set the BH switch assy. ① to the base holder assy. with the screw ❶.

***Key point**

- Check that the boss part ③ of the BH switch holder assy. engaged with the positioning hole ② of the BH switch assy. ①.
- Refer to "4-17 Adjustment : BH lever switch position".

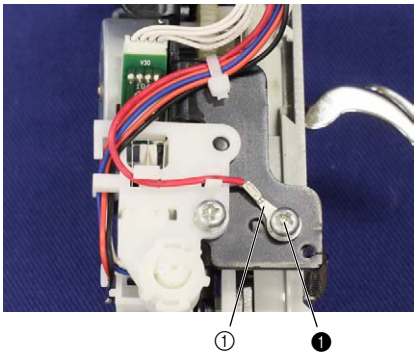
❶		Screw, Pan (S/P washer) M4X8	Torque 1.18 – 1.57 N·m

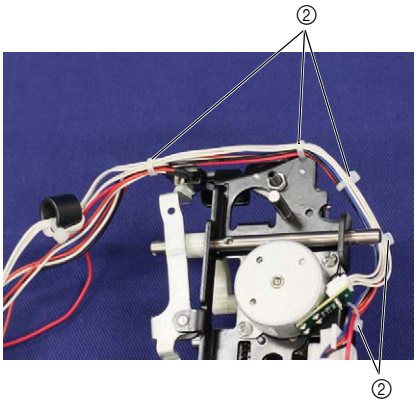


20 Attachment of Lead wire assy: ground

1. Set the lead wire assy: ground ① to the base holder assy. with the screw ❶.
2. Bind the each lead wire with the 5 bands ②.

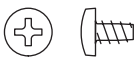
❶		Screw, Pan (S/P washer) M4X8	Torque 1.18 – 1.57 N·m

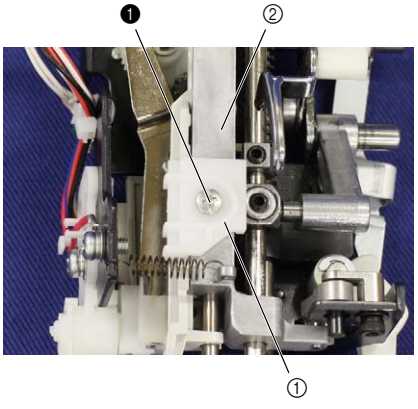




21 Attachment of Thread slider guide

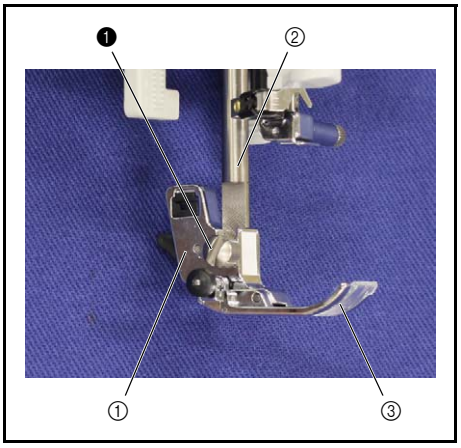
1. Set the thread slider guide ① to the needle bar supporter assy. ② with the screw ❶.

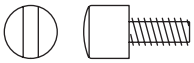
❶		Taptite, Bind B M3X5	Torque 0.59 – 0.78 N·m



22 Attachment of Presser feed holder assy

1. Set the presser feed holder assy. ① to the presser bar ② with the screw ❶.
2. Set the Z foot ③ to the presser feed holder assy. ①.



❶		Screw 3.57	Torque 0.78 – 1.18 N·m

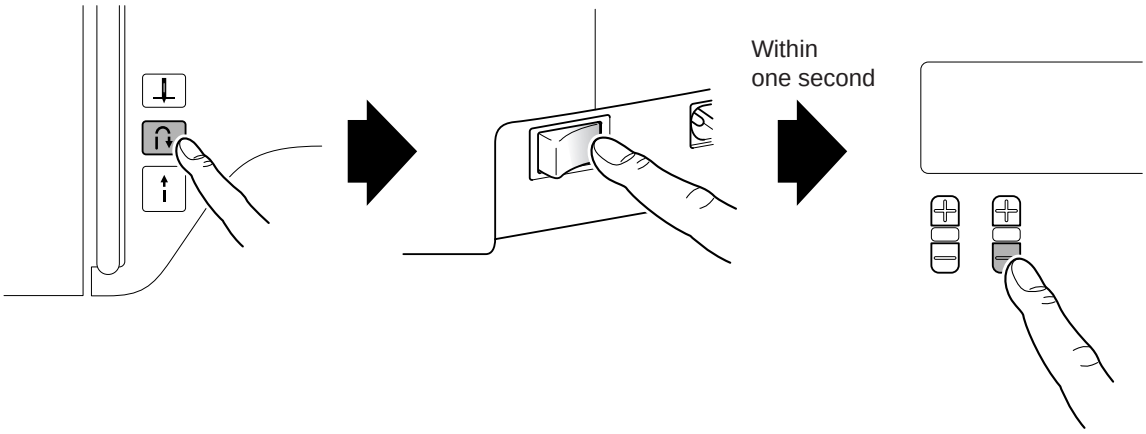
4 Adjustment

1. How to start test mode

   • Turn on the power while pressing (Reverse/reinforcement stitch button), and press (Stitch selection key) in the state that continued pressing (Reverse/reinforcement stitch button) within one second, four beeps sound, and then test mode starts.

   ***Key point**

   • In case of models not equipped with the buzzer, beep does not sound.



2. Mode selection

   • Press (Stitch selection keys) and select pattern number (mode).

3. Starting and stopping test mode

   • Press (Start/stop button).

   • In case of models not equipped with (Start/stop button), press down and/or release the foot controller.

4. Test modes (used for adjustments)

No.	Mode	Z (zigzag) operations	F (feed) operations	Operating speed	Used adjustment	Ref. page
02	3 Point Needle Drop	Switches base line with each stitch. *Switches left base line/center base line/right base line with pressing [↑].	0mm (none)	Any speed may be selected using the speed control lever.	Left base line needle drop	4 - 7
					Rotary hook unit position	4 - 8
					Needle clearance left/right	4 - 9
					Needle bar rising	4 - 10
					Needle bar height	4 - 11
					Clearance between needle and rotary hook point	4 - 12
04	Switch Monitor	When each switch was turned ON/OFF, the number displayed on the right side of LCD changes. (Presser switch, BH lever switch, BH switch, Bobbin winder switch) * In case of models equipped with the buzzer, One beep sounds when each switch was turned ON/OFF.			BH lever switch position	4 - 17
05	Forward and Reverse Feed	100 stitches forward on the left base line. 100 stitches reverse on the right base line.		Switches low/middle/high speed with pressing [↑].	Feed forward/ backward	4 - 15
07	Feed Dog Position	Stops center base line.	Switches 0mm/5mm with pressing [↑].	Any speed may be selected using the speed control lever.	Front/back and left/right position of feed dog	4 - 19

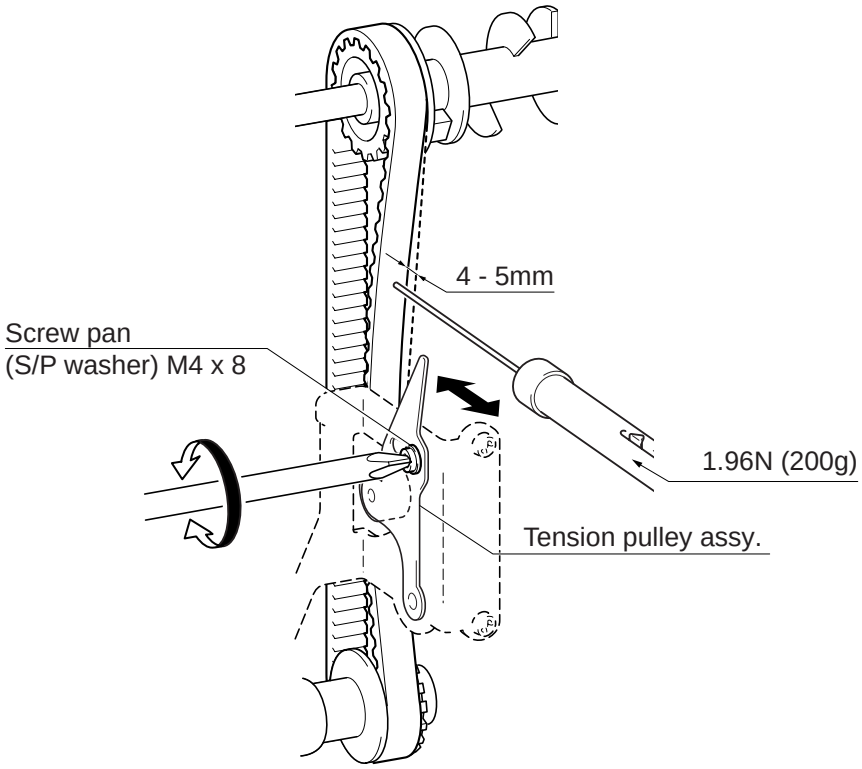
[Adjustment standard]

The belt deflection must be 4 to 5 mm when pushing the center of the timing belt with a force of 1.96N (200g).

[Adjustment procedure]

1. Remove the front cover.
2. Loosen the screw (screw pan (S/P washer) M4 x 8) of the tension pulley assy..
3. Move tension pulley assy. back and forth, to adjust the belt deflection to 4 to 5 mm when pushing the center of the timing belt with a force of 1.96N (200g).
4. Tighten the screw (screw pan (S/P washer) M4 x 8) of the tension pulley assy..

XC2277001	Push-pull gauge (5N)



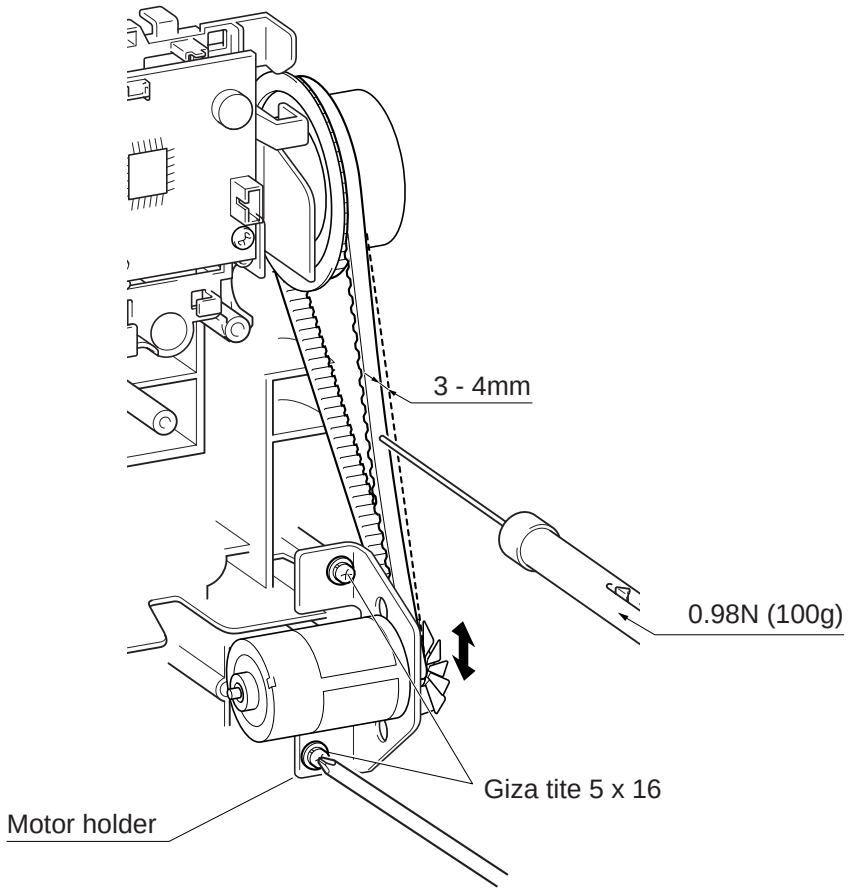
[Adjustment standard]

The belt deflection must be 3 to 4 mm when pushing the center of the motor belt with a force of 0.98N (100g).

[Adjustment procedure]

1. Remove the front cover.
2. Remove the power supply unit.
3. Loosen the 2 screws (giza tite 5 x 16) of the motor holder.
4. Move the motor holder up and down, to adjust the belt deflection is 3 to 4 mm when pushing the center of the motor belt with a force of 0.98N (100g).
5. Tighten the 2 screws (giza tite 5 x 16) of the motor holder.

XC2277001	Push-pull gauge (5N)



[Adjustment standard]

Pass the schappe spun thread #60 through thread guide path, and lower the presser lever, and pull the thread down slowly with the tension gauge, then adjust the thread tension must be 0.32 to 0.37N (33 to 38g).

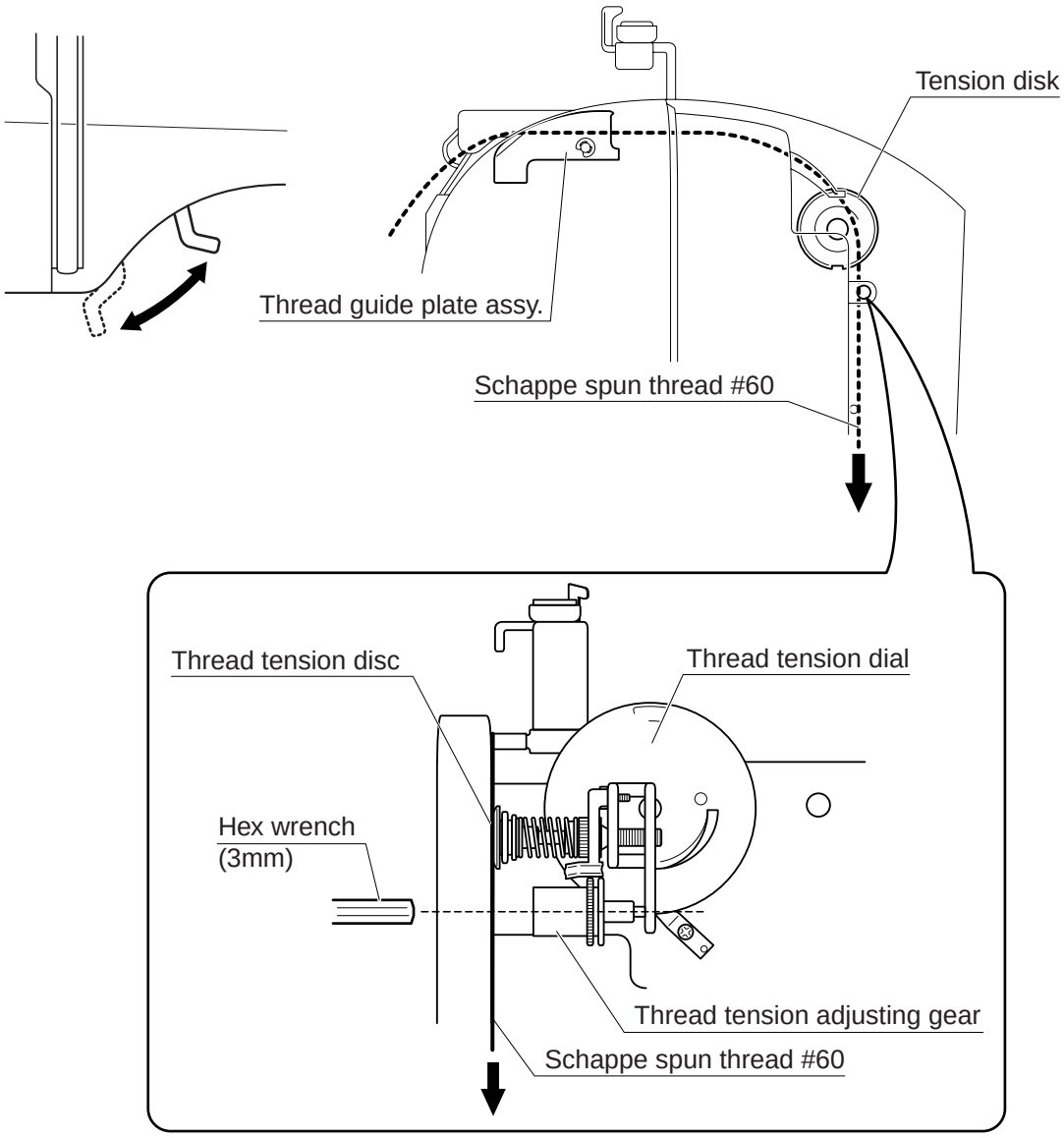
[Adjustment procedure]

1. Remove the face plate.
2. Set the thread tension dial to [4].
3. Raise the presser lever.
4. Pass the schappe spun thread #60 through the thread guide plate assy., tension disk in this order.
5. Lower the presser lever.
6. Pull the thread down slowly with the tension gauge, and turn the thread tension adjusting gear with the hex wrench (3mm), to adjust the thread tension to 0.32 to 0.37N (33 to 38g).

***Key point**

- Loosen the thread tension adjusting gear. (turn to the left) ⇒ Tension larger.
- Tighten the thread tension adjusting gear. (turn to the right) ⇒ Tension smaller.

XA9154001	Tension gauge 50 (0.5N)



[Adjustment standard]

The needle top (left base line) must drop in the right side of “V” groove on the needle plate A.

[Adjustment procedure]

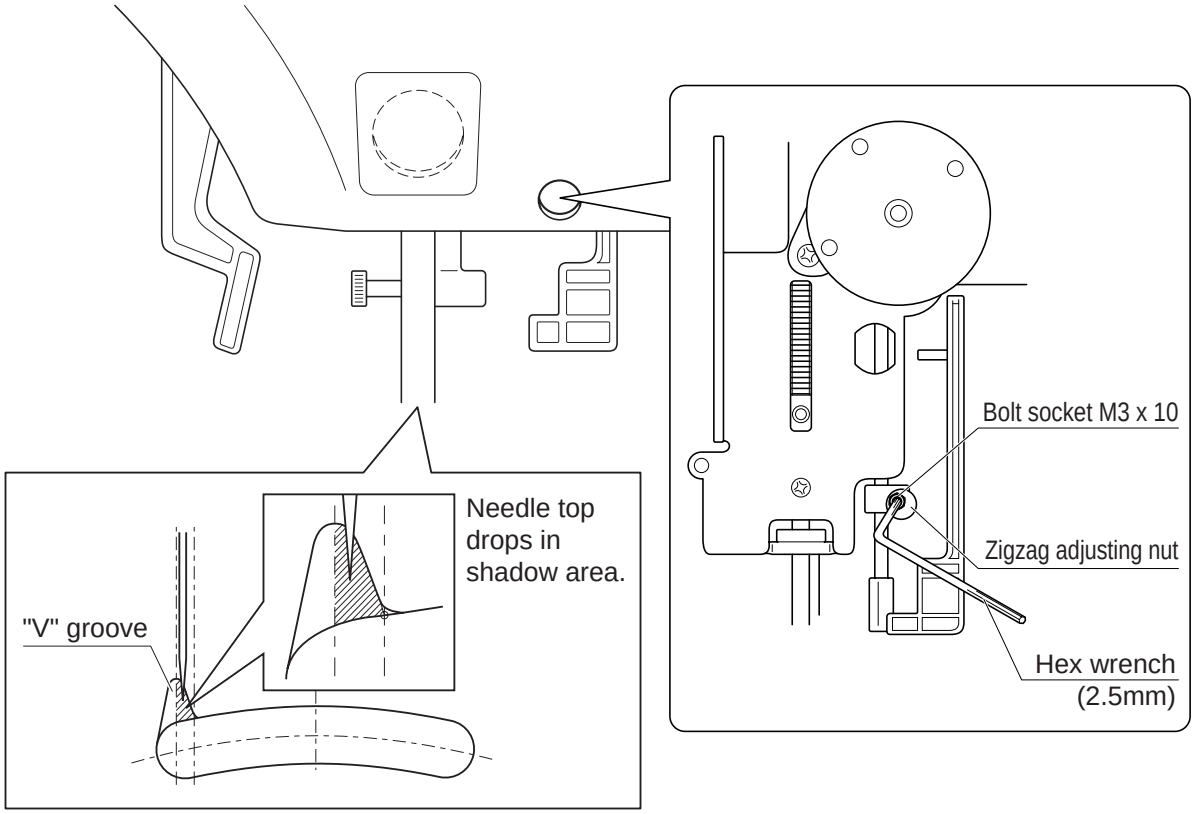
1. Remove the presser foot.
2. Start the test mode.
3. Select the pattern number "02" (3-point needle drop mode).
4. Press (Reverse/reinforcement stitch button) and move the needle bar to the left base line, then turn off the power.
5. Turn the pulley by hand, until the needle top comes to the needle plate A surface.
6. Loosen the screw (bolt socket M3 x 10) of the zigzag adjusting nut with the hex wrench (2.5mm).
7. Turn the zigzag adjusting nut by finger, to adjust the needle top drops in the right side of “V” groove on the needle plate A.
8. Tighten the screw (bolt socket M3 x 10) of the zigzag adjusting nut.

***Key point**

- Tighten it while fixing the zigzag adjusting nut by finger so that the zigzag adjusting nut does not turn.

NOTE

- Refer to the next page “4-8 Rotary hook unit position“ when it cannot be adjusted correctly using the above procedure.

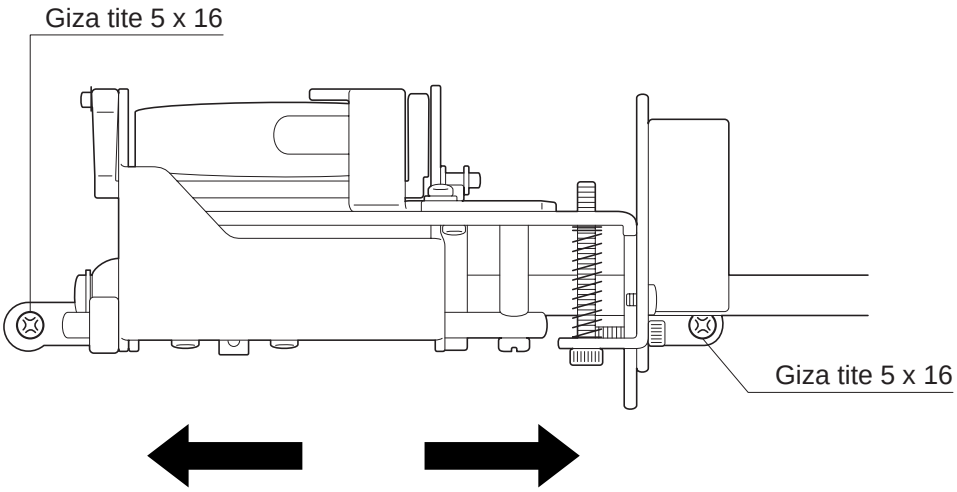


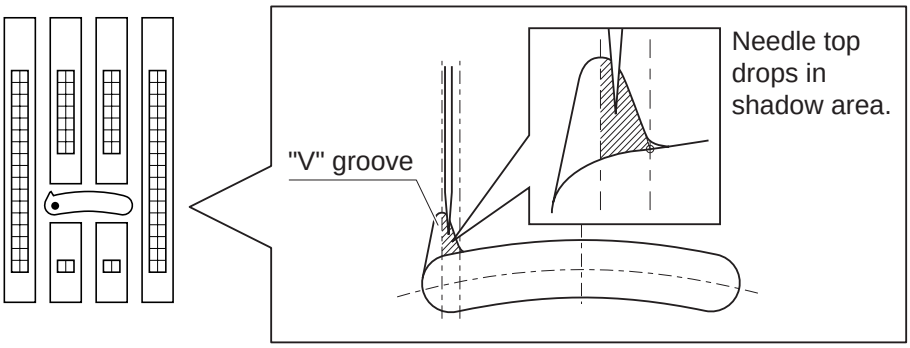
[Adjustment standard]

The needle top (left base line) must drop in the right side of “V” groove on the needle plate A.

[Adjustment procedure]

1. Remove the presser foot.
2. Start the test mode.
3. Select the pattern number "02" (3-point needle drop mode).
4. Press (Reverse/reinforcement stitch button) and move the needle bar to the left base line, then turn off the power.
5. Remove the front cover.
6. Turn the pulley by hand, until the needle top comes to the needle plate A surface.
7. Loosen the 2 screws (giza tite 5 x 16) of the rotary hook unit.
8. Move the rotary hook unit right and left, to adjust the needle top drops in the right side of "V" groove on the needle plate A.
9. Tighten the 2 screws (giza tite 5 x 16) of the rotary hook unit.



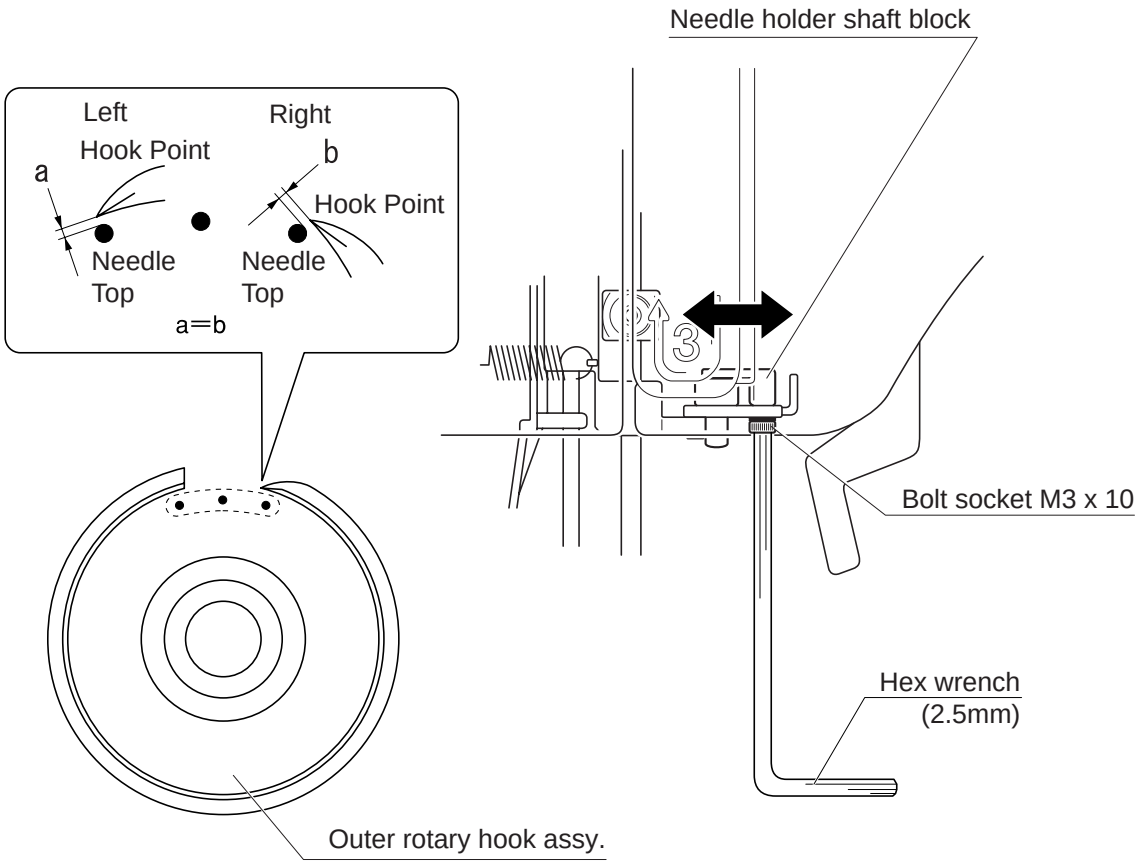


[Adjustment standard]

The clearance between the needle top and the outer rotary hook point must be the same at the base line of both left and right.

[Adjustment procedure]

1. Remove the presser foot, the needle plate B and the needle plate A, then remove the inner rotary hook.
2. Start the test mode.
3. Select the pattern number "02" (3-point needle drop mode).
4. Turn the pulley by hand until the needle aligns with the outer rotary hook point.
5. Loosen the screw (bolt socket M3 x 10) of the needle holder shaft block with the hex wrench (2.5mm).
6. Move the needle holder shaft block to the left and right, to adjust the clearance between the needle top and the outer rotary hook point is the same at the base line of both left and right.
7. Tighten the screw (bolt socket M3 x 10) of the needle holder shaft block.

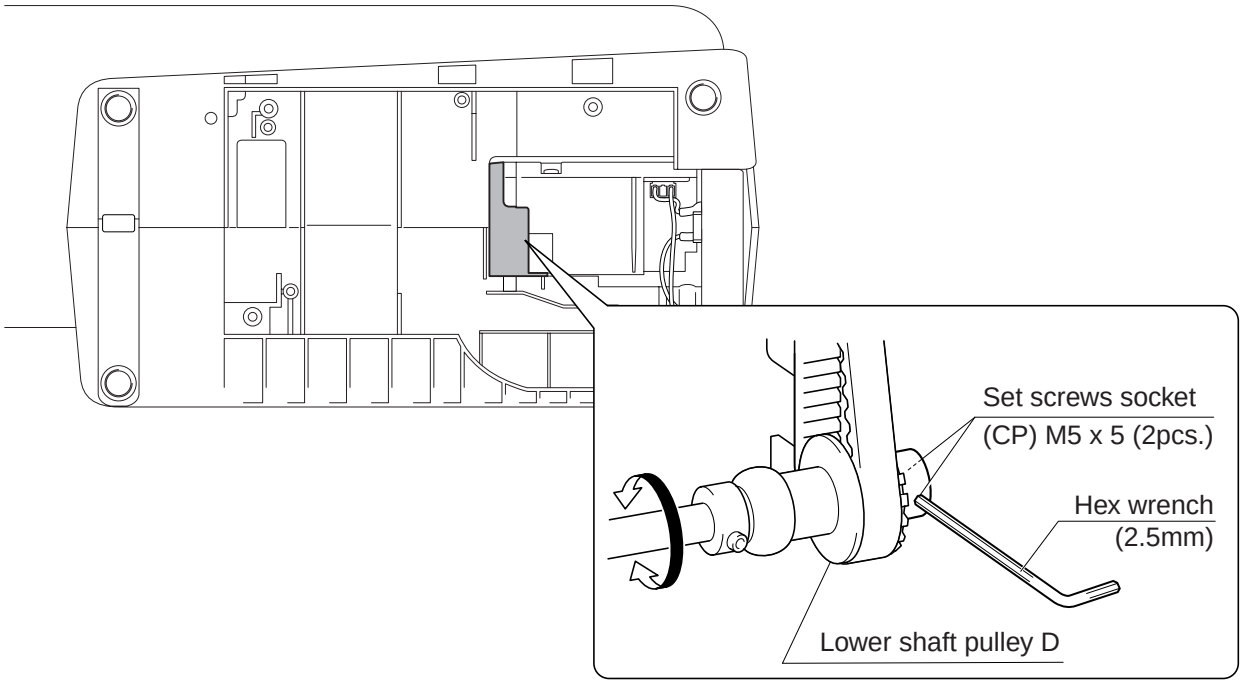


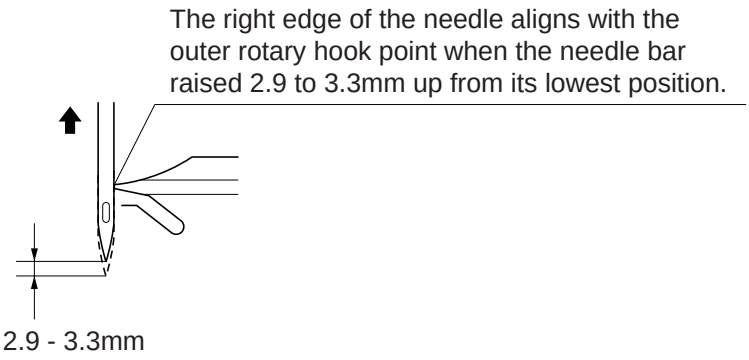
[Adjustment standard]

The right edge of the needle must align with the rotary hook point when the needle bar raised 2.9 to 3.3mm up from its lowest position.

[Adjustment procedure]

1. Remove the presser foot, the needle plate B and the needle plate A, then remove the inner rotary hook.
2. Start the test mode.
3. Select the pattern number "02" (3-point needle drop mode).
4. Press [ ] (Reverse/reinforcement stitch button) and move the needle bar to the left base line, then turn off the power.
5. Turn the pulley by hand and move the needle bar to its lowest position.
6. Remove the base cover.
7. Loosen the 2 screws (set screws socket (CP) M5 x 5) of the lower shaft pulley D with the hex wrench (2.5mm).
8. Turn the pulley by hand and raise the needle bar 2.9 to 3.3 mm from its lowest position, then turn the outer rotary hook by hand and align the right edge of the needle with the outer rotary hook point.
9. Tighten the 2 screws (set screws socket (CP) M5 x 5) of the lower shaft pulley D.





[Adjustment standard]

When turn the pulley by hand until the right edge of the needle aligns with the outer rotary hook point, the distance between the top edge of the needle eye and the bottom edge of the outer rotary hook point must be 1.0 to 1.4mm.

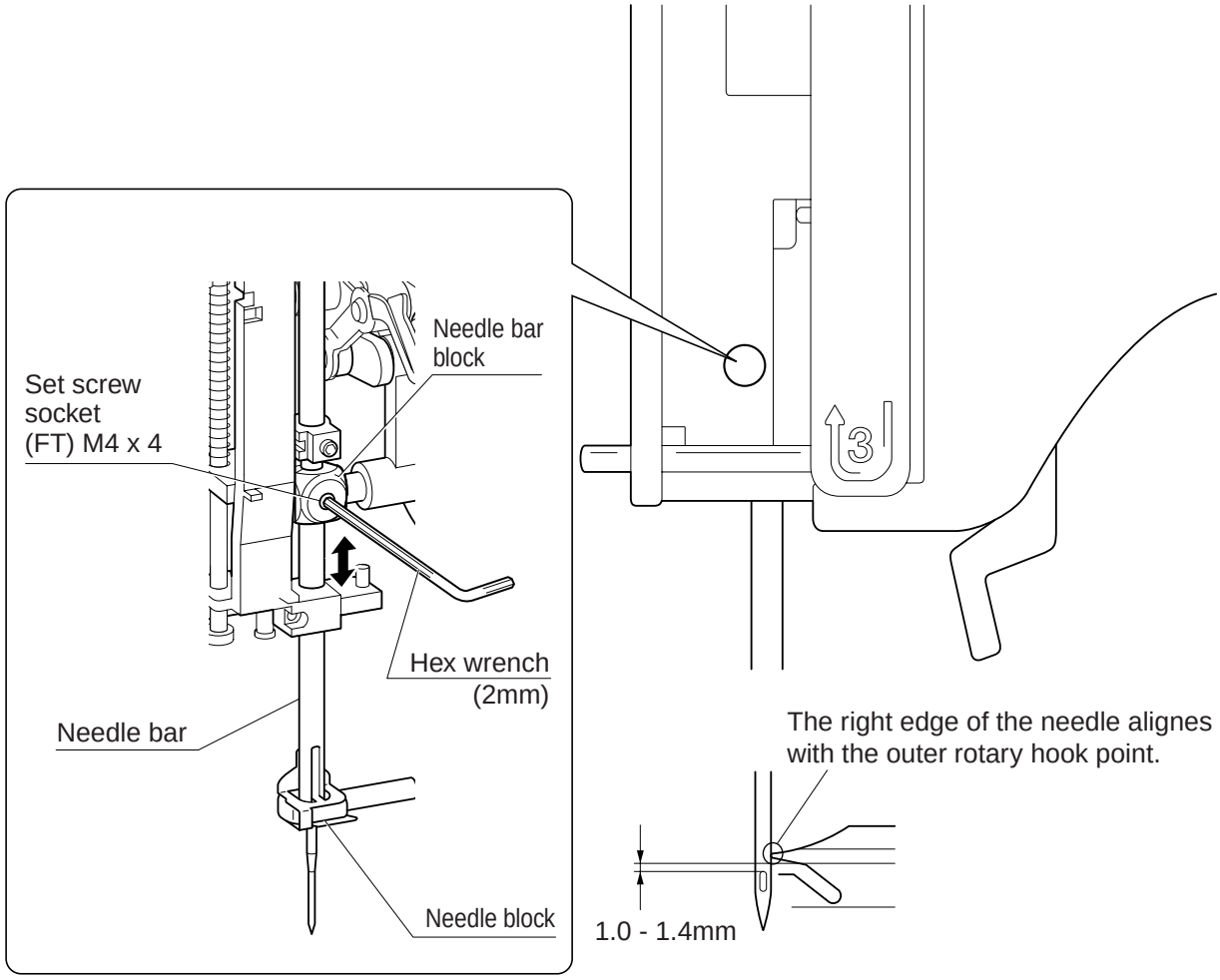
[Adjustment procedure]

1. Remove the presser foot, the needle plate B and the needle plate A, then remove the inner rotary hook.
2. Remove the face plate.
3. Start the test mode.
4. Select the pattern number "02" (3-point needle drop mode).
5. Press [ ] (Reverse/reinforcement stitch button) and move the needle bar to the left base line, then turn off the power.
6. Turn the pulley by hand until the right edge of the needle aligns with the outer rotary hook point.
7. Loosen the screw (set screw socket (FT) M4 x 4) of the needle bar block with the hex wrench (2mm).
8. Move the needle bar up and down, to adjust the distance between the top edge of the needle eye and the bottom edge of the outer rotary hook point to 1.0 to 1.4mm.

   NOTE
   - Check that the needle block faces front.

9. Tighten the screw (set screw socket (FT) M4 x 4) of the needle bar block.

   NOTE
   - Need to adjust “4-13 Needle threader” after this adjustment.



[Adjustment standard]

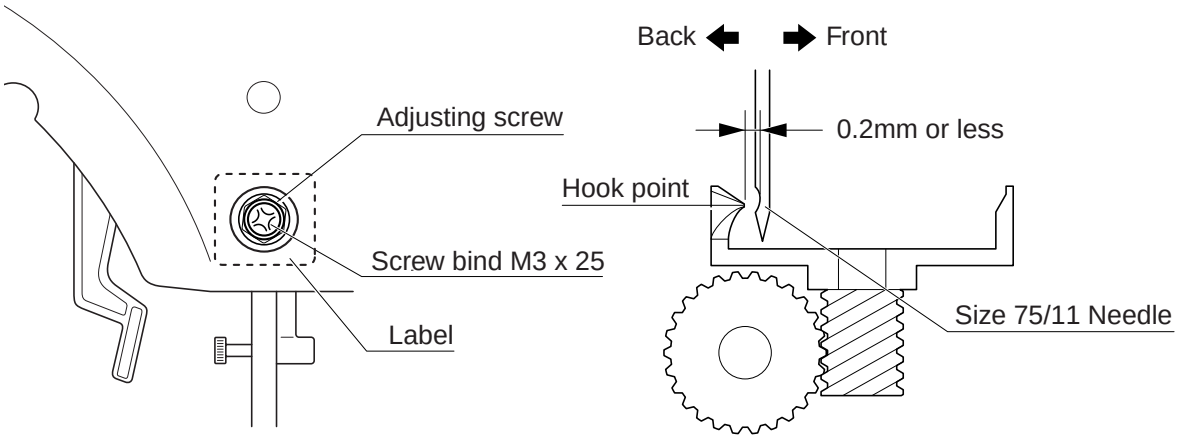
The clearance between the scarf of needle and the outer rotary hook point (front/back) must be 0.2mm or less on the left base line.

[Adjustment procedure]

1. Remove the presser foot, the needle plate B and the needle plate A, then remove the inner rotary hook.
2. Attach the size 75/11 needle.
3. Start the test mode.
4. Select the pattern number “02” (3-point needle drop mode).
5. Press [ ] (Reverse/reinforcement stitch button) and move the needle bar to the left base line, then turn off the power.
6. Remove the label.
7. Loosen the fixing screw (screw bind M3 x 25) of the adjusting screw.
8. Turn the pulley by hand until the right edge of the needle aligns with the outer rotary hook point.
9. Turning the adjusting screw with the box driver (7mm), to adjust the clearance between the scarf of needle and the outer rotary hook point (front/back) to 0.2mm or less on the left base line.

   ***Key point**
   - Loosen the thread tension adjusting gear. (turn to the left) ⇒ Needle moves to the rear side. (clearance smaller.)
   - Tighten the thread tension adjusting gear. (turn to the right) ⇒ Needle moves to the front side. (clearance larger.)
10. Tighten the fixing screw (screw bind M3 x 25) of the adjusting screw.

XE2396001	Box driver 7



[Adjustment standard]

When passing the hook into the needle eye, the clearance between the top edge of the hook and the top edge of the needle eye must be 0 to 0.1mm.

[Adjustment procedure]

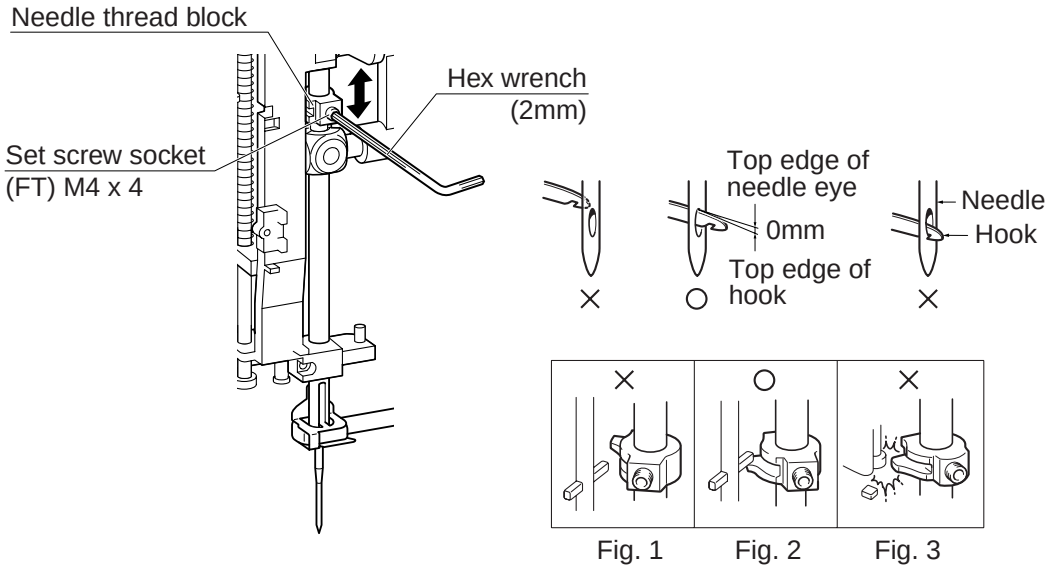
1. Remove the face plate.
2. Attach the size 75/11 needle.
3. Turn the pulley by hand and move the needle to its highest point.
4. Loosen the screw (set screw socket (FT) M4 x 4) of the needle thread block with the hex wrench (2mm).
5. Move the needle thread block up and down, to adjust the clearance between the top edge of the hook and the top edge of the needle eye to 0 to 0.1mm. After that, tighten the screw (set screw socket (FT) M4 x 4) of the needle thread block.

***Key point**

- Tighten the screw (set screw socket (FT) M4 x 4) at the position slightly to the left when viewed from the front of the machine.
- Adjust it so that the top edge of the hook and the top edge of the needle eye is the same height.

NOTE

- In case the position of the screw (set screw socket (FT) M4 x 4) is too left, the hook doesn't turn. (Fig.1)
- In case the position of the screw (set screw socket (FT) M4 x 4) is too right, the needle thread block contacts the needle bar supporter assy., and get damaged. (Fig.3)



[Adjustment standard]

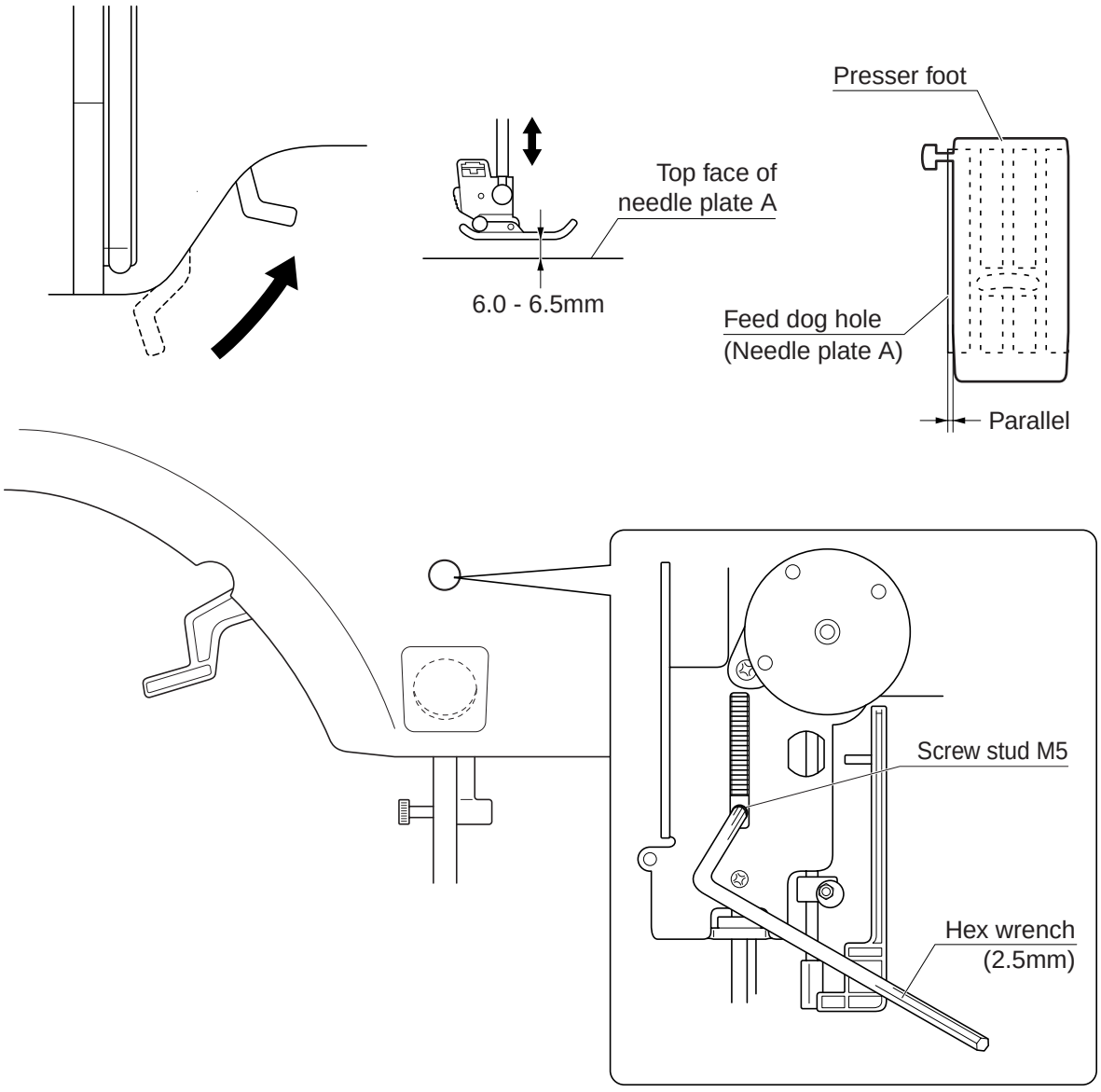
- The clearance between the needle plate A and bottom surface of the presser foot must be 6.0 to 6.5mm.
- The presser foot must parallel with the feed dog hole of needle plate A.

[Adjustment procedure]

1. Attach the J foot.
2. Raise the presser lever.
3. Turn the pulley by hand and down the feed dog lower than the needle plate A.
4. Loosen the screw (screw stud M5) of the presser bar clamp assy. with the hex wrench (2.5mm).
5. Move the needle presser bar up and down, to adjust the clearance between the needle plate A and the bottom surface of the presser foot to 6.0 to 6.5mm.
6. Tighten the screw (screw stud M5) of the presser bar clamp assy..

***Key point**

- Check the presser foot parallel with the feed dog hole of needle plate A after adjusting presser bar height. (to prevent slanting during overcast stitch and damage to the needle.)



[Adjustment standard]

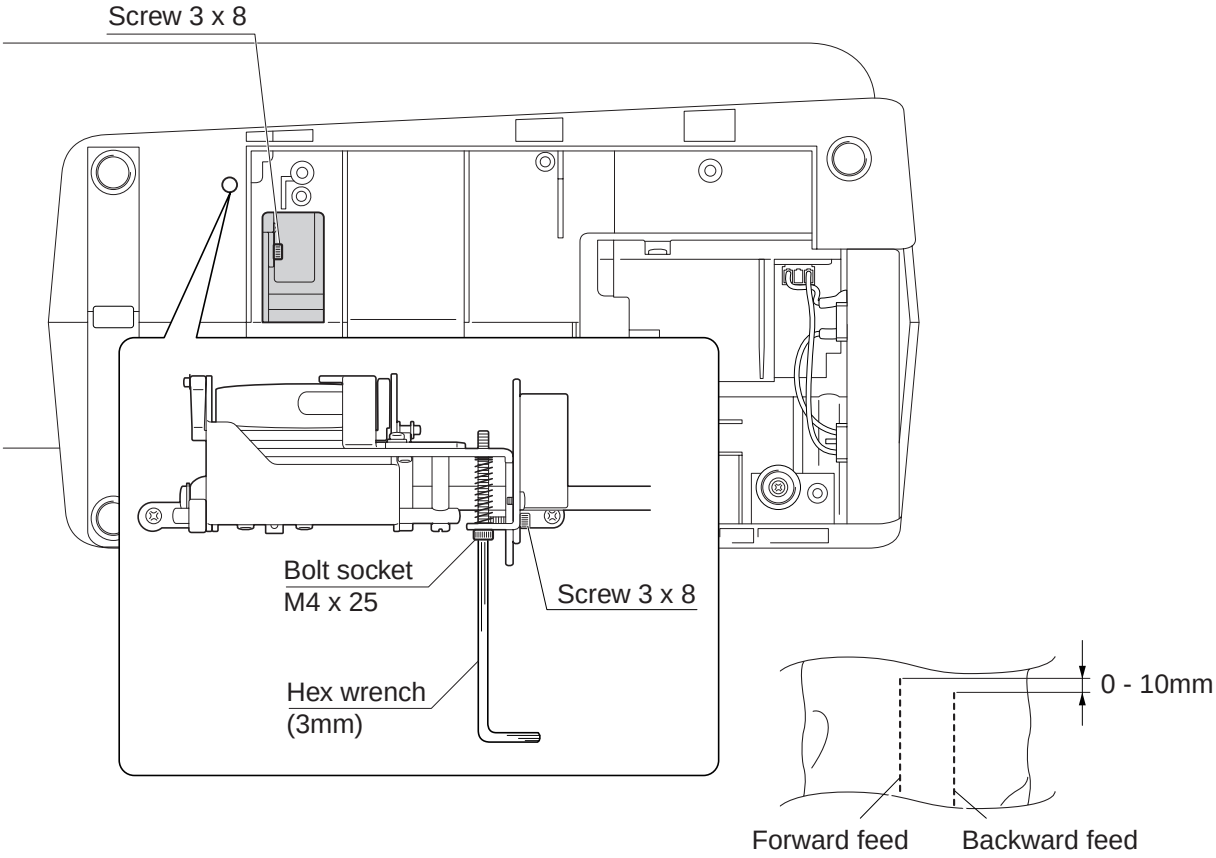
In the test mode “05”, sewing 100 forward stitches, and 100 reverse stitches without thread, the forward feed length must be 0 to 10mm longer than the backward feed length.

[Adjustment procedure]

1. Start the test mode.
2. Select the pattern number “05” (Forward and reverse feed mode).
3. Insert a paper between folded broadcloth.
4. Lower the presser lever.
5. Press [↑] (Start/Stop button), then 100 forward stitches and 100 reverse stitches starts without thread.

   In case of models not equipped with [↑] (Start/stop button), press down the foot controller, then 100 forward stitches and 100 reverse stitches starts without thread.
6. Check the forward and backward feed length.
7. Remove the base cover.
8. Loosen the fixing screw (screw 3 x 8) of the FPM holder assy. with the hex wrench (2.5mm).
9. Turn the screw (bolt socket M4 x 25) of the FPM holder assy. with the hex wrench (3mm), to adjust that the forward feed length is 0 to 10mm longer than the backward feed length.

   ***Key point**
   - Tighten the screw (bolt socket M4 x 25). (turn to the left) ⇒ Backward feed shorter
   - Loosen the screw (bolt socket M4 x 25). (turn to the right) ⇒ Backward feed longer
10. Apply a small amount thread locker to the screw (bolt socket M4 x 25).
11. Tighten the fixing screw (screw 3 x 8) of the FPM holder assy..



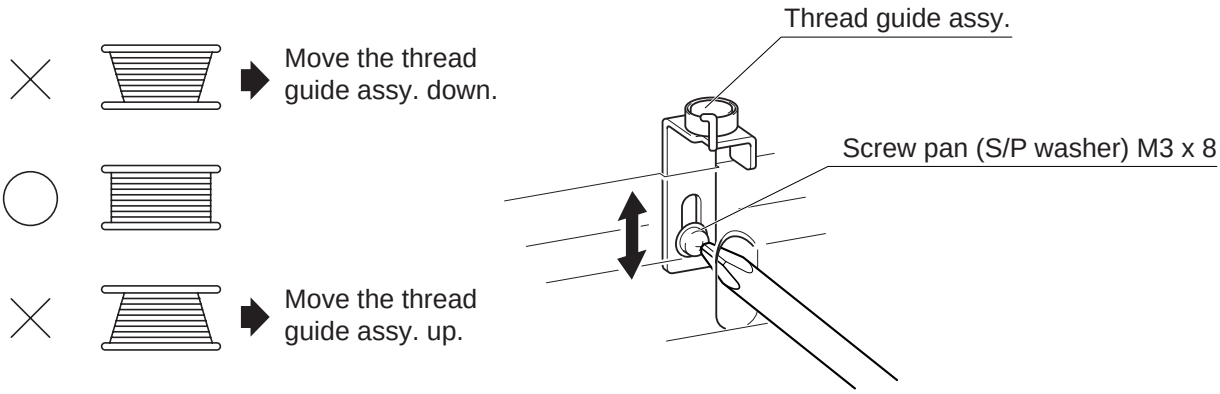
[Adjustment standard]

- No uneven bobbin winding.
- The target for the bobbin winding quantity must be filling 80 to 90% of the diameter.

[Adjustment procedure]

1. Loosen the screw (screw pan (S/P washer) M3 x 8) of the thread guide assy..
2. Move the thread guide assy. up and down, to adjust uneven bobbin winding.
3. Tighten the screw (screw pan (S/P washer) M3 x 8) of the thread guide assy..

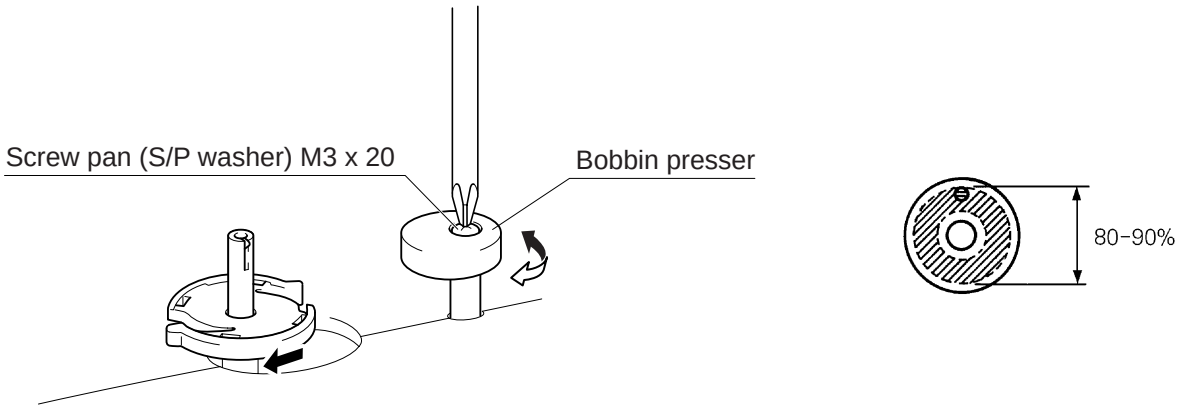
***Key point**
- When the uneven bobbin winding is upper side, move the thread guide assy. down.
- When the uneven bobbin winding is lower side, move the thread guide assy. up.



4. Loosen the screw (screw pan (S/P washer) M3 x 20) of the bobbin presser.
5. Turn the bobbin presser left and right, to adjust the winding quantity.
6. Tighten the screw (screw pan (S/P washer) M3 x 20) of the bobbin presser.

***Key point**
- The target for the bobbin winding quantity is filling 80 to 90% of the diameter.

NOTE
- The large side of the bobbin presser must be at the front cover side.



[Adjustment standard]

- BH 0 touches the BH 1 in the state that the clearance between the BH presser foot A and the BH presser foot B is 0.5mm.
- BH 0 does not touch the BH 1 in the state that the clearance between the BH presser foot A and the BH presser foot B is 1.5mm.

[Adjustment procedure]

1. Start the test mode.
2. Raise the presser lever.
3. Attach the BH presser foot.
4. Turn the pulley by hand and move the needle bar to its lowest position. (down the feed dog lower than the needle plate A.)
5. Lower the presser lever in the state that the clearance between the BH presser foot A and the BH presser foot B is 0.5mm. (Fig. 1)
6. Lower the BH lever, and set to the BH presser foot.
7. Start the test mode, and select the pattern number “04” (Switch monitor mode).
8. Rotate the BH lever eccentric shaft in a counterclockwise, to adjust the number displayed on the right side of LCD to “00”.
9. Rotate the BH lever eccentric shaft in a clockwise, to adjust the number displayed on LCD to “08” from “00”. (Fig. 2)
   In case of models equipped with the buzzer, adjust it at the position where the buzzer begins to sound.

   ***Key point**
   - When the BH0 touches the BH1, change the number displayed on LCD to “08” from “00”.
   - In case of models equipped with the buzzer, when the BH0 touches the BH1, the buzzer begins to sound.
10. When the clearance between the BH presser foot A and the BH presser foot B is 1.5mm, check that the number displayed on LCD is “00”. (Fig. 3, Fig. 4)

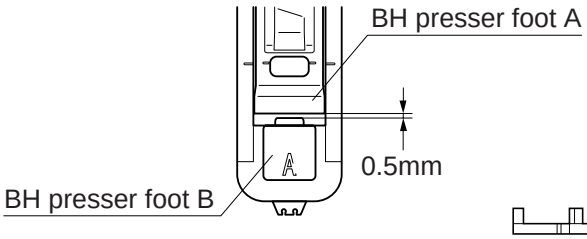


Fig. 1

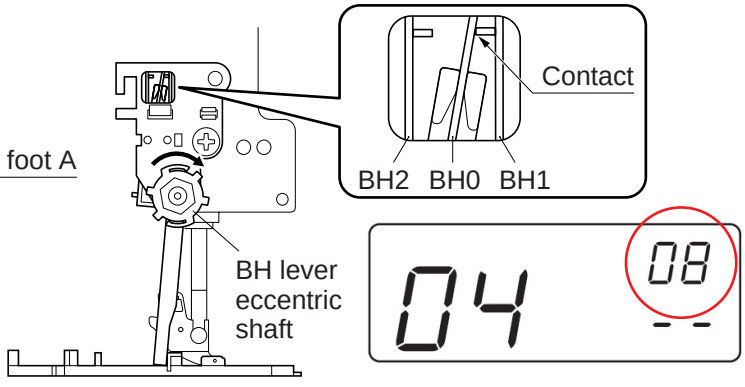


Fig. 2

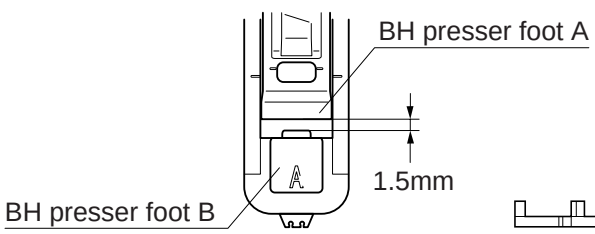


Fig. 3

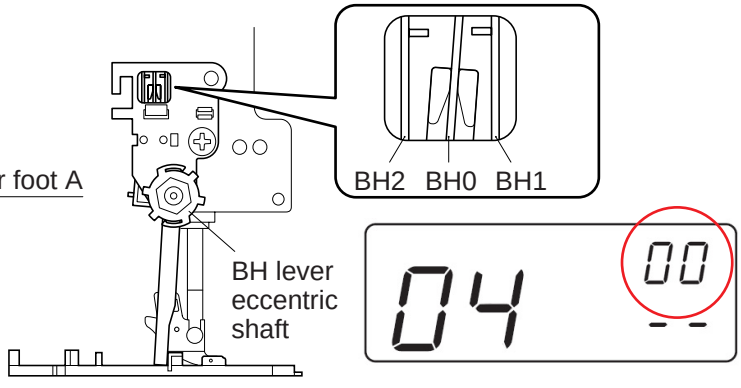


Fig. 4

[Adjustment standard]

The needle top must drop in the center position (front/back) of the presser foot hole.

[Adjustment procedure]

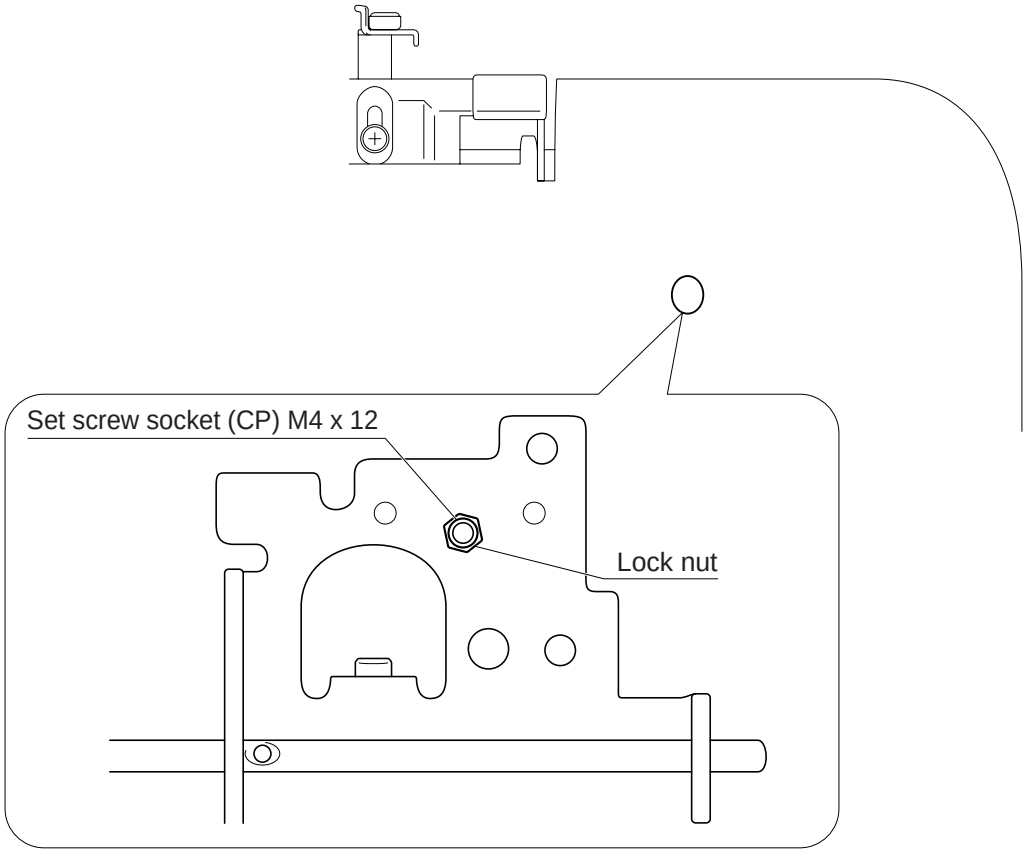
1. Attach the J foot, and lower the presser lever.
2. Turn the pulley by hand, and drop the needle top into the presser foot hole.
3. Turn the screw (set screw socket (CP) M4 x 12) with the hex wrench (2mm), to adjust the needle top to the center position (front/back) of the presser foot hole.

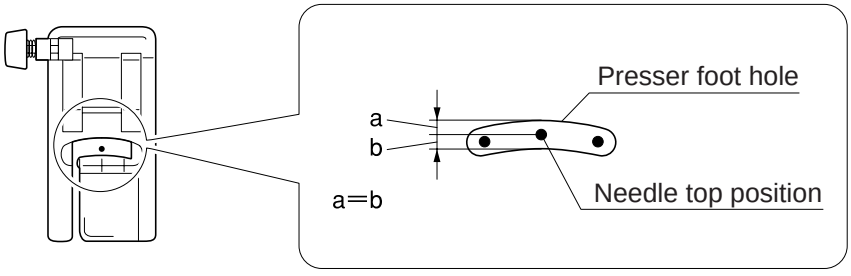
***Key point**

- If loosen the screw (set screw socket (CP) M4 x 12) drastically, the fixing lock nut may be loosen.
- When the lock nut is loosen, remove the needle bar-presser unit and tighten the lock nut, then tighten the screw (set screw socket (CP) M4 x 12).

NOTE

- Need to adjust “4-12 Clearance between needle and rotary hook point” after this adjustment.





[Adjustment standard]

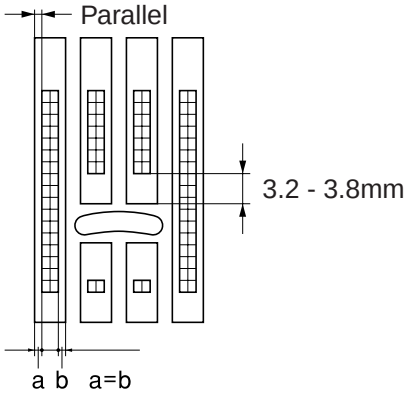
The clearance (front/back) between the forward edge of the feed dog middle tooth and the feed dog hole of the needle plate A must be 3.2 to 3.8mm, and the both clearance (left/right) between the feed dog and the feed dog hole must be equal.

[Adjustment procedure]

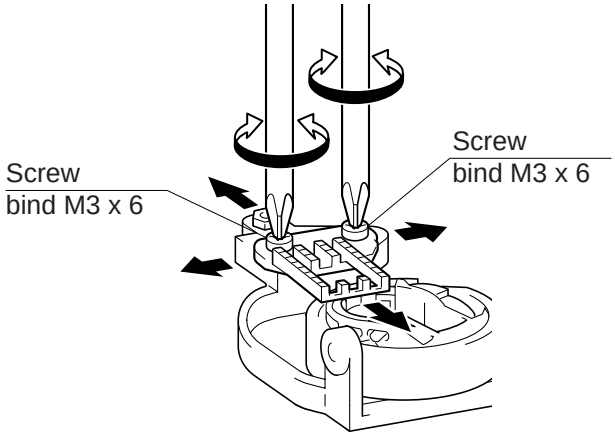
1. Remove the needle plate B, the presser foot and the needle.
2. Start the test mode.
3. Select the pattern number “07” (Feed dog position mode).
4. Remove the 2 screws (screw needle plate) of the needle plate A, then remove the needle plate A.
5. Turn the pulley by hand to set the feed length to 0 mm. (Check that the mark on the feed adjusting gear alignes with the mark on the F pulse motor gear.)
6. Loosen the 2 screws (screw bind M3 x 6) of the feed dog, temporarily attach the needle plate A, to adjust the front/back and left/right position of the feed dog.

***Key point**

- Adjust the clearance (front/back) between the forward edge of the feed dog middle tooth and the feed dog hole of the needle plate A to 3.2 to 3.8mm.
- Adjust the both clearance (left/right) between the feed dog and the feed dog hole is equal. (a=b)
- Assemble the feed dog parallel with the feed dog hole.



7. Secure the feed dog with the 2 screws (screw bind M3 x 6).
8. Fully tighten the 2 screws (screw needle plate) of the needle plate A.



[Adjustment standard]

When the feed dog is its highest position, the feed dog height from the needle plate A surface must be 0.9 to 1.1mm.

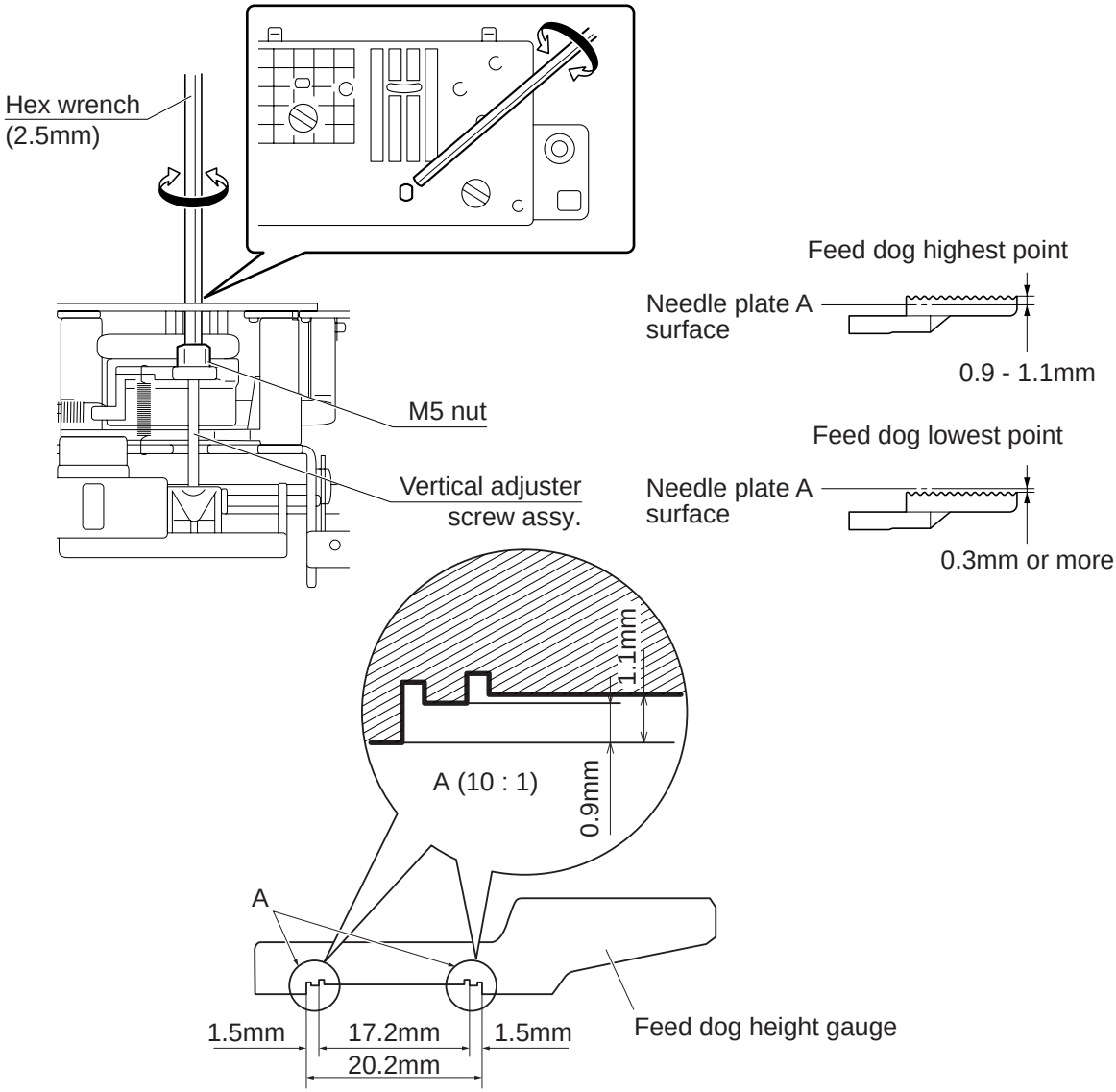
[Adjustment procedure]

1. Turn the pulley by hand to raise the feed dog to its highest position.
2. Remove the needle plate B, the needle plate A and the presser feed holder, then loosen the M5 nut.
3. Temporarily attach the needle plate A.
4. Turn the vertical adjuster screw assy. with the hex wrench (2.5mm), to adjust the feed dog height from the needle plate A surface to 0.9 to 1.1mm.
5. Tighten the M5 nut (Do not turn the vertical adjuster screw assy.).
6. When the feed dog is its lowest position, check that the feed dog is 0.3mm or more below the upper surface of the needle plate A.

NOTE

- When the feed dog is too high/low, abnormal noise, feed problems may happen.

XC2278001	Feed dog height gauge

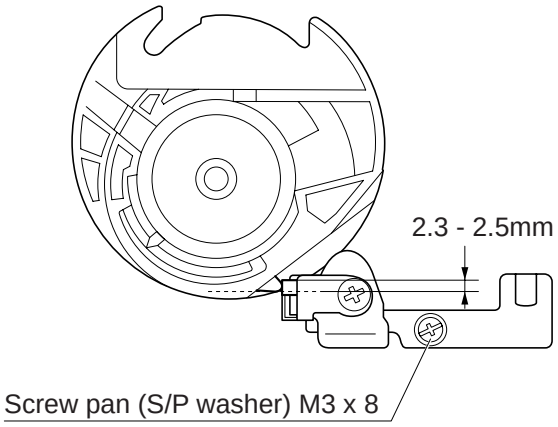


[Adjustment standard]

The clearance (overlap) between the inner rotary hook point and the bracket spring must be 2.3 to 2.5mm.

[Adjustment procedure]

1. Remove the front cover.
2. Set the inner rotary hook assy. in the outer rotary hook.
3. Loosen the screw (screw pan (S/P washer) M3 x 8) of the inner rotary hook bracket assy..
4. Move the inner rotary hook bracket assy. back and forth, to adjust the clearance (overlap) between the inner rotary hook point and the bracket spring to 2.3 to 2.5mm.
5. Tighten the screw (screw pan (S/P washer) M3 x 8) of the inner rotary hook bracket assy..



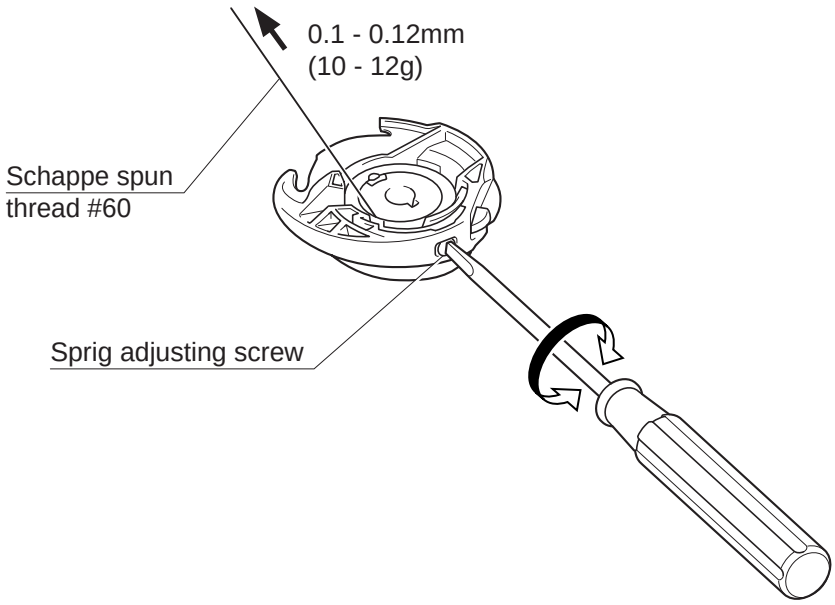
[Adjustment standard]

Inner rotary hook assy. (lower thread) tension must be 0.1 to 0.12N (10 to 12g).

[Adjustment procedure]

1. Set the bobbin (the schappe spun thread #60) in the inner rotary hook assy., and pass the thread.
2. Pull the thread with the tension gauge, and turn the spring adjusting screw, to adjust the tension to 0.1 to 0.12N (10 to 12g).
3. After adjustment, apply a small amount of the thread locker to the spring adjusting screw.

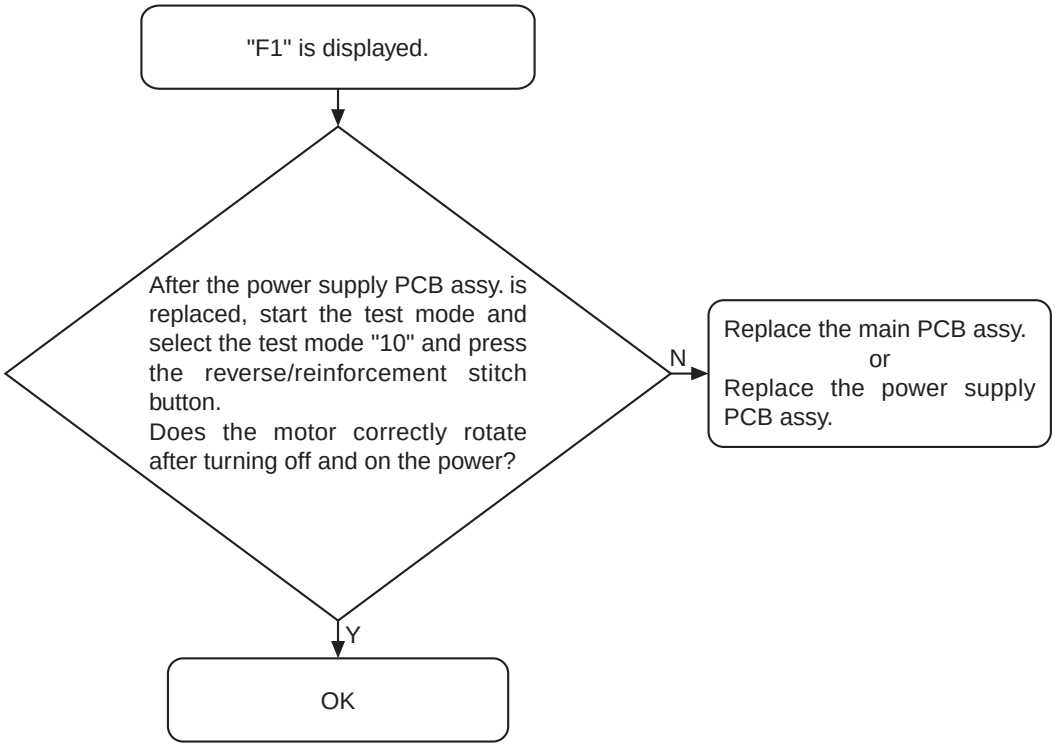
XA9153001	Tension gauge 30 (0.3N)

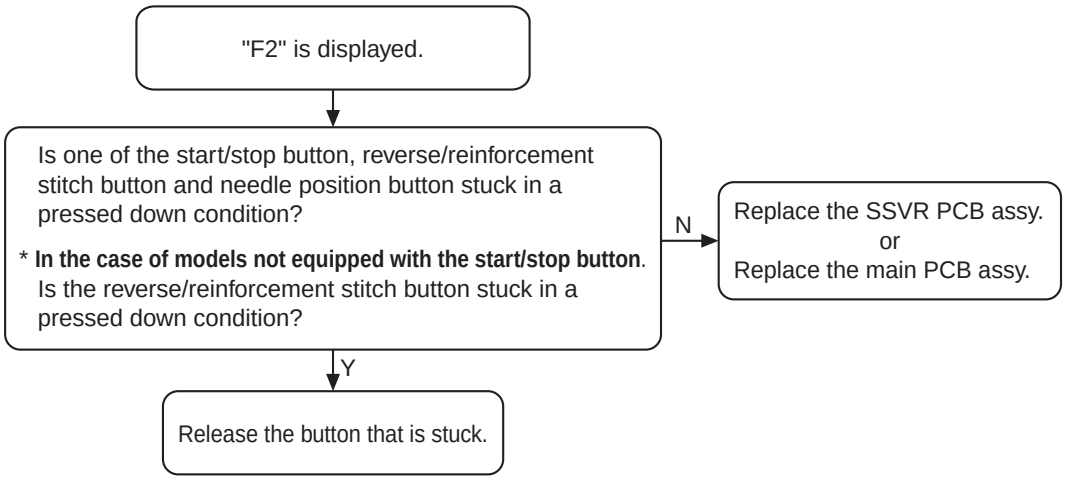


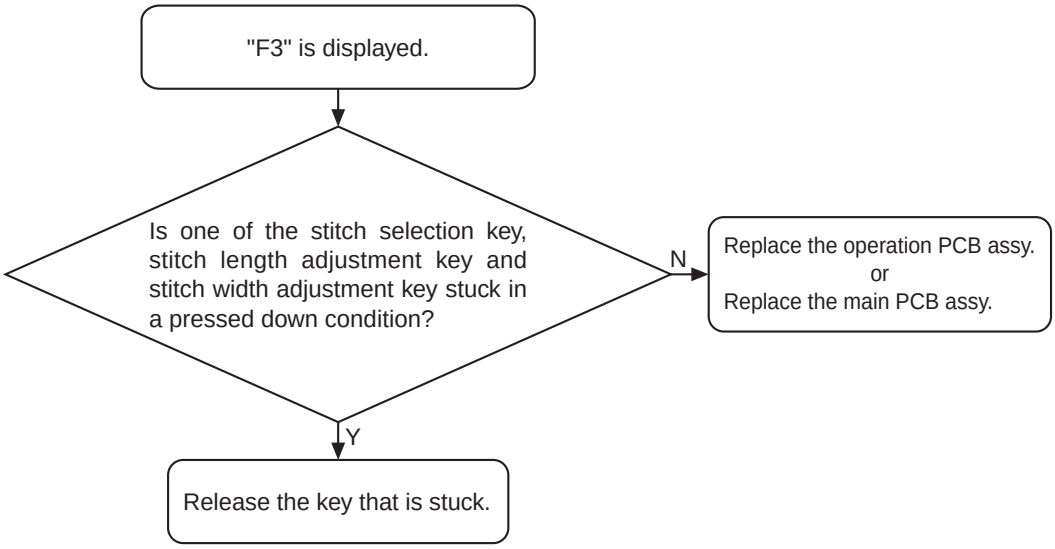
5 Failure Investigation for Electronic Parts

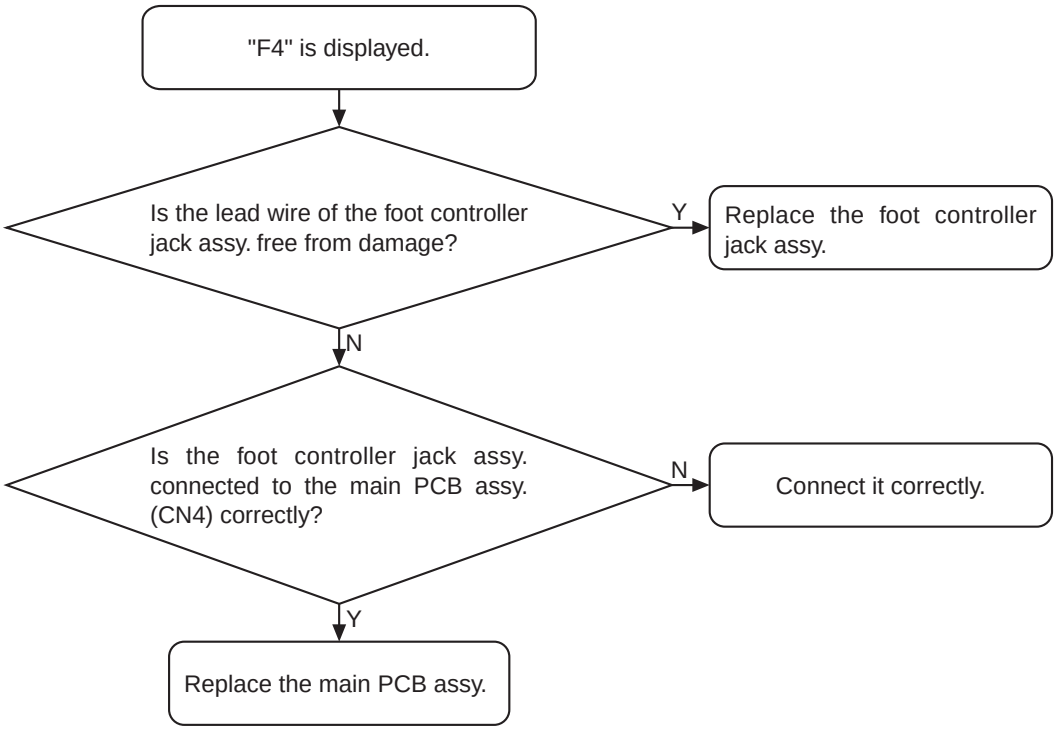
* Perform resistance measurements after turning off the power, and detaching the connectors to be measured from the PCB.

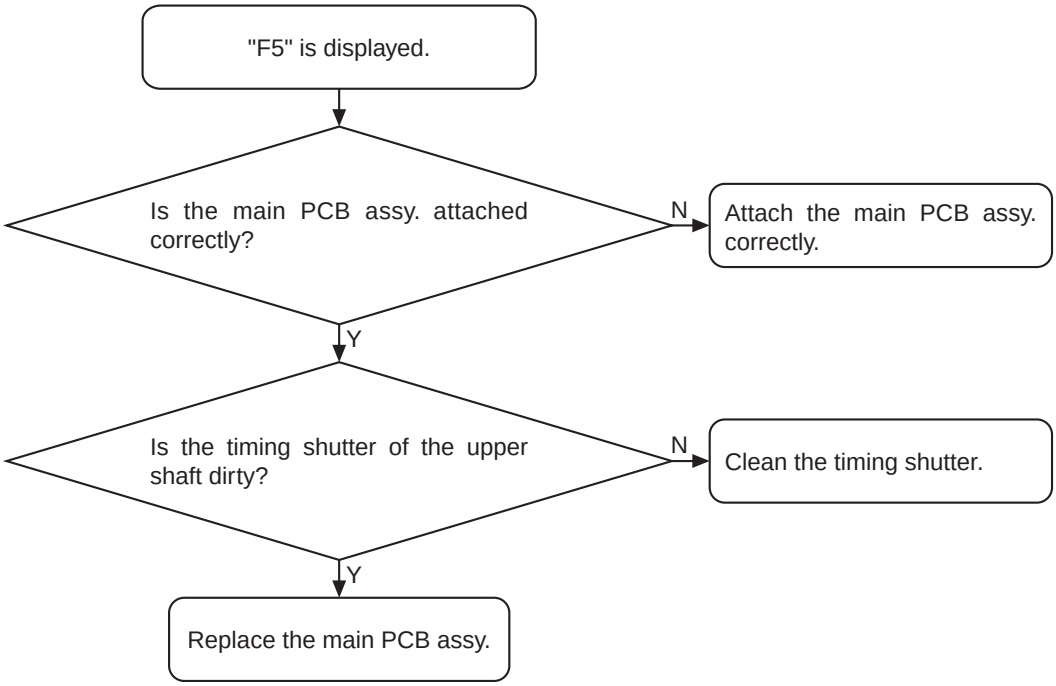
Error message	Probable cause
F1 (5 - 3)	Rotation failure in main motor
F2 (5 - 3)	Button pressed continually with power ON. (Operation switch)
F3 (5 - 4)	Key pressed continually with power ON. (Setting mode switch)
F4 (5 - 4)	Foot controller disconnection
F5 (5 - 5)	Dirty speed sensor
F7 (5 - 5)	Speed VR disconnection
F8 (5 - 6)	Power supply failure
F9 (5 - 6)	EEPROM failure

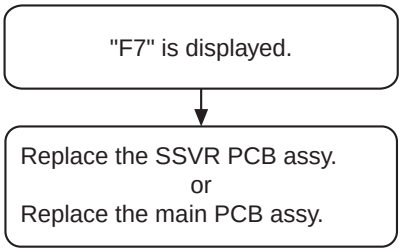

"F1" is displayed.
After the power supply PCB assy. is replaced, start the test mode and select the test mode "10" and press the reverse/reinforcement stitch button.
Does the motor correctly rotate after turning off and on the power?
N
Replace the main PCB assy.
or
Replace the power supply PCB assy.
Y
OK

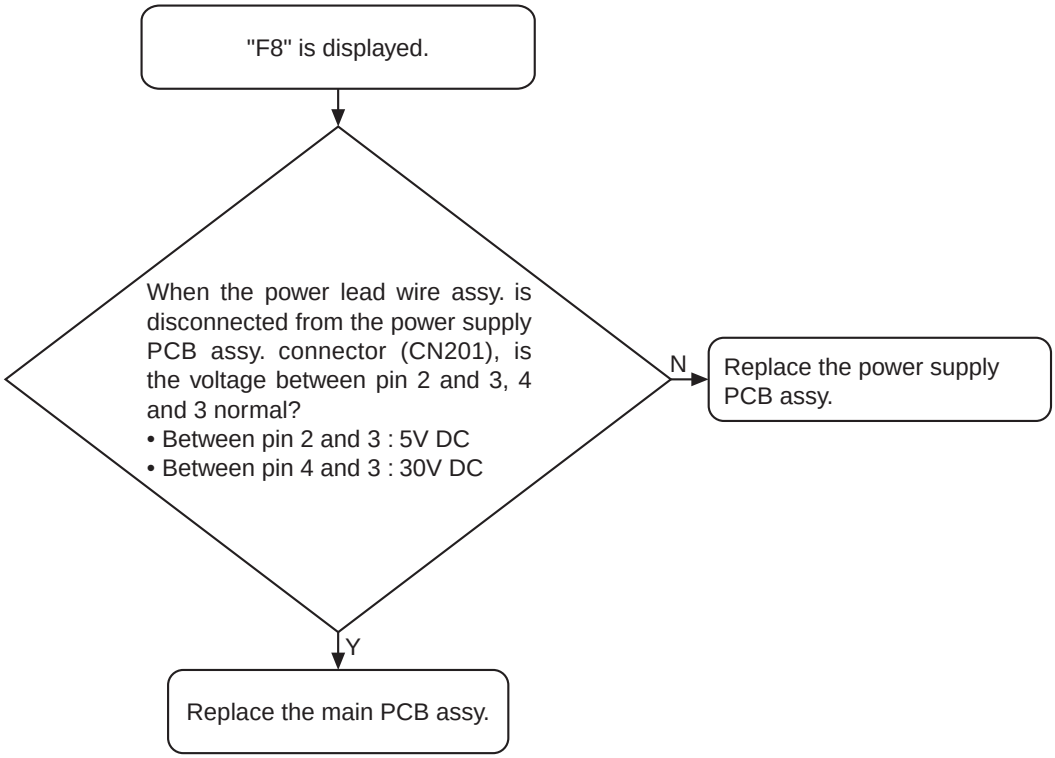

"F2" is displayed.
Is one of the start/stop button, reverse/reinforcement stitch button and needle position button stuck in a pressed down condition?
* In the case of models not equipped with the start/stop button.
Is the reverse/reinforcement stitch button stuck in a pressed down condition?
N
Replace the SSVR PCB assy.
or
Replace the main PCB assy.
Y
Release the button that is stuck.

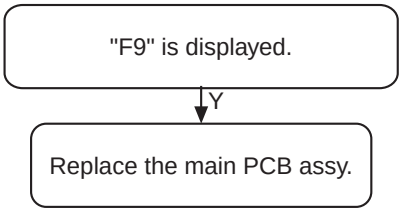

"F3" is displayed.
Is one of the stitch selection key, stitch length adjustment key and stitch width adjustment key stuck in a pressed down condition?
N
Replace the operation PCB assy.
or
Replace the main PCB assy.
Y
Release the key that is stuck.


"F4" is displayed.
Is the lead wire of the foot controller jack assy. free from damage?
Y
Replace the foot controller jack assy.
N
Is the foot controller jack assy. connected to the main PCB assy. (CN4) correctly?
N
Connect it correctly.
Y
Replace the main PCB assy.

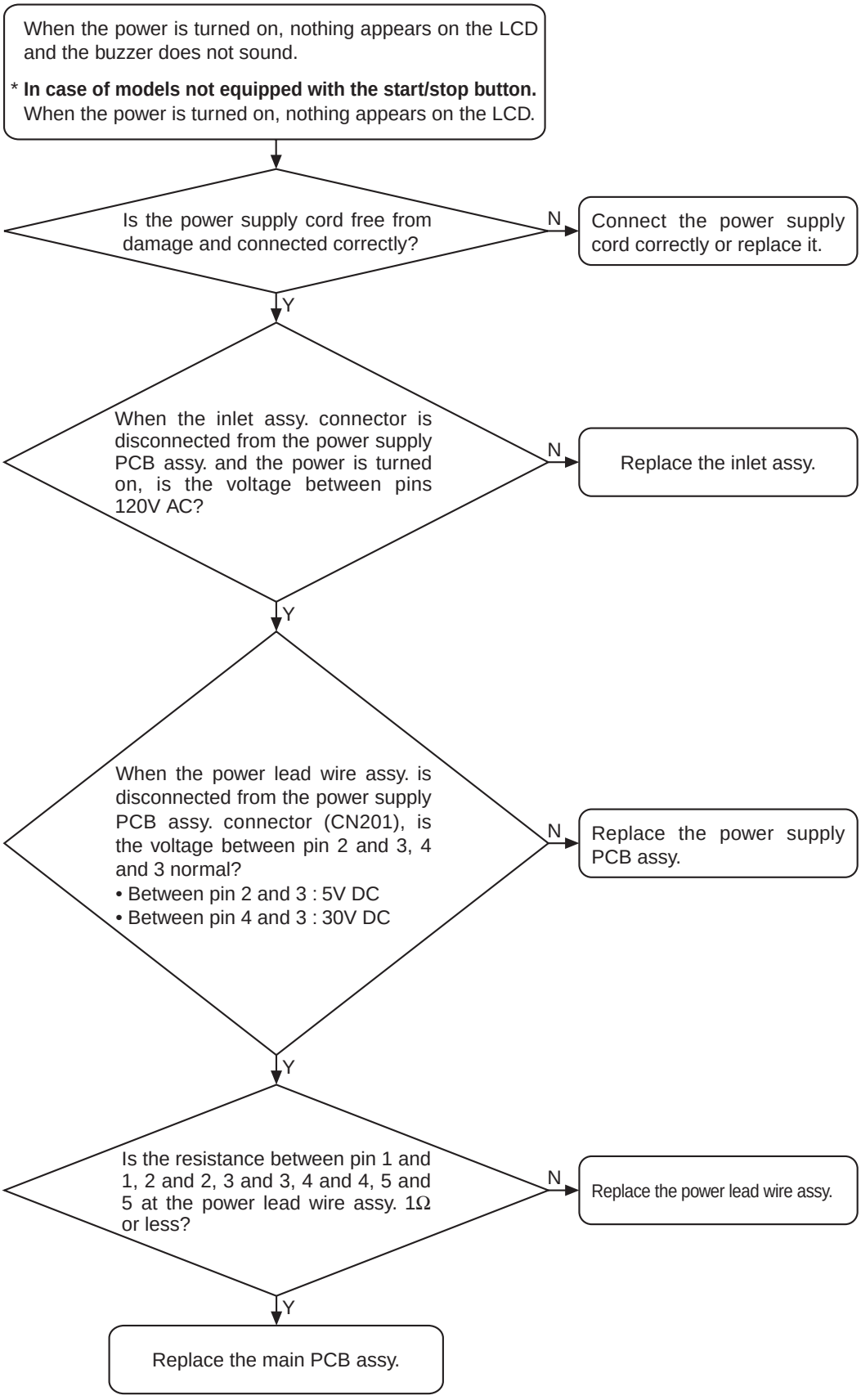

"F5" is displayed.
Is the main PCB assy. attached correctly?
N
Attach the main PCB assy. correctly.
Y
Is the timing shutter of the upper shaft dirty?
N
Clean the timing shutter.
Y
Replace the main PCB assy.


"F7" is displayed.
Replace the SSVR PCB assy.
or
Replace the main PCB assy.

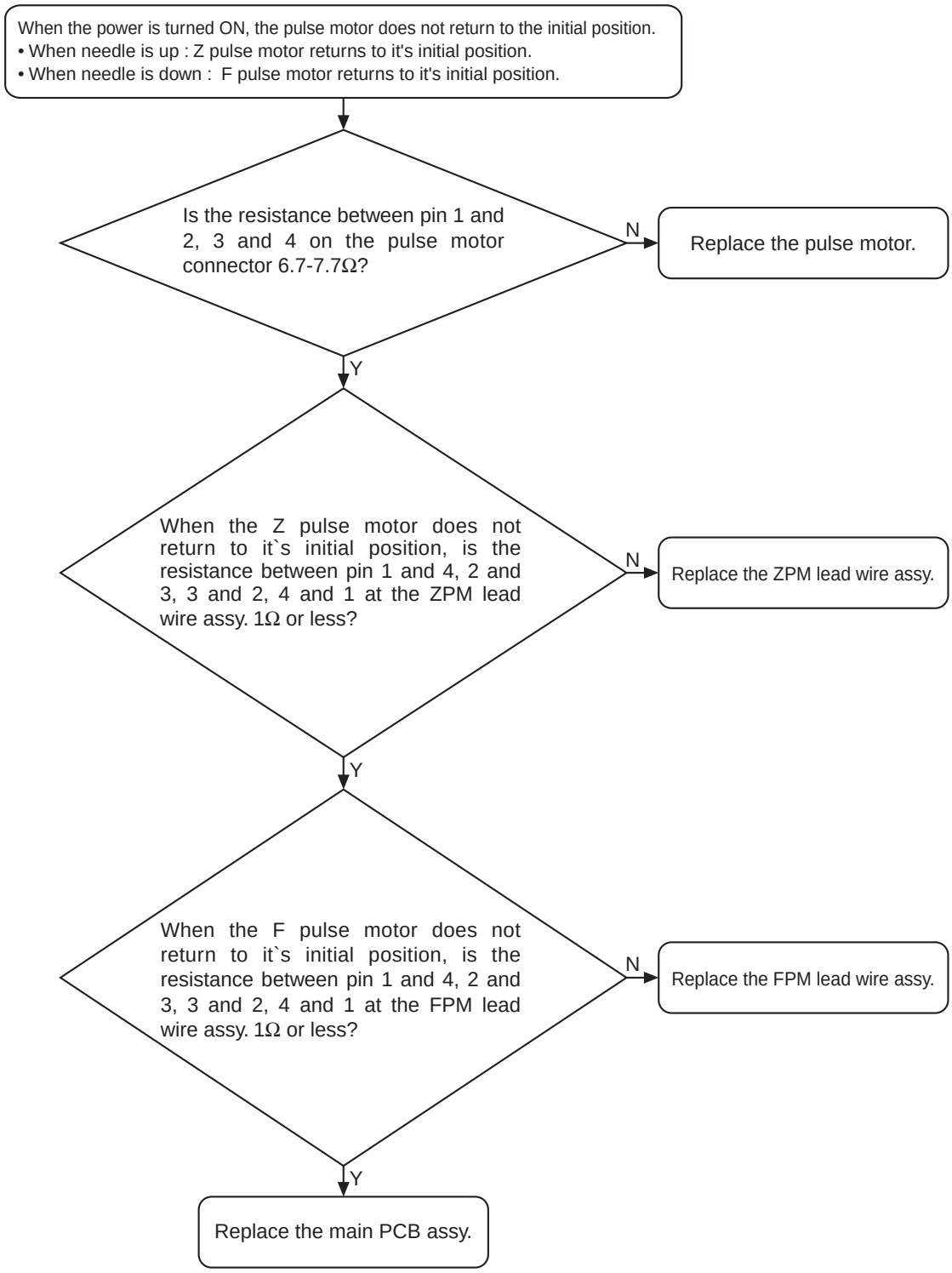

"F8" is displayed.
When the power lead wire assy. is disconnected from the power supply PCB assy. connector (CN201), is the voltage between pin 2 and 3, 4 and 3 normal?
• Between pin 2 and 3 : 5V DC
• Between pin 4 and 3 : 30V DC
N
Replace the power supply PCB assy.
Y
Replace the main PCB assy.


"F9" is displayed.
Y
Replace the main PCB assy.

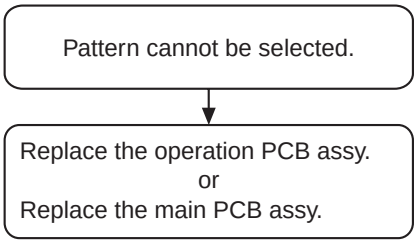
Power does not come on

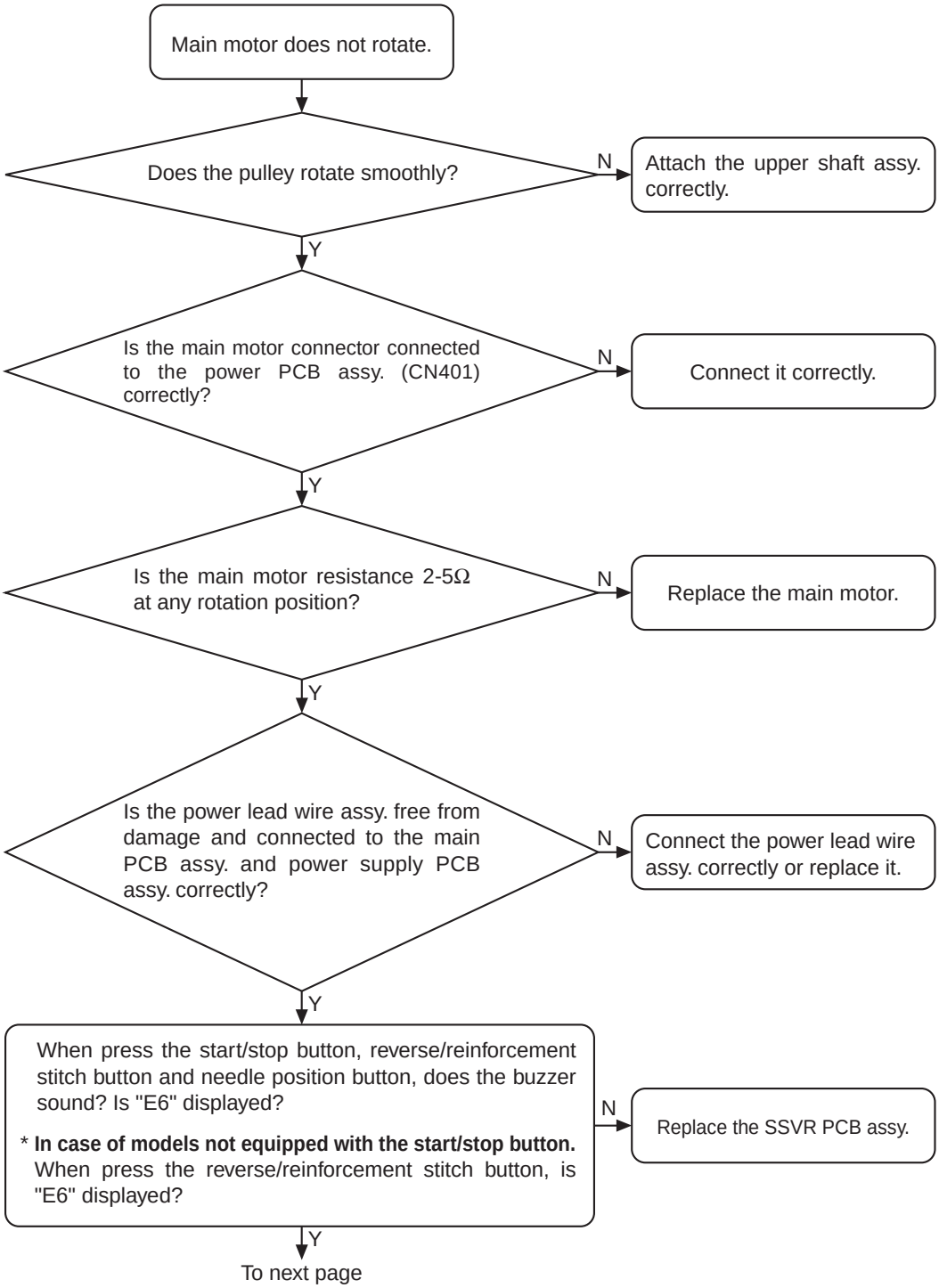


Pulse motor does not return to initial position

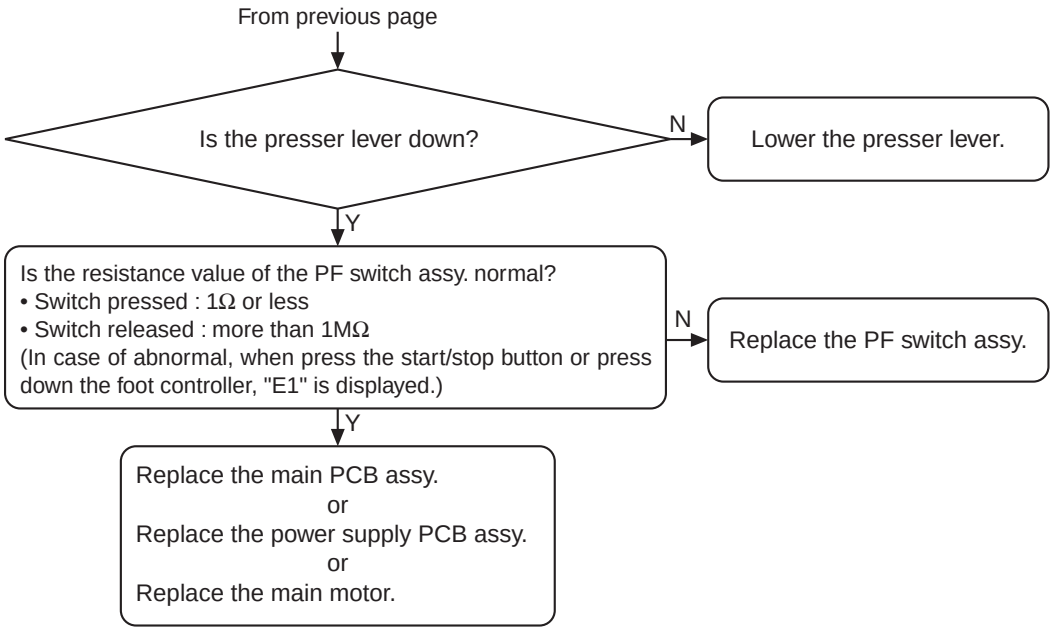


Pattern cannot be selected

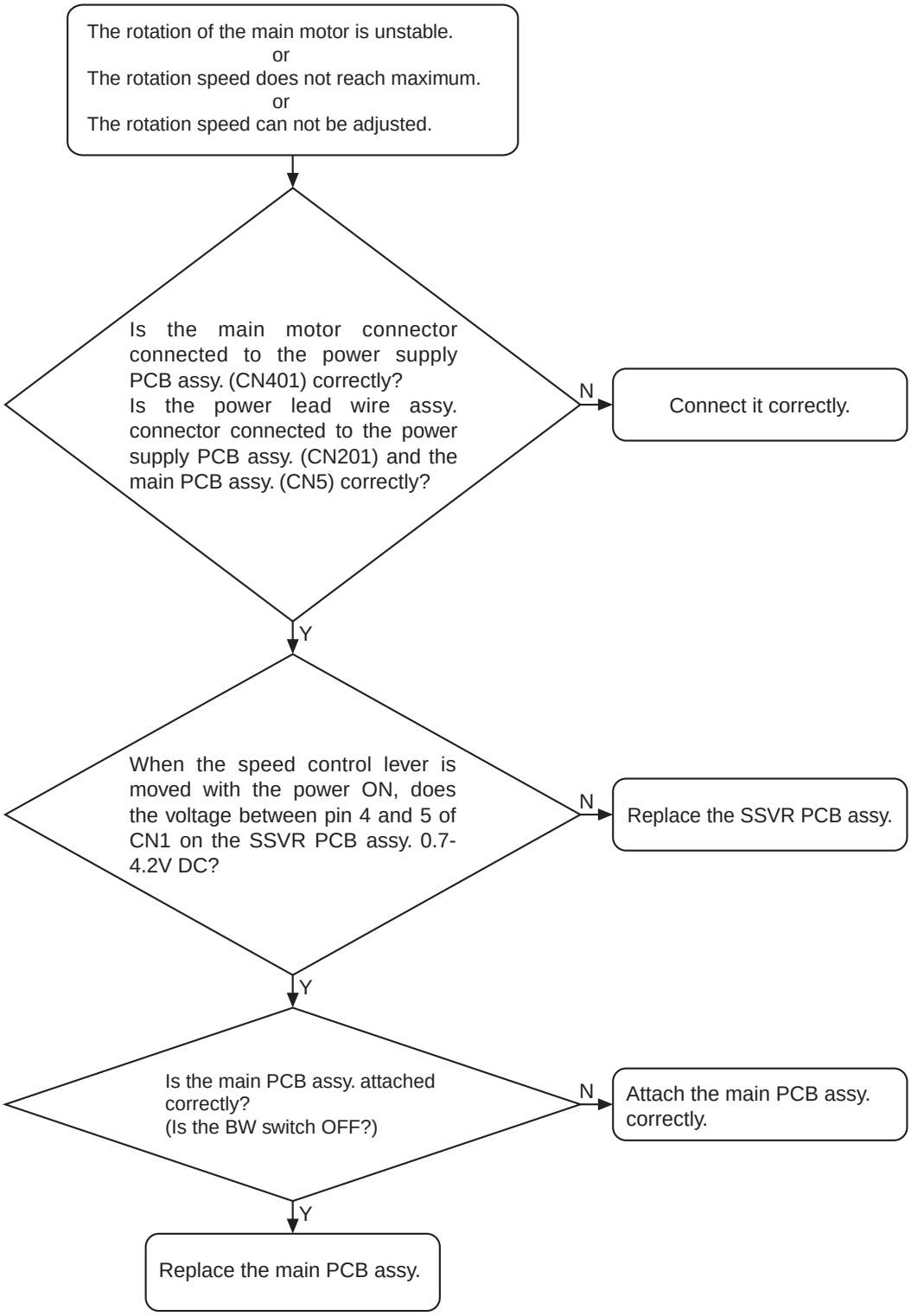



Main motor does not rotate.
Does the pulley rotate smoothly?
N
Attach the upper shaft assy. correctly.
Y
Is the main motor connector connected to the power PCB assy. (CN401) correctly?
N
Connect it correctly.
Y
Is the main motor resistance 2-5Ω at any rotation position?
N
Replace the main motor.
Y
Is the power lead wire assy. free from damage and connected to the main PCB assy. and power supply PCB assy. correctly?
N
Connect the power lead wire assy. correctly or replace it.
Y
When press the start/stop button, reverse/reinforcement stitch button and needle position button, does the buzzer sound? Is "E6" displayed?
* In case of models not equipped with the start/stop button. When press the reverse/reinforcement stitch button, is "E6" displayed?
N
Replace the SSVR PCB assy.
Y
To next page

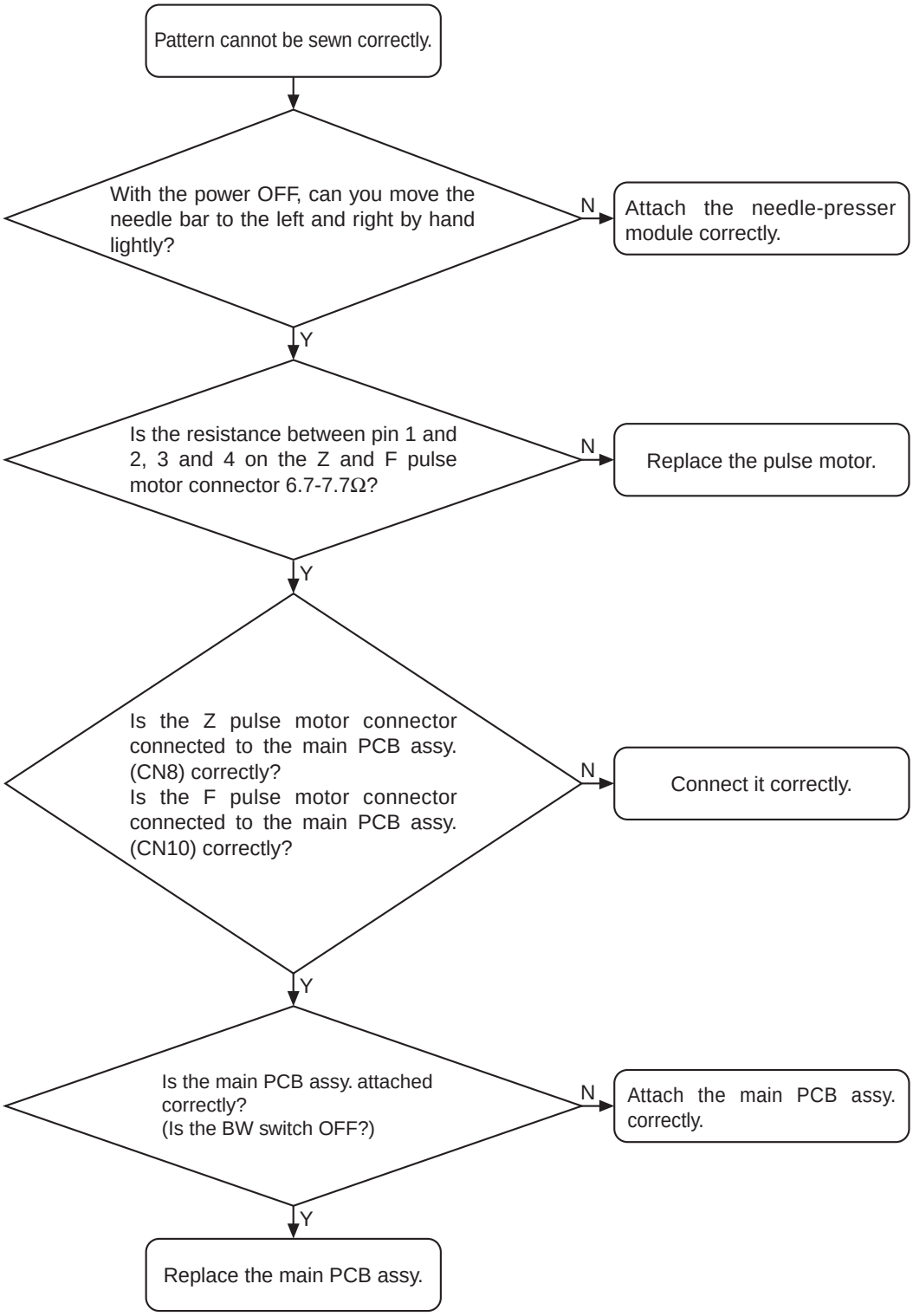
Main motor does not rotate

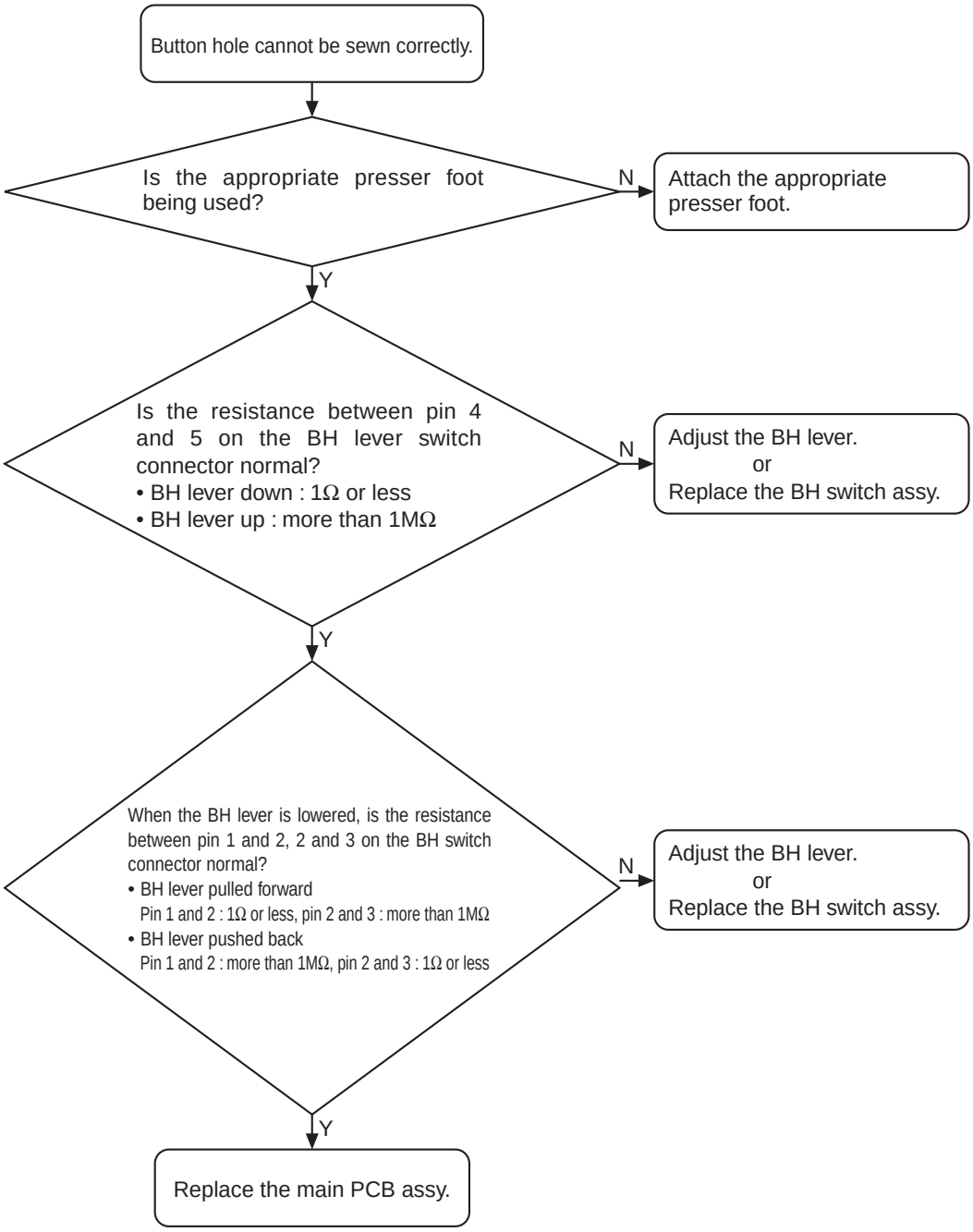


Main motor rotation is not normal

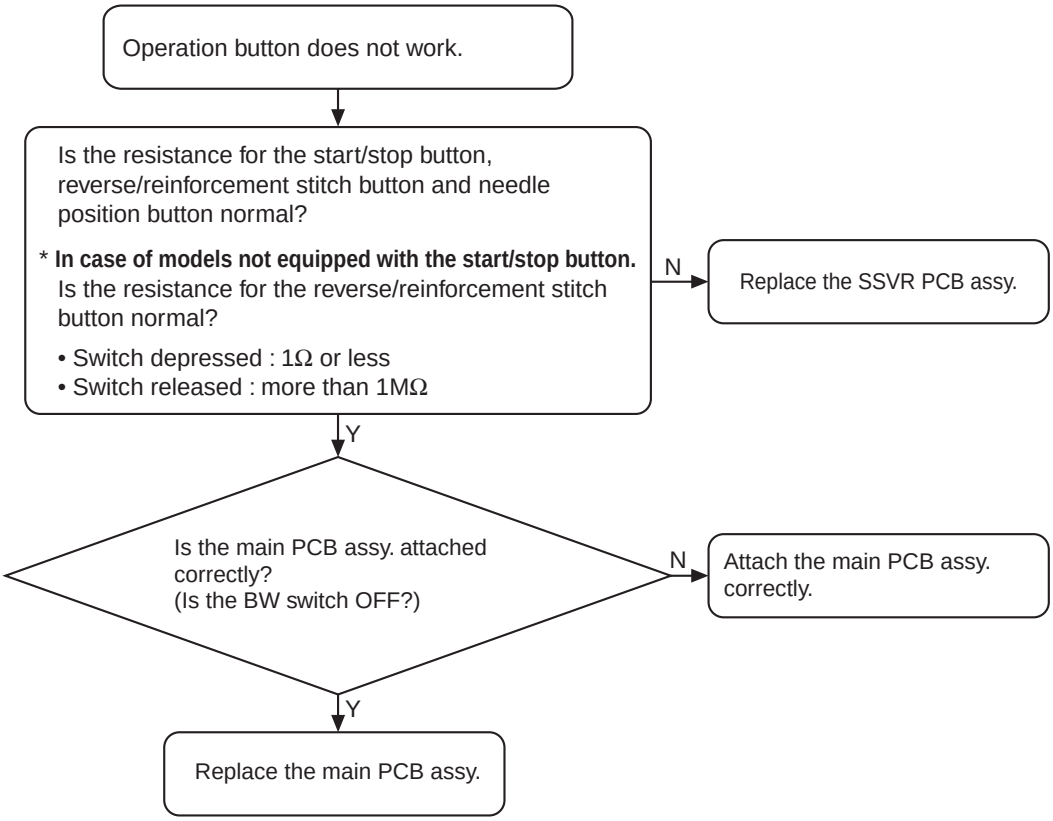


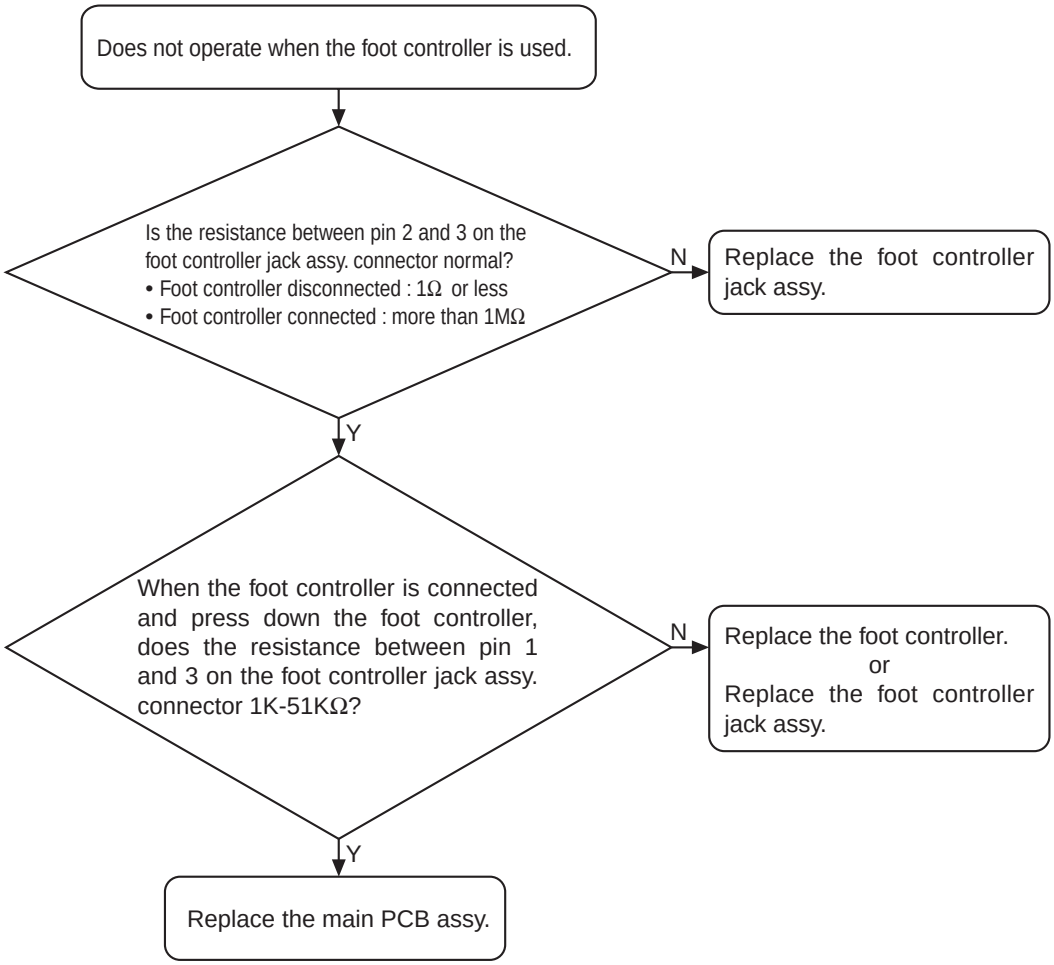
Pattern cannot be sewn correctly



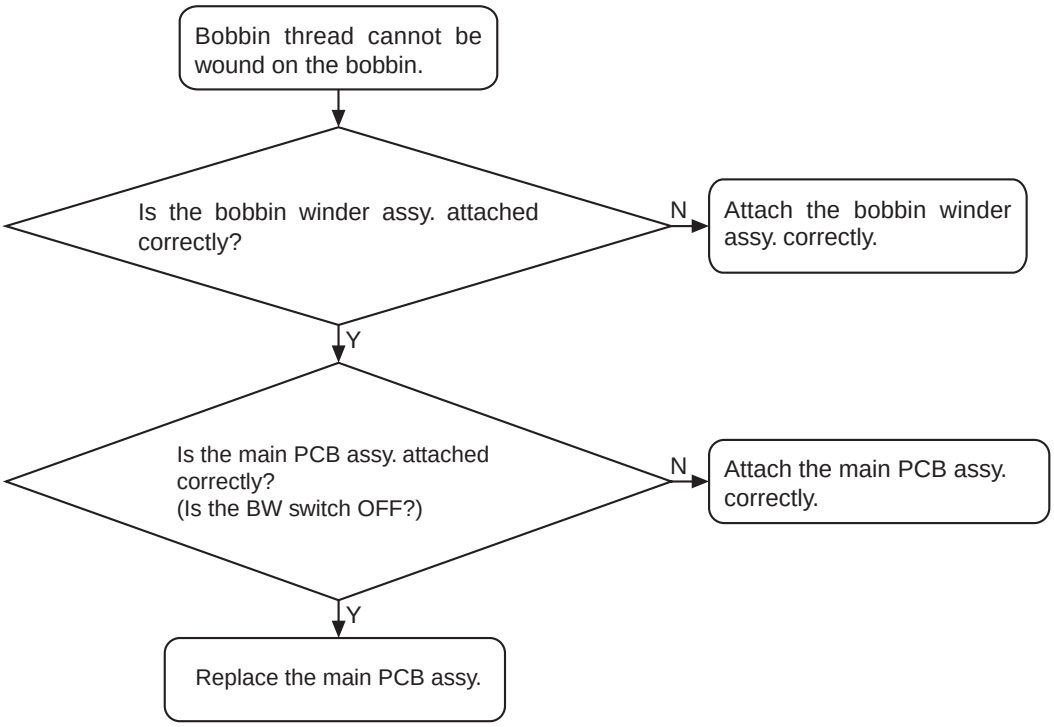

Button hole cannot be sewn correctly.
Is the appropriate presser foot being used?
N
Attach the appropriate presser foot.
Y
Is the resistance between pin 4 and 5 on the BH lever switch connector normal?
• BH lever down : 1Ω or less
• BH lever up : more than 1MΩ
N
Adjust the BH lever.
or
Replace the BH switch assy.
Y
When the BH lever is lowered, is the resistance between pin 1 and 2, 2 and 3 on the BH switch connector normal?
• BH lever pulled forward
Pin 1 and 2 : 1Ω or less, pin 2 and 3 : more than 1MΩ
• BH lever pushed back
Pin 1 and 2 : more than 1MΩ, pin 2 and 3 : 1Ω or less
N
Adjust the BH lever.
or
Replace the BH switch assy.
Y
Replace the main PCB assy.

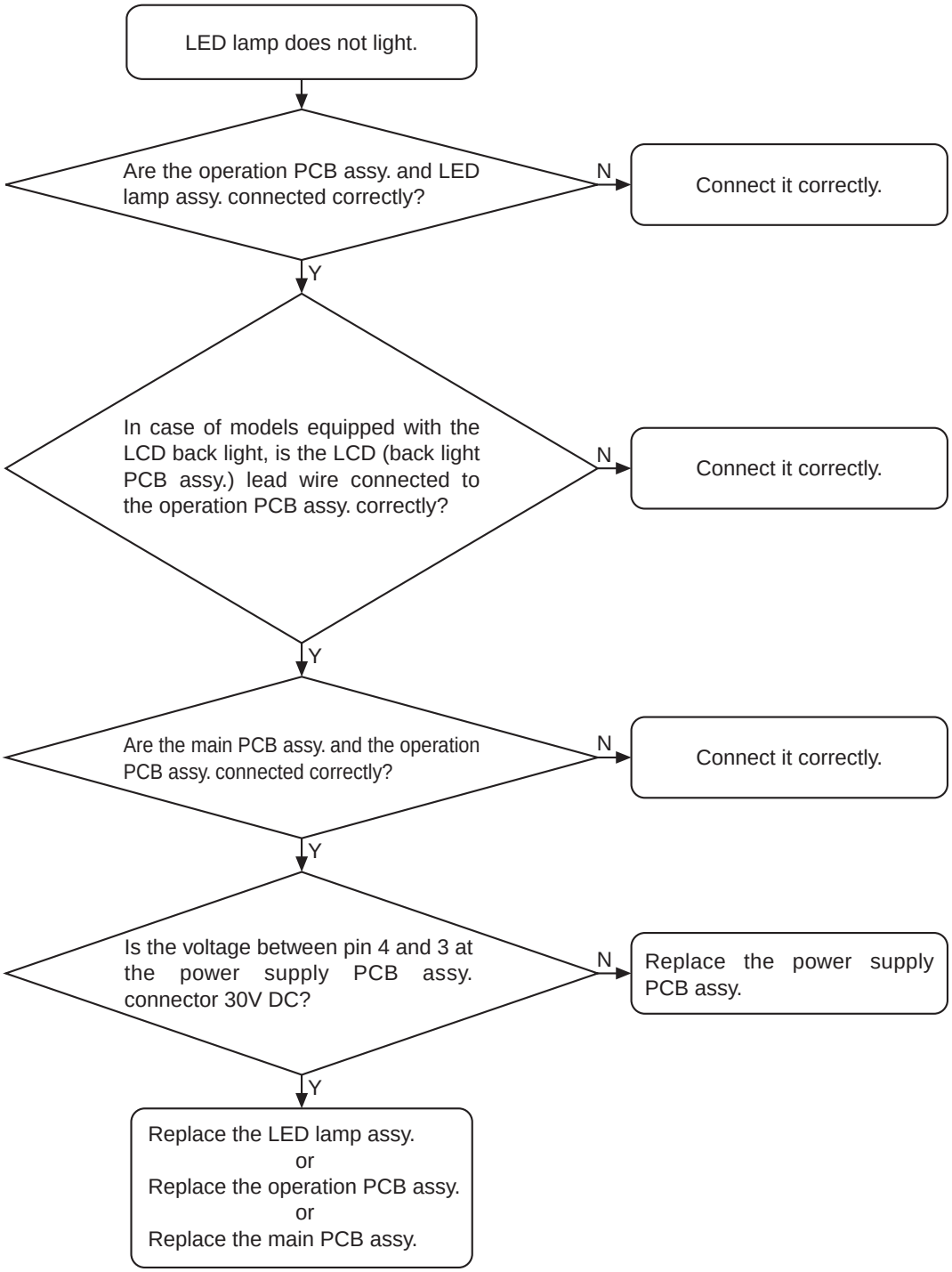
Operation button does not work



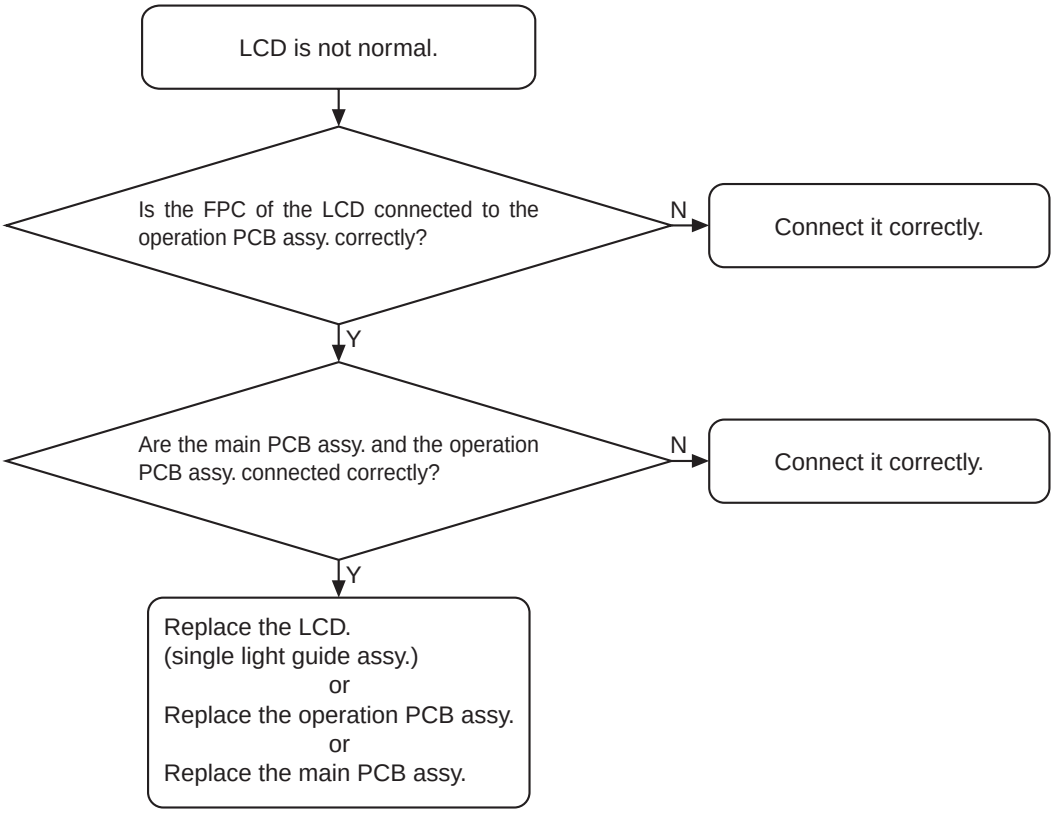

Does not operate when the foot controller is used.
Is the resistance between pin 2 and 3 on the foot controller jack assy. connector normal?
• Foot controller disconnected : 1Ω or less
• Foot controller connected : more than 1MΩ
N
Replace the foot controller jack assy.
Y
When the foot controller is connected and press down the foot controller, does the resistance between pin 1 and 3 on the foot controller jack assy. connector 1K-51KΩ?
N
Replace the foot controller.
or
Replace the foot controller jack assy.
Y
Replace the main PCB assy.

Bobbin thread cannot be wound on the bobbin

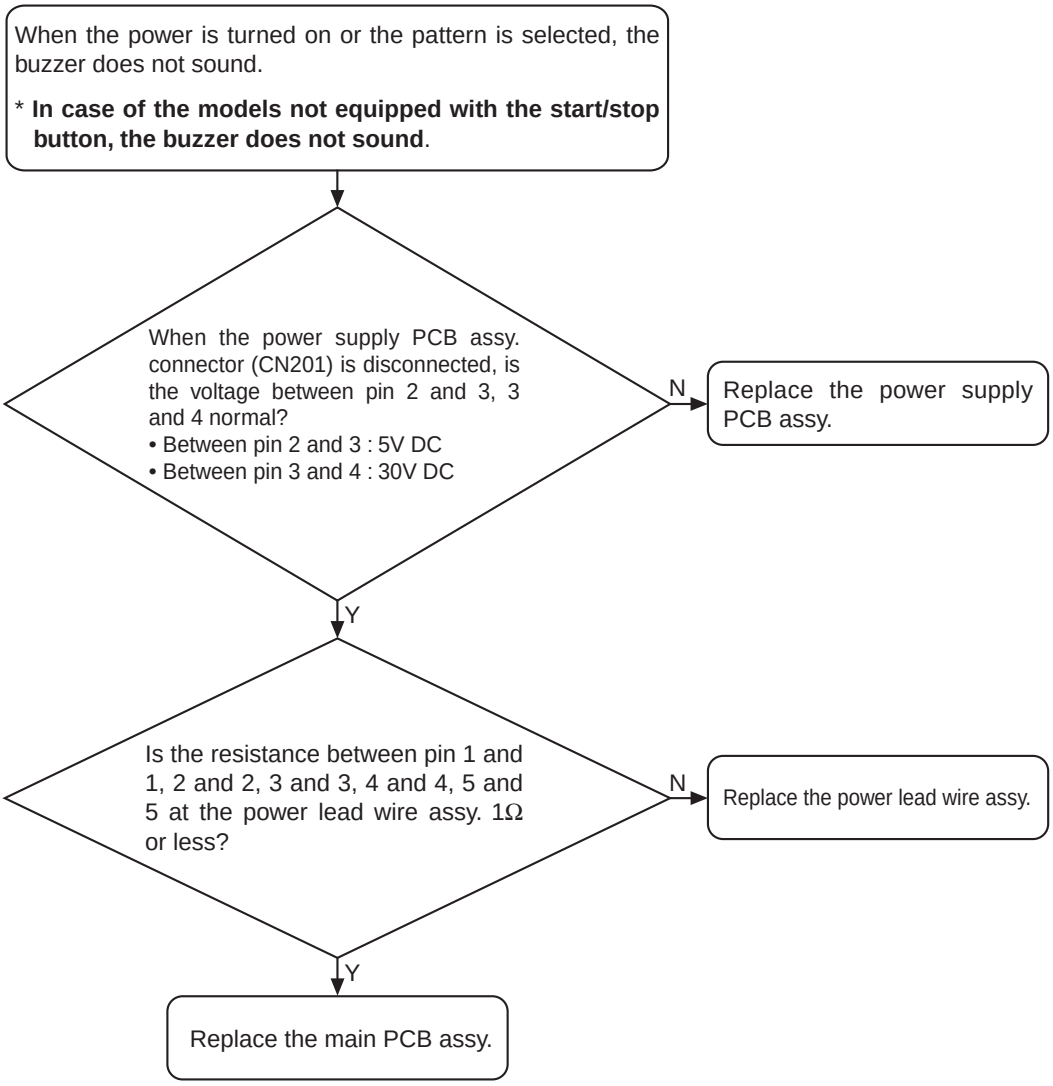



LED lamp does not light.
Are the operation PCB assy. and LED lamp assy. connected correctly?
N
Connect it correctly.
Y
In case of models equipped with the LCD back light, is the LCD (back light PCB assy.) lead wire connected to the operation PCB assy. correctly?
N
Connect it correctly.
Y
Are the main PCB assy. and the operation PCB assy. connected correctly?
N
Connect it correctly.
Y
Is the voltage between pin 4 and 3 at the power supply PCB assy. connector 30V DC?
N
Replace the power supply PCB assy.
Y
Replace the LED lamp assy.
or
Replace the operation PCB assy.
or
Replace the main PCB assy.

LCD is not normal

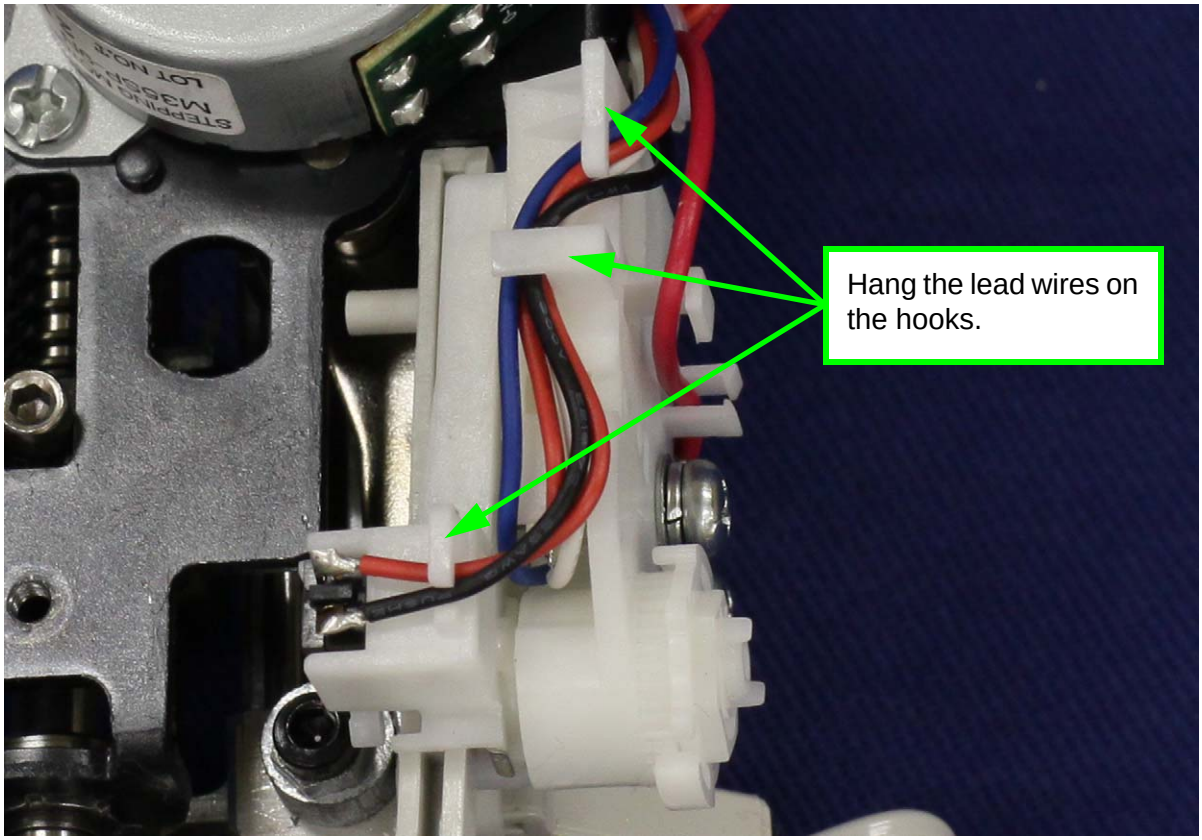


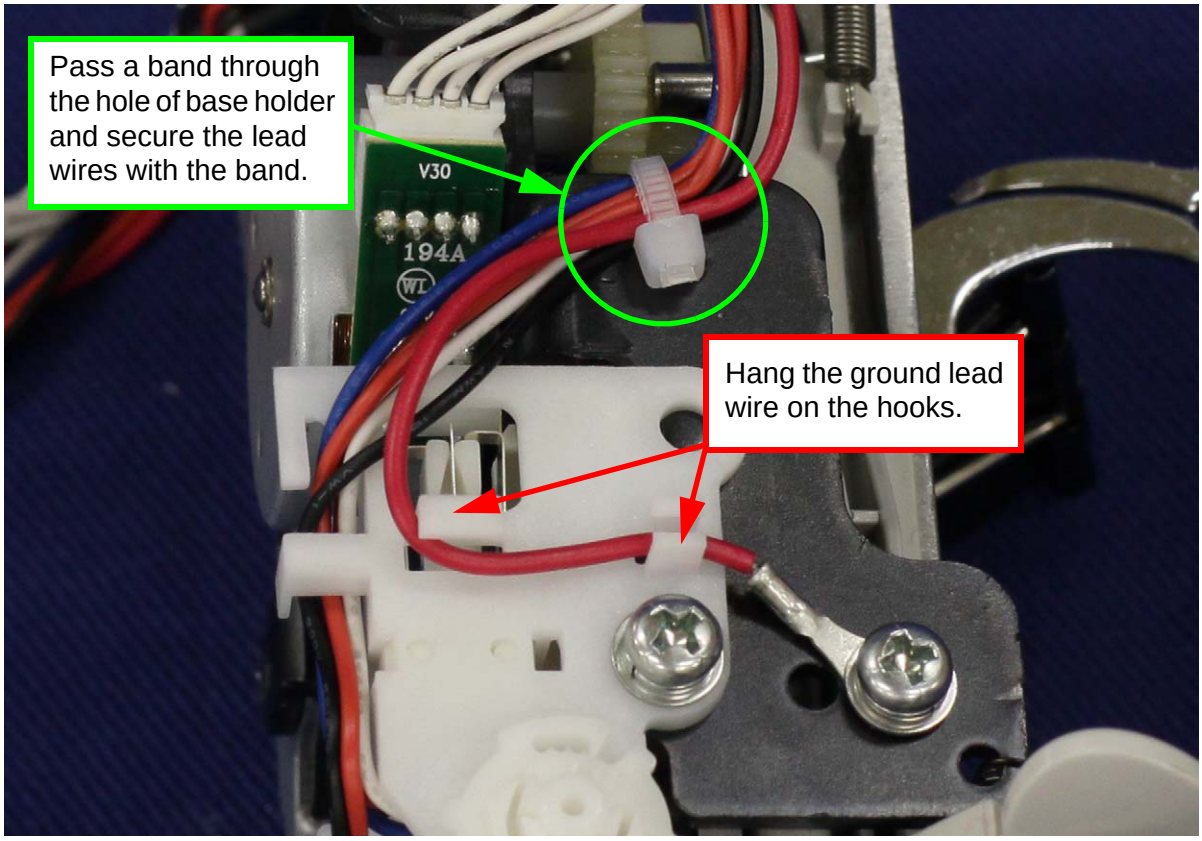
Buzzer does not sound



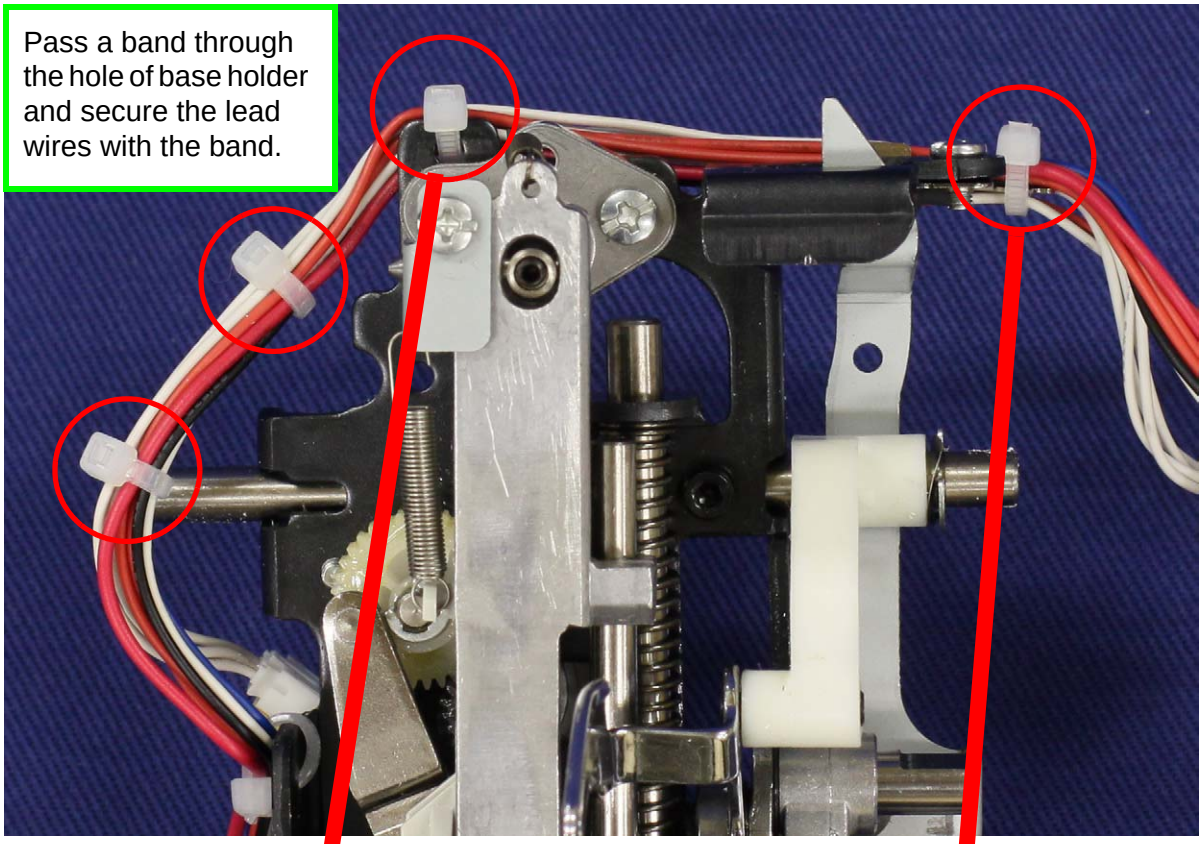
6 Special Instructions of Wiring

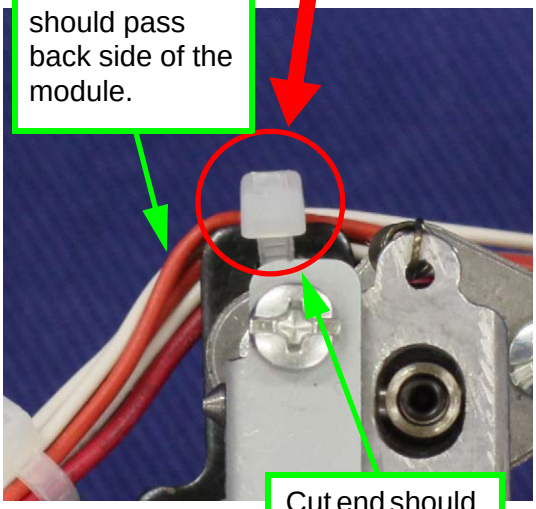
1. Wiring of BH switch assy.

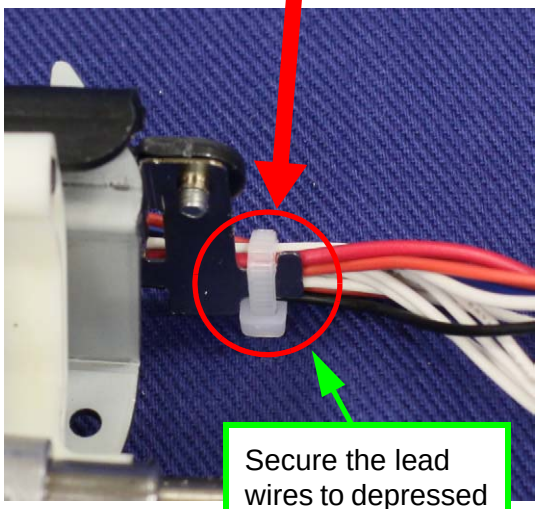




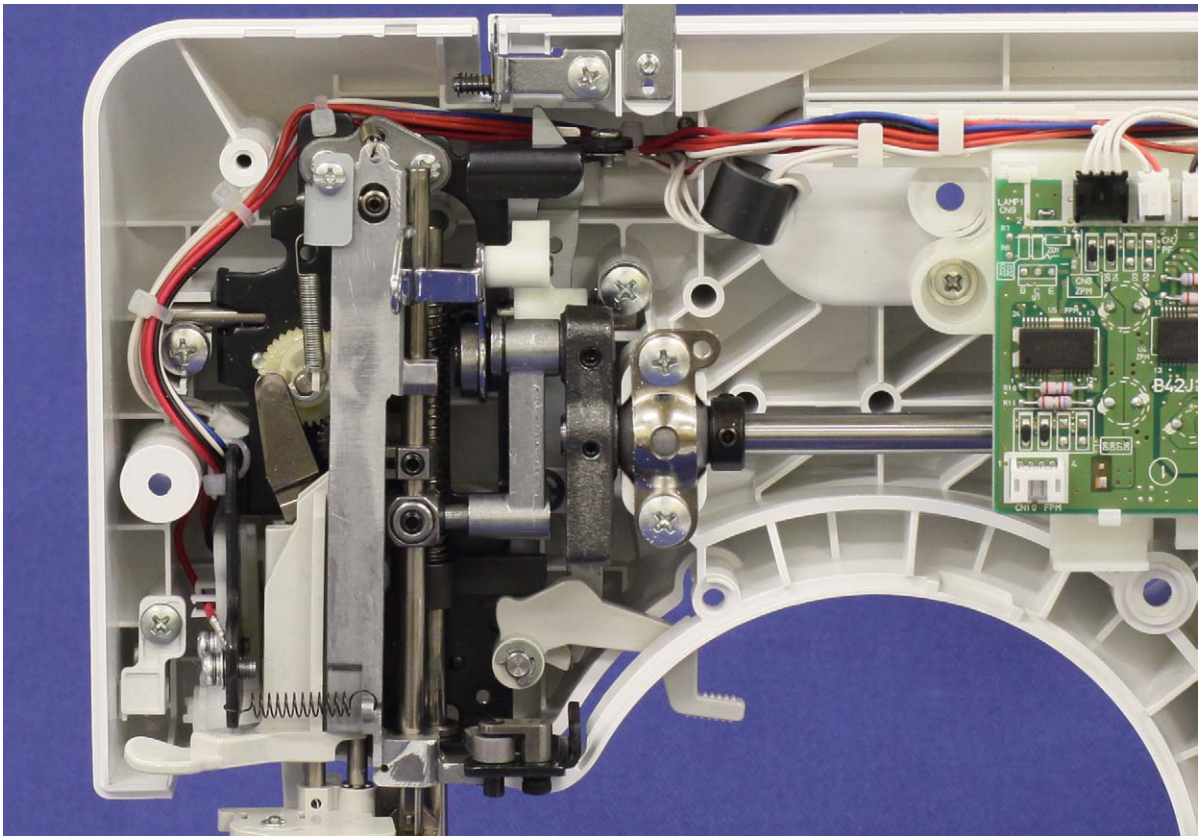
2. Wiring on upper side of needle bar / presser module



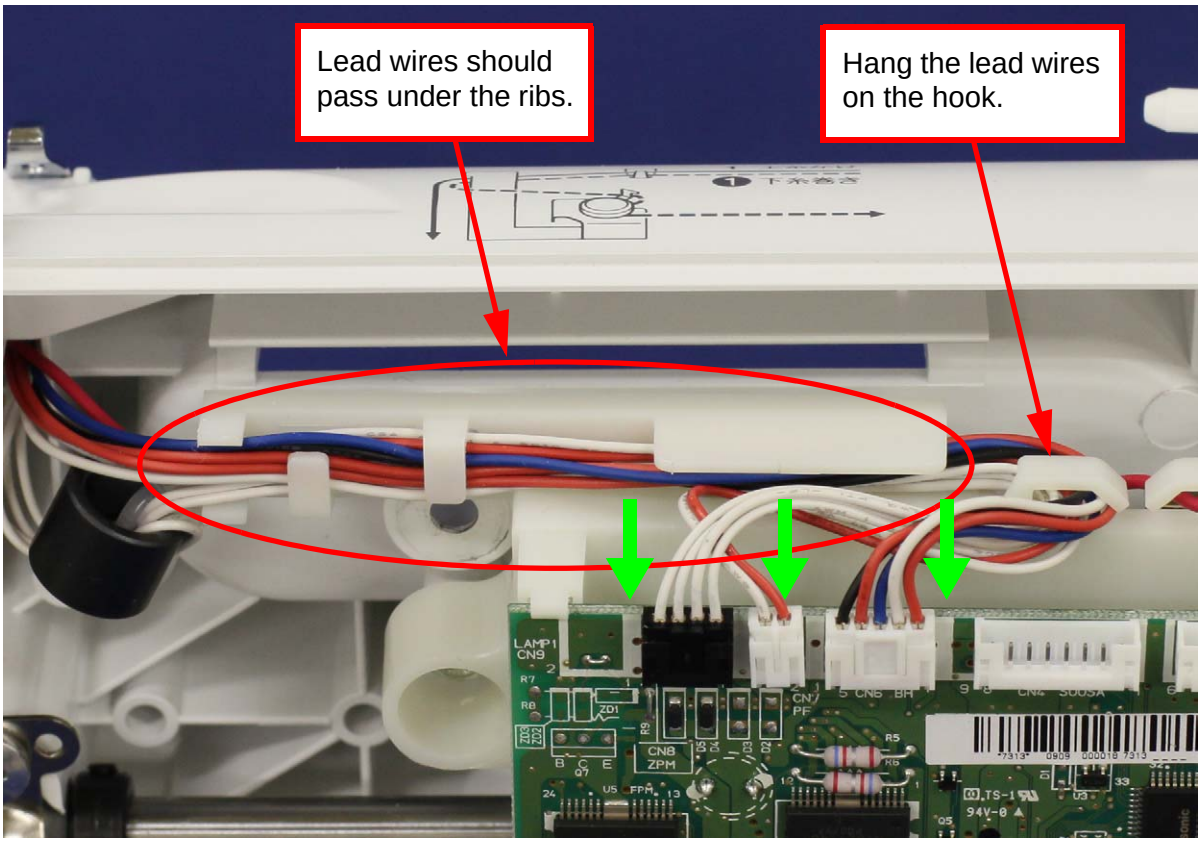




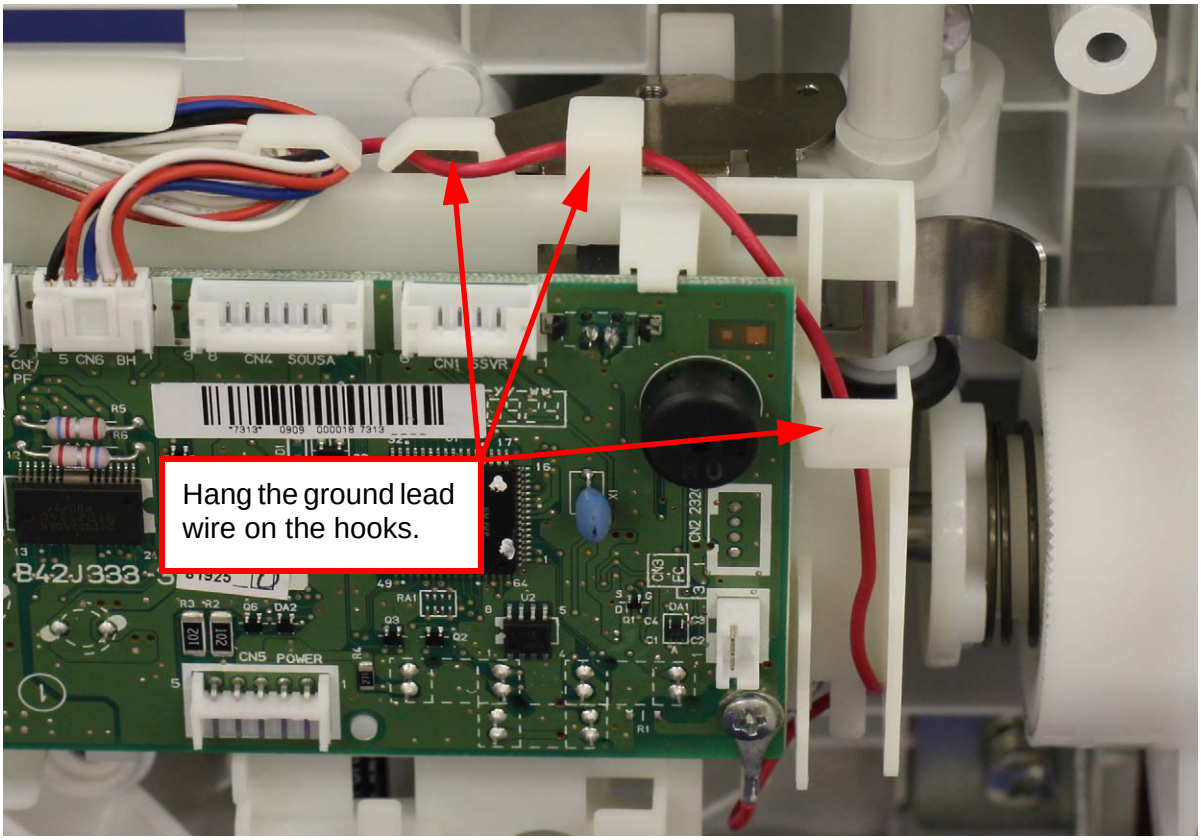
3. Wiring on front side of needle bar / presser module



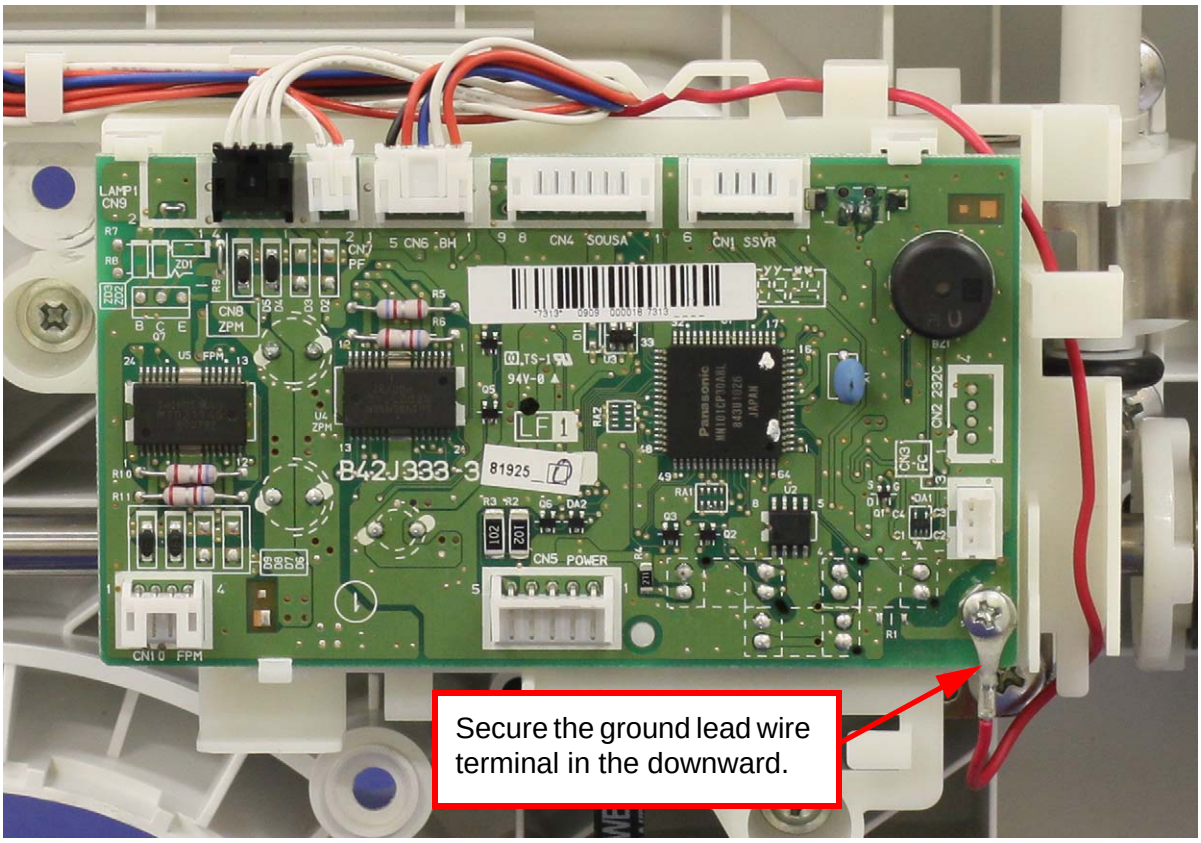
4. Wiring on left upper side of main PCB assy.



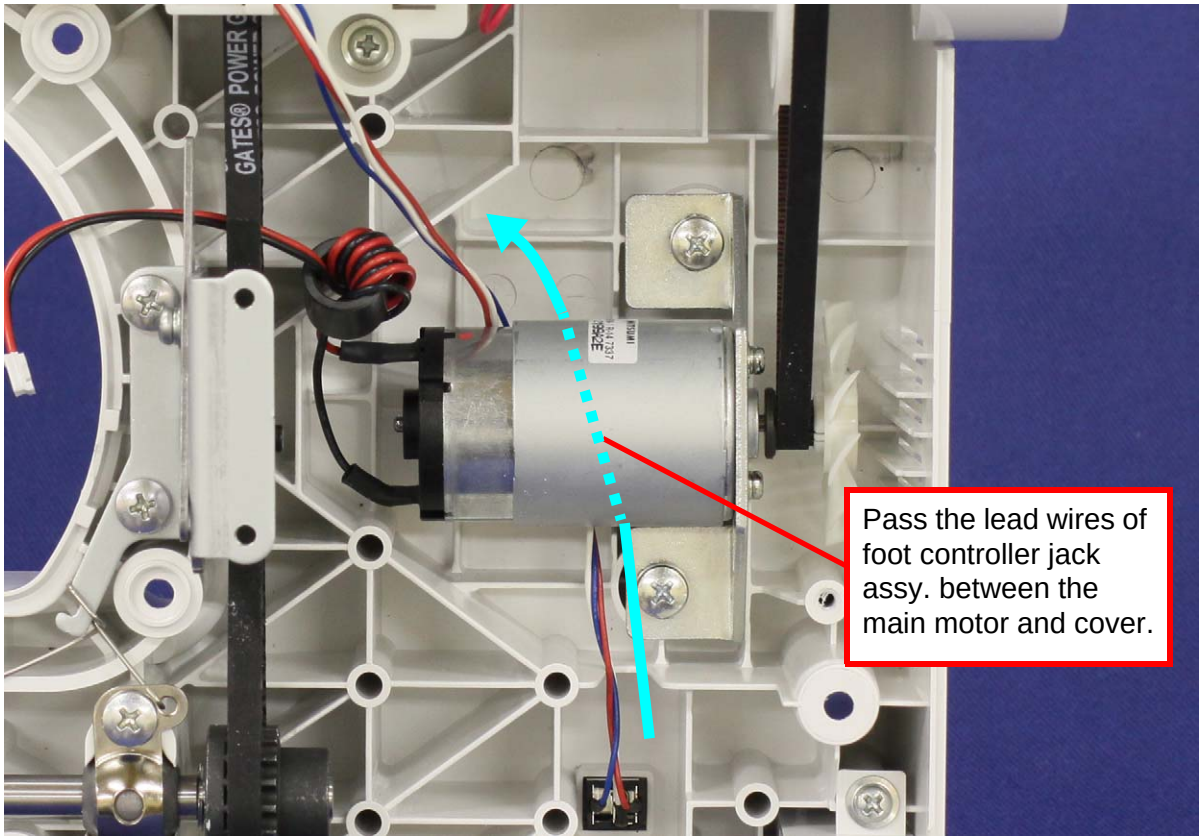
5. Wiring on right upper side of main PCB assy.



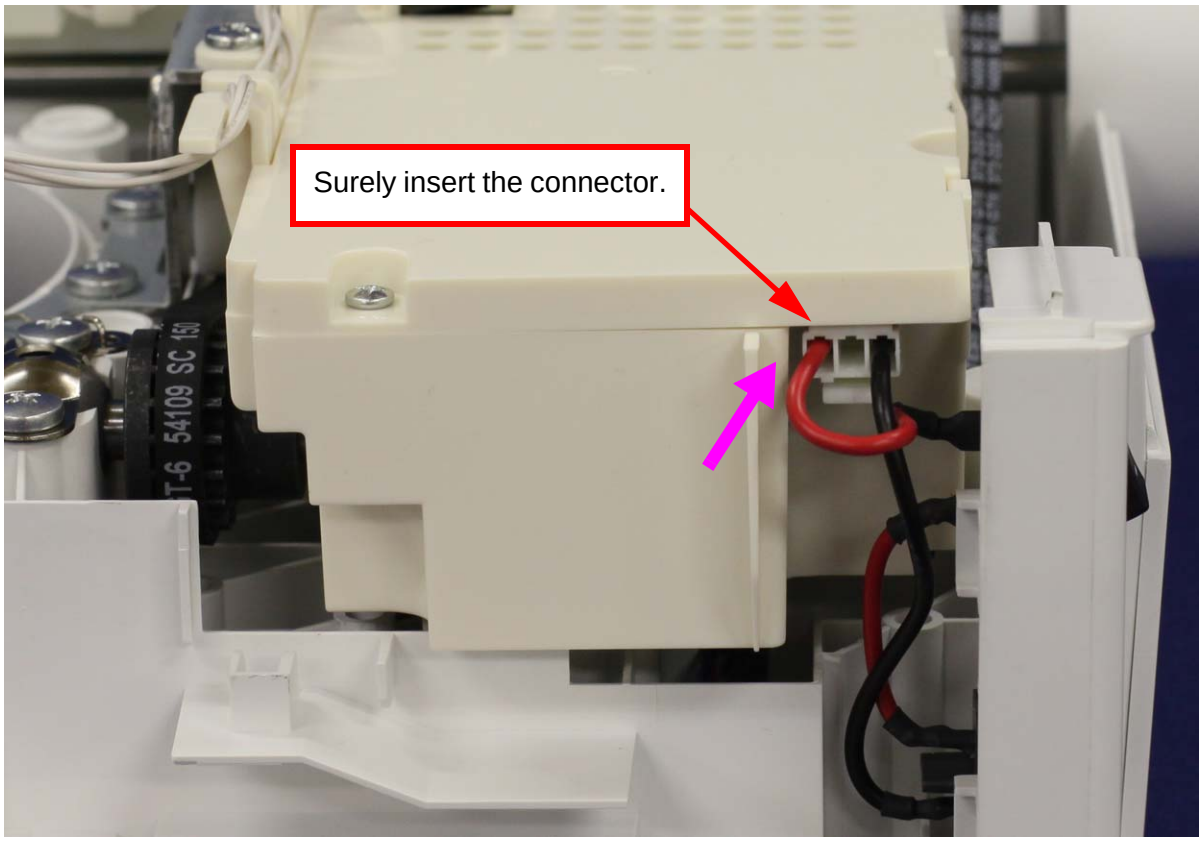
6. Wiring on front side of main PCB assy.



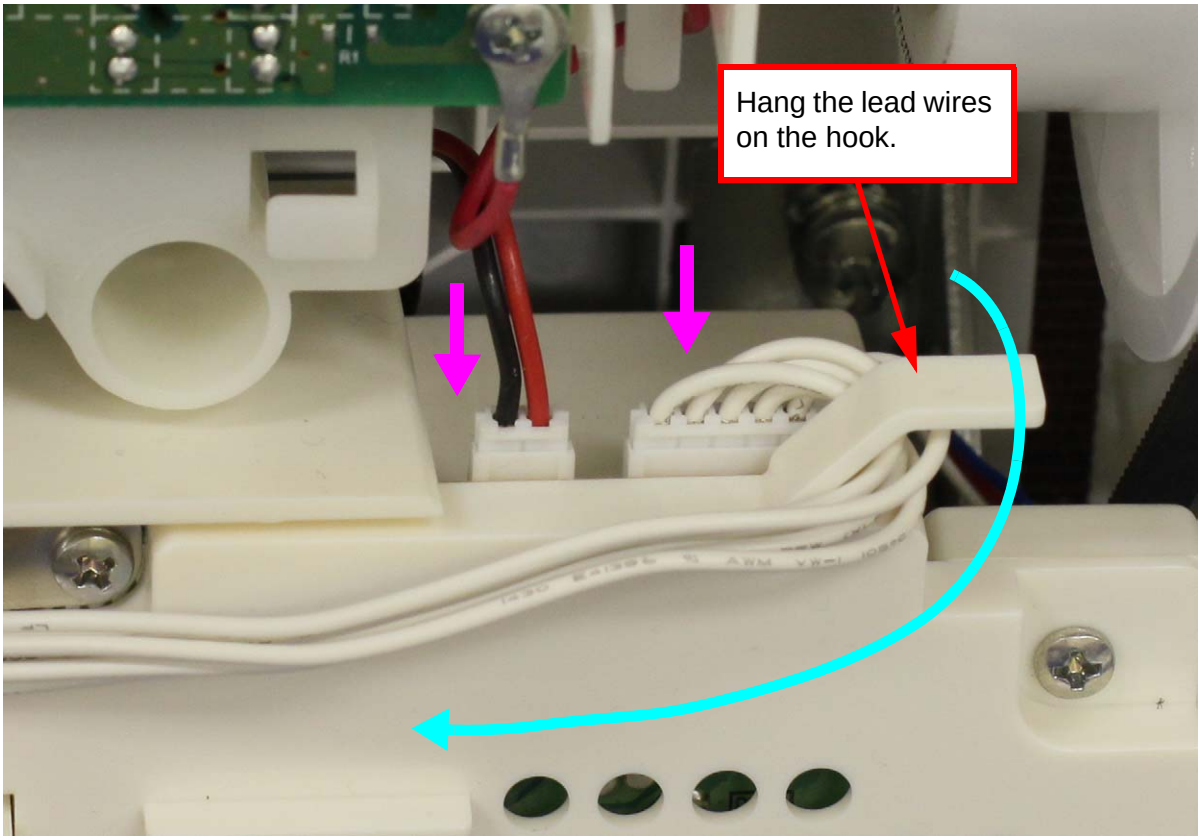
1. Wiring of foot controller jack assy.



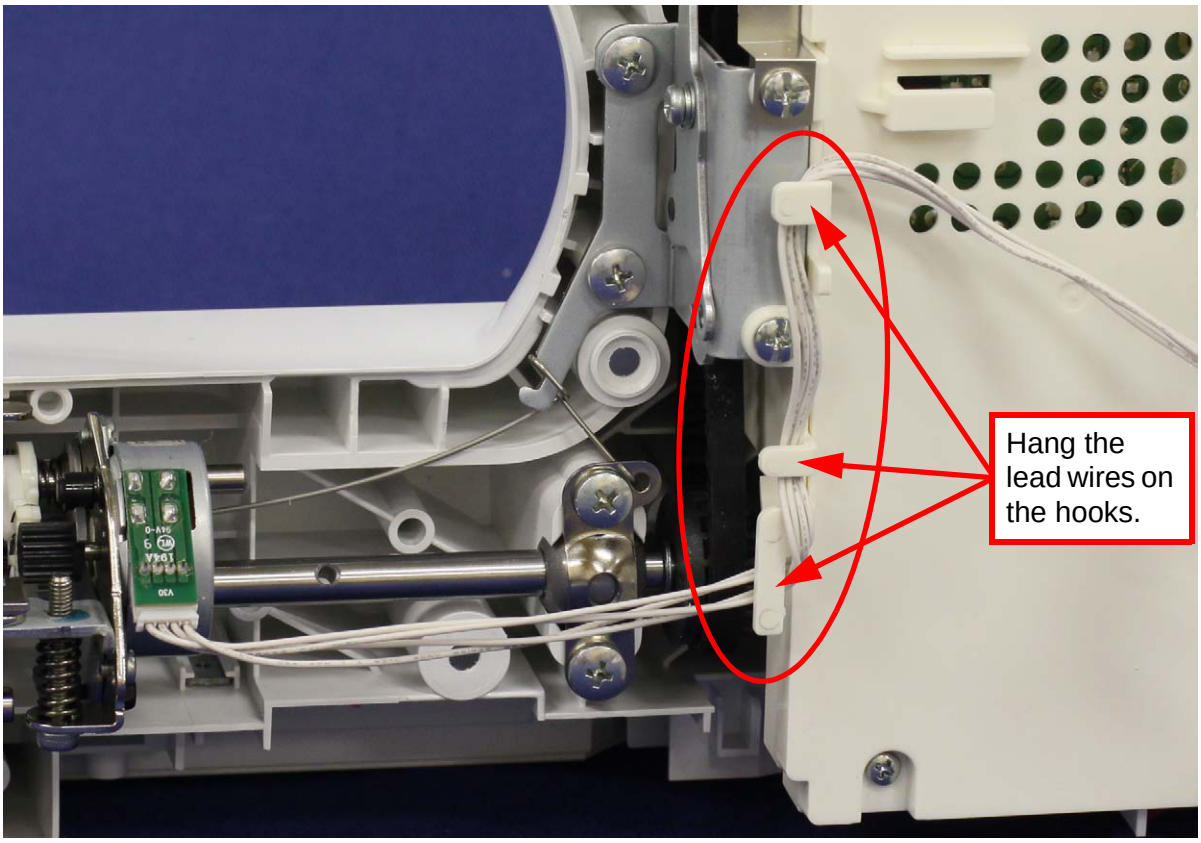
2. Wiring on lower side of power supply unit



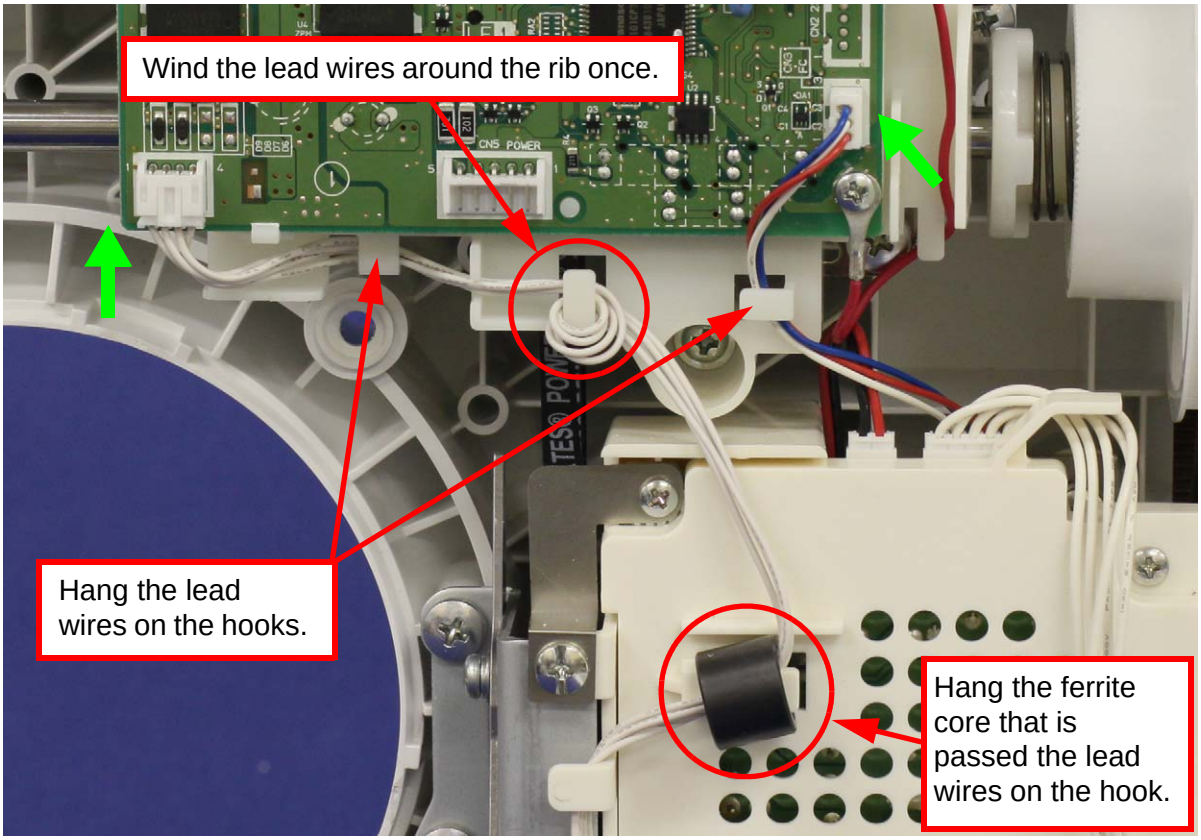
3. Wiring on upper side of power supply unit

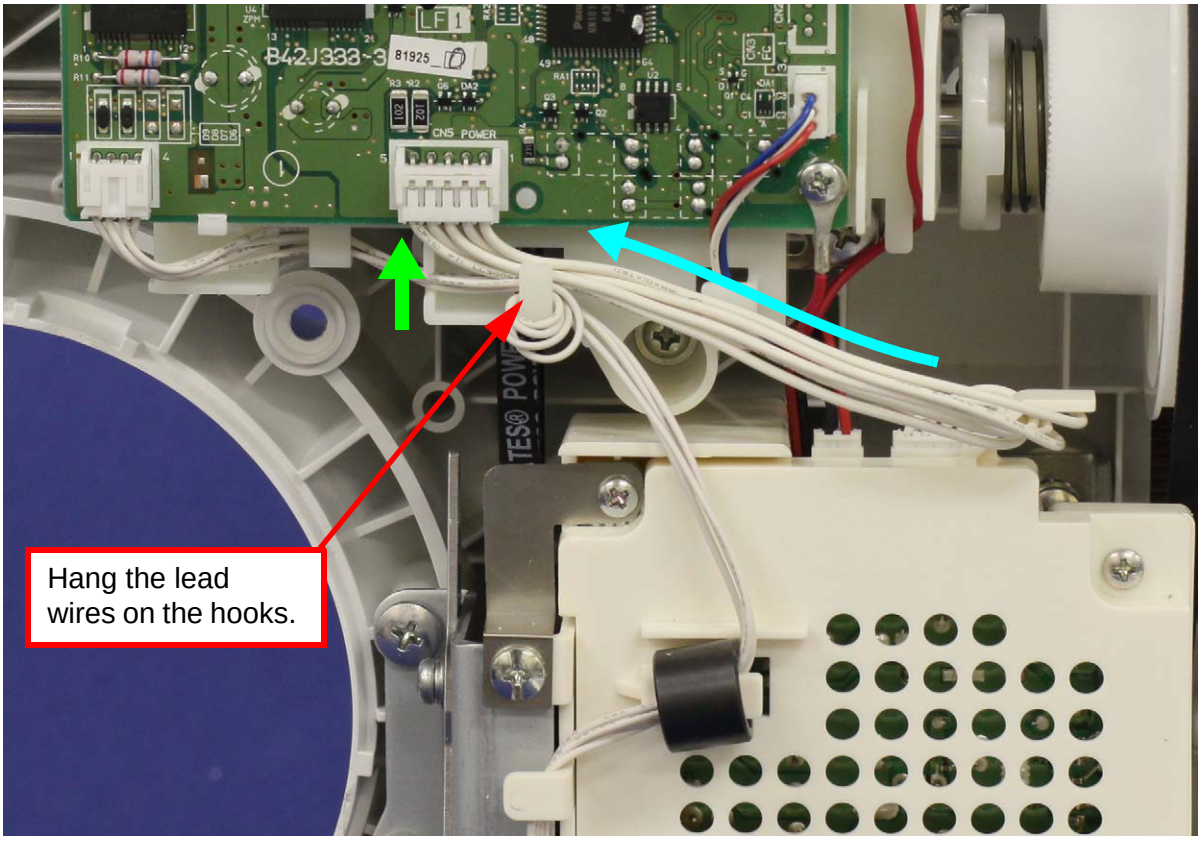


4. Wiring on left side of power supply unit

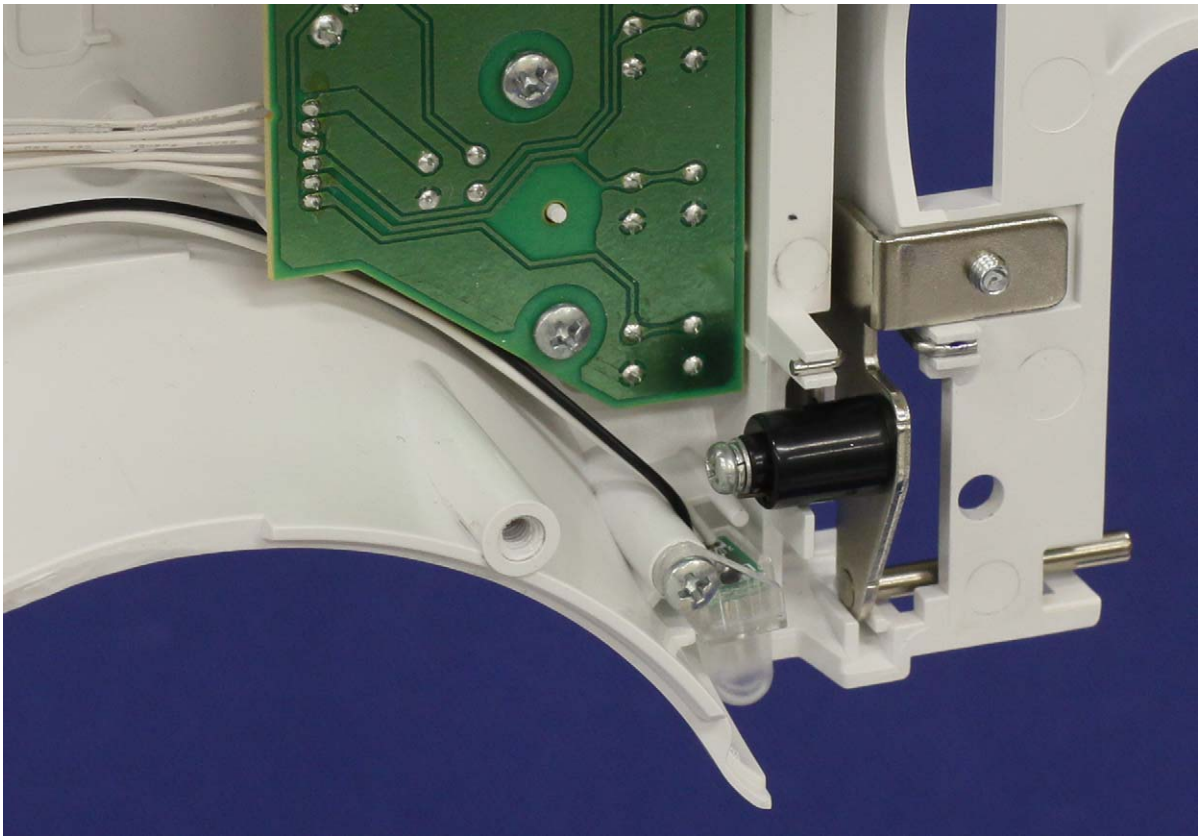


5. Wiring of power supply unit and main PCB assy.



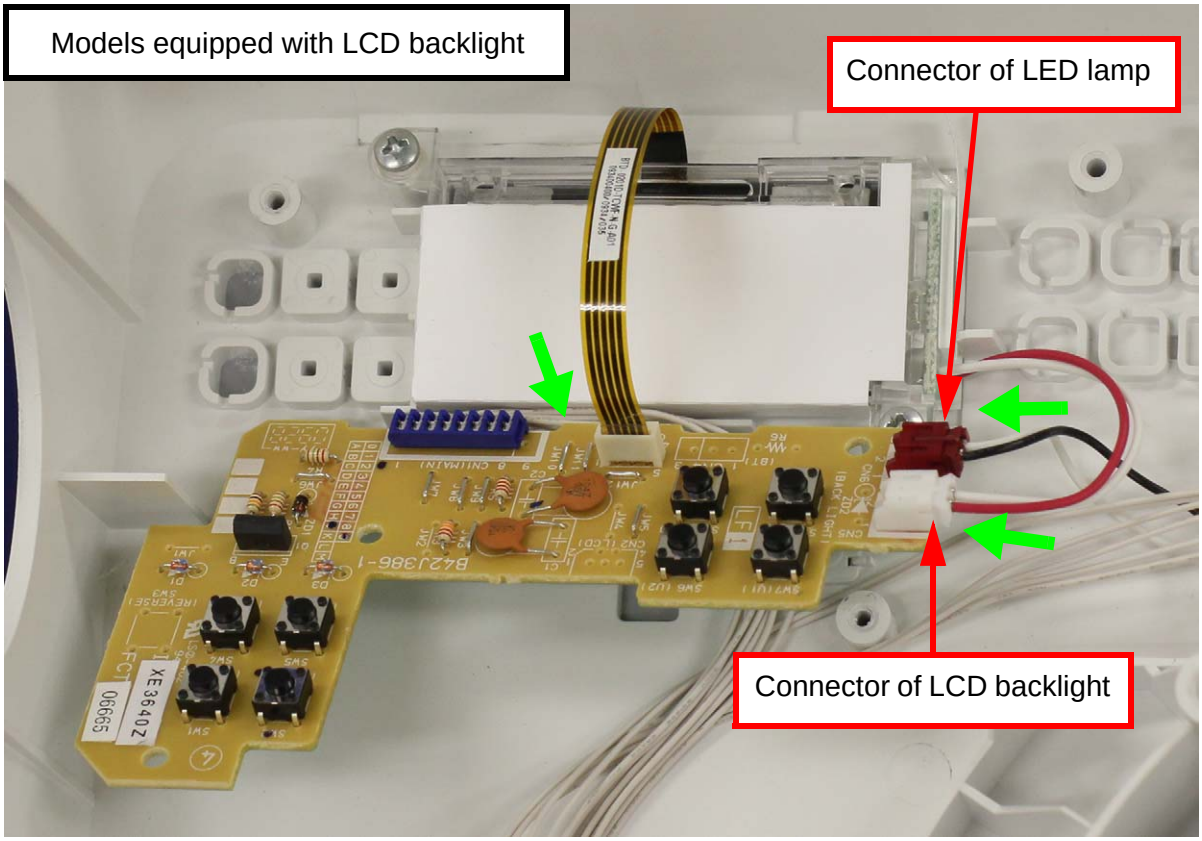


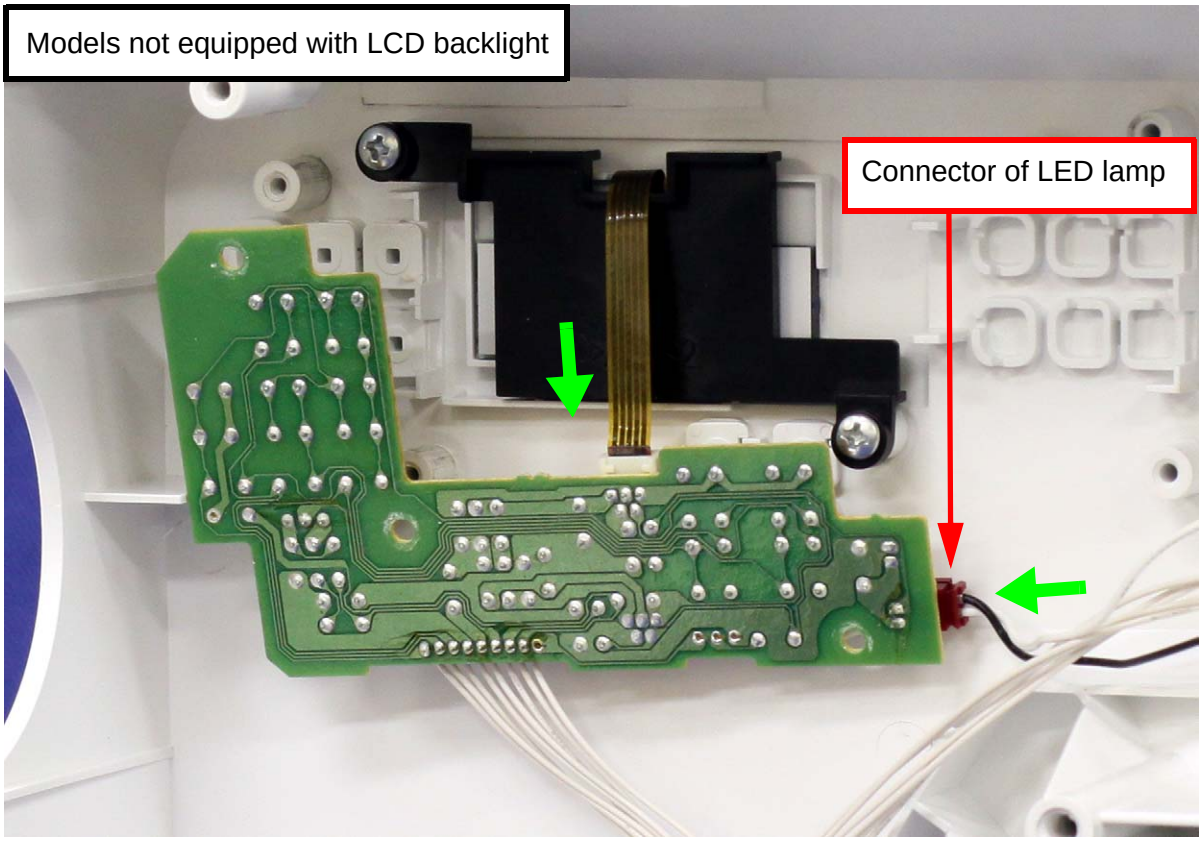
1. Wiring of LED lamp assy.



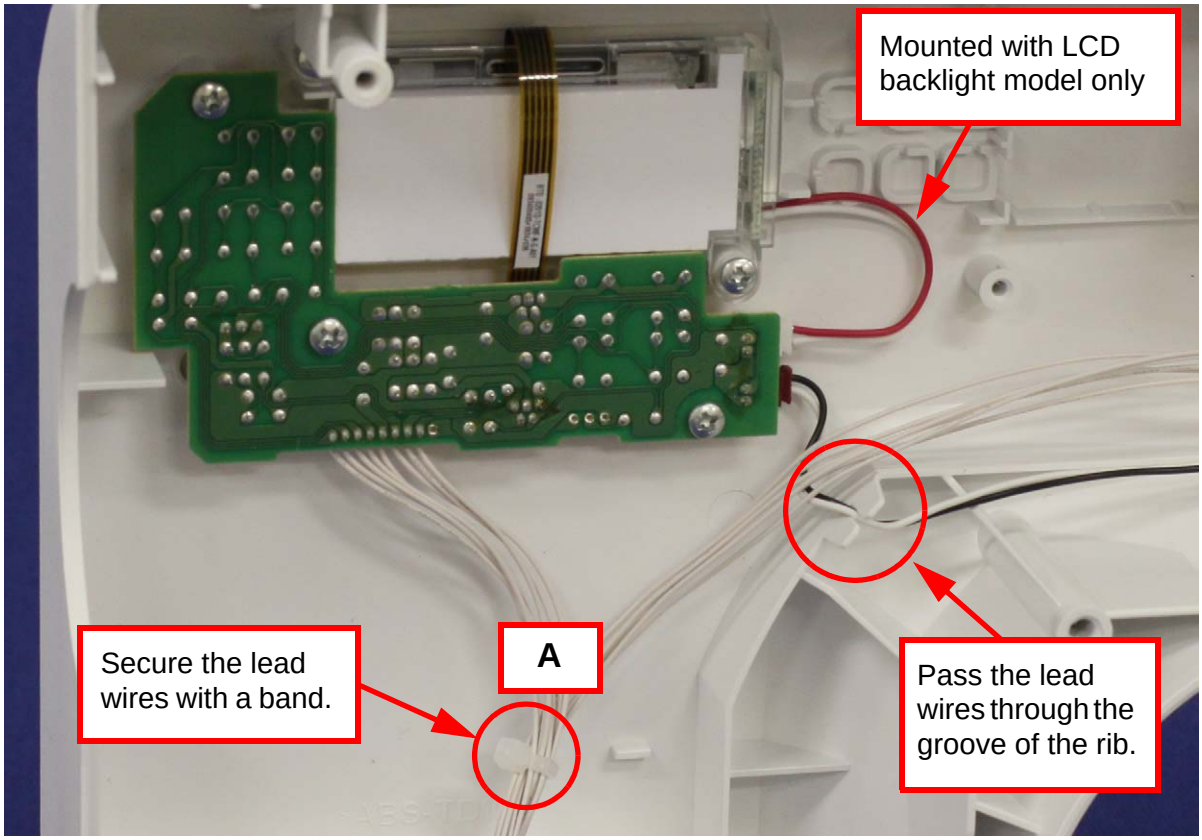
2. Wiring of operation PCB assy.

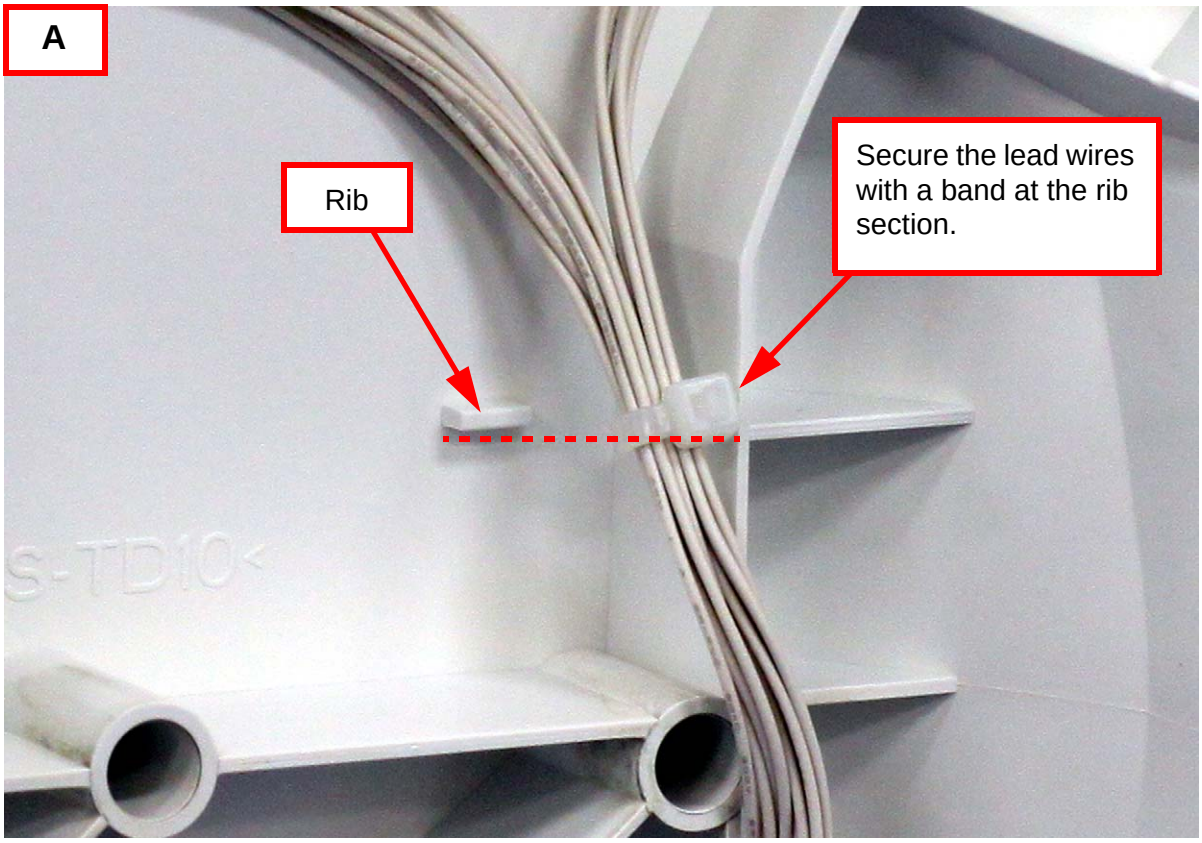
2-1. In case of “Square shape model”



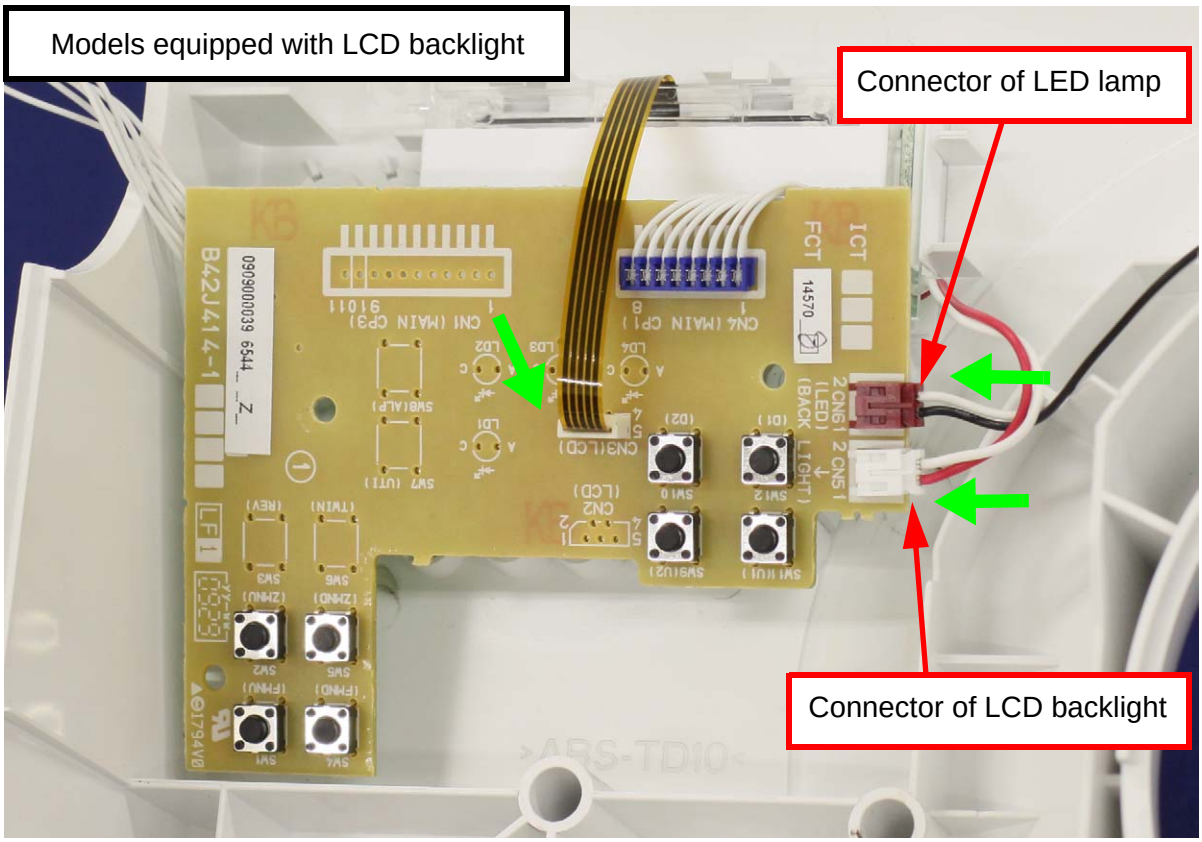


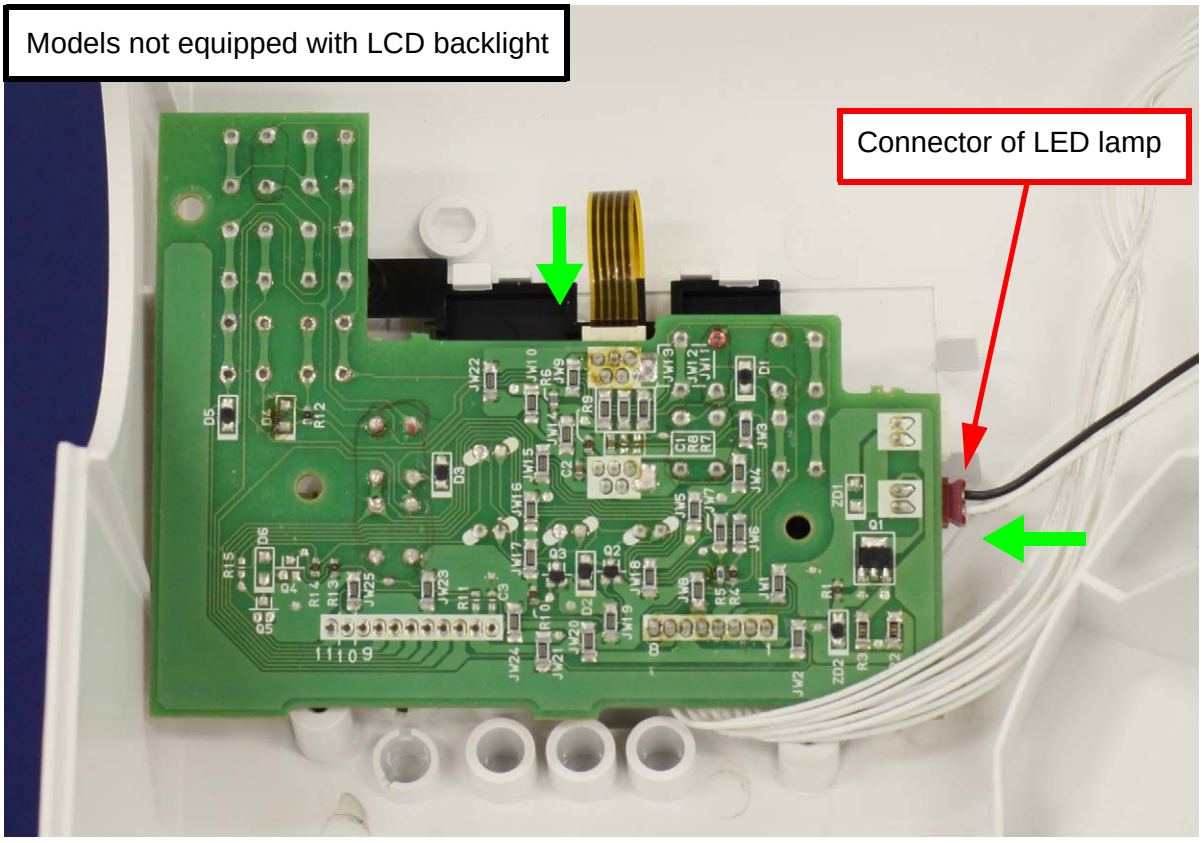
2-2. In case of “Square shape model”



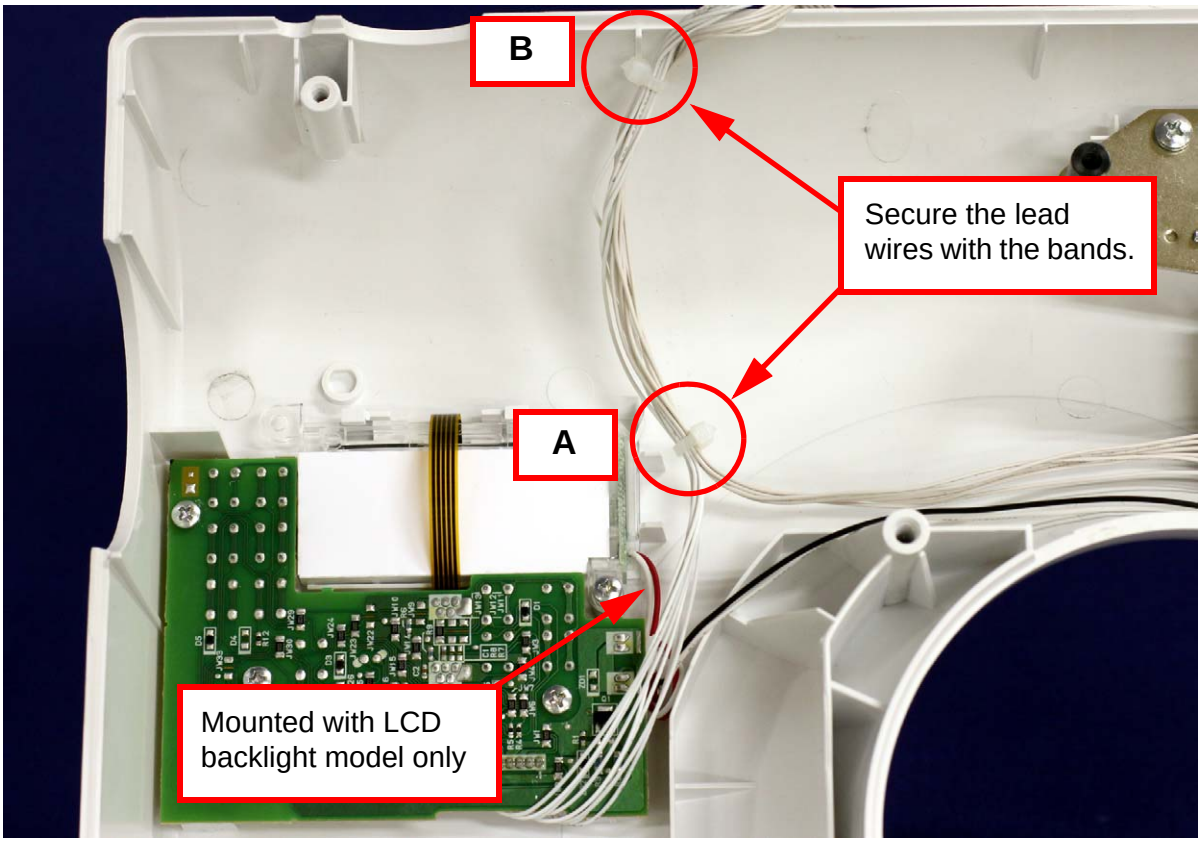


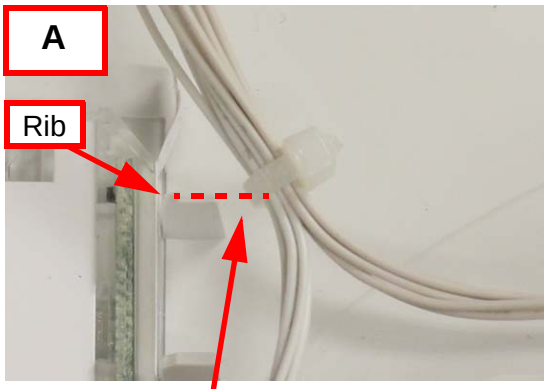
2-3. In case of “Curvy shape model”

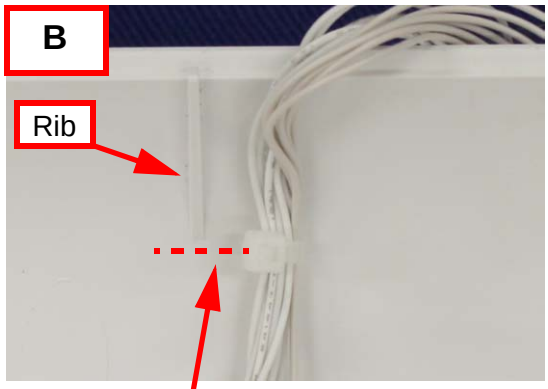




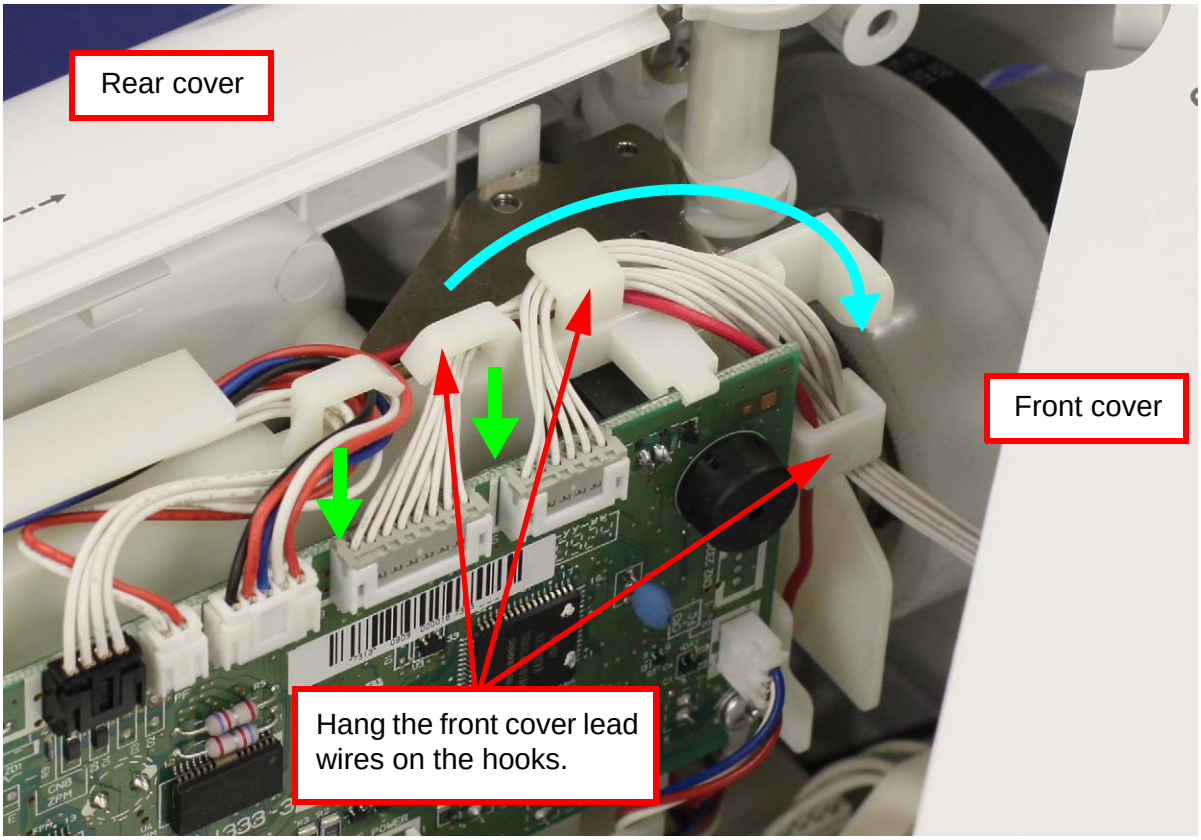
2-4. In case of “Curvy shape model”

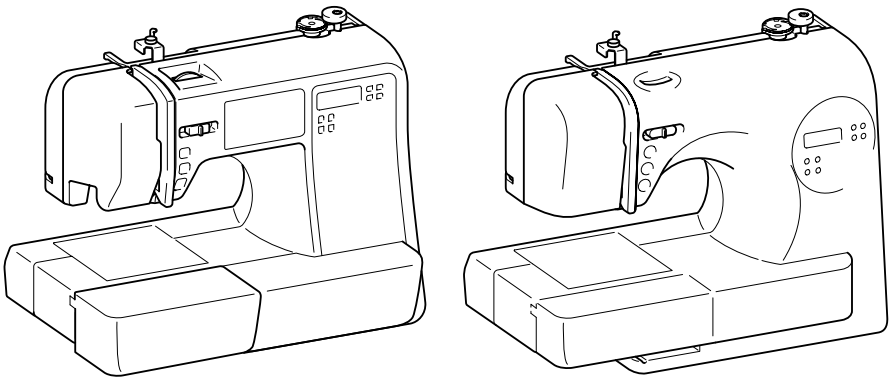






3. Wiring of front cover and main PCB





CE-5500PRW/CE-5500/HS-2500
CP6500/CP7500/CE5500T
DS-120/DS-140/FS-20/FS-40/FS-40WT/AS40
XR4040/SC6600/CE-8080PRW/CE-8080
ModerN40E/ModerN50E/ModerN60E
CS5055PRW/XR6060/XR1300
Style-40e/Style-50e/Style-60e
CE7070PRW

02A10HF885V60/V61/V62/V63/V64/V65