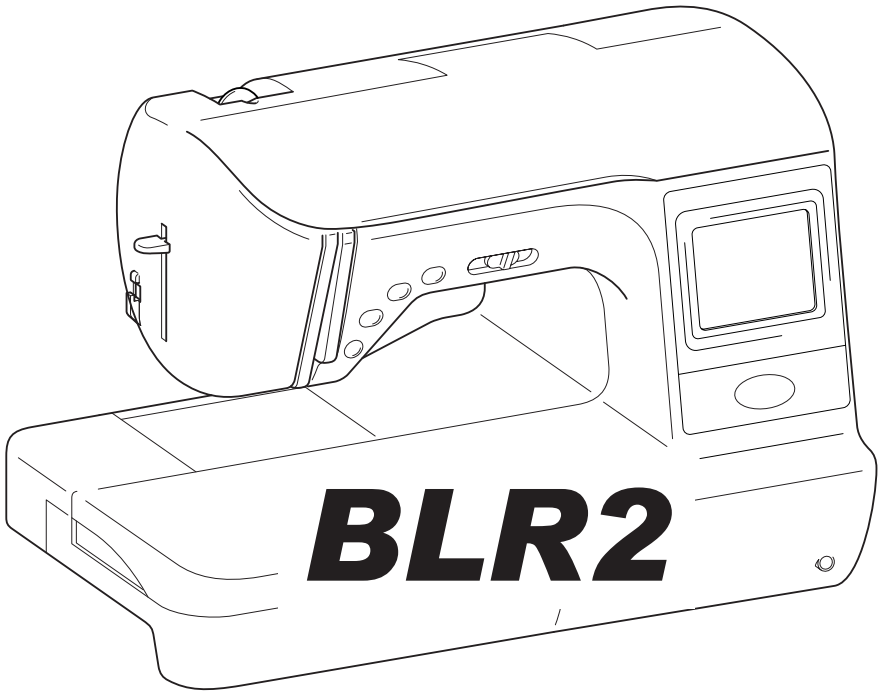
SERVICE MANUAL FOR COMPUTERIZED SEWING MACHINE



The CD-ROM version of service manual contains movie!

CD-ROM version of service manual contains movies "2. Disassembly" "3. Assembly".Please click on mark to start the movie.

10. 2006.

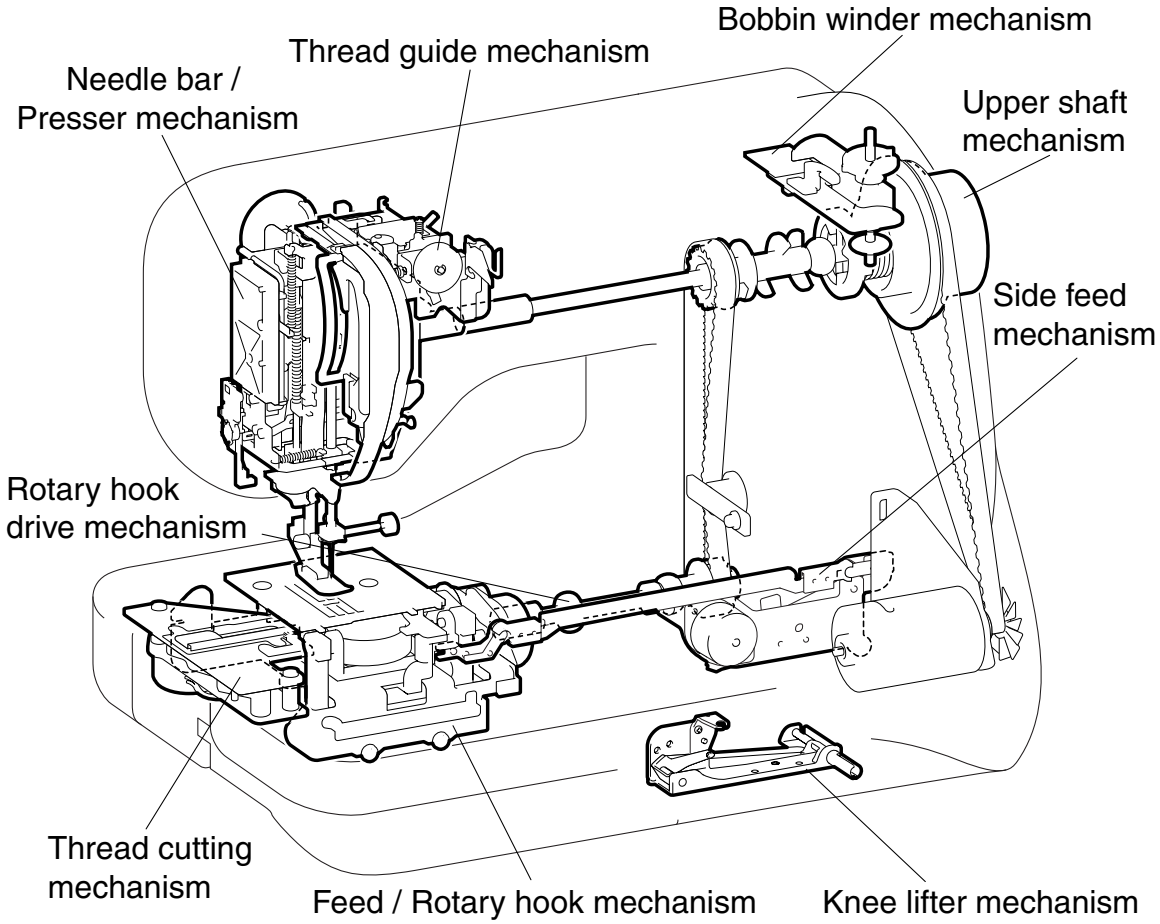
GENERAL INFORMATION

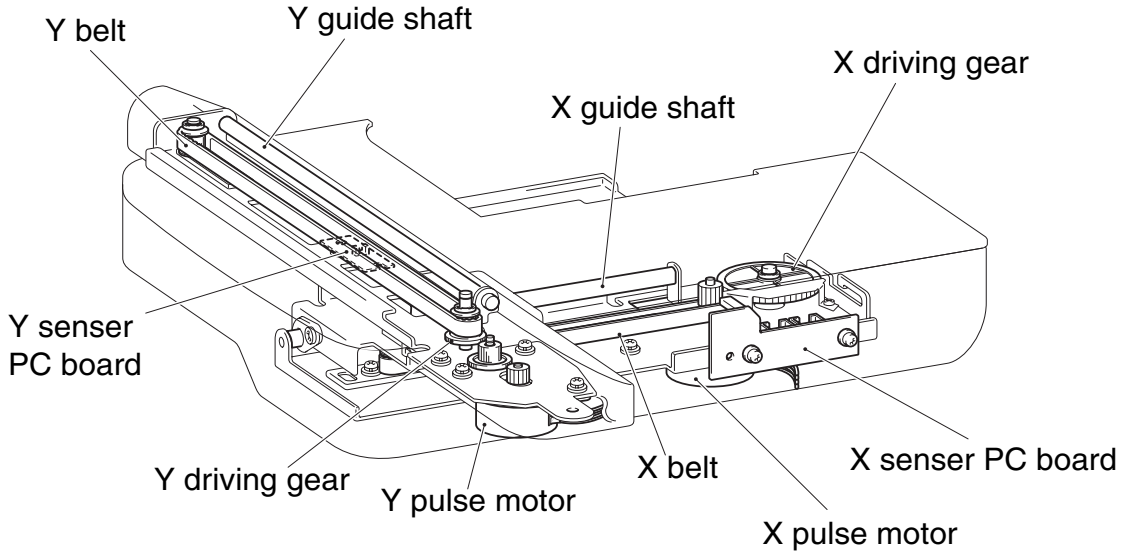
This service manual has been compiled for explaining repair procedures of this MODEL.
This was produced based on up-to-date product specifications at the time of issue, but there may have been changes of specifications for the purpose of improvements.
Contact manufacturer or local sales company for information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

CAUTION

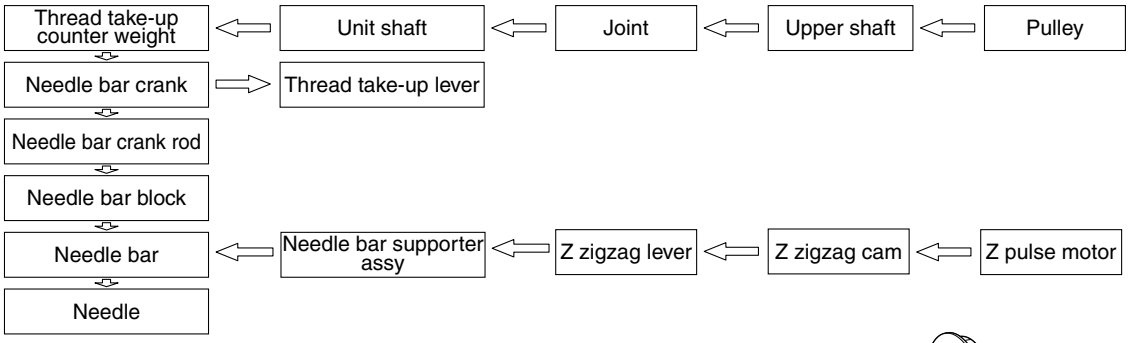
1. When you repair a sewing machine,turn off a power switch and then pull out a power supply plug from outlet.
2. Use an anti-static device to prevent static electricity when you work with electronic parts.
3. Do not touch or damage the metal portion of a printed circuit with a screwdriver or any other tool while making repairs or the like.
4. Make sure that a connector is connected securely.
5. When you pull out a connector,hold all lead wires of the connector and pull them out straight.

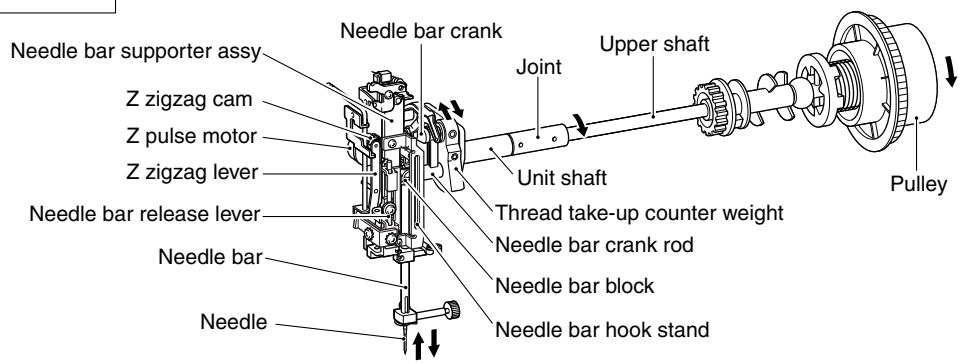
1 Outline of Mechanism


Bobbin winder mechanism
Thread guide mechanism
Needle bar /
Presser mechanism
Upper shaft
mechanism
Side feed
mechanism
Rotary hook
drive mechanism
Thread cutting
mechanism
Feed / Rotary hook mechanism
Knee lifter mechanism

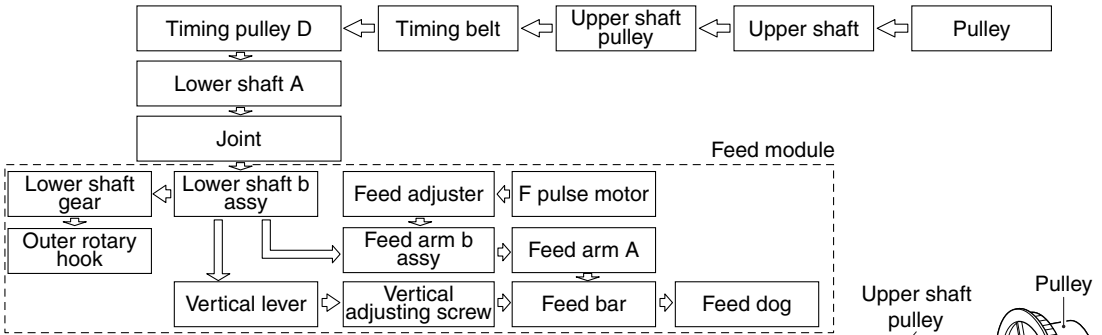

Y belt
Y guide shaft
X driving gear
X guide shaft
Y senser
PC board
Y driving gear
Y pulse motor
X belt
X senser PC board
X pulse motor

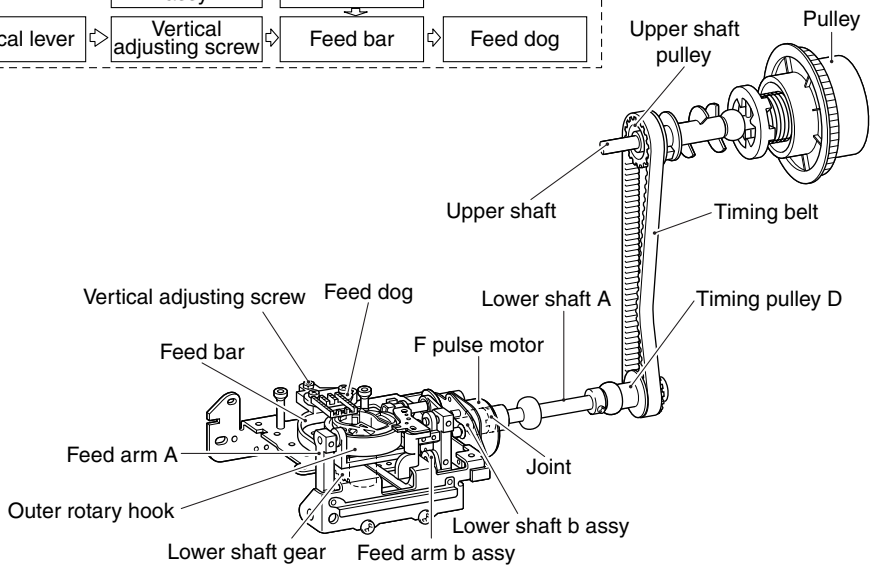
A) Up and down movement of needle bar, movement of thread take-up lever and zigzag mechanism

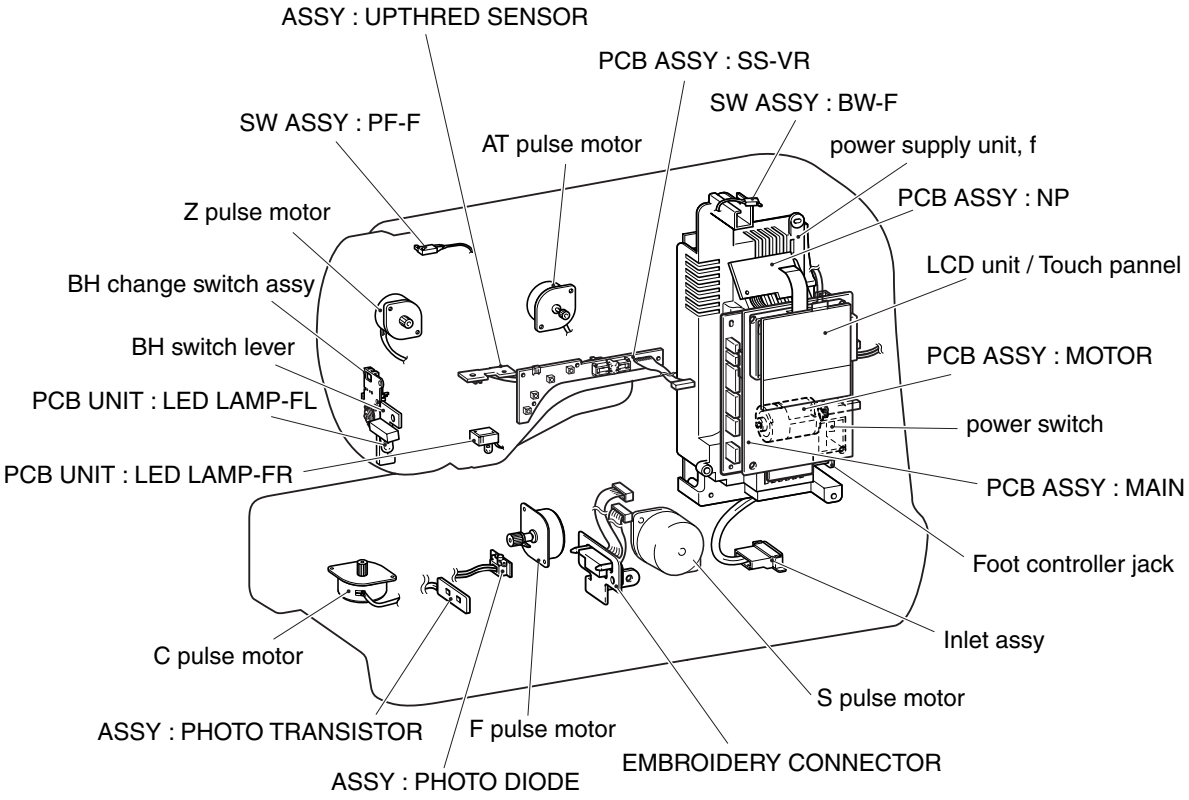


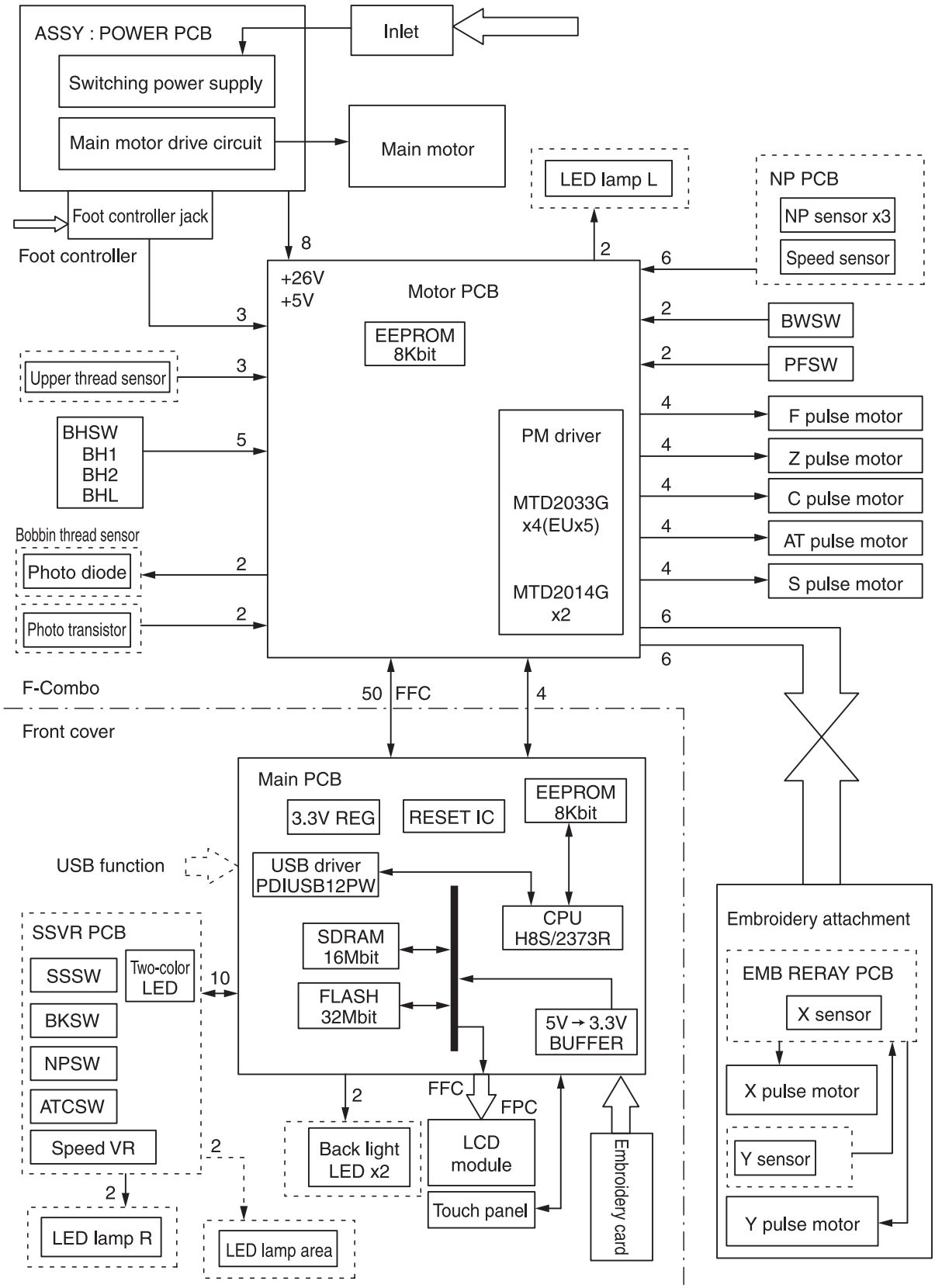


B) Movement of feed dog and bobbin






ASSY : UPTHRED SENSOR
PCB ASSY : SS-VR
SW ASSY : BW-F
SW ASSY : PF-F
AT pulse motor
power supply unit, f
PCB ASSY : NP
Z pulse motor
LCD unit / Touch pannel
BH change switch assy
BH switch lever
PCB ASSY : MOTOR
PCB UNIT : LED LAMP-FL
power switch
PCB UNIT : LED LAMP-FR
PCB ASSY : MAIN
Foot controller jack
Inlet assy
C pulse motor
S pulse motor
ASSY : PHOTO TRANSISTOR
F pulse motor
EMBROIDERY CONNECTOR
ASSY : PHOTO DIODE


ASSY : POWER PCB
Switching power supply
Main motor drive circuit
Inlet
Main motor
LED lamp L
NP PCB
NP sensor x3
Speed sensor
Foot controller jack
Foot controller
8
2
6
+26V
+5V
Motor PCB
EEPROM
8Kbit
3
2
BWSW
2
PFSW
Upper thread sensor
3
4
F pulse motor
BHSW
BH1
BH2
BHL
5
PM driver
MTD2033G
x4(EUx5)
MTD2014G
x2
4
Z pulse motor
4
C pulse motor
4
AT pulse motor
4
S pulse motor
Bobbin thread sensor
Photo diode
2
Photo transistor
2
6
6
F-Combo
50
FFC
4
Front cover
Main PCB
3.3V REG
RESET IC
EEPROM
8Kbit
USB function
USB driver
PDIUSB12PW
CPU
H8S/2373R
SDRAM
16Mbit
FLASH
32Mbit
5V→3.3V
BUFFER
SSVR PCB
SSSW
Two-color
LED
10
BKSW
NPSW
ATCSW
Speed VR
2
2
2
FFC
FPC
Back light
LED x2
LCD
module
Touch panel
Embroidery card
LED lamp R
LED lamp area
Embroidery attachment
EMB RERAY PCB
X sensor
X pulse motor
Y sensor
Y pulse motor

Start/Stop (SS) Switch, LED	Switch for starting and stopping the sewing machine. The machine operates at a slow speed while the switch is being held down.
Reverse switch	This switch is for backtracking or ending a seam. If the switch is pushed, it makes three to four stitches in that place and stops automatically. If the switch is held down, it sews at a slow speed in the reverse direction as long as the switch is held.
Raise needle switch	This switch toggles the needle between the up and down positions.
Cut thread switch	This switch is for cutting the thread. If the switch is pressed, the thread is cut regardless of the position of the needle, and the machine stops with the needle up.
Touch Panel	Used to select pattern and input test mode number required for sewing by simply touching the display on the panel. This simplifies the oparation for selecting the desired pattern and number.
Speed Control Lever.	This lever detects for the speed of sewing.
BH (buttonhole) switch	This switch is for detecting the forward and rear ends of the button hole according to the BH presser and lever.
BH (button hole) lever switch	This switch detects whether the BH lever is up or down.
NP sensor	This sensor detects the drive timing for the pulse motor for the vertical stop position for the needle. It detects the upper shaft angle of rotation 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 using a shutter attached to the upper shaft and an optical sensor.
Presser switch	This switch detects the vertical position of the presser foot lifter.
BW (bobbin winder) switch	When the bobbin thread is wound, this switch detects whether the bobbin is set for winding or not.
Foot control jack.	This is the jack for plugging in the foot controller when it is used.
R assembly and L assembly LED lamps	White LED lamps for illuminating the work space.
Up thread PCB assy	Detects the presence or absence of the upper thread and whether it is cut or not.
Initial Sensor PCB Assembly	Detects the original position of pulse motor for the vertical position of presser foot, needle thread switch, and thread tension.
Photo diode PCB assy, photo transistor PCB assy.	When the bobbin thread is low, this detects it.

The threader provided on this sewing machine is a device for making threading easy, but there are cases where it cannot be used because of the combination of sewing machine thread and needle type.

At present, there are various types of sewing machine thread and sewing machine needles on the market for handling a variety of sewing conditions. Not only may it be impossible to carry out the threading operation due to the combination, but also there is a danger of damaging the threader. Be sure to check the combinations for which it can be used, those for which it cannot and those for which it can but which do not give full performance in the following table to deal with customer claims.

<Cautions>

1. The threader cannot be used with sewing machine thread and needle combinations that are not in the table or those marked with an x.

2. Since combinations marked with an asterisk have a greater possibility of damaging the threader or not working properly, do your best to encourage users to avoid them.

3. When using the threader, lower the presser.

4. When transparent nylon thread is used, use a #14 - #16 sewing machine needle, regardless of what is in the table below.

5. Do not turn the pulley while using the threader.

6. To not push the needle thread lever down when the sewing machine is in use. Not only could the threader be damaged, but this could be a cause of needle breakage and injury.

7. When a #9 sewing machine needle is used, threading may be difficult. (This is caused by variations in needle precision.)

8. If the needle tip is less than 8 mm from the upper surface of needle plate A, threading may not be possible.

9. When a side cutter is being used, the threader cannot be used. Perform the threading operation before attaching the side cutter.

Thread size / Needle size	#30	#50	#60	#80	#100	#120
#9	×	×	×	○	○	○
#11	×	○	○	○	○	※
#14	×	○	○	○	※	※
#16	※	○	○	※	※	※
#18	※	※	※	※	※	※

2 Disassembly

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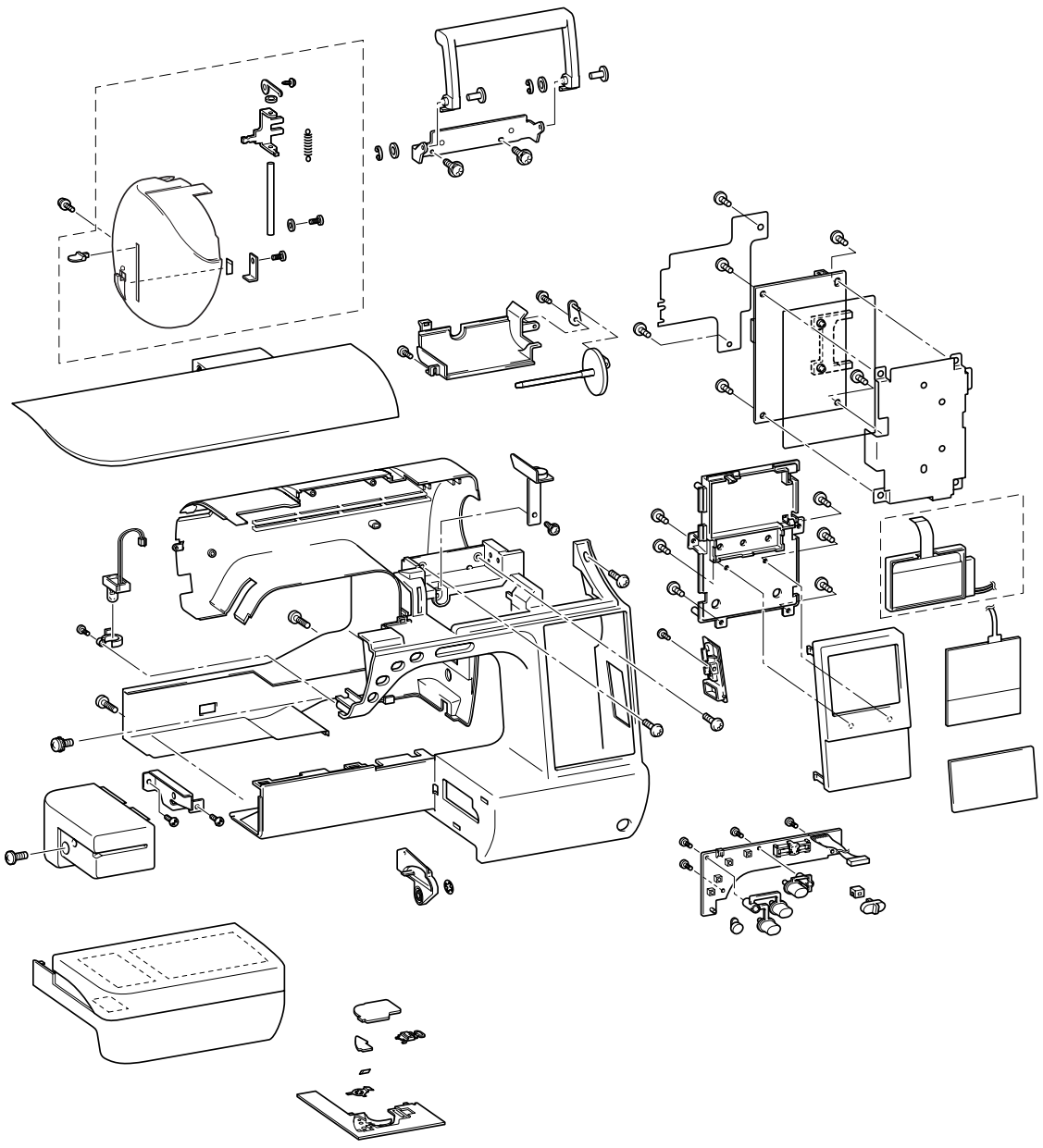
Main parts location diagram



1 Accessory table removal

1. Remove the accessory table ①.
2. Remove the accessory table door ② from the accessory table ①.

2 Top cover removal

1. Remove top cover ①.

***Key point**

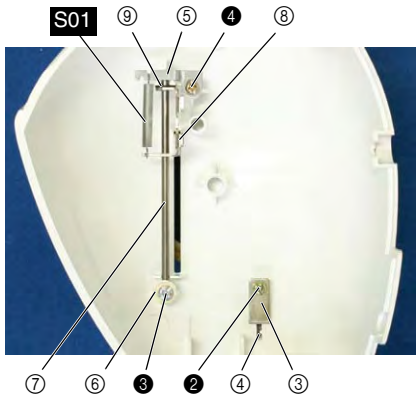
- Push the attached part toward the inside and remove.

Start movie clip (CD-ROM version only)

3 Face plate removal and disassembly

1. Remove the screw ❶, and then remove the face plate assembly ①.
2. Remove the needle thread lever knob ②.
3. Remove the screw ❷, and then remove the face plate cutter holder ③ and the NT lower thread cutter ④.
4. Remove the screws ❸ and ❹, and then remove the shaft presser plate ⑤ and the plain washer ⑥.
5. Remove the spring S01.
6. Remove the needle thread lever shaft ⑦.
7. Remove the needle thread lever ⑧ and the rubber washer ⑨ from the needle thread lever shaft ⑦.

Start movie clip (CD-ROM version only)



4 Front thread guard cover removal

1. Remove the screw ❶, and remove the front thread guard cover ①.

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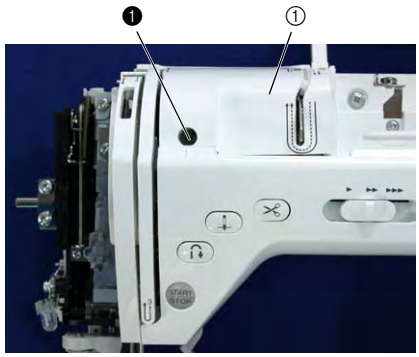
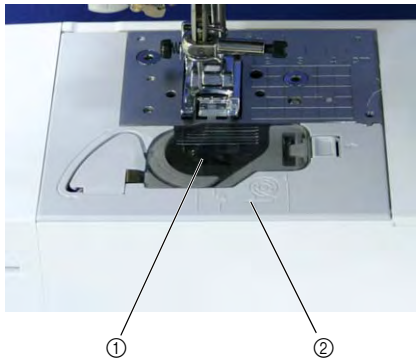
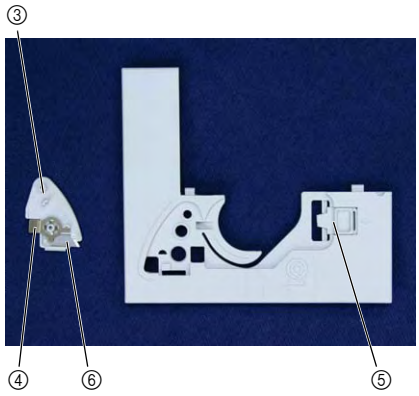


5 Needle plate B removal and disassembly

1. Remove the needle plate cover ①.
2. Remove the needle plate B ②.
3. Remove the cutter cover ③.
4. Remove the spring plate ④ from the cutter cover ③, and remove the NT lower thread cutter ⑥.
5. Undo the slide button hook (two locations), and remove the slide button ⑤.





6 Free arm cover removal

1. Remove the screw ❶, and then remove the free arm cover ①.

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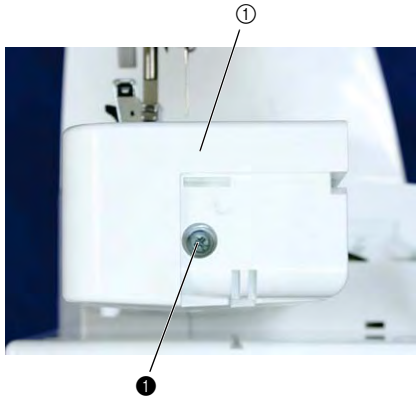


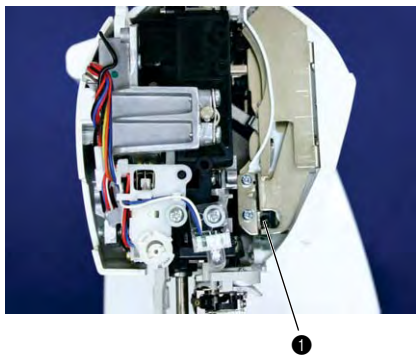
7 Front cover removal

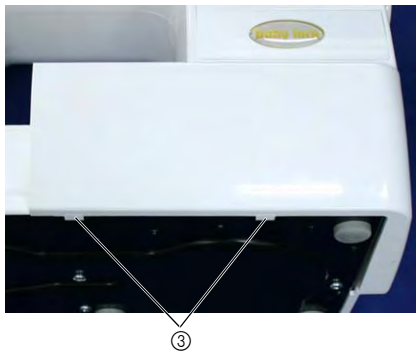
1. Remove the screw ❶ and the 3 screws ❷.
2. Remove the hook ① on the front cover, and then remove the hook ② by pushing the hook attachment section ② on the rear cover.

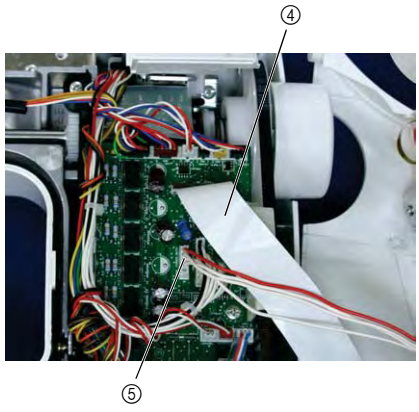
   ***Key point**
   - Be careful not to damage the hooks ① and ② on the front cover.
3. Remove the 2 bottom hooks ③ from the base plate while sliding the front cover to the right.
4. Remove the flat cable ④ and the connector ⑤ from the main PCB assembly, and then remove the front cover.

   ***Key point**
   - Move the lock of the connector ⑤ on the main PCB to the upright position to release it, and then pull out the flat cable ④.

Start movie clip (CD-ROM version only)

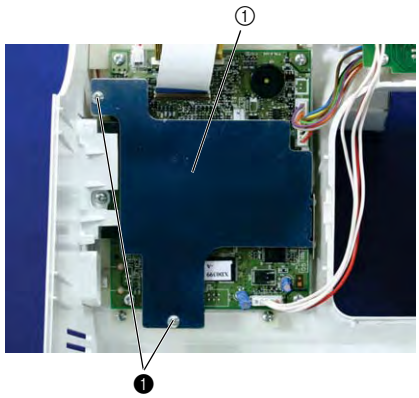






8 Board plate A removal

1. Remove the 2 screws ❶, and then remove the board plate A ①.

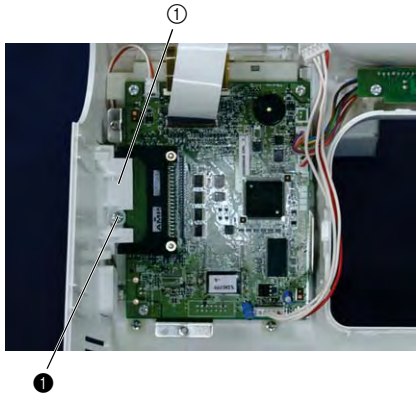


9 Card cover removal

1. Remove the screw ❶, and then remove the card cover ①.

***Key point**

- Press the 2 hooks on the card cover ① from the inside of the front cover.



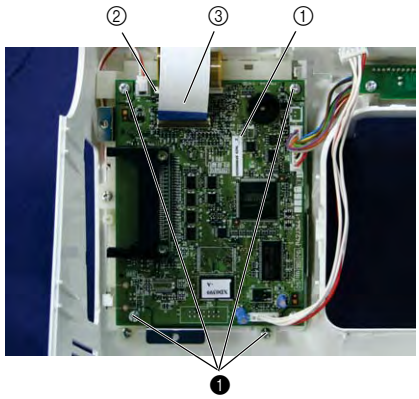
10 Main PCB assembly removal

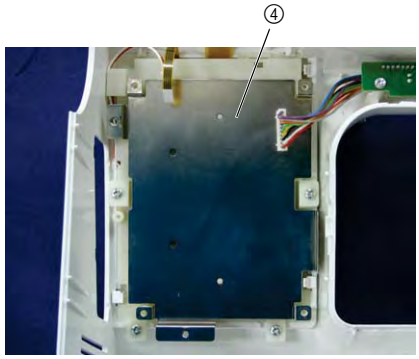
1. Remove the 3 connectors from the main PCB ①, and then disconnect the 3 FFC cords.

***Key point**

- Pull up the lock of the connector on the main PCB ① to release it, and then disconnect the FFC cord ②.
- Move the lock of the connector on the main PCB to the upright position to release it, and then disconnect the FFC cord ③.

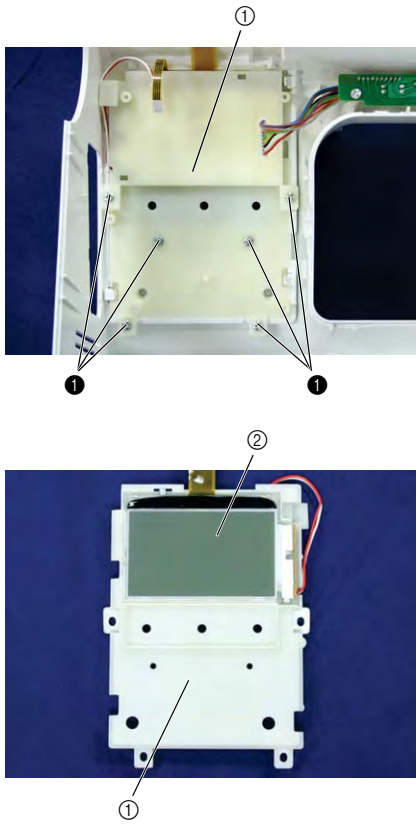
2. Remove the 4 screws ❶, and then remove the main PCB ① and the board plate B ④.





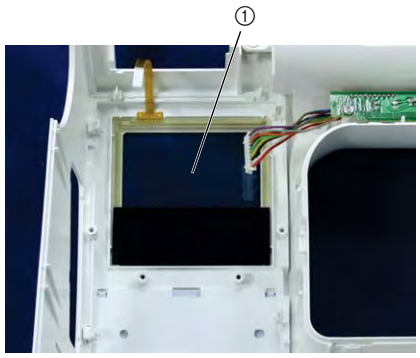
11 Main PCB holder assembly removal

1. Remove the 6 screws ❶, and then remove the main PCB holder assembly ①.
2. Remove the 2 hooks on the main PCB holder assembly ①, and then remove the light plate assembly ②.



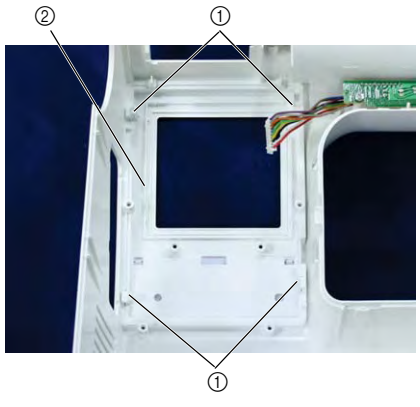
12 Touch panel assembly removal

1. Remove the touch panel assembly ① from the front cover.



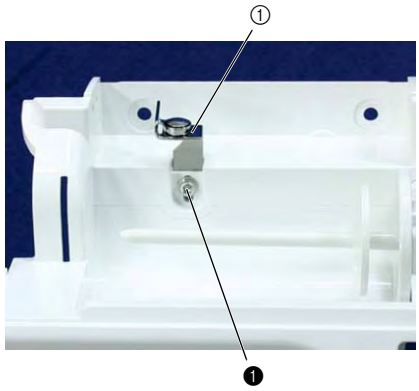
13 Indication panel removal

1. Remove the 4 hooks ① from the backside of the front cover, and then remove the indication panel ②.



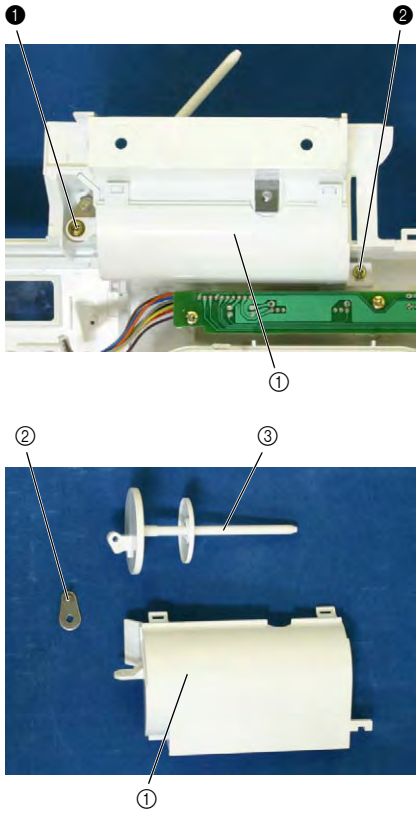
14 Front cover disassembly (bobbin winder guide assembly removal)

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



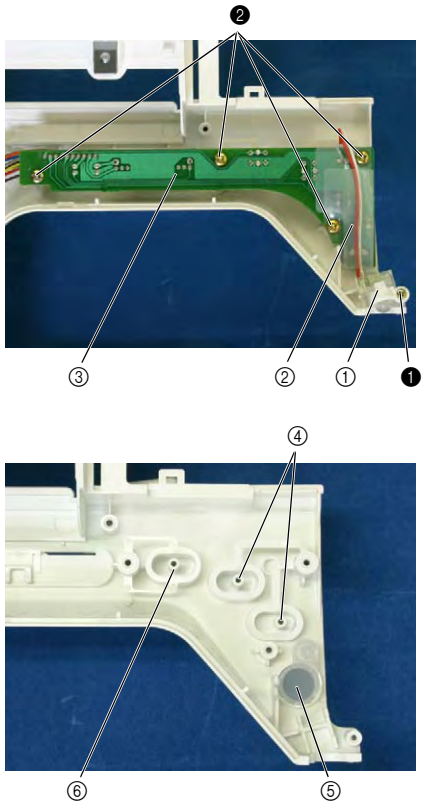
15 Front cover disassembly (spool pin holder removal)

1. Remove the screws ❶ and ❷, and then remove the thread bobbin cover ①, spool pin holder assembly ②, and spool pin ③.



16 Front cover disassembly (SS-VR PCB assembly removal)

1. Remove the screw ❶, and then remove the lamp holder supporter ①.
2. Remove the 4 screws ❷, and then remove the insulation sheet ② and the SS-VR PCB assembly ③.
3. Remove the connector of the PCB unit LED lamp (FR).
4. Remove the reverse button ④, SS button ⑤, and thread cut button ⑥.

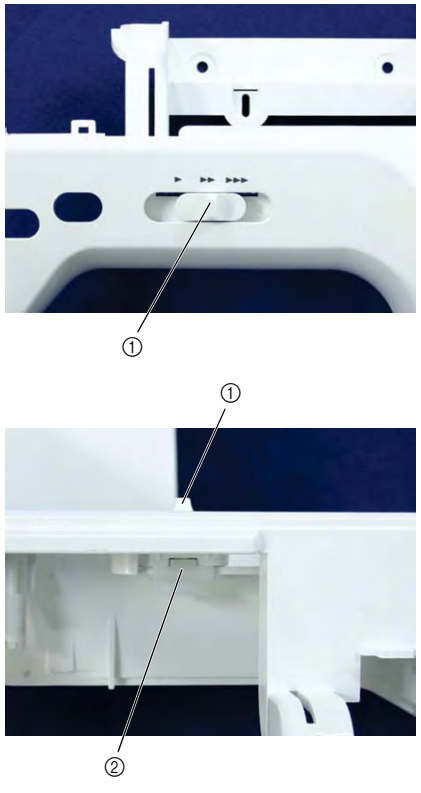


17 Front cover disassembly (SV keytop removal)

1. Remove the SV keytop ①.

   ***Key point**
   - Insert a standard screwdriver between ① and ②, and push the SV keytop ① out on the front side.

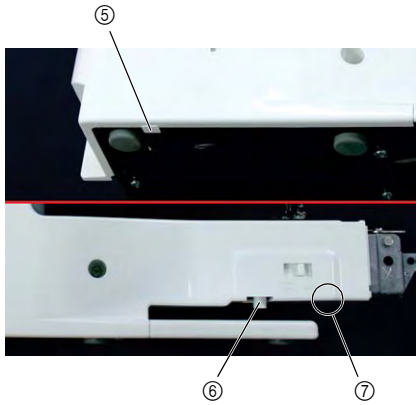
2. Remove the SV joint plate ②.

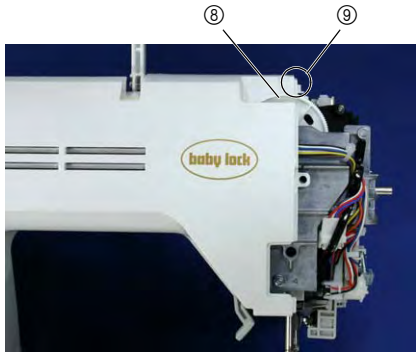


18 Rear cover removal

1. Remove the screw ❶.
2. Lower the presser lever ①, and then remove section ②, being careful to prevent the presser lever ① being caught in section ②.
3. Remove section ④, being careful to prevent the switch ③ of the power supply unit being caught in section ④.
4. Remove the hook ⑤.
5. Remove section ⑦, being careful to prevent the drop lever ⑥ being caught in section ⑦.
6. Remove section ⑨, being careful to prevent the presser dial ⑧ being caught in section ⑨, and then remove the rear cover.

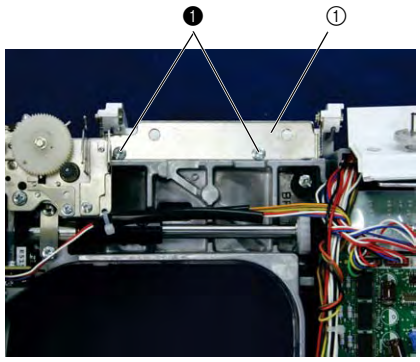
Start movie clip (CD-ROM version only)

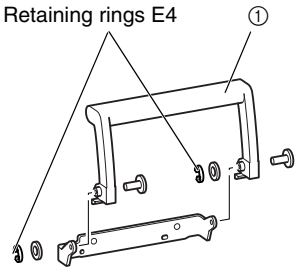




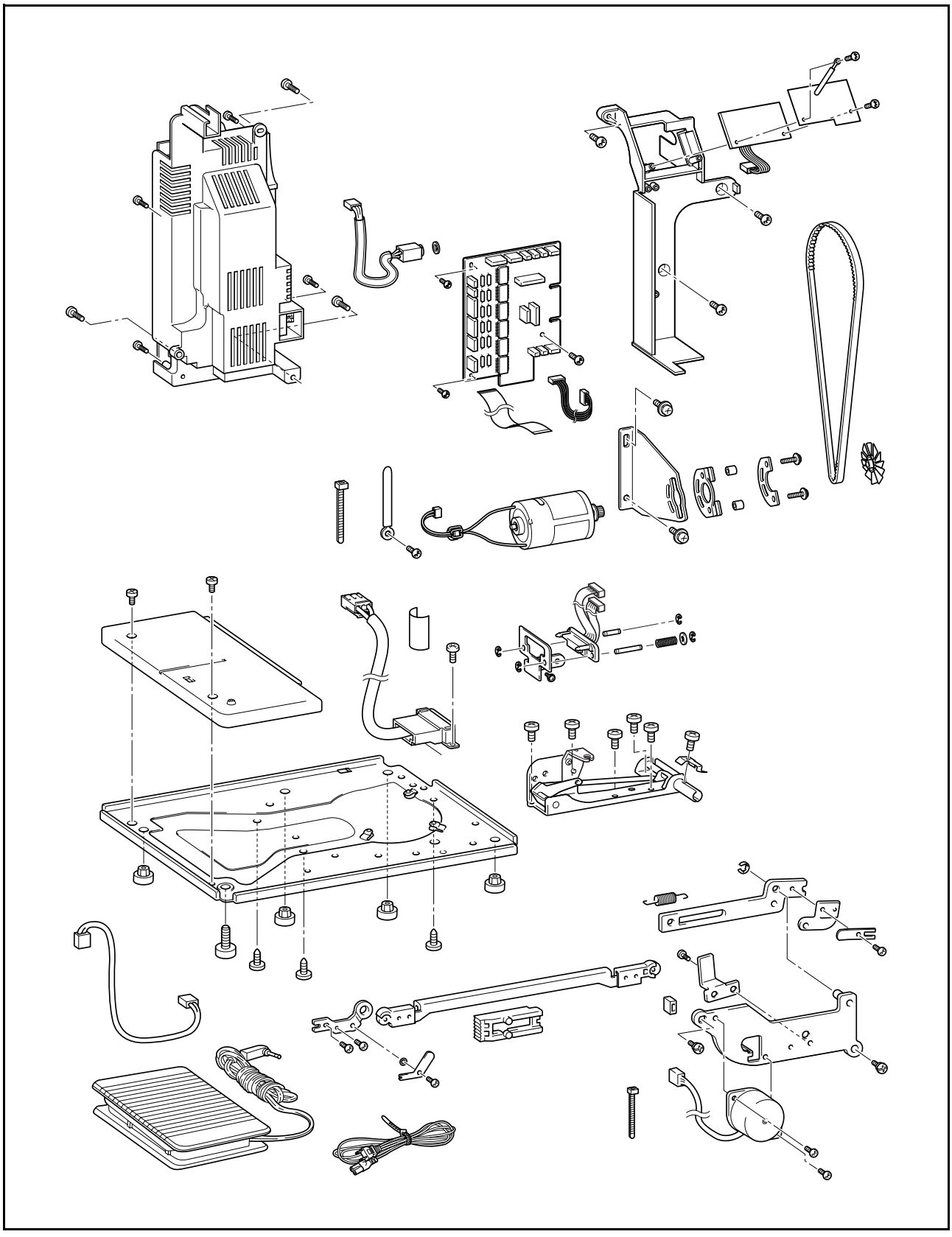
19 Handle removal

1. Remove the 2 screws ❶, and remove the handle ①.
2. Remove the 2 retaining rings E4 from the handle shafts, and remove the handle ①, the 2 handle shafts and the 2 polyester sliders from the handle holder.



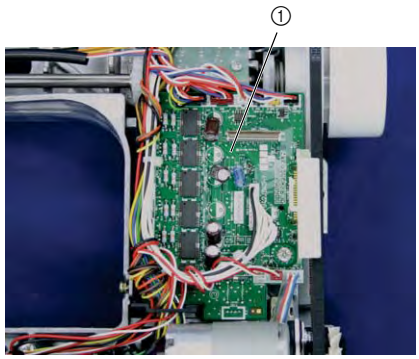


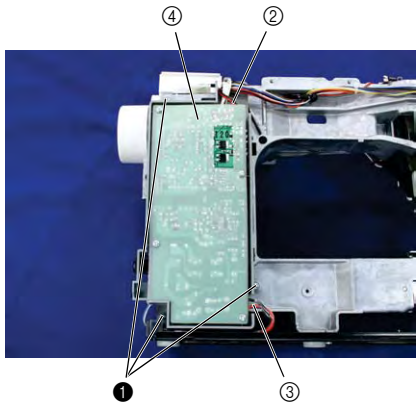
Electrical parts and motors location diagram



1 Power supply unit F removal

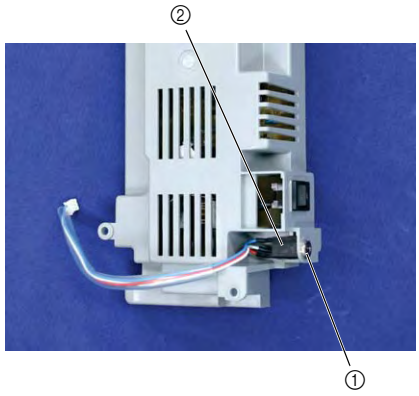
1. Unplug all of the connectors on the motor PCB assy. ①.
2. Remove the main motor connector ②.
3. Disconnect the connector ③ of the inlet assembly lead wire.
4. Remove the 3 screws ❶, and remove the power supply unit F ④.





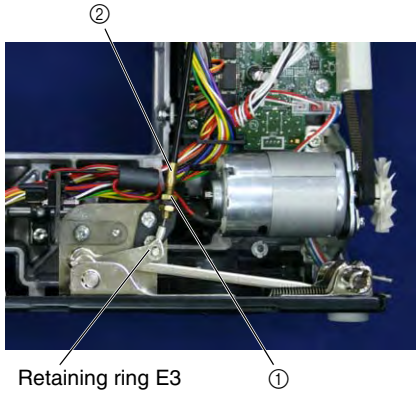
2 Assy. pin jack F removal

1. Remove the nut ①, and remove the assy. pin jack F ②.



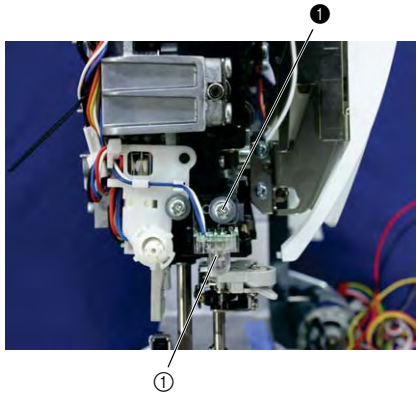
3 Wire assy. removal

1. Remove retaining ring E3.
2. Loosen nut M8 ①, and remove the wire assy. ②.



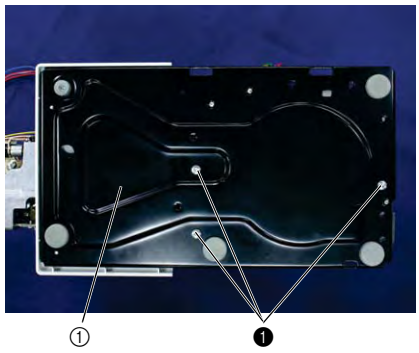
4 PCB Unit LED lamp FL removal

1. Disconnect the bands on the back of the arm bed (3 locations).
2. Remove the screw ❶, and remove the PCB unit LED lamp FL ①.



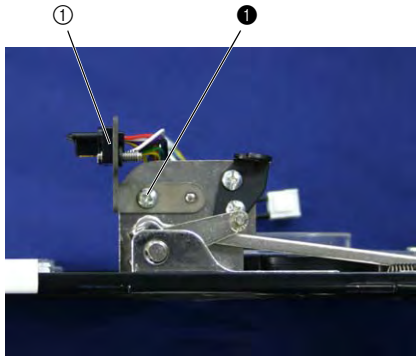
5 Base plate sub assy. removal

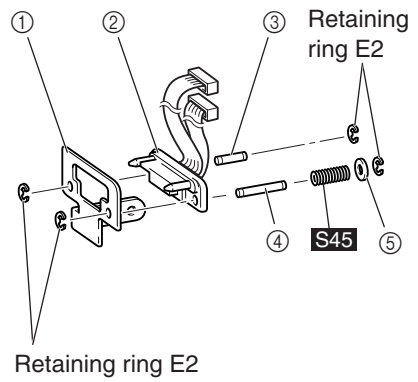
1. Remove the 3 screws ❶, and remove the base plate sub assy. ①.



6 Connector holder assembly removal and disassembly.

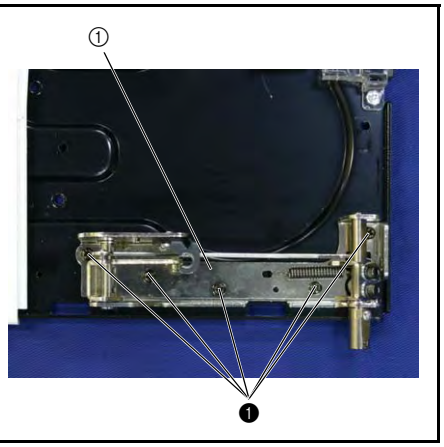
1. Remove the screw ❶, and then remove the connector holder assembly ①.
2. Remove the 2 retaining rings E2, and then remove the lead wire assy. ②, ES pin F-A ③, and ES pin F-B ④ from the connector holder assembly ①.
3. Remove the retaining E2 from ES pin F-A ③.
4. Remove the spring S45 and the feed bar spacer ⑤ from ES pin F-B ④, and then remove the retaining ring E2.





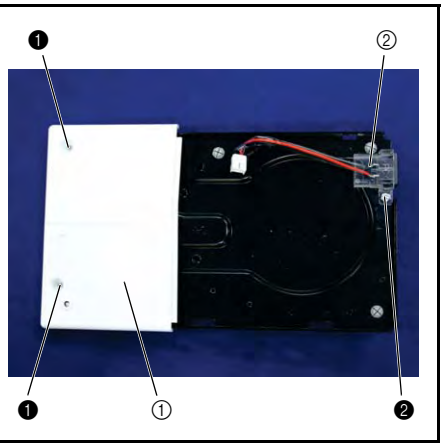
7 Knee lifter assembly removal

1. Remove the 5 screws ❶, and then the knee lifter assembly ①.



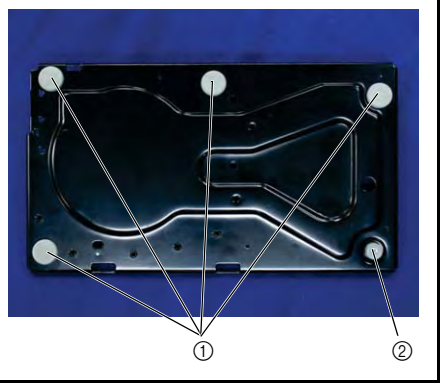
8 Base plate cover and inlet assembly removal

1. Remove the 2 screws ❶, and then remove the base plate cover ①.
2. Remove the screw ❷, and then remove the inlet assembly ②.



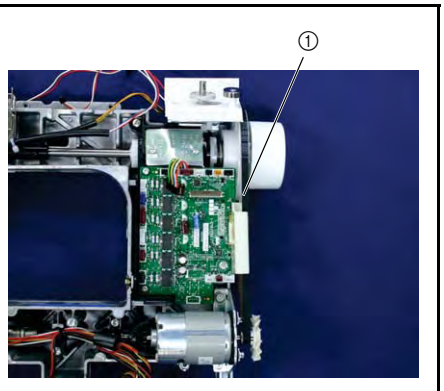
9 Base rubber removal

1. Remove the 4 base rubbers A ①.
2. Remove the adjusting screw assembly ②.



10 Timing belt (motor belt) removal

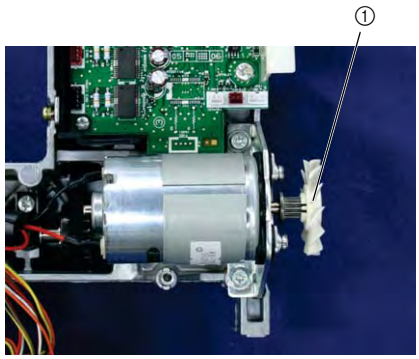
1. Remove the timing belt ①.



11 Motor fan removal

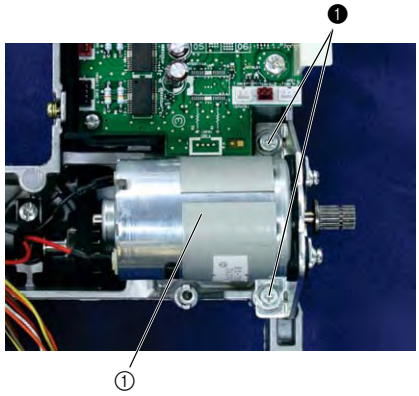
1. Remove the motor fan ①.

NOTE •Be careful not to bend the fins of the motor fan ①.



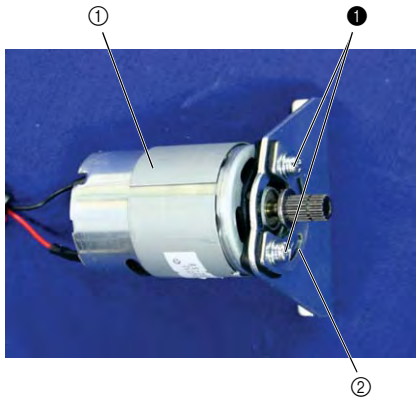
12 Main motor assembly removal

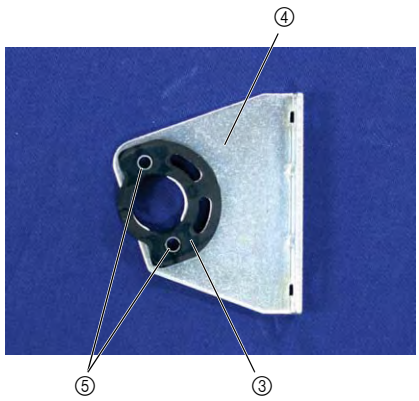
1. Remove the 2 screws ❶, and remove the main motor assembly ①.



13 Main motor assembly disassembly

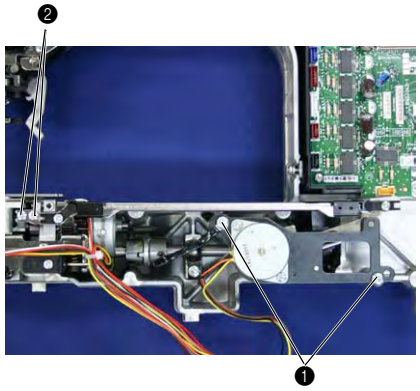
1. Remove the 2 screws ❶, and remove the main motor assembly ① and the motor spacer presser ②.
2. Remove the fender rubber ③ from the motor holder ④.
3. Remove the 2 spacer 4x6 ⑤ from the fender rubber ③.





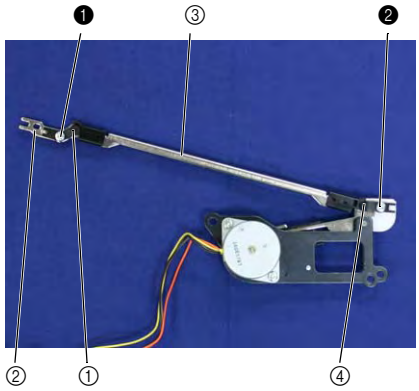
14 Side feed mechanism removal

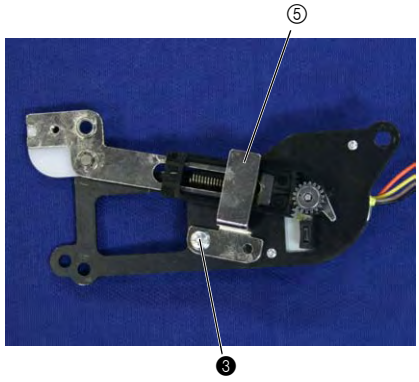
1. Remove 2 screws ❶ and 2 screws ❷, and remove the side feed unit and wire clip.

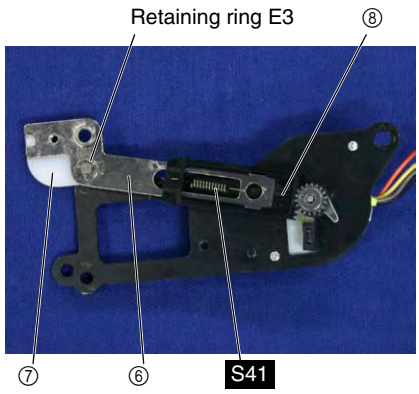


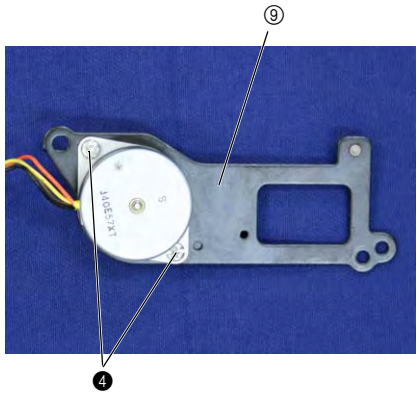
15 Side feed mechanism disassembly

1. Remove screw ❶ and screw ❷, and remove plate spring B ①, the side feed adjust plate ②, washer, side feed arm assy. ③ and plate spring A ④.
2. Remove the rubber.
3. Remove screw ❸, and remove the S stopper ⑤.
4. Remove retaining ring E3, and remove the side feed plate ⑥ and side feed spacer ⑦.
5. Remove S41 , and remove the side feed gear ⑧.
6. Remove screws ❹ (two), and remove the S pulse motor ⑨.



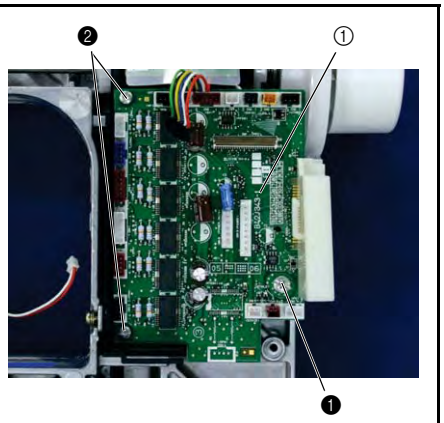






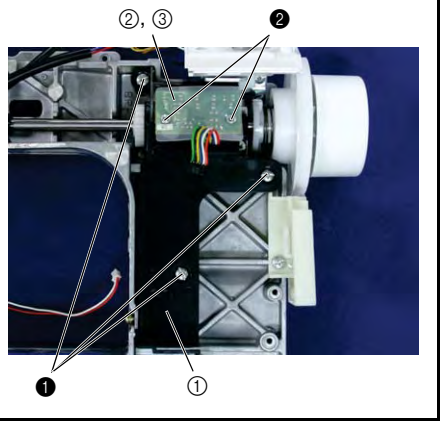
16 Motor PCB assy. removal

1. Remove the screw ❶ and the 2 screws ❷, and remove the motor PCB assy. ①.



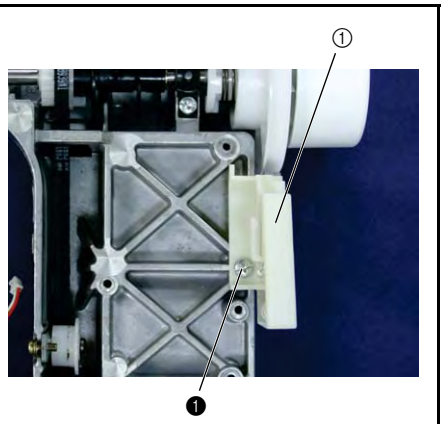
17 NP PCB assy. removal

1. Remove the 3 screws ❶, and remove the PCB holder ①.
2. Remove the 2 screws ❷, and remove the insulation sheet ② and the NP PCB assy ③ from the PCB holder ①.

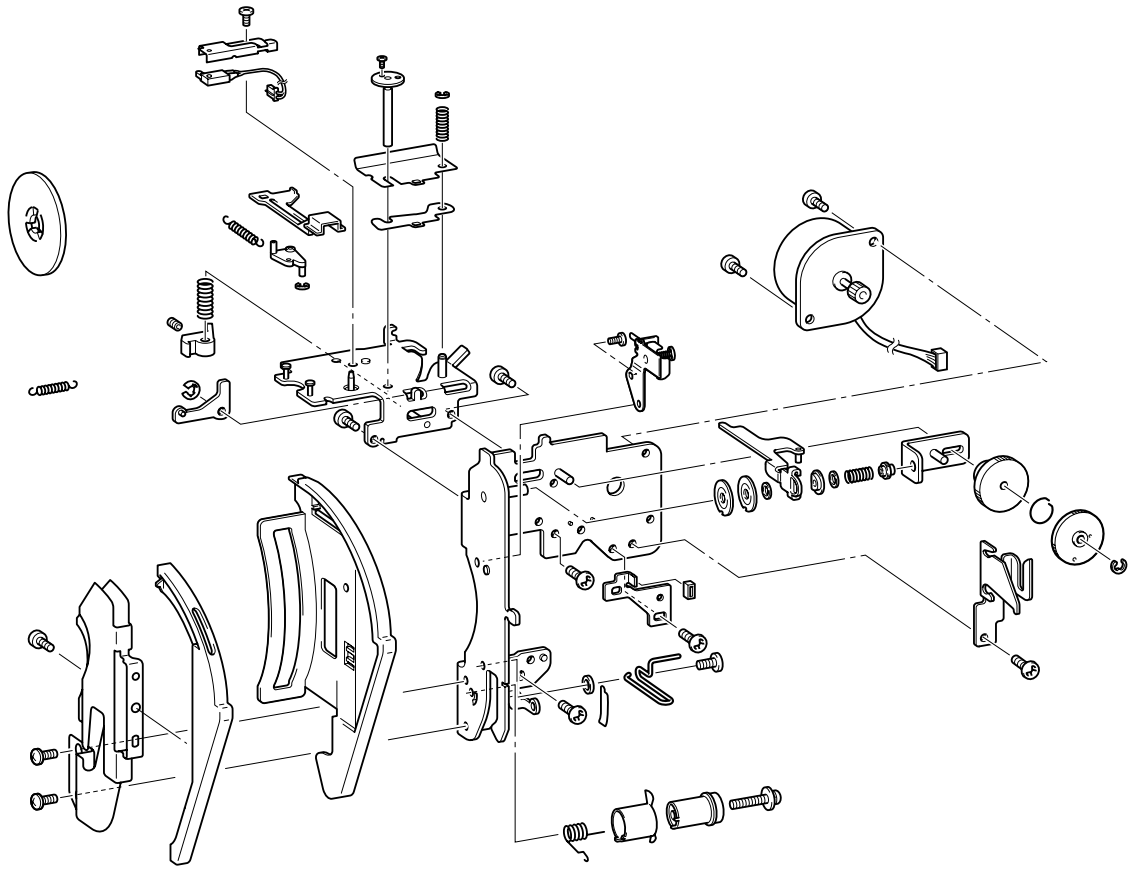


18 Belt guard removal

1. Remove the screw ❶, and then remove the belt guard ①.

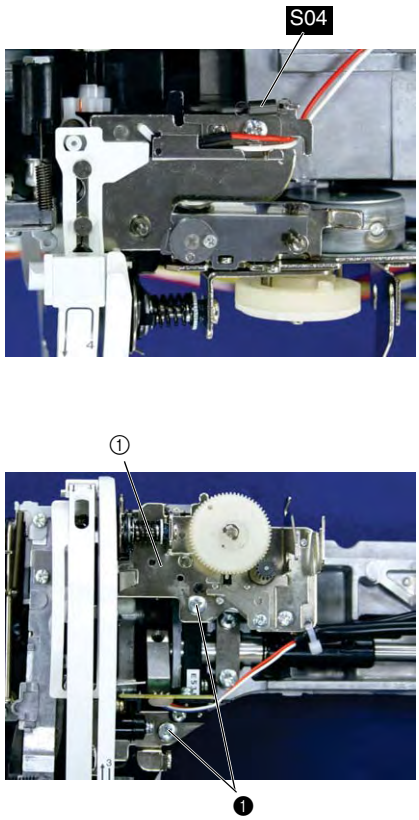


Thread tension mechanism location diagram



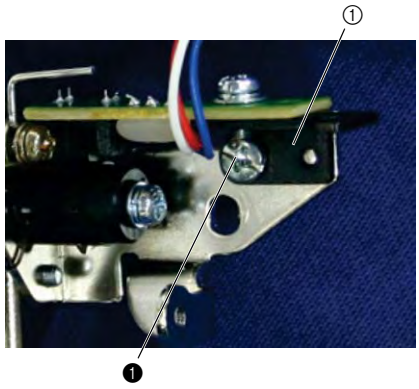
1 Thread tension assy removal

1. Remove the spring S04.
2. Remove the 2 screws ❶, and remove the thread tension assy ①.



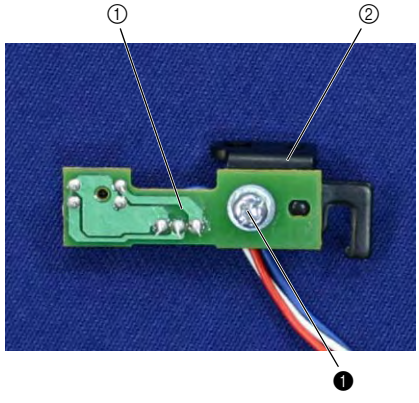
2 Upper thread PCB unit removal

1. Remove the screw ❶, and then remove the upper thread PCB unit ①.



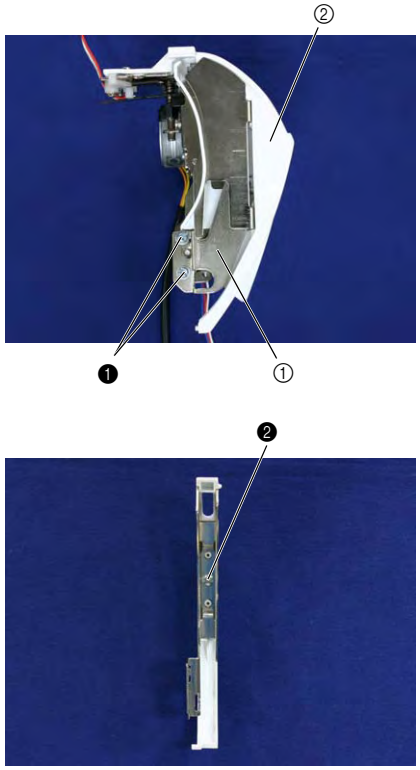
3 Upper thread PCB unit disassembly

1. Remove the screw ❶, and then remove the upper thread PCB assembly ① from the thread sensor holder ②.



4 Thread guide removal

1. Remove the 2 screws ❶, and remove the thread guide assy. ①.
2. Remove the screw ❷, and remove the thread guide cover ②.

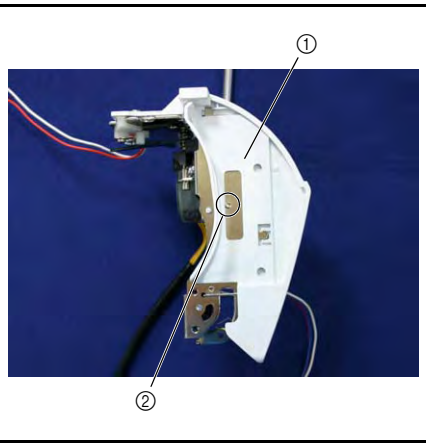


5 Thread guide cover removal

1. Remove the thread guide cover ①.

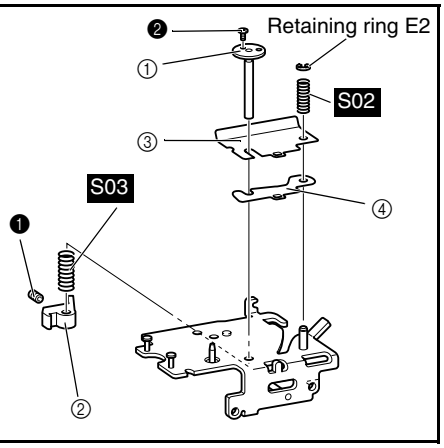
***Key point**

- Lift the protrusion ② and slide to the right.



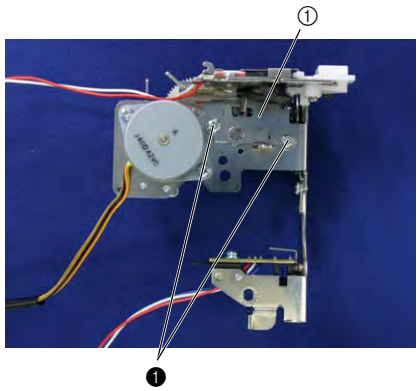
6 Tension plate removal

1. Remove retaining ring E2, and remove the spring S02.
2. Remove the screw ❶, and remove the tension pressure assy ① the spring S03 and the tension release cam ②.
3. Remove the tension plate ③ and the spacer ④.
4. Remove the screw the screw ❷.



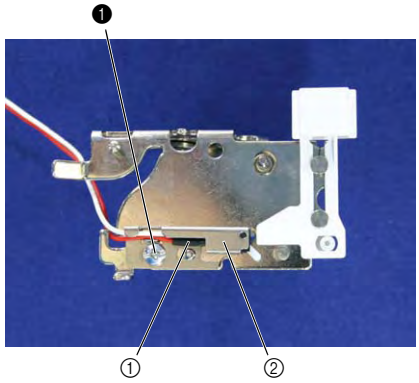
7 Thread release holder assy. F removal

1. Remove the 2 screws ❶, and remove the thread release holder assy. ①.



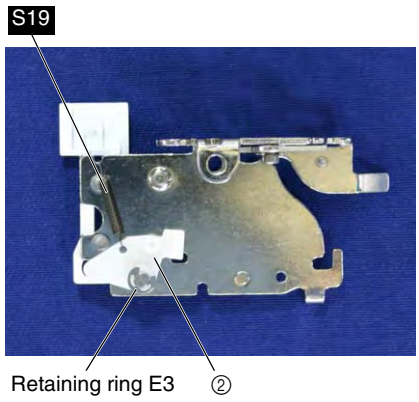
8 PF-F SW assy. removal

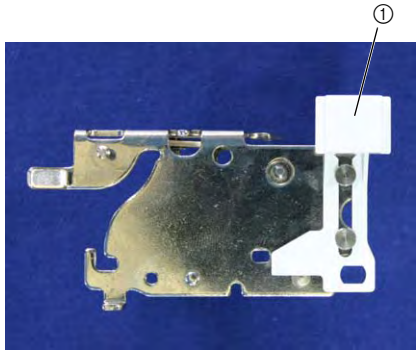
1. Remove the screw ❶, and remove the PF-F SW assy ① and the presser switch holder ②.



9 Thread guide shutter removal

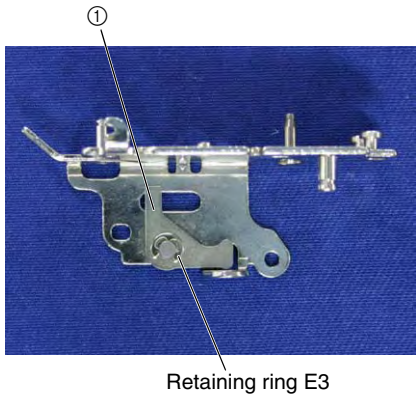
1. Remove the spring S19.
2. Remove retaining ring E3, and remove the thread guide shutter ① and the thread guide shutter link ②.





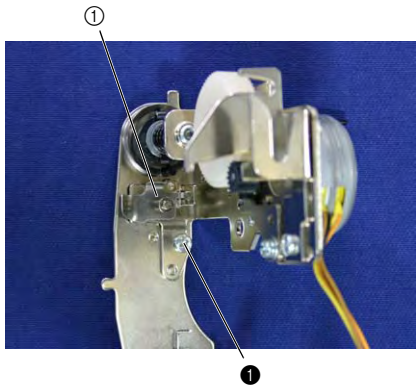
10 Tension releaser link removal

1. Remove the retaining ring E3 and remove the tension releaser link ①.



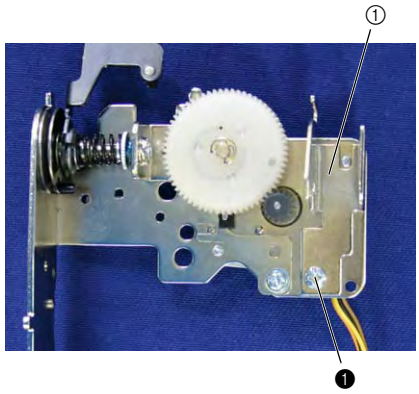
11 Plate assembly removal

1. Remove the screw ❶, and remove the plate assembly ①.



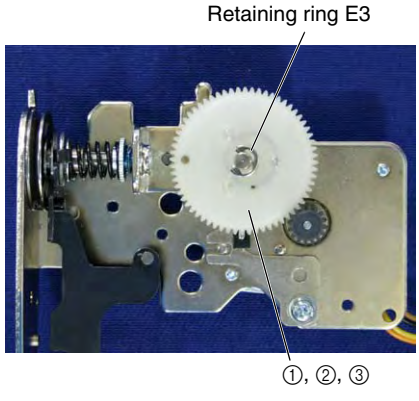
12 Thread guide removal

1. Remove the 2 screws ❶, and remove the thread guide ①.



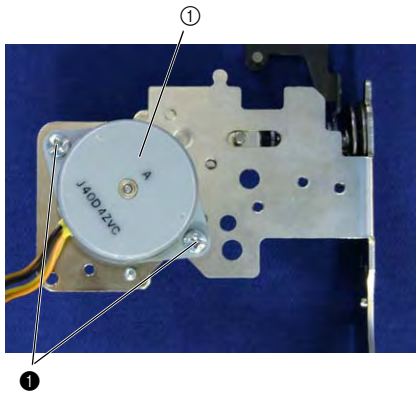
13 Thread tension gear removal

1. Remove the retaining ring E3 and remove the thread tension gear ①, thread tension gear cover ② and the spring ③.



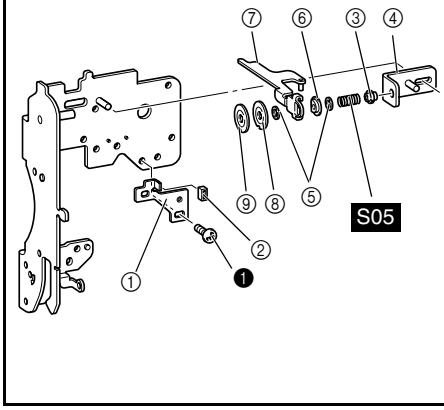
14 AT pulse motor removal

1. Remove the 2 screws ❶, and remove the AT pulse motor ①.



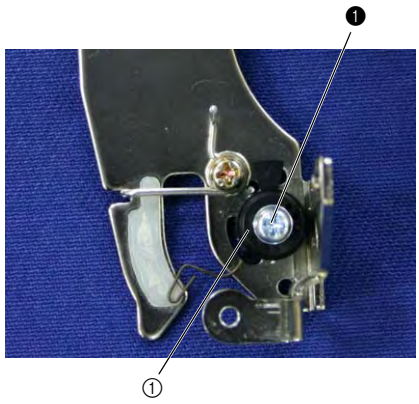
15 Tension disk removal

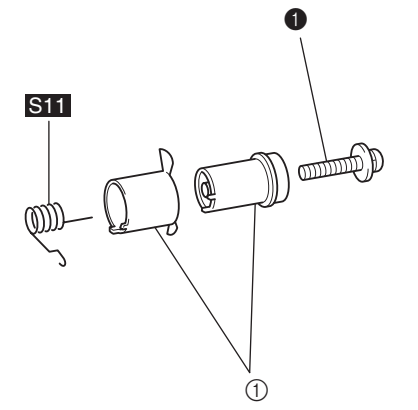
1. Remove the screw ❶, and remove the initial adjustment plate ①.
2. Remove the rubber ② from the initial adjustment plate ①.
3. Loosen the thread tension adjusting screw ③, and remove the tension plate assy ④.
4. Remove the thread tension adjusting screw ③, the spring S05 , washer ⑤, tension disc washer ⑥, tension release plate assy A ⑦, washer ⑤, tension disk B ⑧ and tension disk A ⑨.



16 Thread take up spring removal

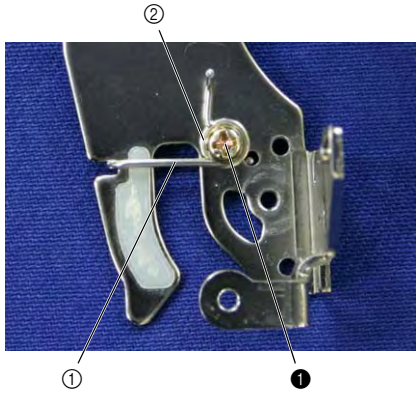
1. Remove the screw ❶, and remove the thread catching spring case ①.
2. Remove the spring S11 from the thread catching spring case ①.



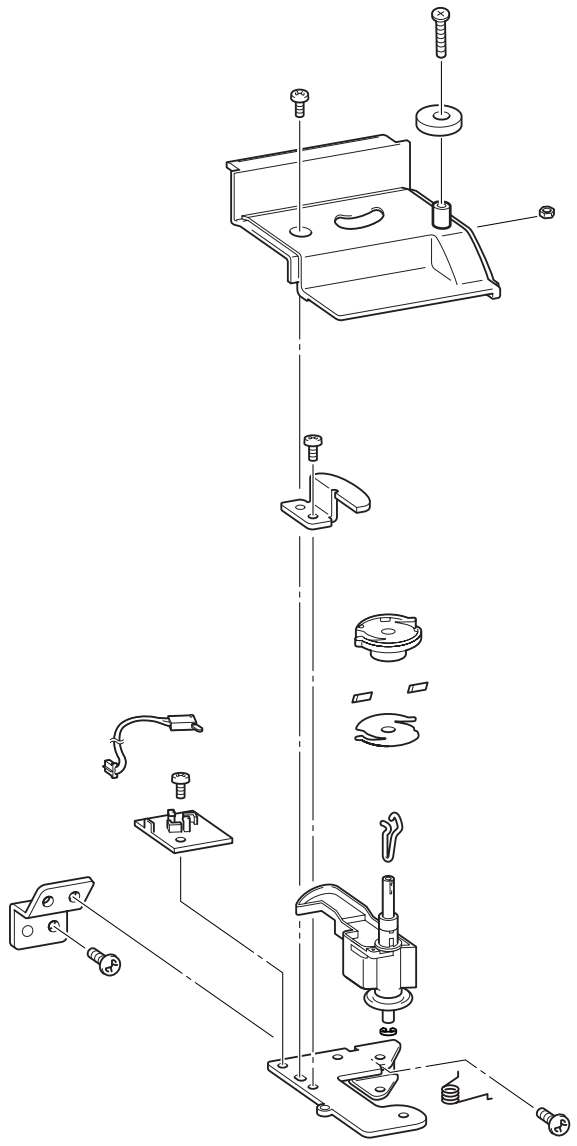


17 Thread guide wire removal

1. Remove the screw ❶, and remove the thread guide wire ① and the washer ②.

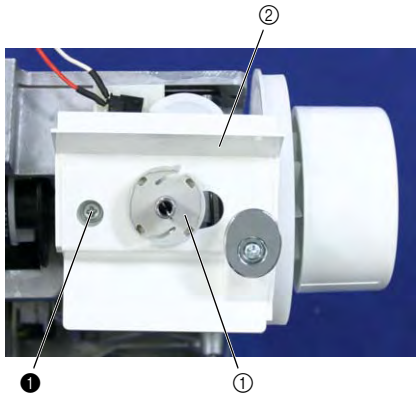


Bobbin winder mechanism location diagram



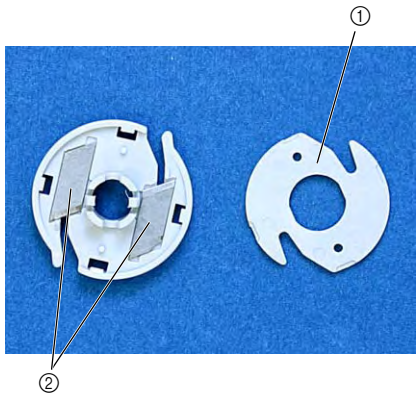
1 Bobbin winder cover removal

1. Remove the bobbin base ①.
2. Remove the screw ❶, and remove the bobbin winder cover ②.



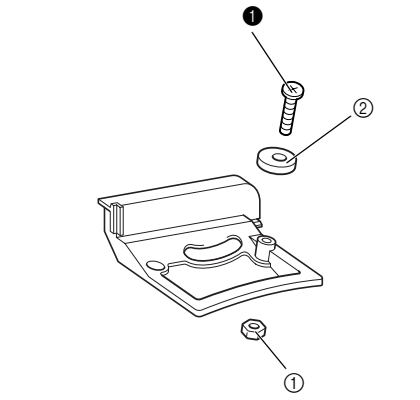
2 Bobbin base disassembly

1. Remove the bobbin thread cutter holder ①.
2. Remove the 2 NT lower thread cutters ②.



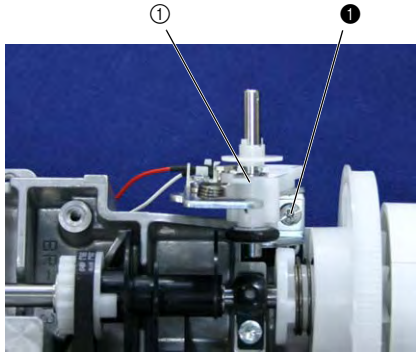
3 Bobbin presser removal

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



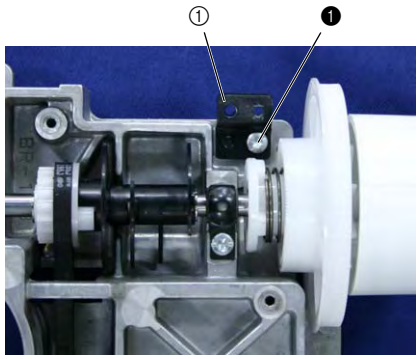
4 Bobbin winder assembly removal

1. Remove the screw ❶, and remove the bobbin winder assembly ①.



5 BW holder supporter removal

1. Remove the screw ❶, and remove the BW holder supporter ①.

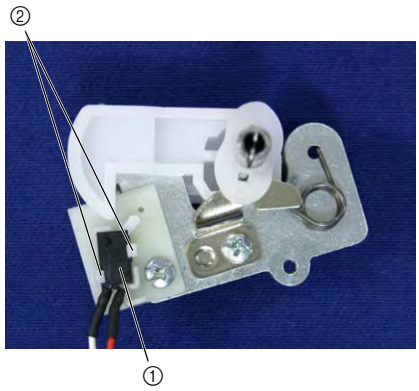


6 BW-F SW assy. removal

1. Remove the BW-F SW assy ①.

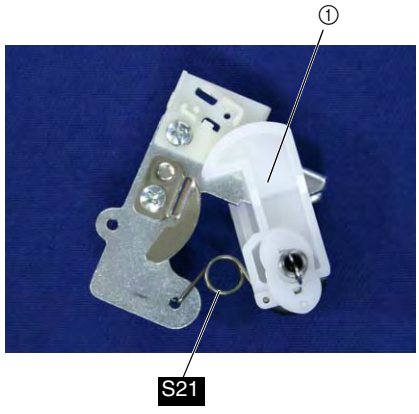
***Key point**

- Open the SW adjust plate ② clip and remove it.



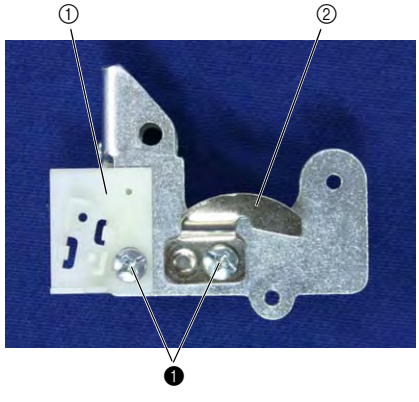
7 BW shaft holder assembly removal

1. Move the BW shaft holder assembly ① to the right (bobbin winding ON).
2. Remove the spring S21.
3. Remove the BW shaft holder assembly ①.

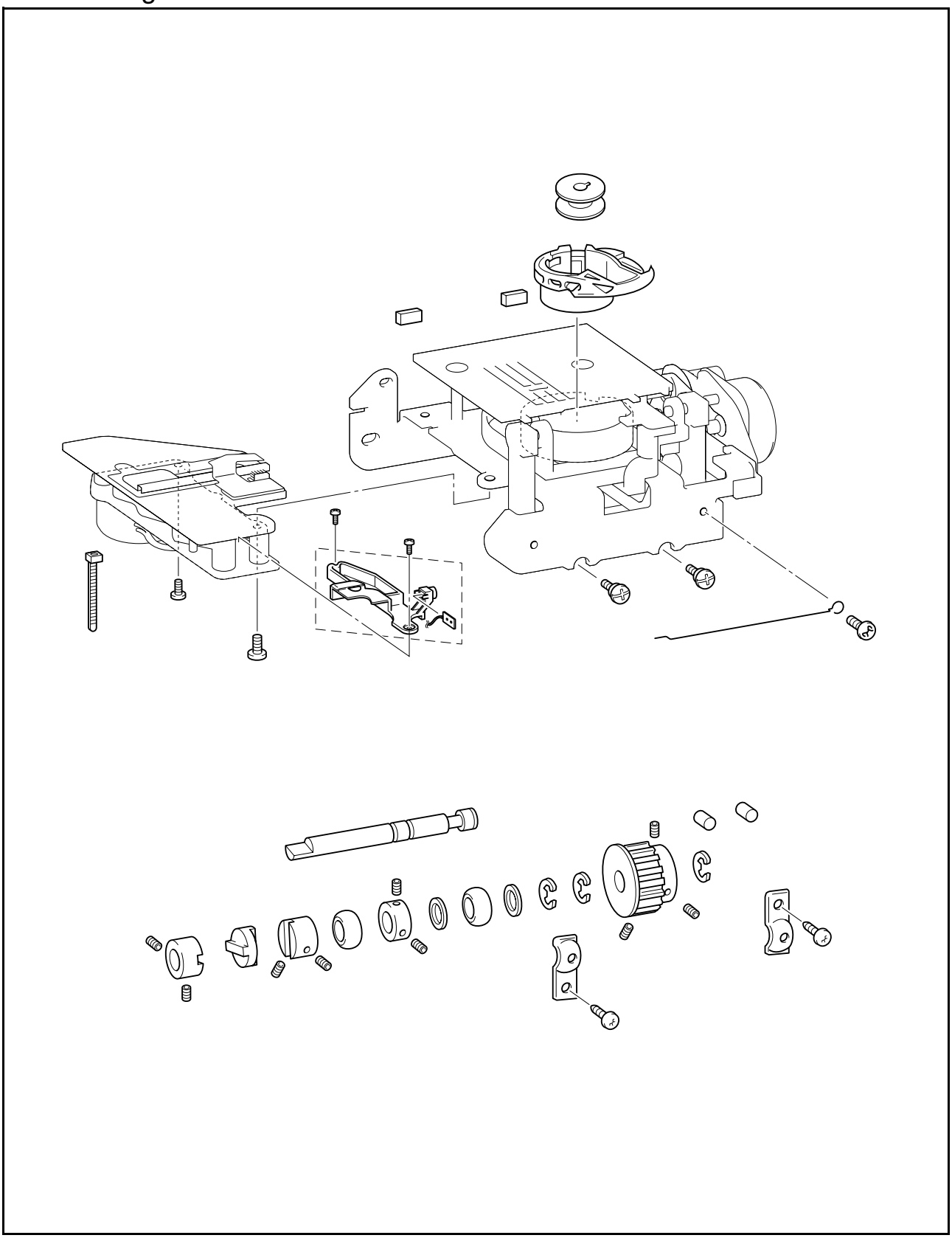


8 Bobbin winder shaft stopper removal

1. Remove the 2 screws ❶, and remove the SW adjust plate ① and the bobbin winder shaft stopper ②.

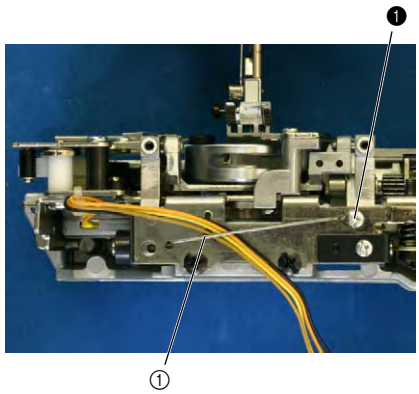


Rotary hook drive mechanism / Feed and bobbin mechanism / Cutter assy. location diagram



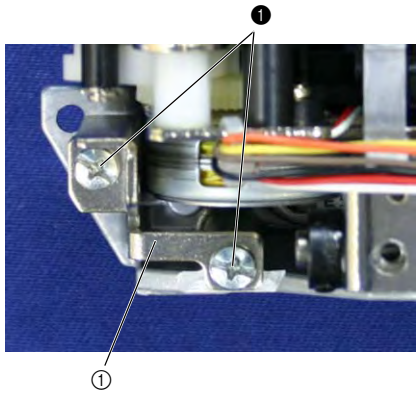
1 Leading guide removal

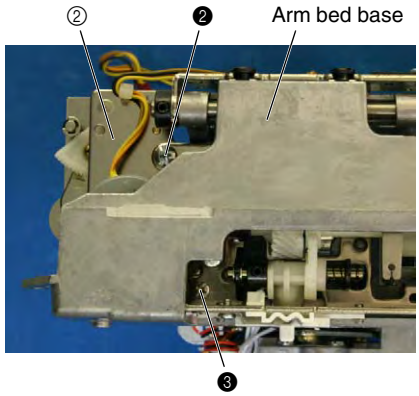
1. Remove the screw ❶, and then remove the leading guide ①.



2 Thread cutter module removal

1. Remove the 2 screws ❶, and then remove the free arm plate ①.
2. Remove the screws ❷ and ❸, and then remove the thread cutter module ②.



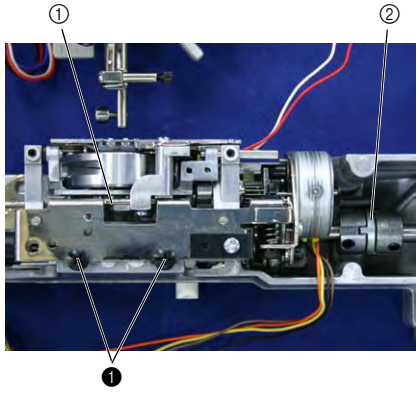


3 Feed module removal

1. Rotate the upper shaft, and bring the needle bar to its highest point
2. Remove the 2 screws ❶, and detach the feed module ① and the disk ②.

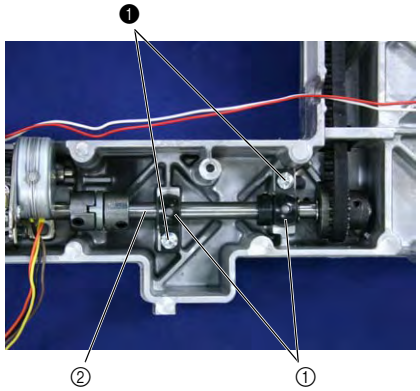
***Key point**

- Raise the needle bar to the top position.



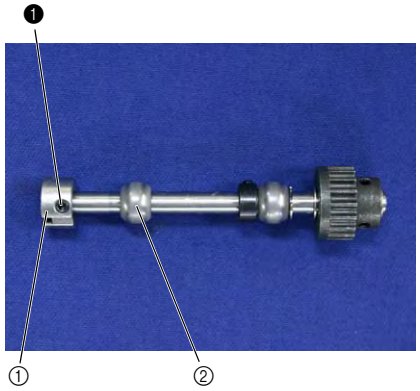
4 Lower shaft A assy. removal

1. Remove the 2 screws ❶, and remove the 2 bushing pressers ①.
2. Remove the lower shaft A assy ②.



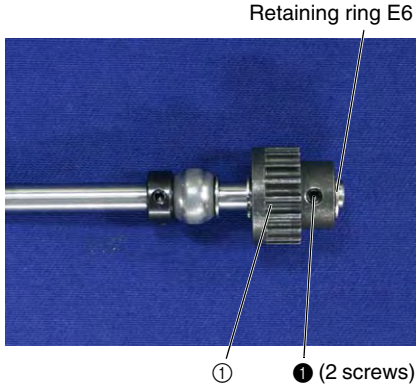
5 Joint removal

1. Remove the 2 screws ❶, and remove the joint ① and the lower shaft bushing ②.



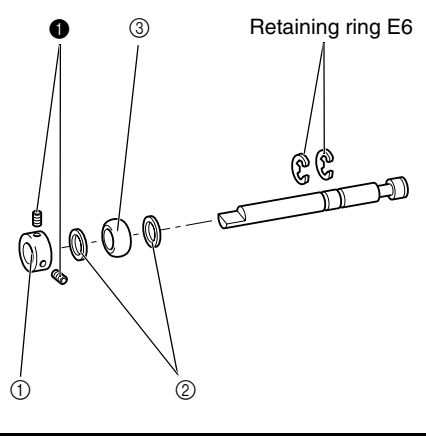
6 Timing pulley D removal

1. Remove the 2 screws ❶.
2. Remove retaining ring E6, and remove the timing pulley D ①.

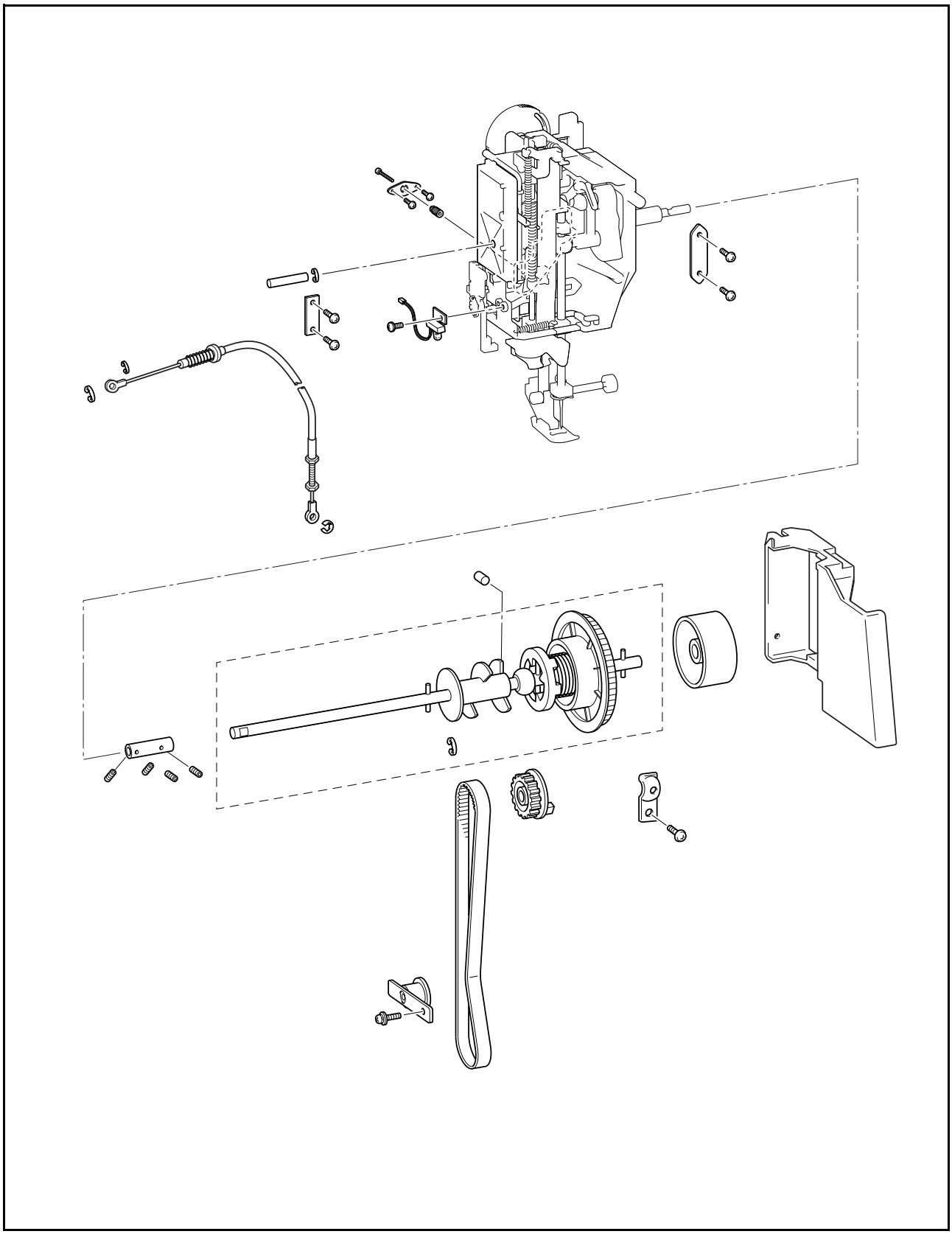


7 Lower shaft bushing removal

1. Remove the 2 screws ❶, and remove the set screw collar ①, thrust washer ②, lower shaft bushing ③ and thrust washer ②.
2. Remove the 2 retaining rings E6.

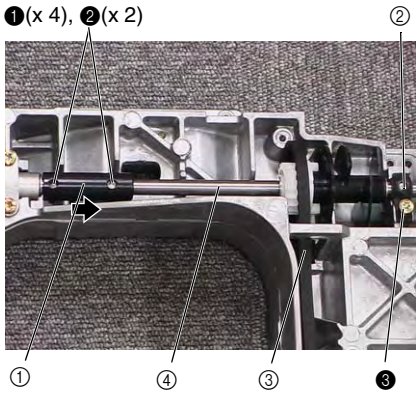


Needle bar, presser mechanism / Upper shaft mechanism location diagram



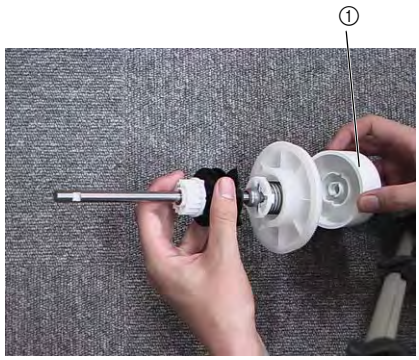
1 Upper shaft removal

1. Remove the 4 screws ❶ and the 2 screws ❷, and slide the fixed joint ① to the right.
2. Remove the screw ❸, and detach the bushing presser ②.
3. Remove the timing belt ③ and the upper shaft ④.
4. Remove the fixed joint ① from the upper shaft ④.



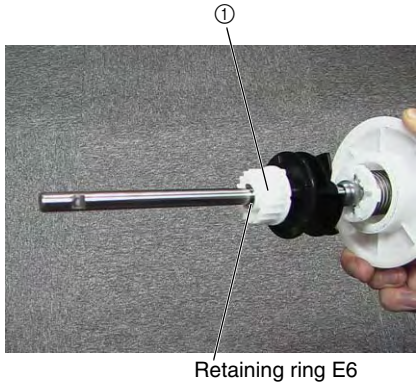
2 Pulley removal

1. Remove the pulley ①.



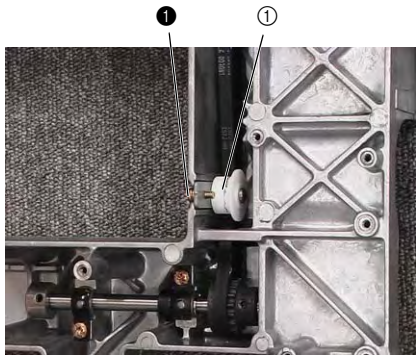
3 Upper shaft pulley removal

1. Remove retaining ring E6, and remove the upper shaft pulley ①.



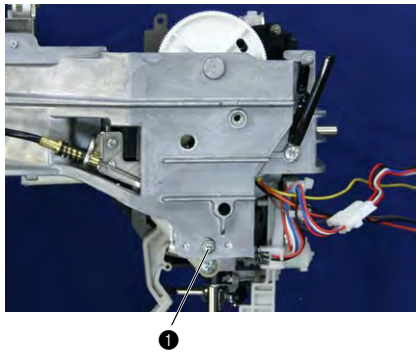
4 Tension pulley assembly removal

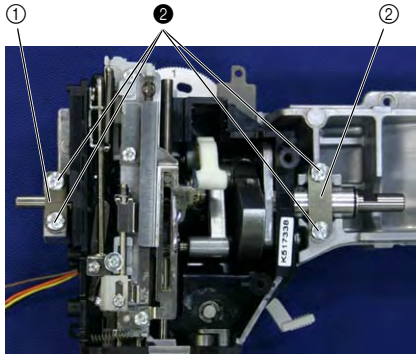
1. Remove the screw ❶, and remove the tension pulley assembly ①.

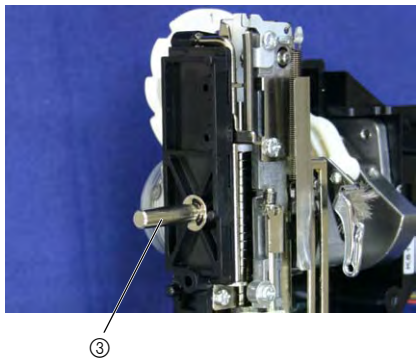


5 Needle-presser module removal

1. Remove the screw ❶.
2. Remove the 4 screws ❷, and detach the presser plate A ① and the presser plate B ②.
3. Remove the needle-presser module.
4. Detach the shaft ③ from the needle-presser module.

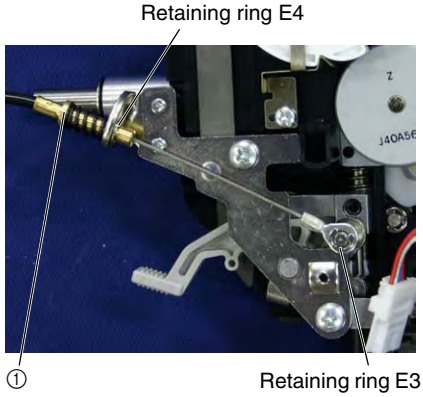






6 Wire assy. removal

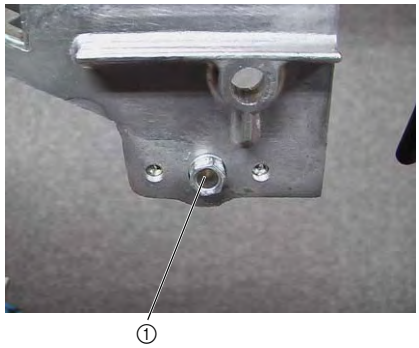
1. Remove retaining ring E3.
2. Remove retaining ring E4, and remove the wire assy. ①.



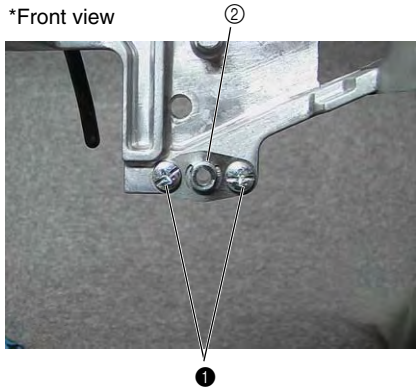
7 Plate spring removal

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

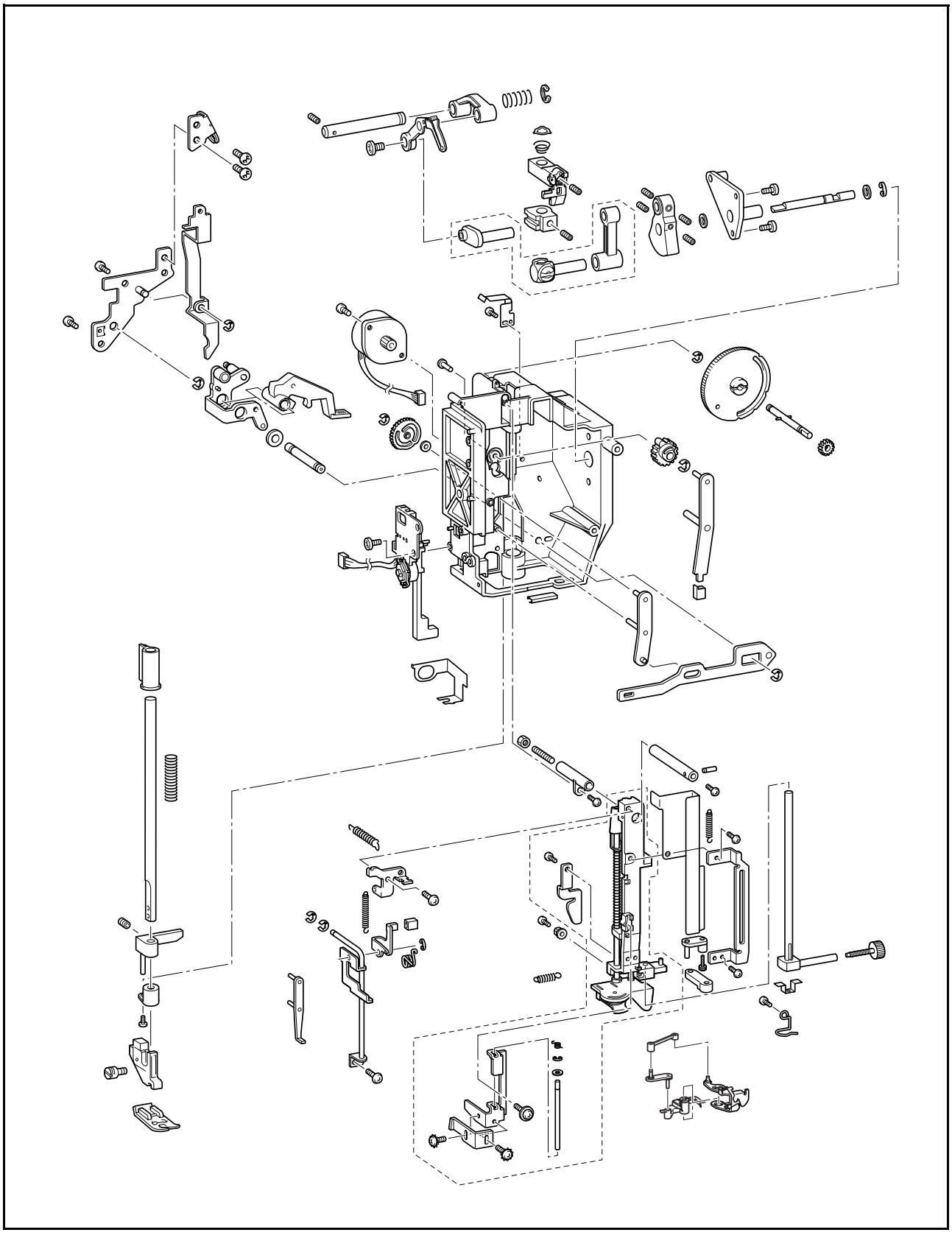
*Rear view



*Front view

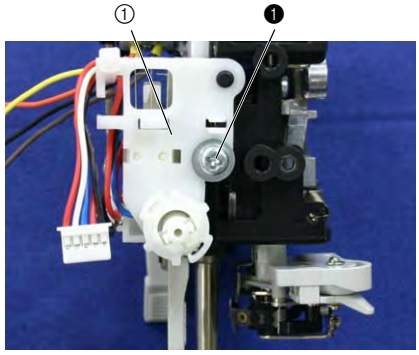


Needle-presser module breakout diagram



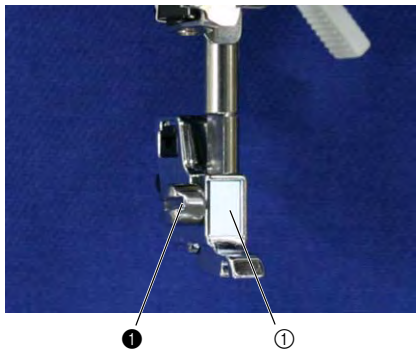
1 BH switch assy. removal

1. Remove the screw ❶, and detach the BH switch assy ①.



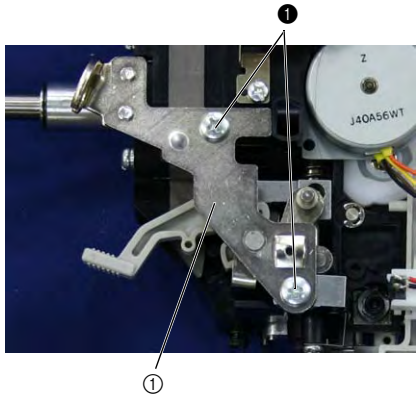
2 Presser feed holder assy. removal

1. Remove the screw ❶, and detach the presser feed holder assy ①.



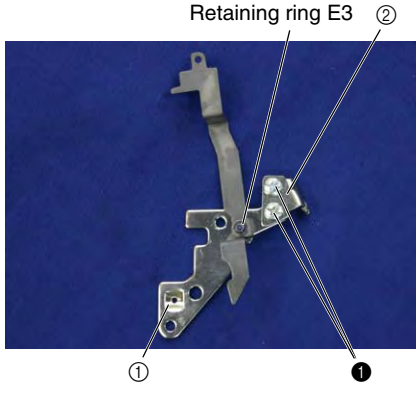
3 Adjusting plate assy. removal

1. Remove the 2 screws ❶, and remove the adjusting plate assy ①.



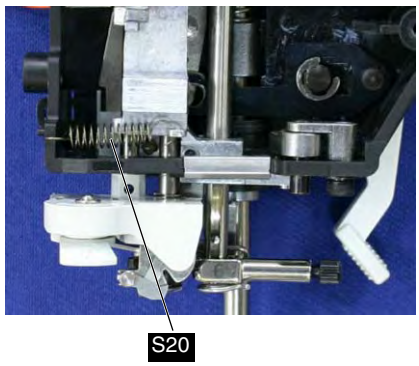
4 Adjusting plate ASSY disassembly

1. Remove the retaining ring E3, and detach the tension releaser C ①.
2. Remove the 2 screws ❶, and detach wire guide plate U ②.



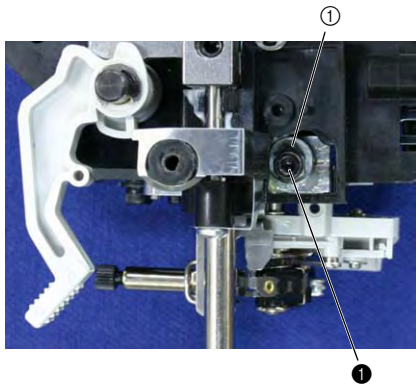
5 Spring-Z removal

1. Remove the spring S20.



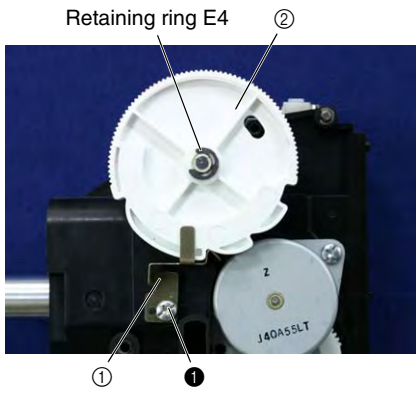
6 Zigzag adjusting nut removal

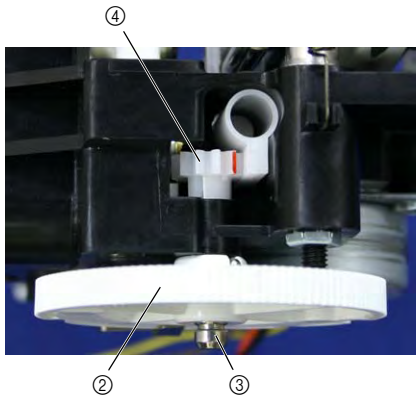
1. Remove the screw ❶, and remove the zigzag adjusting nut ①.



7 Presser dial removal

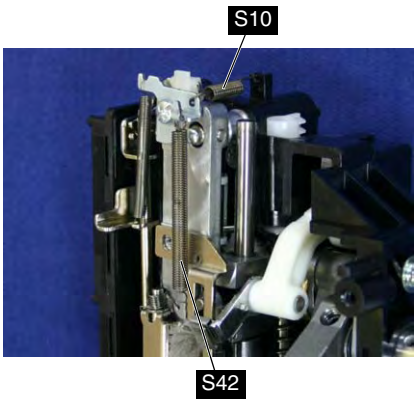
1. Remove the screw ❶, and remove the spring plate ①.
2. Remove the retaining ring E4, and then remove the presser dial ②, the presser dial gear shaft assy ③, and the presser dial gear ④.





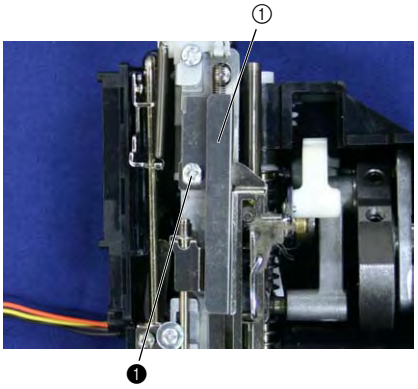
8 Spring / needle bar hook stand spring removal

1. Remove S10 and S42 .



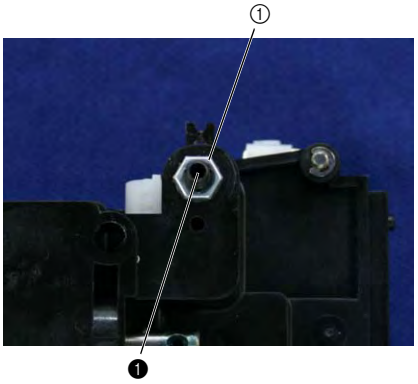
9 Spring guard removal

1. Remove the screw ❶, and remove the spring guard ①.



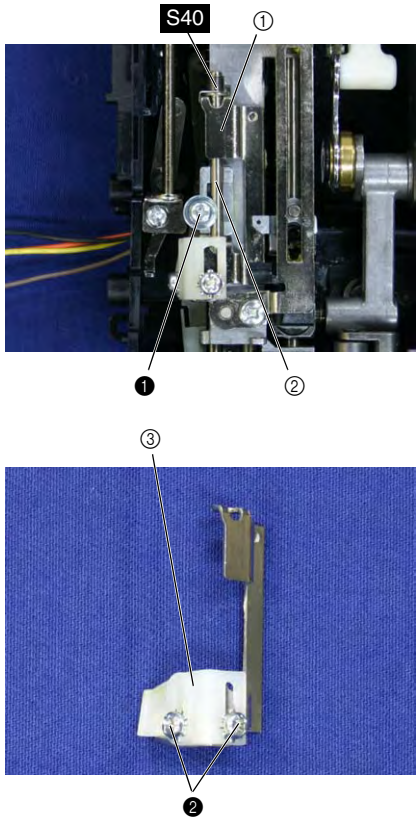
10 Lock nut removal

1. Remove the lock nut ① and the screw ❶.



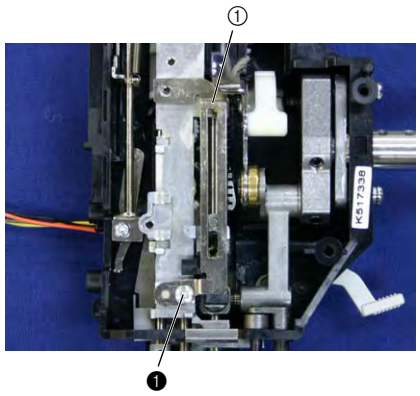
11 Release lever removal

1. Remove S40.
2. Remove screw ❶, and remove the release lever ①, release lever shaft ② and polyester slider.
3. Remove screws ❷ (two), and remove the release adjuster ③ from the release lever.
4. Remove retaining ring E2 from the release lever shaft.



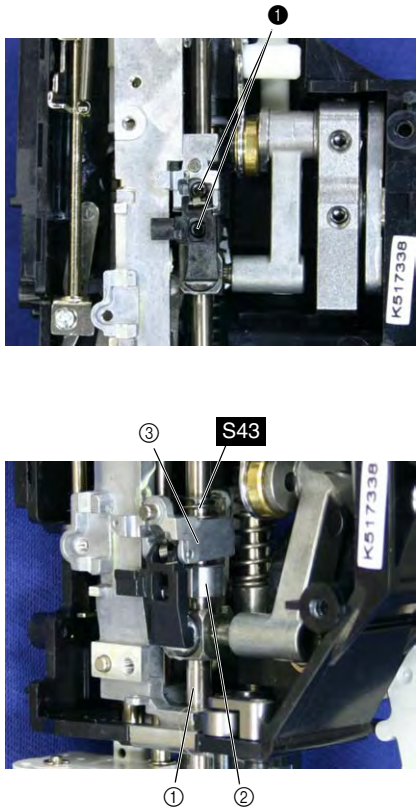
12 Release guide plate removal

1. Remove screws ❶, and remove the release guide plate ①.



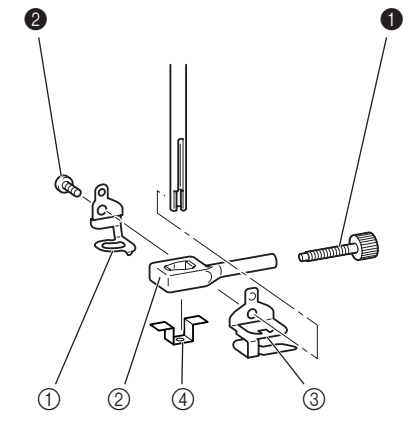
13 Needle bar assy. removal

1. Remove screws ❶ (two).
2. Remove the needle bar ① needle thread block ②, needle bar hook stand assy. ③, thrust washer and S43.



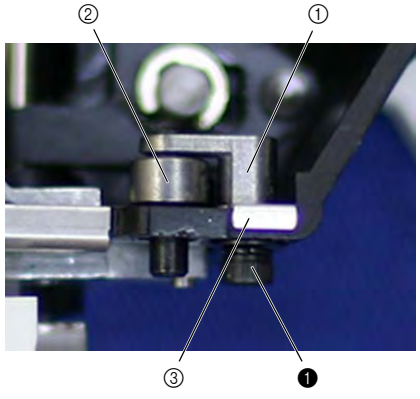
14 Needle bar assy. disassembly

1. Remove the screw ❶.
2. Remove the screw ❷, and then remove the needle thread guide spring ①, the needle block ② and the needle bar thread guide ③.
3. Remove the needle thread plate ④ from the needle block ②.



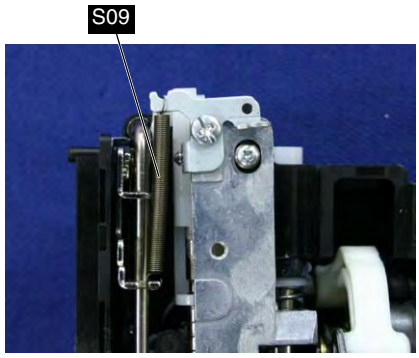
15 Needle holder shaft block removal

1. Remove the screw ❶, and then remove he needle holder shaft block ① and the needle holder block ②.
2. Remove the upper unit support plate ③.



16 Lever A spring removal

1. Remove the spring S09 .

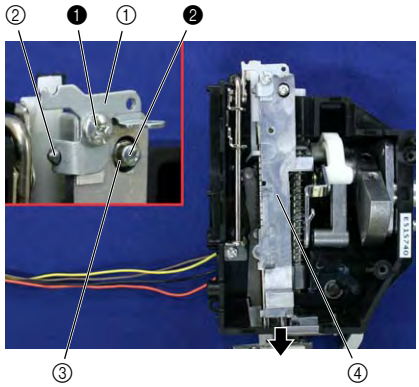


17 Needle bar supporter assy. removal

1. Remove the screw ❶, and remove the plate ①.
2. Remove the screw ❷, and remove the shaft ②.
3. Remove the shaft ③.
4. Remove the needle bar supporter assy ④.

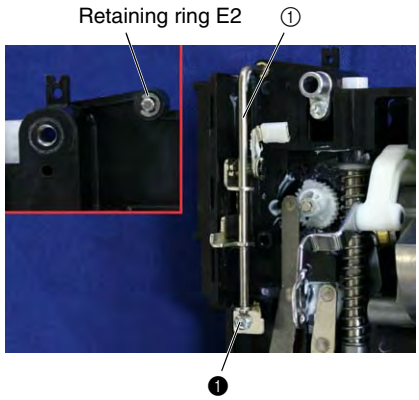
***Key point**

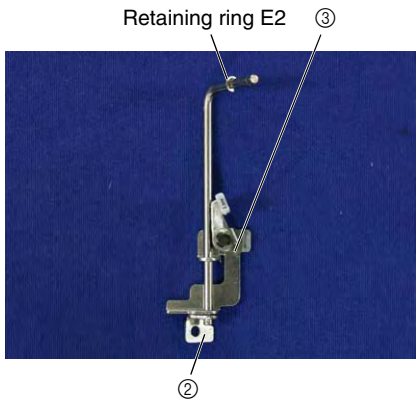
- Move the Z zigzag lever assy to the right.



18 Lever AB assy. removal

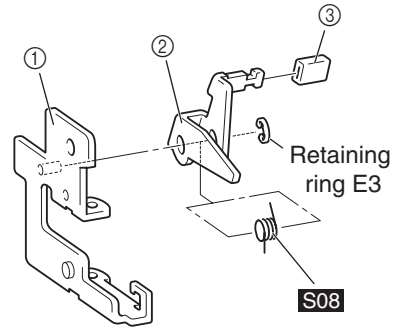
1. Remove retaining ring E2.
2. Remove the screw ❶, and remove the lever guide shaft ①.
3. Remove the lever presser plate ②, lever AB assy ③ and the retaining ring E2 from the lever guide shaft ①.





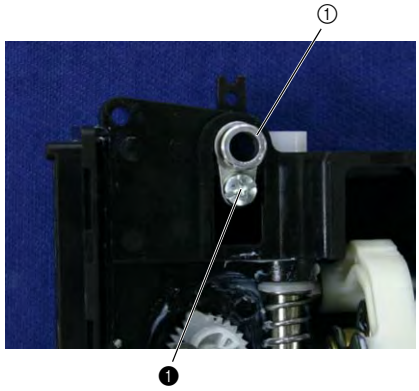
19 Lever AB assy. disassembly

1. Remove retaining ring E3, and remove the lever B ② and the spring S08 from the lever A assy. ①.
2. Remove the cap ③ from the lever B ②.



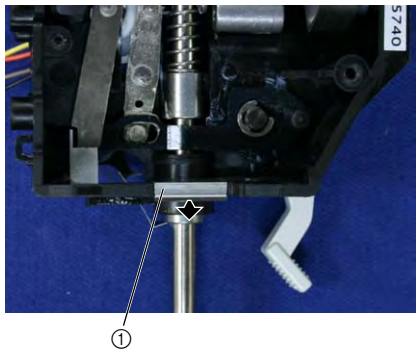
20 Shaft bushing A removal

1. Remove the screw ❶, and detach the shaft bushing A ①.



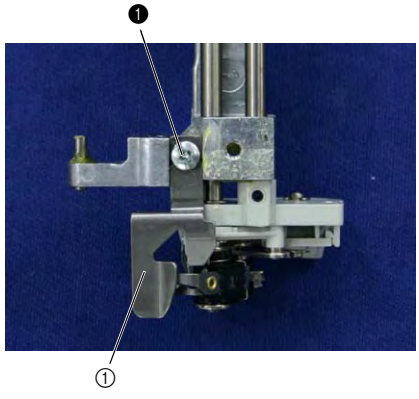
21 Thread guide plate removal

1. Remove the thread guide pate ①.



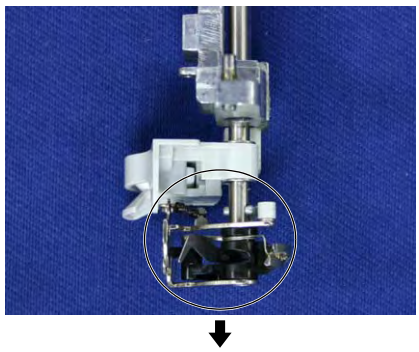
22 Hook release plate removal

1. Remove the screw ❶, and detach the hook release plate ①.



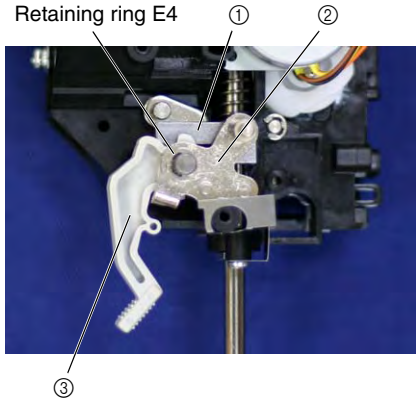
23 Threader hook assy. disassembly

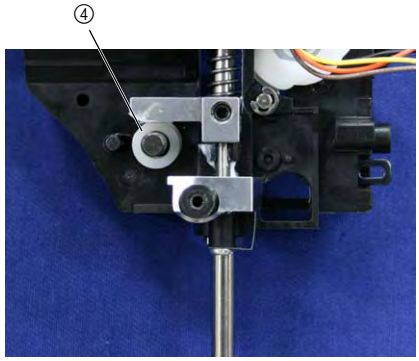
1. Remove the thread guide assy, threader hook assy, link A assy, and link B.

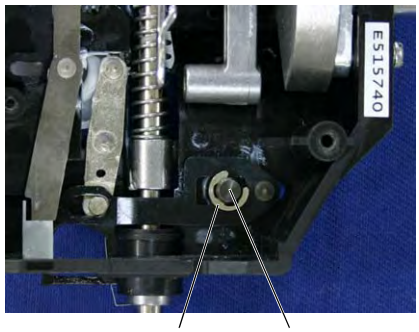


24 Presser foot lifter removal

1. Remove the retaining ring E4.
2. Lift up the presser bar clamp ①, and then remove the lifter assembly ② and the lifter ③, and then remove the washer ④.
3. Remove the presser lift shaft ⑤, and then remove the retaining ring E4.





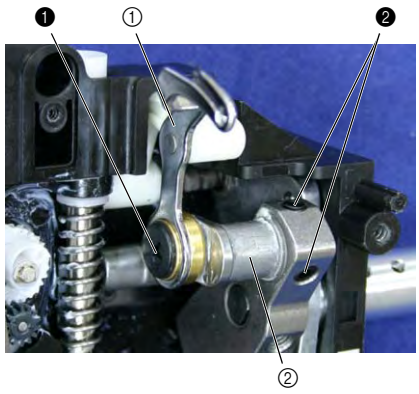


25 Thread take-up assy. removal

1. Remove the screw ❶, and detach the thread take-up lever assy ①.

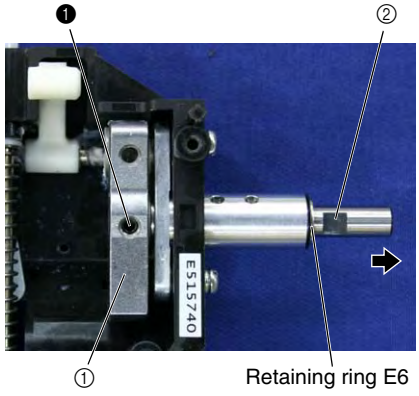
NOTE •The screw ❶ is reverse threaded.

2. Remove the 2 screws ❷, and detach the needle bar crank rod assy ②.



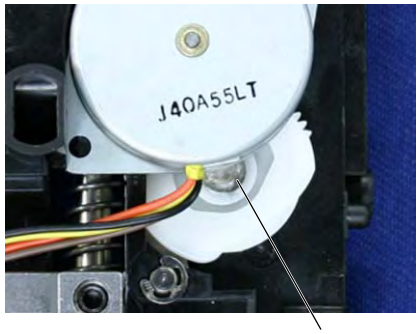
26 Thread take-up counter weight removal

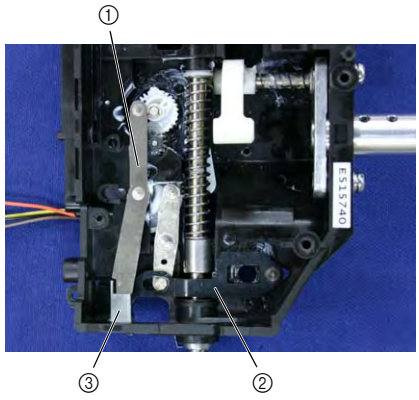
1. Remove the 2 screws ❶, and thread take-up counter weight ①, thrust washer, unit shaft ② and thrust washer.
2. Remove the retaining ring E6 from the unit shaft ②.



27 Z zigzag lever and thread releaser assy. removal

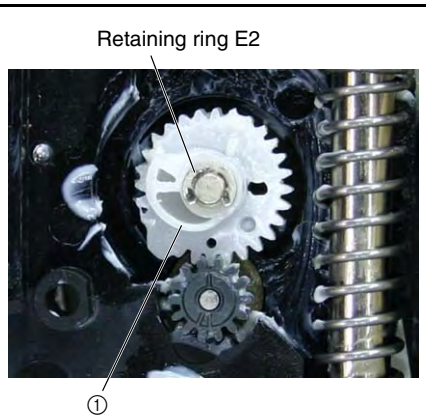
1. Remove the retaining ring E3.
2. Detach the Z zigzag lever ① and the thread releaser assy ②.
3. Remove the Z lever cup ③ from the Z zigzag lever ①.





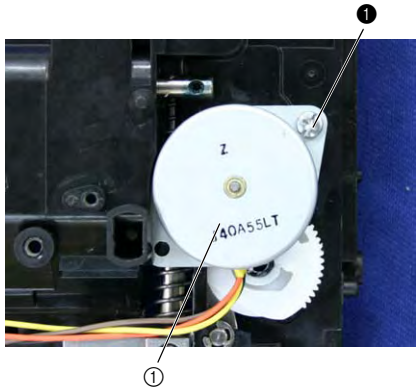
28 Remove the Z zigzag cam

1. Remove the retaining ring E2, and remove the Z zigzag cam ①.



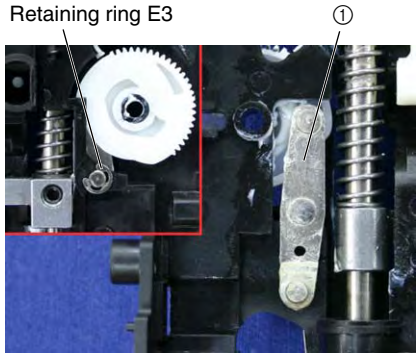
29 Z pulse motor removal

1. Remove the screw ❶, and detach the Z pulse motor (ZPMSMJ35-4840-A) ①.



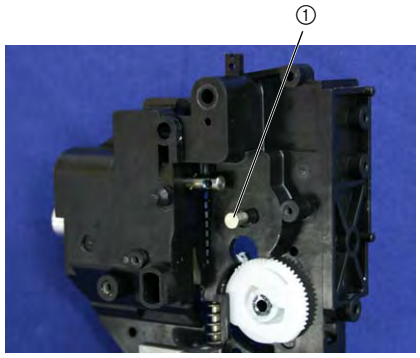
30 Thread release lever assy. removal

1. Remove thte retaining ring E3.
2. Remove the thread release lever assy ① and the polyester slider.



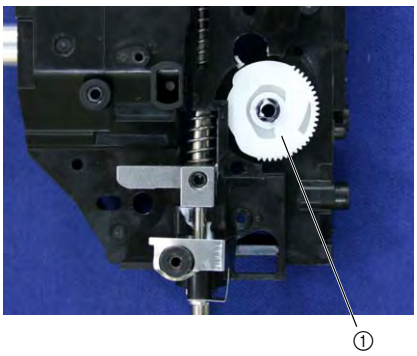
31 Remove the shaft

1. Remove the shaft ①.



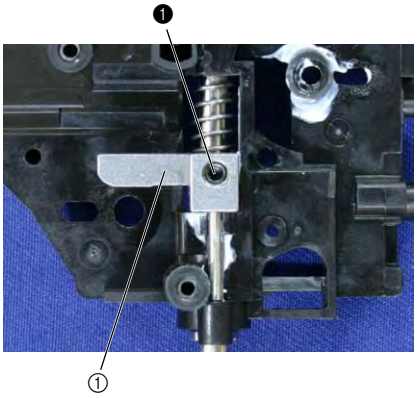
32 T cam removal

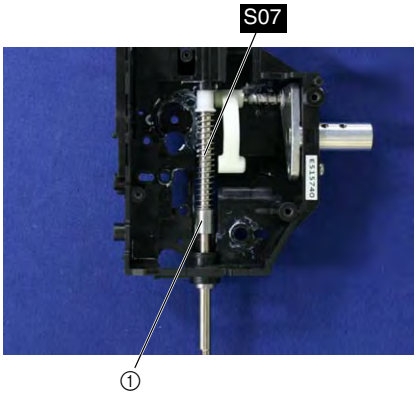
1. Remove the T cam ①.

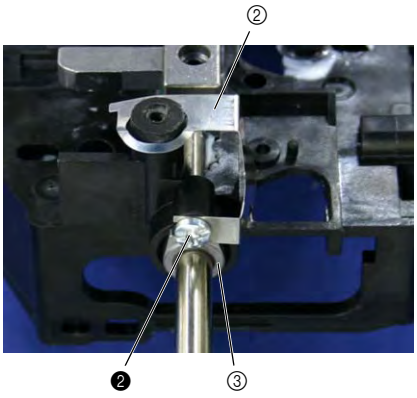


33 Presser bar removal

1. Remove the screw ❶ from the presser bar clamp assembly ①, and then pull the presser bar downward.
2. Remove the presser bar clamp assembly ① and spring S07.
3. Remove the screw ❷, and then remove the plate spring ② and the presser bar bushing ③.

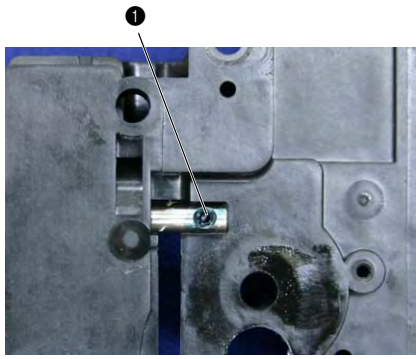


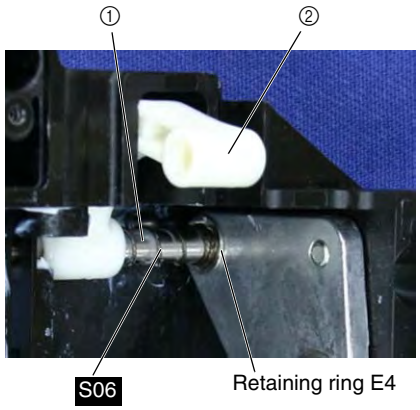




34 Thread take-up lever link removal

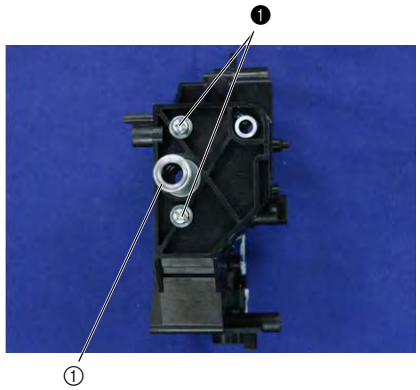
1. Remove the screw ❶.
2. Remove the retaining ring E4, and remove the shaft ①, spring S06 and thread take-up lever link ②.



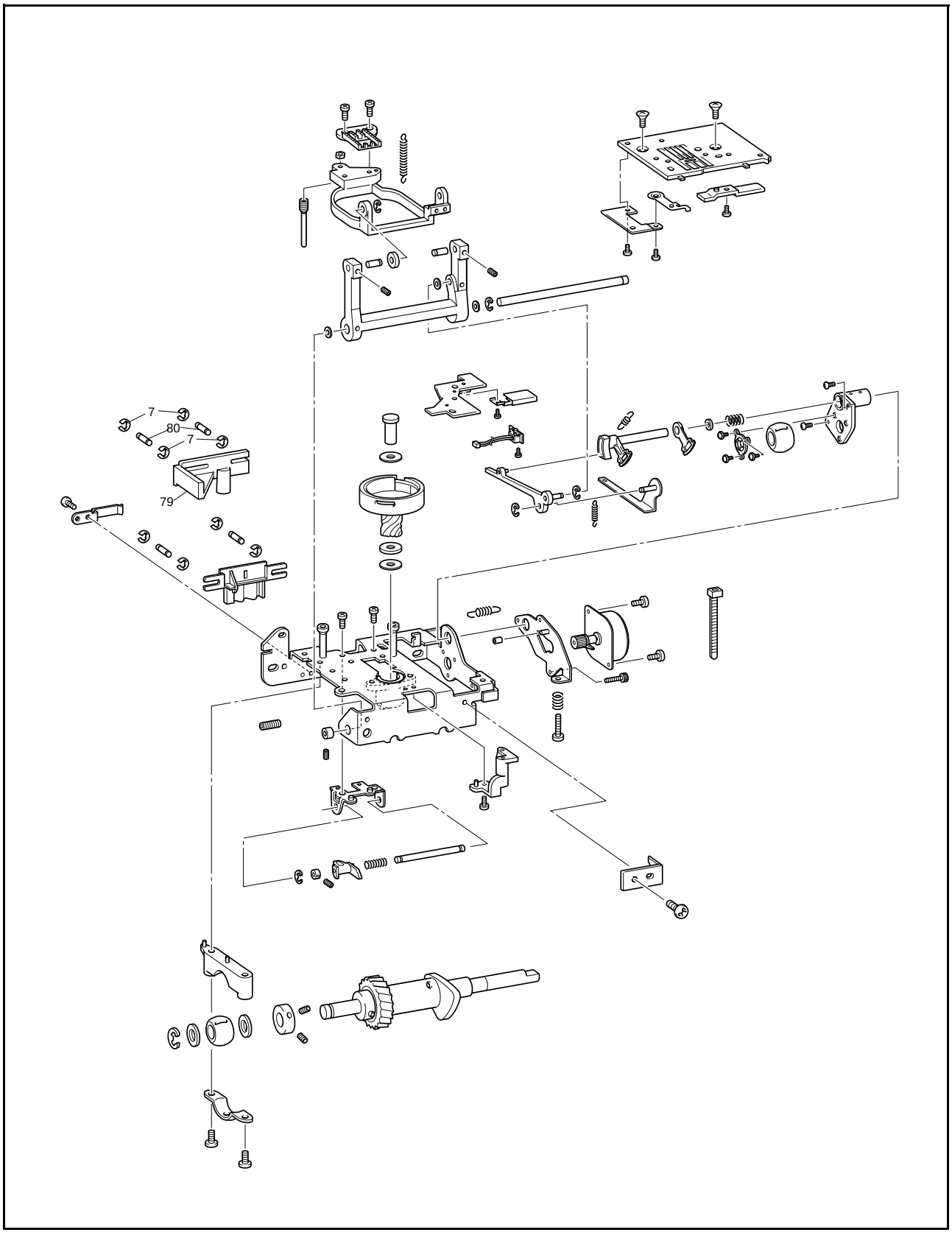


35 Shaft bushing assembly removal

1. Remove the 2 screws ❶, and remove the shaft bushing assembly ①.

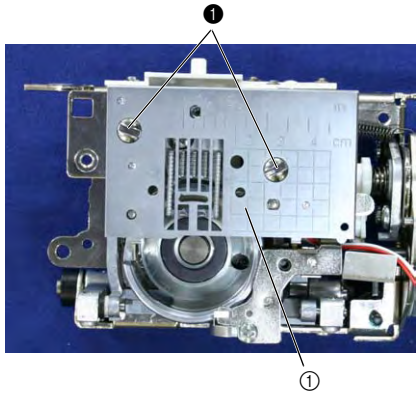


Feed and bobbin module breakout diagram



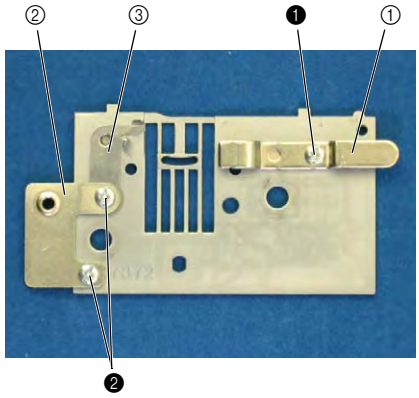
1 Needle plate A removal

1. Remove the 2 screws ❶, and remove the needle plate A ①.



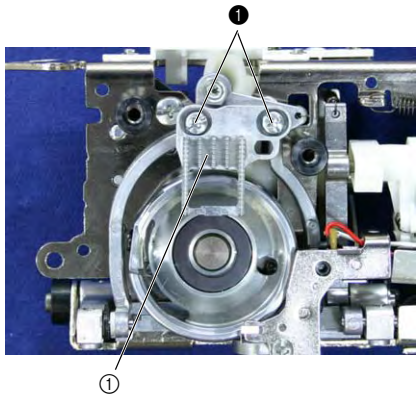
2 Needle plate A disassembly

1. Remove the screw ❶, and then remove the F gear stopper plate ①.
2. Remove the 2 screws ❷, and then remove the needle plate B support plate ② and the stopper plate ③.



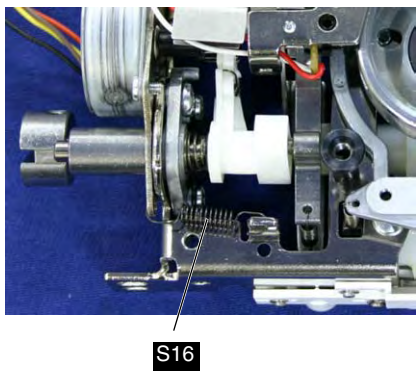
3 Feed dog removal

1. Remove the 2 screws ❶, and remove the feed dog ①.



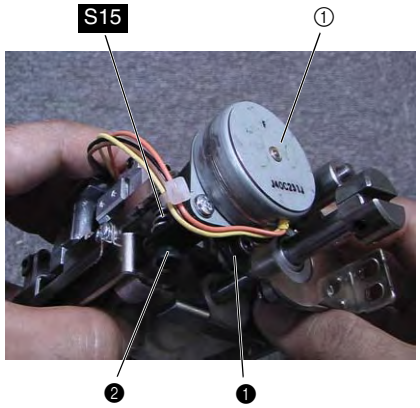
4 FPM spring removal

1. Remove the spring S16.



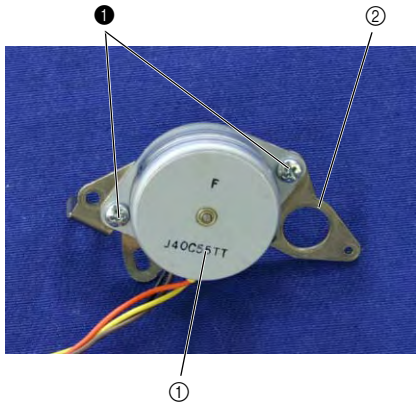
5 F pulse motor assembly removal

1. Remove the screw ❶ and the screw ❷, and detach the spring S15 and the F pulse motor assembly ①.



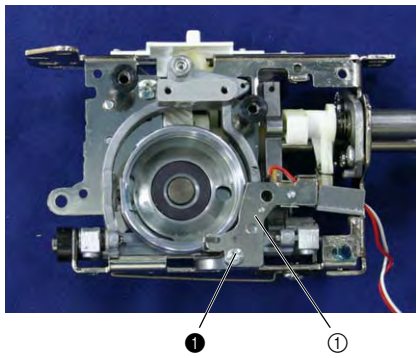
6 F pulse motor disassembly

1. Remove the 2 screws ❶, and remove the F pulse motor (FPMSMJ35-4840-C) ①.
2. Remove the rubber from the FPM holder assy. ②.



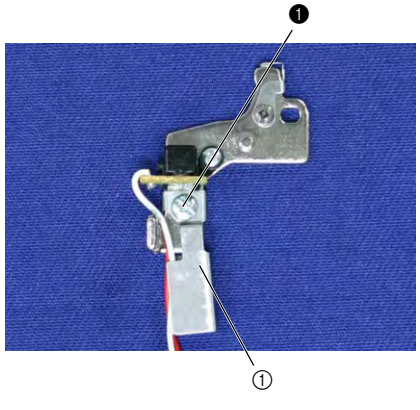
7 Inner rotary hook bracket assy. removal

1. Remove the screw ❶, and remove the inner rotary hook bracket assy ①.



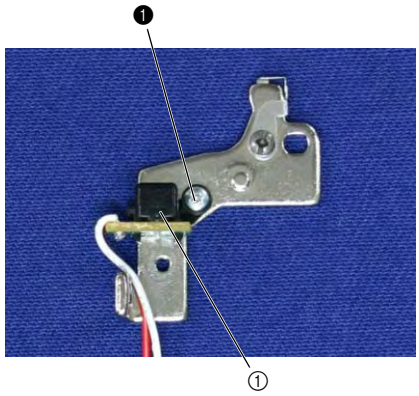
8 Cord supporter removal

1. Remove the screw ❶, and then remove the cord supporter ①.



9 Photo diode holder assembly removal

1. Remove the screw ❶, and then remove the photo diode holder assembly ①.

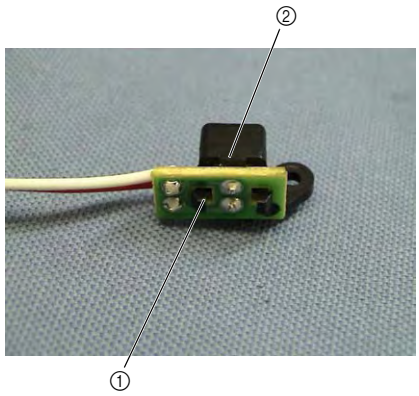


10 Photo diode assembly disassembly

1. Remove the photo diode assembly ① from the photo diode holder ②.

***Key point**

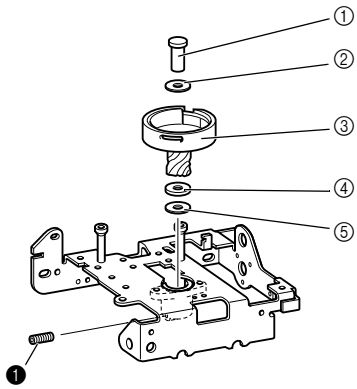
- Disengage the 2 hooks on the photo diode holder ②.



11 Outer rotary hook assy. removal

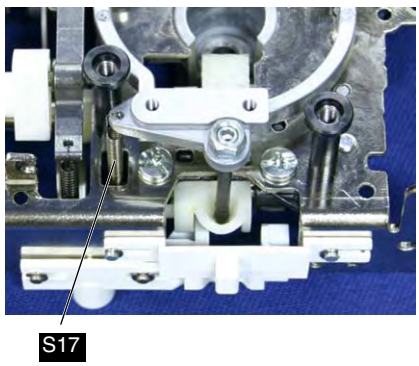
1. Remove the screw ❶, and remove the outer rotary hook shaft ①, spacer ②, outer rotary hook assy ③, washer 6 ④ and the spacer ⑤.

NOTE •Spacer and washer 6 attachment order
outer rotary hook shaft --> spacer (thin) --> outer rotary hook assy. ① --> washer 6 (thick) --> spacer (thin)



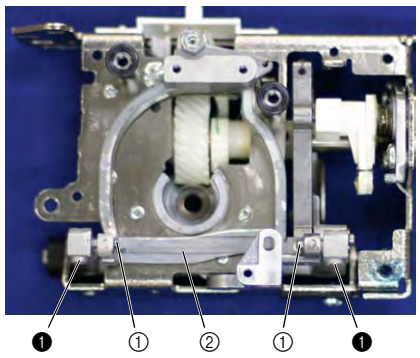
12 Feed bar spring removal

1. Remove the spring S17.



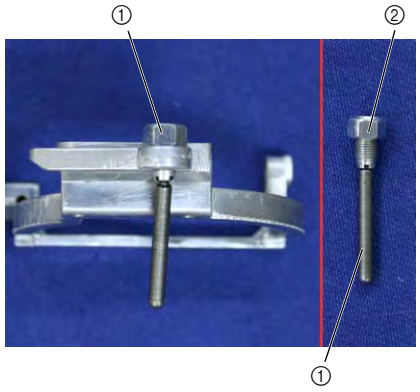
13 Feed bar removal

1. Remove the 2 screws ❶, and remove the 2 feed bar shaft A ①.
2. Remove the feed bar ②.



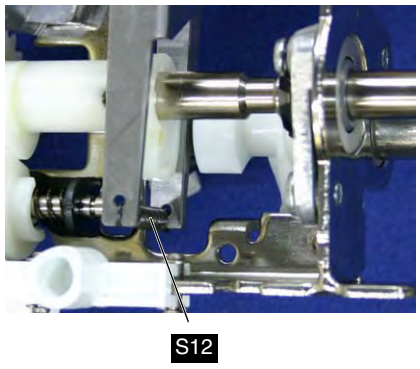
14 Vertical adjusting screw removal

1. Remove the vertical adjusting screw ①.
2. Remove the M5 nut ② from the vertical adjusting screw ①.



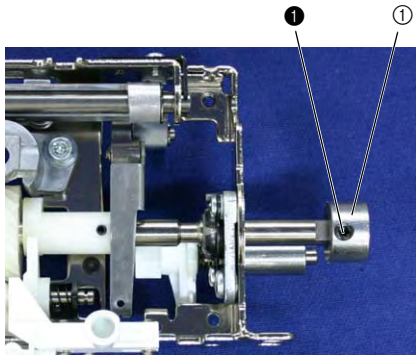
15 Feed supporting plate spring removal

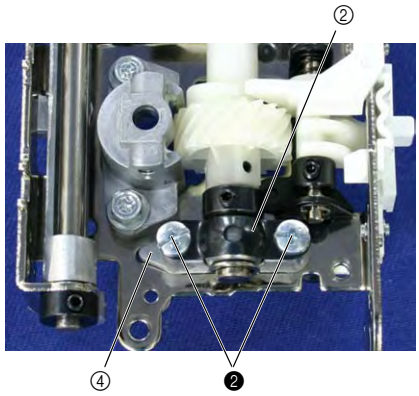
1. Remove the spring S12.

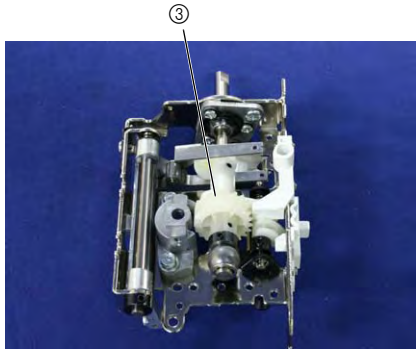


16 Lower shaft B assy. removal

1. Remove the 2 screws ❶, and remove the joint ①.
2. Remove the 2 screws ❷, and remove the bushing presser A ②.
3. Remove the lower shaft B assy ③.
4. Remove the bushing supporter A ④ from the feed base.

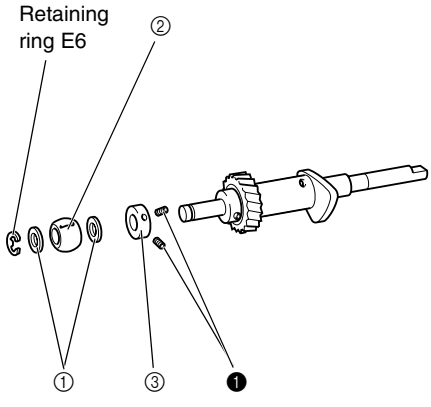






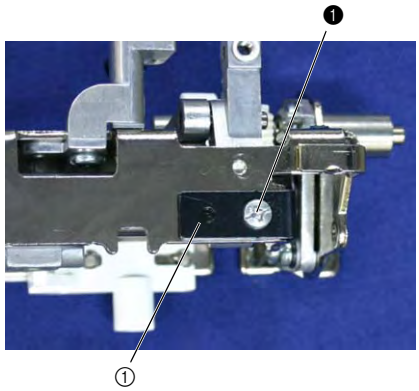
17 Lower shaft B assy. disassembly

1. Remove the retaining ring E6, and remove the thrust washer ①, lower shaft bushing ② and thrust washer ①.
2. Remove the 2 screws ❶, and remove the set screw collar ③.



18 Shaft stopper plate removal

1. Remove the screw ❶, and then remove the shaft stopper plate ①.



19 Set screw collar removal

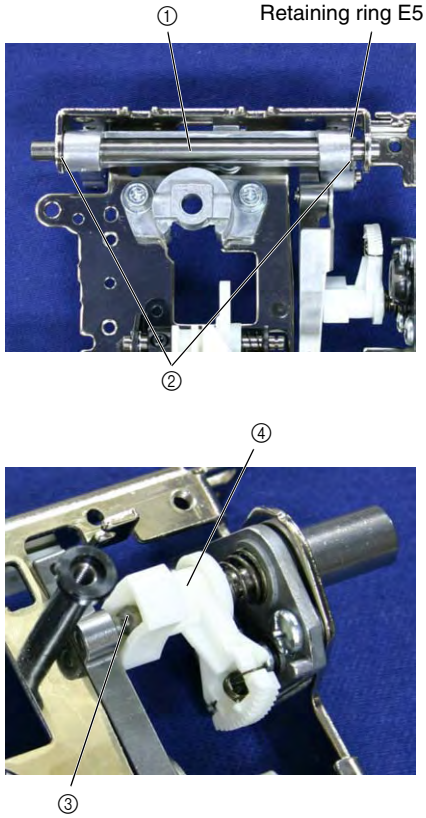
1. Remove the screw ❶, and then remove the set screw collar ①.

20 Feed arm assembly removal

1. Remove the retaining ring (E5) of the horizontal feed shaft ①.
2. Pull the horizontal feed shaft ① to the left to remove it, and then remove the 2 thrust washers ②.
3. Remove the feed arm assembly from the bottom of the feed/rotary hook module.

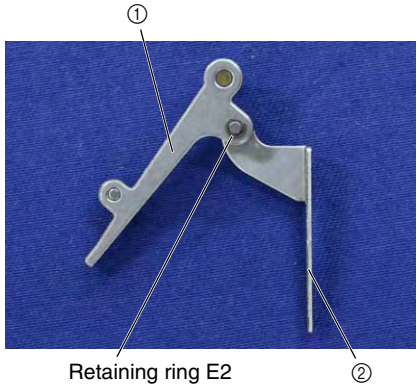
***Key point**

- Remove the rectangular feed slide shaft of feed arm B ③ on the top of the feed arm assembly from the feed adjuster ④.



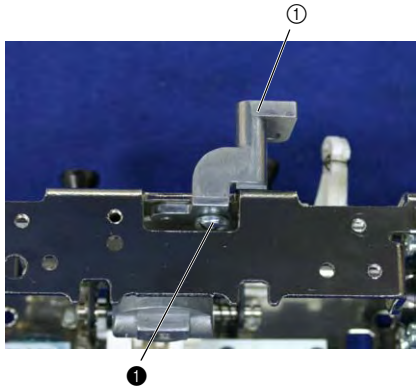
21 Feed arm assy. disassembly

1. Remove the retaining ring E3, and remove the feed arm B assy ① and the polyester slider.
2. Remove the retaining ring E2, and remove the feed supporting plate assy ② from the feed arm B assy ①.



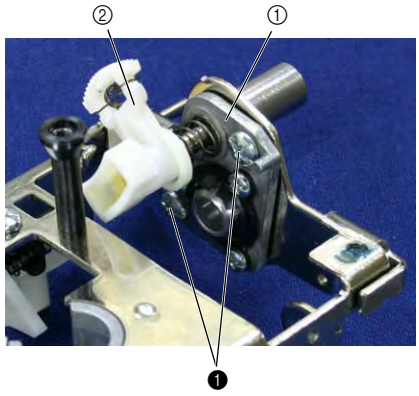
22 Stopper plate block assy. removal

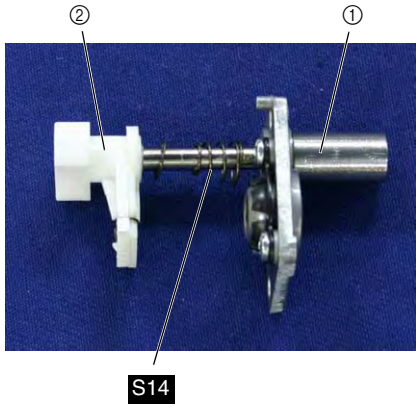
1. Remove the screw ❶, and remove the stopper plate block assy ①.



23 Feed adjuster assembly removal

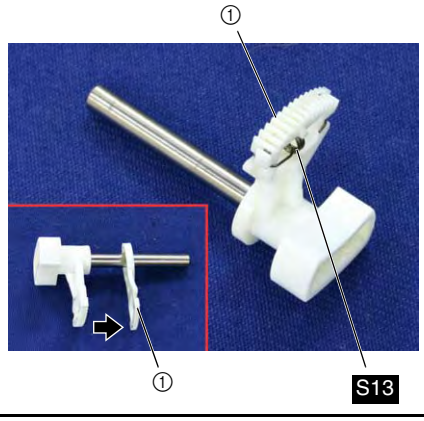
1. Remove the 2 screws ❶, and remove the bushing supporter assy ①, feed adjuster assembly ②, spring S14 and polyester slider.





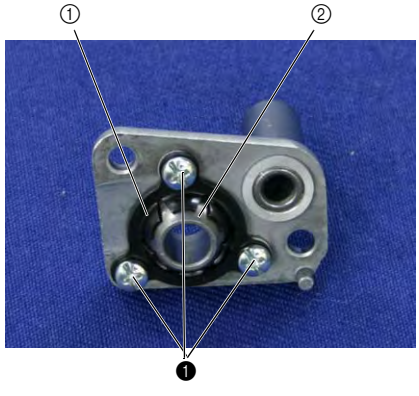
24 Feed adjuster assembly disassembly

1. Remove the spring S13, and detach the F gear ①.



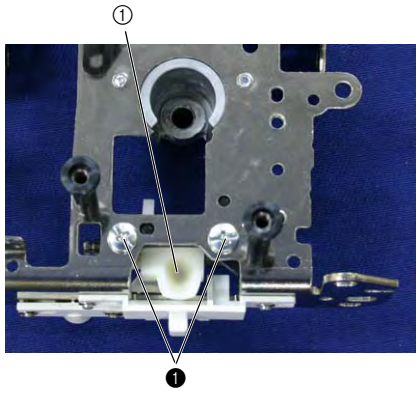
25 Bushing presser B removal

1. Remove the 3 screws ❶, and remove the bushing presser B ① and the lower shaft bushing ②.



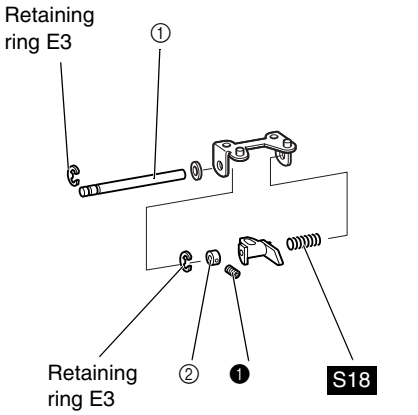
26 Drop assy. removal

1. Remove the 2 screws ❶, and remove the drop assy. ①.



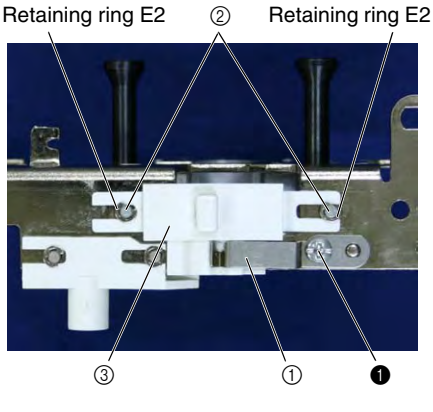
27 Drop assy. disassembly

1. Remove the screw ❶.
2. Remove the retaining ring E3, and remove the vertical feed shaft ①, polyester slider, set screw collar 4 ② and spring S18.
3. Remove the retaining ring E3 from the vertical feed shaft ①.



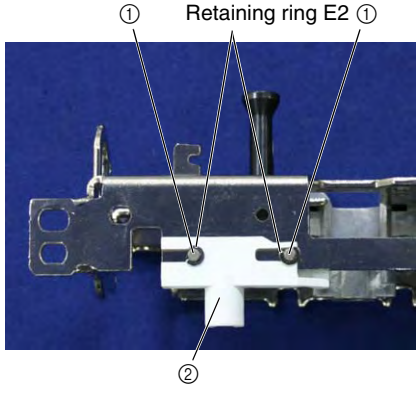
28 Drop knob removal

1. Remove the screws ❶, and remove the spring plate ①.
2. Remove the 2 retaining rings E2, and remove the 2 slide shafts B ② and the drop knob ③.
3. Remove the 2 retaining rings E2 from the 2 slide shafts B ②.

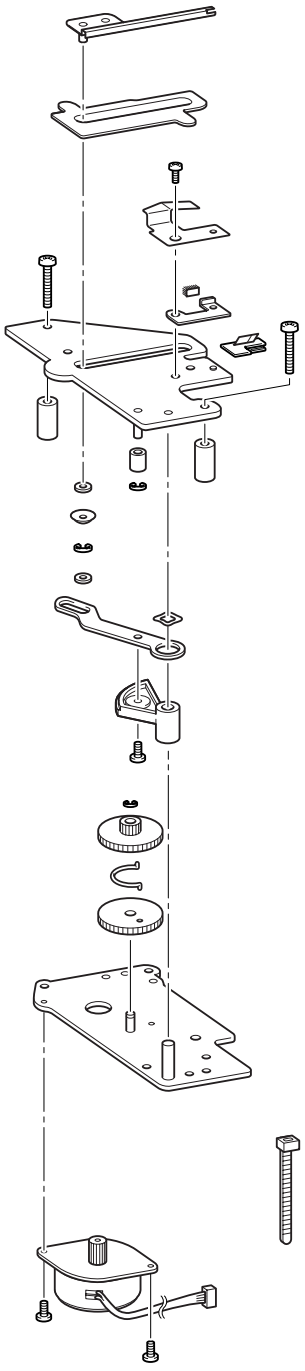


29 Drop lever FE removal

1. Remove the 2 retaining rings (E6), and then remove the 2 slide shafts A ① and the drop lever FE ②.
2. Remove the 2 retaining rings (E6) from 2 slider shafts A ①.

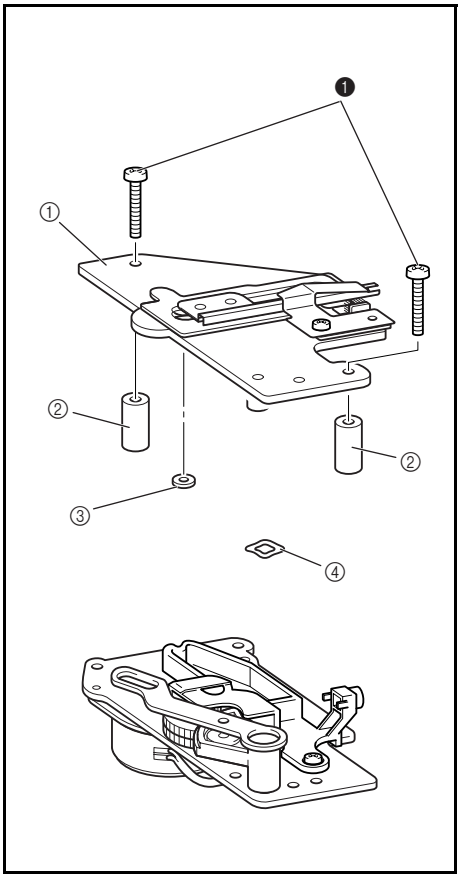


Thread cutter module breakout diagram



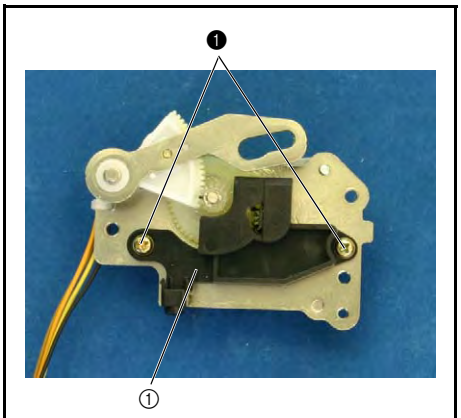
1 Thread cutter frame assembly removal

1. Remove the 2 screws ❶, and then remove the thread cutter frame assembly ①, 2 collars ②, and polyester slider ③.
2. Remove the wave-shape spring washer ④.



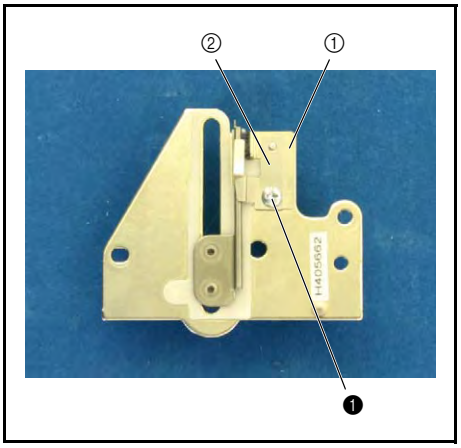
2 Photo transistor assembly removal

1. Remove the 2 screws ❶, and then remove the photo transistor assembly ①.



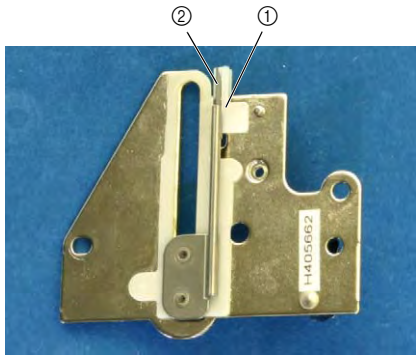
3 Presser plate removal

1. Remove the screw ❶, and then remove the presser plate ① and spring ②.



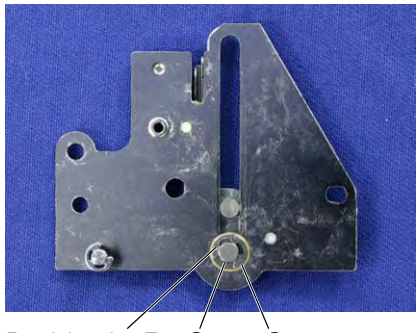
4 Cutter holder assembly removal

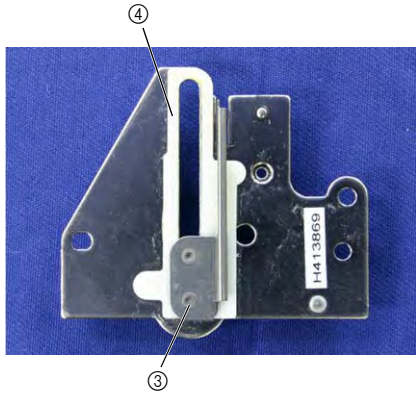
1. Remove the cutter holder assembly ①.
2. Remove the NT lower thread cutter ② from the cutter holder assembly ①.



5 Thread hook assy. disassembly

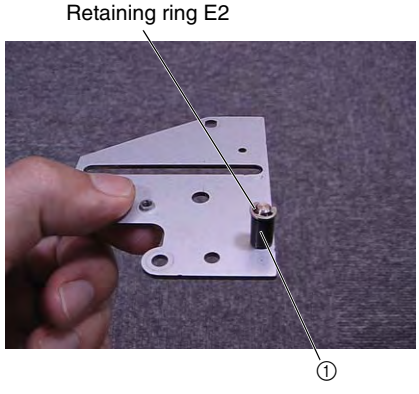
1. Remove the retaining ring E4, and remove the polyester slider ①, polyester slider ② and the thread hook assy ③.
2. Detach the spacer ④.





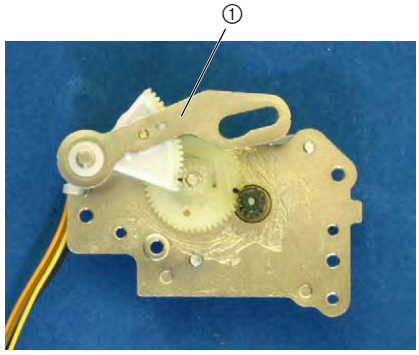
6 Rubber removal

1. Remove the retaining ring E2, and remove the rubber ①.



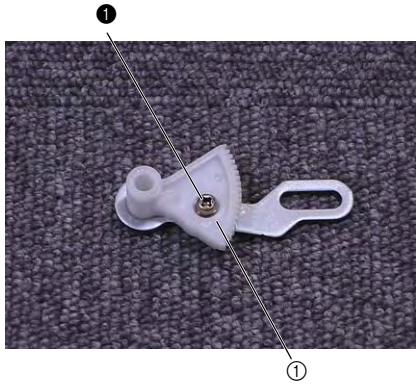
7 Thread cutter lever assy. removal

1. Remove the thread cutter lever assy ①.



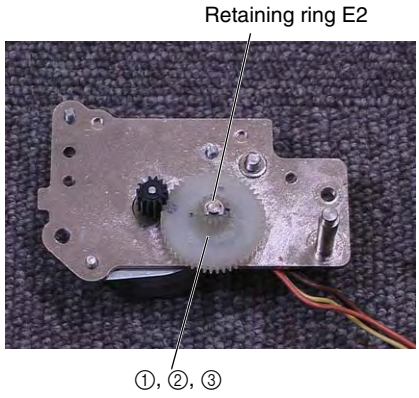
8 Thread cutter lever assy. disassembly

1. Remove the screw ❶, and remove the thread cutter lever gear ①.



9 Idle gear A and idle gear B removal

1. Remove the retaining ring E2, and remove the idle gear A ①, idle gear B ② and spring ③.

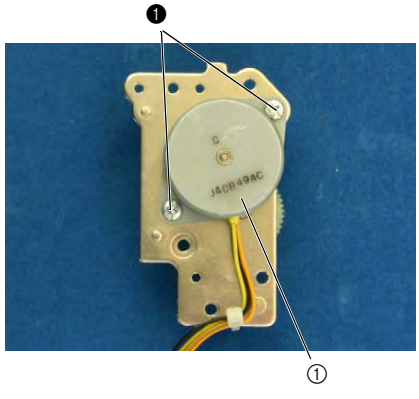


10 Pulse motor C removal

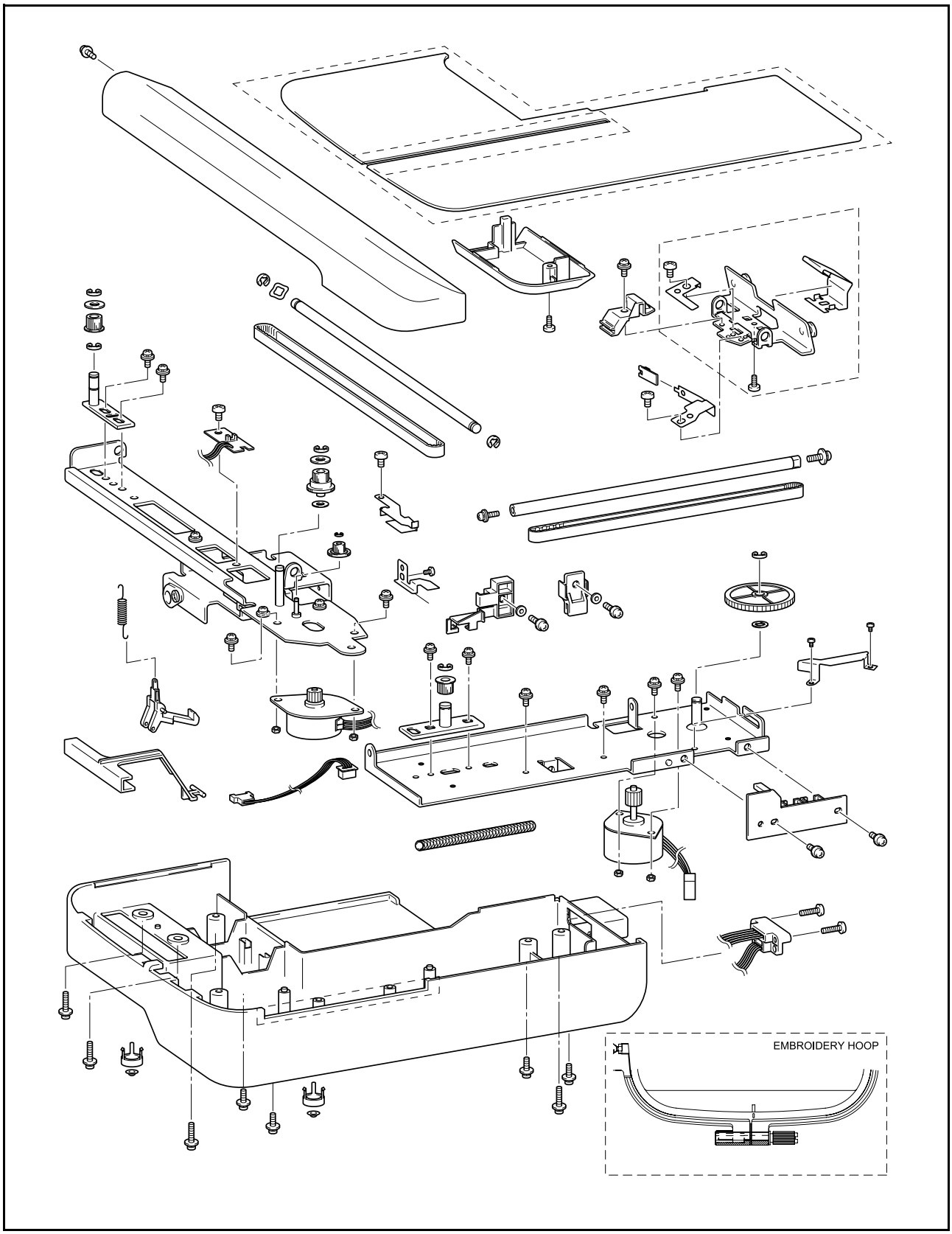
1. Remove the 2 screws ❶, and then remove the pulse motor C (CPMSMJ35-4840-B) ①.

***Key point**

- Cut the band.

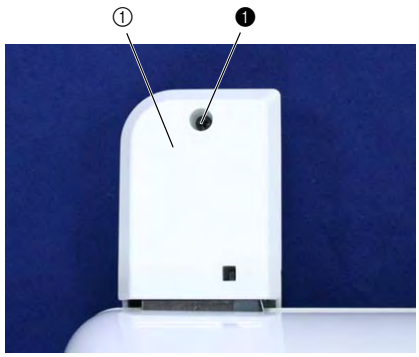


Embroidery parts location diagram



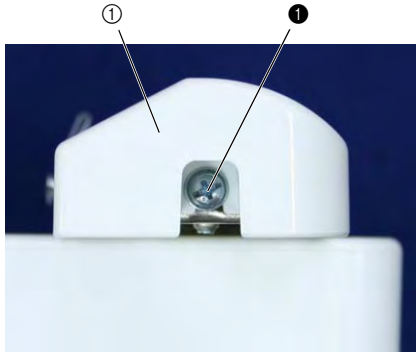
1 YPM cover removal

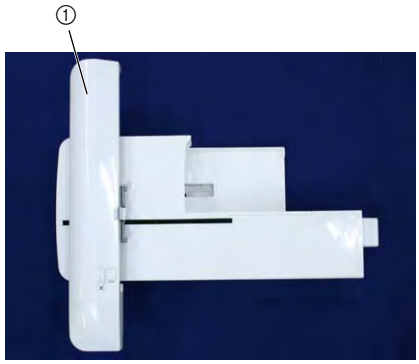
1. Remove the screw ❶, and then remove the YPM cover ①.



2 X carriage cover removal

1. Remove the screw ❶, and then remove the X carriage cover ①.



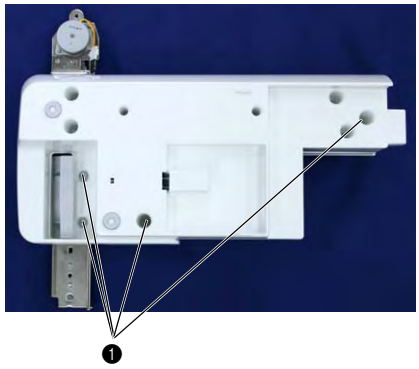


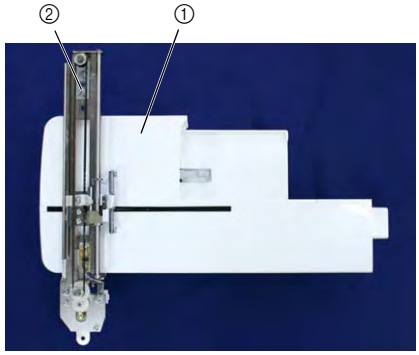
3 ES main cover assembly removal

1. Remove the 4 screws ❶, and then remove the ES main cover assembly ①.

***Key point**

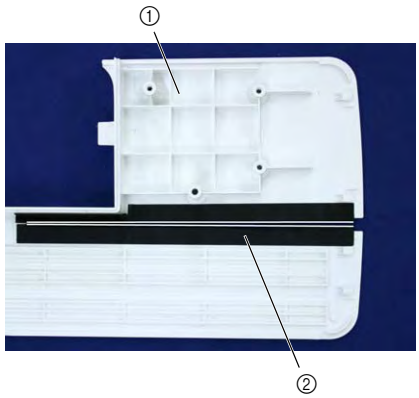
- Position the embroidery machine as shown in the photo on the right, and then slide the X carriage assembly ① to the left.
- Arrows are engraved on the outer surface of the base cover to indicate the locations of the 4 screws ❶.





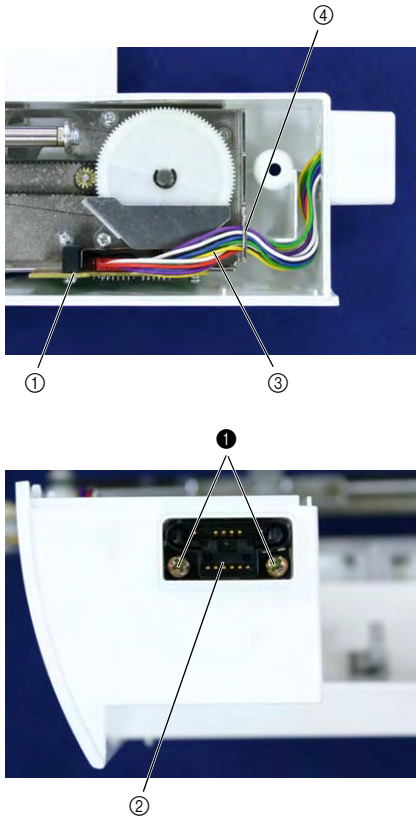
4 Groove cover removal

1. Remove the groove cover ② from the ES main cover assembly ①.



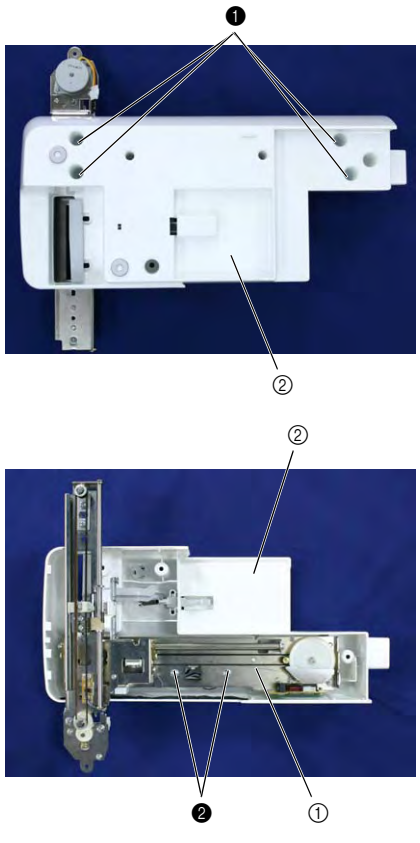
5 Lead wire assembly (EMB unit FCOMB) removal

1. Remove the 2 connectors from the EMB relay PCB assembly ①.
2. Remove the lead wire ③ of the lead wire assembly (EMB unit FCOMB) ② from the guide ④ of the main frame subassembly.
3. Remove the 2 screws ❶, and then remove the lead wire assembly ②.



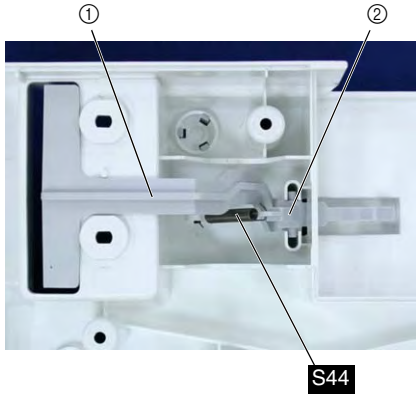
6 ES base cover unit removal

1. Remove the 6 screws (❶x4, ❷x2), and then remove the EX base cover unit ② from the main frame ①.



7 Lock release lever assembly removal

1. Remove the spring S44 from the lock finger ② on the lock release lever assembly ①.
2. Remove the lock release lever assembly ①.
3. Remove the spring S44 from the ES base cover.

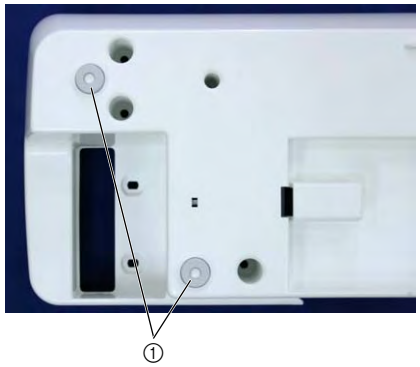


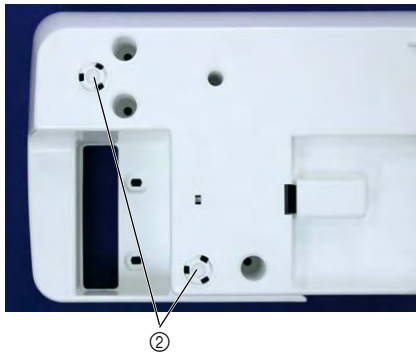
8 Lock release lever ASSY disassembly

1. Remove the lock finger ② from the lock release lever ①.

9 Rubber cushion and rubber cushion cover removal

1. Disengage the 3 hooks from the outer surface of the ES base cover, and then remove the 2 rubber cushion covers ①.
2. Peel the 2 rubber cushions ② from the ES base cover.



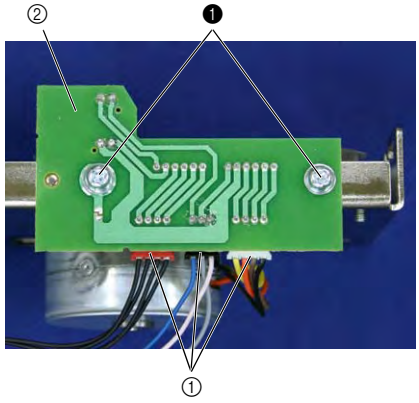


10 Groove cover removal

1. Remove the groove cover ① from the ES base cover.

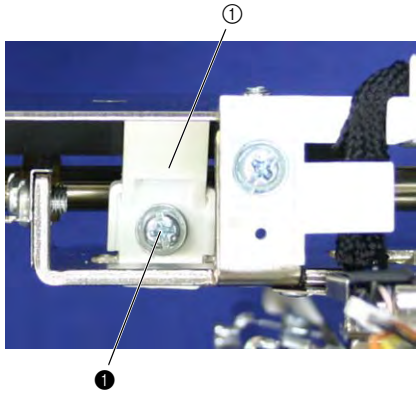
11 EMB relay PCB assembly removal

1. Remove the 3 connectors ① from the EMB relay PCB assembly ②.
2. Remove the 2 screws ❶, and then remove the EMB relay PCB assembly ②.



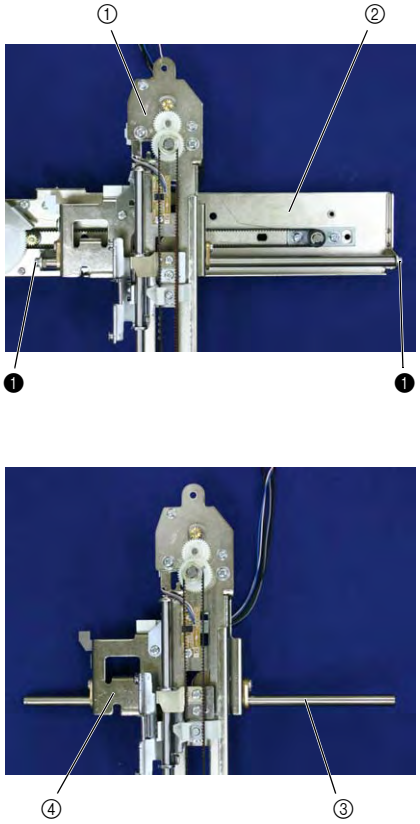
12 X belt presser removal

1. Remove the screw ❶, and then remove the X belt presser ①.



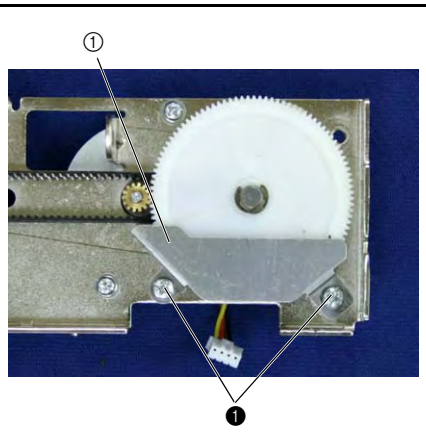
13 XY carriage unit removal

1. Remove the 2 screws ❶, and then remove the XY carriage unit ① from the main frame ②.
2. Remove the X guide shaft ③ from the Y carriage assembly ④.



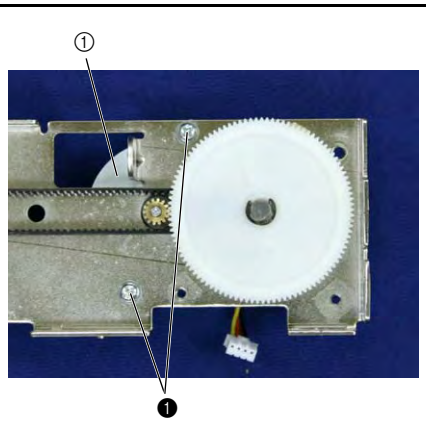
14 Oil guard plate removal

1. Remove the 2 screws ❶, and then remove the oil guard plate ①.



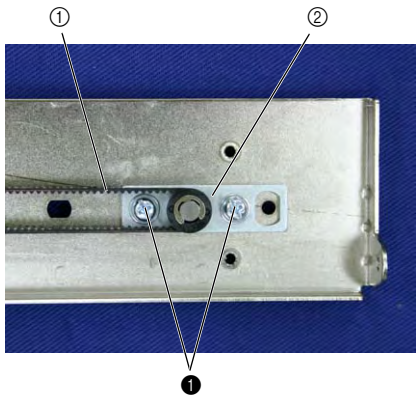
15 X pulse motor assembly removal

1. Remove the 2 screws ❶, and then remove the X pulse motor assembly ①.



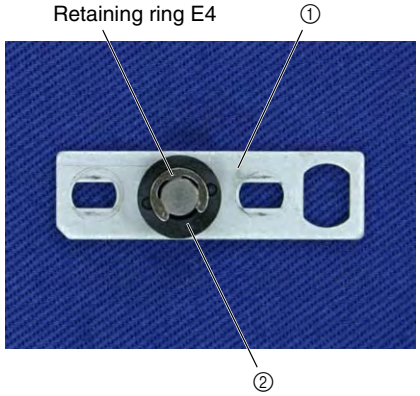
16 X tension pulley assembly removal

1. Remove the 2 screws ❶, and then remove the timing belt ① and the X tension pulley assembly ②.



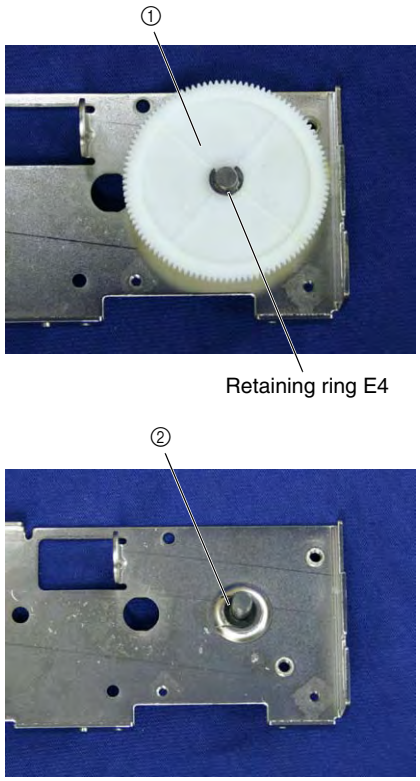
17 X tension pulley ASSY disassembly

1. Remove the retaining ring (E4), and then remove the tension pulley ② from the X tension pulley assembly ①.



18 X driving gear pulley removal

1. Remove the retaining ring (E4), and then remove the X driving gear pulley ① and the washer ②.

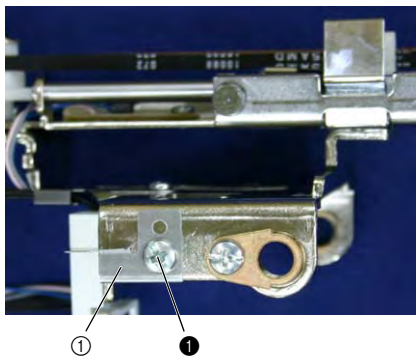


19 X initial shutter removal

1. Remove the screw ❶, and then remove the X initial shutter ①.

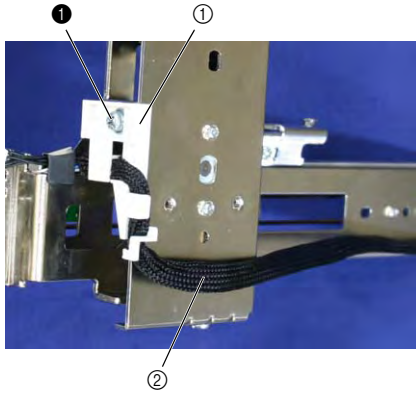
***Key point**

- The X initial shutter has sharp edges. Be careful when handling it.



20 X slider removal

1. Remove the lead wire from the guide of the X slider ①.
2. Remove the screw ❶, and then remove the X slider ①.
3. Remove the nylon sleeve ② from the lead wire.



21 Cord guide removal

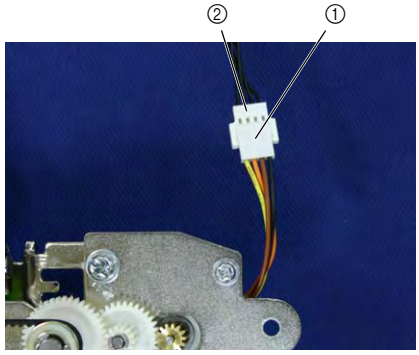
1. Remove the screw ❶, and then remove the cord guide ①.

22 Lead wire assembly YPM relay removal

1. Remove the lead wire assembly YPM relay ② from the lead wire connector on the Y pulse motor assembly ①.

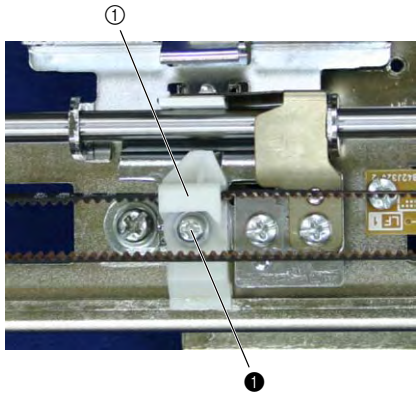
***Key point**

- Cut the band securing the Y sensor PCB assembly's lead wire and the lead wire assembly YPM relay ②.



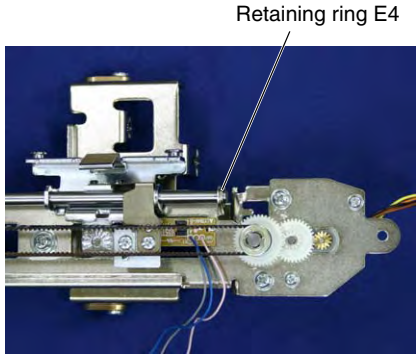
23 Y slider removal

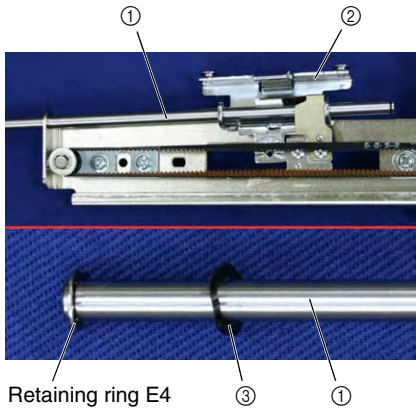
1. Remove the screw ❶, and then remove the Y slider ①.



24 Y carriage unit removal

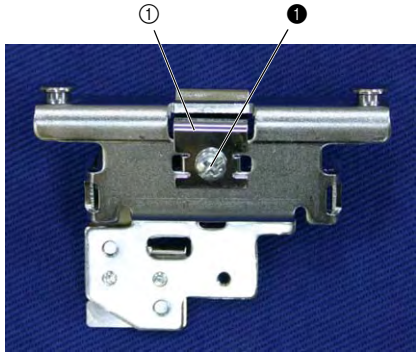
1. Remove the retaining ring (E4).
2. Pull out the Y guide shaft ① from the Y carriage unit ②.
3. Pull out the wave spring washer ③ from the Y guide shaft ①, and then remove the retaining ring (E4).

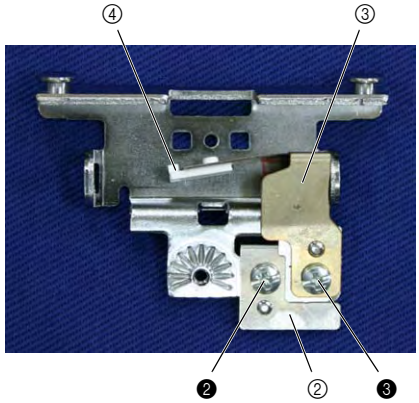




25 Y carriage ASSY disassembly

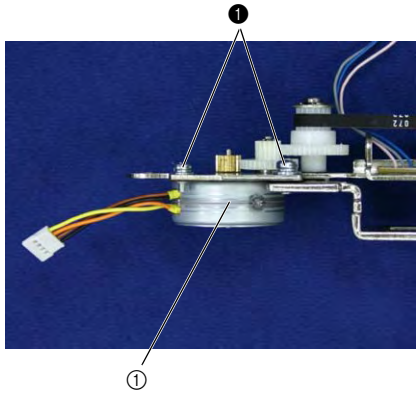
1. Remove the screw ❶, and then remove the spring ①.
2. Remove the screw ❷, and then remove the Y initial shutter ②.
3. Remove the screw ❸, and then remove the Y guide shaft presser plate ③.
4. Remove the Y guide shaft presser ④ from the Y guide shaft presser plate ③.





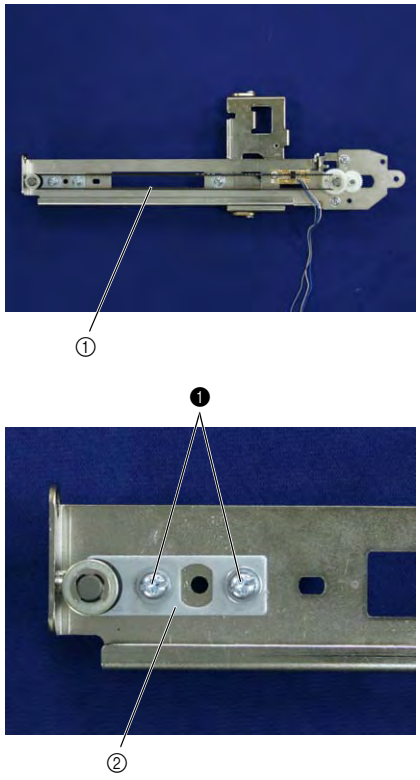
26 Y pulse motor assembly removal

1. Remove the 2 screws ❶, and then remove the Y pulse motor assembly ①.



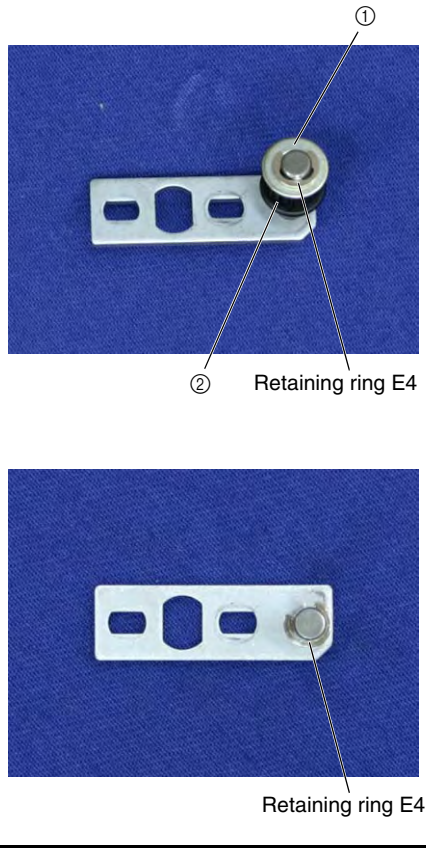
27 Y tension pulley assembly removal

1. Remove the 2 screws ❶, and then remove the timing belt ① and the Y tension pulley assembly ②.



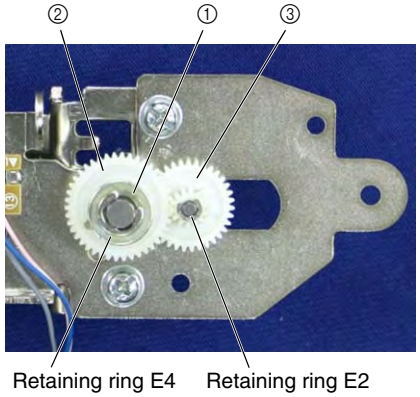
28 Y tension pulley ASSY disassembly

1. Remove the retaining ring (E4), and then remove the plain washer (M6) ① and the tension pulley ②.
2. Remove the retaining ring (E4).



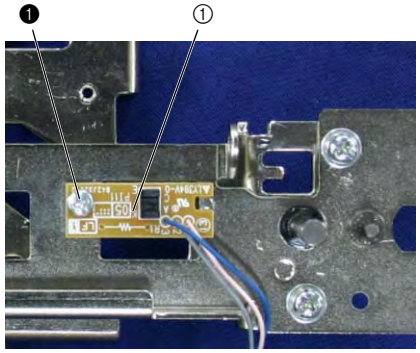
29 Y driving gear pulley assembly removal

1. Remove the retaining ring (E4), and then remove the plain washer (M6) ① and the Y driving gear pulley ②.
2. Remove the retaining ring (E2), and then remove the gear ③.



30 Y sensor PCB assembly removal

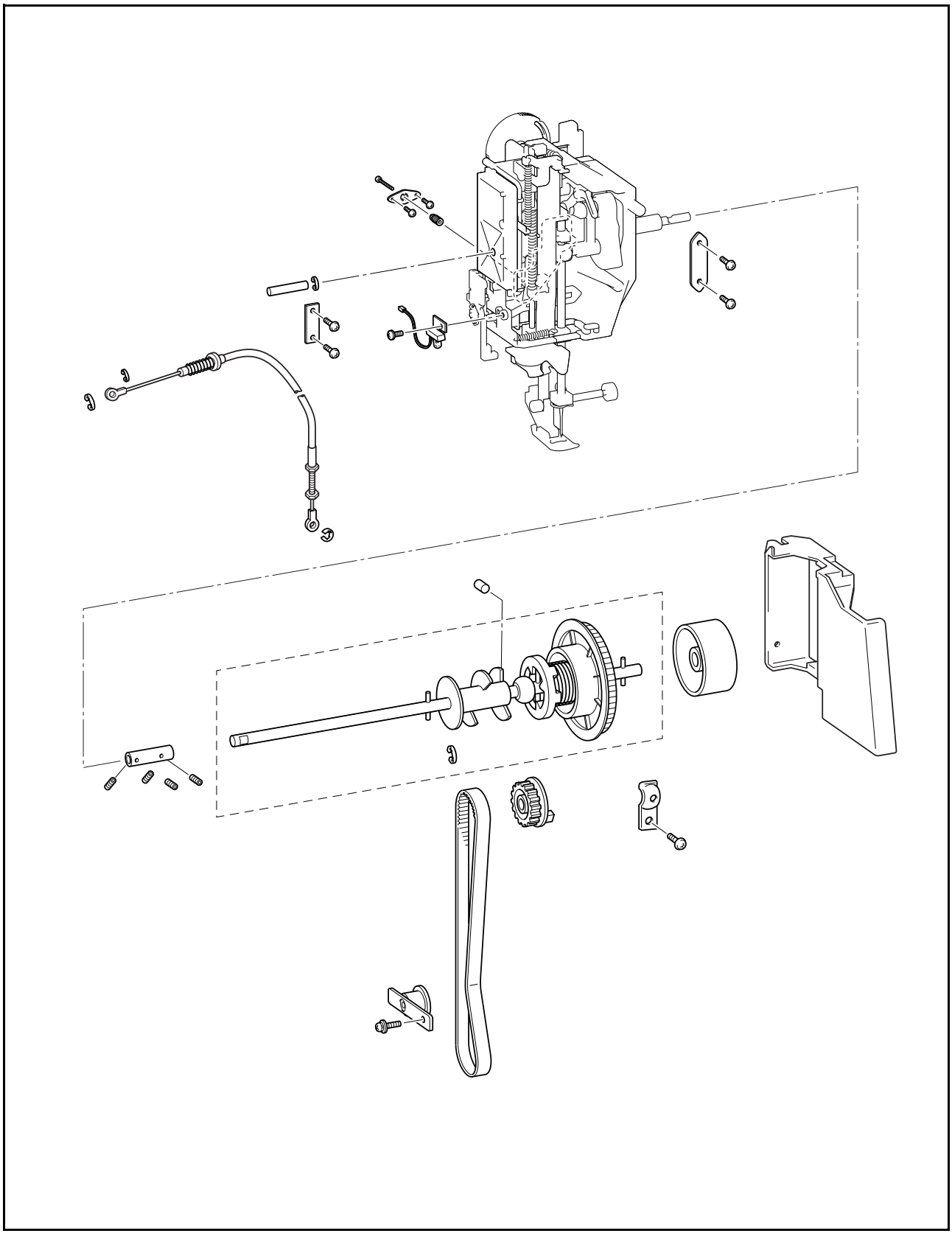
1. Remove the screw ❶, and then remove the Y sensor PCB assembly ①.



3 Assembly

When disassembly and assembly are performed, make adjustments according to "4 Adjustments."

Needle bar, presser mechanism / upper shaft mechanism location diagram

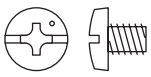


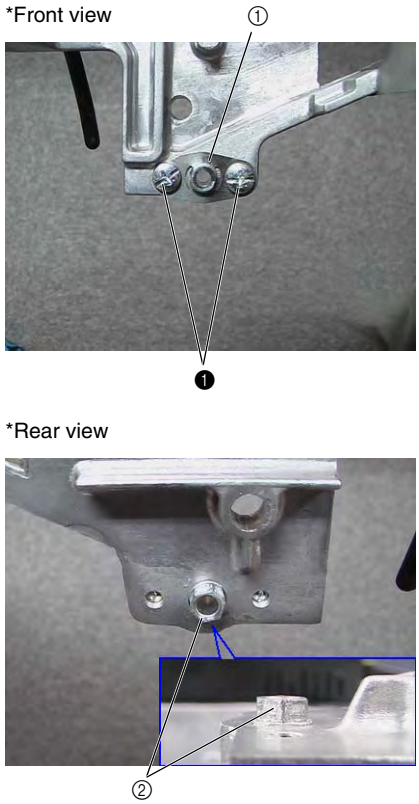
1 Plate spring attachment

1. Attach the plate spring ① from the front of the arm bed using the 2 screws ❶.
2. Attach the plate spring ① from the back of the arm bed using the adjusting screw ②.

***Key point**

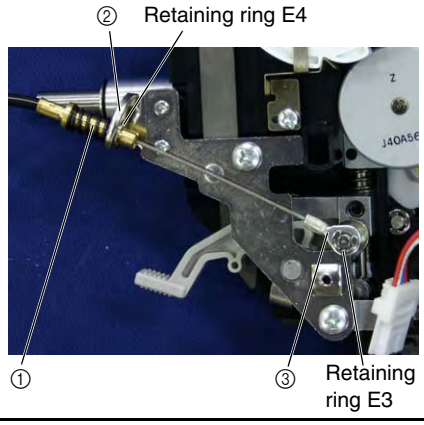
- Tighten adjusting screw ② so that the screw threads are completely hidden.

❶		Screw, Bind M4X5	Torque 1.18 – 1.57 N·m



2 Wire assy. attachment (lifter assy.)

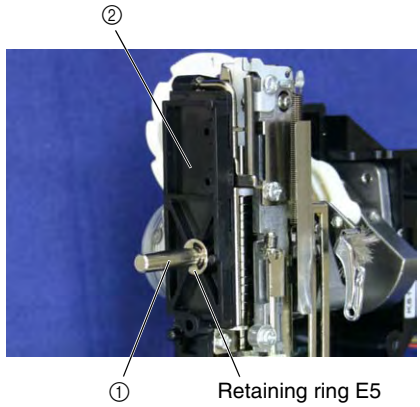
1. Insert the fitting ① (on the spring side) on the end of the wire assy. into the wire holder ② on the lifter assy., and attach retaining ring E4.
2. Attach the hook ③ on the end of the wire assy. to the lifter assy. shaft, and attach retaining ring E3.

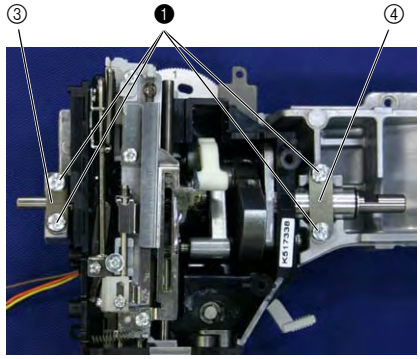


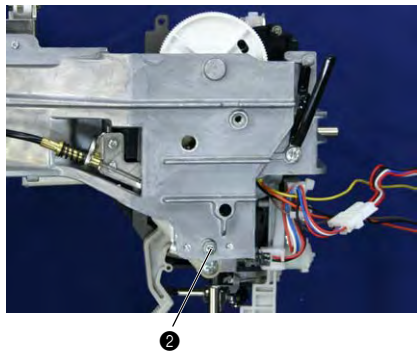
3 Needle-presser module attachment

1. Attach the retaining ring E5 to the shaft ①.
2. Insert the shaft ① into the shaft hole on the left side of the needle presser module ②.

   ***Key point**
   - Insert the shorter end of the shaft ① from the reataining ring (E5) into the shaft hole on the needle presser module ②.
3. Insert the shaft ① into the needle presser module ②, and then attach the presser plate A ③ with the 2 screws ❶.
4. Attach the presser plate B ④ with the 2 screws ❶.
5. Tighten the screw ❷ temporarily. (Fully tighten the screw after performing 4-11 Needle clearance adjustment.)



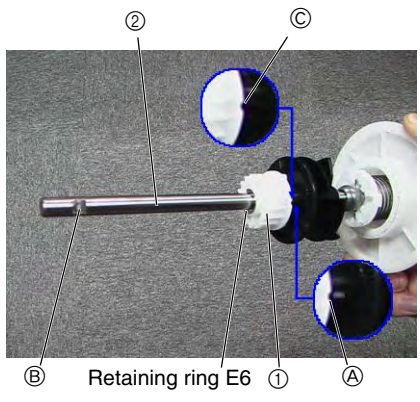




❶	Taptite, Bind S M4X10	Torque 1.47 – 1.98 N·m
❷	Screw, Pan (S/P washer) M3X16A	Torque 0.78 – 1.18 N·m

4 Upper shaft pulley attachment

1. Align the base line on the rotation shutter Ⓐ (on the same surface as the upper shaft Ⓑ D cut) and the base line on the upper shaft pulley Ⓒ, and attach the upper shaft pulley ① to the upper shaft assy. ②.
2. Attach retaining ring E6.

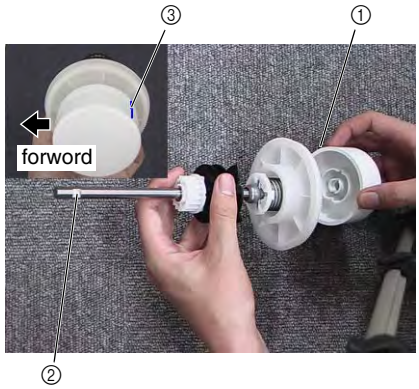


5 Pulley attachment

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

***Key point**

- When the D cut ② on the upper shaft is facing forward, the pulley base line ③ is on the upper side.



6 Upper shaft assy. attachment

1. Attach the fixed joint ① to the upper shaft.

***Key point**

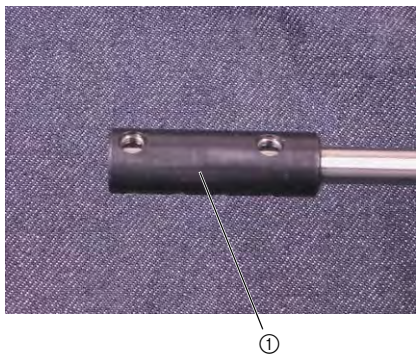
- Attach so that the fixed joint ① screw holes are toward the left side.

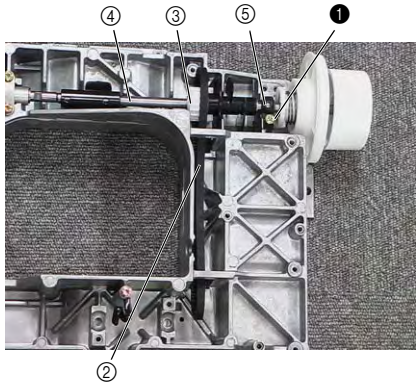
2. Place the timing belt ② around the upper shaft pulley ③, and insert the upper shaft assembly ④.
3. Attach the bushing presser ⑤ using the screw ❶.

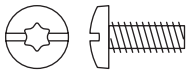
***Key point**

- Move the fixed joint ① to the left side of the upper shaft.

Screw holes toward the left side





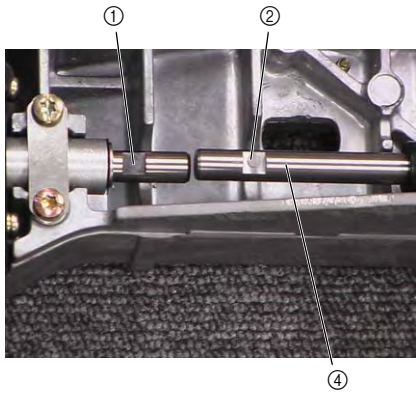
❶		Taptite, Bind S M4X10	Torque 1.47 – 1.98 N·m

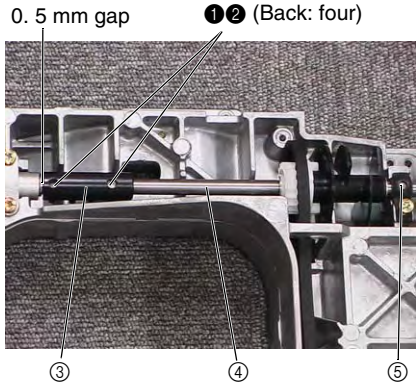
7 Connecting the needle-presser module and upper shaft

1. Face the unit shaft D cut ① and the upper shaft D cut ② forward.
2. Screw the 2 screws ❶ into the fixed joint ③.

   ***Key point**
   - Adjust the gap on the left side of the fixed joint ③ to 0.5 mm.
   - Align the screw holes for the screw ❶ with the D cuts ① and ②.
3. Rotate the upper shaft ④ 180 degrees, and screw the 4 screws ❷ into the fixed joint ③.
4. Tap the lower shaft bushing ⑤ on lightly so that the upper shaft ④ turns easily.

Needle bar and presser unit assy. and fixed joint gap	0.5 mm

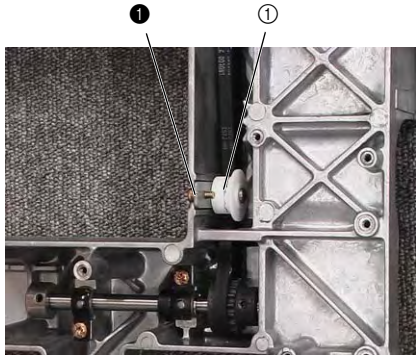




❶		Set Screw, Socket (FT) M5X5	Torque 1.37 – 1.79 N·m
❷		Set Screw, Socket (CP) M4X4	Torque 0.78 – 1.18 N·m

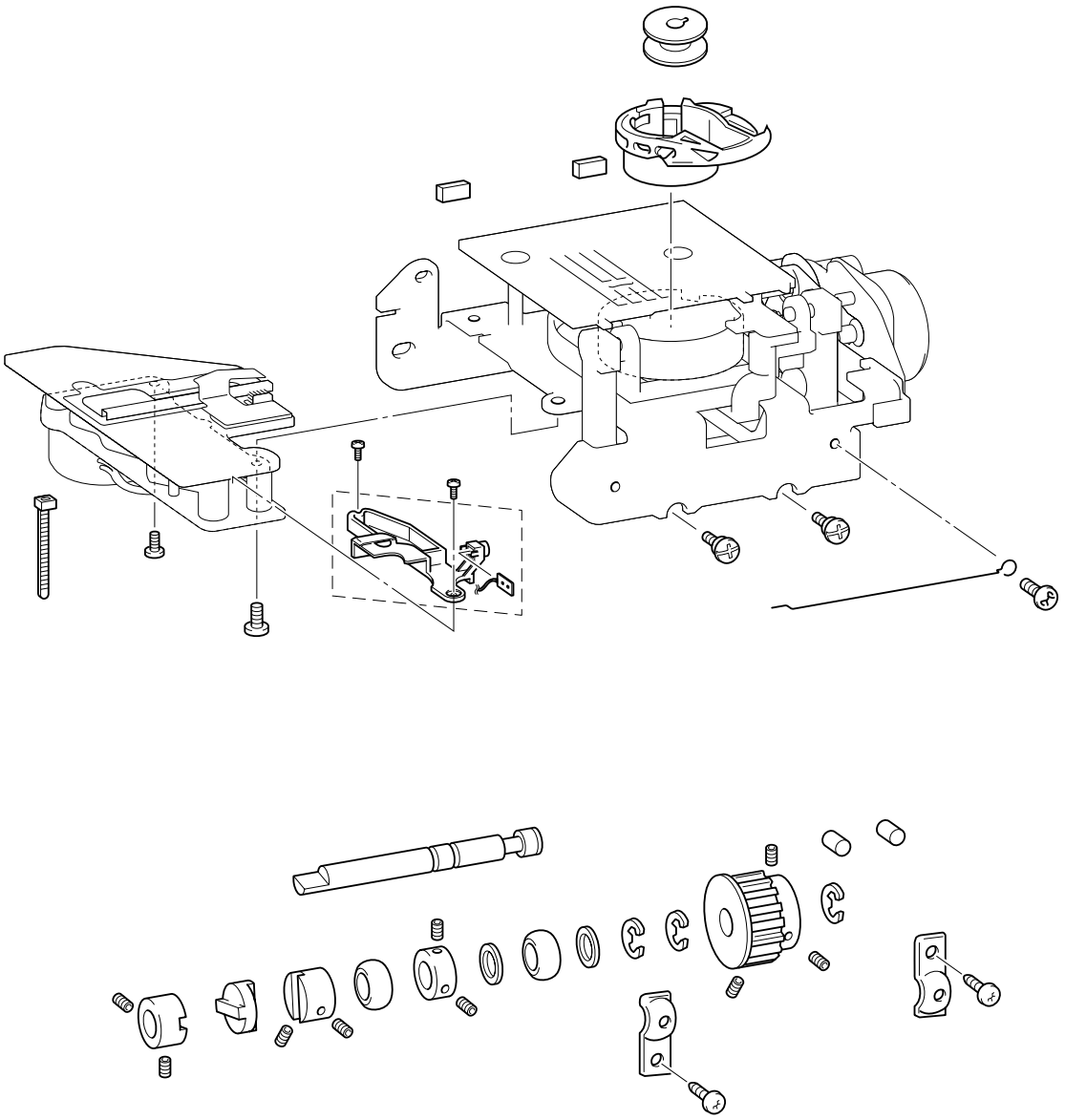
8 Tension pulley assembly attachment

1. Hand start the screw the screw ❶ in the tension pulley ① and attach to the arm bed (fully tighten after 4 - 4 "Timing belt tension adjustment.").



❶		Screw, Pan (S/P washer) M4X10DA	Torque 1.18 – 1.57 N·m

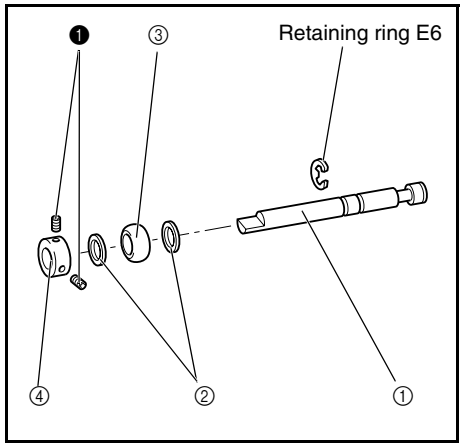
Rotary hook drive mechanism / Feed and bobbin mechanism /Cutter assy. location diagram



1 Assembling the Lower shaft A assembly

1. Attach the retaining ring E6 to the lower shaft A ①.
2. Attach the thrust washer ②, lower shaft bushing ③, thrust washer ② and set screw collar ④ (Face the ground surface toward the lower shaft bushing).
3. Move the set screw collar ④ to the right and secure it with the 2 screws ❶.

❶		Set Screw, Socket (CP) M4X4	Torque 1.47 – 1.98 N·m



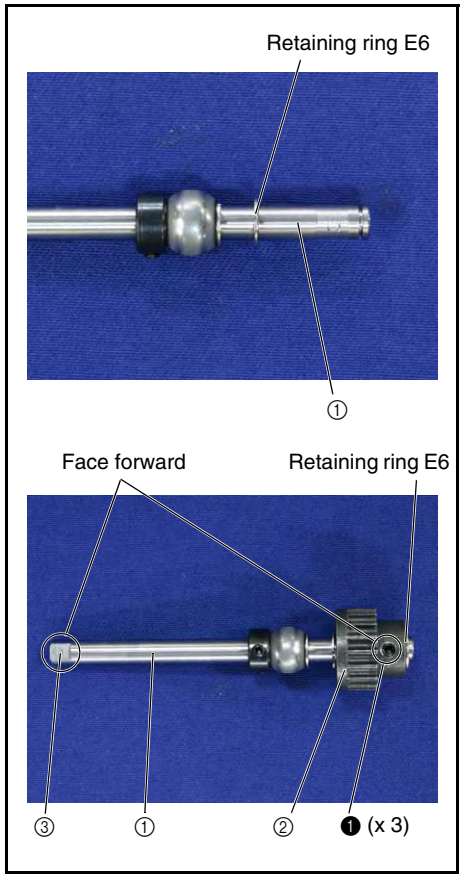
2 Timing pulley D attachment

1. Attach the retaining ring E6 to the lower shaft A ①.
2. Attach the timing pulley D ② to the lower shaft A ①, and attach the retaining ring E6.
3. Hand start the 3 screws ❶ in the timing pulley D ②.
   (Fully tighten after 4 - 6 "Needle bar rise adjustment".)

***Key point**

- With the lower shaft A D cut ③ facing forward, secure using one of the three screw holes in the timing pulley D ② in the forward facing position.

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



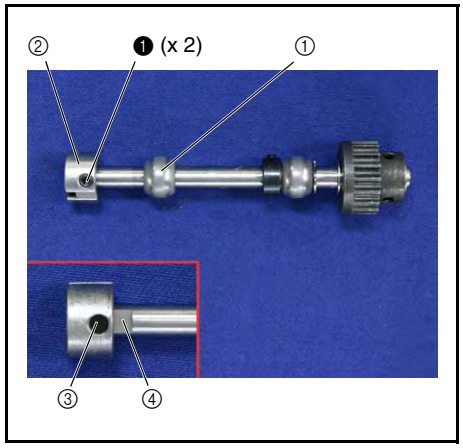
3 Joint attachment

1. Put the lower shaft bushing ① on the lower shaft A assy.
2. Put the joint ② on the lower shaft A assy., and hand start the 2 screws ❶ (fully tighten after 3 - 9 "6 feed module attachment.)

***Key point**

- Align the screw hole ③ in the joint with the D cut ④ in lower shaft A.

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



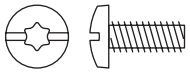
4 Lower shaft A attachment

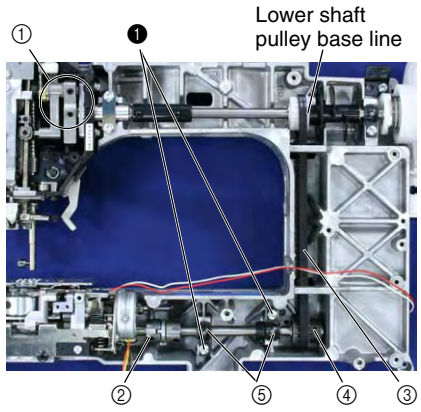
1. Rotate the lower shaft, and bring the needle bar to its highest point ① (lower shaft pulley base line forward).
2. Insert lower shaft A.

***Key point**

- Face the screw hole ② in the joint forward, and attach the timing belt ③ to timing pulley D ④.

3. Attach the 2 bushing pressers ⑤ using the 2 screws ❶.

❶		Taptite, Bind S M4X10	Torque 1.47 – 1.96 N·m



5 feed module attachment

1. Rotate the lower shaft, and bring the needle bar to its highest point (lower shaft pulley base line forward).
2. Apply EPNOC AP(N)0 to the disk ①, and attach it to the lower shaft joint.
3. Rotate feed module lower shaft B, and bring the solid dot on the outer rotary hook to the front, directly above the D cut in lower shaft B.
4. Attach the feed module attachment.

***Key point**

- The needle bar should be at the highest point.
- The solid circle mark on the outer rotary hook should be forward.
- (Feed module side) D cut in lower shaft B is directly above

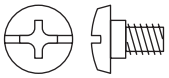
5. Attach the 2 screws ❶.

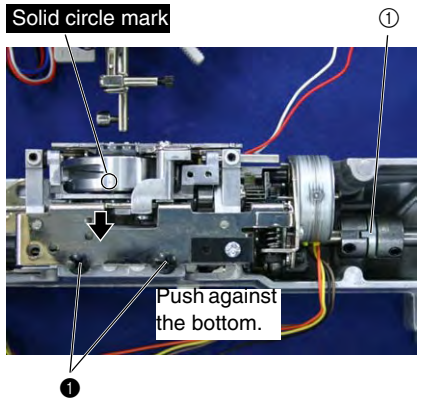
***Key point**

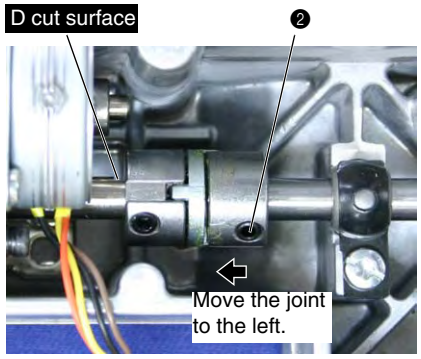
- While holding the feed module against the bottom, tighten the screw ❶ on the left.

6. Move the lower shaft A joint to the left, and fully tighten the 2 screws ❷.

Application of EPNOC AP(N)0 to joint contact area	Small amount XC8387***

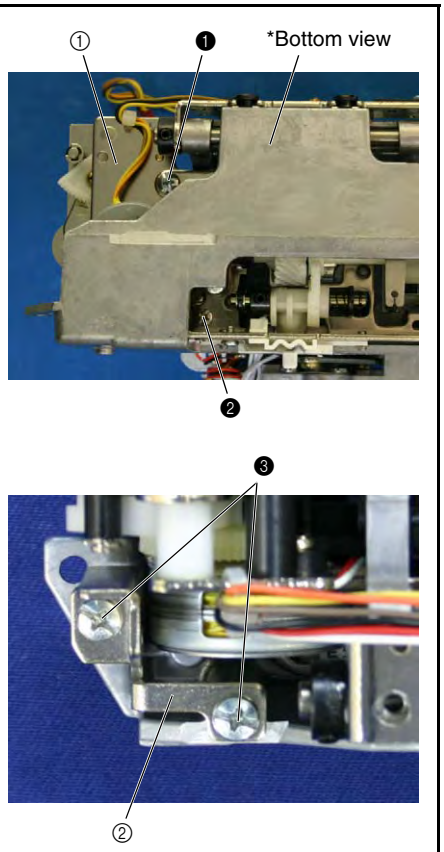
❶		Screw M4	Torque 1.18 – 1.57 N·m
❷		Set Screw, Socket (FT) M5X5	Torque 1.47 – 1.96 N·m





6 Thread cutter module attachment

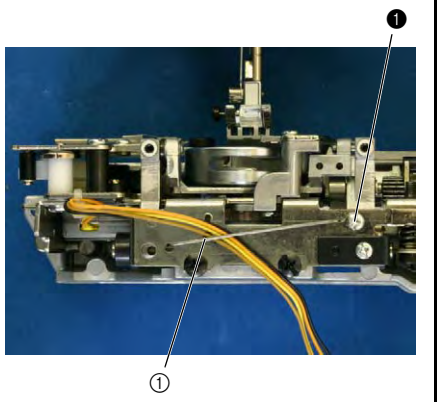
1. Attach the thread cutting module ① with the screws ❶ and ❷.
2. Attach the free arm plate ② with the 2 screws ❸.



❶ ❸	Screw, Bind M4X5	Torque 1.18 – 1.57 N·m
❷	Screw, Bind M3X5	Torque 0.78 – 1.18 N·m

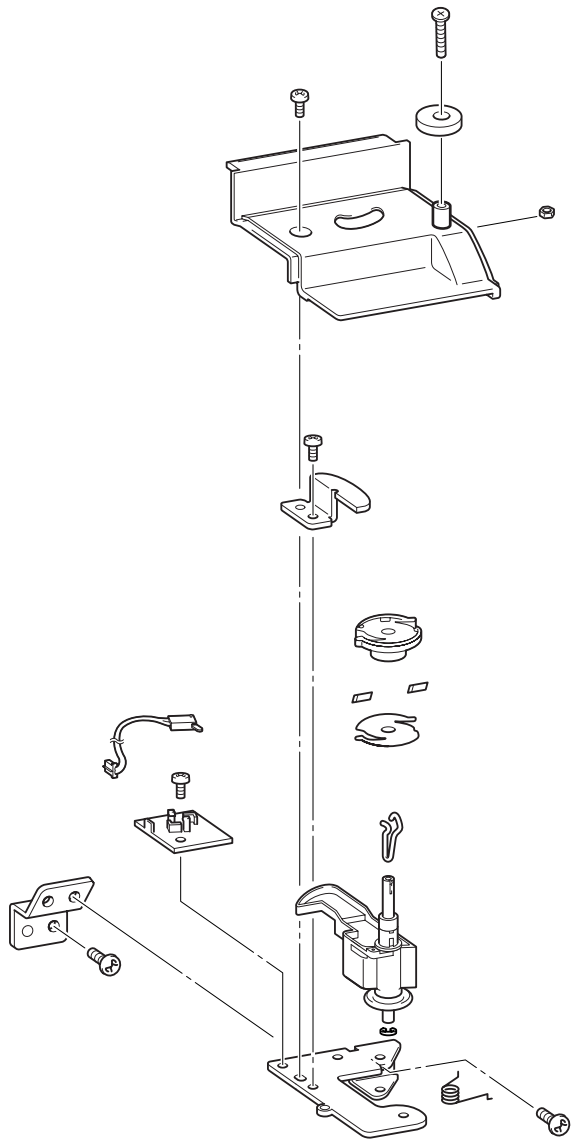
7 Leading guide attachment

1. Attach the leading guide ① with the screw ❶.



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

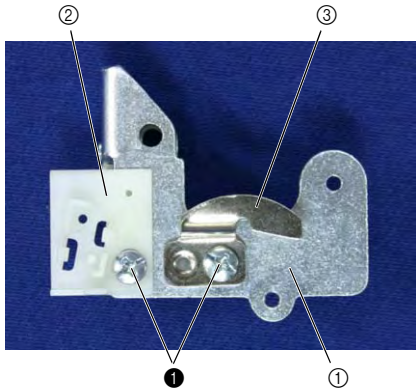
Bobbin winder mechanism location diagram



1 Bobbin winder shaft stopper (bobbin winder assembly holder) assembly

1. Attach the bobbin winder shaft stopper ① and SW adjust plate ② to the bobbin winder assembly holder ③, and hand start the 2 screws ❶.
   (Fully tighten after 3 - 13 "5 Bobbin winder holder assembly attachment.")

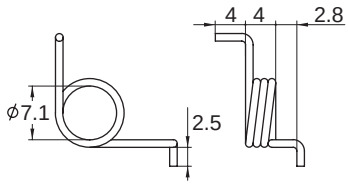
❶		Taptite, Bind B M3X6	Torque Hand tighten



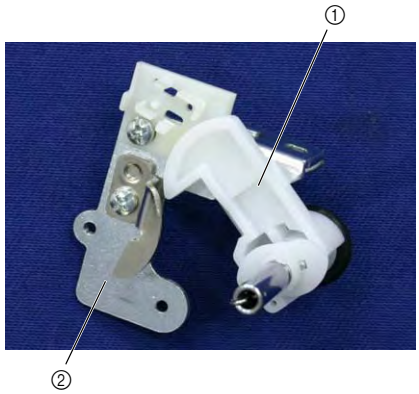
2 BW shaft holder assembly attachment

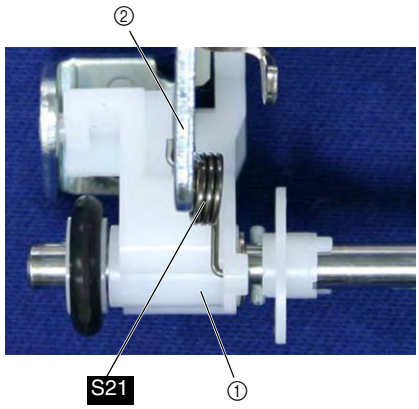
1. Attach the BW shaft holder assembly ① to the bobbin winder assembly holder ②.
2. Attach the spring S21 to the BW shaft holder assembly ① and bobbin winder assembly holder ②.

S21



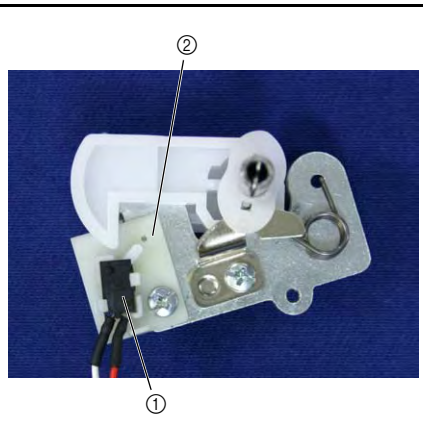
BOBBIN WINDER SPRING
XZ0070***





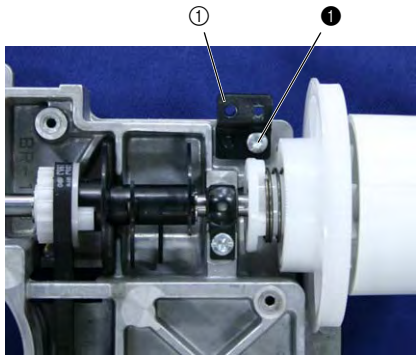
3 BW-F SW assy. attachment

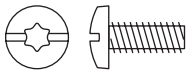
1. Attach the BW-F SW assy ① to the SW adjust plate ②.



4 BW holder supporter attachment

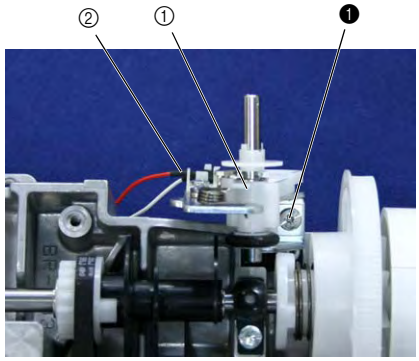
1. Attach the BW holder supporter ① using the screw ❶.

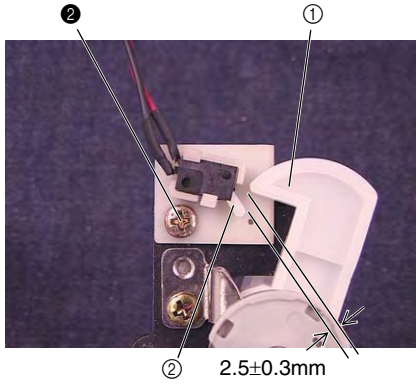


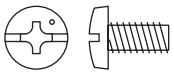
❶		Taptite, Bind S M4X10	Torque 1.18 – 1.57 N·m

5 Bobbin winder holder assembly attachment

1. Attach the bobbin winder assembly ① using the screw ❶.
2. With the bobbin winder OFF, adjust the SW adjust plate left or right so that the gap between the BW shaft holder assembly ① and the BW-F SW assy ② is 2.5 ±0.3 mm, and fully tighten the screw ❷.





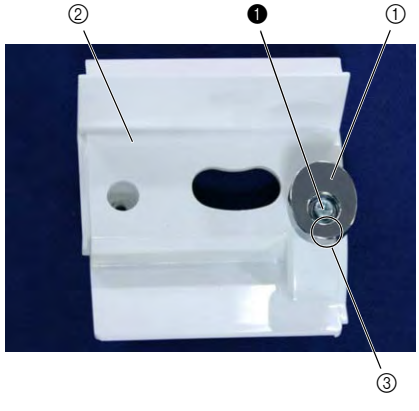
❶		Screw, Bind M4X8	Torque 1.18 – 1.57 N·m
❷		Screw, Bind M3X6	Torque 0.78 – 1.18 N·m

6 Bobbin presser assembly

1. Attach the bobbin presser ① to the bobbin winder cover ② using the screw ❶ and a M3 nut.

***Key point**

- Set the side of the bobbin presser ① with the least eccentricity to the near side ③ (see figure to the right).

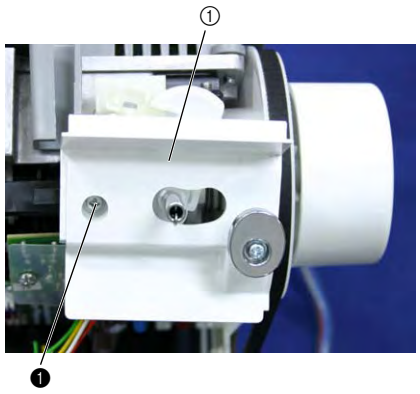


❶		Screw, Pan (S/P washer) M3X20DA	Torque 1.18 – 1.57 N·m

7 Bobbin winder cover attachment

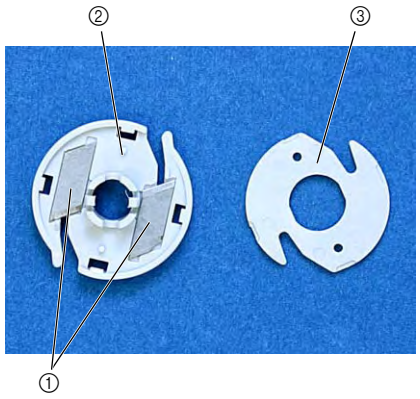
1. Attach the bobbin winder cover ① using the screw ❶.

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



8 Bobbin base assembly

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

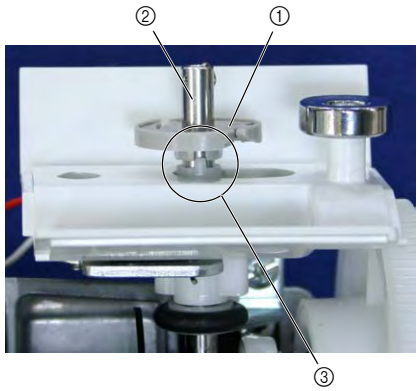


9 Bobbin base attachment

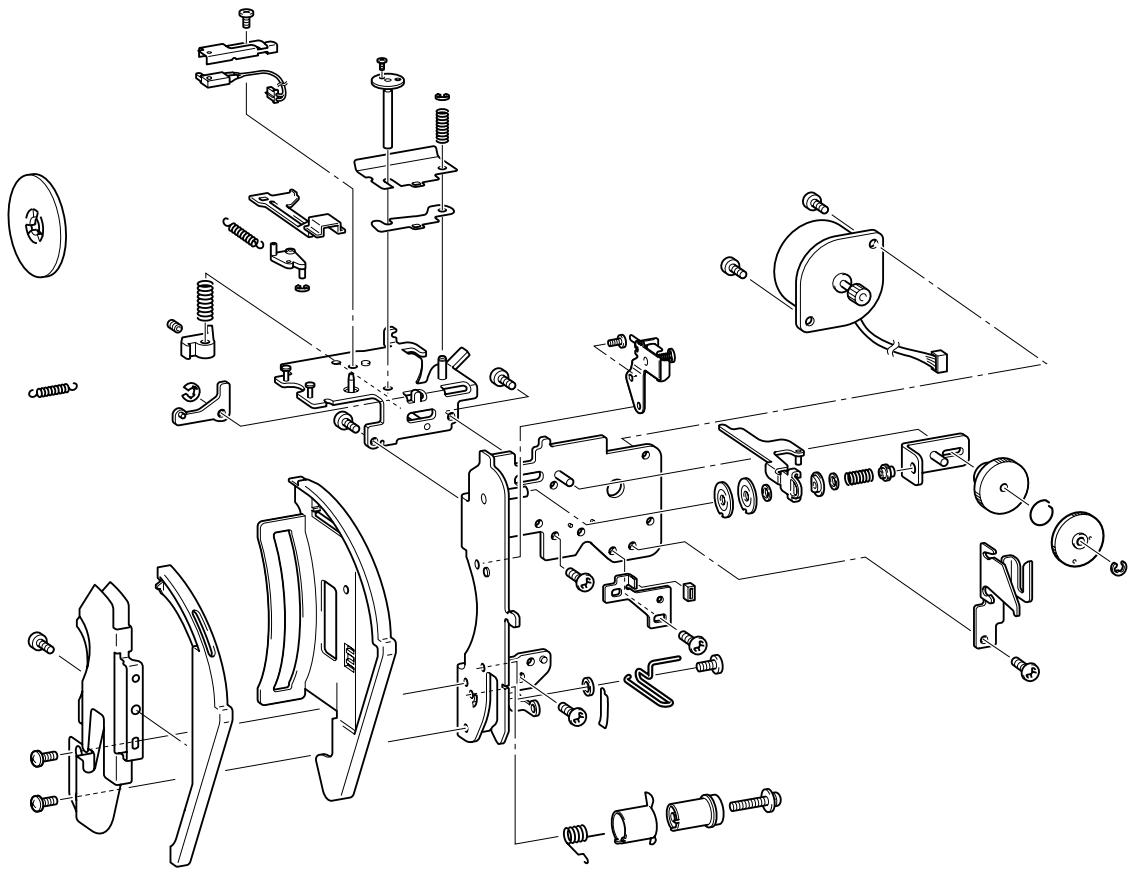
1. Attach the bobbin base ① to the bobbin winder shaft ②.

***Key point**

- Attach the bobbin base ① to position ③.



Thread tension mechanism location diagram

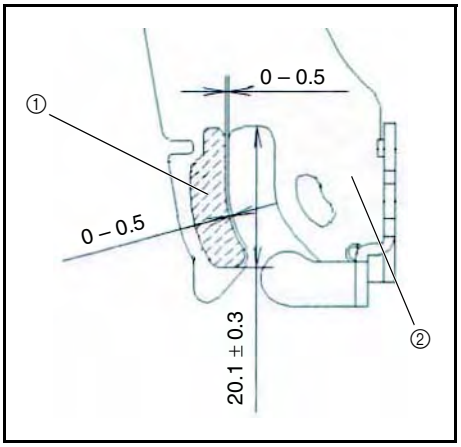


1 Spring tape attachment

1. Attach the spring tape ① to the thread guard assembly ②.

***Key point**

- See the figure to the right for positioning.

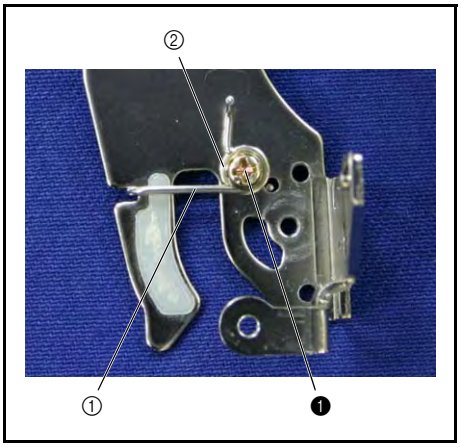


2 Thread guide wire attachment

1. Attach the thread guide wire ① and the washer ② using the screw ❶.

***Key point**

- While holding the thread guide wire ① up, tighten the screw ❶.



❶		Screw, Pan (S/P washer) M3X6	Torque 0.78 – 1.18 N·m

3 Thread take up spring attachment

1. Attach the spring S11 to the thread catching spring case ①.

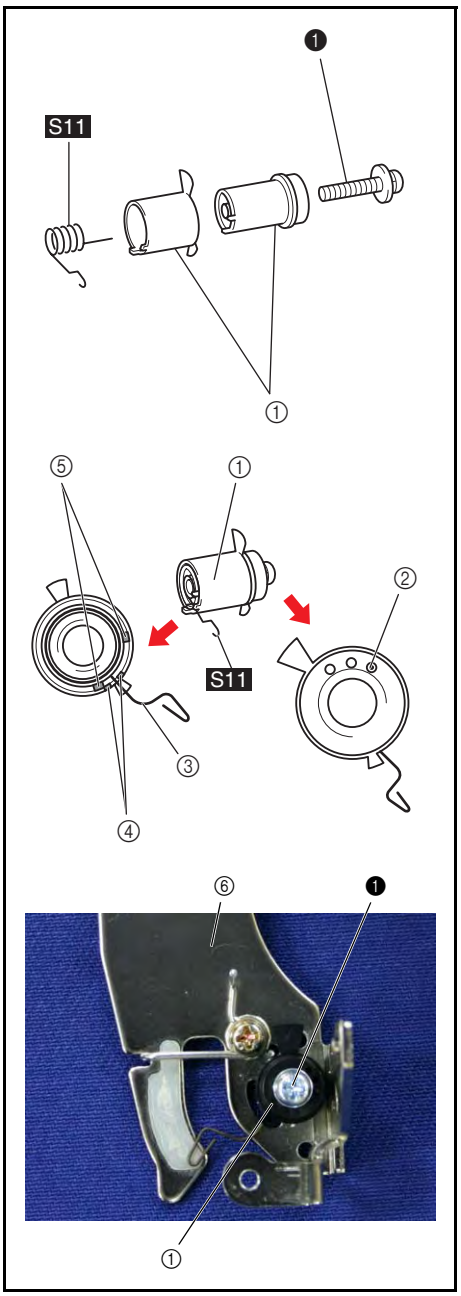
   ***Key point**

   - Insert the tip ② of the spring S11 into the right-most hole of the three spring tension positioning holes.
   - Insert the bent end ③ of the spring S11 between the two tabs ④ of the thread catching spring case, and then engage it with the spring groove ⑤.

2. Attach the thread catching spring case ① to the thread guard assembly ⑥ using the screw ❶

   ***Key point**

   - Align the protrusions ⑤ (two) on the bottom of the thread catching spring case ① with the oval hole in the thread guard assembly ④, and turn clockwise to the end of the hole to attach.



❶	 Screw, Pan (S/P washer) M3X18DA	Torque 0.78 – 1.18 N·m
S11		THREAD TAKE UP SPRING XZ0145***

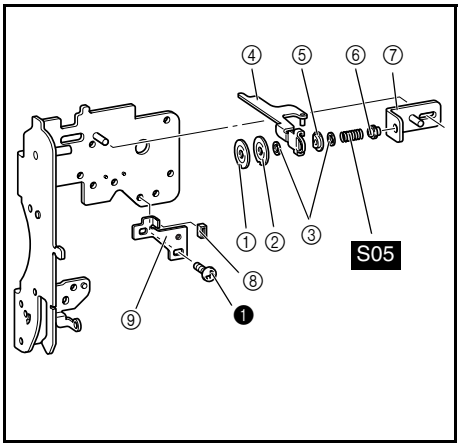
4 Tension disk attachment

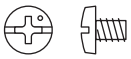
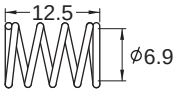
1. Attach the tension disc A ①, tension disc B ②, washer ③, thread tension plate A ④, the tension disc washer ⑤, washer ③, spring S05 and tension adjusting screw ⑥ to the thread tension disk shaft.
2. Attach the tension plate assy ⑦ to the thread tension gear shaft, and screw the tension adjusting screw ⑥ into the tension plate assy.

***Key point**

- The tension adjusting screw ⑥ should be screwed in so that the tip protrudes approximately 0.5 mm from the right of the tension plate assy. ⑦.

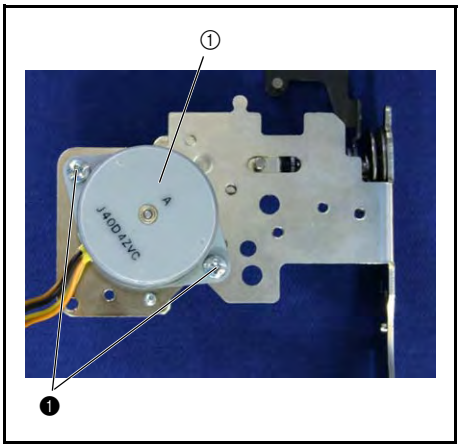
3. Attach the rubber ⑧ to the initial adjusting plate ⑨.
4. Install the screw ❶ into the initial adjusting plate ⑨.

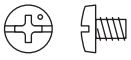


❶		Screw, Bind M3X4	Torque 0.78 – 1.18 N·m
S05		THREAD TENSION SPRING XA9900***	

5 AT pulse motor attachment

1. Attach the AT pulse motor ① using the 2 screws ❶.



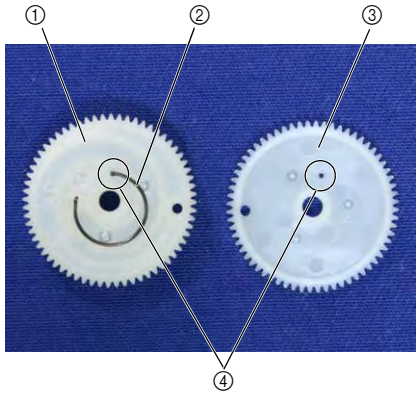
❶		Screw, Bind M3X4	Torque 0.78 – 1.18 N·m

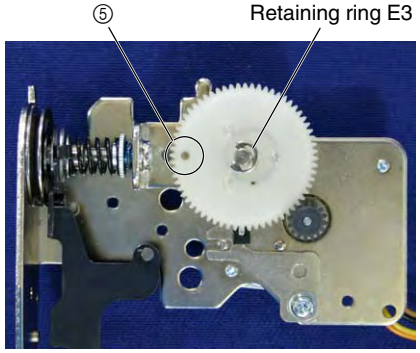
6 Thread tension gear attachment

1. Attach the thread tension gear ①, spring ② and thread tension gear cover ③ and attach the retaining washer E3.

***Key point**

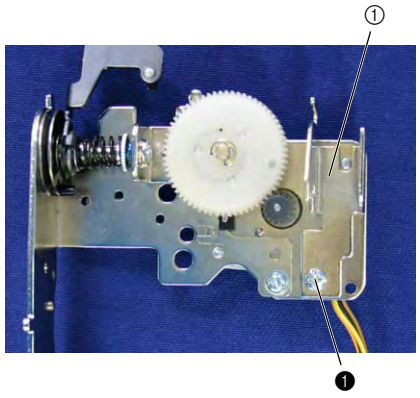
- Attach the spring ② to the small holes ④ in the thread tension gear ① and the thread tension gear cover ③.
- Turn the thread tension gear cover ③ clockwise until the large holes ⑤ in the thread tension gear ① and the thread tension gear cover ③ are on top of each other, and attach the thread tension gear assembly.

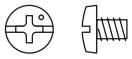




7 Thread guide attachment

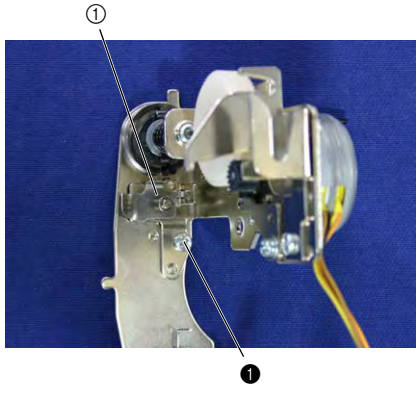
1. Attach the thread guide ① using the screw ❶.

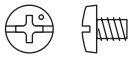


❶		Screw, Bind M3X4	Torque 0.78 – 1.18 N·m

8 Plate assembly attachment

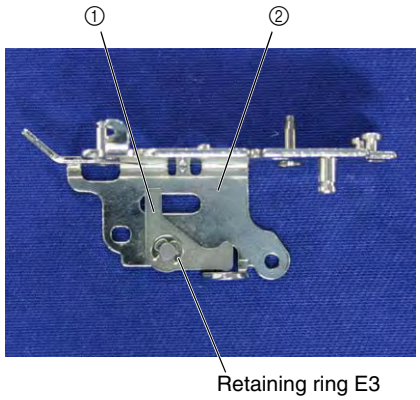
1. Attach the plate assembly ① using the screw ❶.



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

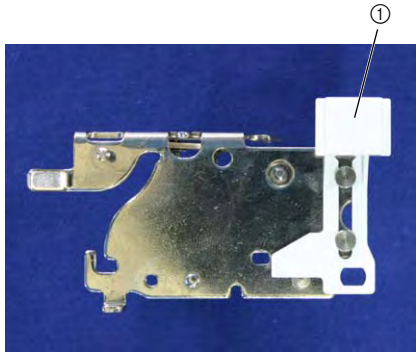
9 Tension releaser link attachment

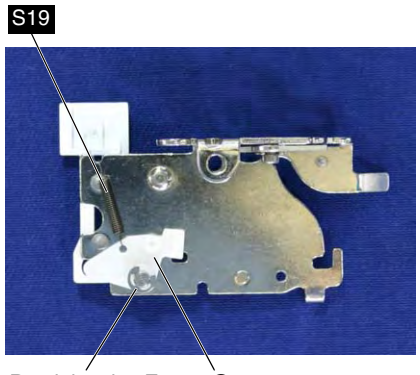
1. Attach the tension releaser link ① to the thread release holder assy ②, and the attach retaining ring E3.



10 Thread guide shutter assembly

1. Attach the thread guide shutter ① to the tension release holder assy.
2. Attach the thread guide shutter link ② to the tension release holder assy, and the attach the retaining ring E3.
3. Attach the spring S19 to the thread guide shutter link ② and the tension release holder assy.





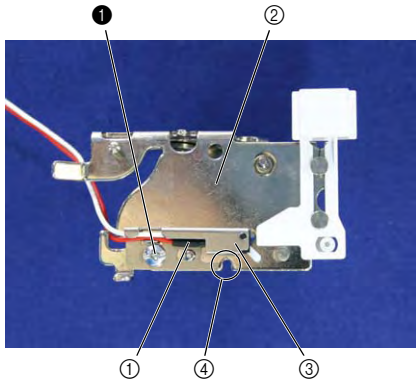
S19	16	SPRING XC2650***

11 PF-F SW assy. assembly

1. Attach the PF-F SW assy ① and the presser switch holder ③ to the thread release holder assy ② using the screw ❶.

***Key point**

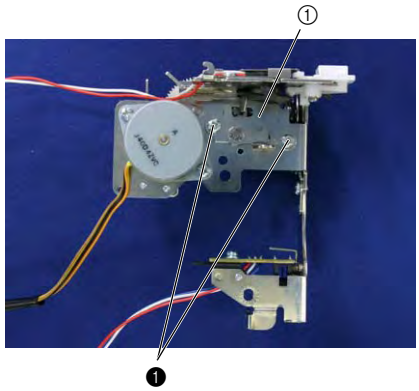
- Align the edge ④ of the thread release holder assy ② and the presser switch holder ③.



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

12 Thread release holder assy. attachment

1. Attach the tension release holder assy ① to the thread guard assembly using the 2 screws ❶.



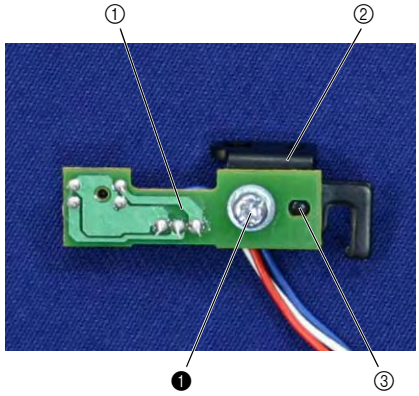
❶	Screw, Bind M3X4	Torque 0.78 – 1.18 N·m

13 Upper thread PCB unit assembly

1. Attach the upper thread PCB assembly ① to the thread sensor holder ② with the screw ❶.

***Key point**

- Align the positioning tab on the thread sensor holder ② with the center of the oval positioning hole ③ on the upper thread PCB assembly ①.



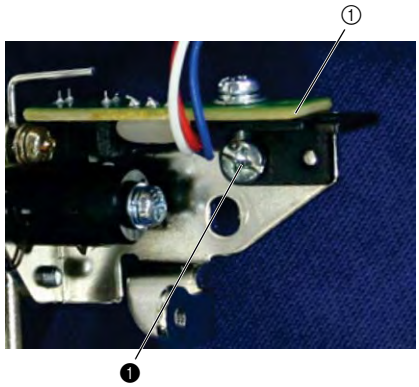
❶	Screw, Bind M3X4	Torque 0.78 – 1.18 N·m

14 Upper thread PCB unit attachment

1. Attach the upper thread PCB unit ① to the thread guide assembly with the screw ❶.

***Key point**

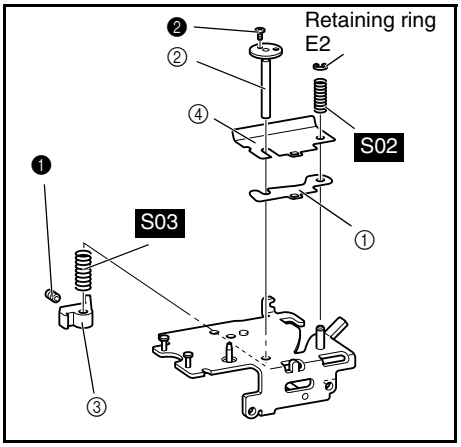
- Engage the positioning tab on the thread guide assembly with the positioning hole on the upper thread PCB unit ①.
- Check that the thread cutting shutter is positioned at the center relative to the sensor of the upper thread PCB unit ①.



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

15 Tension plate attachment

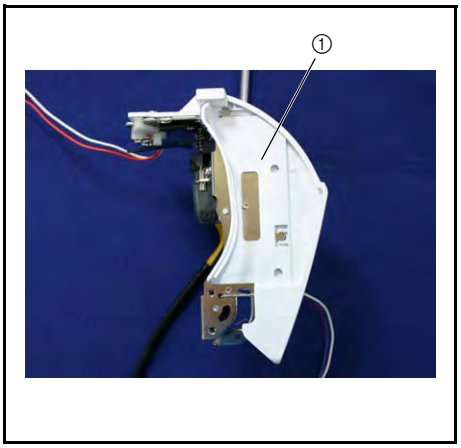
1. Attach the spacer ① to the tension release holder assy.
2. Attach the tension pressure assy ②, the spring S02 and tension release cam ③.
3. Attach the tension plate ④.
4. Install the screw ❶ in the tension release cam ③.
5. Hand start the screw ❷ in the tension pressure assy. ②
   (after assembly, perform 4 - 13 "Fine tension adjustment").
6. Attach the spring S03 to the tension release holder assy shaft, and attach the retaining washer E2.



❶	Set Screw, Socket (FT) M3X4	Torque 0.78 – 1.18 N·m
❷	Power Lock 2X3	Amount screw should be tightened Screw head should protrude 0.2 - 5.0 mm
S02	9, ϕ3.7	SPRING X57605***
S03	13.2, ϕ4.1	SPRING XA9577***

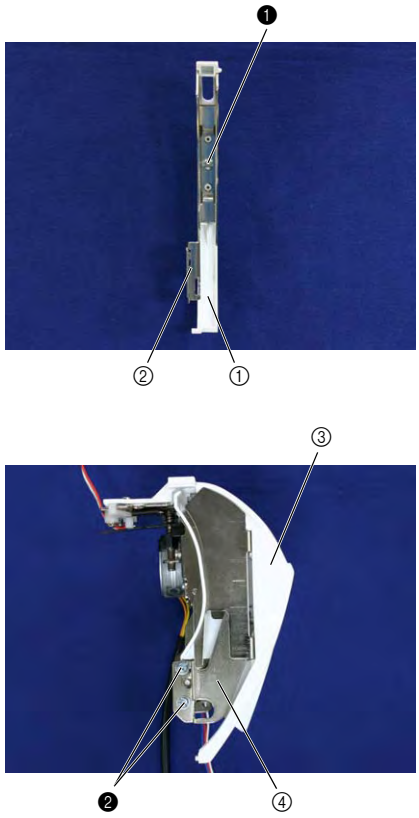
16 Thread guide cover attachment

1. Attach the thread guide cover ① to the thread guard assembly.



17 Thread guide cover assembly

1. Attach the thread guide cover ① to the thread guide assy ② using the screw ❶.
2. Attach the thread guide cover assembly ③ to the thread guard assembly ④ using the 2 screws ❷.

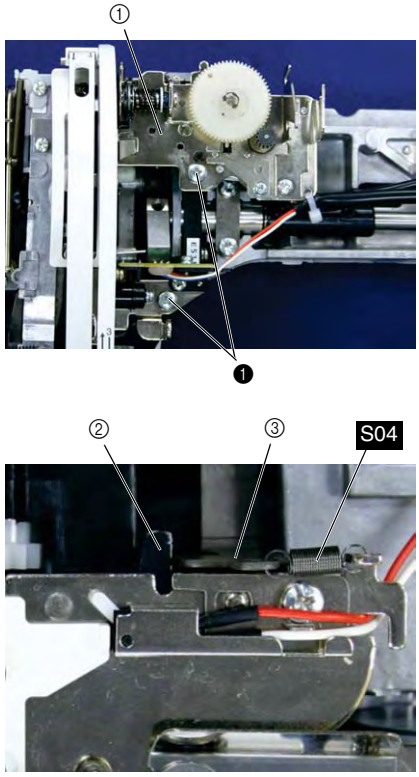


❶	Taptite, Bind B M3X6	Torque 0.78 – 1.18 N·m
❷	Screw, Pan (S/P washer) M3X6	Torque 0.78 – 1.18 N·m

18 Thread tension assy. attachment

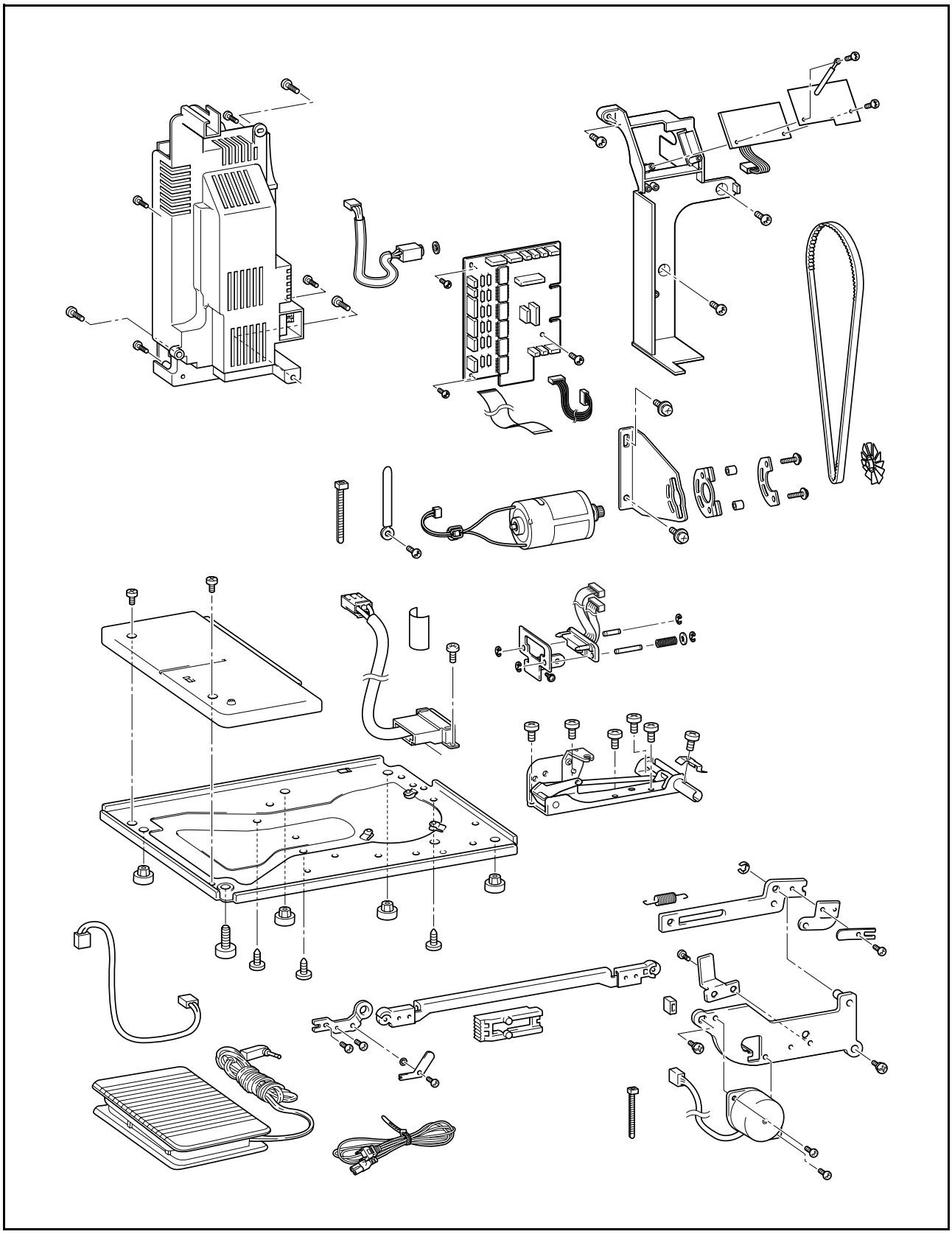
1. Attach the thread tension assy ① using the 2 screws ❶.

   ***Key point**
   - For the position of the thread release lever assy A ②, see the diagram to the right.
2. Attach the spring S04 to the tension release holder shaft and tension release plate C ③ on the needle-presser module.



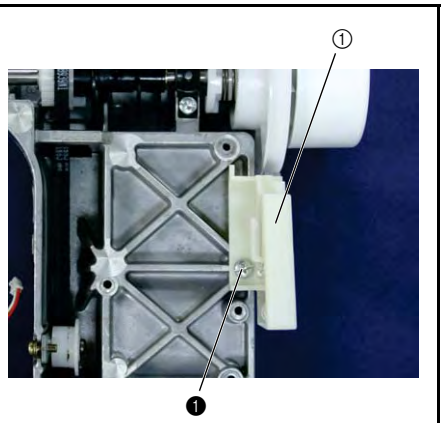
❶	Taptite, Bind B M4X10	Torque 1.18 – 1.57 N·m
S04	14, ϕ4	SPRING XA9787***

Electrical parts and motors location diagram



1 Belt guard attachment

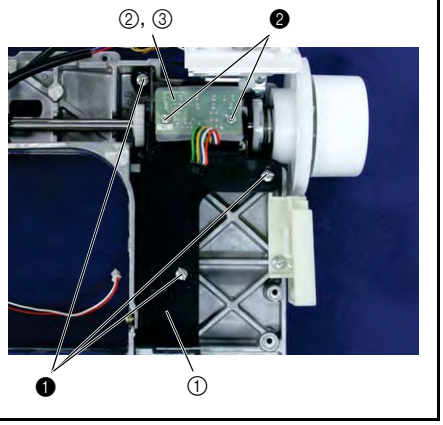
1. Attach the belt guard ① to the arm bed with the screw ❶.



❶	Screw, Bind M4X8	Torque 0.78 – 1.18 N·m

2 NP PCB assy. attachment

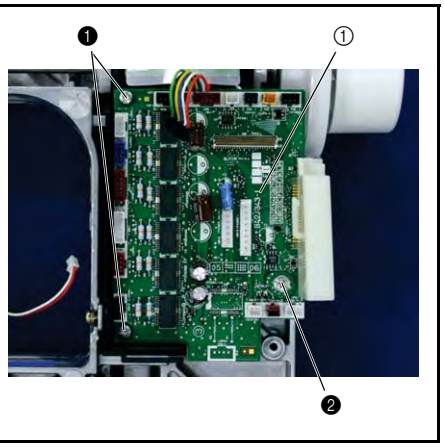
1. Attach the PCB holder ① to the arm bed using the 3 screws ❶.
2. Attach NP PCB assy ② and the insulation sheet ③ to the PCB holder ① using the 2 screws ❷.



❶	Taptite, Bind B M3X8	Torque 0.59 – 0.78 N·m
❷	Screw, Bind M4X8	Torque 0.78 – 1.18 N·m

3 Motor PCB assy. attachment

1. Attach the motor PCB assy ① to the PCB holder and arm bed using the 2 screws ❶ and the screw ❷.

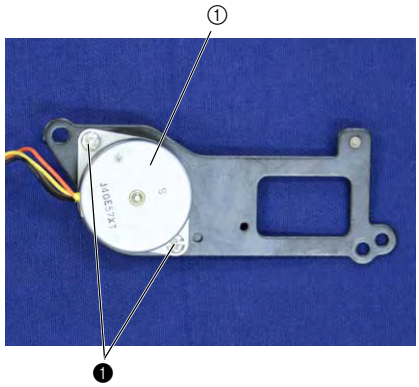


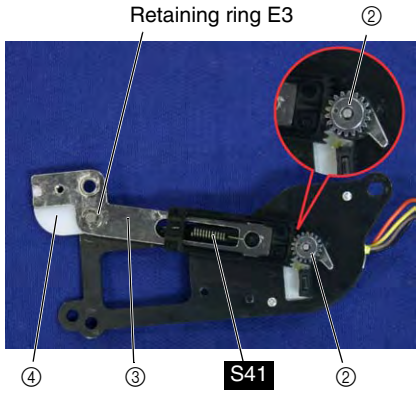
❶	Taptite, Bind B M3X8	Torque 0.59 – 0.78 N·m
❷	Screw, Bind M4X8	Torque 0.78 – 1.18 N·m

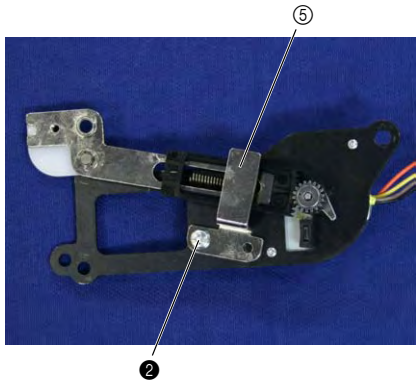
4 Side feed mechanism assembly

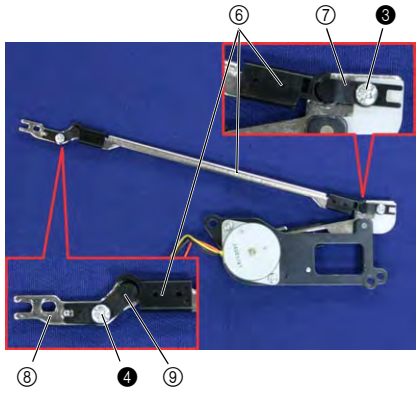
1. Attach the S pulse motor ① using screws ❶ (two).
2. Attach the side feed gear ② to the side feed plate ③, and attach S41 .
3. Attach the side feed plate and side feed spacer ④ to the SPM holder, and attach retaining ring E3.

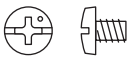
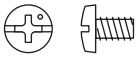
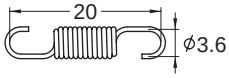
   ***Key point**
   - Align the match marks on the side feed gear and the S pulse motor gear.
4. Attach the rubber.
5. Attach the S stopper ⑤ using screw ❷.
6. Attach the side feed arm assy. ⑥ and plate spring A ⑦ using screw ❸.
7. Attach the side feed adjust plate ⑧, washer and plate spring B ⑨ using screw ❹.





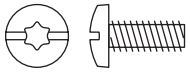


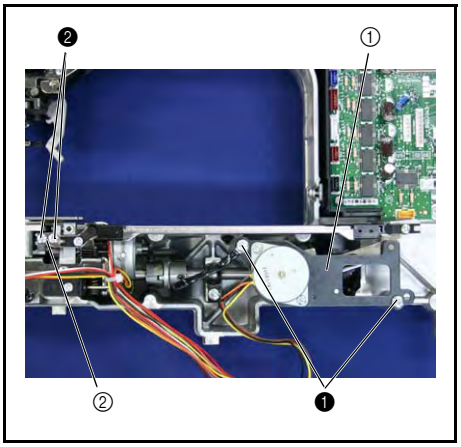


❶		Screw, Bind M3X4	Torque 0.79 – 1.18 N·m
❷ ❸		Screw, Bind M3X6	Torque 0.79 – 1.18 N·m
❹		Screw, Bind M3X5	Torque 0.79 – 1.18 N·m
S41			SPRING, EXTENTION XA9508***

5 Side feed mechanism attachment

1. Attach the side feed unit ① and wire clip using 2 screws ❶.
2. Attach the side feed adjust plate ② to the feed module feed bar using 2 screws ❷.

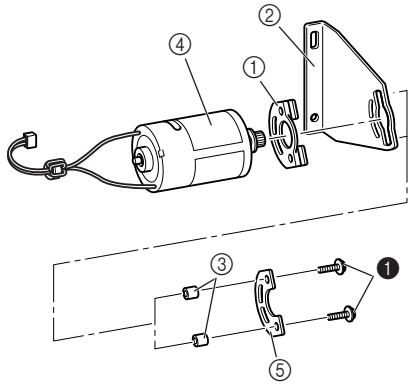
❶		Taptite, Bind S M4X10	Torque 1.47 – 1.96 N·m
❷		Screw, Bind M3X6	Torque 0.79 – 1.18 N·m



6 Assembly of main motor assembly

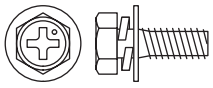
1. Attach the fender rubber ① to the motor holder ②.
2. Engage the 2 spacers (4 x 6) ③ with the 2 round holes on the fender rubber ①.
3. Attach the main motor ④ and the motor spacer presser ⑤ to the motor holder ② with the 2 screws ❶.

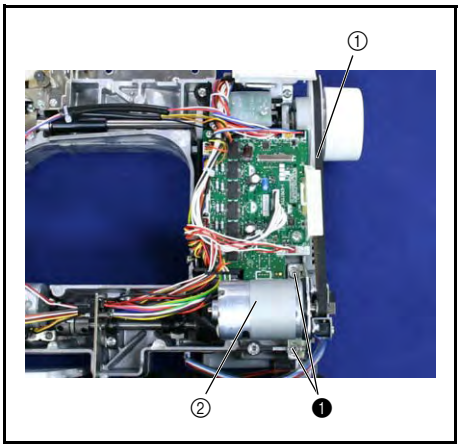
❶		Screw, Pan (S/P washer) M4X14	Torque 1.18 – 1.57 N·m



7 Main motor assembly attachment

1. Attach the timing belt ① to the upper shaft timing pulley and the motor pulley, align the main motor assembly ② with the arm bed and hand start the 2 screws ❶.
   (Fully tighten after 4 - 5 "Motor belt tension adjustment").

❶		Upset 4X12DB	Torque Hand tighten

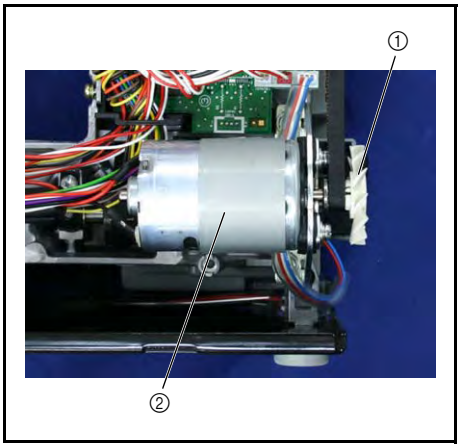


8 Motor fan attachment

1. Attach the motor fan ① to the main motor assembly ②.

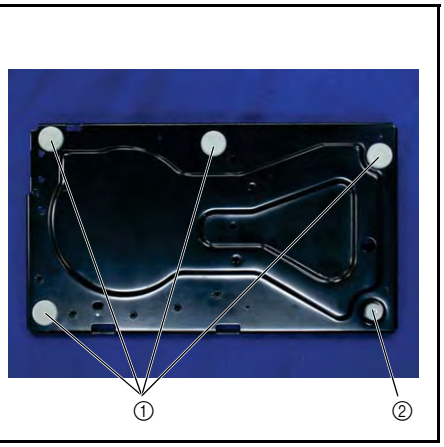
***Key point**

- Be careful removing the motor fan ① because the wings of the fan are very fragile.



9 Base plate rubber attachment

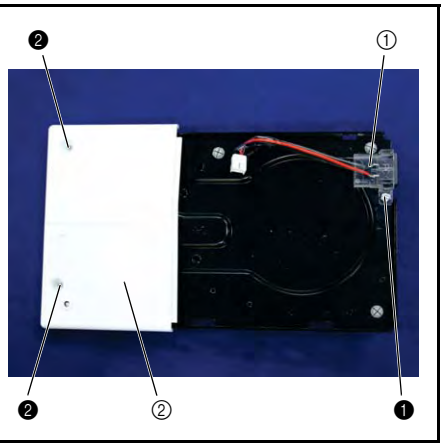
1. Attach the 4 base plate rubbers ① to the base plate.
2. Attach the adjusting screw assembly ②.



10 Inlet assy. and base plate cover attachment

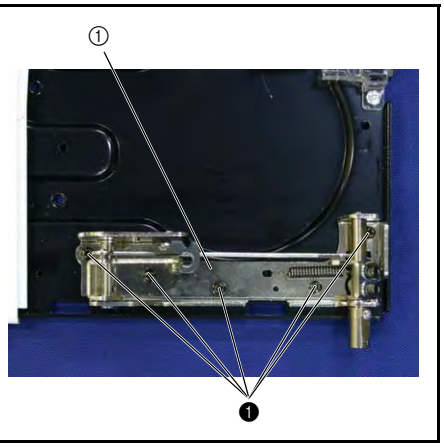
1. Attach the inlet assy ① to the base plate using the screws the screw ❶.
2. Attach the base plate cover ② to the base plate with the 2 screws ❷.

❶	Screw, Bind M4X6	Torque 1.18 – 1.57 N·m
❷	Screw, Bind M3X5	Torque 0.78 – 1.18 N·m



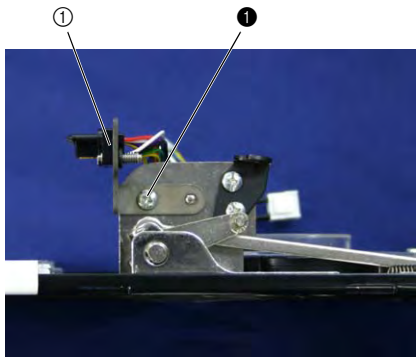
11 Knee lifter assembly attachment

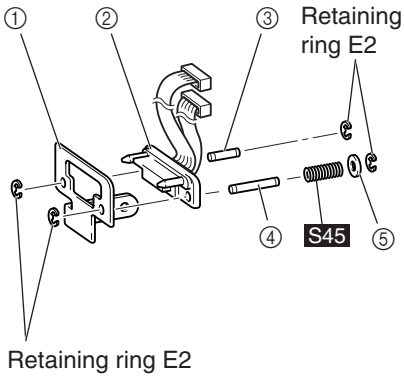
1. Attach the knee lifter assembly ① with the 5 screws ❶.



12 Connector holder assembly attachment

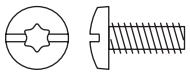
1. Attach the retaining ring E2 to ES pin F-A ③.
2. Attach the retaining ring E2 to the end of ES pin F-B ④, and then insert the feed bar spacer ③ and the spring S45 .
3. Attach the lead wire assy. (main body FCOMB) ② to the connector holder (F-EU) ①.
4. Insert ES pin F-A ③ into the lead wire assy. ②, and then attach the retaining ring E2.
5. Insert ES pin F-B ④ into the lead wire assy. ②, and then attach the retaining ring E2.
6. Attach the connector holder assembly ⑥ to the base plate with the 2 screws ❶.

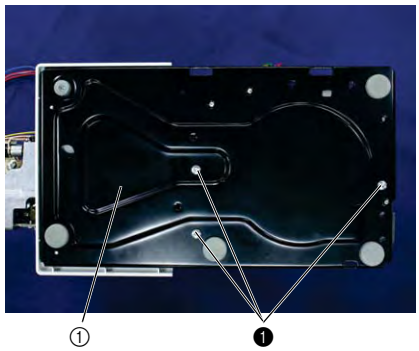




13 Base plate attachment

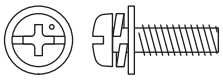
1. Attach the base plate assembly ① to the arm bed using the 3 screws ❶.

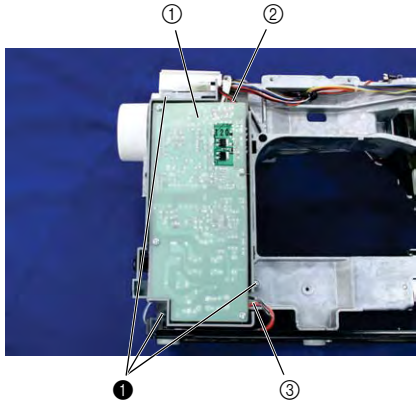
❶		Taptite, Bind S M4X10	Torque 1.47 – 1.96 N·m



14 Power supply unit F attachment

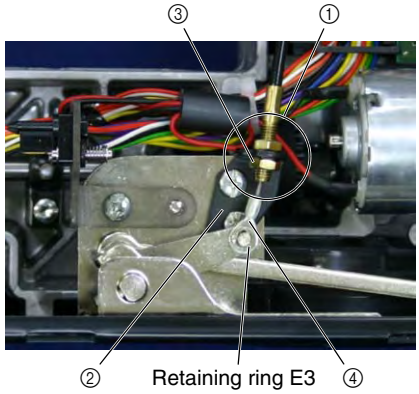
1. Attach the power supply unit ① to the arm bed with the 3 screws ❶.
2. Connect the inlet assembly lead wirefs connector ② to the power supply unit.
3. Connect the main motor assemblyfs connector ③ to the power supply unit.

❶		Screw, Pan (S/P washer) M4X14	Torque 0.78 – 1.18 N·m



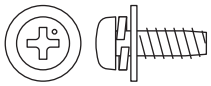
15 Wire assy. and knee lifter assy. attachment

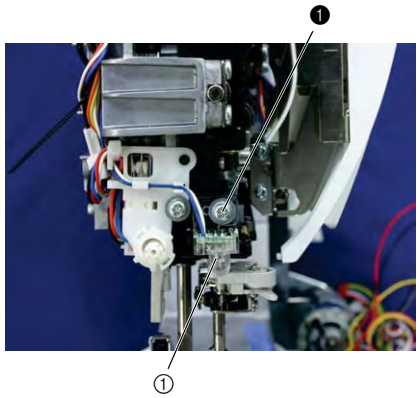
1. Attach the fitting ① on the end of the wire assy. (side with two M8 nuts on it) to the wire holder ② on the knee lifter assy., and hand tighten the M8 nut ③ on the lower side.
   (Fully tighten after 4 - 19"Knee lifter adjustment.")
2. Attach the hook ④ on the end of the wire assy. to the knee lifter assy. shaft, and attach retaining ring E3.



16 PBC unit LED lamp-FL attachment

1. Attach the PBC unit LED lamp-FL ① to the needle-presser module using the screw ❶.

❶		Taptite,Pan B M4X12	Torque 0.78 – 1.18 N·m

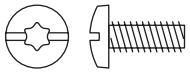


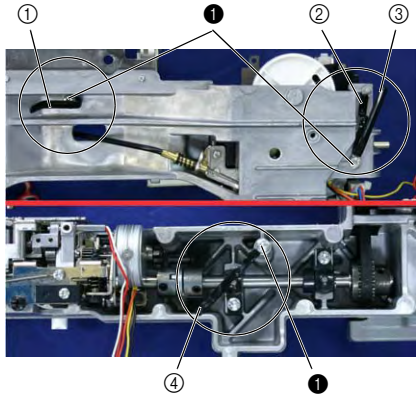
17 Wire clip attachment

1. Attach the 4 wire clips ① to ④ with the 3 screws ❶.

***Key point**

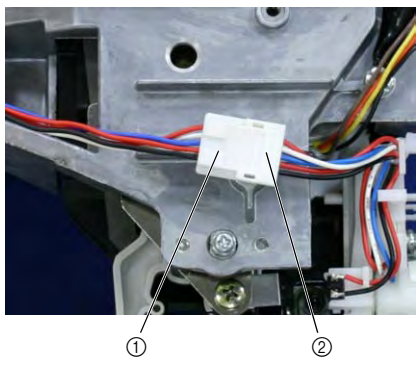
- Secure wire clips ② and ③ with one screw ❶.

❶		Taptite, Bind S M4X10	Torque 1.47 – 1.98 N·m

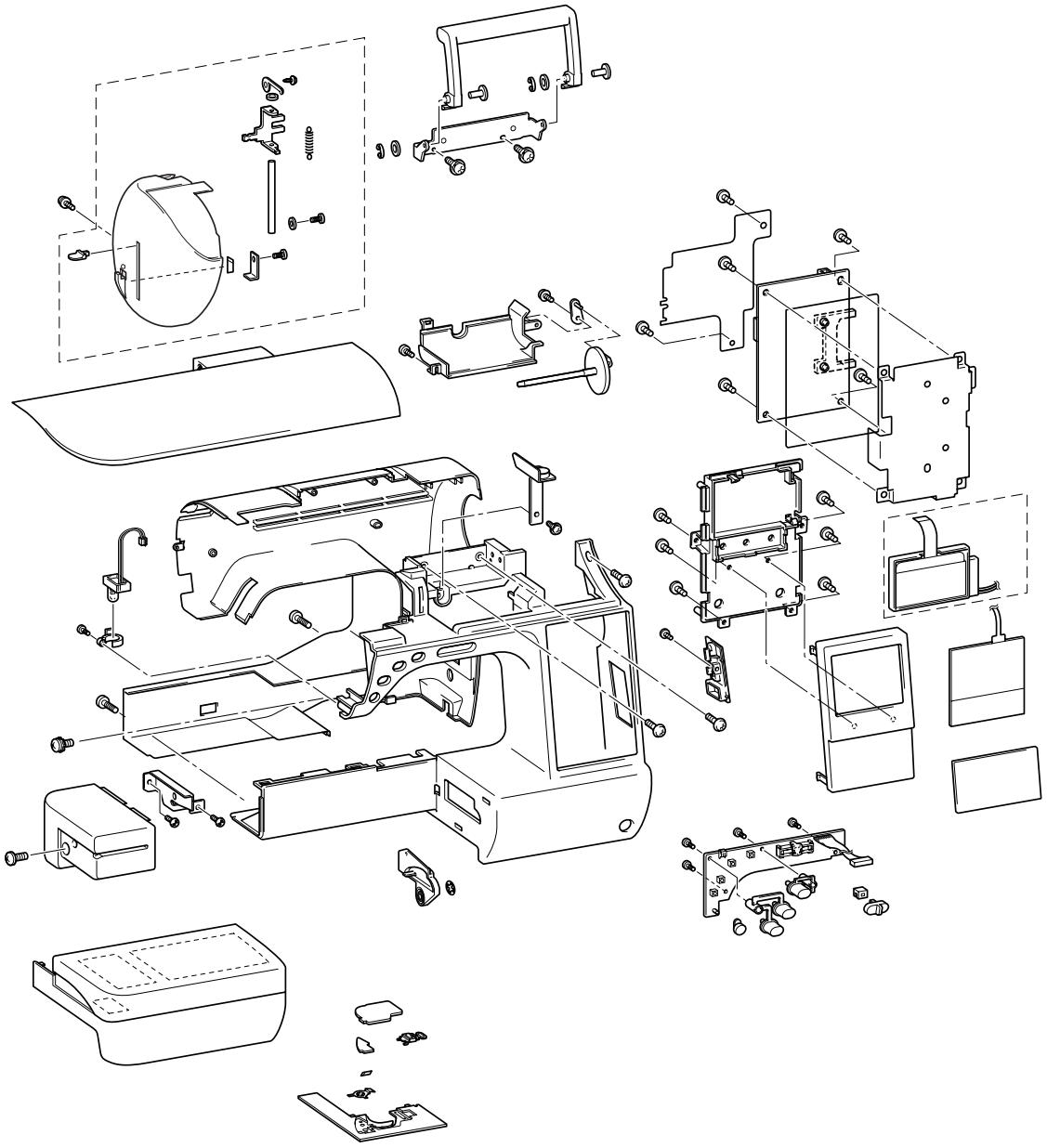


18 Lead assembly (BH-cable-F) attachment

1. Attach the lead assembly (BH-cable-F) ① to the connector on the BH switch assembly ②.
2. Refer to Chapter 6 [Special Instructions of Wiring] for cord treatment of each section.

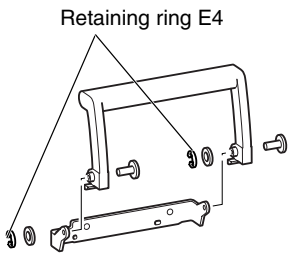


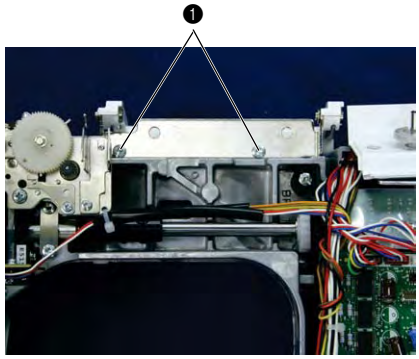
Main parts location diagram

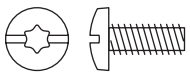


1 Handle assembly and attachment

1. Attach the handle, handle holder and polyester slider to the handle shafts, and attach 2 retaining rings E4.
2. Attach the handle to the arm bed using the 2 screws ❶.

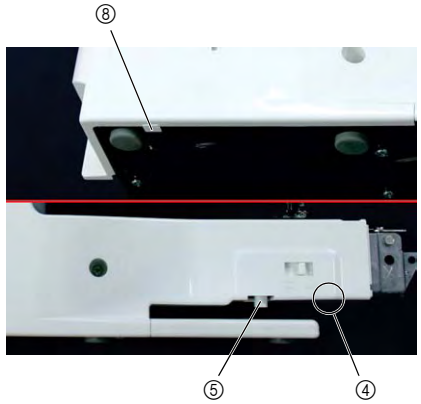


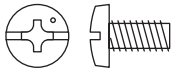


❶		Taptite, Bind S M4X10	Torque 1.47 – 1.96 N·m

2 Rear cover attachment

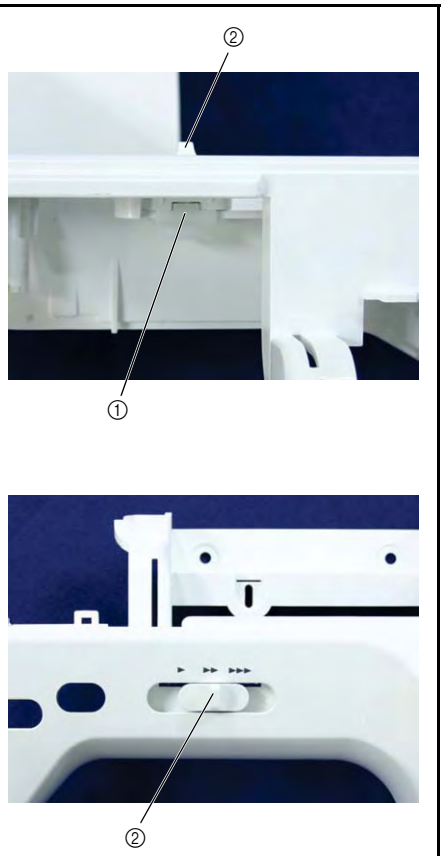
1. Lower the presser lever ①.
2. Attach the rear cover, being careful to avoid the presser dial ③ being caught in section ②.
3. Attach the rear cover, being careful to avoid the drop lever ⑤ being caught in section ④.
4. Attach the rear cover, being careful to avoid the switch ⑦ being caught in section ⑥, and then attach the hook ⑧ to the base plate.
5. Attach the rear cover, being careful to avoid the presser lever ① being caught in section ⑨.
6. Secure the rear cover to the arm bed with the screw ❶.



❶		Screw, Bind M4X8	Torque 0.78 – 1.18 N·m

3 Front cover assembly (SV keytop attachment)

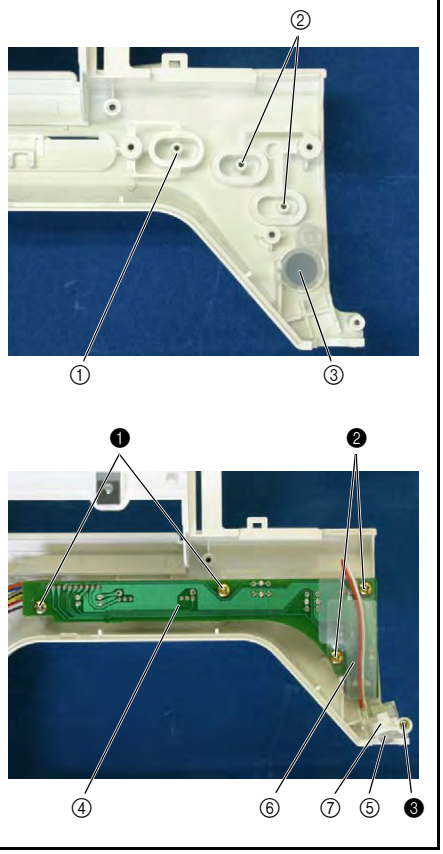
1. Attach the SV joint plate ① to the speed control key part of the front cover.
2. Attach the SV keytop ② to the SV joint plate ①.



4 Front cover assembly (SS-VR F PCB assy. attachment)

1. Attach the thread cut button ①, reverse button ②, and SS button ③.
2. Attach the SS-VR PCB assembly ④ to the front cover with the 2 screws ❶.

   ***Key point**
   - Align VR1 on the SS-VR PCB assembly with the SV joint plate.
3. Connect the connector of the PCB unit LED lamp (FR) ⑤ to the SS-VR PCB assembly ④.
4. Cover the cord of the PCB unit LED lamp (FR) ⑤ with the insulation sheet ⑥. Secure the SS-VR PCB assembly ④ and the SS-VR insulation sheet ⑥ with the 2 screws ❷, and then attach these to the front cover.
5. Pass the lamp of the PCB unit LED lamp (FR) ⑤ through the lamp holder support ⑦, and then attach the lamp holder support ⑦ to the front cover with the screw ❸.



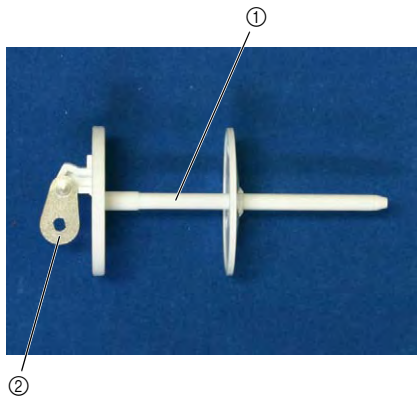
❶ ❷	Taptite, Bind B M3X8	Torque 0.57 – 0.78 N·m
❸	Taptite, Pan B M2.6X8	Torque 0.29 – 0.49 N·m

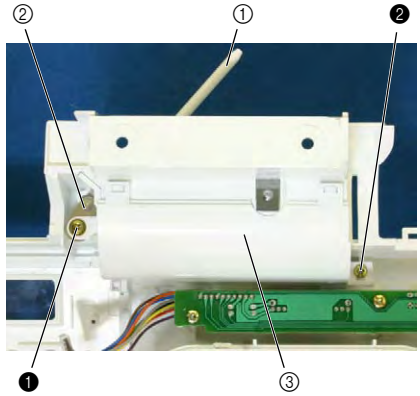
5 Front cover assembly (spool pin attachment)

1. Attach the spool pin ① to the spool pin holder assembly ②.
2. Attach the thread bobbin cover ③ and the spool pin holder assembly ② with the screws ❶ and ❷.

***Key point**

- Secure both the spool pin holder assembly ② and the thread bobbin cover ③ with the screw ❶.

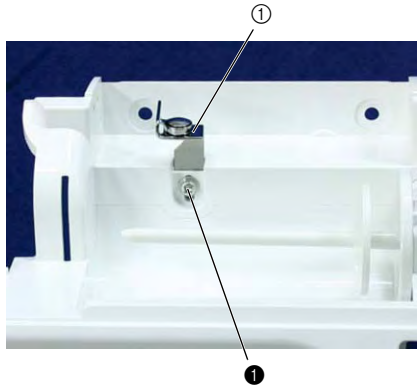




❶	Taptite, Cup B M3X10	Torque 0.29 – 0.49 N·m
❷	Taptite, Bind B M3X8	Torque 0.29 – 0.49 N·m

6 Front cover assembly (assembling bobbin winder guide assembly)

1. Attach the bobbin winder guide assembly ① to the front cover.
2. Hand start the screw ❶.
   (Fully tighten after 4 - 16 "Bobbin winder adjustment.")



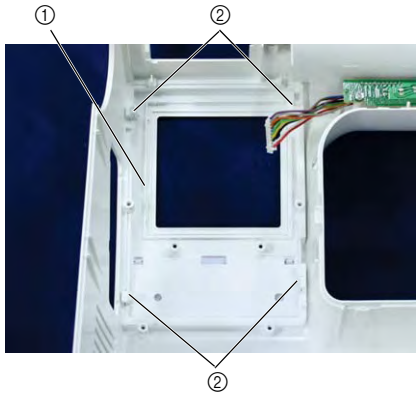
❶	Screw, Pan (S/P washer) M3X8DA	Torque 0.57 – 0.78 N·m

7 Indication panel attachment

1. Attach the indication panel ① to the front cover.

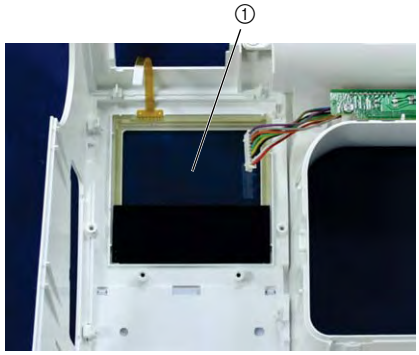
***Key point**

- Insert the indication panel ① from the top of the front cover to set it on the front side of the front cover, and then attach the 4 hooks ② to the inside of the front cover.



8 Touch panel assembly attachment

1. Attach the touch panel assembly ① to the front cover.

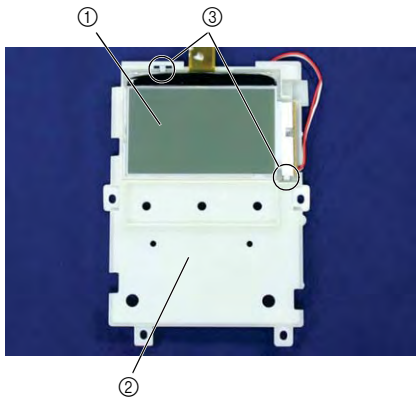


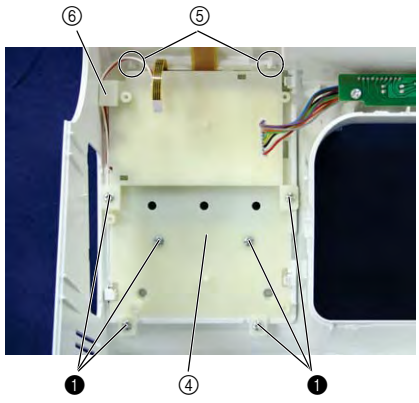
9 Main PCB holder assembly attachment

1. Attach the light plate assembly ① to the main PCB holder ② using the 2 hooks ③ on the main PCB holder ②.
2. Attach the main PCB holder assembly ④ to the front cover with the 6 screws ❶.

***Key point**

- Hang the main PCB holder assembly ④ over the 2 hooks ⑤ at the upper section of the front cover.
- Check that the lead wire of the light plate assembly ① passes under the left upper guide ⑥ of the main PCB holder assembly ④.





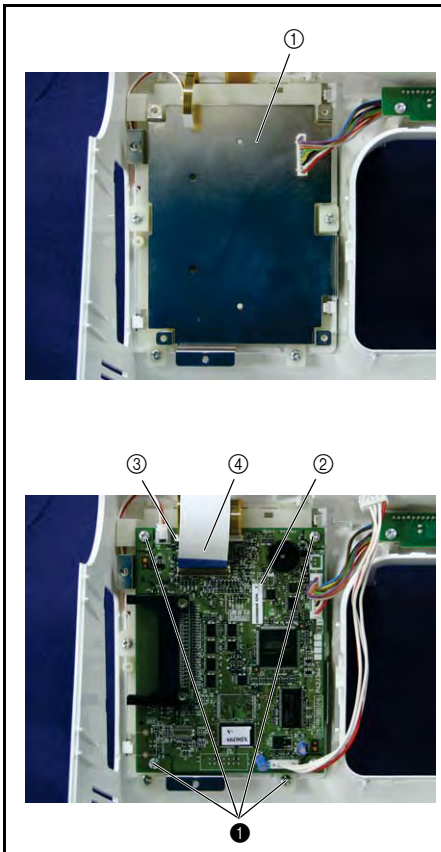
❶		Taptite, Bind B M3X8	Torque 0.39 – 0.79 N·m

10 Main PCB assembly attachment

1. Position the PCB plate B ① and then the main PCB assembly ②, and then attach these to the front cover with the 4 screws ❶.
2. Connect the lead wirefs connectors and FFC cords (3 each) to the main PCB assembly ②.

***Key point**

- Pull up the lock of the connector on the main PCB to release it, insert the FFC cord ③, and then push down the lock to secure the cord.
- Move the lock of the connector on the main PCB to the upright position to release it, insert the FFC cord ④ with the blue surface facing down, and then press the lock down to secure the cord.
- After connection, check that the three FFC cords are connected to the connectors on the main PCB correctly.



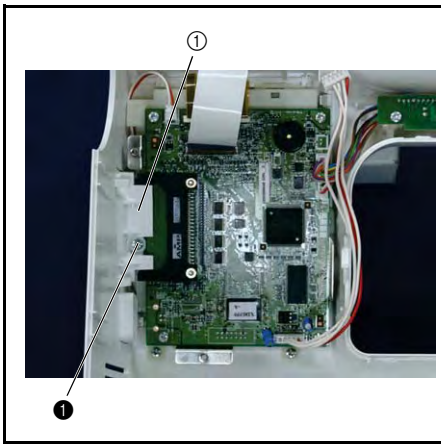
❶	Taptite, Bind B M3X8	Torque 0.39 – 0.79 N·m

11 Card cover attachment

1. Attach the card cover ① to the front cover with the screw ❶.

***Key point**

- Check that the hook on the card cover ① is attached to the backside of the front cover.



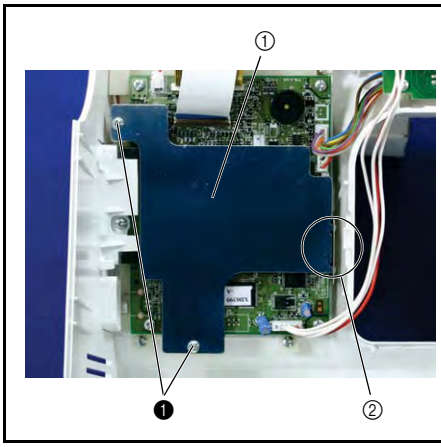
❶	Taptite, Bind B M3X8	Torque 0.39 – 0.79 N·m

12 Board plate A attachment

1. Attach the board plate A ① to the front cover with the 2 screws ❶.

***Key point**

- Engage the 2 tabs on the right side of board plate A ① with the 2 slots on the right side of board plate B ②.



❶	Screw, Bind M3X5	Torque 0.39 – 0.79 N·m

13 Front cover attachment

1. Connect the FFC cord ① and the lead wirefs connector to the main PCB ②.

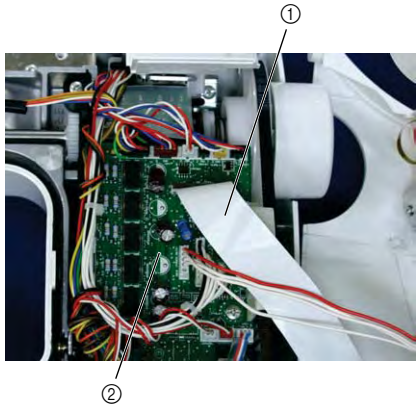
   ***Key point**
   - Move the lock of the connector on the main PCB ② to the upright position to release it, insert the FFC cord ① with the blue surface facing up, and then press the lock down to secure the cord.

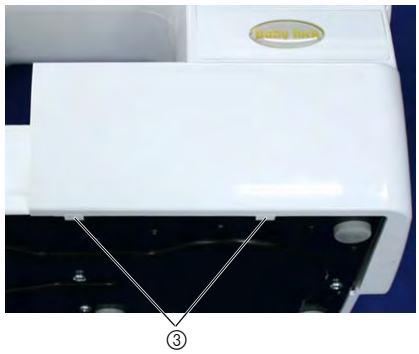
2. Engage the 2 hooks ③ with the bottom plate and 2 hooks ④ with the rear cover, and then secure the front cover with the 3 screws ❶.

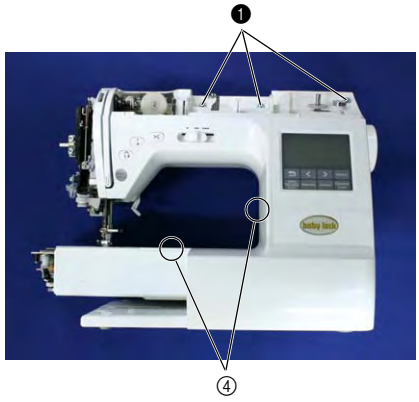
   ***Key point**
   - Check that the bobbin winder cover is at the upper section of the front cover.

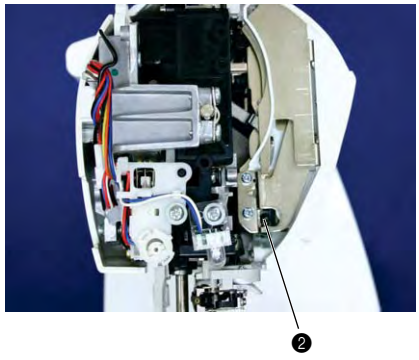
3. Tighten the screw ❷.

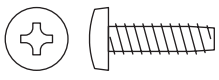
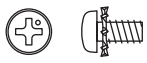
   ***Key point**
   - Secure both the thread guard assembly and the groove on the front cover with the screw ❷.







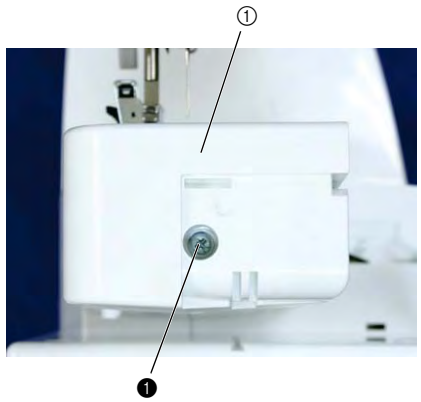


❶		Taptite, Bind B M4X14	Torque 0.78 – 1.18 N·m
❷		Screw, Pan (T washer) M3X6	Torque 0.57 – 0.78 N·m

14 Free arm cover attachment

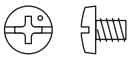
1. Attach the free arm cover ① to the arm bed with the screw ❶.

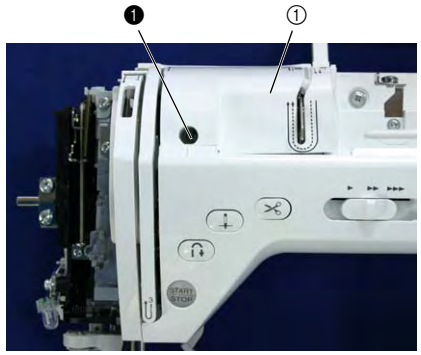
❶		Screw, Pan (S/P washer) M4X8	Torque 0.78 – 1.18 N·m



15 Front thread guide cover attachment

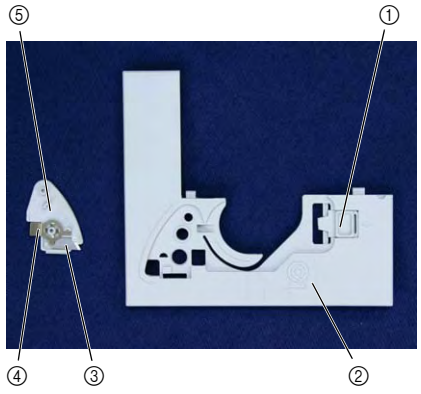
1. Attach the front thread guide cover ① using the screw ❶.

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



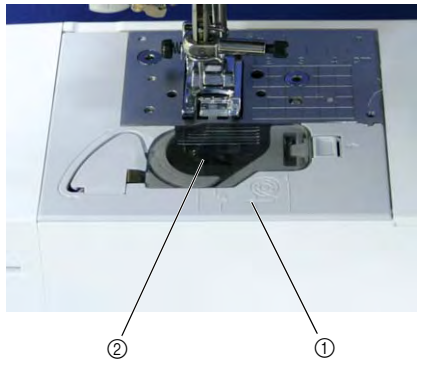
16 Assembling needle plate B assy

1. Attach the slide button ① to the needle plate B ②.
2. Attach the NT lower thread cutter ③ and the spring plate ④ to the cutter cover ⑤.
3. Attach the cutter cover ⑤ to the needle plate B ②.



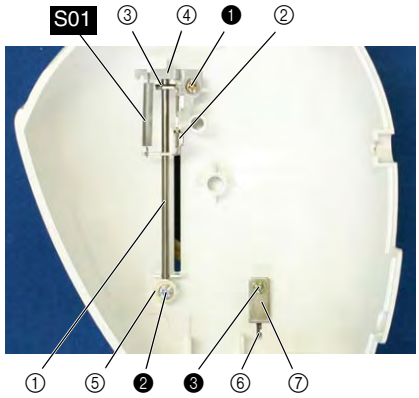
17 Needle plate B assy. attachment

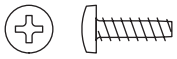
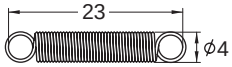
1. Attach the needle plate B assy ① to the main unit.
2. Attach the needle plate cover ② to the needle plate B assy ①.



18 Face plate assembly

1. Attach the needle thread lever shaft ①, needle thread lever ②, and rubber washer ③ to the face plate.
2. Attach the shaft presser plate ④ to the face plate with the screw ❶.
3. Attach the screw ❷ and the washer ⑤.
4. Attach the spring S01 to the needle thread lever ② and the shaft presser plate ④.
5. Attach the NT lower thread cutter ⑥ to the face plate, and then attach the face plate cutter holder with the screw ❸.
6. Attach the needle thread lever knob ⑧.



❶ ❸		Taptite, Pan B M3X6	Torque 0.29 – 0.34 N·m
❷		Taptite, Bind B M3X10	Torque 0.29 – 0.34 N·m
S01		THREAD THROUGH LEVER SPRING 138260***	

19 Face plate assy. attachment

1. Secure the face plate assy ① to the arm bed with the screw ❶.

***Key point**

- Align and attach the hole in the center on the inside of the face plate assy ① to the shaft on the needle-presser module.

❶		Screw, Pan (S/P washer) M4X14	Torque 0.78 – 1.18 N·m

20 Top cover attachment

1. Attach the top cover ① to the front cover.

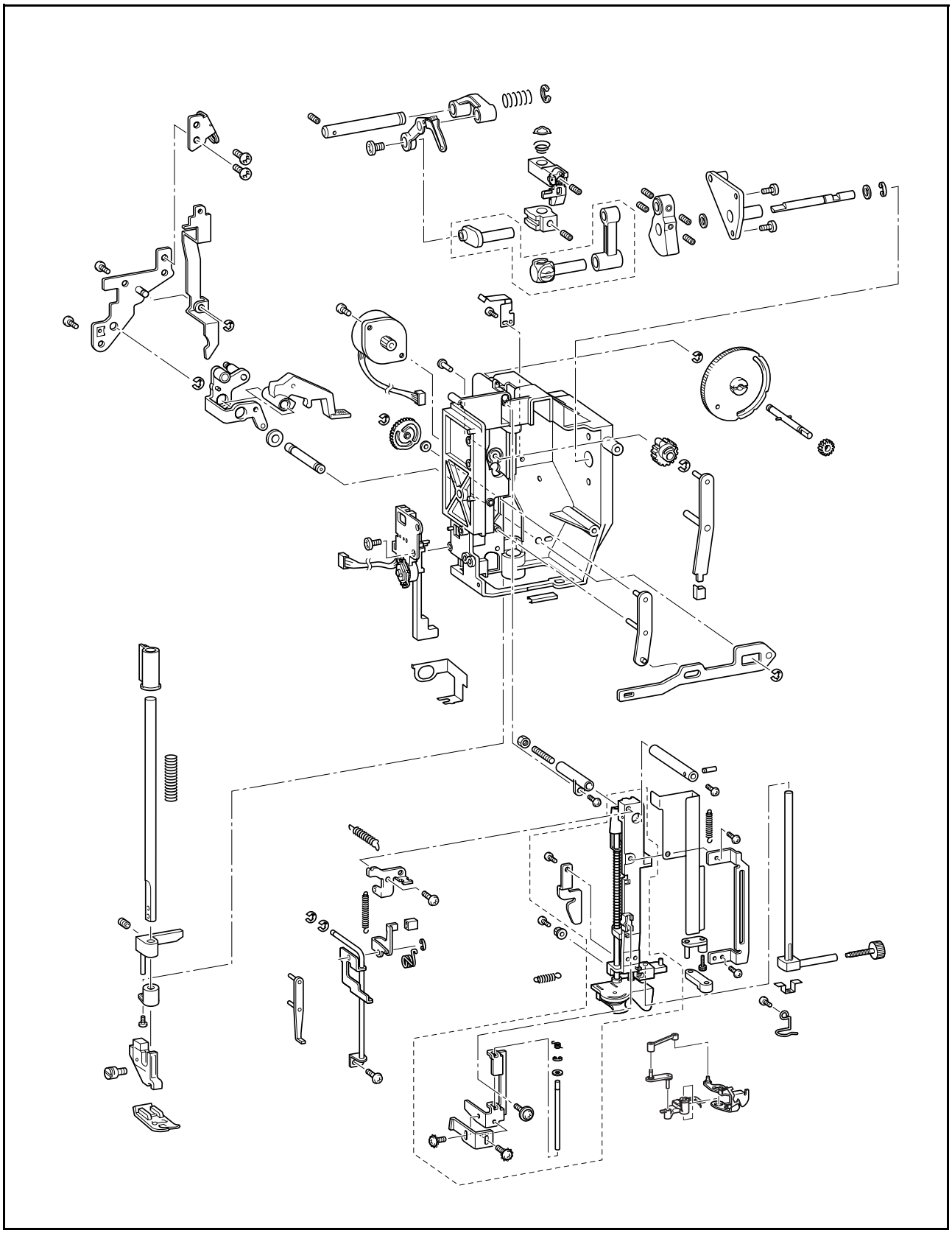
***Key point**

- The attachments (two, left and right) for the top cover ① fall to the inside.

21 Accessory table assembly and attachment

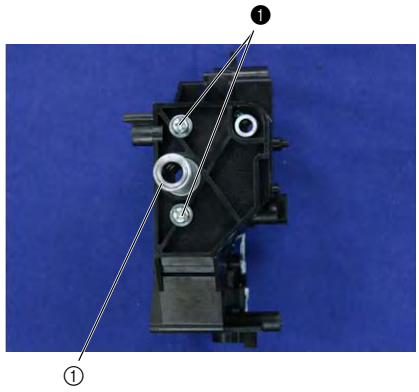
1. Attach the accessory table door to the accessory table ①.
2. Attach the accessory table ① to the main unit.

Needle-presser module breakout diagram



1 Shaft bushing assembly attachment

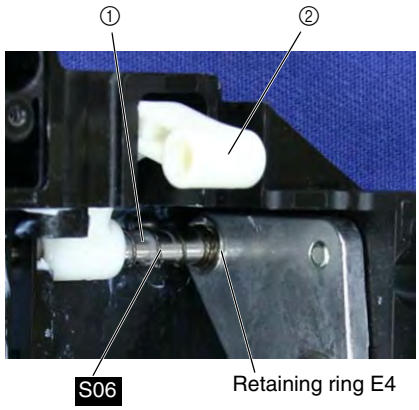
1. Using the 2 screws ❶, attach the shaft bushing assembly ① to the upper unit holder.



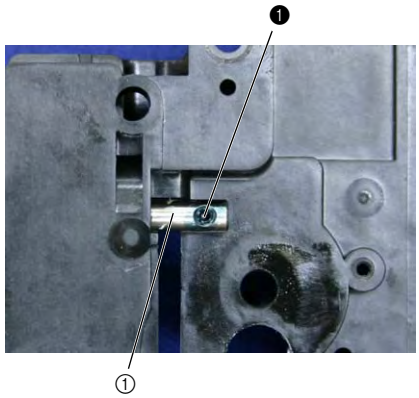
❶	Screw, Pan (S/P washer) M4X14DB	Torque 1.18 – 1.57 N·m

2 Thread take-up lever link assembly

1. Apply a small amount of MOLYKOTE EM30L to the shaft hole in the thread take-up lever link.
2. Attach the shaft ①, spring S06 and thread take-up lever link ② to the upper unit holder, and attach retaining ring E4.
3. Install the screw ❶ in the shaft ①.



Apply MOLYKOTE EM30L all the way around the shaft hole in the thread take-up lever link.	small amount XC8385



❶	Set Screw, Socket (CP) M3X5	Torque 0.49 N·m
S06	20.7, ϕ5.2	SPRING XC2441***

3 Presser bar attachment

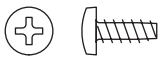
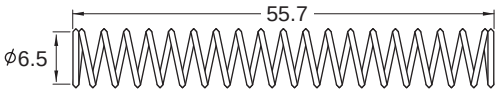
1. Insert the presser bar bushing ① into the shaft hole on the bottom of the unit holder.
2. Attach the plate spring ② to the unit holder with the screw ❶.

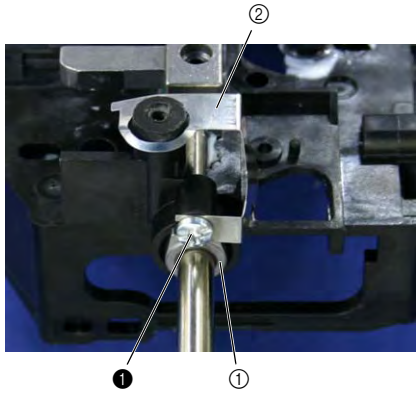
   ***Key point**
   - Press the presser bar bushing with the plate spring.
3. Dip the tip of the presser bar ③ (opposite end from the retaining ring) in FBK OIL RO 100.
4. Insert the presser bar ③ into the presser foot rack ④.
5. Temporarily attach the screw ❷ to the presser bar clamp ⑤.
6. Adjust the presser bar height and parallel alignment, and then fully tighten the screw ❷.

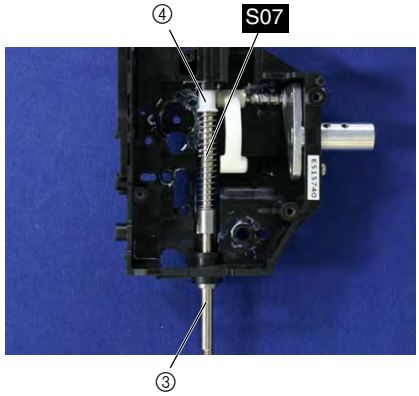
   ***Key point**
   - Refer to "Presser bar height and parallel adjustment" on page 4 - 11 for the adjustment procedure.
7. Apply a bead of MOLYKOTE EM30L to the groove on the stopper pin of the unit holder.
8. Insert spring S07 and the presser bar clamp ⑤ into the presser bar ③.

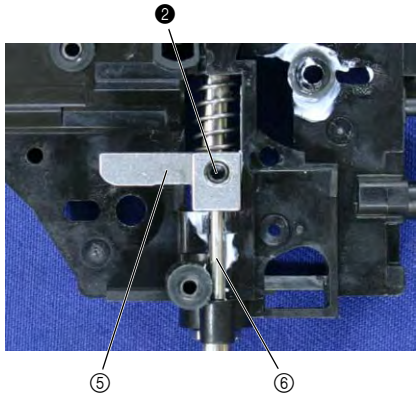
   ***Key point**
   - Engage the stopper pin ⑥ of the presser bar clamp ⑤ with the groove on the stopper pin of the unit holder.
9. Pass the presser bar ③ through to the presser bar bushing ①.

Dip the tip of the presser bar (opposite end from the retaining ring) in FBK OIL RO 100.	Dipping XC8388***
Apply MOLYKOTE EM30L to the groove on the stopper pin of the unit holder.	Bead XC8385***

❶		Taptite, Bind B M3X8	Torque 0.78 – 1.18 N·m
❷		Set Screw, Socket (CP) M5X10	Torque Hand tighten
S07			SPRING XC4457***



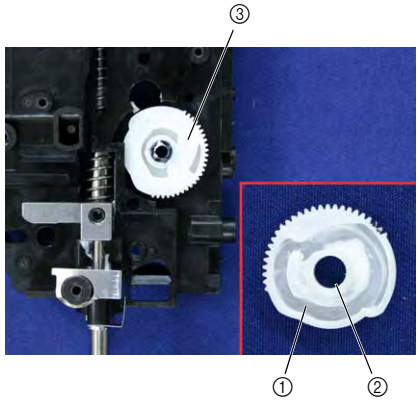




4 T cam attachment

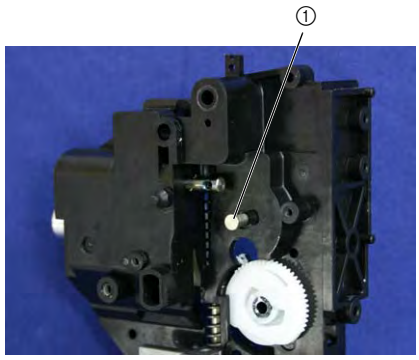
1. Apply a small amount of MOLYKOTE EM30L to the cam groove ① and shaft hole ② of the T cam.
2. Attach the T cam ③ to the upper unit holder.
3. Apply a small amount of MOLYKOTE EM30L to the gear for the T cam ③.

Apply MOLYKOTE EM30L to the entire cam groove in the T cam	Small amount XC8385***
Apply MOLYKOTE EM30L to the shaft hole in the T cam	Small amount XC8385***
Apply MOLYKOTE EM30L to the entire surface of the gear for the T cam	Small amount XC8385***



5 Shaft attachment

1. Attach the shaft ①.



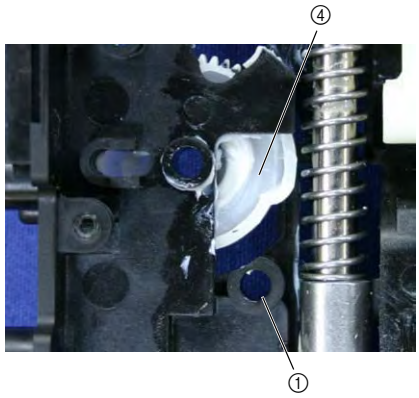
6 Thread release lever assy. attachment

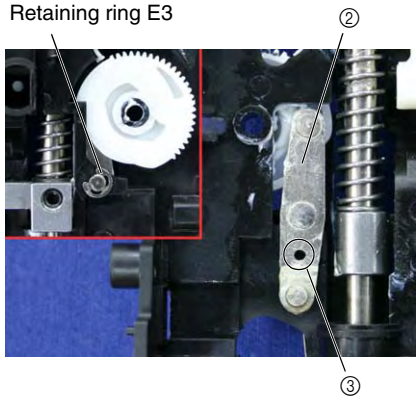
1. Apply a small amount of MOLYKOTE EM30L to the thread release lever assy hole ① in the upper unit holder.
2. Attach the thread release lever assy ② and polyester slider to the upper unit holder, and attach retaining ring E3.

***Key point**

- The side of the thread release lever assy ② with the hole ③ is the bottom.
- Align the pin on the thread release lever assy ② with the cam groove ④ in the T cam.

Apply MOLYKOTE EM30L to the thread release attachment hole	Small amount XC8385***
Apply MOLYKOTE EM30L to thread release assembly shaft	Small amount XC8385***



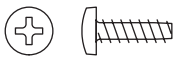


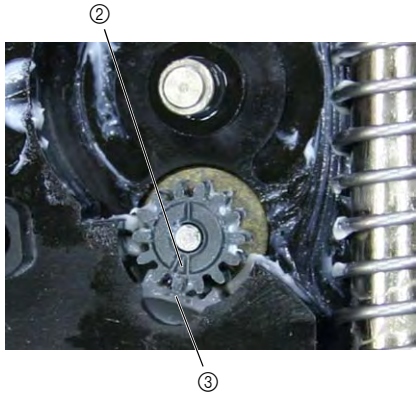
7 Z pulse motor attachment

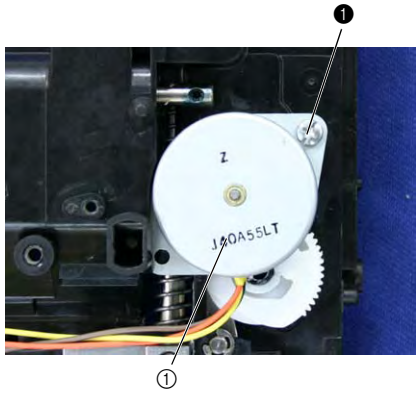
1. Attach the Z pulse motor (ZPMSMJ-35-4840-A) ① to the upper unit holder using the screw ❶.

***Key point**

- Align the match mark ② on the Z pulse motor gear and the match mark ③ on the T cam gear.

❶		Taptite, Bind B M3X10	Torque 0.78 – 1.18 N·m





8 Z zigzag cam attachment

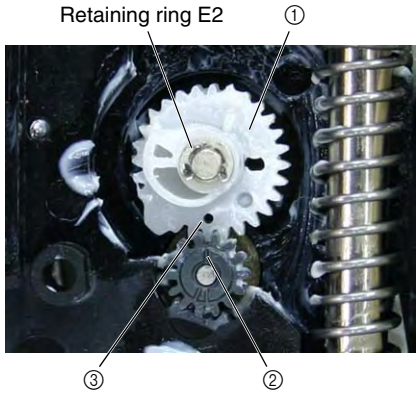
1. Install the Z zigzag cam ① on the Z zigzag cam shaft, and attach the retaining washer E2.

***Key point**

- Align the match mark ② on the Z pulse motor gear and the match mark ③ on the Z zigzag cam.

2. Apply a small amount of MOLYKOTE EM30L to the Z zigzag cam ① gear part and cam part.

Apply MOLYKOTE EM30L to all of the sliding part of the Z zigzag cam pin	Small amount XC8385***
Apply MOLYKOTE EM30L to all of the Z zigzag cam	Small amount XC8385***
Apply MOLYKOTE EM30L all around the Z zigzag cam gear	Small amount XC8385***



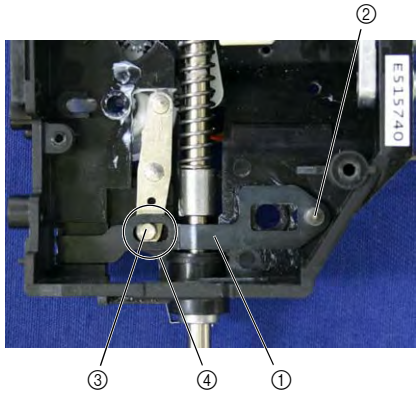
9 Thread releaser assy. attachment

1. Apply MOLYKOTE EM30L to the thread releaser assy ①.
2. Attach the thread releaser assy ① to the upper unit holder.

***Key point**

- Align the thread releaser assy ①, pin ② and upper unit holder hole as well as the thread release lever pin ③ and the round hole ④ in the thread releaser assy ①.

Apply MOLYKOTE EM30L to all of the sliding part of the thread releaser assy.	Small amount XC8385***



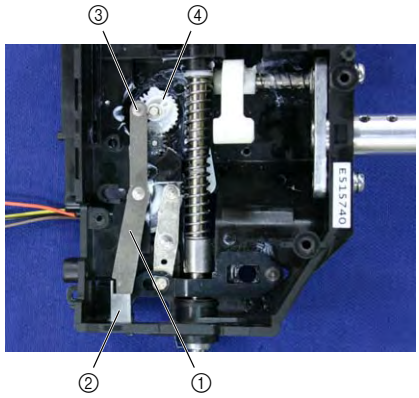
10 Z zigzag lever assy. attachment

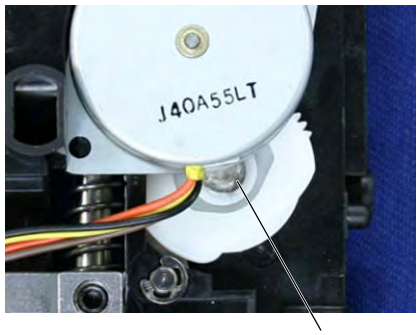
1. Attach the cap ② to the Z zigzag lever assy ①.
2. Apply a small amount of MOLYKOTE EM30L to the 2 Z zigzag lever assy ① pins.
3. Attach the Z zigzag lever assy ① to the upper unit holder, and the attach retaining ring E3.

***Key point**

- The end ③ of the Z zigzag lever ① is the left side of the Z zigzag cam ④.

Apply MOLYKOTE EM30L to the two pins on the Z zigzag lever	Small amount XC8385***





Retaining ring E3

11 Thread take-up counter weight attachment

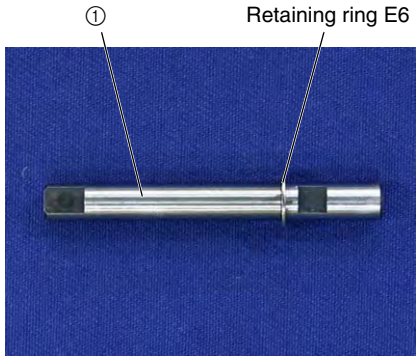
1. Attach the retaining ring E6 to the unit shaft ①.
2. Attach the thrust washer ②, unit shaft ①, thrust washer ② to the shaft bushing assembly ③.
3. Attach the thread take-up counter weight ④ using the 2 screws ❶.

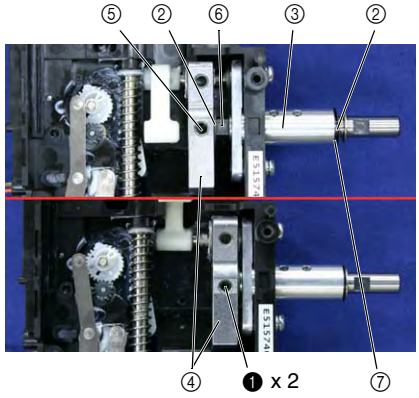
***Key point**

- Align the screw hole ⑤ in the thread take-up counter weight ④ and the unit shaft D cut surface ⑥.

4. Lubricate part ⑦ of the shaft bushing assembly ③ with one to two drops of OILER B ASSY.

Lubricate the unit shaft with OILER B ASSY.	1 – 2 drops XZ0206***
Lubricate the inside of the shaft bushing with OILER B ASSY	1 – 2 drops XZ0206***





❶		Set Screw, Socket (FT) M5X5	Torque 1.37 – 1.77 N·m

12 Thread take-up lever assy. attachment

1. Apply a bead of MOLYKOTE EM30L to the 2 calking shafts of the needle bar crank ①.
2. Apply a bead of MOLYKOTE EM30L to the calking shaft of the thread take-up lever assembly ②.
3. Insert the needle bar crank ③ rod (end with the larger diameter) into the calking shaft (longer) of the needle bar crank ①.
4. Apply a bead of MOLYKOTE EM30L to the screw attachment face of the needle bar crack ① (tip of the shorter calking shaft).
5. Insert the calking shaft (longer) of the needle bar crank ③ into the thread take-up counter weight ④.

***Key point**

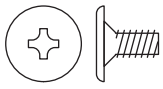
- Align the D-cut face ⑤ of the needle bar crank calking shaft with the screw hole ⑥ on the thread take-up counter weight.

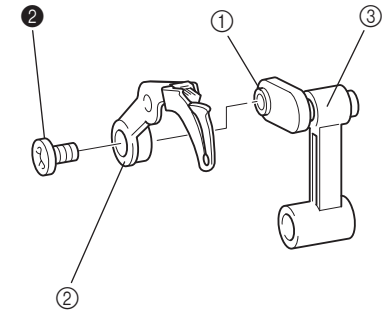
6. Fully tighten the 2 screws ❶ temporarily attached to the thread take-up counter weight ④.
7. Insert the calking shaft of the thread take-up lever assembly ② into the shaft hole on the thread take-up lever link ⑦.
8. Insert the calking shaft (shorter) of the needle bar crank ① into the shaft hole on the thread take-up lever assembly ②, and then tighten the screw ❷.

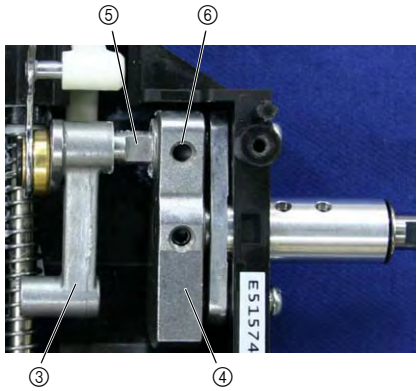
***Key point**

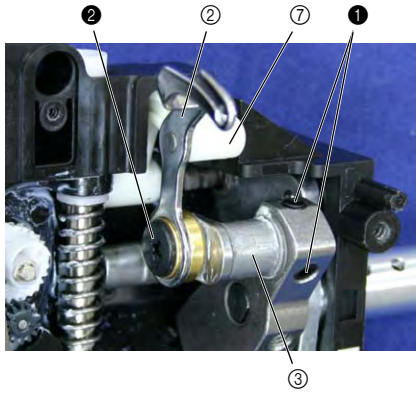
- The screw ❷ has a reverse helical flute thread.

Apply MOLYKOTE EM30L to the 2 calking shafts of the needle bar crank.	Bead XC8385***
Apply MOLYKOTE EM30L to the calking shaft of the thread take-up lever assembly.	Bead XC8385***
Apply MOLYKOTE EM30L to the screw attachment face of the needle bar crack (tip of the shorter calking shaft).	Bead XC8385***

❶		Set Screw, Socket (FT) M5X5	Torque 1.37 – 1.77 N·m
❷		Screw, Flat SM3.57-40X7 L	Torque 1.18 – 1.57 N·m



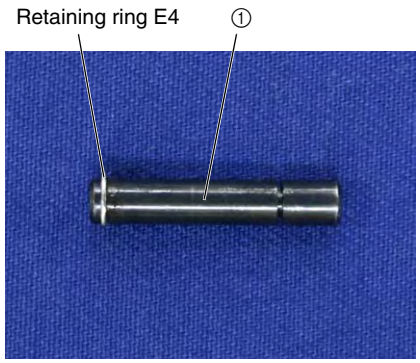


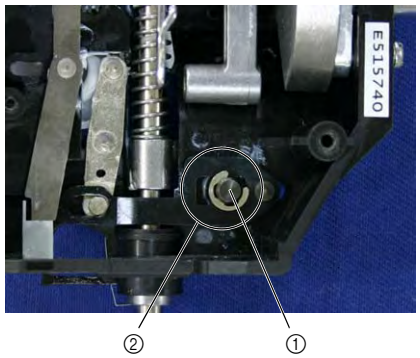


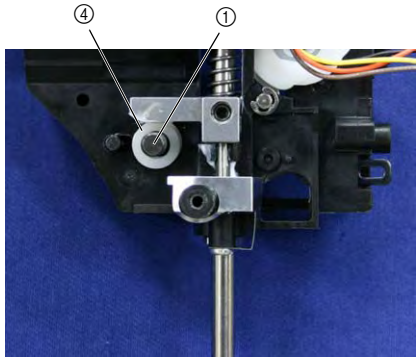
13 Presser foot lifter attachment

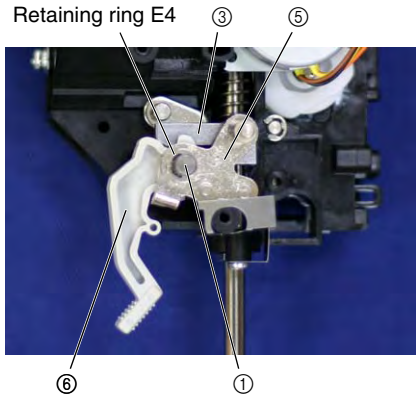
1. Attach the retaining ring E4 to the presser lift shaft ①.
2. Apply a small amount of MOLYKOTE EM30L to the presser lift shaft ①.
3. Insert the presser lift shaft ① into the hole ② in the thread releaser assembly.
4. Attach the washer ④ to the presser lift shaft ①.
5. Lift up the presser bar clamp ③, and then attach the lifter assembly ⑤ and the presser foot lifter ⑥ to the presser lift shaft ①.
6. Attach the retaining ring E4 to the presser lift shaft ①.

Apply MOLYKOTE EM30L to the operating surface of the presser lifter shaft presser foot lifter.	Small amount XC8385***
Apply MOLYKOTE EM30L to the operating surface of the presser foot lifter presser bar clamp	Small amount XC8385***







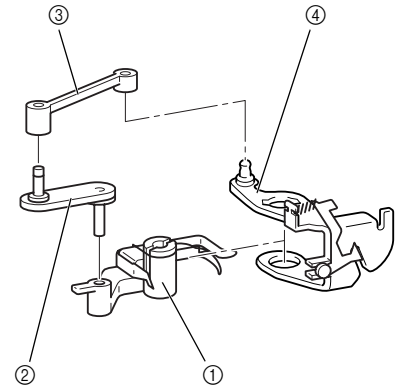


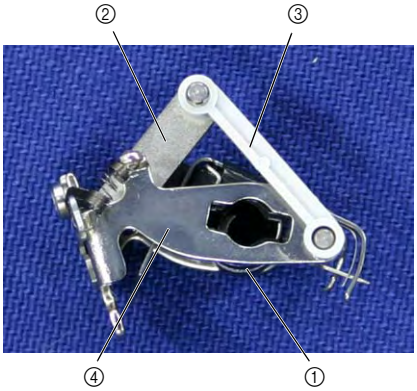
14 Threader hook assy. attachment

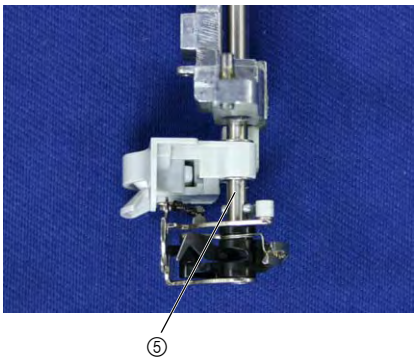
1. Assemble the threader hook assy ①, link A assy ②, link B ③ and thread guide assy ④.
2. Align the needle thread shaft A ⑤ to the shape of the threader hook assy ① shaft hole, and attach the threader hook assy ① to the needle thread shaft A ⑤.

***Key point**

- Assemble the link A assembly ②, link B assembly ③, and thread guide assembly ④ so that a triangle is formed.



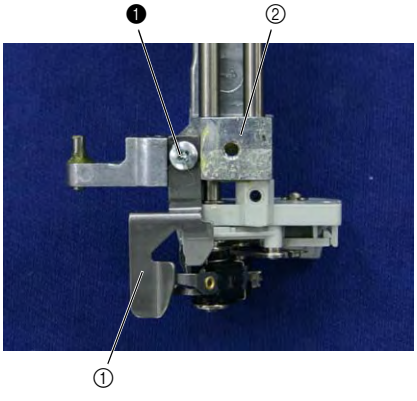




15 Hook release plate attachment

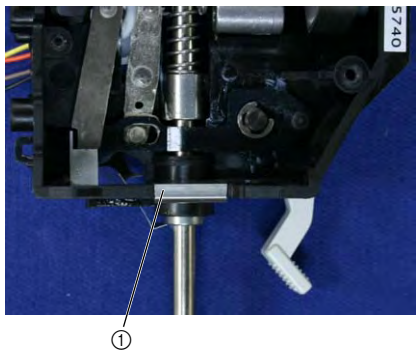
1. Attach the hook release plate ① to the needle bar supporter assy ② the screw ❶.

❶		Screw, Bind M2.6X5	Torque 0.29 – 0.49 N·m



16 Thread guide plate attachment

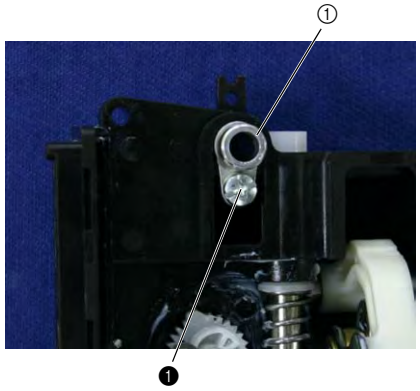
1. Attach the thread guide plate ① to the upper unit holder.



17 Shaft bushing A attachment

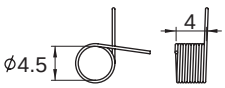
1. Attach the shaft bushing A ① to the upper unit holder using the screw ❶.

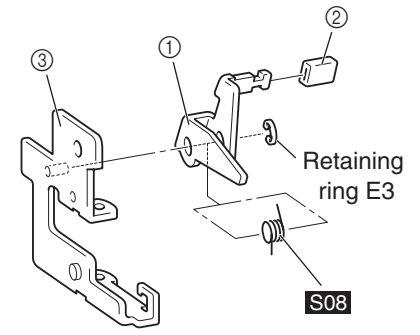
❶		Taptite, Bind B M3X8	Torque 0.78 – 1.18 N·m



18 Assembling the Lever AB assy

1. Attach the cap ② to the lever B ①.
2. Attach the lever B ① and the spring S08 to the lever A assembly ③, and then attach the retaining ring (E3).

S08		TORSION SPRING XC2460***

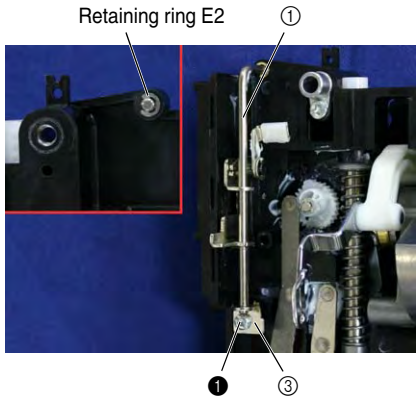


19 Lever AB assy. attachment

1. Attach the retaining ring E2 to the lever guide shaft ①.
2. Apply a small amount of EPNOC AP(N)0 to the lever guide shaft ①.
3. Apply a small amount of MOLYKOTE EM30L to the upper unit holder slide groove.
4. Attach the lever AB assy ② to the lever guide shaft ①.
5. Attach the lever guide shaft assy ① to the upper unit holder, and attach the lever presser plate ③ using the screw ❶.
6. Attach the retaining ring E2 to the lever guide shaft ①.

Apply EPNOC AP(N)0 to the lever guide shaft	Small amount XC8387***
Apply MOLYKOTE EM30L to the full width of the slide lever groove	Small amount XC8385***
Apply MOLYKOTE EM30L to the operating surfaces of the lever B cap and the thread guide slider.	Small amount XC8385***

❶		Taptite, Bind B M3X6	Torque 0.78 – 1.18 N·m

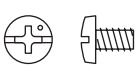


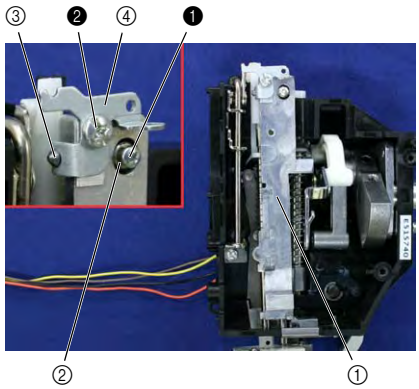
20 Needle bar supporter assy. attachment

1. Attach the needle bar supporter assy ① to the upper unit holder.

   ***Key point**
   - Move the lever AB assy up.
   - Turn the T cam, and move the lower end of the Z zigzag lever to the left.
2. Attach the shaft ②.
3. Attach the shaft ③, and install the screw ❶.
4. Attach the plate ④ using the screw ❷.

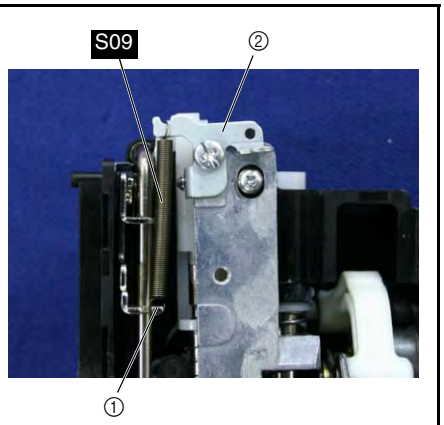
Lubricate the shaft with FBK OIL RO 100.	1 – 2 drops XC8388***

❶		Set Screw, Socket (FT) M4X4	Torque 0.78 – 1.18 N·m
❷		Screw, Bind M3X5	Torque 0.78 – 1.18 N·m



21 Lever A spring attachment

1. Attach the spring S09 to the lever AB assy ① and the plate ②.



S09	30.1, ϕ3.2 A decided hook form is the same.	SPRING XC2461***

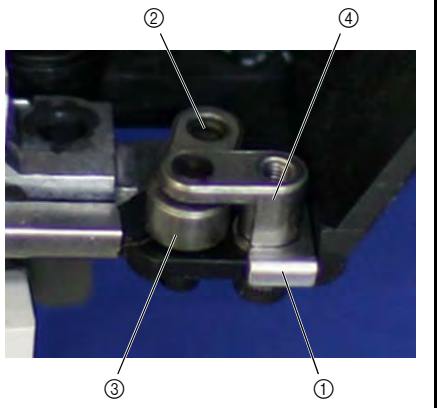
22 Shaft assy. attachment

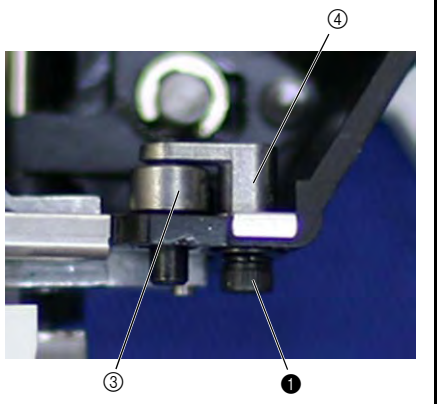
1. Attach the upper unit support plate ①.
2. Apply a small amount of EPNOC AP(N)0 to the needle bar supporter assy needle roller ②.
3. Attach the needle holder block ③ to the needle bar supporter assy needle roller ②.

***Key point**

- The flat surface of the needle holder block is the bottom.

4. Apply a small amount of EPNOC AP(N)0 to the shaft assy ④ shaft.
5. Attach the shaft assy ④ to the needle holder block ③ and upper unit holder, and hand start an the screw ❶.
   (Fully tighten after 4 - 9"Needle interference left/right adjustment.")





Apply EPNOC AP(N)0 to the upper unit holder needle roller		Small amount XC8387***
Apply EPNOC AP(N)0 to the shaft assy. shaft.		Small amount XC8387***

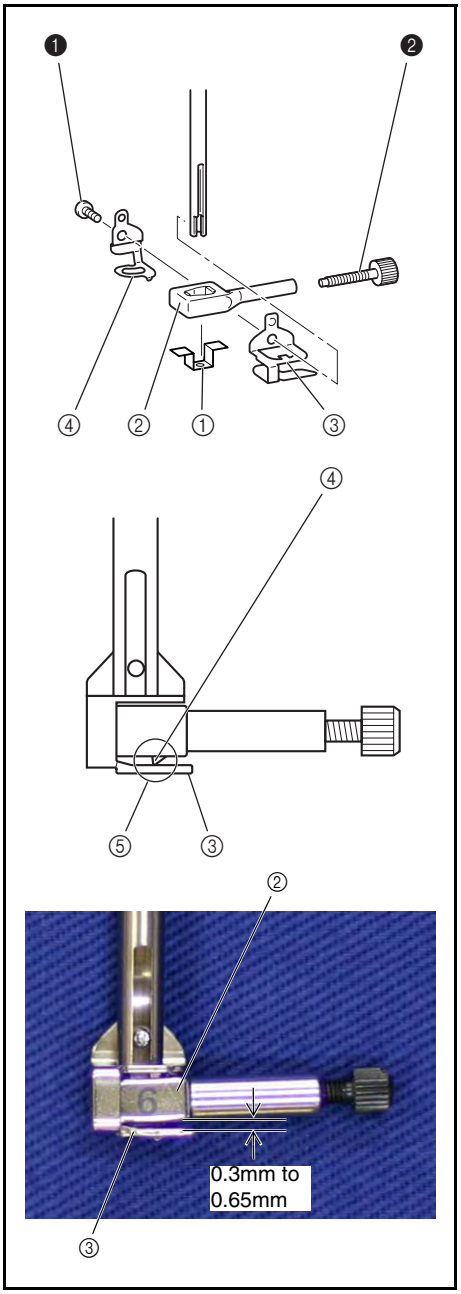
❶		Screw 3X10	Torque 0.78 – 1.18 N·m

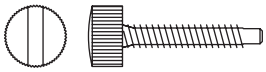
23 Needle bar assembly

1. Attach the needle thread plate ① to the needle block ②.
2. Attach the needle bar thread guide ③, the needle block ② and the needle thread guide spring ④ to the needle bar with the screw ❶.
3. Attach the screw ❷.

***Key point**

- With the needle bar groove facing forward, the screw ❷ is on the right side.
- There should no gap ⑤ between the tip of the thread guide spring ④ and needle bar thread guide ③.
- There should be a 0.3 mm – 0.65 mm gap between the needle bar thread guide ③ and needle block ②.



❶		Screw SM2.58	Torque 0.39 – 1.78 N·m
❷		Needle Clamp Screw	–

24 Needle bar assembly attachment

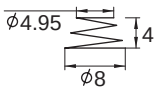
1. Apply a small amount of Epnoc Grease AP to the needle thread block ①.
2. Attach the needle bar ②, needle thread block ①, needle bar hook stand assy. ③, thrust washer and, S43 hand start screws ❶ (two).
   (Fully tighten after 4 - 7 "Needle bar height adjustment," and 4 - 27"Adjust the needle thread block.")

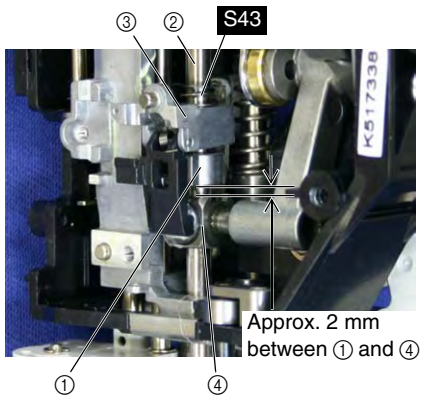
***Key point**

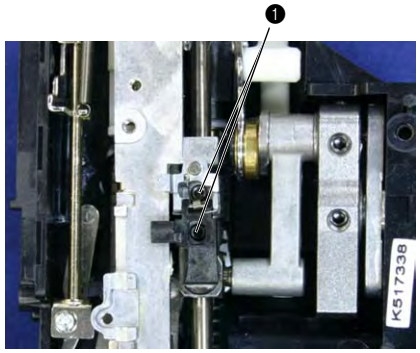
- With the unit shaft D cut ④ facing forward, the upper surface of the needle block ⑤ and the needle bar supporter assy. ⑥ should be adjusted to approximately 10 mm separation.
- Adjust the space between the needle thread block ① and the needle bar block ④ to approximately 2 mm.
- When the needle thread block ① is viewed from the front, it is secured in a position turned slightly counterclockwise (see 4 - 27 "Adjust the needle thread block").

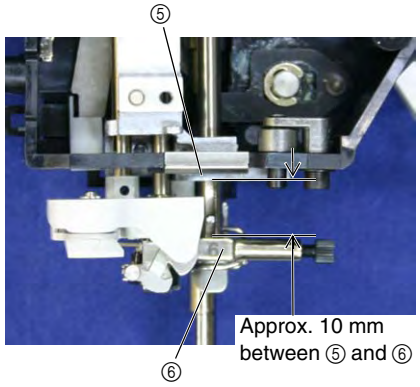
Lubricate the needle bar crank joint area with Molykote (Sewing Lube 90% + Molykote dispersion).	1 – 2 drops
Apply Epnoc Grease AP to the sliding pin part of the needle thread block.	Small amount
Lubricate the needle bar supporter assy. needle operating area with Sewing Lube.	1 – 2 drops

Start movie clip (CD-ROM version only)

❶		Set Screw, Socket (FT) M4X4	Torque Hand tighten
S43		NEEDLE BAR PRESSER SPRING XC6254***	



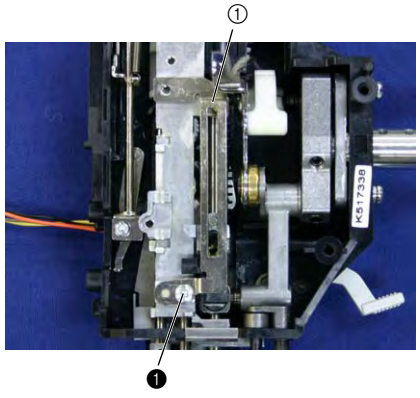




25 Release guide plate attachment

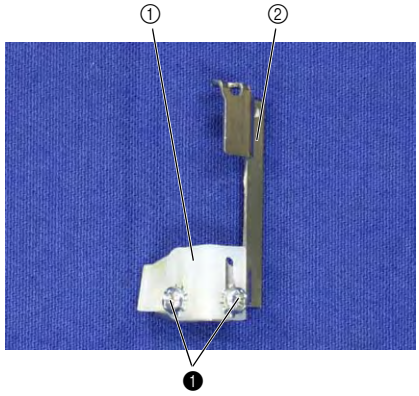
1. Attach the release guide plate ① using screws ❶.

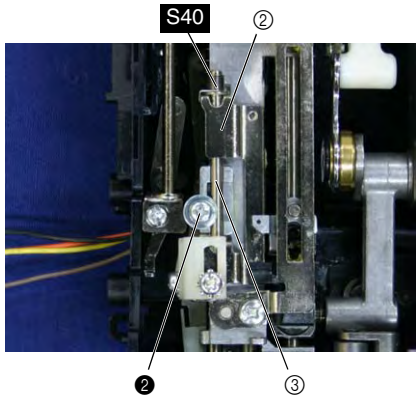
❶		Screw, Bind M3X6	Torque 0.79 – 1.18 N·m



26 Release lever attachment

1. Attach retaining washer E2 to the release lever shaft.
2. Attach the release adjuster ① to the release lever ②, and hand start screws ❶ (two). (Fully tighten following 4 - 23 "Release adjustment.")
3. Attach the release lever shaft ③, polyester slider and release lever ② using screw ❷.
4. Attach S40.





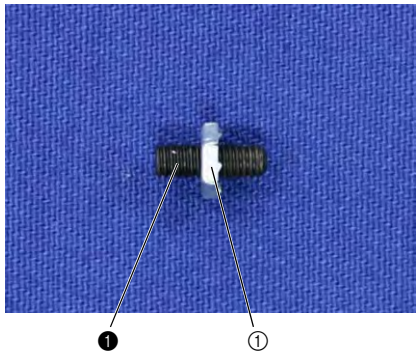
❶	Screw, Pan (T washer) M3X6 Color; Silver	Torque Hand tighten
❷	Screw, Pan (S/P washer) M3X6F Color; Silver	Torque 0.79 – 1.18 N·m
S40	ϕ3.6, 2.9 — RELEASE LEVER SPRING XC3448***	

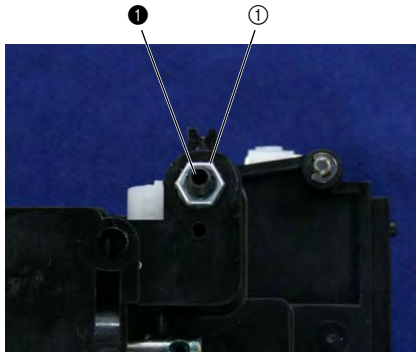
27 Lock nut attachment

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

   ***Key point**
   - The screw ❶ in approximately half its length.
2. Install the screw ❶ in the upper unit holder.

   ***Key point**
   - Tighten until the lock nut ① hits the upper unit holder.
3. Tighten the lock nut ①.





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

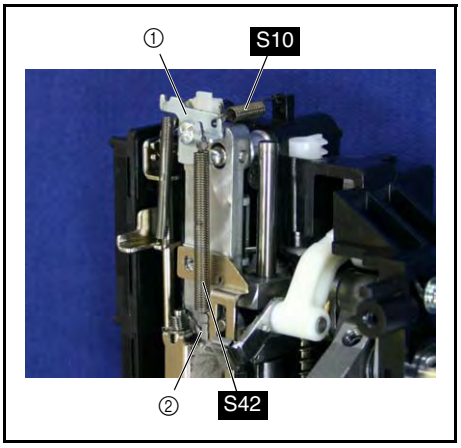
28 Spring (for needle bar supporter assy.) attachment

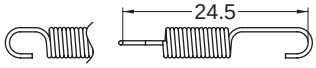
1. Attach S10 to the needle bar supporter assy. plate ① and the upper unit holder.

   ***Key point**
   - Connect the side with the short hook to the needle bar supporter assy. plate ① and the long side to the upper unit holder.

2. Attach S42 to the needle bar supporter assy. plate ① and release guide plate ②.

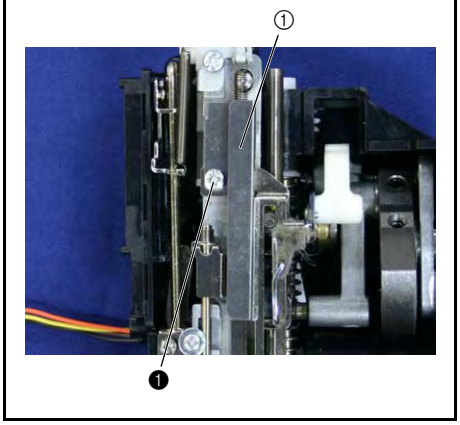
Start movie clip (CD-ROM version only)



S10		SPRING XC2429***
S42	 A decided hook form is the same.	SPRING XC6252***

29 Spring guard attachment

1. Attach the spring guard ① with the screw ❶.



30 Presser dial attachment

1. Attach the presser dial shaft assy ① to the presser dial ②, and attach the retaining ring E4.

   ***Key point**
   - See the figure to the right for the presser dial shaft assy ① D cut ③ and presser dial ② hole ③.

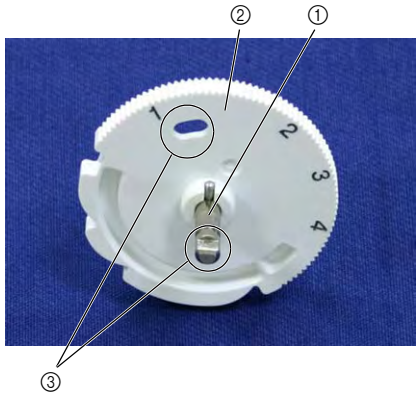
2. Attach the presser dial gear ④.

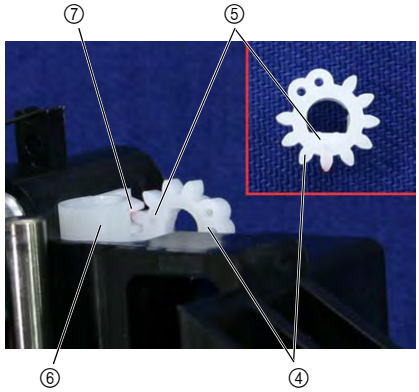
   ***Key point**
   - Align the presser dial gear ④ match mark ⑤ and the first indentation ⑦ from the top in the tension spring receiving gear ⑥ .

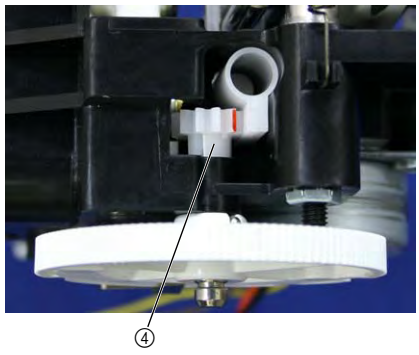
3. Attach the presser dial assy.

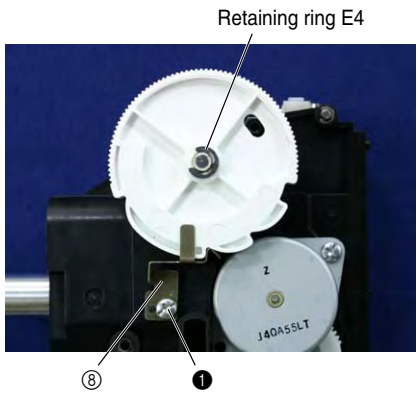
   ***Key point**
   - Align the presser dial shaft assy ① D cut ③ and the presser dial gear ④ D cut.

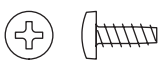
4. Attach the spring plate ⑧ to the upper unit holder using the screw ❶.









❶		Taptite, Bind B M3X8	Torque 0.78 – 1.18 N·m

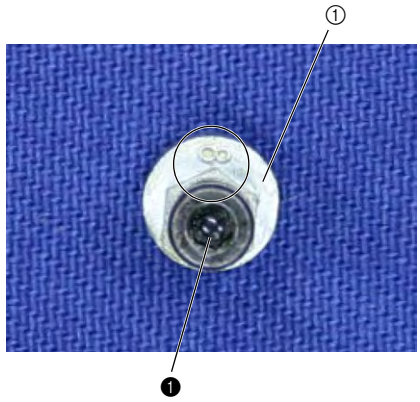
31 Zigzag adjusting nut attachment

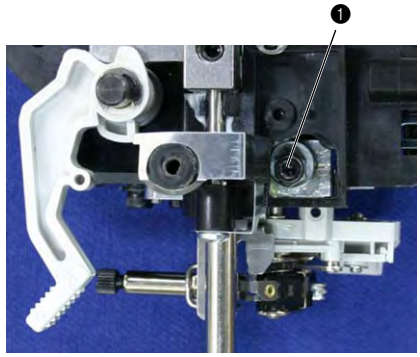
1. Apply a small amount of EPNOC AP(N)0 to the zigzag adjusting nut ①.
2. Hand tighten the zigzag adjusting nut ① on the needle bar supporter assy using the screw ❶.
   (Fully tighten after 4 - 8 "Three point needle drop adjustment.")

***Key point**

- Set the side of the zigzag adjusting nut ① with the greatest eccentricity toward the top (see figure at the right).

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

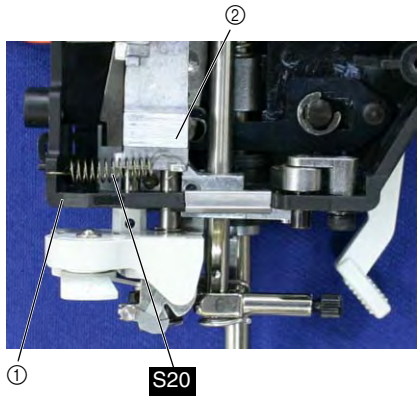




❶	Bolt, Socket M4X25	Torque 0.78 – 1.18 N·m

32 Spring-Z attachment

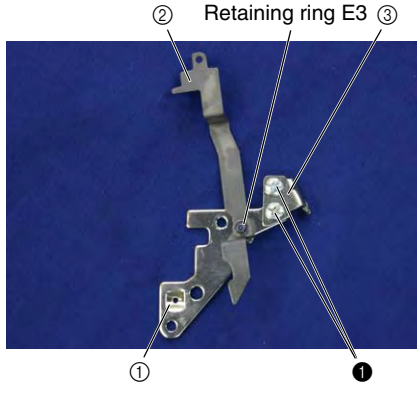
1. Attach the spring S20 to the upper unit holder ① and the needle bar supporter assy ②.



S20	14.3, ϕ5 A decided hook form is the same.	SPRING-Z XC2748***

33 Adjusting plate assy. assembly

1. Attach tension release plate C ① to the adjusting plate assy. ②, and attach retaining ring E3.
2. Attach wire guide plate U ③ to the adjusting plate assy. ② using the screws ❶ (two).



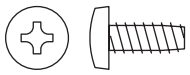
❶	Screw, Bind M4X6	Torque 1.18 – 1.57 N·m

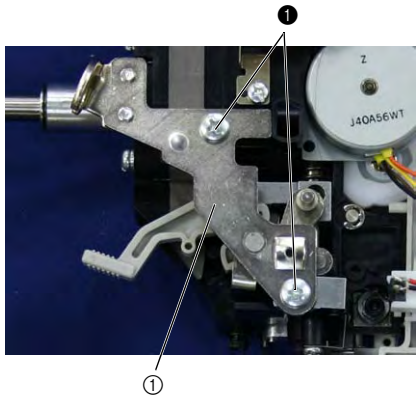
34 Adjusting plate assy. attachment

1. Attach the adjusting plate assy ① to the upper unit holder using the 2 screws ❶.

***Key point**

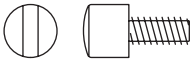
- Hold the adjusting plate assy ① against the right stopper ② and attach.
- Align the presser lifter shaft and the adjusting plate assy hole ③.

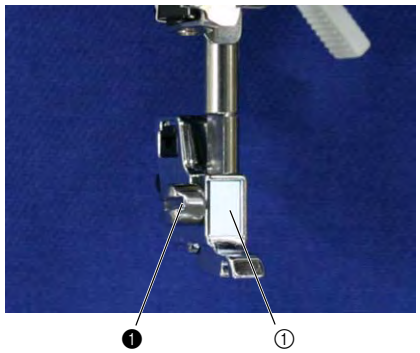
❶		Taptite, Bind B M4X10	Torque 1.18 – 1.57 N·m



35 Presser feed holder assy. attachment

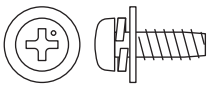
1. Attach the presser feed holder assy ① to the presser bar using the screw ❶.

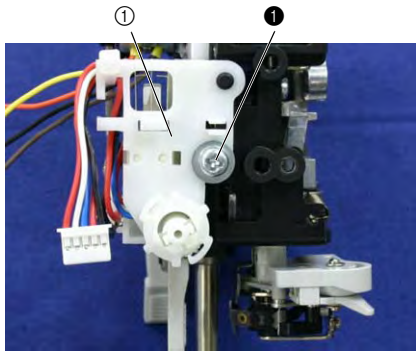
❶		Screw 3.57	Torque 1.18 – 1.57 N·m



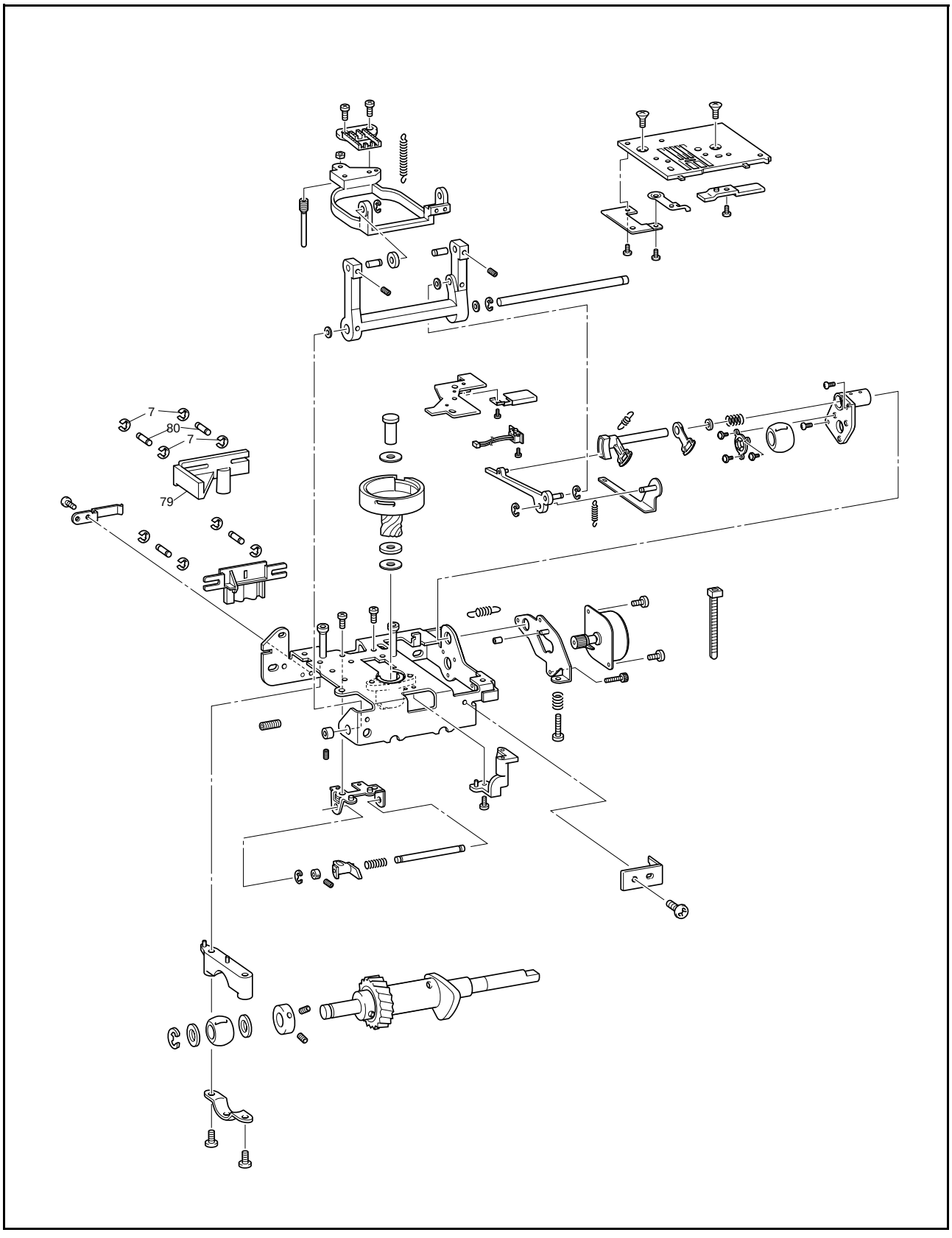
36 BH switch assy. attachment

1. Attach the BH switch assy ① to the upper unit holder using the screw ❶.

❶		Taptite,Pan B M4X12	Torque 1.18 – 1.57 N·m

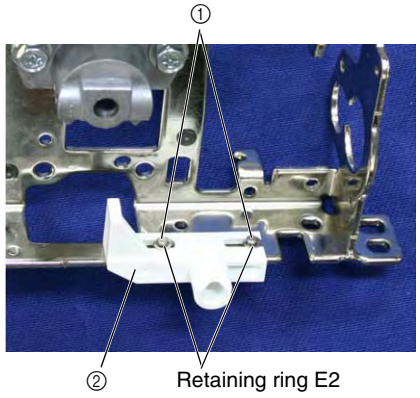


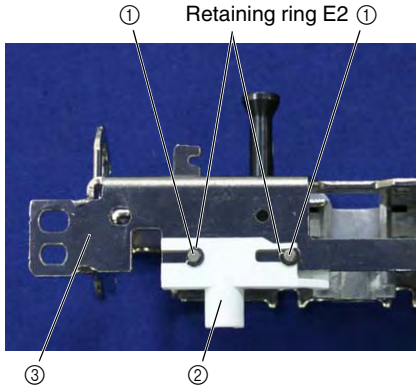
Feed module breakout diagram



1 Drop lever FE attachment

1. Attach the 2 retaining rings (E6) to 2 slide shafts A ①.
2. Attach 2 slide shafts ① and the drop lever FE ② to the feed base ③, and then attach the 2 retaining rings (E6).

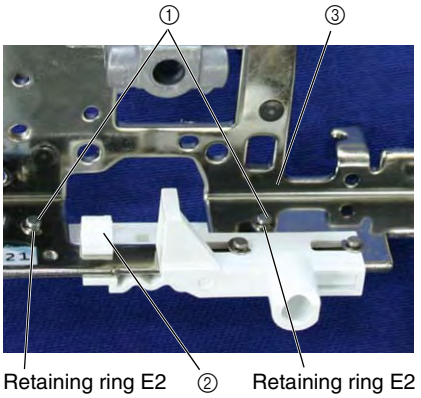


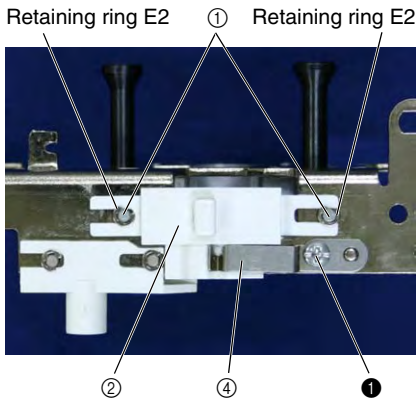


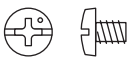
2 Drop knob attachment

1. Attach the 2 retaining rings E2 to the 2 slide shafts B ①.
2. Attach the drop knob ② and to the 2 slide shaft B assembly ① to the feed base ③, and the 2 attach retaining rings E2.
3. Apply a small amount of Molykote EM30L to the drop knob ②.
4. Attach the spring plate ④ using the screw ❶.

Apply MOLYKOTE EM30L to the sliding parts of the drop knob and spring plate	Small amount XC8385***





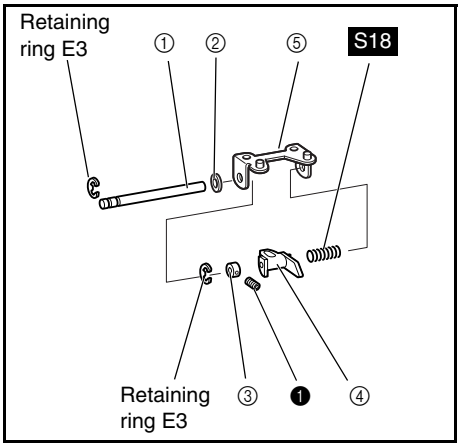
❶		Screw, Bind M3X4	Torque 0.78 – 1.18 N·m

3 Drop assy. assembly

1. Attach the retaining ring E3 to the vertical feed shaft ①.
2. Attach the vertical feed shaft assy ①, polyester slider ②, set screw collar 4 ③, vertical lever ④, and spring S18 to the vertical supporting plate ⑤, and attach retaining ring E3.
3. Hand start the screw ❶ in the set screw collar 4 ③.
   (Fully tighten after 3 - 68 "11. Lower shaft B assy. attachment.")
4. Apply 1 – 2 drops of OILER B ASSY to the vertical feed shaft assy. ①.

Lubricate the vertical feed shaft with OILER B ASSY.	1 – 2 drops XZ0206***

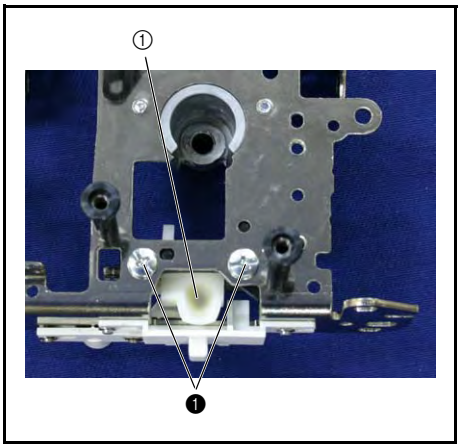
❶		Set Screw, Socket (CP) M4X4	Torque Hand tighten
S18	11, ϕ5.7		SPRING XC2550***



4 Drop assy. attachment

1. Attach the drop assy ① using the 2 screws ❶.

❶		Screw, Bind M4X5	Torque 1.18 – 1.57 N·m

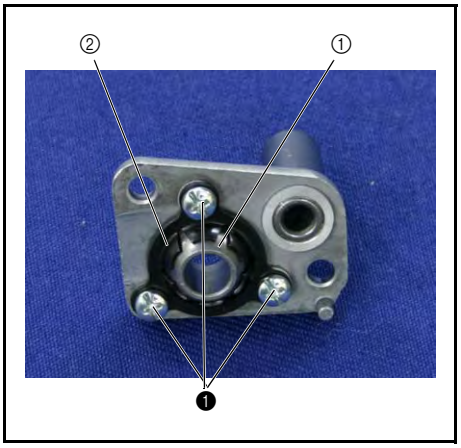


5 Bushing supporter assy. assembly

1. Attach the lower shaft bushing ① and the bushing presser B ② to the bushing supporter assy ③ using the 3 screws ❶.
2. Lubricate the lower shaft bushing ① with 1 – 2 drops of FBK OIL RO 100.

Lubricate the lower shaft bushing round surface with FBK OIL RO 100.	1 – 2 drops XC8388***

❶		Screw, Bind M4X5	Torque 0.78 – 1.18 N·m

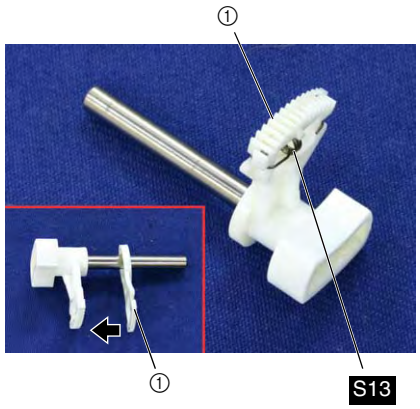


6 Feed adjuster assembly

1. Apply a small amount of EPNOC AP(N)0 to the F gear ①.
2. Align the F gear ① and the feed adjuster assy. ② and attach spring S13.

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

S13		SPRING XC2530***

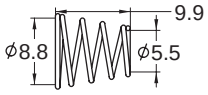


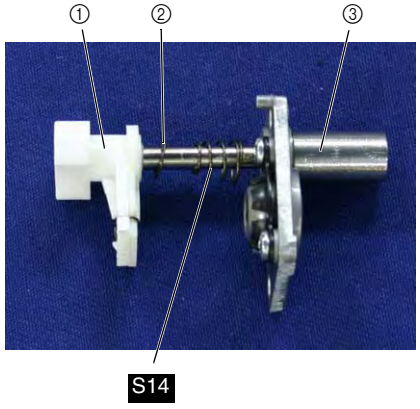
7 Feed adjuster assembly attachment

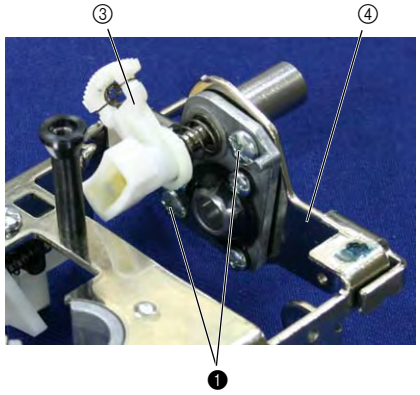
1. Attach the feed adjuster assy. ①, polyester slider ② and spring S14 to the bushing supporter assy. ③.

   ***Key point**
   - Attach spring S14 to the feed adjuster assy. ② starting with the side having the smaller spring diameter.
2. Attach the bushing supporter assy. ③ and feed adjuster assy. ② to the feed base ④ using the screws ❶ (two).

Lubricate the feed adjuster assembly 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.	Small amount XC8387***

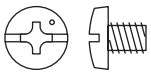
❶		Screw, Bind M4X6	Torque 1.18 – 1.57 N·m
S14			SPRING XC2531***

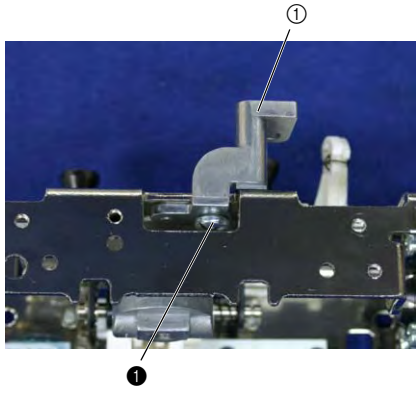




8 Stopper plate block assy. attachment

1. Attach the stopper plate block assy. ① using the screw ❶.

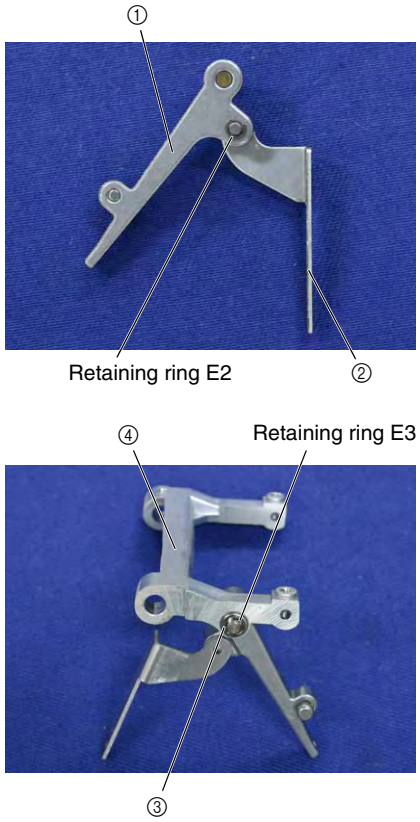
❶		Screw, Bind M4X5	Torque 1.18 – 1.57 N·m



9 Assembling the feed arm assy

1. Attach the feed arm B assy ① to the feed supporting plate assy ②, and attach the retaining ring E2.
2. Lubricate the feed supporting plate assy ② shaft with 1 – 2 drops of FBK OIL RO 100.
3. Attach the feed arm B assy ① and the polyester slider ③ to the feed arm A ④, and the attach retaining ring E3.
4. Lubricate the feed arm B assy ① with 1 – 2 drops of FBK OIL RO 100.

Lubricate the feed supporting plate assy. shaft with FBK OIL RO 100	1 – 2 drops XC8388***
Lubricate the feed arm B assy. with FBK OIL RO 100	1 – 2 drops XC8388***



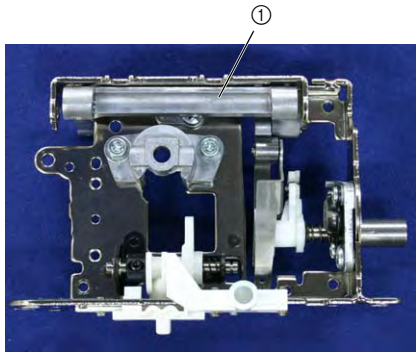
10 Feed arm assembly attachment

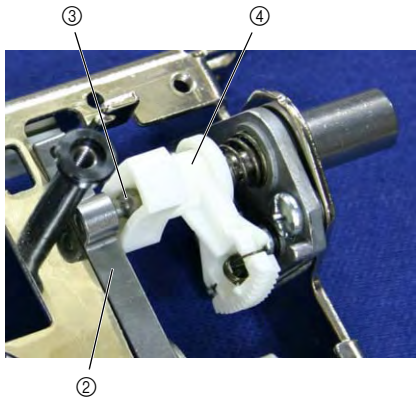
1. Insert the feed arm assembly ① from the bottom.

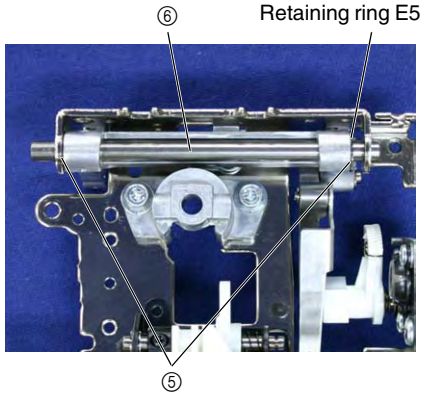
   ***Key point**
   - Insert the feed rectangular side shaft ③ of the feed arm B ② into the feed adjuster ④ on the top side.
2. Place the thrust washer ⑤ between the left base plate and feed arm A.
3. Insert the grooved end of the horizontal feed shaft ⑥ from the left base plate.
4. Pass the horizontal feed shaft ⑥ through to the left feed arm A.
5. Place the thrust washer ⑤ between right feed arm A and the base plate.
6. Pass the horizontal feed shaft ⑥ through to the right base plate.
7. Attach the retaining ring (E5) between right feed arm A and the base plate.

   ***Key point**
   - Move the retaining ring (E5) to feed arm A so that it can secure the thrust washer ⑤.
8. Apply 1 or 2 drops of sewing lubricant to the 2 sections ⑥ where the horizontal feed shaft is inserted in feed arm A.

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





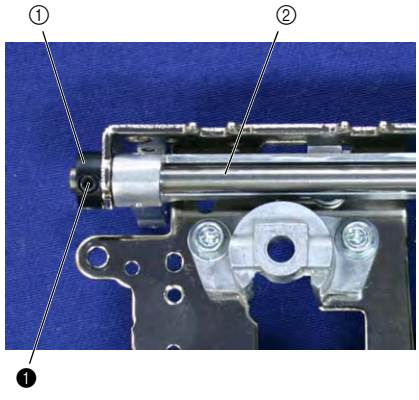


11 Set screw collar attachment

1. Attach the set screw collar ① to the horizontal feed shaft ② with the screw ❶.

   ***Key point**
   - Move the horizontal feed shaft ② in the direction of the set screw collar ① to eliminate backlash, and then press the set screw collar ① to the base plate.

❶		Set Screw, Socket (CP) M4X4	Torque 1.18 – 1.57 N·m

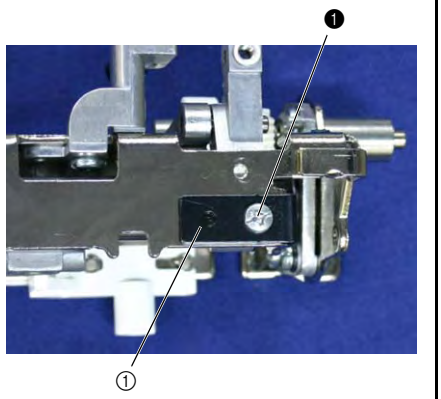


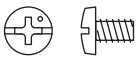
12 Shaft stopper plate attachment

1. Attach the shaft support plate ① to the base plate with the screw ❶.

***Key point**

- Engage the positioning tab on the shaft support plate ① with the positioning hole on the base plate.



❶		Screw, Bind M3X5	Torque 1.18 – 1.57 N·m

13 Assembling the lower shaft B assy

1. Attach the set screw collar ①, thrust washer ②, lower shaft bushing ③ and thrust washer ② to the lower shaft B assy. ④, and attach retaining ring E6.

***Key point**

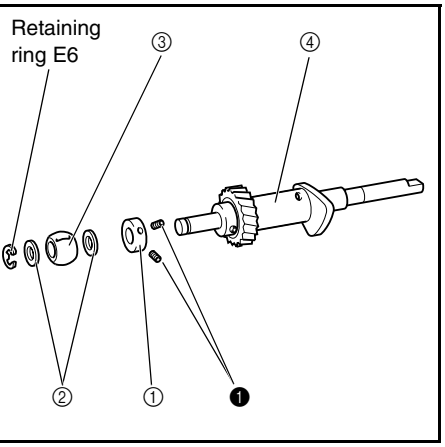
- Attach the set screw collar ① with the ground surface facing the lower shaft bushing ③.

2. Install the 2 screws ❶ in the set screw collar ①.

***Key point**

- Attach the set screw collar ① in a position that allows the lower shaft bushing ③ to turn smoothly.

3. Lubricate the lower shaft bushing ③ with 1 – 2 drops of OILER B ASSY.



Lubricate the lower shaft bushing with OILER B ASSY	1 – 2 drops XZ0206***

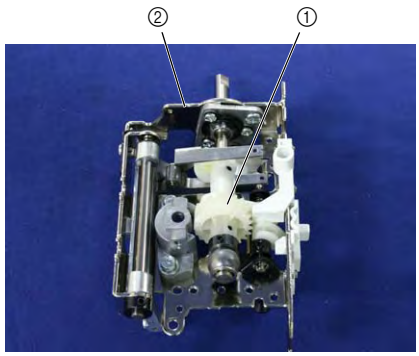
❶		Set Screw, Socket (CP) M4X4	Torque 0.78 – 1.18 N·m

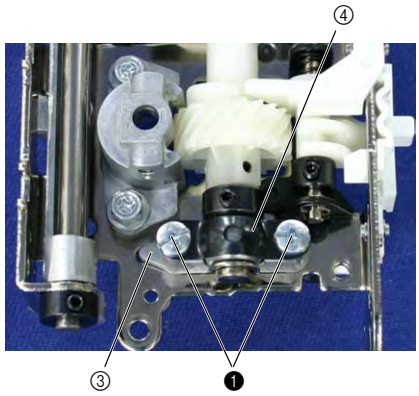
14 Lower shaft B assy. attachment

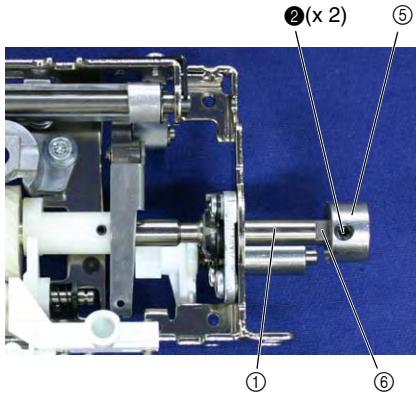
1. Attach the lower shaft B assy ① to the feed base ②.
2. Attach the bushing supporter A ③ to the feed base ②.
3. Attach the bushing presser A ④ using the 2 screws ❶.
4. Attach the joint ⑤ using the 2 screws ❷.

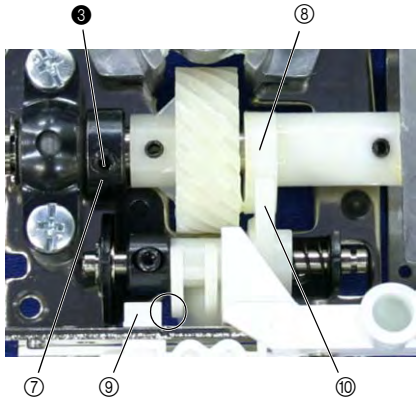
   ***Key point**
   - Align the screw hole in the joint ⑤ and the D cut surface ⑥ in the lower shaft B assy ①.
5. Adjust the right-left position of the set screw collar 4 ⑦ so that there is a gap between the vertical lever ⑧ and the drop knob ⑨ and so that the contact area of the vertical lever ⑧ does not come off of the vertical feed cam ⑩ of the vertical lever ⑧, and fully tighten the screw ❸.

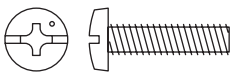
Lubricate the lower shaft (inserted side of bushing supporter assy.) with OILER B ASSY.	1 – 2 drops XZ0206***





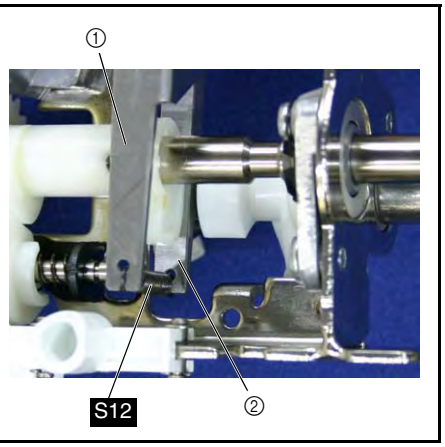


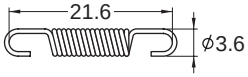


❶		Screw, Bind M4X16	Torque 1.18 – 1.57 N·m
❷		Set Screw, Socket (FT) M5X5	Torque 1.18 – 1.57 N·m
❸		Set Screw, Socket (CP) M4X4	Torque 0.78 – 1.18 N·m

15 Supporting plate spring attachment

1. Attach the spring S12 to the feed supporting plate assy ① and the feed arm B assy ②.

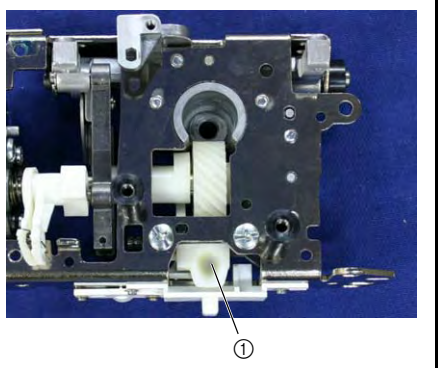


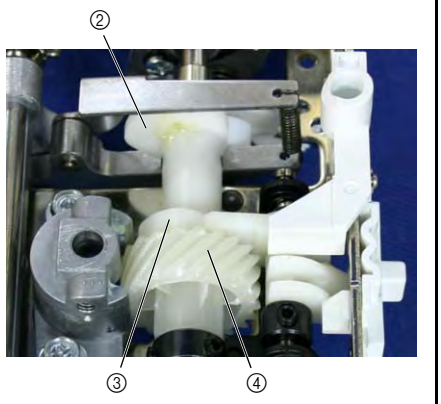
S12		SPRING XC2524***

16 Grease applications

1. Apply a small amount of EPNOC AP(N)0 to the vertical rod seat ① on the vertical lever, the lower shaft horizontal feed cam surface ② and the vertical feed cam surface ③.
2. Apply a small amount of MOLYKOTE EM30L to the lower shaft gear ④.

Apply EPNOC AP(N)0 to the vertical rod seat	Small amount XC8387***
Apply EPNOC AP(N)0 to the vertical feed cam surface	Small amount XC8387***
Apply EPNOC AP(N)0 to the horizontal feed cam surface	Small amount XC8387***
Apply MOLYKOTE EM30L to all of the teeth around the lower shaft gear	Small amount XC8385***





17 Vertical adjusting screw attachment

1. Attach the M5 nut ① to the vertical adjusting screw ②.

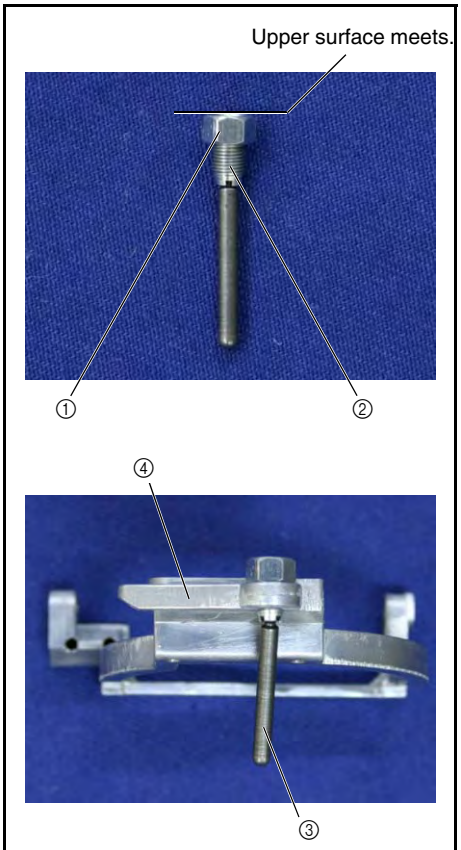
***Key point**

- Tighten the M5 nut ① until the M5 nut ① and the upper surface of the vertical adjusting screw ② meet.

2. Attach the vertical adjusting screw assembly ③ to the feed bar ④.

***Key point**

- Tighten until the bottom of the M5 nut ① touches the feed bar ④.



18 Feed bar attachment

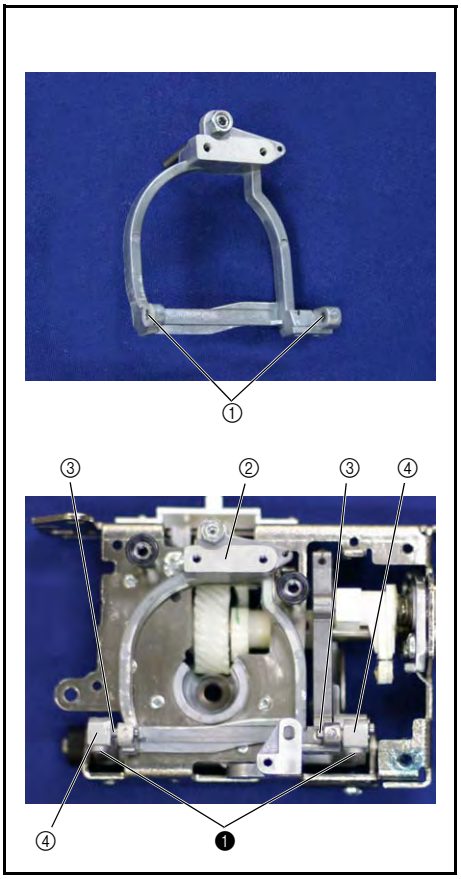
1. Apply a small amount Molykote EM30L to the 2 shaft holes ① in the feed bar.
2. Attach the feed bar ② and feed bar shaft A ③ to the feed arm A ④ using the 2 screws ❶.

***Key point**

- Feed bar shaft A ③ is attached from the inside of the feed bar ②.

Apply MOLYKOTE EM30L to feed shaft holes in the feed bar	Small amount XC8385***
Apply MOLYKOTE EM30L to feed bar shaft A	Small amount XC8385***

❶		Set Screw, Socket (CP) M4X4	Torque 1.18 – 1.57 N·m

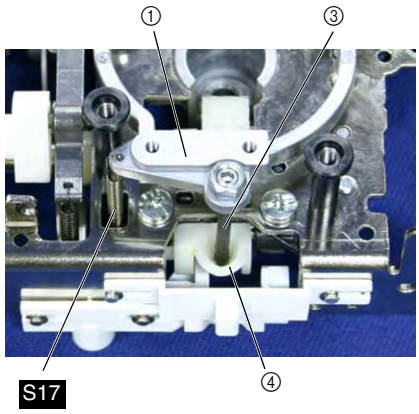


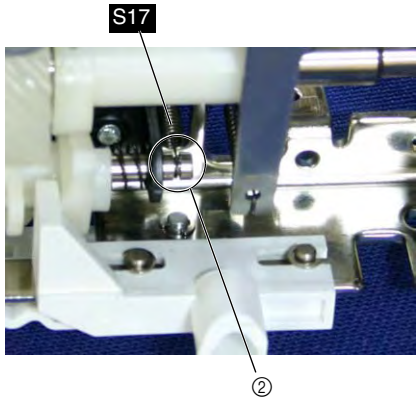
19 Feed bar spring attachment

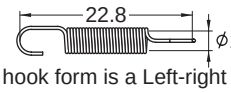
1. Attach the spring S17 to the feed bar ① and vertical feed shaft ②.

***Key point**

- Align the vertical rod ③ with the seat of the vertical lever ④.





S17	 A hook form is a Left-right object.	SPRING XC2547***

20 Outer rotary hook assy. attachment

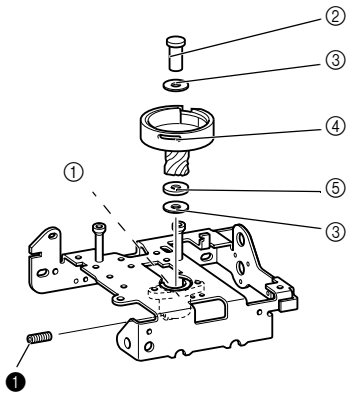
1. Apply a small amount of Molykote EM30L to the shaft supporter ①.
2. Install the outer rotary hook shaft ②, spacer (thin) ③, outer rotary hook assy ④, washer 6 (thick) ⑤ and the spacer (thin) ③.

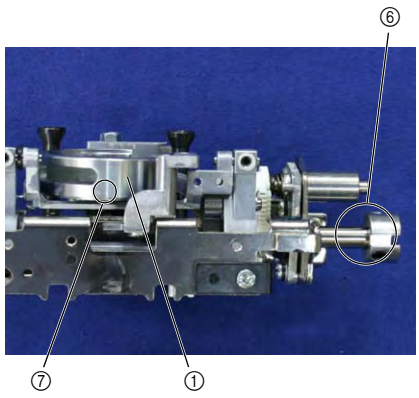
***Key point**

- With the D cut ⑥ in the lower shaft B facing upward, attach so that the solid dot ⑦ on the rotary hook assy faces forward.
  *Attach from a position where ⑦ is 45 deg. to the right.

3. Install the screw ❶ in the shaft supporter.

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

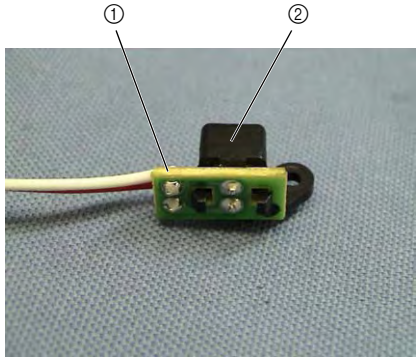




❶		Set Screw, Socket (CP) M4X6	Torque 1.18 – 1.57 N·m

21 Photo diode holder ASSY assembly

1. Engage the photo diode assembly ① with the 2 hooks on the photo diode holder ②.



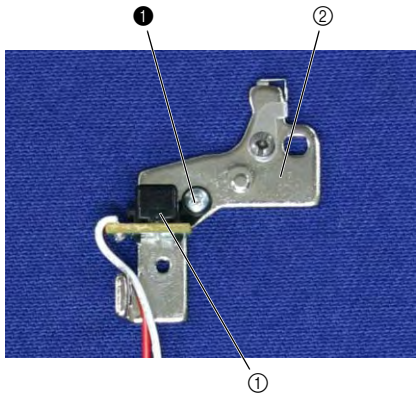
22 Photo diode holder assembly attachment

1. Attach the photo diode holder assembly ① to the inner rotary hook bracket ② with the screw ❶.

***Key point**

- Engage the positioning tab on the photo diode holder assembly ① with the positioning hole on the inner rotary hook bracket ②.

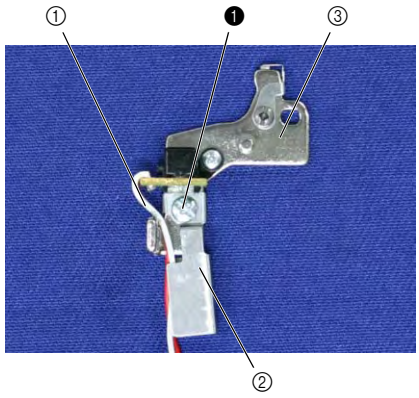
❶		Screw, Bind M2X4	Torque 0.29 – 0.49 N·m



23 Cord holder attachment

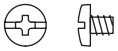
1. Pass the photo diode lead wire ① through the cord holder ②.
2. Attach the cord holder ② to the inner rotary hook bracket ③ with the screw ❶.

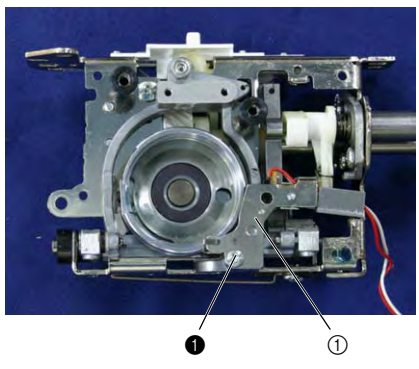
❶		Screw, Bind M2X3	Torque 0.29 – 0.49 N·m



24 Inner rotary hook bracket assy. attachment

1. Align the inner rotary hook bracket assy ① with the stopper plate block, and hand start the screw ❶
   (Fully tighten after 4 - 26"Inner rotary hook bracket position adjustment.")

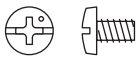
❶		Screw, Bind M2.6X3	Torque 0.78 – 1.18 N·m

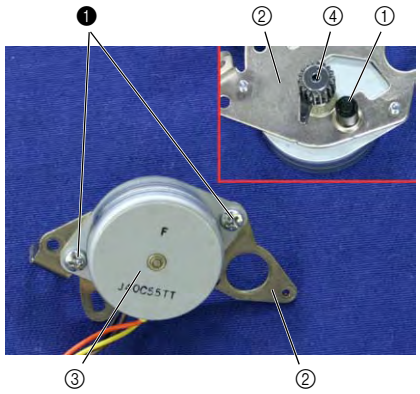


25 Assembling F pulse motor assembly

1. Attach the rubber ① to the FPM holder assy ②.
2. Attach the F pulse motor (FPM35SP-9N) ③ to the FPM holder assy ② using the screws the 2 screws ❶.
3. Lubricate bearing ④ of the F pulse motor (FPM35SP-9N) ② with FBK OIL RO 100.

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

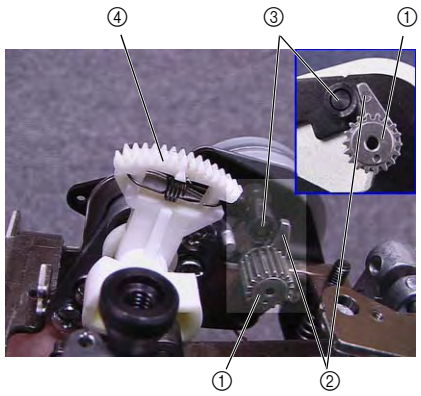
❶		Screw, Bind M3X5	Torque 0.78 – 1.18 N·m

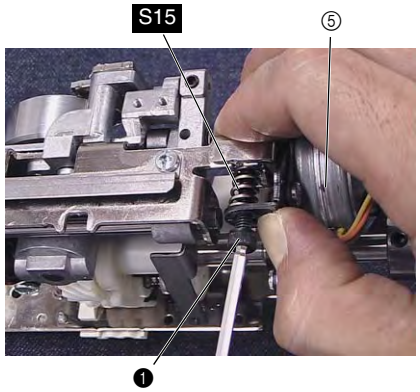


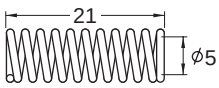
26 FPM holder assy. attachment

1. Turn the F pulse motor gear ① counterclockwise until the stopper ② on it touches the FPM holder assy shaft. ③.
2. Set the feed adjuster assy ④ to the position in the figure to the right.
3. Attach the F pulse motor assy ⑤.
4. Attach the spring S15 and the screw ❶.

   ***Key point**
   - To prevent the screw ❶ from being tightened into the spacer at an angle, tighten the screw ❶ with the spring S15 compressed.
   - Tighten the screw ❶ until the screw hole in the feed base comes approximately to the center of the hole ⑥ in the FPM holder assy.
5. Hand start the screw ❷.
   (Fully tighten after 4 - 15 "Feed adjustment.")





❶		Bolt, Socket M4X25	—
❷		Screw M3X8	Torque 0.27 – 0.48 N·m
S15			SPRING XC2537***

27 F gear teeth alignment

1. Apply a small amount of EPNOC AP(N)0 to the feed adjuster assy F gear ①.
2. Turn the F pulse motor gear ② clockwise until the stopper ③ on it touches the bushing supporter assy shaft ④.
3. Turn the feed adjuster assy ⑤ until it touches ⑥ the F pulse motor gear ②.

***Key point**

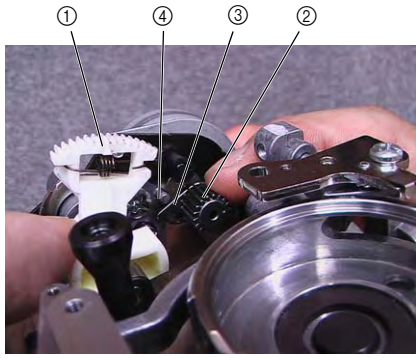
- Once the feed adjuster assy ⑤ and F pulse motor gear ② are touching, hold the F pulse motor gear ② with your finger ⑦ so that it does not turn.

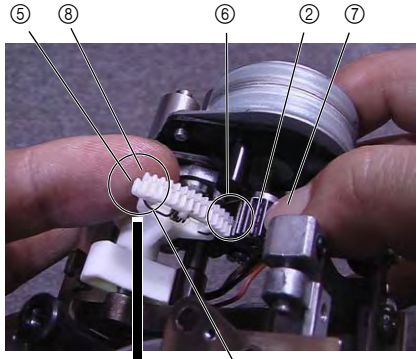
4. Push the feed adjuster assy ⑤ until it and the F gear ⑧ have their gears aligned ⑨.
5. With the gears aligned ⑨, push them down, and mesh the feed adjuster assy ⑤ and F pulse motor gear ②.

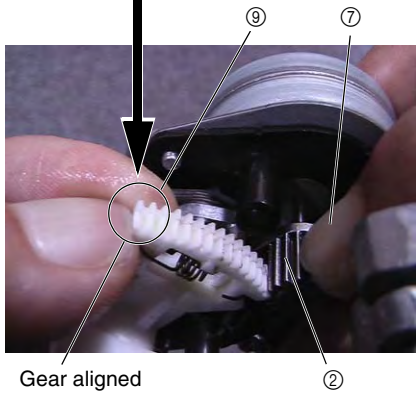
***Key point**

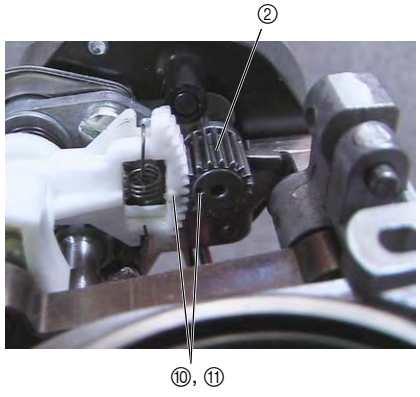
- Check that the feed adjuster assy ⑤ gear match mark ⑩ and the F pulse motor gear ② match mark ⑪ are together.

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



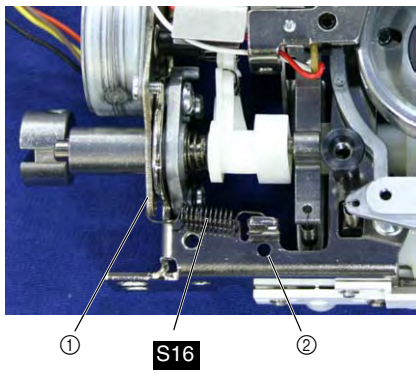


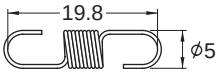




28 Spring attachment (for FPM holder assy.)

1. Attach the spring S16 to the feed base ① and FPM holder assy ②.



S16		SPRING XC2538***

29 Needle plate A ASSY assembly

1. Attach the F gear stopper plate ① to the rear of the needle plate A ② with the screw ❶.

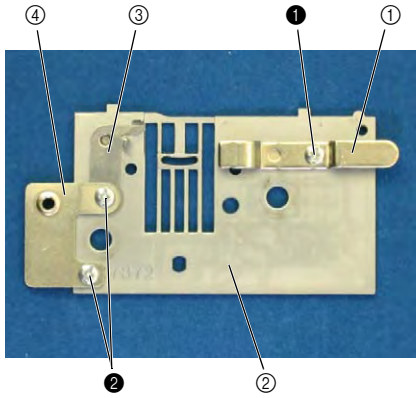
***Key point**

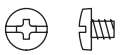
- Engage the positioning tab on the stopper plate with the positioning hole on the needle plate A ②.

2. Attach the stopper plate ③ and then the needle plate B support plate ④ to the rear of needle plate A ② with the 2 screws ❷.

***Key point**

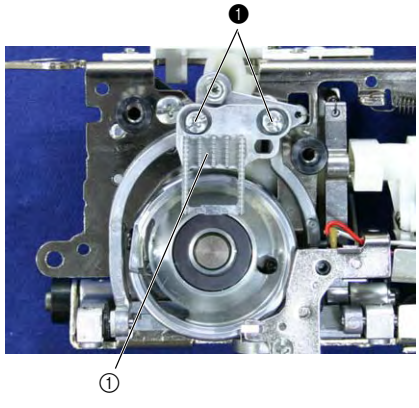
- Engage the positioning tab on the stopper plate with the positioning hole on needle plate A.



❶ ❷		Screw, Bind M2.6X3	Torque 0.57 – 1.78 N·m

30 Feed dog attachment

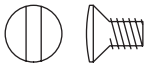
1. Attach the feed dog ① and hand start screws the 2 screws ❶.
(Fully tighten after 4 - 24 "Front/back, left/right position of feed dog adjustment.")

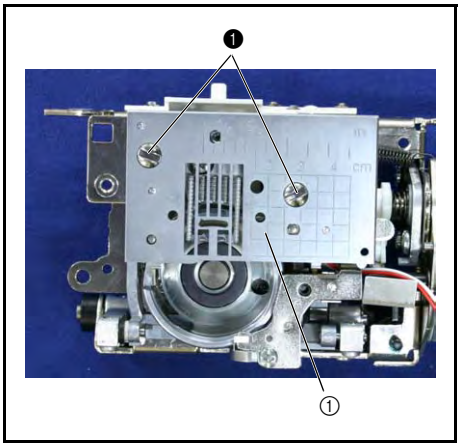


❶		Screw, Bind M3X8	Torque 0.78 – 1.18 N·m

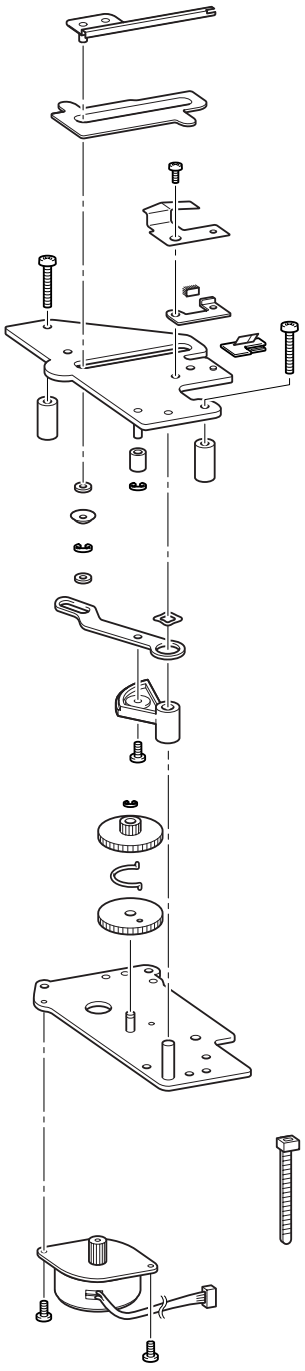
31 Needle plate A assy. attachment

1. Attach the needle plate A ① using the 2 screws ❶.

❶		Screw M4	Torque 1.18 – 1.57 N·m



Thread cutter module breakout diagram



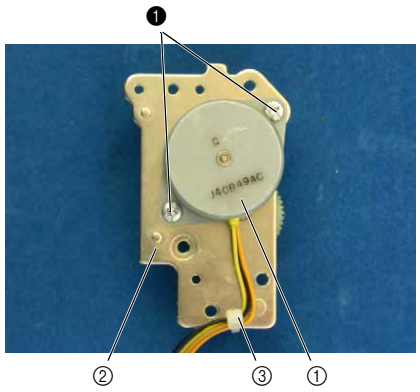
1 C pulse motor attachment

1. Attach the C pulse motor (ZPMM35SP-9N) ① to the motor holder assy ② using the 2 screws ❶.

   ***Key point**

   - Attach the band ③.
2. Lubricate the C pulse motor ① bearing with 1 – 2 drops of turbine oil # 100.

Lubricate the CPM bearing with FBK OIL RO 100.		1 – 2 drops XC8388***
❶	Screw, Bind M3X4	Torque 0.78 – 1.18 N·m



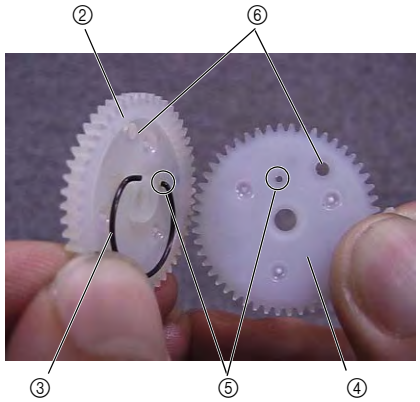
2 Idle gears A and B attachment

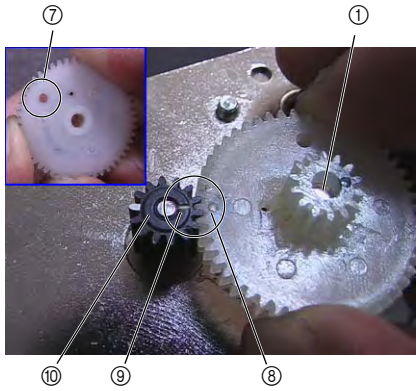
1. Apply a small amount of EPNOC AP(N)0 to the idle gear shaft ①.
2. Attach the idle gear A ②, spring ③ and idle gear B ④ to the idle gear shaft ①, and attach the retaining ring E2.

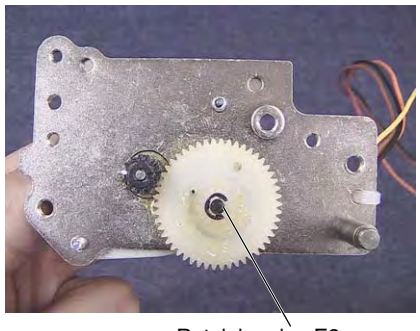
   ***Key point**

   - Insert the spring ③ into the small holes ⑤ in the idle gear A ② and the idle gear B ④, and turn the idle gear A ② clockwise until the large holes ⑥ in the idle gear A ② and the idle gear B ④ overlap ⑦.
   - With the large holes ⑥ aligned, align the match mark ⑧ on the idle gear assy and the match mark ⑨ on the C pulse motor gear ⑩, and attach the idle gear assy to the shaft ①.

Apply EPNOC AP(N)0 to the lever guide shaft	Small amount XC8387***



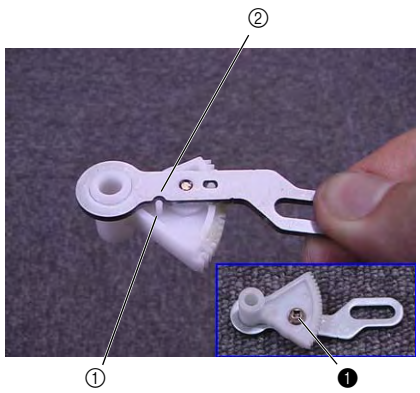




3 Assembling the thread cutter lever assy

1. Attach the thread cutter lever gear ① to the thread cutter lever ② using the screw ❶.

❶		Screw, Pan (S/P washer) M3X6DA	Torque 0.78 – 1.18 N·m



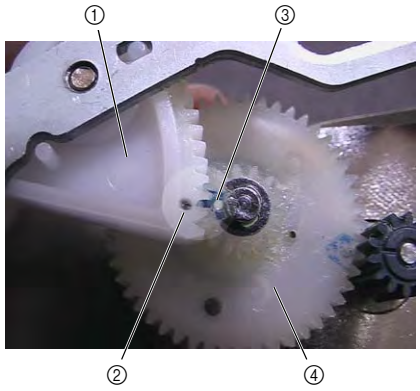
4 Thread cutter lever assy. attachment

1. Apply a small amount of EPNOC AP(N)0 to the thread cutter lever shaft.
2. Attach the thread cutter lever assy ① to the thread cutter lever shaft.

***Key point**

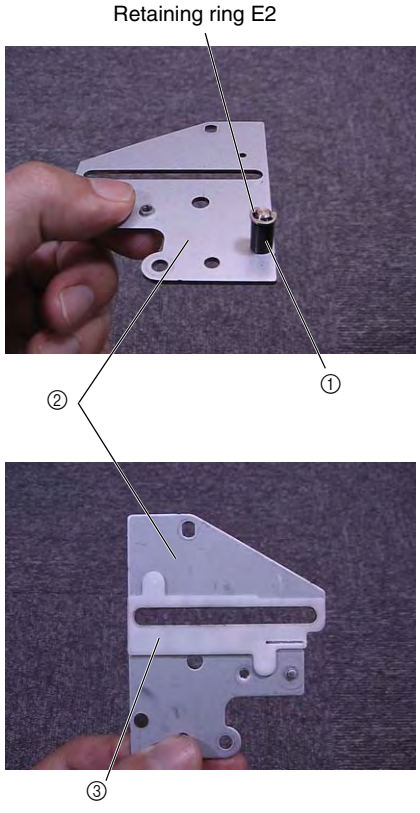
- Align the thread cutter lever assy ① match mark ② with the idle gear assy ④ match mark ③.

Apply a small amount of EPNOC AP(N)0 to the thread cutter lever shaft.	Small amount XC8387***



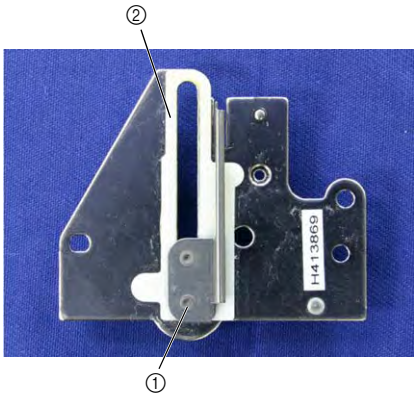
5 Rubber and spacer attachment

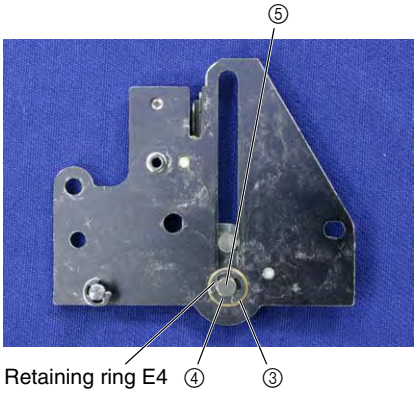
1. Attach the rubber ① to the thread cutter frame ② shaft, and attach retaining ring E2.
2. Attach the spacer ③ to the thread cutter frame ②.



6 Assembling the thread hook assy

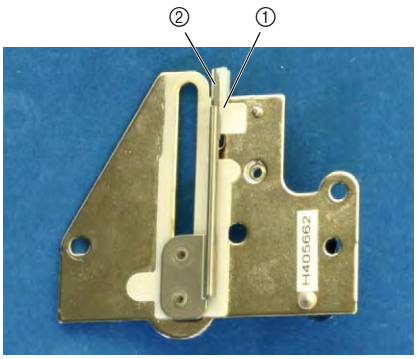
1. Attach the thread hook assembly ① to the spacer ②.
2. Attach the washer ③, polyester slider ④ to pin A ⑤, and then attach the retaining ring (E4).





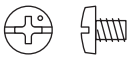
7 Cutter holder assembly attachment

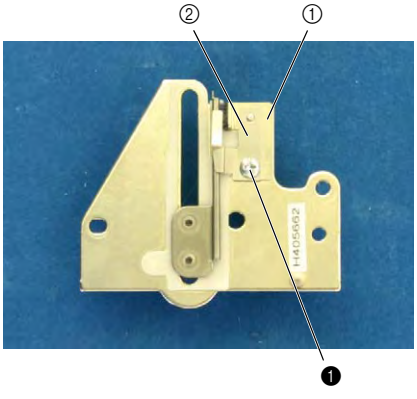
1. Attach the NT lower thread cutter ② to the cutter holder assembly ①.
2. Engage the cutter holder assembly ① with the thread cutter frame.



8 Presser plate assy. attachment

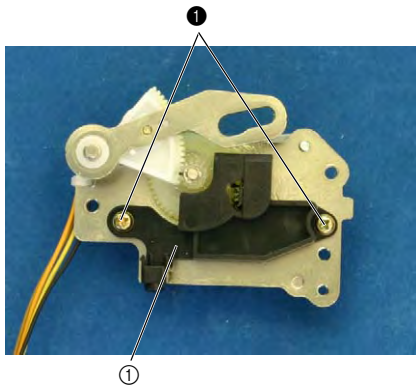
1. Attach the spring ① and the presser plate assembly ② to the thread cutter frame with the screw ❶.

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



9 Sensor holder attachment

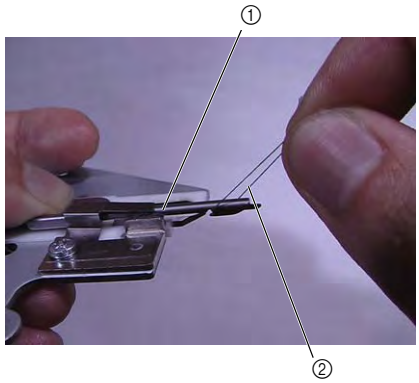
1. Attach the sensor holder ① with the 2 screws ❶.



❶		Screw, Pan (S/P washer) M3X6DA	Torque 0.78 – 1.18 N·m

10 Thread cutter check

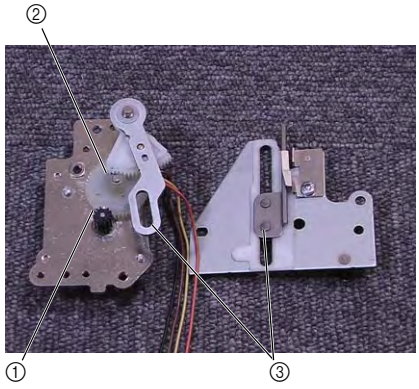
1. Pull the thread hook assy ① from the thread cutter frame assy.
2. Attach Schappe Spun Sewing Thread #30 ② to the end of the thread hook assy ①, and check that the thread is cut when the thread hook assy returns.



11 Grease applications

1. Apply a small amount of EPNOC AP(N)0 to the all of the operating surfaces ① of the idle gear assy. and C pulse motor gear.
2. Apply a small amount of EPNOC AP(N)0 to the all of the operating surfaces ② of the thread cutter lever gear and idle gear assy.
3. Apply a small amount of EPNOC AP(N)0 to the entire operating surface ③ of the thread cutter lever thread hook pin A.

Apply EPNOC AP(N)0 to the entire operating surfaces of idle gears A and B and the CPM gear.	Small amount XC8387***
Apply EPNOC AP(N)0 to the to the operating surfaces of the thread cutter lever gear and idle gears A and B	Small amount XC8387***
Apply EPNOC AP(N)0 to the operating surface of thread hook pin A	Small amount XC8387***

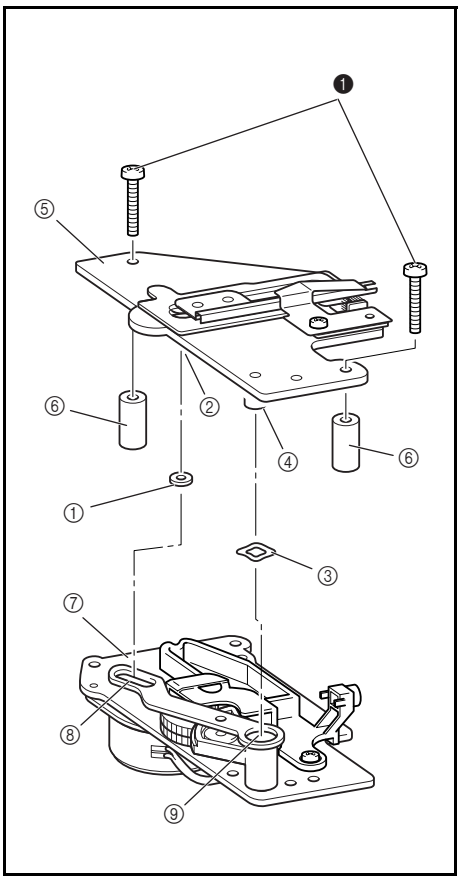


12 Thread cutter frame assembly attachment

1. Attach the polyester slider ① to thread hook pin A ②.
2. Attach the wave-shape spring washer ③ to the thread cutter lever shaft ④.
3. Attach the thread cutter frame assembly ⑤ and the 2 collars ⑥ to the motor holder assembly ⑦ with the 2 screws ❶.

***Key point**

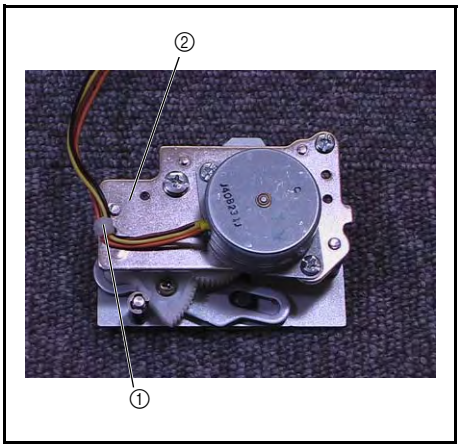
- Align the thread cutter lever shaft ⑧ with the reference hole ⑨ on thread cutter frame, and align thread hook pin A with the hole on the thread cutter lever.



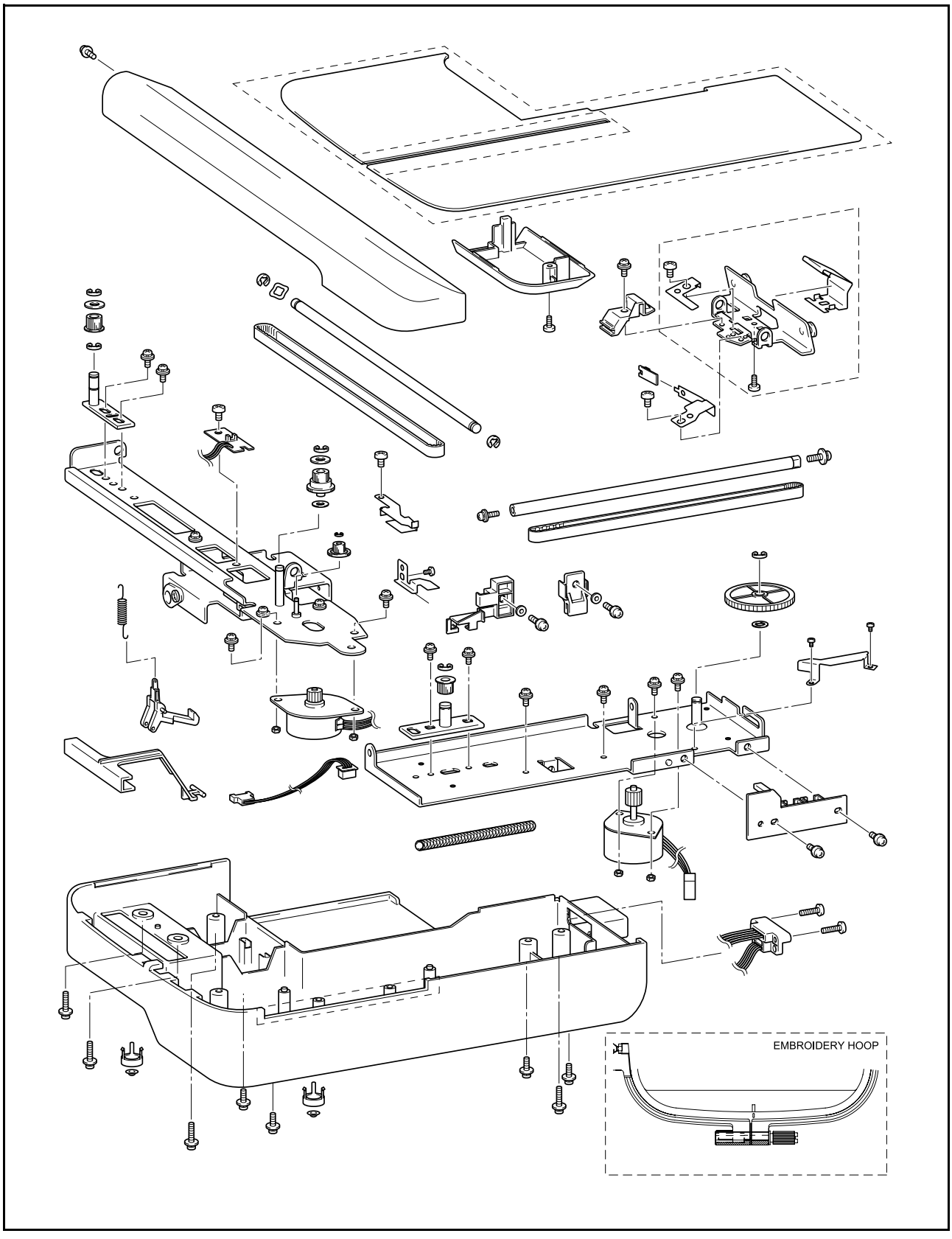
❶	Screw, Bind M4X20	Torque 1.18 – 1.57 N·m

13 CPM lead processing

1. Attach the CPM leads to the motor holder ② using a band ①.



Embroidery parts location diagram

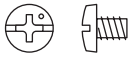


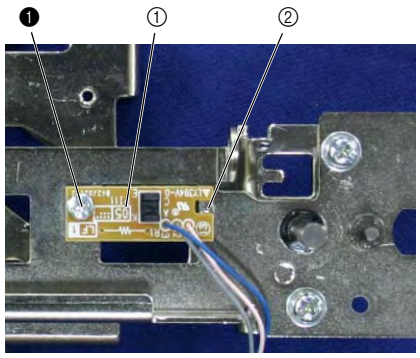
1 Y sensor PCB assembly attachment

1. Attach the Y sensor PCB assembly ① to the X carriage assembly with the screw ❶.

***Key point**

- Engage the tab ② on the X carriage assembly with the groove on the Y sensor PCB assembly ①.

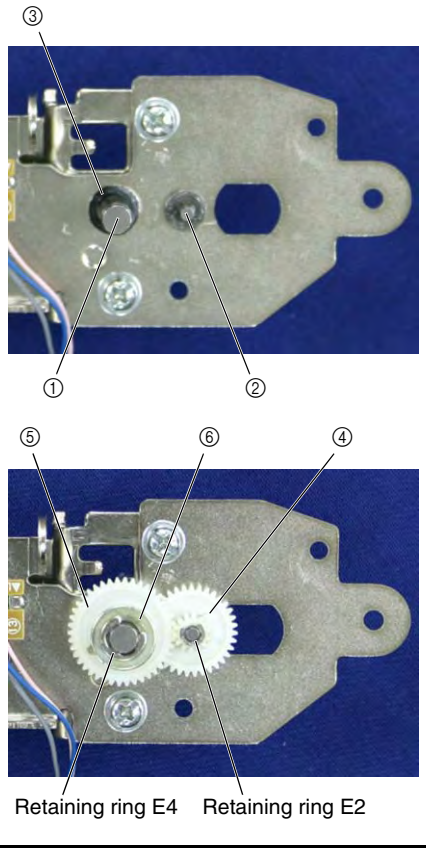
❶		Screw, Bind M3X4	Torque 0.59 – 0.79 N·m



2 Y driving gear pulley assembly attachment

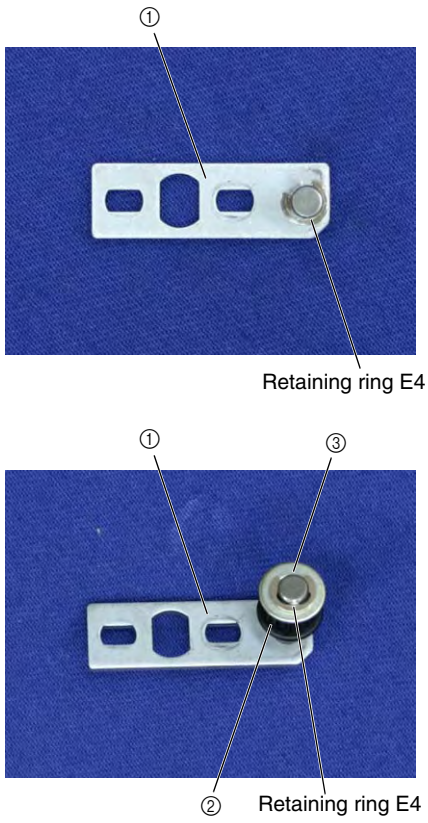
1. Apply a bead of EPNOC AP (N)0 to the 2 shafts ①② of the X carriage assembly.
2. Set the washer ③ onto the shaft ① of the X carriage assembly.
3. Set the gear ④ onto the shaft ② of the X carriage assembly, and then attach the retaining ring (E2).
4. Set the Y driving gear pulley ⑤ and then the plain washer (M6) ⑥ onto the shaft ① of the X carriage assembly, and then attach the retaining ring (E4).

Apply EPNOC AP (N)0 to the 2 shafts of the X carriage assembly.	Bead XC8387***



3 Y tension pulley assembly

1. Attach the retaining ring (E4) to the shaft (lower groove) of the Y tension pulley assembly ①.
2. Set the tension pulley ② and the plain washer (M6) ③ onto the shaft of the Y tension pulley assembly ①, and then attach the retaining ring (E4).

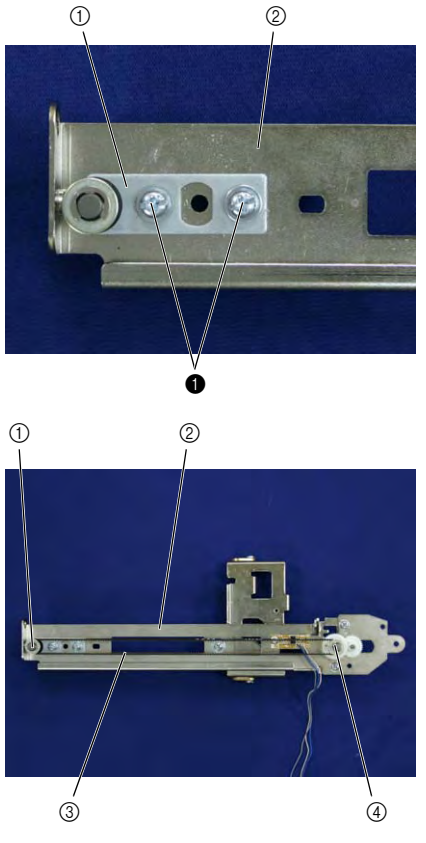


4 Y tension pulley assembly attachment

1. Temporarily attach the Y tension pulley assembly ① to the X carriage assembly ② with the 2 screws ❶.
2. Hang one end of the timing belt ③ over the Y driving gear pulley ④, and the other end over the Y tension pulley assembly ①.

***Key point**

- Fully tighten the screws after adjustment.



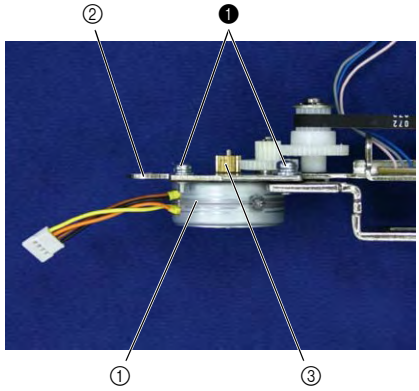
❶		Screw, Pan (S/P washer) M4X8	Torque Hand tighten

5 Y pulse motor assembly attachment

1. Apply 1 or 2 drops of FBK OIL RO 100 to the shaft of the Y pulse motor assembly ①.
2. Attach the Y pulse motor assembly ① to the X carriage assembly ② with the 2 screws ❶.

***Key point**

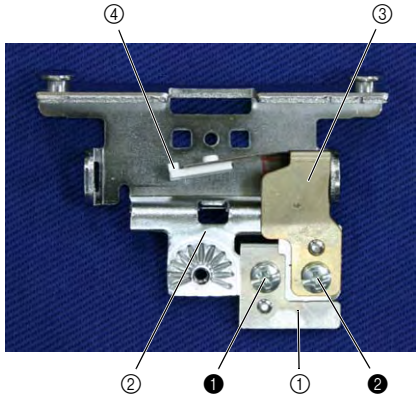
- Position the X carriage assembly ② as shown in the photo on the right, and attach the Y pulse motor assembly ① with the gear ③ on the top.
- Check that the lead wire of the Y pulse motor assembly ① is on the left side.

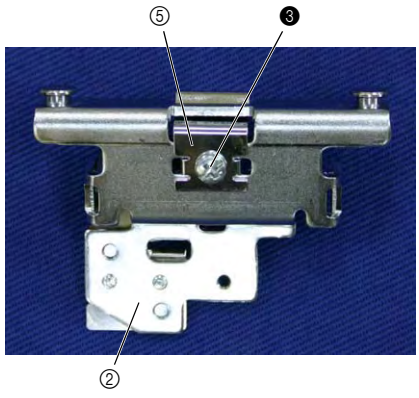


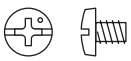
Apply FBK OIL RO 100 to the shaft of the Y pulse motor assembly.		1 - 2 drops XC8388***
❶	 Screw, Pan (S/P washer) M3X7	Torque 0.79 – 1.18 N·m

6 Y carriage ASSY assembly

1. Attach the Y initial shutter ① to the Y carriage unit ② with the screw ❶.
2. Attach the Y guide shaft presser ④ to the Y guide shaft presser plate ③, and then secure these to the Y carriage unit ② with the screw ❷.
3. Attach the hoop fixed spring ⑤ to the Y carriage unit ② with the screw ❸.

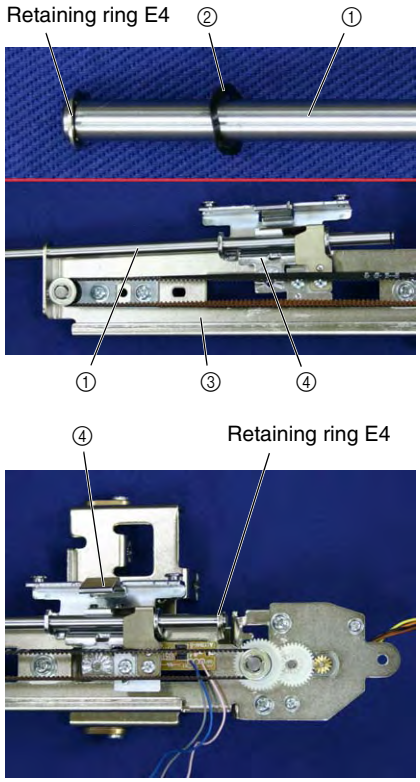




❶ ❷ ❸	 Screw, Bind M3X4	Torque 0.59 – 0.79 N·m

7 Y carriage unit attachment

1. Attach the retaining ring (E4) to the Y guide shaft ①, and then attach the wave spring washer ② to the Y guide shaft ①.
2. Insert the Y guide shaft ① from the Y tension pulley assembly side of the X carriage assembly ③.
3. Set the Y carriage assembly ④ onto the Y guide shaft ①, and then push it to the YPM motor. Attach the retaining ring (E4).

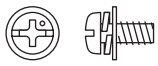


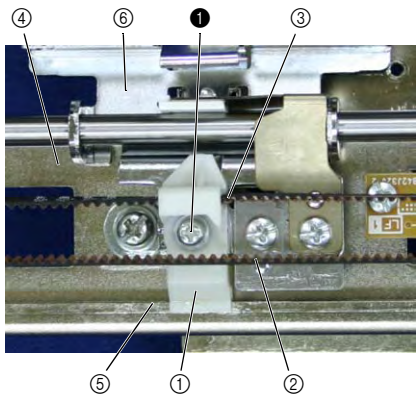
8 Y slider attachment

1. Insert the Y slider ① into the gear ③ of the timing belt ②.
2. Engage the groove on the Y slider ① with the rail ⑤ of the X carriage unit ④.
3. Slide the Y carriage unit ⑥ to align the Y slider ① with the screw hole on the Y carriage unit, and then secure these with the screw ❶.

***Key point**

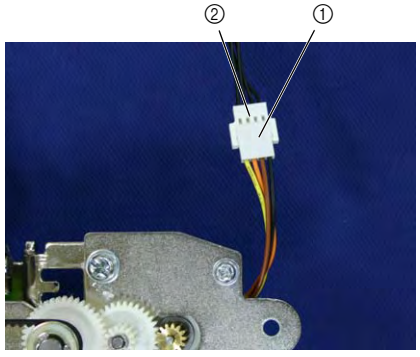
- Move the Y carriage unit ⑥ left and right to check that the timing belt ② moves accordingly.

❶		Screw, Pan (S/P washer) M3X7	Torque 0.79 – 0.98 N·m



9 Lead wire assembly YPM relay attachment

1. Connect the lead wire assembly YPM relay ② to the lead wire connector on the Y pulse motor assembly ①.

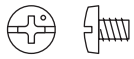


10 Cord guide attachment

1. Insert the lead wire assembly YPM relay ① and then the lead wire of the Y sensor PCB assembly ② into the groove on the cord guide ③, and then secure these with the screw ❶.

***Key point**

- Check that the lead wire assembly YPM relay ① and the lead wire of the Y sensor PCB assembly ② are routed as shown in the photo on the right.

❶		Screw, Bind M3X4	Torque 0.79 – 1.18 N·m

11 X slider attachment

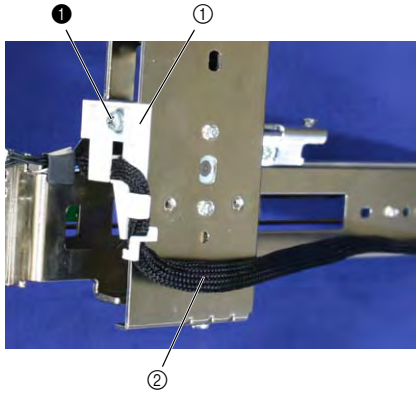
1. Align the boss on the X slider ① with the oval hole on the bent section at the lower section of the X carriage assembly.
2. Temporarily tighten the screw ❶.

***Key point**

- Fully tighten the screw after the XY carriage unit has been attached.

3. Insert the lead wire into the nylon sleeve ②, and then attach the guide of the X slider ①.

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



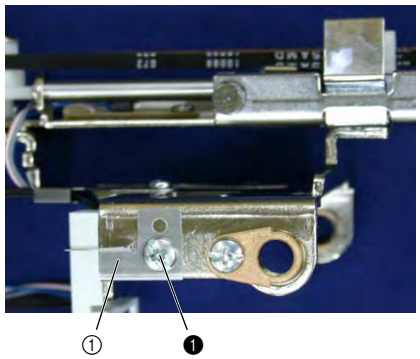
12 X initial shutter attachment

1. Attach the X initial shutter ① with the screw ❶.

***Key point**

- The X initial shutter has sharp edges. Be careful when handling it.

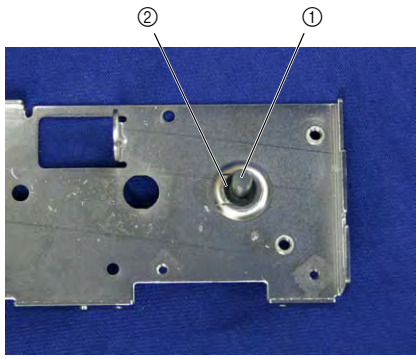
❶		Screw, Bind M4X6	Torque 1.18 – 1.57 N·m

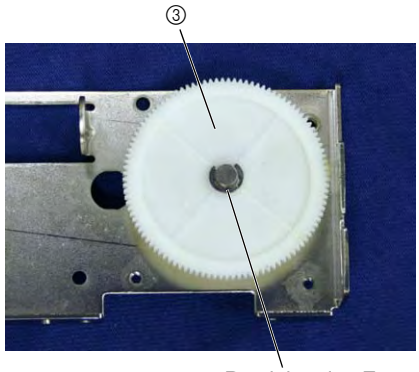


13 X driving gear pulley attachment

1. Apply a bead of EPNOC AP (N)0 to the shaft ① of the main frame subassembly.
2. Set the washer ② and the X driving gear pulley ③ onto the shaft ①, and then attach the retaining ring (E4).

Apply EPNOC AP (N)0 to the shaft of the main frame subassembly.	bead XC8387***

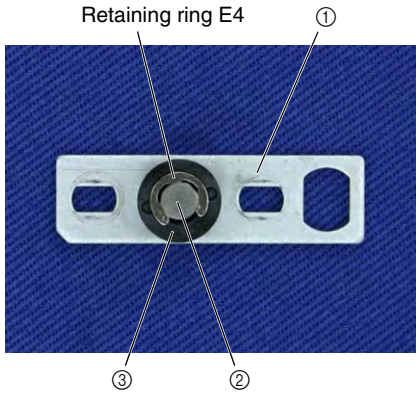




Retaining ring E4

14 X tension pulley ASSY assembly

1. Set the tension pulley ③ onto the shaft ② of the X tension pulley assembly ①, and then attach the retaining ring (E4).

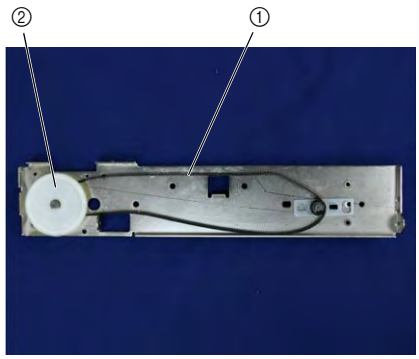


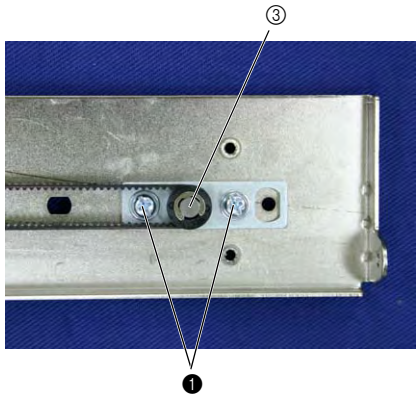
15 X tension pulley ASSY attachment

1. Hang one end of the timing belt ① over the X driving gear pulley ②, and the other end over the X tension pulley assembly ③.
2. Move the X tension pulley assembly ③ to the right, and then temporarily tighten the 2 screws ❶.

***Key point**

- Fully tighten the screws after adjustment.





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

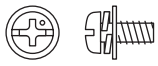
16 X pulse motor assembly attachment

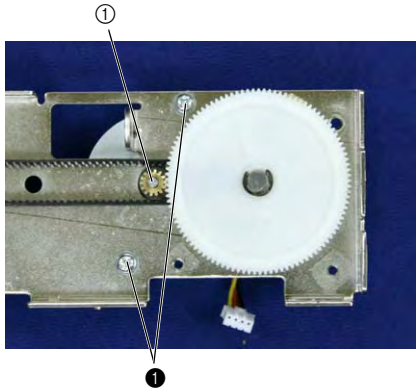
1. Apply 1 or 2 drops of FBK OIL RO 100 to the X pulse motor assembly.
2. Position the main frame unit as shown in the photo on the right, and then attach the X pulse motor assembly ① from the rear of the main frame unit with the gear on the top. Secure these with the 2 screws ❶.

***Key point**

- Check that the lead wire of the X pulse motor assembly ① is at the lower right .

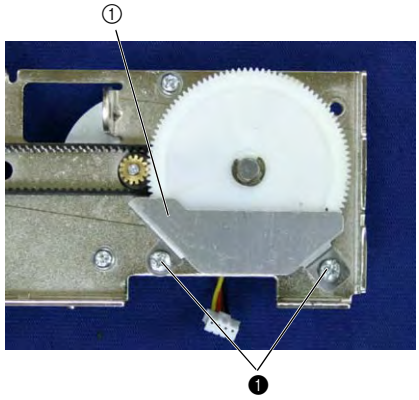
Apply FBK OIL RO 100 to the X pulse motor assembly.		1 - 2 drops XC8388***

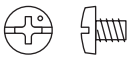
❶		Screw, Pan (S/P washer) M3X7	Torque 0.79 – 1.18 N·m



17 Oil guard plate attachment

1. Attach the oil guard plate ① to the main frame unit with the 2 screws ❶.



❶		Screw, Bind M3X4	Torque 0.79 – 1.18 N·m

18 XY carriage unit removal

1. Position the XY carriage unit ① as shown in the photo on the right, and then insert the X guide shaft ②.

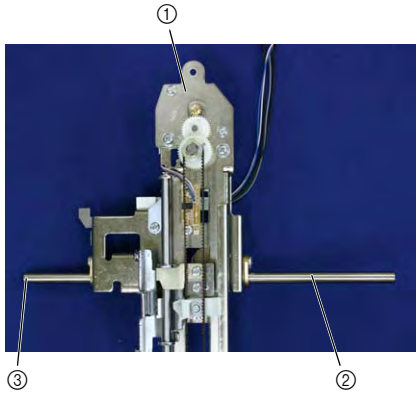
   ***Key point**
   - Check that the cut face end ③ of the X guide shaft ② is on the left side.

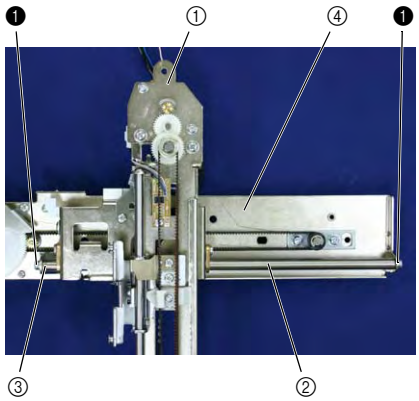
2. Position the main frame unit ④ and the XY carriage unit ① as shown in the photo on the right.

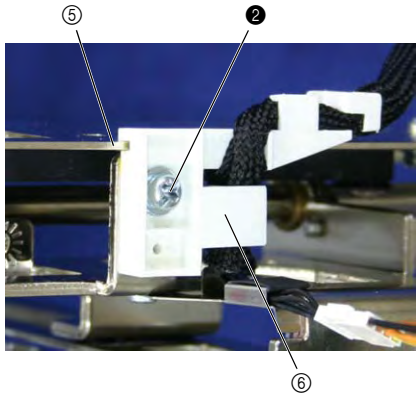
   ***Key point**
   - Check that the cut face end ③ of the X guide shaft ② is on the left side.
   - Check that the rail ⑤ of the main frame unit ④ is engaged with the groove on the X slider ⑥.

3. Attach the X guide shaft ② to the main frame unit ④ with the 2 screws ❶.

   ***Key point**
   - Fully tighten the X slider securing screw ❷.







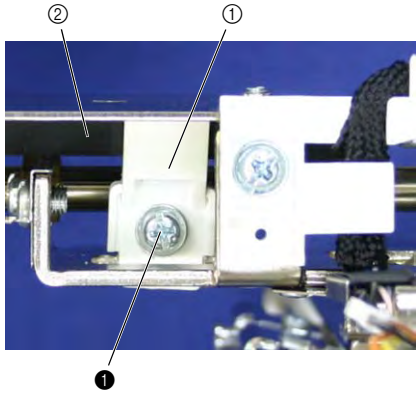
❶		Screw, Pan (S/P washer) M4X8	Torque 1.18 – 1.57 N·m
❷		Screw, Pan (S/P washer) M4X8	Torque 0.79 – 0.98 N·m

19 X belt presser removal

1. Insert the X belt presser ① into the gear of the timing belt ②.
2. Slide the XY carriage unit to align the round hole on the X belt presser ① with the screw hole on the XY carriage unit, and then secure these with the screw ❶.

***Key point**
- Move the XY carriage unit left and right to check that the timing belt ② moves accordingly.

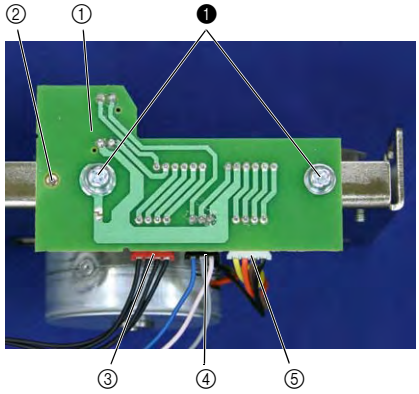
❶		Screw, Pan (S/P washer) M4X8	Torque 0.79 – 0.98 N·m



20 EMB relay PCB assembly attachment

1. Align the hole on the EMB relay PCB assembly ① with the boss ② on the main frame unit, and then secure these with the 2 screws ❶.
2. Attach the lead wire assembly YPM relay ③, Y sensor PCB assembly lead wire ④, and XPM lead wire ⑤ to the EMB relay PCB assembly ①.

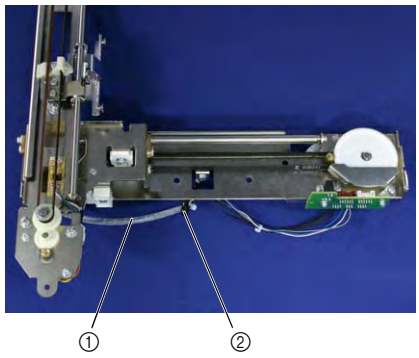
❶		Screw, Pan (S/P washer) M3X7	Torque 0.79 – 0.98 N·m



21 Cord treatment

1. Slide the XY carriage assembly of the main frame assembly to the left as far as possible.
2. Attach the spiral tube to the lead wire of the X sensor PCB assembly.
3. Attach the lead wire of the X sensor OCB assembly to the coating clip with the band.
4. Attach the band to the lead wire of the X sensor PCB assembly so that the distance between the band and the right edge of the coating clip should be 55 to 60mm.

***Key point**
- Refer to [6.Special Instruction of Wiring].

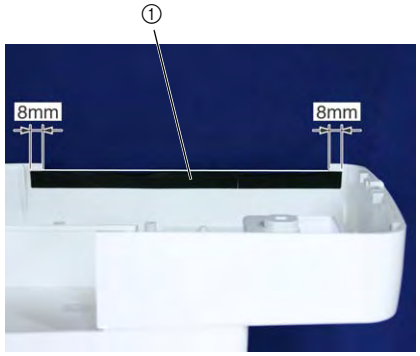


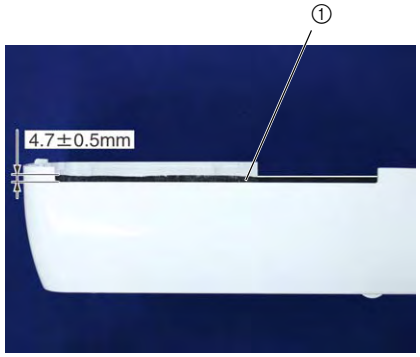
22 Groove cover attachment

1. Attach the groove cover ① to the ES base cover.

***Key point**

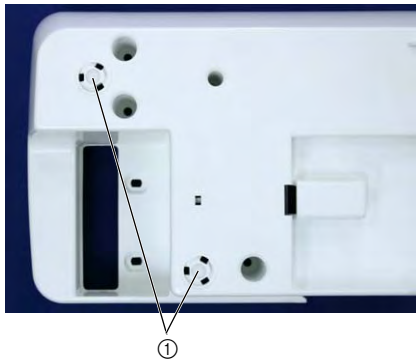
- Refer to the two photos on the right for attachment of the groove cover ①.

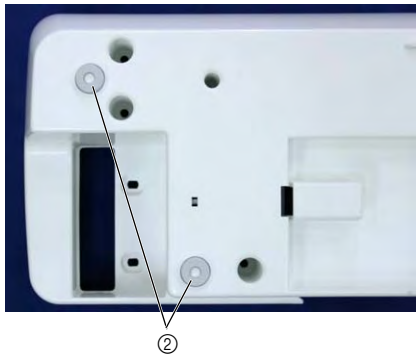




23 Rubber cushion and rubber cushion cover attachment

1. Attach the 2 rubber cushions ① to the ES base cover.
2. Insert the 2 rubber cushion covers ② into the attachment groove.



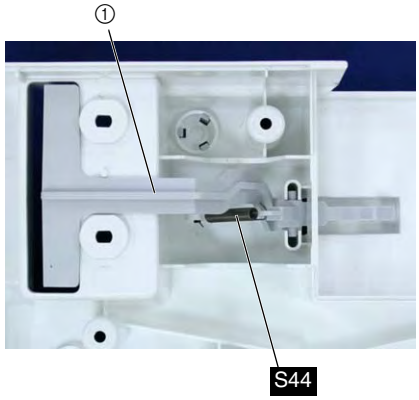


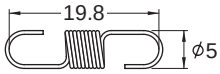
24 Lock release lever ASSY assembly

1. Attach the lock finger ② to the lock release lever ①.

25 Lock release lever assembly attachment

1. Attach the lock release lever assembly ① to the ES base cover unit.
2. Attach the spring S44.



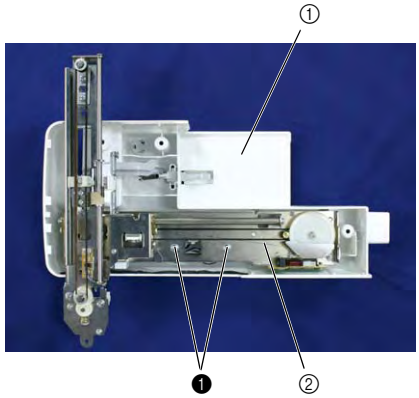
S44		SPRING XC8096***

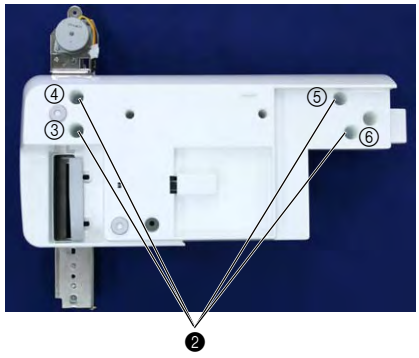
26 ES base cover unit attachment

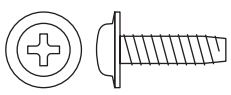
1. Align the 2 positioning holes on the main frame unit ② with the 2 bosses at the center of the ES base cover unit ①.
2. Secure the ES base cover unit ① to the main frame unit ② with the 6 screws (❶x2, ❷x4).

***Key point**

- Attach the 4 screws ❷ in the following sequence: ③ → ④ → ⑤ → ⑥.





❶		Taptite, Cup B M4X14	Torque 0.79 – 1.18 N·m
❷		Screw, Pan (S/P washer) M4X8	Torque 0.79 – 1.18 N·m

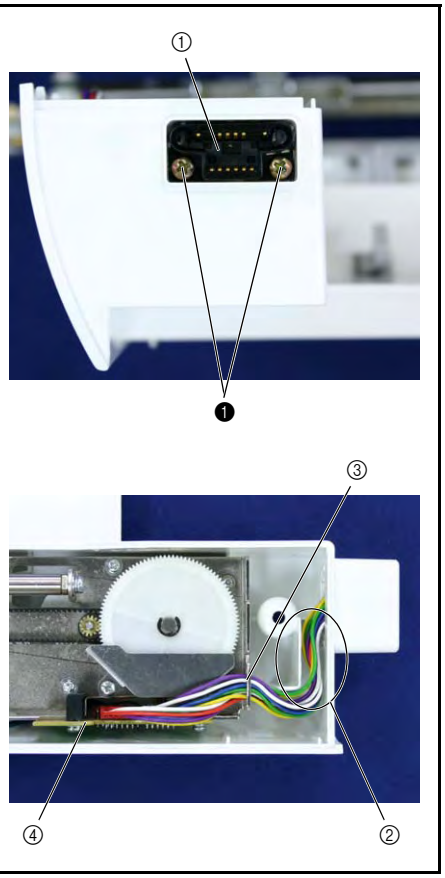
27 Lead wire assembly (EMB unit FCOMB) attachment

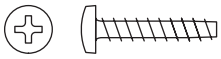
1. Pass the lead wires of the lead wire assembly EMB unit FCOMB ① through the hole on the ES base cover unit.
2. Attach the lead wire assembly ① to the ES base cover unit with the 2 screws ❶.

***Key point**

- Route the lead wires ① as shown in section ② in the photo, and then hang the lead wires onto the guide ③ of the main frame unit.

3. Attach the 2 connectors of the lead wire assembly ① to the EMB relay PCB assembly ④.



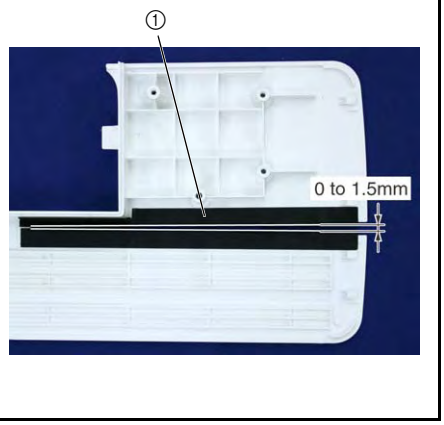
❶		Taptite, Bind P M3X16	Torque 0.59 – 0.79 N·m

28 Groove cover attachment

1. Attach the groove cover ① to the ES main cover.

***Key point**

- Refer to the photo on the right for attachment of the groove cover ①.

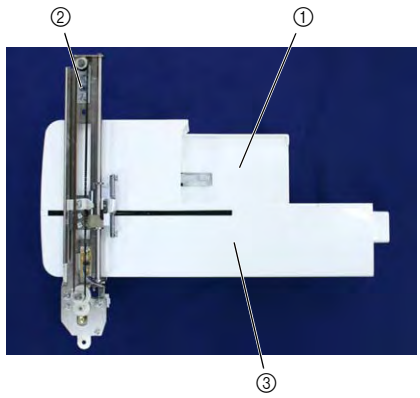


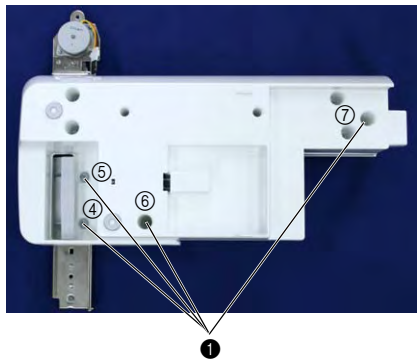
29 ES main cover assembly attachment

1. Position the ES base cover unit ① as shown in the photo on the right, and then slide the X carriage assembly ② to the left.
2. Slide the X carriage assembly ② along the slit on the ES main cover assembly ③ so that the X carriage assembly is fully engaged with the ES main cover assembly.
3. Secure the ES main cover assembly ③ with the 4 screws ❶.

***Key point**

- Attach the 4 screws ❶ in the following sequence: ④ → ⑤ → ⑥ → ⑦.
- Arrows are engraved on the outer surface of the base cover to indicate the locations of the 4 screws ❶.





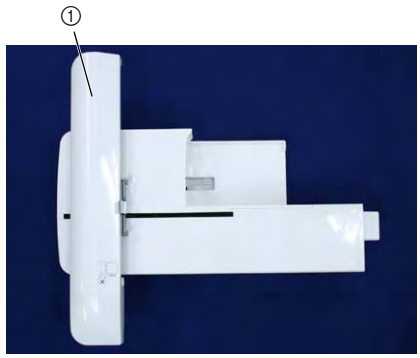
❶	Taptite, Cup B M4X14	Torque 0.79 – 1.18 N·m

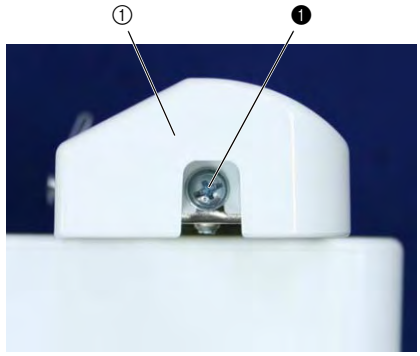
30 X carriage cover attachment

1. Position the X carriage cover ① so that it covers the X carriage assembly, and then temporarily tighten the screw ❶.

***Key point**

- Fully tighten the screw after the YPM cover has been attached.

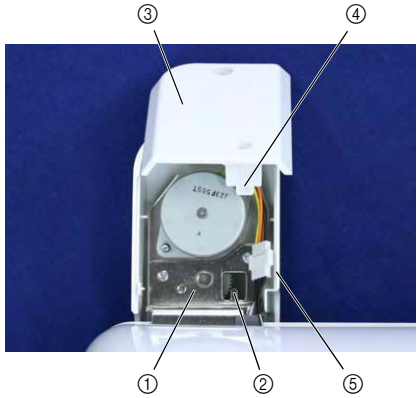


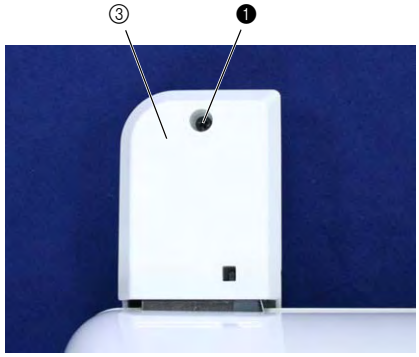


❶	Screw, Pan (S/P washer) M4X8	Torque 0.79 – 1.18 N·m

31 YPM cover attachment

1. Align the tab ② on the X carriage assembly ① with the slot ④ on the YPM cover ③.
2. Secure the YPM cover ③ via the X carriage cover ⑤ to the X carriage assembly with the screw ❶.



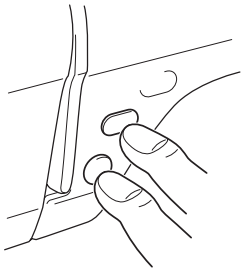


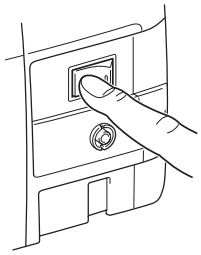
❶		Taptite, Bind P M3X10	Torque 0.59 – 0.79 N·m

4 Adjustment

With the CD-ROM version, click to start the movie clip.

- Press (START/STOP) and (headphone) button on the front cover while turning the power on; the buzzer will sound four times, and test mode will start.





Starting and stopping operation

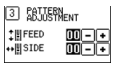
- Press the (START/STOP) button on the front cover.

Return to test mode selection screen.

- Press (back) button on the touch panel.

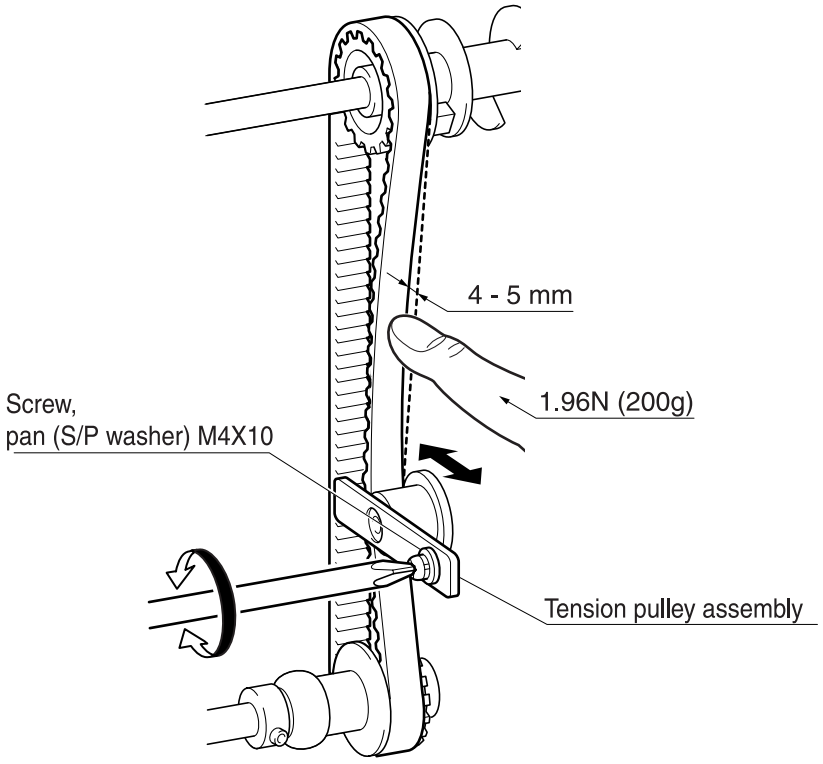
Test mode selection screen

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Mode	Mode selection button	Z (zigzag) operations	F (feed) operations	Operating speed
3 point needle drop 	Select [4] and press START/STOP.	Switches left base line / center base line / right base line with each stitch *Pressing (needle) stops the base line from changing	0 mm (none)	Any speed may be selected using the speed control key
Forward and reverse feed 	Select [13] and press START/STOP.	100 stitches forward on the left base line 100 stitches reverse on the right baseline		Switches low / middle / high speed with each push of the (needle).
Feed dog position 	Select [6] and press START/STOP.	Each time you press (scissors), the feed dog changes position left / center / right.	None	Cannot be adjusted
Pattern adjustment 	Select [3] and press START/STOP.	One-point pattern sewing		Cannot be adjusted

1. Loosen the screw (screw, pan (S/P washer) M4X10) on the tension pulley assembly.
2. With a force of 1.96 N (200 g) pushing on the center of the belt, adjust the tension pulley assembly position for a deflection of 4 – 5 mm.
3. Tighten the screw (screw, pan (S/P washer) M4X10) on the tension pulley assembly.

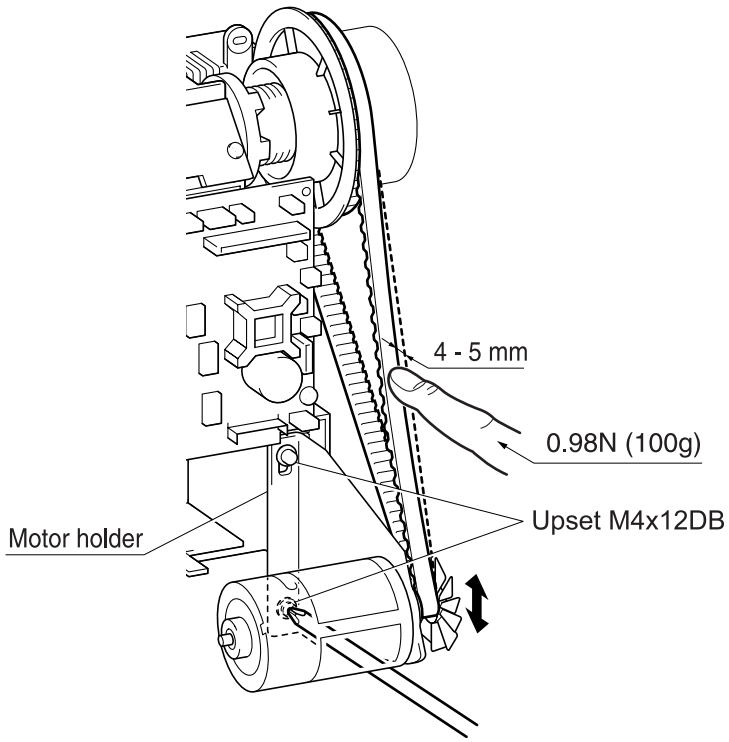
XC2277001	Push-pull gauge (3 N)



Motor belt tension adjustment

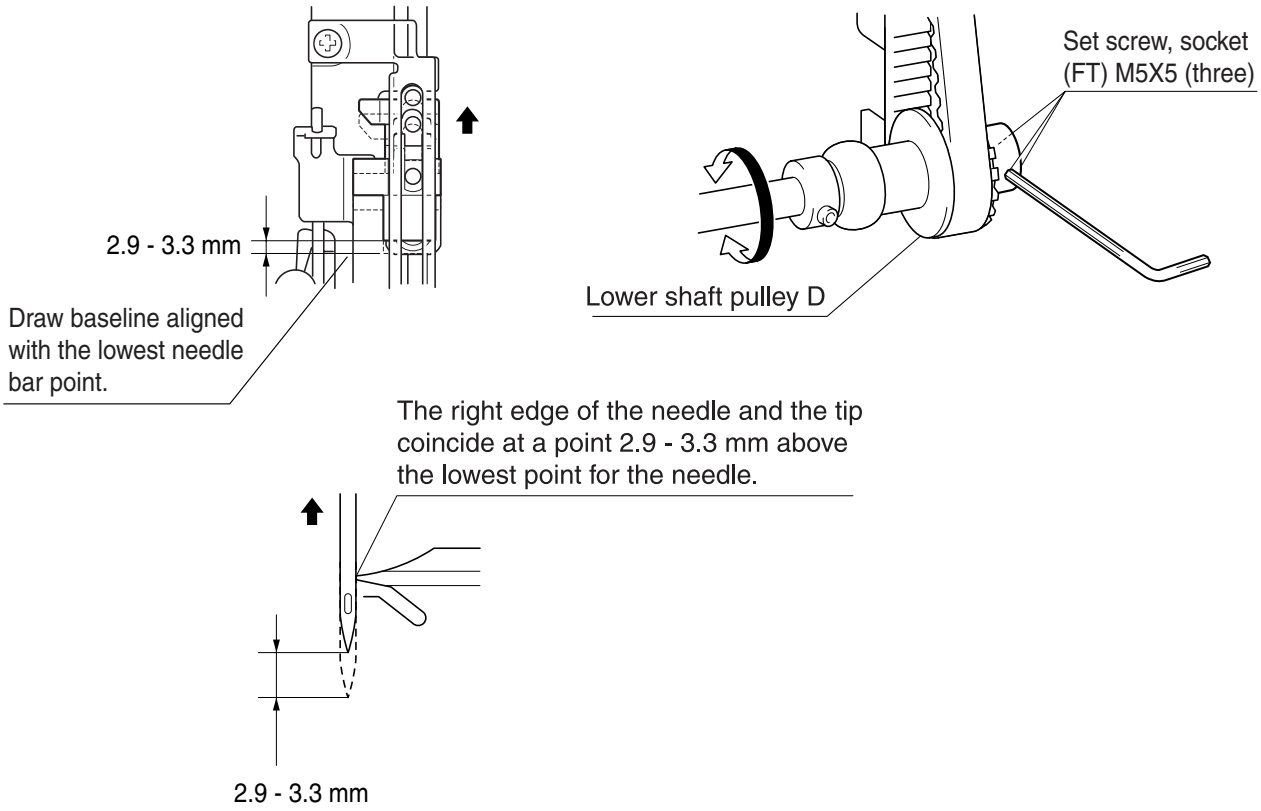
1. Loosen the 2 upset M4 x 12 DB in the motor holder.
2. With a force of 0.98 N (100 g) pushing on the center of the belt, adjust the motor pulley position for a deflection of 4 – 5 mm.
3. Tighten the 2 upset M4 x 12 DB in the motor holder.

XC2277001	Push-pull gauge (3 N)



1. Enter the test mode, and press the [4].
   *See (4 - 3 "List of the Test Mode") for starting test mode with the front cover in place.
2. Press the [←] to move the needle bar to the left base line.
3. Turn off the swich.
4. Turn the pulley by hand, and set the needle bar at its lowest point.
5. Draw a needle bar low point reference line on the needle bar supporter assy.
6. Loosen the 3 screws (set screw, socket (FT) M5X5) on lower shaft pulley D.
7. With the needle bar raised 2.9 - 3.3 mm from the needle bar low point reference line, adjust by moving the lower shaft pulley D and lower shaft A assembly so that the right edge of the needle and the outer rotary hook tip come together.
8. Secure the 3 screws (set screw, socket (FT) M5X5) on lower shaft pulley D.

Start movie clip (CD-ROM version only)

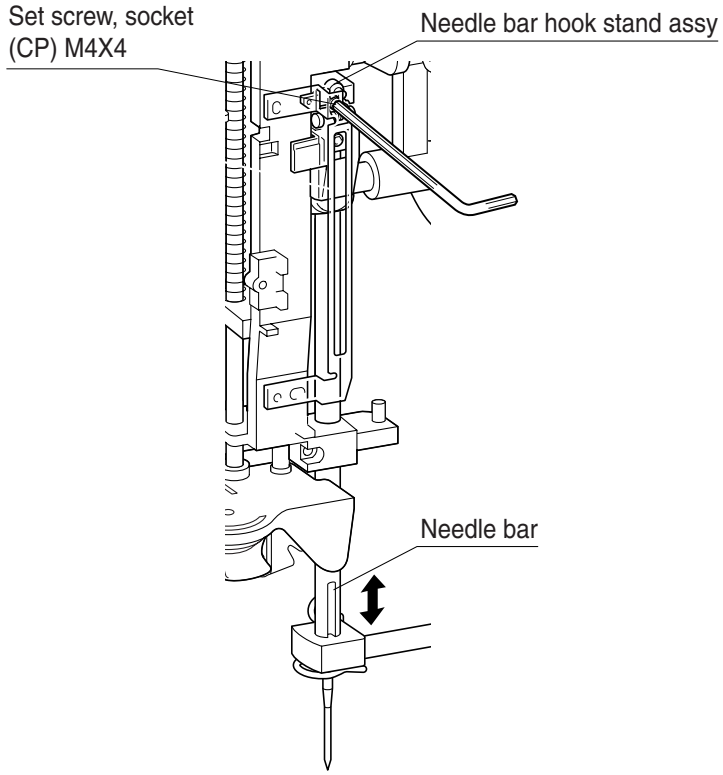


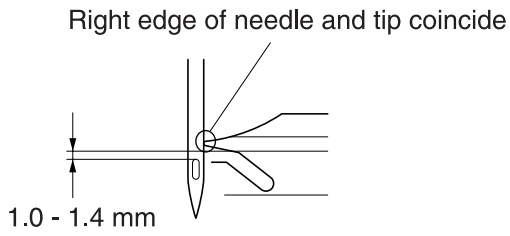
1. Enter the test mode, and press the [4].
   *See (4 - 3 "List of the Test Mode") for starting test mode with the front cover in place.
2. Press the [←] to move the needle bar to the left base line.
3. Turn off the swich.
4. Remove the 2 screws (M4), and remove needle plate A from the feed base.
5. Hand turn the pulley until the right edge of the needle and the outer rotary hook tip meet.
6. Loosen the screw (set screw, socket (CP) M4X4) in the needle bar hook stand assy.
7. Adjust the height of the needle bar for 1.0 – 1.4 mm between the top of the needle hole and lower edge of the outer rotary hook tip.

NOTE •Make sure the needle block is not positioned at a slant.

8. Perform "Adjust the needle thread block" (4 - 27).
9. Attach needle plate A to the feed base using the 2 screw (screw M4).

Start movie clip (CD-ROM version only)

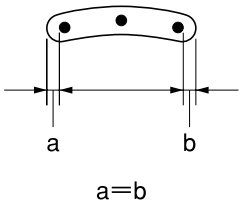


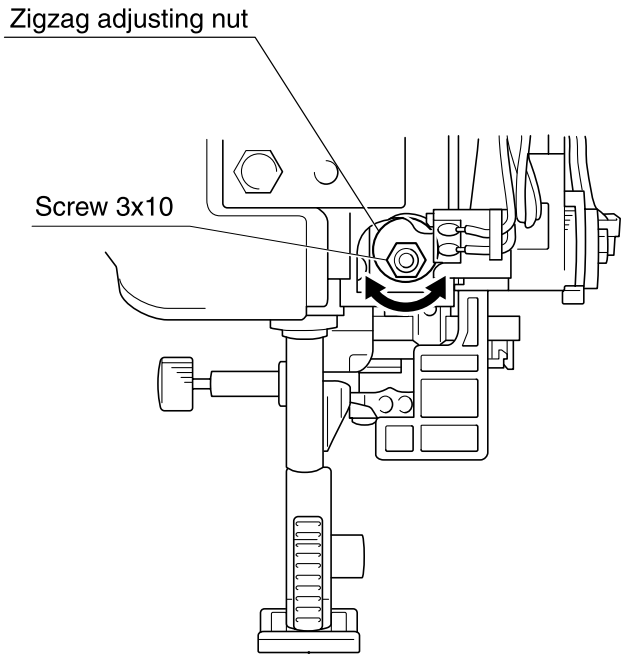


Three point needle drop adjustment

1. Enter the test mode, and press the [4].
   *See (4 - 3 "List of the Test Mode") for starting test mode with the front cover in place.
2. Press the [←] to move the needle bar to the left base line.
3. Turn the pulley by hand, and insert the tip of the needle into the needle hole.
4. Loosen the screw 3X10.
5. Adjust the zigzag adjusting nut so that the left base line / center base line / right base needle drop is uniform to the left and right of the needle plate A needle hole.
6. Tighten the screw 3X10.

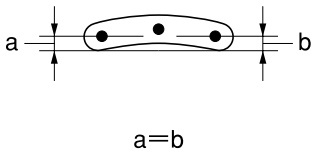
Start movie clip (CD-ROM version only)



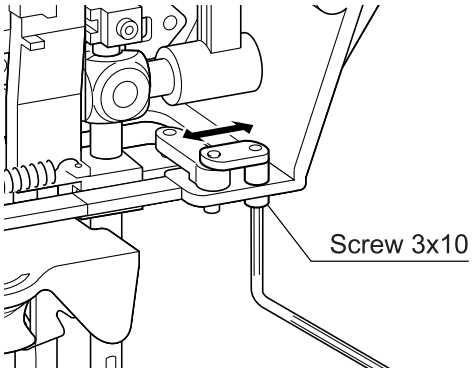


Needle interference left/right adjustment.

1. Enter the test mode, and press the [4].
2. Turn the pulley by hand, and insert the tip of the needle into the needle hole.
3. Loosen the screw 3X10.
4. Adjust the needle holder shaft block to the left or right so that the left base line / right base line needle drop is uniform forward and back with respect to the needle plate A hole.
5. Tighten the screw 3X10.

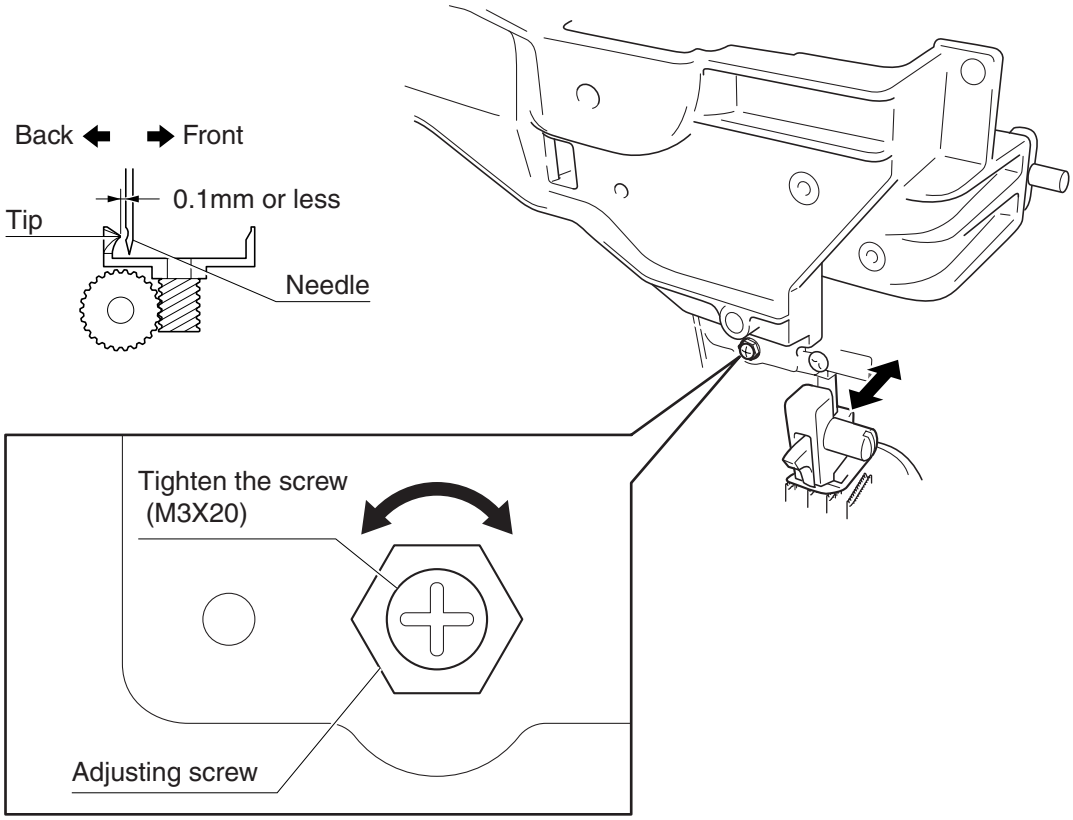


a=b



1. Enter the test mode, and press the [4].
   *See (4 - 3 "List of the Test Mode") for starting test mode with the front cover in place.
2. Press the [←] to move the needle bar to the left base line.
3. Remove the 2 screws (M4), and remove needle plate A from the feed base.
4. Loosen the screw M3X20.
5. Hand turn the pulley until the right edge of the needle and the outer rotary hook tip meet.
6. Adjust the gap between the needle and the outer rotary hook tip (front and back) to 0.1 mm or less using the tightening depth of the adjusting screw.
7. Tighten the screw M3X20.

Start movie clip (CD-ROM version only)

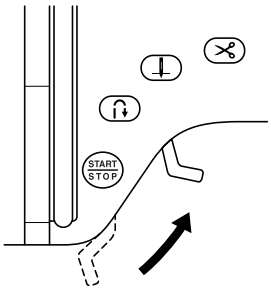


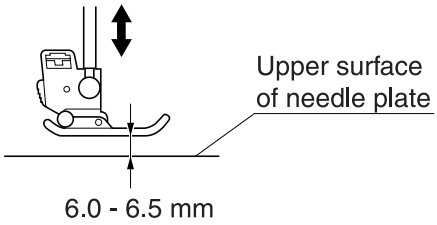
Presser bar height and parallel adjustment

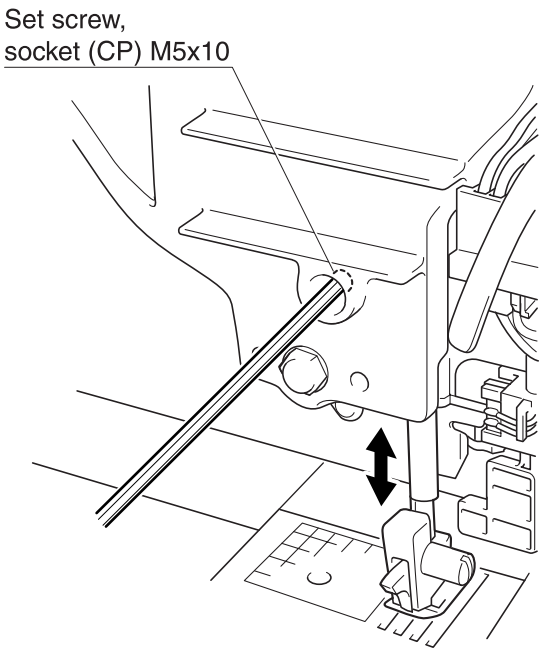
1. Raise the presser foot lifter.
2. Turn the pulley so that the feed dog drops below needle plate A.
3. Loosen the screw (set screw, (CP) M5X10) in the presser bar clamp assy.
4. Adjust the height of the presser bar so that there is 6.0 – 6.5 mm between the top of needle plate A and the bottom of the presser.

NOTE •Use the J presser.
•Adjust the presser bar so that the needle plate feed dog hole and the presser are parallel (to prevent slanting during serging and damage to the needle).

Start movie clip (CD-ROM version only)



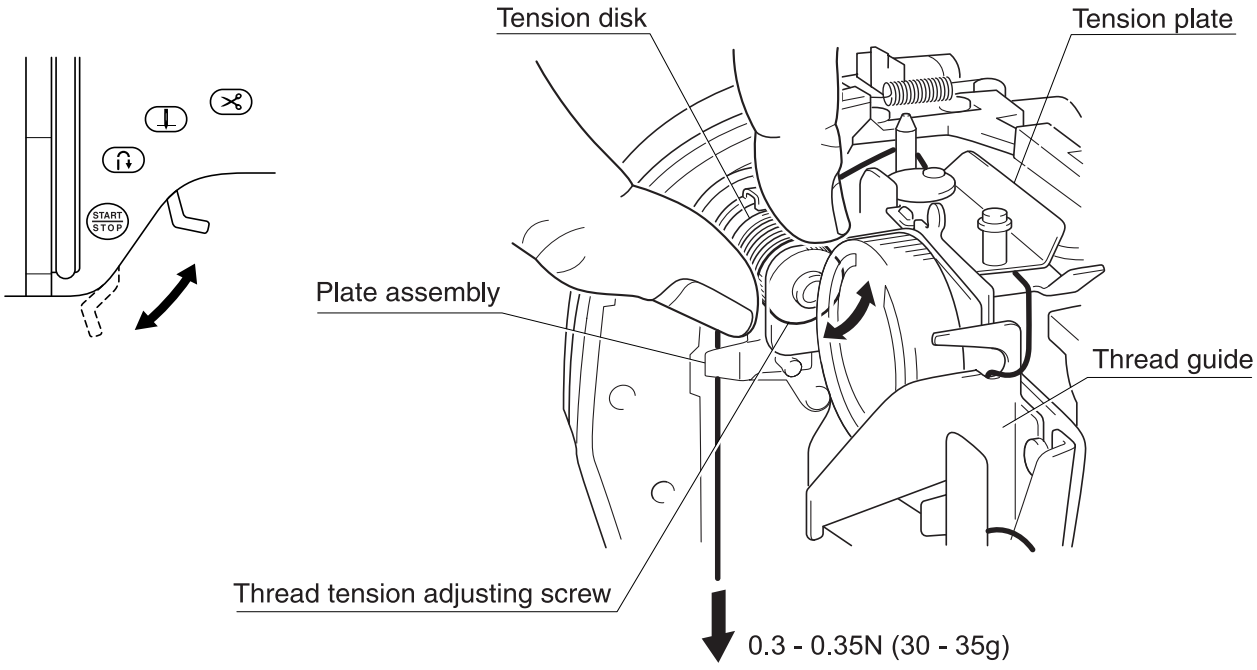




1. Raise the presser foot lifter.
2. Turn the thread tension dial to the “Auto” position.
3. Pass a Schappe Spun Sewing Thread #60 through the thread guide => tension plate => tension disk => plate assembly.
4. Lower the presser foot lifter.
5. Pull the thread with a tension gauge, and adjust the thread tension adjusting screw depth for 0.3 – 0.35 N (30 – 35 g).
6. Apply a small amount of screw locking compound to the thread tension adjusting screw.

Screw locking compound for thread tension adjusting screw	Small amount
XA9154001	Tension gauge 50 (0.5 N)

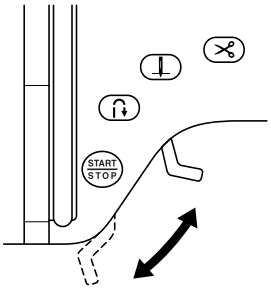
Start movie clip (CD-ROM version only)

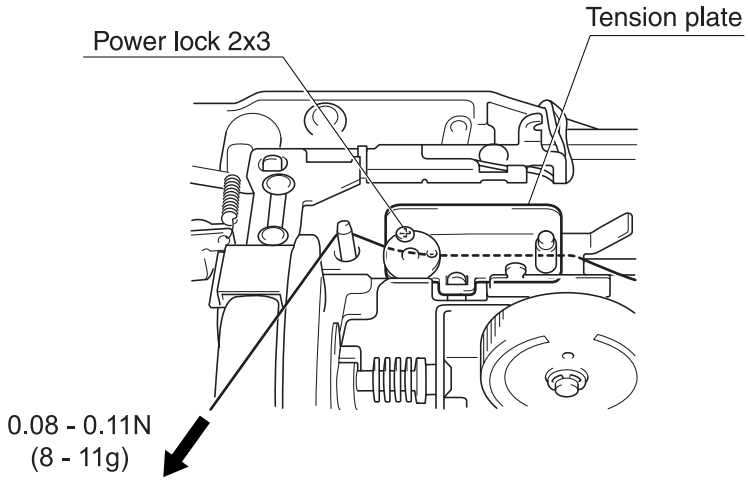


1. Raise the presser foot lifter.
2. Pass Schappe Spun Sewing Thread #60 through the thread guide => tension plate.
3. Lower the presser foot lifter.
4. Pull the thread with a tension gauge, and adjust the power lock 2x3 so that it is 0.08 – 0.11 N (8 – 11 g).

XA9153001	Tension gauge 30 (0.3 N)

Start movie clip (CD-ROM version only)

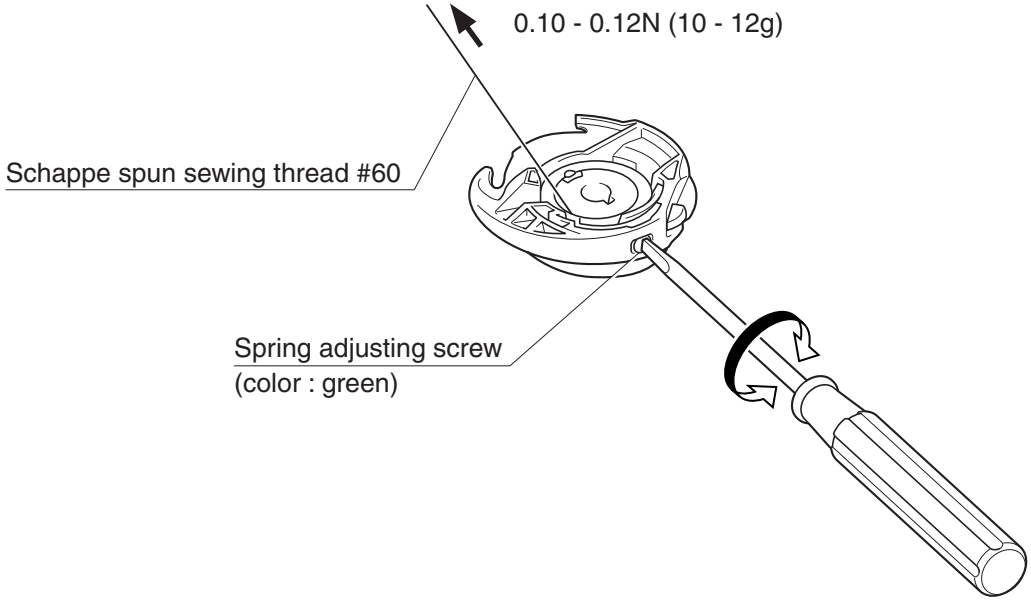




■ Bobbin case with green screw (for embroidery)

1. Set a bobbin (wound with Schappe Spun Sewing Thread #60) to the inner rotary hook.
2. Pull the thread with a tension gauge, and adjust the tension to 0.10 to 0.12N (10 to 12g) using the spring adjusting screw.
3. Apply a small amount of screw lock agent to the spring adjusting screw.

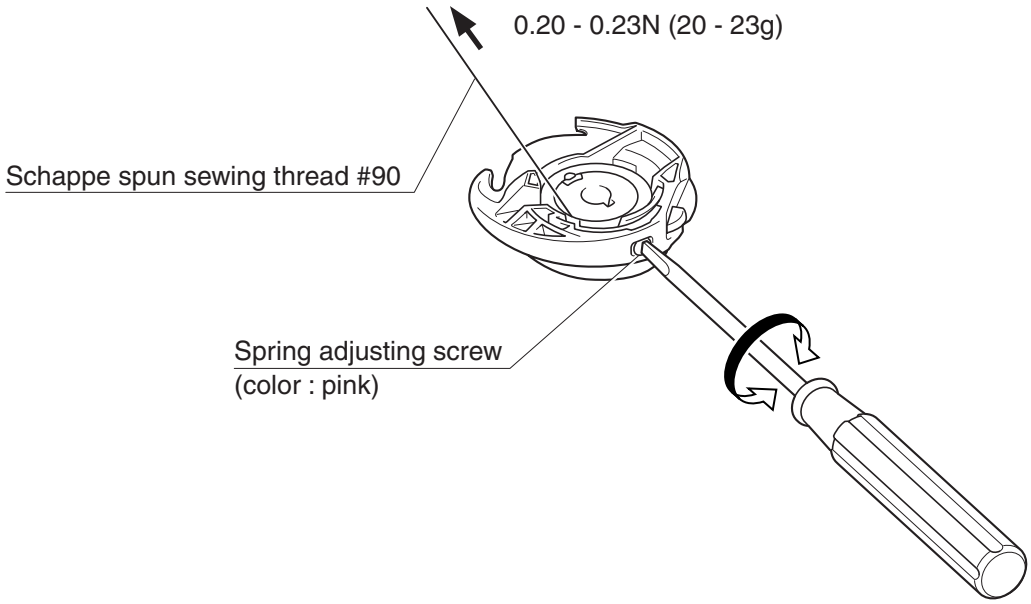
XA9153001	Tension gauge 30 (0.3N)



■ Bobbin case with pink screw (for embroidery)

1. Set a bobbin (wound with Schappe Spun Sewing Thread #90) to the inner rotary hook.
2. Pull the thread with a tension gauge, and adjust the tension to 0.20 to 0.23N (20 to 23g) using the spring adjusting screw.
3. Apply a small amount of screw lock agent to the spring adjusting screw.

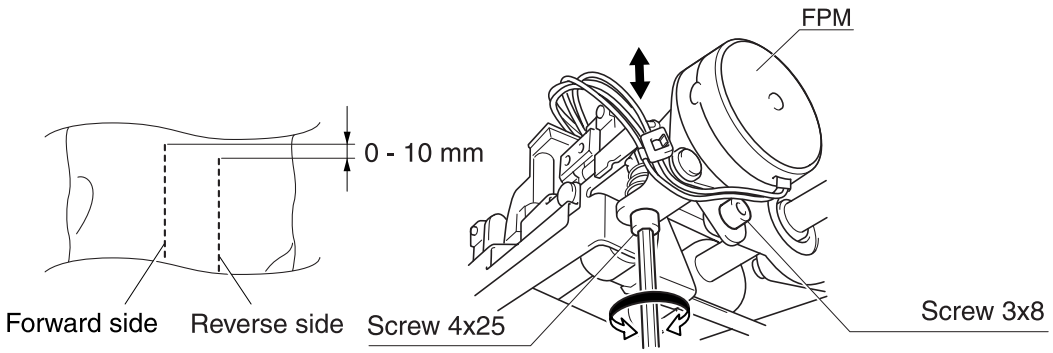
XA9153001	Tension gauge 30 (0.3N)



1. Enter the test mode, and press the [13].
   *See (4 - 3 "List of the Test Mode") for starting test mode with the front cover in place.
2. Press the START/STOP button on the front cover and run "Feed forward and reverse mode," checking the forward and reverse feed amounts.
3. Loosen the screw 3 x 8.
4. Adjust the forward and reverse feed using the screw 4 x 25.

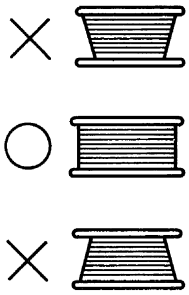
***Key point**

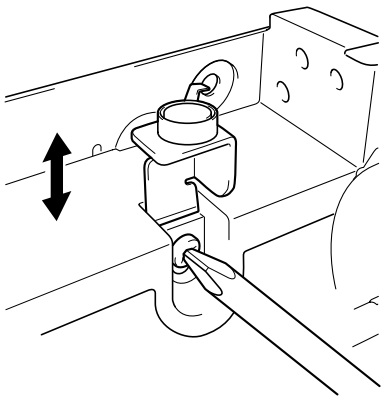
- Confirm that when a material of two layers of broadcloth with paper in between is given 100 stitches forward and reverse ("Feed forward and reverse" mode), the forward side is 0 – 10 mm longer than the reverse side.
- Tightening the screw 4 x 25 => lengthens the reverse side.
- Loosening the screw 4 x 25 => shortens the reverse side.



Feed module lower right

1. Move the bobbin winder guide assembly up and down and adjust uneven bobbin winding.

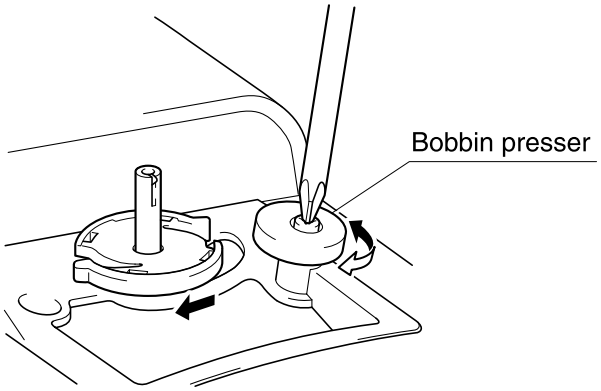


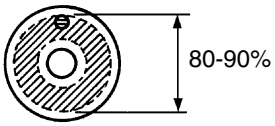


2. Turn the bobbin presser left and right, and adjust the winding quantity.

***Key point**

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



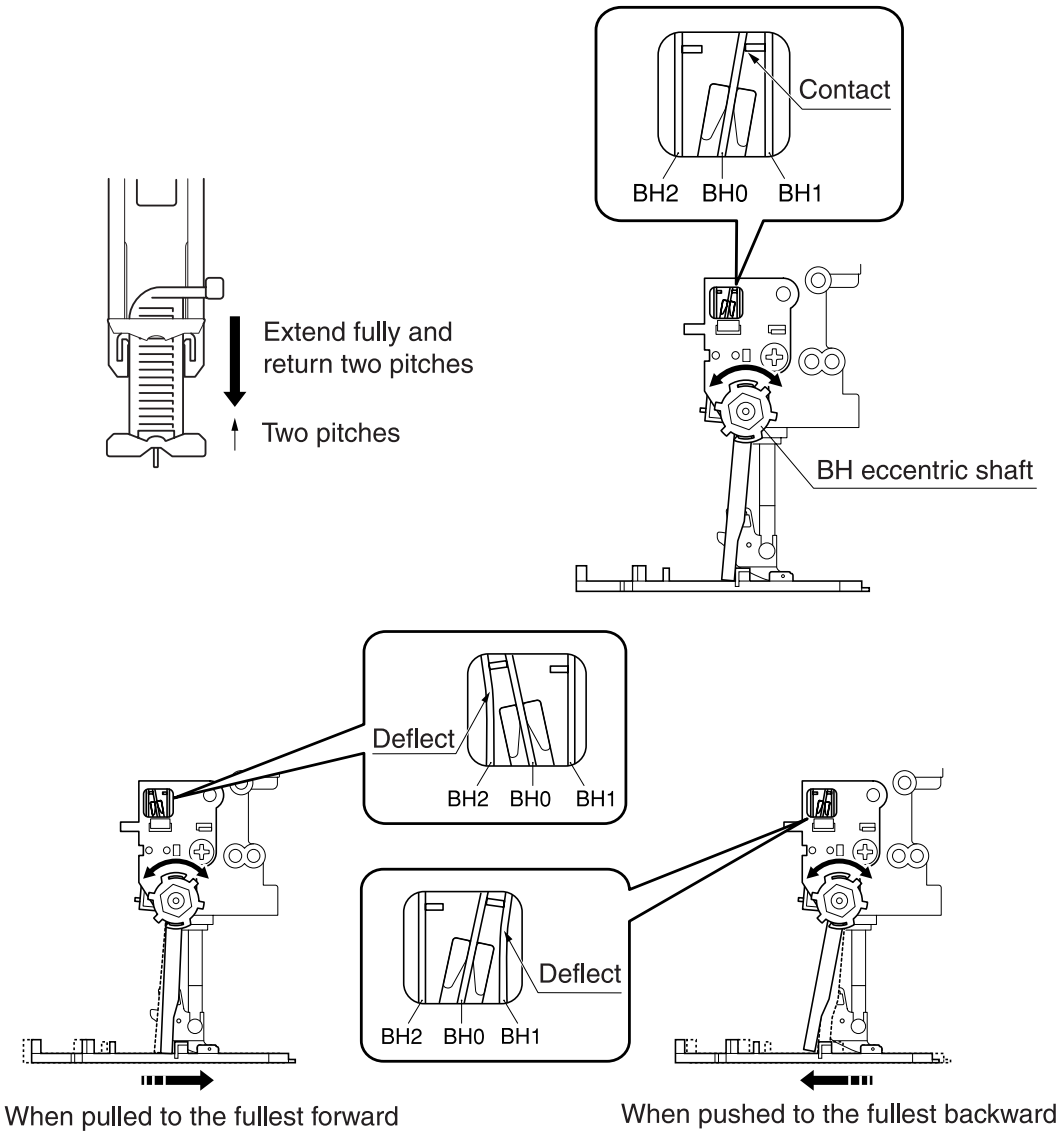


BH lever switch position adjustment

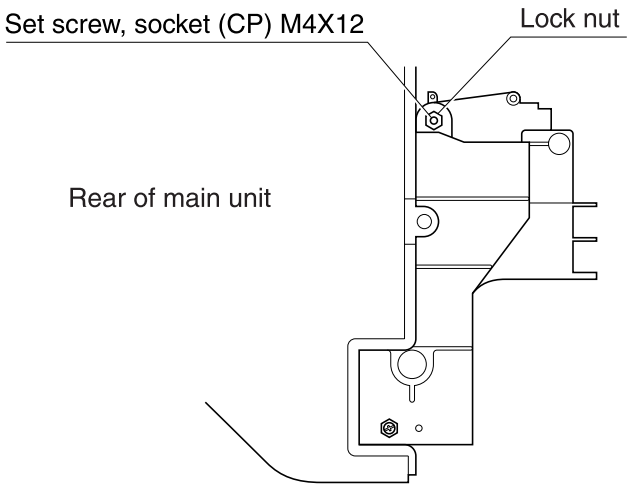
1. Raise the presser foot lifter.
2. Set the BH presser two pitches smaller than the maximum length.
3. Attach the BH presser.
4. Lower the presser foot lifter.
5. Lower the BH lever, and set to the BH presser.
6. Rotate the BH eccentric shaft so that BH0 comes into contact with BH1.

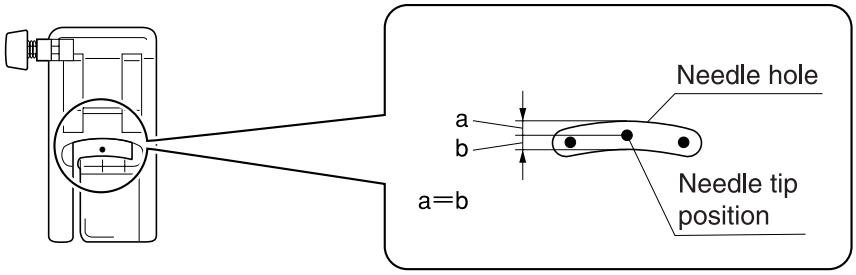
***Key point**

- With the presser foot lifter raised, pull the BH presser forward as much as possible, and check that BH0 comes into contact with BH2 and that BH2 has some deflection.
- With the presser foot lifter raised, push the BH presser back as much as possible, and check that BH0 comes into contact with BH1 and that BH1 has some deflection.



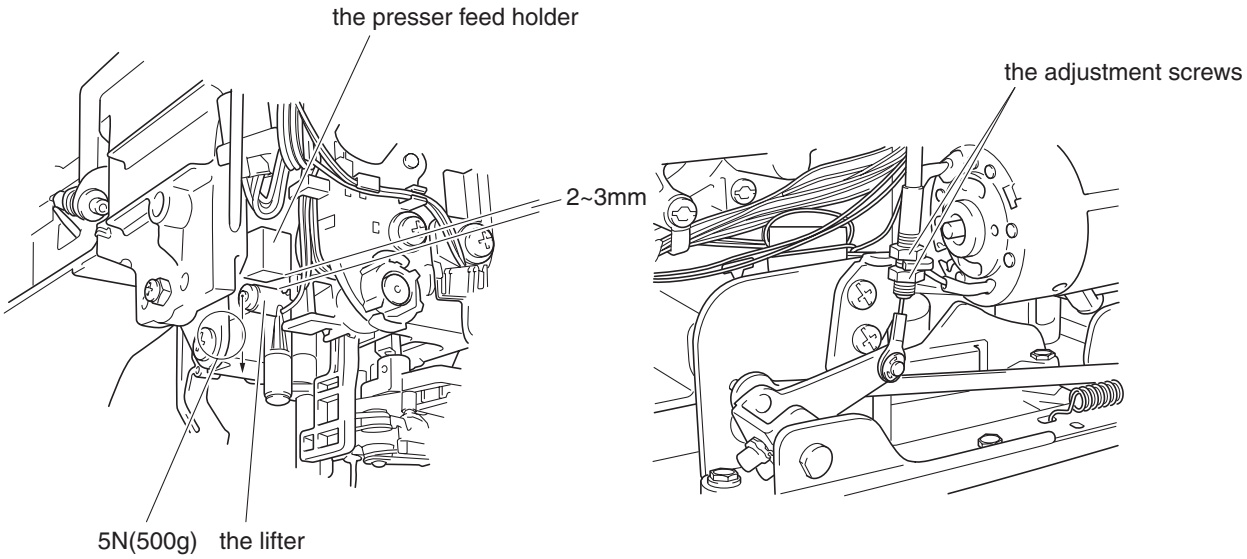
1. Turn the pulley by hand, and insert the tip of the needle into the needle hole.
2. Loosen the locknut.
3. Adjust the needle tip to the front/back center position of the needle hole using the screw (set screw, socket (CP) M4X12).
4. Tighten the lock nut.





1. Lower the presser foot lifter.
2. Loosen the adjustment screws (two).
3. With a load of 5N (500 g) applied to the lifter, adjust the lifter and presser feed holder space.

   ***Key point**
   - Space between lifter and presser feed holder is 2 - 3 mm.
   - Adjust by the amount the upper adjusting screw is tightened.
4. Tighten the lower adjusting screw.



1. Attach the N pressure foot.
2. Select test mode [11], and check the sewing condition.
3. Adjust the feed dog height is almost on the right and the sewing length at the upper section is 26-31 mm.

Fig.A

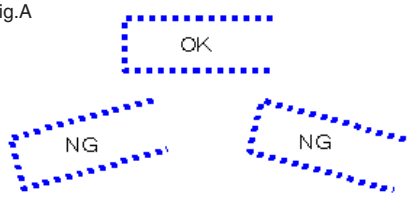
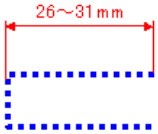
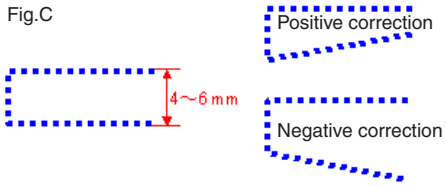


Fig.B



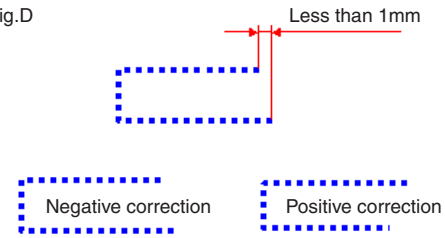
4. Adjust the horseshoe pattern should be oriented the following conditions ① and ②.
   ① Adjust the up and down gap on the right to 4-6 mm using + or - by the FEED.

Fig.C

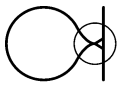


   ② Adjust the difference in length between the top and the bottom to less than 1 mm using + or - by the SIDE.

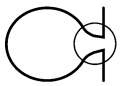
Fig.D



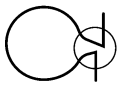
1. Attach the N pressure foot.
2. Select test mode [3].
3. Press the start / stop button.
4. Adjust a right pattern following conditions.



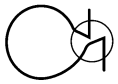
If the pattern is compressed in the ↕ direction, press the vertical [+] button.



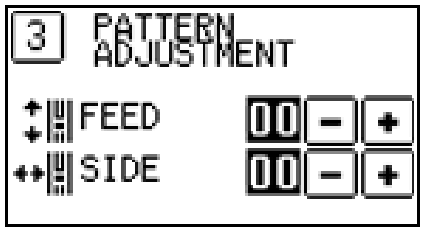
If the pattern is stretched in the ↕ direction, press the vertical [-] button.



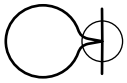
If the pattern is compressed in the ↔ direction, press the horizontal [+] button.



If the pattern is stretched in the ↔ direction, press the horizontal [-] button.

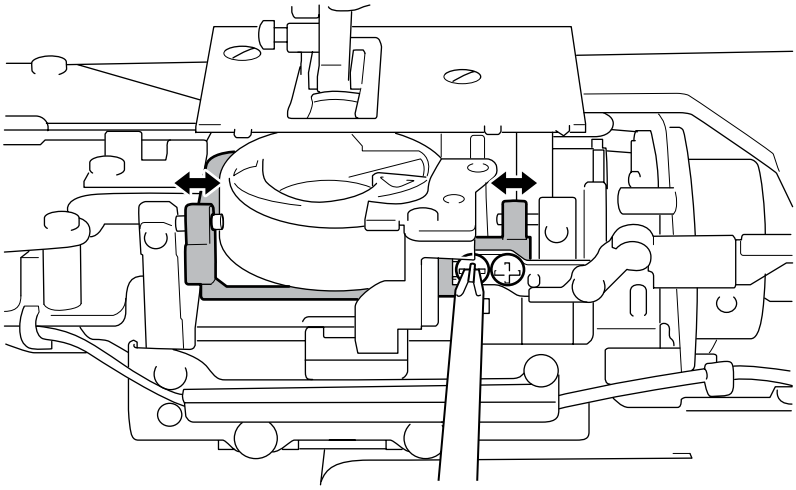


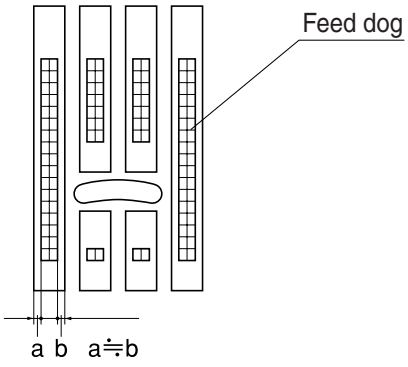
A right pattern.



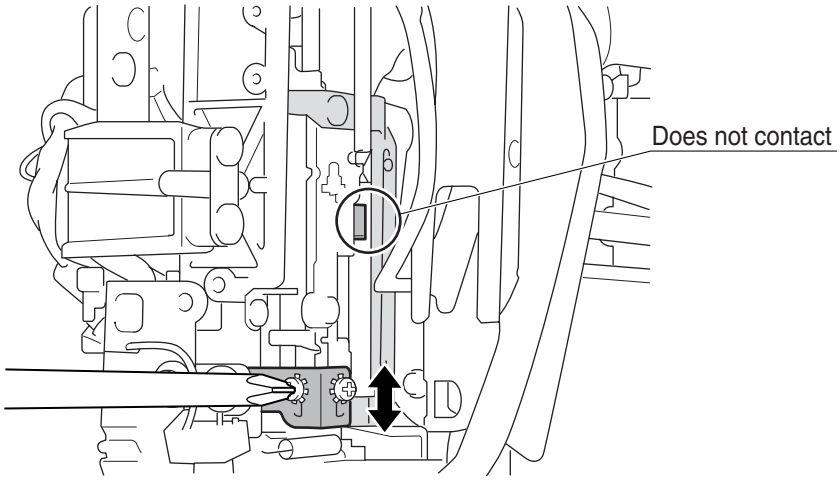
Joint a thread.

1. Perform "4-21 Front and back feed dog position adjustment."
2. Start test mode (refer to 4.4 "Test Mode" for test mode startup methods).
3. After pressing ▶ and selecting 08, press OK, and select "FEED DOG POSITION."
4. Press ✂, and set the left-right feed dog position to center.
5. Turn off the power, and remove the front cover.
6. Adjust the left-right feed dog position.

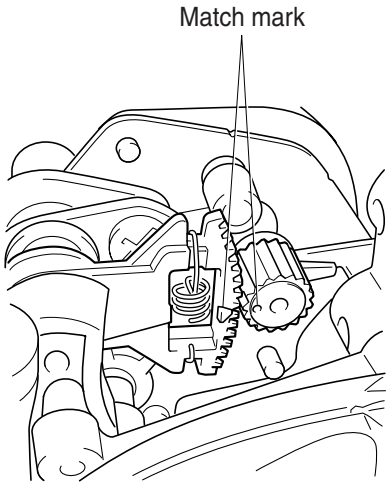




1. Remove the face plate.
2. Start test mode (refer to 4.4 "Test Mode" for test mode startup methods).
3. After pressing ▸ and selecting 06, press OK, and select "RELEASE."
4. Adjust the release adjuster up and down so that the moving part of the needle bar holder assy. does not come into contact with the release guide plate.



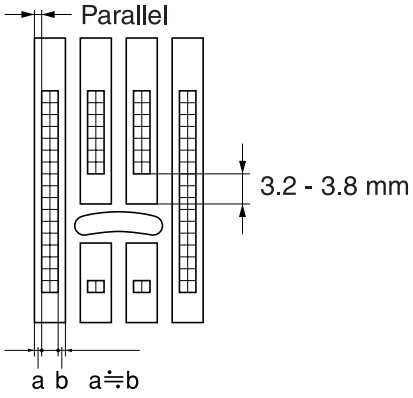
1. Remove the 2 screws (M4), and remove needle plate A from the feed base.
2. Align the feed adjuster assy. gear and F pulse motor gear match marks (feed in 0 mm position).



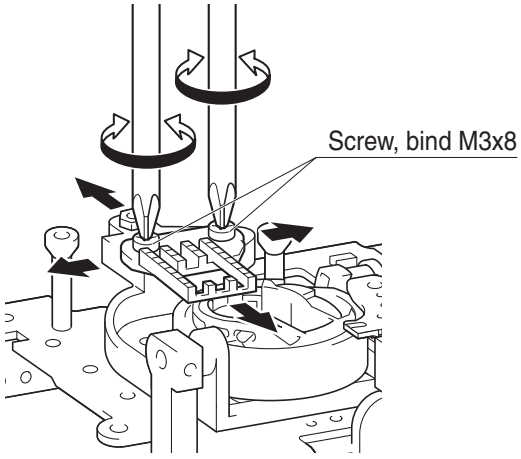
3. Loosen the 2 screws (bind M3 x 8), temporarily install needle plate A, and adjust the forward/reverse and left/right positions of the feed dog.

***Key point**

- Adjust the gap between the forward edge of the feed dog middle tooth and feed plate A front to back to 3.2 – 3.8 mm.
- Adjust the left and right gaps between the feed dog and needle plate A to be approximately the same.
- Make sure that the feed dog and needle plate A are not at an angle to each other.



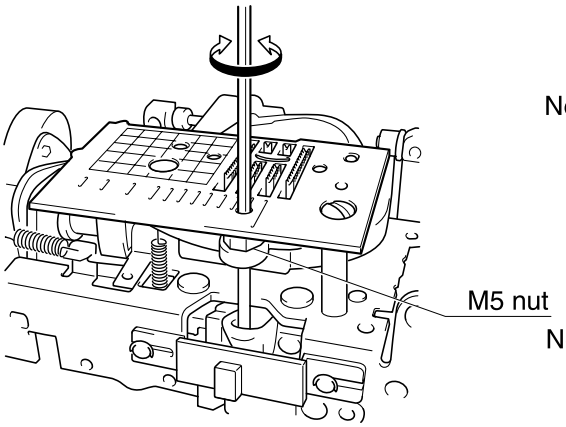
4. Secure the feed dog with the 2 screws (bind M3x8).
5. Fully tighten the 2 screws (M4), and secure needle plate A.

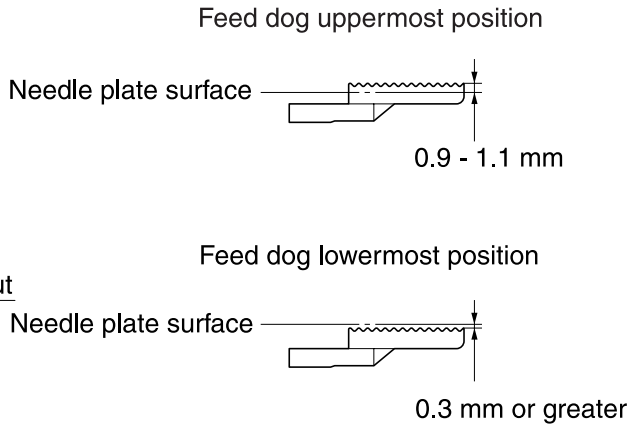


Feed dog height adjustment

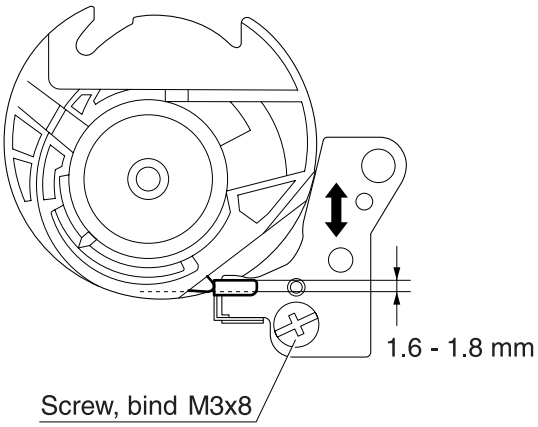
1. Turn lower shaft B, and bring the feed dog to its highest position (D cut of the lower shaft B facing up).
2. Loosen the M5 nut.
3. Adjust the feed dog height so that it is 0.9 – 1.1 mm from the upper surface of needle plate A by the amount the vertical adjuster screw assembly is screwed in.
4. Tighten the M5 nut being careful that the vertical adjuster screw assembly does not turn.
5. With the feed dog in the lowest position, check that the feed dog is 0.3 mm or more below the upper surface of needle plate.

NOTE •When the feed dog is too high, problems such as abnormal noise, bad feed quantities and the cloth not being fed arise.
•When the feed dog is too low, problems such as bad feed quantities and the cloth not being fed arise.





1. Set the inner rotary hook in the outer rotary hook.
2. Loosen the screw (bind M3x8) securing the inner rotary hook bracket assy.
3. Adjust the inner rotary hook bracket assy. attachment position so that contact between the inner rotary bracket assy. and inner rotary hook is 1.6 – 1.8 mm, and secure with the screw (bind M3x8)



Adjust the needle thread block

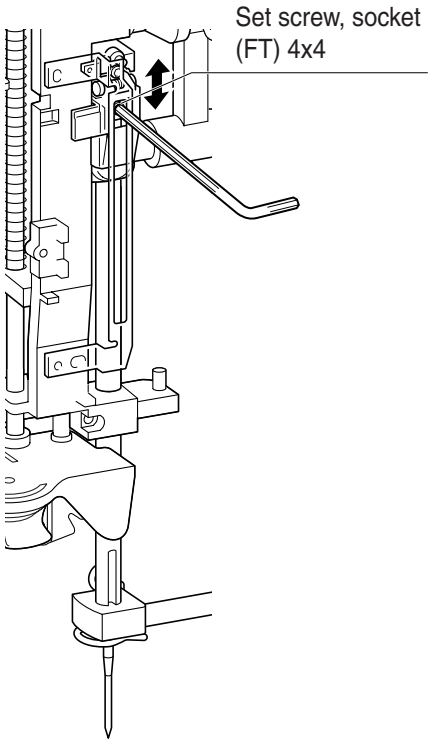
1. Attach a needle.
2. Turn the unit shaft, and position the needle bar at its highest point (position where the D cut of the unit axis faces forward).
3. Loosen the screw (set screw, socket (FT) 4 x 4).
4. Adjust the height of the needle thread block so that the threading hook passes through the needle hole, and secure with the screw (set screw, socket (FT) 4 x 4).

***Key point**

- Secure the screw (set screw, socket (FT) 4 x 4) so that the position of the needle thread block set screw is seen to be slight to the left when viewed from the front.
- Adjust so that the upper edge of the threading hook and the upper edge of the needle hole are at the same height.

NOTE •If the needle thread block set screw position is too far to the left, the hook will not operate and treading cannot be done. (Fig. 1).
•If the needle thread block set screw position is too far to the right, the needle bar supporter assy. and the needle thread block will come into contact and be damaged (Fig. 2).

Start movie clip (CD-ROM version only)



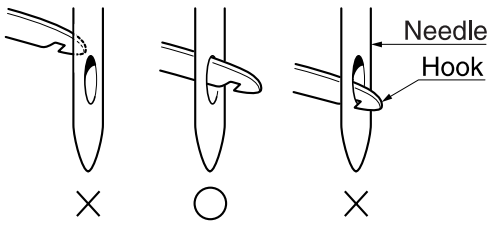


Fig. 1

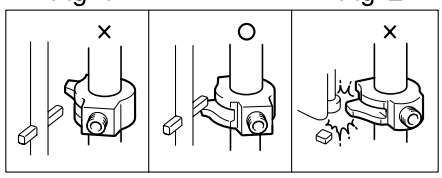
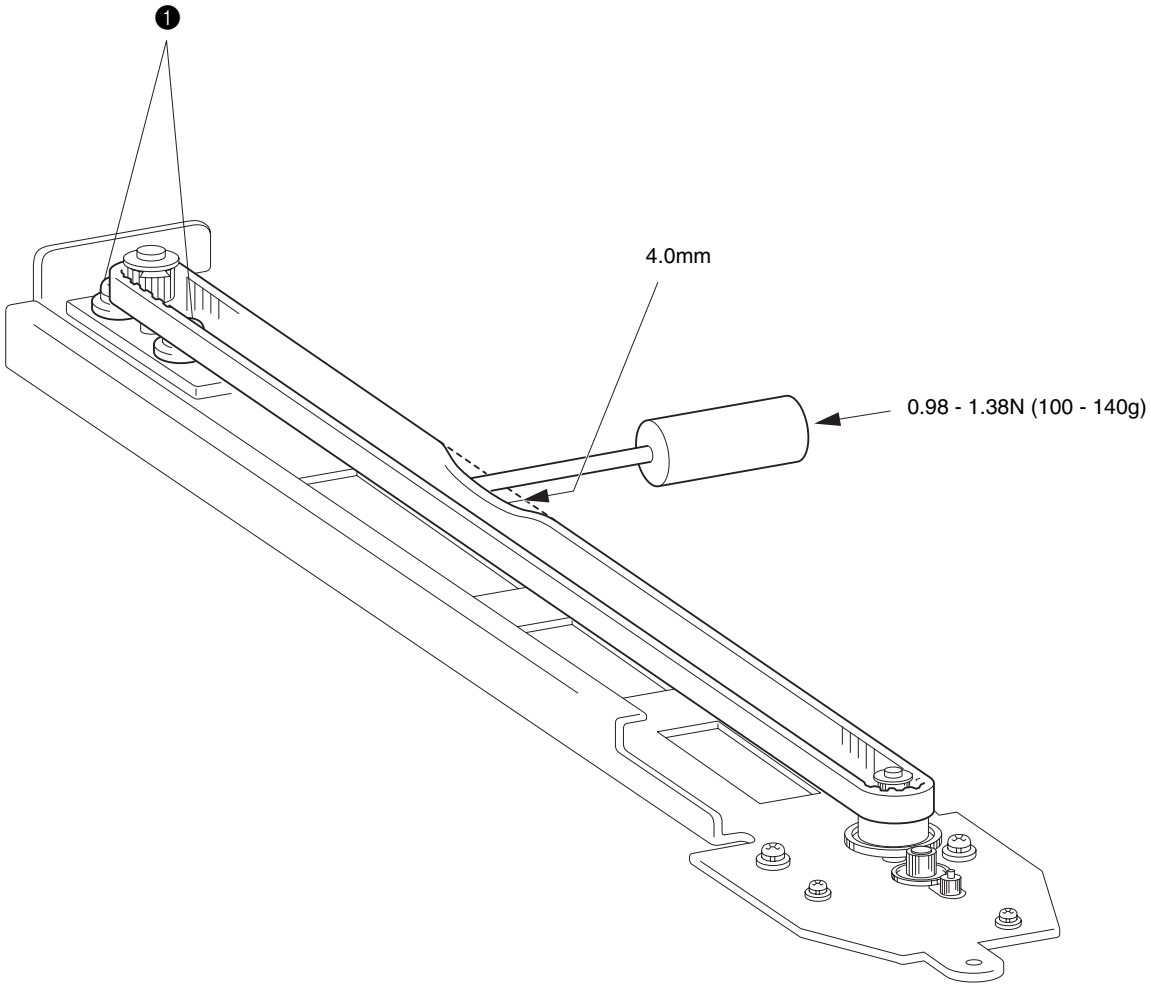
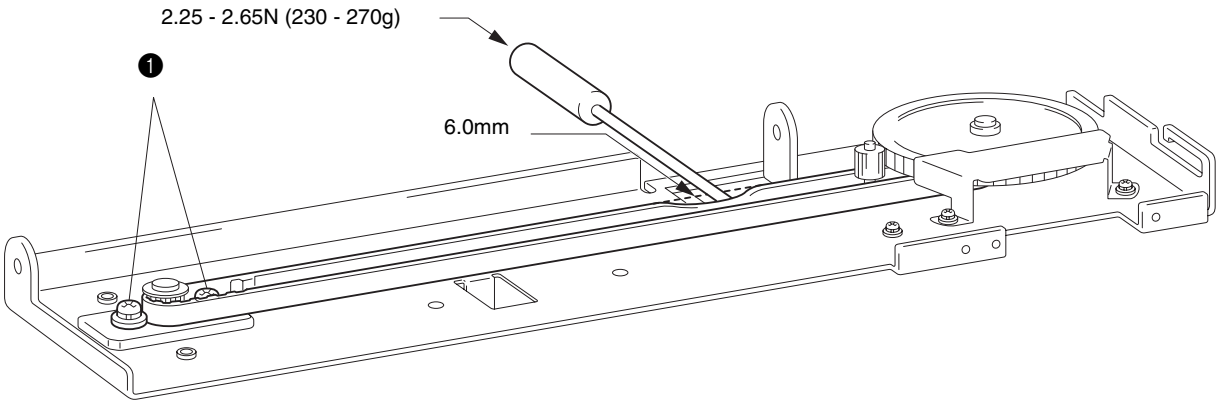


Fig. 2

1. Loosen the 2 screws ❶.
2. Move the tension pulley plate assembly right and left to adjust the X-belt tension.
3. Tighten the 2 screws ❶.
   Load when center of X-belt is deflected 4.0 mm: 0.98 to 1.38N (100 to 140g)



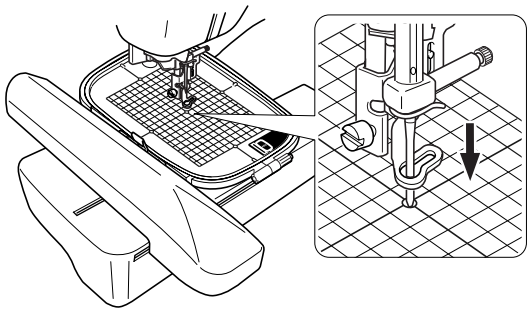
1. Loosen the 2 screws ❶.
2. Move the tension pulley plate assembly right and left to adjust the Y-belt tension.
3. Tighten the 2 screws ❷.
   Load when center of Y-belt is deflected 6.0 mm: 2.25 to 2.65N (230 to 270g)



If the embroidery unit replace, or the PCB replace, check the central position of the embroidery.

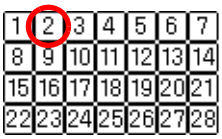
A point to be checked the central position of the embroidery.

1. Attach the embroidery unit.
2. Turn on the power, and press [OK] , and move the embroidery carriage.
3. Put the embroidery sheet L on the top of the inside embroidery frame L.
4. Attach the embroidery frame (point. 3) on the embroidery unit.
5. Turn the pulley on this side without haste, and check that the needle put into the central hole of the embroidery.

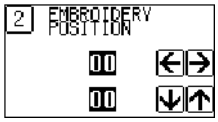


A point to be adjustmented, when the needle don't put into the central hole of the embroidery.

1. Start the test mode.
2. Select test mode " 2 "



3. Adjust the needle position with ←→↓↑ .

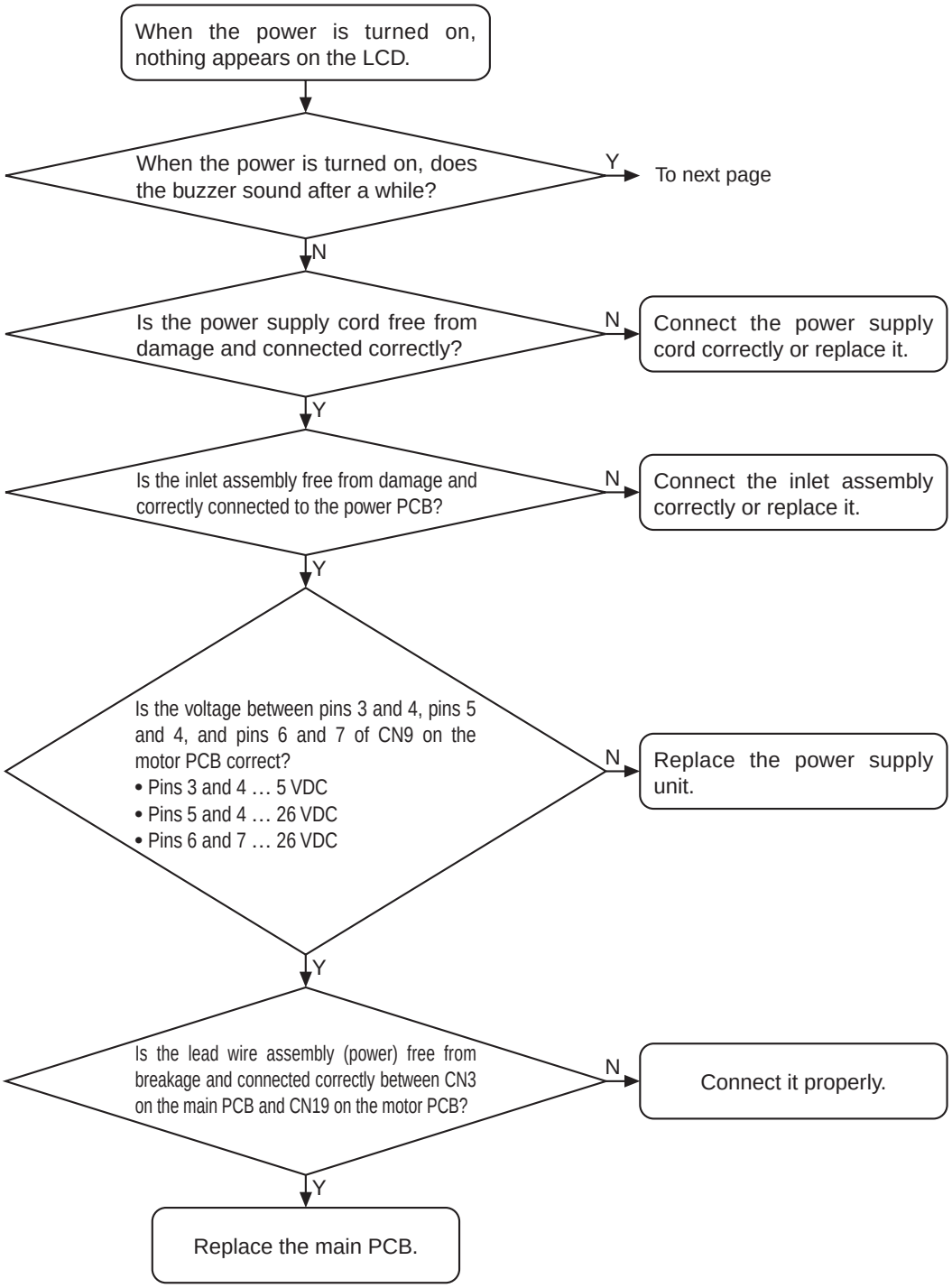


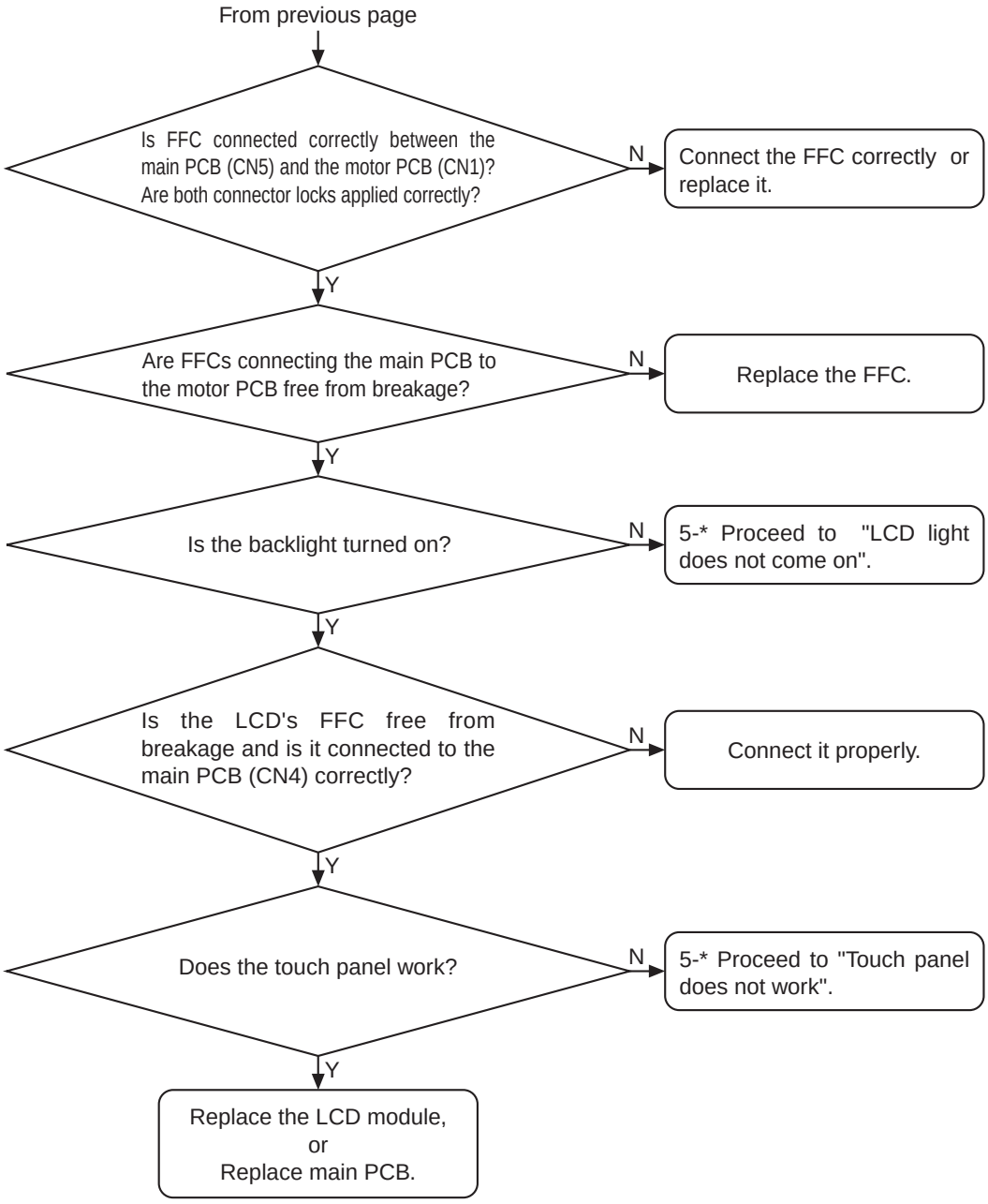
4. If the adjustment is finished, turn off the power to put on record the adjustment.

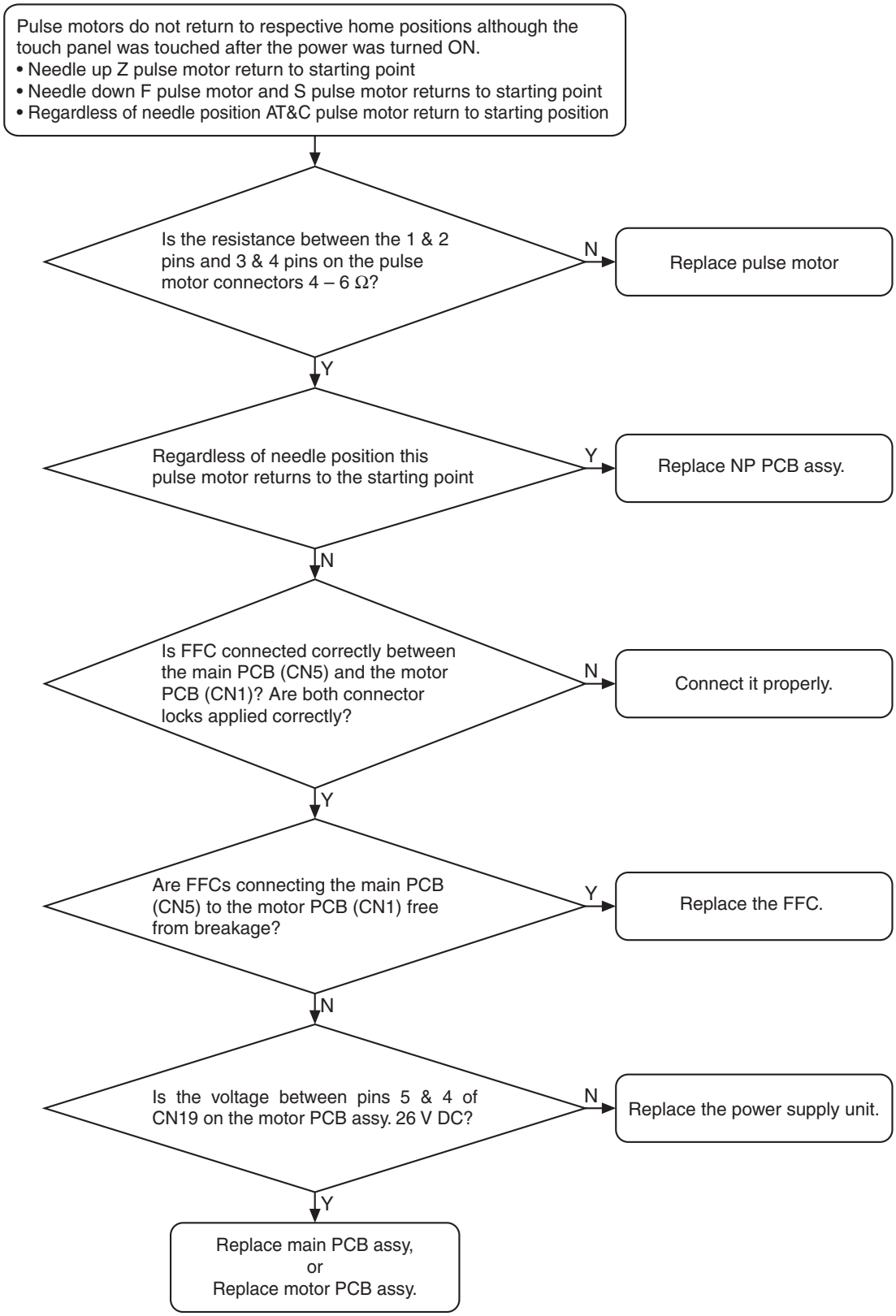
5 Failure Investigation for Electronic Parts

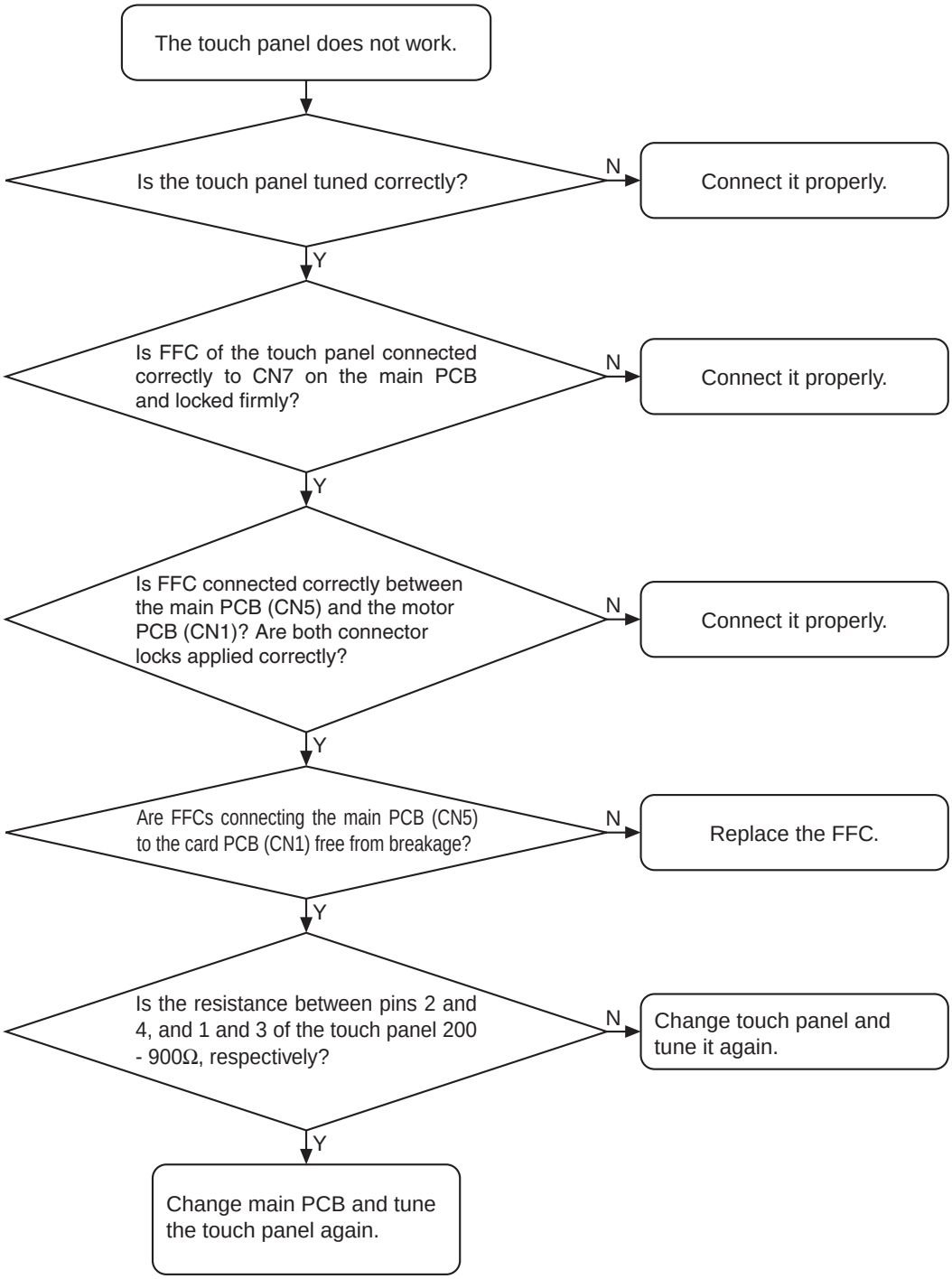
* Perform resistance measurements after turning off the power, and detaching the connectors to be measured from the PCB.

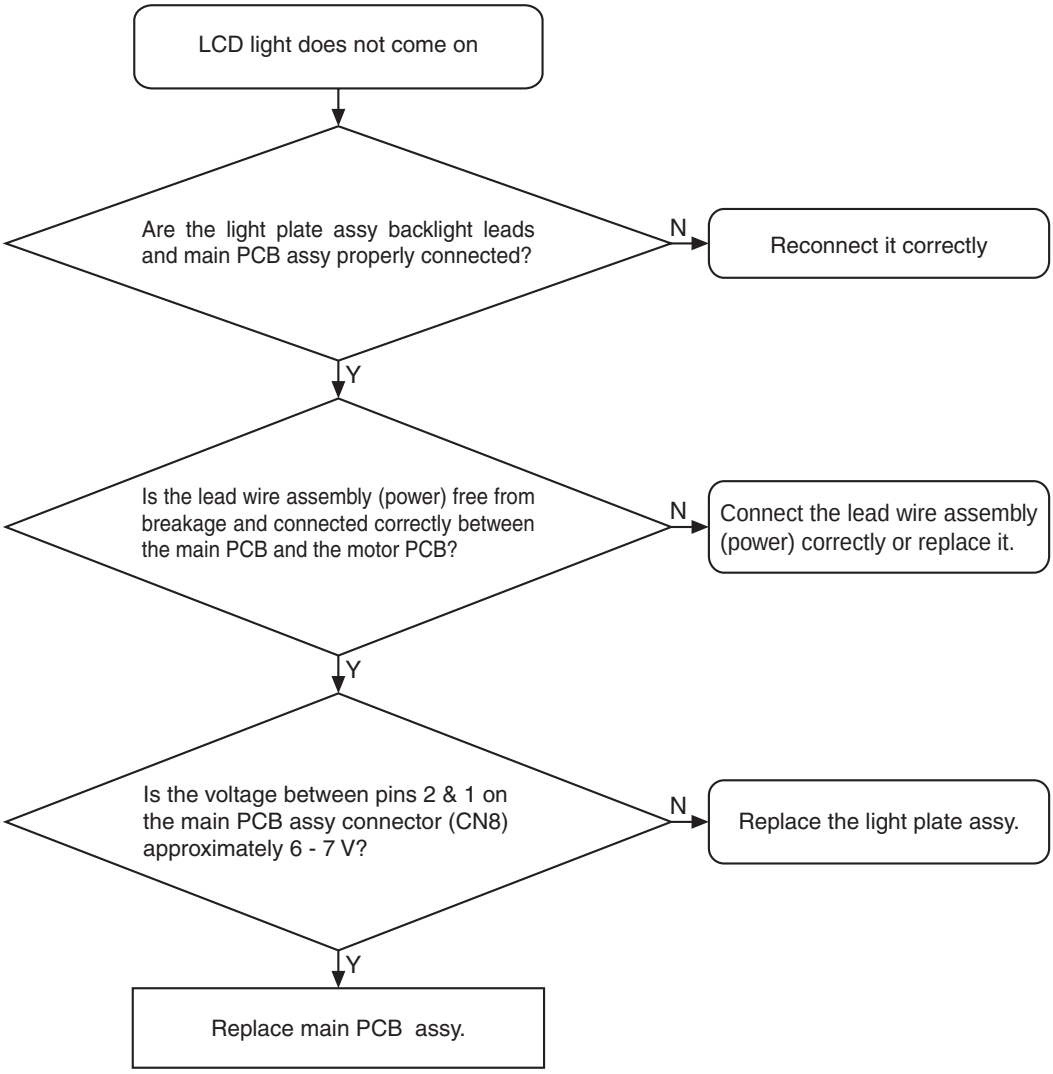
Error display	Cause
F01 (5 - 29)	Abnormal rotation in main motor.
F02 (5 - 30)	Key pressed continually with power ON (operation system SW).
F04 (5 - 31)	FC disconnect
F05 (5 - 32)	Dirty speed sensor
F06 (5 - 32)	NP sensor disconnect
F07 (5 - 33)	Speed VR disconnect
The safety device has been activated. Is the turned tougled? Is the needle bent?	No rotation in main motor.
A malfunction occurred. Turn the machine off, the on again *-PM	Each pulse motor has not returned to its original position.

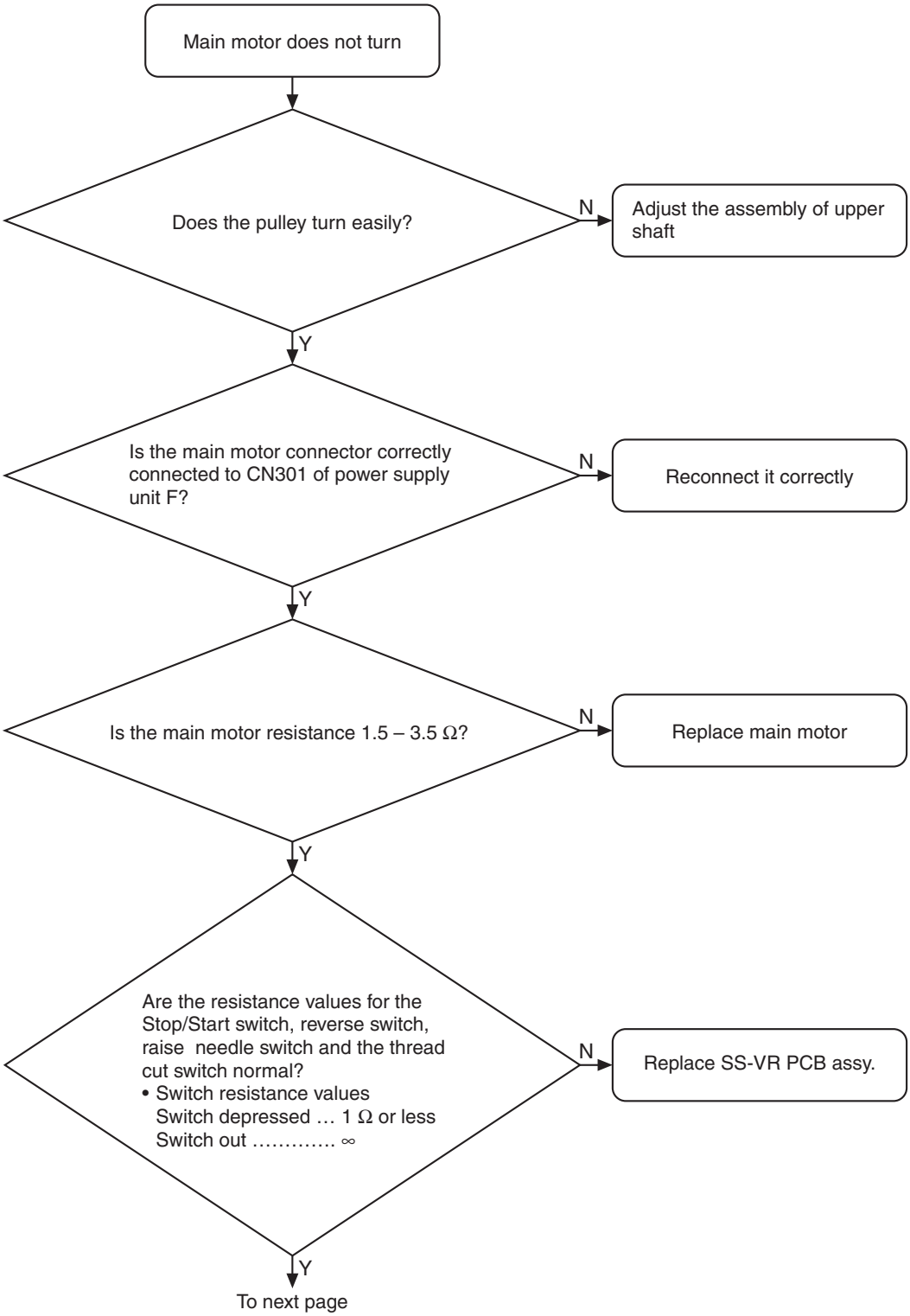

When the power is turned on, nothing appears on the LCD.
When the power is turned on, does the buzzer sound after a while?
Y
To next page
N
Is the power supply cord free from damage and connected correctly?
N
Connect the power supply cord correctly or replace it.
Y
Is the inlet assembly free from damage and correctly connected to the power PCB?
N
Connect the inlet assembly correctly or replace it.
Y
Is the voltage between pins 3 and 4, pins 5 and 4, and pins 6 and 7 of CN9 on the motor PCB correct?
• Pins 3 and 4 … 5 VDC
• Pins 5 and 4 … 26 VDC
• Pins 6 and 7 … 26 VDC
N
Replace the power supply unit.
Y
Is the lead wire assembly (power) free from breakage and connected correctly between CN3 on the main PCB and CN19 on the motor PCB?
N
Connect it properly.
Y
Replace the main PCB.

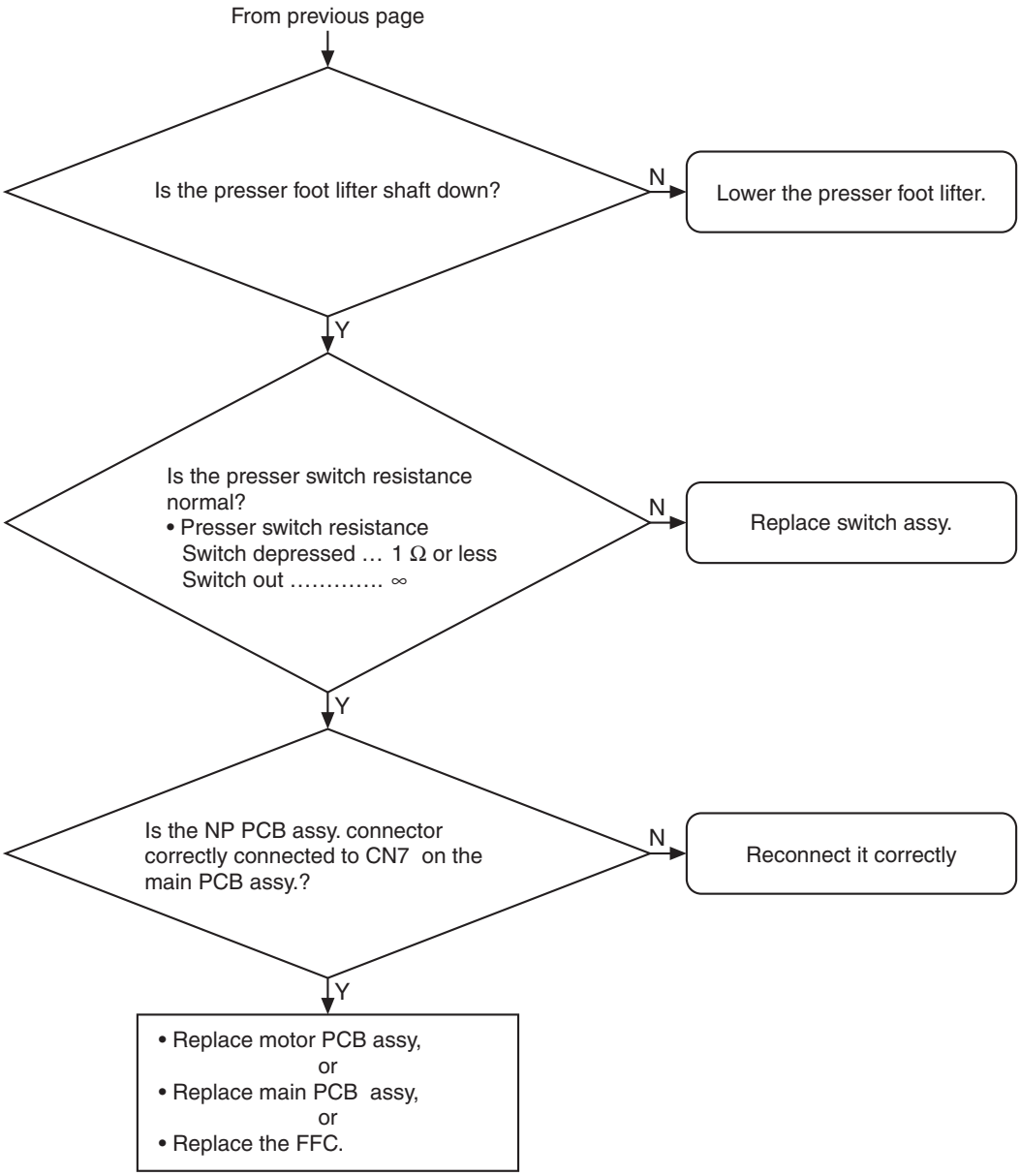

From previous page
Is FFC connected correctly between the main PCB (CN5) and the motor PCB (CN1)? Are both connector locks applied correctly?
N
Connect the FFC correctly or replace it.
Y
Are FFCs connecting the main PCB to the motor PCB free from breakage?
N
Replace the FFC.
Y
Is the backlight turned on?
N
5-* Proceed to "LCD light does not come on".
Y
Is the LCD's FFC free from breakage and is it connected to the main PCB (CN4) correctly?
N
Connect it properly.
Y
Does the touch panel work?
N
5-* Proceed to "Touch panel does not work".
Y
Replace the LCD module,
or
Replace main PCB.

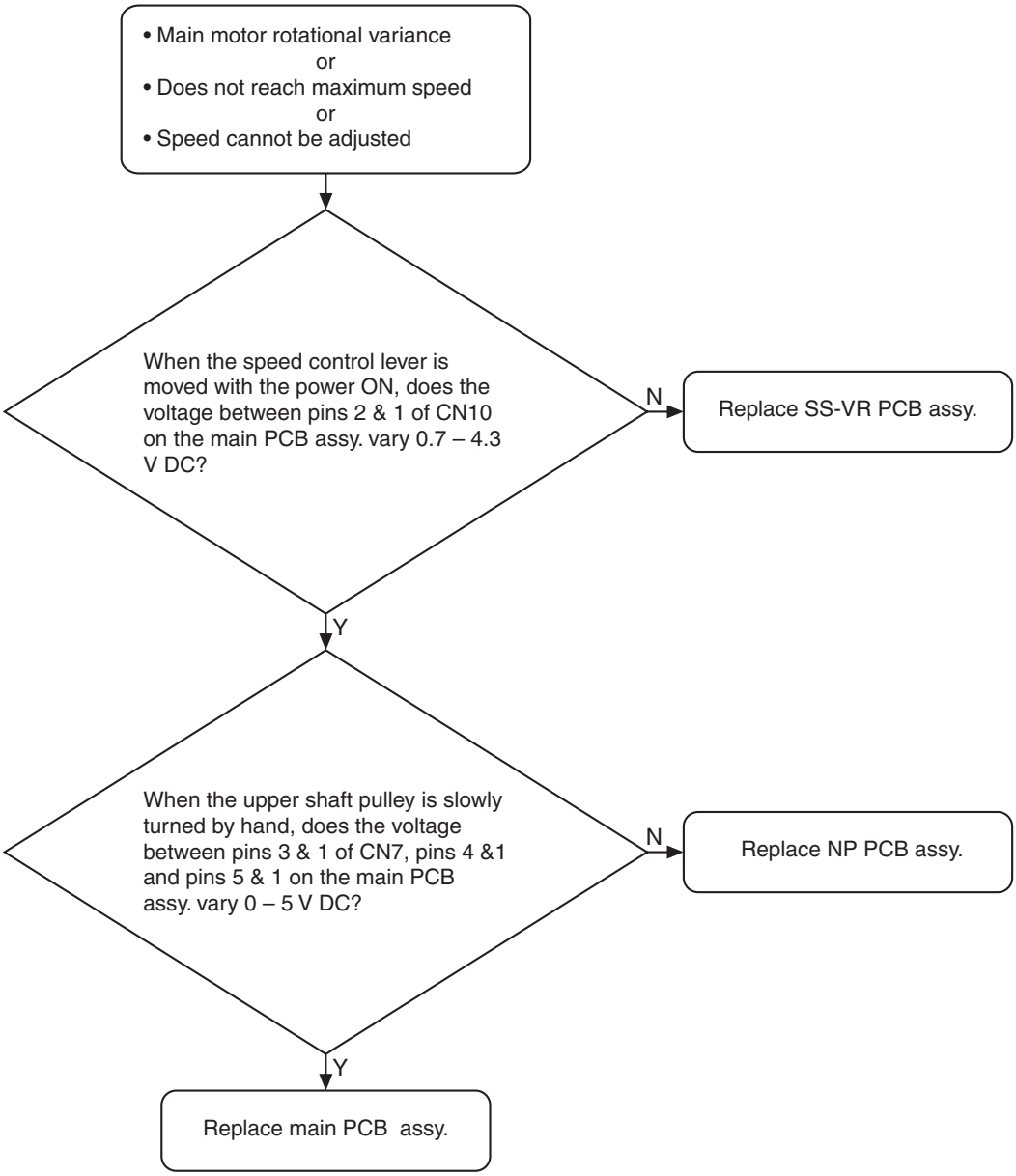

Pulse motors do not return to respective home positions although the touch panel was touched after the power was turned ON.
• Needle up Z pulse motor return to starting point
• Needle down F pulse motor and S pulse motor returns to starting point
• Regardless of needle position AT&C pulse motor return to starting position
Is the resistance between the 1 & 2 pins and 3 & 4 pins on the pulse motor connectors 4 – 6 Ω?
N
Replace pulse motor
Y
Regardless of needle position this pulse motor returns to the starting point
Y
Replace NP PCB assy.
N
Is FFC connected correctly between the main PCB (CN5) and the motor PCB (CN1)? Are both connector locks applied correctly?
N
Connect it properly.
Y
Are FFCs connecting the main PCB (CN5) to the motor PCB (CN1) free from breakage?
Y
Replace the FFC.
N
Is the voltage between pins 5 & 4 of CN19 on the motor PCB assy. 26 V DC?
N
Replace the power supply unit.
Y
Replace main PCB assy,
or
Replace motor PCB assy.

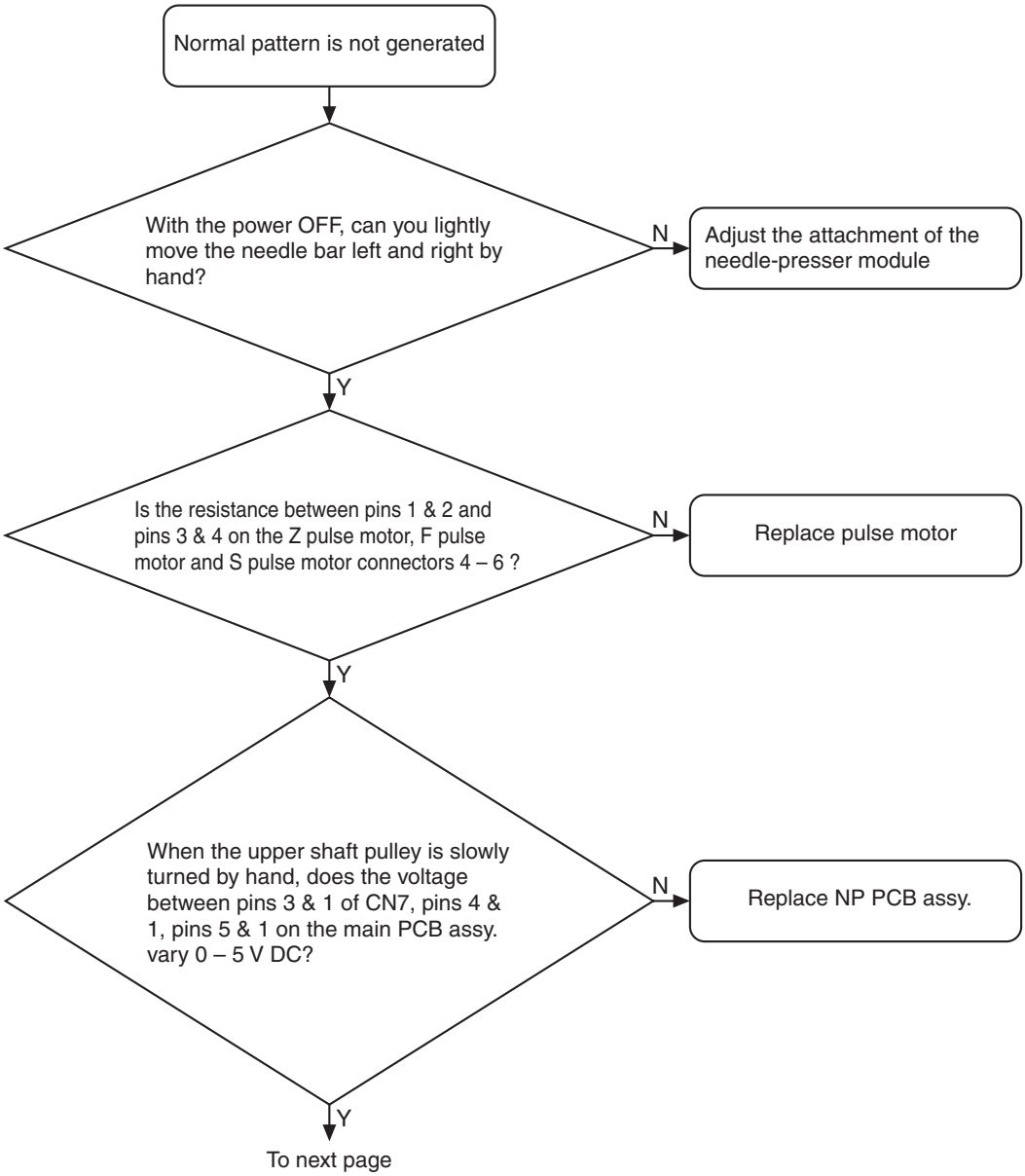

The touch panel does not work.
Is the touch panel tuned correctly?
N
Connect it properly.
Y
Is FFC of the touch panel connected correctly to CN7 on the main PCB and locked firmly?
N
Connect it properly.
Y
Is FFC connected correctly between the main PCB (CN5) and the motor PCB (CN1)? Are both connector locks applied correctly?
N
Connect it properly.
Y
Are FFCs connecting the main PCB (CN5) to the card PCB (CN1) free from breakage?
N
Replace the FFC.
Y
Is the resistance between pins 2 and 4, and 1 and 3 of the touch panel 200 - 900Ω, respectively?
N
Change touch panel and tune it again.
Y
Change main PCB and tune the touch panel again.

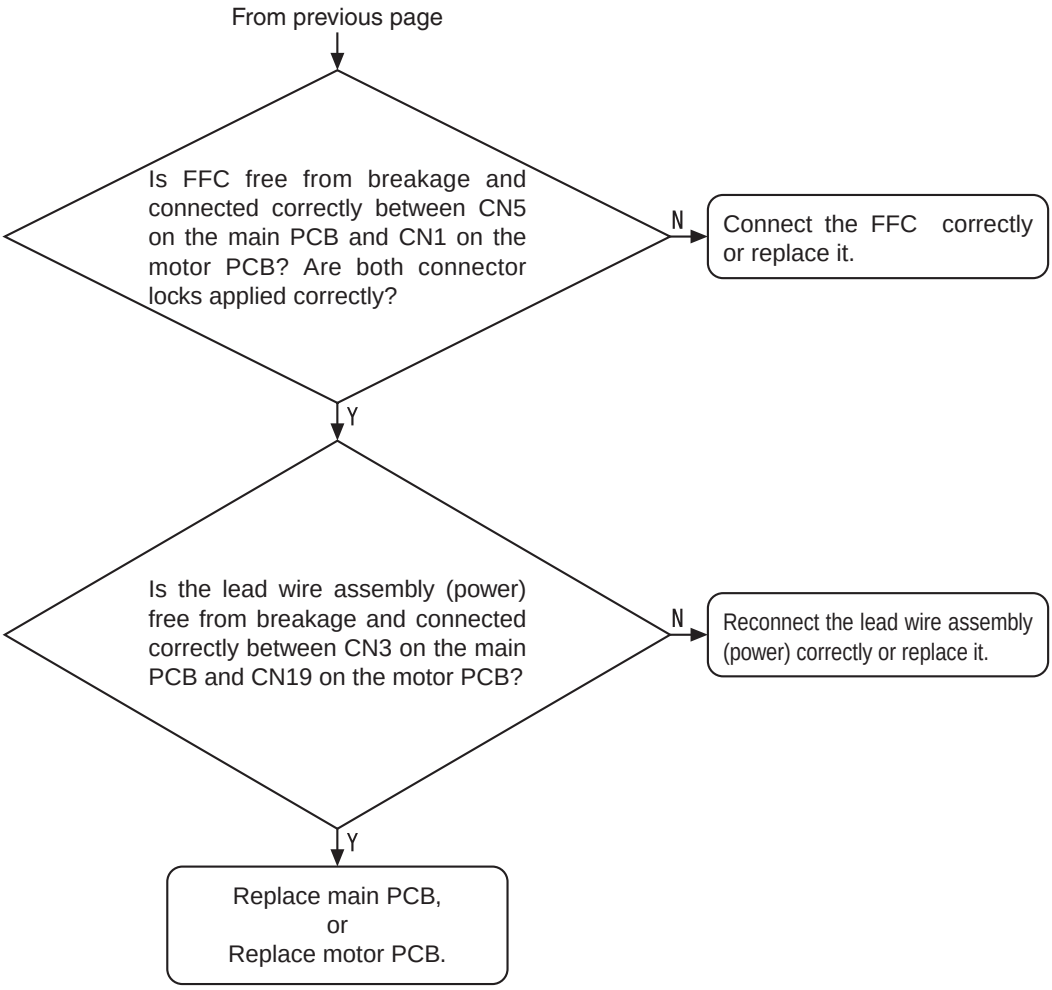

LCD light does not come on
Are the light plate assy backlight leads and main PCB assy properly connected?
N
Reconnect it correctly
Y
Is the lead wire assembly (power) free from breakage and connected correctly between the main PCB and the motor PCB?
N
Connect the lead wire assembly (power) correctly or replace it.
Y
Is the voltage between pins 2 & 1 on the main PCB assy connector (CN8) approximately 6 - 7 V?
N
Replace the light plate assy.
Y
Replace main PCB assy.

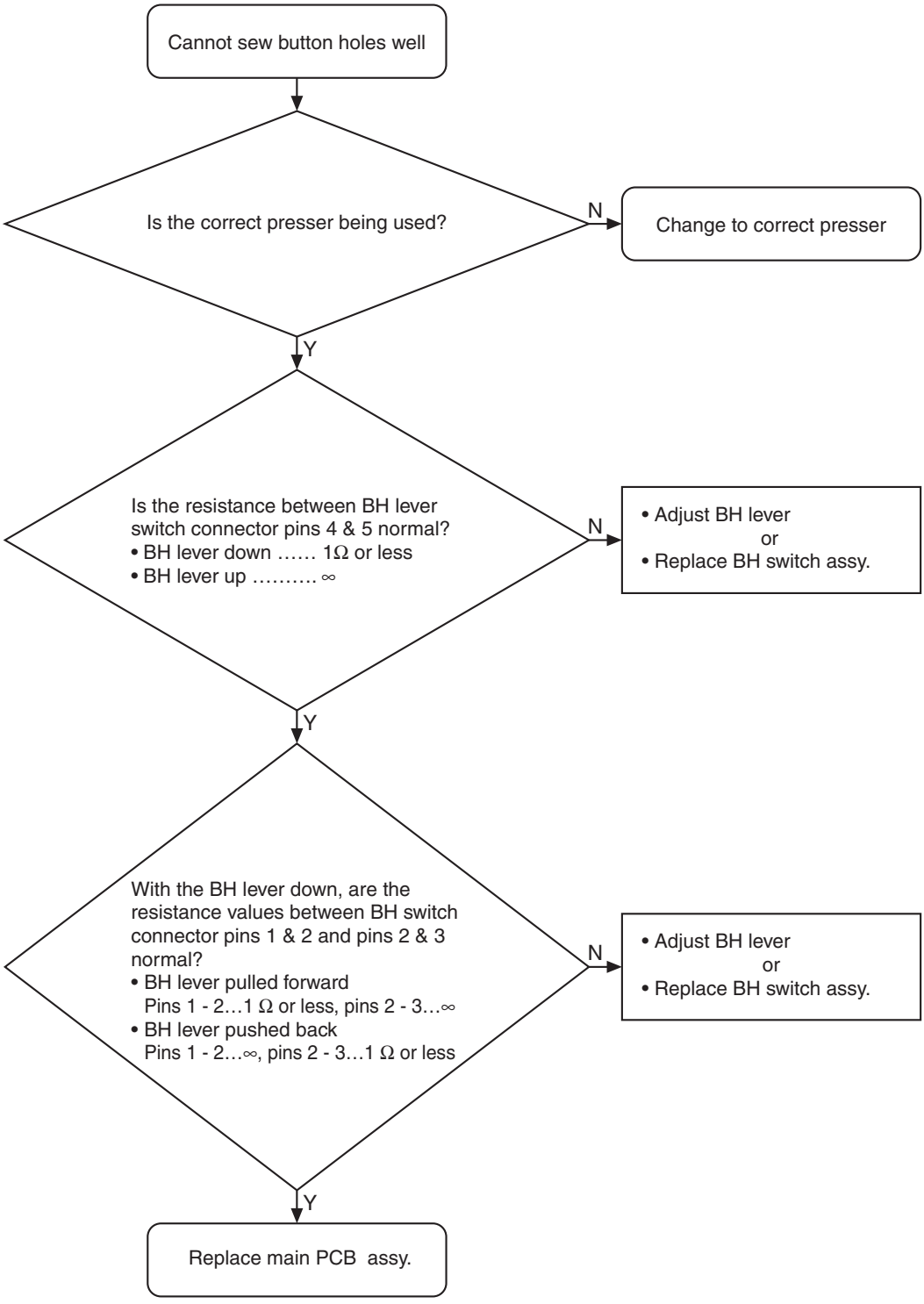

Main motor does not turn
Does the pulley turn easily?
N
Adjust the assembly of upper shaft
Y
Is the main motor connector correctly connected to CN301 of power supply unit F?
N
Reconnect it correctly
Y
Is the main motor resistance 1.5 – 3.5 Ω?
N
Replace main motor
Y
Are the resistance values for the Stop/Start switch, reverse switch, raise needle switch and the thread cut switch normal?
• Switch resistance values
Switch depressed … 1 Ω or less
Switch out ……. ∞
N
Replace SS-VR PCB assy.
Y
To next page

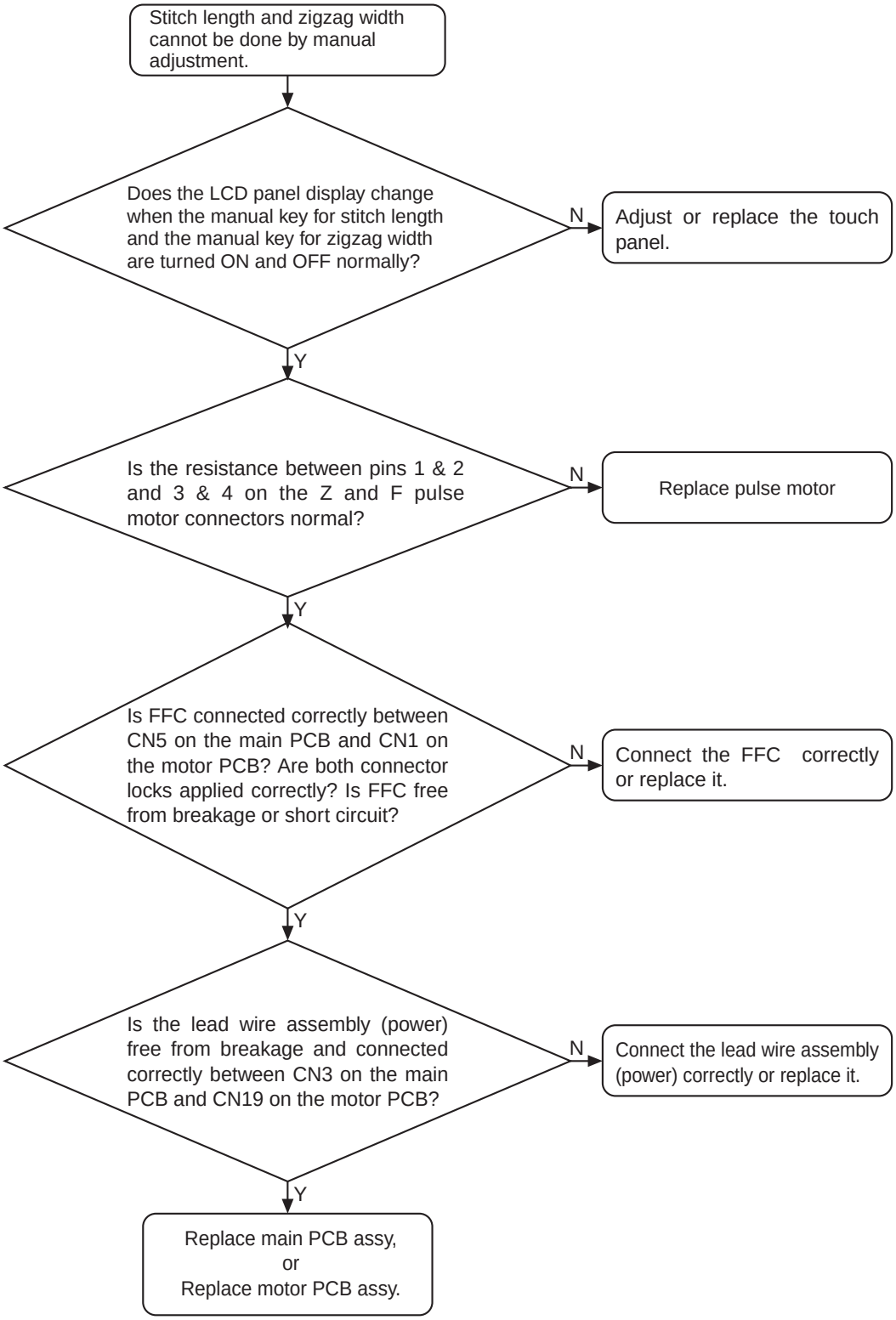

From previous page
Is the presser foot lifter shaft down?
N
Lower the presser foot lifter.
Y
Is the presser switch resistance normal?
• Presser switch resistance
Switch depressed … 1 Ω or less
Switch out ……. ∞
N
Replace switch assy.
Y
Is the NP PCB assy. connector correctly connected to CN7 on the main PCB assy.?
N
Reconnect it correctly
Y
• Replace motor PCB assy,
or
• Replace main PCB assy,
or
• Replace the FFC.

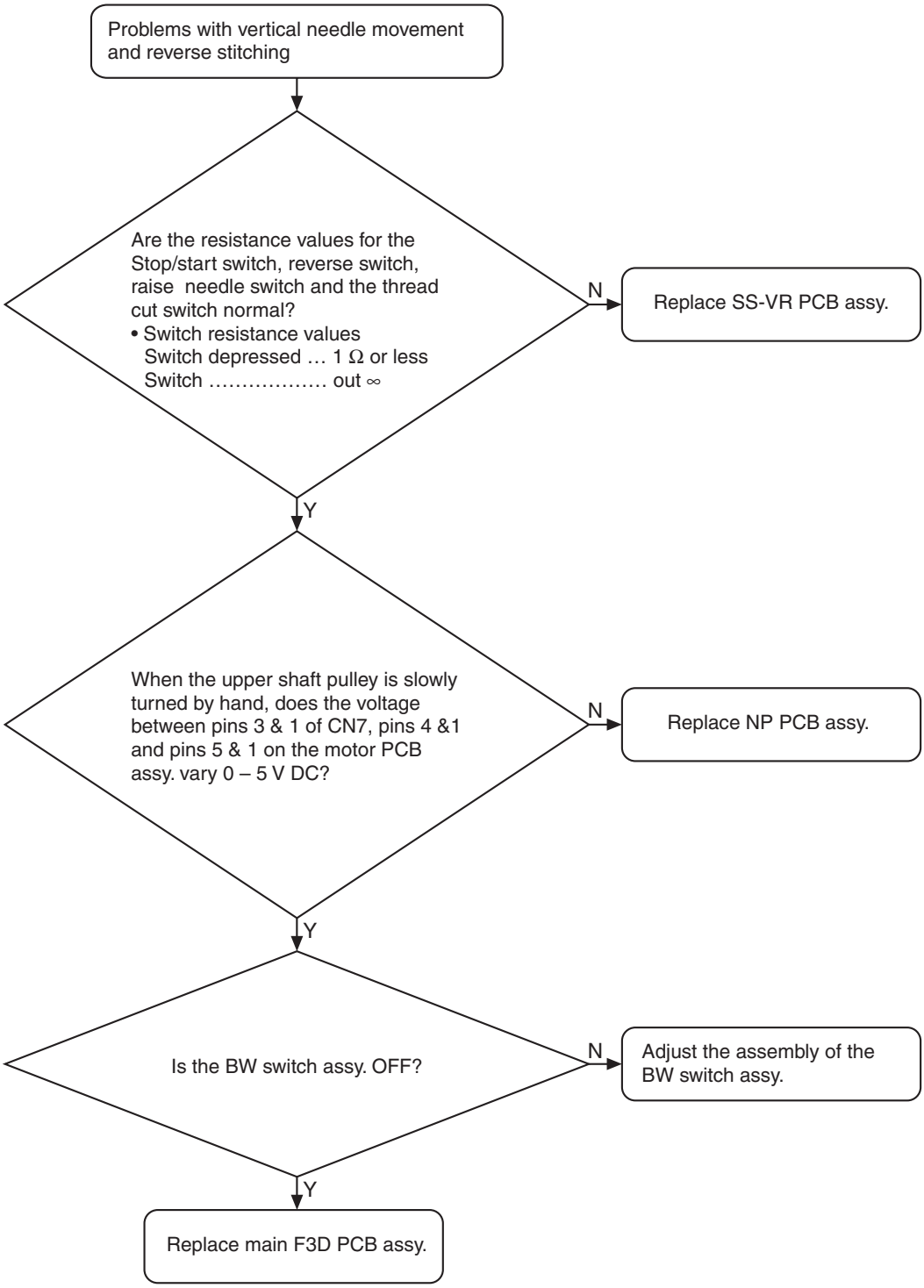

• Main motor rotational variance
or
• Does not reach maximum speed
or
• Speed cannot be adjusted
When the speed control lever is moved with the power ON, does the voltage between pins 2 & 1 of CN10 on the main PCB assy. vary 0.7 – 4.3 V DC?
N
Replace SS-VR PCB assy.
Y
When the upper shaft pulley is slowly turned by hand, does the voltage between pins 3 & 1 of CN7, pins 4 &1 and pins 5 & 1 on the main PCB assy. vary 0 – 5 V DC?
N
Replace NP PCB assy.
Y
Replace main PCB assy.

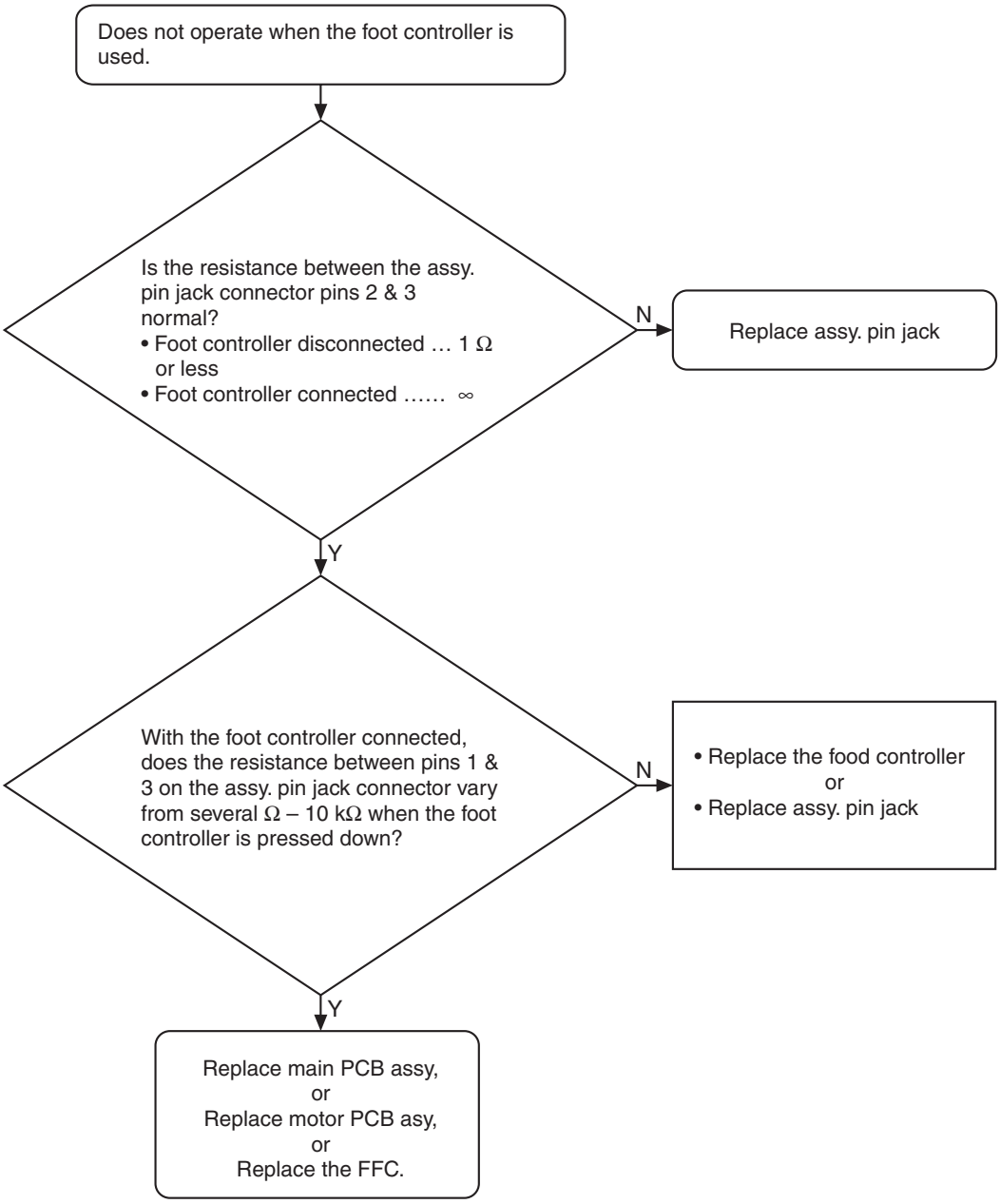

Normal pattern is not generated
With the power OFF, can you lightly move the needle bar left and right by hand?
N
Adjust the attachment of the needle-presser module
Y
Is the resistance between pins 1 & 2 and pins 3 & 4 on the Z pulse motor, F pulse motor and S pulse motor connectors 4 – 6 ?
N
Replace pulse motor
Y
When the upper shaft pulley is slowly turned by hand, does the voltage between pins 3 & 1 of CN7, pins 4 & 1, pins 5 & 1 on the main PCB assy. vary 0 – 5 V DC?
N
Replace NP PCB assy.
Y
To next page

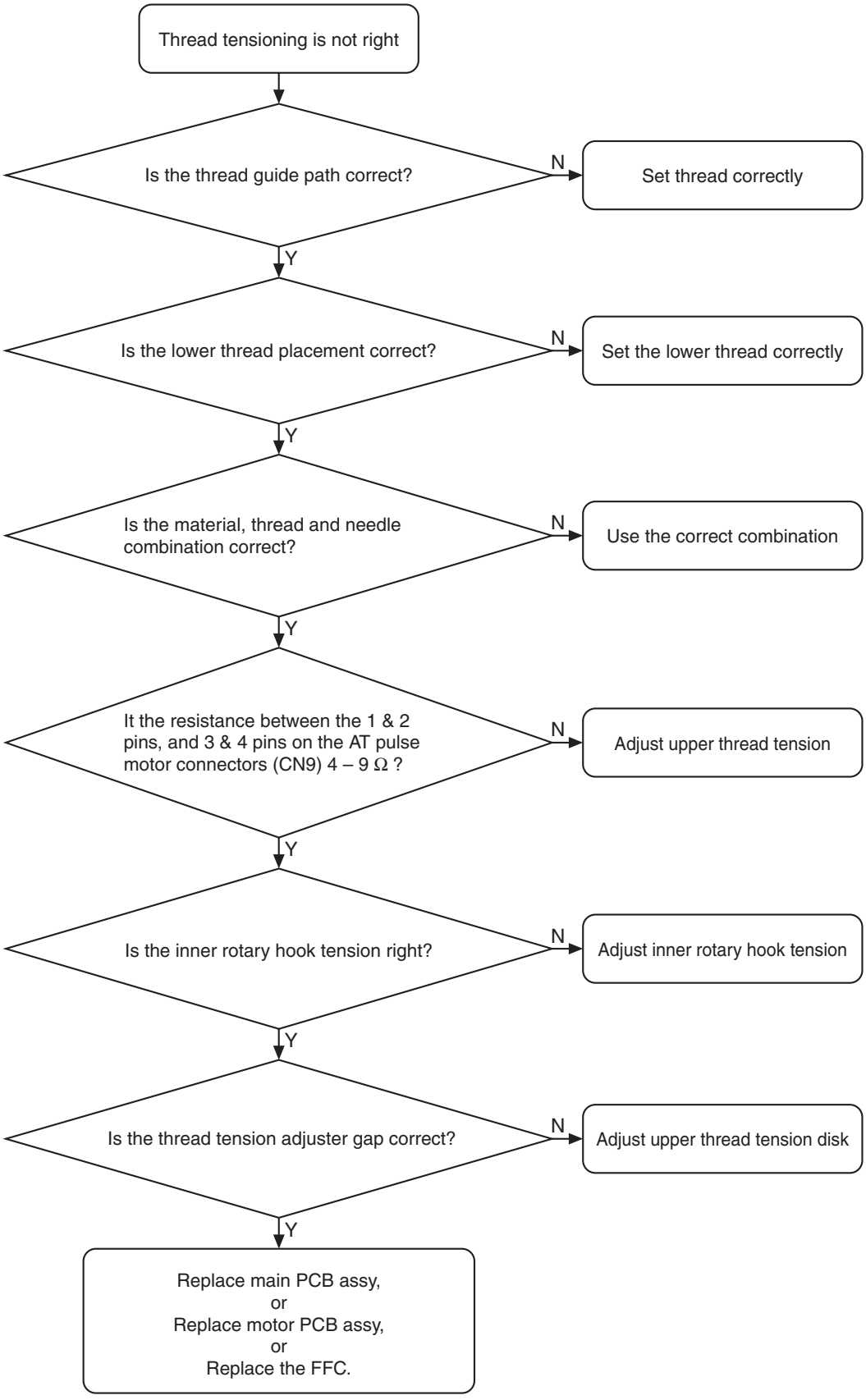

From previous page
Is FFC free from breakage and connected correctly between CN5 on the main PCB and CN1 on the motor PCB? Are both connector locks applied correctly?
N
Connect the FFC correctly or replace it.
Y
Is the lead wire assembly (power) free from breakage and connected correctly between CN3 on the main PCB and CN19 on the motor PCB?
N
Reconnect the lead wire assembly (power) correctly or replace it.
Y
Replace main PCB,
or
Replace motor PCB.

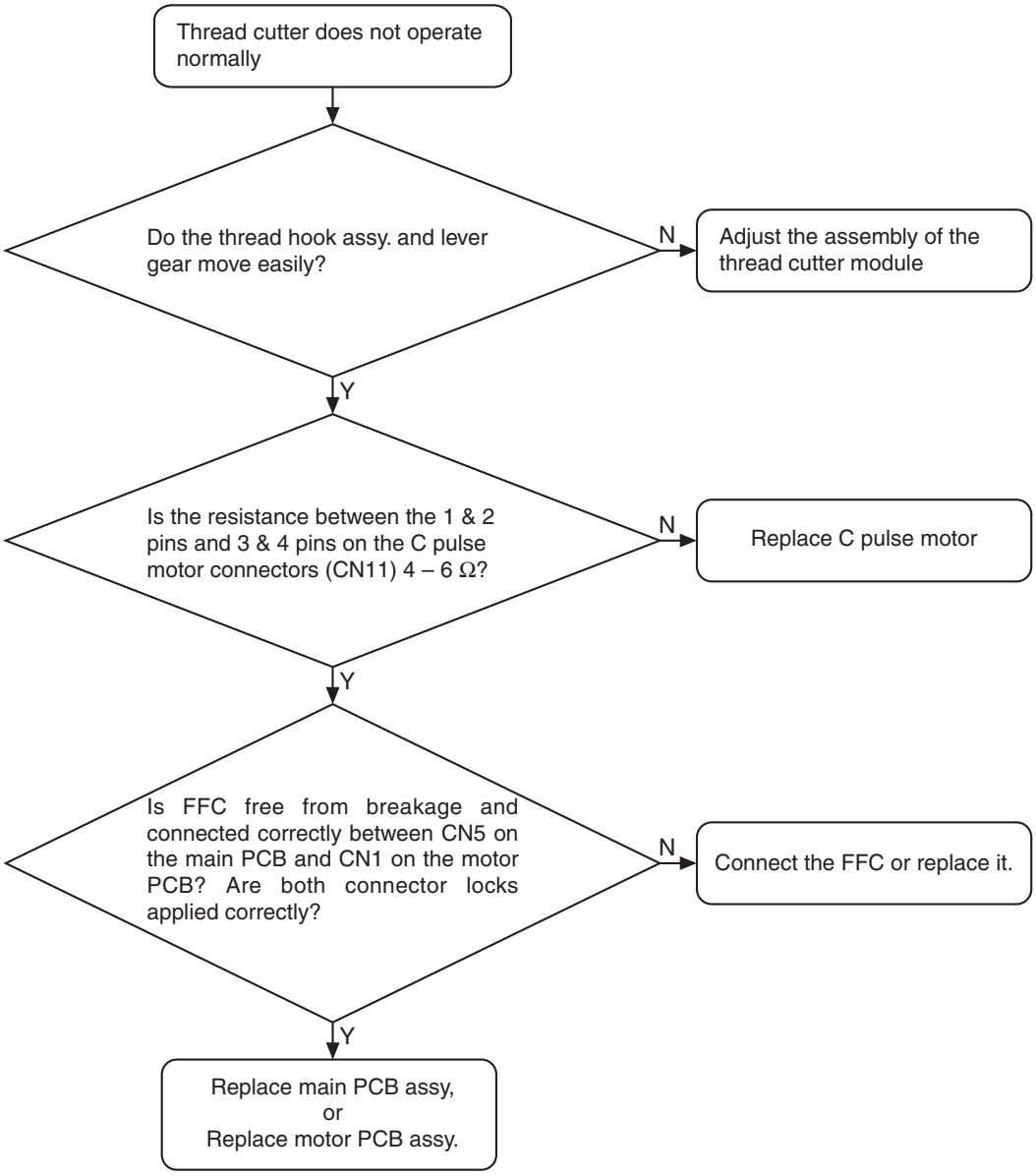

Cannot sew button holes well
Is the correct presser being used?
N
Change to correct presser
Y
Is the resistance between BH lever switch connector pins 4 & 5 normal?
• BH lever down …… 1Ω or less
• BH lever up ……. ∞
N
• Adjust BH lever
or
• Replace BH switch assy.
Y
With the BH lever down, are the resistance values between BH switch connector pins 1 & 2 and pins 2 & 3 normal?
• BH lever pulled forward
Pins 1 - 2…1 Ω or less, pins 2 - 3…∞
• BH lever pushed back
Pins 1 - 2…∞, pins 2 - 3…1 Ω or less
N
• Adjust BH lever
or
• Replace BH switch assy.
Y
Replace main PCB assy.

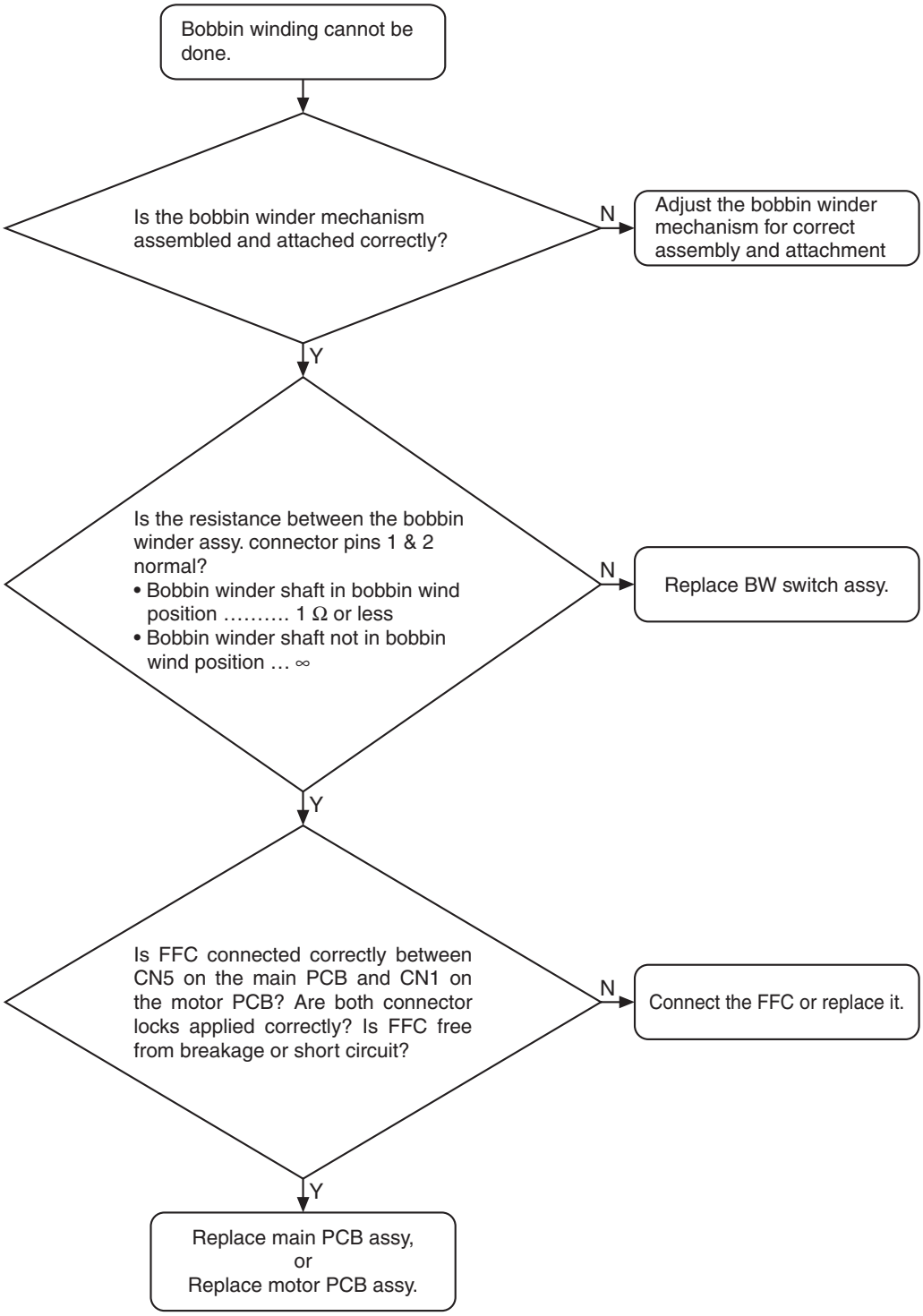

Stitch length and zigzag width cannot be done by manual adjustment.
Does the LCD panel display change when the manual key for stitch length and the manual key for zigzag width are turned ON and OFF normally?
N
Adjust or replace the touch panel.
Y
Is the resistance between pins 1 & 2 and 3 & 4 on the Z and F pulse motor connectors normal?
N
Replace pulse motor
Y
Is FFC connected correctly between CN5 on the main PCB and CN1 on the motor PCB? Are both connector locks applied correctly? Is FFC free from breakage or short circuit?
N
Connect the FFC correctly or replace it.
Y
Is the lead wire assembly (power) free from breakage and connected correctly between CN3 on the main PCB and CN19 on the motor PCB?
N
Connect the lead wire assembly (power) correctly or replace it.
Y
Replace main PCB assy,
or
Replace motor PCB assy.

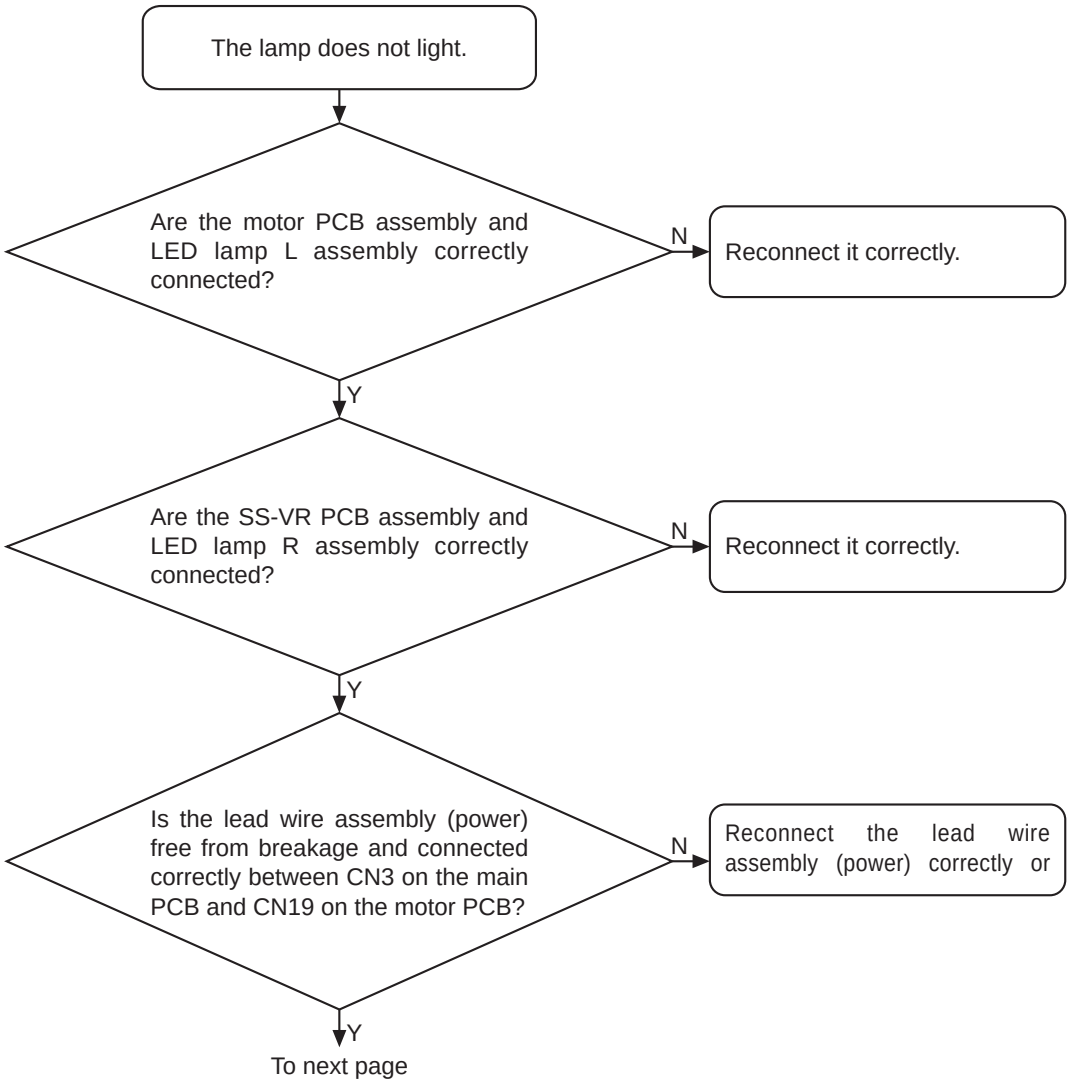

Problems with vertical needle movement and reverse stitching
Are the resistance values for the Stop/start switch, reverse switch, raise needle switch and the thread cut switch normal?
• Switch resistance values
Switch depressed … 1 Ω or less
Switch …… out ∞
N
Replace SS-VR PCB assy.
Y
When the upper shaft pulley is slowly turned by hand, does the voltage between pins 3 & 1 of CN7, pins 4 &1 and pins 5 & 1 on the motor PCB assy. vary 0 – 5 V DC?
N
Replace NP PCB assy.
Y
Is the BW switch assy. OFF?
N
Adjust the assembly of the BW switch assy.
Y
Replace main F3D PCB assy.

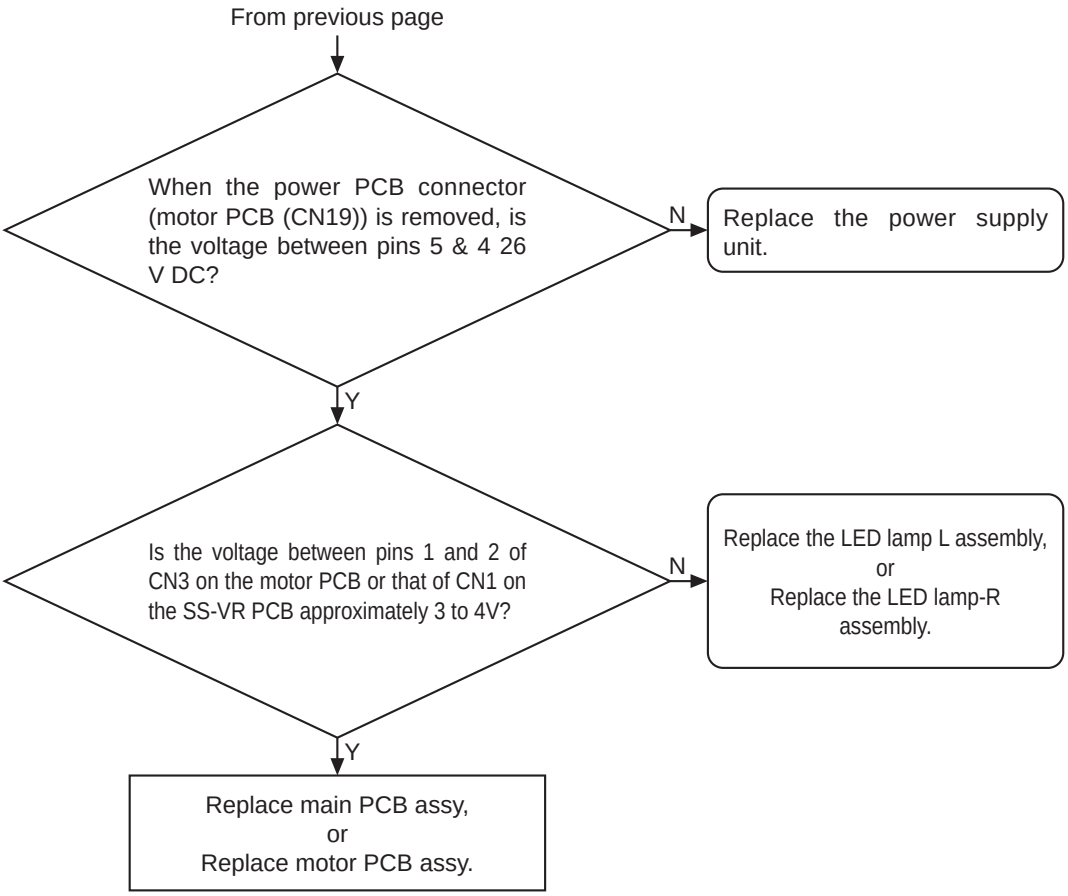

Does not operate when the foot controller is used.
Is the resistance between the assy. pin jack connector pins 2 & 3 normal?
• Foot controller disconnected … 1 Ω or less
• Foot controller connected …… ∞
N
Replace assy. pin jack
Y
With the foot controller connected, does the resistance between pins 1 & 3 on the assy. pin jack connector vary from several Ω – 10 kΩ when the foot controller is pressed down?
N
• Replace the food controller
or
• Replace assy. pin jack
Y
Replace main PCB assy,
or
Replace motor PCB asy,
or
Replace the FFC.

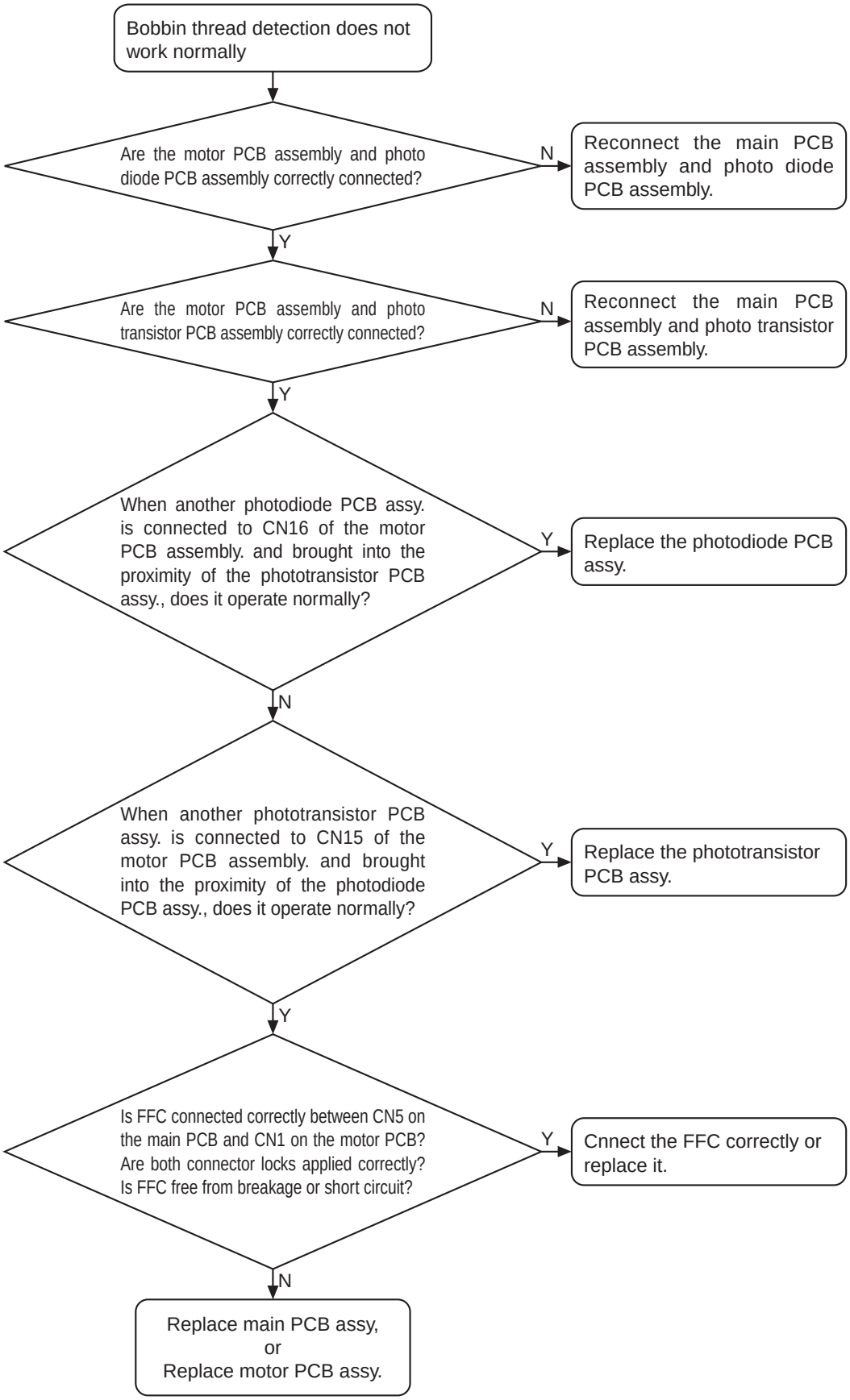

Thread tensioning is not right
Is the thread guide path correct?
N
Set thread correctly
Y
Is the lower thread placement correct?
N
Set the lower thread correctly
Y
Is the material, thread and needle combination correct?
N
Use the correct combination
Y
It the resistance between the 1 & 2 pins, and 3 & 4 pins on the AT pulse motor connectors (CN9) 4 – 9 Ω ?
N
Adjust upper thread tension
Y
Is the inner rotary hook tension right?
N
Adjust inner rotary hook tension
Y
Is the thread tension adjuster gap correct?
N
Adjust upper thread tension disk
Y
Replace main PCB assy,
or
Replace motor PCB assy,
or
Replace the FFC.

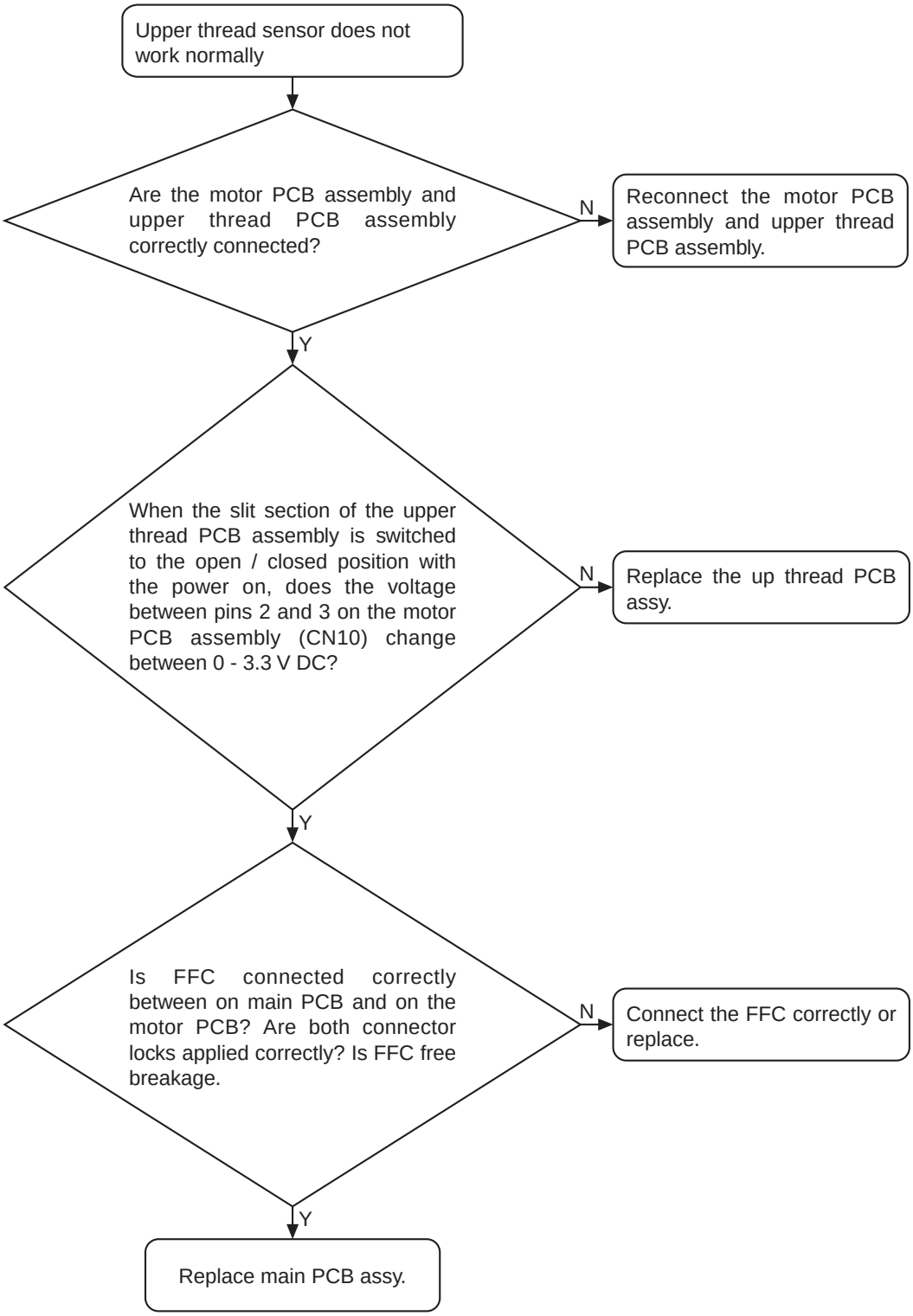

Thread cutter does not operate normally
Do the thread hook assy. and lever gear move easily?
N
Adjust the assembly of the thread cutter module
Y
Is the resistance between the 1 & 2 pins and 3 & 4 pins on the C pulse motor connectors (CN11) 4 – 6 Ω?
N
Replace C pulse motor
Y
Is FFC free from breakage and connected correctly between CN5 on the main PCB and CN1 on the motor PCB? Are both connector locks applied correctly?
N
Connect the FFC or replace it.
Y
Replace main PCB assy,
or
Replace motor PCB assy.

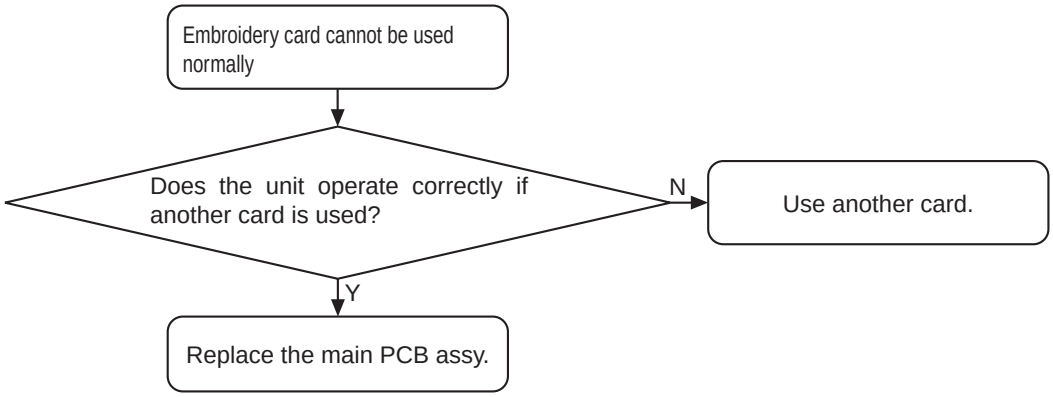

Bobbin winding cannot be done.
Is the bobbin winder mechanism assembled and attached correctly?
N
Adjust the bobbin winder mechanism for correct assembly and attachment
Y
Is the resistance between the bobbin winder assy. connector pins 1 & 2 normal?
• Bobbin winder shaft in bobbin wind position ……. 1 Ω or less
• Bobbin winder shaft not in bobbin wind position … ∞
N
Replace BW switch assy.
Y
Is FFC connected correctly between CN5 on the main PCB and CN1 on the motor PCB? Are both connector locks applied correctly? Is FFC free from breakage or short circuit?
N
Connect the FFC or replace it.
Y
Replace main PCB assy,
or
Replace motor PCB assy.

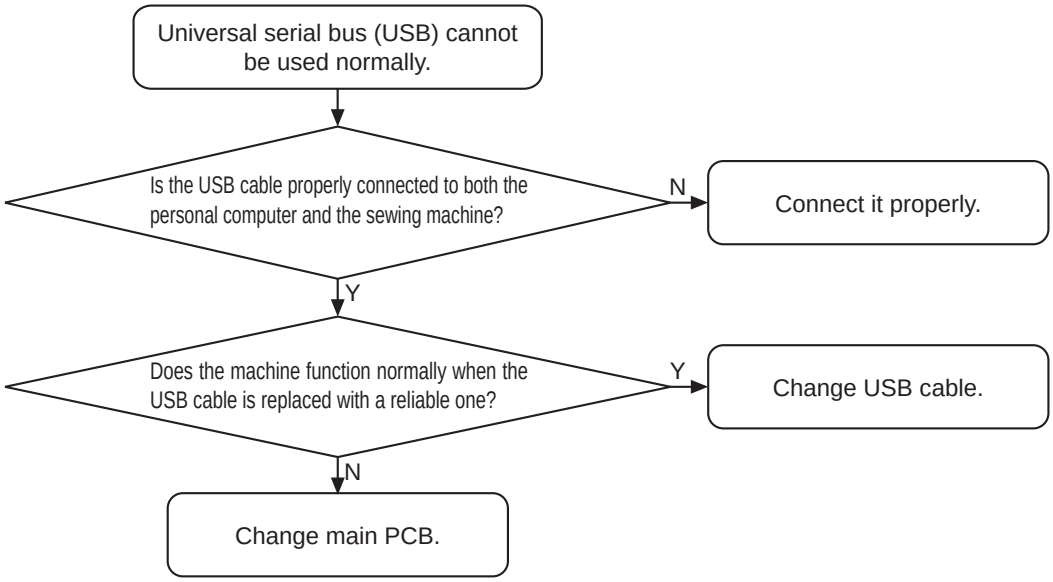

The lamp does not light.
Are the motor PCB assembly and LED lamp L assembly correctly connected?
N
Reconnect it correctly.
Y
Are the SS-VR PCB assembly and LED lamp R assembly correctly connected?
N
Reconnect it correctly.
Y
Is the lead wire assembly (power) free from breakage and connected correctly between CN3 on the main PCB and CN19 on the motor PCB?
N
Reconnect the lead wire assembly (power) correctly or
Y
To next page

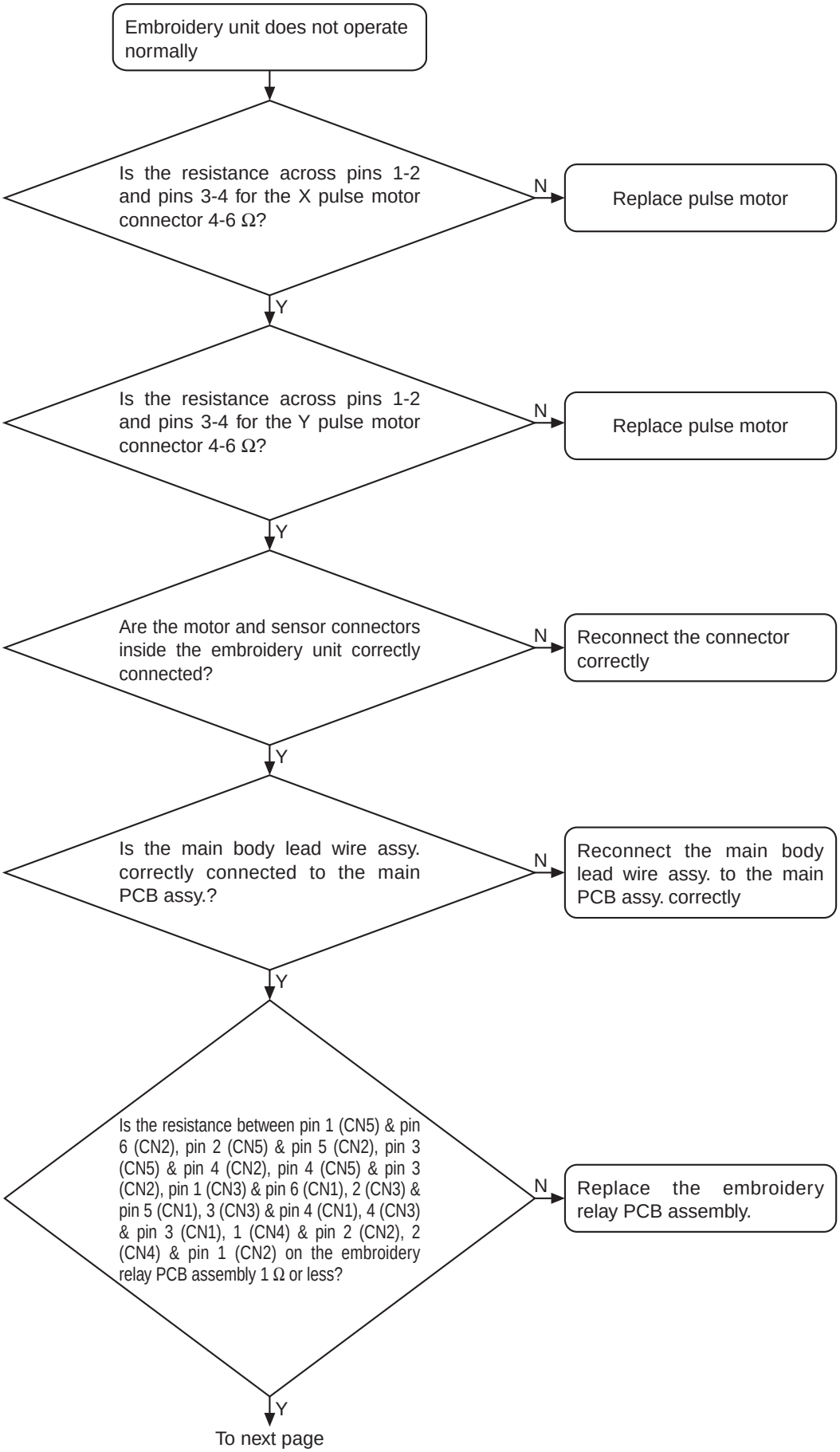

From previous page
When the power PCB connector (motor PCB (CN19)) is removed, is the voltage between pins 5 & 4 26 V DC?
N
Replace the power supply unit.
Y
Is the voltage between pins 1 and 2 of CN3 on the motor PCB or that of CN1 on the SS-VR PCB approximately 3 to 4V?
N
Replace the LED lamp L assembly,
or
Replace the LED lamp-R assembly.
Y
Replace main PCB assy,
or
Replace motor PCB assy.

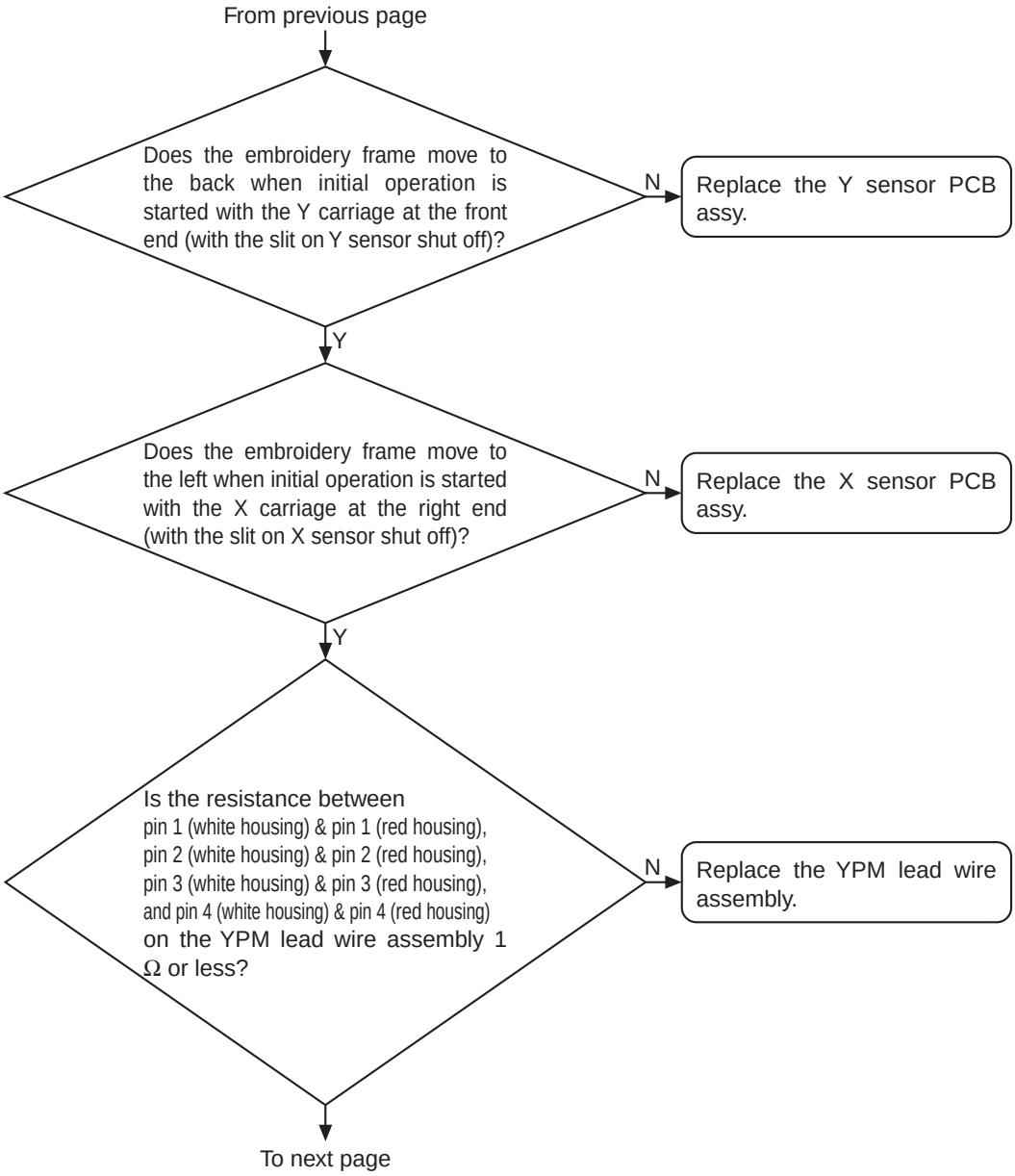

Bobbin thread detection does not work normally
Are the motor PCB assembly and photo diode PCB assembly correctly connected?
N
Reconnect the main PCB assembly and photo diode PCB assembly.
Y
Are the motor PCB assembly and photo transistor PCB assembly correctly connected?
N
Reconnect the main PCB assembly and photo transistor PCB assembly.
Y
When another photodiode PCB assy. is connected to CN16 of the motor PCB assembly. and brought into the proximity of the phototransistor PCB assy., does it operate normally?
Y
Replace the photodiode PCB assy.
N
When another phototransistor PCB assy. is connected to CN15 of the motor PCB assembly. and brought into the proximity of the photodiode PCB assy., does it operate normally?
Y
Replace the phototransistor PCB assy.
Y
Is FFC connected correctly between CN5 on the main PCB and CN1 on the motor PCB? Are both connector locks applied correctly? Is FFC free from breakage or short circuit?
Y
Cnnect the FFC correctly or replace it.
N
Replace main PCB assy,
or
Replace motor PCB assy.

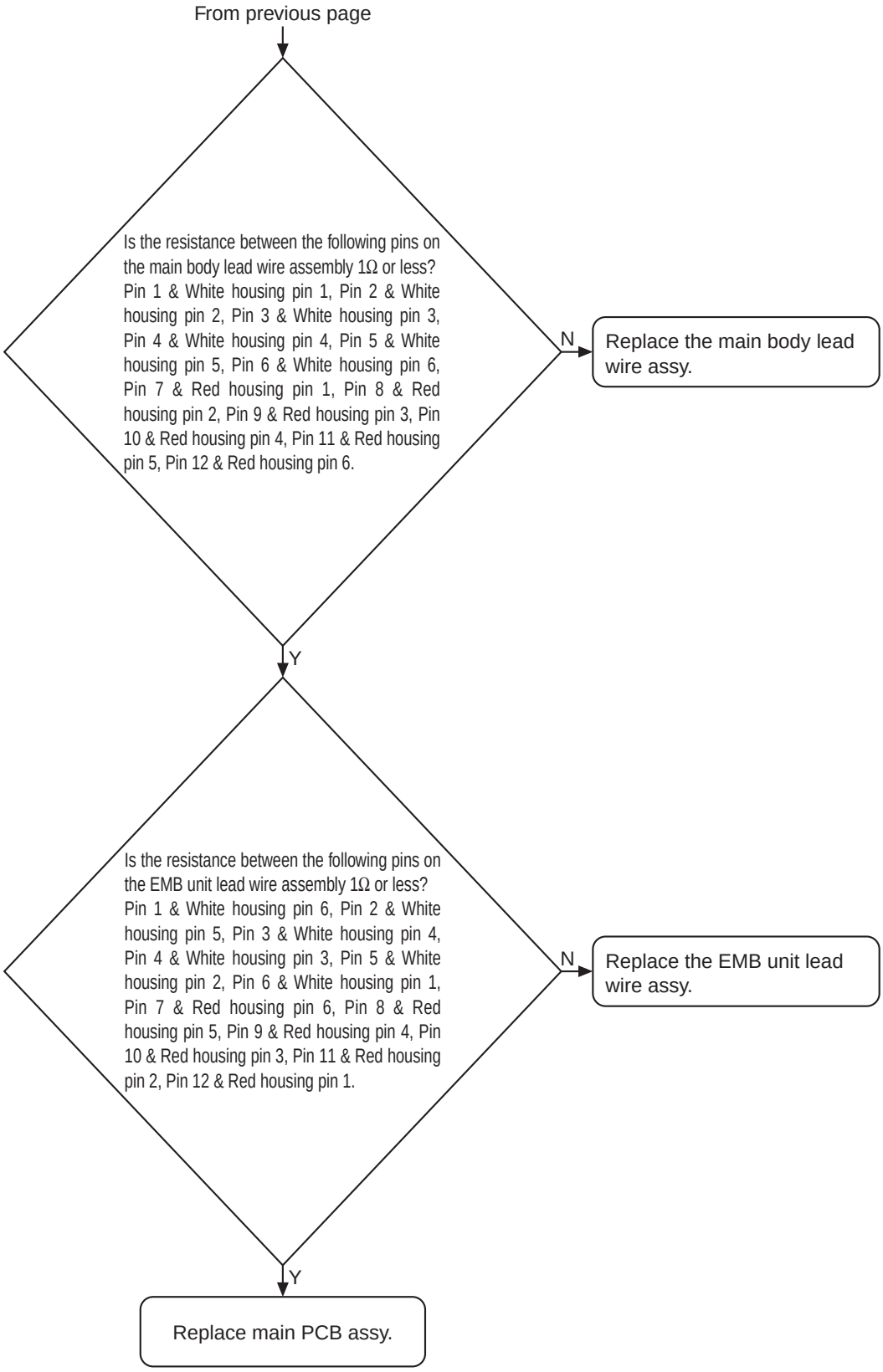

Upper thread sensor does not work normally
Are the motor PCB assembly and upper thread PCB assembly correctly connected?
N
Reconnect the motor PCB assembly and upper thread PCB assembly.
Y
When the slit section of the upper thread PCB assembly is switched to the open / closed position with the power on, does the voltage between pins 2 and 3 on the motor PCB assembly (CN10) change between 0 - 3.3 V DC?
N
Replace the up thread PCB assy.
Y
Is FFC connected correctly between on main PCB and on the motor PCB? Are both connector locks applied correctly? Is FFC free breakage.
N
Connect the FFC correctly or replace.
Y
Replace main PCB assy.

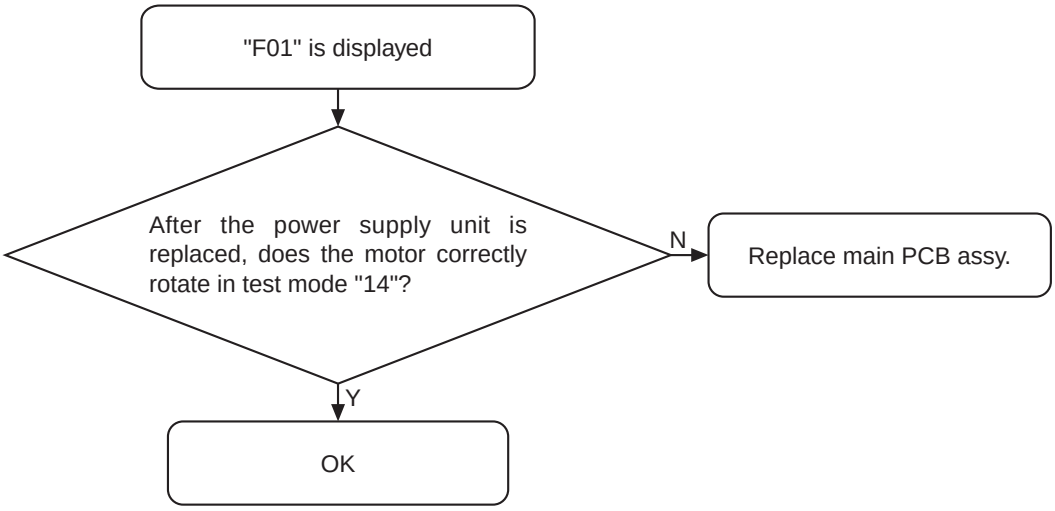

Embroidery card cannot be used normally
Does the unit operate correctly if another card is used?
N
Use another card.
Y
Replace the main PCB assy.

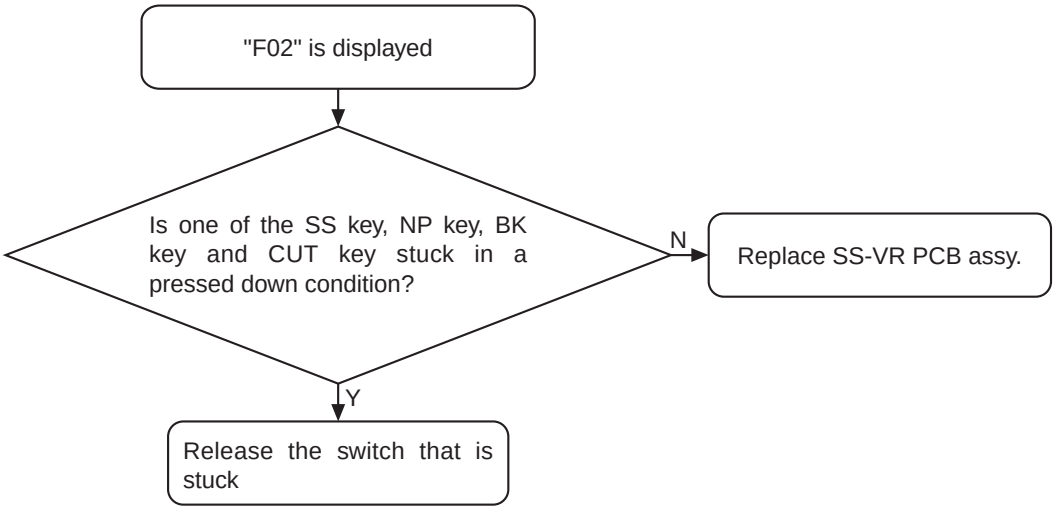

Universal serial bus (USB) cannot be used normally.
Is the USB cable properly connected to both the personal computer and the sewing machine?
N
Connect it properly.
Y
Does the machine function normally when the USB cable is replaced with a reliable one?
Y
Change USB cable.
N
Change main PCB.

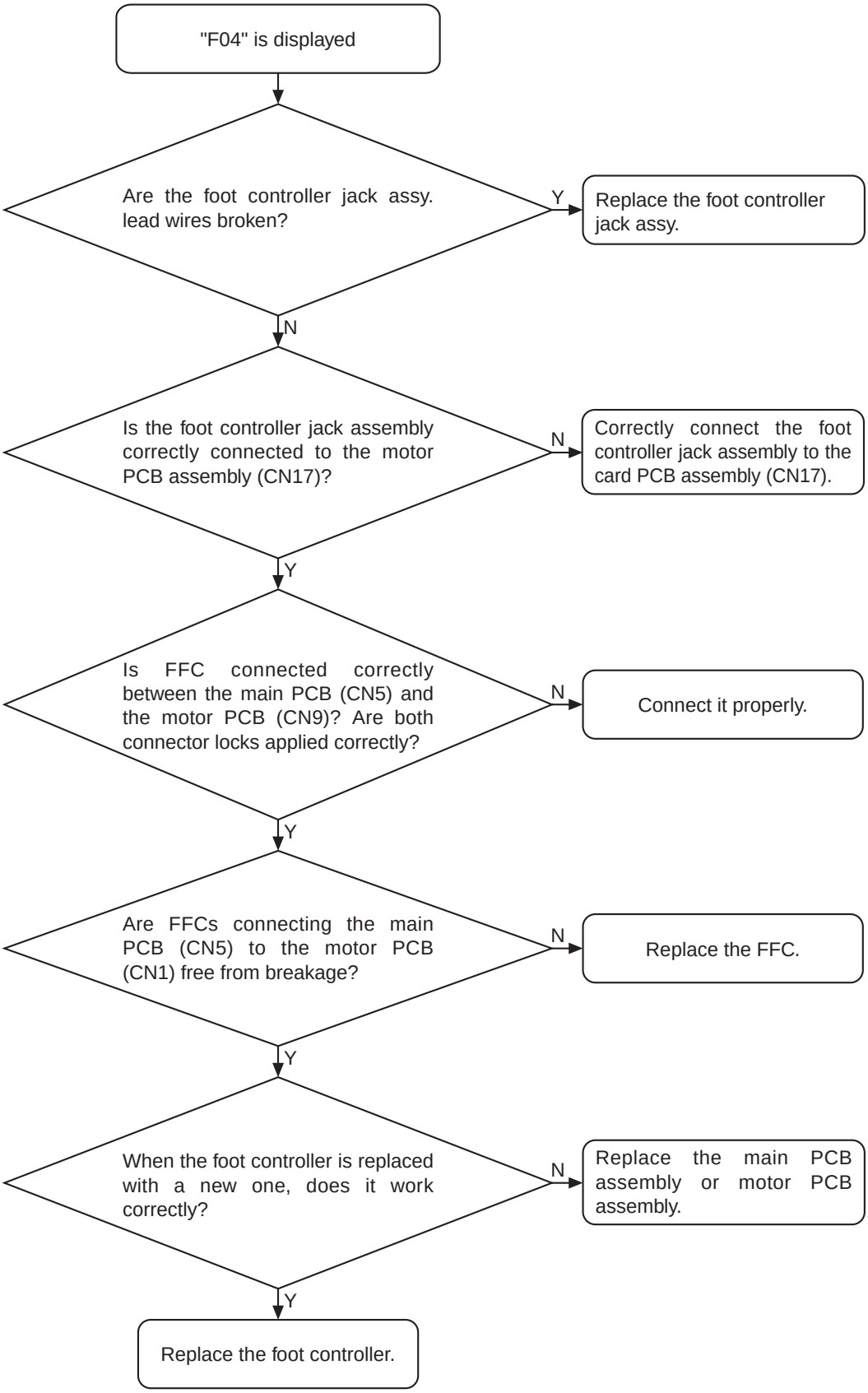

Embroidery unit does not operate normally
Is the resistance across pins 1-2 and pins 3-4 for the X pulse motor connector 4-6 Ω?
N
Replace pulse motor
Y
Is the resistance across pins 1-2 and pins 3-4 for the Y pulse motor connector 4-6 Ω?
N
Replace pulse motor
Y
Are the motor and sensor connectors inside the embroidery unit correctly connected?
N
Reconnect the connector correctly
Y
Is the main body lead wire assy. correctly connected to the main PCB assy.?
N
Reconnect the main body lead wire assy. to the main PCB assy. correctly
Y
Is the resistance between pin 1 (CN5) & pin 6 (CN2), pin 2 (CN5) & pin 5 (CN2), pin 3 (CN5) & pin 4 (CN2), pin 4 (CN5) & pin 3 (CN2), pin 1 (CN3) & pin 6 (CN1), 2 (CN3) & pin 5 (CN1), 3 (CN3) & pin 4 (CN1), 4 (CN3) & pin 3 (CN1), 1 (CN4) & pin 2 (CN2), 2 (CN4) & pin 1 (CN2) on the embroidery relay PCB assembly 1 Ω or less?
N
Replace the embroidery relay PCB assembly.
Y
To next page

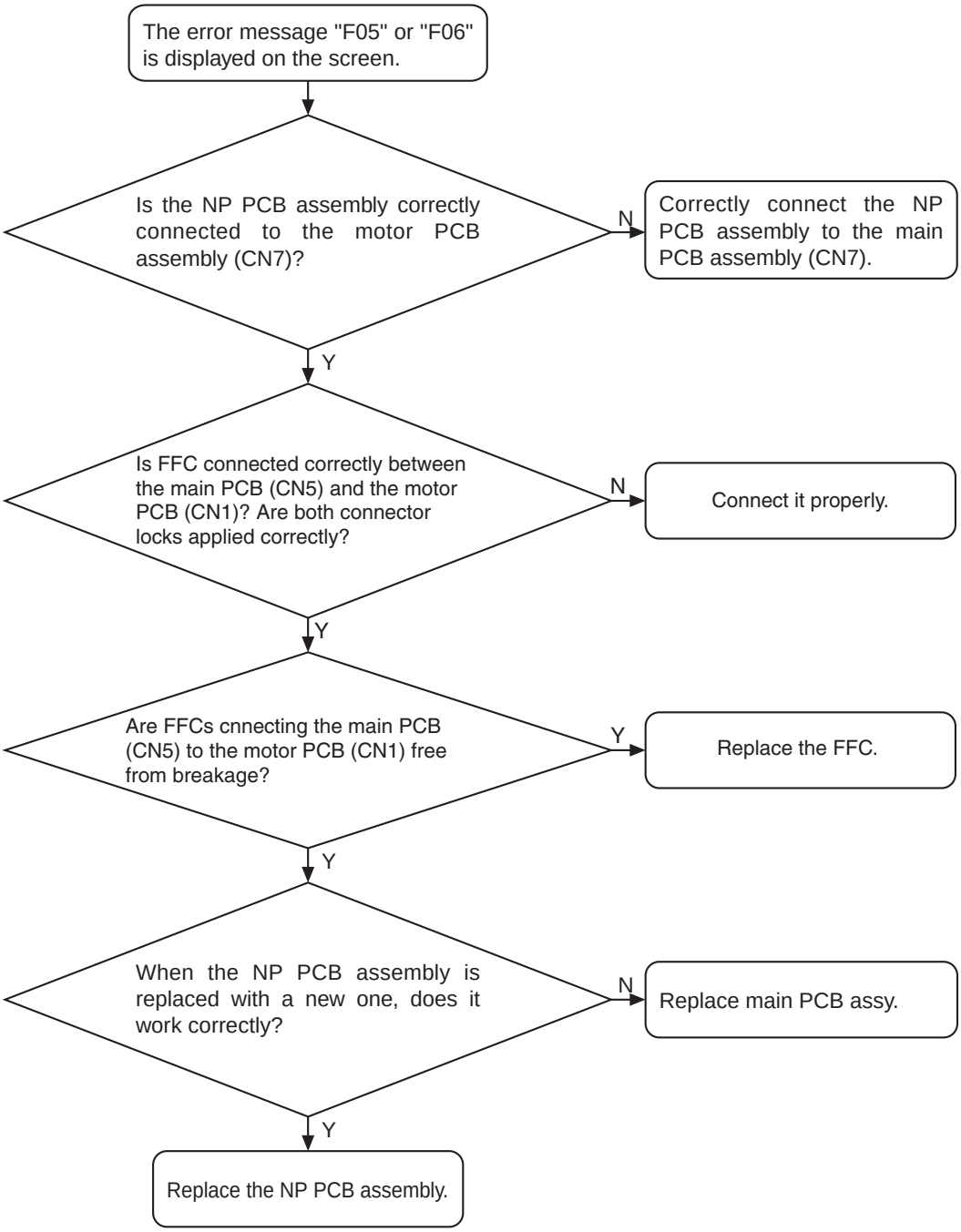

From previous page
Does the embroidery frame move to the back when initial operation is started with the Y carriage at the front end (with the slit on Y sensor shut off)?
N
Replace the Y sensor PCB assy.
Y
Does the embroidery frame move to the left when initial operation is started with the X carriage at the right end (with the slit on X sensor shut off)?
N
Replace the X sensor PCB assy.
Y
Is the resistance between
pin 1 (white housing) & pin 1 (red housing),
pin 2 (white housing) & pin 2 (red housing),
pin 3 (white housing) & pin 3 (red housing),
and pin 4 (white housing) & pin 4 (red housing)
on the YPM lead wire assembly 1 Ω or less?
N
Replace the YPM lead wire assembly.
To next page

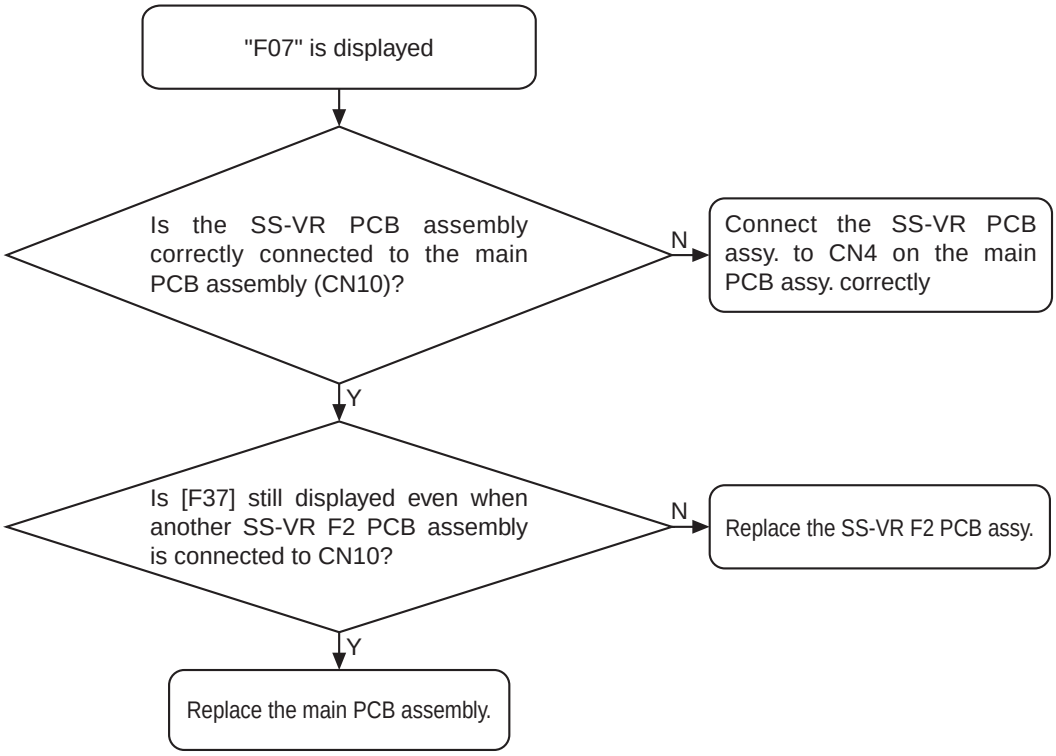

From previous page
Is the resistance between the following pins on the main body lead wire assembly 1Ω or less?
Pin 1 & White housing pin 1, Pin 2 & White housing pin 2, Pin 3 & White housing pin 3, Pin 4 & White housing pin 4, Pin 5 & White housing pin 5, Pin 6 & White housing pin 6, Pin 7 & Red housing pin 1, Pin 8 & Red housing pin 2, Pin 9 & Red housing pin 3, Pin 10 & Red housing pin 4, Pin 11 & Red housing pin 5, Pin 12 & Red housing pin 6.
N
Replace the main body lead wire assy.
Y
Is the resistance between the following pins on the EMB unit lead wire assembly 1Ω or less?
Pin 1 & White housing pin 6, Pin 2 & White housing pin 5, Pin 3 & White housing pin 4, Pin 4 & White housing pin 3, Pin 5 & White housing pin 2, Pin 6 & White housing pin 1, Pin 7 & Red housing pin 6, Pin 8 & Red housing pin 5, Pin 9 & Red housing pin 4, Pin 10 & Red housing pin 3, Pin 11 & Red housing pin 2, Pin 12 & Red housing pin 1.
N
Replace the EMB unit lead wire assy.
Y
Replace main PCB assy.


"F01" is displayed
After the power supply unit is replaced, does the motor correctly rotate in test mode "14"?
N
Replace main PCB assy.
Y
OK


"F02" is displayed
Is one of the SS key, NP key, BK key and CUT key stuck in a pressed down condition?
N
Replace SS-VR PCB assy.
Y
Release the switch that is stuck

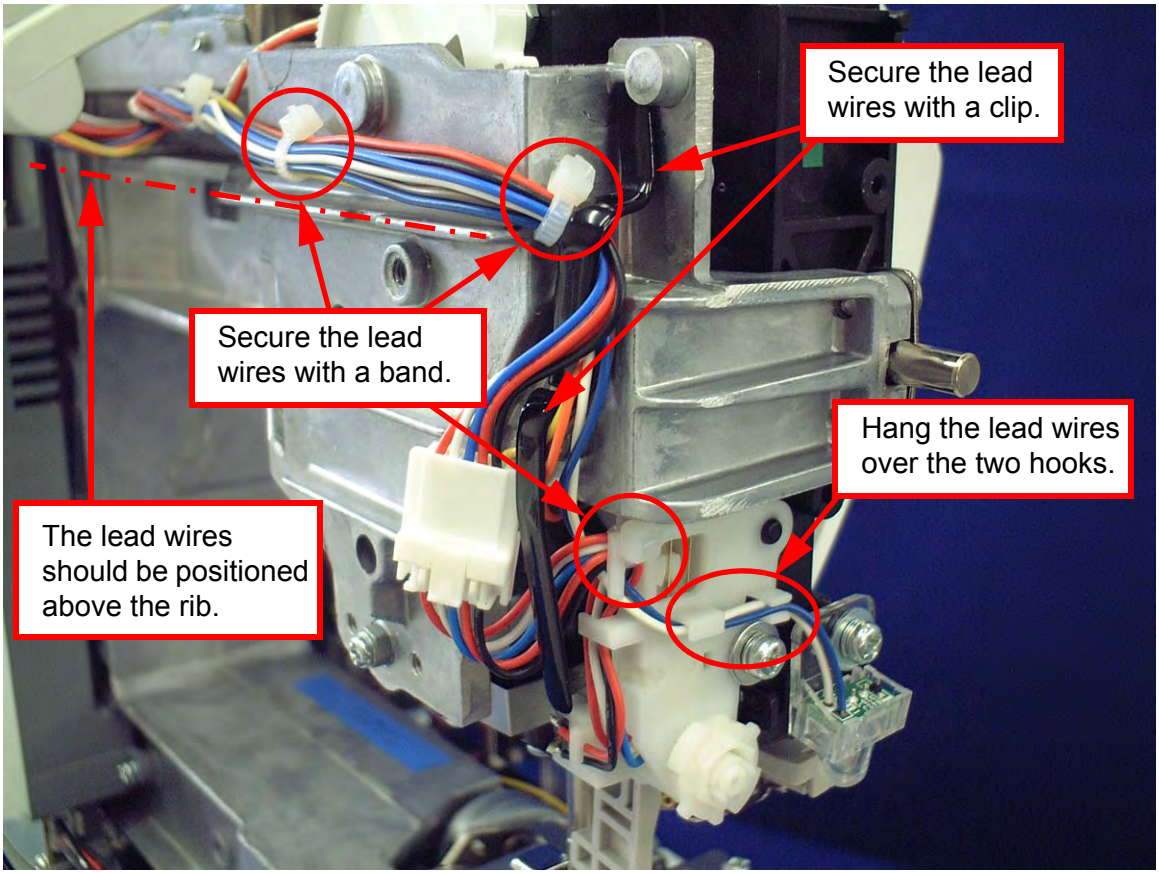

"F04" is displayed
Are the foot controller jack assy. lead wires broken?
Y
Replace the foot controller jack assy.
N
Is the foot controller jack assembly correctly connected to the motor PCB assembly (CN17)?
N
Correctly connect the foot controller jack assembly to the card PCB assembly (CN17).
Y
Is FFC connected correctly between the main PCB (CN5) and the motor PCB (CN9)? Are both connector locks applied correctly?
N
Connect it properly.
Y
Are FFCs connecting the main PCB (CN5) to the motor PCB (CN1) free from breakage?
N
Replace the FFC.
Y
When the foot controller is replaced with a new one, does it work correctly?
N
Replace the main PCB assembly or motor PCB assembly.
Y
Replace the foot controller.


The error message "F05" or "F06" is displayed on the screen.
Is the NP PCB assembly correctly connected to the motor PCB assembly (CN7)?
N
Correctly connect the NP PCB assembly to the main PCB assembly (CN7).
Y
Is FFC connected correctly between the main PCB (CN5) and the motor PCB (CN1)? Are both connector locks applied correctly?
N
Connect it properly.
Y
Are FFCs cnnecting the main PCB (CN5) to the motor PCB (CN1) free from breakage?
Y
Replace the FFC.
Y
When the NP PCB assembly is replaced with a new one, does it work correctly?
N
Replace main PCB assy.
Y
Replace the NP PCB assembly.

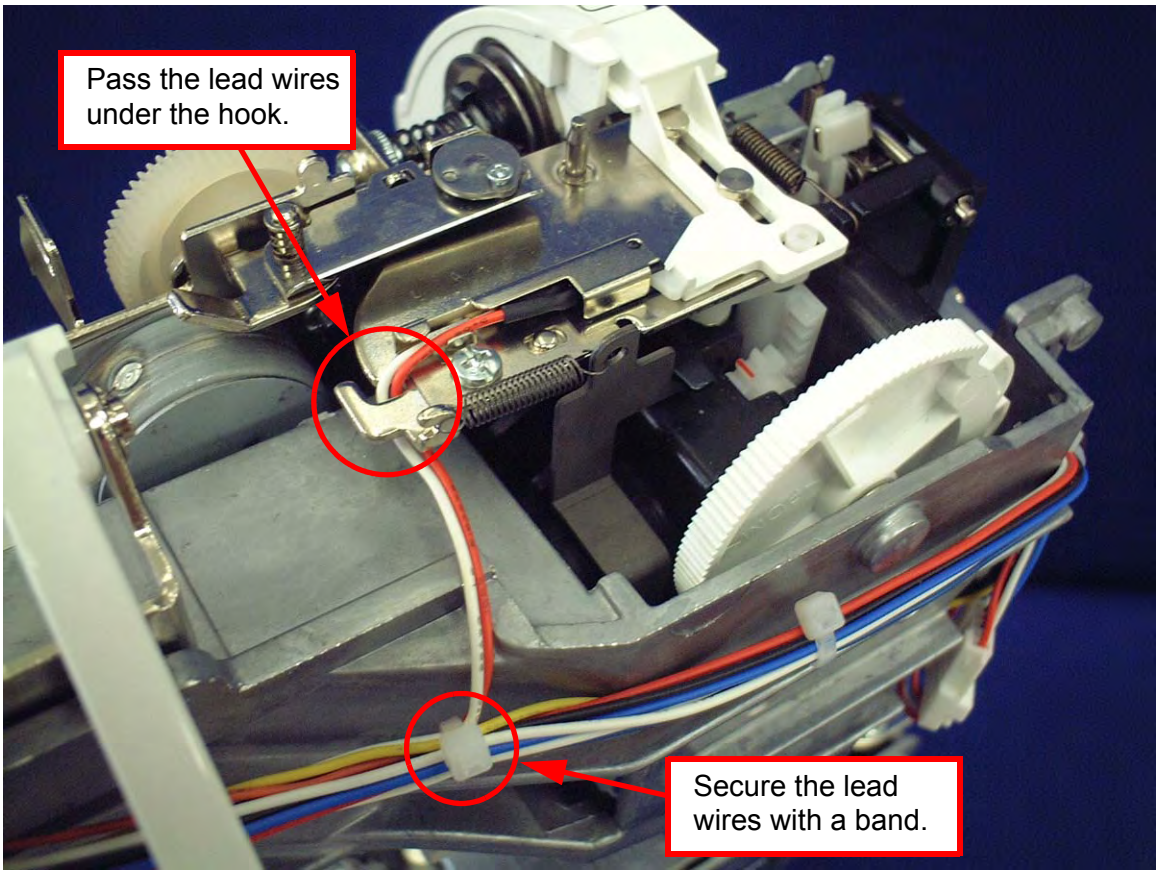

"F07" is displayed
Is the SS-VR PCB assembly correctly connected to the main PCB assembly (CN10)?
N
Connect the SS-VR PCB assy. to CN4 on the main PCB assy. correctly
Y
Is [F37] still displayed even when another SS-VR F2 PCB assembly is connected to CN10?
N
Replace the SS-VR F2 PCB assy.
Y
Replace the main PCB assembly.

6 Special Instructions of Wiring

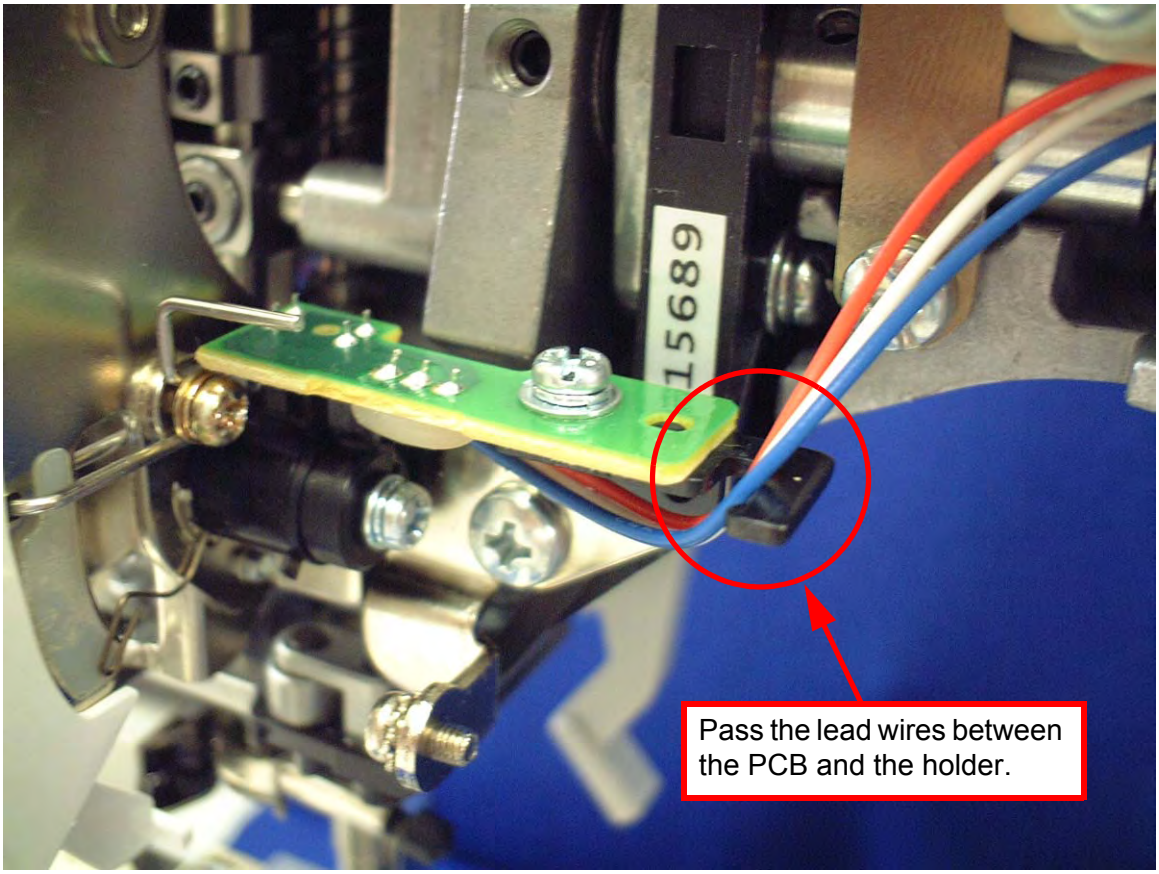
1. Wiring on left side of needle-presser module



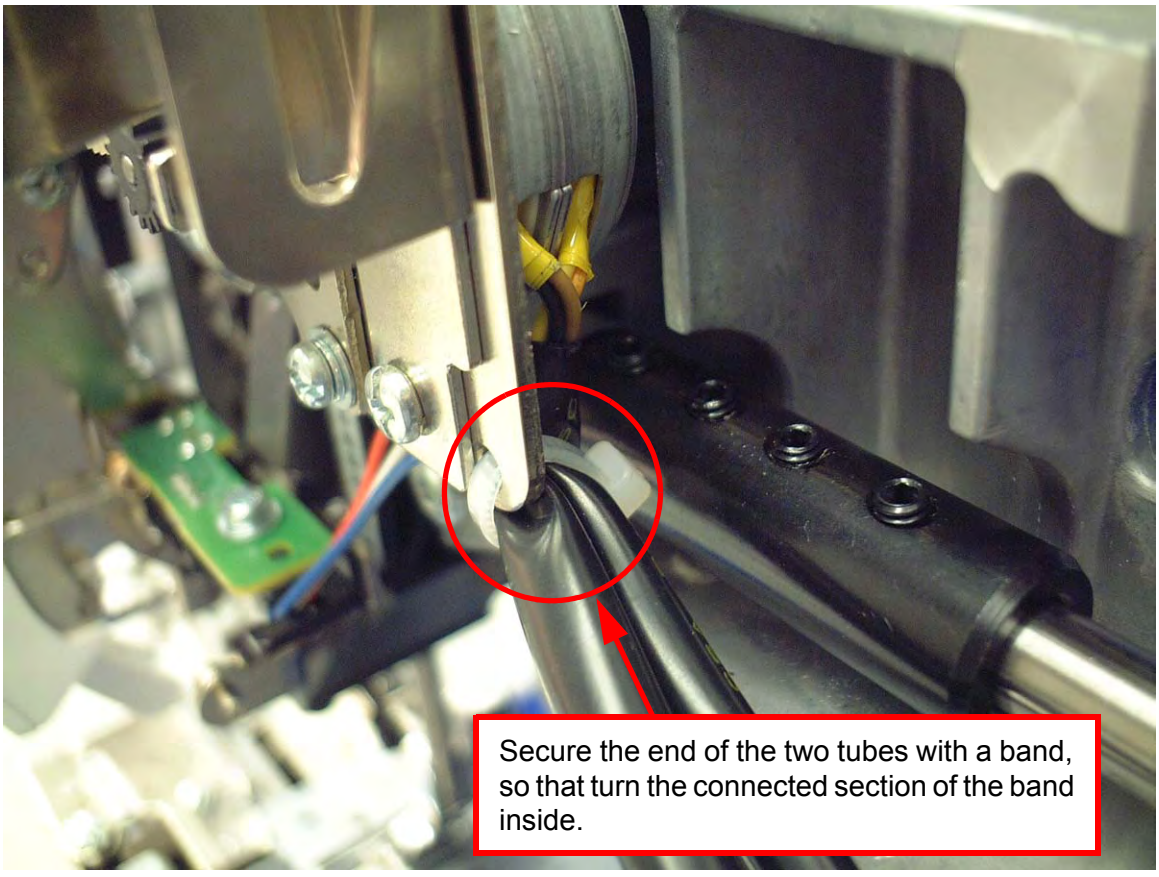
2. Wiring on upper side of needle-presser module



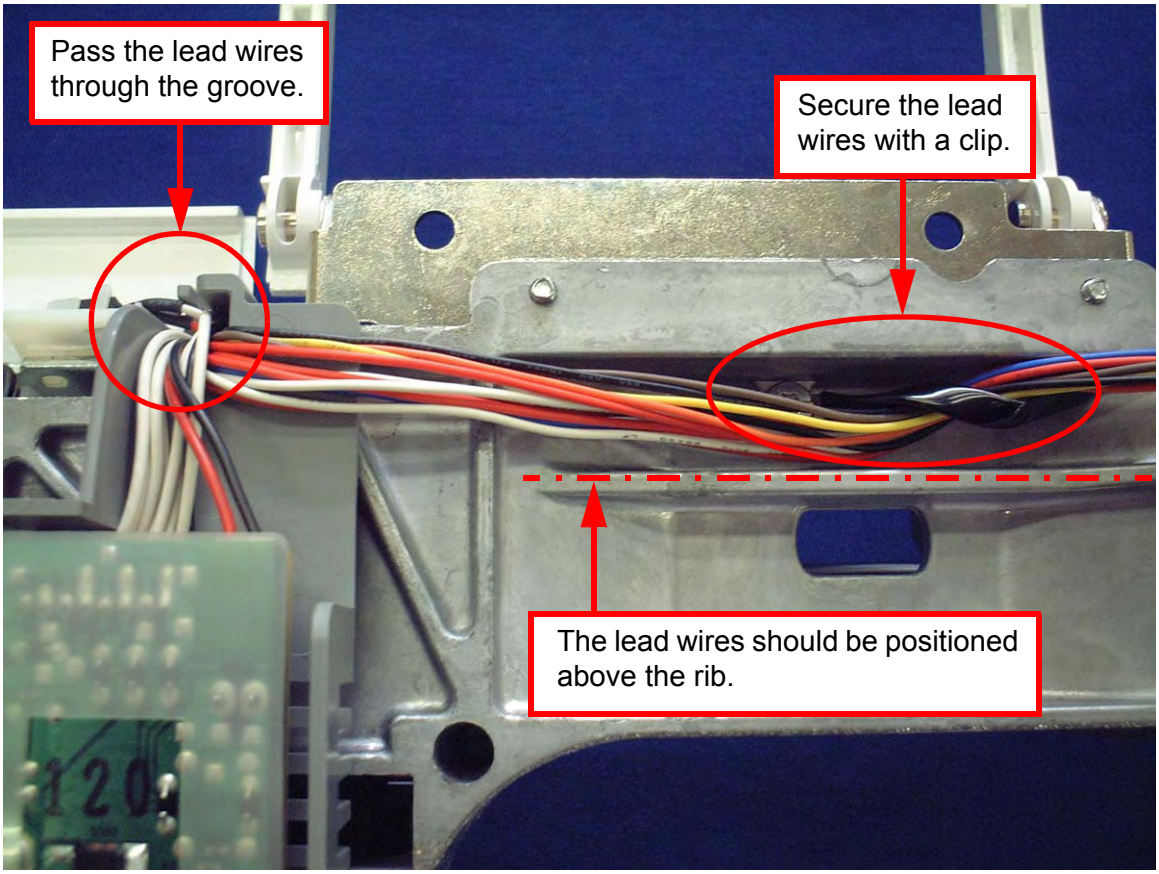
3. Wiring on lower side of needle-presser module



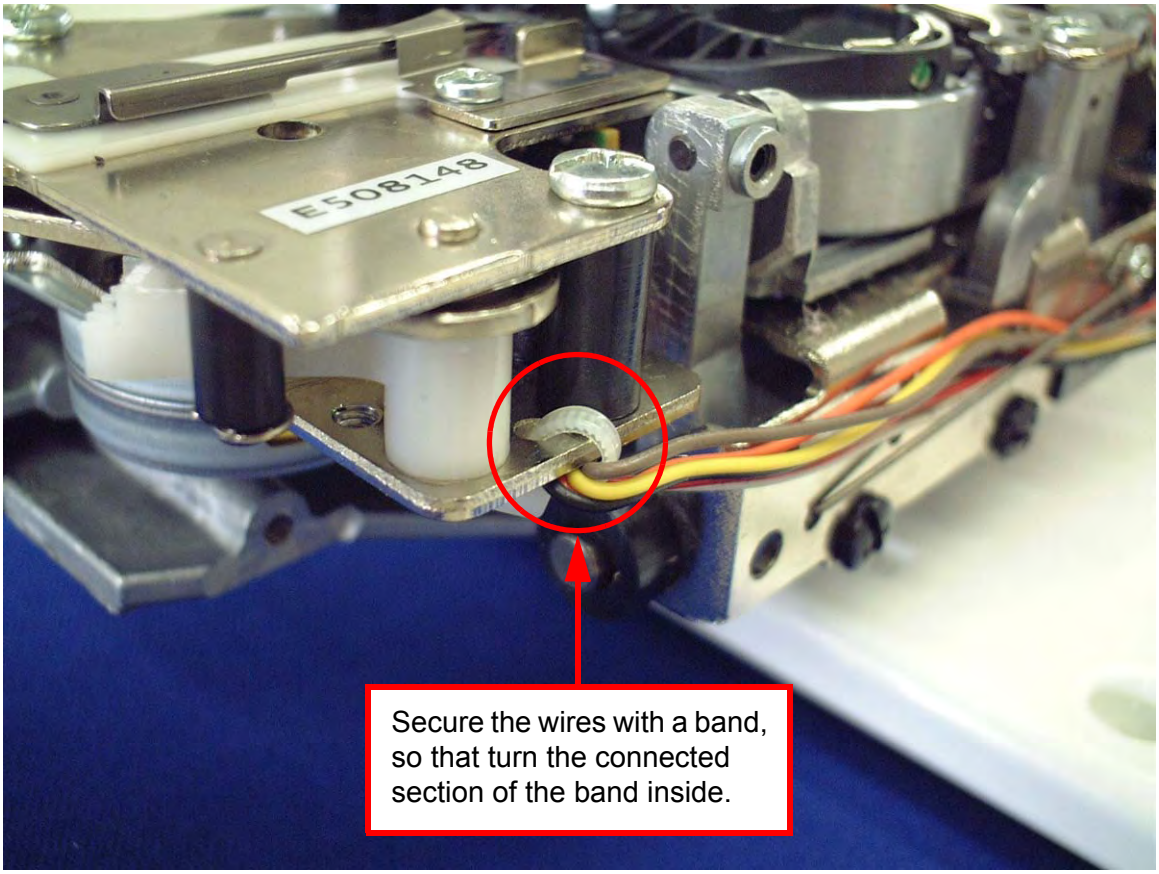
4. Wiring on right side of AT pulse motor assembly



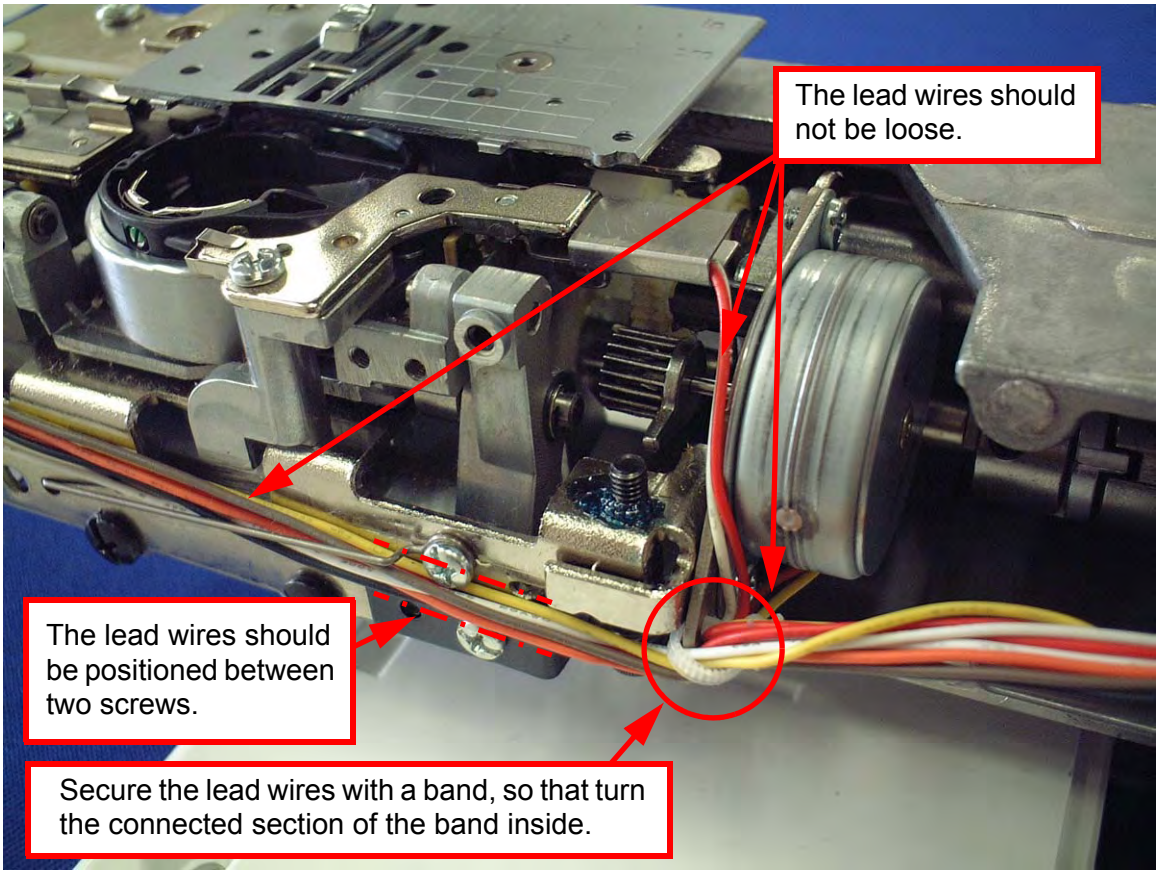
5. Wiring on back side of arm bed



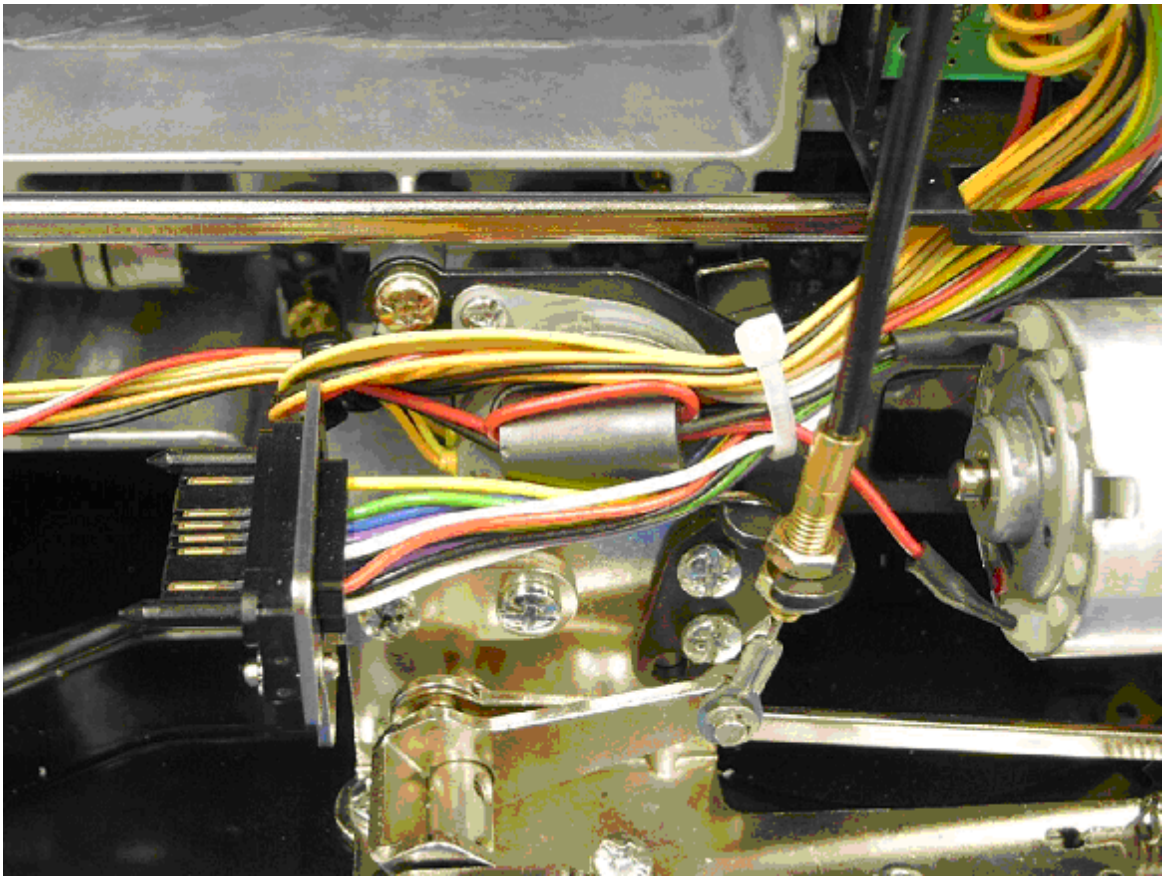
1. Wiring on front side of thred cutter module

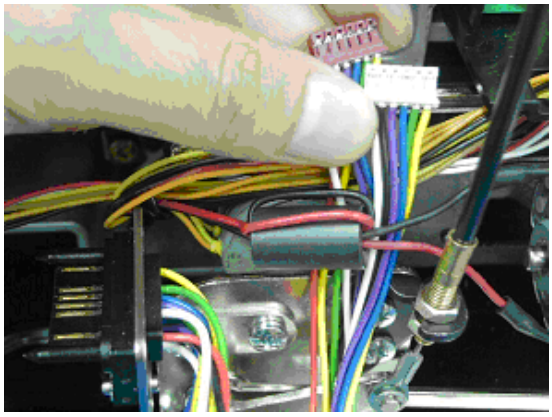


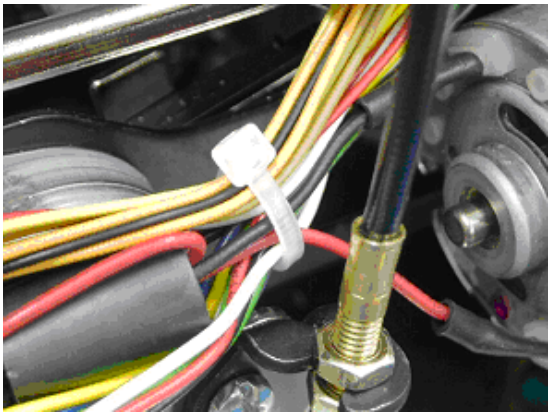
2. Wiring on front side of rotary hook module



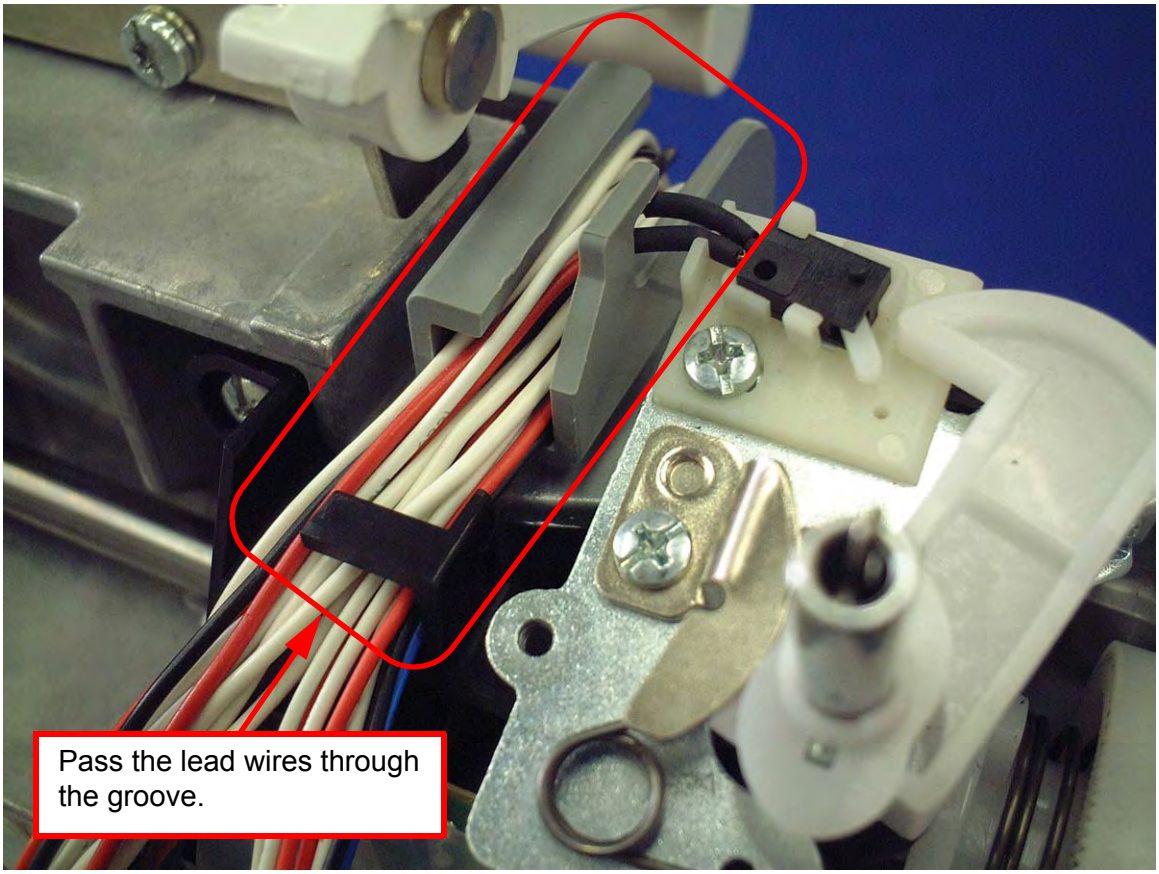
1. Wiring on front side of side feed mechanism assy.



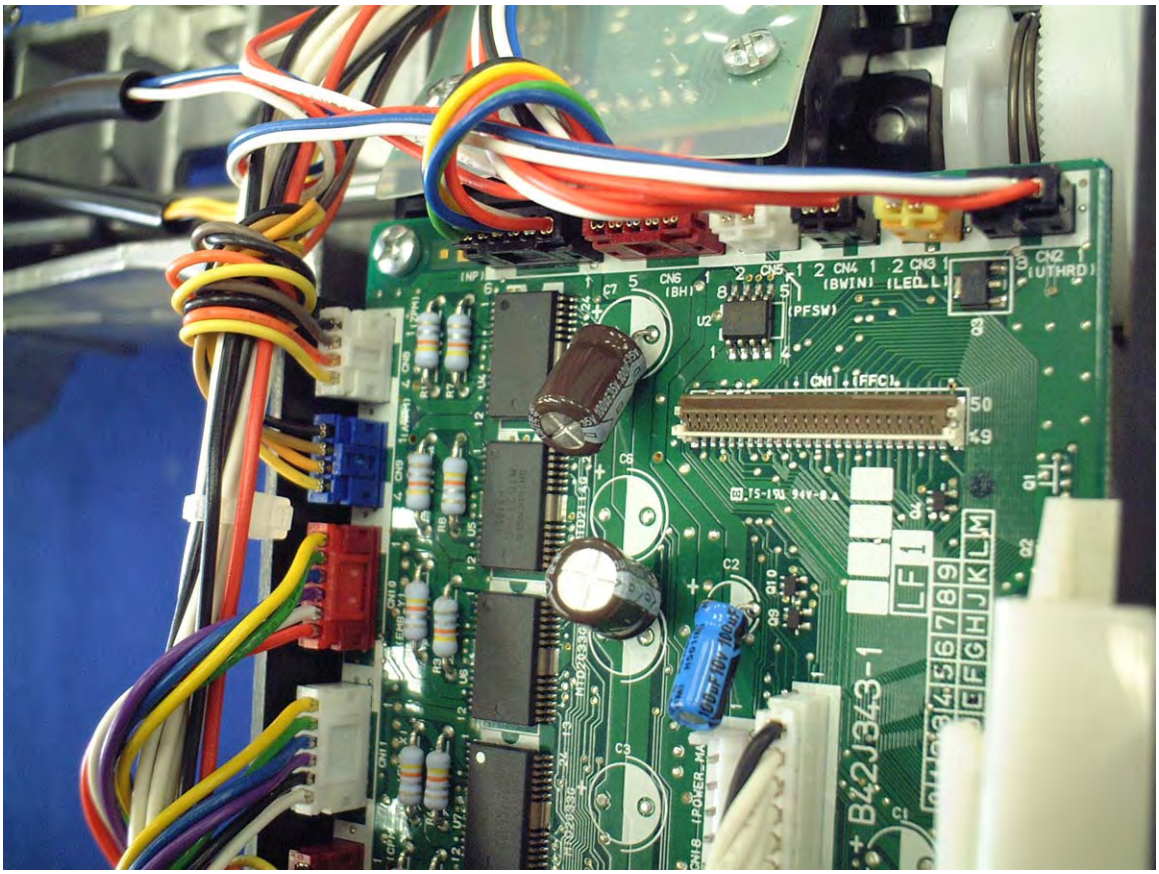




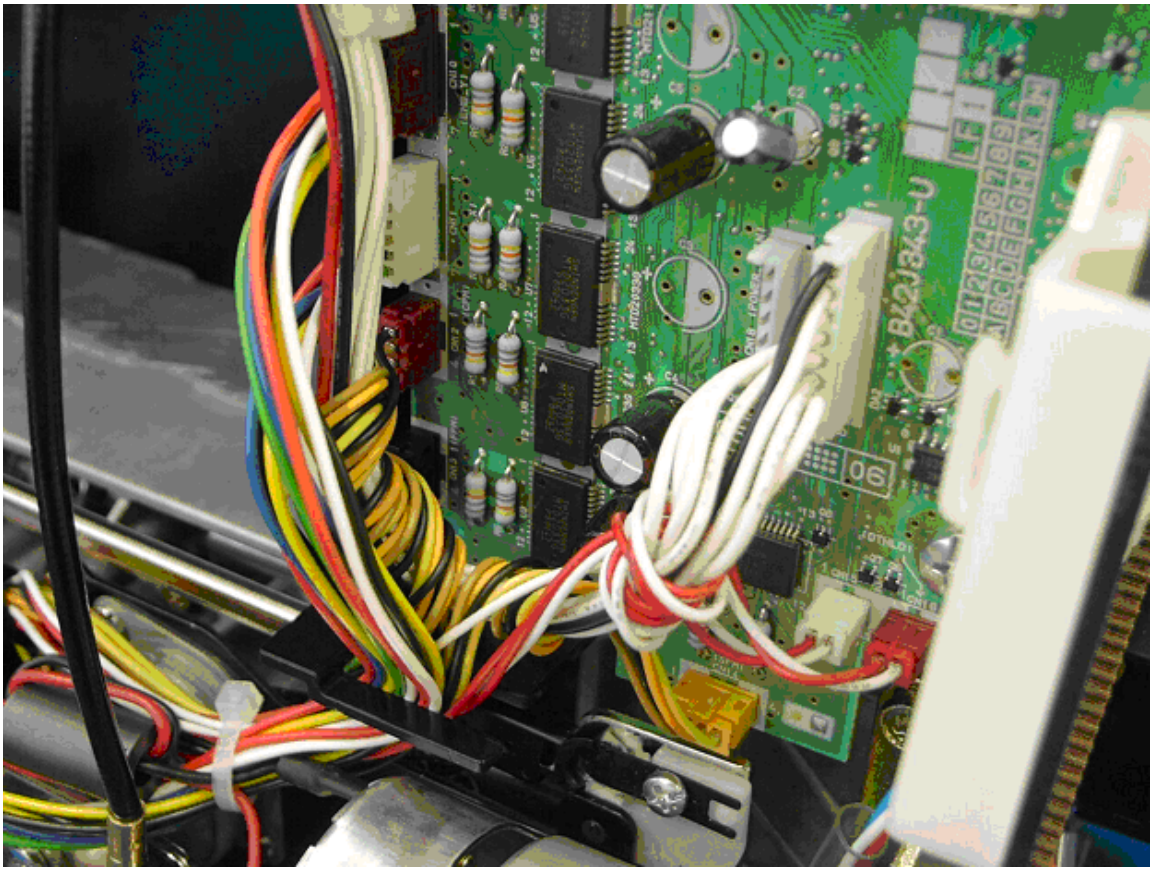
1. Wiring at top side of motor PCB



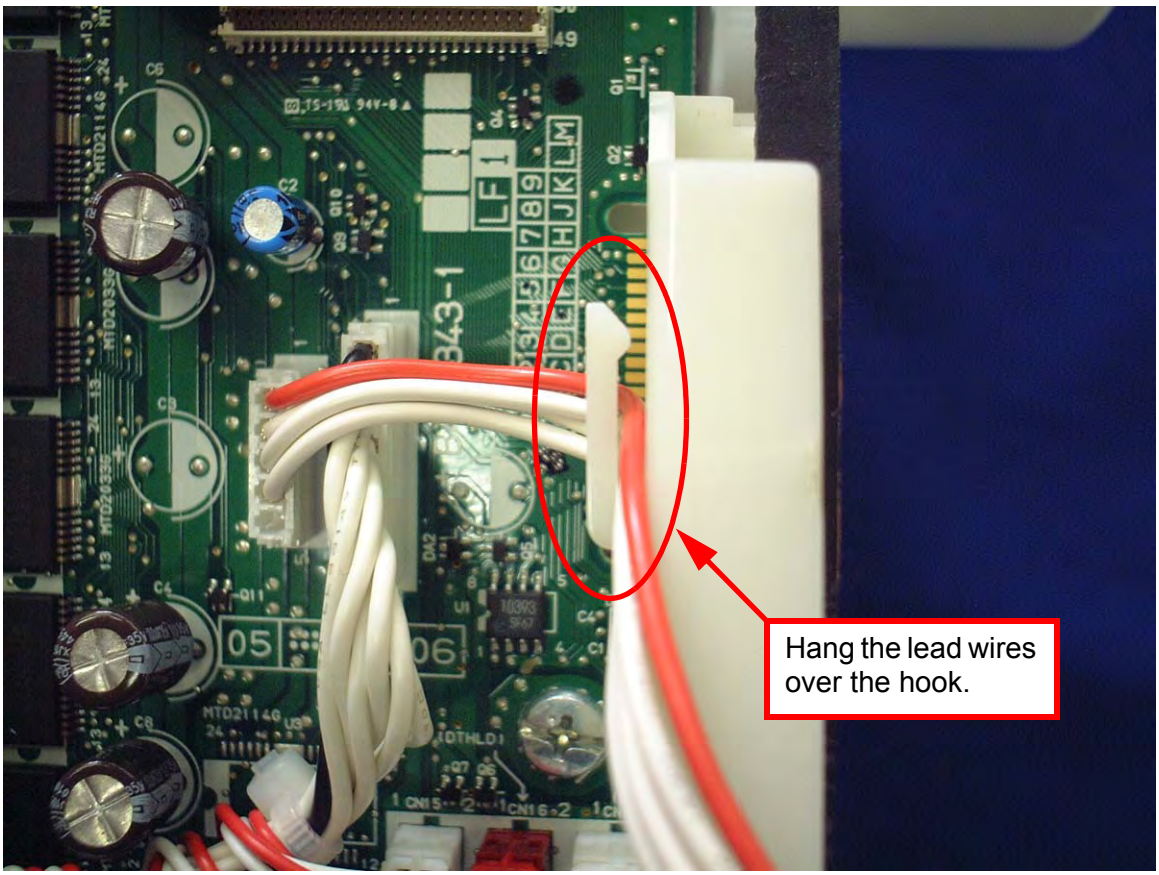
2. Wiring at upper section of motor PCB



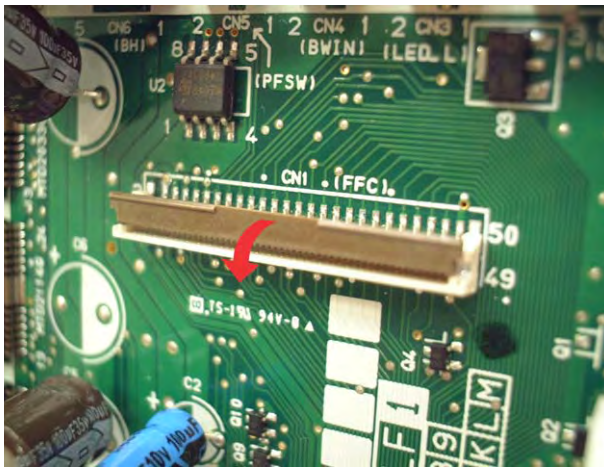
3. Wiring at lower section of motor PCB



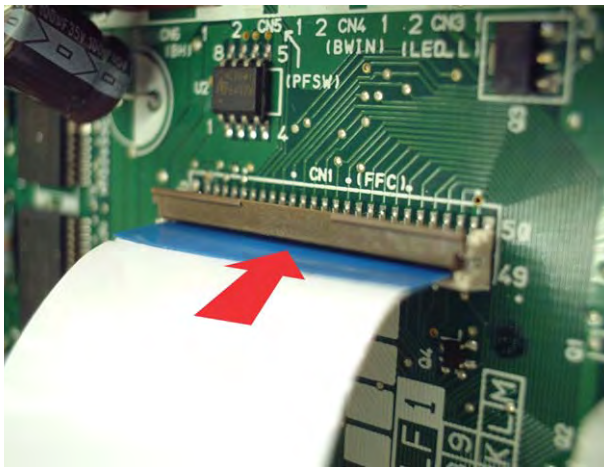
4. Wiring at middle section of motor PCB (Connecting the lead wire from front cover assembly)



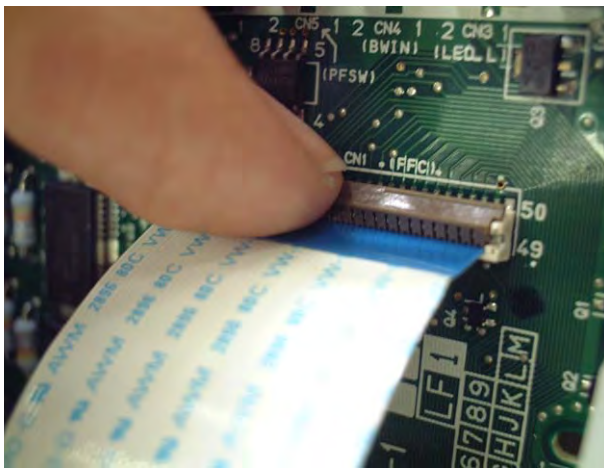
5. Wiring at middle section of motor PCB (Connecting the FFC from front cover assembly)



1. Raise the flap of the connector.

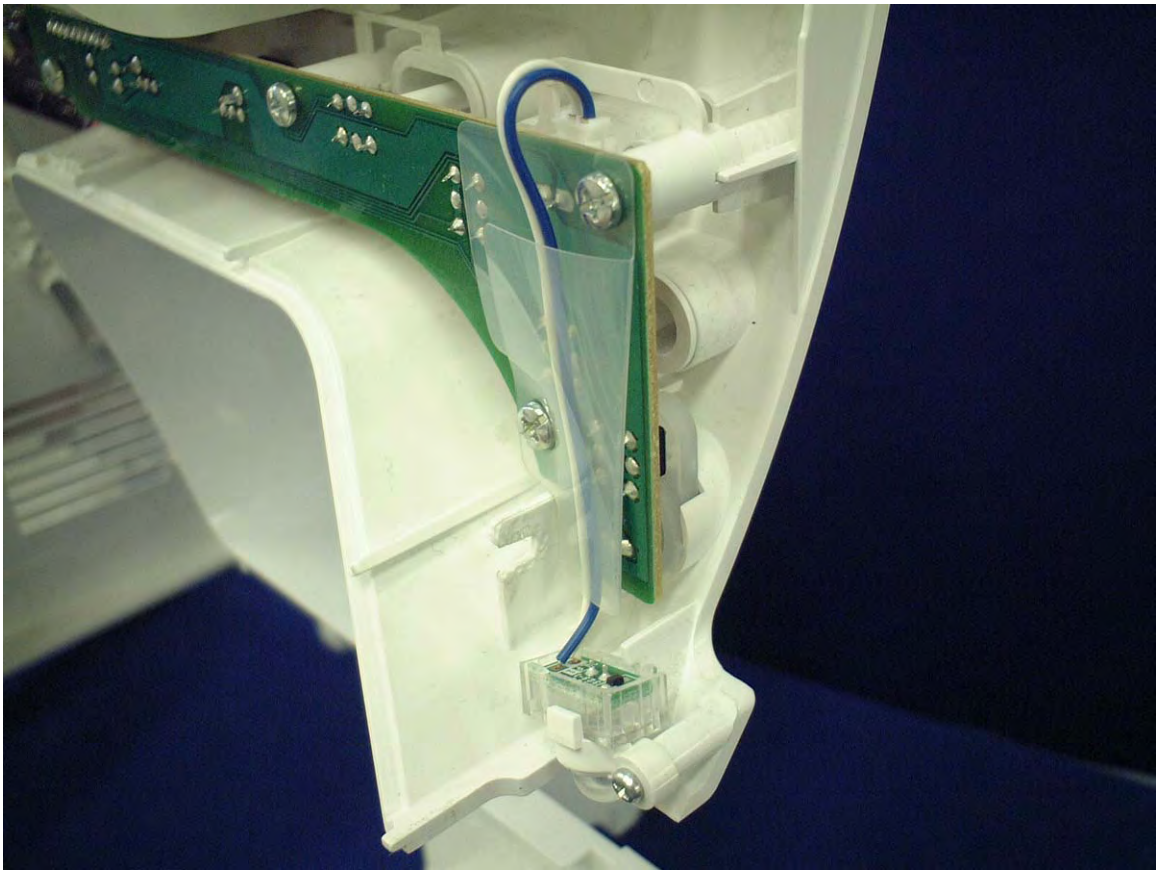


2. Insert the FFC in the connector.

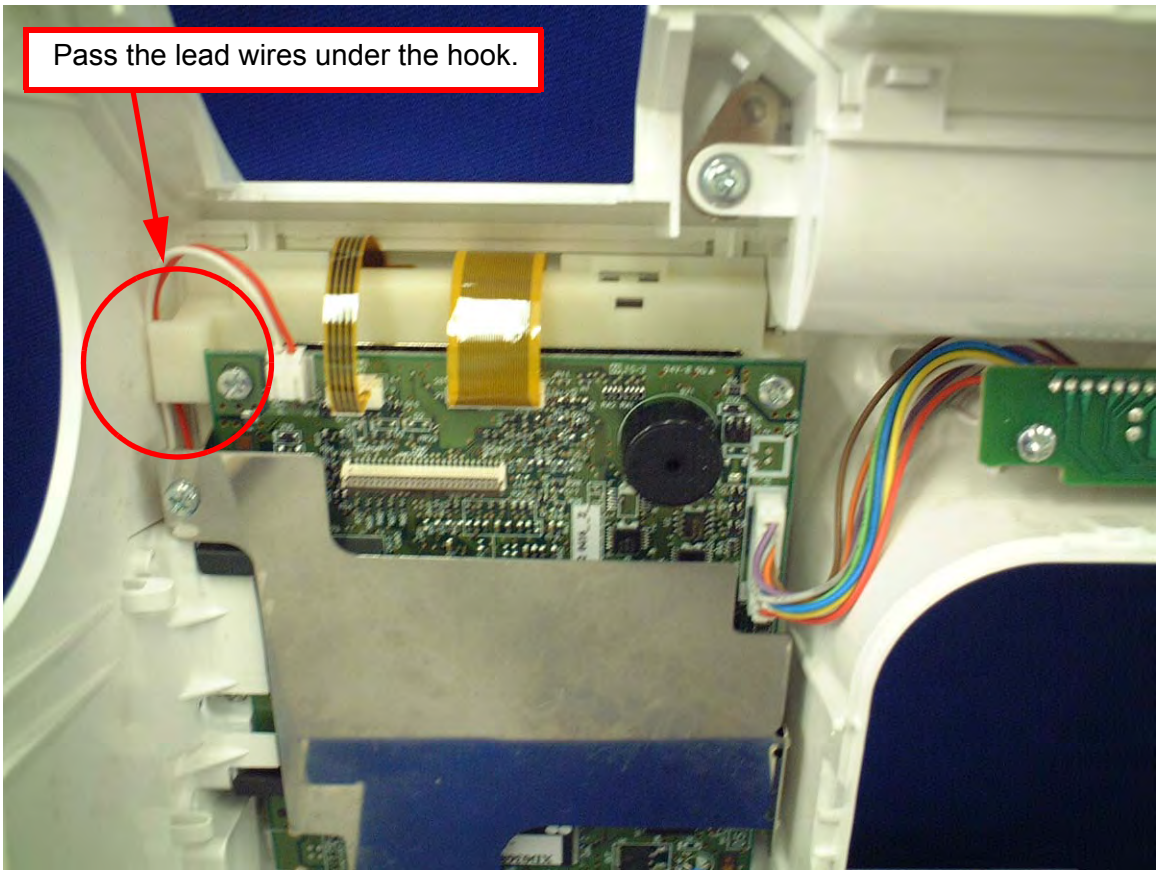


3. Push down the flap of the connector.

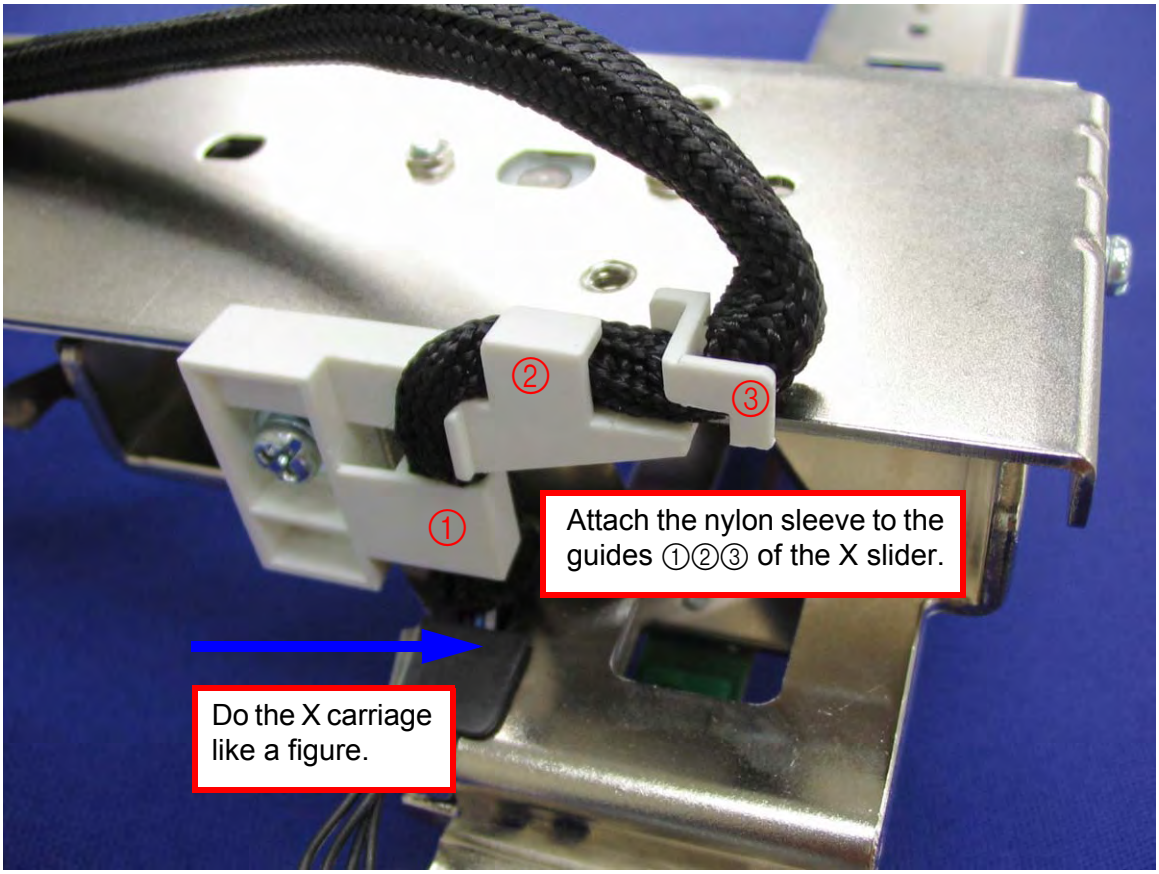
1. Wiring of LED lamp assembly

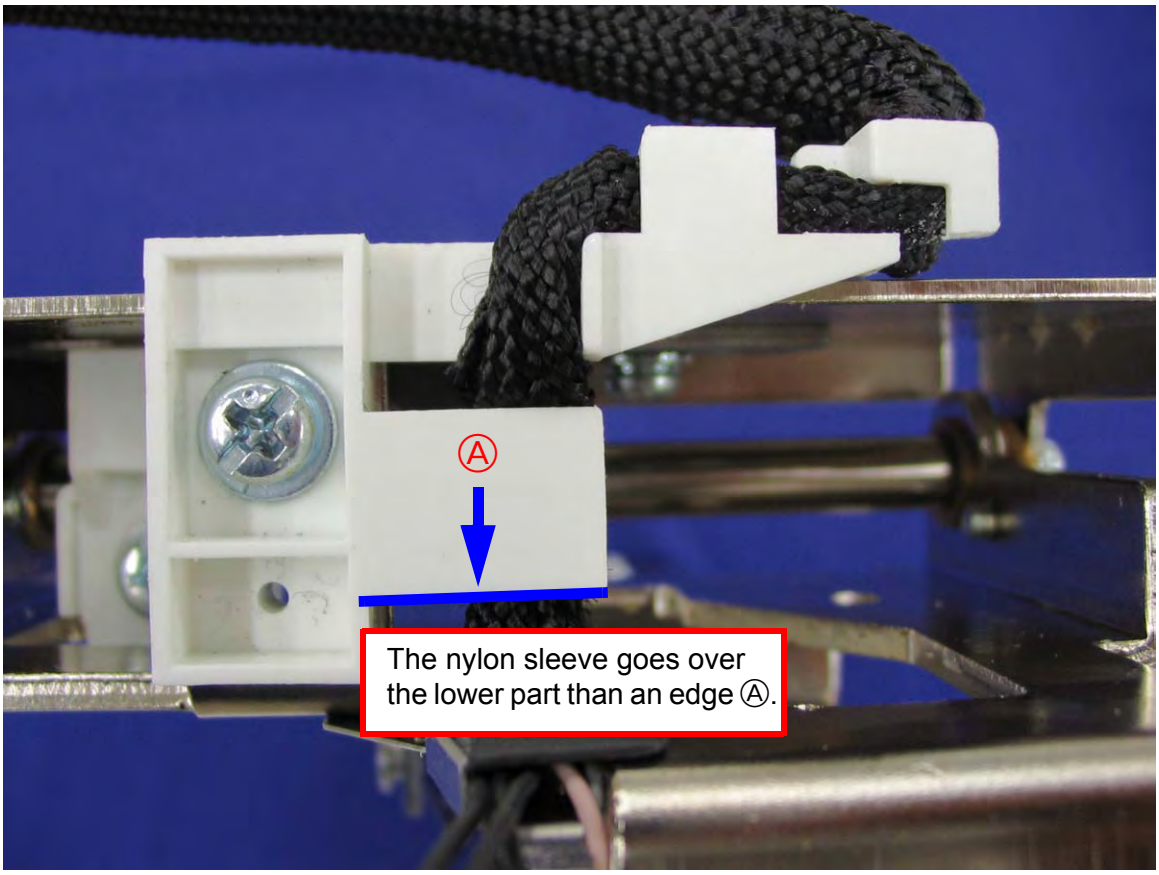


2. Wiring of main PCB assembly

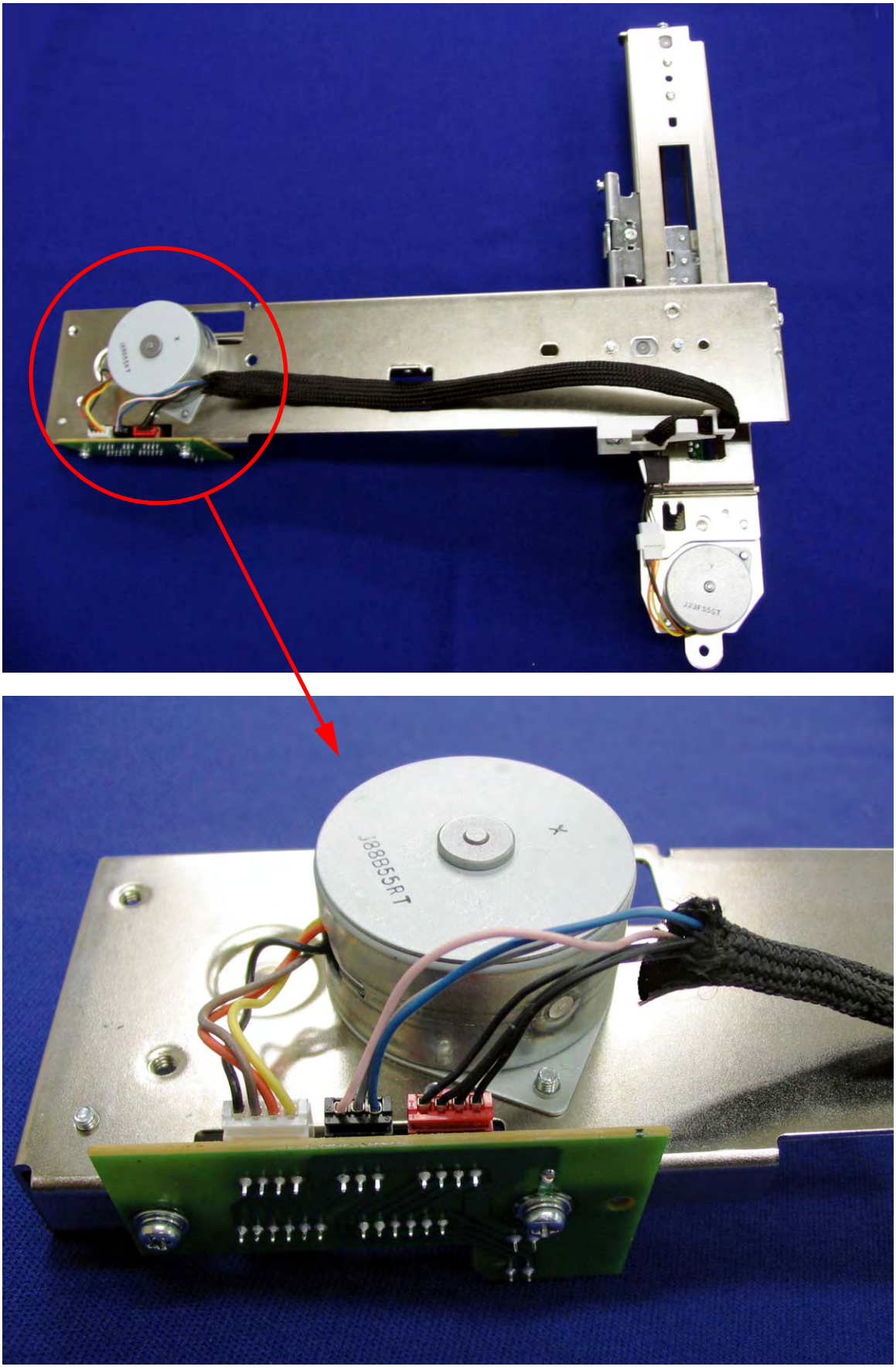


1. Wiring of X slider assembly

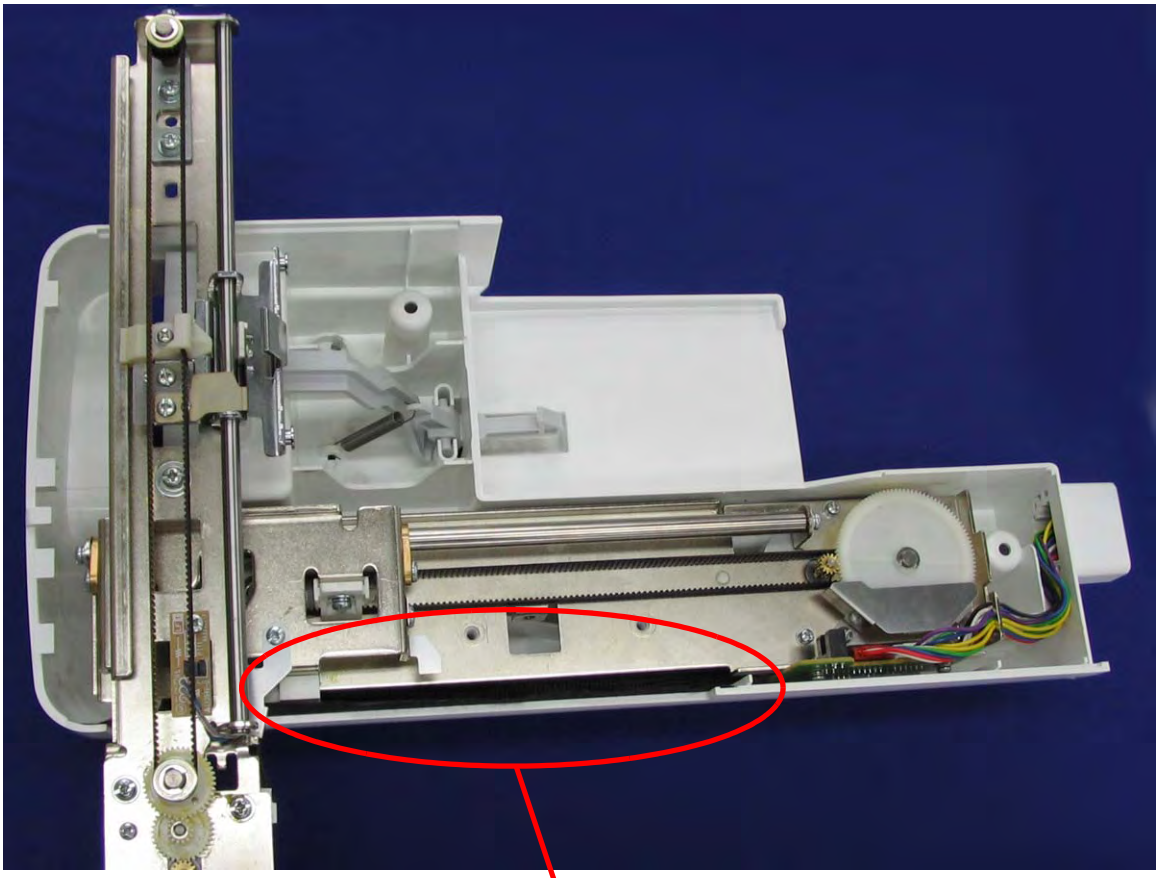


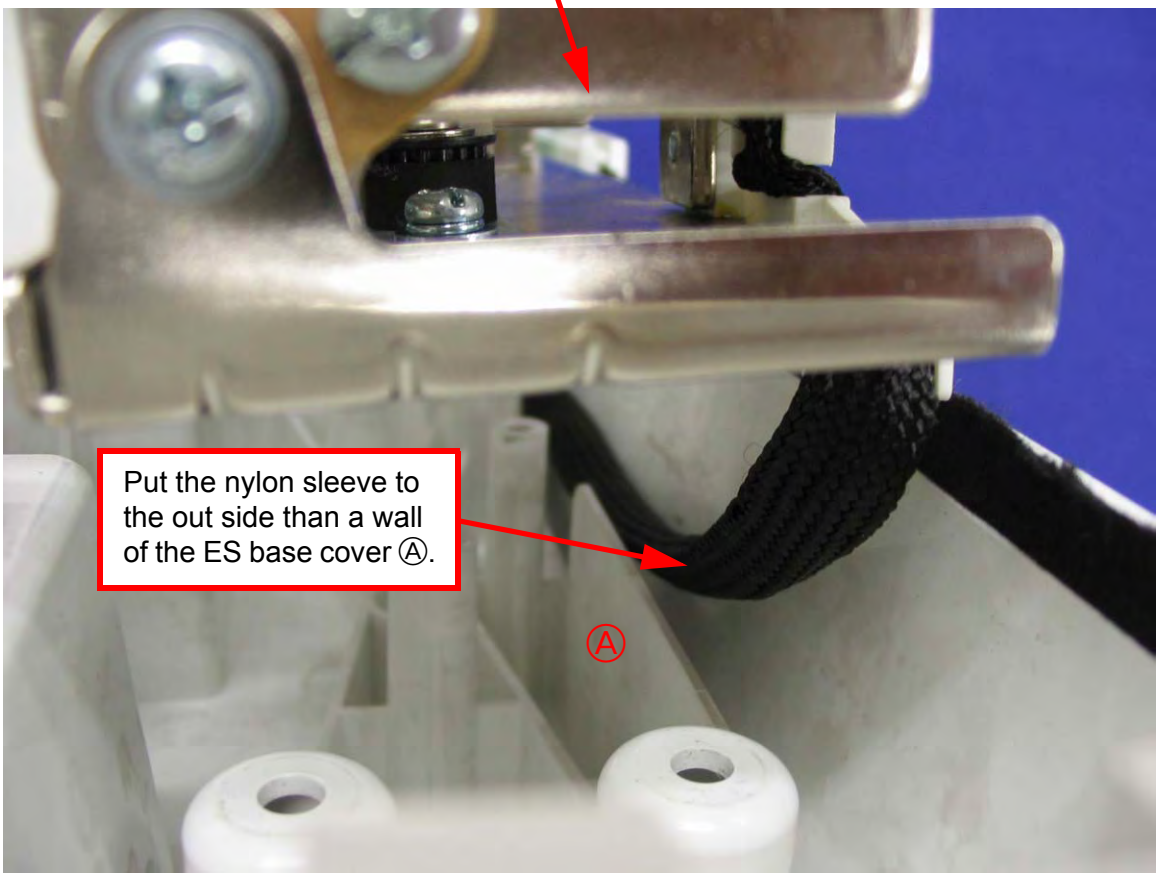


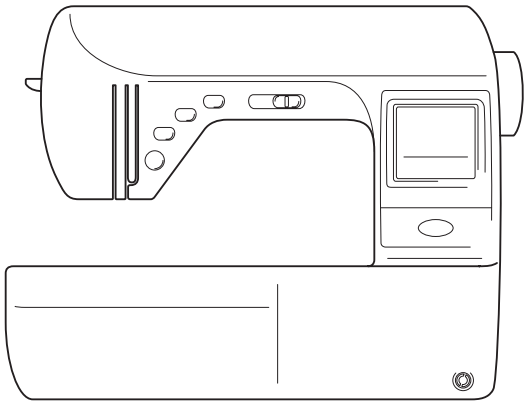
2. Wiring on back side of mainframe



3. Wiring on lower side of embroidary driving assembly







BLR2

BLR2
36J06HF885U13