

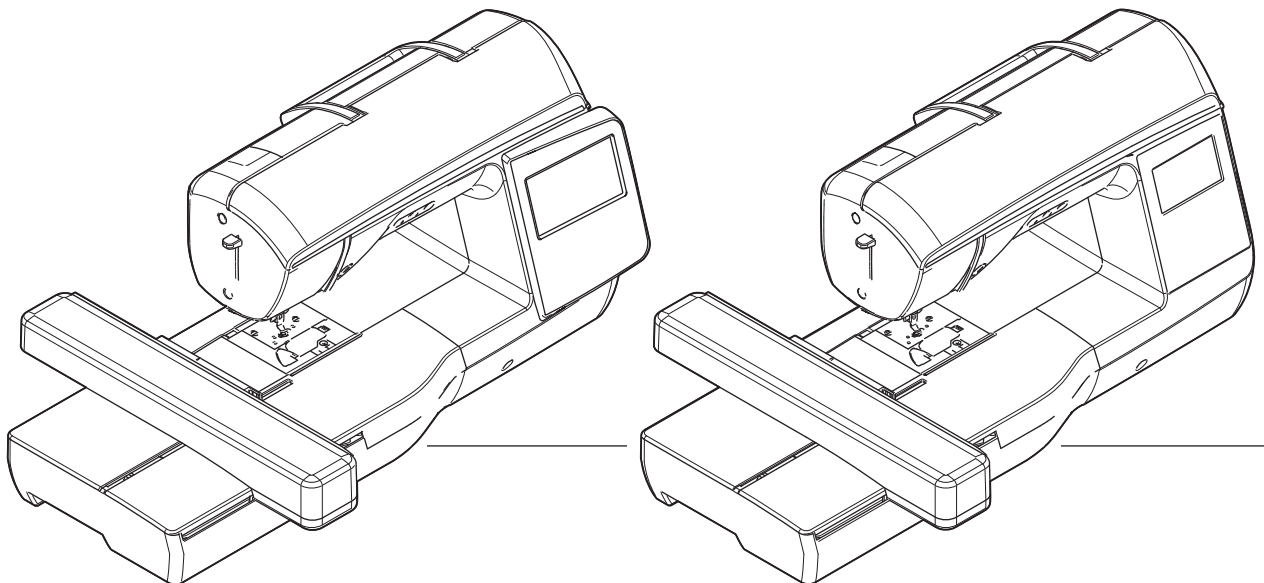
brother

Home Sewing Machine

SERVICE MANUAL

MODEL :

NQ1400E/NV800E/BP1430L
NV850E/BP1400E/NQ1600E



CONFIDENTIAL

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GENERAL INFORMATION

This service manual has been compiled for explaining repair procedures of this MODEL.

This was produced based on up-to-date product specifications at the time of issue, but there may have been changes of specifications for the purpose of improvements.

Contact manufacturer or local sales company for information concerning such changes.

Brother Industries, Ltd.
Nagoya, Japan

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

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

1. Outline of Mechanism	1 - 1
Main mechanisms	1 - 2
Driveline	1 - 3
Positions of electronic components	1 - 5
Control system block diagram	1 - 7
Layout for PCB connectors	1 - 8
Operation of other electronic components	1 - 10
2. Basic of Disassembly/Assembly	2 - 1
Disassembly	
Preparation	2 - 2
Disconnecting cables and removing accessories	2 - 2
Main frame and Covers	2 - 3
Removal of Top cover assy and Embroidery unit	2 - 4
Removal of Needle plate B assy, Free arm cover and Free arm front cover assy	2 - 5
Removal of Face plate assy and Front thread guard cover	2 - 6
Removal of Front cover assy	2 - 7
Removal of Rear cover assy	2 - 8
Removal of Free arm plate and Base plate cover	2 - 9
Removal of Connector holder assy	2 - 10
Removal of Bobbin winder assy	2 - 11
Removal of Rear cover plate and Face plate holder U assy	2 - 12
Removal of Base plate assembly	2 - 13
Removal of Handle assy	2 - 14
Electric parts and Main motor unit	2 - 15
Removal of Main motor assy	2 - 16
Removal of Main PCB assy	2 - 17
Removal of Power unit	2 - 18
Needle threading mechanism	2 - 19
Removal of Thread tension U assy	2 - 20
Lower driving mechanism	2 - 21
Removal of Tension pulley assembly and Belt supports	2 - 22
Removal of SPM holder	2 - 23
Removal of Feed module	2 - 24
Removal of Thread cutter module	2 - 25
Upper driving mechanism	2 - 26
Removal of Upper shaft assy	2 - 27
Removal of Needle-presser module	2 - 28
Assembly	
Upper driving mechanism	2 - 29
Lubrication	2 - 30
Attachment of Needle-presser module	2 - 31
Attachment of Upper shaft assy	2 - 32
Lower driving mechanism	2 - 33
Lubrication	2 - 34

Attachment of Thread cutter module	2 - 35
Attachment of Feed module	2 - 36
Attachment of SPM holder	2 - 37
Attachment of Belt supports and Tension pulley assembly	2 - 38
Needle threading mechanism	2 - 39
Attachment of Thread tension U assy	2 - 40
Electric parts and Main motor unit	2 - 41
Attachment of Power unit	2 - 42
Attachment of Main PCB assy	2 - 43
Attachment of Main motor assy	2 - 44
Main frame and Covers	2 - 45
Attachment of Handle assy	2 - 46
Attachment of Base plate assembly	2 - 47
Attachment of Face plate holder U assy and Rear cover plate	2 - 48
Attachment of Bobbin winder assy	2 - 49
Attachment of Connector holder assy	2 - 50
Attachment of Base plate cover and Free arm plate	2 - 51
Attachment of Rear cover assy	2 - 52
Attachment of Front cover assy	2 - 53
Attachment of Front thread guard cover and Face plate assy	2 - 54
Attachment of Free arm front cover assy, Free arm cover and Needle plate B assy	2 - 55
Attachment of Embroidery unit and Top cover unit assy	2 - 56

3. Application of Disassembly/Assembly 3 - 1

Disassembly

Main frame and Covers	3 - 2
Disassembly of Needle plate B assy	3 - 3
Disassembly of Face plate assy	3 - 4
Disassembly of Front cover assy	3 - 5
Removal of Connectors, USB cover, Panel PCB assy and Board plate	3 - 5
Removal of LED PCB assy and SSVR PCB assy	3 - 6
Removal of Buttons	3 - 7
Removal of Thread bobbin cover, Spool pin, Spool presser C and Bobbin winder guide assy	3 - 8
Removal of LCD unit assy	3 - 9
Disassembly of LCD unit assy	3 - 10
Disassembly of Connector holder assy	3 - 14
Disassembly of Handle assy	3 - 15
Disassembly of Face plate holder U assy	3 - 16
Disassembly of Free arm front cover assy	3 - 17
Disassembly of Base plate assembly	3 - 18
Bobbin winding mechanism	3 - 19
Removal of Bobbin base assy	3 - 20
Disassembly of Bobbin base assy	3 - 20
Removal of Bobbin presser, Bobbin winder assy holder and Bobbin winder shaft stopper	3 - 21
Removal of BW SW assy, BW unit holder, Bobbin winder spring and Bobbin winder rubber band	3 - 22
Removal of Bobbin winder assy	3 - 23
Electric parts and Main motor unit	3 - 24
Removal of NP PCB assy	3 - 25
Removal of Main motor assy	3 - 26
Needle threading mechanism	3 - 27

Removal of Thread guard cover	3 - 28
Removal of Uphread PCB assy and Thread guide wire	3 - 29
Removal of Thread guide, Initial adjusting plate, Cover holder and Plate assembly	3 - 30
Removal of Thread catching spring case and Thread cutting shutter	3 - 31
Removal of AT pulse motor, Thread tension gear cover and Thread tension cam	3 - 32
Removal of Thread guide shutter	3 - 34
Removal of Tension release unit and Tension plate	3 - 35
Removal of Tension pressure assy and Links	3 - 37
Removal of Tension discs	3 - 38
Feed module	3 - 39
Removal of Needle plate A assy, Inner rotary hook assy and Inner rotary hook bracket assy	3 - 40
Disassembly of Inner rotary hook bracket assy	3 - 41
Removal of Outer rotary hook assy	3 - 42
Removal of Lower shaft assy	3 - 43
Removal of Feed holder side plates	3 - 45
Thread cutter module	3 - 46
Disassembly of Motor holder assy and Thread cutter frame assy	3 - 47
Removal of Thread hook assy	3 - 48
Removal of Photo transistor assy and C pulse motor	3 - 49
Needle-presser module	3 - 50
Removal of Needle bar crank rod assy and Thread take-up lever assy	3 - 51
Removal of U presser foot	3 - 52
Removal of PT holder assembly	3 - 53
Removal of PF INIT PCB assy, Cord guide, PF pulse motor and Presser PM holder	3 - 54
Removal of Presser dial and Lock nut	3 - 55
Removal of Presser foot lifter and PF SW assy	3 - 56
Removal of Guard plate	3 - 57
Removal of Needle bar assy, Needle bar hook stand assy and Needle thread block	3 - 58
Removal of Needle supporter arm base	3 - 59
Removal of Springs	3 - 60
Removal of Needle bar supporter assy	3 - 61
Removal of Threader hook assy	3 - 62
Removal of Lever AB	3 - 63
Removal of Presser bar and Presser bar clamp assy	3 - 65
Removal of Presser dial gear and Shaft bushing A assy	3 - 67
Embroidery unit	3 - 68
Removal of YPM cover and X carriage cover	3 - 69
Removal of E hoop stay plate assy	3 - 70
Disassembly of E hoop stay plate assy	3 - 71
Removal of ES main cover assy	3 - 72
Removal of EMB relay PCB assy	3 - 73
Removal of ES base cover assy	3 - 74
Removal of Lead wire assy EMB unit-MAIN	3 - 75
Removal of Lock release lever	3 - 76
Removal of Rubber cushion	3 - 77
Removal of X carriage unit	3 - 78
Removal of X slider	3 - 80
Removal of Y pulse motor and Y sensor PCB assy	3 - 81
Removal of Flexible flat cable:SML2CD-6 and Hole cover	3 - 82
Removal of Y carriage assy	3 - 84
Removal of Y slider and Timing belt 40S2M660	3 - 85
Disassembly of Main frame assy	3 - 86

Assembly

Needle threading mechanism	3 - 87
Attachment of Tension discs	3 - 88
Attachment of Links and Tension pressure assy	3 - 89
Attachment of Tension plate and Tension release unit	3 - 90
Attachment of Thread guide shutter	3 - 92
Attachment of Thread tension cam, Thread tension gear cover and AT pulse motor	3 - 93
Attachment of Thread cutting shutter and Thread catching spring case	3 - 95
Attachment of Plate assembly, Cover holder, Initial adjusting plate and Thread guide	3 - 96
Attachment of Thread guide wire and Upthread PCB assy	3 - 97
Attachment of Thread guard cover	3 - 98
Electric parts and Main motor unit	3 - 99
Assembly of Main motor assy	3 - 100
Assembly of NP PCB assy	3 - 101
Bobbin winding mechanism	3 - 102
Attachment of Bobbin winder assy	3 - 103
Attachment of Bobbin winder rubber band, Bobbin winder spring, BW unit holder and BW SW assy	3 - 104
Attachment of Bobbin winder shaft stopper, Bobbin winder assy holder and Bobbin presser	3 - 105
Attachment of Bobbin base assy	3 - 106
Assembly of Bobbin base assy	3 - 106
Main frame and Covers	3 - 107
Assembly of Base plate assembly	3 - 108
Assembly of Free arm front cover assy	3 - 109
Assembly of Face plate holder U assy	3 - 110
Assembly of Handle assy	3 - 111
Assembly of Connector holder assy	3 - 112
Assembly of Front cover assy	3 - 113
Assembly of LCD unit assy	3 - 113
Attachment of LCD unit assy	3 - 117
Attachment of Bobbin winder guide assy, Spool presser C, Spool pin and Thread bobbin cover	3 - 118
Attachment of Buttons	3 - 119
Attachment of LED PCB assy and SSVR PCB assy	3 - 120
Attachment of Board plate, Panel PCB assy, USB cover and Connectors	3 - 121
Assembly of Face plate assy	3 - 122
Assembly of Needle plate B assy	3 - 123
Needle-presser module	3 - 124
Lubrication	3 - 125
Attachment of Shaft bushing A assy and Presser dial gear	3 - 127
Attachment of Presser bar clamp assy and Presser bar	3 - 128
Attachment of Lever AB	3 - 130
Attachment of Threader hook assy	3 - 132
Attachment of Needle bar supporter assy	3 - 133
Attachment of Springs	3 - 134
Attachment of Needle supporter arm base	3 - 135
Attachment of Needle thread block, Needle bar hook stand assy and Needle bar	3 - 136
Attachment of Guard plate	3 - 137
Attachment of PF SW assy and Presser foot lifter	3 - 138
Attachment of Lock nut and Presser dial	3 - 139
Attachment of Presser PM holder, PF INIT PCB assy	3 - 140
Attachment of PT holder assembly	3 - 141
Attachment of U presser foot	3 - 142

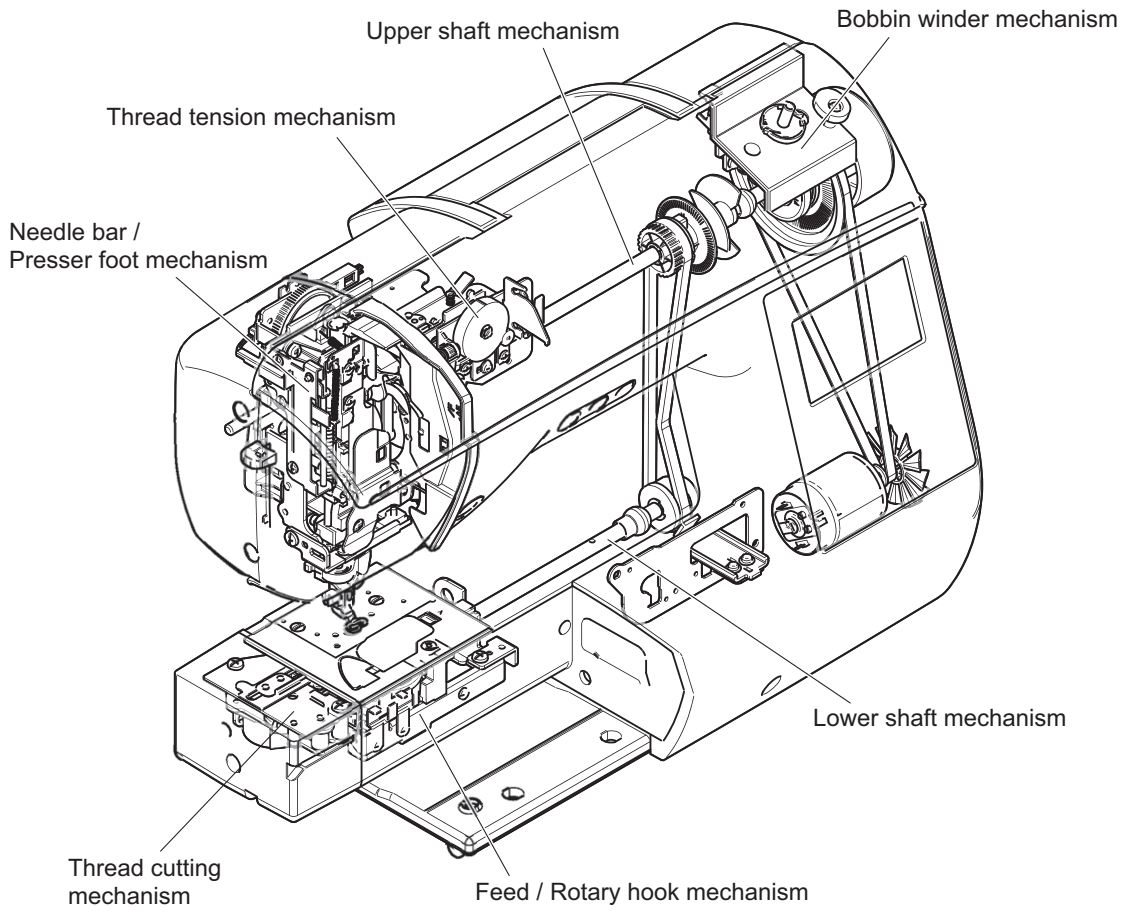
Attachment of Thread take-up lever assy and Needle bar crank rod assy	3 - 143
Thread cutter module	3 - 144
Lubrication	3 - 145
Attachment of C pulse motor and Photo transistor assy	3 - 146
Attachment of Thread hook assy	3 - 147
Assembly of Thread cutter frame assy and Motor holder assy	3 - 148
Feed module	3 - 149
Lubrication	3 - 150
Attachment of Feed holder plates	3 - 151
Attachment of Lower shaft assy	3 - 152
Attachment of Outer rotary hook assy	3 - 154
Assembly of Inner rotary hook bracket assy	3 - 155
Attachment of Inner rotary hook bracket assy, Inner rotary hook assy and Needle plate A assy	3 - 156
Embroidery unit	3 - 157
Lubrication	3 - 158
Assembly of Main frame assy	3 - 159
Attachment of Timing belt 40S2M660 and Y slider	3 - 160
Attachment of Y carriage assy	3 - 161
Attachment of Hole cover and Flexible flat cable:SML2CD-6	3 - 162
Attachment of Y sensor PCB assy and Y pulse motor	3 - 164
Attachment of X slider	3 - 165
Attachment of X carriage unit	3 - 166
Attachment of Rubber cushion	3 - 169
Attachment of Lock release lever	3 - 170
Attachment of Lead wire assy EMB unit-MAIN	3 - 171
Attachment of ES base cover assy	3 - 172
Attachment of EMB relay PCB assy	3 - 173
Attachment of ES main cover assy	3 - 174
Assembly of E hoop stay plate assy	3 - 175
Attachment of E hoop stay plate assy	3 - 176
Attachment of X carriage cover and YPM cover	3 - 177
4. Adjustment	4 - 1
Needle point damage	4 - 2
Start test mode	4 - 3
Touch panel	4 - 4
Timing belt tension	4 - 5
Timing belt and belt support upper/lower clearance	4 - 6
Motor belt tension	4 - 7
Fine tension	4 - 8
Upper thread tension	4 - 9
Front/back position of needle and presser foot	4 - 10
Right/left position of needle and presser foot	4 - 11
Needle bar rising	4 - 12
Needle bar height	4 - 13
Needle clearance	4 - 14

Needle threader	4 - 15
Presser bar height	4 - 16
Fabric thickness setting	4 - 17
Inner rotary hook bracket position	4 - 19
Lower thread winding	4 - 20
Lower thread tension (inner rotary hook assy)	4 - 21
Belt tension (embroidery unit)	4 - 22
X carriage height (embroidery unit)	4 - 23
Embroidery center position (embroidery unit)	4 - 24
5. Troubleshooting for Electronic Parts	5 - 1
Error message list	5 - 2
Error is displayed	5 - 3
Replacement of main PCB assy or panel PCB assy	5 - 6
Display position of parts code of PCB	5 - 7
6. Maintenance	6 - 1
How to reset counter of the maintenance	6 - 2
Necessary grease & oil	6 - 3
Maintenance point	6 - 4
7. Special Instructions of Wiring	7 - 1
Module wiring	7 - 2
Main body wiring	7 - 5
Front cover wiring	7 - 13
Embroidery unit wiring	7 - 16

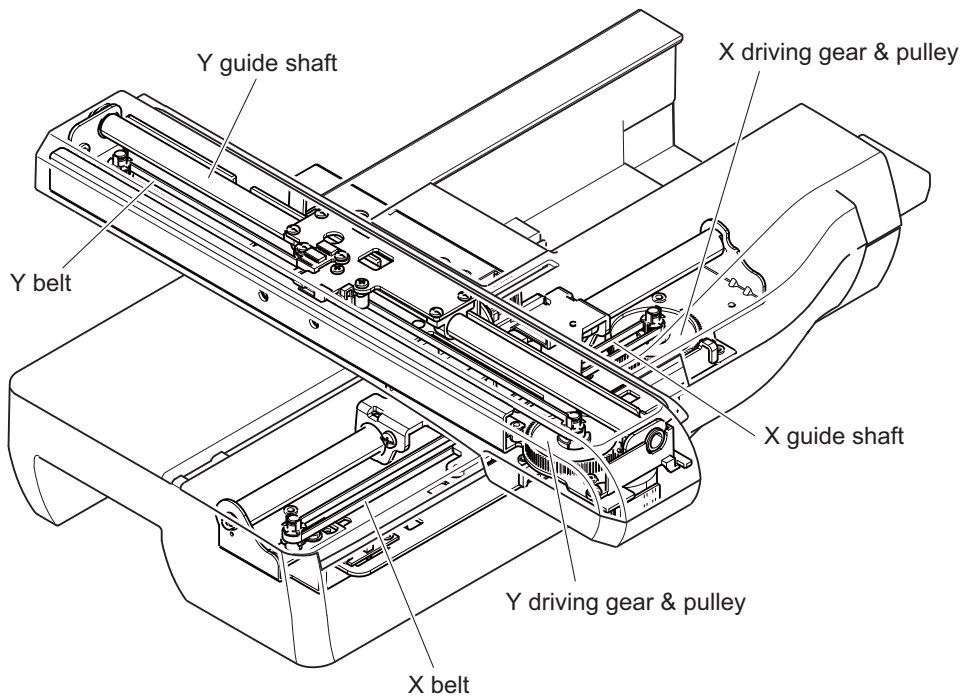
1 Outline of Mechanism

Main mechanisms	1 - 2
Driveline	1 - 3
Positions of electronic components.....	1 - 5
Control system block diagram.....	1 - 7
Layout for PCB connectors	1 - 8
Operation of other electronic components	1 - 10

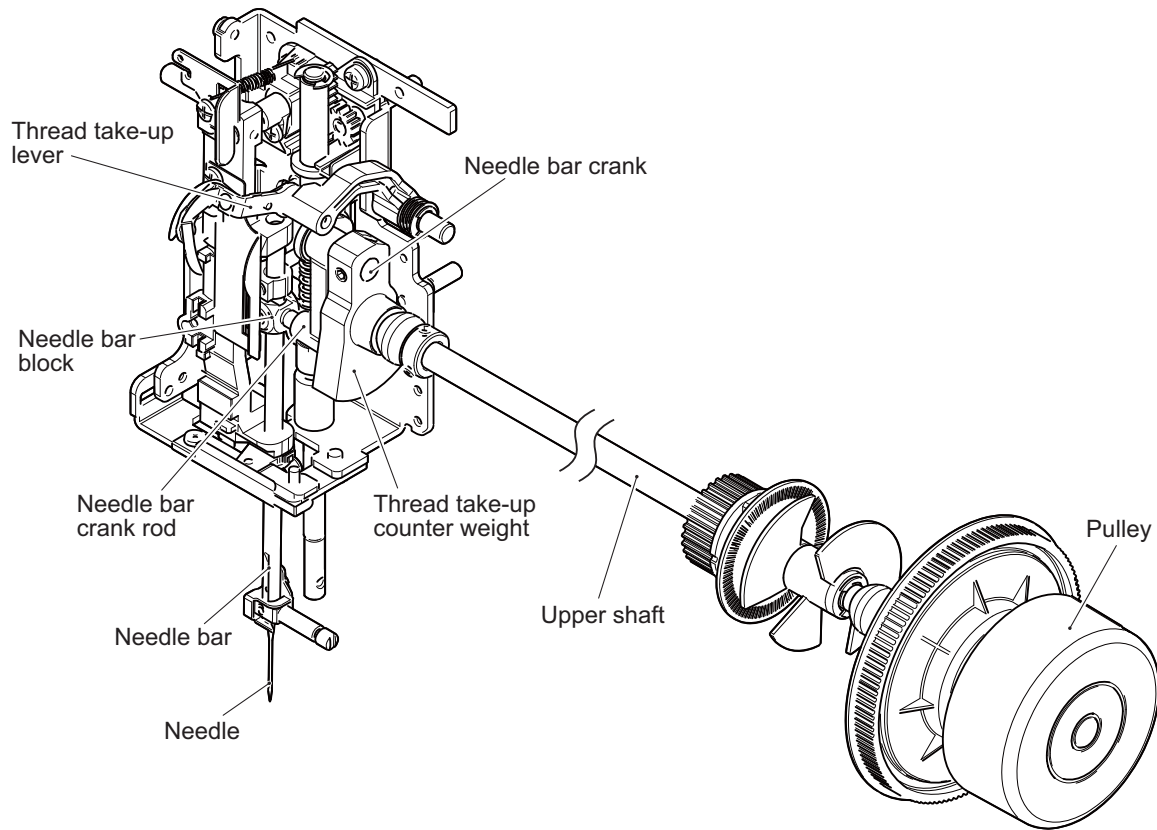
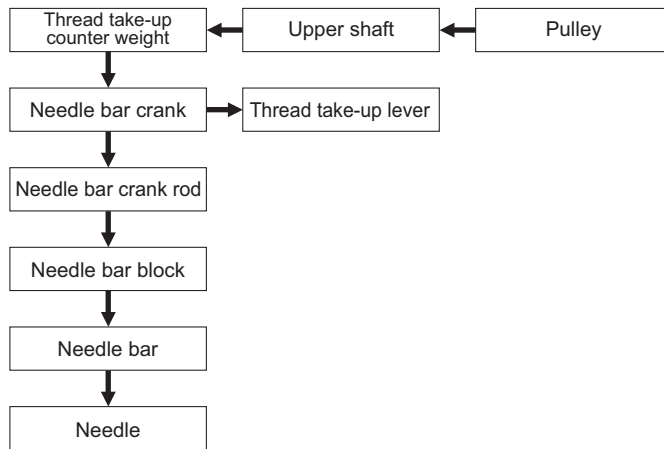
Main body



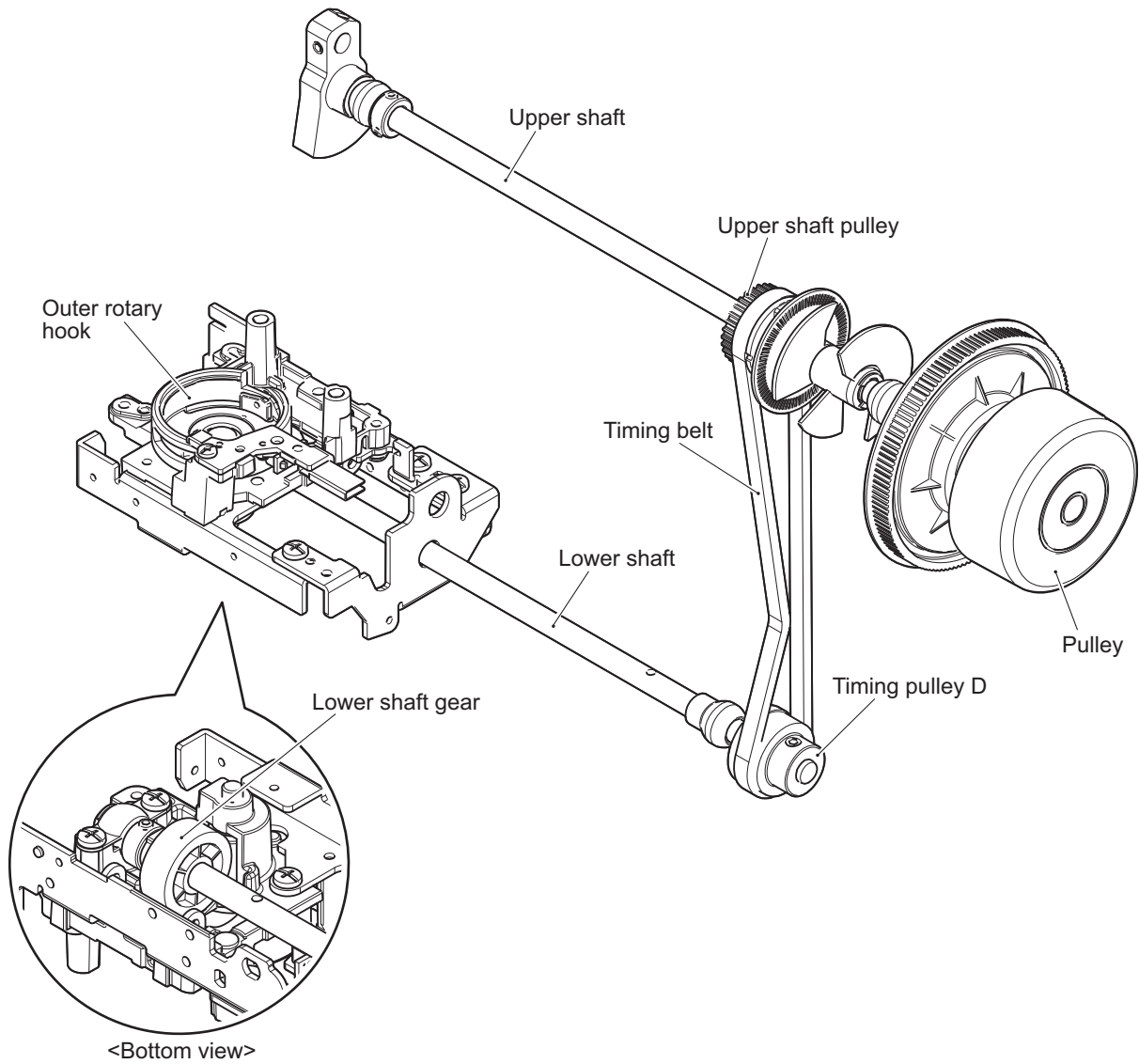
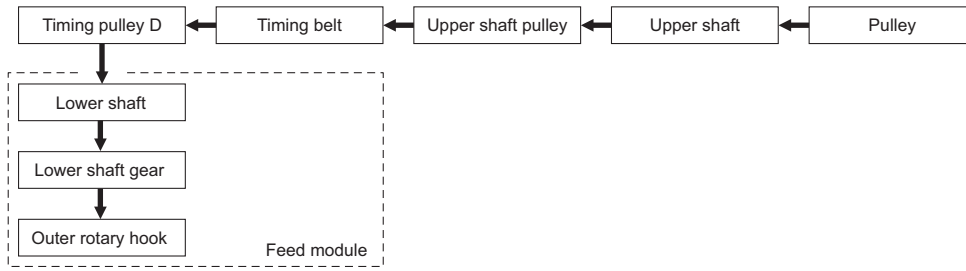
Embroidery unit



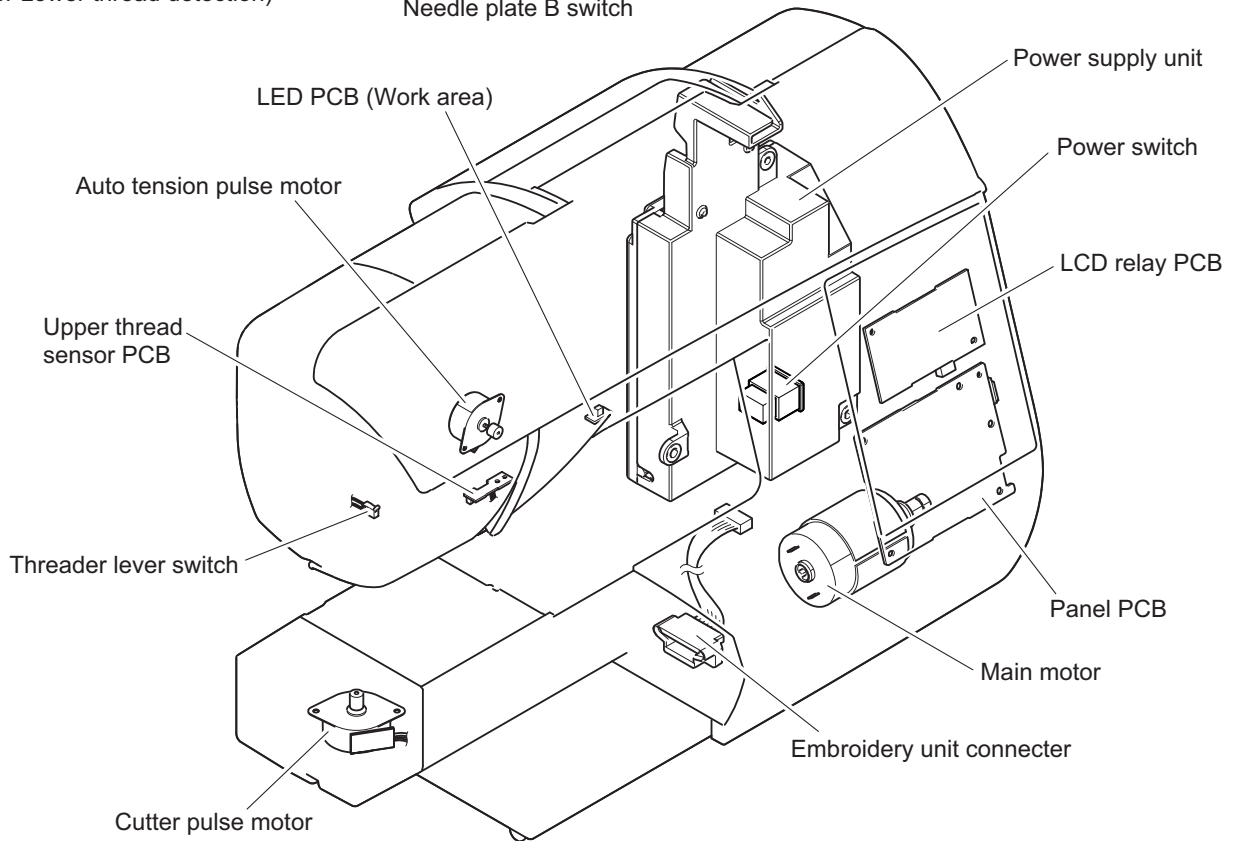
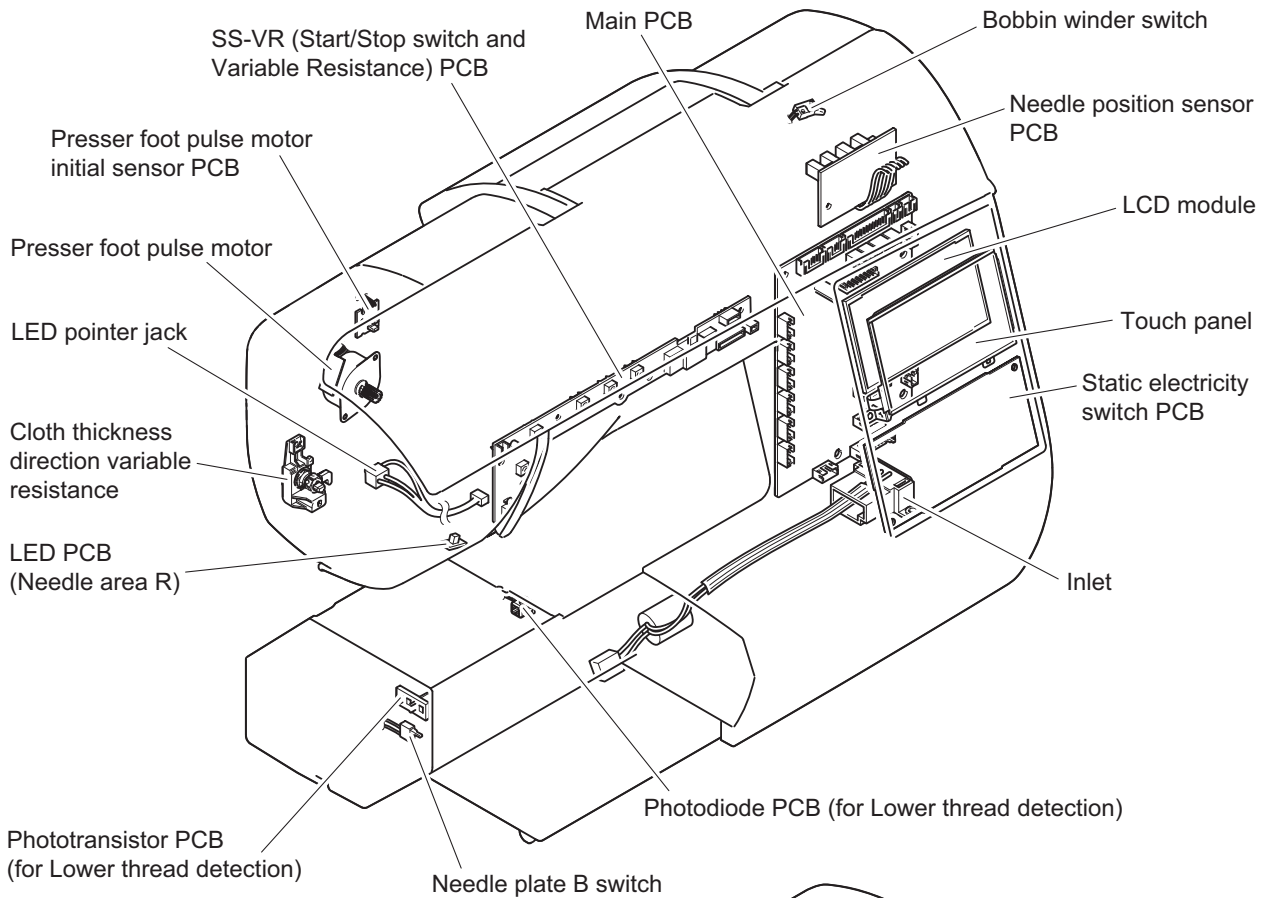
(A) Up and down movement of needle bar, movement of thread take-up lever and zigzag movement of needle bar mechanism



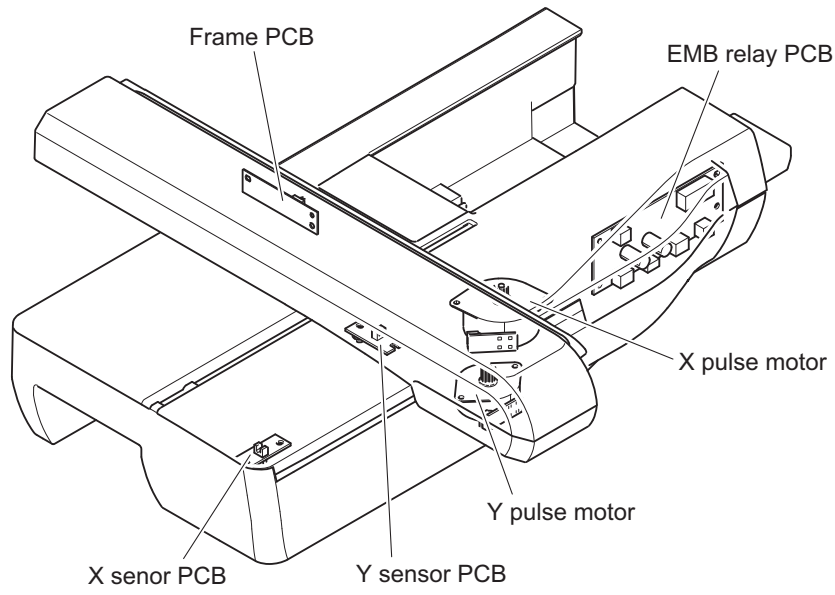
(B) Movement of feed dog and rotary hook

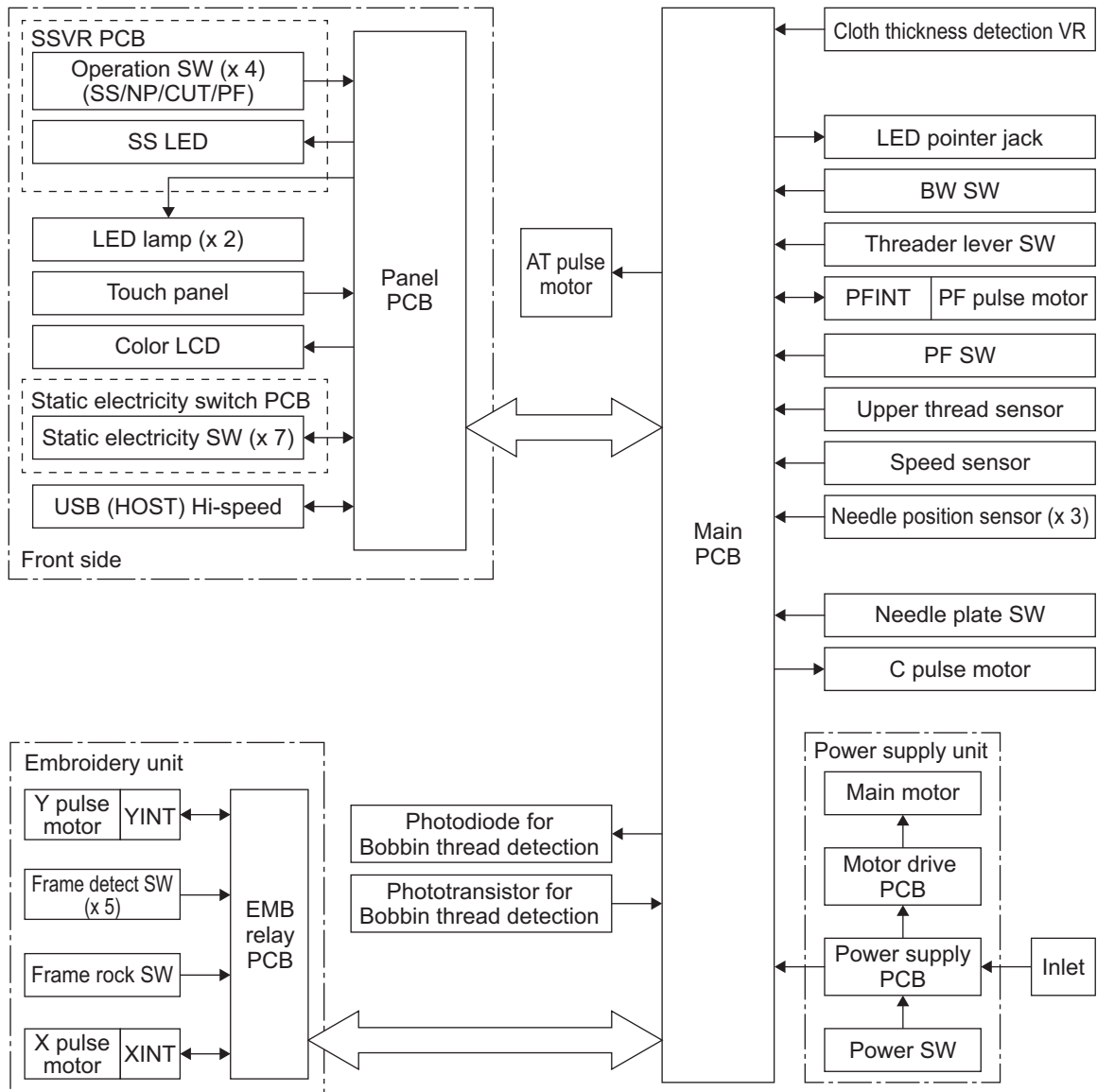


Main body



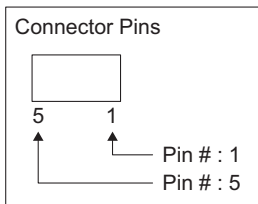
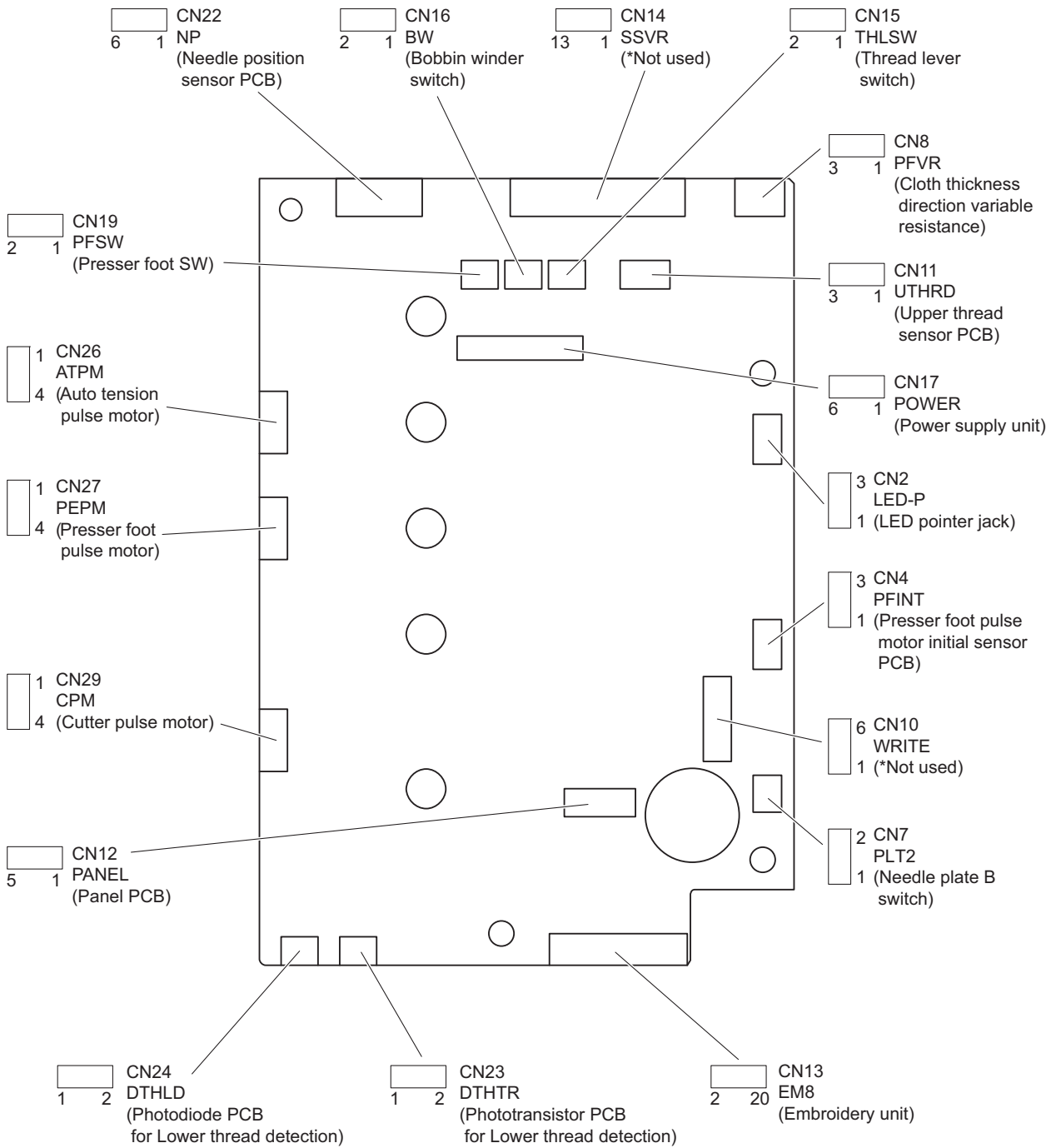
Embroidery unit



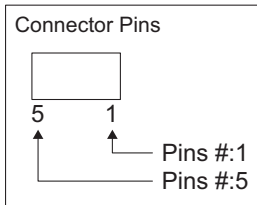
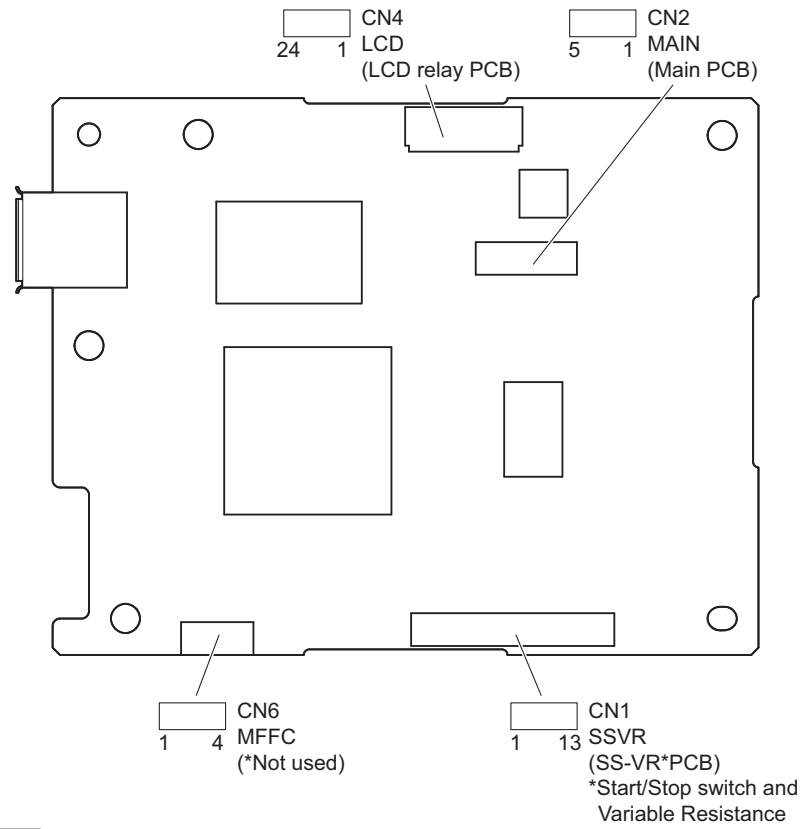


The illustration below shows layout for Printed Board connectors.

■ Main PCB



■ Panel PCB



Outline of Mechanism

Outline of Mechanism

Start/Stop (SS) button	Button for starting and stopping the sewing machine. The machine operates at a slow speed while the button is being held down.
Needle position button	This button toggles the needle between the up and down positions.
Thread cutter button	This button is for cutting the thread. In case the button is pressed, the thread is cut regardless of the needle position and stop with the needle up.
Presser foot lifter button	This button toggles the presser foot between the up and down positions.
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 operation for selecting the desired pattern and number.
Needle position (NP) sensor	This sensor detects the drive timing of each pulse motor and the vertical stop of the needle position. It detects the upper shaft angle of rotation by using a shutter attached to the upper shaft and an optical sensor.
Speed sensor	This sensor detects the rotational speed of the main motor. It detects the upper shaft rotational speed by using a shutter attached to the upper shaft and an optical sensor.
Cloth thickness sensor	This sensor detects the thickness of cloth.
Presser switch	This switch detects the vertical position of the presser foot lifter.
BW (bobbin winder) switch	This switch detects whether the bobbin is set for winding or not, when the bobbin thread is wound.
Needle plate switch	This switch detects normal needle plate or straight stitch needle plate.
ELECSW (Static electricity SW) PCB assy (in panel assy)	This PCB assy is equipped with sensors which detect the change in static electricity capacity when a finger touches it.
LED pointer jack	Insert this terminal when the LED pointer foot (optional accessory) is used.
LED lamp PCB assy	White LED lamps for illuminating the work space.

Up thread sensor PCB assy Detects the presence or absence of the upper thread and whether it is cut or not.

Initial sensor PCB assy. Detects the original position of each pulse motor.

Photo diode PCB assy,
photo transistor PCB assy This assy detects the bobbin thread is low.

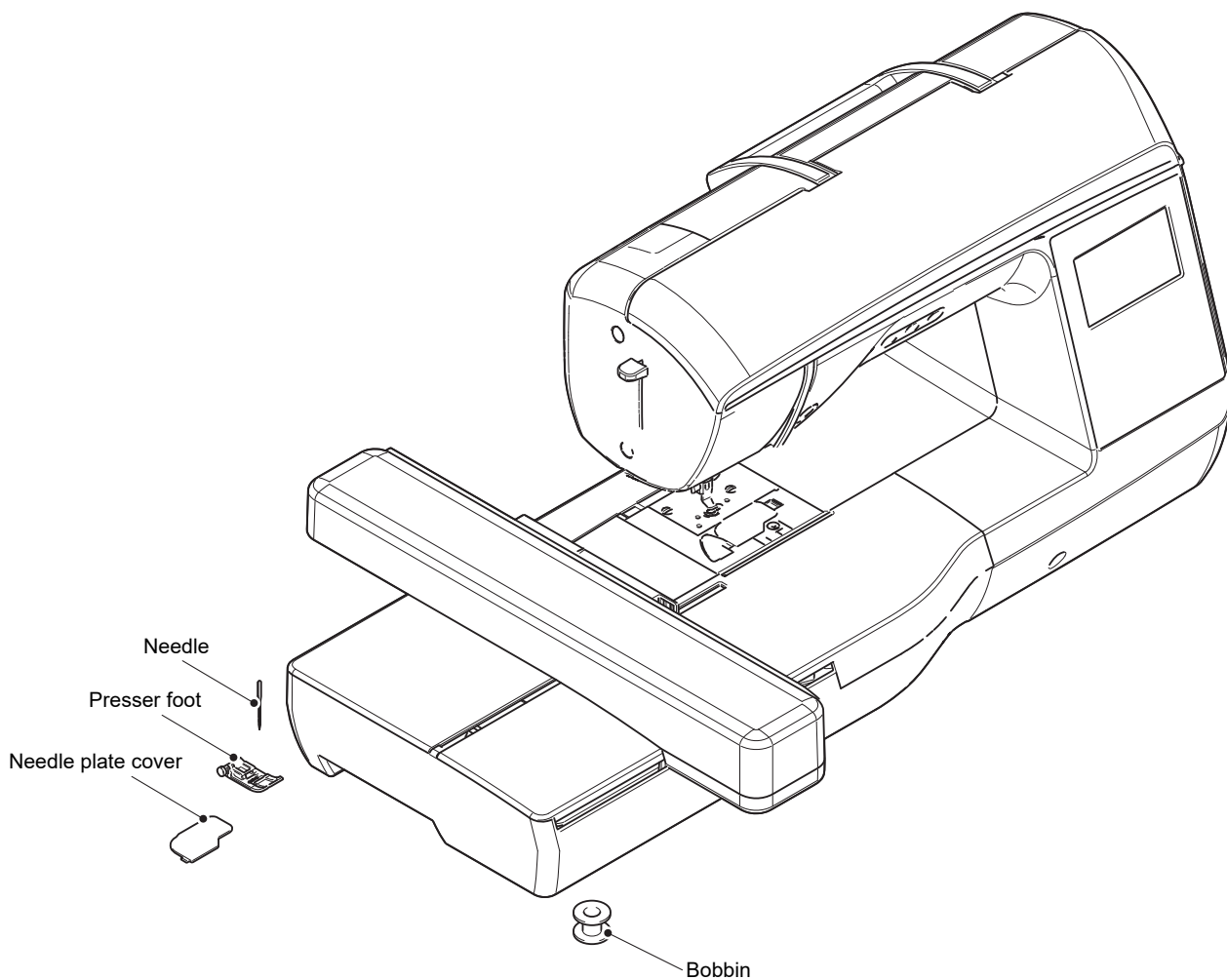
2 Basic of Disassembly/Assembly

For repairing or replacing parts of this machine, refer to “CHAPTER 3: Application of Disassembly/Assembly”.

Disassembly	Preparation	2 - 2
	Main frame and Covers	2 - 3
	Electric parts and Main motor unit...	2 - 15
	Needle threading mechanism	2 - 19
	Lower driving mechanism	2 - 21
	Upper driving mechanism	2 - 26
Assembly	Upper driving mechanism	2 - 29
	Lower driving mechanism	2 - 33
	Needle threading mechanism	2 - 39
	Electric parts and Main motor unit...	2 - 41
	Main frame and Covers	2 - 45

1 Disconnecting cables and removing accessories

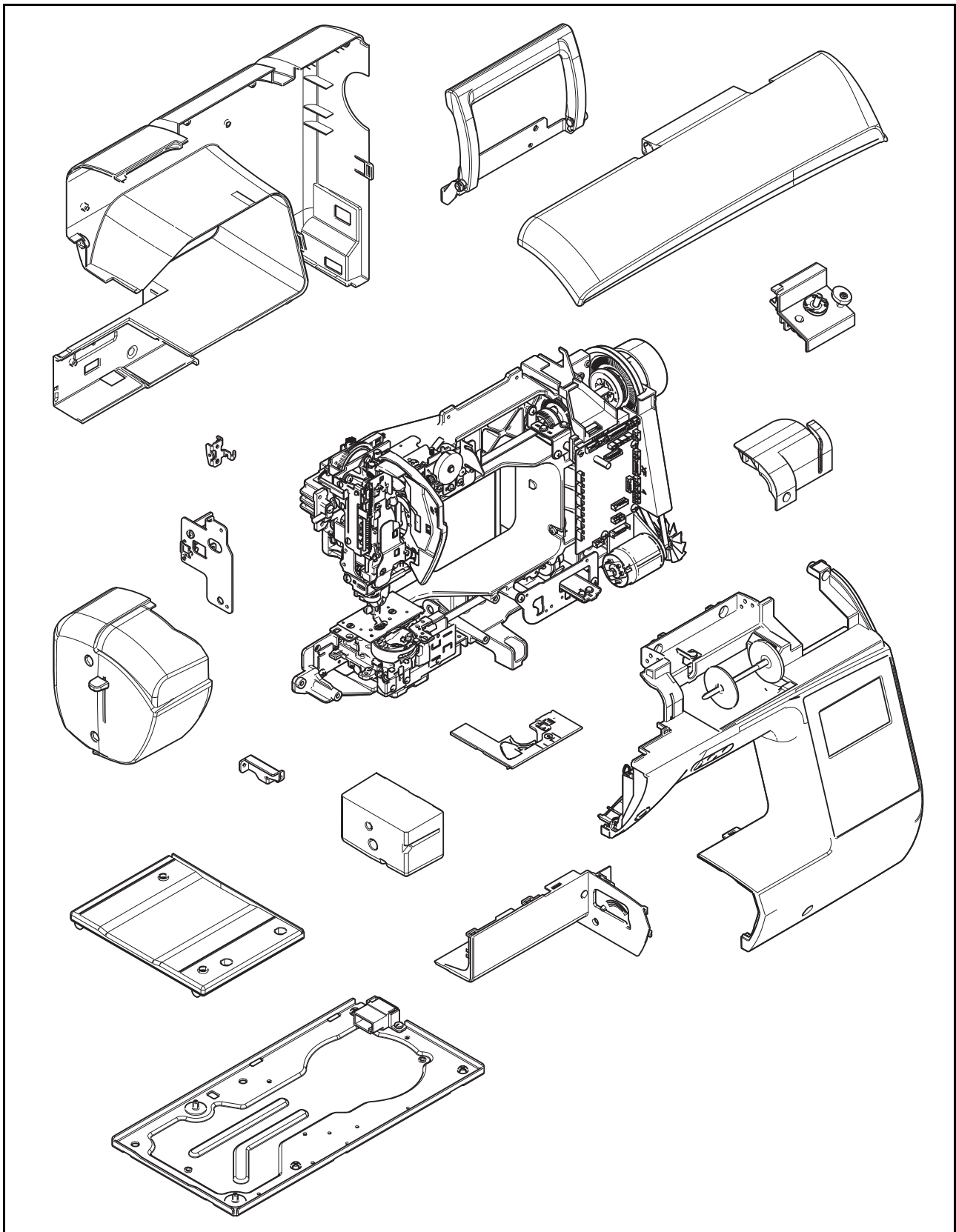
- Needle
- Presser foot
- Needle plate cover
- Bobbin
- Power cord (if connected)
- USB I/F core cable (if connected)
- Foot controller (if connected)



Basic of Disassembly

Basic of Disassembly

Main frame and Covers location diagram



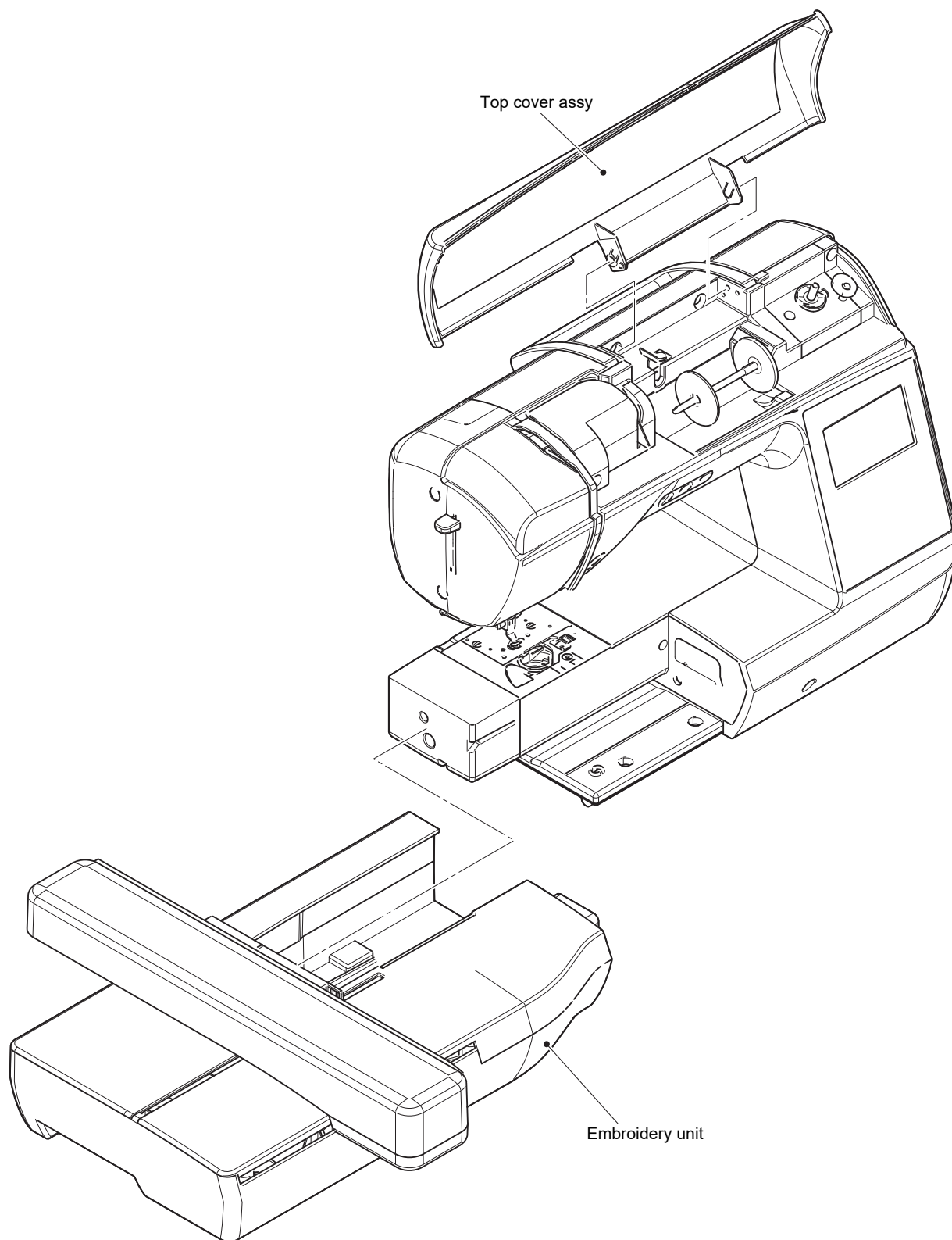
Basic of Disassembly

Basic of Disassembly

1 Removal of Top cover assy and Embroidery unit

1. Remove the embroidery unit.
2. Remove the top cover assy.

→Refer to 3 - 68 "Embroidery unit".



2 Removal of Needle plate B assy, Free arm cover and Free arm front cover assy

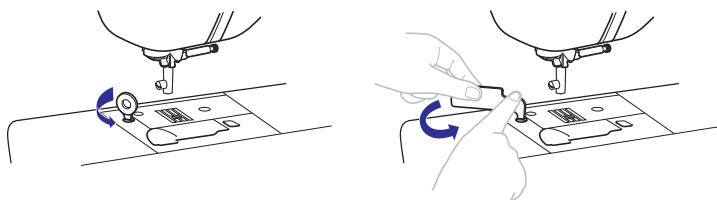
1. Remove the needle plate B assy.

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



Disassembling note

- If there is a screw in the needle plate cover, use the disc shaped screwdriver or L-shaped screwdriver to remove the screw in the needle plate cover.



2. Remove the screw (screw, pan (S/P washer) M4x8) to remove the free arm cover.

3. Remove the screw (screw, pan (T washer) M3x6) and screw (screw, pan (S/P washer) M3x6), release the hook from the hook tray, and remove the free arm front cover assy.

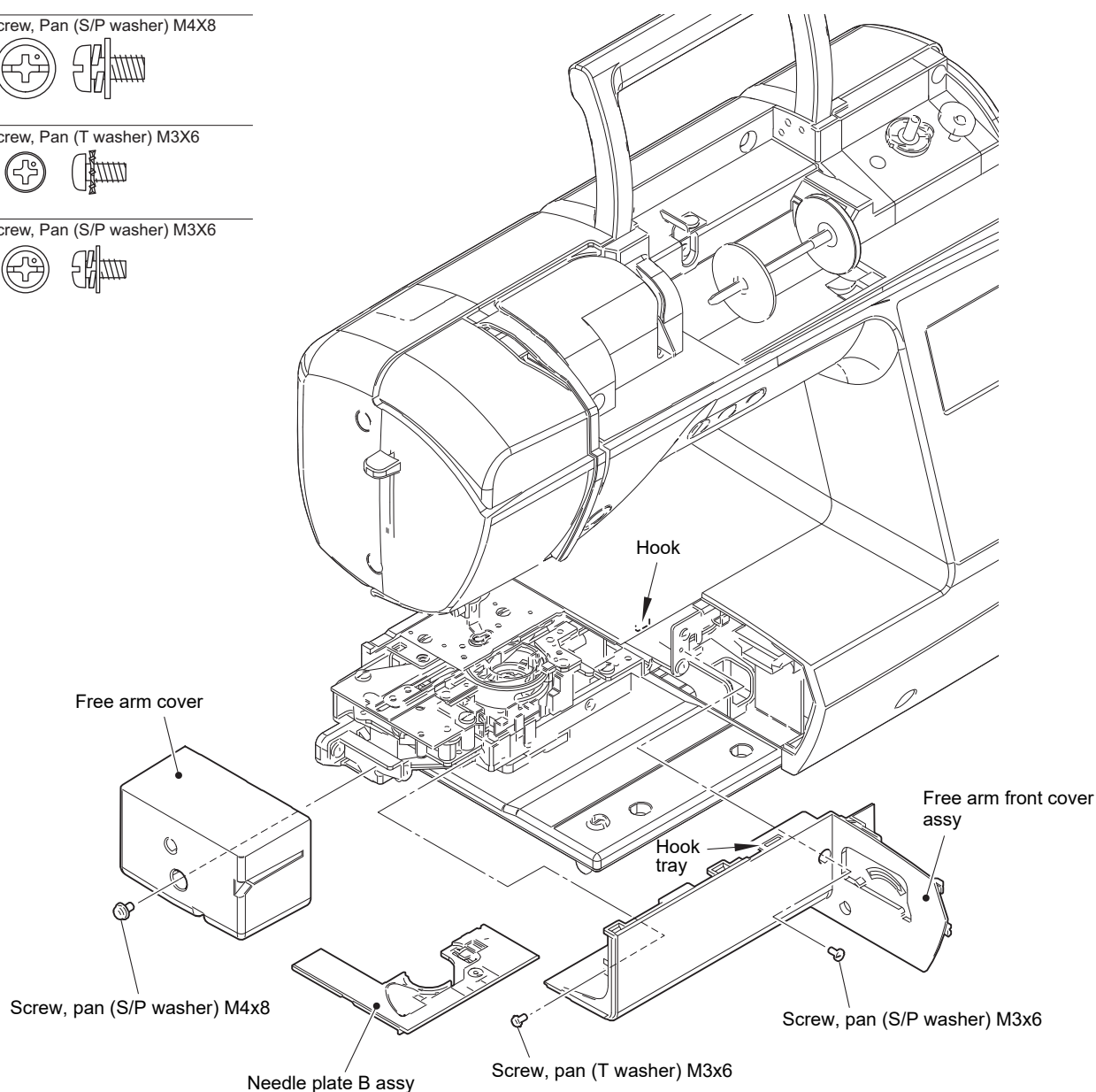
Screw, Pan (S/P washer) M4x8



Screw, Pan (T washer) M3x6



Screw, Pan (S/P washer) M3x6



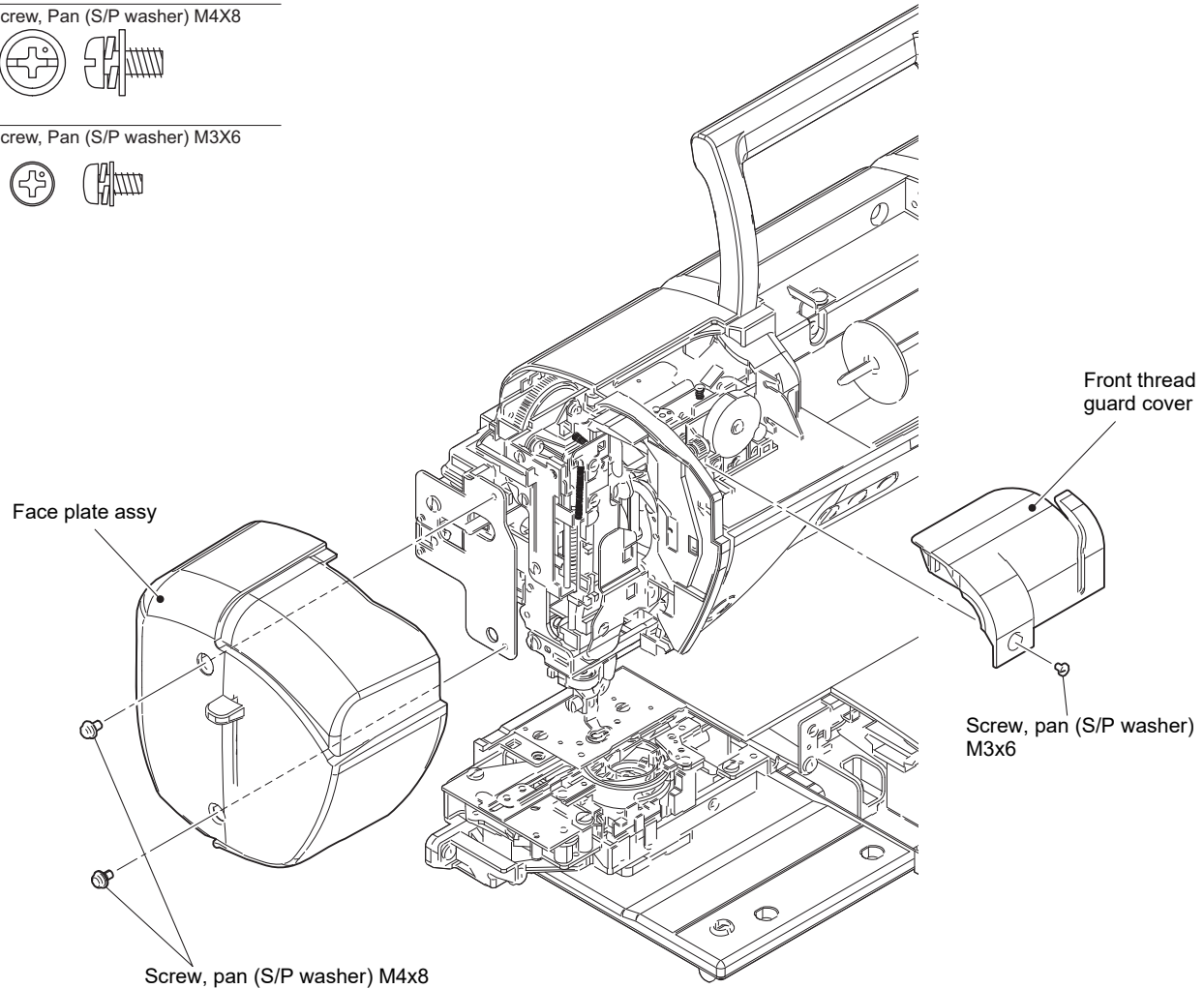
3 Removal of Face plate assy and Front thread guard cover

1. Remove the two screws (screw, pan (S/P washer) M4x8)
→Refer to 3 - 4 "Disassembly of Face plate assy".
2. Remove the screw (screw, pan (S/P washer) M3x6) to remove the front thread guard cover.

Screw, Pan (S/P washer) M4X8



Screw, Pan (S/P washer) M3X6

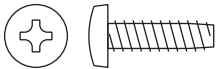


4 Removal of Front cover assy

1. Remove the three screws (taptite, bind B M4x14) and screw (screw, pan (T washer) M3x6) from the front cover assy.
2. Remove the screw (screw bind M3X4) to remove the lead wire assy panel USB FG from the free arm front cover plate.
3. Release the hook A (front cover side), B (rear cover side) and C (front cover side) from the hook tray D (rear cover side), E (front cover side) and F (rear cover side) respectively, to open the upper side of front cover assy, and release the two hooks G from the base plate to remove the front cover assy. Disconnect the lead wire assy main-panel from the main PCB assy.

→Refer to 3 - 5 "Disassembly of Front cover assy".

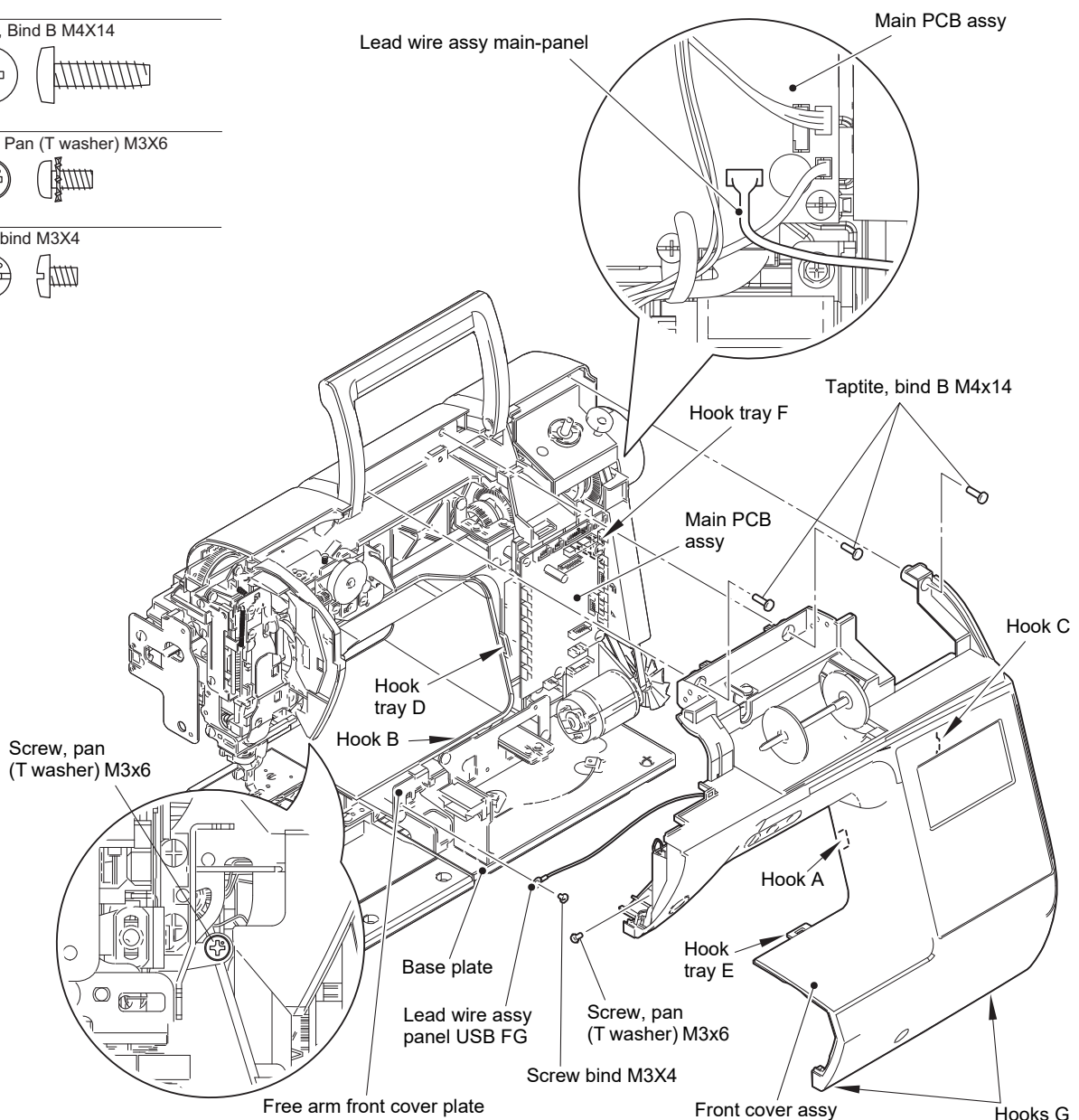
Taptite, Bind B M4X14



Screw, Pan (T washer) M3X6



Screw bind M3X4



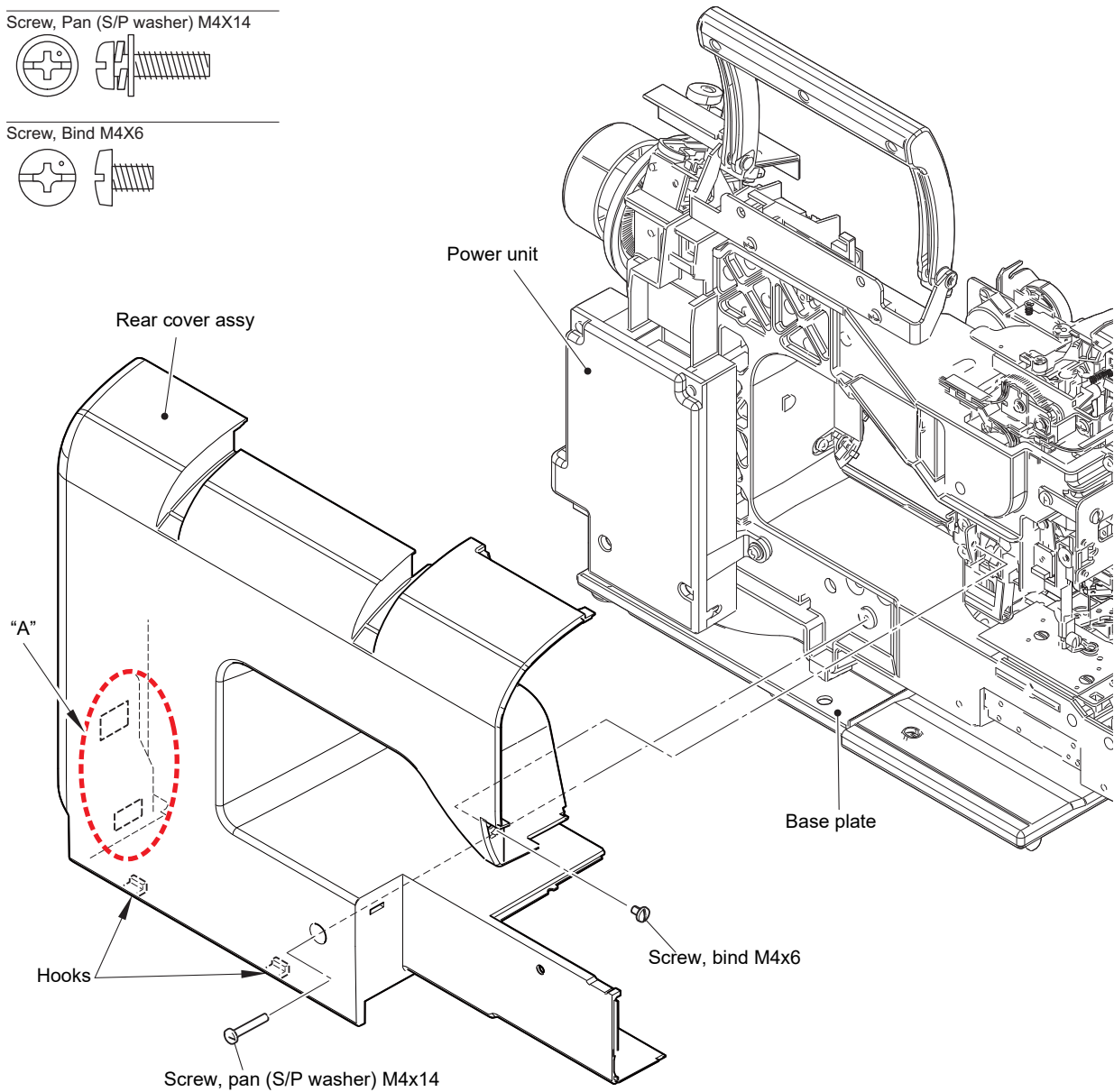
5 Removal of Rear cover assy

1. Remove the screw (screw, pan (S/P washer) M4x14) and screw (screw, bind M4x6) from the rear cover assy.
2. Release the two hooks from the base plate. Remove the rear cover assy while bending the "A" and "B" to get over the switch of power unit and the drop lever.

Screw, Pan (S/P washer) M4X14

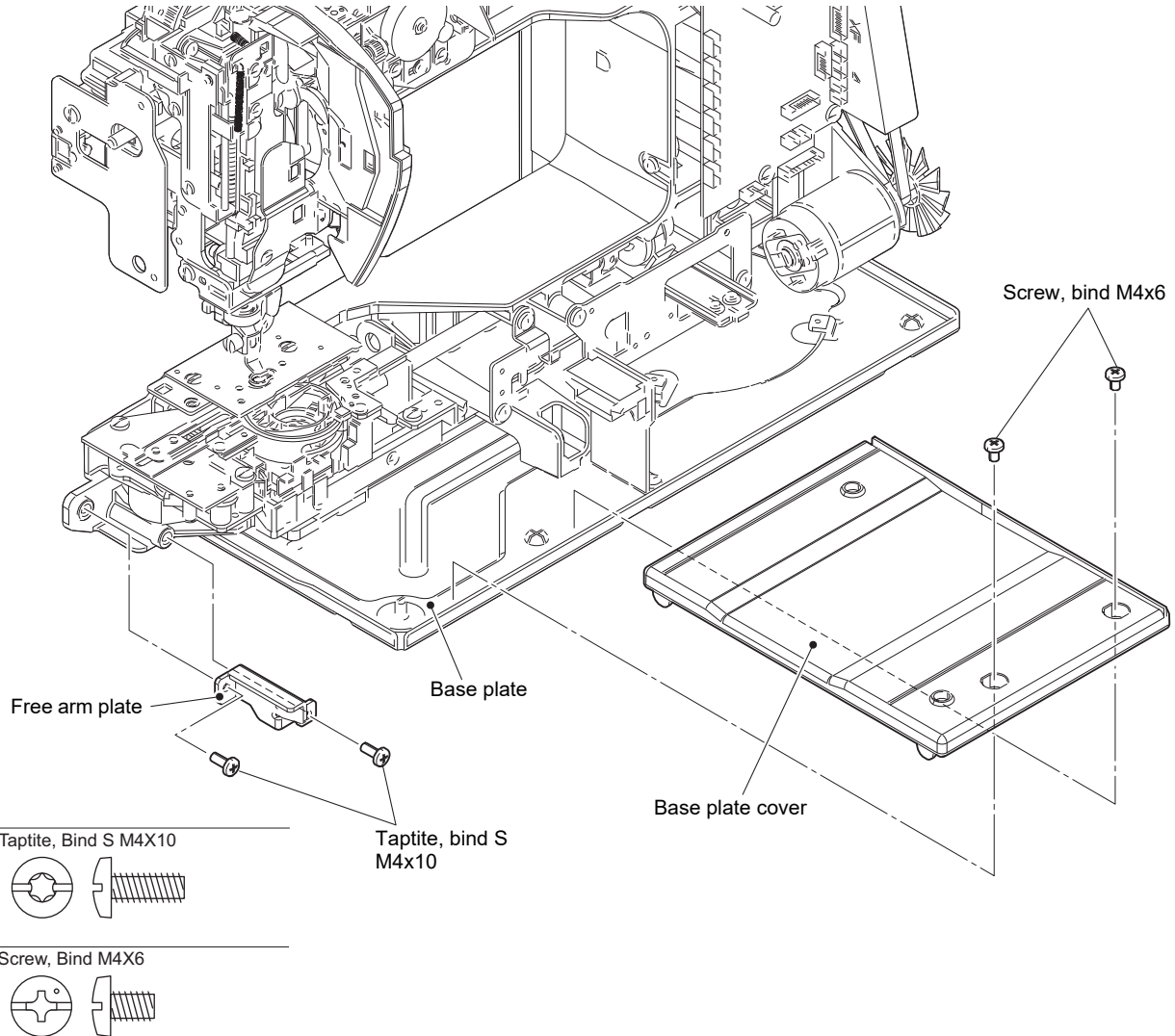


Screw, Bind M4X6



6 Removal of Free arm plate and Base plate cover

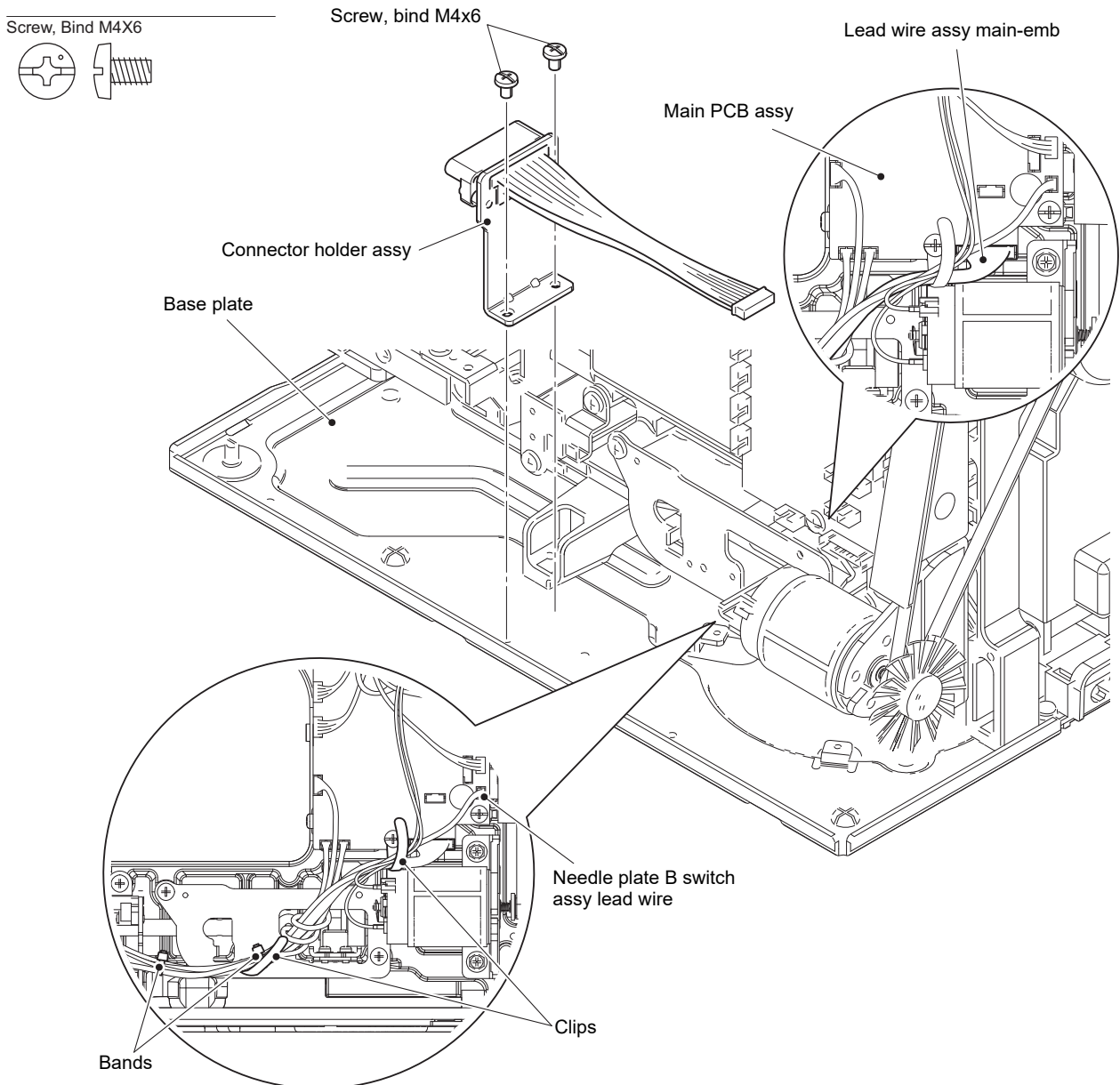
1. Remove the two screws (taptite, bind S M4x10) to remove the free arm plate from the arm bed.
2. Remove the two screws (screw, bind M4x6) to remove the base plate cover from the base plate.



7 Removal of Connector holder assy

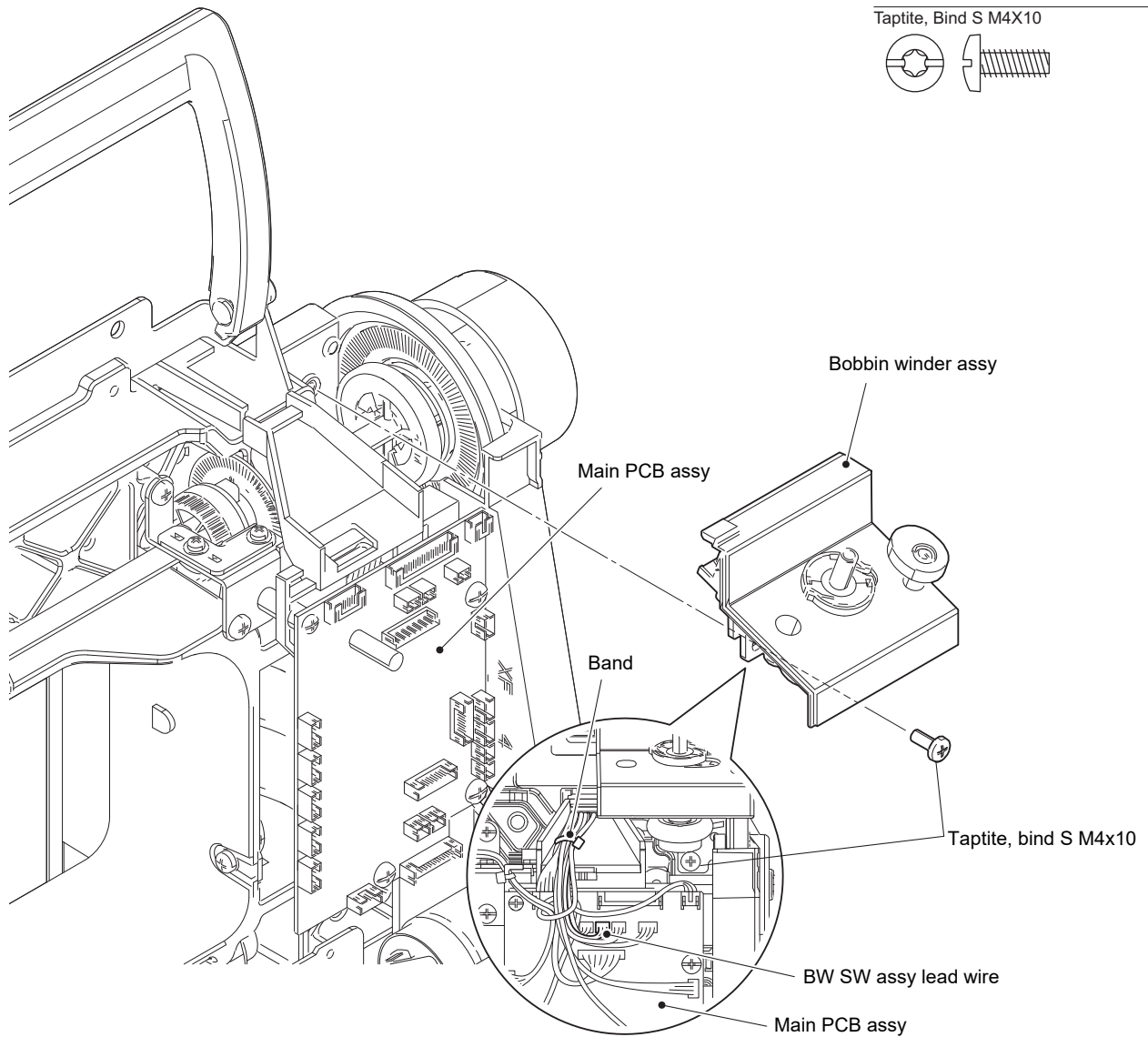
1. Release the two clips to unbind the lead wires.
2. Disconnect the needle plate B switch assy lead wire, and release it to unbind the lead wires.
3. Cut the two bands. Disconnect the lead wire assy main-emb from the main PCB assy.
4. Remove the two screws (screw, bind M4x6) to remove the connector holder assy.

→Refer to 3 - 14 "Disassembly of Connector holder assy".



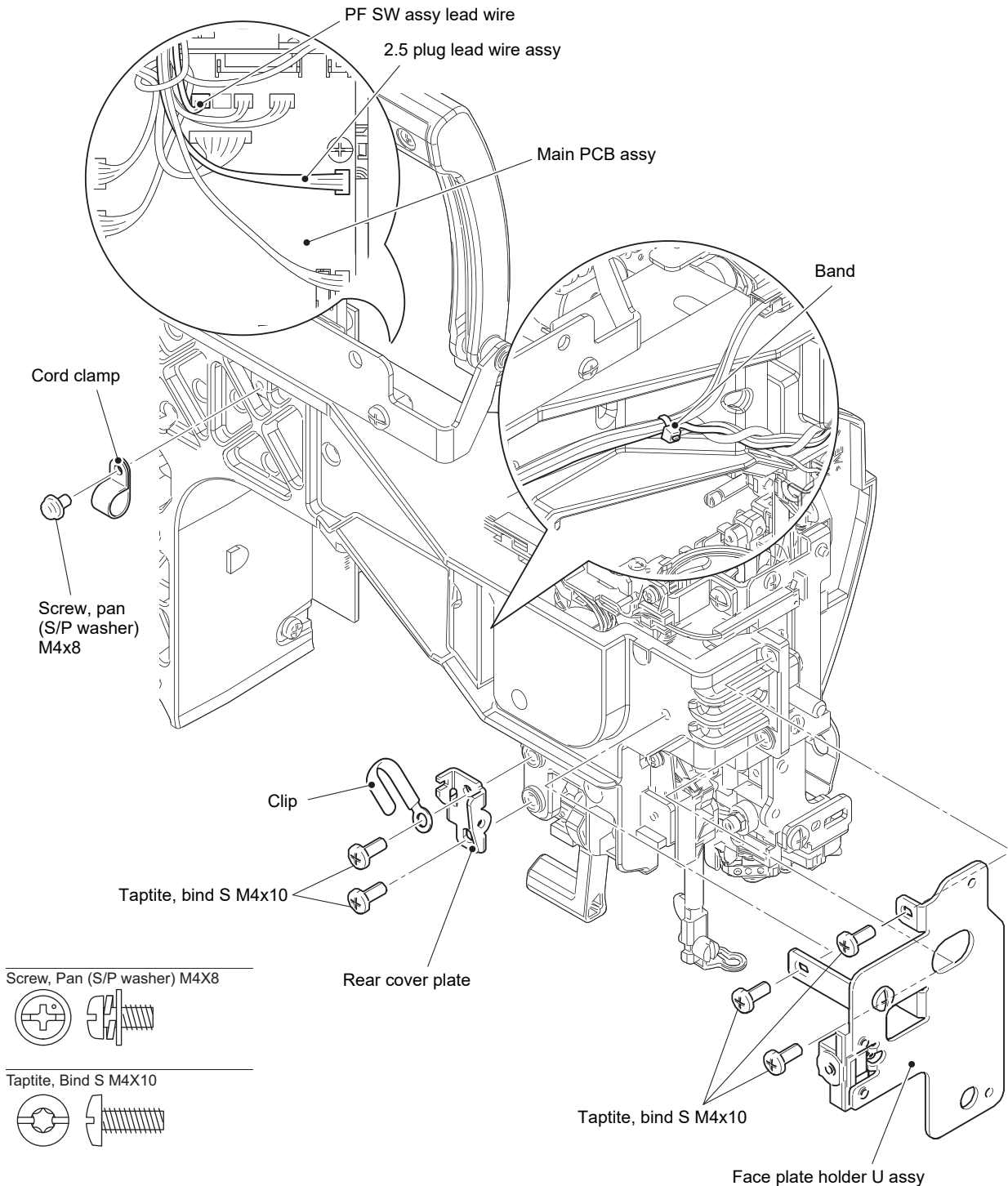
8 Removal of Bobbin winder assy

1. Cut the band. Disconnect the BW SW assy lead wire from the main PCB assy, and release it from the securing fixtures.
2. Remove the screw (taptite, bind S M4x10) to remove the bobbin winder assy.
→Refer to 3 - 20 "Removal of Bobbin base assy".



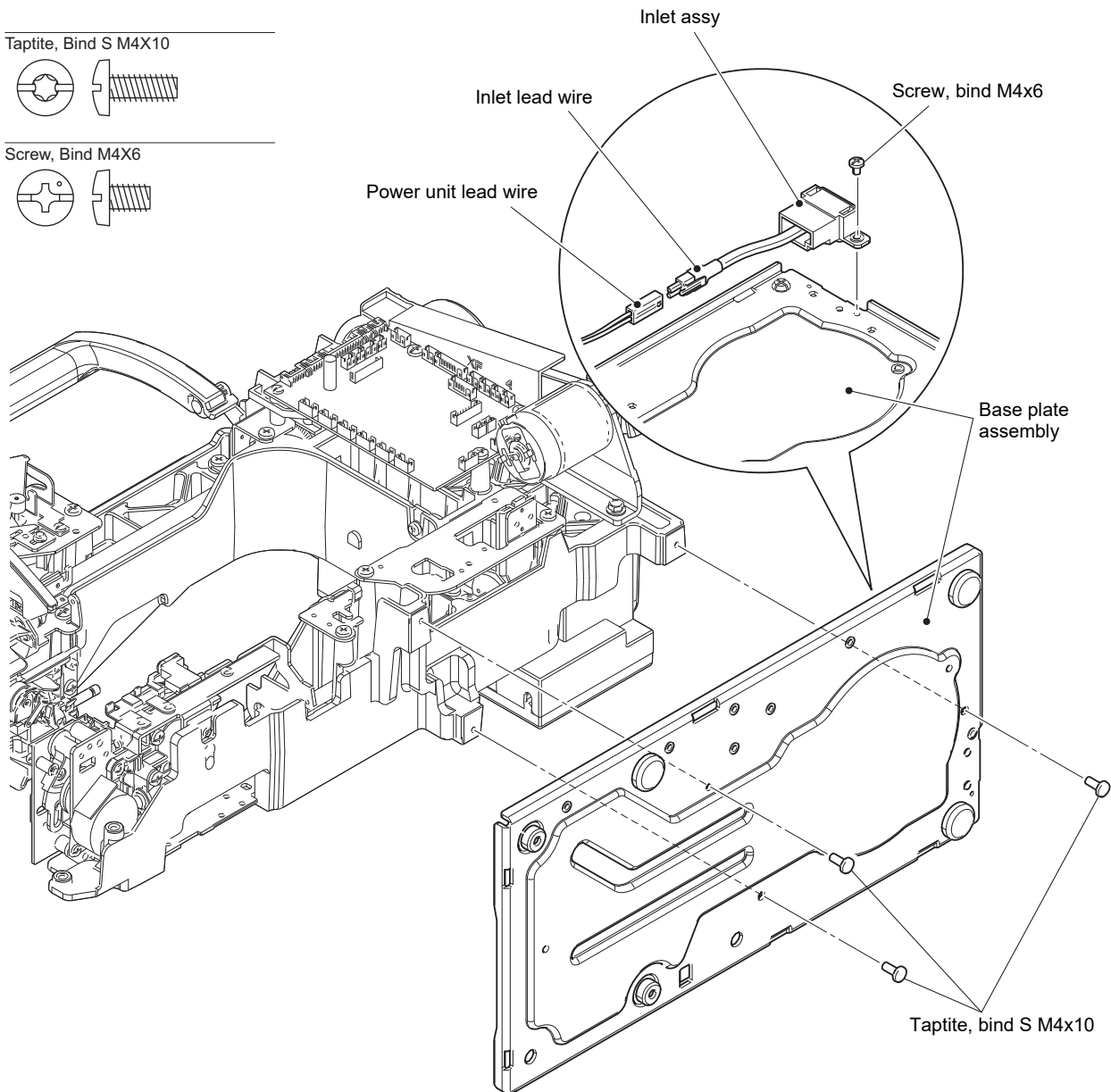
9 Removal of Rear cover plate and Face plate holder U assy

1. Disconnect the 2.5 plug lead wire assy and PF SW assy lead wire from the main PCB assy, and release them from the securing fixtures.
 2. Remove the screw (screw, pan (S/P washer) M4x8) to remove the cord clamp. Release the cord clamp to unbind the lead wires.
 3. Cut the band. Release the clip to unbind the lead wires.
 4. Remove the two screws (taptite, bind S M4x10) to remove the clip and rear cover plate.
 5. Remove the three screws (taptite, bind S M4x10) to remove the face plate holder U assy.
- Refer to 3 - 16 "Disassembly of Face plate holder U assy".



10 Removal of Base plate assembly

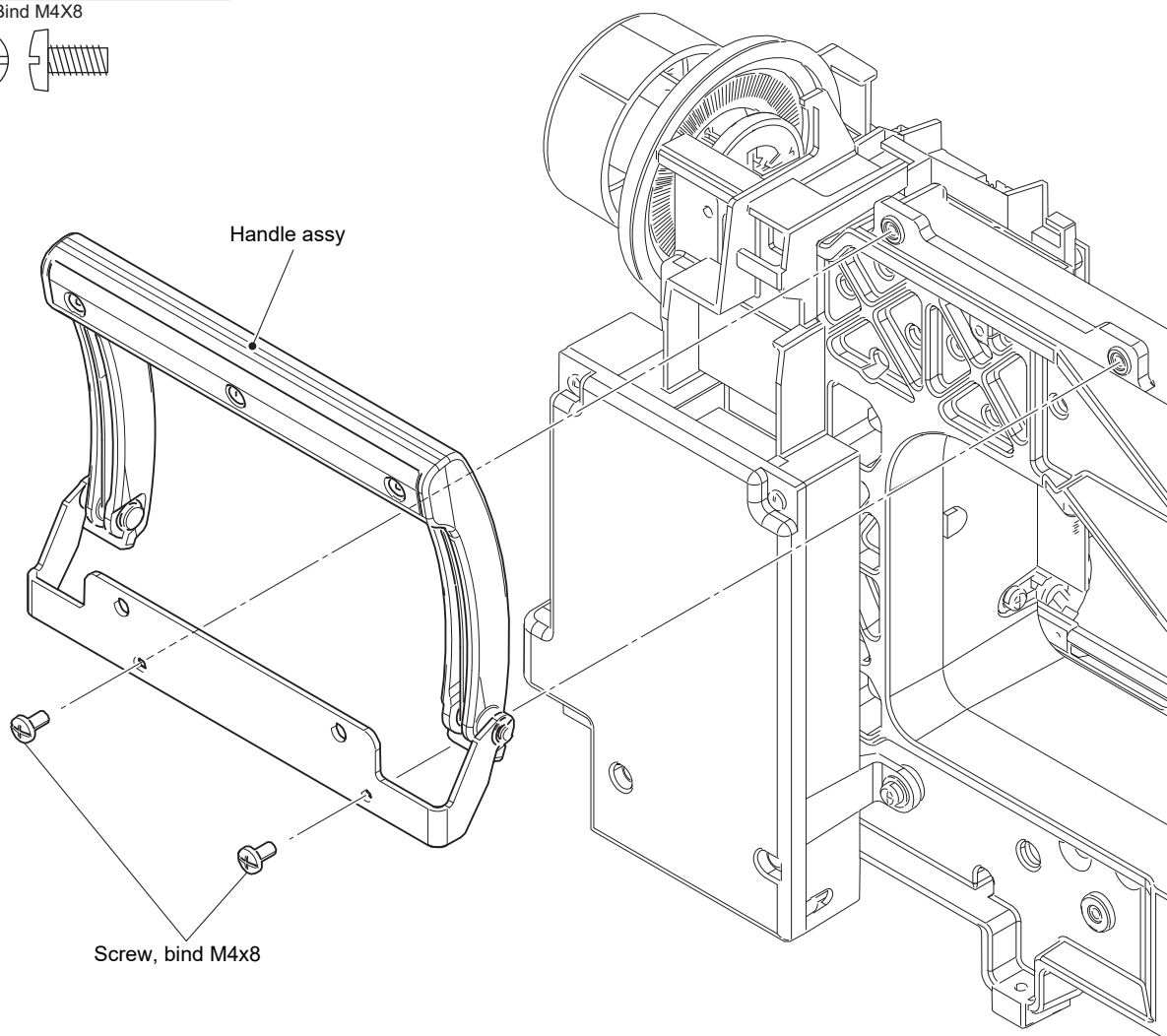
1. Unlock the lock to disconnect the inlet lead wire from the power unit lead wire.
→Refer to 3 - 18 "Disassembly of Base plate assembly".
2. Remove the three screws (taptite, bind S M4x10) to remove the base plate assembly.
3. Remove the screw (screw, bind M4x6) to remove the inlet assy from the base plate assembly.



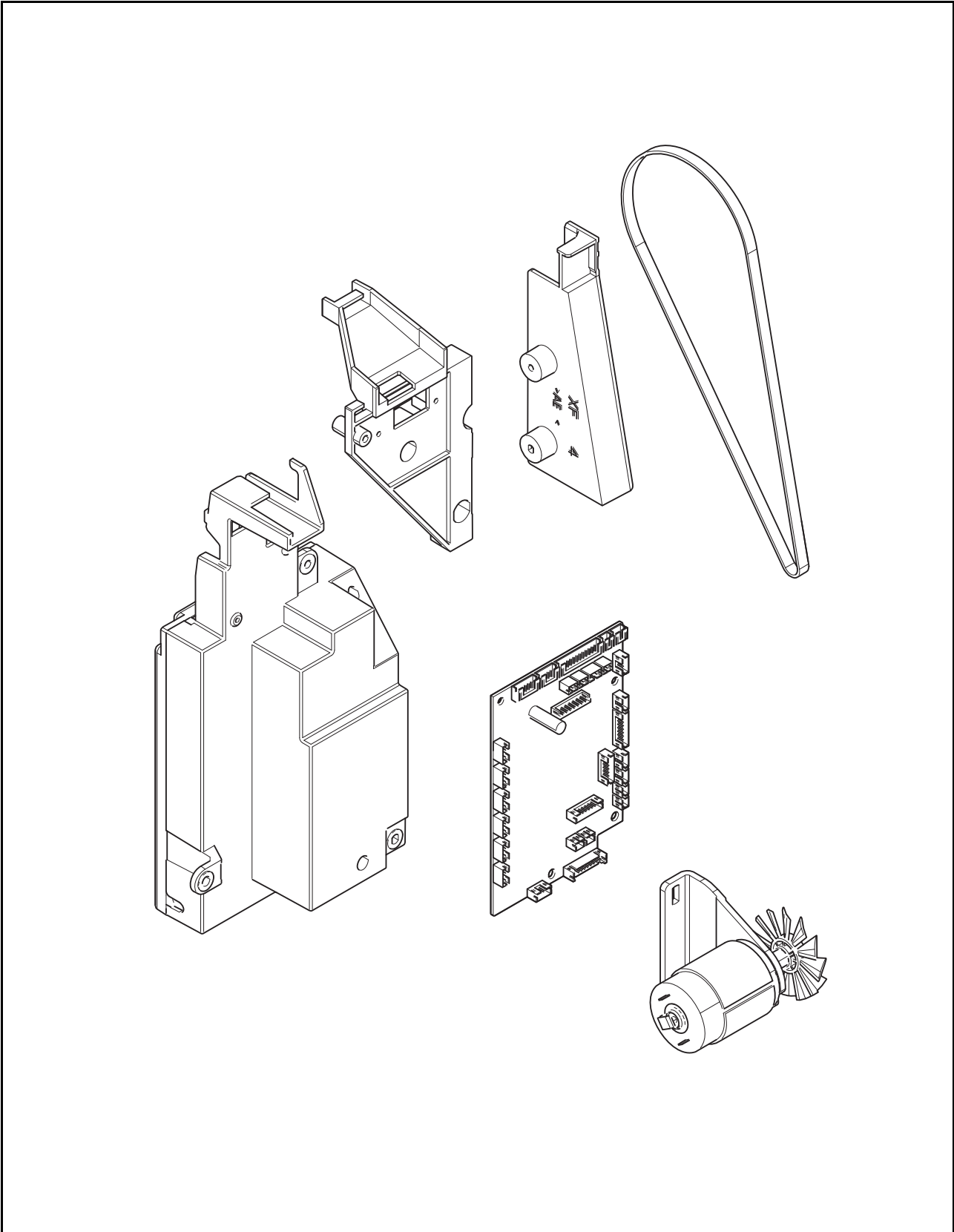
11 Removal of Handle assy

1. Remove the two screws (screw, bind M4x8) to remove the handle assy.

Screw, Bind M4X8



Electric parts and Main motor unit location diagram

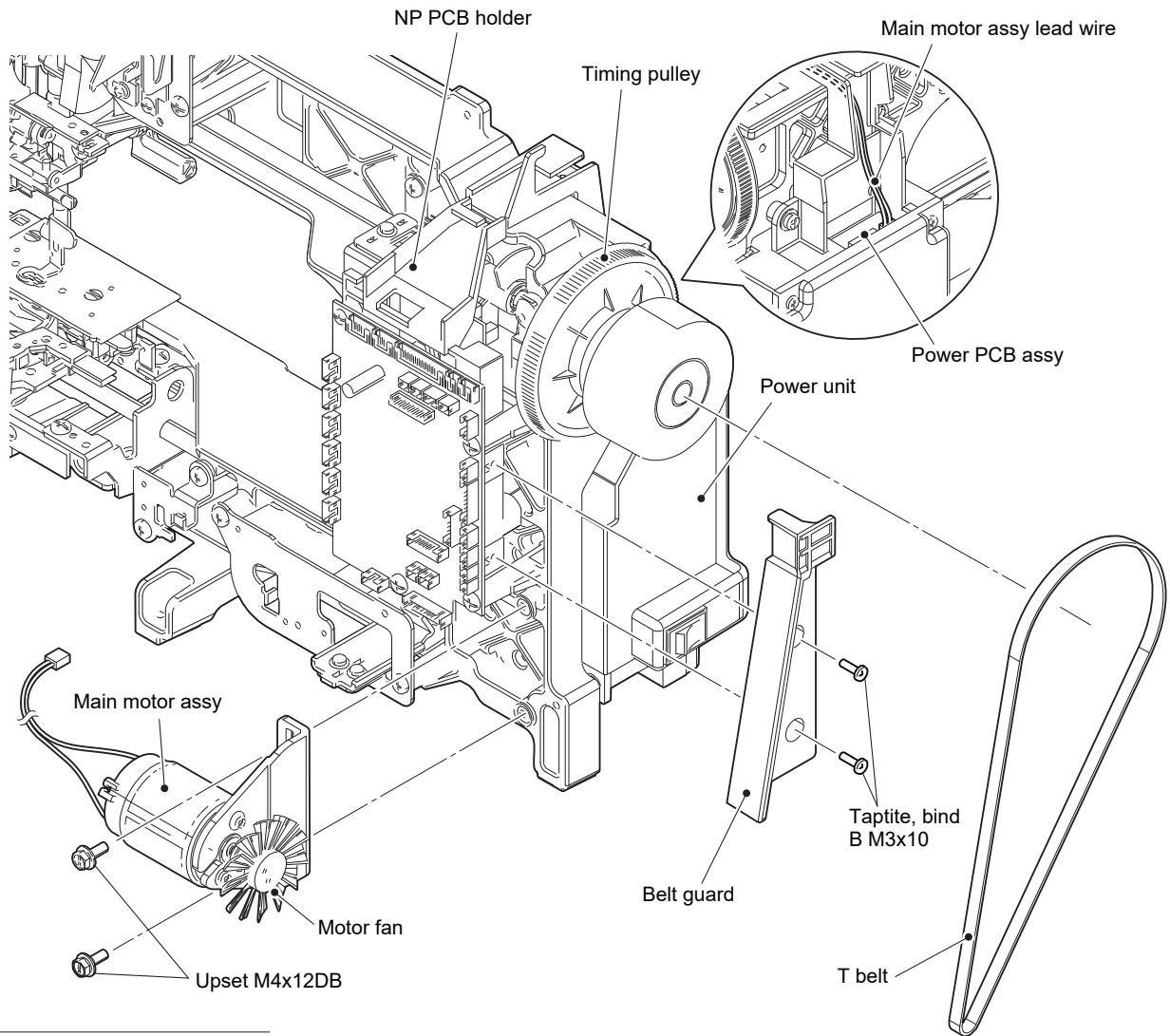


Basic of Disassembly

Basic of Disassembly

1 Removal of Main motor assy

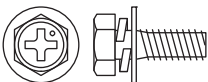
1. Remove the two screws (taptite, bind B M3x10) to remove the belt guard from the NP PCB holder.
 2. Remove the T belt from the timing pulley and the motor fan.
 3. Disconnect the main motor assy lead wire from the power PCB assy of power unit, and release it from the securing fixtures.
 4. Remove the two screws (upset M4x12DB) to remove the main motor assy.
- Refer to 3 - 26 "Removal of Main motor assy".



Taptite, Bind B M3X10

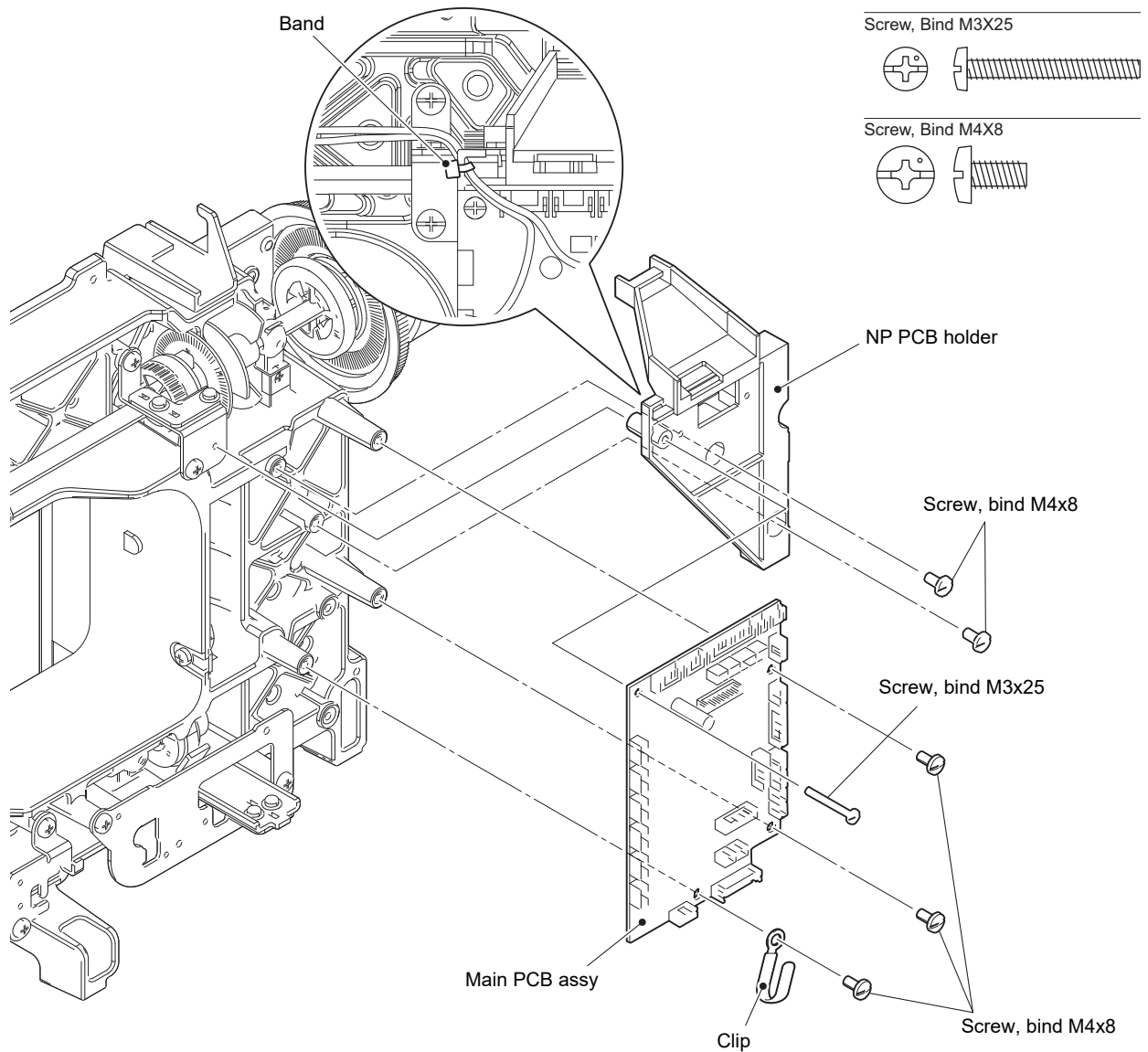


Upset M4X12DB



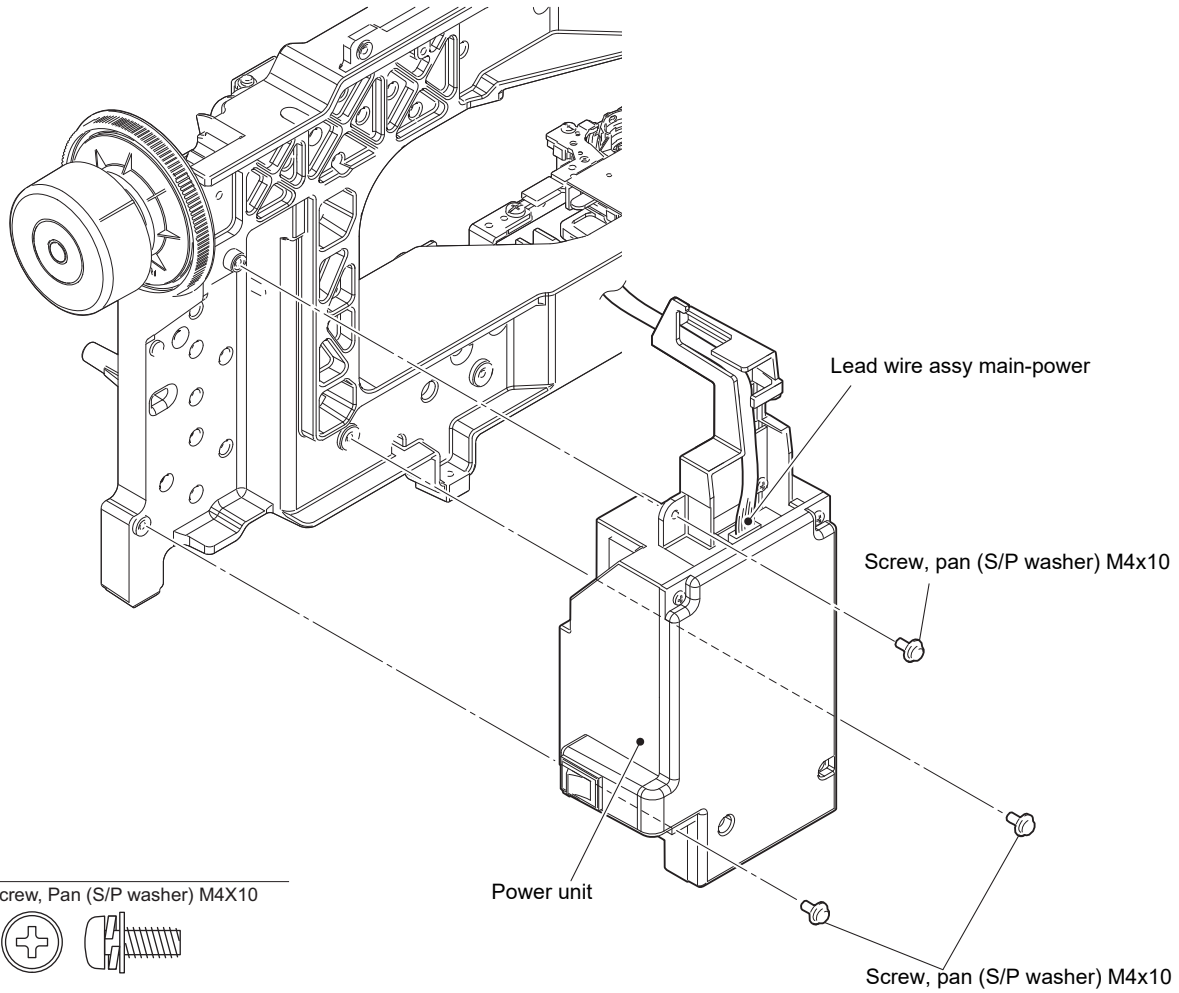
2 Removal of Main PCB assy

1. Disconnect all connectors connected to the main PCB assy.
 2. Remove the screw (screw, bind M3x25) and three screws (screw, bind M4x8) to remove the clip and the main PCB assy.
 3. Cut the band and release the lead wires from the securing fixtures of NP PCB holder.
 4. Remove the two screws (screw, bind M4x8) to remove the NP PCB holder.
- Refer to 3 - 25 "Removal of NP PCB assy".

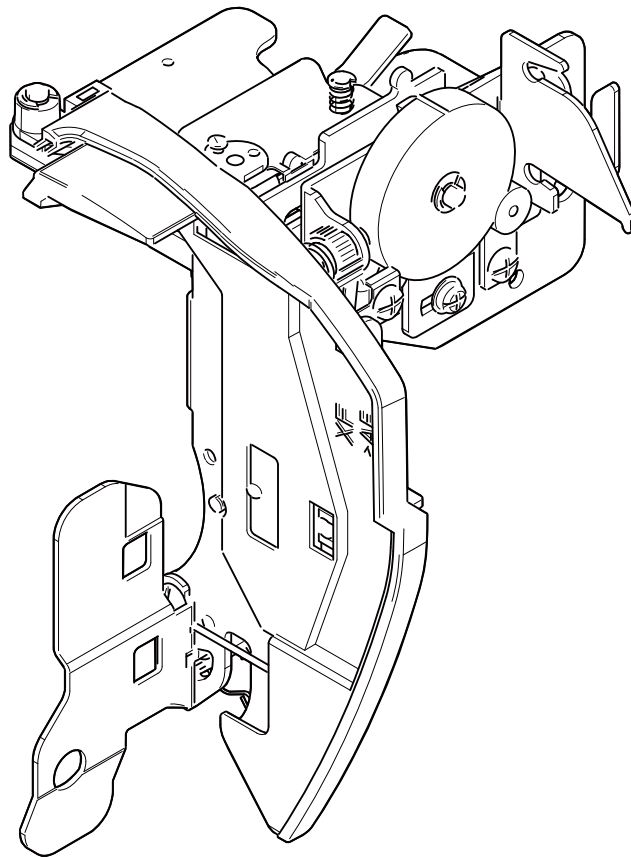


3 Removal of Power unit

1. Remove the three screws (screw, pan (S/P washer) M4x10) to remove the power unit.
2. Disconnect the lead wire assy main-power from the power unit, and release it from the securing fixtures.



Needle threading mechanism location diagram



Basic of
Disassembly

Basic of
Disassembly

1 Removal of Thread tension U assy

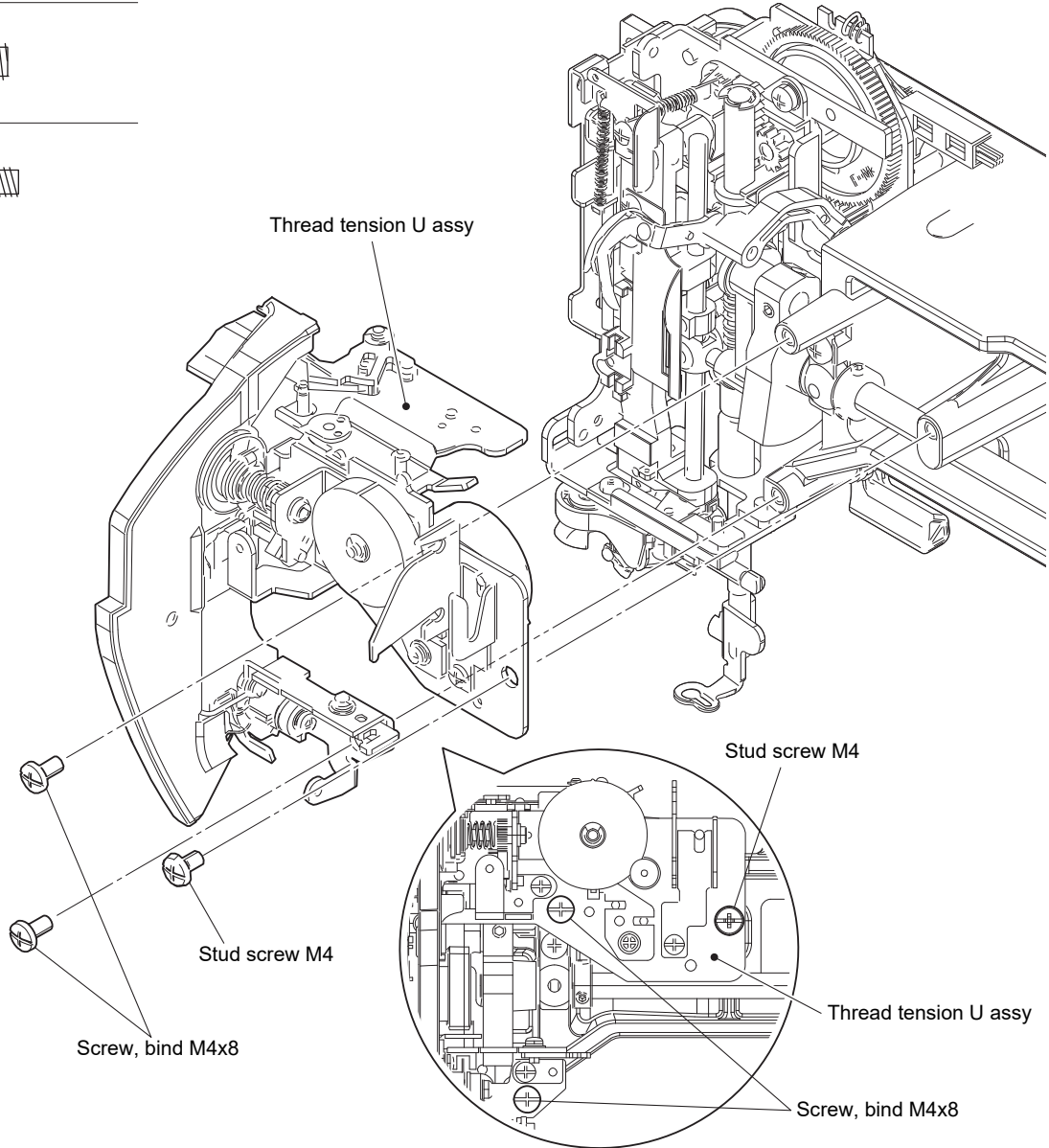
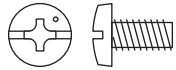
1. Remove the screw (stud screw M4) and two screws (screw, bind M4x8) to remove the thread tension U assy.

→Refer to 3 - 28 "Removal of Thread guard cover".

Stud screw M4



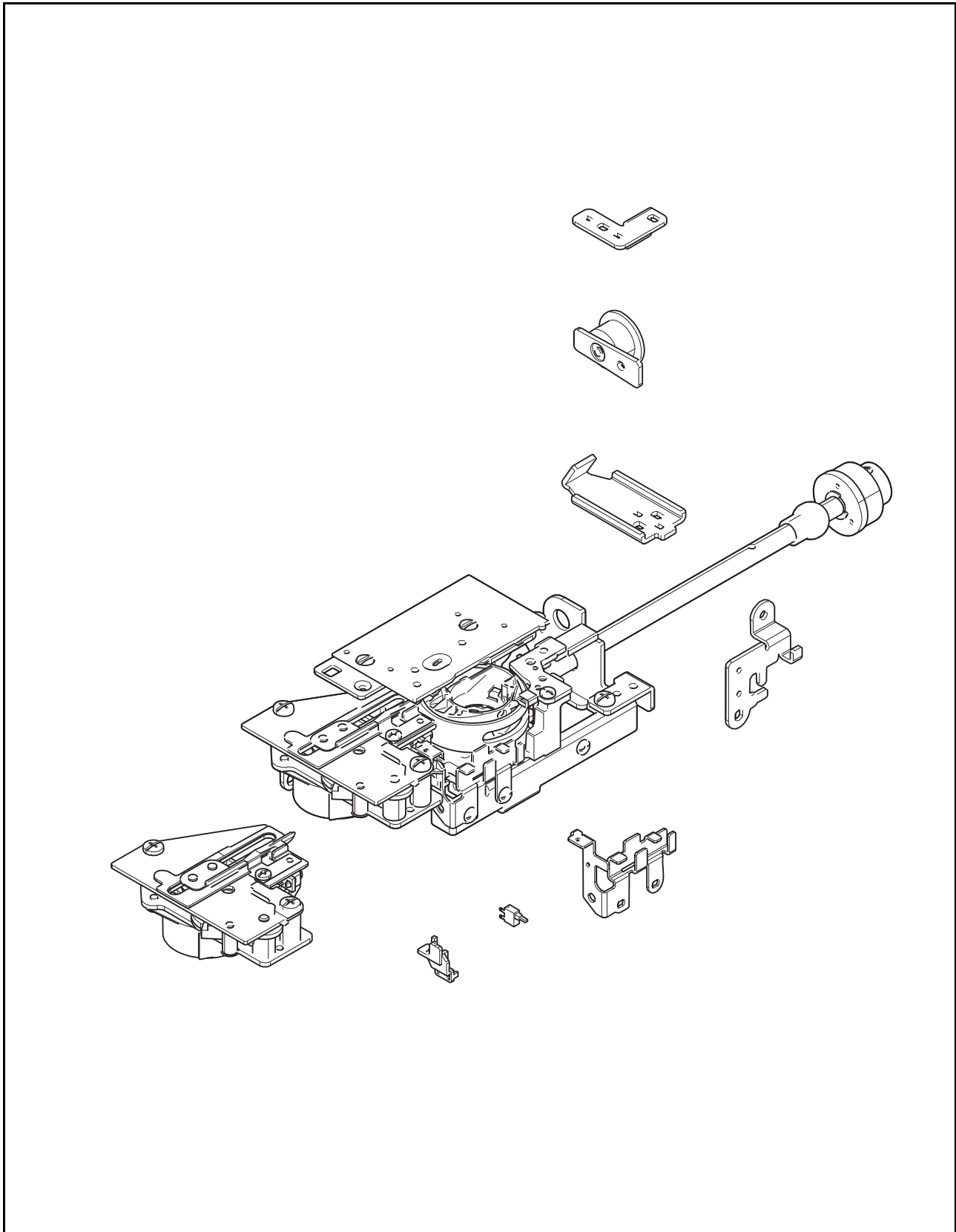
Screw, Bind M4X8



Basic of Disassembly

Basic of Disassembly

Lower driving mechanism location diagram

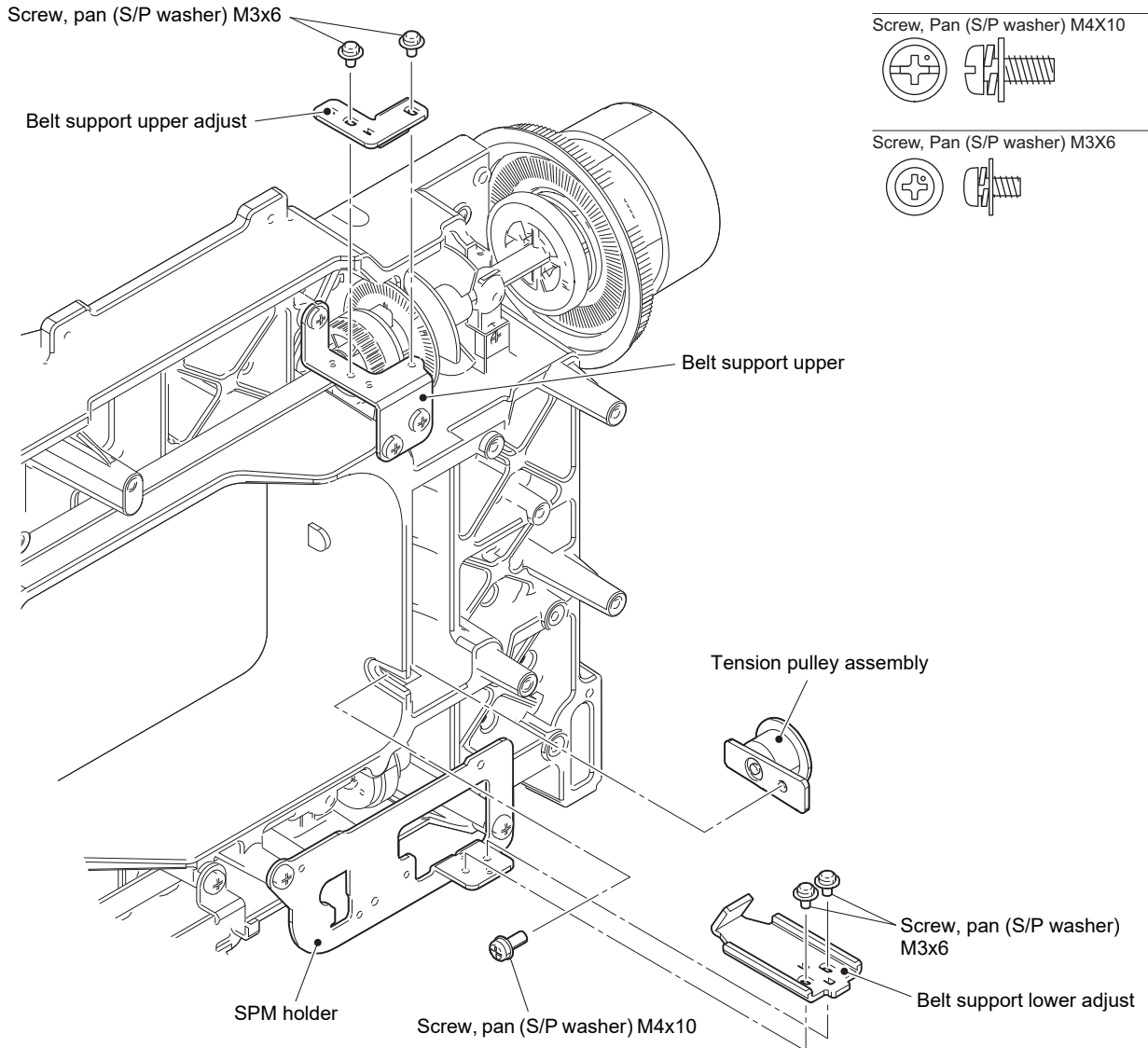


Basic of Disassembly

Basic of Disassembly

1 Removal of Tension pulley assembly and Belt supports

1. Remove the screw (screw, pan (S/P washer) M4x10) to remove the tension pulley assembly.
2. Remove the two screws (screw, pan (S/P washer) M3x6) to remove the belt support upper adjust from the belt support upper.
3. Remove the two screws (screw, pan (S/P washer) M3x6) to remove the belt support lower adjust from the SPM holder.



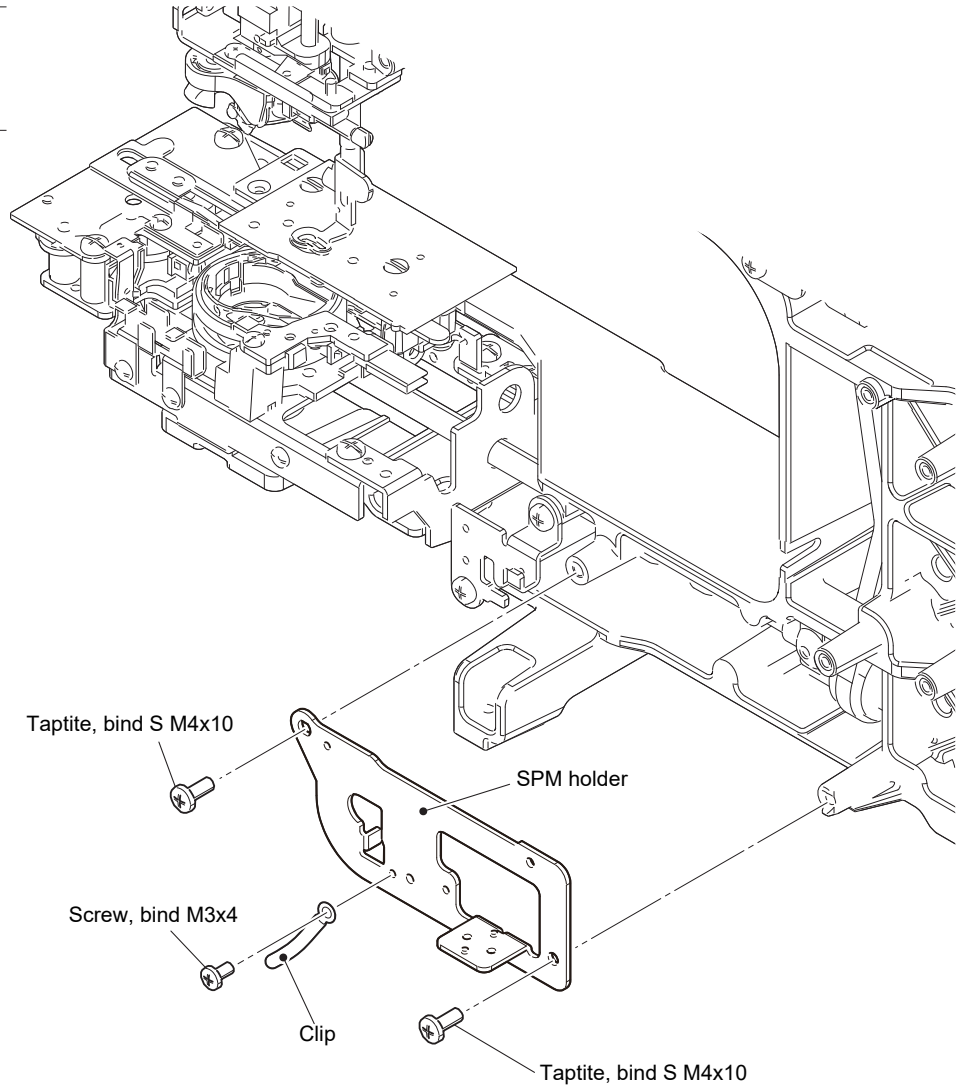
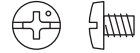
2 Removal of SPM holder

1. Remove the two screws (taptite, bind S M4x10) to remove the SPM holder.
2. Remove the screw (screw, bind M3x4) to remove the clip from the SPM holder.

Taptite, Bind S M4X10



Screw, Bind M3X4

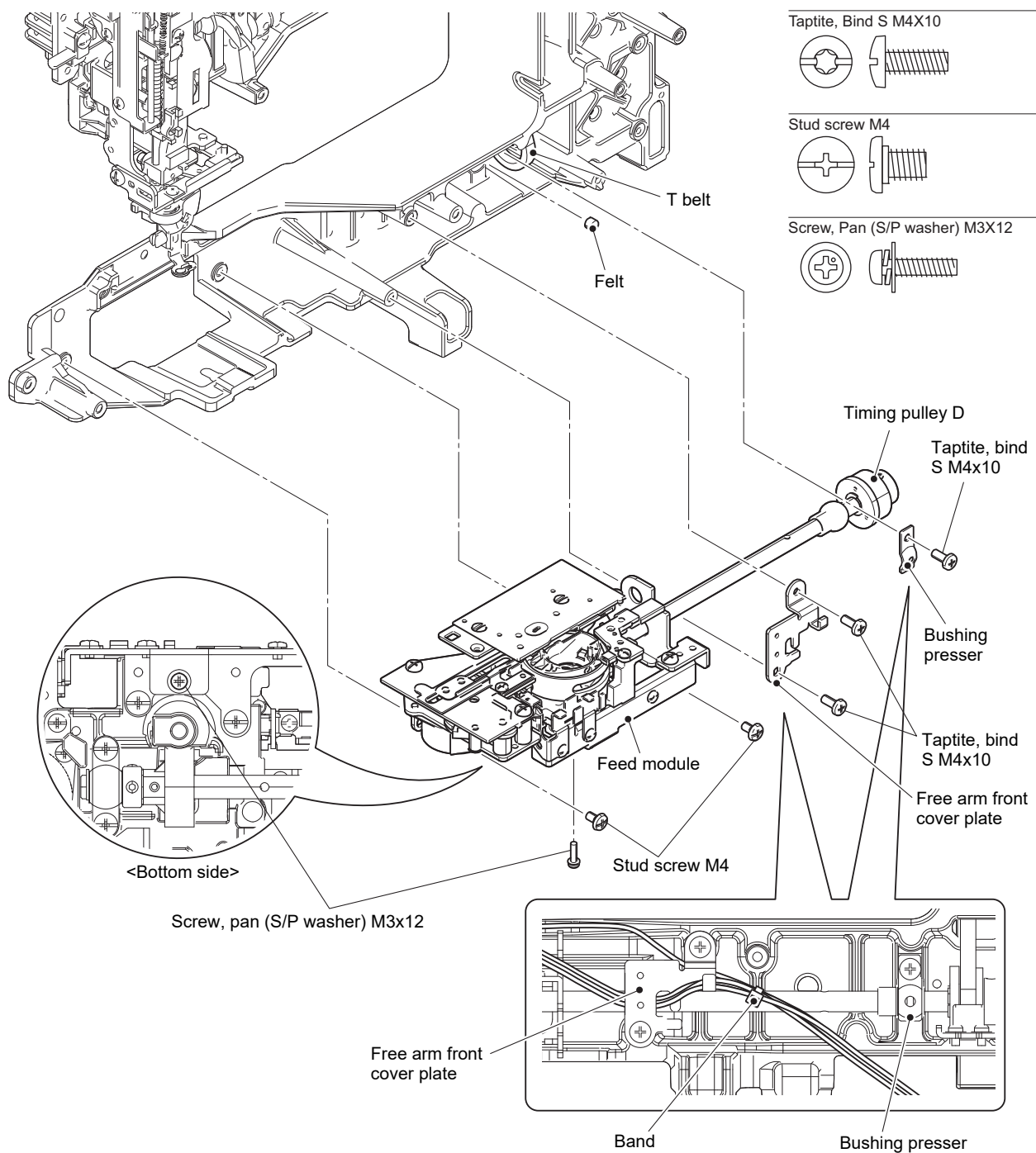


3 Removal of Feed module

1. Cut the band to release the lead wires from the securing fixtures of free arm front cover plate.
2. Remove the two screws (taptite, bind S M4x10) to remove the free arm front cover plate.
3. Remove the screw (taptite, bind S M4x10) to remove the bushing presser.
4. Remove the two screws (stud screw M4) and screw (screw, pan (S/P washer) M3x12) from the feed module. Remove the feed module, and release the T belt from the timing pulley D.

→Refer to 3 - 39 "Feed module".

5. Remove the felt.



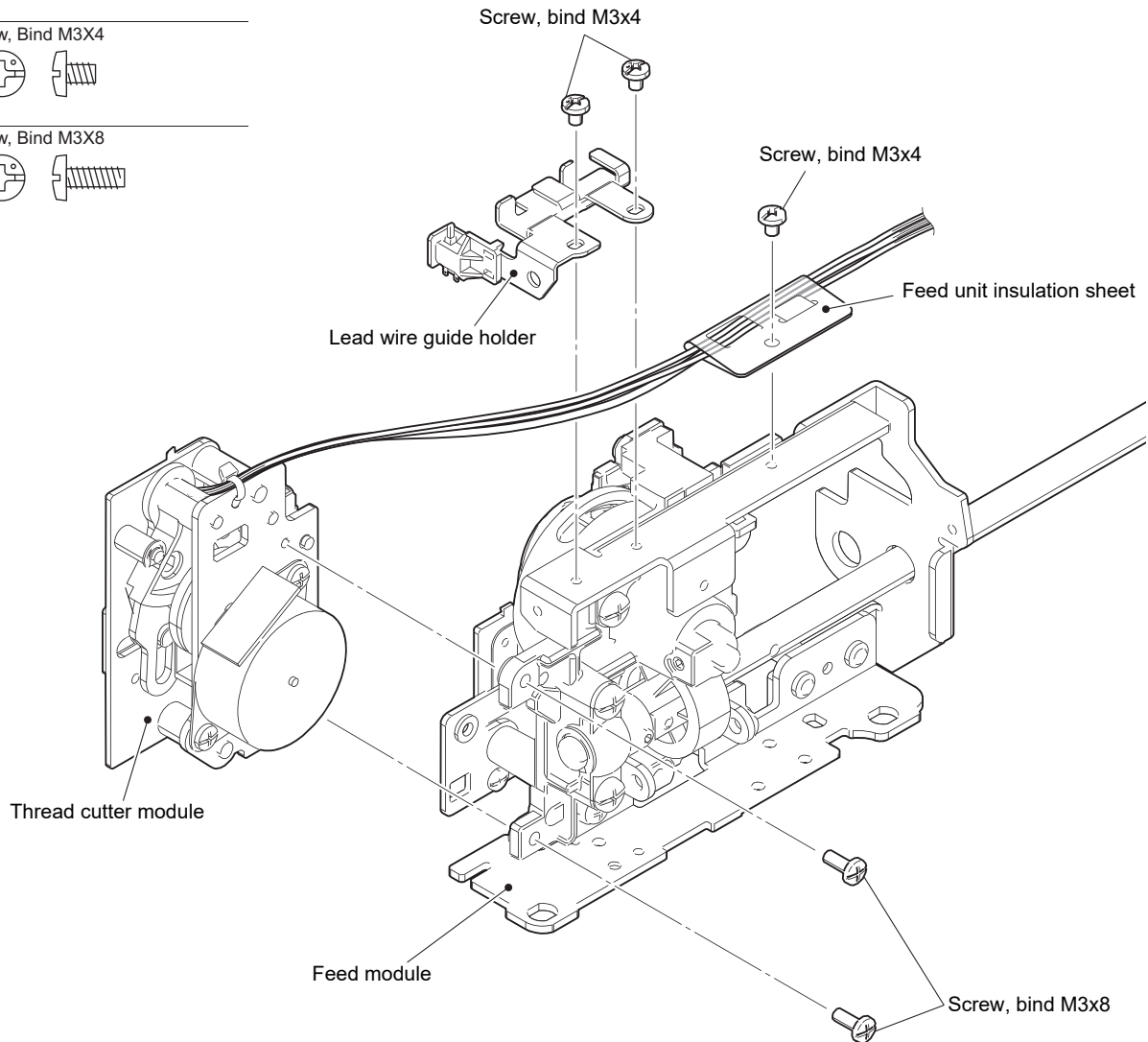
4 Removal of Thread cutter module

1. Remove the screw (screw, bind M3x4) to remove the feed unit insulation sheet. Release the lead wires from the feed unit insulation sheet, and release it from the securing fixtures.
2. Remove the two screws (screw, bind M3x8) to remove the thread cutter module from the feed module.
→Refer to 3 - 46 "Thread cutter module".
3. Remove the two screws (screw, bind M3x4) to remove the lead wire guide holder from the feed module.

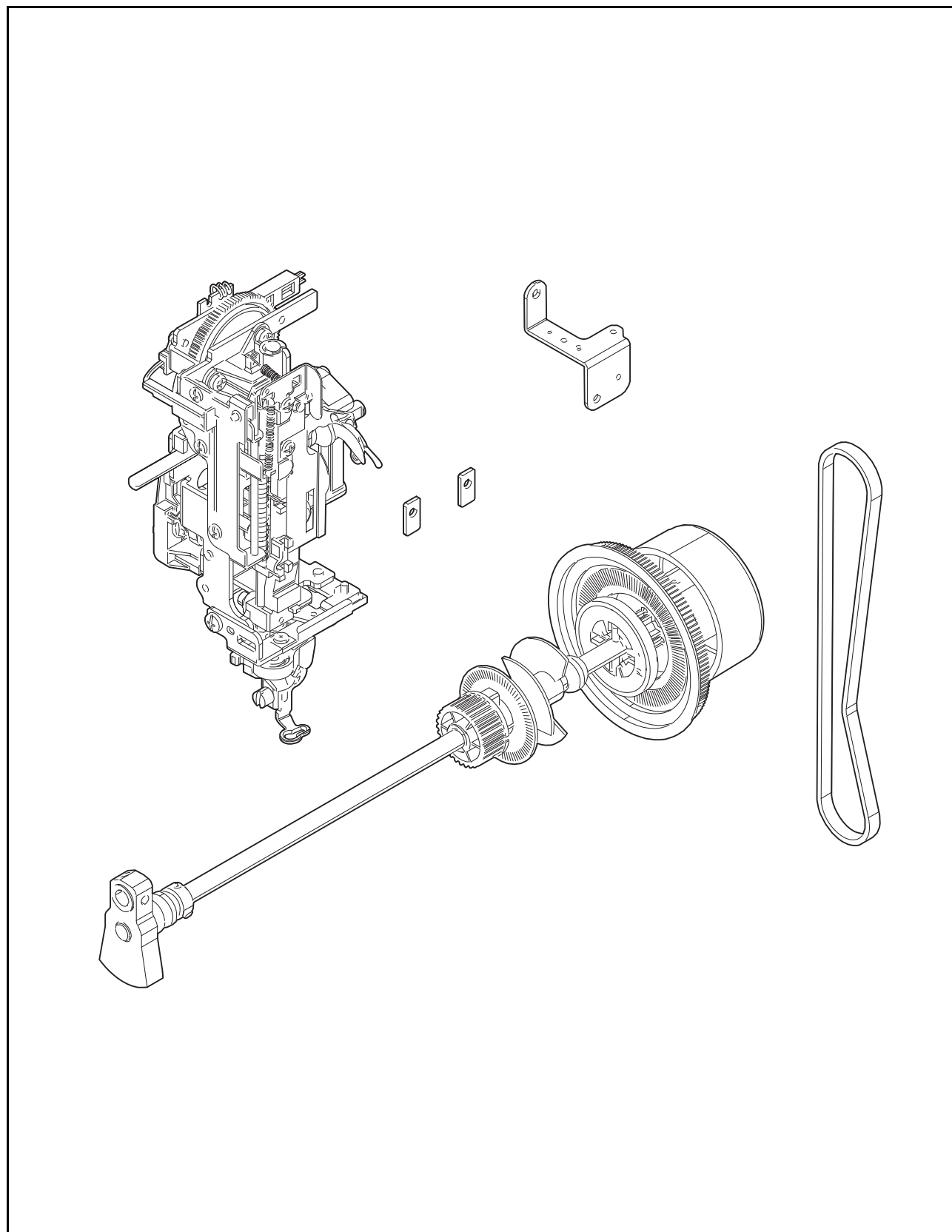
Screw, Bind M3X4



Screw, Bind M3X8



Upper driving mechanism location diagram

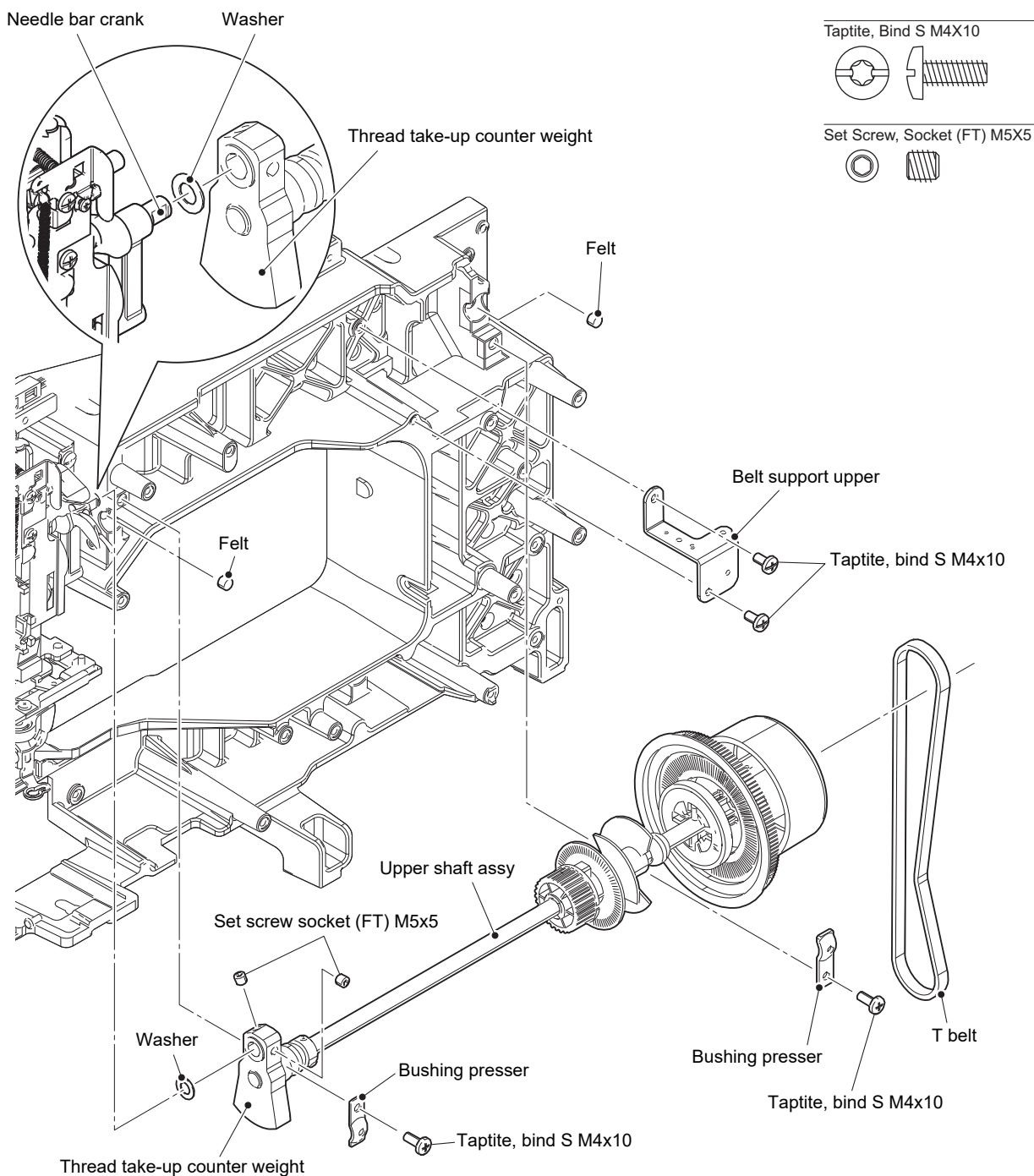


Basic of Disassembly

Basic of Disassembly

1 Removal of Upper shaft assy

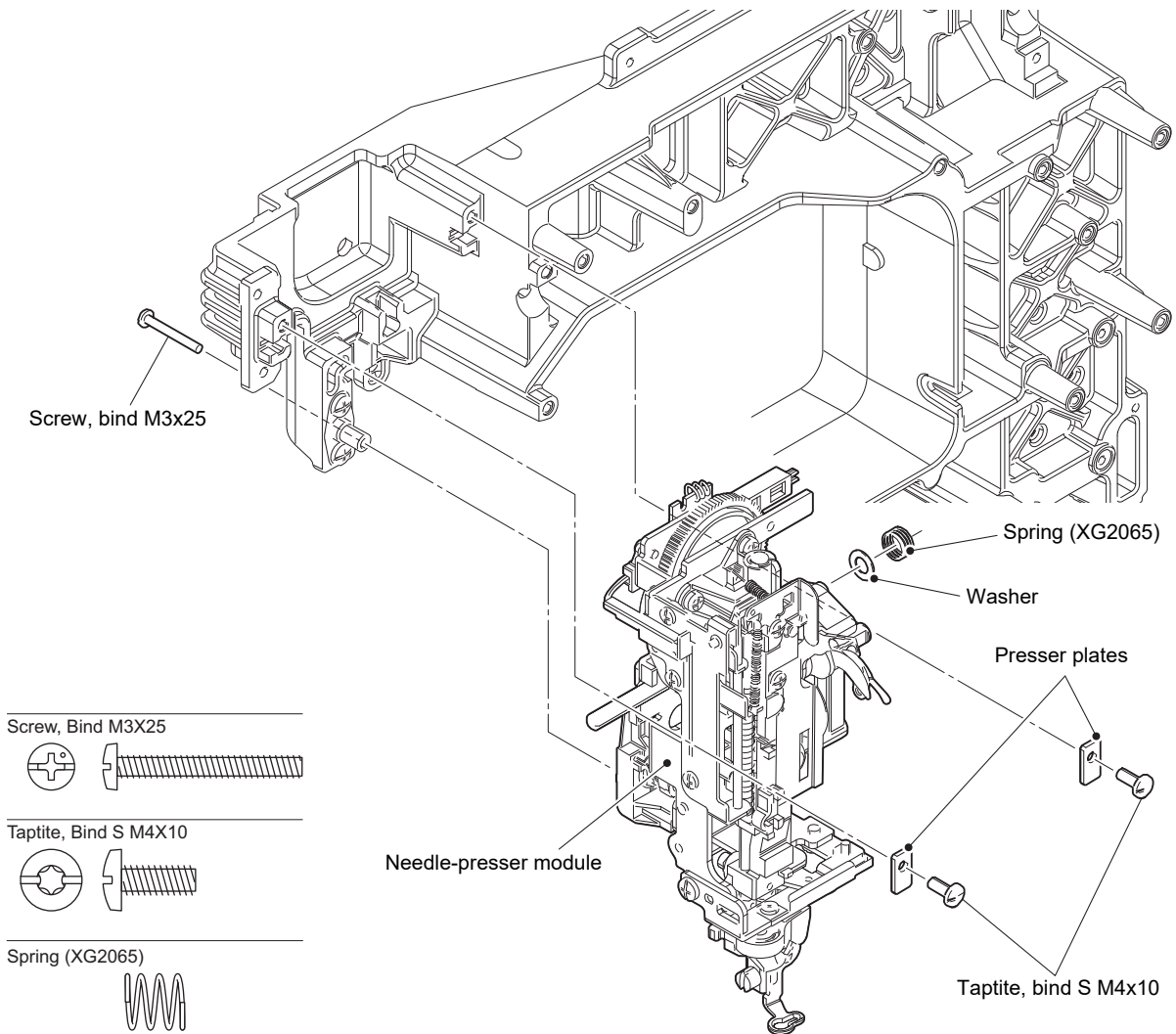
1. Remove the two screws (taptite, bind S M4x10) to remove the belt support upper.
2. Remove the two screws (taptite, bind S M4x10) to remove the two bushing pressers.
3. Remove the two screws (set screw, socket (FT) M5x5) from the thread take-up counter weight. Lift the upper shaft assy, and pull out the thread take-up counter weight from the needle bar crank to remove the upper shaft assy and washer.
4. Remove the T belt from the upper shaft assy.
5. Remove the two felts.



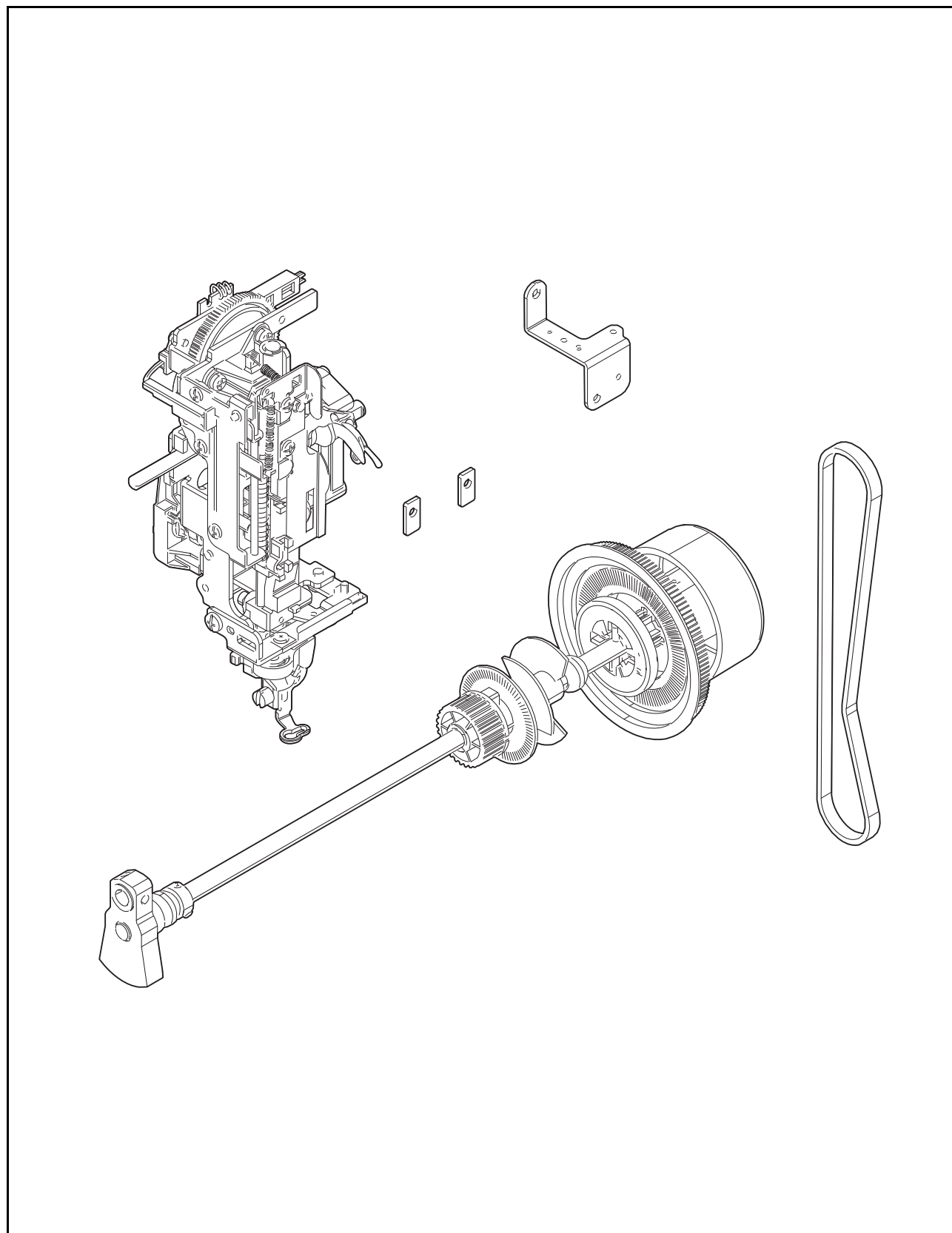
2 Removal of Needle-presser module

1. Remove the screw (screw, bind M3x25).
2. Remove the two screws (taptite, bind S M4x10) to remove the two presser plates.
3. Remove the needle-presser module. Remove the spring (XG2065) and the washer from the needle-presser module.

→Refer to 3 - 50 "Needle-presser module".



Upper driving mechanism location diagram

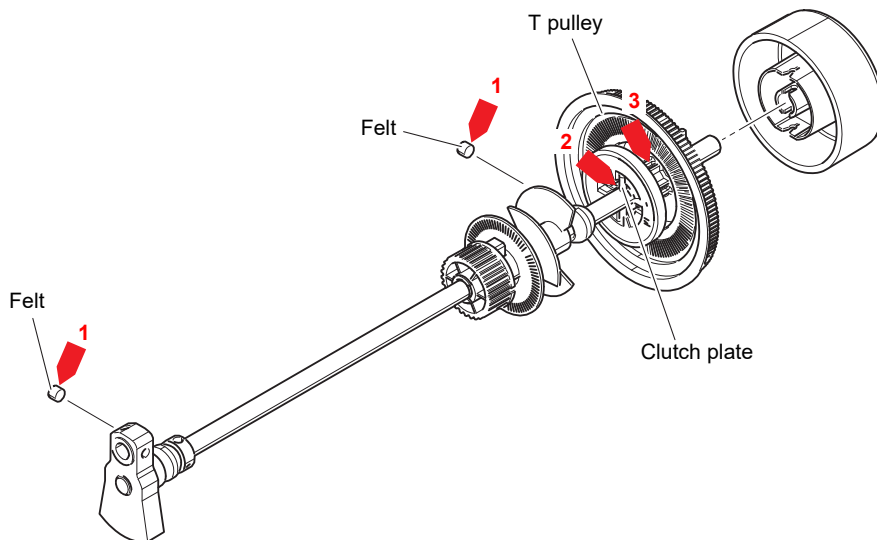


Basic of Assembly

Basic of Assembly

1 Lubrication

Lubrication point			Lubricating oil type	Quantity of lubrication
1	Felt	2 places	FBK OIL RO 100	1 - 2 drops
2	Clutch plate	1 place	MOLYKOTE EM30L	Small bead
3	T pulley	1 place	MOLYKOTE EM30L	Small bead



Basic of Assembly

Basic of Assembly

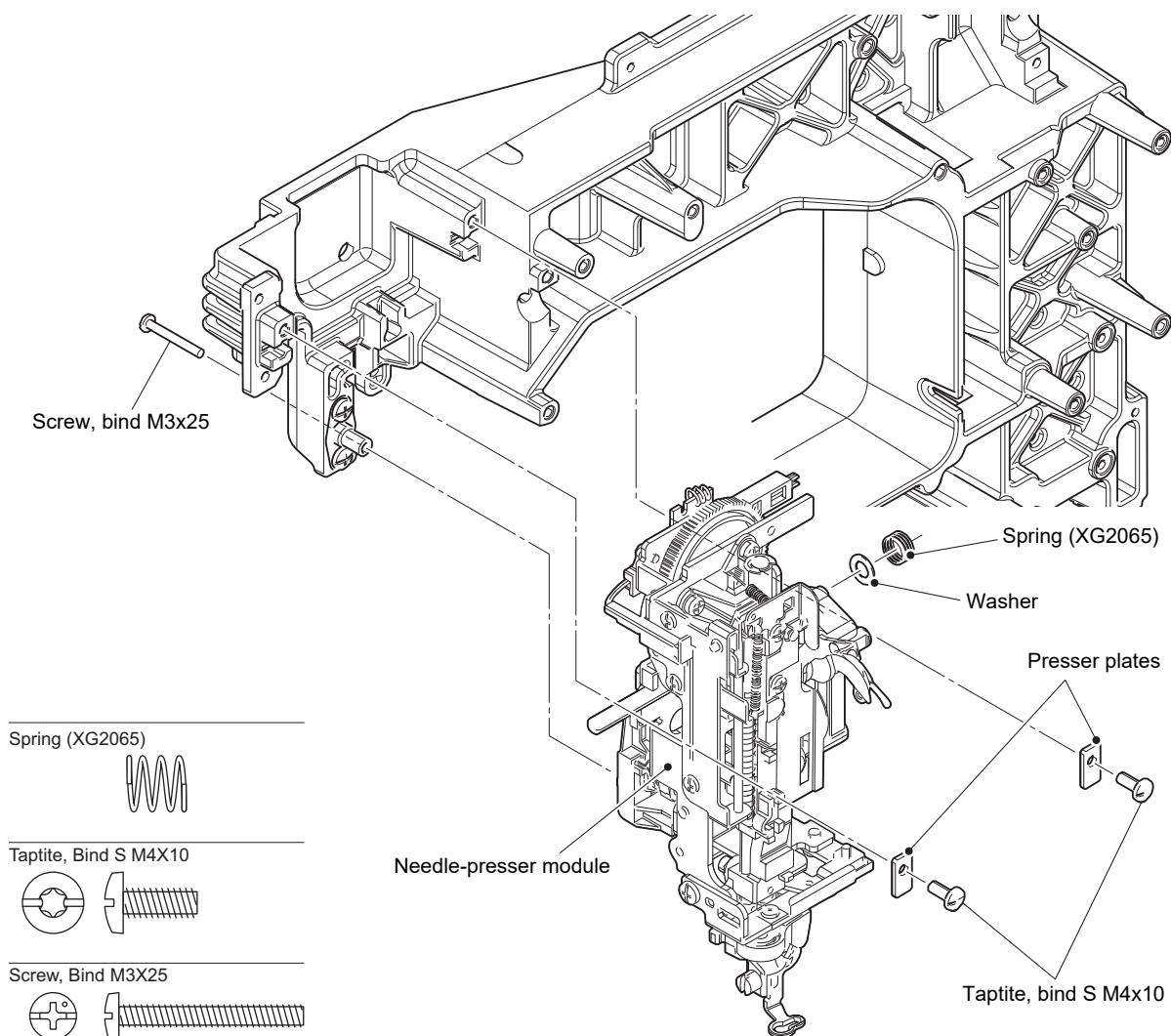
2 Attachment of Needle-presser module

1. Set the washer and the spring (XG2065) to the needle-presser module.
2. Set the needle-presser module to the mounting position of arm bed. Attach the two presser plates to the arm bed with the two screws (taptite, bind S M4x10).
3. Tighten the screw (screw, bind M3x25) temporarily to the needle-presser module.

*Key point

- Fully tighten the screw after performing "Adjustment of Needle clearance".

→Refer to 3 - 124 "Needle-presser module".



3 Attachment of Upper shaft assy

1. Set the two felts to the two mounting positions of arm bed.
2. Set the washer to the shaft of needle bar crank.
3. Hang the T belt on the upper shaft assy. Pass the T belt through the hole of arm bed. Insert the shaft of needle bar crank into the hole of thread take-up counter weight, and set the two upper shaft metals to the two mounting positions of arm bed. Attach the two bushing pressers with the two screws (taptite, bind S M4x10).

***Key point**

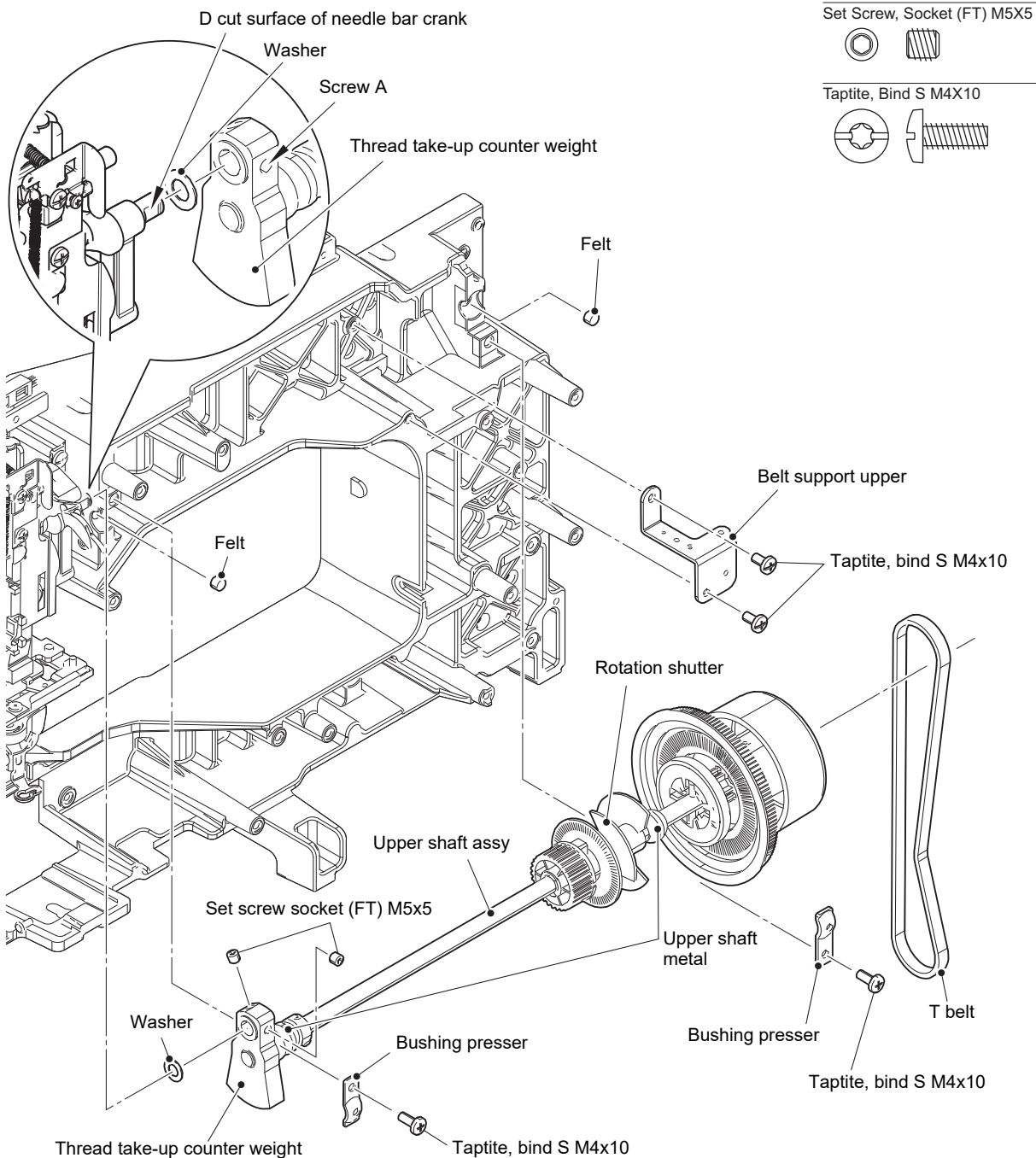
- Be careful not to damage the rotation shutter of the upper shaft assy.

4. Tighten the screw (set screw socket (FT) M5x5) A and B.

***Key point**

- Check that the screw A with the D cut surface of the needle bar crank.

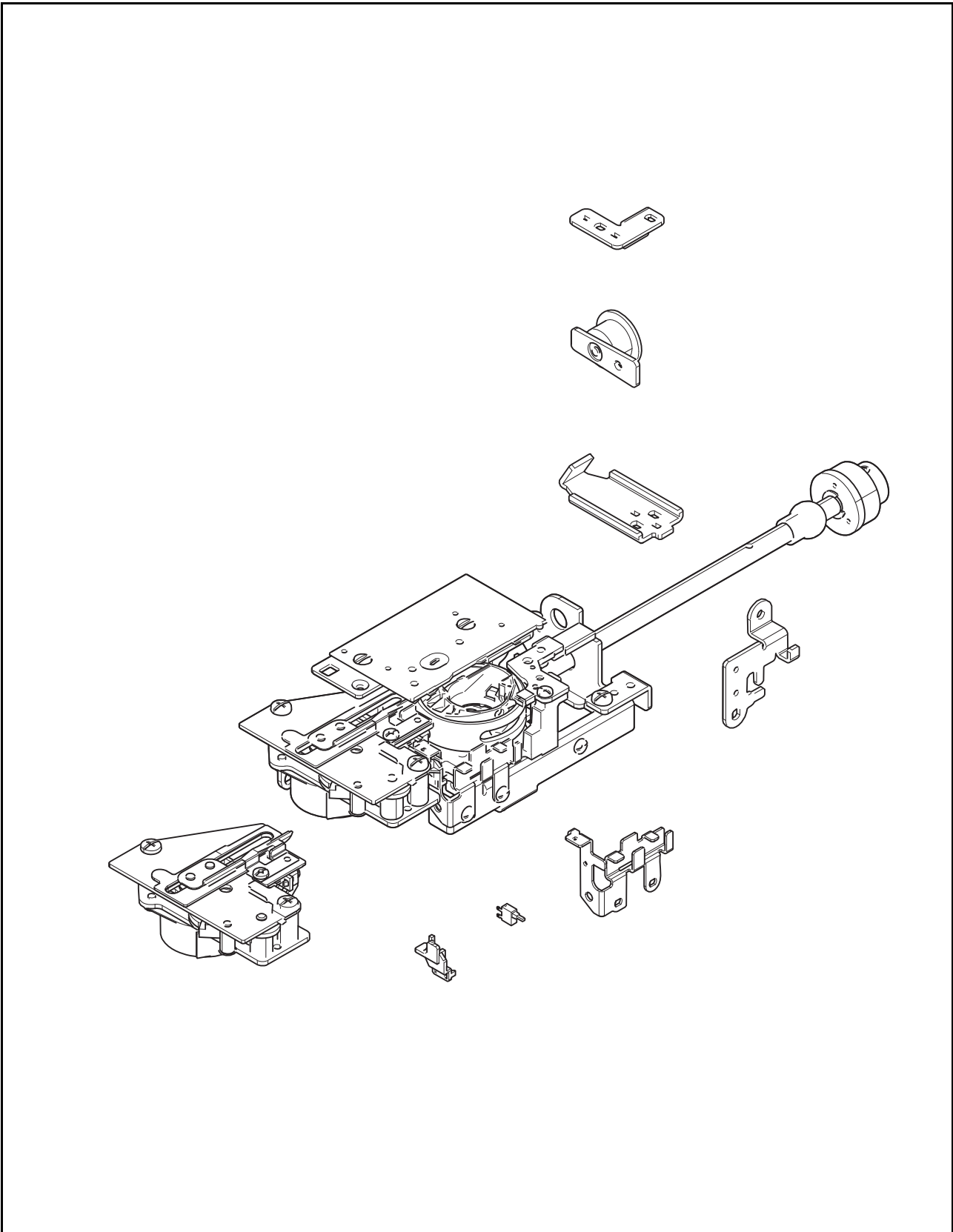
5. Attach the belt support upper with the two screws (taptite, bind S M4x10).



Basic of Assembly

Basic of Assembly

Lower driving mechanism location diagram

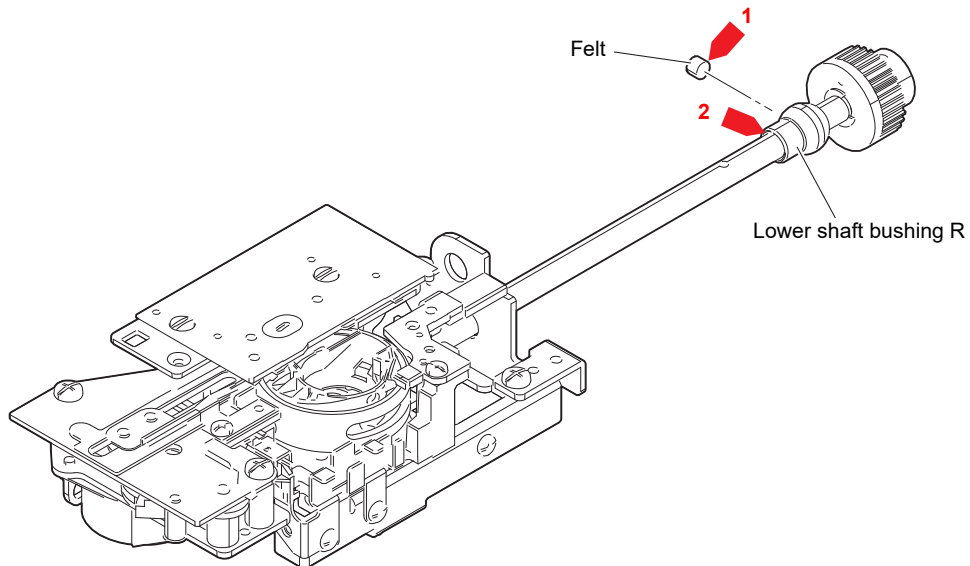


Basic of Assembly

Basic of Assembly

1 Lubrication

Lubrication point			Lubricating oil type	Quantity of lubrication
1	Felt	1 place	FBK OIL RO 100	1 - 2 drops
2	Lower shaft bushing R	1 place	FBK OIL RO 100	1 - 2 drops

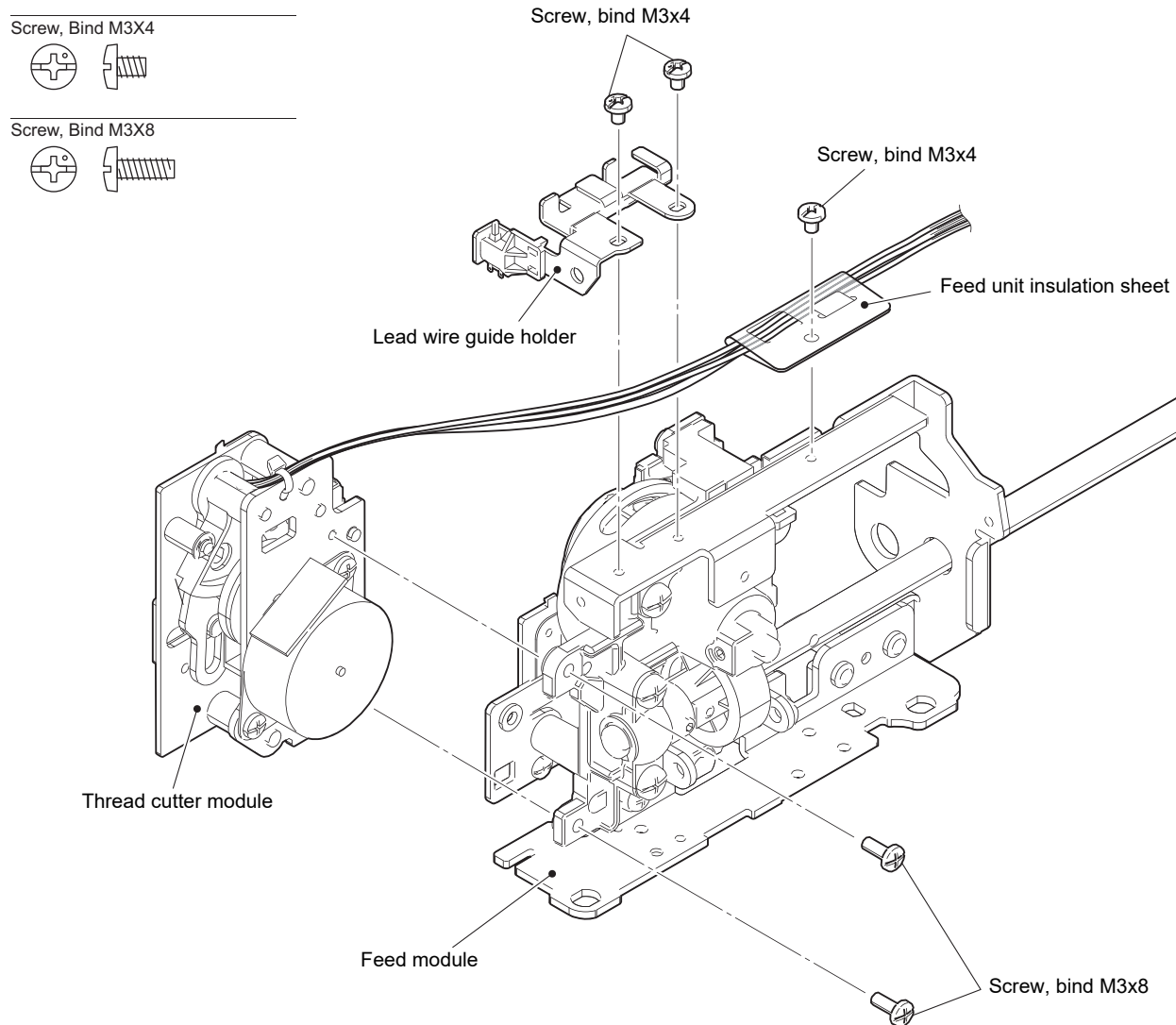


2 Attachment of Thread cutter module

1. Attach the lead wire guide holder with the two screws (screw, bind M3x4).
2. Align the boss of thread cutter module with the positioning hole of feed module, and attach the thread cutter module to the feed module with the two screws (screw, bind M3x8).

→Refer to 3 - 144 "Thread cutter module".

3. Pass the lead wires through the securing fixtures of lead wire guide holder. Set the lead wires to the feed unit insulation sheet, and attach the feed unit insulation sheet to the feed module with the screw (screw, bind M3x4).



3 Attachment of Feed module

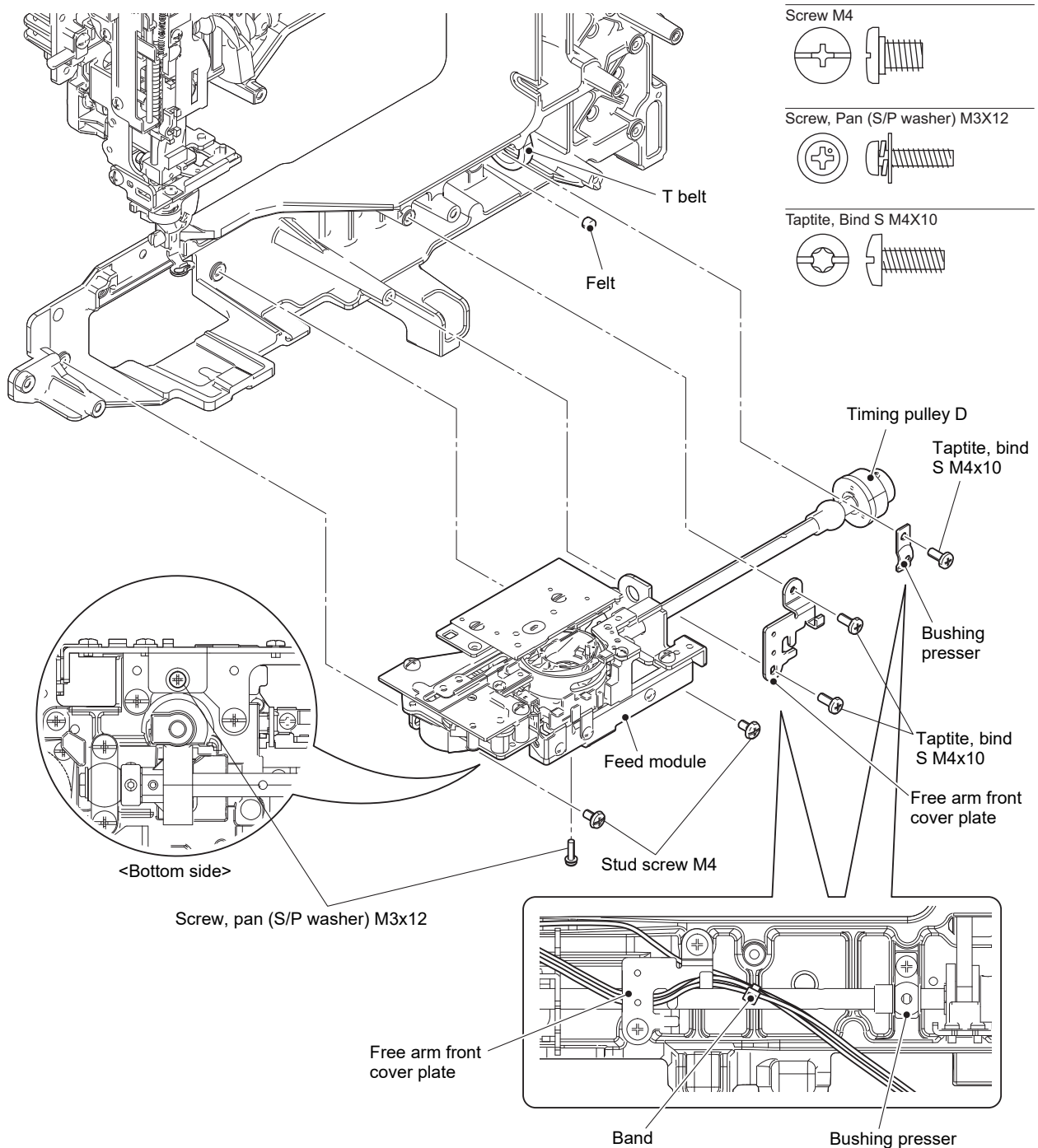
1. Set the felt.
2. Hang the T belt on the timing pulley D. Set the feed module to the mounting position, and secure it with the two screws (stud screw M4) and screw (screw, pan (S/P washer) M3x12).

→Refer to 3 - 149 "Feed module".

3. Attach the bushing presser with the screw (taptite, bind S M4x10).
4. Attach the free arm front cover plate with the two screws (taptite, bind S M4x10).
5. Pass the lead wires through the securing fixtures, and bind up them with the band.

***Key point**

- Refer to "Wiring of Thread cutter module / Feed module".



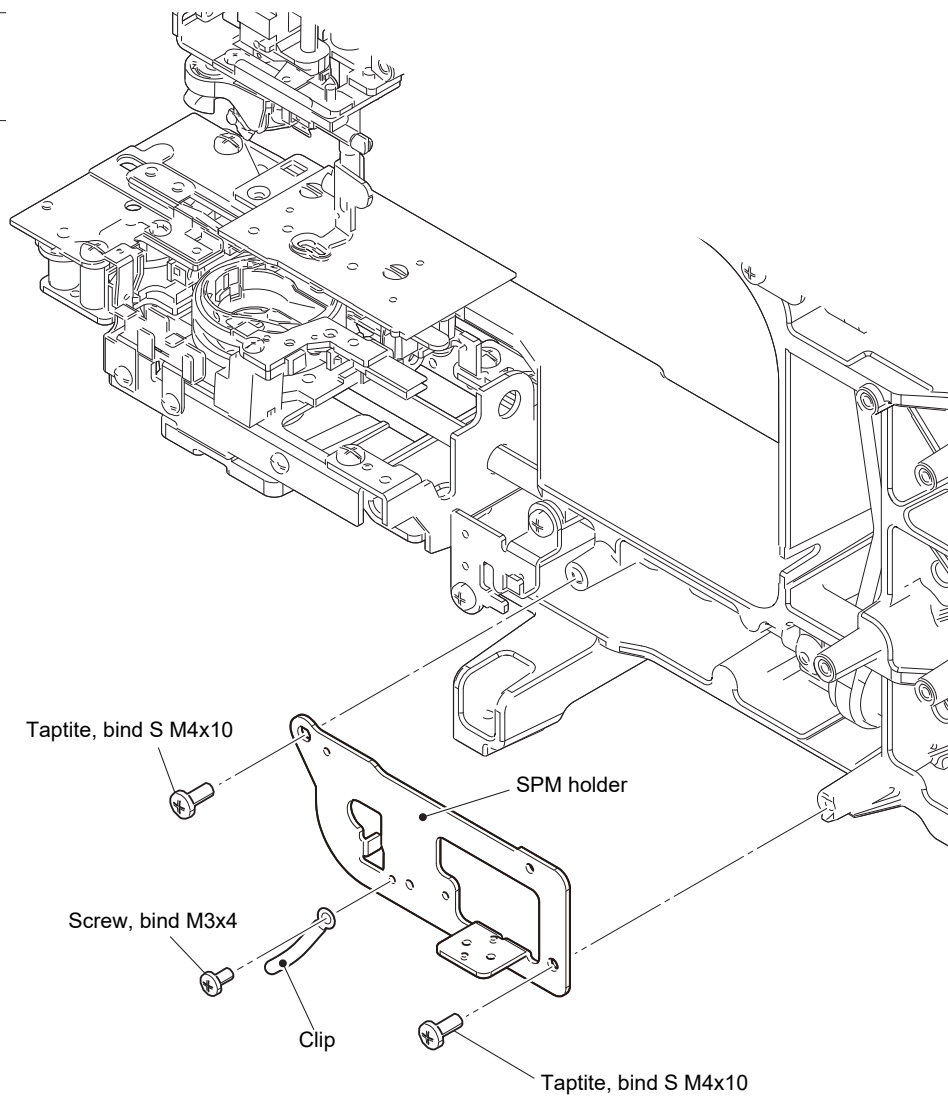
4 Attachment of SPM holder

1. Attach the clip with the screw (screw, bind M3x4).
2. Attach the SPM holder with the two screws (taptite, bind S M4x10).

Screw, Bind M3X4



Taptite, Bind S M4X10



5 Attachment of Belt supports and Tension pulley assembly

1. Set the belt support upper adjust to the belt support upper, and tighten the two screws (screw, pan (S/P washer) M3x6) temporarily.

***Key point**

- Fully tighten the screw after performing "Adjustment of Timing belt and belt support upper/lower clearance".

2. Set the tension pulley assembly, and tighten the screw (screw, pan (S/P washer) M4x10) temporarily.

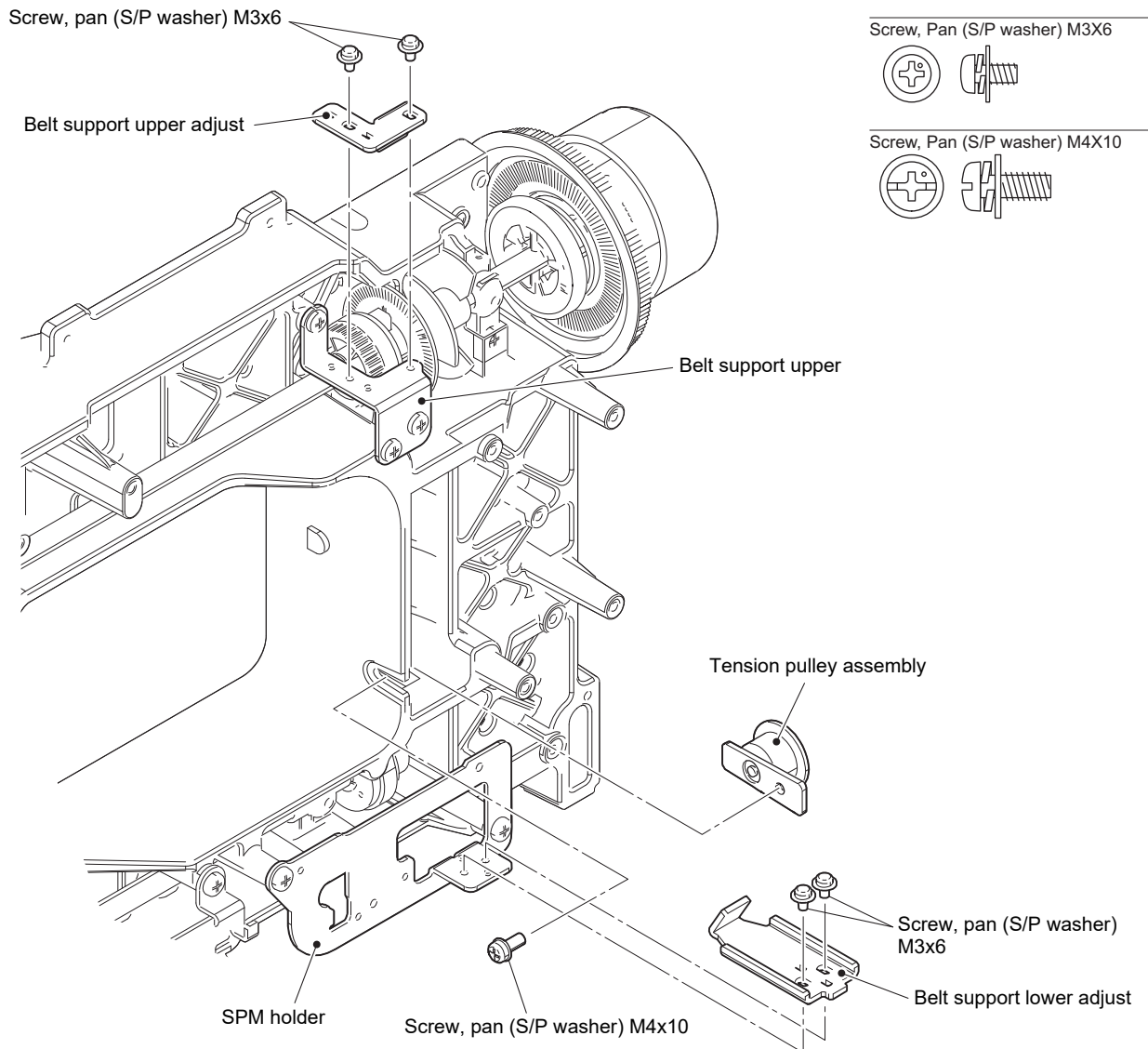
***Key point**

- Fully tighten the screw after performing "Adjustment of Timing belt tension".

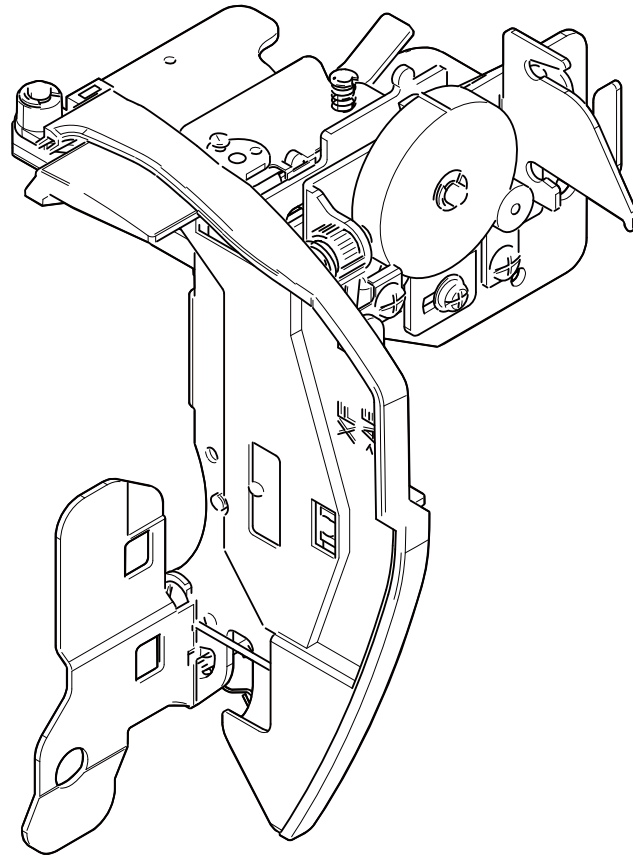
3. Set the belt support lower adjust to the SPM holder, and tighten the two screws (screw, pan (S/P washer) M3x6) temporarily.

***Key point**

- Fully tighten the screw after performing "Adjustment of Timing belt and belt support upper/lower clearance".



Needle threading mechanism location diagram



Basic of Assembly

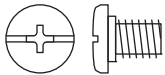
Basic of Assembly

1 Attachment of Thread tension U assy

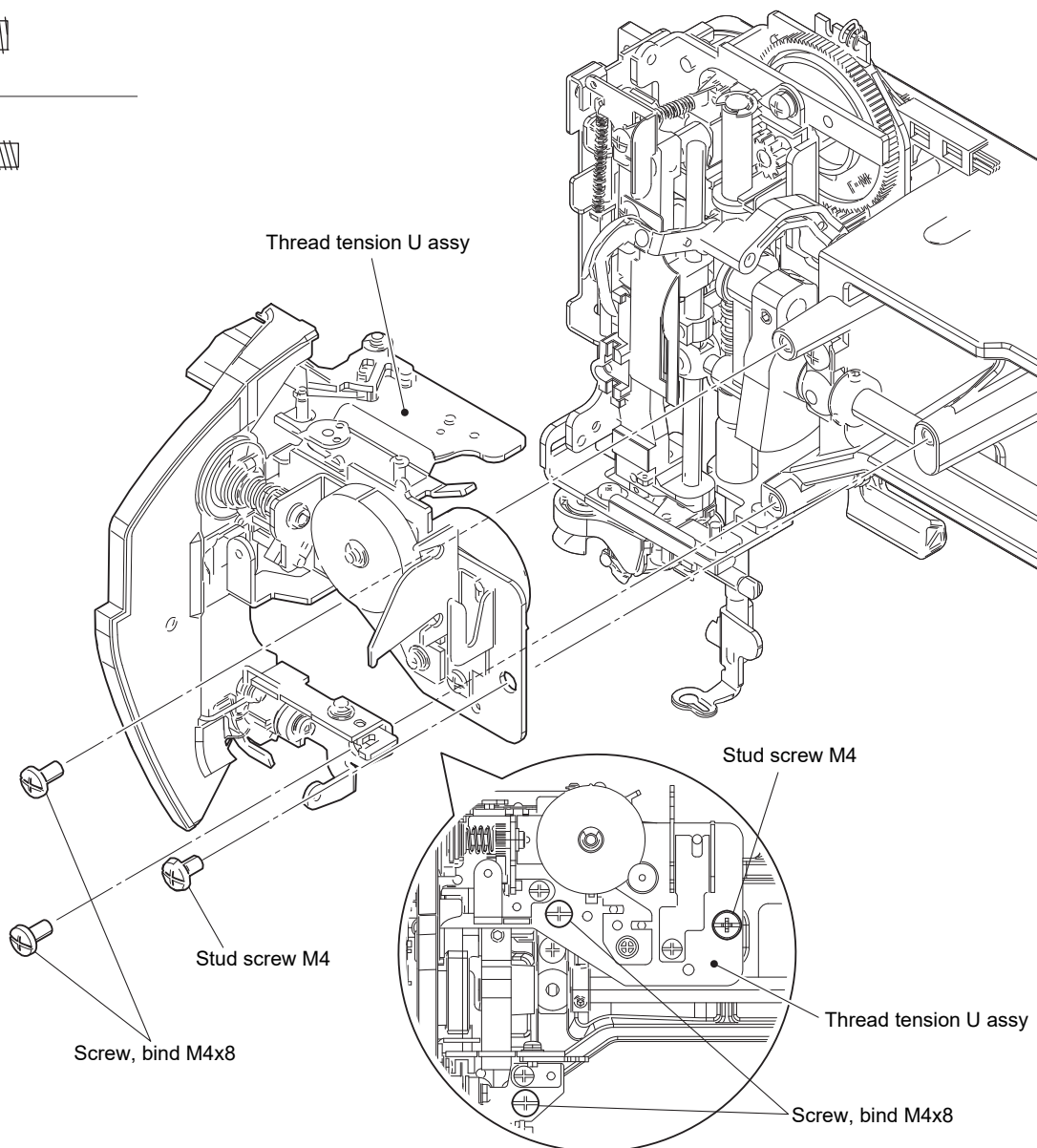
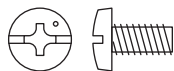
1. Attach the thread tension U assy with the screw (stud screw M4) and the two screws (screw, bind M4x8).

→Refer to 3 - 87 "Needle threading mechanism".

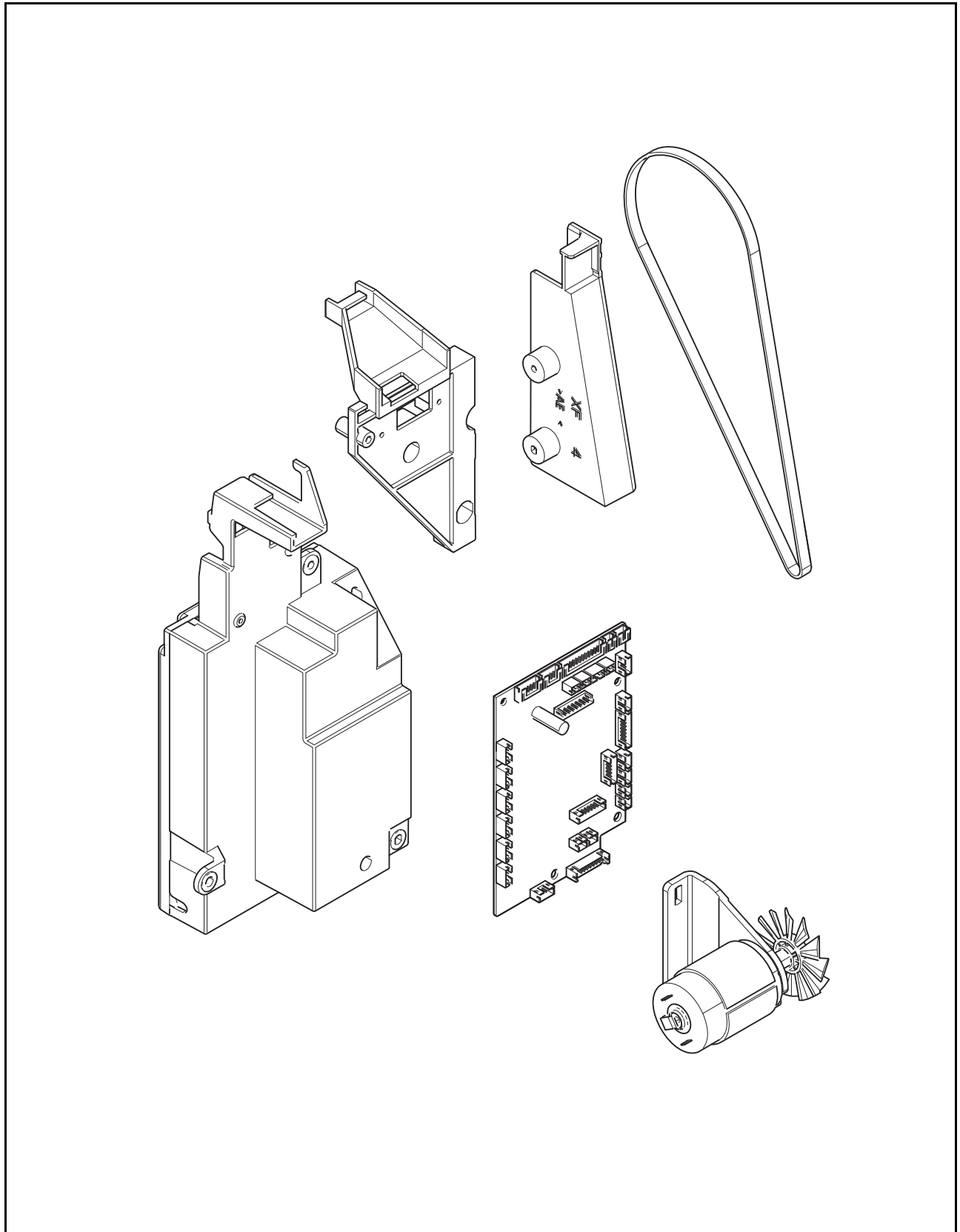
Stud screw M4



Screw, Bind M4X8



Electric parts and Main motor unit location diagram



Basic of Assembly

Basic of Assembly

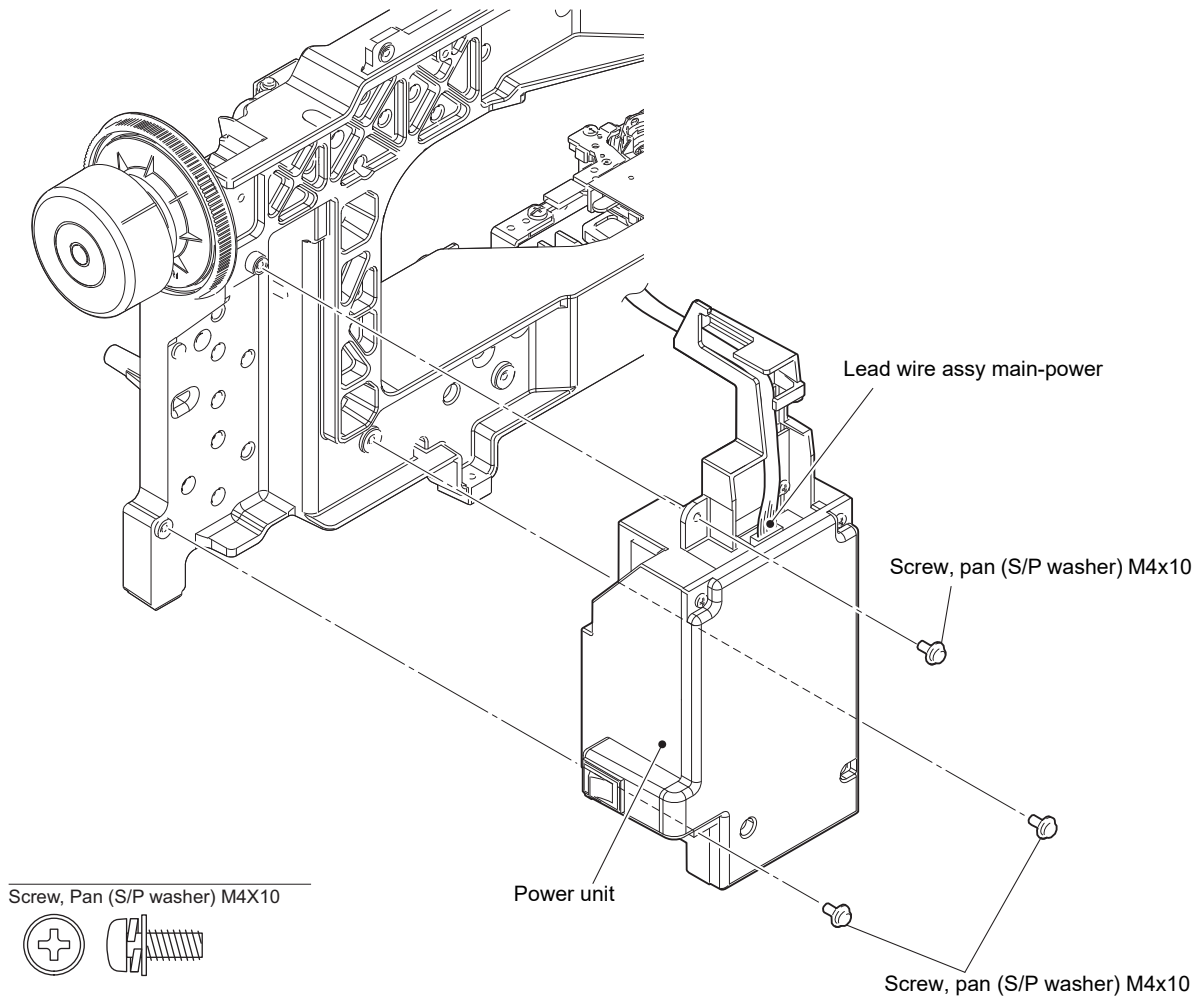
1 Attachment of Power unit

1. Connect the lead wire assy main-power to the power unit, and pass it through the securing fixtures.

***Key point**

- Refer to "Wiring of Power unit".

2. Attach the power unit with the three screws (screw, pan (S/P washer) M4x10).

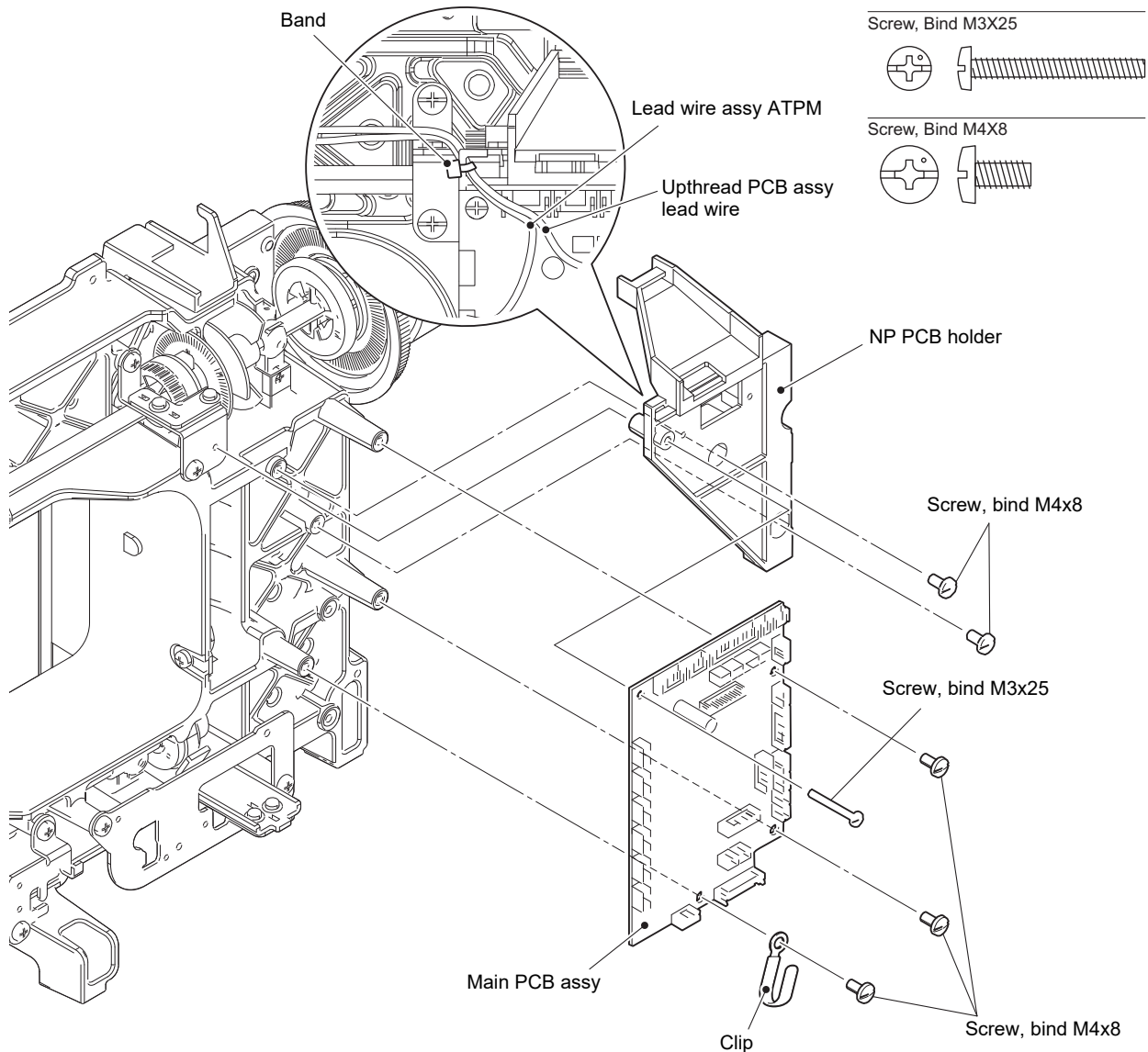


2 Attachment of Main PCB assy

1. Attach the NP PCB holder with the two screws (Screw, bind M4x8).
→Refer to 3 - 101 "Assembly of NP PCB assy".
2. Attach the main PCB assy and the clip to the NP PCB holder with the three screws (screw, bind M4x8) and screw (screw, bind M3x25).
3. Pass the lead wires through the securing fixtures, and connect them to the main PCB assy. Secure the lead wire assy ATPM and the upthread PCB assy lead wire to the NP PCB holder with the band.

***Key point**

- Refer to "Wiring of Upper side of Main PCB".



3 Attachment of Main motor assy

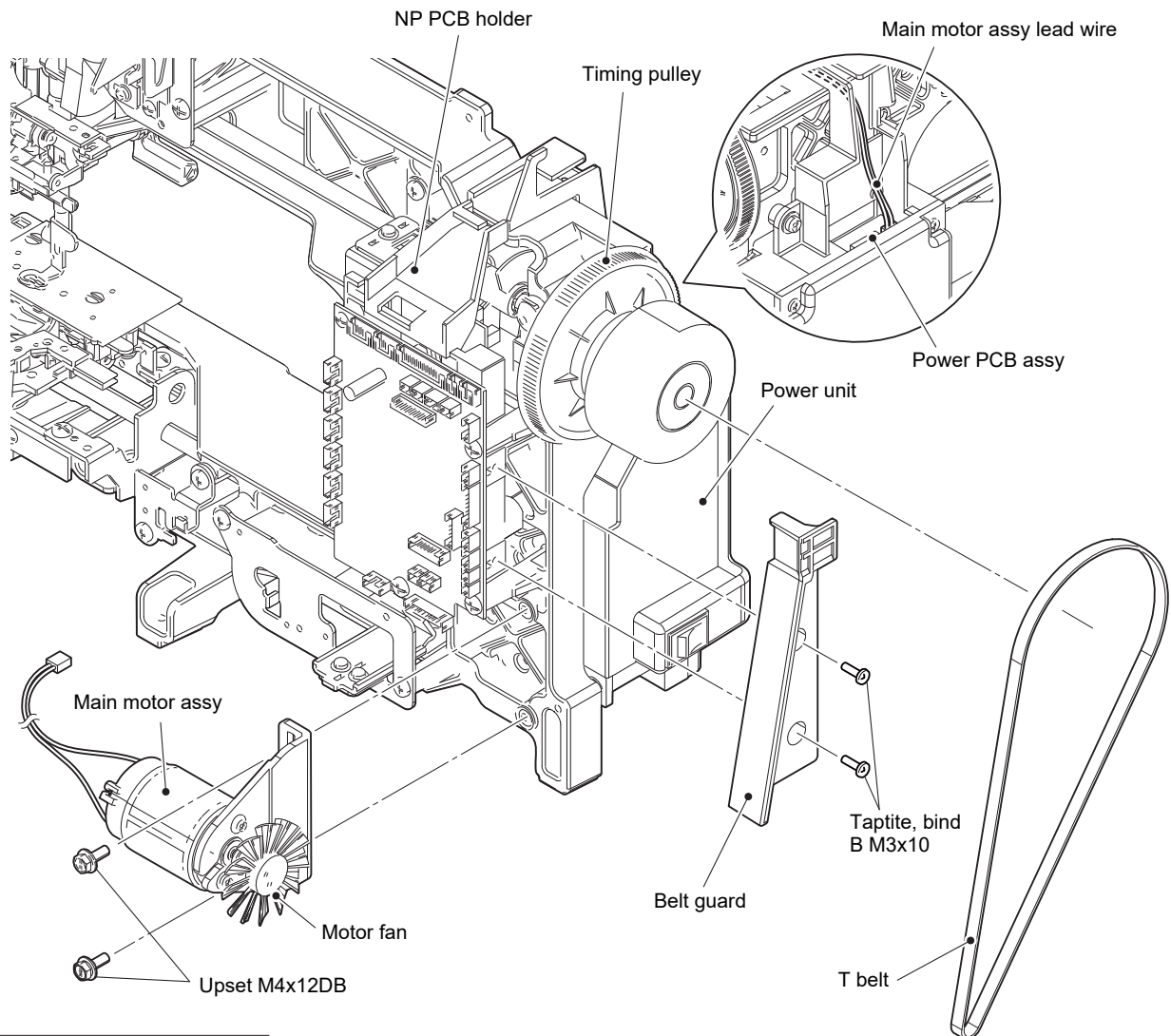
1. Set the main motor assy, and tighten the two screws (upset M4x12DB) temporarily.

***Key point**

- Fully tighten the screw after performing "Adjustment of Motor belt tension".

→Refer to 3 - 100 "Assembly of Main motor assy".

2. Pass the main motor assy lead wire through the securing fixtures, and connect it to the power PCB assy of power unit.
3. Hang the T belt on the timing pulley of upper shaft assy and the motor fan.
4. Attach the belt guard to the NP PCB holder with the two screws (taptite, bind B M3x10).



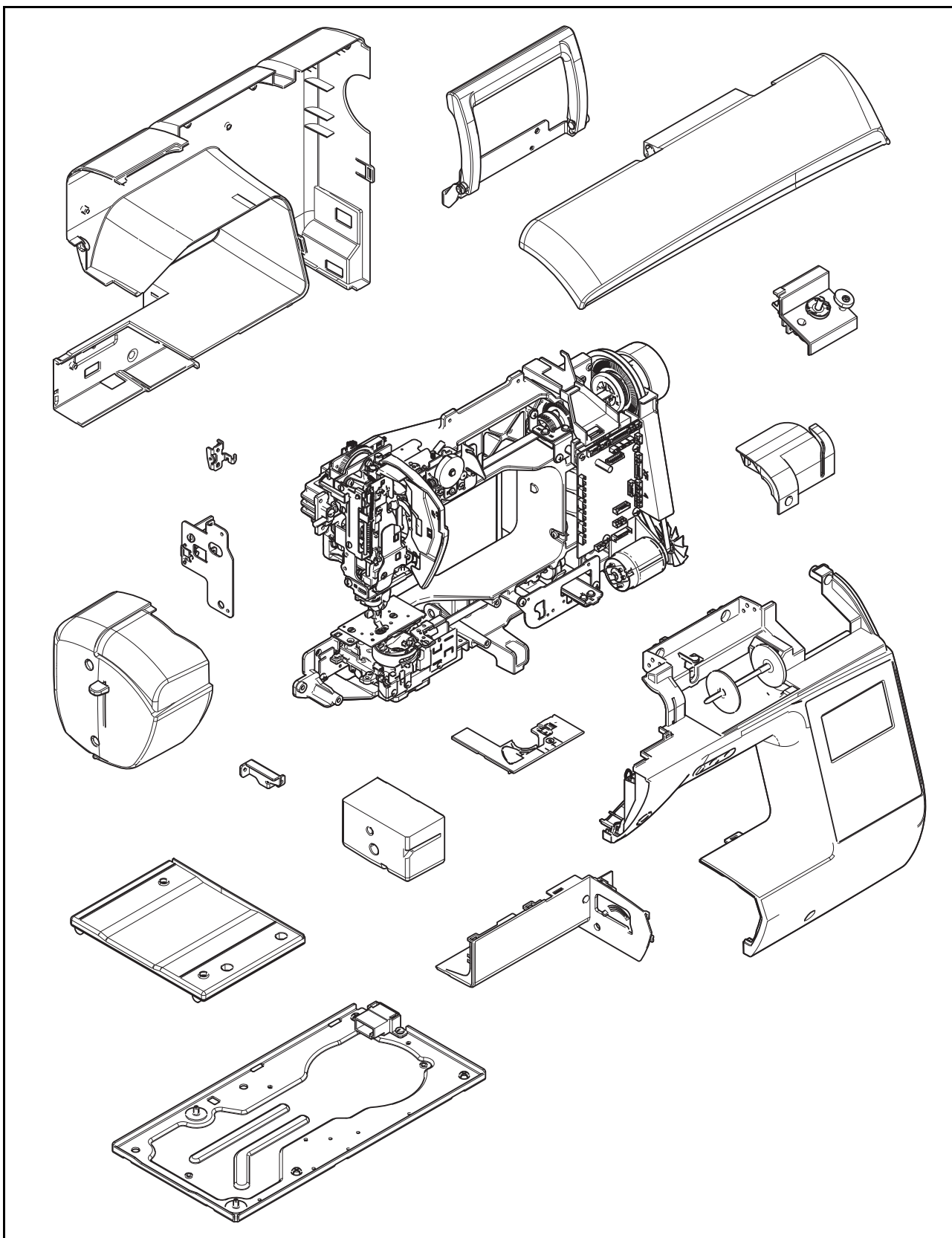
Upset M4X12DB



Taptite, Bind B M3X10



Main frame and Covers location diagram



Basic of Assembly

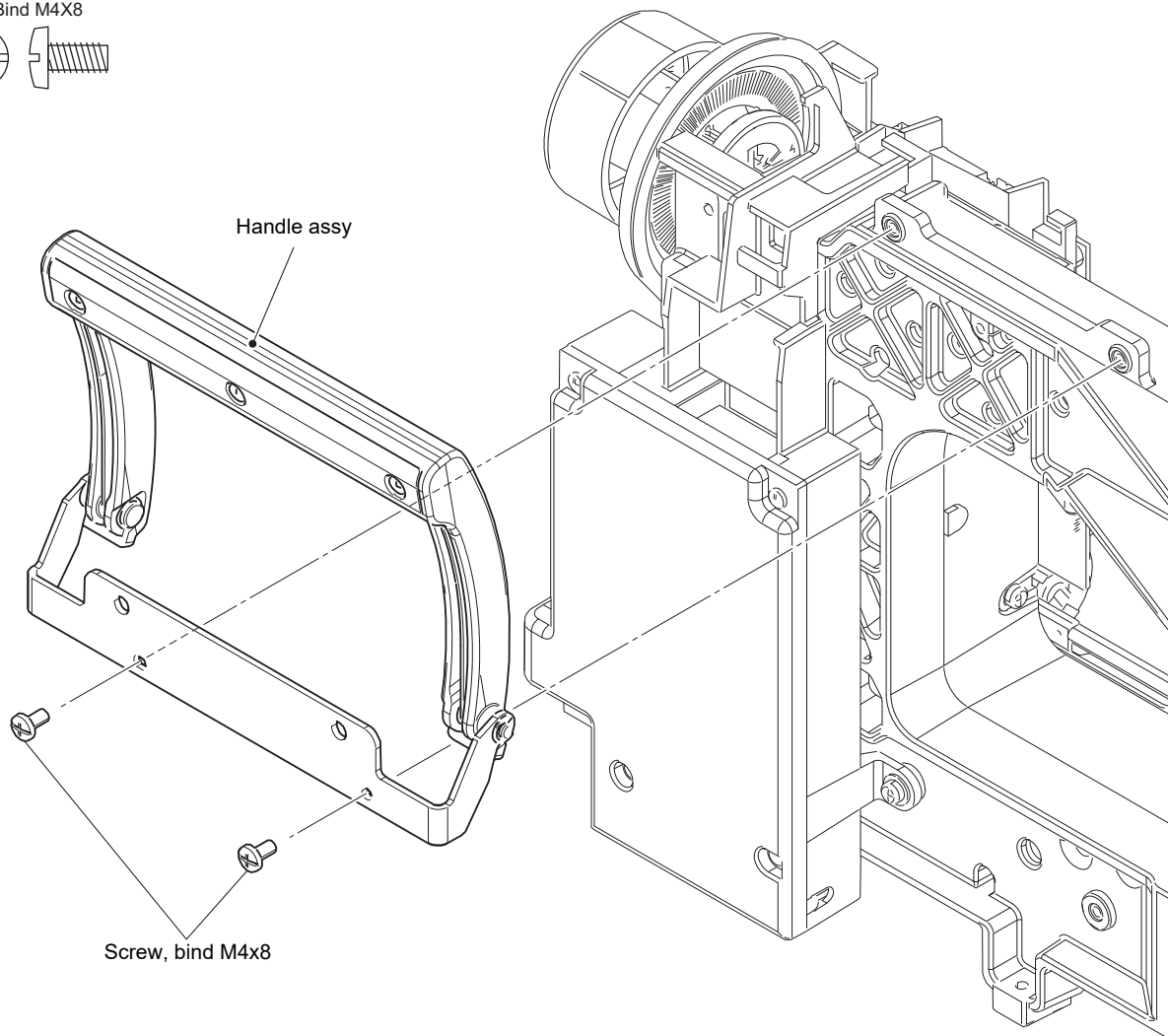
Basic of Assembly

1 Attachment of Handle assy

1. Attach the handle assy with the two screws (screw, bind M4x8).

→Refer to 3 - 111 "Assembly of Handle assy".

Screw, Bind M4X8

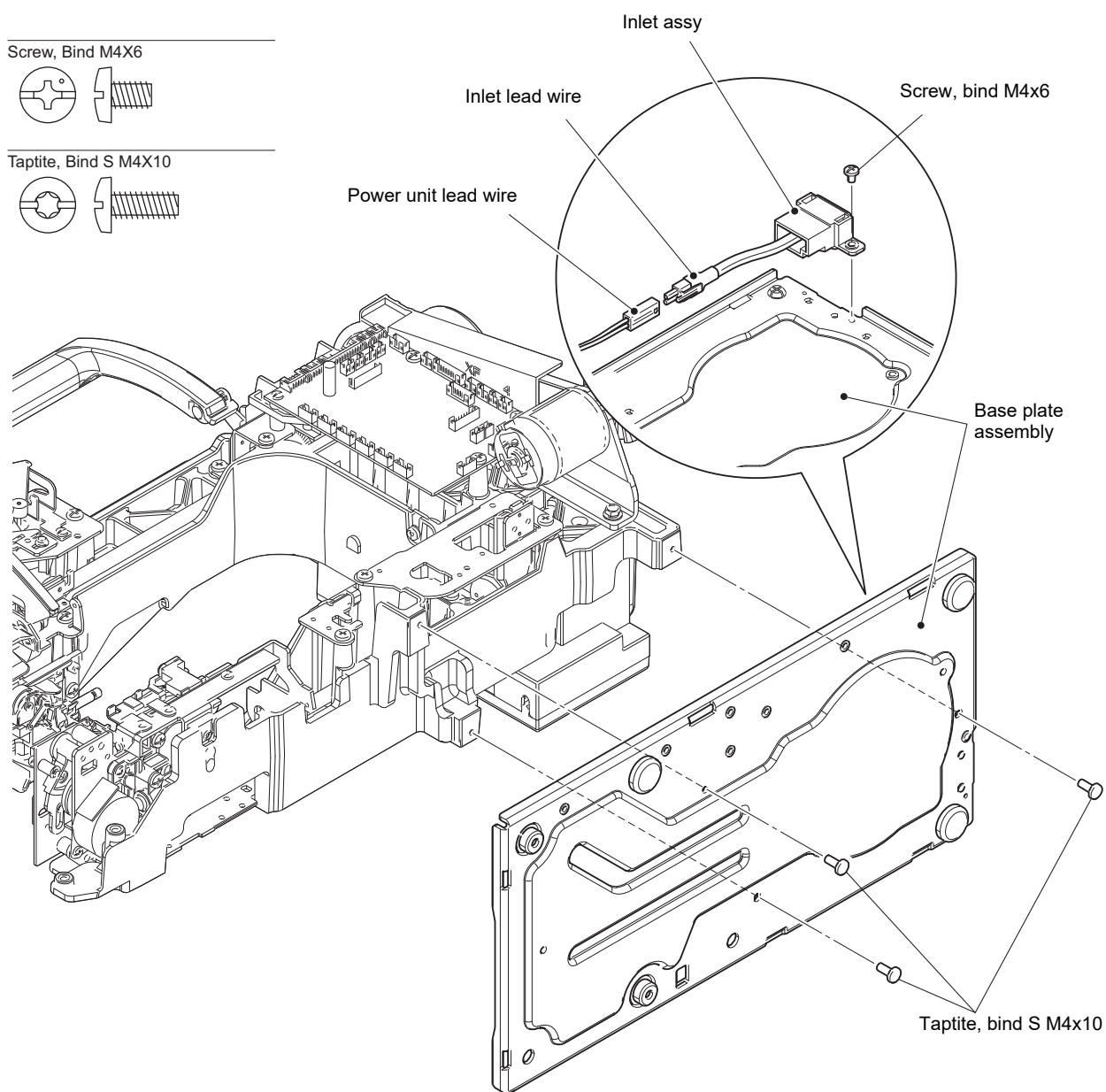


2 Attachment of Base plate assembly

1. Attach the inlet assy to the base plate assembly with the screw (screw, bind M4x6).
2. Attach the base plate assembly with the three screws (taptite, bind S M4x10).
3. Connect the inlet lead wire to the power unit lead wire.

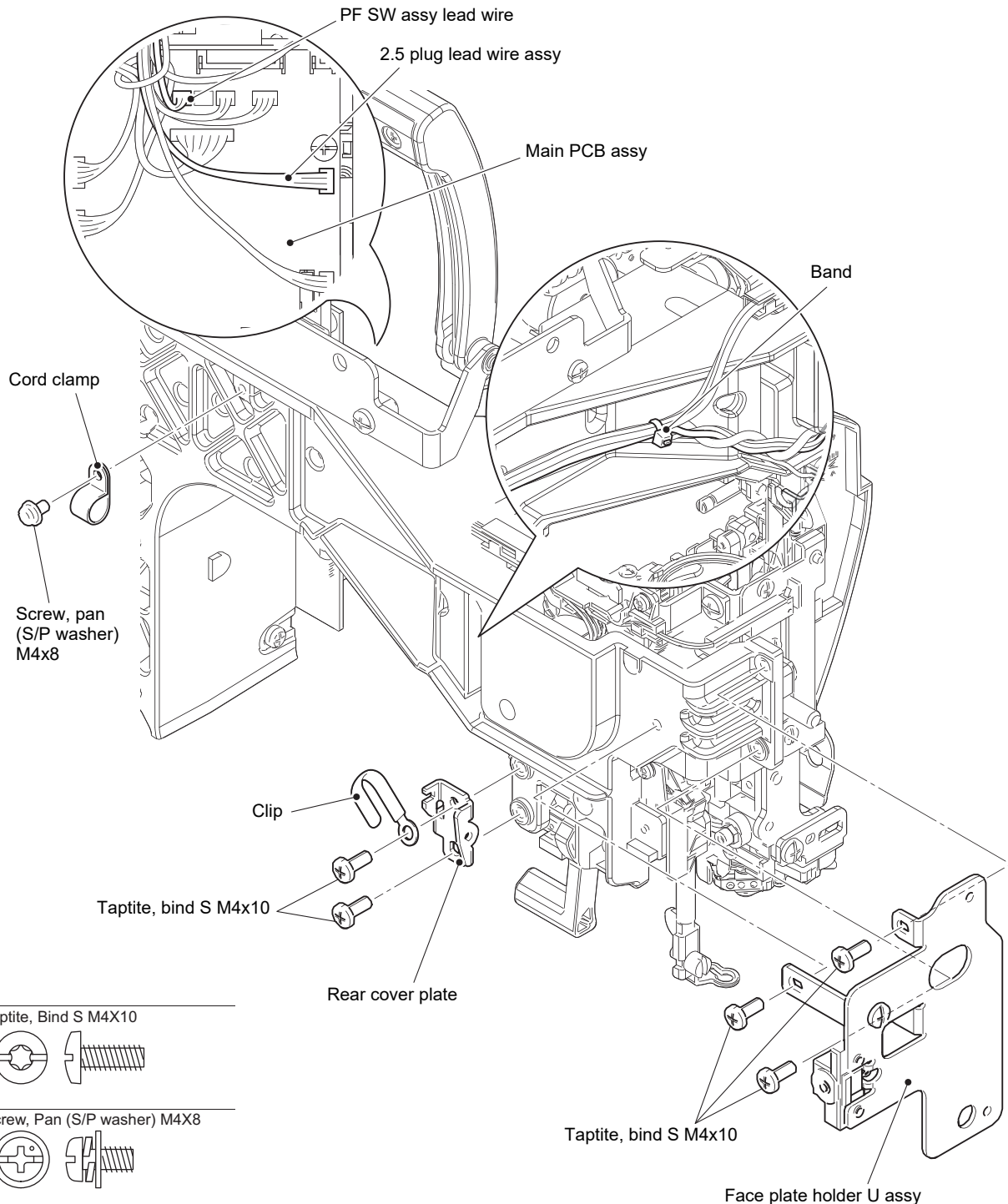
***Key point**

- Refer to "Wiring of Power unit".



3 Attachment of Face plate holder U assy and Rear cover plate

1. Attach the face plate holder U assy with the three screws (taptite, bind S M4x10).
→Refer to 3 - 110 "Assembly of Face plate holder U assy".
2. Attach the rear cover plate and the coating clip with the two screws (taptite, bind S M4x10).
3. Bind the lead wires with the band and clip the lead wires together.
4. Bind the lead wires with the cord clamp. Attach the cord clamp with the screw (screw, pan (S/P washer) M4x8).
5. Pass the 2.5 plug lead wire assy and PF SW assy lead wire through the securing fixtures, and connect them to the main PCB assy.



4 Attachment of Bobbin winder assy

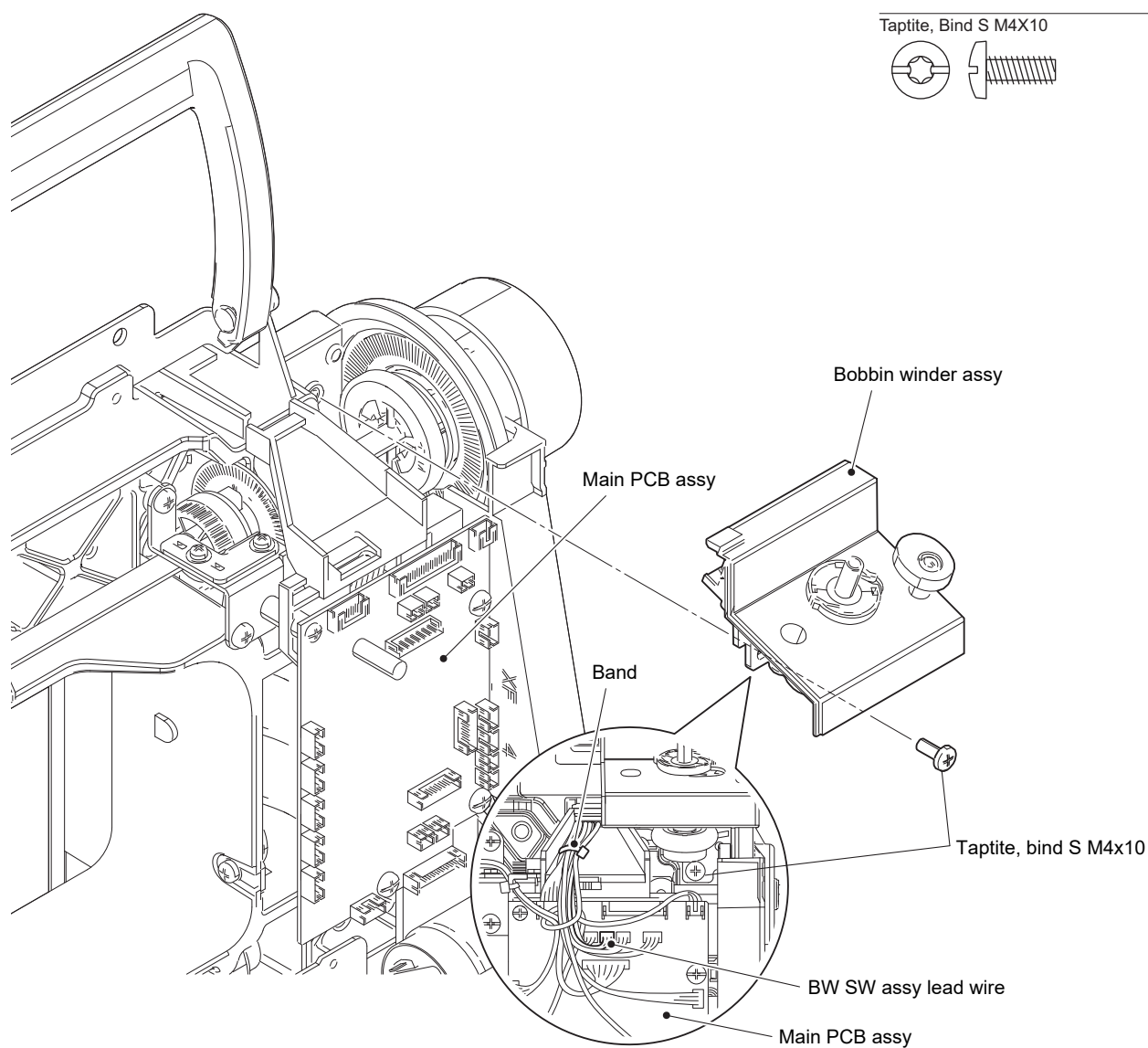
1. Attach the bobbin winder assy with the screw (taptite, bind S M4x10).

→Refer to 3 - 106 "Attachment of Bobbin base assy".

2. Pass the BW SW assy lead wire through the securing fixtures, and connect it to the main PCB assy. Bind up the lead wires with the band.

***Key point**

- Refer to "Wiring of Upper side of Main PCB".



5 Attachment of Connector holder assy

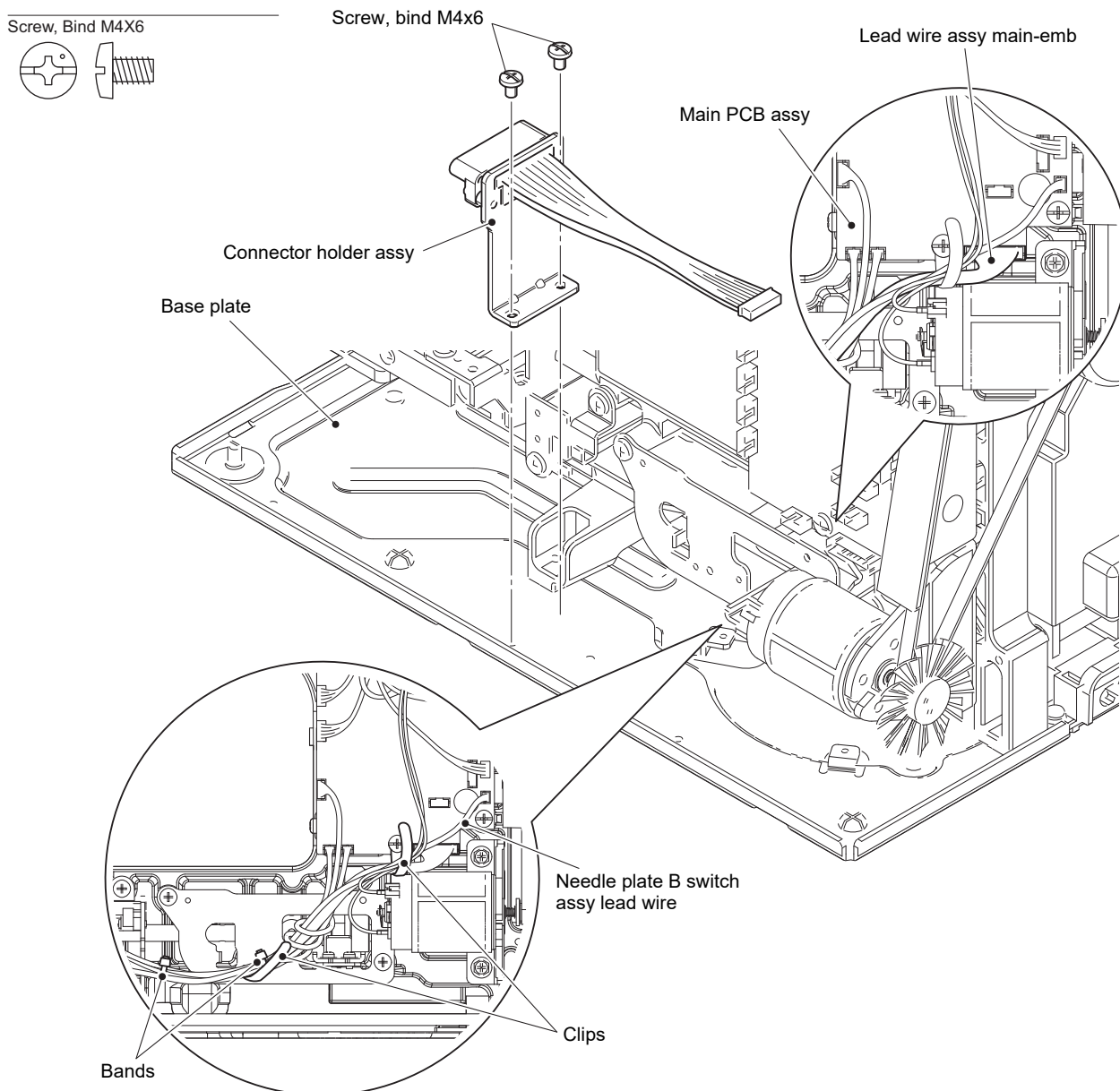
1. Attach the connector holder assy to the base plate with the two screws (screw, bind M4x6). Connect the lead wire assy main-emb to the main PCB assy.

→Refer to 3 - 112 "Assembly of Connector holder assy".

2. Bind up the lead wires with the two bands. Pass the needle plate B switch assy lead wire through the securing fixtures, and connect it to the main PCB assy. Clip the lead wires together (two locations).

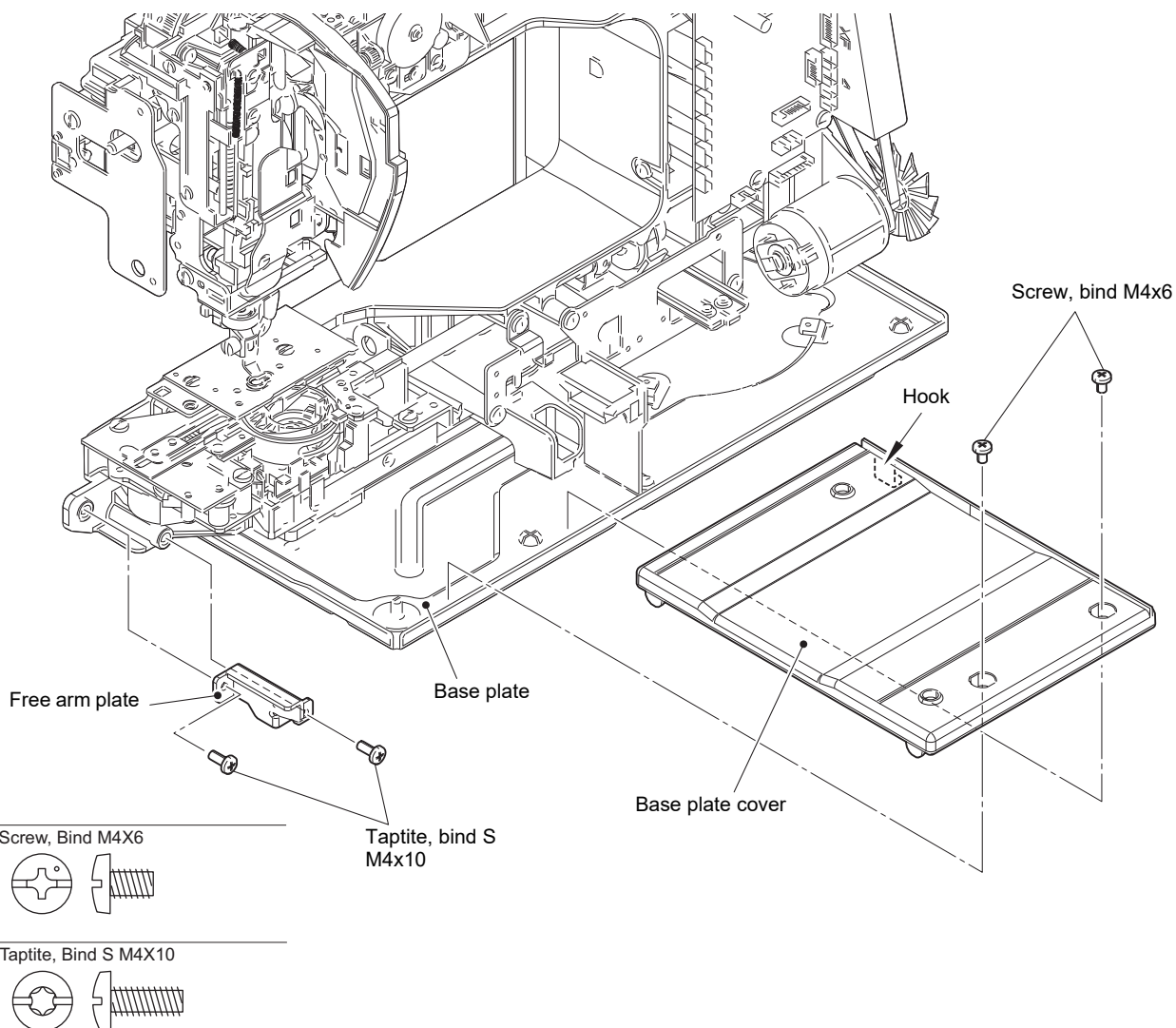
***Key point**

- Refer to "Wiring of Lower side of Main PCB", "Wiring of Thread cutter module / Feed module".



6 Attachment of Base plate cover and Free arm plate

1. Set the base plate cover to the base plate, and hang the hook on base plate. Secure the base plate cover with the two screws (screw, bind M4x6).
2. Attach the free arm plate to the arm bed with the two screws (taptite, bind S M4x10).



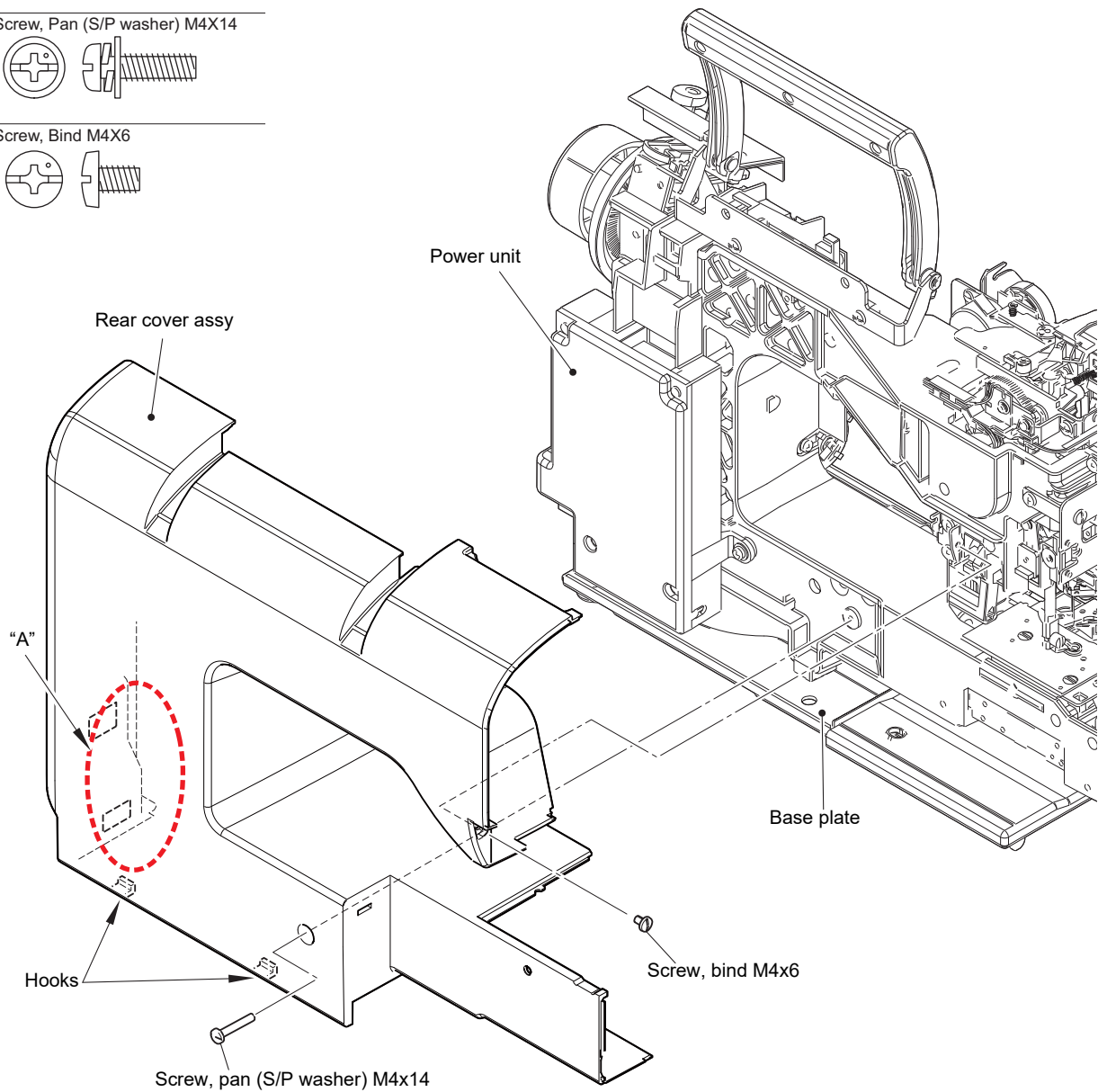
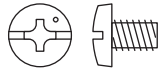
7 Attachment of Rear cover assy

1. Set the rear cover assy while bending the "A" and "B" to get over the switch of power unit and the drop lever, and hang the two hooks of rear cover assy on the base plate. Secure the rear cover assy with the screw (screw, pan (S/P washer) M4x14) and screw (screw, bind M4x6).

Screw, Pan (S/P washer) M4X14



Screw, Bind M4X6



8 Attachment of Front cover assy

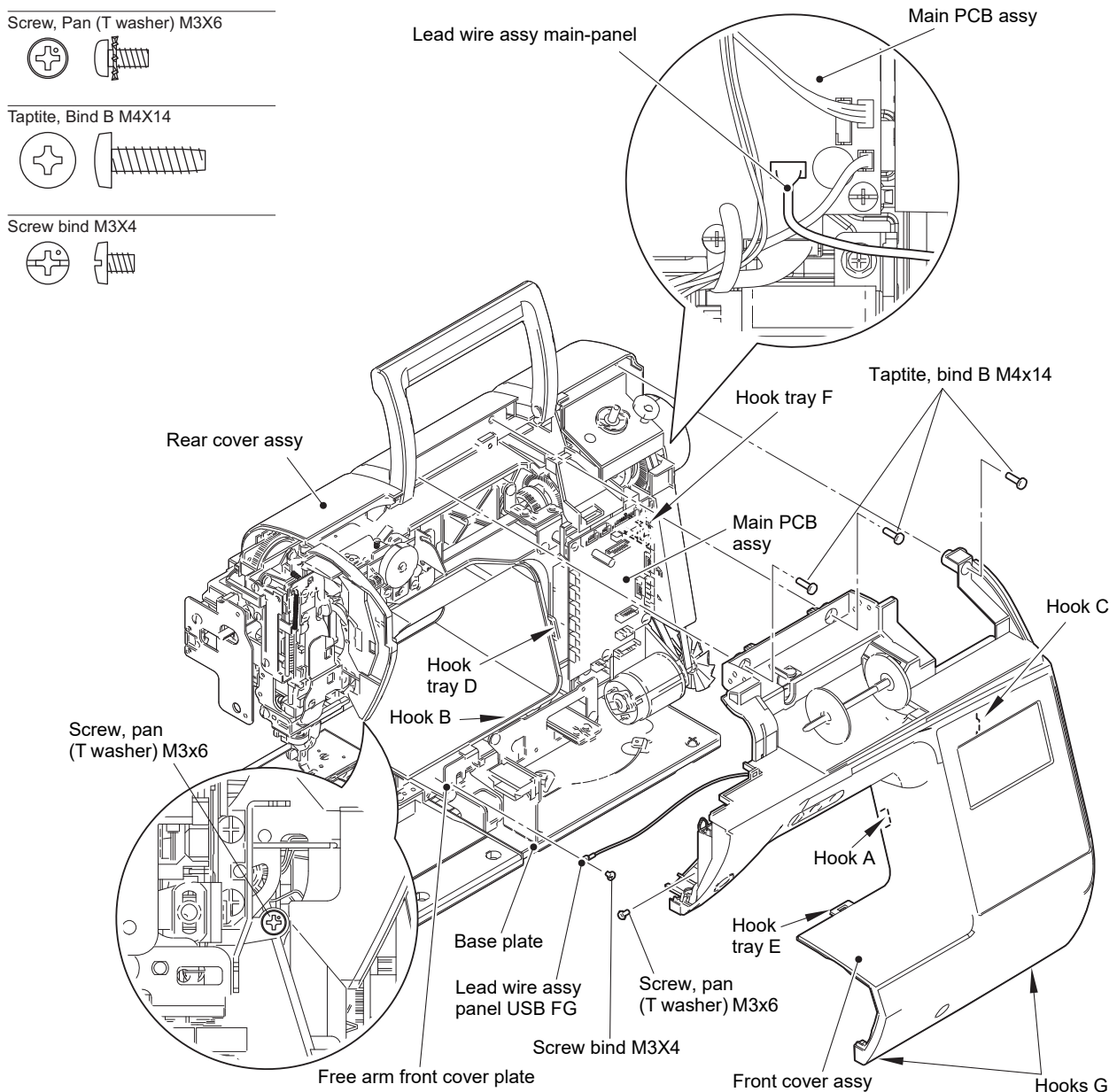
1. Connect the lead wire assy main-panel to the main PCB assy.
2. Hang the hook A (front cover side), B (rear cover side), and C (front cover side) to the hook tray D (rear cover side), E (front cover side) and F (rear cover side) respectively, and hang the two hooks G on the base plate to attach the front cover.

*Key point

- Be careful not to get each lead wire caught in the front cover assy and rear cover assy.

→Refer to 3 - 113 "Assembly of Front cover assy".

3. Secure the front cover assy with the screw (screw, pan (T washer) M3x6) and three screws (taptite, bind B M4x14).
4. Attach the lead wire assy panel USB FG with the screw (screw, bind M3x4) to the free arm front cover plate.



9 Attachment of Front thread guard cover and Face plate assy

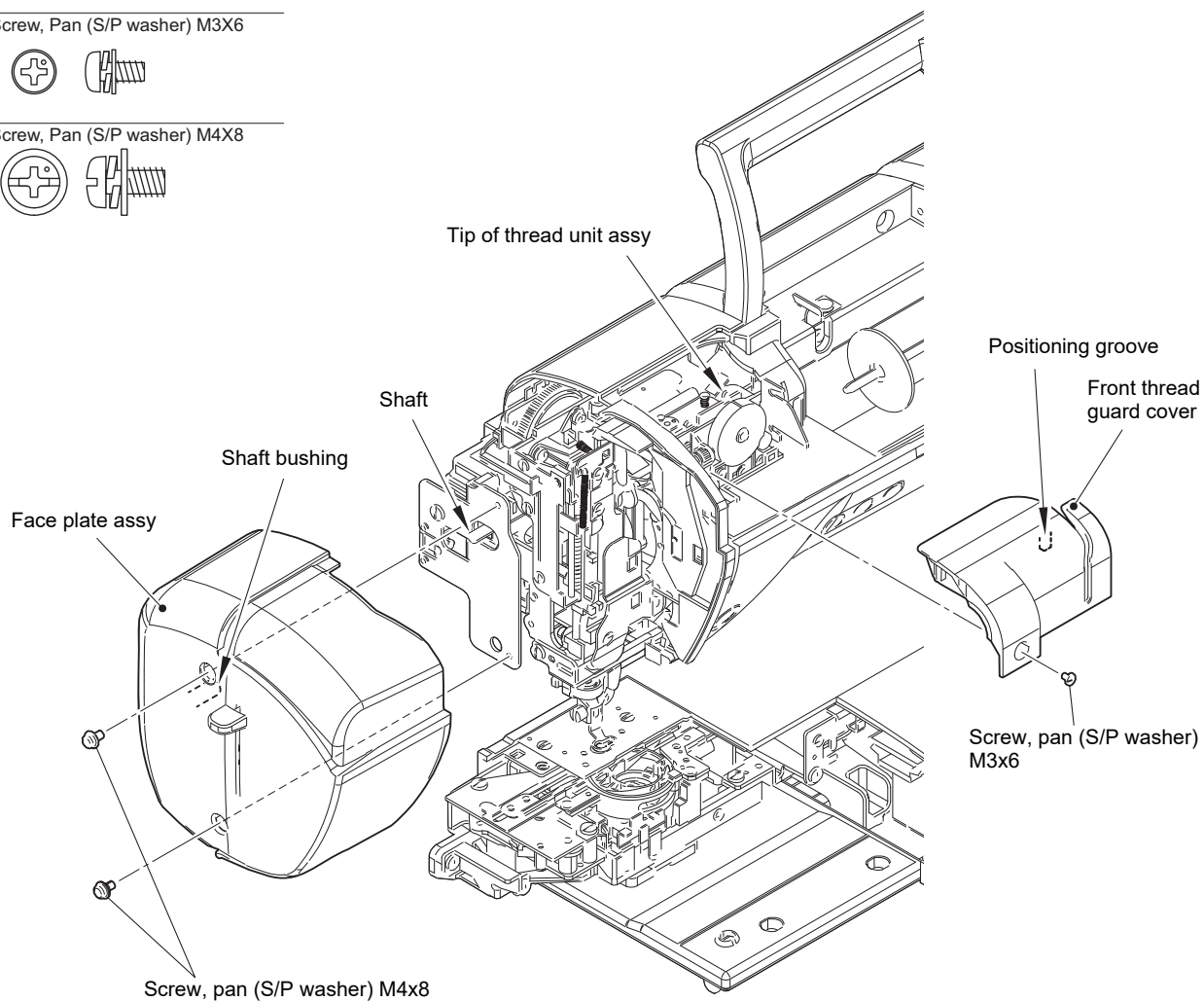
1. Fit the positioning groove to the tip of thread unit assy, and attach the front thread guard cover with the screw (screw, pan (S/P washer) M3x6).
2. Insert the shaft into the shaft bushing, and attach the face plate assy with the two screws (screw, pan (S/P washer) M4x8).

→Refer to 3 - 122 "Assembly of Face plate assy".

Screw, Pan (S/P washer) M3X6



Screw, Pan (S/P washer) M4X8



10 Attachment of Free arm front cover assy, Free arm cover and Needle plate B assy

1. Set the free arm front cover assy, hang the two hooks A on the front cover assy and hook B on the hook tray, then attach the free arm front cover assy with the screw (screw, pan (S/P washer) M3x6) and screw (screw, pan (T washer) M3x6).
2. Attach the free arm cover with the screw (screw, pan (S/P washer) M4x8).
3. Attach the needle plate B assy.

→Refer to 3 - 123 "Assembly of Needle plate B assy".

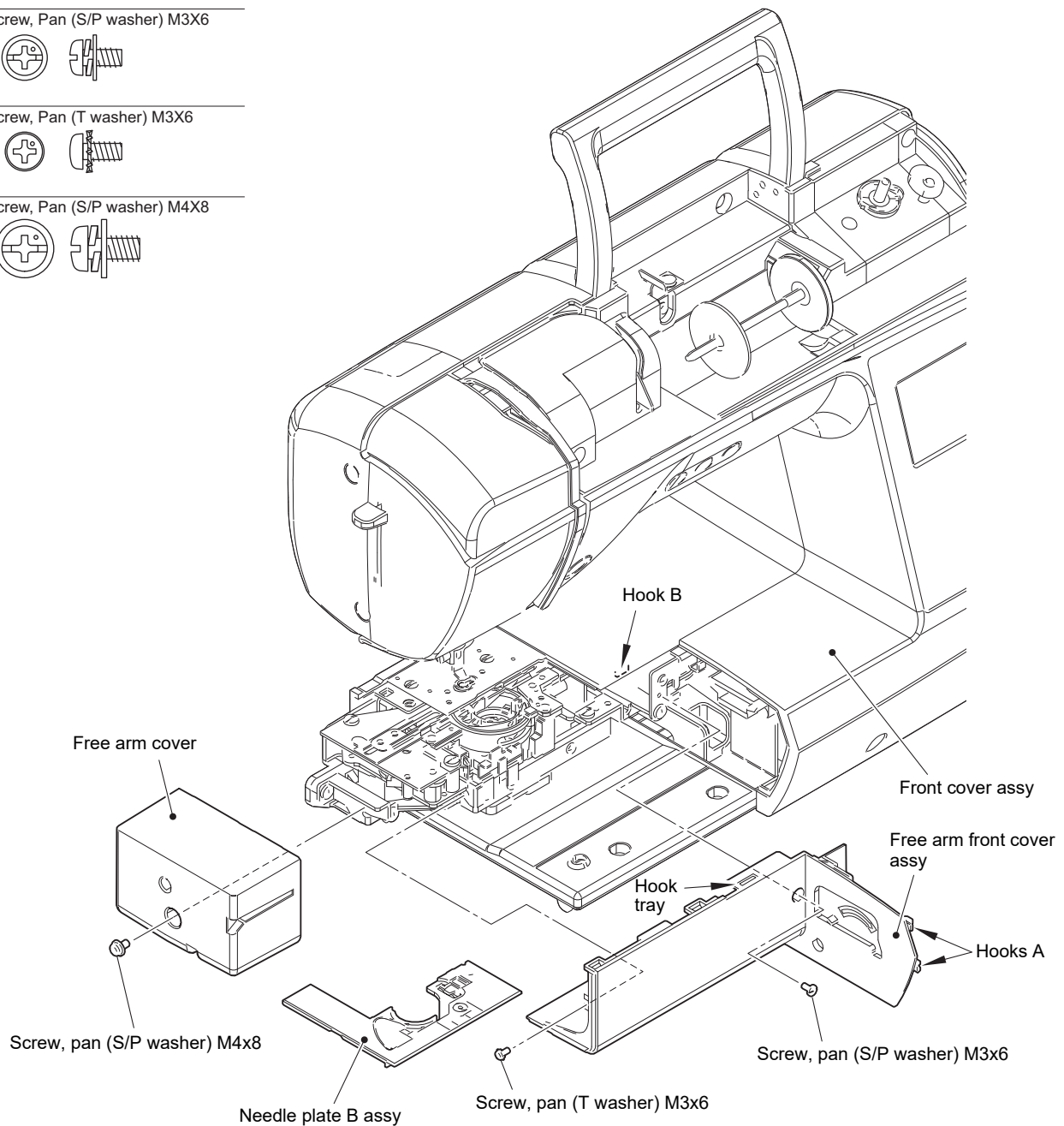
Screw, Pan (S/P washer) M3X6



Screw, Pan (T washer) M3X6

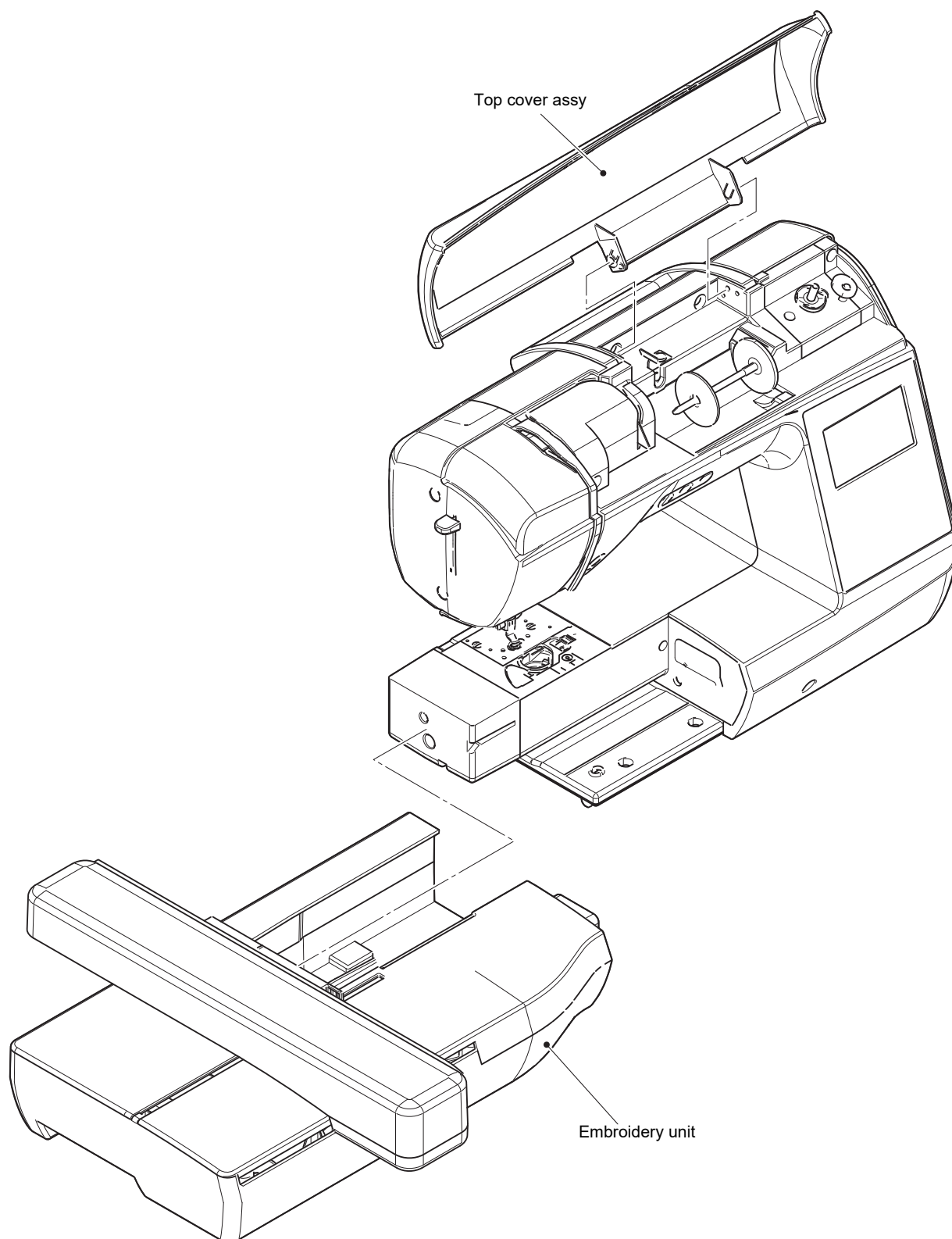


Screw, Pan (S/P washer) M4X8



11 Attachment of Embroidery unit and Top cover unit assy

1. Attach the embroidery unit.
→Refer to 3 - 68 "Embroidery unit".
2. Attach the top cover assy.

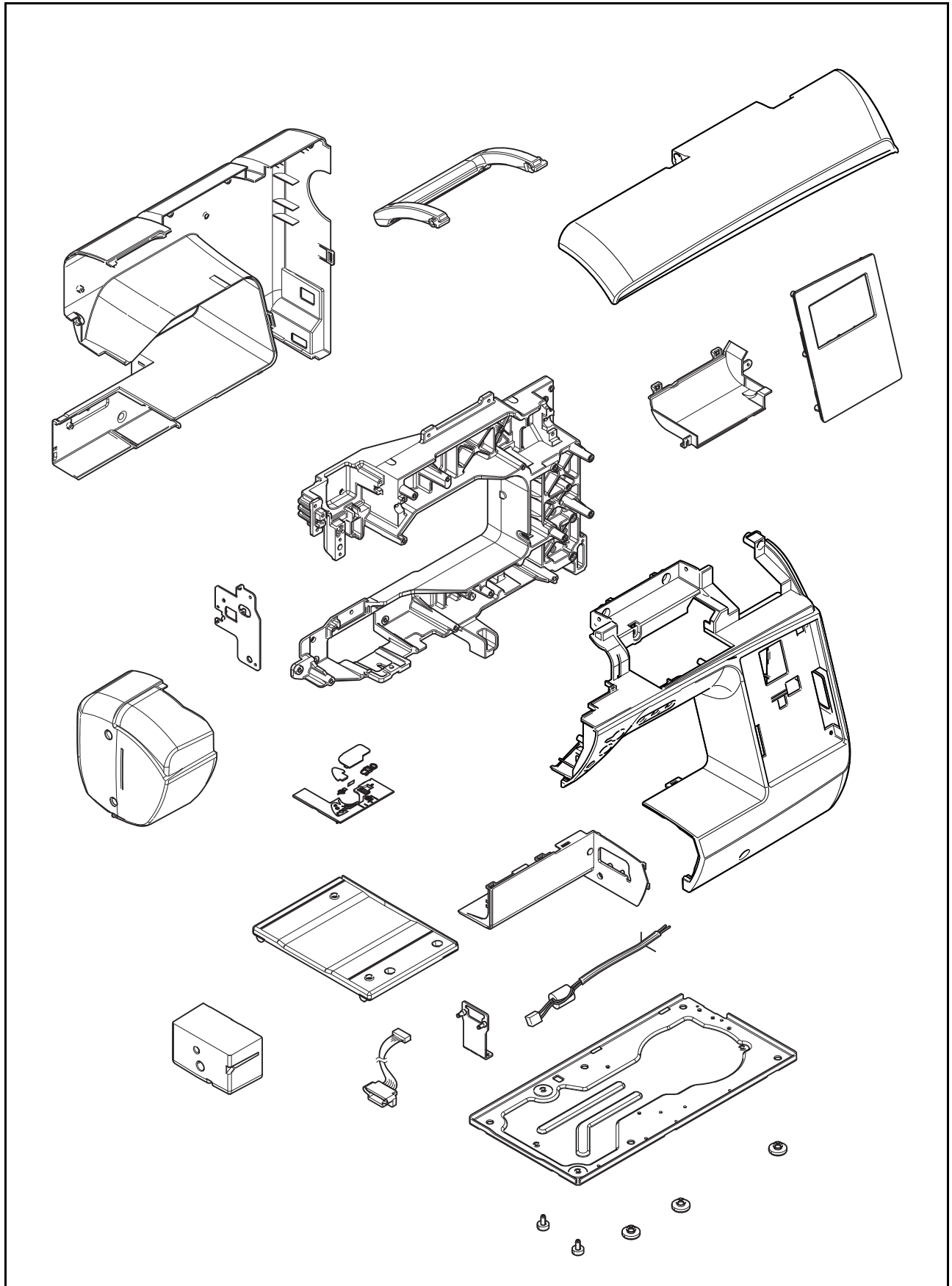


3 Application of Disassembly/Assembly

This chapter explains how to disassemble or assemble each module. Refer to this chapter for fixing and replacing each module.

Disassembly	Main frame and Covers	3 - 2
	Bobbin winding mechanism	3 - 19
	Electric parts and Main motor unit ...	3 - 24
	Needle threading mechanism	3 - 27
	Feed module	3 - 39
	Thread cutter module	3 - 46
	Needle-presser module	3 - 50
	Embroidery unit	3 - 68
Assembly	Needle threading mechanism	3 - 87
	Electric parts and Main motor unit	3 - 99
	Bobbin winding mechanism	3 - 102
	Main frame and Covers	3 - 107
	Needle-presser module	3 - 124
	Thread cutter module	3 - 144
	Feed module	3 - 149
Embroidery unit	3 - 157	

Main frame and Covers location diagram

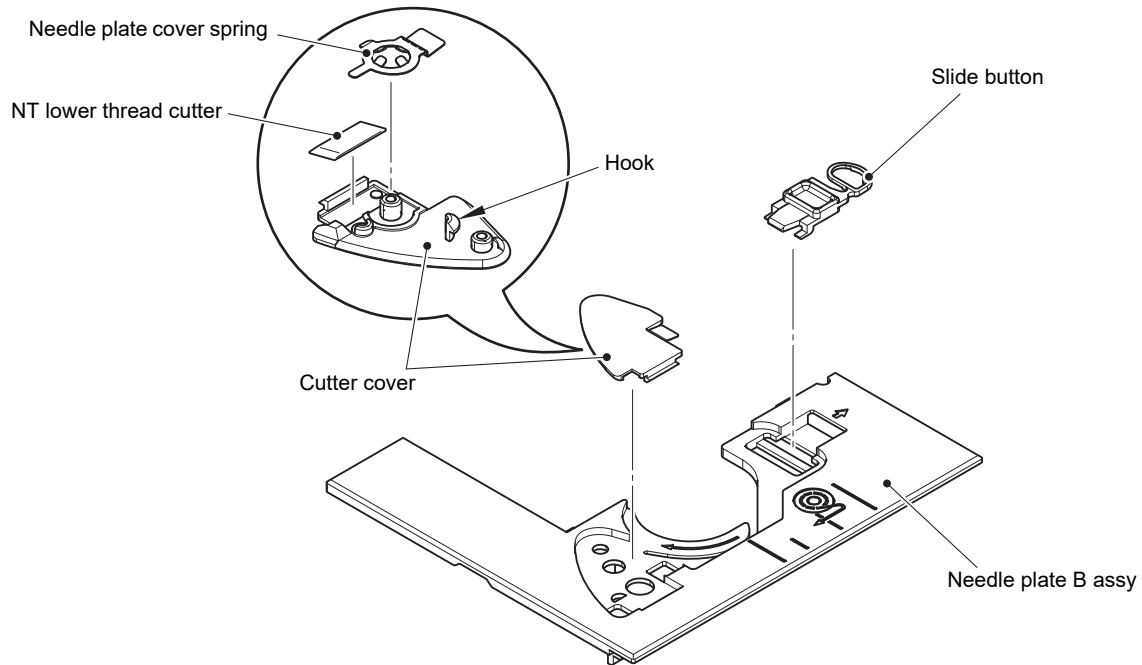


Application of Disassembly

Application of Disassembly

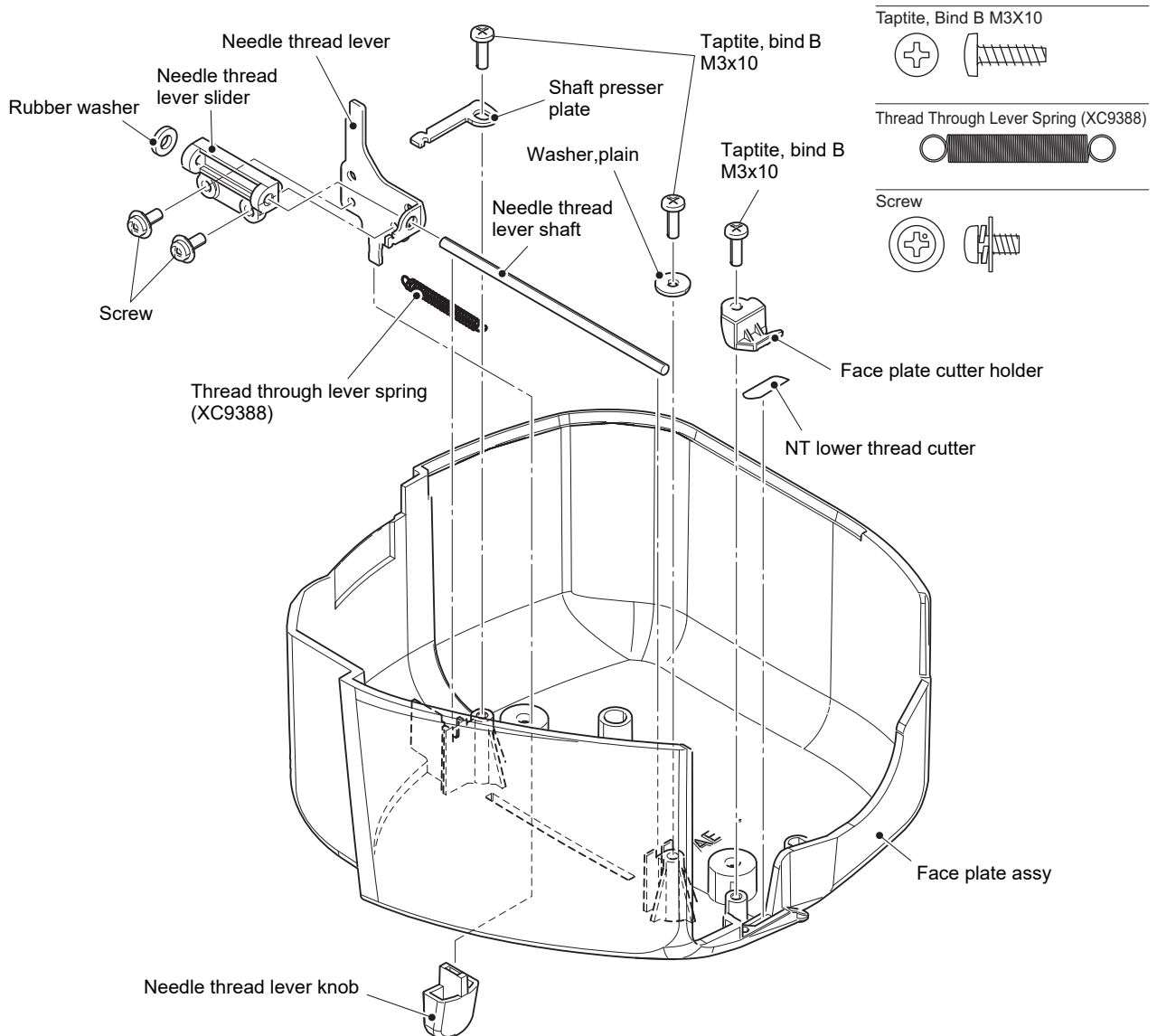
1 Disassembly of Needle plate B assy

1. Remove the slide button from the needle plate B assy.
2. Release the hook to remove the cutter cover from the needle plate B assy. Remove the needle plate cover spring and the NT lower thread cutter from the cutter cover.



2 Disassembly of Face plate assy

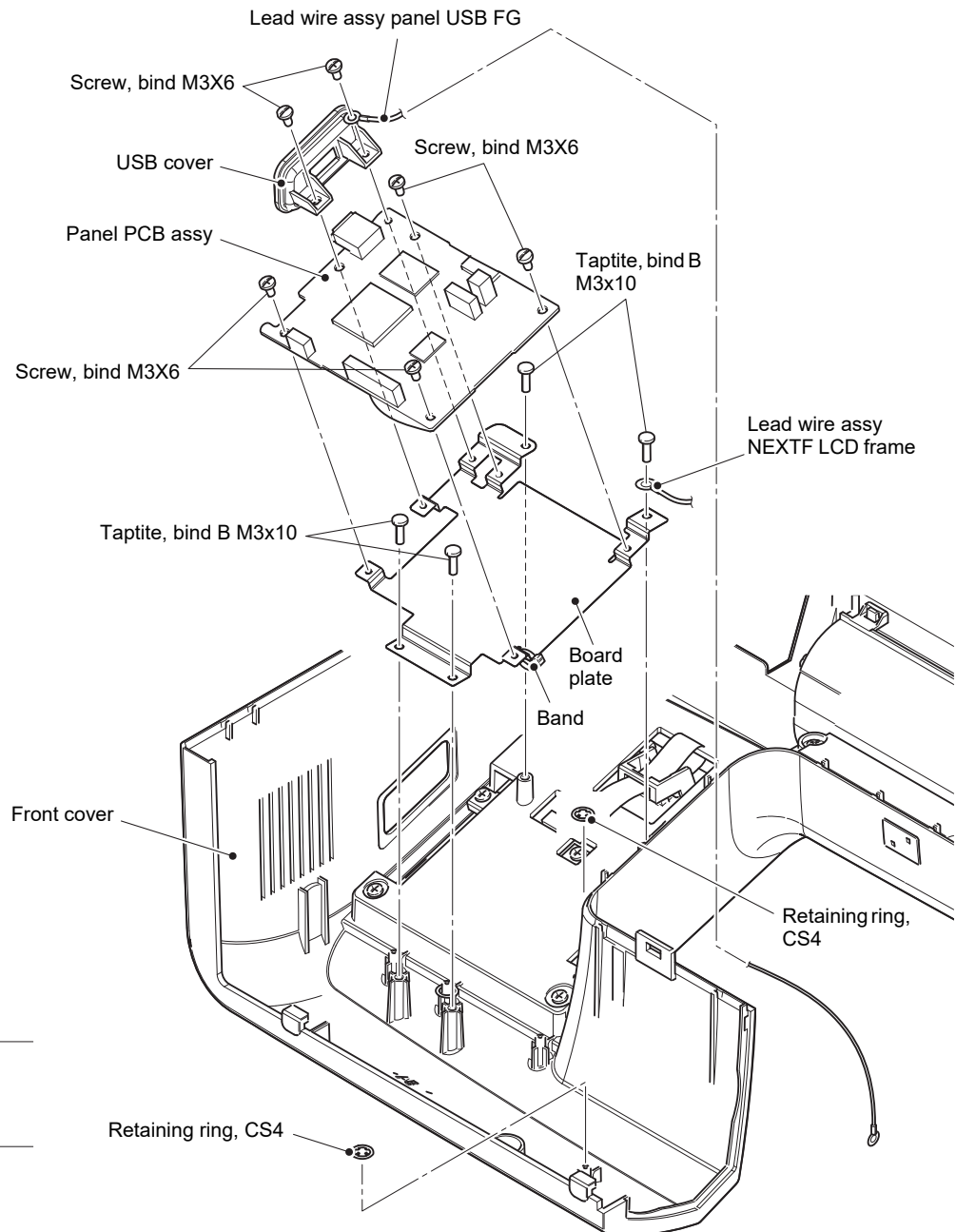
1. Remove the screw (taptite, bind B M3x10) to remove the face plate cutter holder from the face plate assy. Remove the NT lower thread cutter from the face plate assy.
2. Remove the needle thread lever knob.
3. Remove the thread through lever spring (XC9388).
4. Remove the two screws (taptite, bind B M3x10) to remove the shaft presser plate and the washer, plain from the face plate assy.
5. Remove the needle thread lever shaft from the face plate assy. Pull out the rubber washer, the needle thread lever slider and the needle thread lever from the needle thread lever shaft.
6. Remove the two screws (screw) to remove the needle thread lever slider from the needle thread lever.



3 Disassembly of Front cover assy

3-1 Removal of Connectors, USB cover, Panel PCB assy and Board plate

1. Disconnect all connectors and the FFC from the panel PCB assy.
2. Remove the six screws (screw, bind M3X6) to remove the lead wire assy panel USB FG, the USB cover and the panel PCB assy from the board plate.
3. Cut the band.
4. Remove the four screws (taptite, bind B M3x10) to remove the lead wire assy NEXTF LCD frame and the board plate from the front cover.
5. Remove the two retaining rings, CS4 to release the each lead wire assy from the securing fixtures.



3-2 Removal of LED PCB assy and SSVR PCB assy

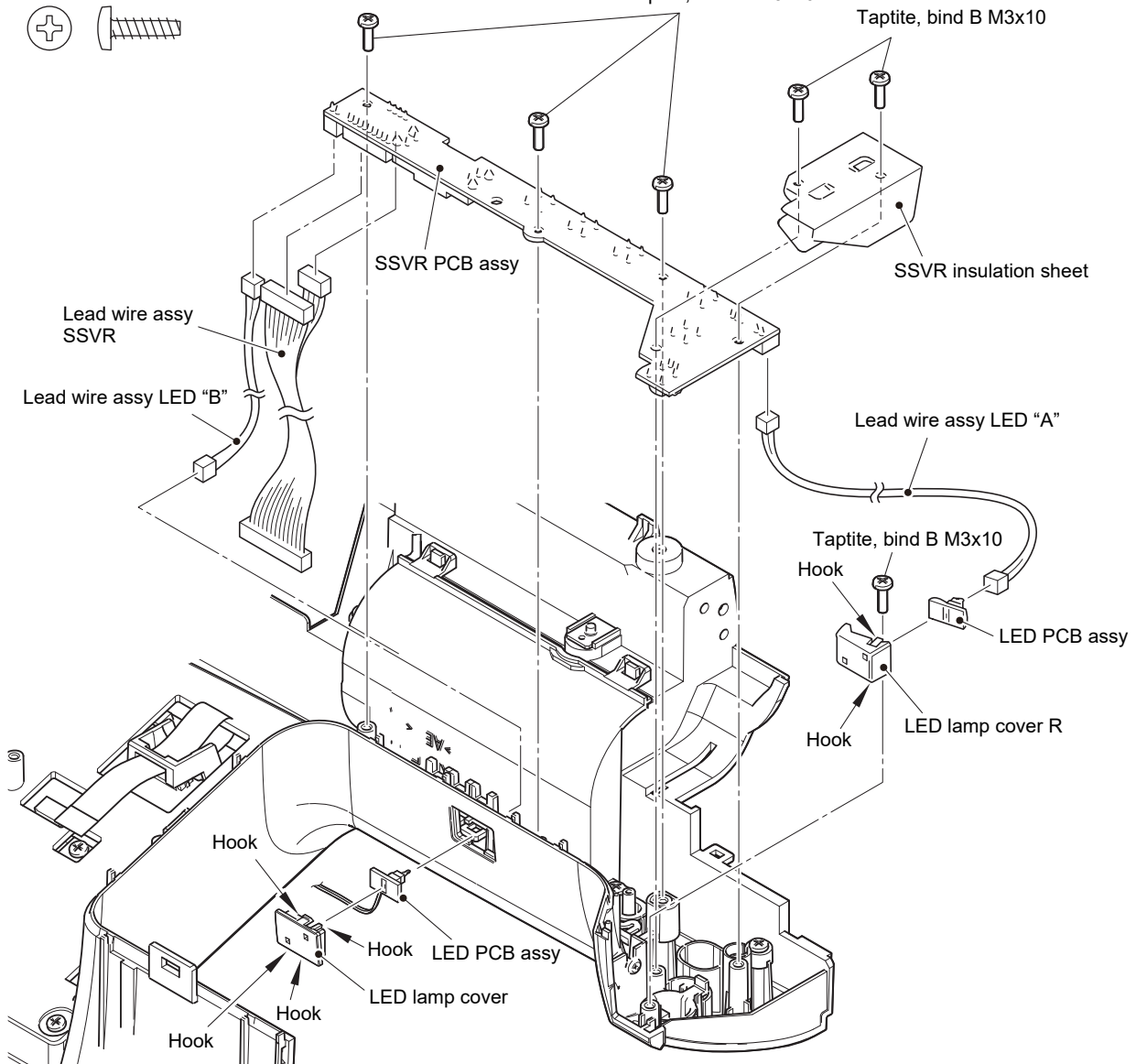
1. Remove the two screws (taptite, bind B M3x10) to remove the SSVR insulation sheet from the SSVR PCB assy. Disconnect the lead wire assy LED "A" from the SSVR PCB assy, and remove the SSVR insulation sheet from the lead wire assy LED "A".
2. Remove the three screws (taptite, bind B M3x10) to remove the SSVR PCB assy.
3. Disconnect the lead wire assy LED "B" and the lead wire assy SSVR from the SSVR PCB assy.
4. Disconnect the lead wire assy LED "A" from LED PCB assy. Remove the screw (taptite, bind B M3x10) to remove the LED lamp cover R. Release the two hooks to remove the LED PCB assy from the LED lamp cover R.
5. Disconnect the lead wire assy LED "B" from LED PCB assy. Release the two hooks to remove the LED lamp cover. Release the two hooks to remove the LED PCB assy from the LED lamp cover.

Taptite, Bind B M3X10



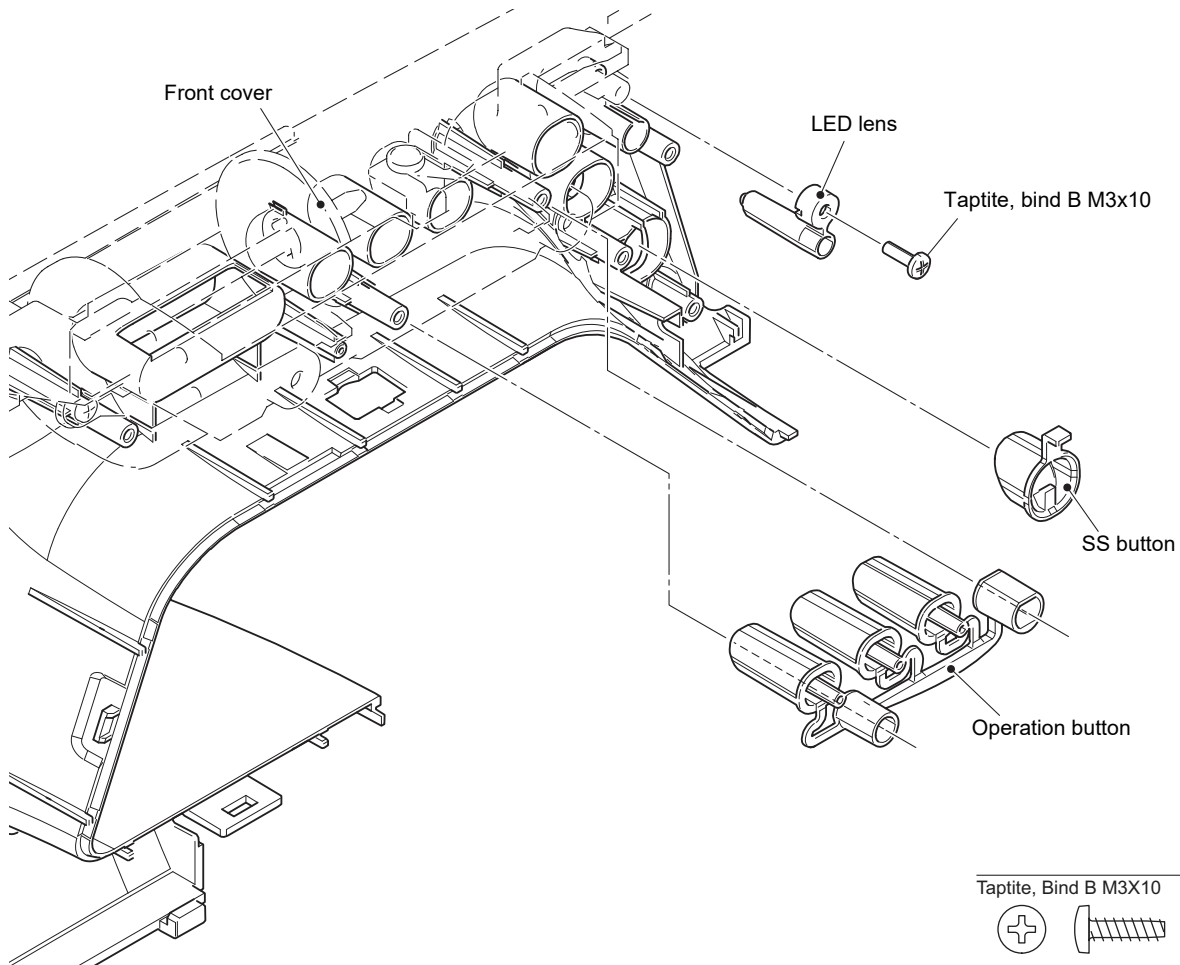
Taptite, bind B M3x10

Taptite, bind B M3x10



3-3 Removal of Buttons

1. Remove the SS button and the operation button from the front cover.
2. Remove the screw (taptite, bind B M3x10) to remove the LED lens from the front cover.

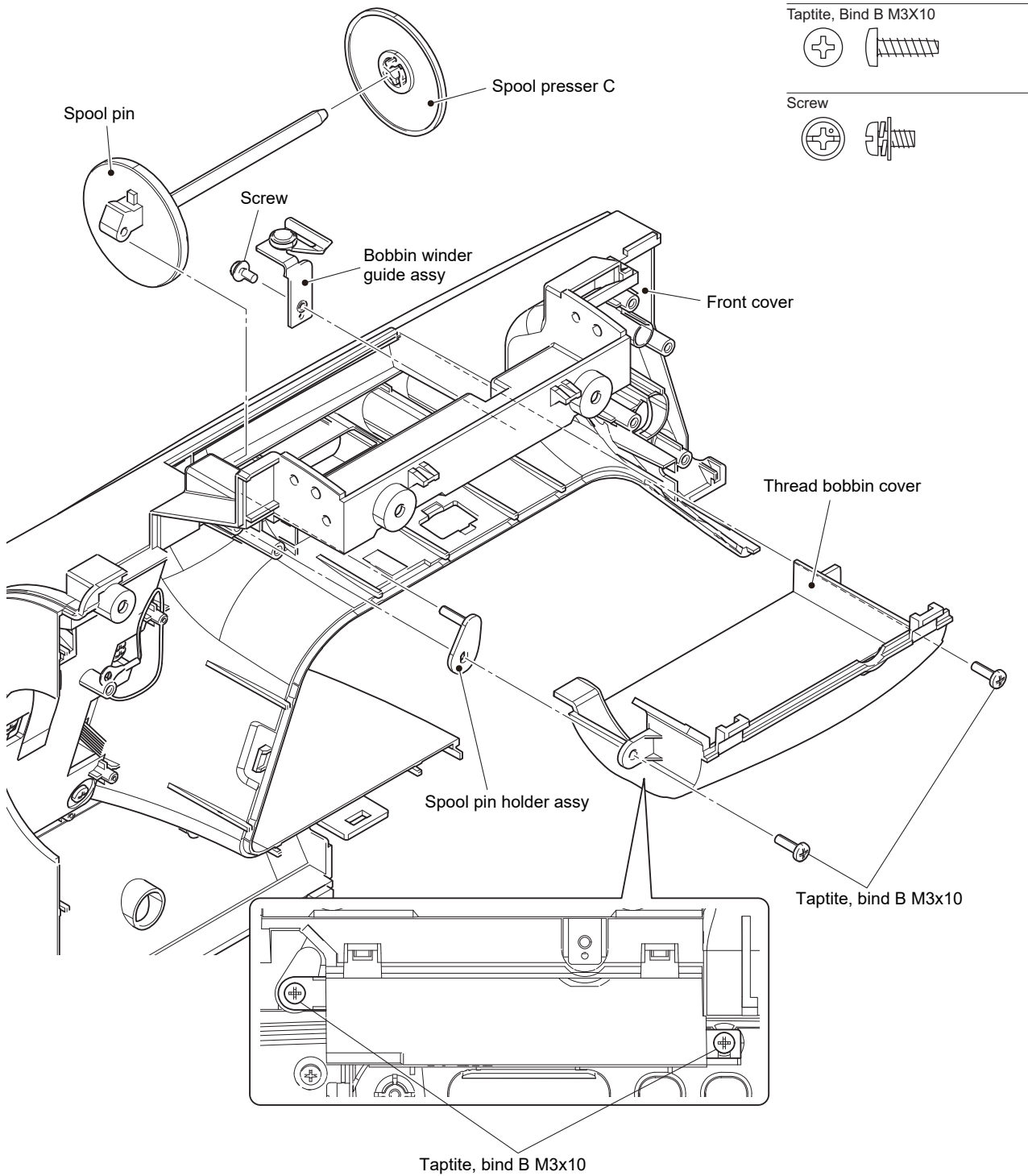


Application of
Disassembly

Application of
Disassembly

3-4 Removal of Thread bobbin cover, Spool pin, Spool presser C and Bobbin winder guide assy

1. Remove the two screws (taptite, bind B M3x10) to remove the thread bobbin cover from the front cover.
2. Remove the spool pin holder assy to remove the spool pin from the front cover. Remove the spool presser C from the spool pin.
3. Remove the screw (screw) to remove the bobbin winder guide assy from the front cover.

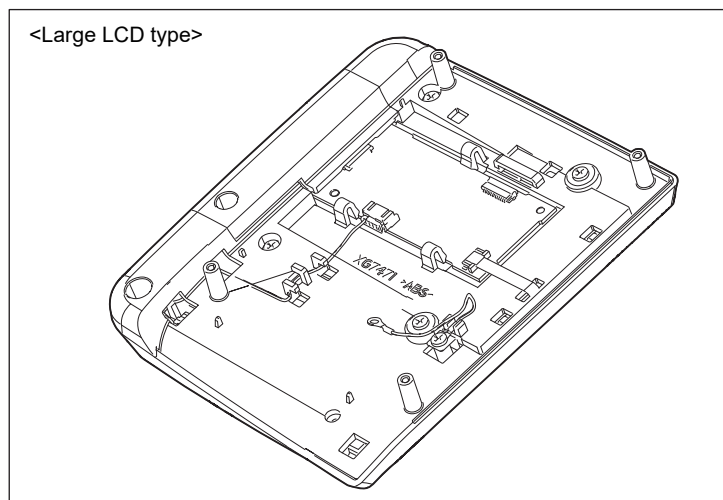
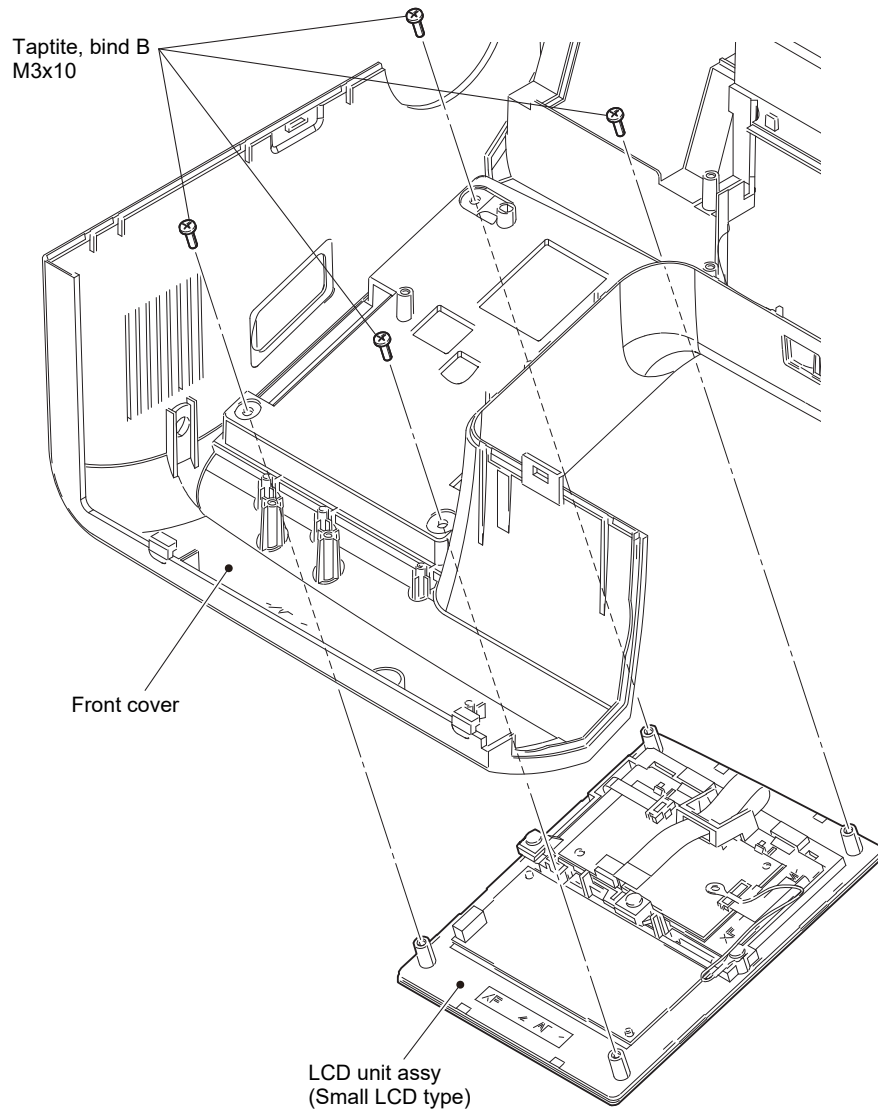


Application of
Disassembly

Application of
Disassembly

3-5 Removal of LCD unit assy

1. Remove the four screws (taptite, bind B M3x10) to remove the LCD unit assy from the front cover.



Taptite, Bind B M3X10



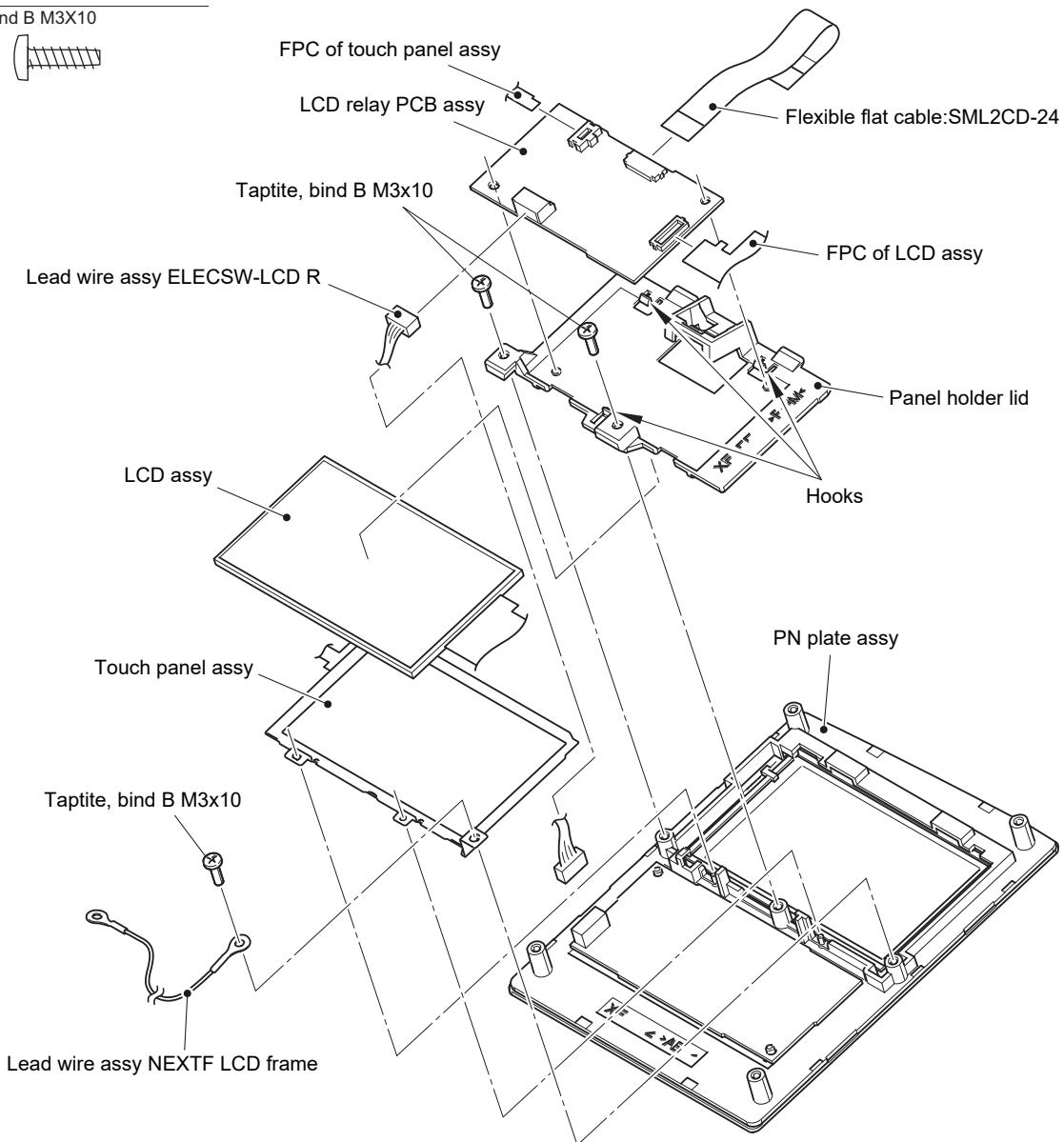
3-6 Disassembly of LCD unit assy

■ Small LCD type <In case of large LCD type, refer to next page>

3-6-1 Removal of LCD relay PCB assy, LCD assy and Touch panel assy

1. Disconnect the lead wire assy ELECSW-LCD R from the LCD relay PCB assy and the PN plate assy.
2. Remove the screw (taptite, bind B M3x10) to disconnect the lead wire assy NEXTF LCD frame.
3. Release the lock to disconnect the FPC of LCD assy from the LCD relay PCB assy. Release the lock to disconnect the FPC of touch panel assy from the LCD relay PCB assy.
4. Remove the two screws (taptite, bind B M3x10) to remove the panel holder lid from the PN plate assy.
5. Release the three hooks to remove the LCD relay PCB assy from the panel holder lid.
6. Release the lock to disconnect the flexible flat cable:SML2CD-24 from the LCD relay PCB assy.
7. Remove the LCD assy from the PN plate assy. Remove the touch panel assy from the PN plate assy.

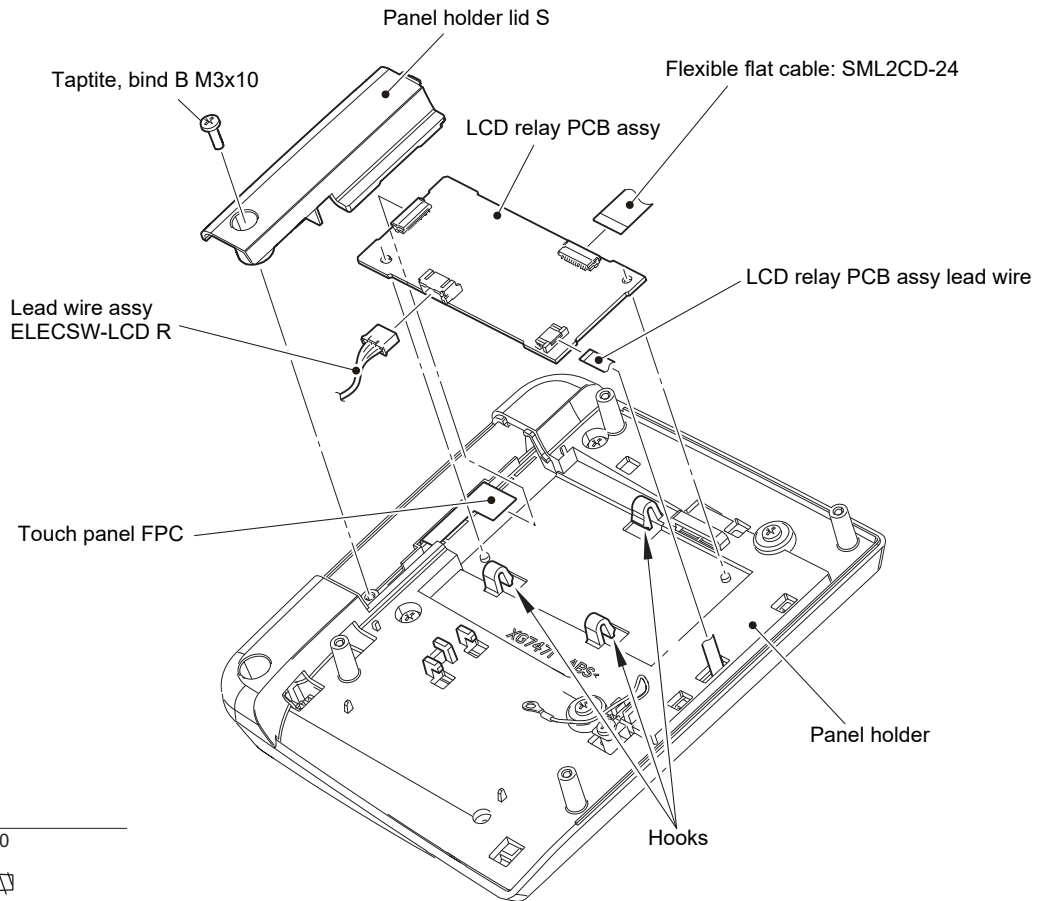
Taptite, Bind B M3X10



■ Large LCD type <In case of small LCD type, refer to previous page>

3-6-1 Removal of Panel holder lid S and LCD relay PCB assy

1. Remove the screw (taptite, bind B M3x10) to remove the panel holder lid S from the panel holder.
2. Disconnect the each harness from the LCD relay PCB assy.
3. Release the three hooks to remove the LCD relay PCB assy from the panel holder.



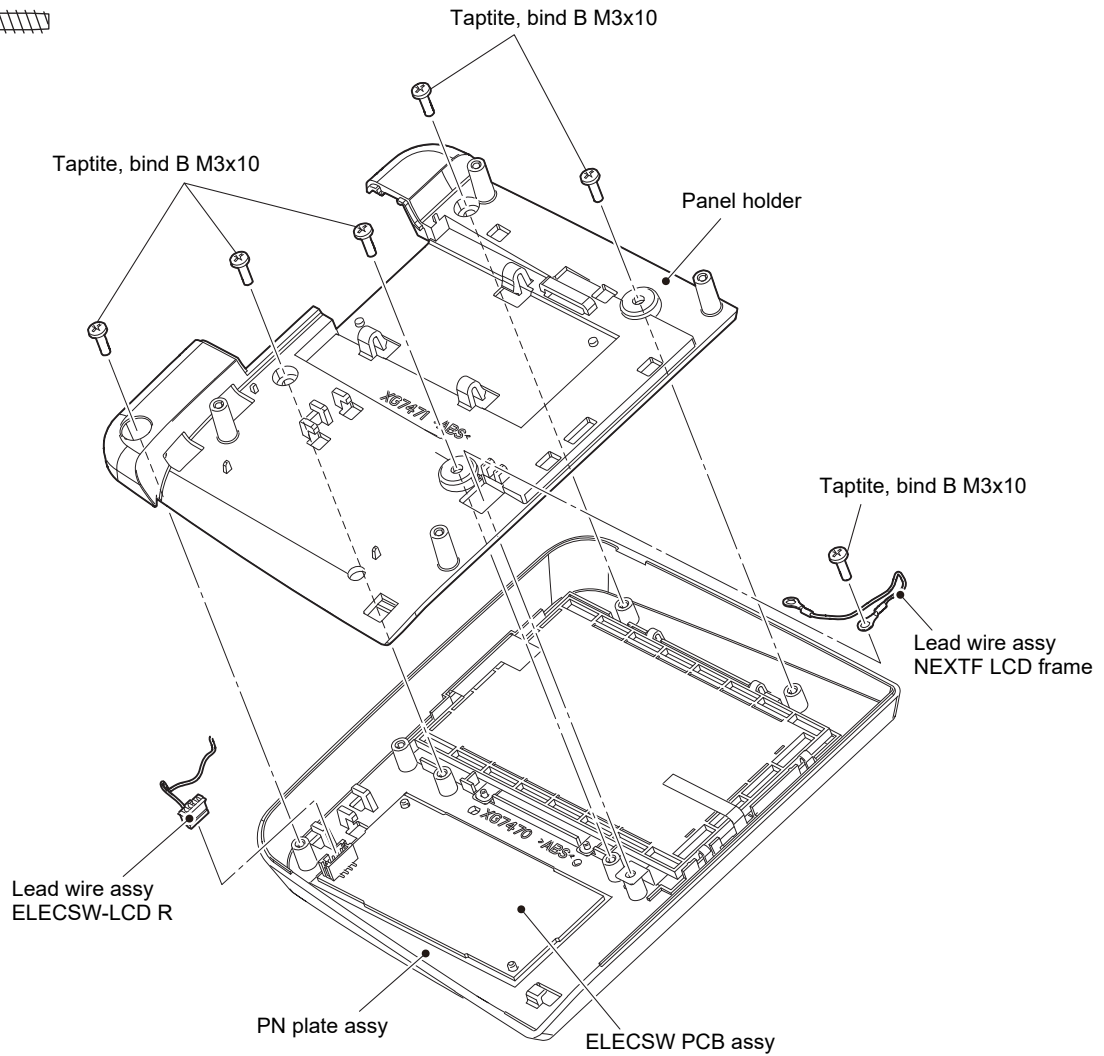
Application of
Disassembly

Application of
Disassembly

3-6-2 Removal of Panel holder

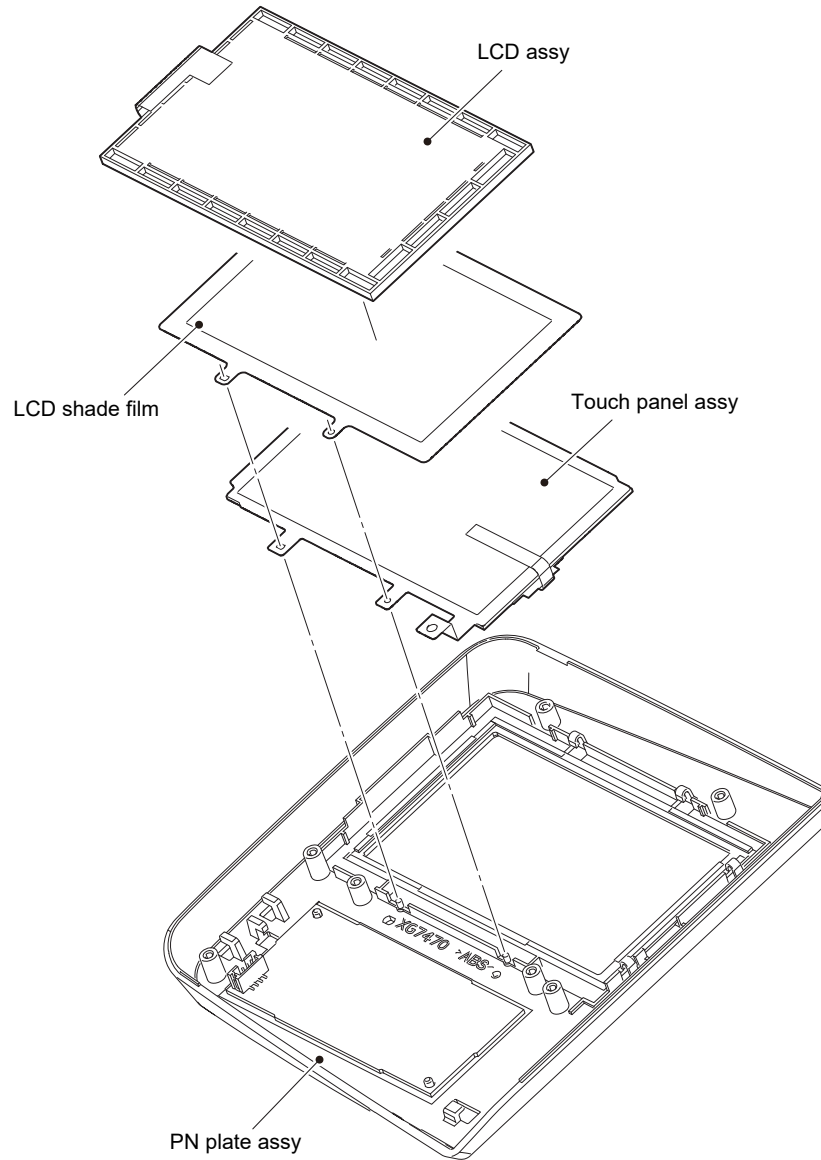
1. Remove the screw (taptite, bind B M3x10) to remove the lead wire assy NEXTF LCD frame from the PN plate assy.
2. Remove the five screws (taptite, bind B M3x10) to remove the panel holder from the PN plate assy.
3. Disconnect the lead wire assy ELECSW-LCD R from the ELECSW PCB assy.

Taptite, Bind B M3X10



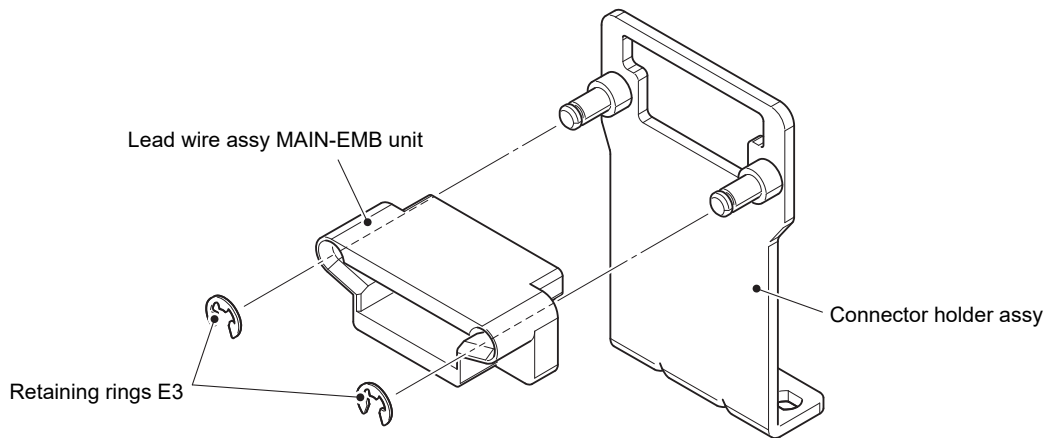
3-6-3 Removal of LCD assy and Touch panel assy

1. Remove the LCD assy from the PN plate assy.
2. Remove the LCD shade film from the PN plate assy.
3. Remove the touch panel assy from the PN plate assy.



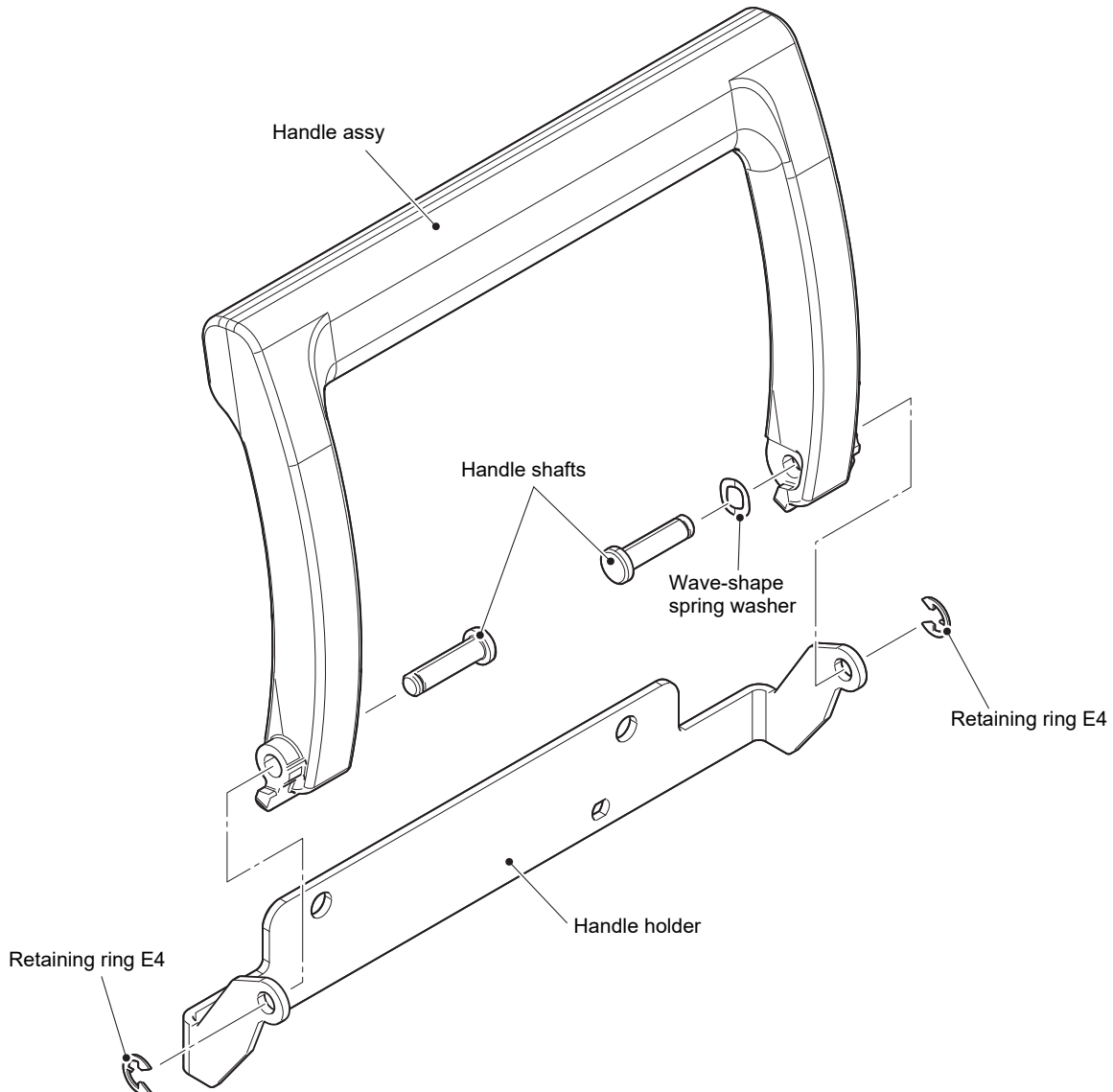
4 Disassembly of Connector holder assy

1. Remove the two retaining rings E3 to remove the lead wire assy MAIN-EMB unit from the connector holder assy.



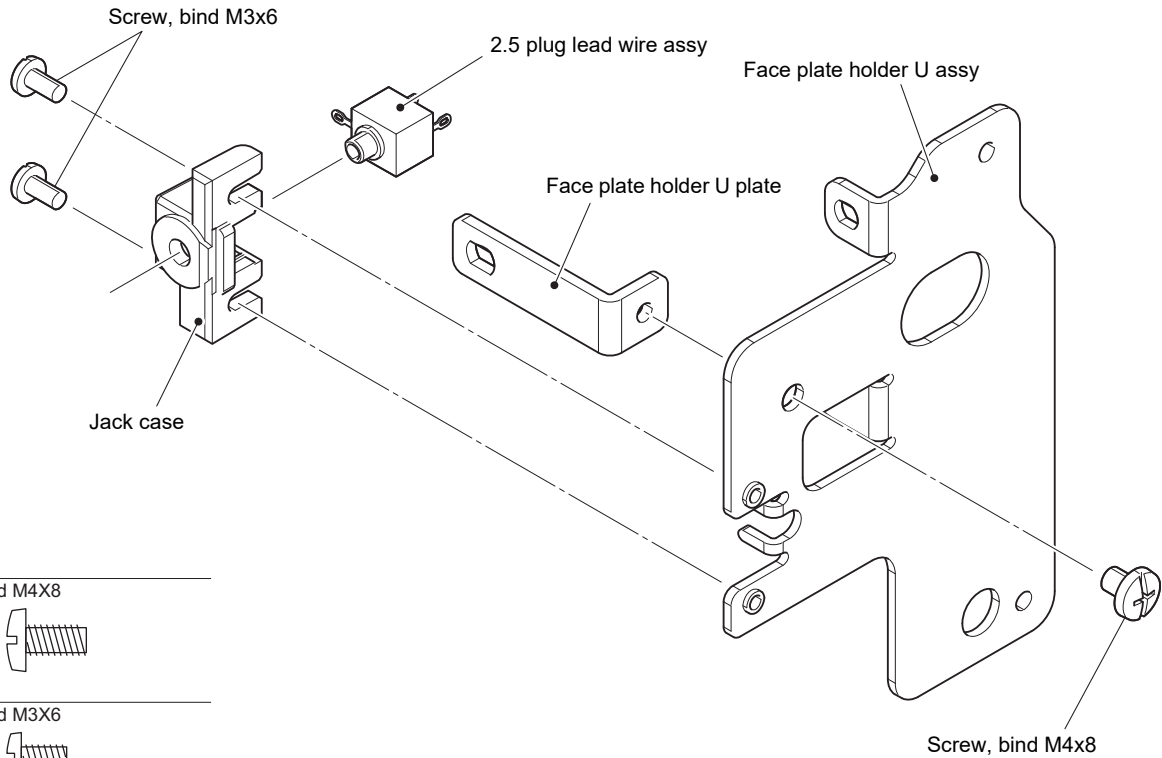
5 Disassembly of Handle assy

1. Remove the two retaining rings E4 to remove the two handle shafts and the wave-shape spring washer from the handle assy.
2. Remove the handle assy from the handle holder.



6 Disassembly of Face plate holder U assy

1. Remove the screw (screw, bind M4x8) to remove the face plate holder U plate from the face plate holder U assy.
2. Remove the two screws (screw, bind M3x6) to remove the jack case from the face plate holder U assy.
3. Remove the 2.5 plug lead wire assy from the jack case.

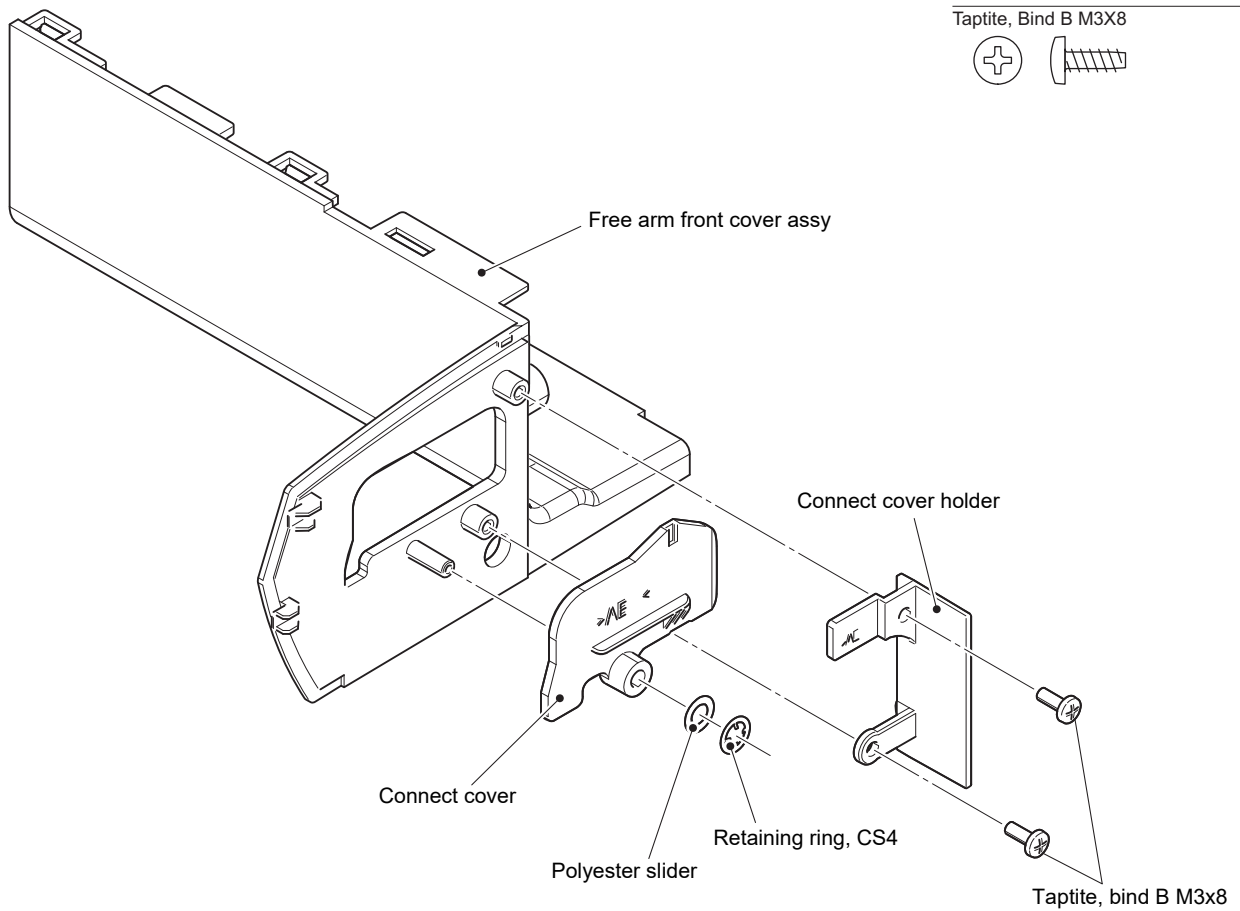


Application of
Disassembly

Application of
Disassembly

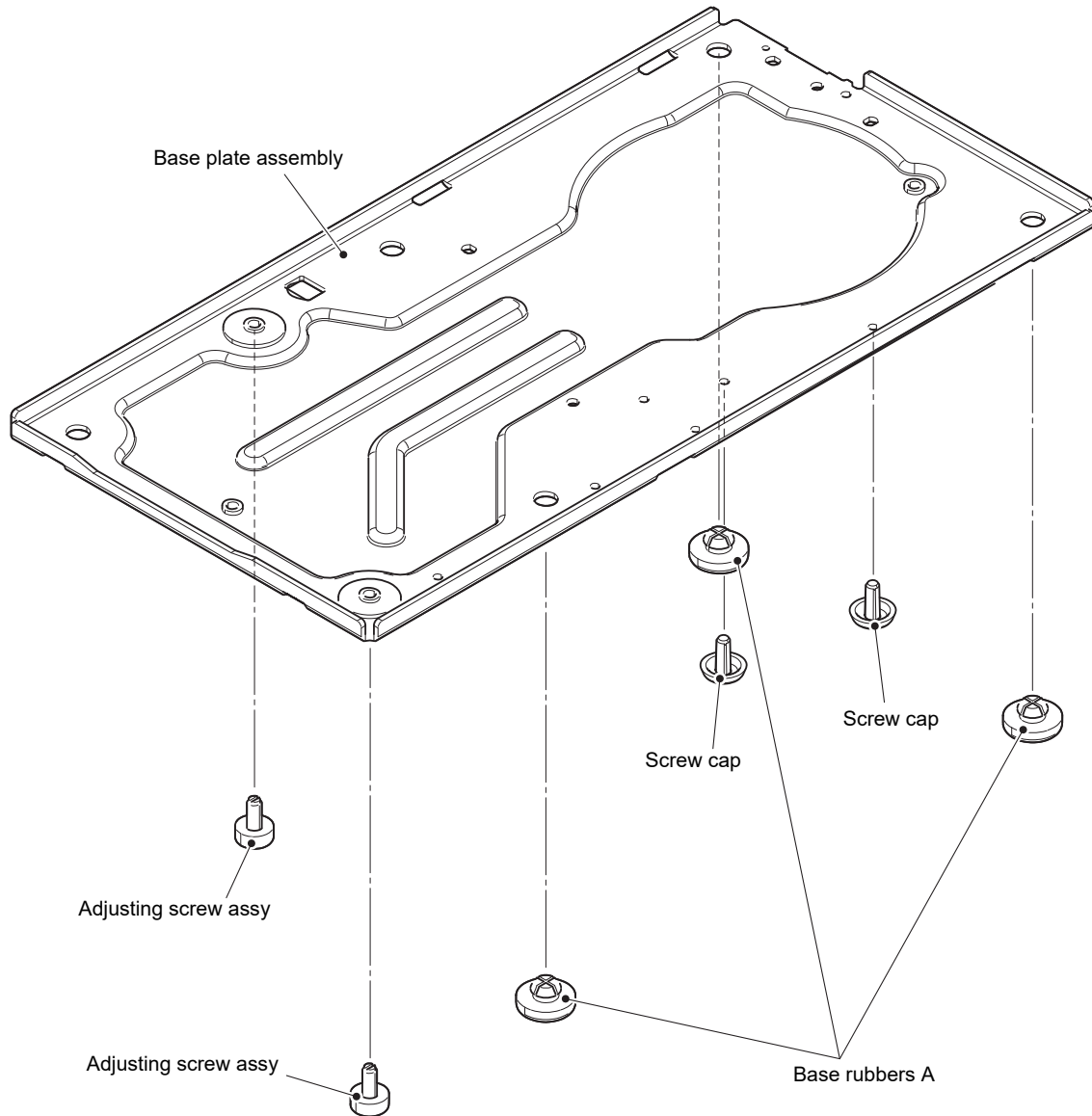
7 Disassembly of Free arm front cover assy

1. Remove the two screws (taptite, bind B M3x8) to remove the connect cover holder from the free arm front cover assy.
2. Remove the retaining ring, CS4 to remove the polyester slider and the connect cover from the free arm front cover assy.

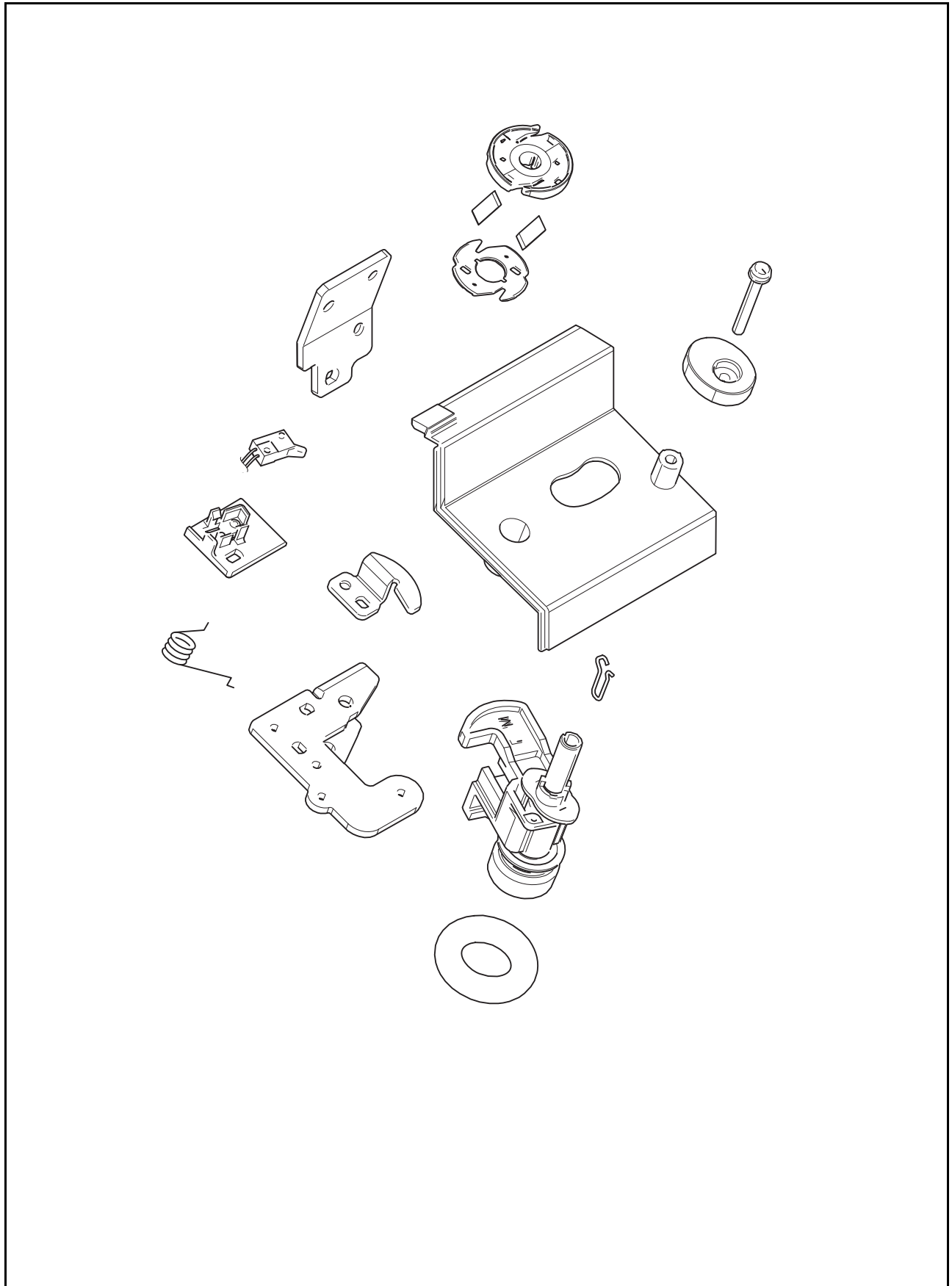


8 Disassembly of Base plate assembly

1. Remove the adjusting screw assy from the base plate assembly (two locations).
2. Remove the three base rubbers A from the base plate assembly.
3. Remove the two screw caps from the base plate assembly.



Bobbin winding mechanism location diagram



Application of Disassembly

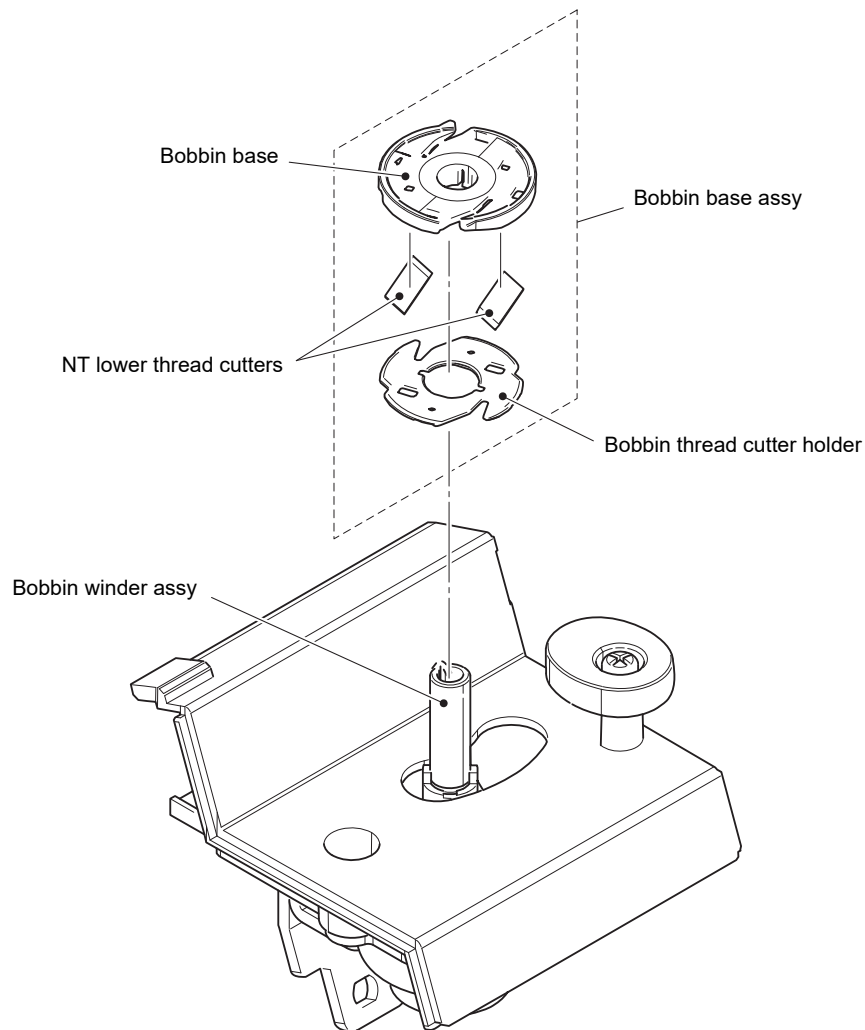
Application of Disassembly

1 Removal of Bobbin base assy

1. Remove the bobbin base assy from the bobbin winder assy.

1-1 Disassembly of Bobbin base assy

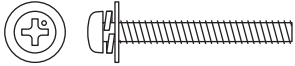
1. Remove the bobbin thread cutter holder from the bobbin base.
2. Remove the two NT lower thread cutters from the bobbin base.



2 Removal of Bobbin presser, Bobbin winder assy holder and Bobbin winder shaft stopper

1. Remove the bobbin winder shaft spring from the bobbin winder assy.
2. Remove the screw (screw, pan (S/P washer) M3x25) to remove the bobbin presser and nut 2 M3 from the bobbin winder cover printed.
3. Remove the screw (screw) to remove the bobbin winder assy holder from the bobbin winder cover printed.
4. Remove the screw (screw, bind M3x6) to remove the bobbin winder shaft stopper from the bobbin winder assy holder.

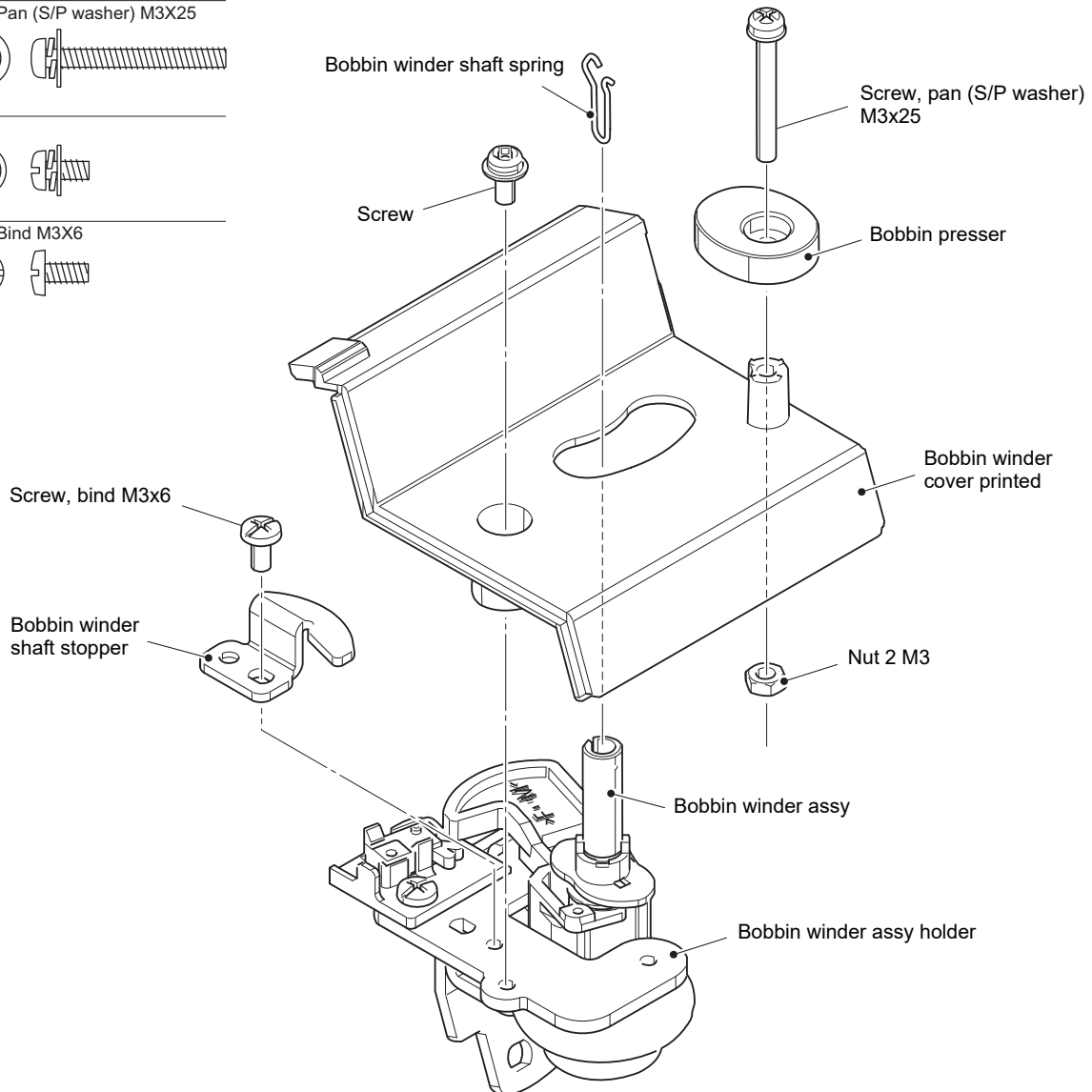
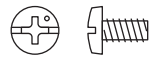
Screw, Pan (S/P washer) M3X25



Screw

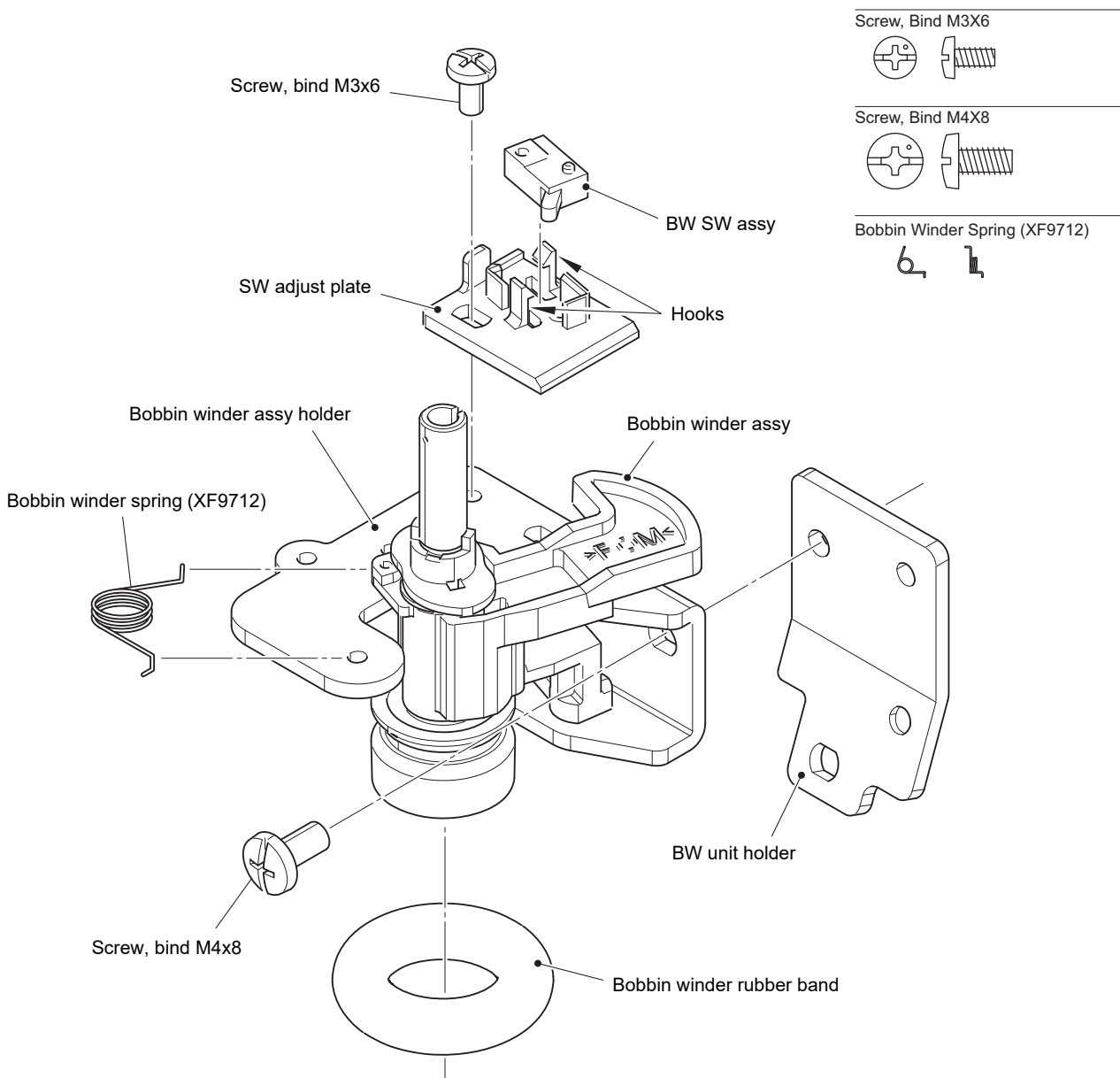


Screw, Bind M3X6



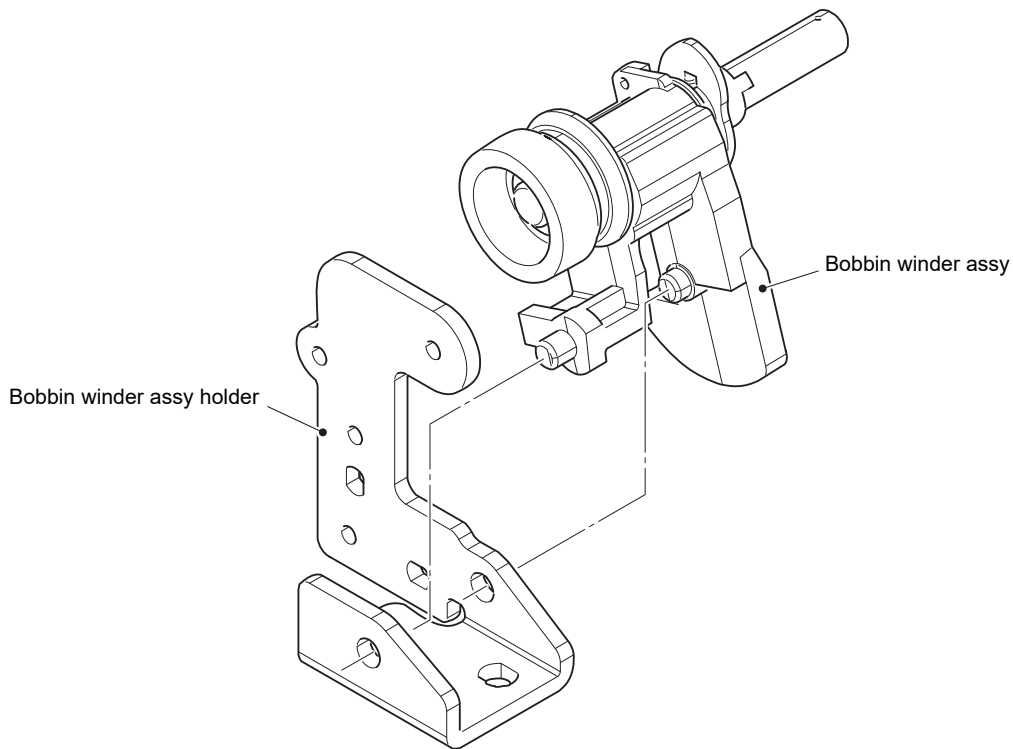
3 Removal of BW SW assy, BW unit holder, Bobbin winder spring and Bobbin winder rubber band

1. Release the two hooks to remove the BW SW assy from the SW adjust plate.
2. Remove the screw (screw, bind M3x6) to remove the SW adjust plate from the bobbin winder assy holder.
3. Remove the screw (screw, bind M4x8) to remove the BW unit holder from the bobbin winder assy holder.
4. Remove the bobbin winder spring (XF9712) from the bobbin winder assy and the bobbin winder assy holder.
5. Remove the bobbin winder rubber band from the bobbin winder assy.

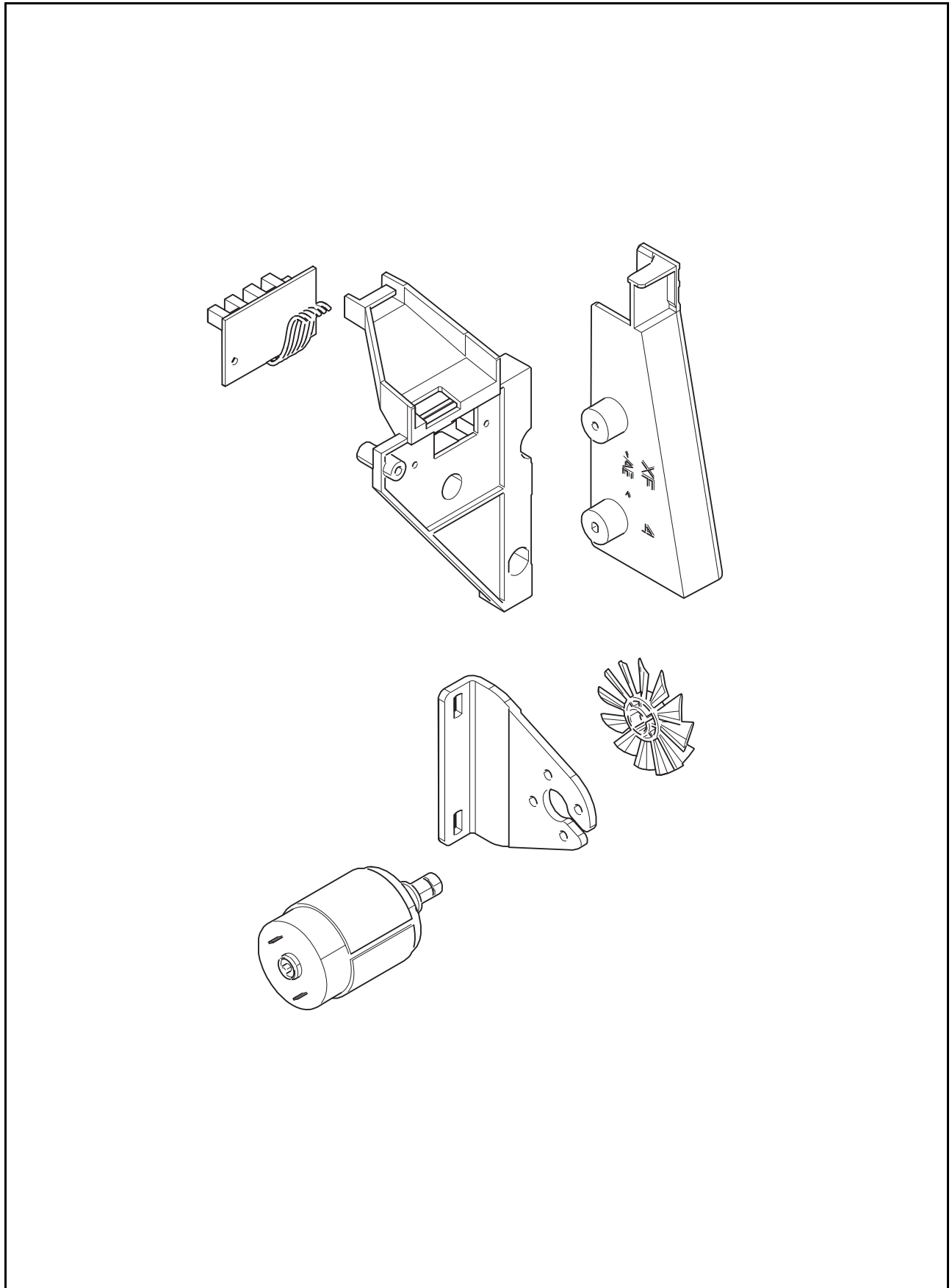


4 Removal of Bobbin winder assy

1. Remove the bobbin winder assy from the bobbin winder assy holder.



Electric parts and Main motor unit location diagram

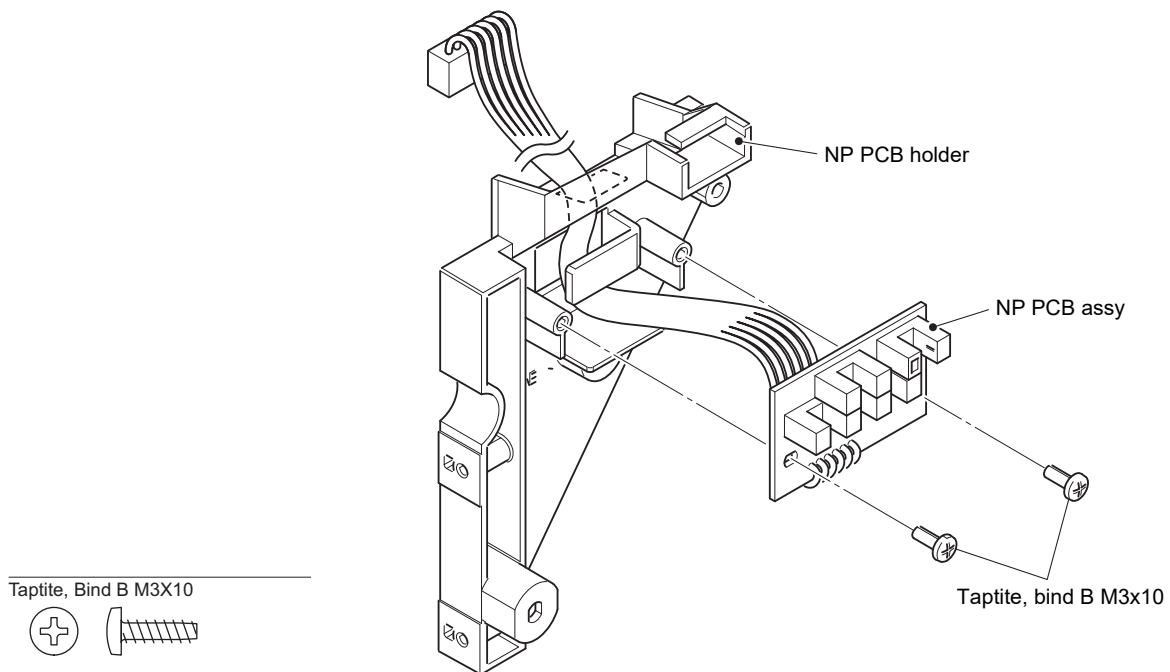


Application of Disassembly

Application of Disassembly

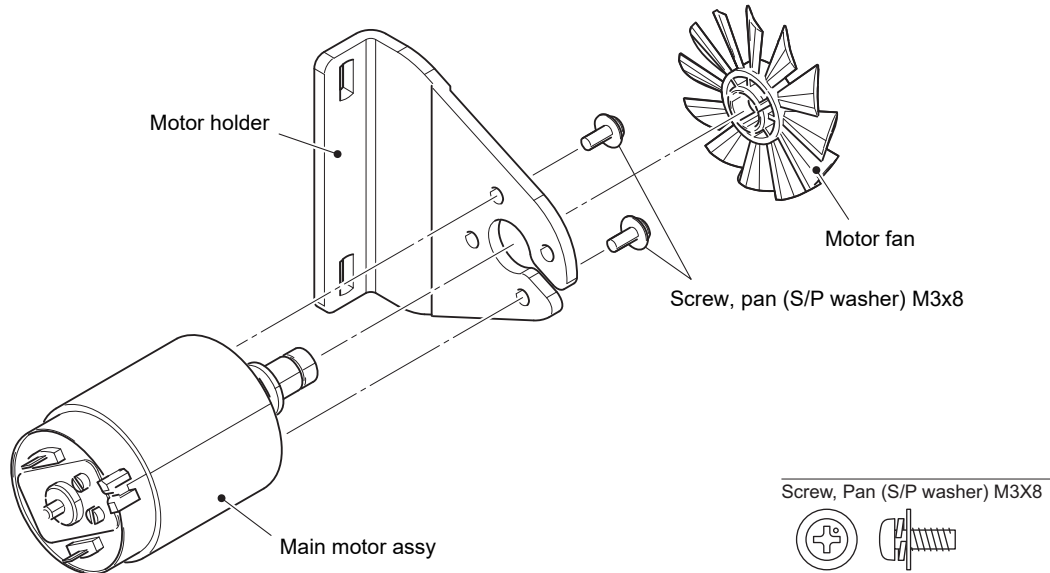
1 Removal of NP PCB assy

1. Remove the two screws (taptite, bind B M3x10) to remove the NP PCB assy from the NP PCB holder.

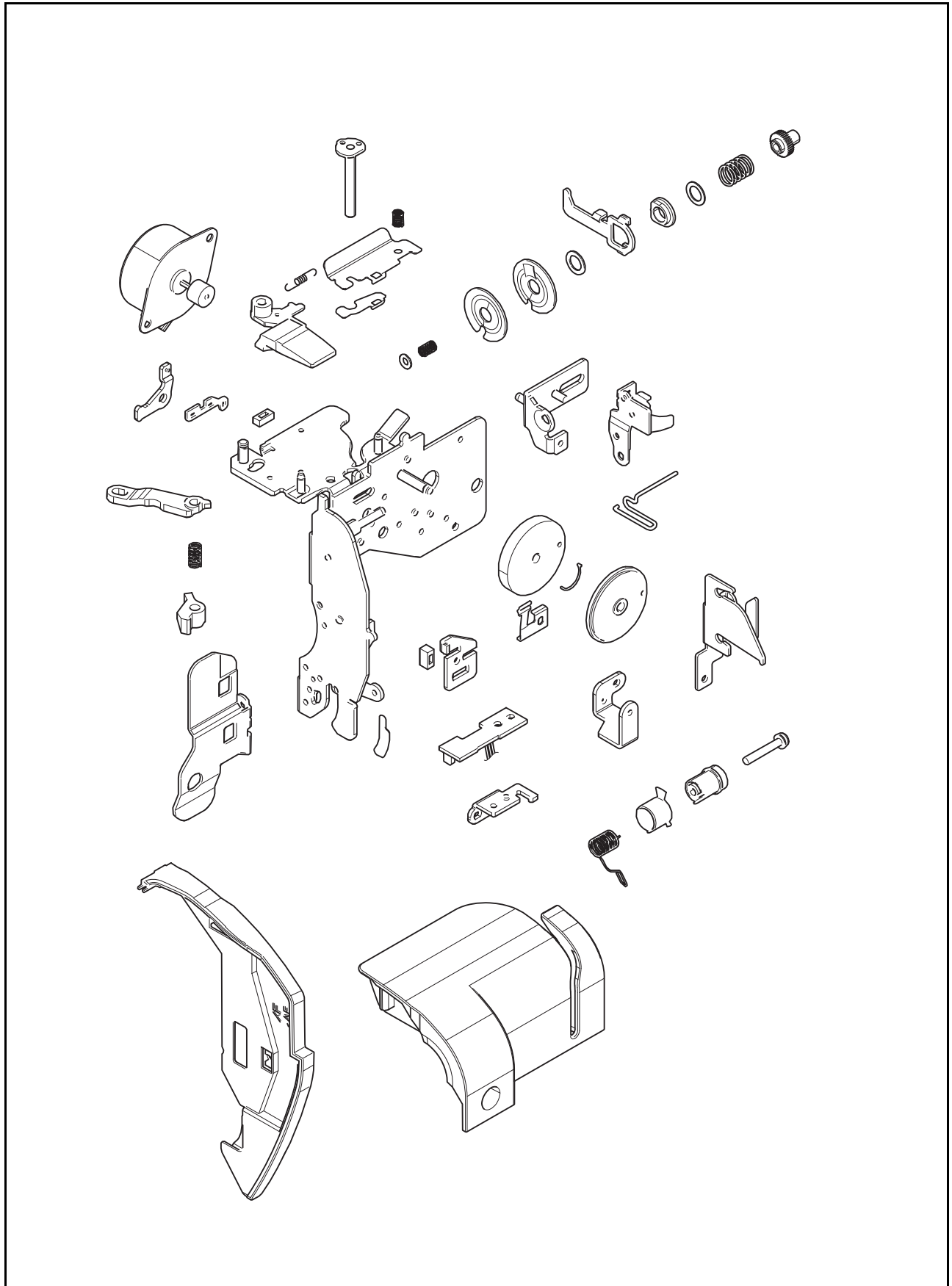


2 Removal of Main motor assy

1. Remove the motor fan from the main motor assy.
2. Remove the two screws (screw, pan (S/P washer) M3x8) to remove the main motor assy from the motor holder.



Needle threading mechanism location diagram

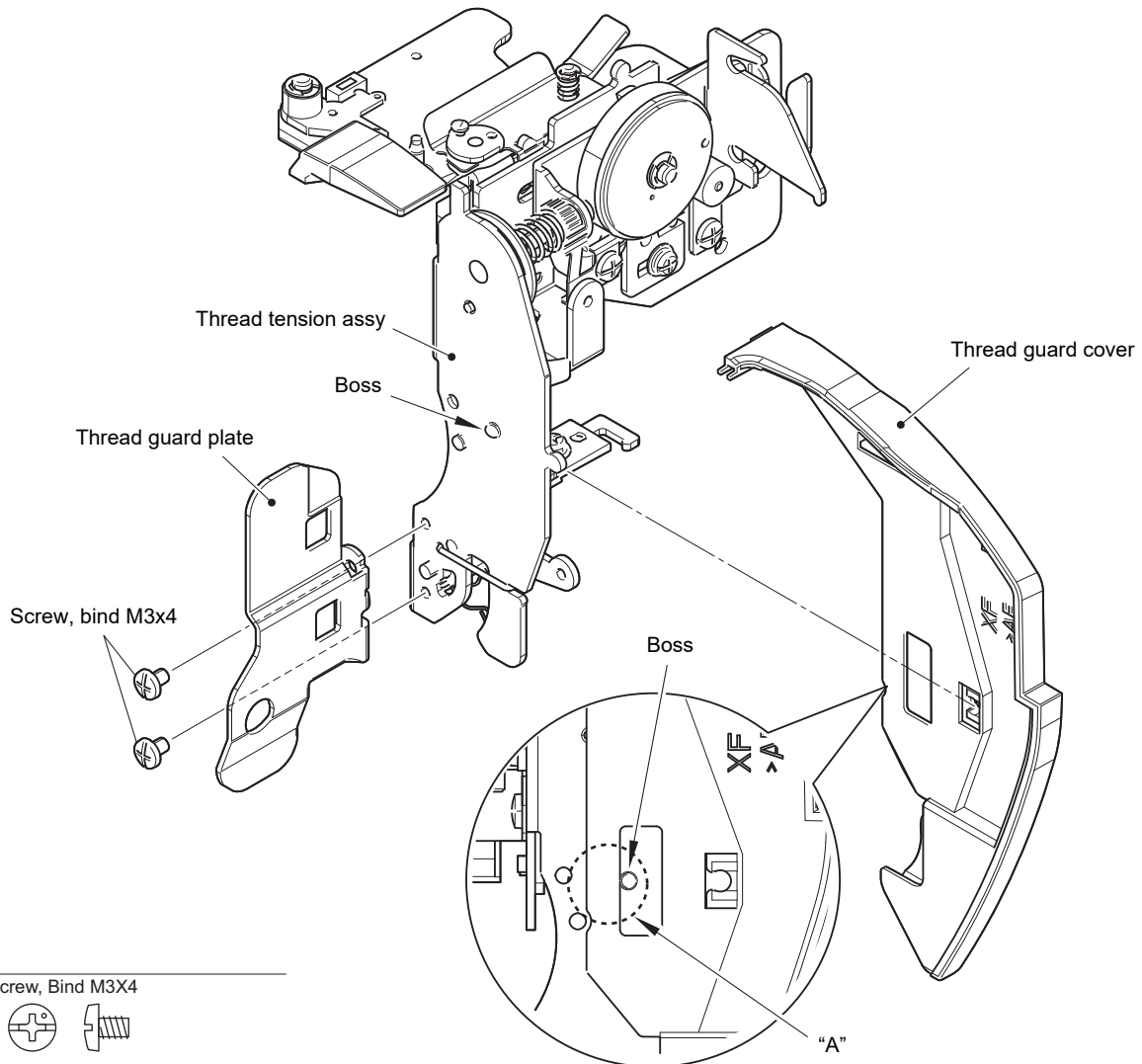


Application of
Disassembly

Application of
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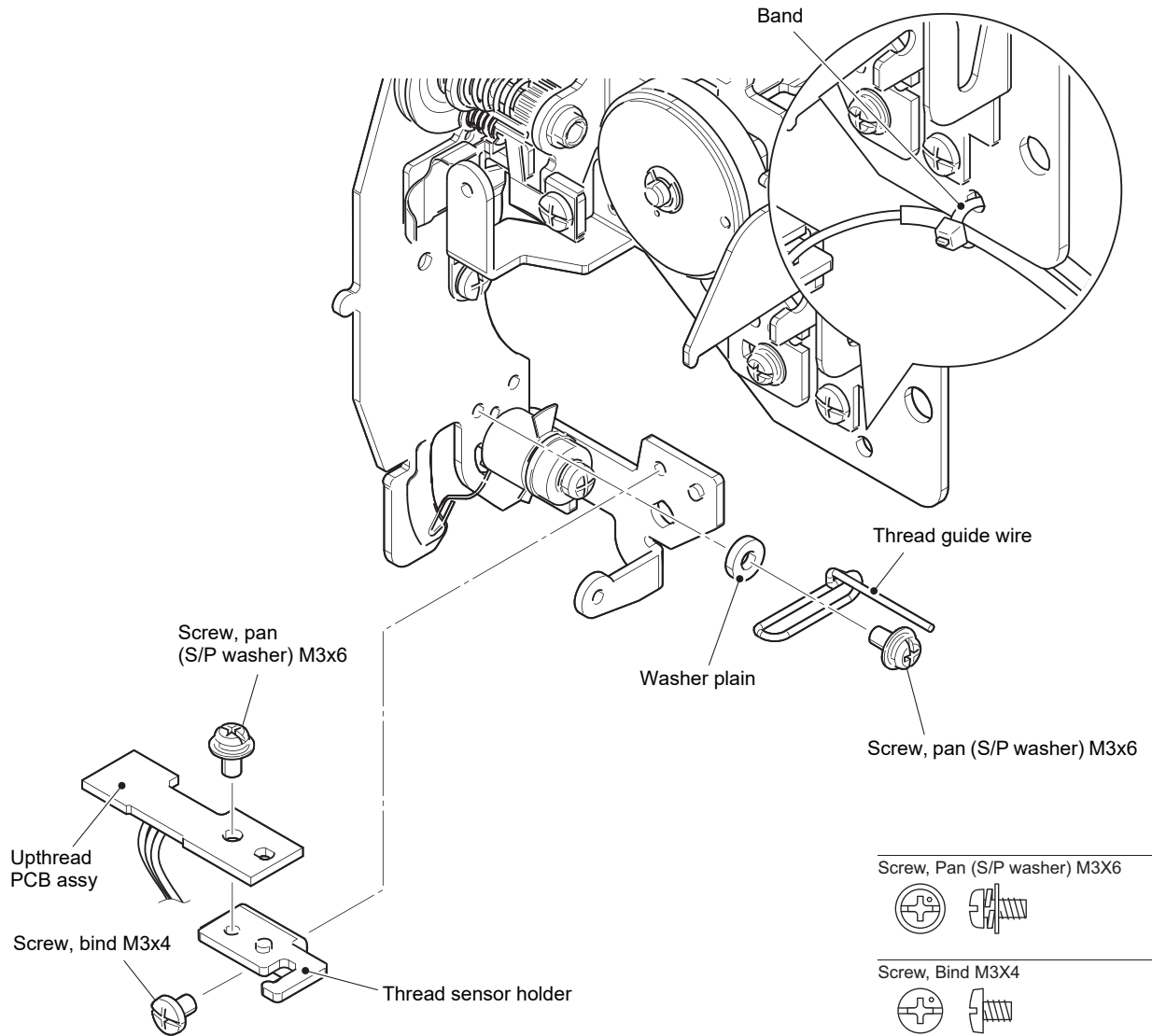
1 Removal of Thread guard cover

1. Remove the thread guard cover while lifting the section "A" to get over the boss of thread tension assy.
2. Remove the two screws (screw, bind M3x4) to remove the thread guard plate.



2 Removal of Upthread PCB assy and Thread guide wire

1. Cut the band. Remove the screw (screw, pan (S/P washer) M3x6) to remove the upthread PCB assy from the thread sensor holder.
2. Remove the screw (screw, bind M3x4) to remove the thread sensor holder.
3. Remove the screw (screw, pan (S/P washer) M3x6) to remove the thread guide wire and washer plain.

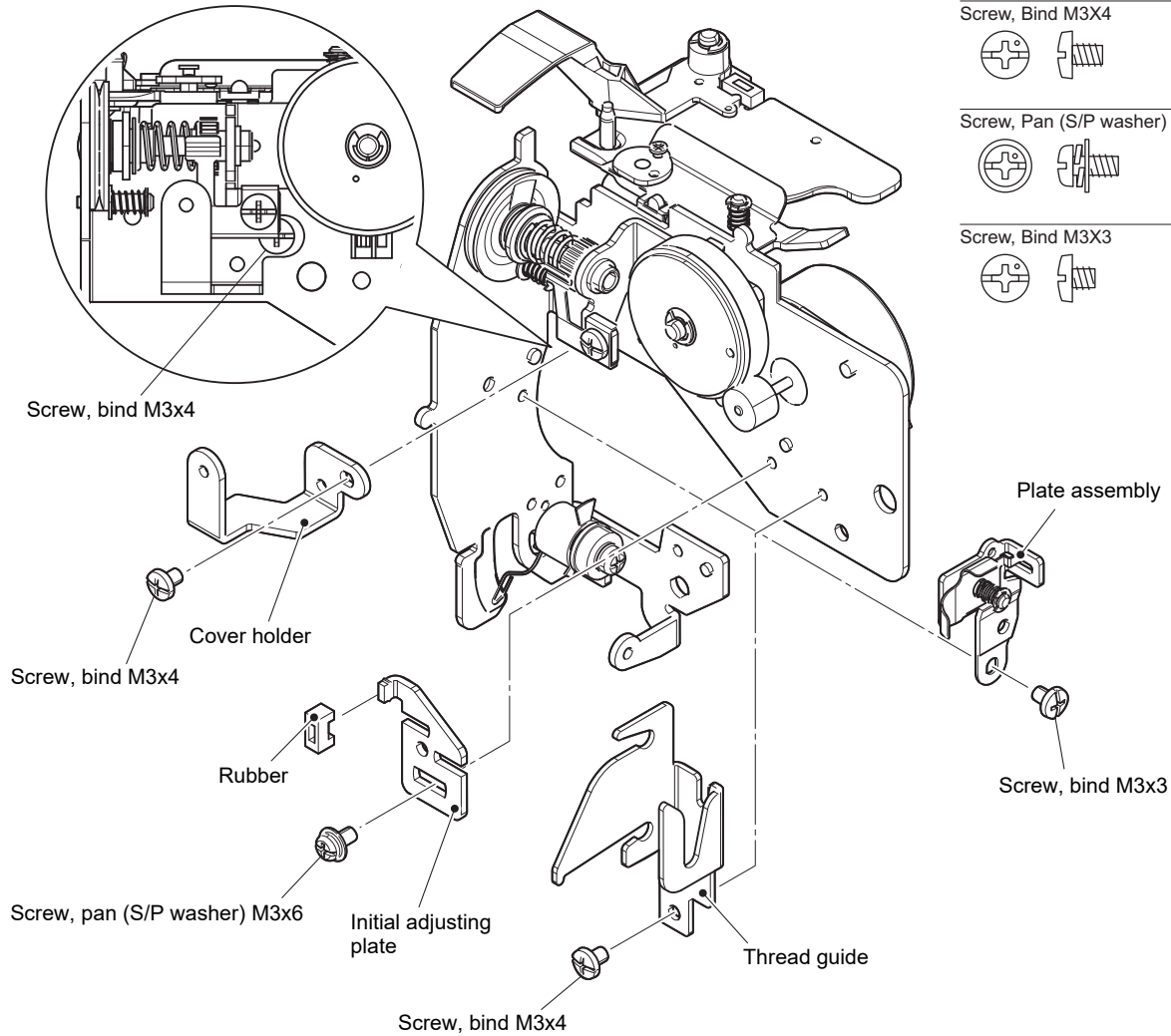


Application of
Disassembly

Application of
Disassembly

3 Removal of Thread guide, Initial adjusting plate, Cover holder and Plate assembly

1. Remove the screw (screw, bind M3x4) to remove the thread guide.
2. Remove the screw (screw, pan (S/P washer) M3x6) to remove the initial adjusting plate. Remove the rubber from the initial adjusting plate.
3. Remove the screw (screw, bind M3x4) to remove the cover holder.
4. Remove the screw (screw, bind M3x3) to remove the plate assembly.



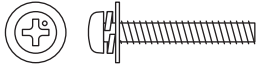
Application of
Disassembly

Application of
Disassembly

4 Removal of Thread catching spring case and Thread cutting shutter

1. Remove the screw (screw, pan (S/P washer) M3x20) to remove the thread catching spring case, the thread cutting shutter and the thread take up spring (XC6957) from the thread tension assy.
2. Remove the spring tape from the thread tension assy.

Screw, Pan (S/P washer) M3x20



Thread Take Up Spring (XC6957)



Thread tension assy

Spring tape

Thread take up spring (XC6957)

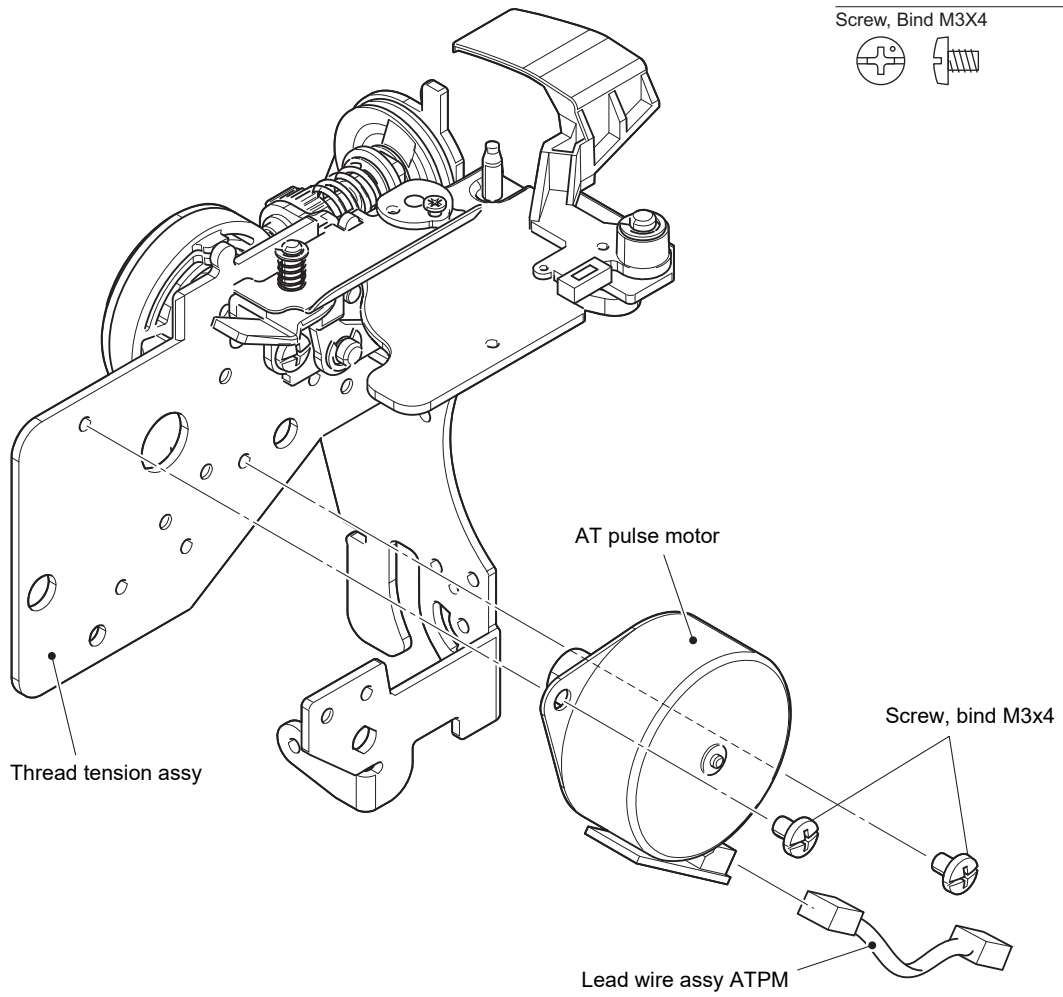
Thread cutting shutter

Thread catching spring case

Screw, pan (S/P washer) M3x20

5 Removal of AT pulse motor, Thread tension gear cover and Thread tension cam

1. Remove the two screws (screw, bind M3x4) to remove the AT pulse motor from the thread tension assy, and disconnect the lead wire assy ATPM from the AT pulse motor.

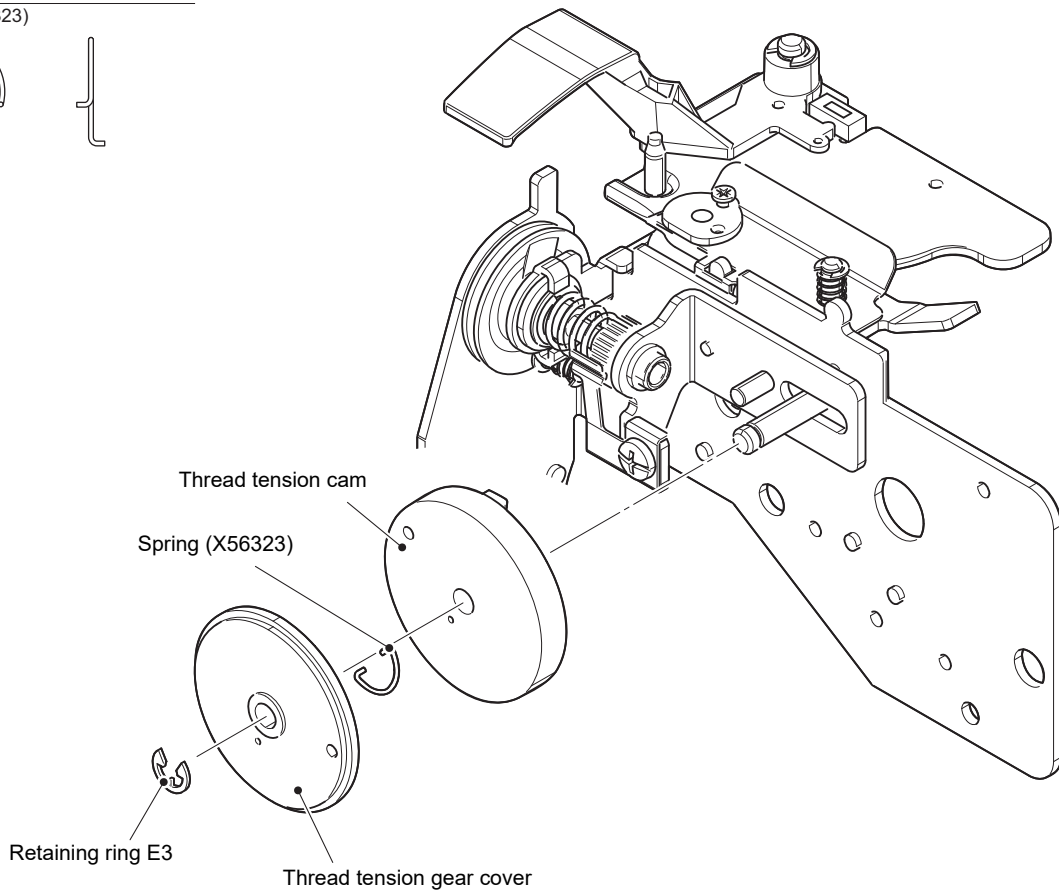


Application of
Disassembly

Application of
Disassembly

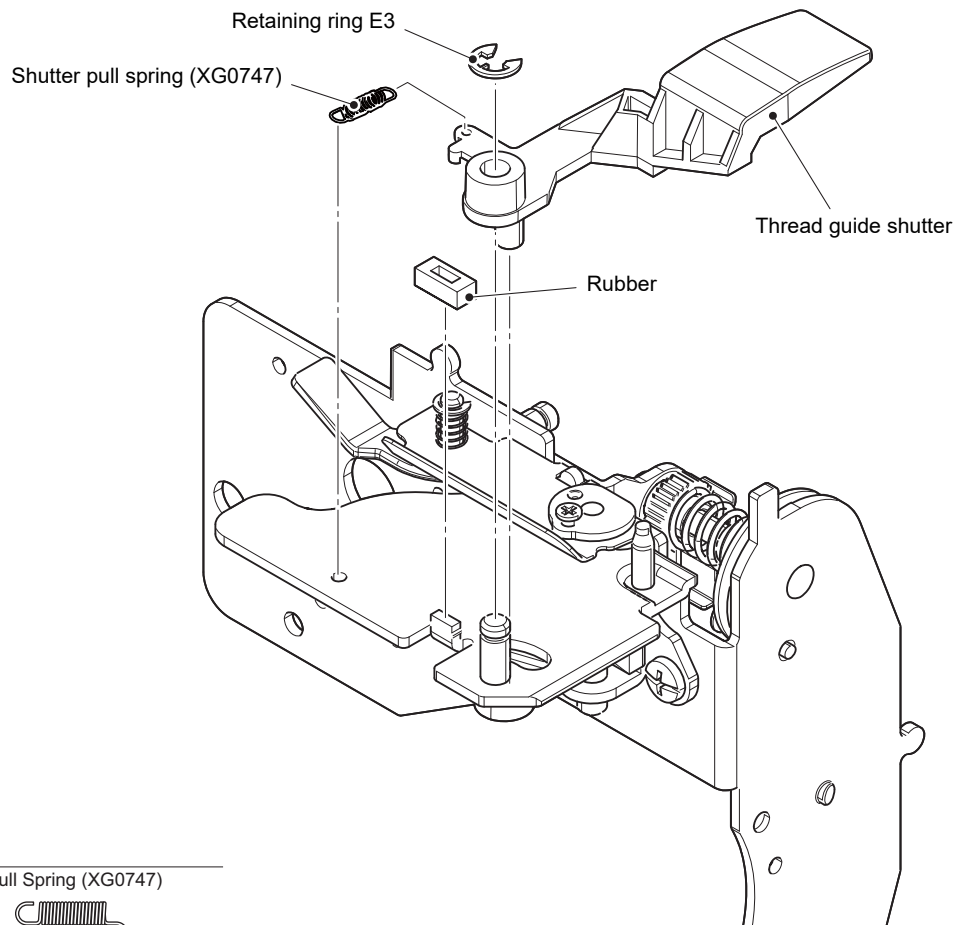
2. Remove the retaining ring E3 to remove the thread tension gear cover, the spring (X56323) and the thread tension cam.

Spring (X56323)



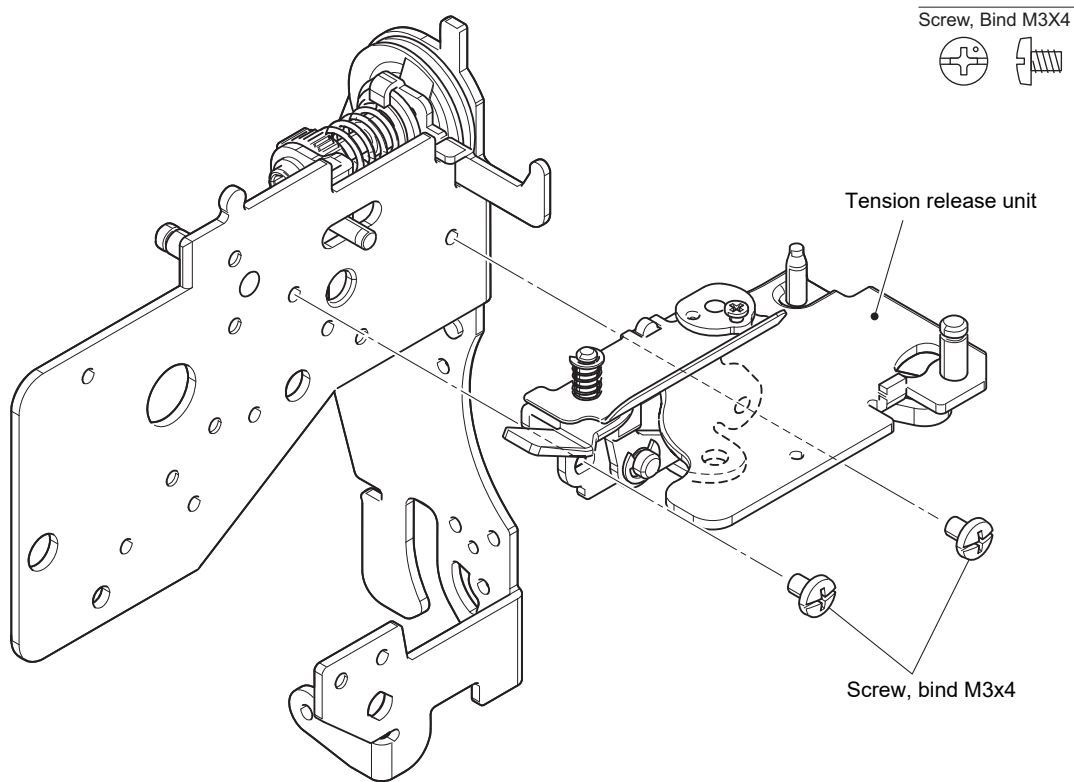
6 Removal of Thread guide shutter

1. Remove the shutter pull spring (XG0747).
2. Remove the retaining ring E3, and remove the thread guide shutter.
3. Remove the rubber.

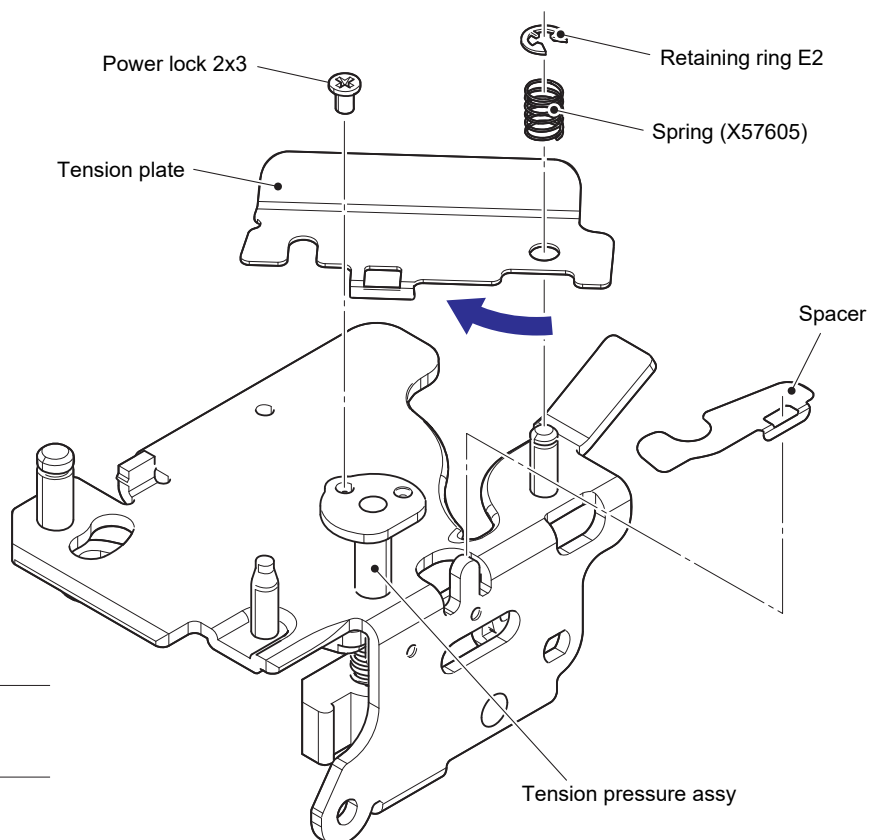


7 Removal of Tension release unit and Tension plate

1. Remove the two screws (screw, bind M3x4) to remove the tension release unit.



2. Remove the screw (power lock 2x3) from the tension pressure assy.
3. Remove the retaining ring E2 to remove the spring (X57605).
4. Turn the tension plate in the direction of the arrow while lifting the tension pressure assy, and remove the tension plate.
5. Remove the spacer while lifting the tension pressure assy.



Power Lock 2X3

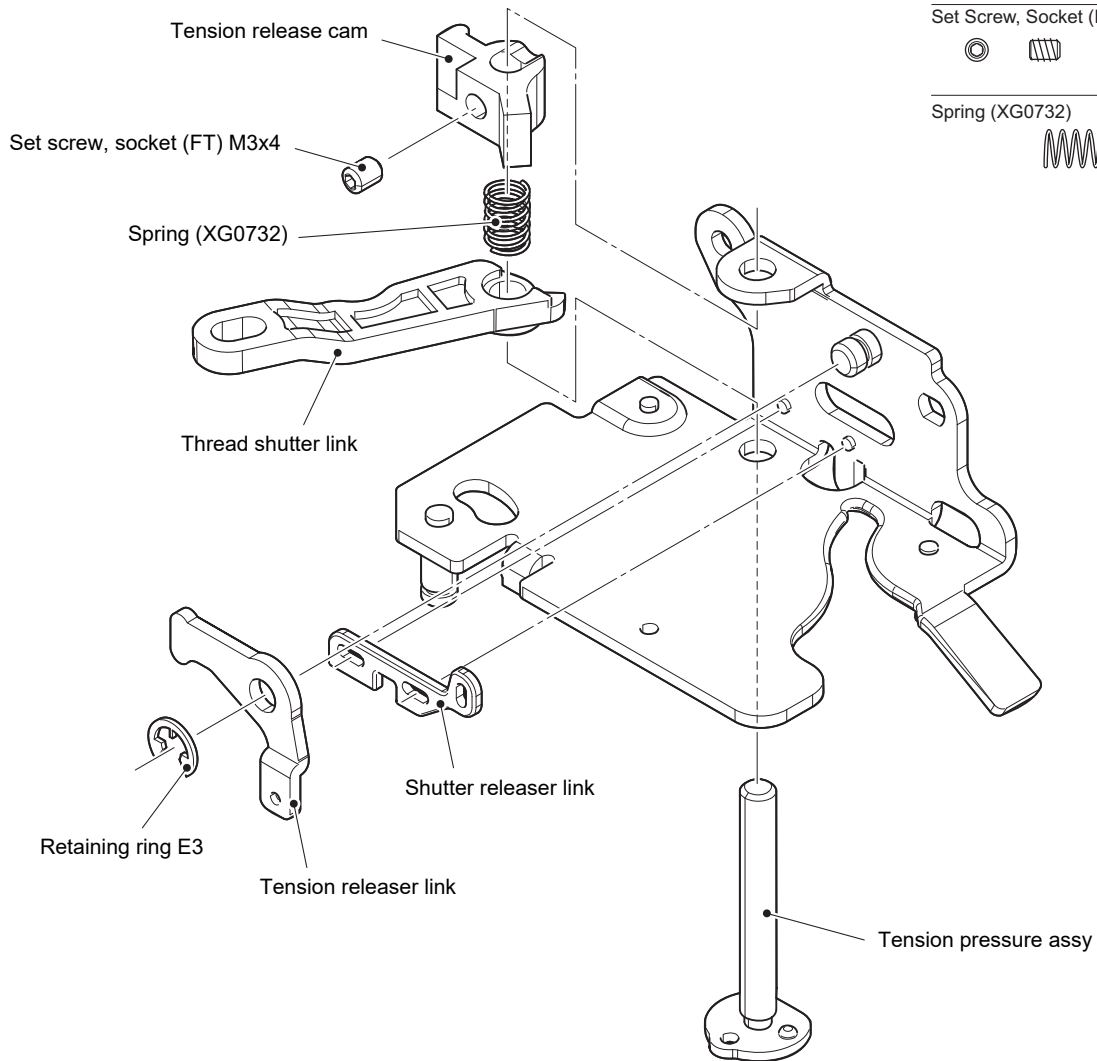


Spring (X57605)



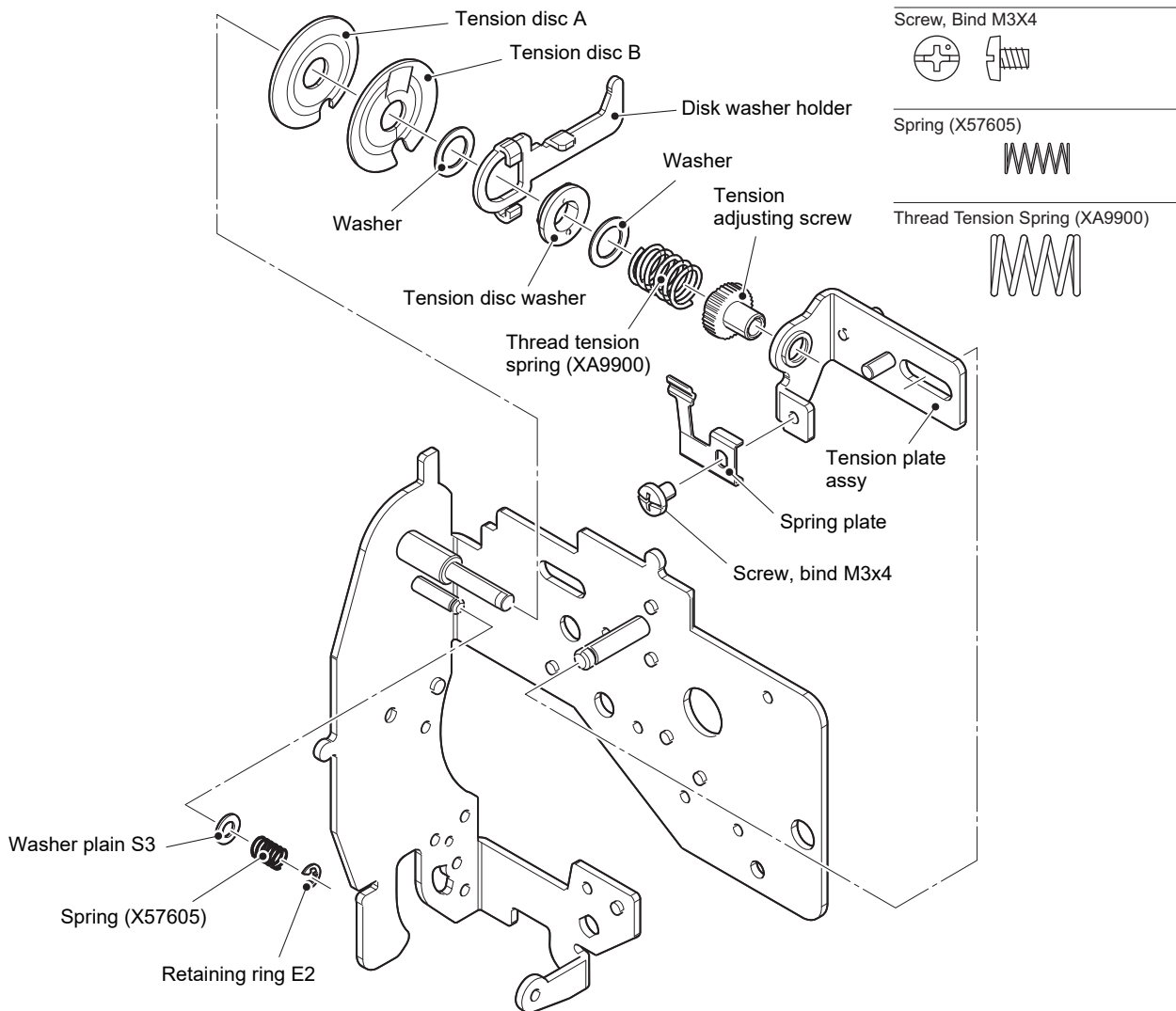
8 Removal of Tension pressure assy and Links

1. Remove the screw (set screw, socket (FT) M3x4) from the tension release cam.
2. Pull out the tension pressure assy to remove the tension release cam, the spring (XG0732) and the thread shutter link.
3. Remove the retaining ring E3 to remove the tension releaser link and the shutter releaser link.

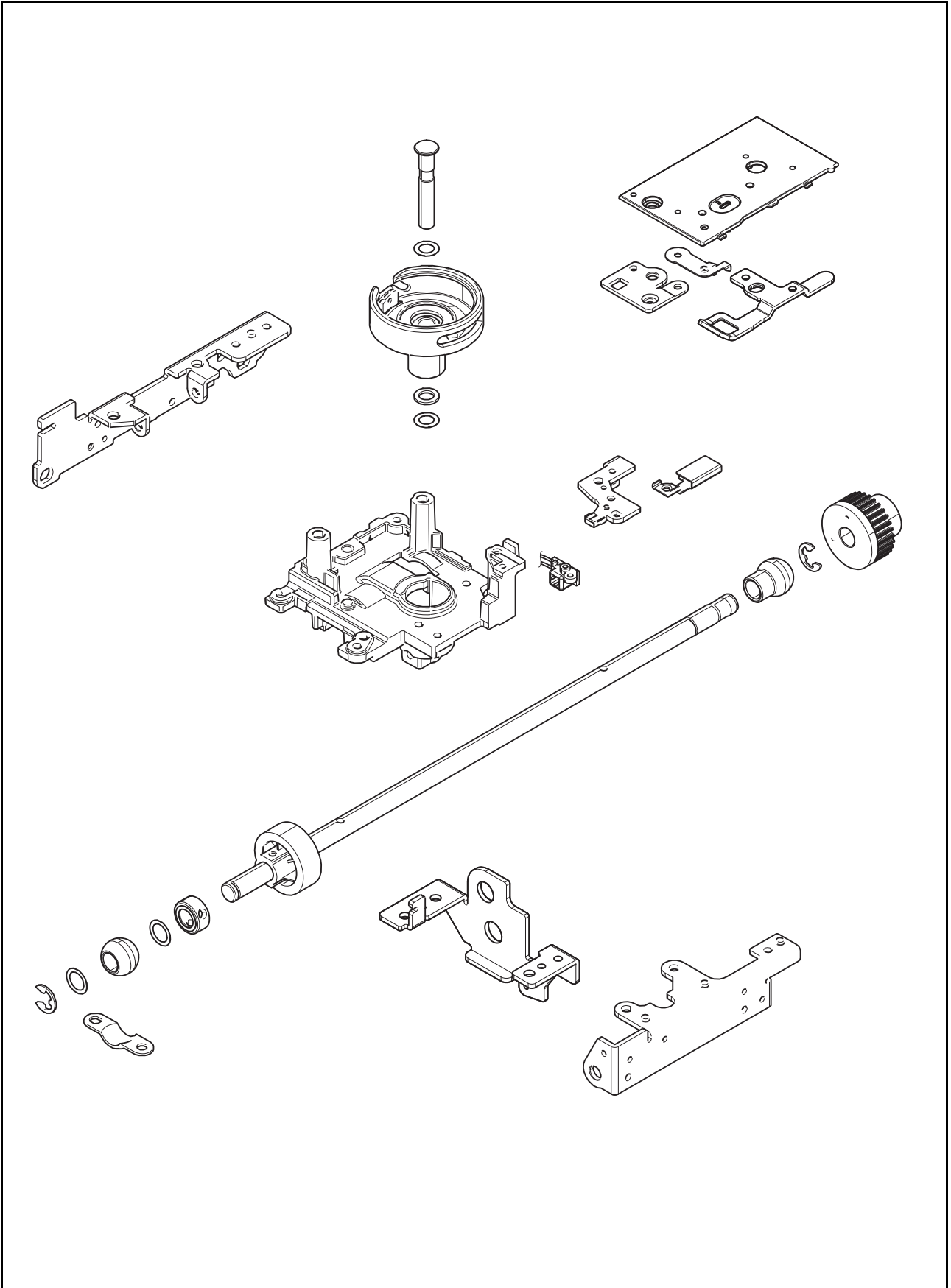


9 Removal of Tension discs

1. Remove the screw (screw, bind M3x4) to remove the spring plate.
2. Remove the retaining ring E2 to remove the spring (X57605) and the washer plain S3.
3. Loosen the tension adjusting screw from the tension plate assy to remove the tension plate assy.
4. Remove the tension adjusting screw, the thread tension spring (XA9900), the washer, the disk washer holder, the washer, the tension disc B and the tension disc A.
5. Remove the tension disc washer from the disk washer holder.



Feed module location diagram

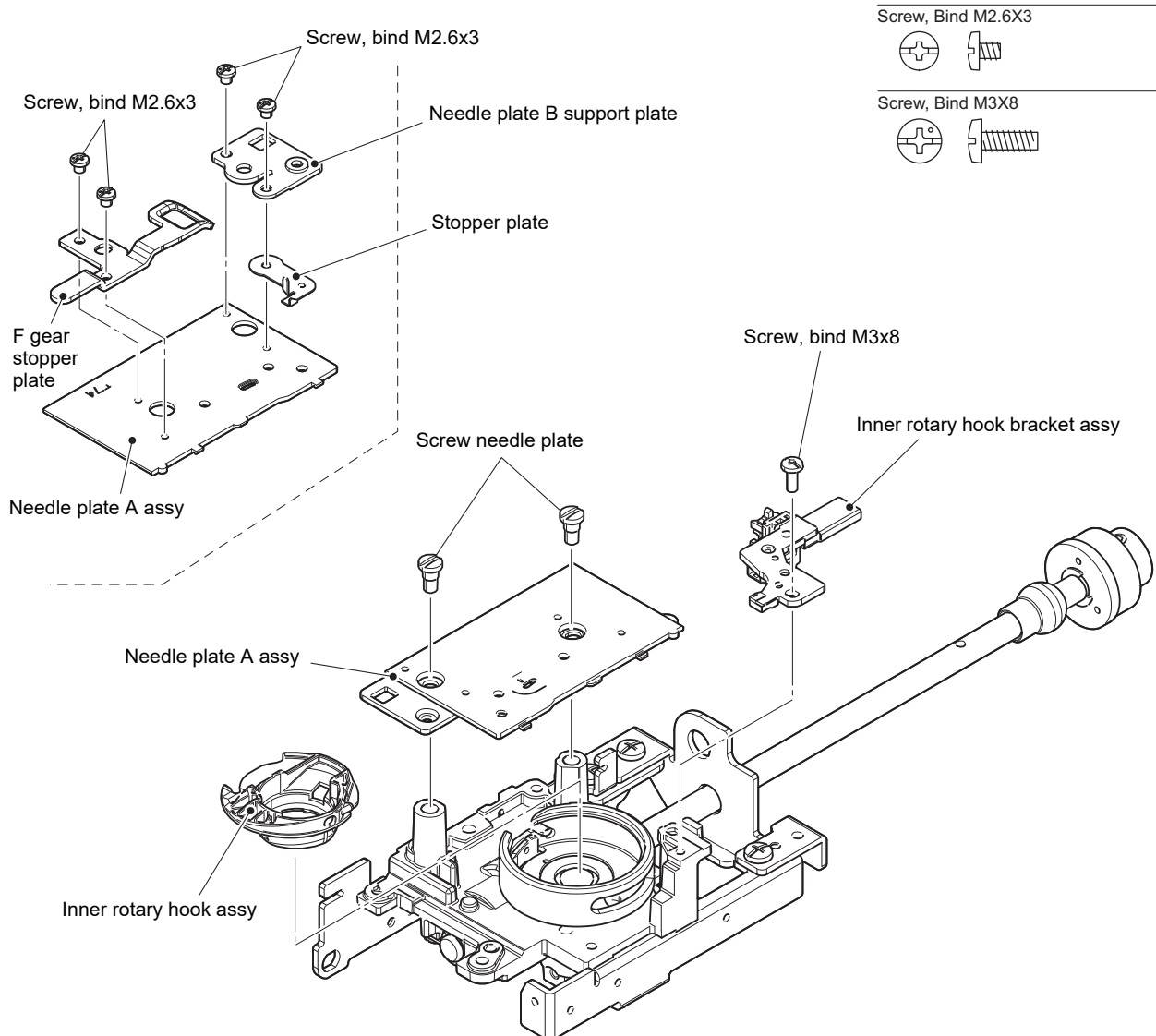


Application of
Disassembly

Application of
Disassembly

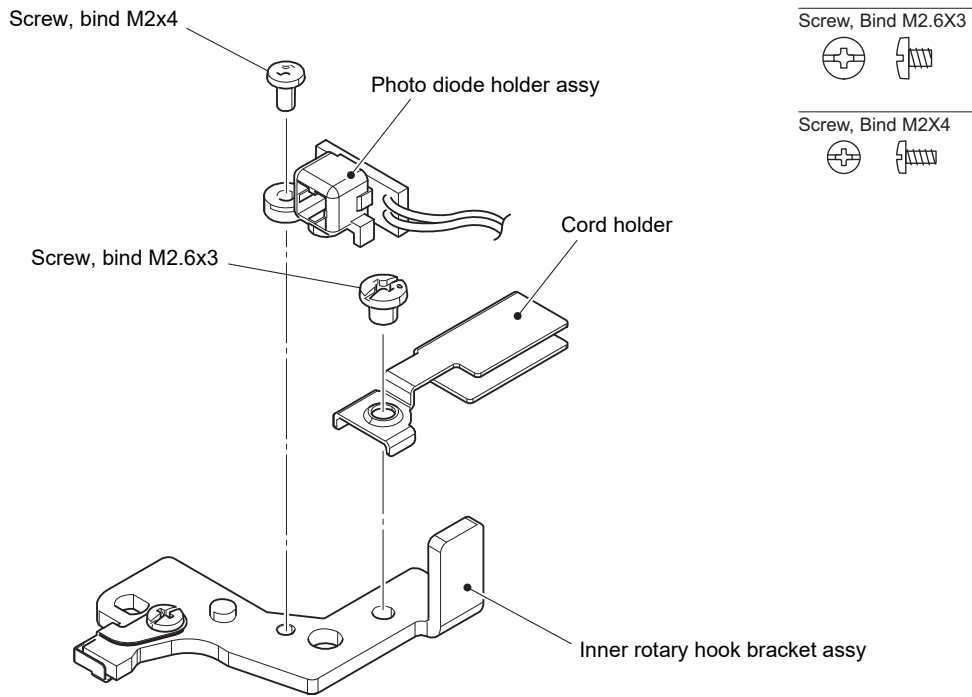
1 Removal of Needle plate A assy, Inner rotary hook assy and Inner rotary hook bracket assy

1. Remove the inner rotary hook assy.
2. Remove the two screws (screw needle plate) to remove the needle plate A assy.
3. Remove the two screws (screw, bind M2.6x3) to remove the needle plate B support plate and the stopper plate from the needle plate A assy.
4. Remove the two screws (screw, bind M2.6x3) to remove the F gear stopper plate from the needle plate A assy.
5. Remove the screw (screw, bind M3x8) to remove the inner rotary hook bracket assy.



2 Disassembly of Inner rotary hook bracket assy

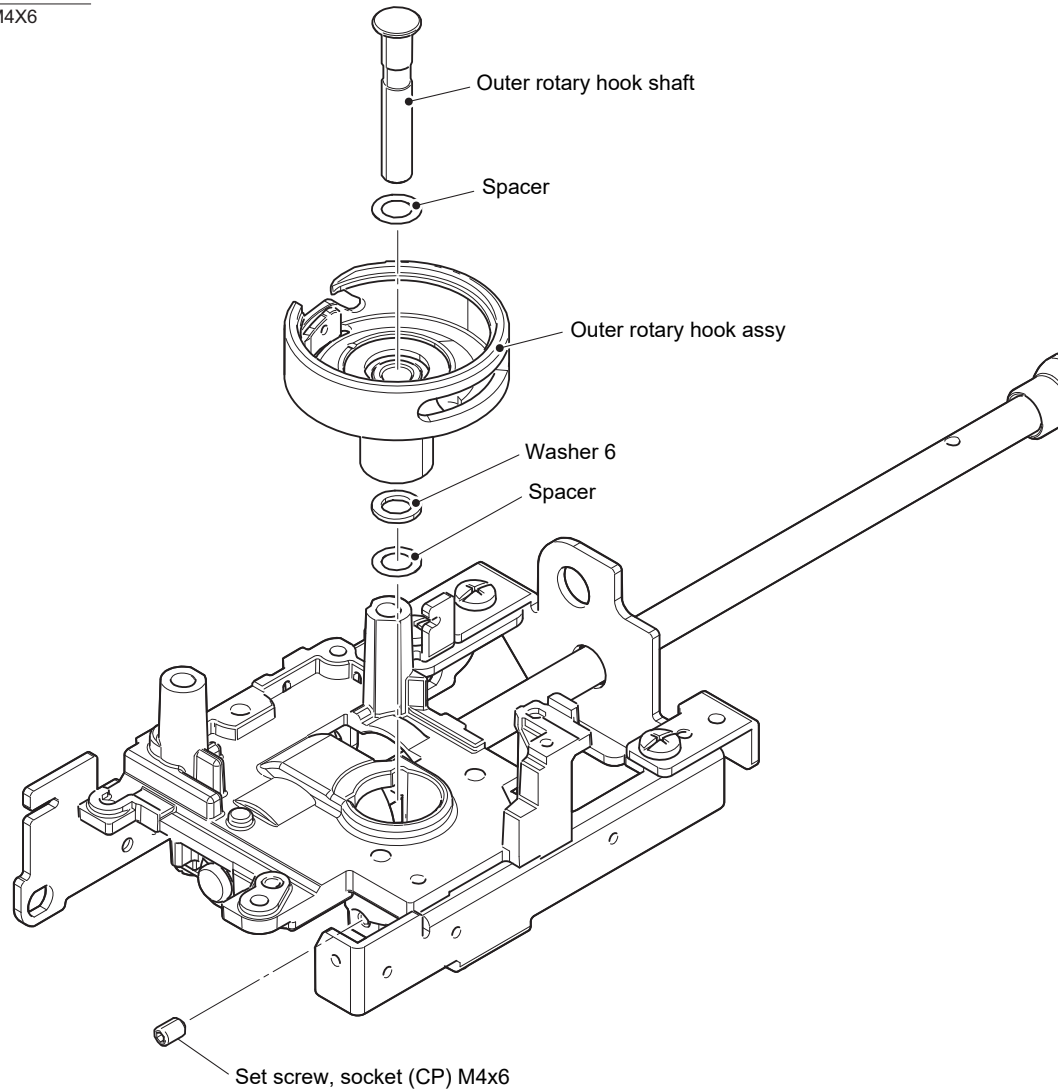
1. Remove the screw (screw, bind M2.6x3) to remove the cord holder from the inner rotary hook bracket assy.
2. Remove the screw (screw, bind M2x4) to remove the photo diode holder assy from the inner rotary hook bracket assy.



3 Removal of Outer rotary hook assy

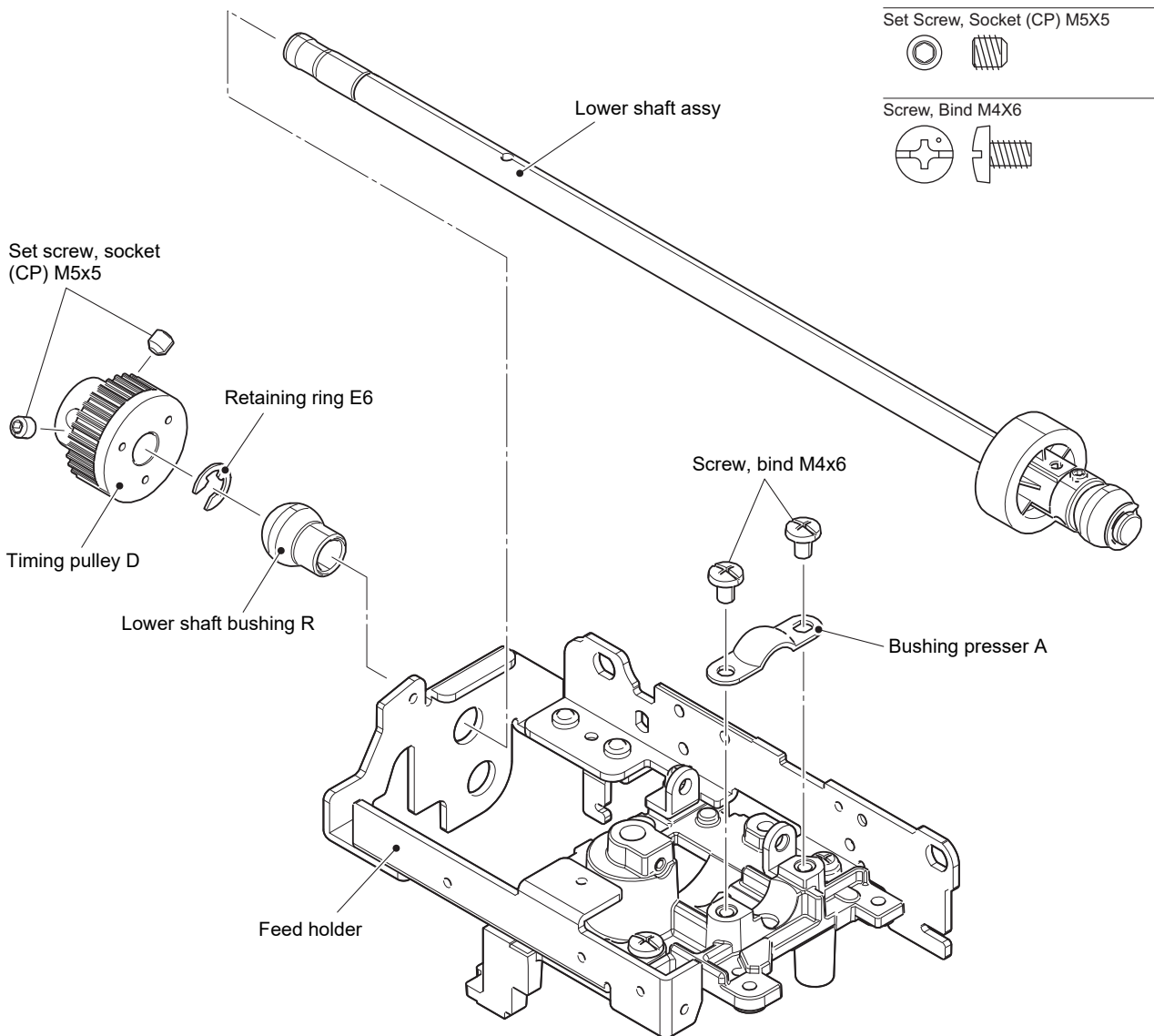
1. Remove the two screws (screw, bind M3x6) to remove the feed dog.
2. Remove the screw (set screw, socket (CP) M4x6), and then pull out the outer rotary hook shaft to remove the spacer, the outer rotary hook assy, the washer 6 and the spacer.

Set Screw, Socket (CP) M4X6

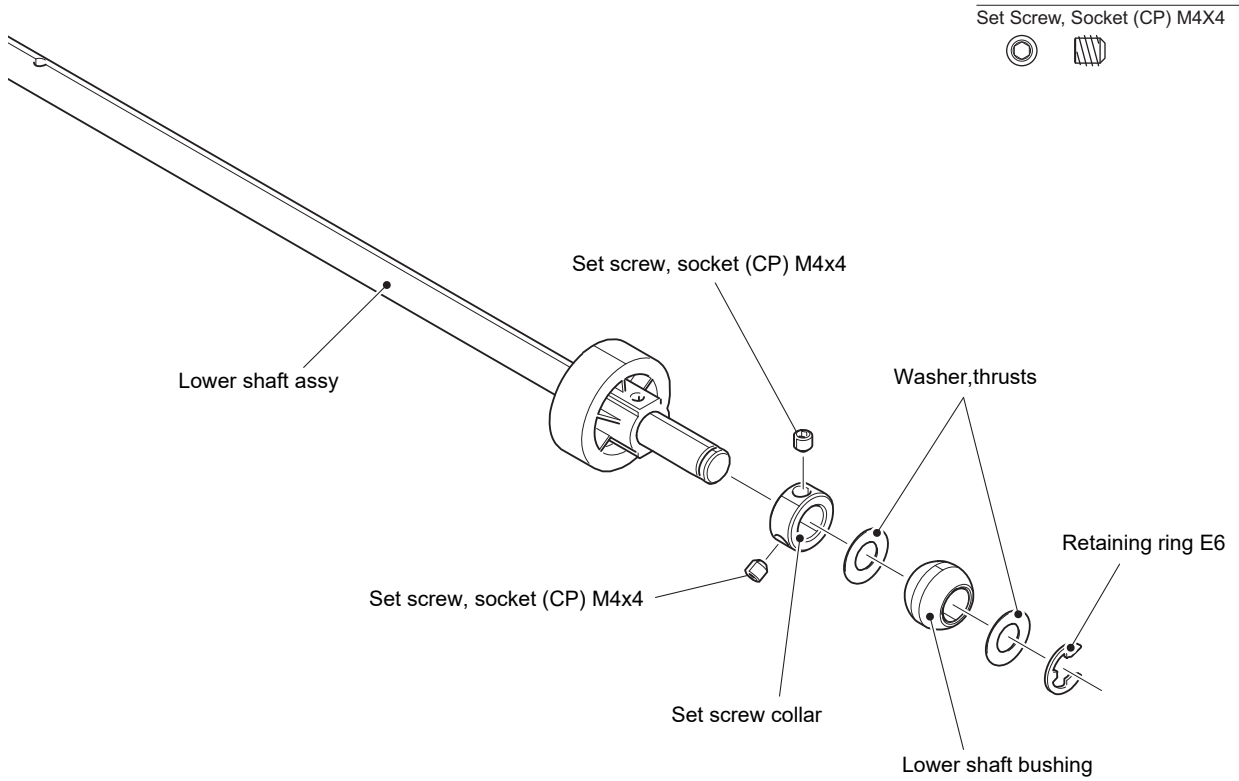


4 Removal of Lower shaft assy

1. Remove the two screws (set screw, socket (CP) M5x5) to remove the timing pulley D from the lower shaft assy. Remove the retaining ring E6 to remove the lower shaft bushing R from the lower shaft assy.
2. Remove the two screws (screw, bind M4x6) to remove the bushing presser A from the feed holder.
3. Remove the lower shaft assy from the feed holder.



4. Remove the retaining ring E6 to remove the washer, thrust, the lower shaft bushing and the washer, thrust from the lower shaft assy.
5. Remove the two screws (set screw, socket (CP) M4x4) to remove the set screw collar from the lower shaft assy.



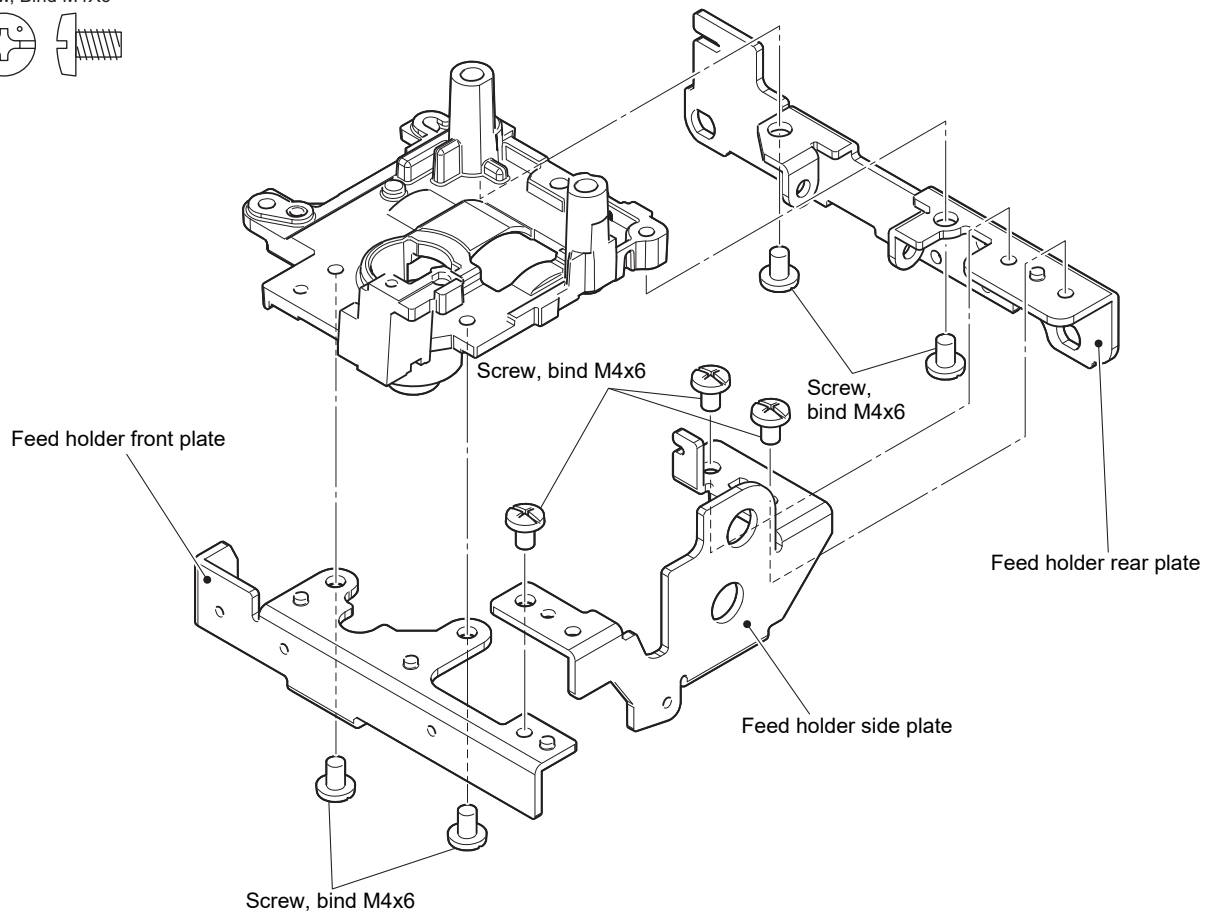
Application of Disassembly

Application of Disassembly

5 Removal of Feed holder side plates

1. Remove the three screws (screw, bind M4x6) to remove the feed holder side plate.
2. Remove the two screws (screw, bind M4x6) to remove the feed holder front plate.
3. Remove the two screws (screw, bind M4x6) to remove the feed holder rear plate.

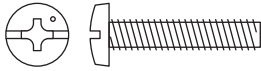
Screw, Bind M4X6



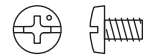
1 Disassembly of Motor holder assy and Thread cutter frame assy

1. Cut the band.
2. Remove the two screws (screw, bind M4x20) to remove the lead wire guide film, the thread cutter frame assy, the wave-shape spring washer, the thread cutter lever gear and two collars from the motor holder assy.
3. Remove the screw (screw, bind M3x5) to remove the spring plate and presser plate assy from the thread cutter frame assy.
4. Remove the screw (screw, pan (S/P washer) M3x6) to remove the thread cutter lever gear from the thread cutter lever.

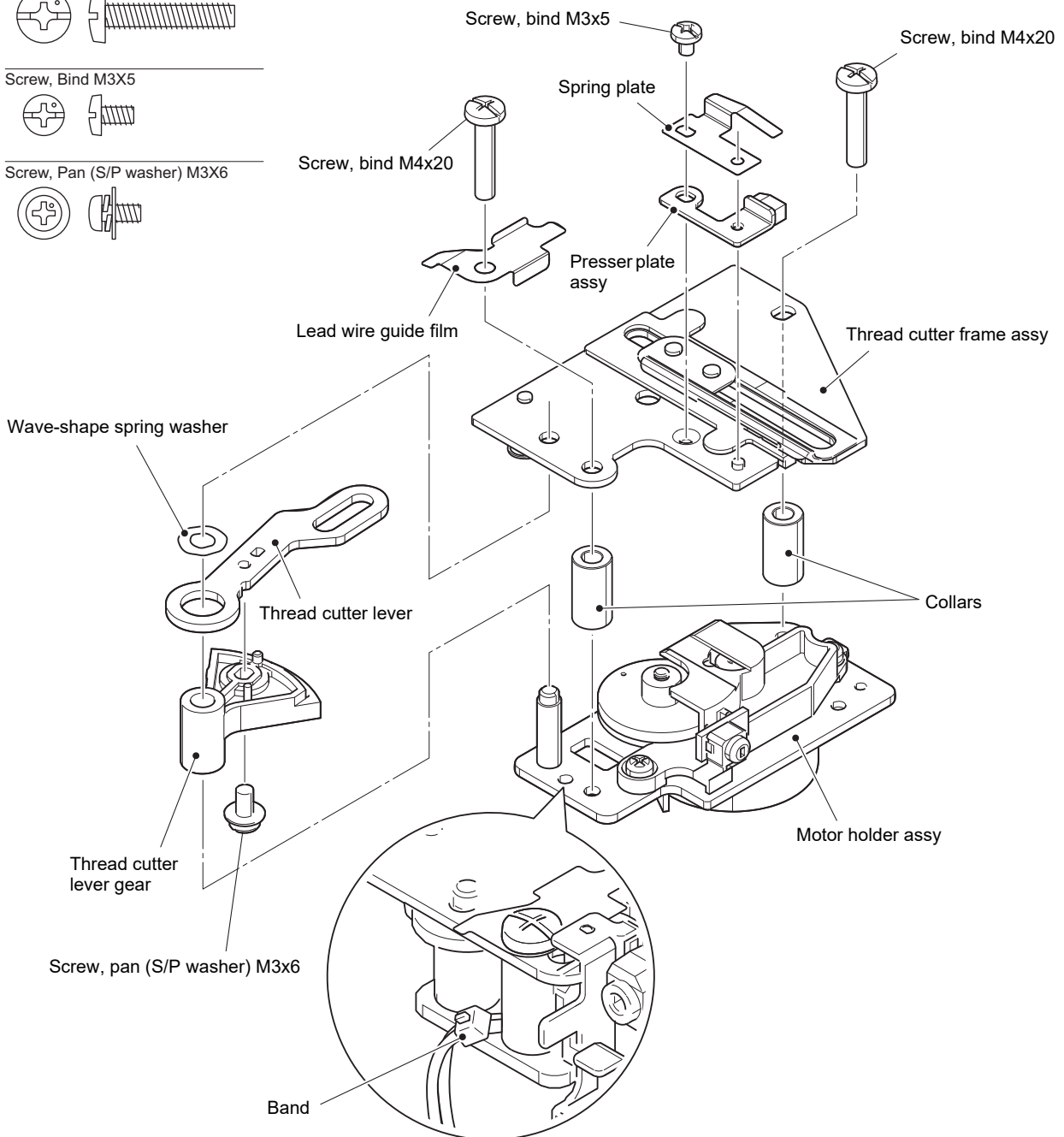
Screw, Bind M4X20



Screw, Bind M3X5

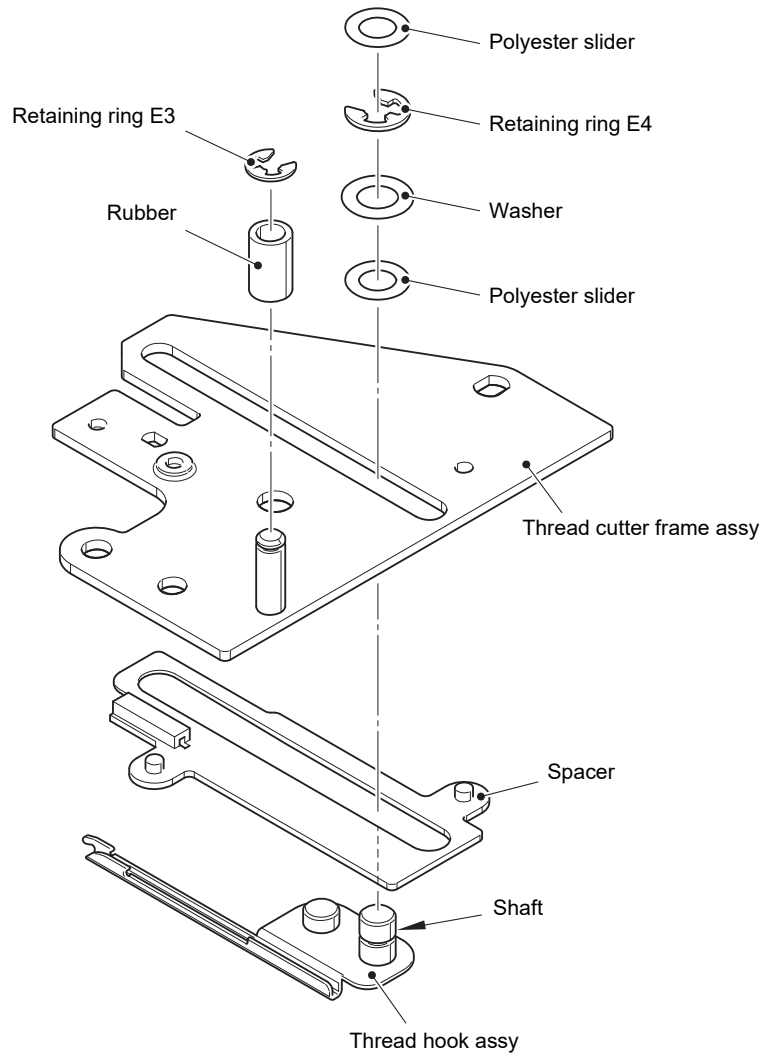


Screw, Pan (S/P washer) M3X6



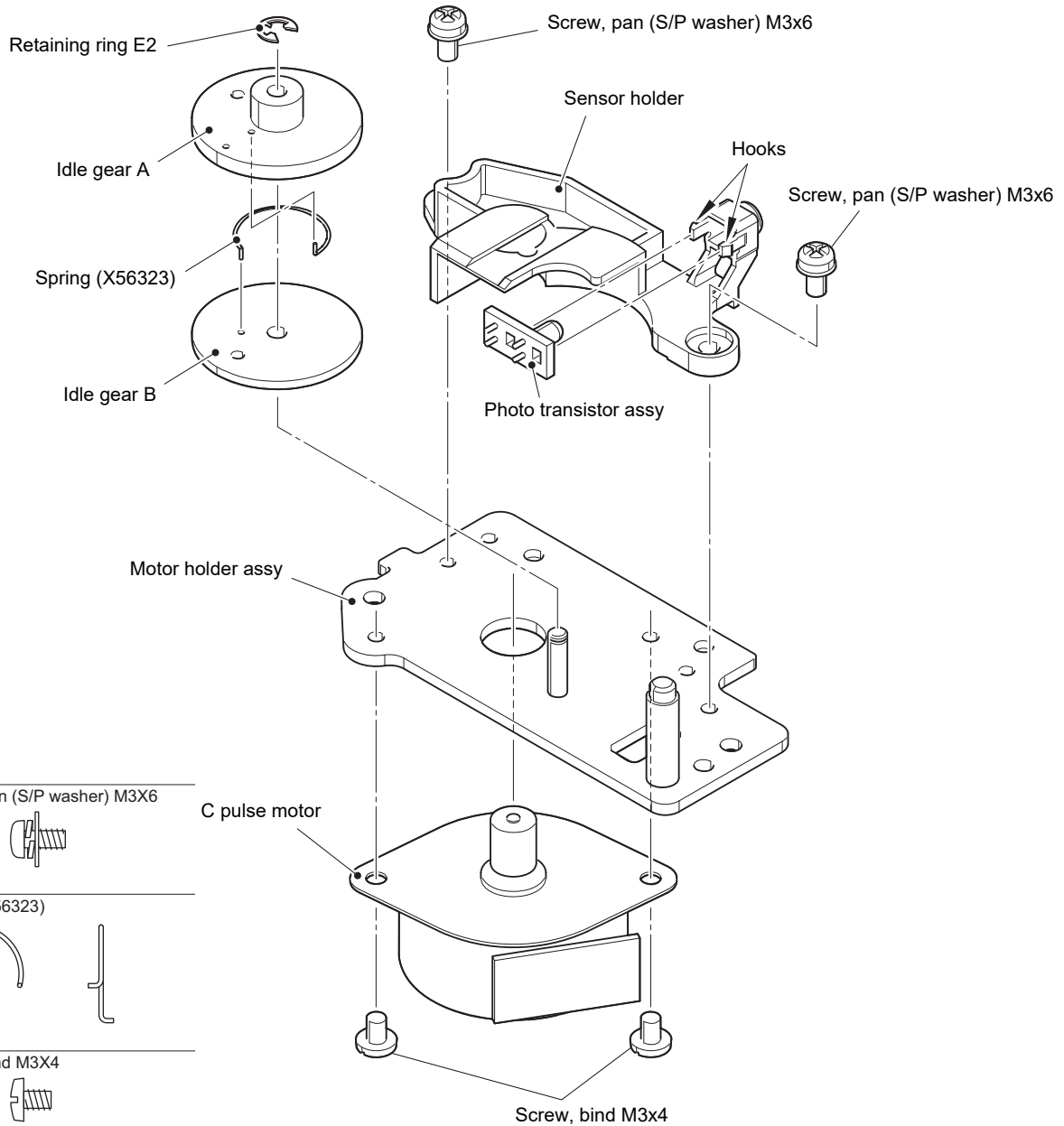
2 Removal of Thread hook assy

1. Remove the retaining ring E3 to remove the rubber from the thread cutter frame assy.
2. Remove the polyester slider from the shaft of thread hook assy.
3. Remove the retaining ring E4 to remove the washer, the polyester slider and the thread hook assy from the thread cutter frame assy. Remove the spacer from the thread cutter frame assy.



3 Removal of Photo transistor assy and C pulse motor

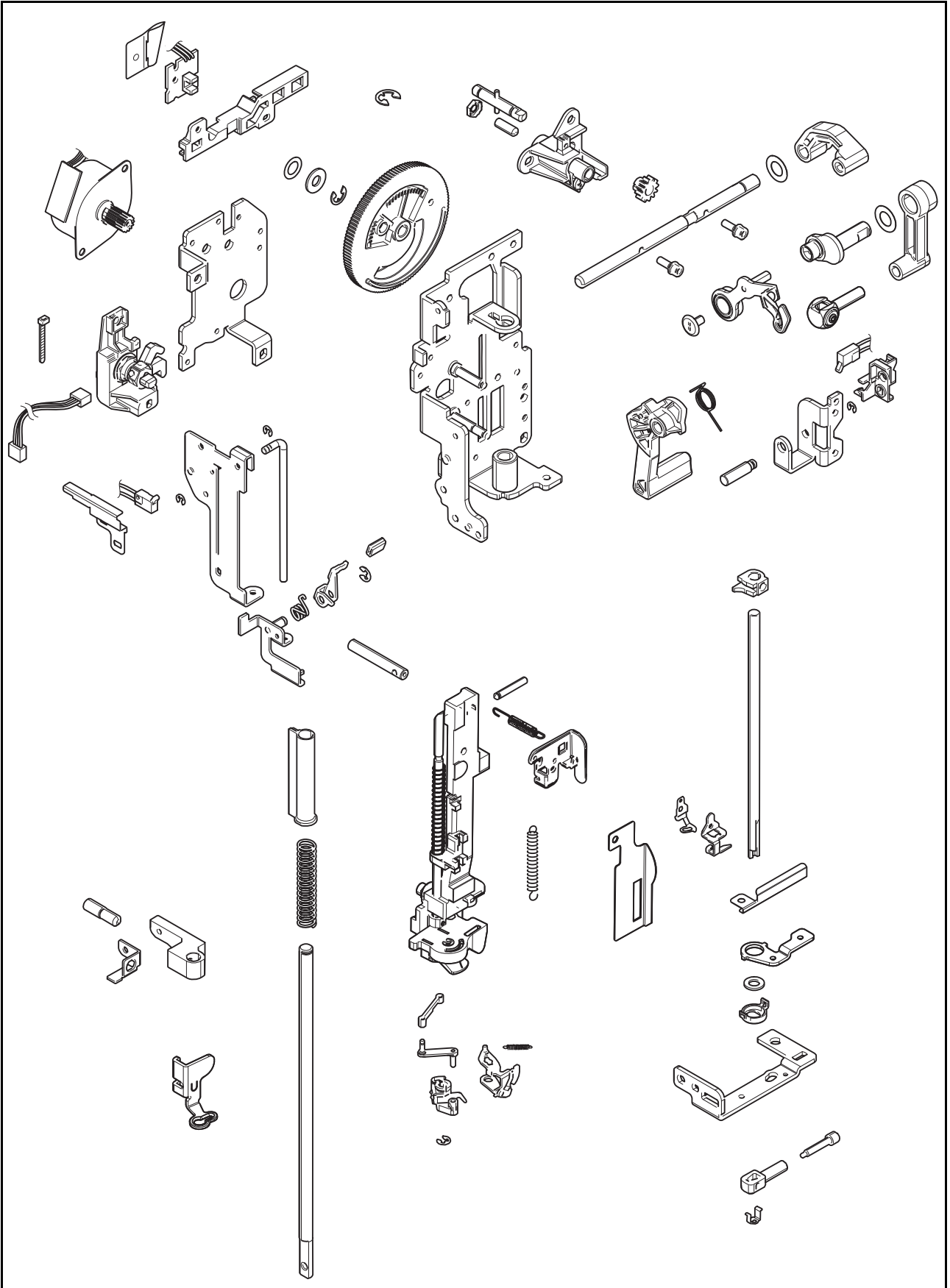
1. Remove the two screws (screw, pan (S/P washer) M3x6) to remove the sensor holder from the motor holder assy. Release the two hooks to remove the photo transistor assy from the sensor holder.
2. Remove the retaining ring E2 to remove the idle gear A, the spring (X56323) and the idle gear B from the motor holder assy.
3. Remove the two screws (screw, bind M3x4) to remove the C pulse motor from the motor holder assy.



Application of Disassembly

Application of Disassembly

Needle-presser module location diagram



Application of Disassembly

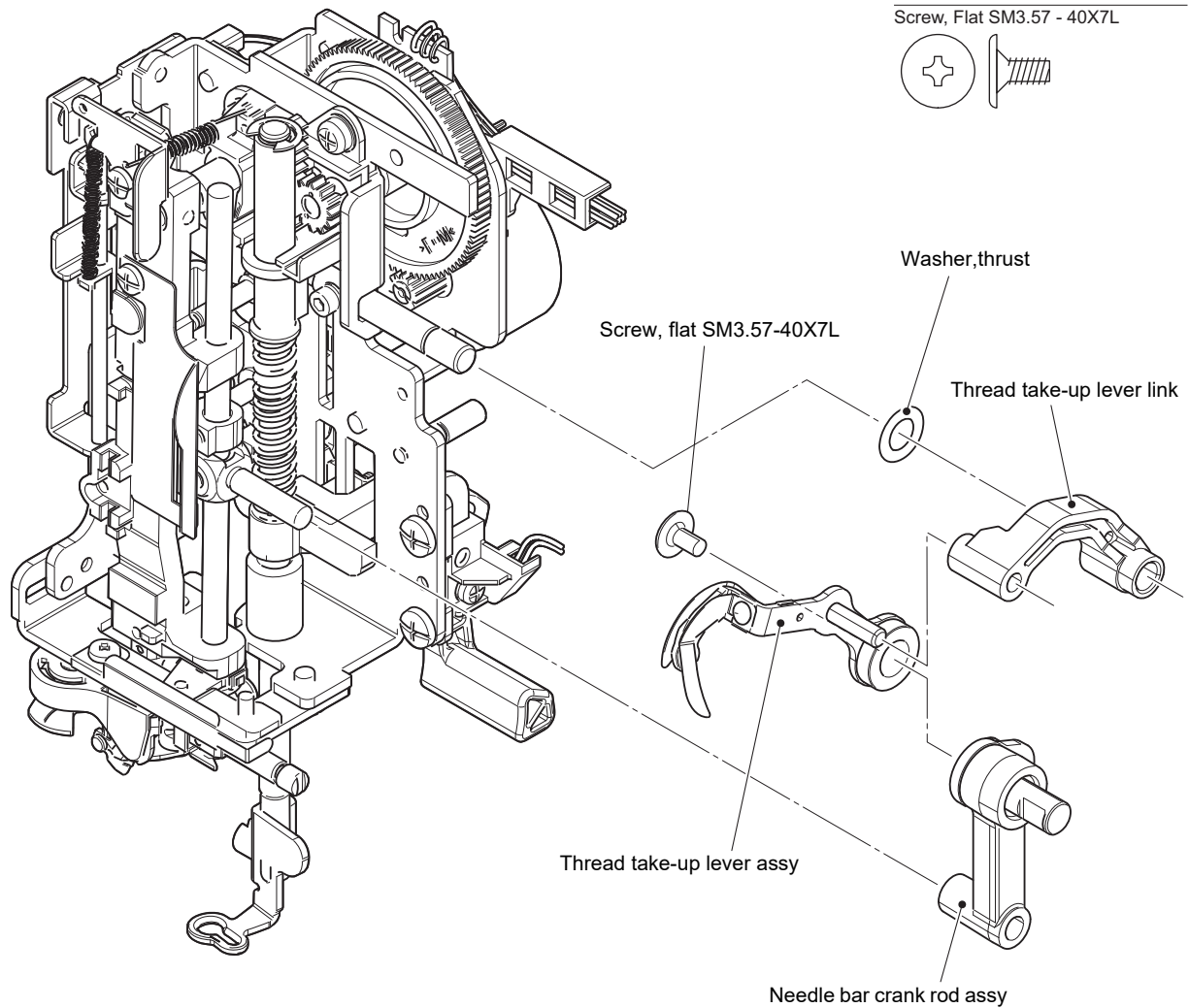
Application of Disassembly

1 Removal of Needle bar crank rod assy and Thread take-up lever assy

1. Remove the thread take-up lever link and the washer, thrust.
2. Remove the thread take-up lever assy and needle bar crank rod assy.
3. Remove the screw (screw, flat SM3.57-40x7L) to remove the thread take-up lever assy from the needle bar crank rod assy.

***Key point**

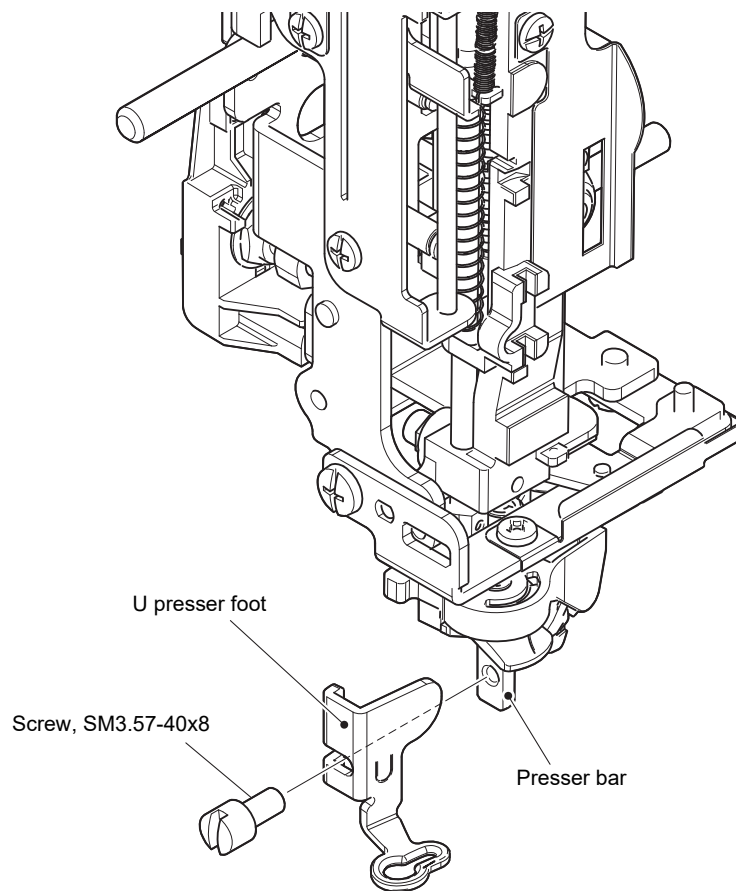
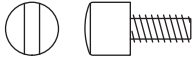
- Tighten the screw by turning it anti-clockwise.



2 Removal of U presser foot

1. Remove the screw (screw, SM3.57-40x8) to remove the U presser foot from the presser bar.

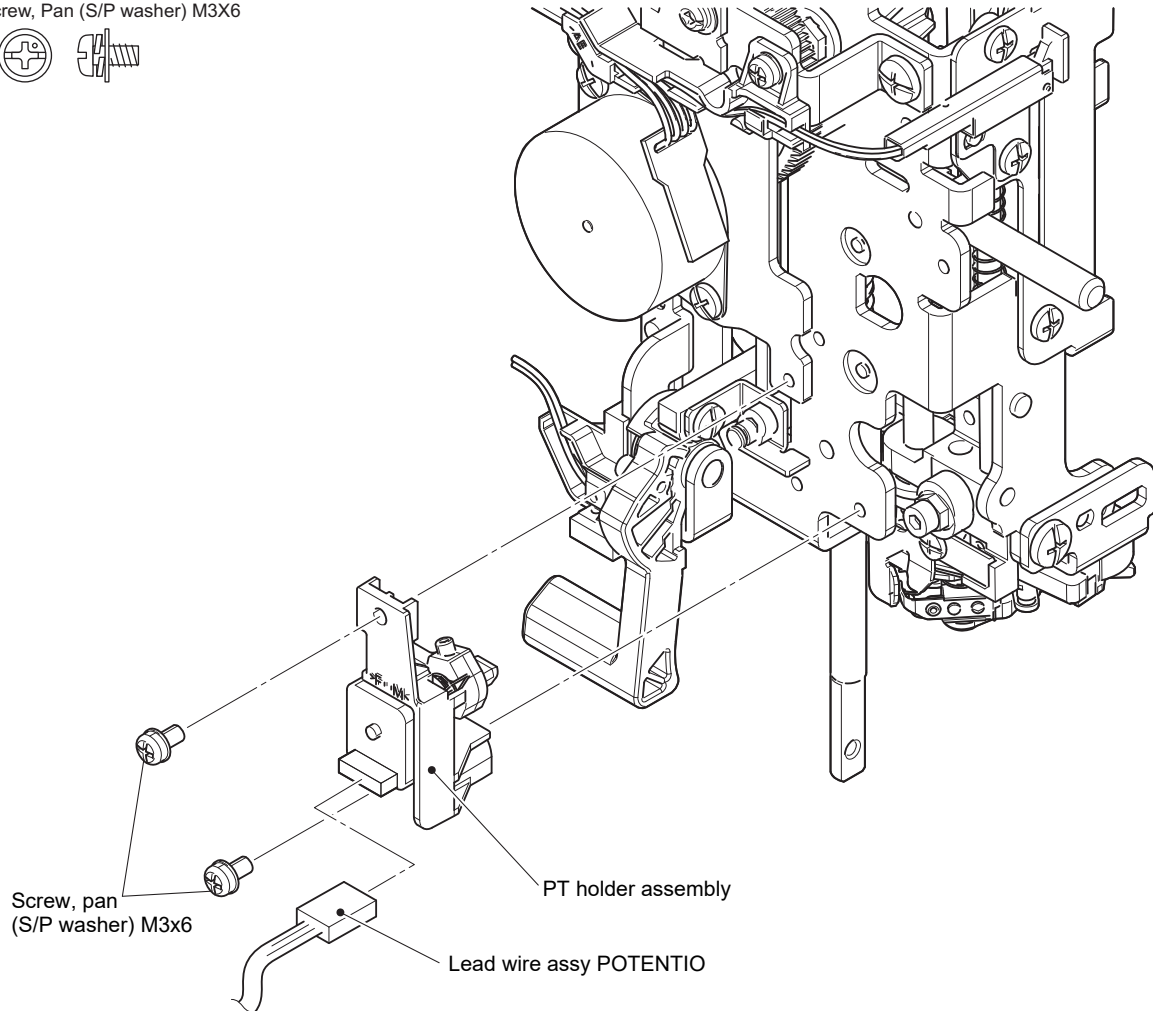
Screw 3.57-40x8



3 Removal of PT holder assembly

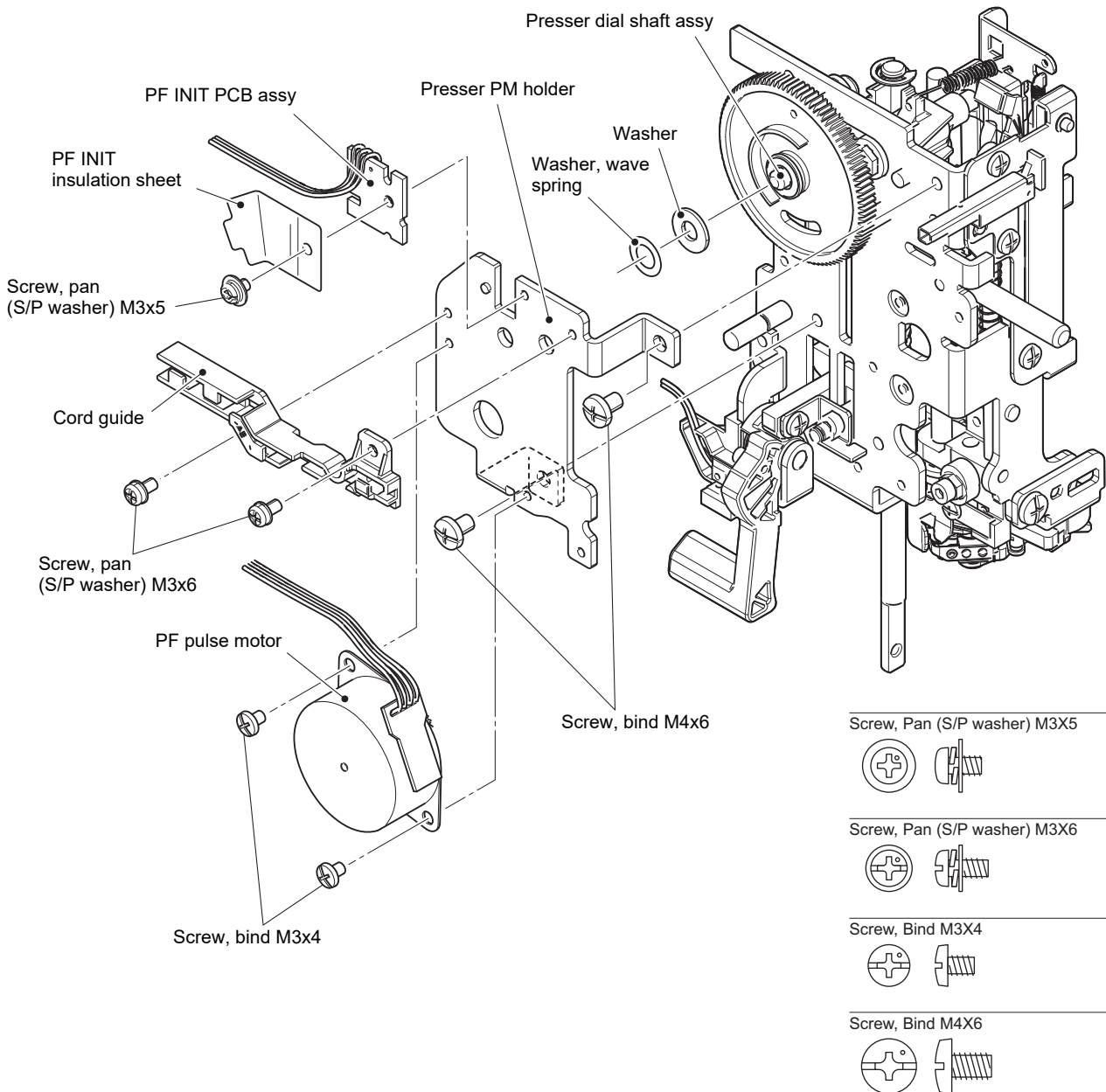
1. Remove the two screws (screw, pan (S/P washer) M3x6) to remove the PT holder assembly.
2. Disconnect the lead wire assy POTENTIO from the PT holder assembly.

Screw, Pan (S/P washer) M3x6



4 Removal of PF INIT PCB assy, Cord guide, PF pulse motor and Presser PM holder

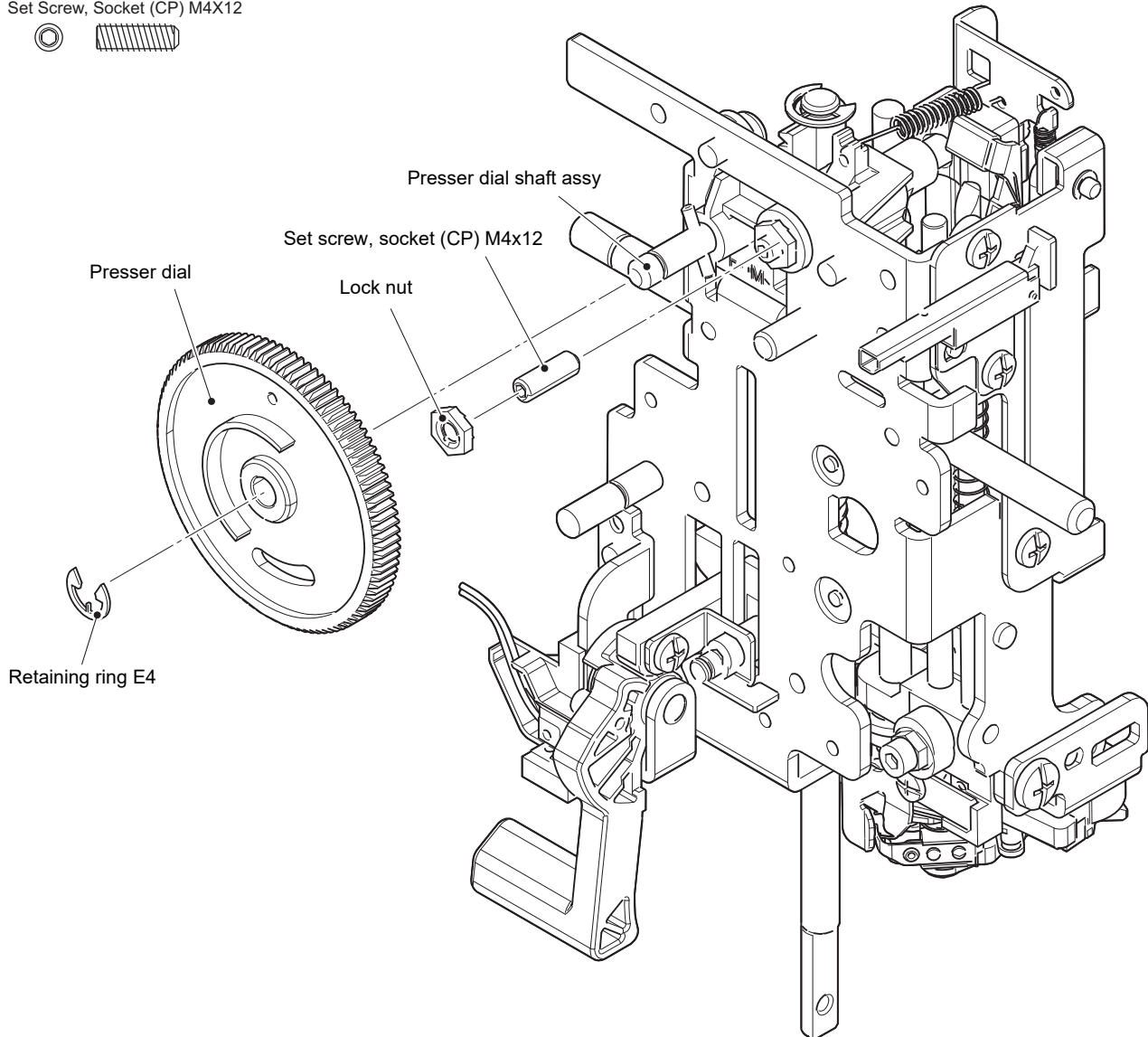
1. Release the lead wires from the cord guide.
2. Remove the screw (screw, pan (S/P washer) M3x5) to remove the PF INIT insulation sheet and the PF INIT PCB assy.
3. Remove the two screws (screw, pan (S/P washer) M3x6) to remove the cord guide.
4. Remove the two screws (screw, bind M3x4) to remove the PF pulse motor.
5. Remove the two screws (screw, bind M4x6) to remove the presser PM holder, the washer, wave spring and the washer.



5 Removal of Presser dial and Lock nut

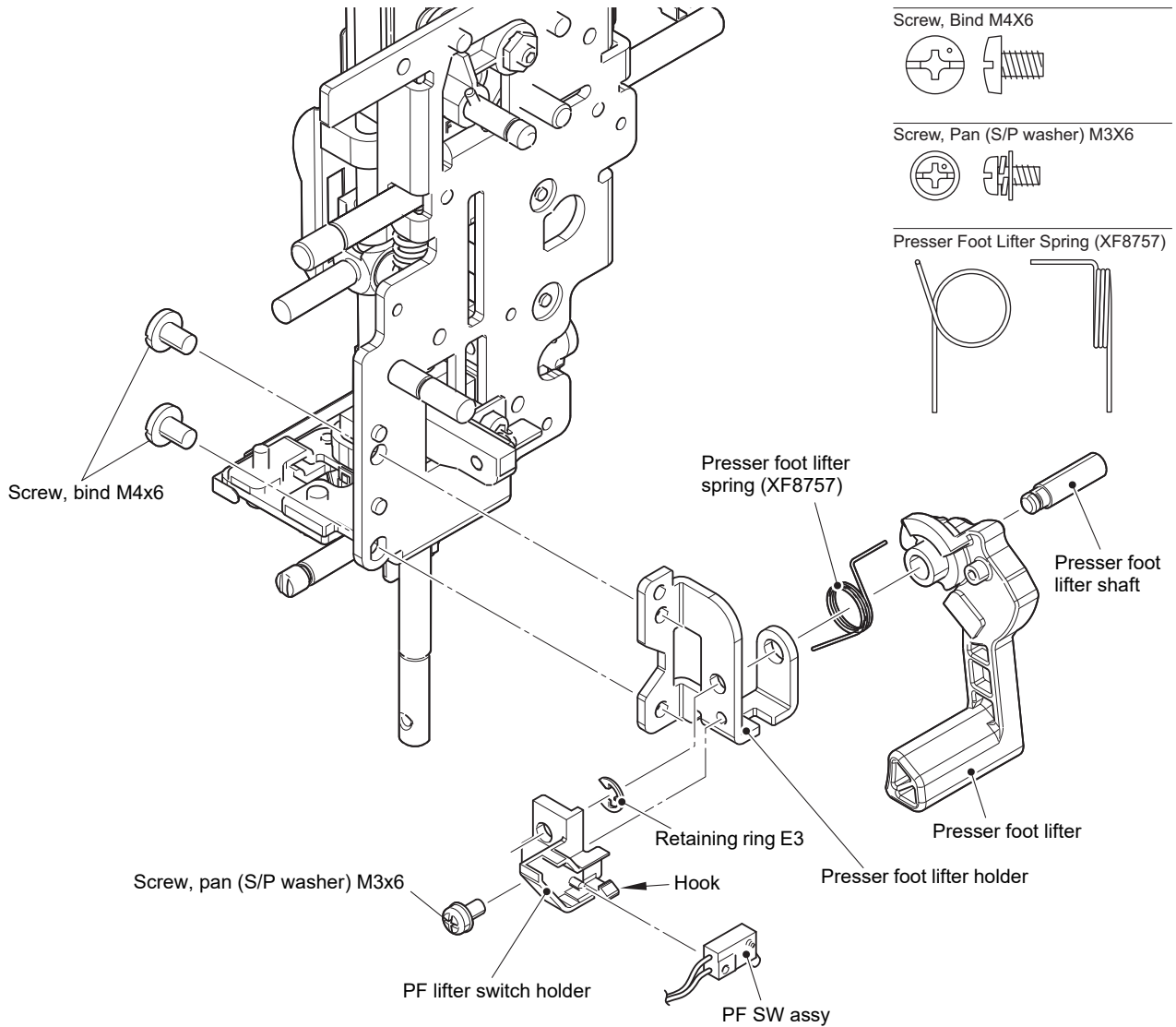
1. Remove the retaining ring E4 to remove the presser dial from the presser dial shaft assy.
2. Loosen the lock nut, remove the screw (set screw, socket (CP) M4x12), and remove the lock nut from the screw (set screw, socket (CP) M4x12).

Set Screw, Socket (CP) M4X12



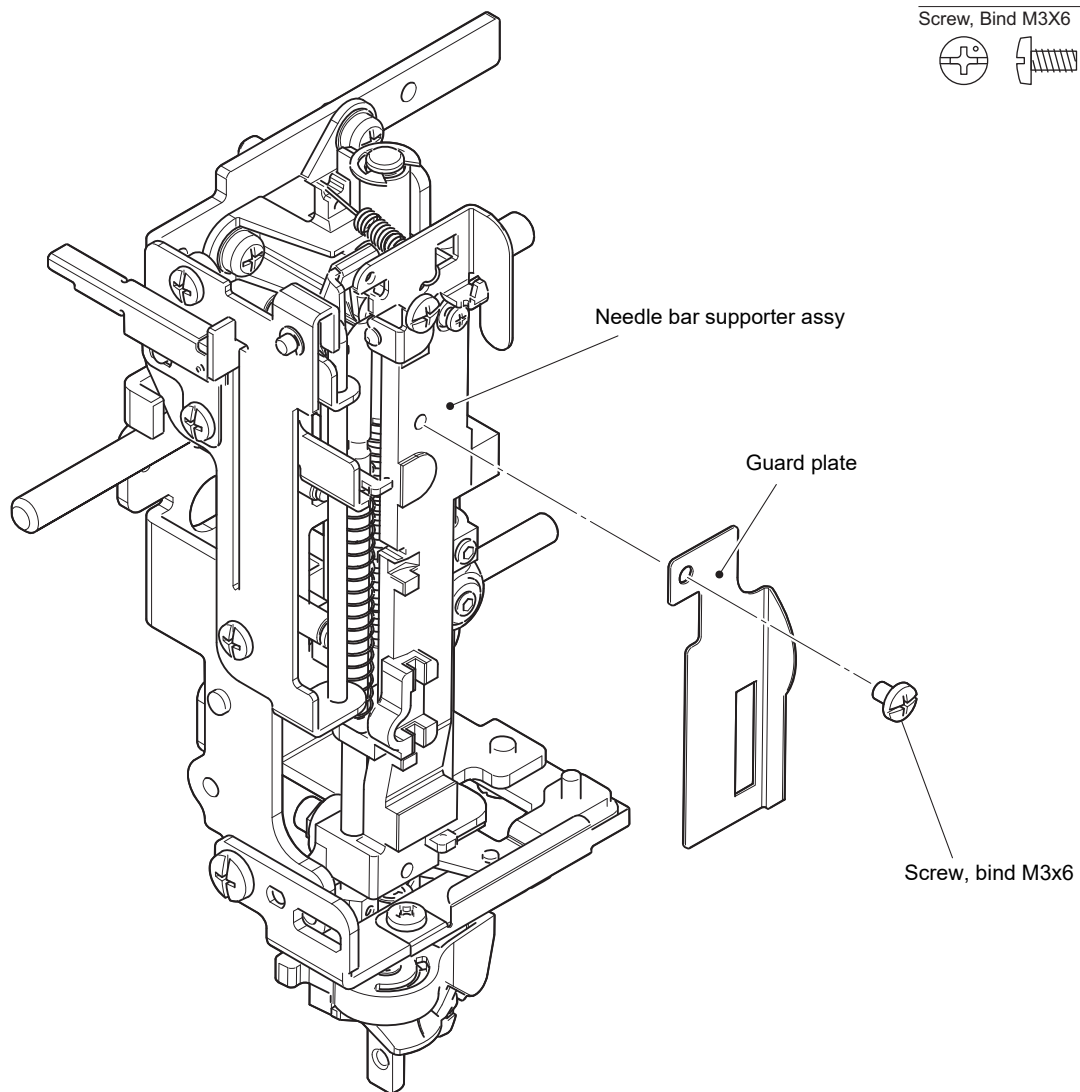
6 Removal of Presser foot lifter and PF SW assy

1. Remove the two screws (screw, bind M4x6) to remove the presser foot lifter holder.
2. Release the hook to remove the PF SW assy from the PF lifter switch holder. Remove the screw (screw, pan (S/P washer) M3x6) to remove the PF lifter switch holder from the presser foot lifter holder.
3. Remove the retaining ring E3, and pull out the presser foot lifter shaft to remove the presser foot lifter spring (XF8757) and the presser foot lifter from the presser foot lifter holder.



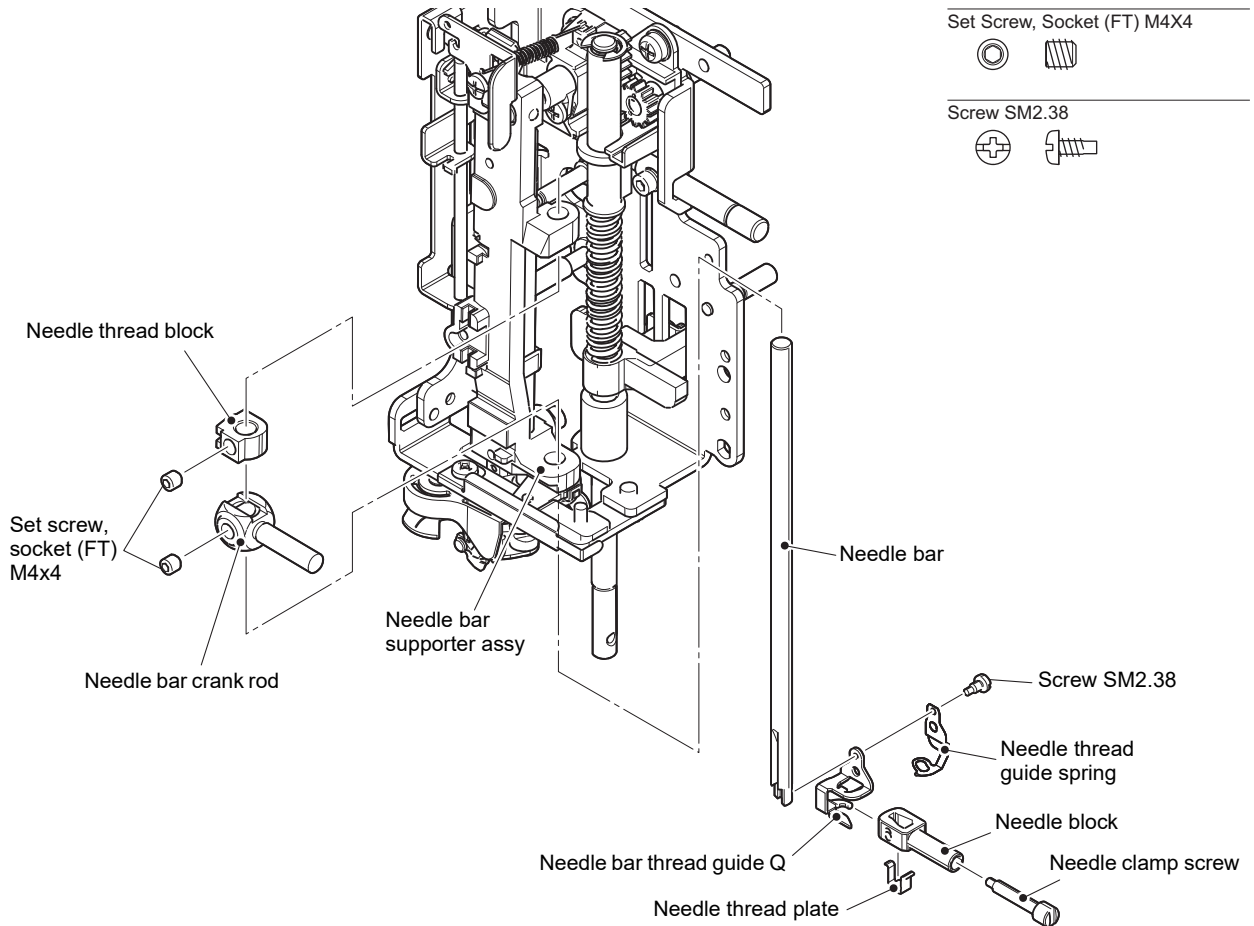
7 Removal of Guard plate

1. Remove the screw (screw, bind M3x6) to remove the guard plate from the needle bar supporter assy.



8 Removal of Needle bar assy, Needle bar hook stand assy and Needle thread block

1. Remove the screw (set screw, socket (FT) M4x4) from the needle thread block, and then remove the screw (set screw, socket (FT) M4x4) from the needle bar crank rod. Pull out the needle bar to remove the needle thread block and the needle bar crank rod.
2. Remove the needle clamp screw from the needle block. Remove the screw (screw SM2.38) to remove the needle thread guide spring and needle bar thread guide Q, and remove the needle thread plate and needle block from the needle bar.

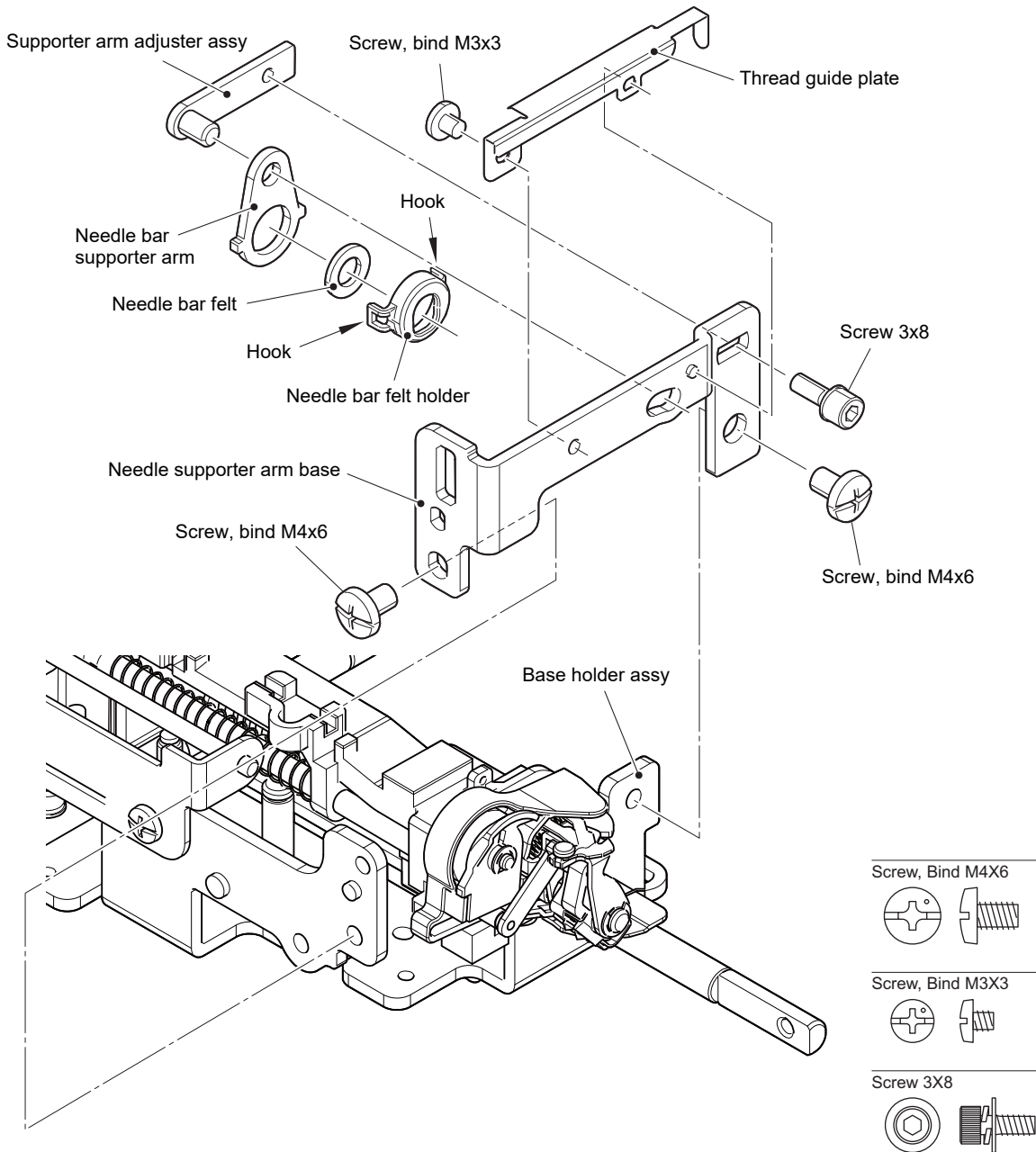


Application of
Disassembly

Application of
Disassembly

9 Removal of Needle supporter arm base

1. Remove the two screws (screw, bind M4x6) to remove the needle supporter arm base.
2. Remove the screw (screw, bind M3x3) to remove the thread guide plate from the needle supporter arm base.
3. Remove the screw (screw 3x8) to remove the supporter arm adjuster assy and the needle bar supporter arm from the needle supporter arm base.
4. Release the two hooks to remove the needle bar felt holder and the needle bar felt from the needle bar supporter arm.



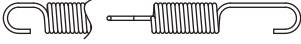
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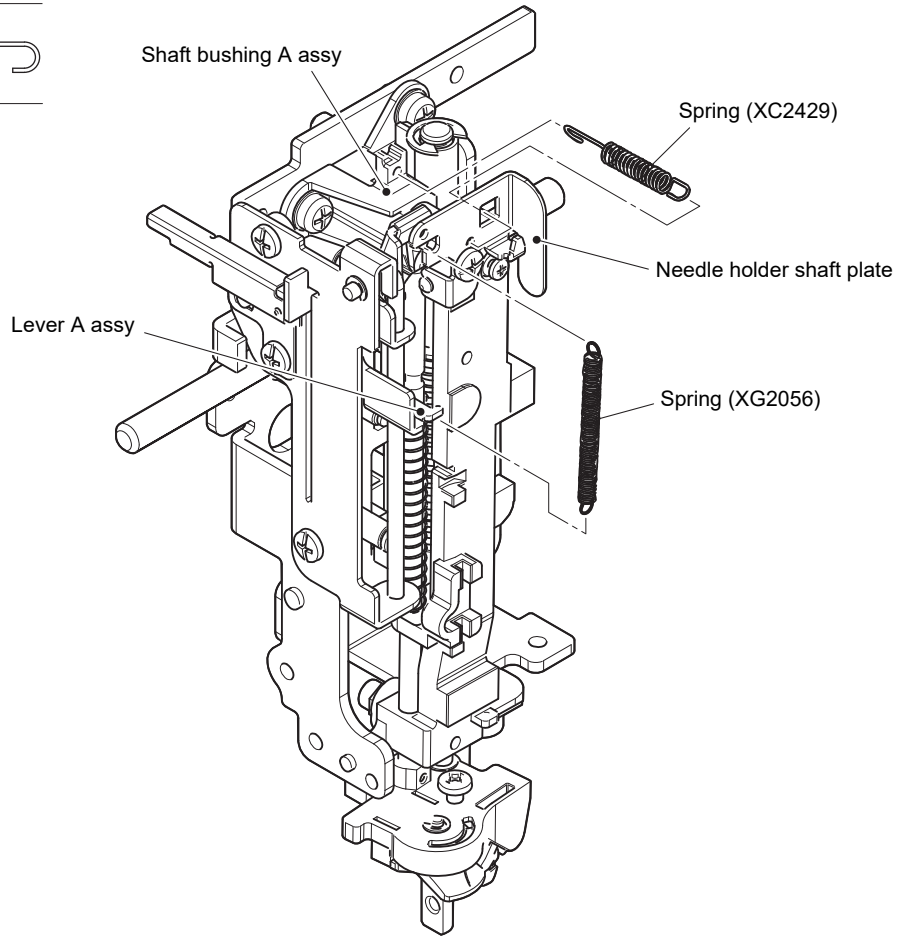
10 Removal of Springs

1. Remove the spring (XC2429) from the needle holder shaft plate and the shaft bushing A assy.
2. Remove the spring (XG2056) from the needle holder shaft plate and the lever A assy.

Spring (XC2429)

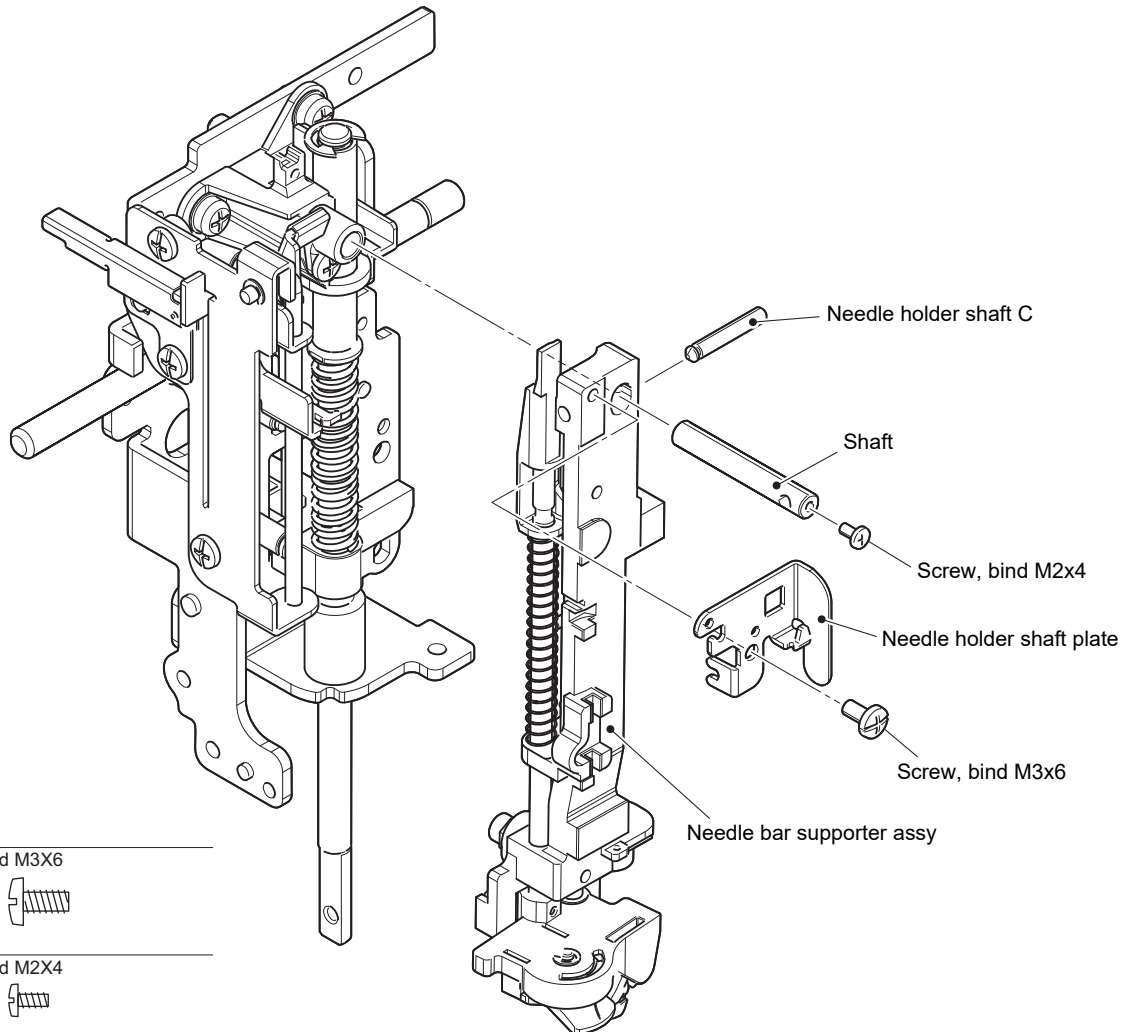


Spring (XG2056)



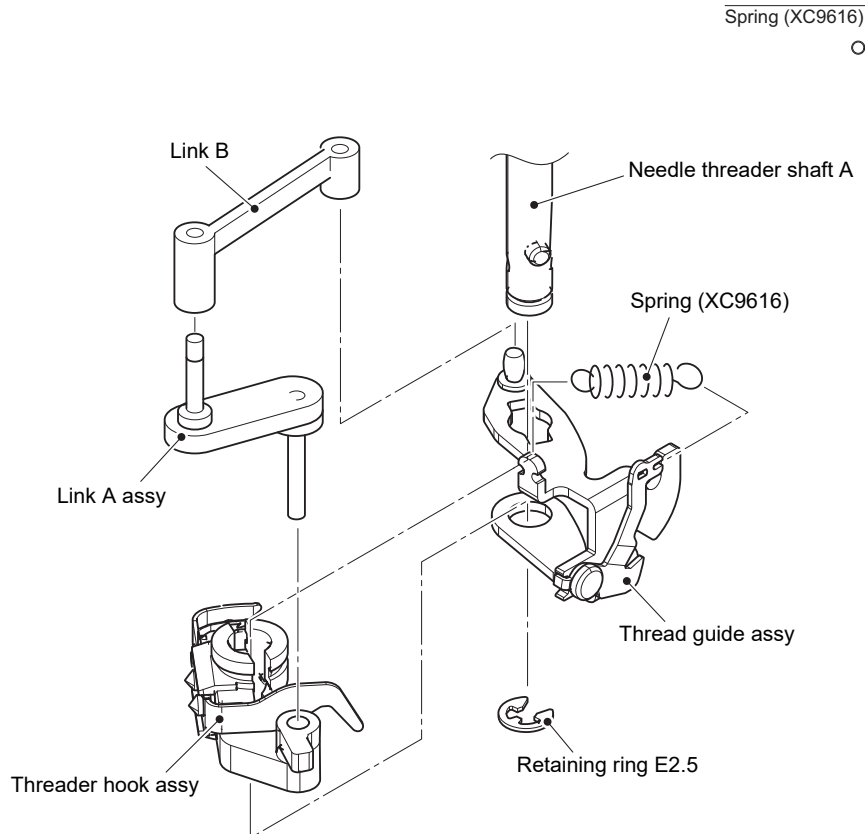
11 Removal of Needle bar supporter assy

1. Remove the needle bar supporter assy from the base holder assy.
2. Remove the screw (screw, bind M3x6) to remove the needle holder shaft plate from the needle bar supporter assy.
3. Remove the screw (screw, bind M2x4) from the shaft. Pull out the needle holder shaft C to remove the shaft from the needle bar supporter assy.



12 Removal of Threader hook assy

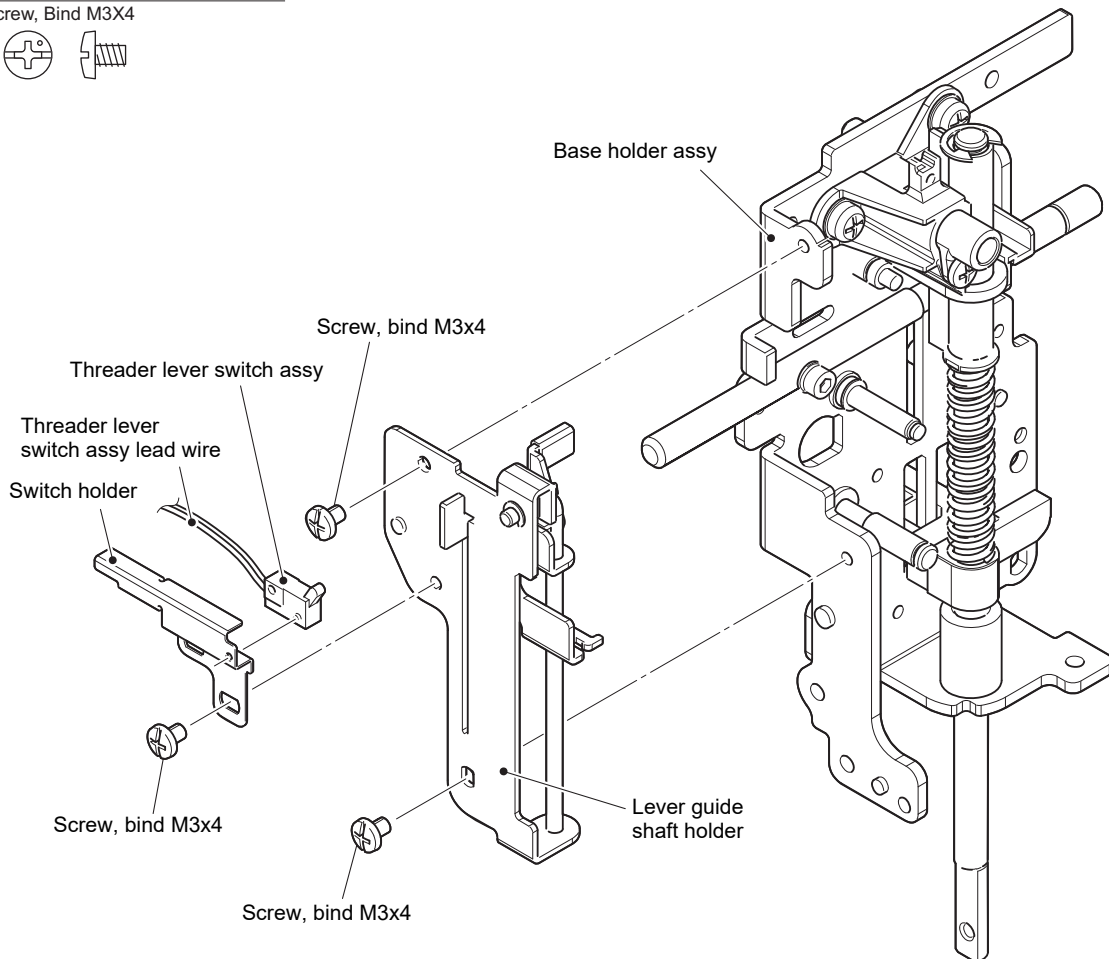
1. Remove the retaining ring E2.5 from the needle threader shaft A of needle bar supporter assy.
2. Pull out the threader hook assy from the needle threader shaft A of needle bar supporter assy.
3. Disassemble the threader hook assy, link A assy, link B, and the thread guide assy.
4. Remove the spring from the thread guide assy.



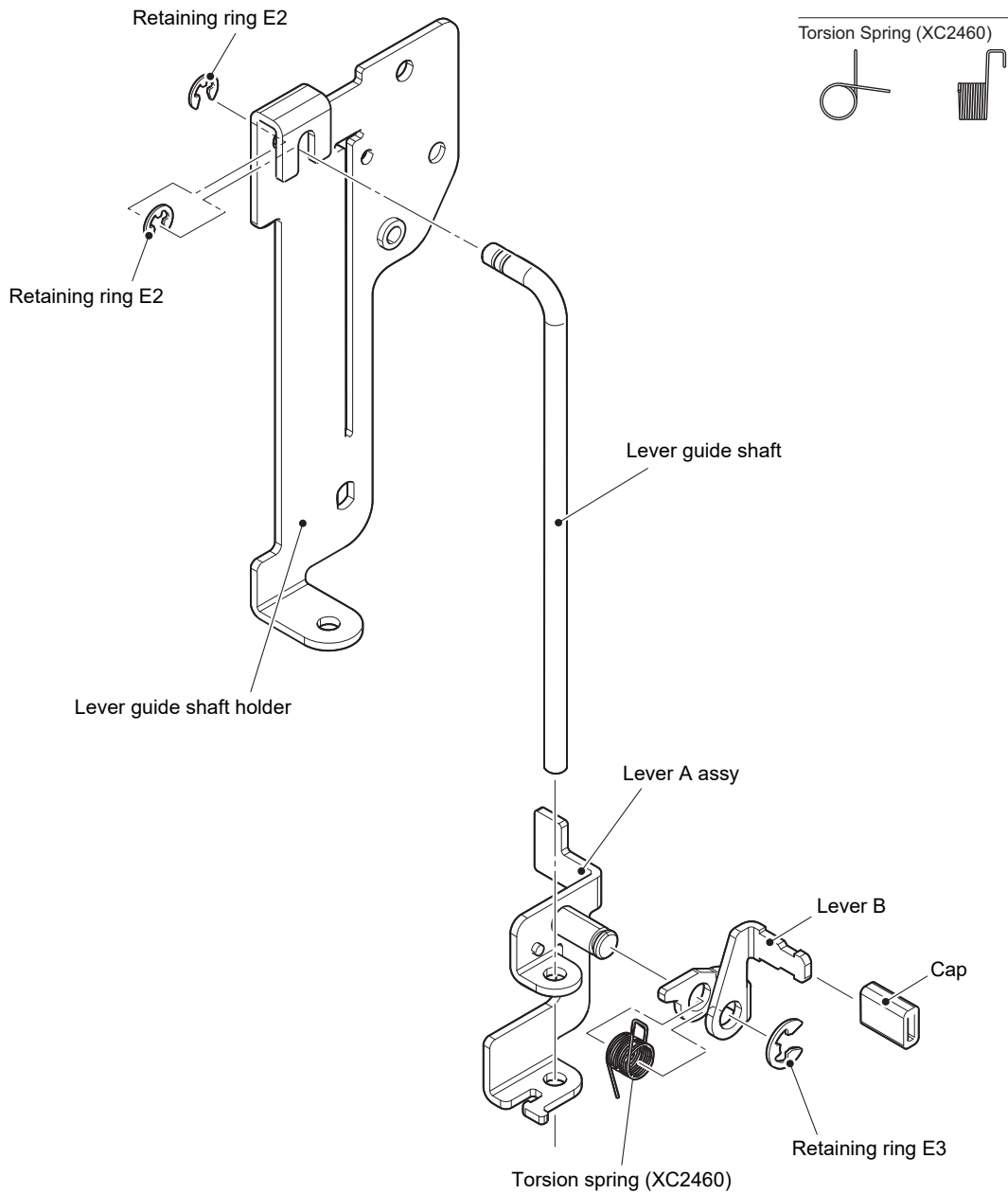
13 Removal of Lever AB

1. Remove the screw (screw, bind M3x4) to remove the switch holder and threader lever switch assy from the lever guide shaft holder.
2. Remove the two screws (screw, bind M3x4) to remove the lever guide shaft holder from the base holder assy.

Screw, Bind M3X4



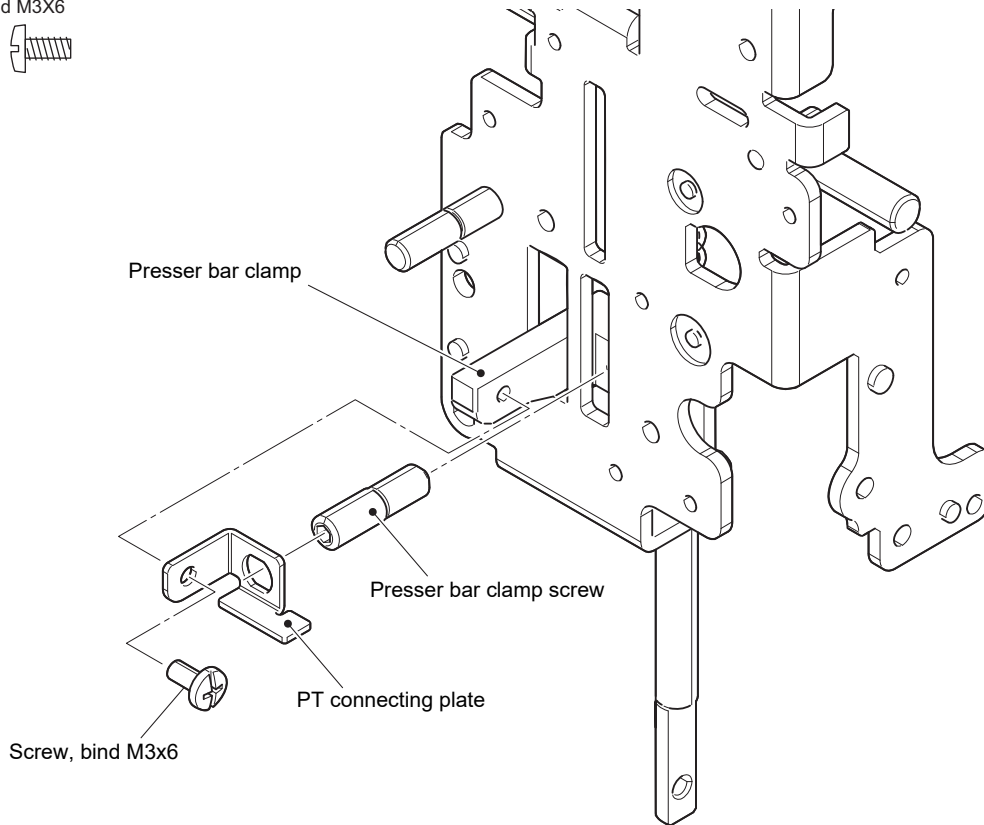
3. Remove the two retaining rings E2 from the lever guide shaft. Remove the lever guide shaft from the lever guide shaft holder. Pull out the lever A assy from the lever guide shaft.
4. Remove the retaining ring E3 to remove the lever B and the torsion spring (XC2460) from the lever A assy.
5. Remove the cap from the lever B.



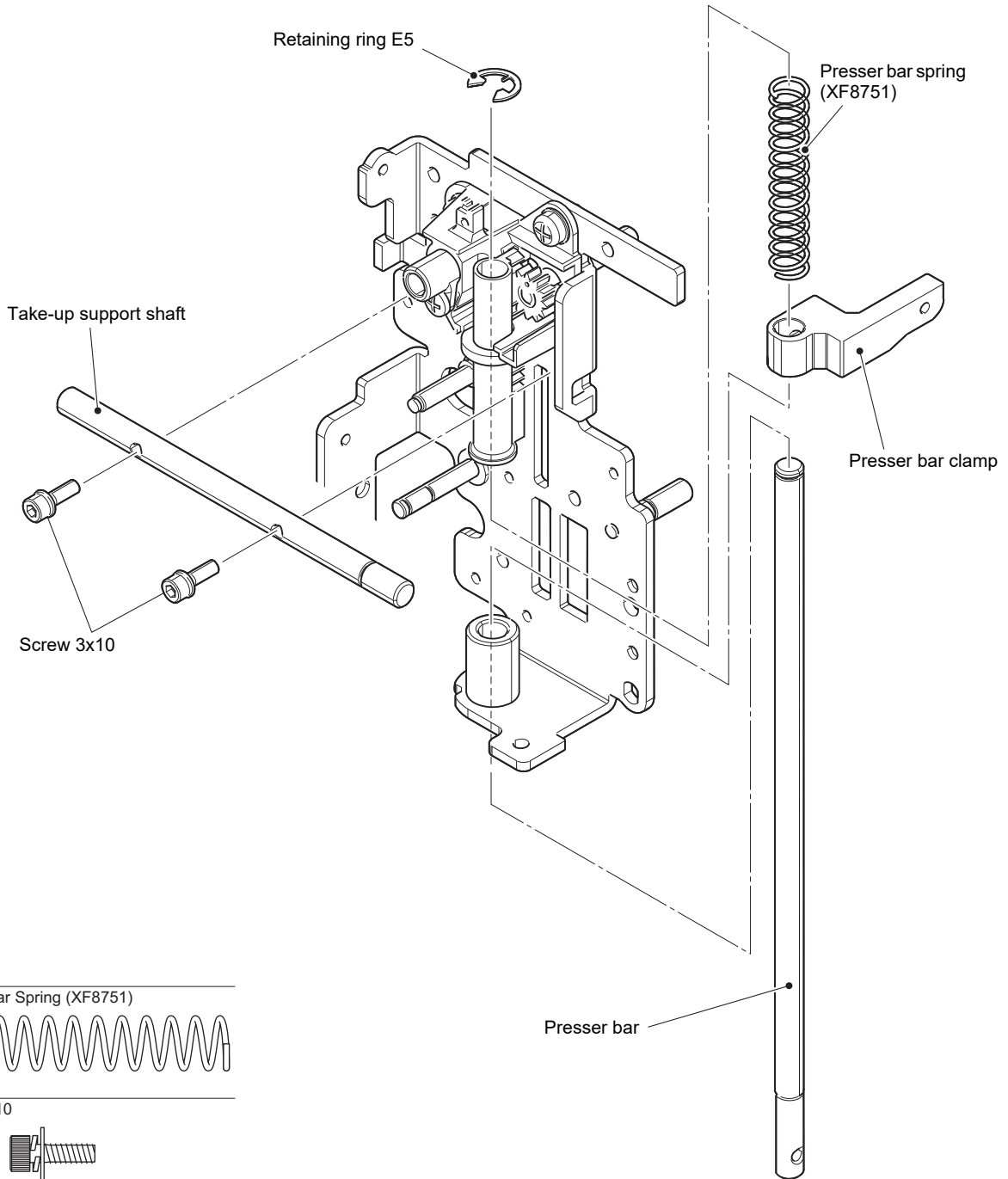
14 Removal of Presser bar and Presser bar clamp assy

1. Remove the screw (screw, bind M3x6) to remove the PT connecting plate from the presser bar clamp.
2. Remove the presser bar clamp screw from the presser bar clamp.

Screw, Bind M3X6



3. Pull out the presser bar to remove the presser bar clamp and the presser bar spring (XF8751). Remove the retaining ring E5 from the presser bar.
4. Remove the two screws (screw 3x10) to remove the take-up support shaft.

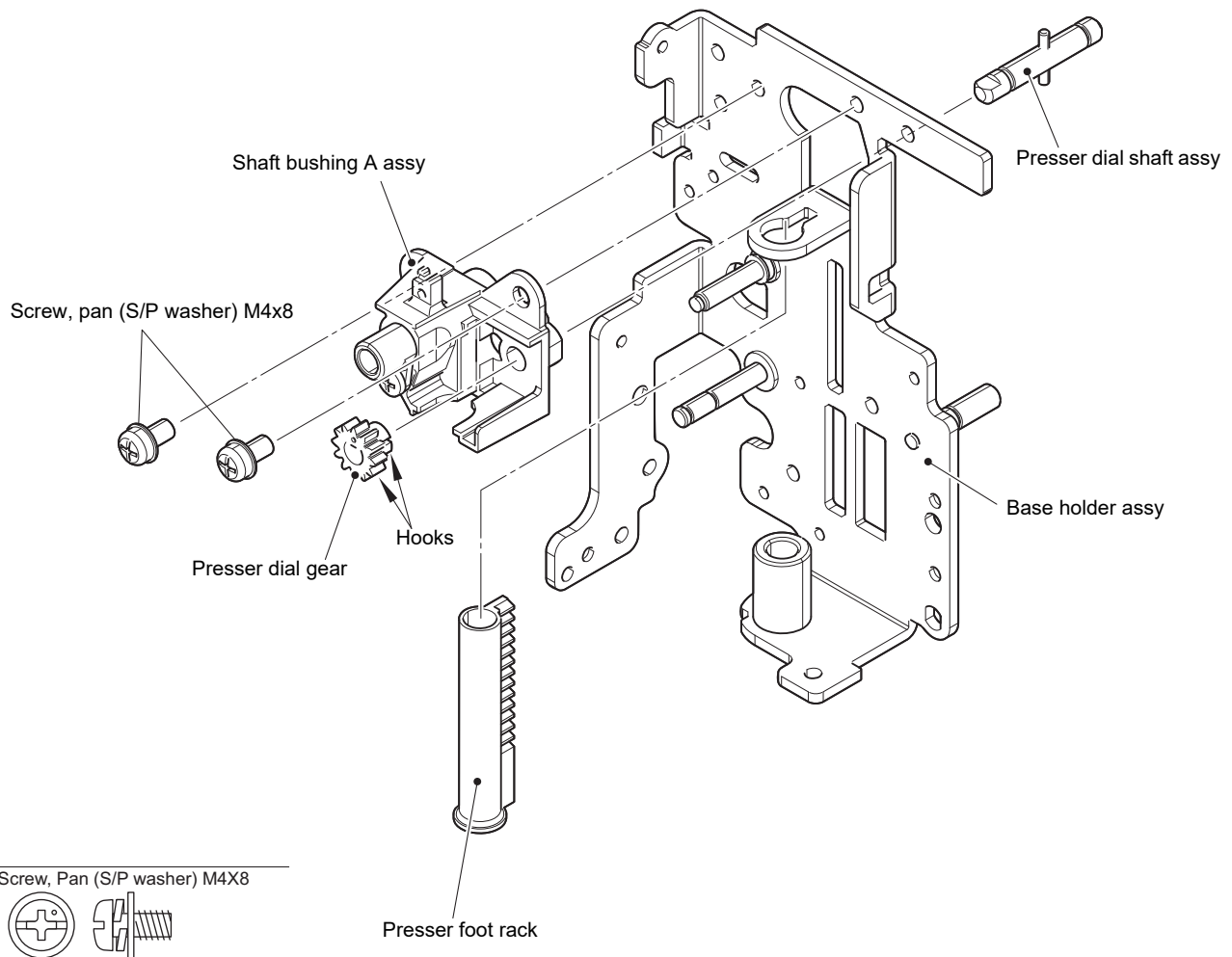


Application of Disassembly

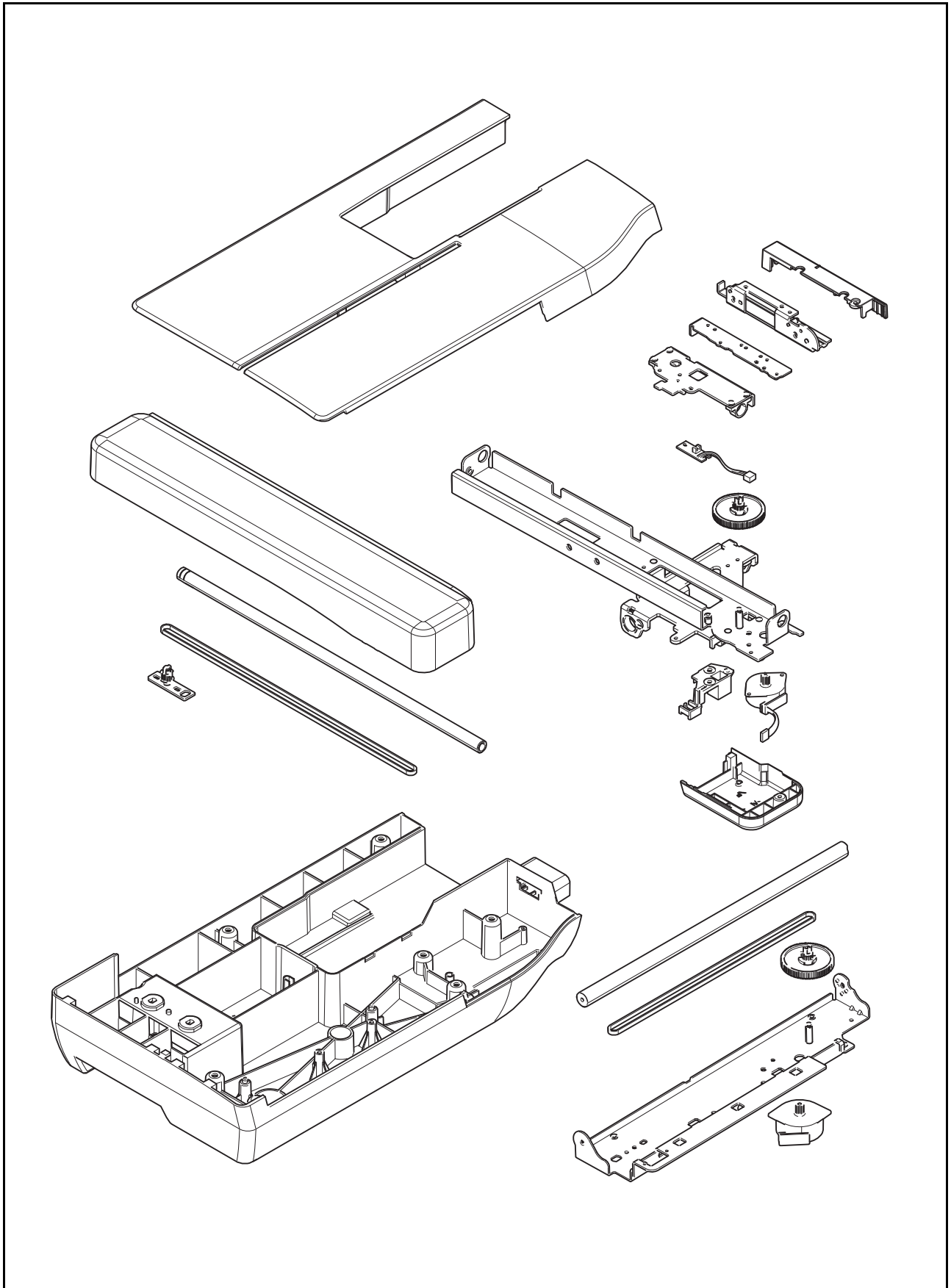
Application of Disassembly

15 Removal of Presser dial gear and Shaft bushing A assy

1. Pull out the presser foot rack.
2. Release the two hooks to remove the presser dial gear and the presser dial shaft assy.
3. Remove the two screws (screw, pan (S/P washer) M4x8) to remove the shaft bushing A assy.



Embroidery unit location diagram

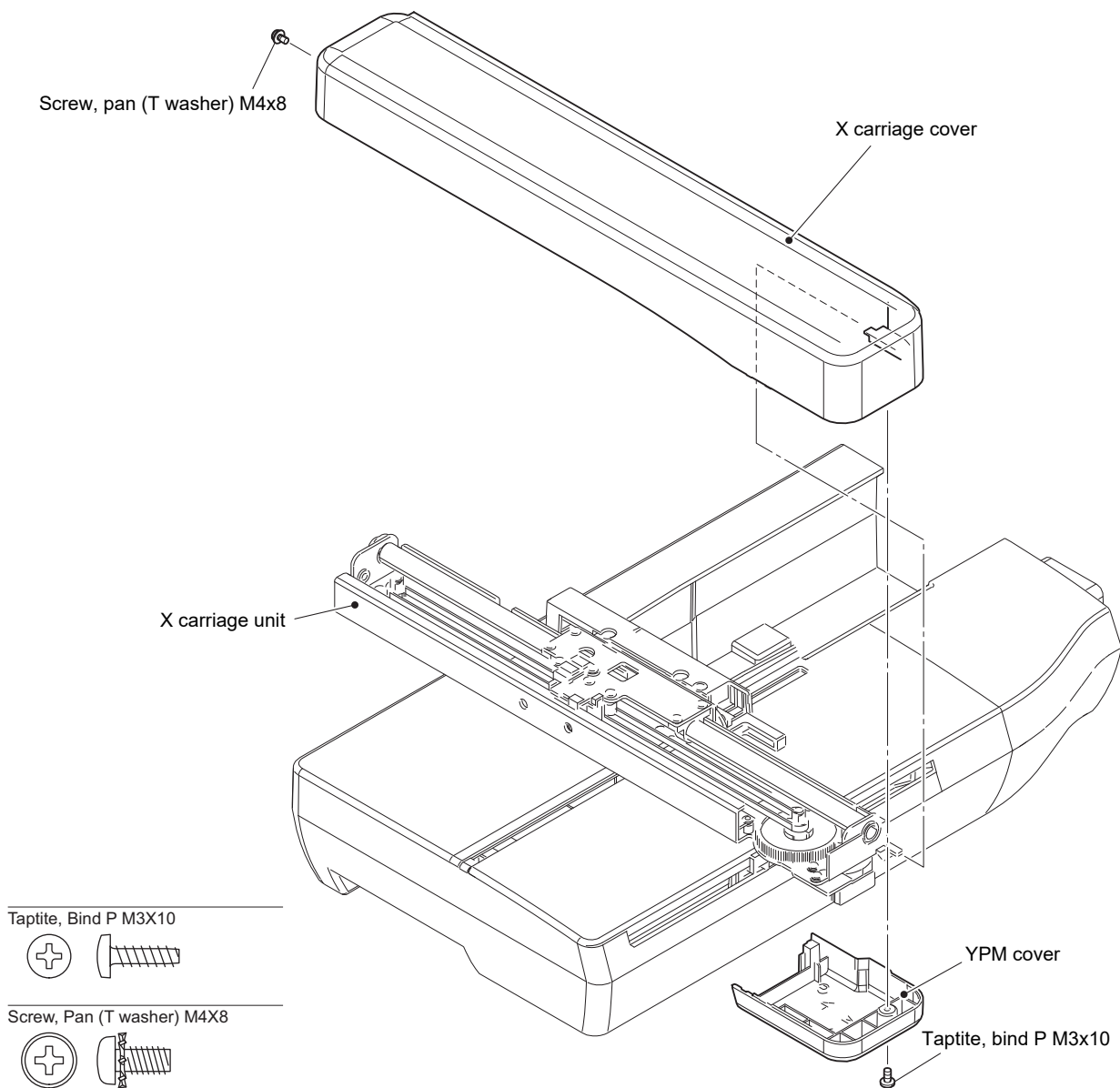


Application of Disassembly

Application of Disassembly

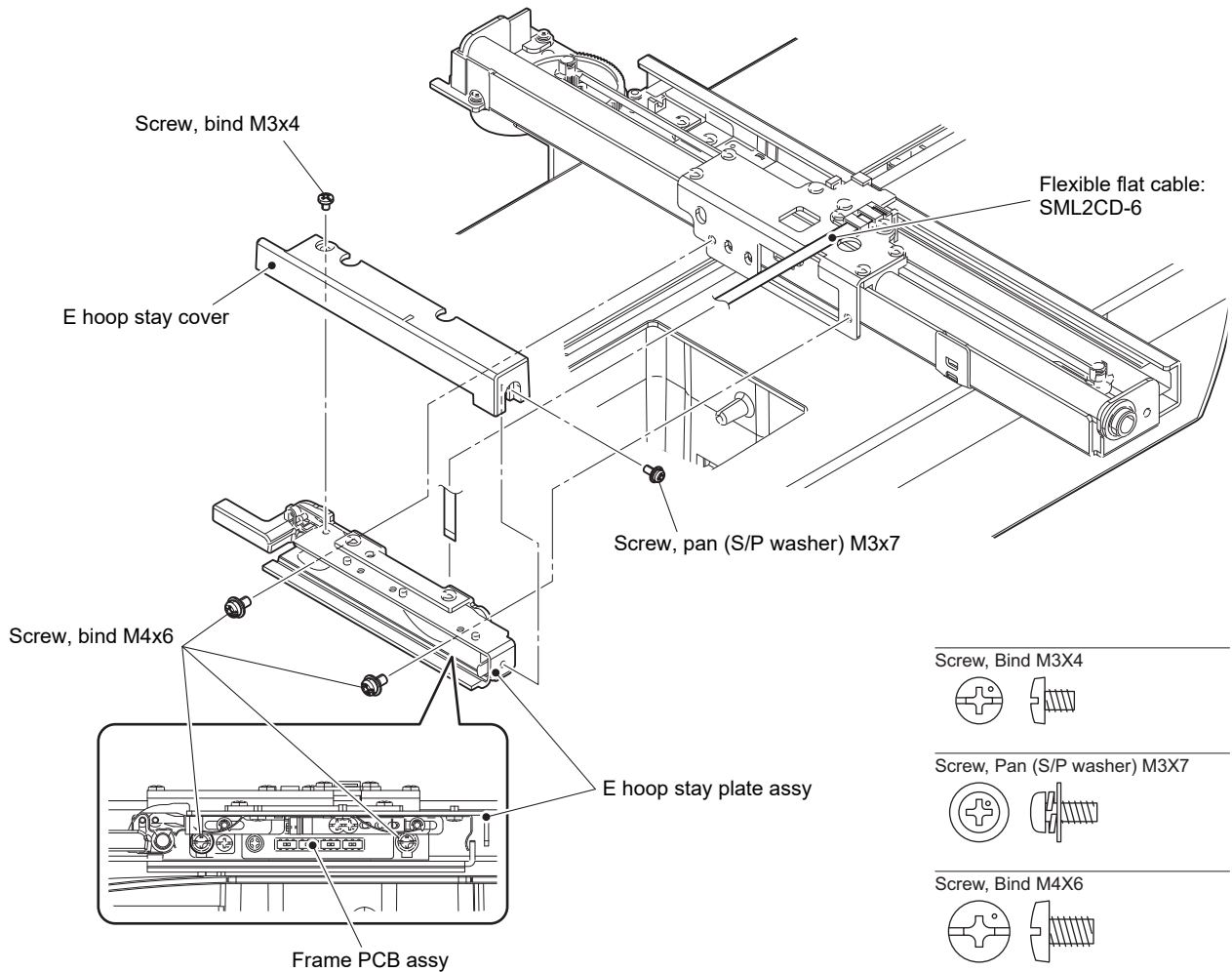
1 Removal of YPM cover and X carriage cover

1. Remove the screw (taptite, bind P M3x10) to remove the YPM cover from the X carriage cover.
2. Remove the screw (screw, pan (T washer) M4x8) to remove the X carriage cover from the X carriage unit.



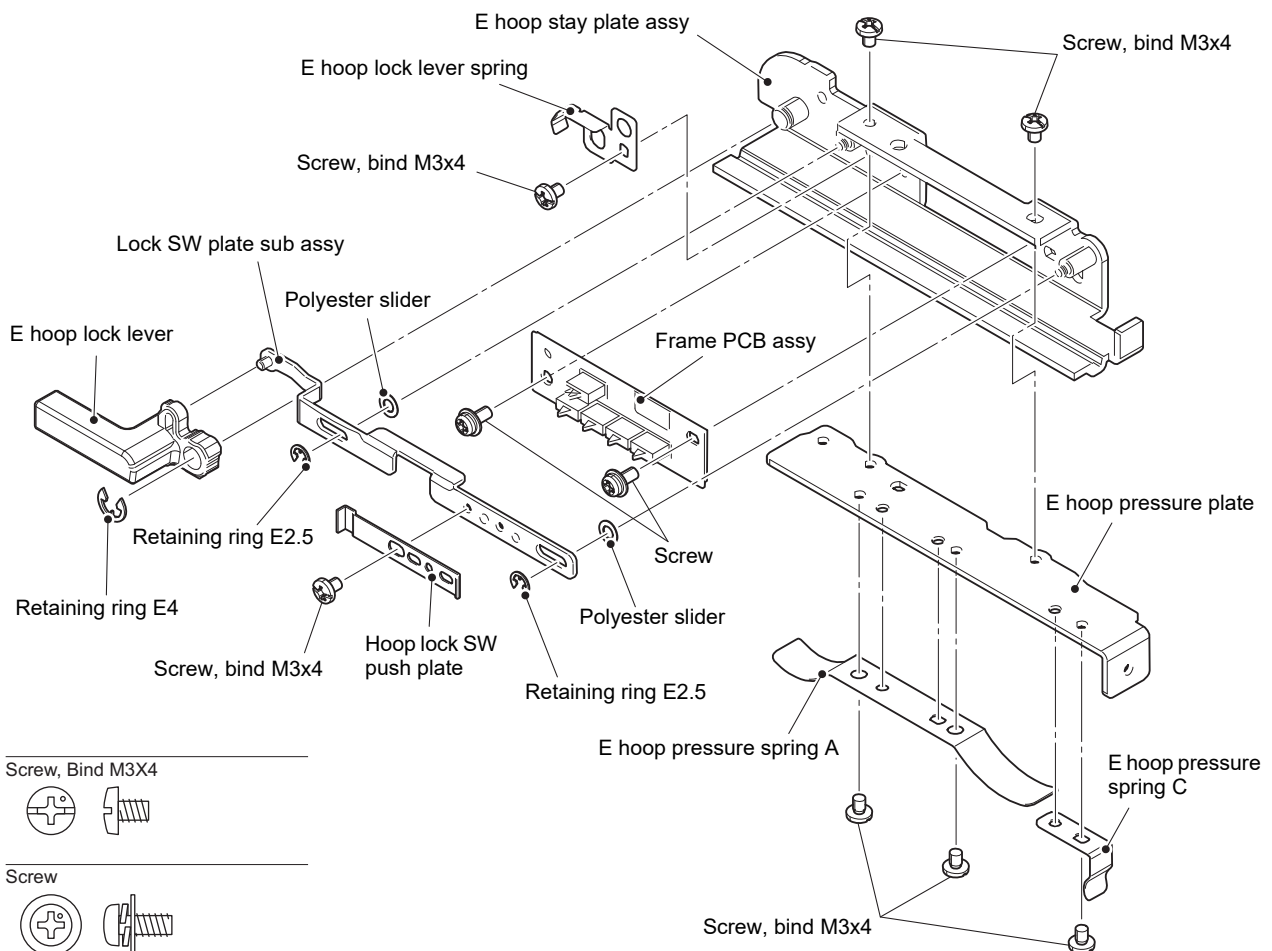
2 Removal of E hoop stay plate assy

1. Remove the screw (screw, bind M3x4) and screw (screw, pan (S/P washer) M3x7) to remove the E hoop stay cover.
2. Remove the two screws (screw, bind M4x6) to remove the E hoop stay plate assy, and disconnect the flexible flat cable:SML2CD-6 from the frame PCB assy.



3 Disassembly of E hoop stay plate assy

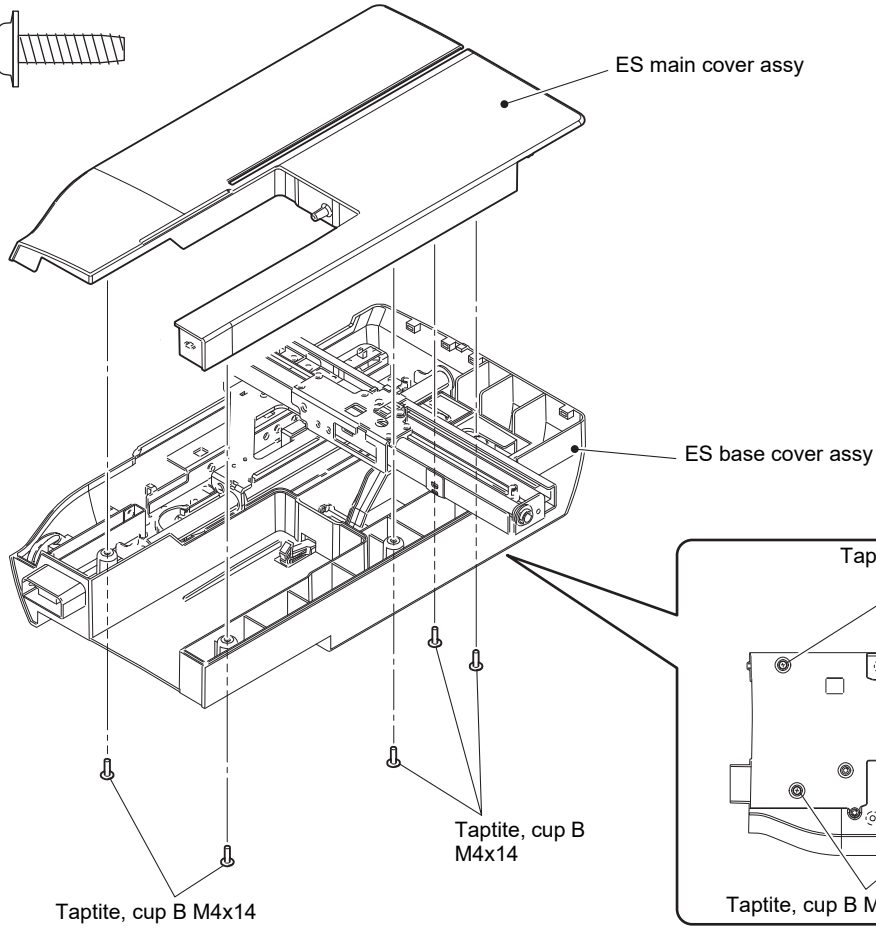
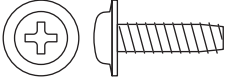
1. Remove the two screws (screw, bind M3x4) to remove the E hoop pressure plate from the E hoop stay plate assy. Remove the two screws (screw, bind M3x4) to remove the E hoop pressure spring A from the E hoop pressure plate. Remove the screw (screw, bind M3x4) to remove the E hoop pressure spring C from the E hoop pressure plate.
2. Remove the screw (screw, bind M3x4) to remove the hoop lock SW push plate from the lock SW plate sub assy.
3. Remove the retaining ring E4, and remove the E hoop lock lever from the E hoop stay plate assy.
4. Remove the two retaining rings E2.5, then remove the lock SW plate sub assy and two polyester sliders from the E hoop stay plate assy.
5. Remove the two screws (screw) to remove the frame PCB assy from the E hoop stay plate assy.
6. Remove the screw (screw, bind M3x4) to remove the E hoop lock lever spring from the E hoop stay plate assy.



4 Removal of ES main cover assy

1. Remove the five screws (taptite, cup B M4x14) from the bottom side of ES base cover assy. Slide the ES main cover assy to the left side, and remove it from the ES base cover assy.

Taptite, Cup B M4X14

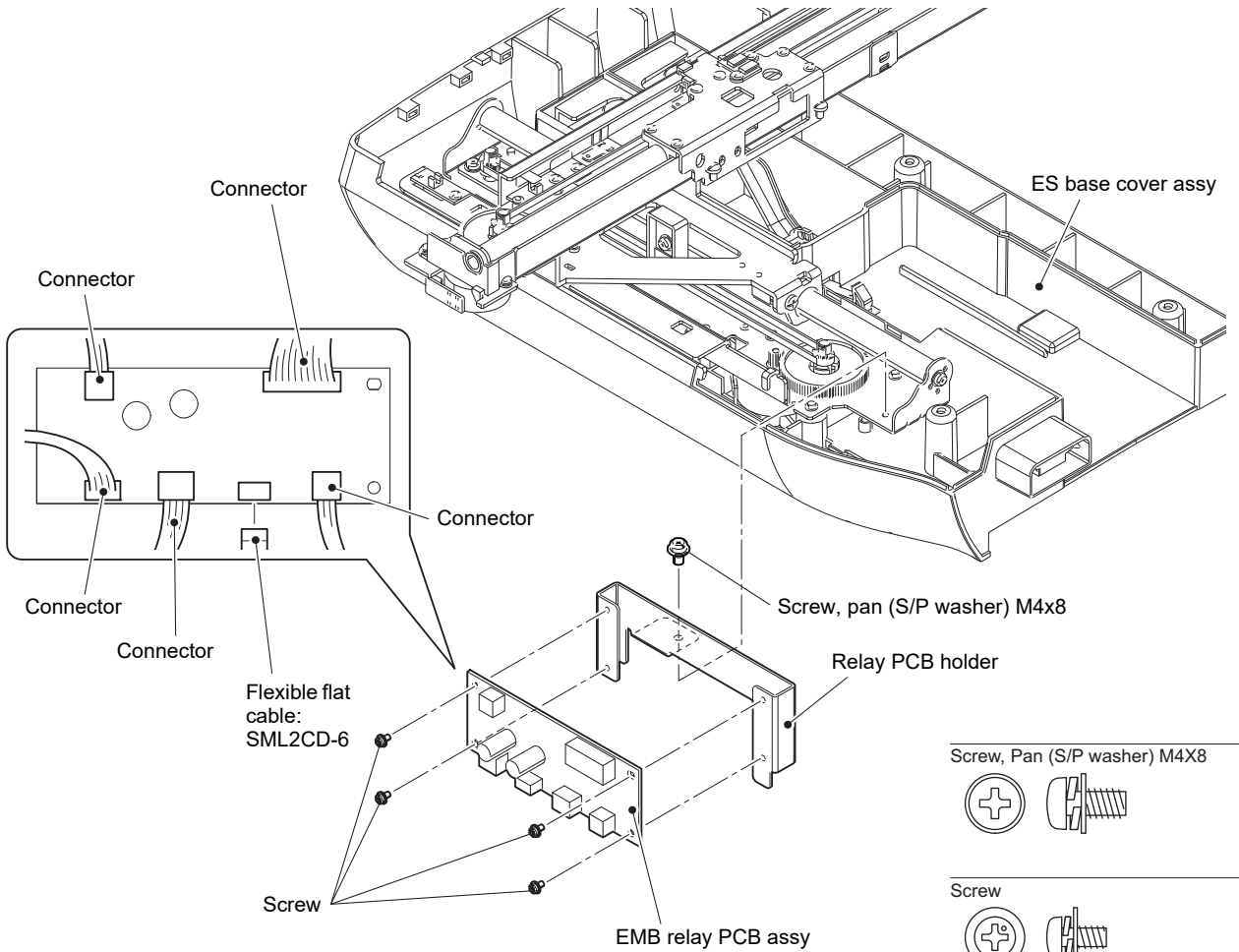


Application of
Disassembly

Application of
Disassembly

5 Removal of EMB relay PCB assy

1. Remove the screw (screw, pan (S/P washer) M4x8) to remove the relay PCB holder from the ES base cover assy. Disconnect the flexible flat cable:SML2CD-6 and five connectors from the EMB relay PCB assy.
2. Remove the four screws (screw) to remove the EMB relay PCB assy from the relay PCB holder.

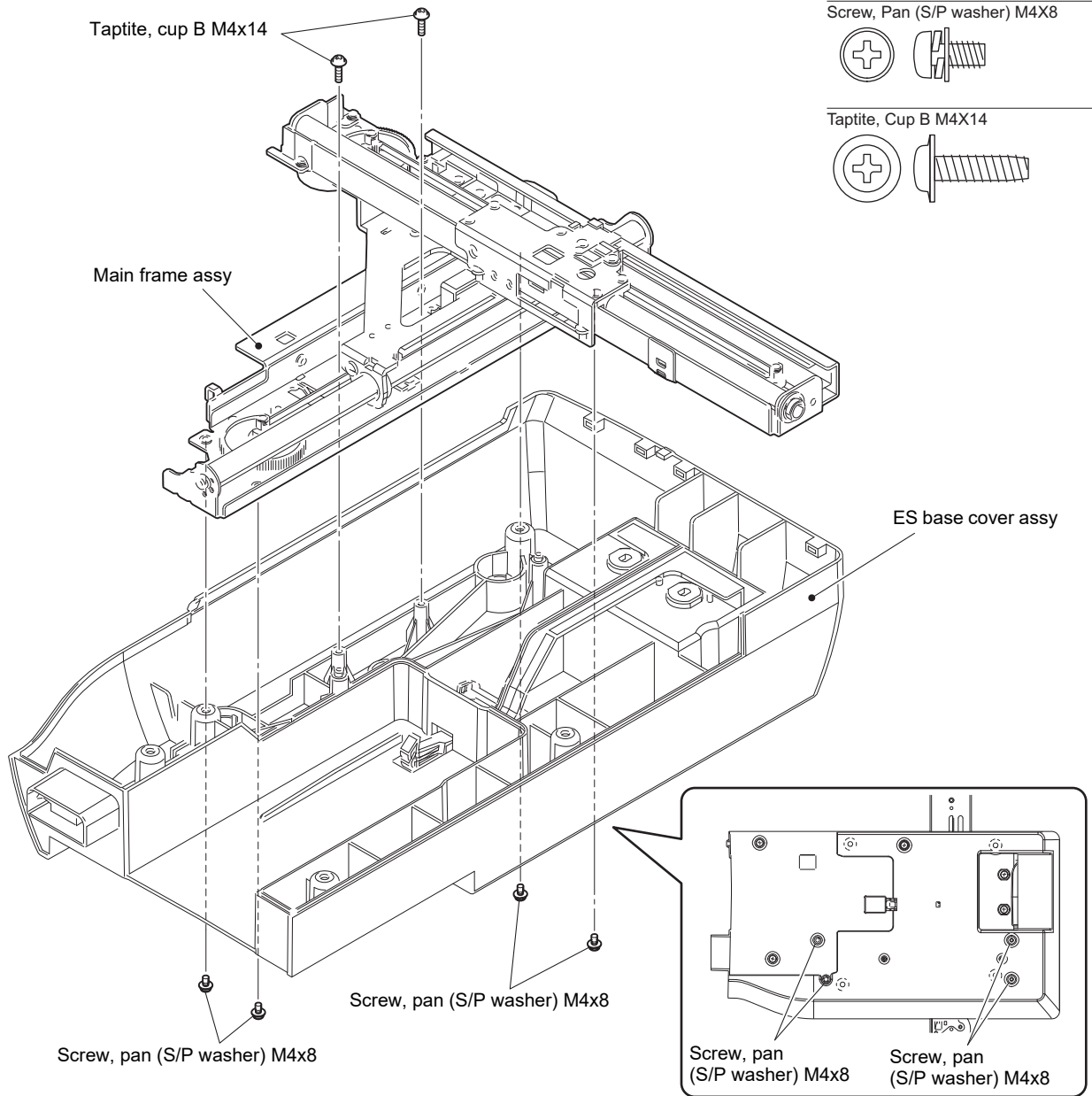


Application of
Disassembly

Application of
Disassembly

6 Removal of ES base cover assy

1. Remove the four screws (screw, pan (S/P washer) M4x8) from the bottom side of ES base cover assy. Remove the two screws (taptite, cup B M4x14) to remove the ES base cover assy from the main frame assy.

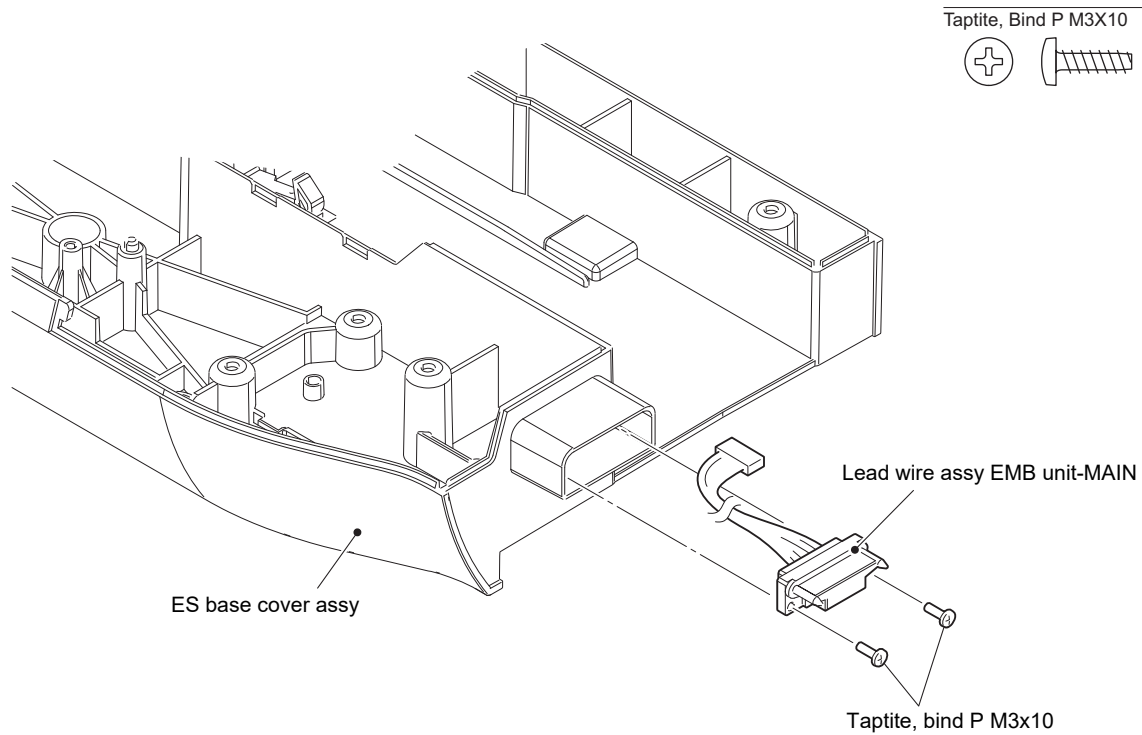


Application of
Disassembly

Application of
Disassembly

7 Removal of Lead wire assy EMB unit-MAIN

1. Remove the two screws (taptite, bind P M3x10) to remove the lead wire assy EMB unit-MAIN from the ES base cover assy.

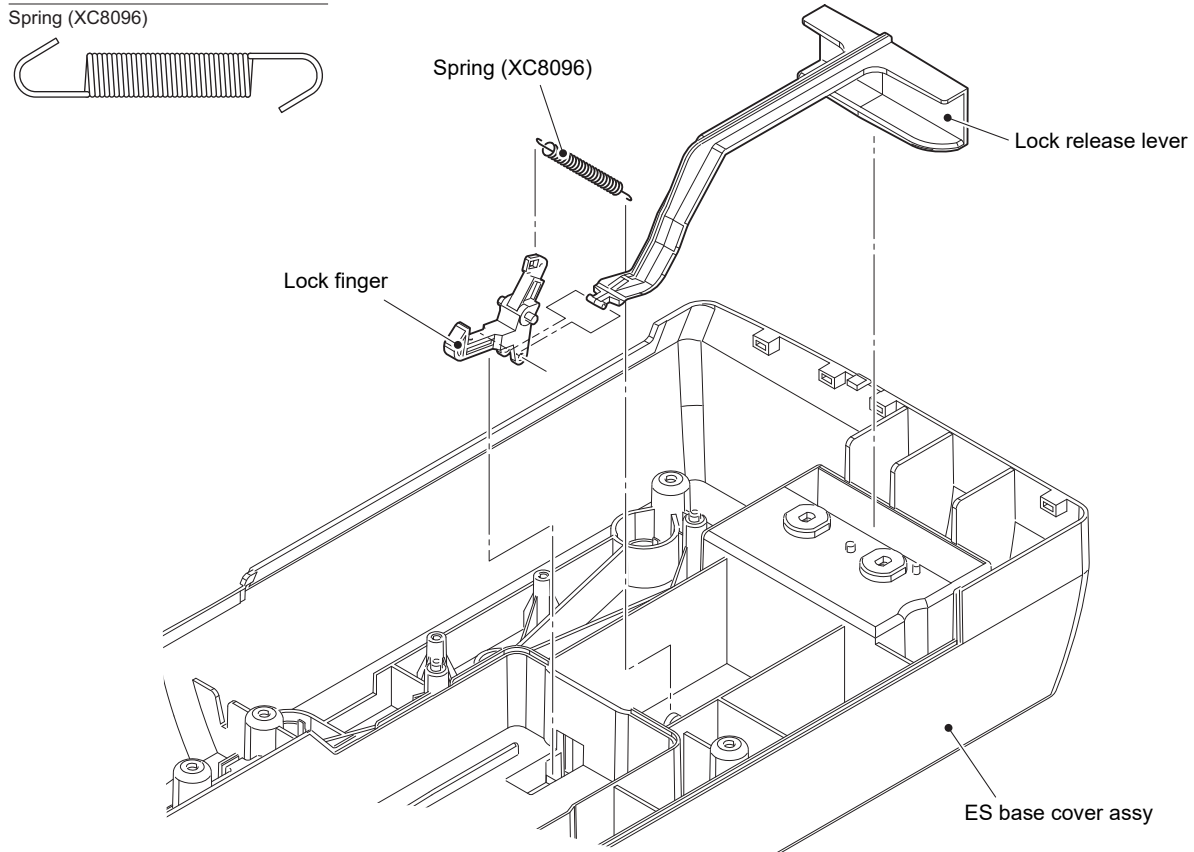


Application of
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Application of
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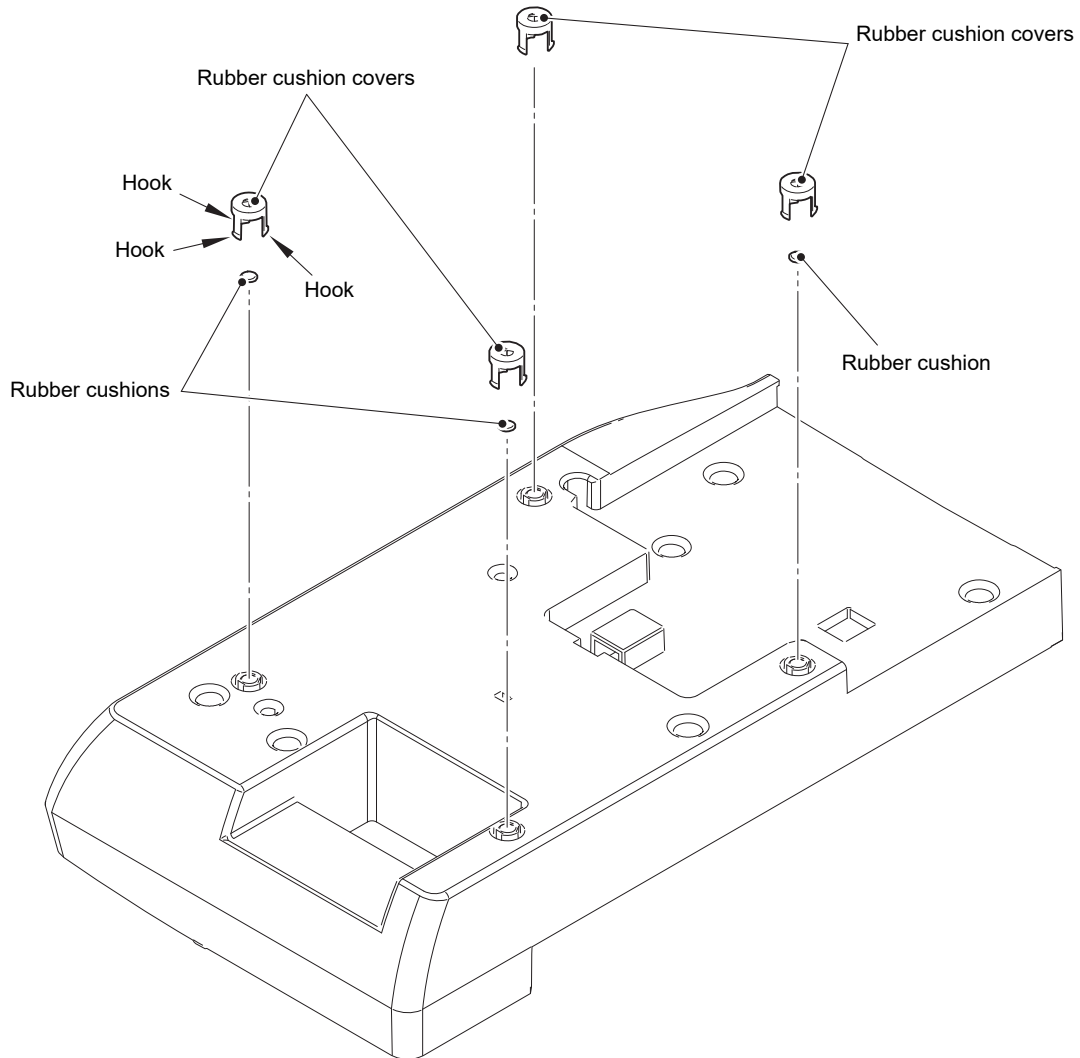
8 Removal of Lock release lever

1. Remove the spring (XC8096) from the lock finger and the ES base cover assy.
2. Remove the lock release lever and the lock finger from the ES base cover assy, and remove the lock finger from the lock release lever.



9 Removal of Rubber cushion

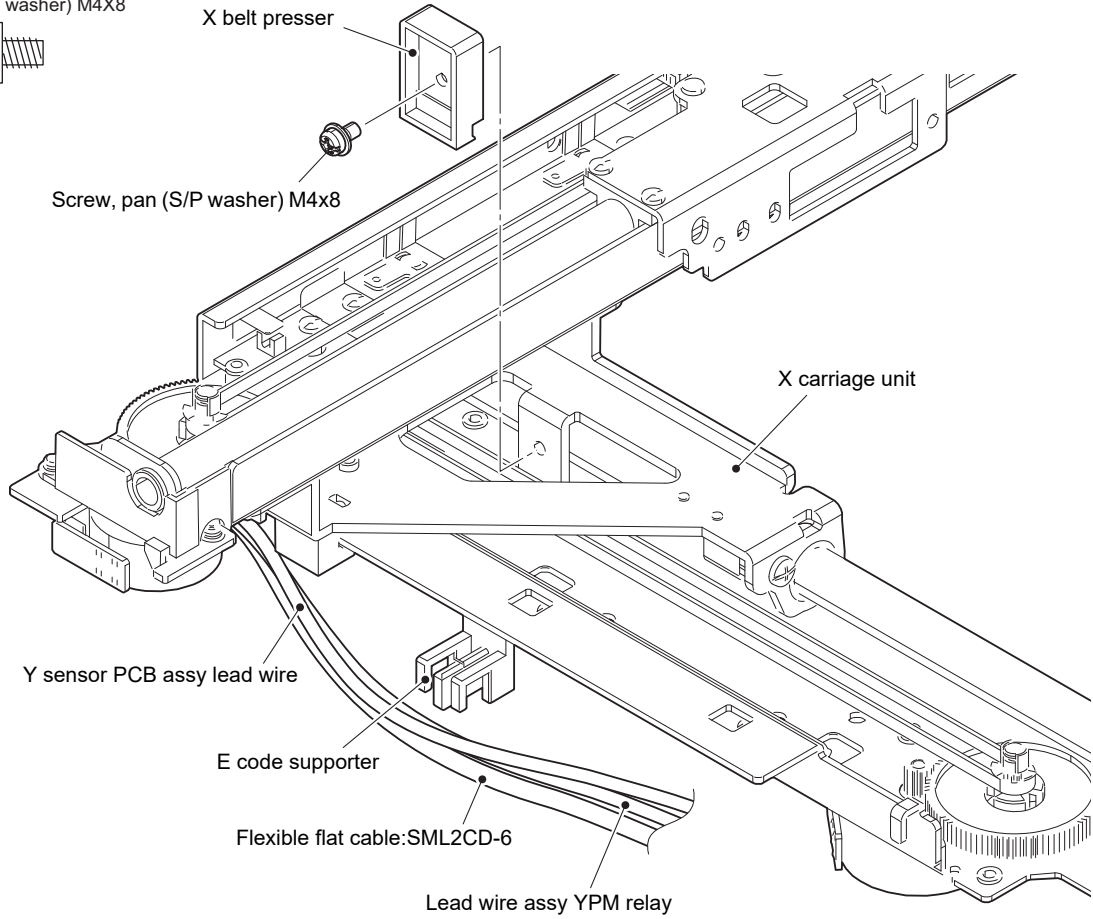
1. Release the three hooks to remove the rubber cushion cover. (four locations)
2. Remove the rubber cushion. (three locations)



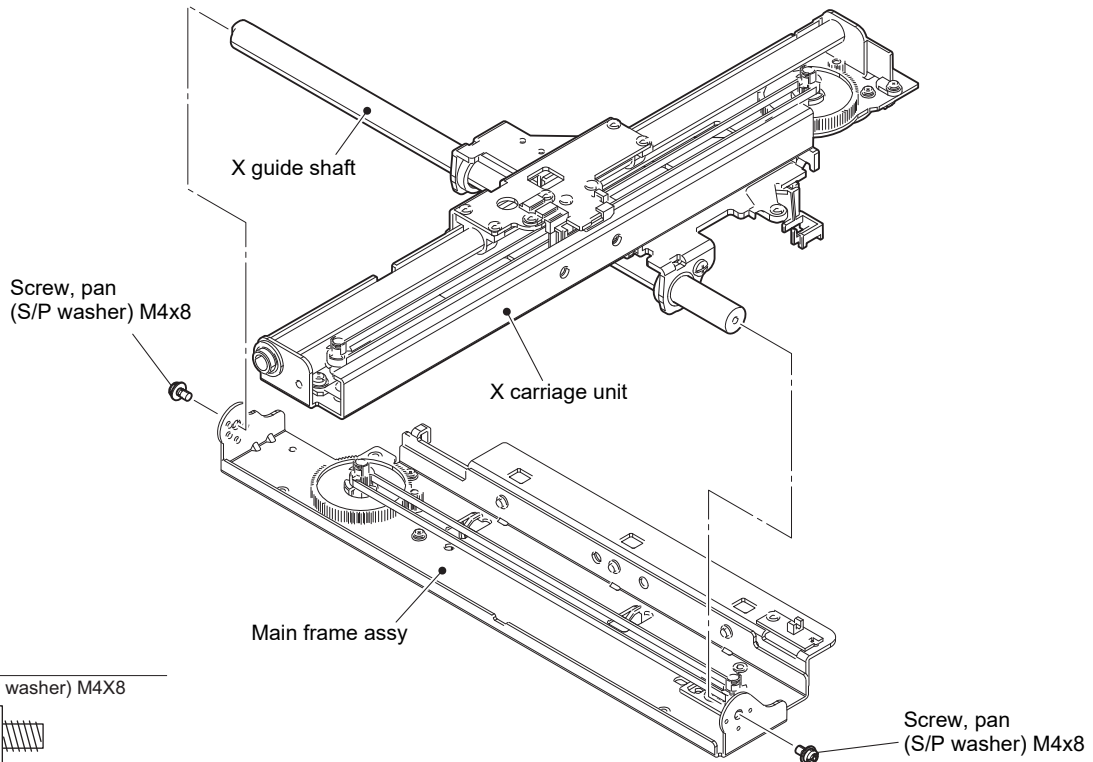
10 Removal of X carriage unit

1. Release the flexible flat cable:SML2CD-6, the Y sensor PCB assy lead wire and the lead wire assy YPM relay from the E code supporter.
2. Remove the screw (screw, pan (S/P washer) M4x8) to remove the X belt presser from the X carriage unit.

Screw, Pan (S/P washer) M4X8



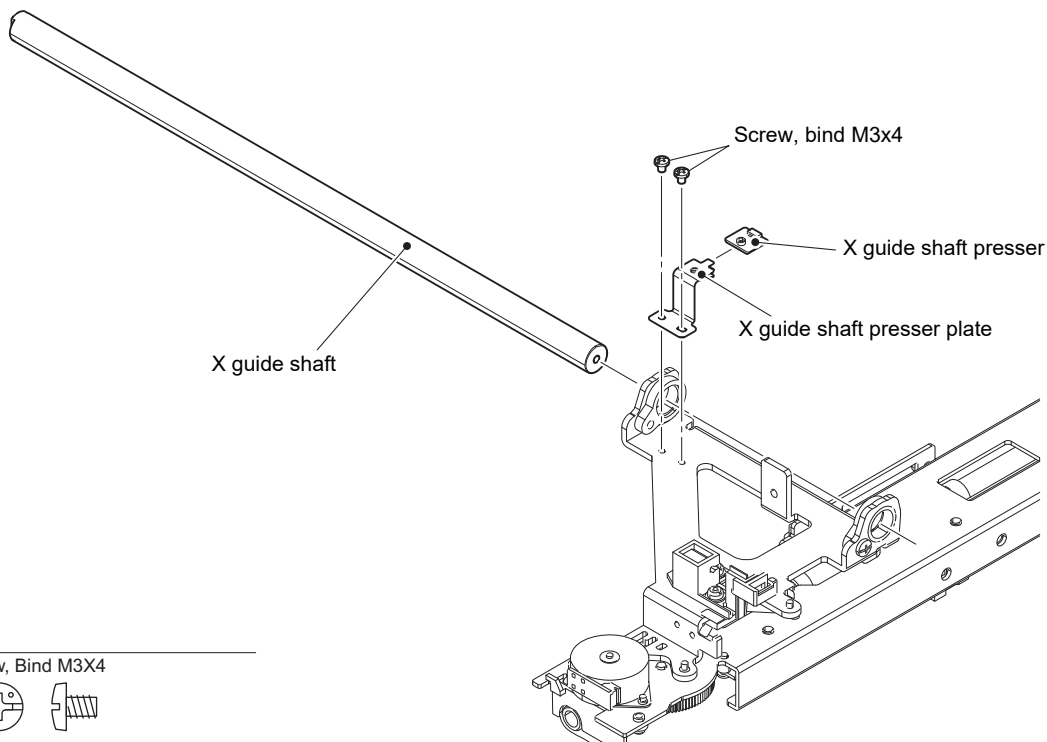
- Remove the two screws (screw, pan (S/P washer) M4x8) to remove the X carriage unit and X guide shaft from the main frame assy.



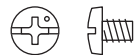
Screw, Pan (S/P washer) M4X8



- Pull out the X guide shaft.
- Remove the X guide shaft presser.
- Remove the two screws (screw, bind M3x4), and then remove the X guide shaft presser plate.

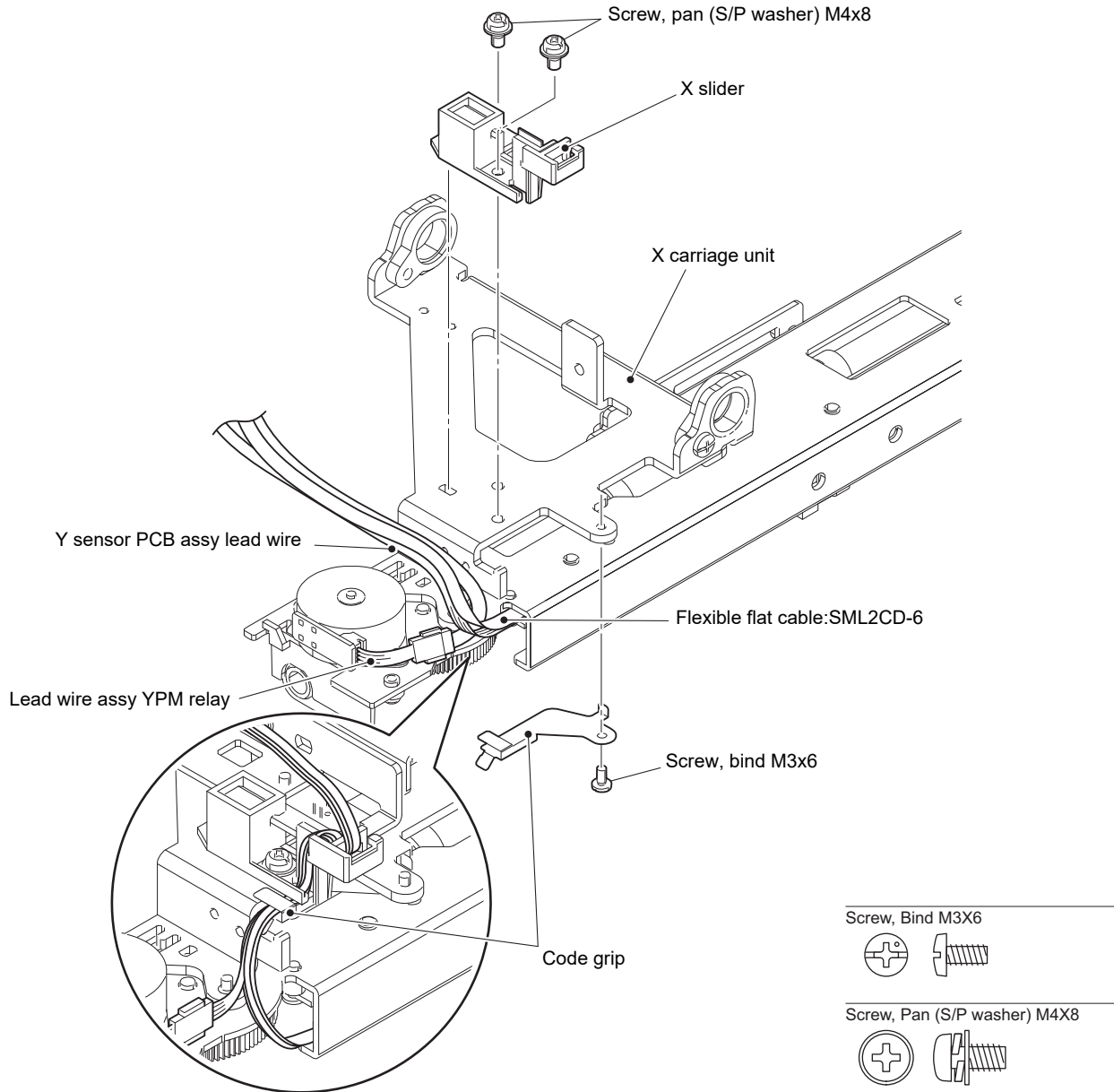


Screw, Bind M3X4



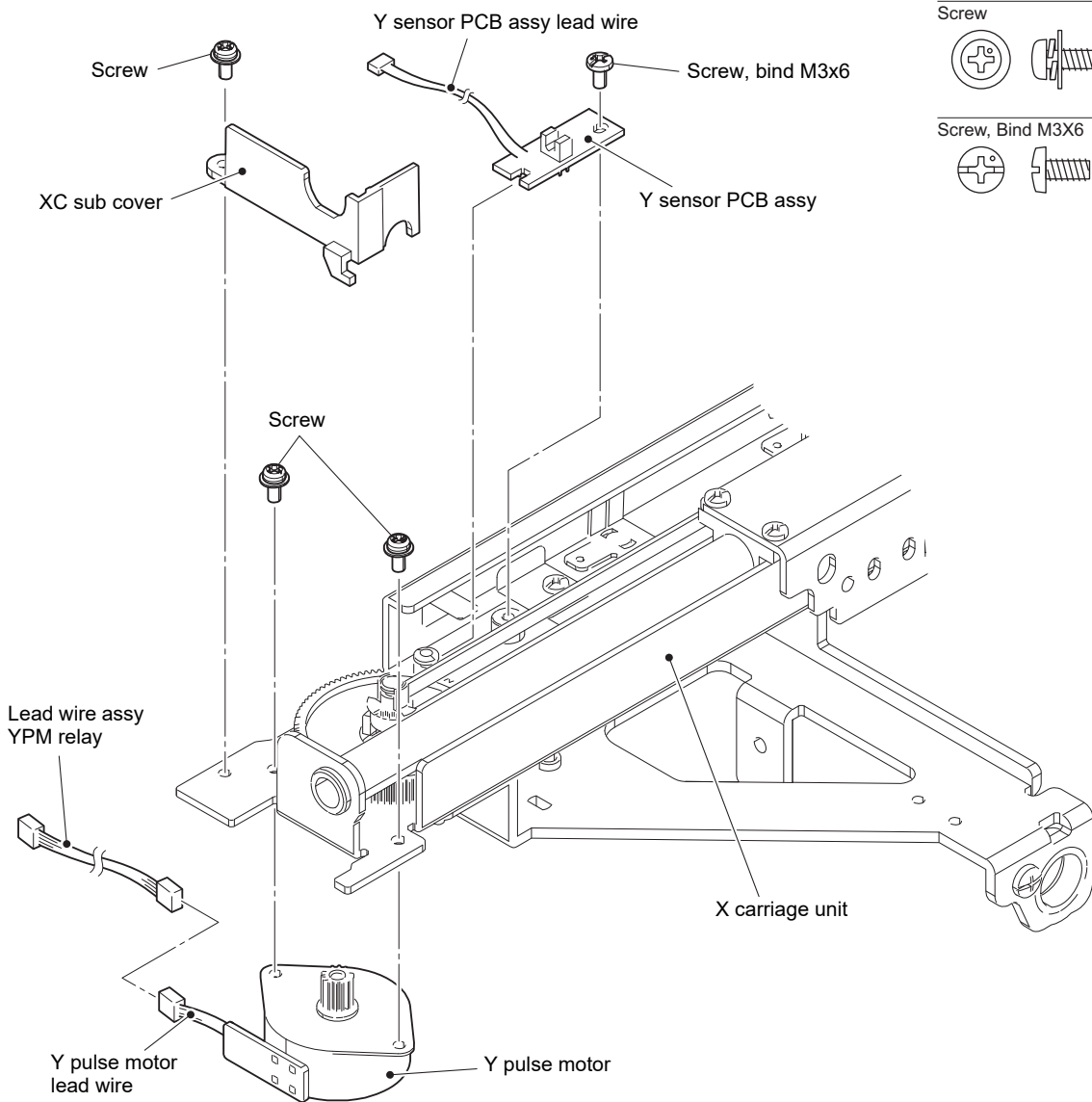
11 Removal of X slider

1. Remove the screw (screw, bind M3x6) to remove the code grip from the X carriage unit. Release the flexible flat cable:SML2CD-6, the Y sensor PCB assy lead wire and the lead wire assy YPM relay from the securing fixtures.
2. Remove the two screws (screw, pan (S/P washer) M4x8) to remove the X slider from the X carriage unit.



12 Removal of Y pulse motor and Y sensor PCB assy

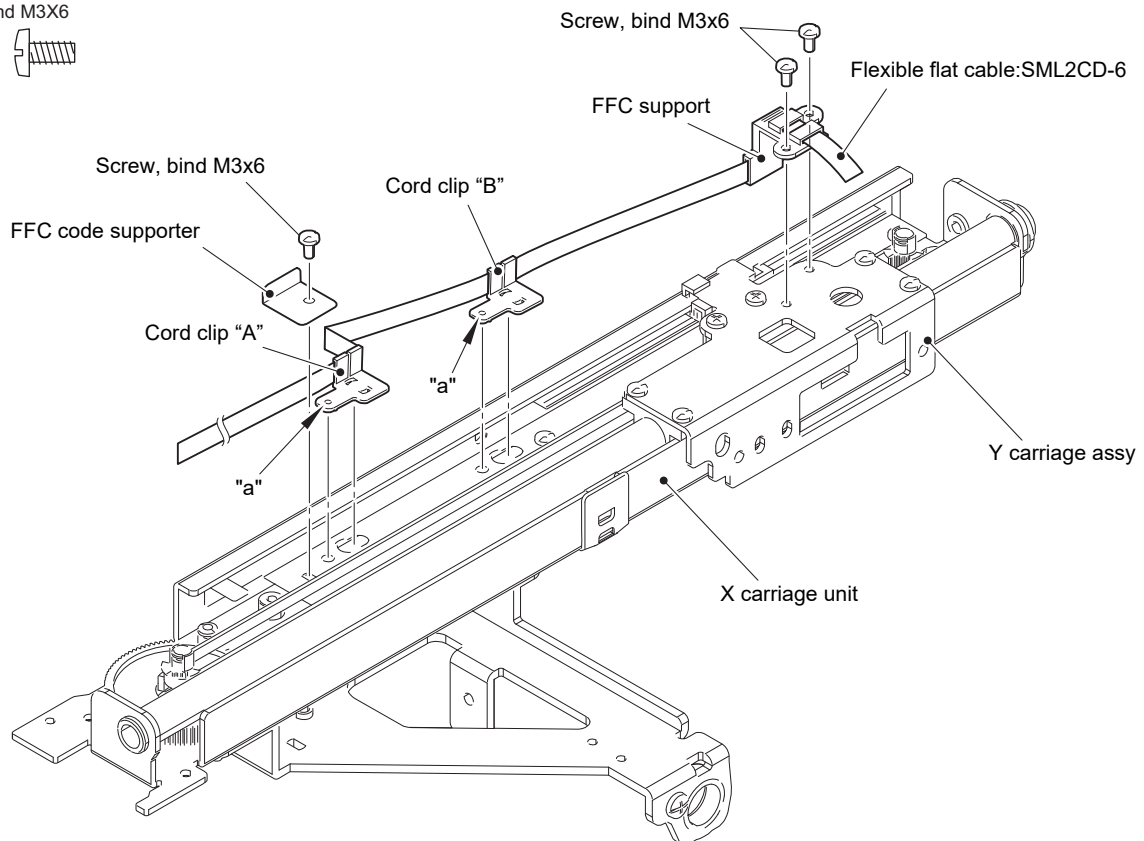
1. Remove the screw (screw) to remove the XC sub cover from the X carriage unit.
2. Remove the two screws (screw) to remove the Y pulse motor from the X carriage unit. Disconnect the lead wire assy YPM relay from the Y pulse motor lead wire.
3. Release the Y sensor PCB assy lead wire from the securing fixtures, and remove the screw (screw, bind M3x6) to remove the Y sensor PCB assy from the X carriage unit.



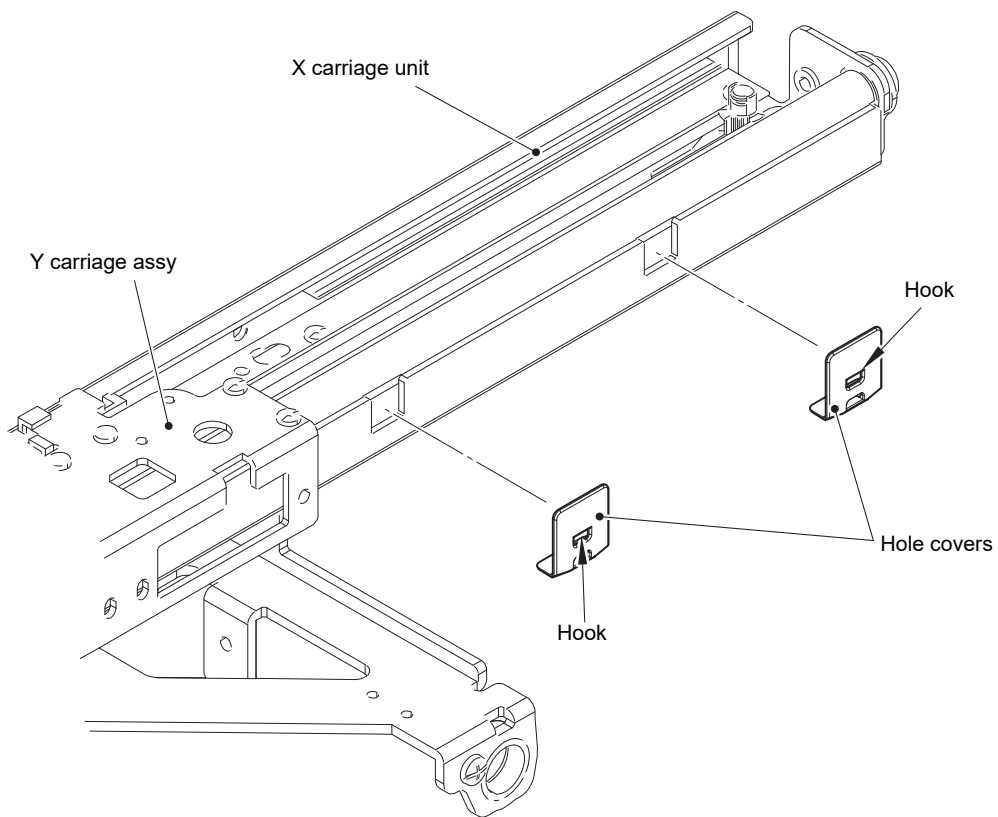
13 Removal of Flexible flat cable:SML2CD-6 and Hole cover

1. Slide the Y carriage assy to come in sight of the two cord clips.
2. Remove the screw (screw, bind M3x6) to remove the FFC code supporter from the X carriage unit.
3. Release the flexible flat cable:SML2CD-6 from the securing fixtures.
4. Slide the cord clip "A" to the left side to remove the cord clip "A" from the X carriage unit while pulling up the position "a". Remove the cord clip "A" from the flexible flat cable:SML2CD-6.
5. Slide the cord clip "B" to the left side to remove the cord clip "B" from the X carriage unit while pulling up the position "a".
6. Remove the two screws (screw, bind M3x6) to remove the FFC support from the Y carriage assy, and remove the flexible flat cable:SML2CD-6 from the FFC support.

Screw, Bind M3X6

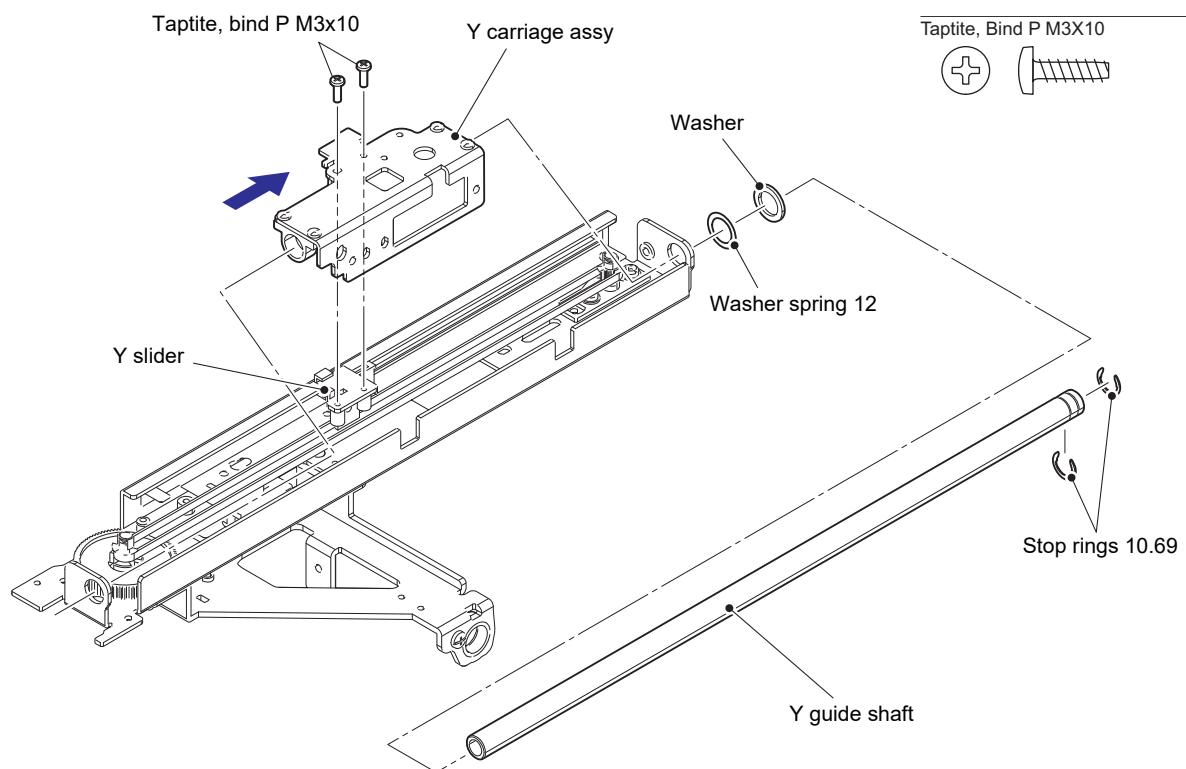


7. Slide the Y carriage assy to come in sight of the two hole covers.
8. Release the hook to remove the hole cover from the X carriage unit. (two locations)



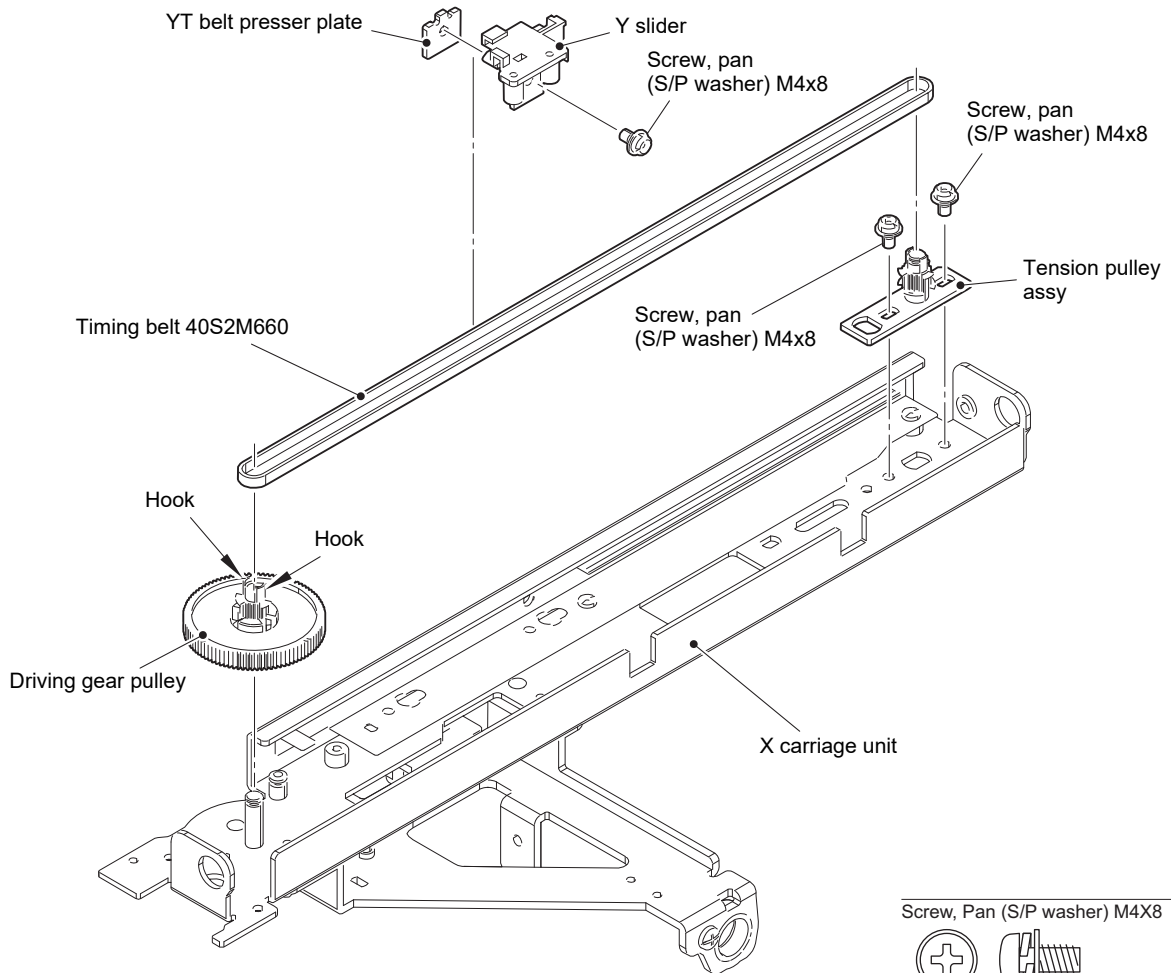
14 Removal of Y carriage assy

1. Remove the two screws (taptite, bind P M3x10), and slide the Y carriage assy to the direction of the arrow to remove it from the Y slider.
2. Remove the stop ring 10.69, and pull out the Y guide shaft to remove the Y carriage assy, the washer spring 12 and the washer from the Y guide shaft. Remove the stop ring 10.69 from the Y guide shaft.



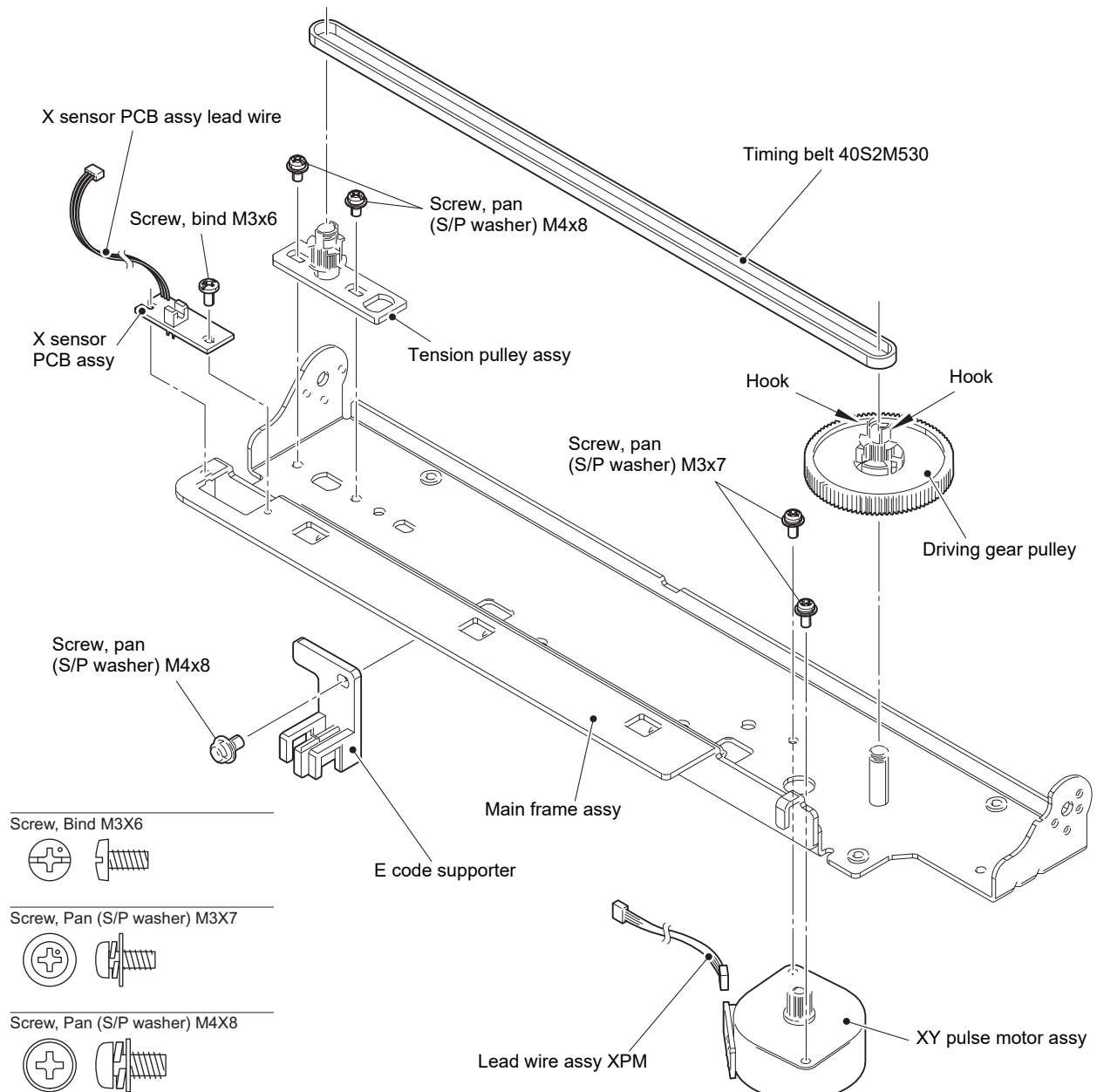
15 Removal of Y slider and Timing belt 40S2M660

1. Slide the Y slider to come in sight of the screw. Remove the screw (screw, pan (S/P washer) M4x8) to remove the YT belt presser plate and Y slider from the timing belt 40S2M660.
2. Remove the two screws (screw, pan (S/P washer) M4x8) to remove the tension pulley assy from the X carriage unit, and remove the timing belt 40S2M660.
3. Release the two hooks to remove the driving gear pulley.



16 Disassembly of Main frame assy

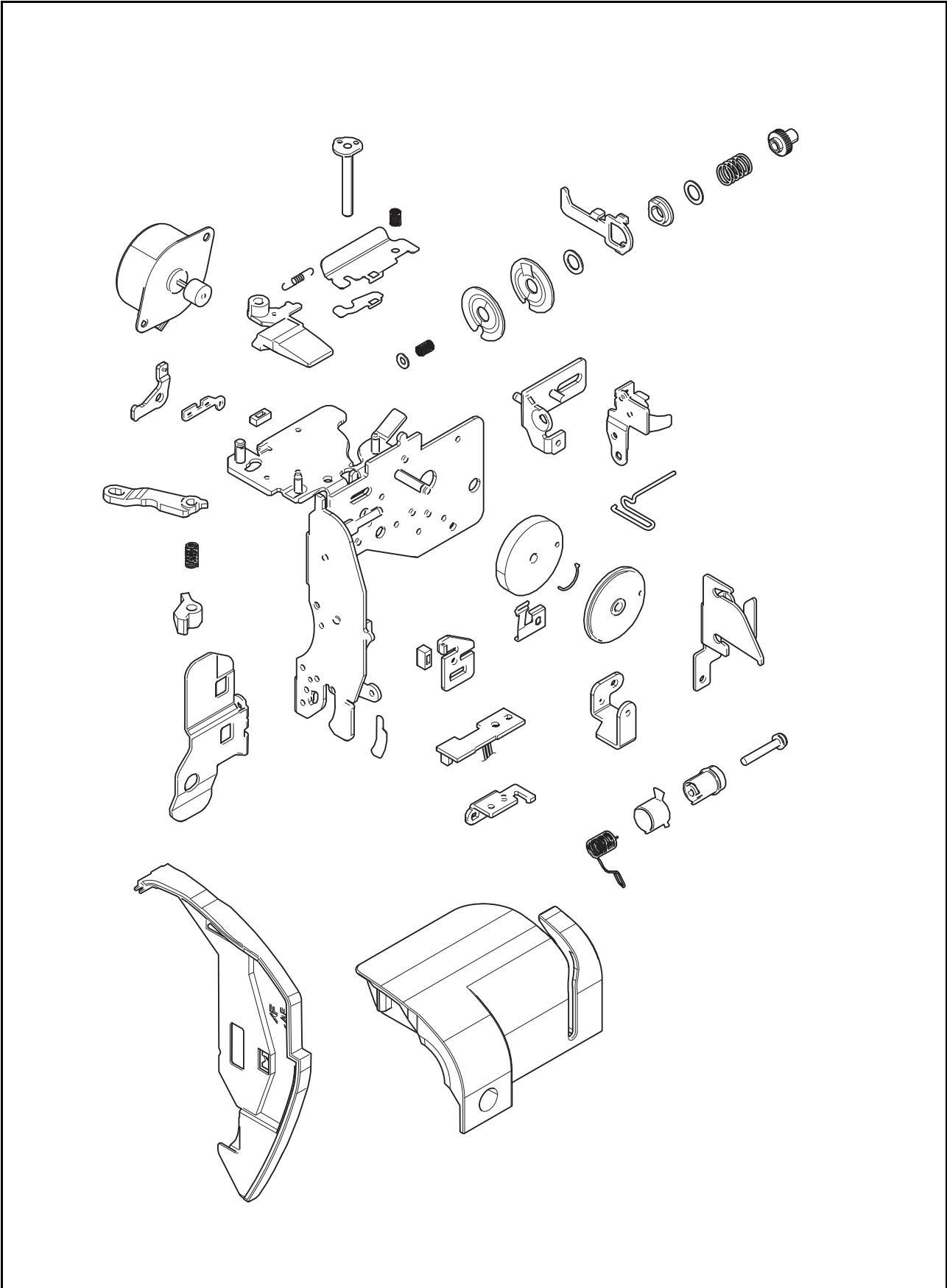
1. Release the X sensor PCB assy lead wire from the securing fixtures. Remove the screw (screw, bind M3x6) to remove the X sensor PCB assy from the main frame assy.
2. Remove the two screws (screw, pan (S/P washer) M3x7) to remove the XY pulse motor assy from the main frame assy. Disconnect the lead wire assy XPM from the XY pulse motor assy.
3. Remove the two screws (screw, pan (S/P washer) M4x8) to remove the tension pulley assy from the main frame assy, and remove the timing belt 40S2M530.
4. Release the two hooks to remove the driving gear pulley.
5. Remove the screw (screw, pan (S/P washer) M4x8) to remove the E code supporter.



Application of
Disassembly

Application of
Disassembly

Needle threading mechanism location diagram

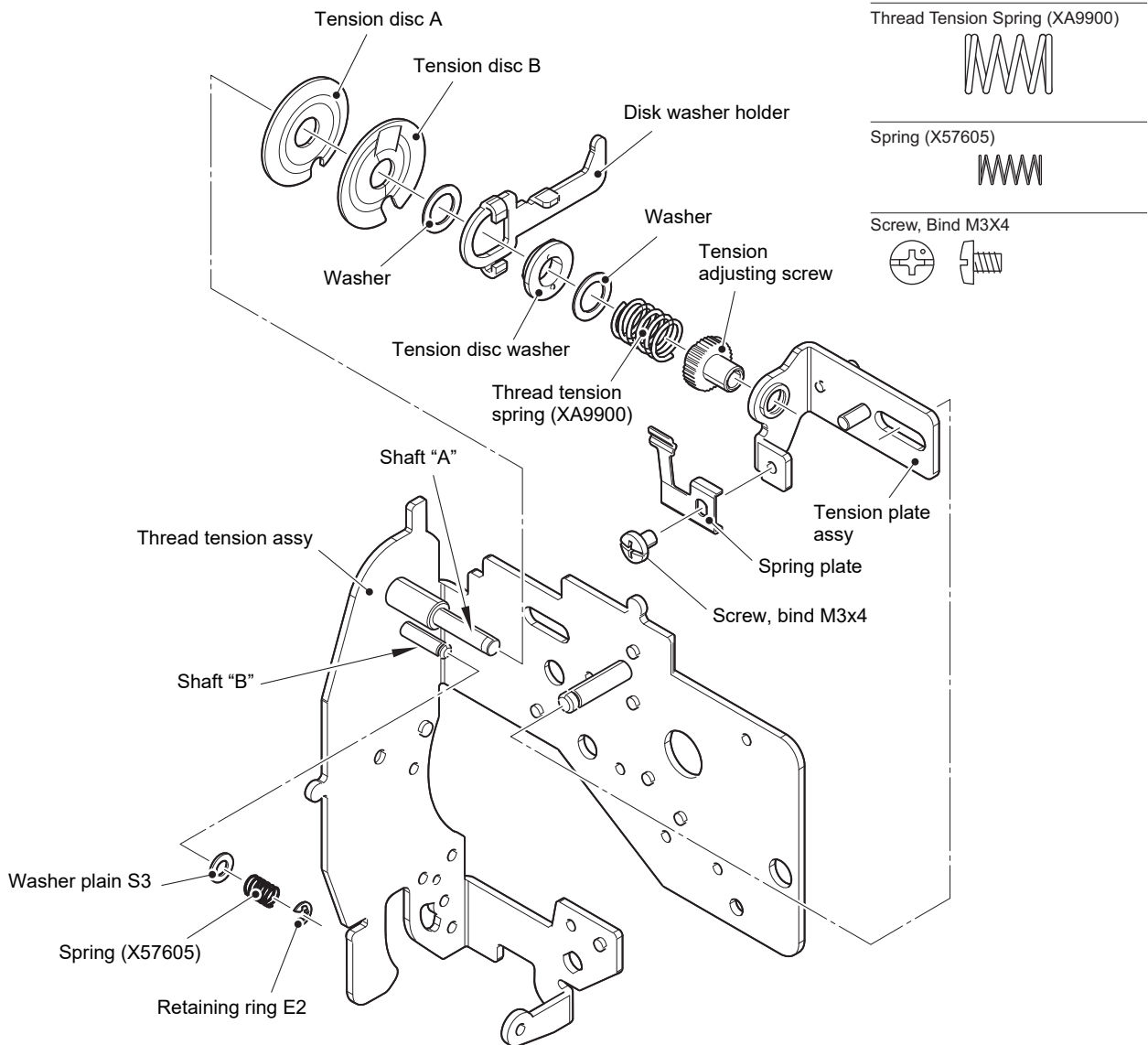


Application of
Assembly

Application of
Assembly

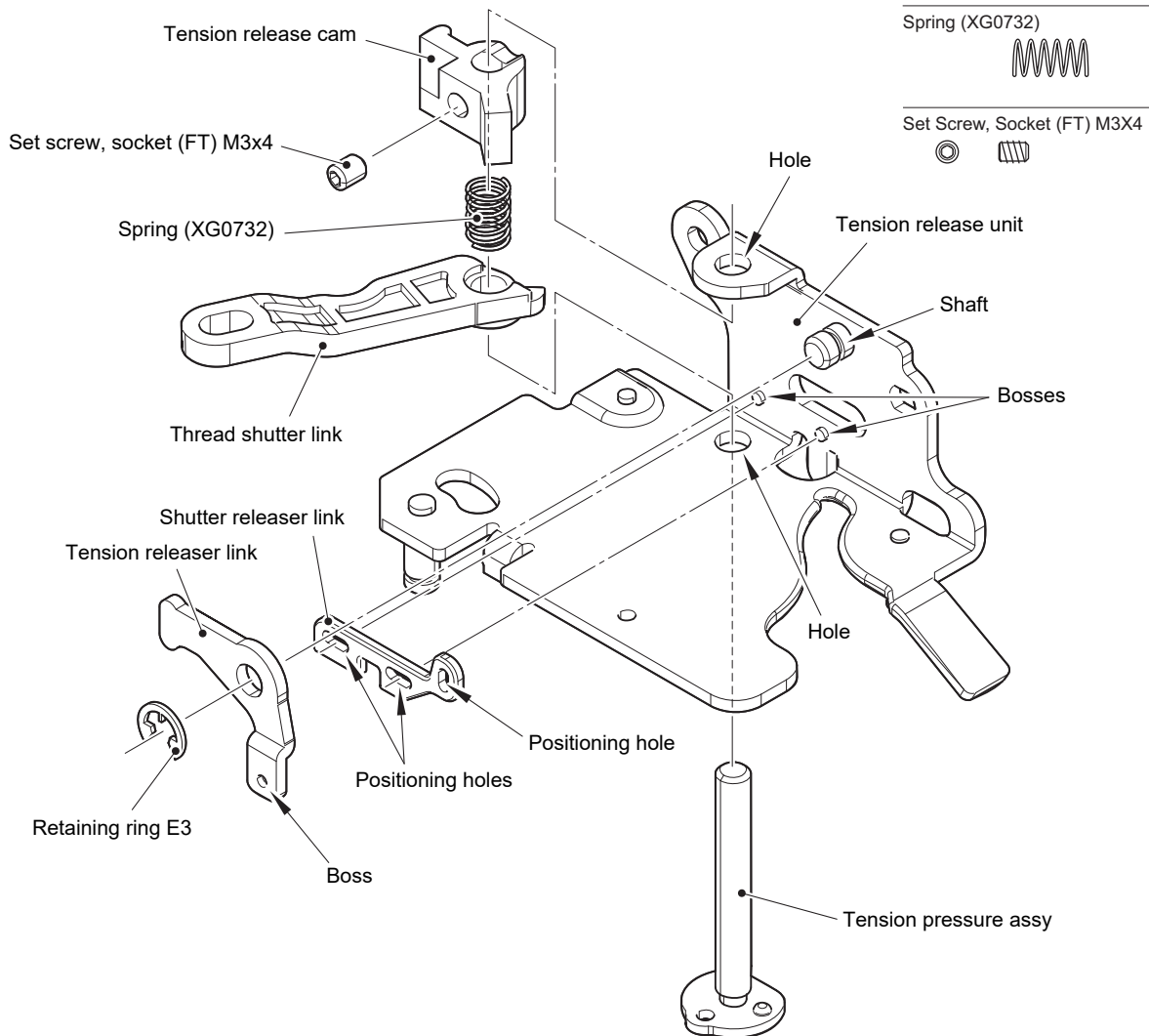
1 Attachment of Tension discs

1. Set the tension disc washer to the disk washer holder.
2. Set the tension disc A, the tension disc B, the washer, the disk washer holder, the washer, the thread tension spring (XA9900) and the tension adjusting screw to the shaft "A" of thread tension assy.
3. Set the tension plate assy to the thread tension assy, and tighten the tension adjusting screw to the tension plate assy.
4. Set the washer plain S3, and the spring (X57605) to the shaft "B" of thread tension assy, and secure them with the retaining ring E2.
5. Attach the spring plate to the tension plate assy with the screw (screw, bind M3x4).



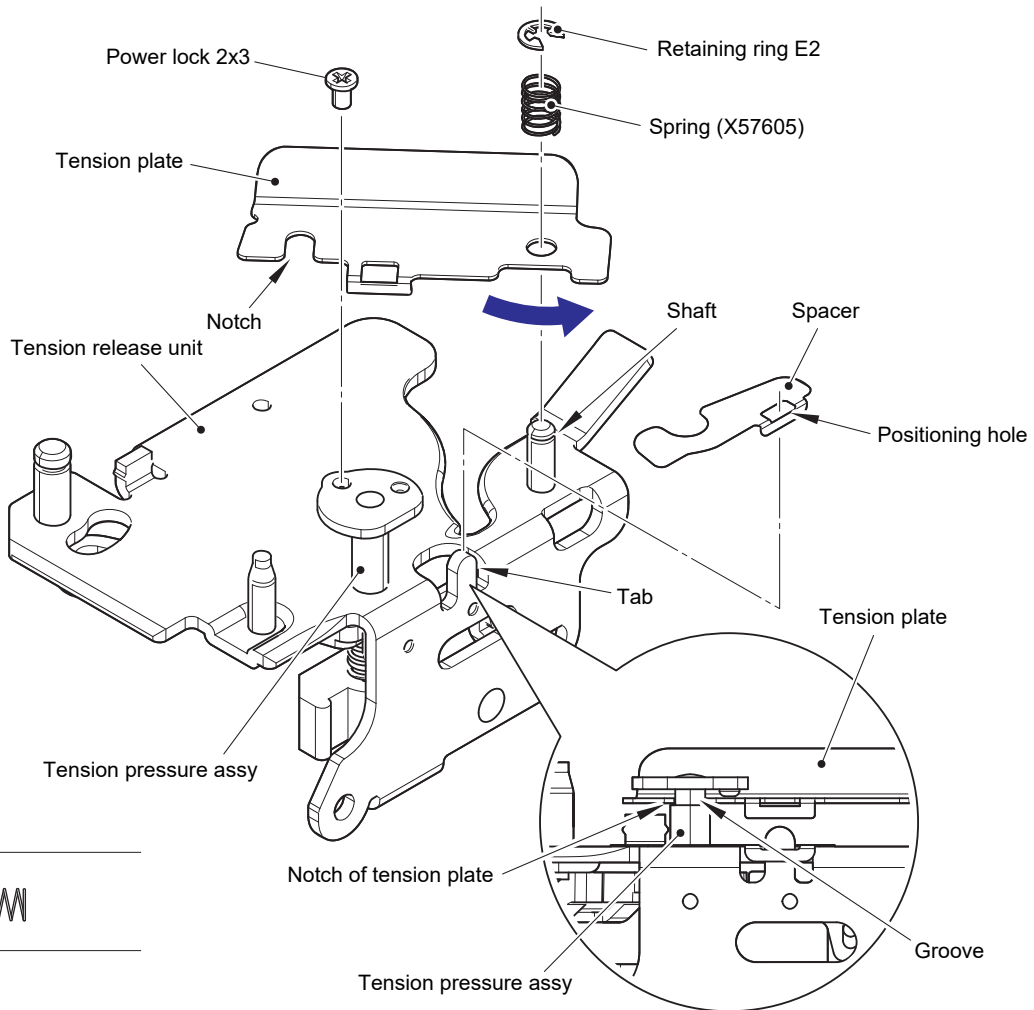
2 Attachment of Links and Tension pressure assy

1. Align the two positioning holes of shutter releaser link with the two bosses of tension release unit, and set it. Set the tension releaser link to the shaft of tension release unit, and align the boss of tension releaser link with the positioning hole of shutter releaser link. Attach the retaining ring E3 to the shaft of tension release unit.
2. Insert the tension pressure assy into order of the hole of tension release unit, the thread shutter link, the spring (XG0732), the tension release cam and the hole of tension release unit, and tighten the screw (set screw, socket (FT) M3x4) to the tension release cam.



3 Attachment of Tension plate and Tension release unit

1. Align the positioning hole of spacer with the tab of tension release unit, and set it while lifting the tension pressure assy.
2. Set the tension plate to the shaft of tension release unit. Turn the tension plate to the direction of the arrow, and set the notch of tension plate to the groove of tension pressure assy while lifting the tension pressure assy.
3. Set the spring (X57605) to the shaft of tension release unit and attach the retaining ring E2 to the shaft of tension release unit.
4. Tighten the screw (power lock 2x3) to the tension pressure assy.



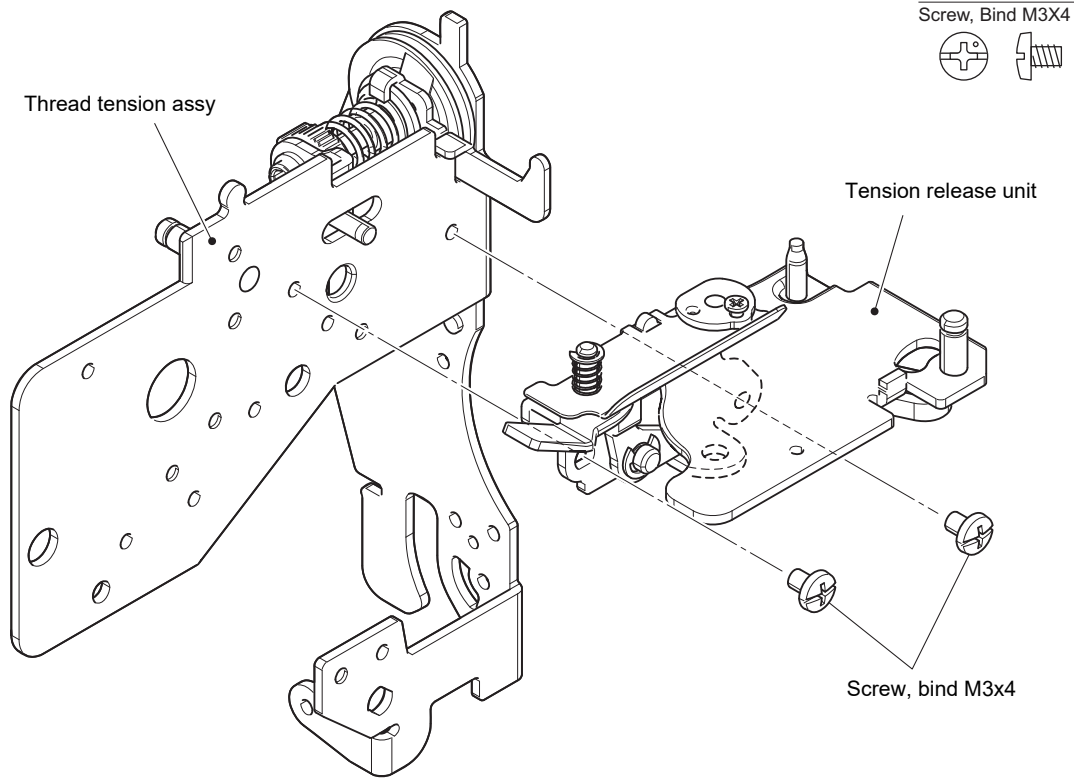
Spring (X57605)



Power Lock 2X3

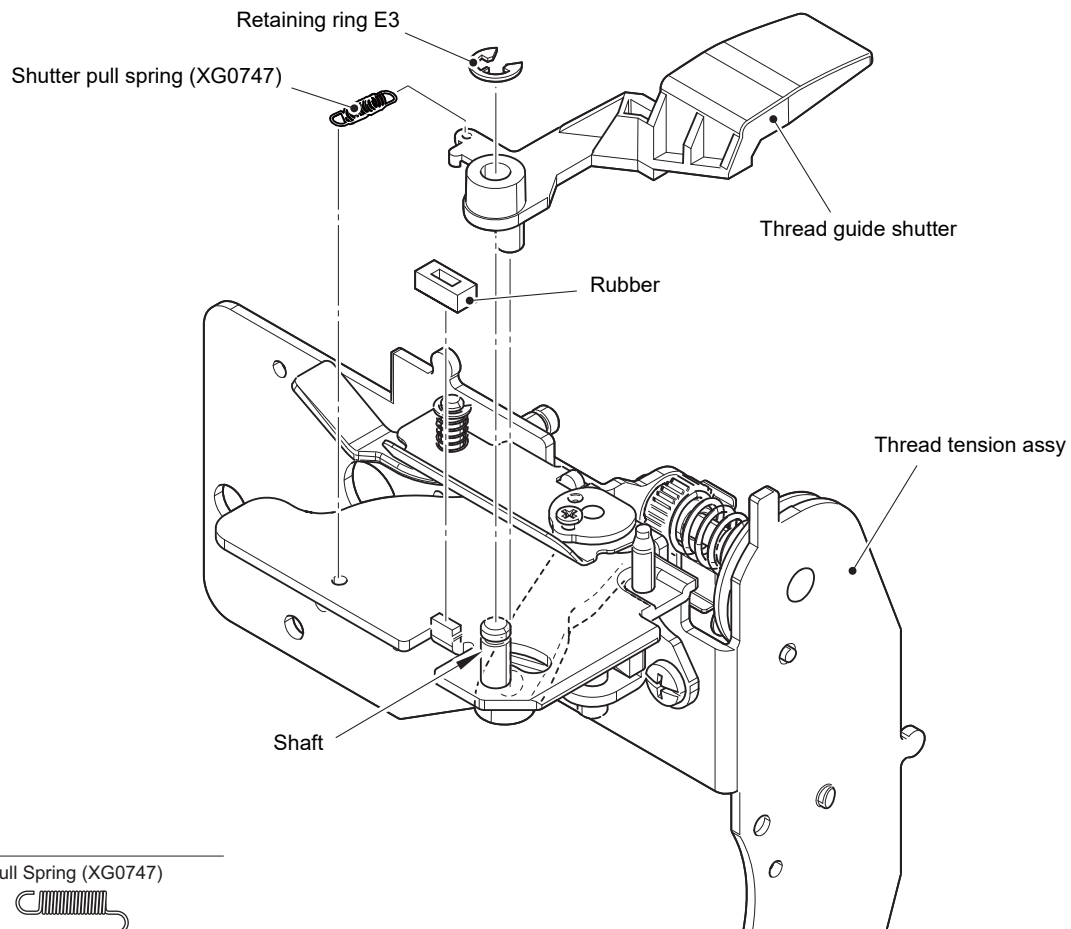


5. Attach the tension release unit to the thread tension assy with the two screws (screw, bind M3x4).



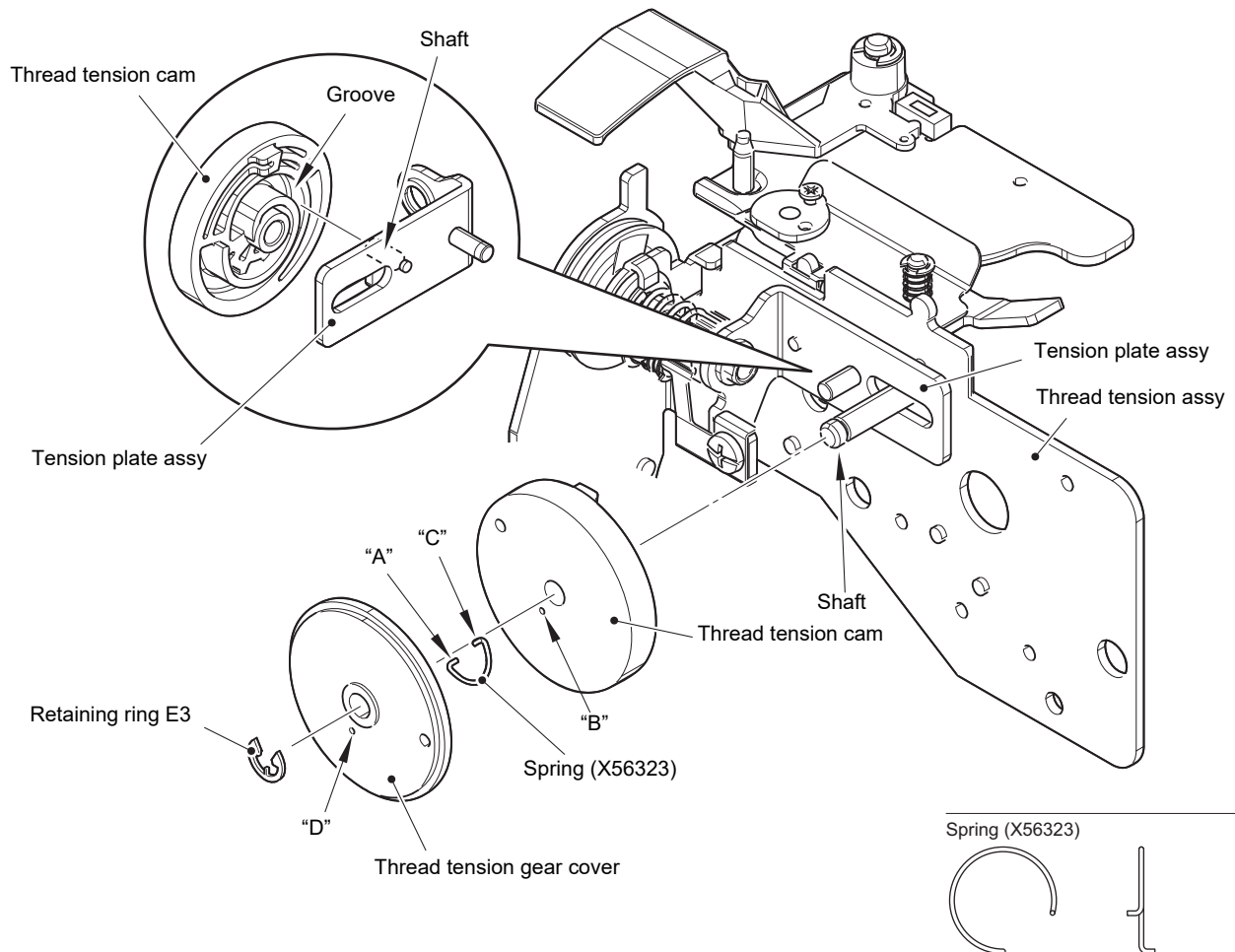
4 Attachment of Thread guide shutter

1. Attach the rubber.
2. Set the thread guide shutter to the shaft of thread tension assy, and attach the retaining ring E3 to the shaft.
3. Attach the shutter pull spring (XG0747) to the thread guide shutter and thread tension assy.

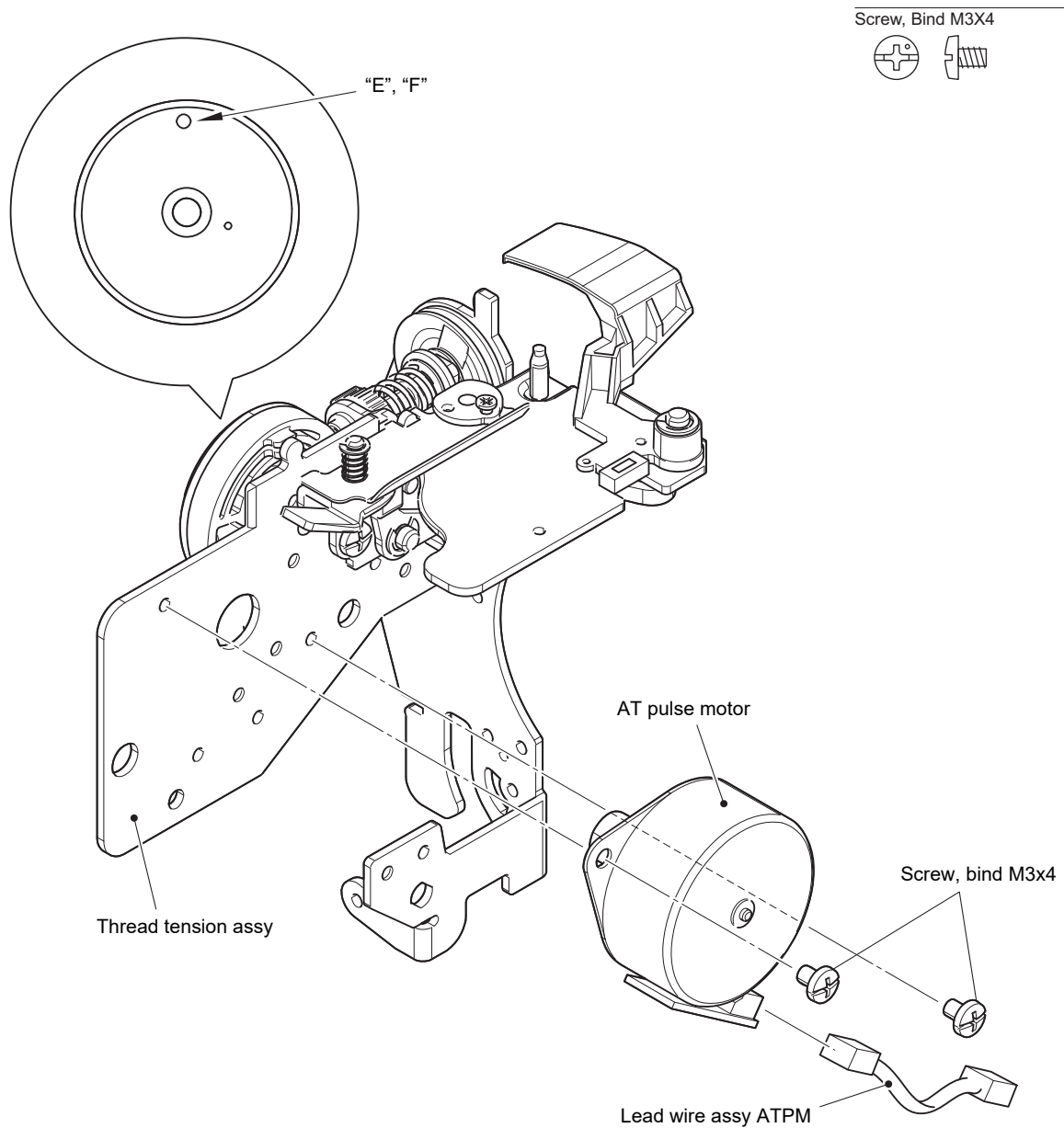


5 Attachment of Thread tension cam, Thread tension gear cover and AT pulse motor

1. Set the thread tension cam to the shaft of thread tension assy, and insert the shaft of tension plate assy into the groove of thread tension cam.
2. Insert the tip "A" of spring (X56323) into the hole "B" of thread tension cam. Set the thread tension gear cover to the shaft of thread tension assy and insert the tip "C" of spring into the hole "D" of thread tension gear cover. Attach the retaining ring E3 to the shaft.

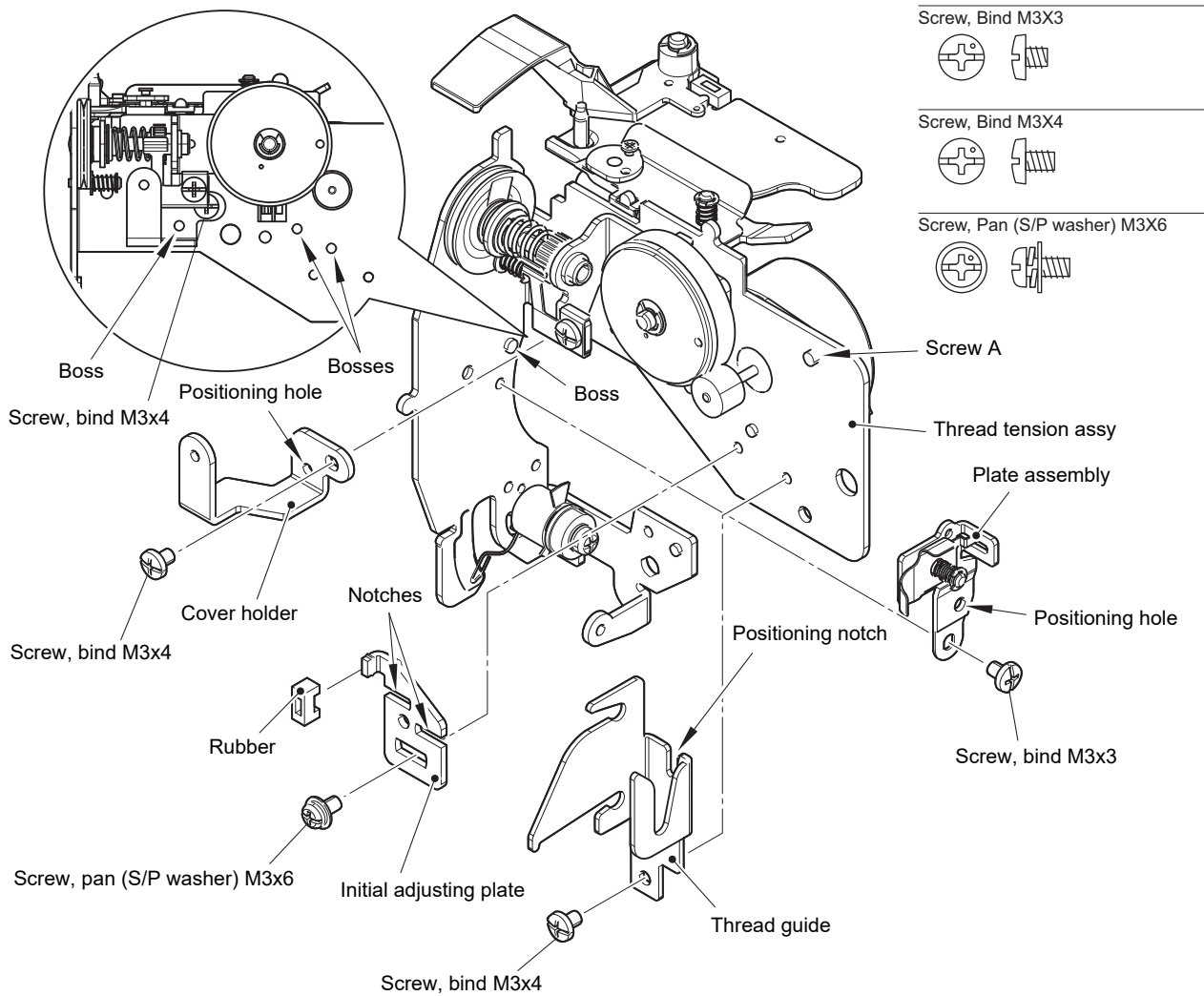


3. Turn the thread tension gear cover clockwise until the hole "E" of thread tension cam and hole "F" of thread tension gear cover are on top of each other, and attach the AT pulse motor to the thread tension with the two screws (screw, bind M3x4).
4. Connect the lead wire assy ATPM to the AT pulse motor.



7 Attachment of Plate assembly, Cover holder, Initial adjusting plate and Thread guide

1. Align the positioning hole of plate assembly with the boss of thread tension assy, and attach it with the screw (screw, bind M3x3).
2. Align the positioning hole of cover holder with the boss of thread tension assy, and attach it with the screw (screw, bind M3x4).
3. Attach the rubber to the initial adjusting plate. Align the two notches of initial adjusting plate with the two bosses of thread tension assy, and attach it with the screw (screw, pan (S/P washer) M3x6).
4. Align the positioning notch of thread guide with the screw A, and attach it with the screw (screw, bind M3x4).



Application of
Assembly

Application of
Assembly

8 Attachment of Thread guide wire and Upthread PCB assy

1. Hang the bent part of thread guide wire on the notch of thread tension assy, and insert the tip of thread guide wire into the positioning hole of thread tension assy. Set the washer plain between the thread guide wire and thread tension assy. Attach the thread guide wire and the washer plain to the thread tension assy with the screw (screw, pan (S/P washer) M3x6).
2. Align the positioning hole of thread sensor holder with the boss of thread tension assy, and attach the thread sensor holder to the thread tension assy with the screw (screw, bind M3x4). Align the positioning hole of upthread PCB assy with the boss of thread sensor holder, and attach the upthread PCB assy to the thread sensor holder with the screw (screw, pan (S/P washer) M3x6). Pass the upthread PCB assy lead wire through the securing fixtures.

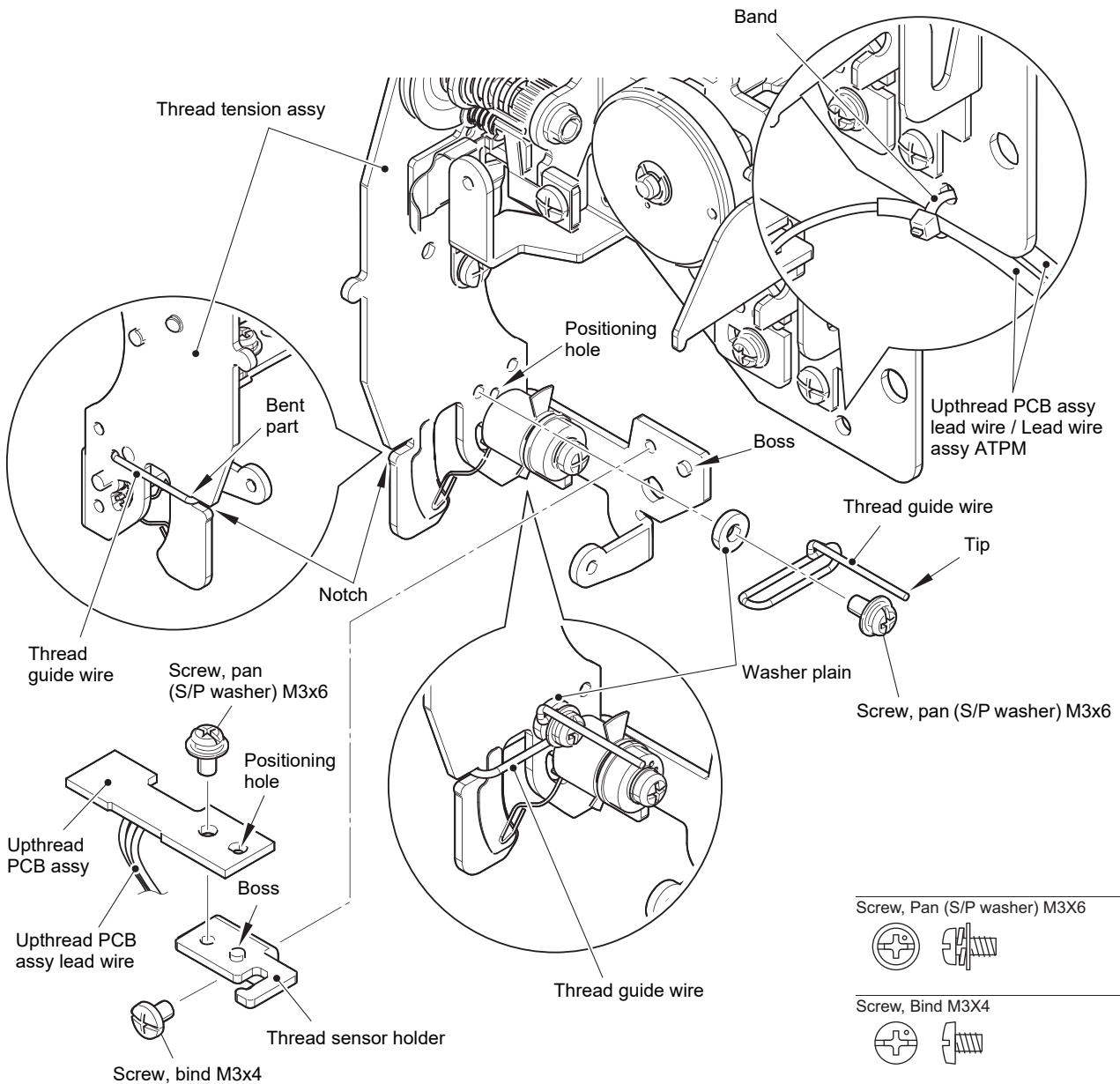
***Key point**

- Refer to "Wiring of Needle thread module".

3. Bind up the upthread PCB assy lead wire and the lead wire assy ATPM to the thread tension assy with the band.

***Key point**

- Refer to "Wiring of Needle thread module".

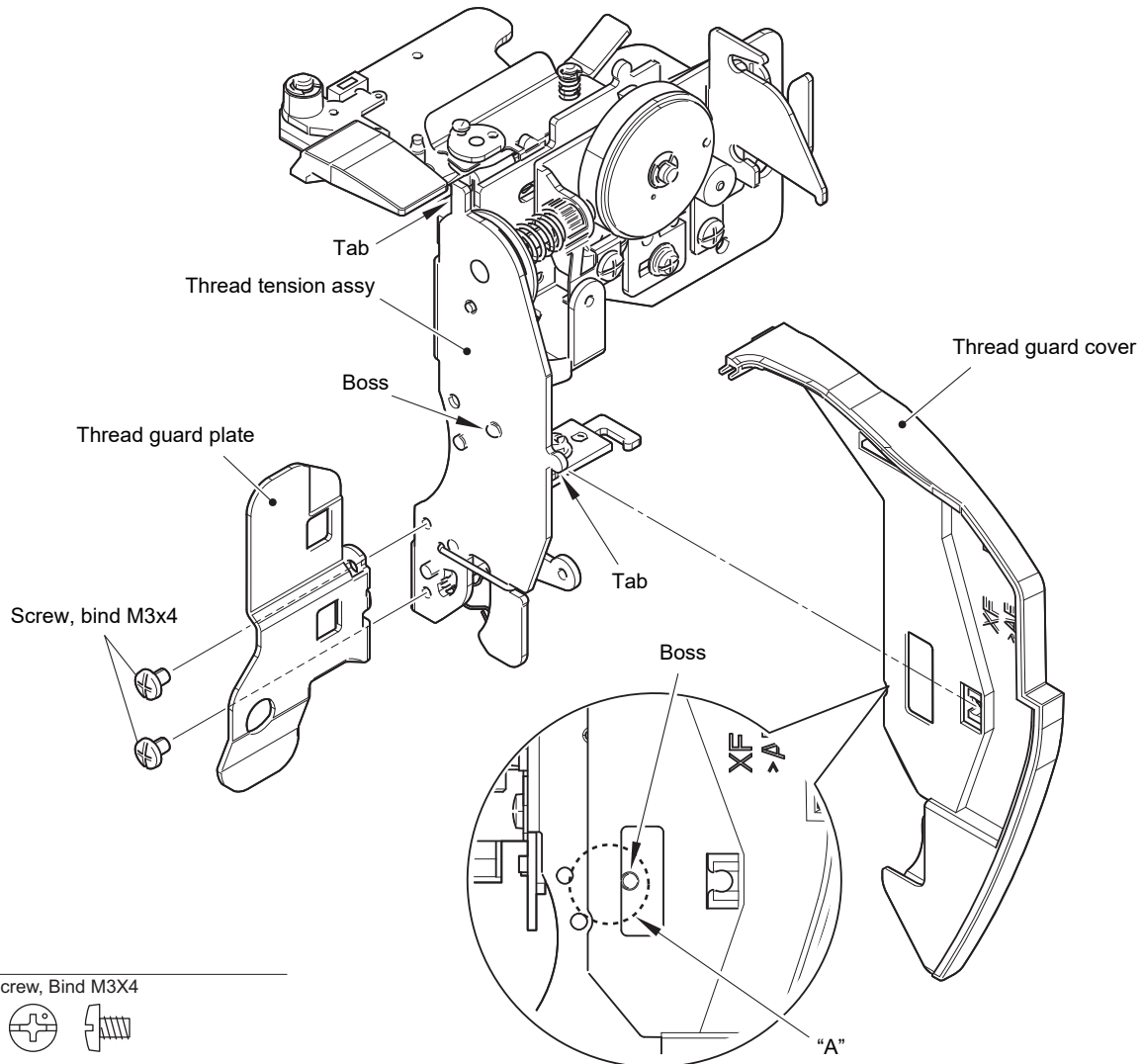


Application of
Assembly

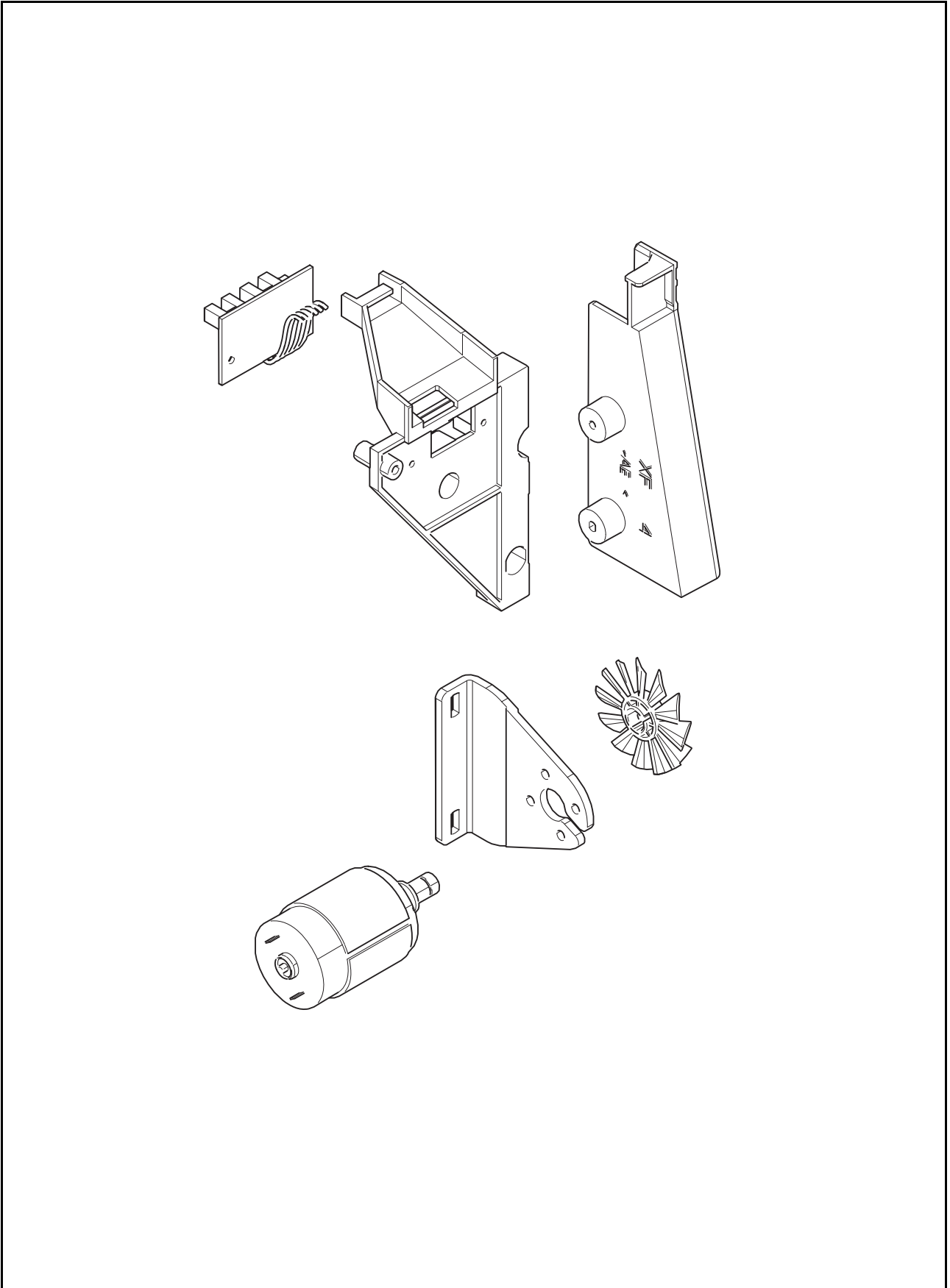
Application of
Assembly

9 Attachment of Thread guard cover

1. Attach the thread guard plate to the thread tension assy with the two screws (screw, bind M3x4).
2. Align the two tabs of thread tension assy with the two gullets of thread guard cover, and attach it to the thread tension assy while lifting the section "A" to get over the boss of thread tension assy.



Electric parts and Main motor unit location diagram

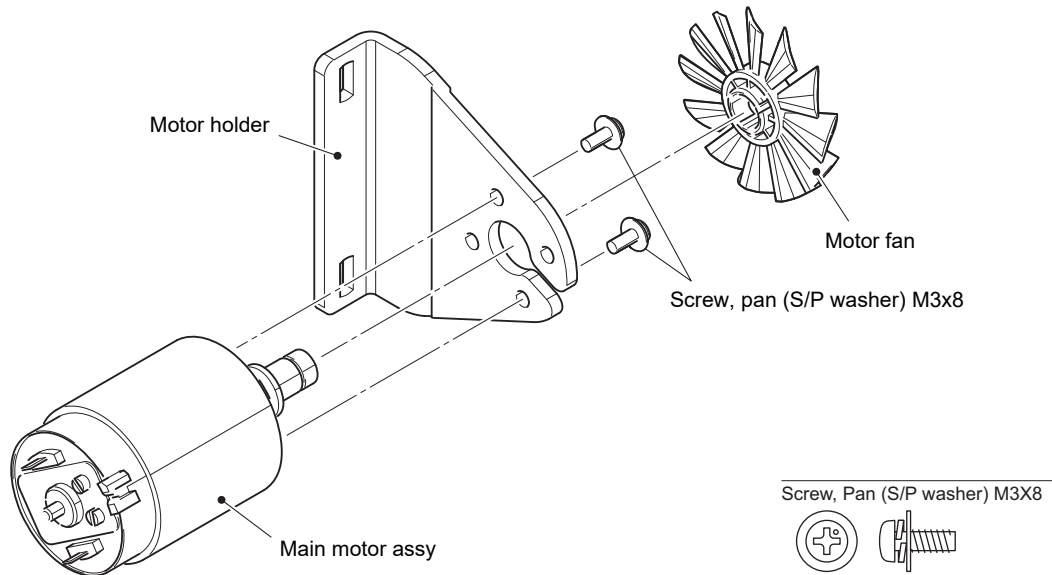


Application of
Assembly

Application of
Assembly

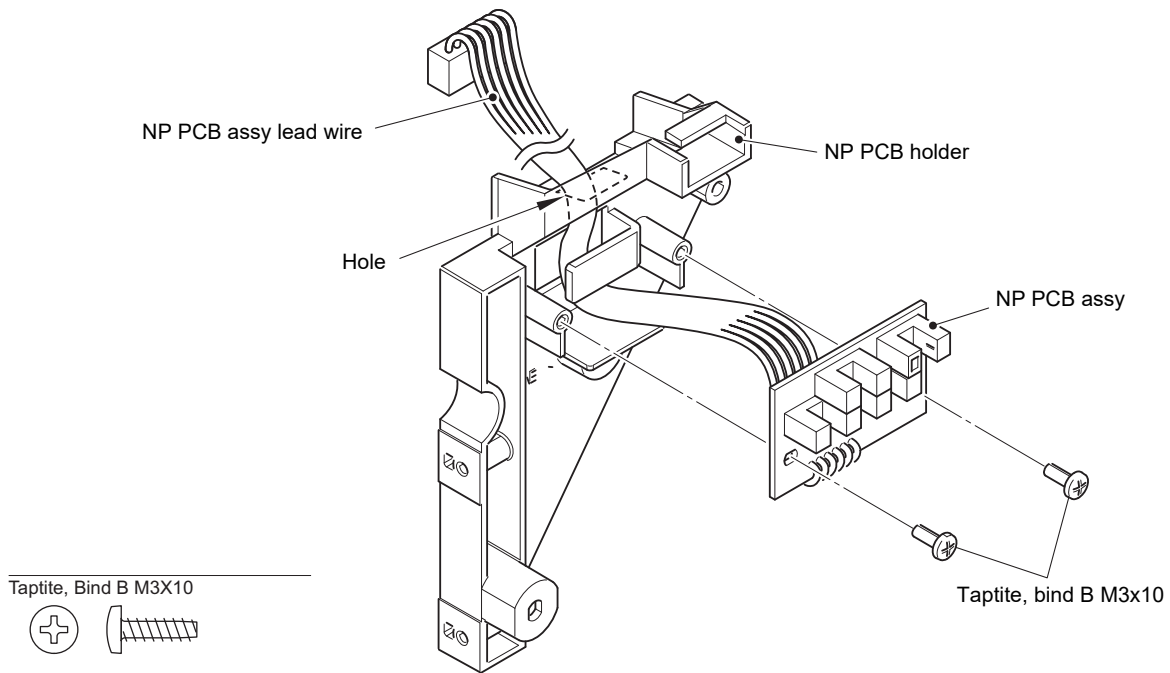
1 Assembly of Main motor assy

1. Attach the main motor assy to the motor holder with the two screws (screw, pan (S/P washer) M3x8).
2. Set the motor fan to the main motor assy.



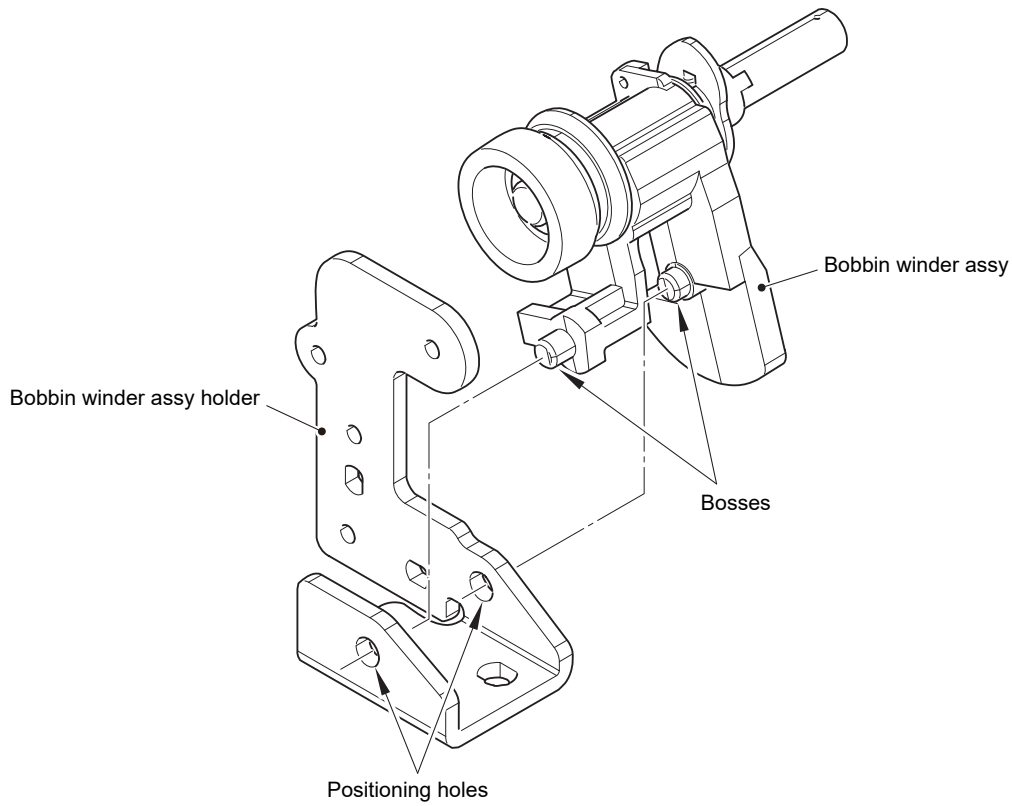
2 Assembly of NP PCB assy

1. Insert the NP PCB assy lead wire into the hole of NP PCB holder, and attach the NP PCB assy to the NP PCB holder with the two screws (taptite, bind B M3x10).



1 Attachment of Bobbin winder assy

1. Align the two bosses of bobbin winder assy with the two positioning holes of bobbin winder assy holder, and set the bobbin winder assy to the bobbin winder assy holder.

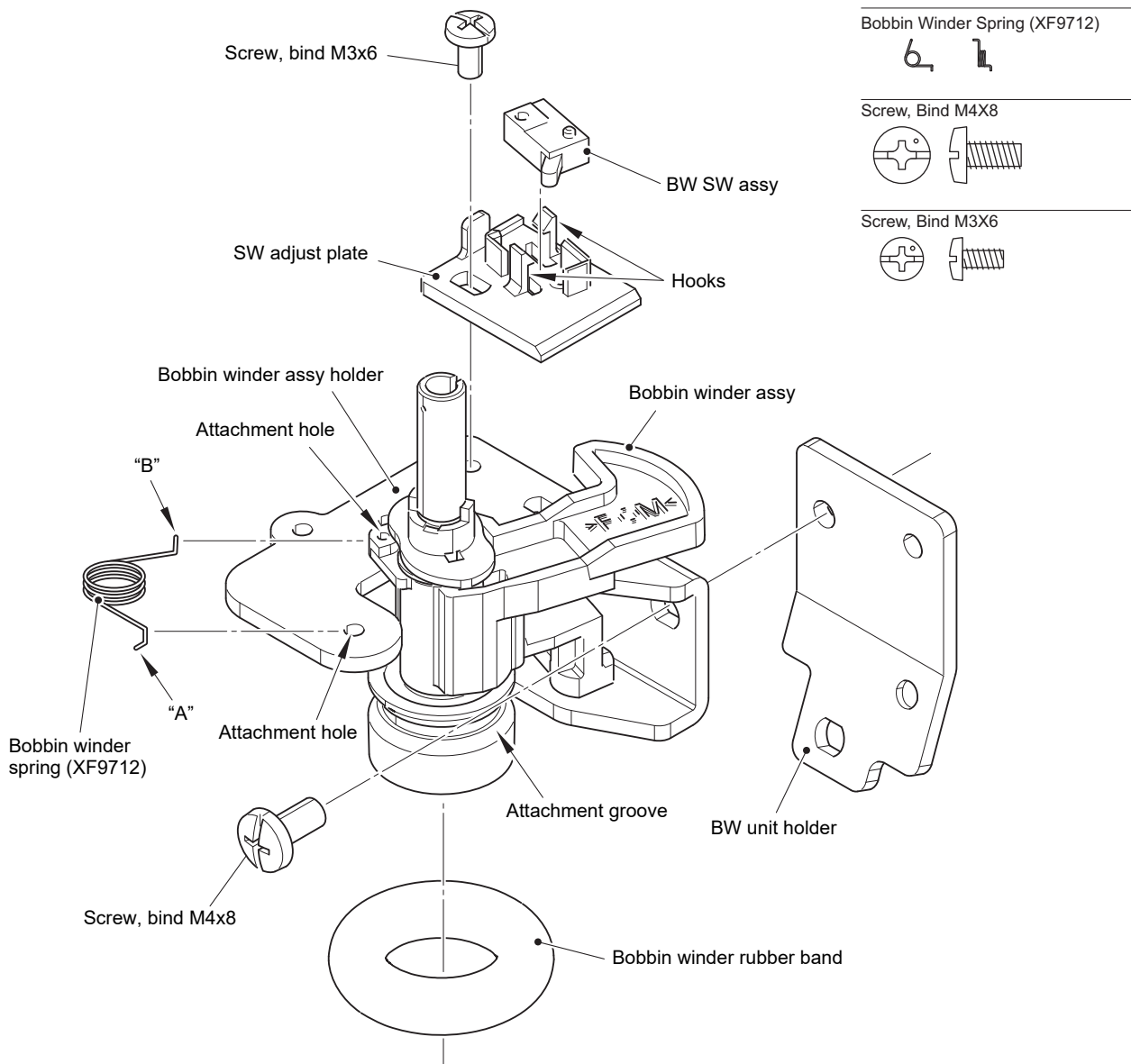


2 Attachment of Bobbin winder rubber band, Bobbin winder spring, BW unit holder and BW SW assy

1. Fit the bobbin winder rubber band into the attachment groove of bobbin winder assy.
2. Set the bobbin winder spring (XF9712) to the attachment holes of bobbin winder assy holder and bobbin winder assy.

***Key point**

- Insert the section "A" of bobbin winder spring into the attachment hole of bobbin winder assy holder, and insert the section "B" of bobbin winder spring into the attachment hole of bobbin winder assy.
3. Attach the BW unit holder to the bobbin winder assy holder with the screw (screw, bind M4x8).
 4. Attach the SW adjust plate to the bobbin winder assy holder with the screw (screw, bind M3x6).
 5. Set the BW SW assy to the SW adjust plate, and hang the two hooks.



3 Attachment of Bobbin winder shaft stopper, Bobbin winder assy holder and Bobbin presser

1. Attach the bobbin winder shaft stopper to the bobbin winder assy holder with the screw (screw, bind M3x6).
2. Attach the bobbin winder assy holder to the bobbin winder cover printed with the screw (screw).
3. Set the bobbin presser and the nut 2 M3 to the bobbin winder cover printed, and secure them with the screw (screw, pan (S/P washer) M3x25).
4. Set the bobbin winder shaft spring to the bobbin winder assy.

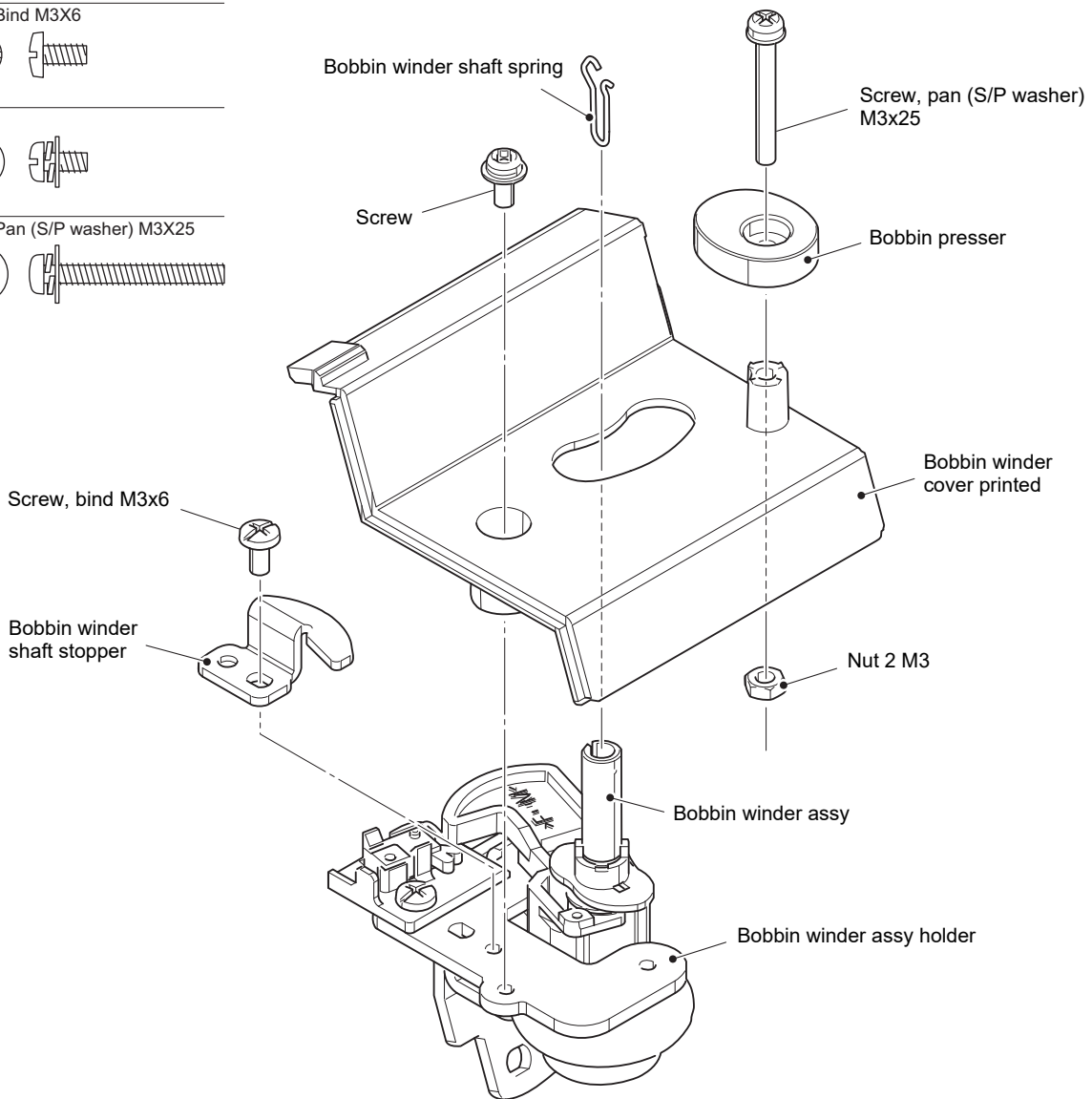
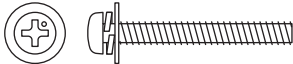
Screw, Bind M3X6



Screw



Screw, Pan (S/P washer) M3X25

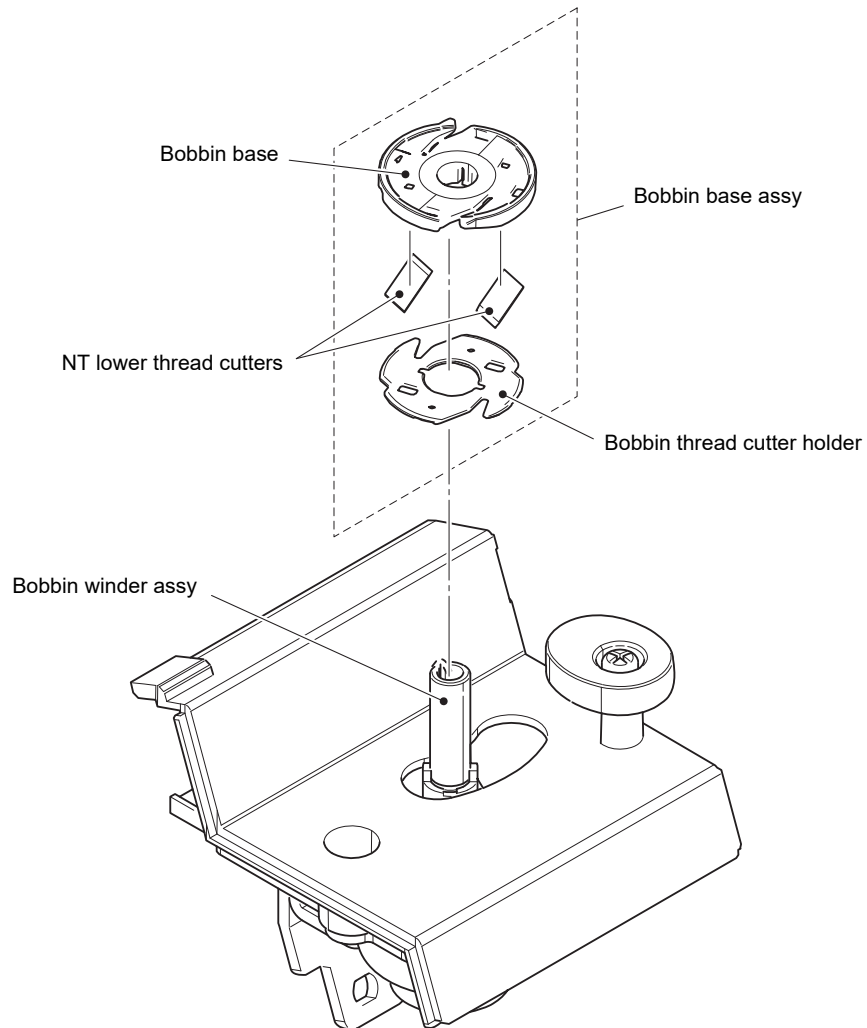


4 Attachment of Bobbin base assy

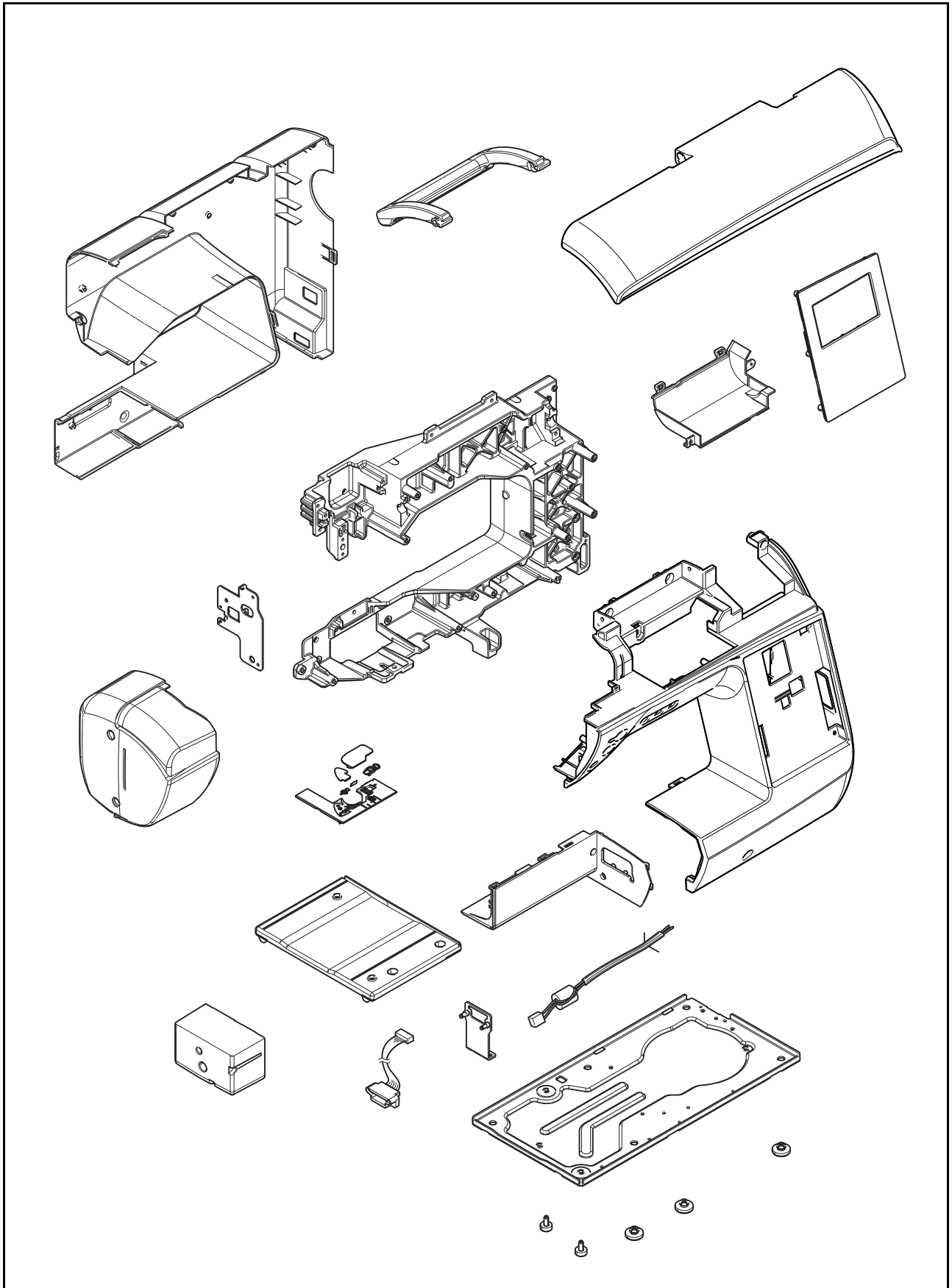
1. Set the bobbin base assy to the bobbin winder assy.

4-1 Assembly of Bobbin base assy

1. Set the two NT lower thread cutters to the bobbin base.
2. Set the bobbin thread cutter holder to the bobbin base.



Main frame and Covers location diagram

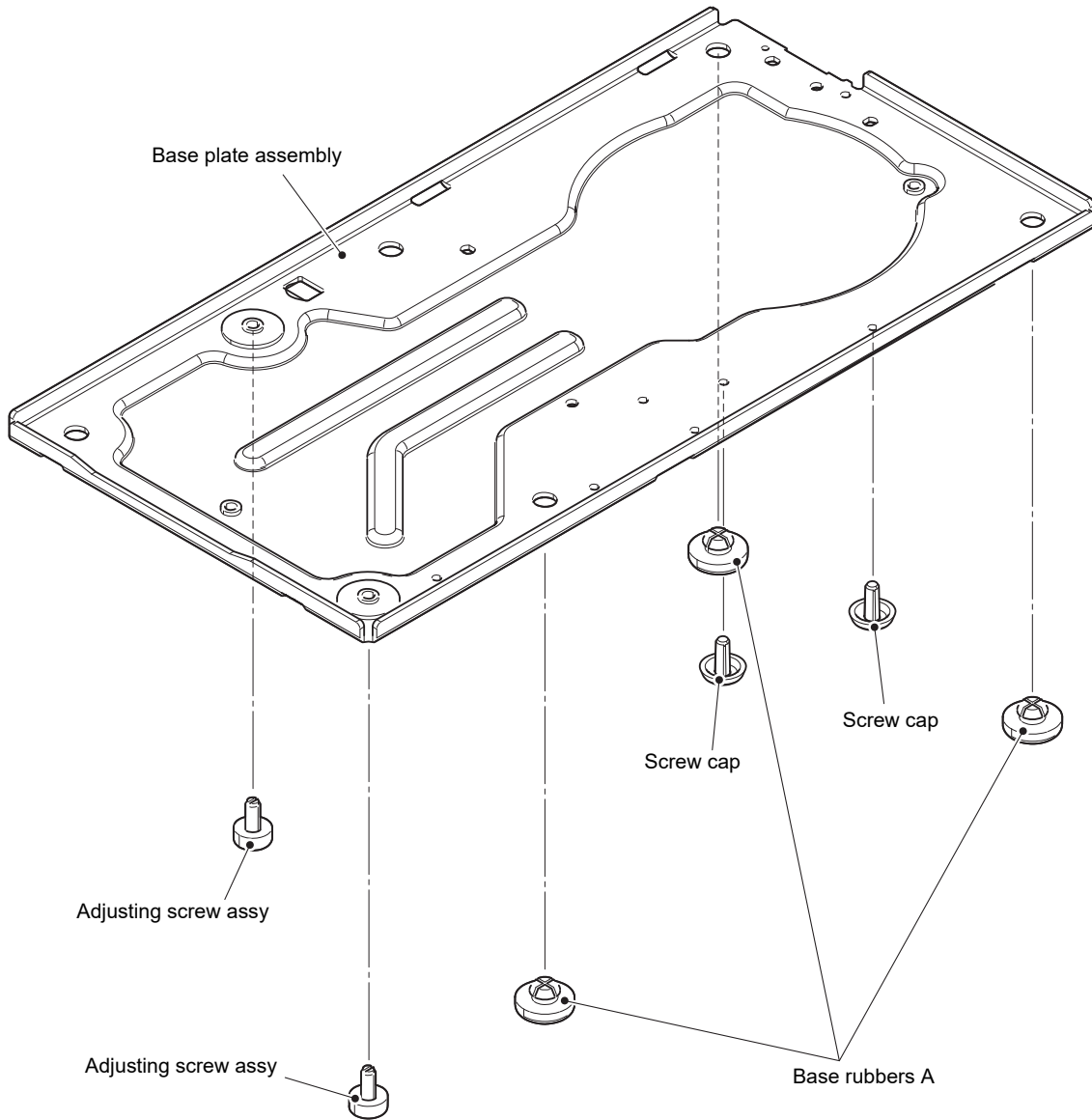


Application of
Assembly

Application of
Assembly

1 Assembly of Base plate assembly

1. Attach the three base rubbers A to the base plate assembly.
2. Attach the two adjusting screws assy to the base plate assembly.
3. Attach the two screw caps to the base plate assembly.

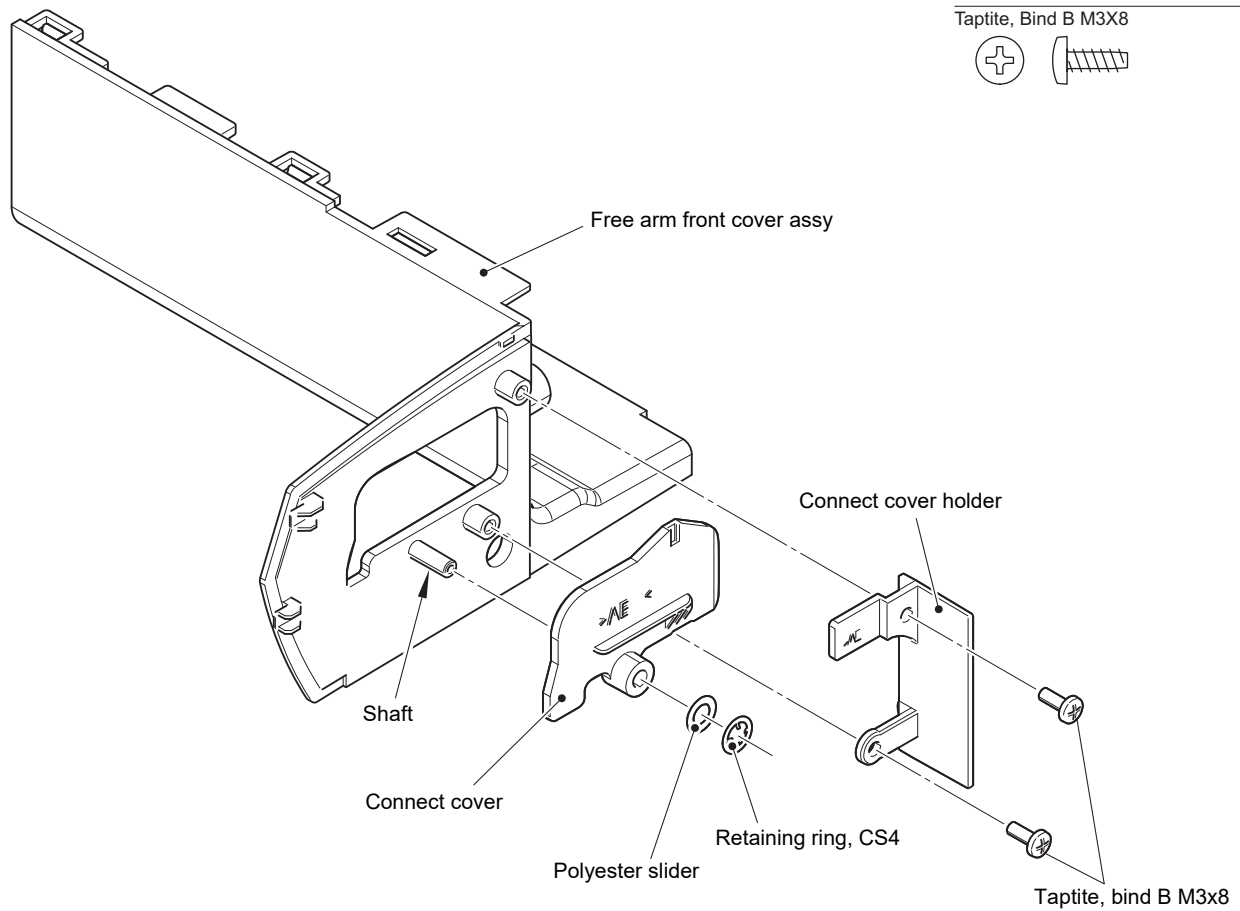


Application of
Assembly

Application of
Assembly

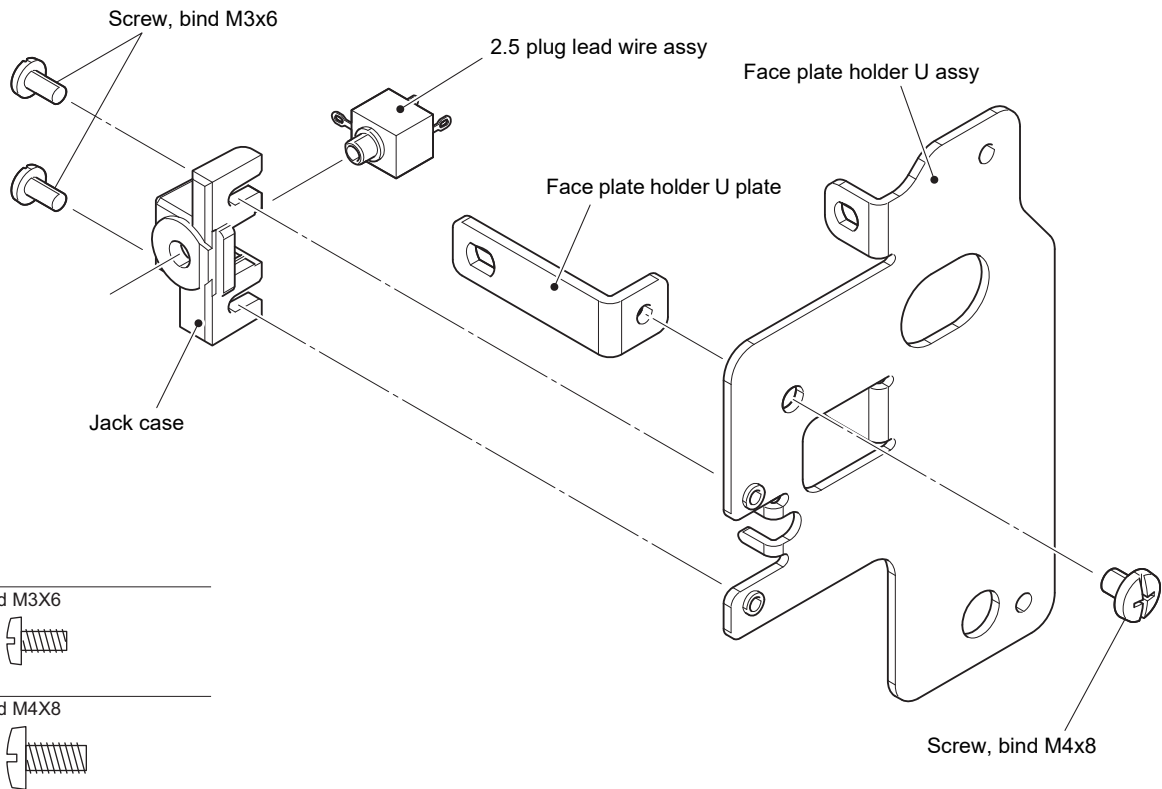
2 Assembly of Free arm front cover assy

1. Set the connect cover and the polyester slider to the shaft of free arm front cover assy, and attach the retaining ring, CS4 to the shaft of free arm front cover assy.
2. Attach the connect cover holder to the free arm front cover assy with the two screws (taptite, bind B M3x8).



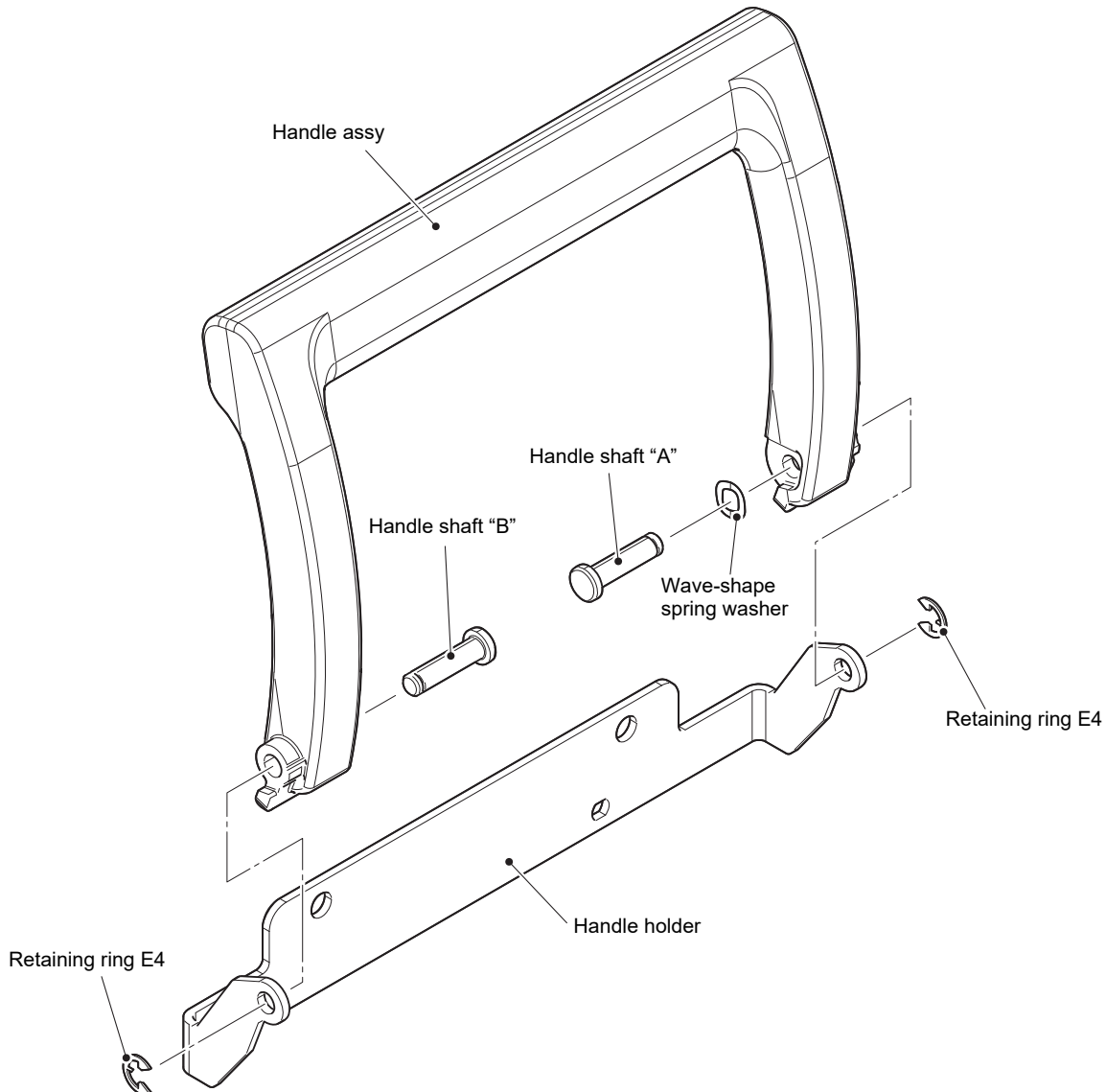
3 Assembly of Face plate holder U assy

1. Set the 2.5 plug lead wire assy to the jack case.
2. Attach the jack case to the face plate holder U assy with the two screws (screw, bind M3x6).
3. Attach the face plate holder U plate to the face plate holder U assy with the screw (screw, bind M4x8).



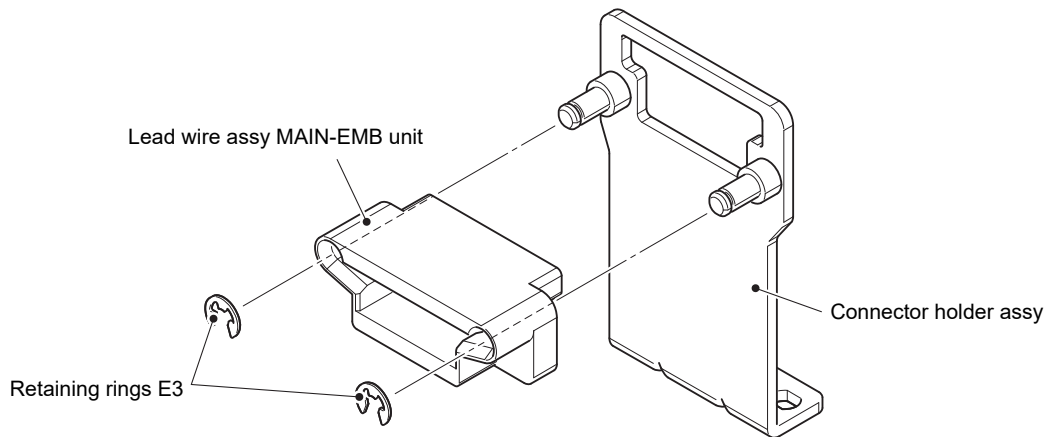
4 Assembly of Handle assy

1. Set the handle assy to the handle holder, and insert the handle shaft "A" into the wave-shape spring washer and the handle assy, and then insert the handle shaft "B" into the handle assy.
2. Attach the retaining ring E4 to the handle shaft (two locations).



5 Assembly of Connector holder assy

1. Set the lead wire assy MAIN-EMB unit to the two shafts of connector holder assy, and attach the two retaining rings E3 to the two shafts.



6 Assembly of Front cover assy

6-1 Assembly of LCD unit assy

■ Small LCD type <In case of large LCD type, refer to next page>

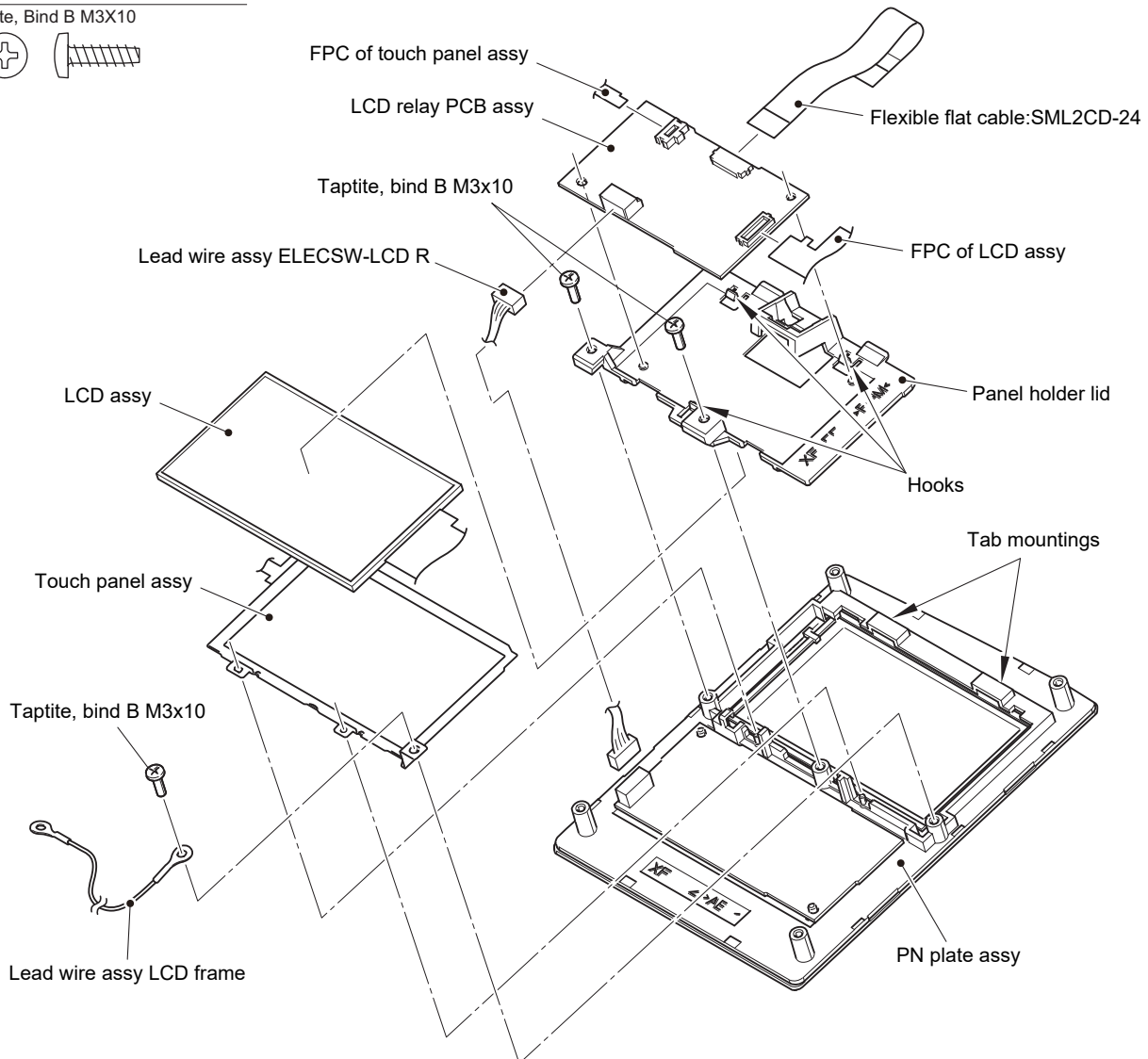
6-1-1 Attachment of Touch panel assy, LCD assy and LCD relay PCB assy

1. Set the touch panel assy to the PN plate assy.
2. Set the LCD assy to the PN plate assy.
3. Connect the flexible flat cable:SML2CD-24 to the LCD relay PCB assy, and lock it.
4. Set the LCD relay PCB assy to the panel holder lid with the three hooks.
5. Insert the two tabs of panel holder lid into the two tab mountings of PN plate assy, and secure the panel holder lid to the PN plate assy with the two screws (taptite, bind B M3x10).
6. Connect the FPC of touch panel assy to the LCD relay PCB assy, and lock it. Connect the FPC of LCD assy to the LCD relay PCB assy, and lock it.
7. Attach the lead wire assy LCD frame to the PN plate assy with the screw (taptite, bind B M3x10).
8. Connect the lead wire assy ELECSW-LCD R to the LCD relay PCB assy and PN plate assy.

***Key point**

- Refer to "Wiring of LCD unit supply assy".

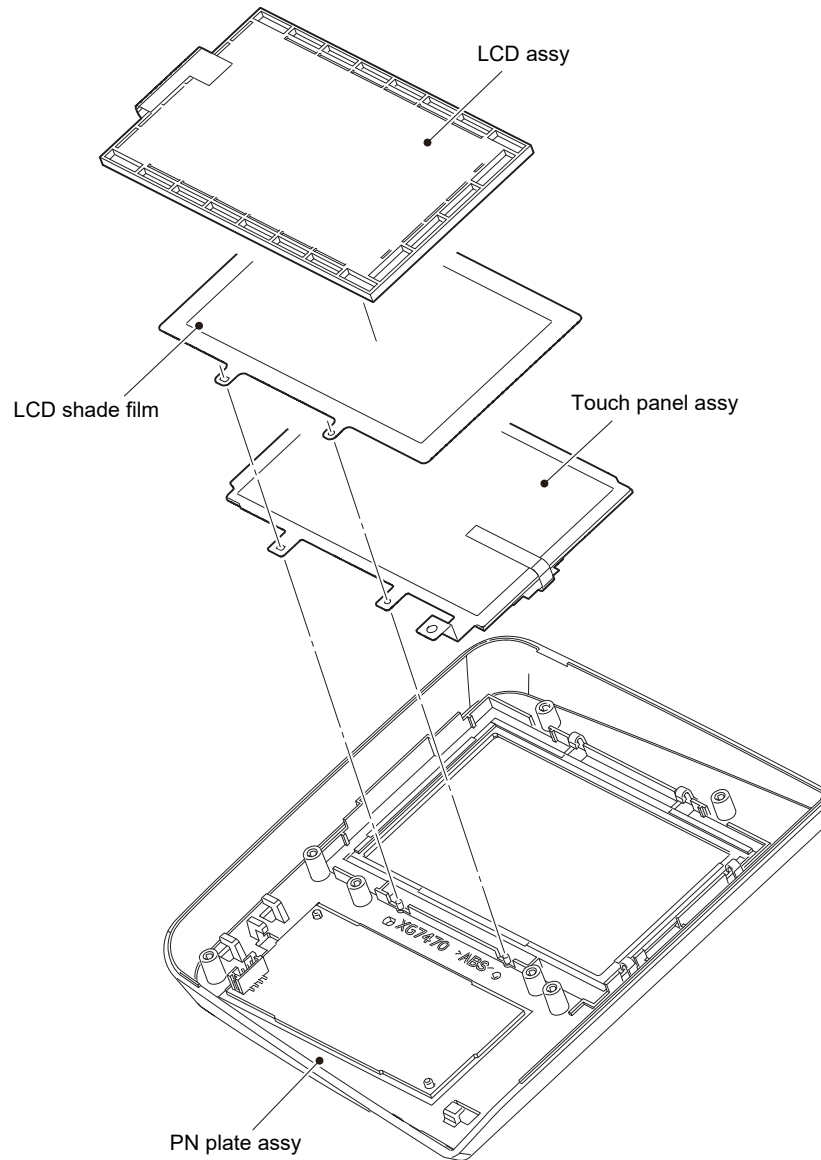
Taptite, Bind B M3X10



■ Large LCD type <In case of small LCD type, refer to previous page>

6-1-1 Attachment of Touch panel assy and LCD assy

1. Set the touch panel assy to the PN plate assy.
2. Set the LCD shade film to the PN plate assy.
3. Set the LCD assy to the PN plate assy.



6-1-2 Attachment of Panel holder

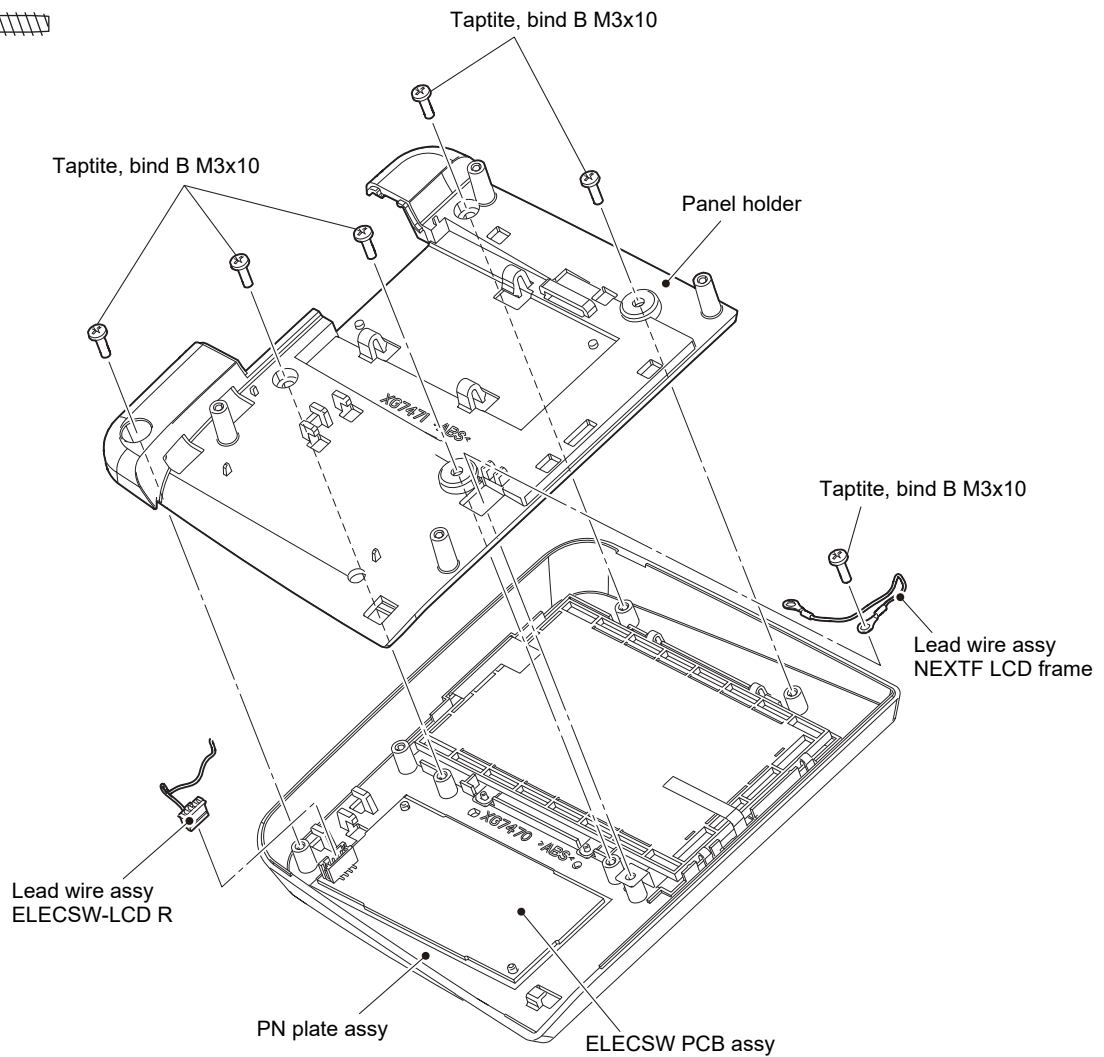
1. Connect the lead wire assy ELECSW-LCD R to the ELECSW PCB assy.
2. Attach the panel holder to the PN plate assy with the five screws (taptite, bind B M3x10).

***Key point**

- Refer to "Wiring of LCD unit supply assy".

3. Attach the lead wire assy NEXTF LCD frame to the PN plate assy with the screw (taptite, bind B M3x10).

Taptite, Bind B M3X10



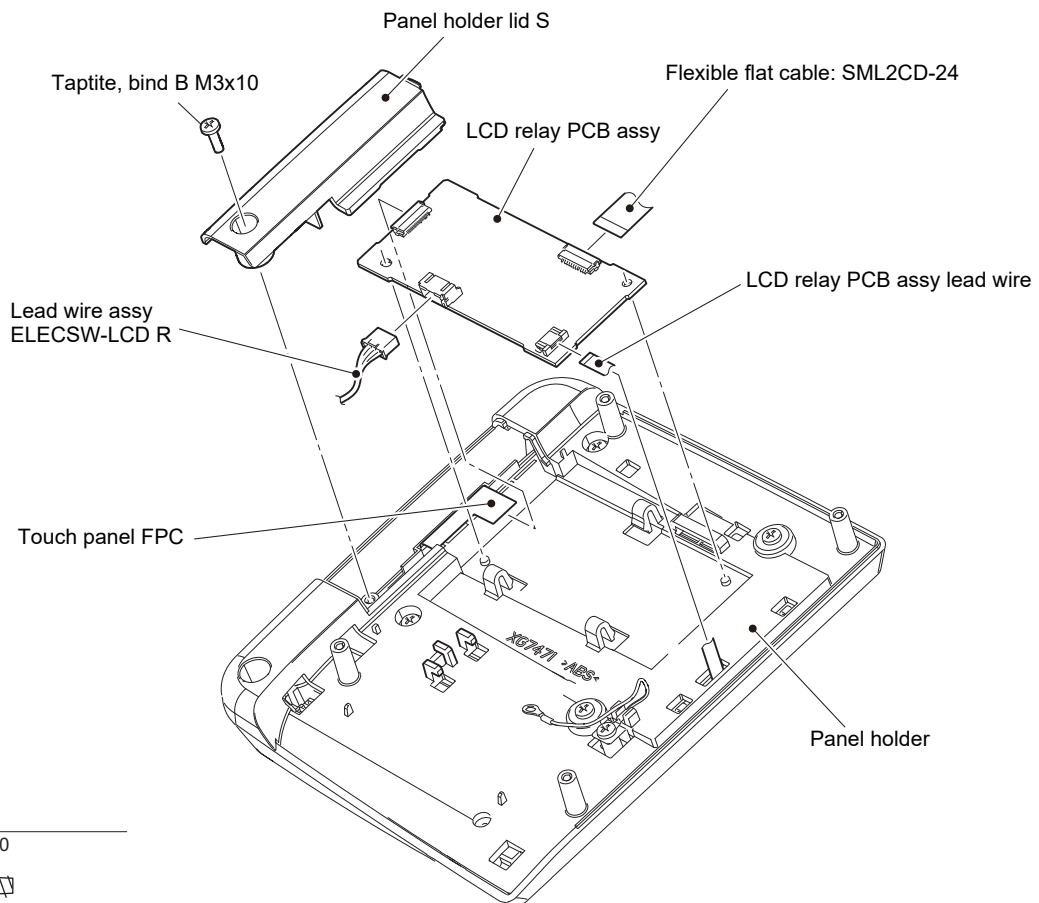
6-1-3 Attachment of LCD relay PCB assy and Panel holder lid S

1. Attach the LCD relay PCB assy to the panel holder.
2. Connect the each harness to the LCD relay PCB assy.

***Key point**

- Refer to "Wiring of LCD unit supply assy".

3. Attach the panel holder lid S to the panel holder with the screw (taptite, bind B M3x10).

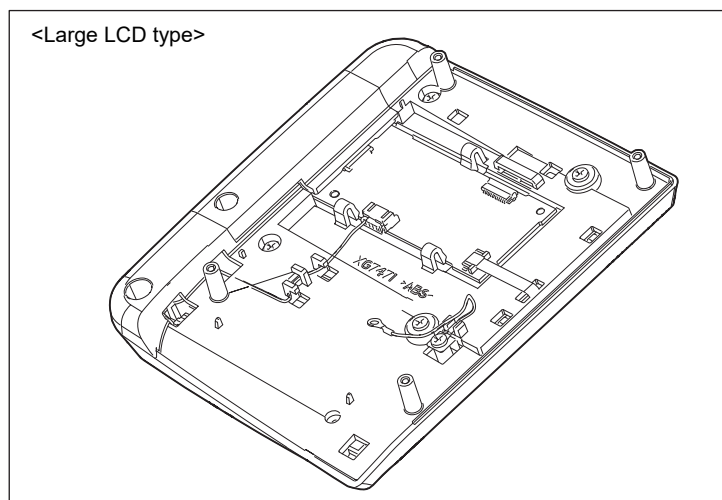
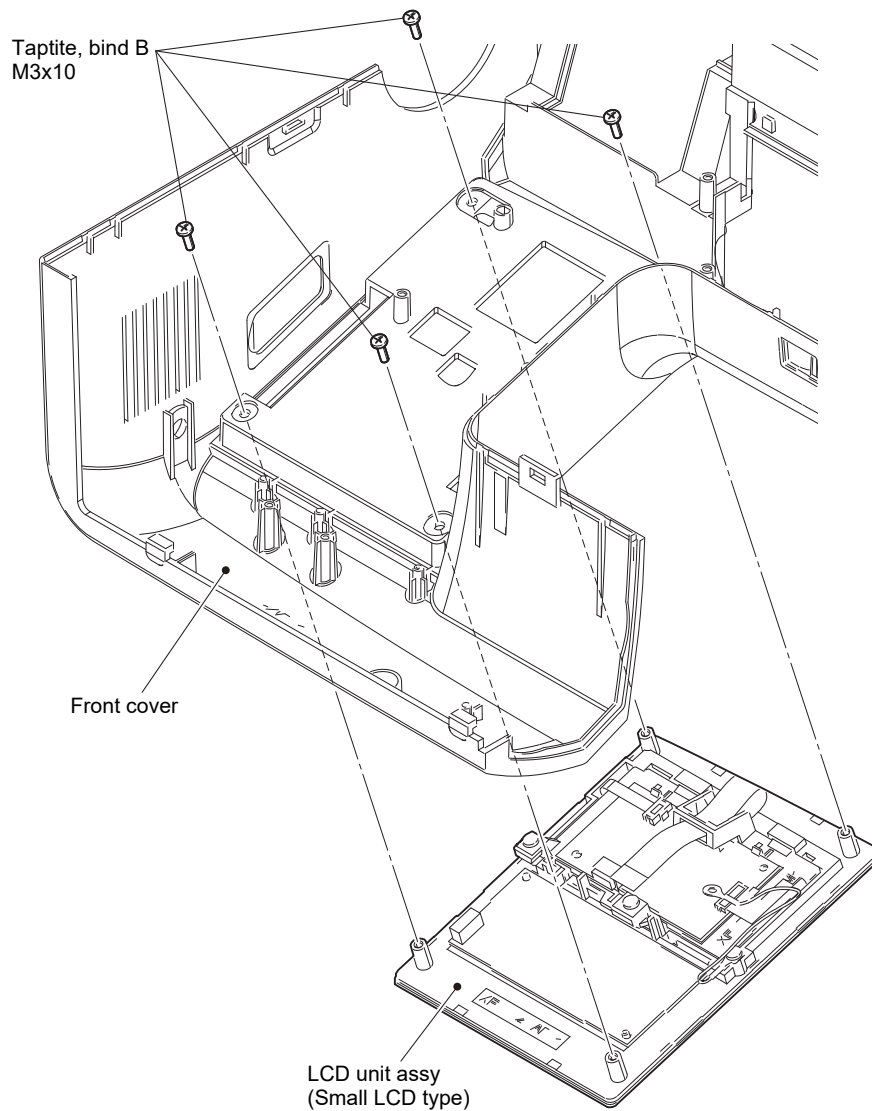


Application of
Assembly

Application of
Assembly

6-2 Attachment of LCD unit assy

1. Attach the LCD unit assy to the front cover with the four screws (taptite, bind B M3x10).



Taptite, Bind B M3X10

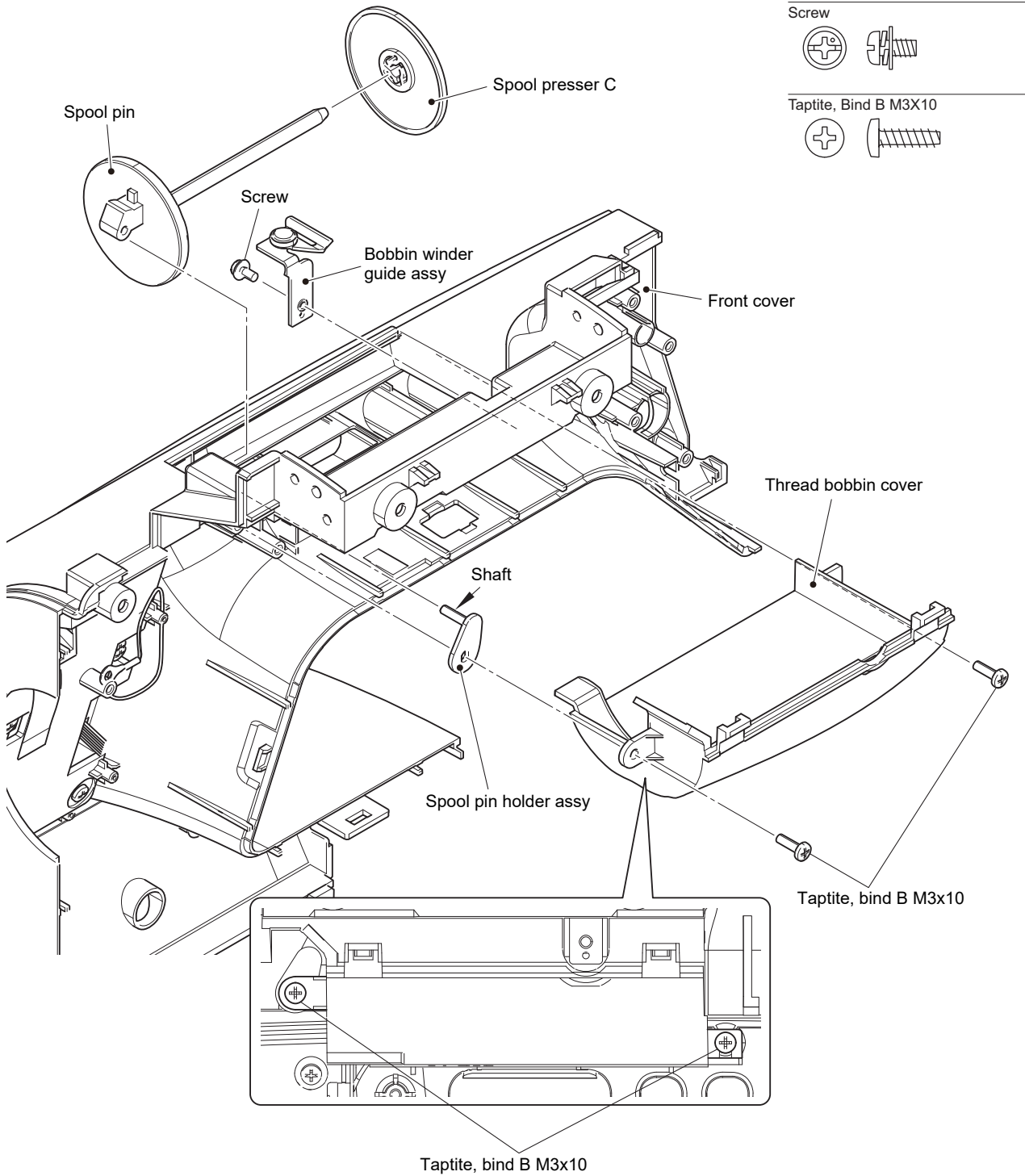


Application of Assembly

Application of Assembly

6-3 Attachment of Bobbin winder guide assy, Spool presser C, Spool pin and Thread bobbin cover

1. Attach the bobbin winder guide assy to the front cover with the screw (screw).
2. Set the spool presser C to the spool pin. Set the spool pin to the front cover, and insert the shaft of spool pin holder assy into the spool pin and the shaft mounting of front cover.
3. Attach the thread bobbin cover to the front cover with the two screws (taptite, bind B M3x10).

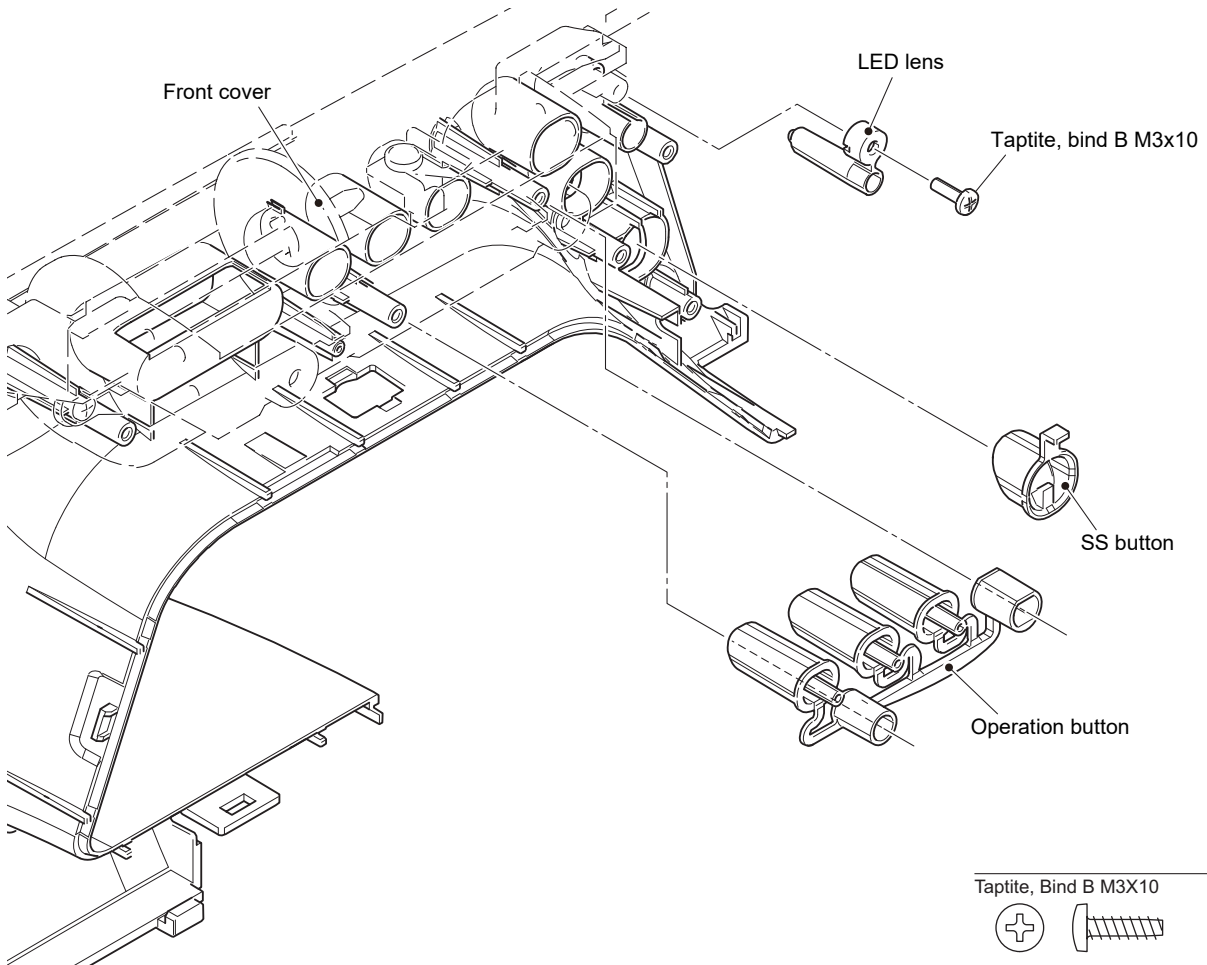


Application of
Assembly

Application of
Assembly

6-4 Attachment of Buttons

1. Attach the LED lens to the front cover with the screw (taptite, bind B M3x10).
2. Set the operation button and the SS button to the front cover.



Application of
Assembly

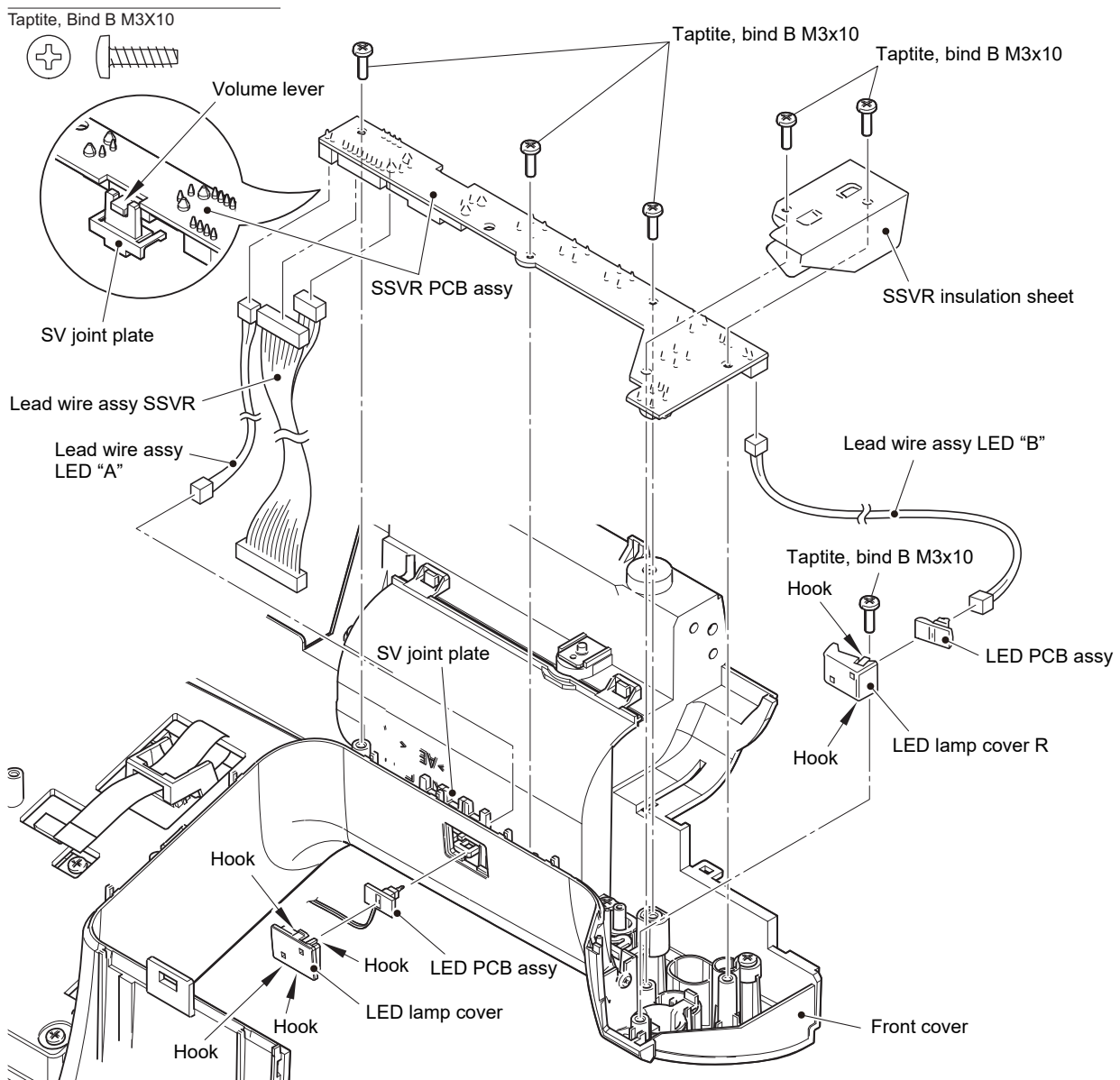
Application of
Assembly

6-5 Attachment of LED PCB assy and SSVR PCB assy

1. Attach the LED PCB assy to the LED lamp cover with the two hooks. Attach the LED lamp cover to the front cover with the two hooks. Connect the lead wire assy LED "A" to the LED PCB assy.
2. Attach the LED PCB assy to the LED lamp cover R with the two hooks. Attach the LED lamp cover R to the front cover with the screw (taptite, bind B M3x10). Connect the lead wire assy LED "B" to the LED PCB assy.
3. Connect the lead wire assy SSVR and the lead wire assy LED "A" to the SSVR PCB assy.
4. Set the volume lever of SSVR PCB assy to the notch of SV joint plate, and attach the SSVR PCB assy to the front cover with the three screws (taptite, bind B M3x10). Pass the lead wires through the securing fixtures.
5. Set the SSVR insulation sheet to the lead wire assy LED "B", and connect the lead wire assy LED "B" to the SSVR PCB assy. Pass the lead wire assy LED "B" through the securing fixtures. Attach the SSVR insulation sheet to the SSVR PCB assy with the two screws (taptite, bind B M3x10).

***Key point**

- Refer to wiring "Wiring of Front cover assy".

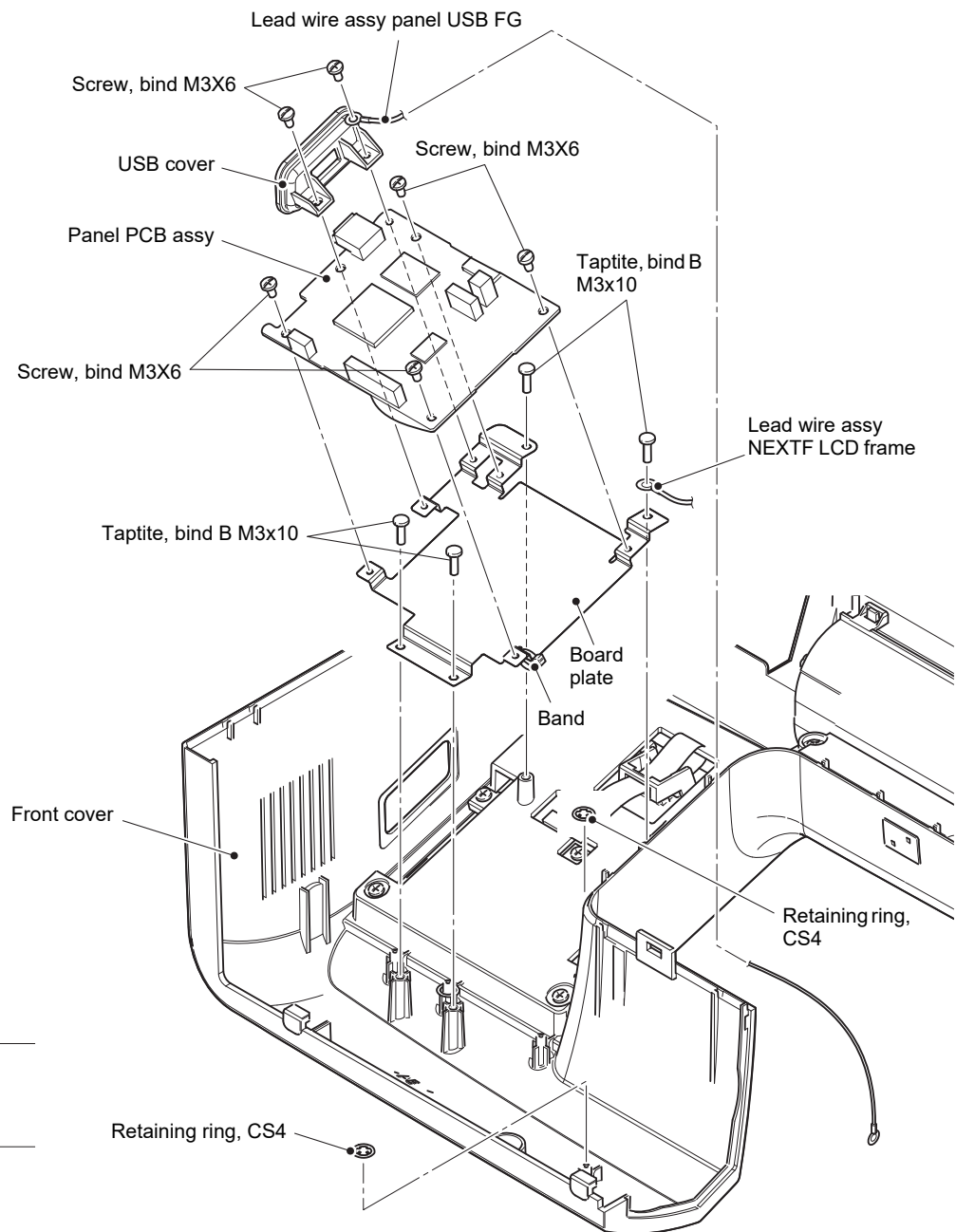


6-6 Attachment of Board plate, Panel PCB assy, USB cover and Connectors

1. Attach the board plate to the front cover with the three screws (taptite, bind B M3x10).
2. Attach the lead wire assy LCD frame to the board plate with the screw (taptite, bind B M3x10).
3. Bind up the lead wire assy SSVR to the board plate with the band.
4. Attach the USB cover and the panel PCB assy to the board plate with the five screws (screw, bind M3x6). Attach the lead wire assy panel USB FG to the USB cover with the screw (screw, bind M3x6).
5. Connect the FC jack assy lead wire, the lead wire assy SSVR, the lead wire assy main-panel and the flexible flat cable:SML2CD-24 to the panel PCB assy.
6. Pass the lead wire assy panel USB FG through the securing fixtures, and secure it with the two retaining rings, CS4.

***Key point**

- Refer to wiring "Wiring of Front cover assy".



Taptite, Bind B M3X10

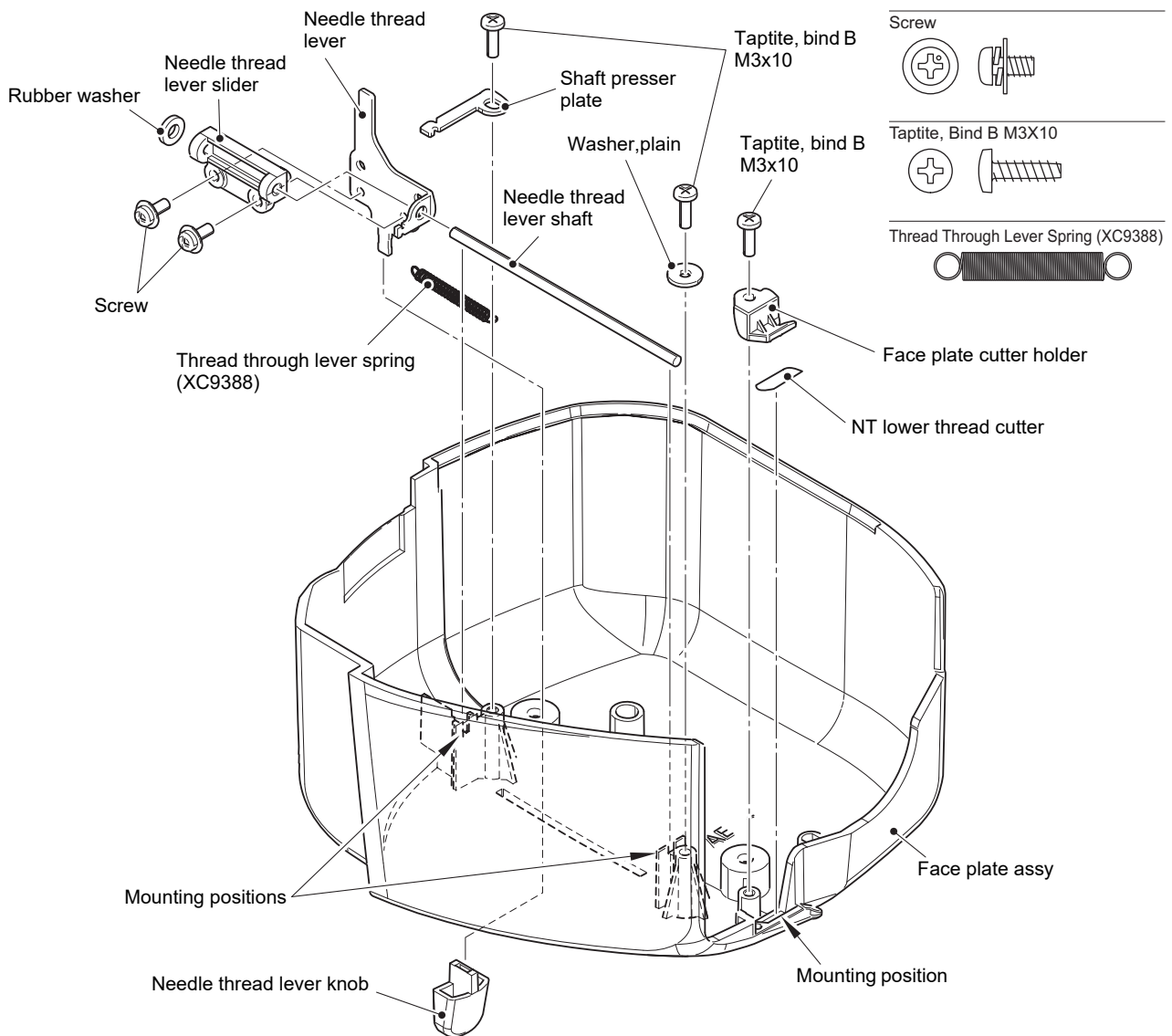


Screw, Bind M3X6



7 Assembly of Face plate assy

1. Attach the needle thread lever slider to the needle thread lever with the two screws (screw).
2. Insert the needle thread lever shaft into the needle thread lever, the needle thread lever slider and the rubber washer. Set the needle thread lever shaft to the two mounting positions of face plate assy.
3. Attach the washer, plain to the face plate assy with the screw (taptite, bind B M3x10).
4. Attach the shaft presser plate to the face plate assy with the screw (taptite, bind B M3x10).
5. Attach the thread through lever spring (XC9388) to the shaft presser plate and the needle thread lever.
6. Set the needle thread lever knob to the needle thread lever.
7. Set the NT lower thread cutter to the mounting position of face plate assy, and attach the face plate cutter holder to the face plate assy with the screw (taptite, bind B M3x10).

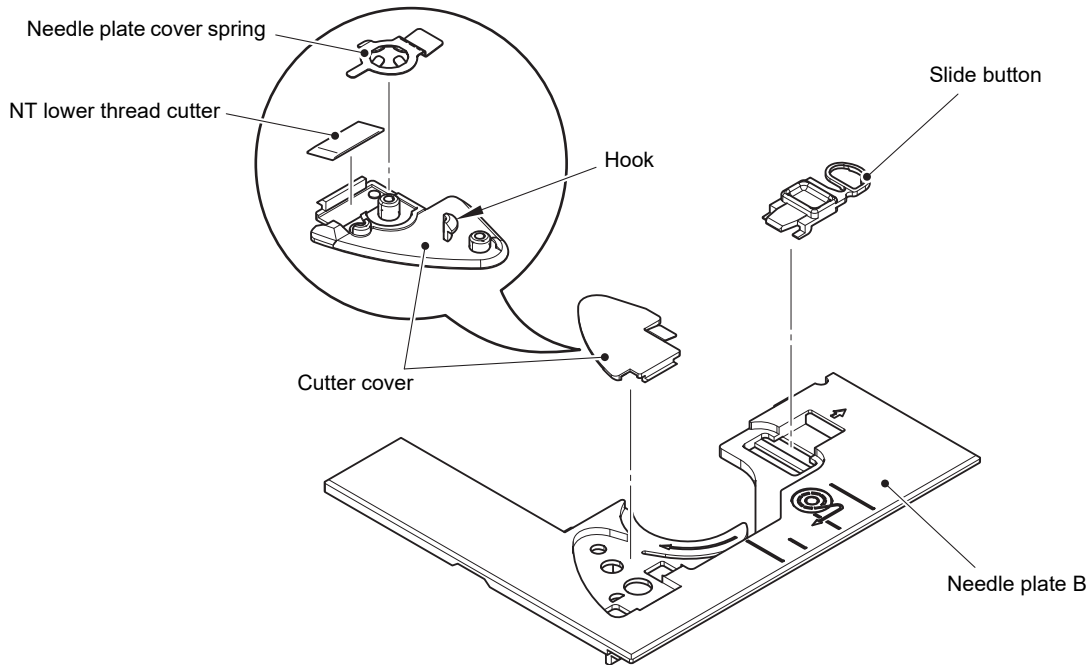


Application of
Assembly

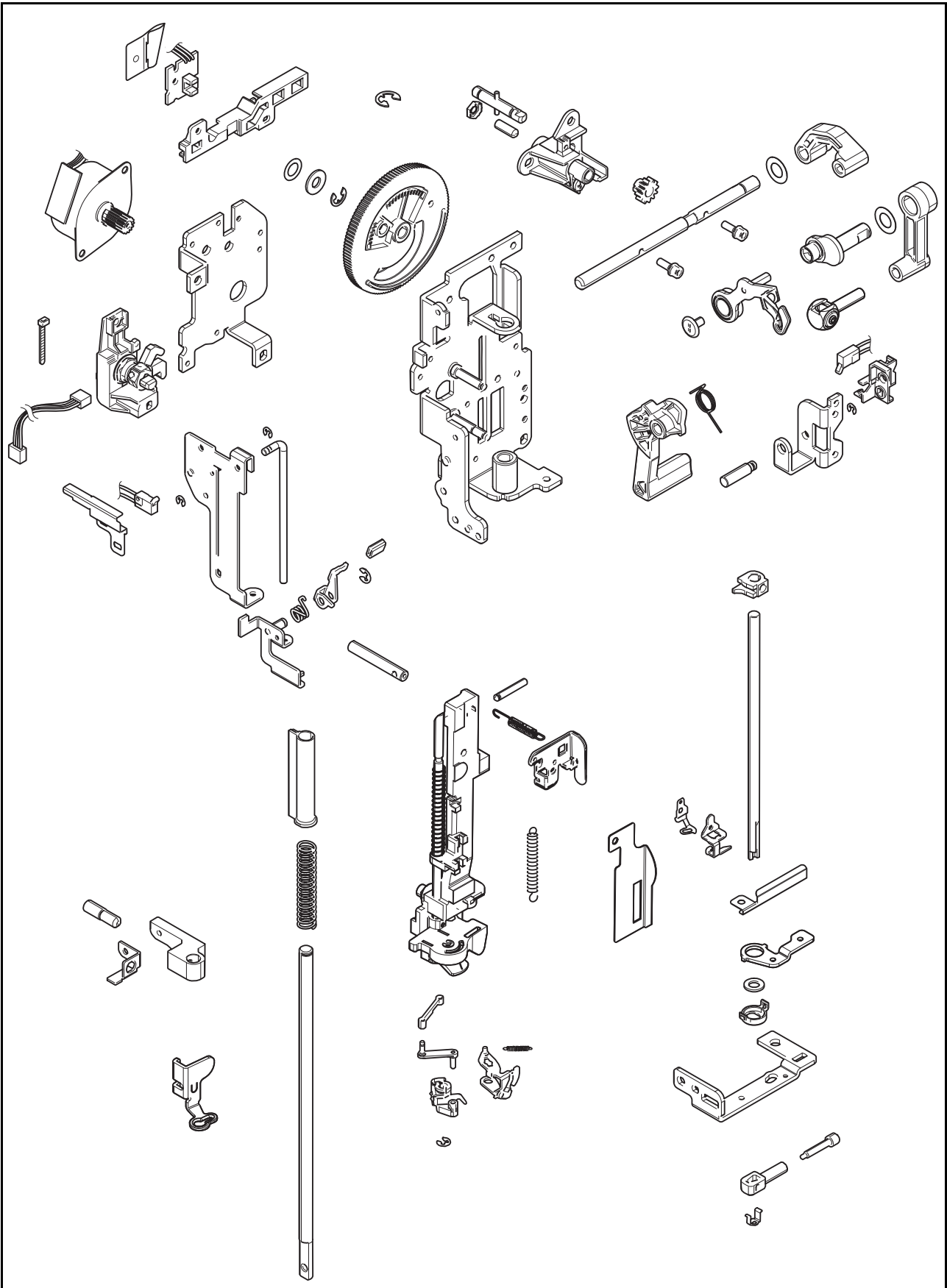
Application of
Assembly

8 Assembly of Needle plate B assy

1. Attach the NT lower thread cutter and the needle plate cover spring to the cutter cover. Attach the cutter cover to the needle plate B with the hook.
2. Attach the slide button to the needle plate B.



Needle-presser module location diagram

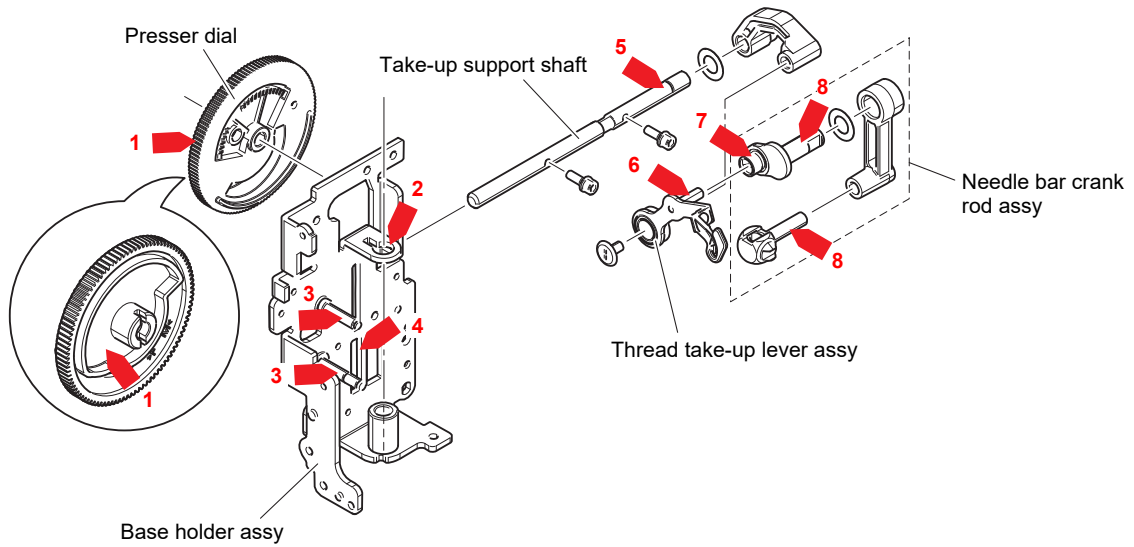


Application of
Assembly

Application of
Assembly

1 Lubrication

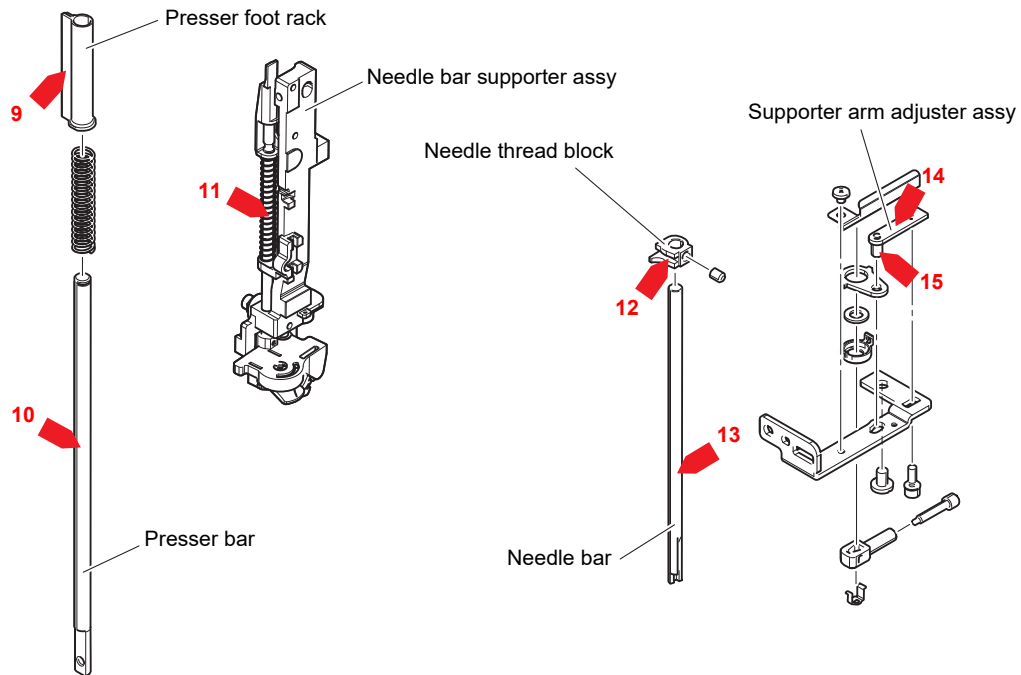
Lubrication point		Lubricating oil type		Quantity of lubrication
1	Presser dial	2 places	MOLYKOTE EM30L	Light covering
2	Base holder assy	1 place	MOLYKOTE EM30L	Rice-grain size
3		2 places	MOLYKOTE EM30L	Small Bead
4		1 place	EPNOC AP (N) 0	Rice-grain size
5	Take-up support shaft	1 place	OILER	Rice-grain size
6	Thread take-up lever assy	1 place	OILER	Rice-grain size
7	Needle bar crank rod assy	1 place	MOLYKOTE EM30L	Small Bead
8		2 places	MOLYKOTE M DISPERSION	1 - 2 drops



Application of Assembly

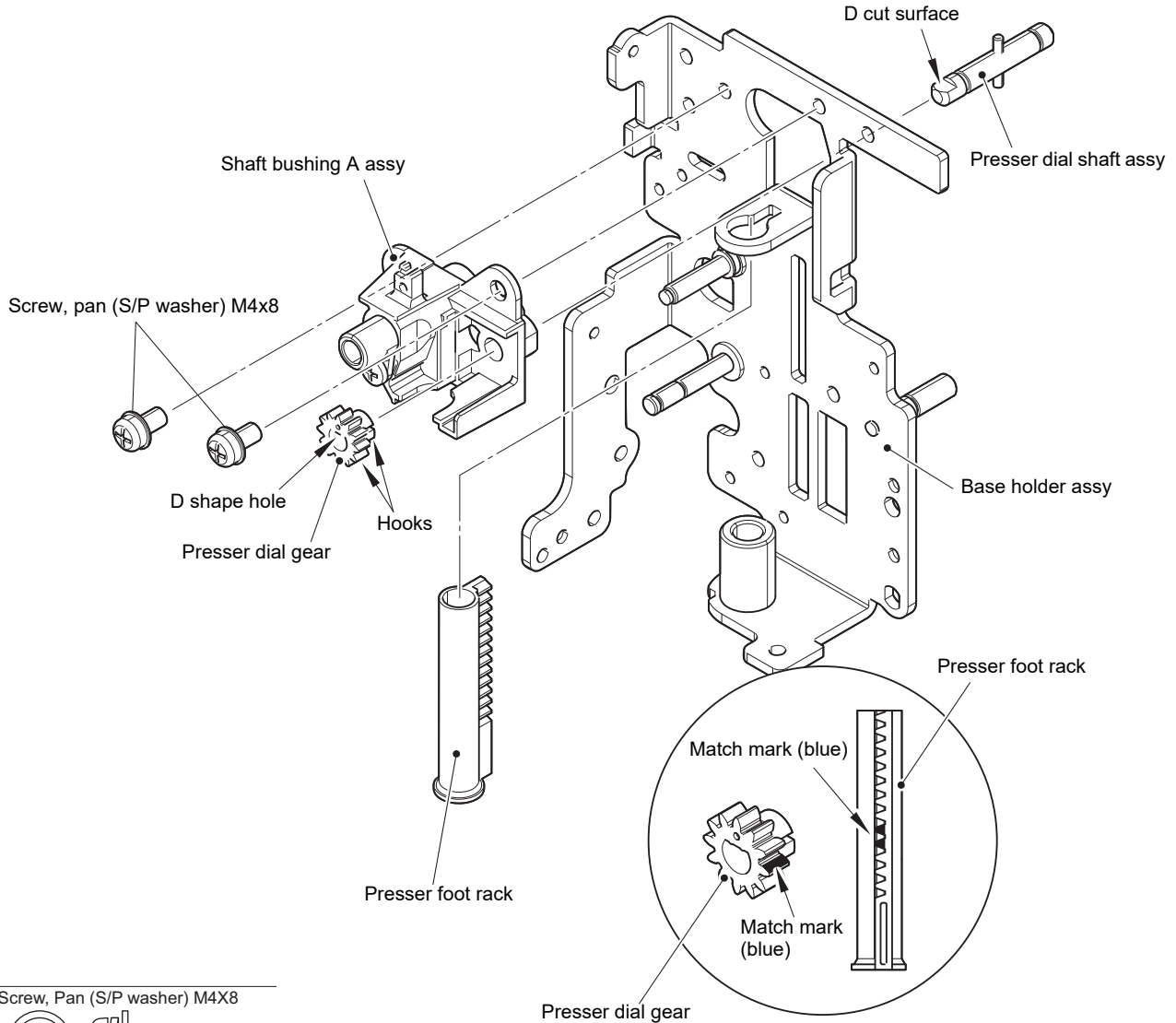
Application of Assembly

Lubrication point			Lubricating oil type	Quantity of lubrication
9	Presser foot rack	1 place	MOLYKOTE EM30L	Light covering
10	Presser bar	1 place	FBK OIL RO 100	1 - 2 drops
11	Needle bar supporter assy	1 place	MOLYKOTE EM30L	1 - 2 drops
12	Needle thread block	1 place	EPNOC AP (N) 0	Light covering
13	Needle bar	1 place	OILER	Rice-grain size
14	Supporter arm adjuster assy	1 place	FBK OIL RO 100	1 - 2 drops
15		1 place	EPNOC AP (N) 0	Small Bead



2 Attachment of Shaft bushing A assy and Presser dial gear

1. Attach the shaft bushing A assy to the base holder assy with the two screws (screw, pan (S/P washer) M4x8).
2. Align and set the match mark (blue) of presser dial gear to the match mark (blue) of presser foot rack. Align the D cut surface of presser dial shaft assy with the D shape hole of presser dial gear, set the presser dial shaft assy to the shaft bushing A assy and presser dial gear, and lock it with the two hooks.
3. Set the presser foot rack to the base holder assy.

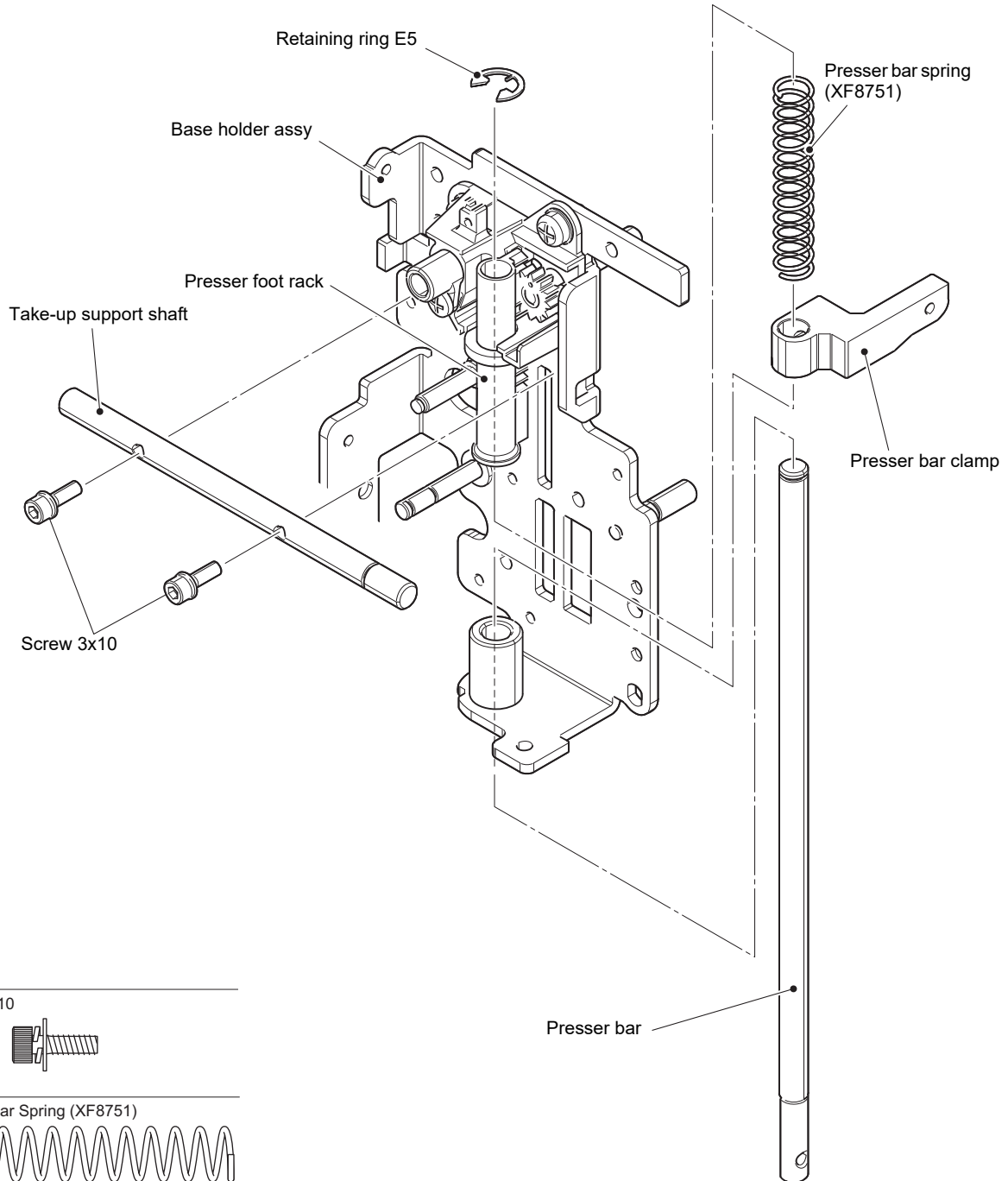


Screw, Pan (S/P washer) M4X8



3 Attachment of Presser bar clamp assy and Presser bar

1. Attach the take-up support shaft to the base holder assy with the two screws (screw 3x10).
2. Insert the presser bar into the base holder assy, the presser bar clamp, the presser bar spring (XF8751) and the presser foot rack, and attach the retaining ring E5 to the presser bar.

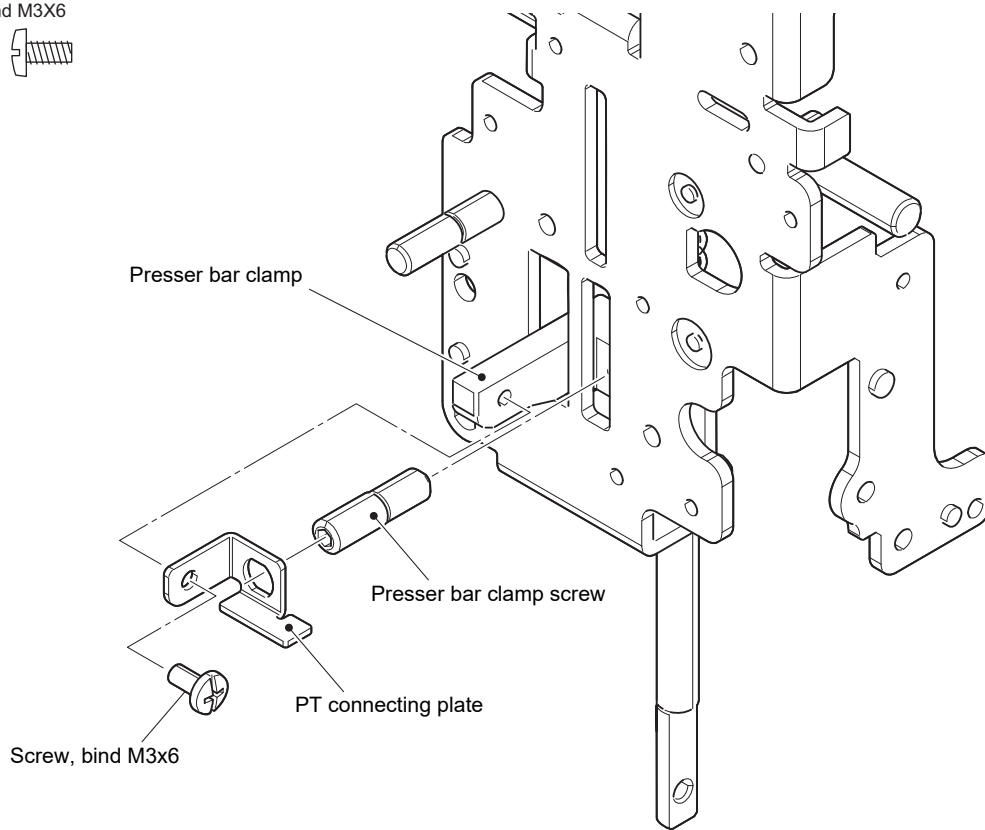


Application of
Assembly

Application of
Assembly

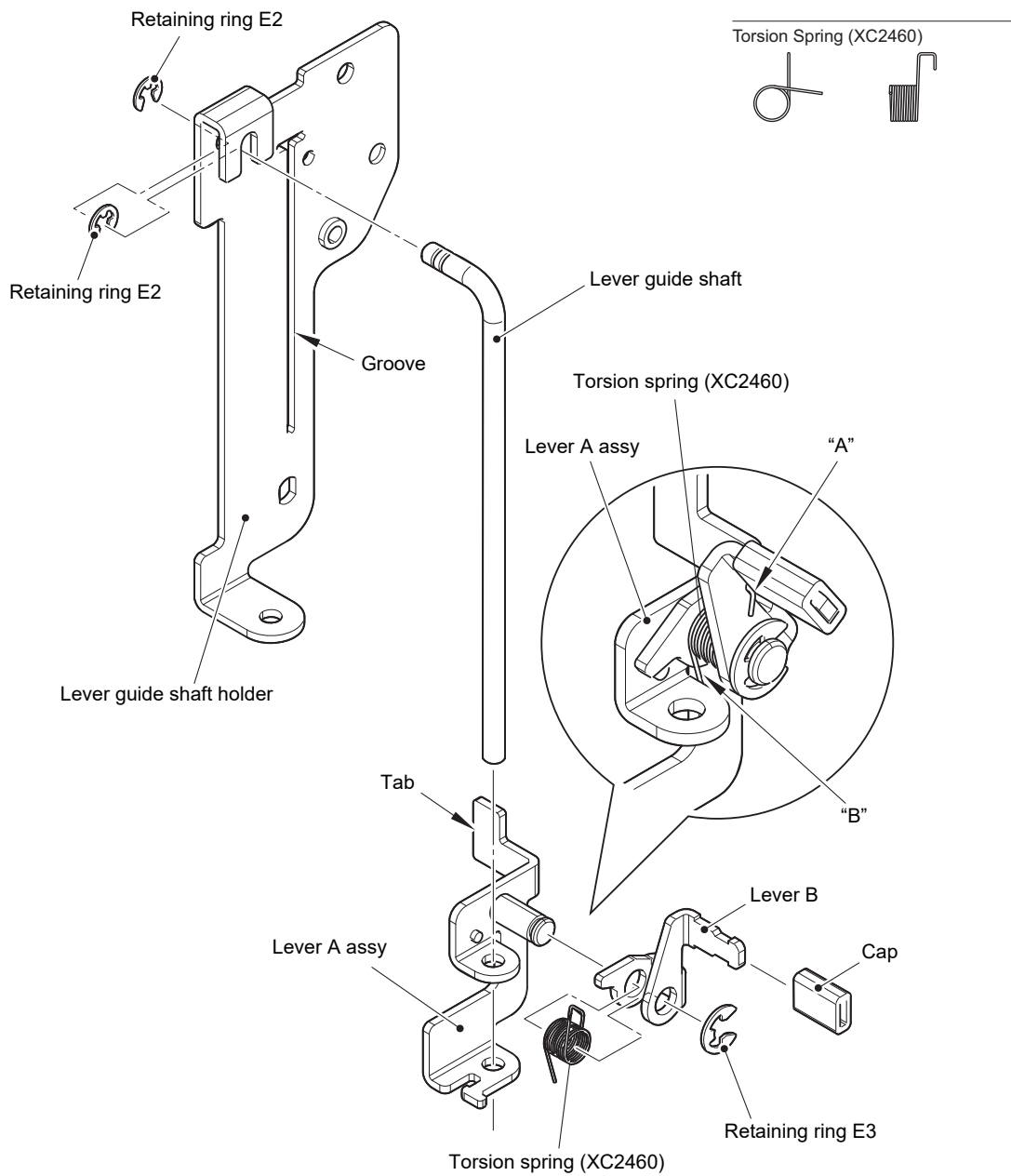
3. Tighten the presser bar clamp screw to the presser bar clamp.
4. Attach the PT connecting plate to the presser bar clamp with the screw (screw, bind M3x6).

Screw, Bind M3X6



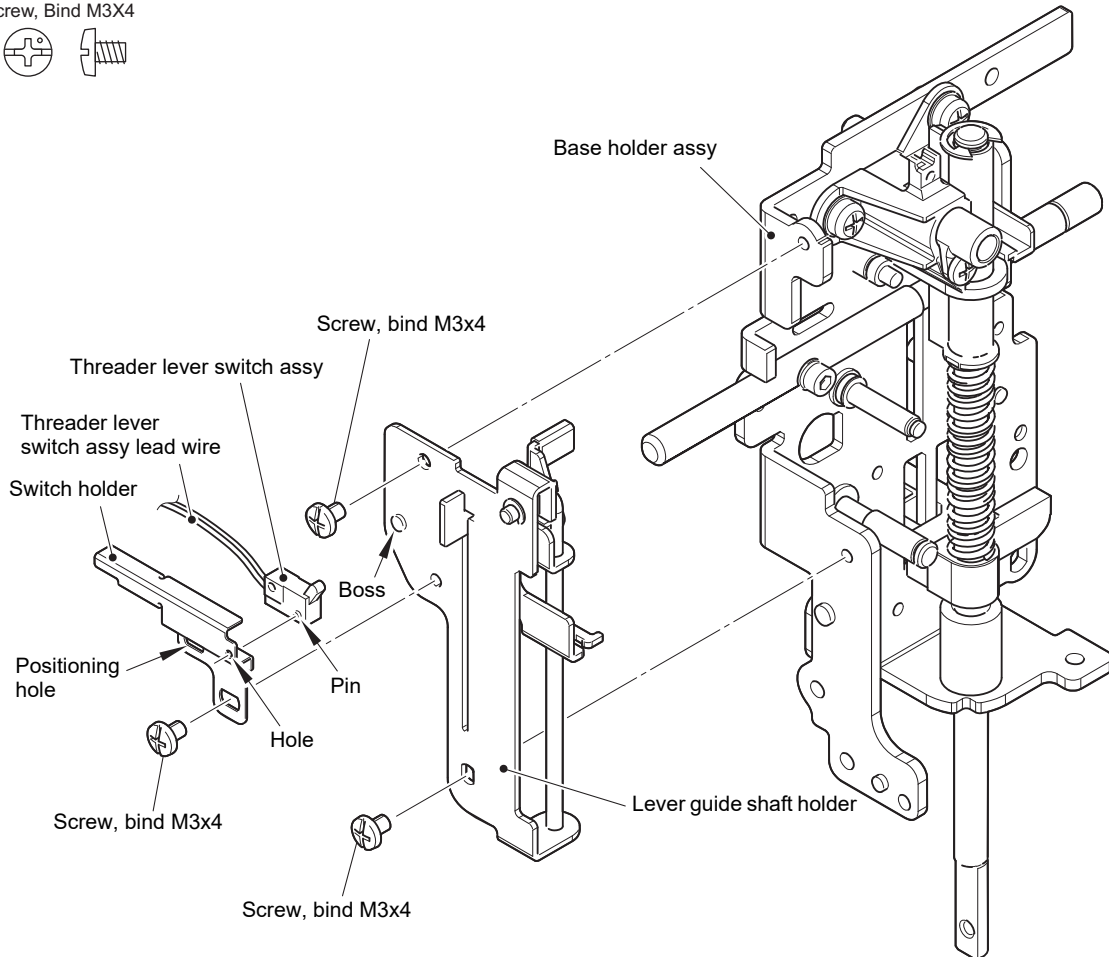
4 Attachment of Lever AB

1. Attach the cap to the lever B.
2. Set the torsion spring (XC2460) to the lever B, and attach them to the lever A assy with the retaining ring E3.
3. Hang the tip "A" and "B" of torsion spring (XC2460) on the lever B and the lever A assy in the figure below.
4. Insert the lever guide shaft into the lever A assy. Set the tab of lever A assy to the groove of lever guide shaft holder, and attach the lever guide shaft to the lever guide shaft holder with the two retaining ring E2.



5. Attach the lever guide shaft holder to the base holder assy with the two screws (screw, bind M3x4).
6. Insert the pin of threader lever switch assy into the hole of switch holder, set the threader lever switch assy to the switch holder, and pass the threader lever switch assy lead wire through the guide of switch holder. Align the positioning hole of switch holder with the boss of lever guide shaft holder, and attach the switch holder to the lever guide shaft holder with the screw (screw, bind M3x4).

Screw, Bind M3X4



5 Attachment of Threader hook assy

1. Set the spring (XC9616) to the thread guide assy.
2. Assemble the threader hook assy, link A assy, link B and thread guide assy.

***Key point**

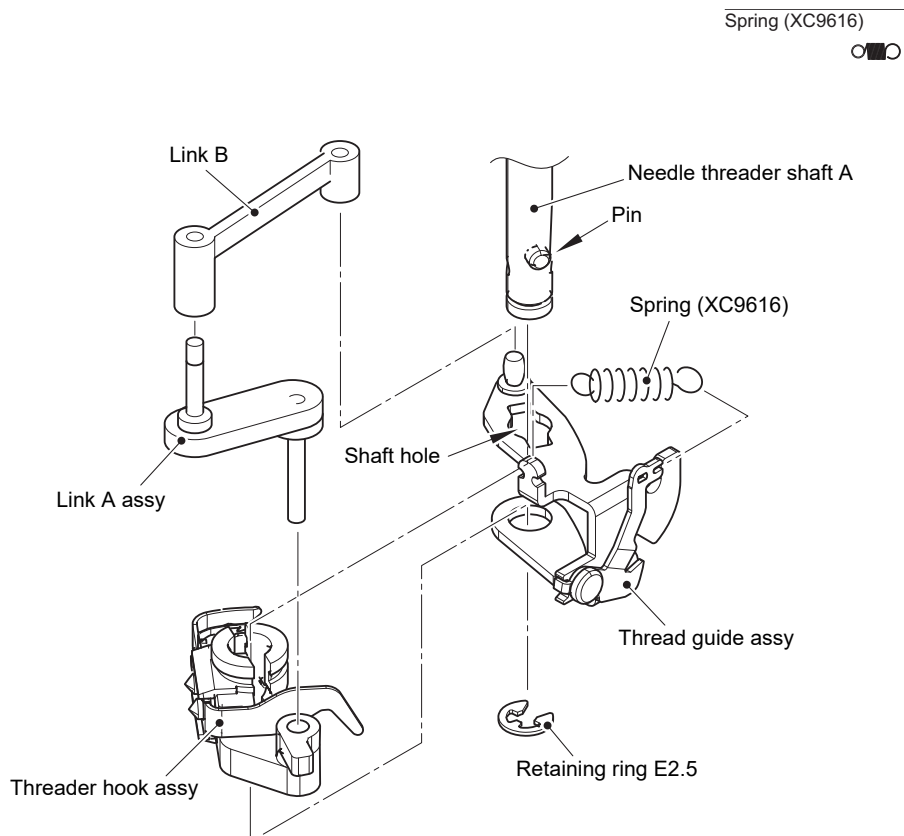
- Assemble the threader hook assy so that a triangle is formed.

3. Attach the threader hook assy to the needle threader shaft A.

***Key point**

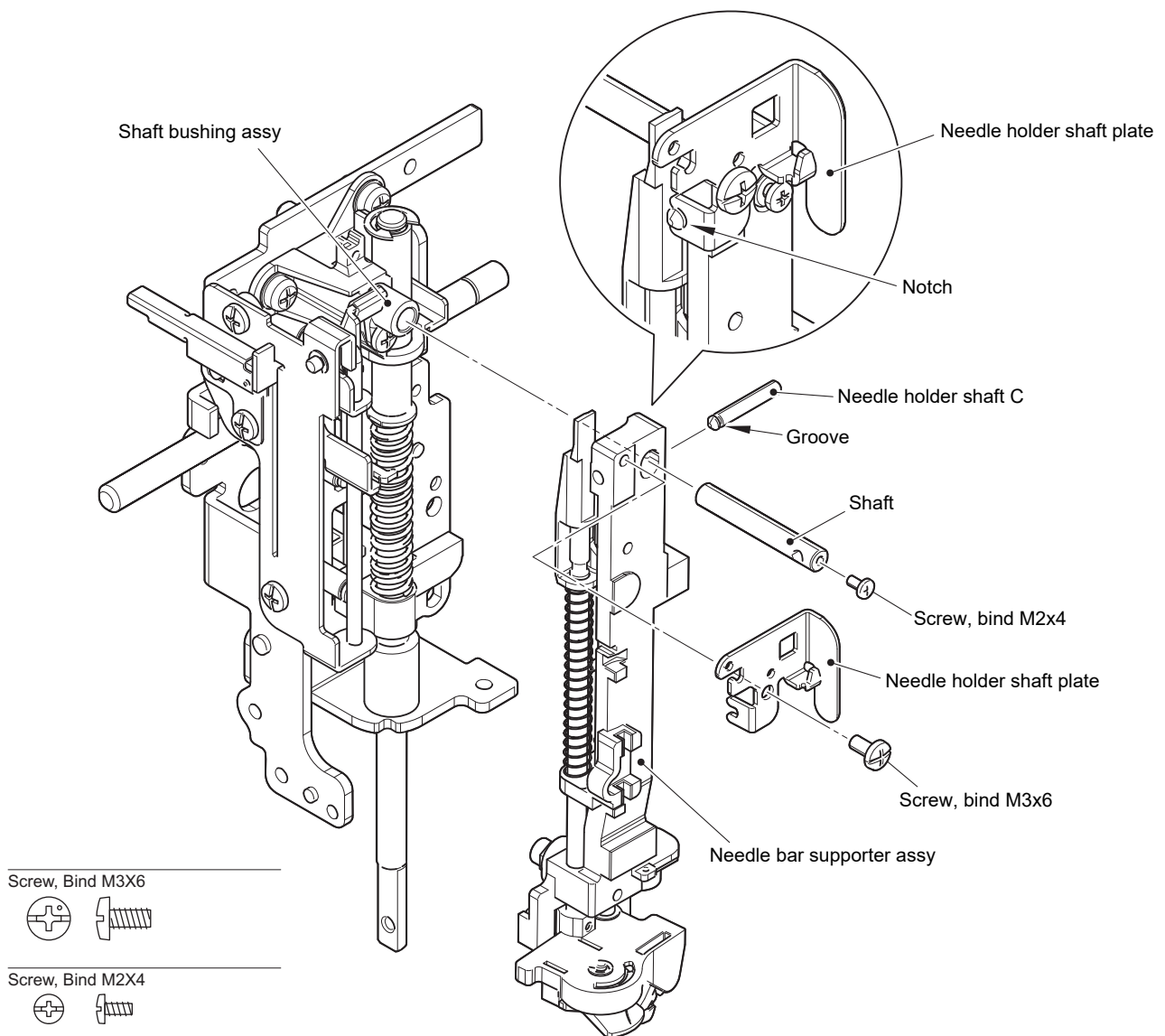
- Align the shaft hole of threader hook assy with the pin of needle threader shaft A.

4. Attach the retaining ring E2.5 to the needle threader shaft A.



6 Attachment of Needle bar supporter assy

1. Set the shaft to the needle bar supporter assy, and insert the needle holder shaft C into the needle bar supporter assy, the shaft and the needle bar supporter assy. Align the notch of needle holder shaft plate with the groove on needle holder shaft C, and attach the needle holder shaft plate to the needle bar supporter assy with the screw (screw, bind M3x6).
2. Tighten the screw (screw, bind M2x4) to the shaft.
3. Insert the shaft into the shaft bushing assy.



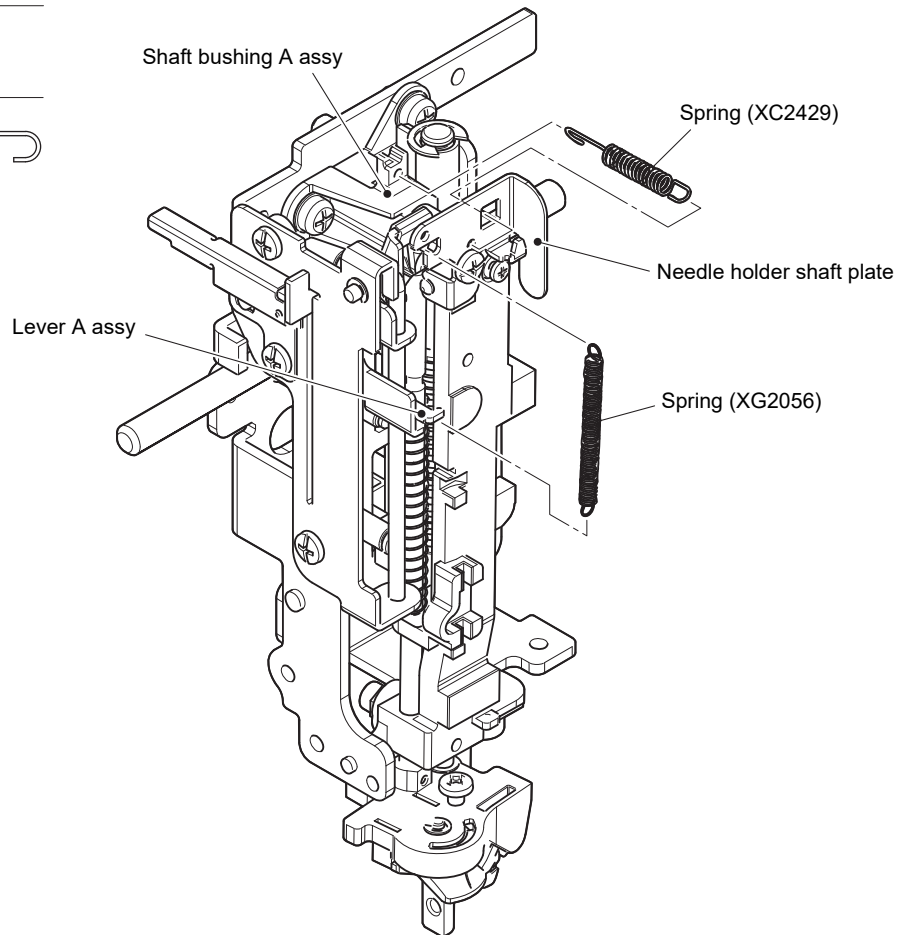
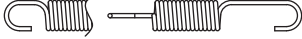
7 Attachment of Springs

1. Attach the spring (XG2056) to the needle holder shaft plate and the lever A assy.
2. Attach the spring (XC2429) to the needle holder shaft plate and the shaft bushing A assy.

Spring (XG2056)



Spring (XC2429)



8 Attachment of Needle supporter arm base

1. Set the needle bar felt to the needle bar felt holder. Attach the needle bar felt holder to the needle bar supporter arm with the two hooks.
2. Insert the shaft of supporter arm adjuster assy into the needle bar supporter arm and the needle supporter arm base, set them, and tighten the screw (screw 3x8) temporarily.

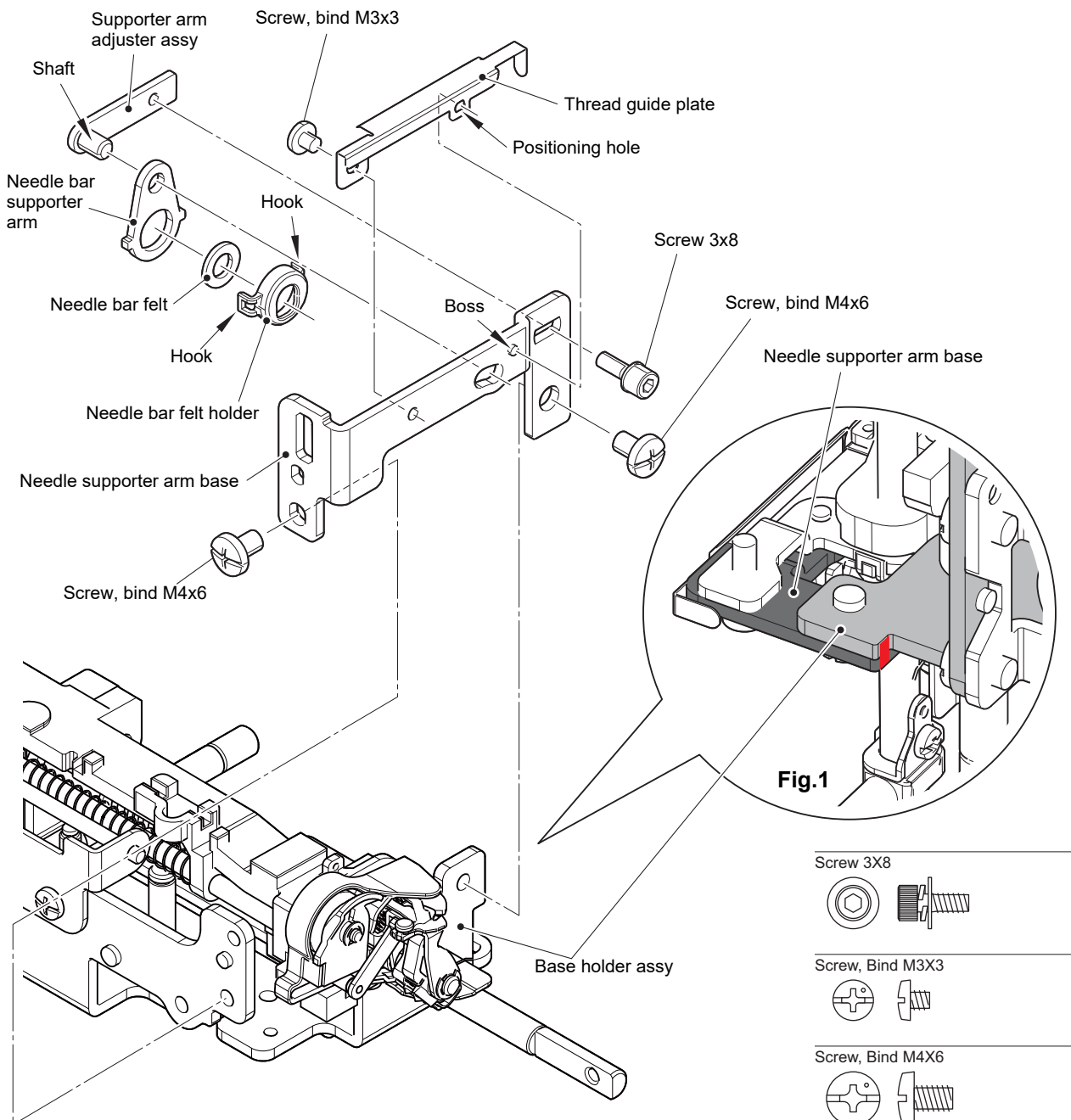
***Key point**

- Fully tighten the screw after performing "Adjustment of Right/left position of needle and presser foot".

3. Align the positioning hole of the thread guide plate with the boss of the needle supporter arm base, and attach the thread guide plate to the needle supporter arm base with the screw (screw, bind M3x3).
4. Attach the needle supporter arm base to the base holder assy with the two screws (screw, bind M4x6).

***Key point**

- Make sure that this surface of the base holder assy and needle supporter arm base are aligned. (Fig.1)



9 Attachment of Needle thread block, Needle bar hook stand assy and Needle bar

1. Set the needle thread plate to the needle block. Attach the needle bar thread guide Q, needle block and needle thread guide spring to the needle bar with the screw (screw SM2.38). Tighten the needle clamp screw to the needle block.

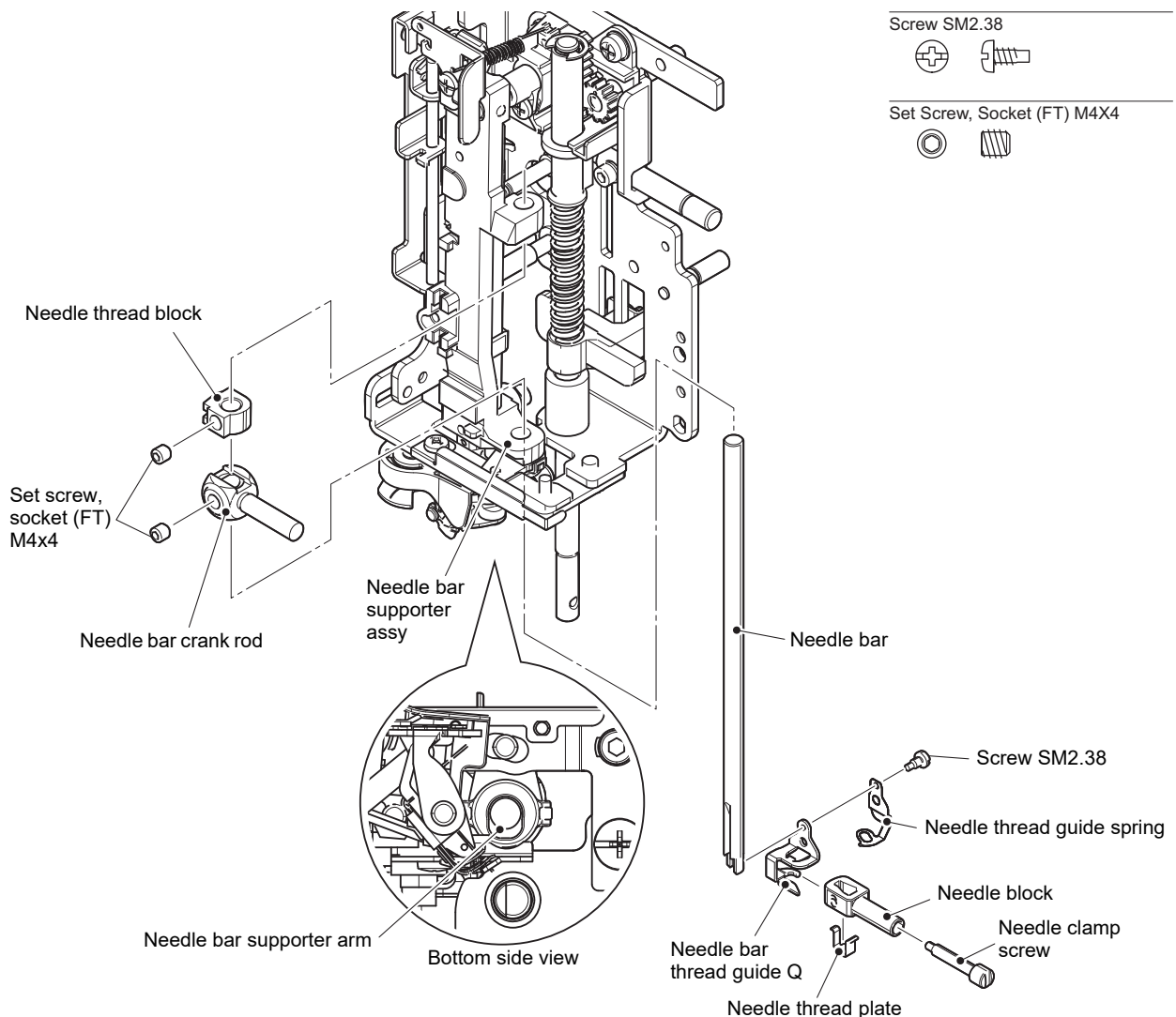
***Key point**

- Make sure that there is no gap between the needle bar thread guide Q and the tip of needle thread guide spring.
- Make sure that there is 0.3 to 0.65 mm gap between the needle block and the right side of needle bar thread guide Q.

2. Insert the needle bar into the needle bar supporter arm, needle bar supporter assy, needle bar crank rod, needle thread block and needle bar supporter assy, then tighten the two screws (set screw, socket (FT) M4x4) temporarily.

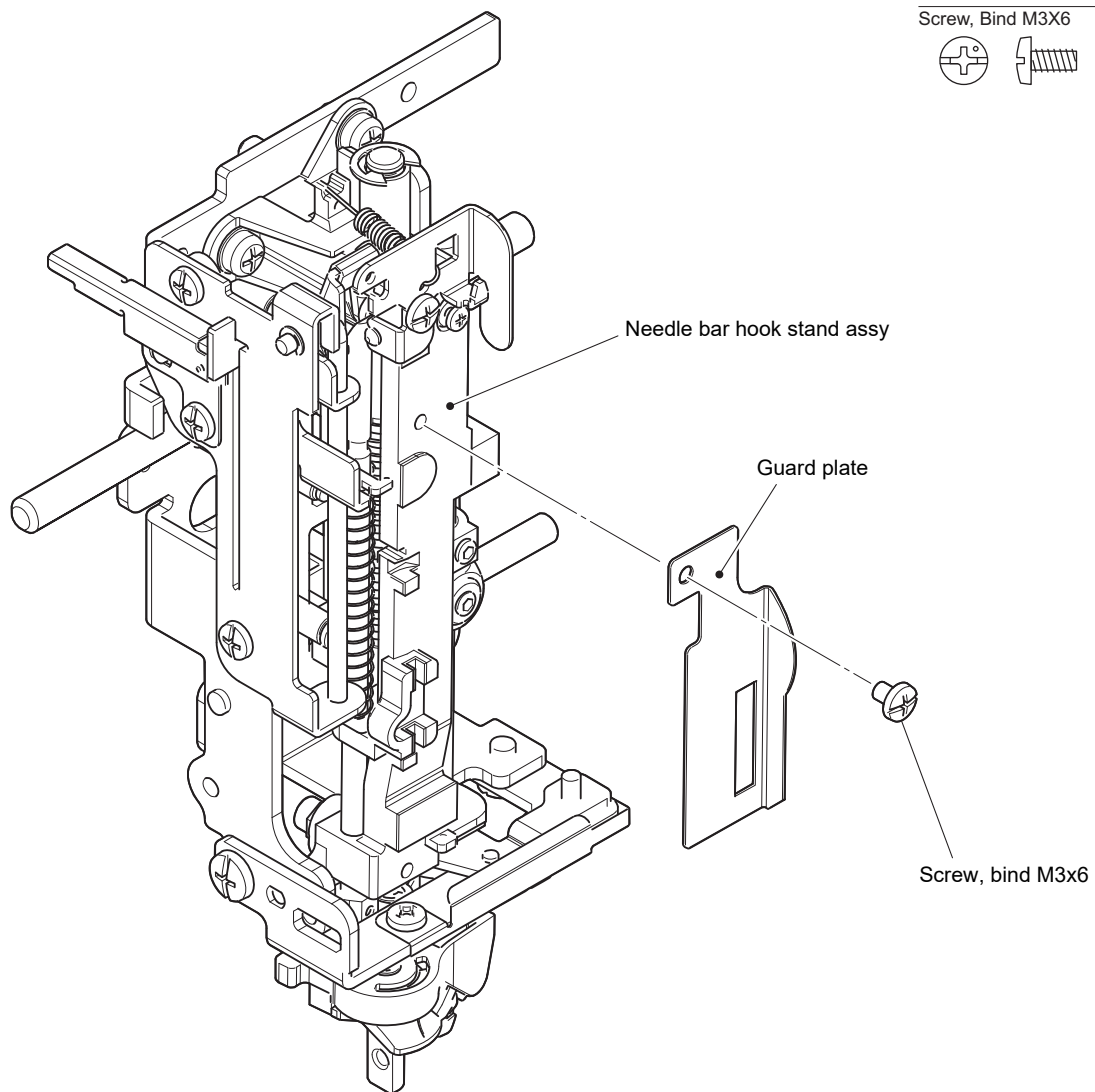
***Key point**

- Fully tighten the screw after performing "Adjustment of Needle bar height".



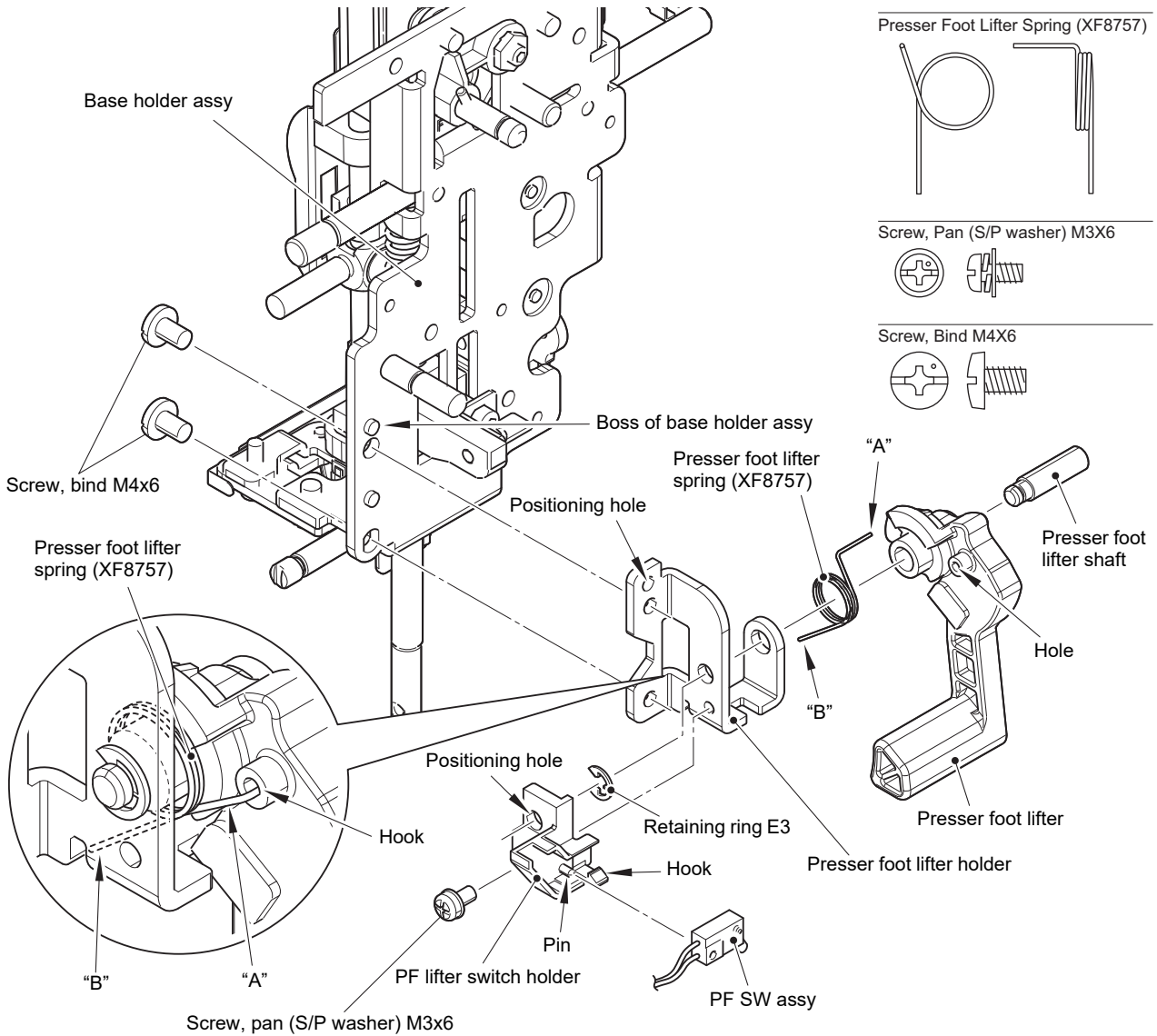
10 Attachment of Guard plate

1. Attach the guard plate to the needle bar supporter assy with the two screws (screw, bind M3x6).



11 Attachment of PF SW assy and Presser foot lifter

1. Set the presser foot lifter spring (XF8757) to the presser foot lifter, and insert the tip end "A" of spring into the hole. Hang the tip end "B" on the presser foot lifter holder, set the presser foot lifter to the presser foot lifter holder, insert the presser foot lifter shaft into the presser foot lifter holder and presser foot lifter, then secure them with the retaining ring E3.
2. Align the positioning hole of PF lifter switch holder with the presser foot lifter shaft, and attach the PF lifter switch holder with the screw (screw, pan (S/P washer) M3x6). Set the PF SW assy to the pin of PF lifter switch holder, and secure it with the hook.
3. Align the positioning hole of presser foot lifter holder with the boss of base holder assy, and attach the presser foot lifter holder with the two screws (screw, bind M4x6).



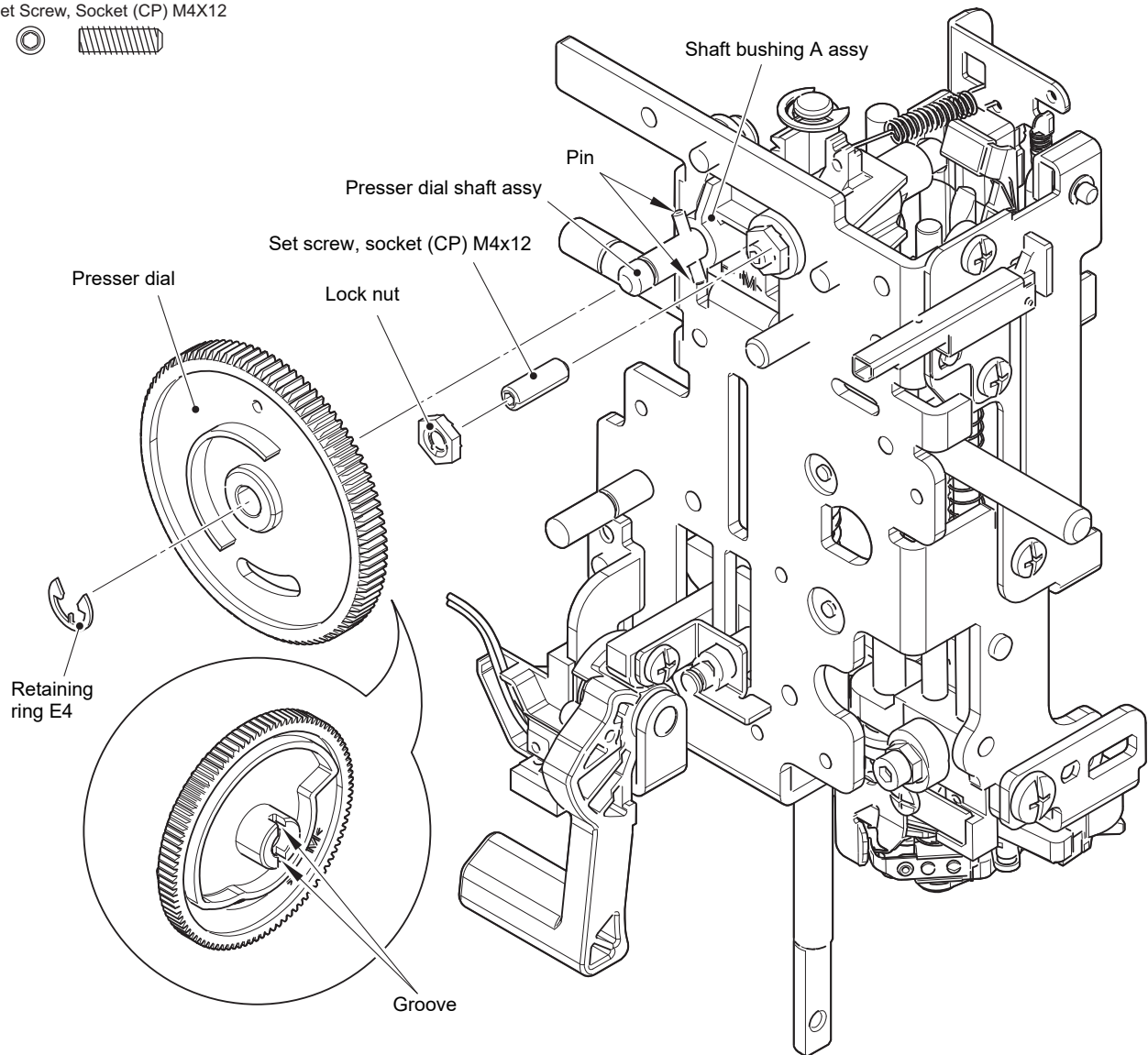
Application of
Assembly

Application of
Assembly

12 Attachment of Lock nut and Presser dial

1. Tighten the lock nut until it comes to the middle of the screw (set screw, socket (CP) M4x12). Tighten the screw (set screw, socket (CP) M4x12) to the shaft bushing A assy until the lock nut comes in contact with the shaft bushing A assy.
2. Align the groove on the back of presser dial with the pin of presser dial shaft assy, set the presser dial to the presser dial shaft assy, and attach the retaining ring E4.

Set Screw, Socket (CP) M4X12

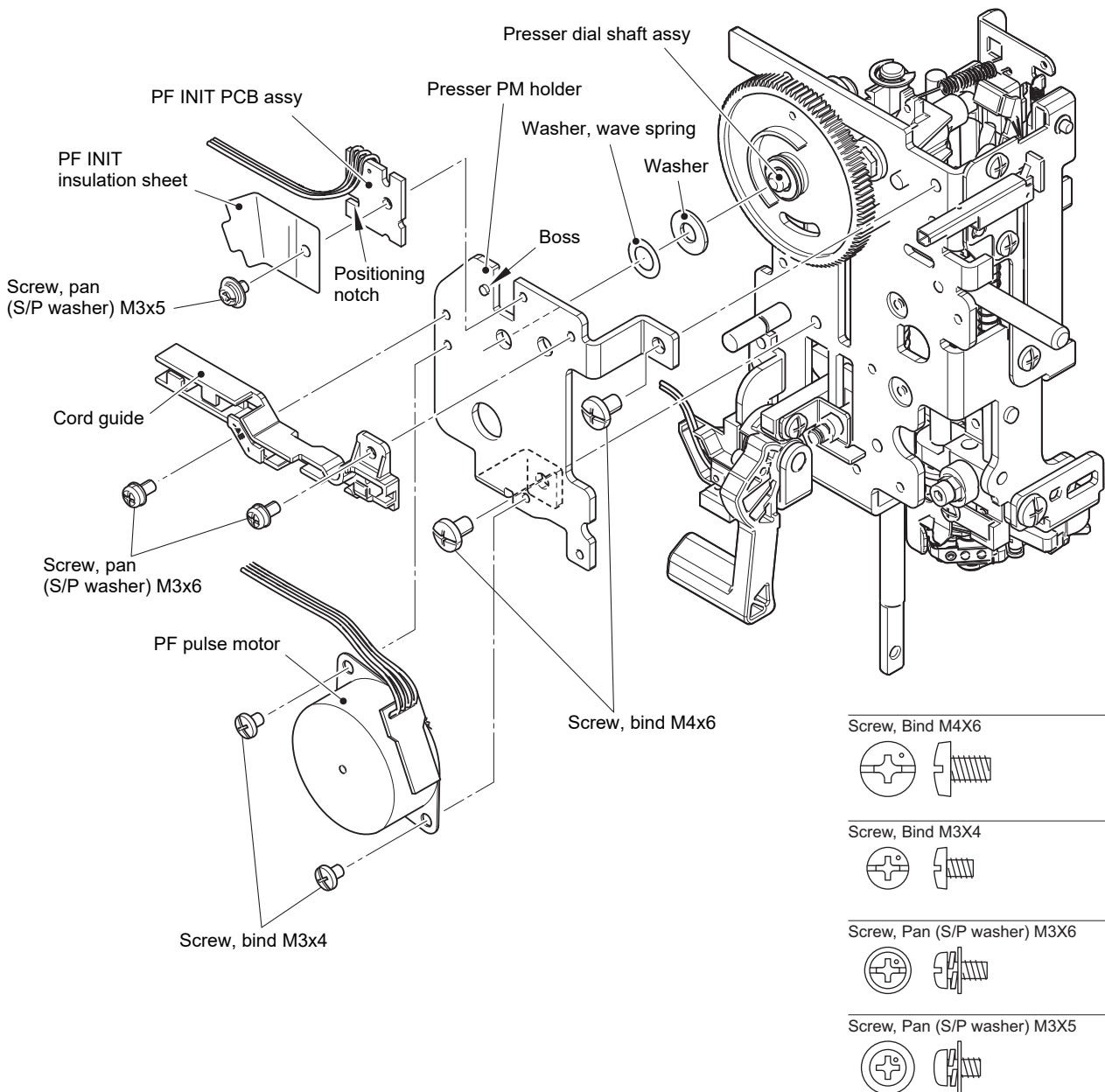


13 Attachment of Presser PM holder, PF INIT PCB assy

1. Set the washer, the washer, wave spring and the presser PM holder to the presser dial shaft assy, and secure them to the base holder assy with the two screws (screw, bind M4x6).
2. Attach the PF pulse motor to the presser PM holder with the two screws (screw, bind M3x4).
3. Attach the cord guide to the presser PM holder with the two screws (screw, pan (S/P washer) M3x6).
4. Set the PF INIT insulation sheet to the PF INIT PCB assy lead wire. Align the positioning notch of PF INIT PCB assy with the boss of presser PM holder, and attach the PF INIT PCB assy and the PF INIT insulation sheet to the presser PM holder with the screw (screw, pan (S/P washer) M3x5).
5. Pass the lead wires through the cord guide.

***Key point**

- Refer to "Wiring of Needle-Presser module".



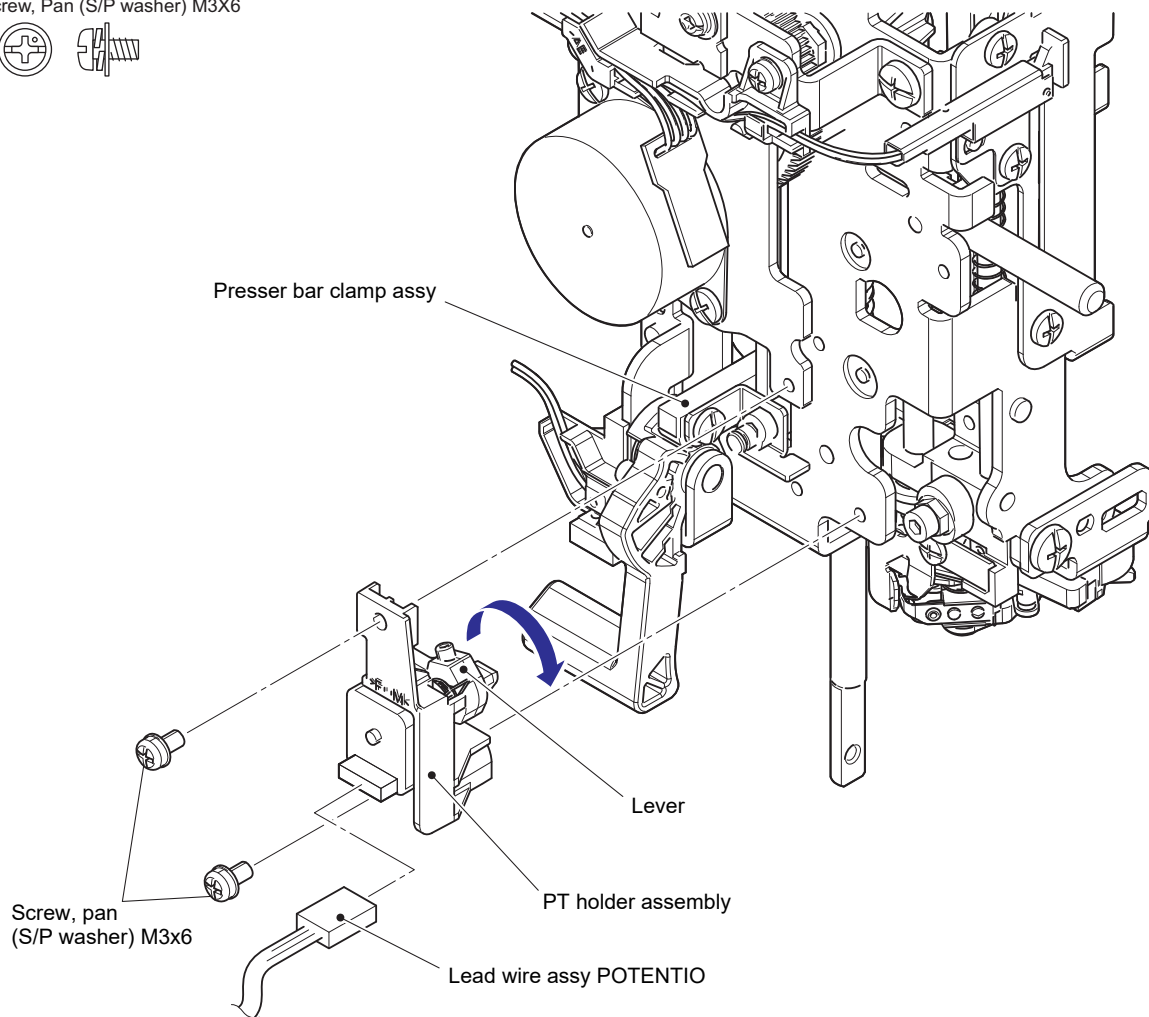
14 Attachment of PT holder assembly

1. Turn the lever of PT holder assembly to the direction of the arrow, put the lever on the presser bar clamp assy, and then attach the PT holder assembly with the two screws (screw, pan (S/P washer) M3x6).
2. Connect the lead wire assy POTENTIO to the PT holder assembly.

***Key point**

- Refer to "Wiring of Needle-Presser module", "Wiring of Presser module".

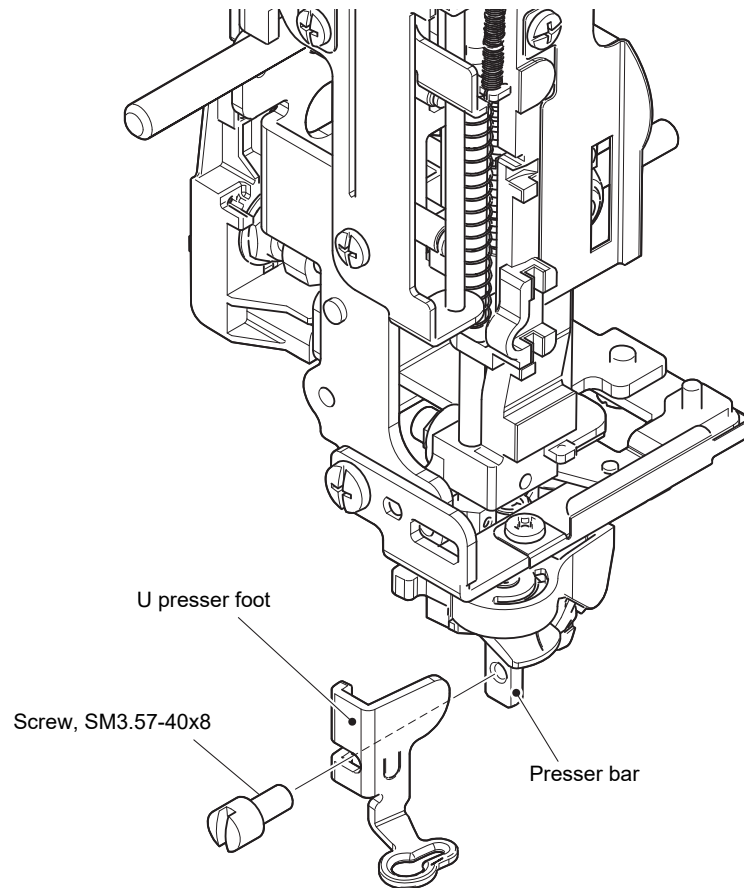
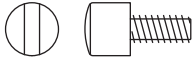
Screw, Pan (S/P washer) M3X6



15 Attachment of U presser foot

1. Attach the U presser foot to the presser bar with the screw (screw, SM3.57-40x8).

Screw 3.57-40x8

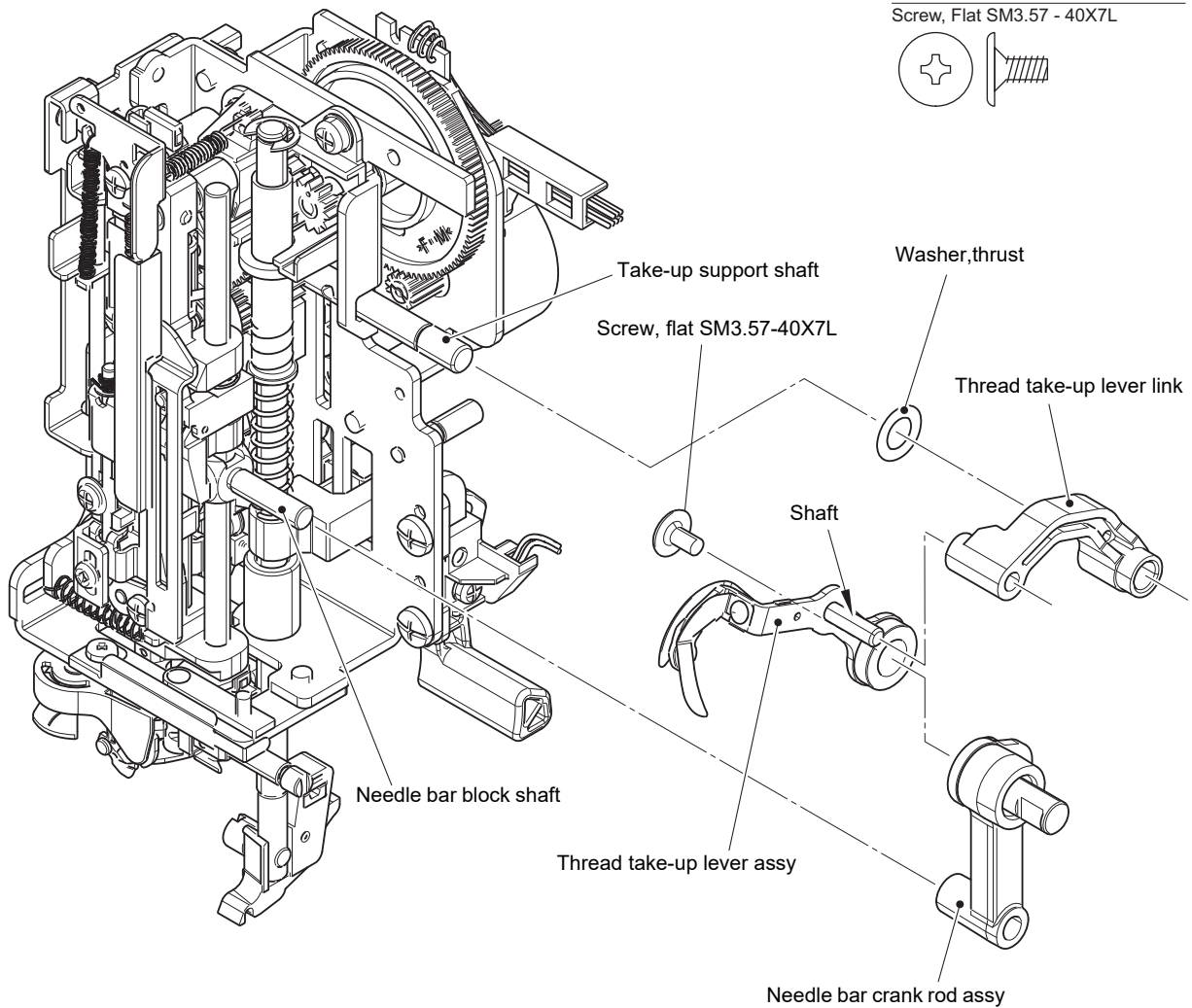


16 Attachment of Thread take-up lever assy and Needle bar crank rod assy

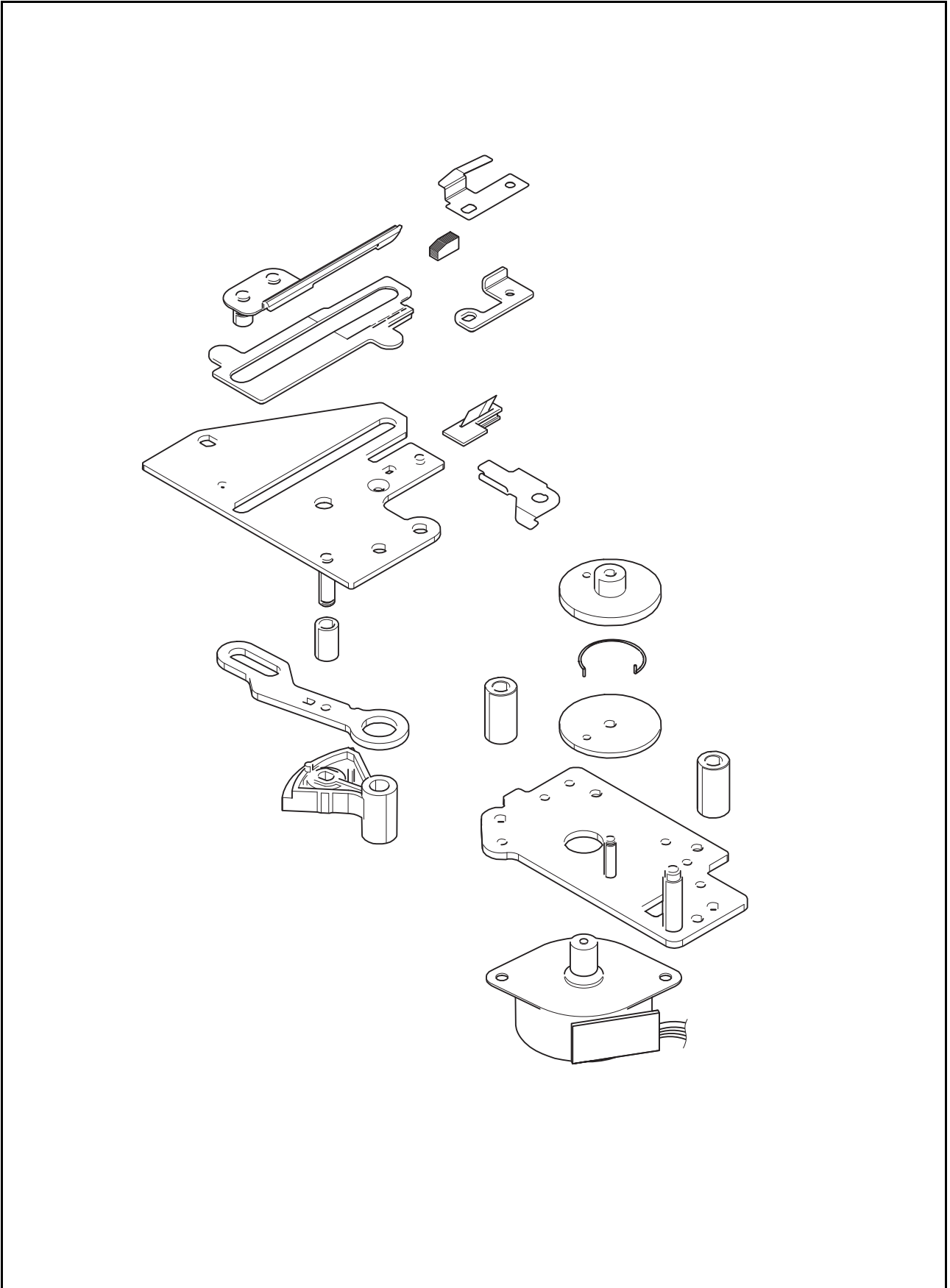
1. Set the washer, thrust and the thread take-up lever assy to the needle bar crank rod assy, and secure it with the screw (screw, flat SM3.57-40X7L).

***Key point**

- Loosen the screw by turning it clockwise.
2. Set the needle bar crank rod assy to the needle bar block shaft.
 3. Set the thread take-up lever link to the take-up support shaft and the shaft of thread take-up lever assy.



Thread cutter module location diagram

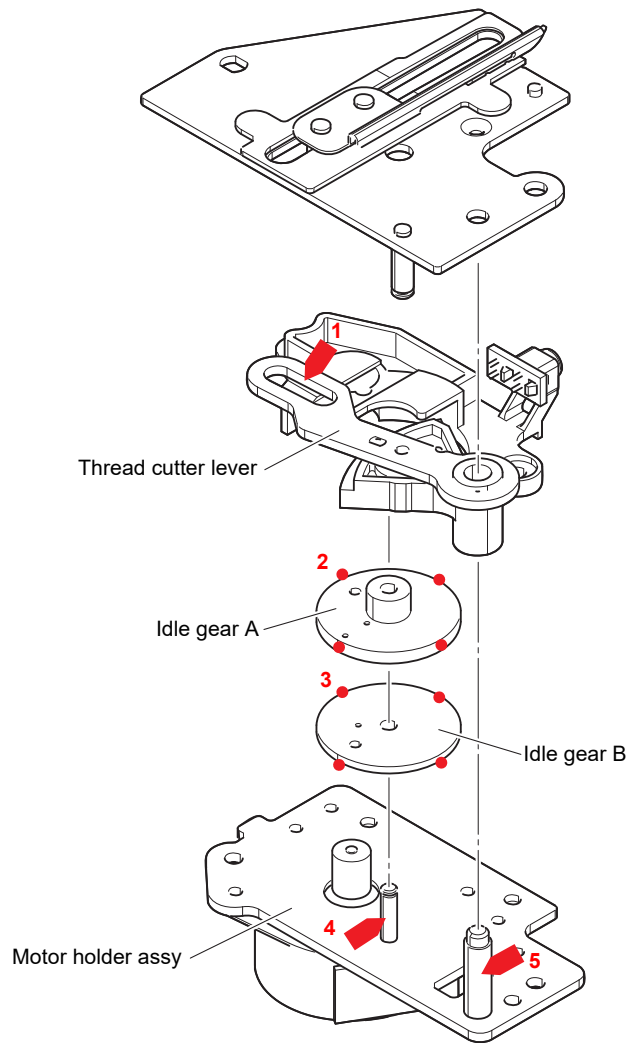


Application of
Assembly

Application of
Assembly

1 Lubrication

Lubrication point			Lubricating oil type	Quantity of lubrication
1	Thread cutter lever	1 place	EPNOC AP (N) 0	Light covering
2	Idle gear A	4 places	EPNOC AP (N) 0	Light covering
3	Idle gear B	4 places	EPNOC AP (N) 0	Light covering
4	Motor holder assy	1 place	EPNOC AP (N) 0	Light covering
5		1 place	EPNOC AP (N) 0	Light covering



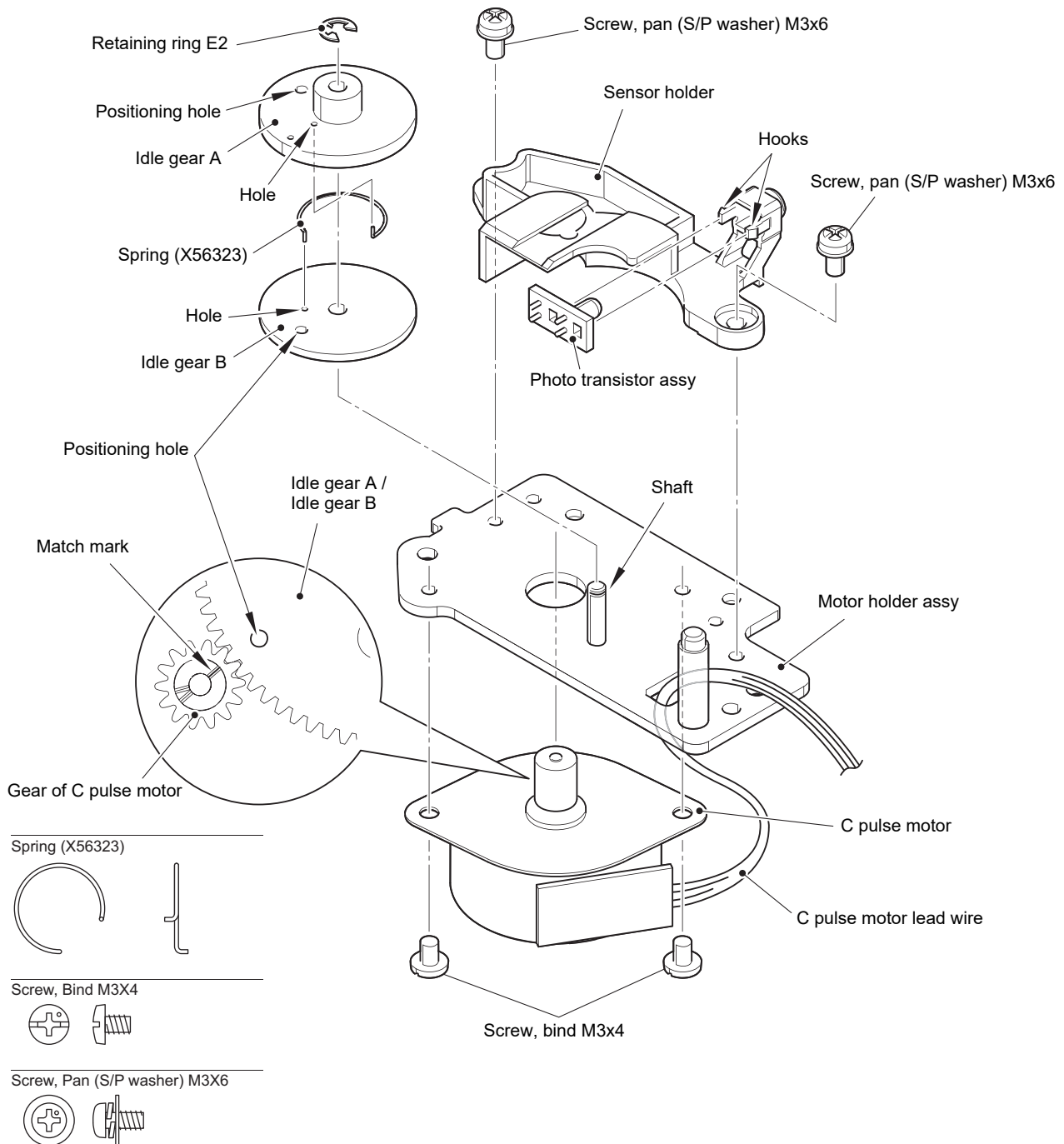
2 Attachment of C pulse motor and Photo transistor assy

1. Insert the tip of spring (X56323) into the hole of idle gear A, and then insert another tip of spring (X56323) into the hole of idle gear B. Assemble the idle gear A, the spring (X56323) and the idle gear B, and set them to the shaft of motor holder assy, and then secure them with the retaining ring E2.
2. Align the positioning hole of idle gear A and positioning hole of idle gear B with the match mark on gear of C pulse motor, and then attach the C pulse motor to the motor holder assy with the two screws (screw, bind M3x4). Pass the C pulse motor lead wire through the securing fixtures.

***Key point**

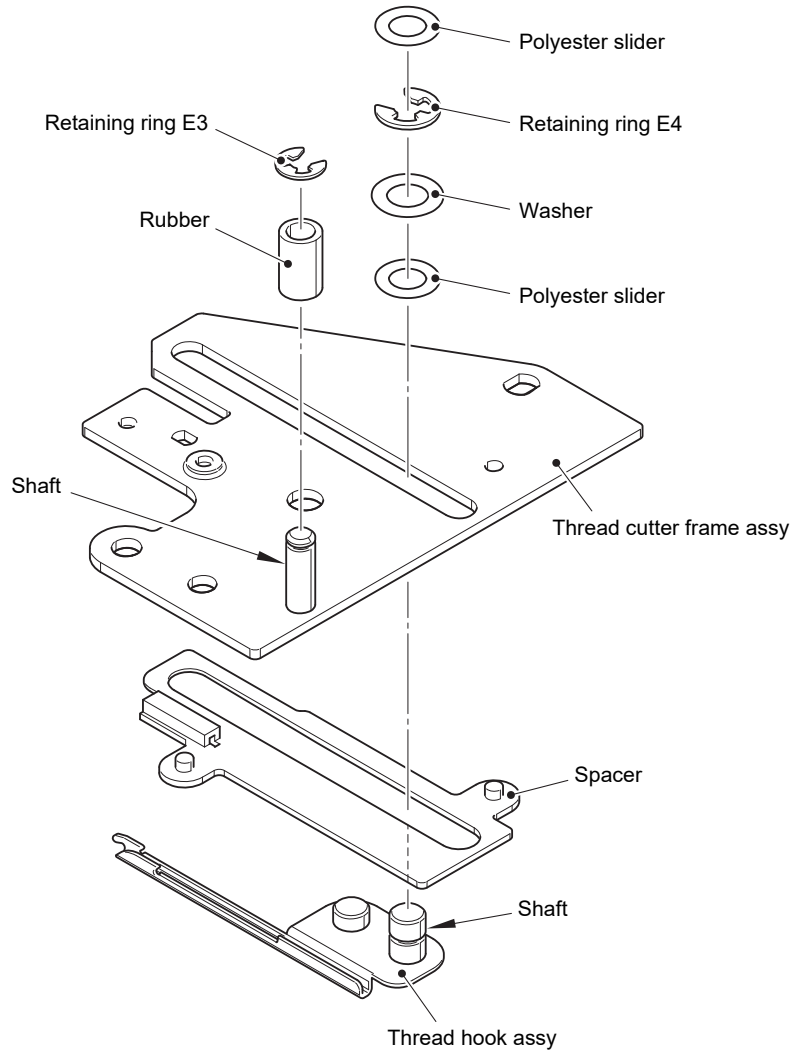
- Refer to "Wiring of Thread cutter module".

3. Attach the photo transistor assy to the sensor holder with the two hooks.
4. Attach the sensor holder to the motor holder assy with the two screws (screw, pan (S/P washer) M3x6).



3 Attachment of Thread hook assy

1. Set the spacer and the thread hook assy to the thread cutter frame assy. Set the polyester slider and the washer to the shaft of thread hook assy, and attach the retaining ring E4.
2. Set the polyester slider to the shaft of thread hook assy.
3. Set the rubber to the shaft of thread cutter frame assy, and attach the retaining ring E3.

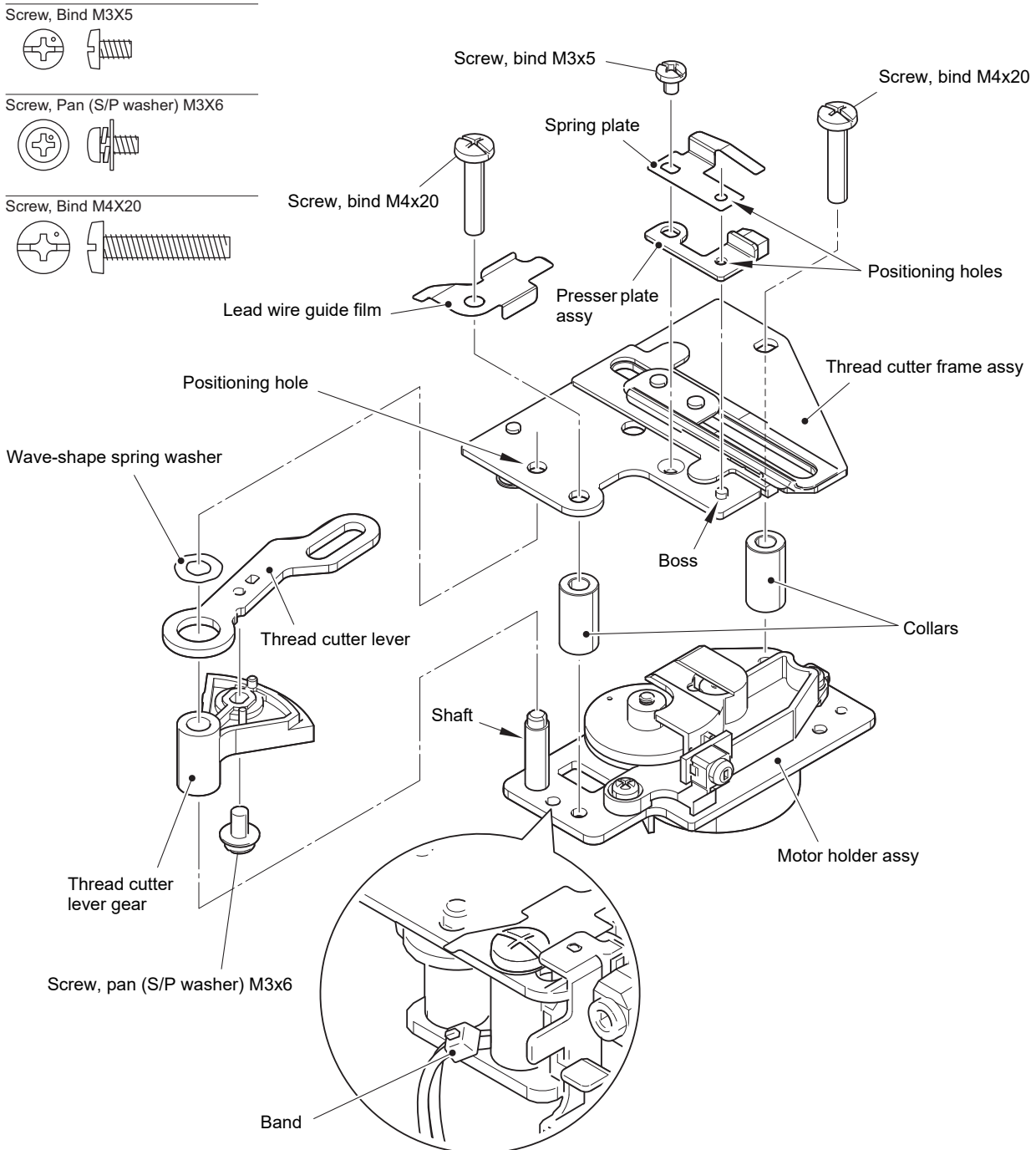


4 Assembly of Thread cutter frame assy and Motor holder assy

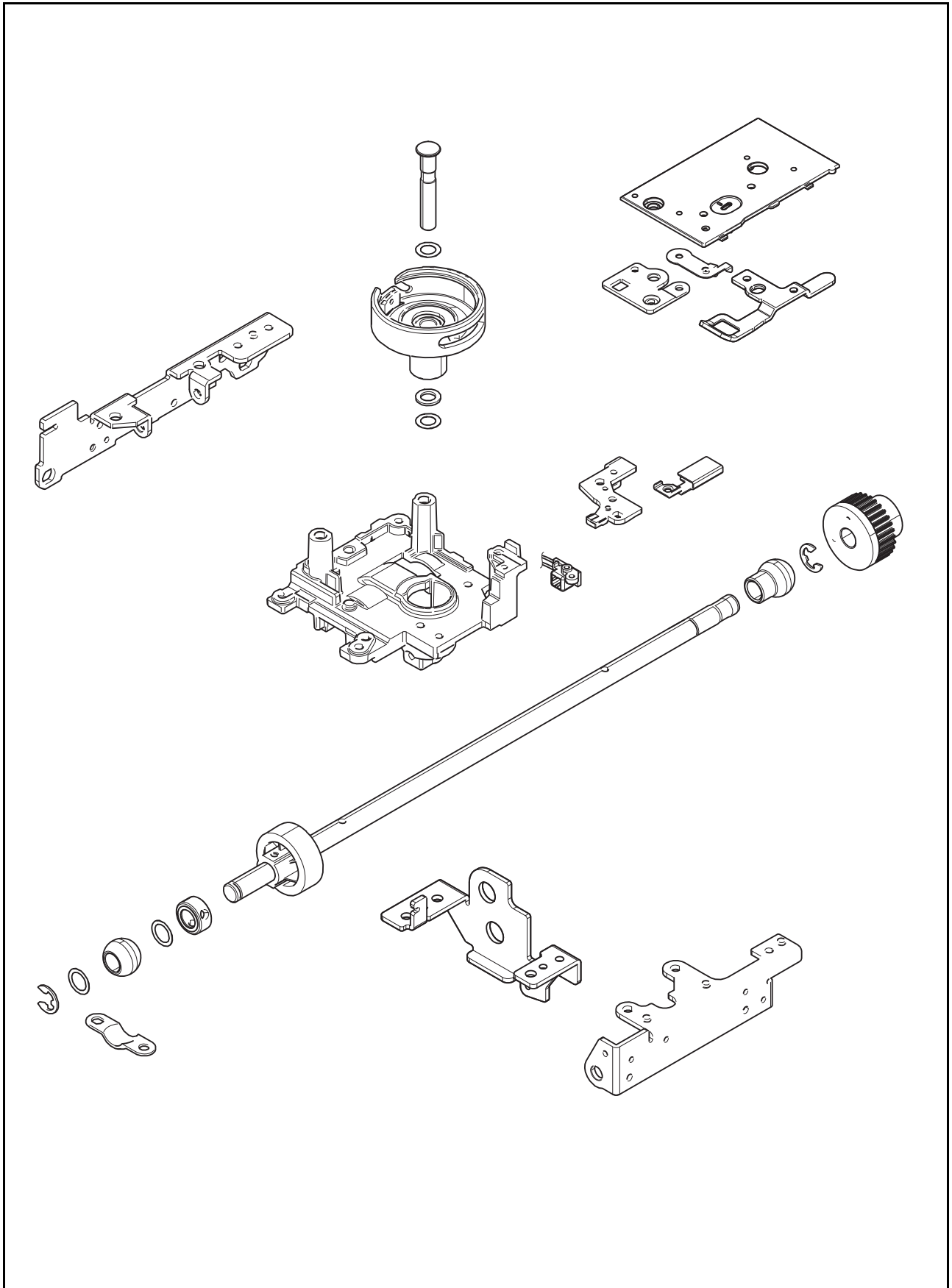
1. Align the positioning holes of presser plate assy and spring plate with the boss of thread cutter frame assy, and attach them with the screw (screw, bind M3x5).
2. Set the thread cutter lever gear to the thread cutter lever with the screw (screw, pan (S/P washer) M3x6). Set the thread cutter lever gear and the wave-shape spring washer to the shaft of motor holder assy.
3. Insert the shaft of motor holder assy into the positioning hole of thread cutter frame assy. Set the two collars, and assemble the lead wire guide film, the thread cutter frame assy, the two collars and the motor holder assy with the two screws (screw, bind M4x20).
4. Bind up the C pulse motor lead wire and the photo transistor assy lead wire with the band.

***Key point**

- Refer to "Wiring of Thread cutter module".



Feed module location diagram

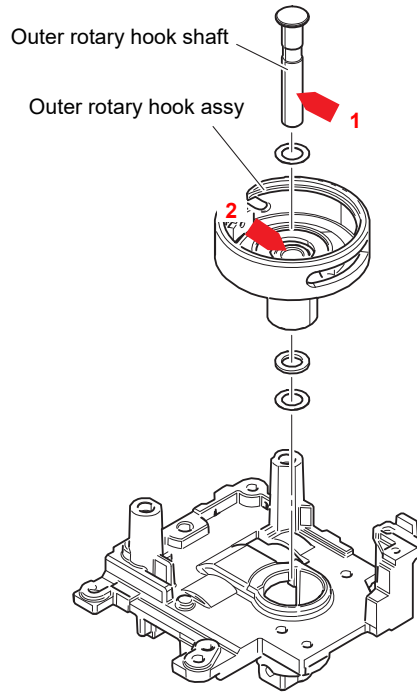


Application of
Assembly

Application of
Assembly

1 Lubrication

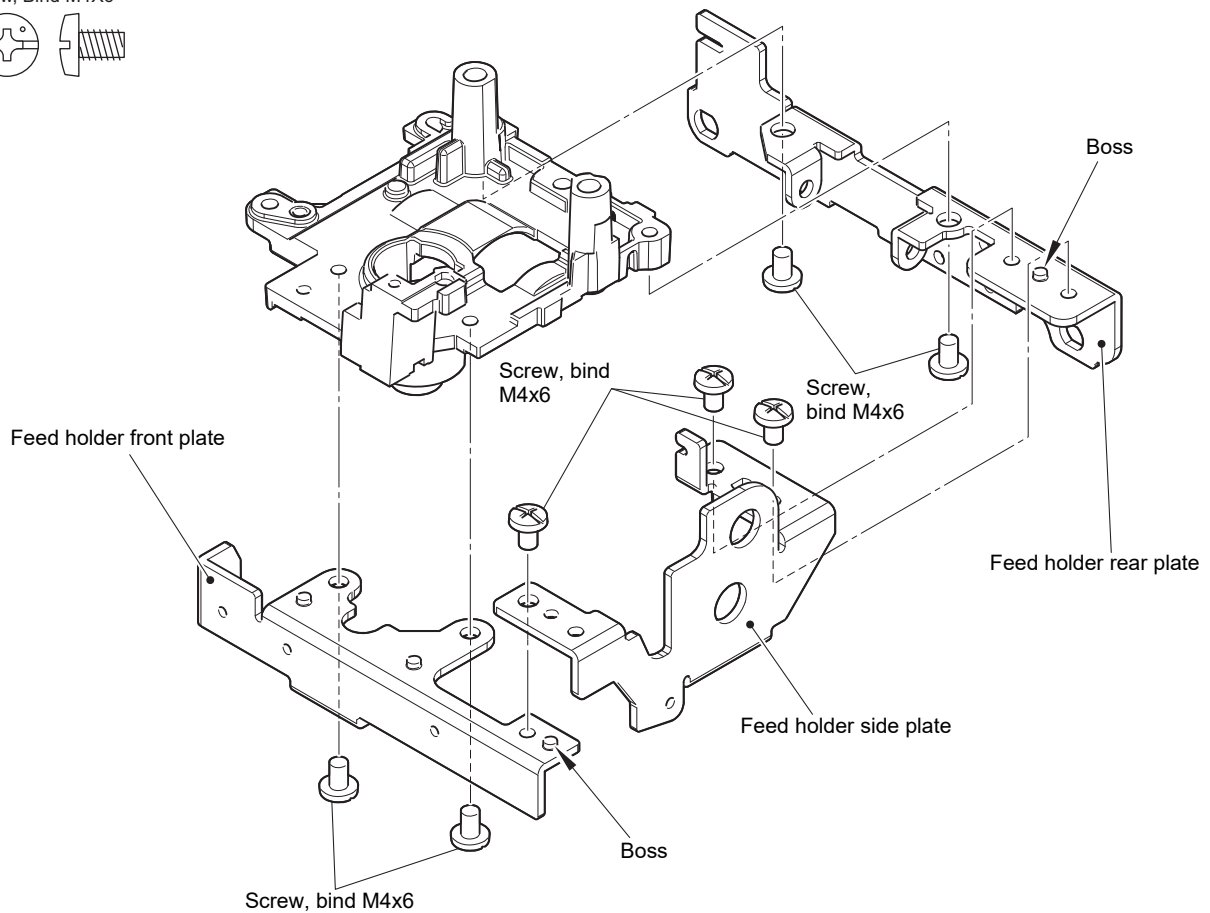
Lubrication point			Lubricating oil type	Quantity of lubrication
1	Outer rotary hook shaft	1 place	OILER	Rice-grain size
2	Outer rotary hook assy	1 place	MOLYKOTE EM30L	Small Bead



2 Attachment of Feed holder plates

1. Attach the feed holder rear plate to the feed holder with the two screws (screw, bind M4x6).
2. Attach the feed holder front plate to the feed holder with the two screws (screw, bind M4x6).
3. Align the each positioning hole of feed holder side plate with the boss of feed holder front plate and the boss of feed holder rear plate, and attach it with the three screws (screw, bind M4x6).

Screw, Bind M4X6

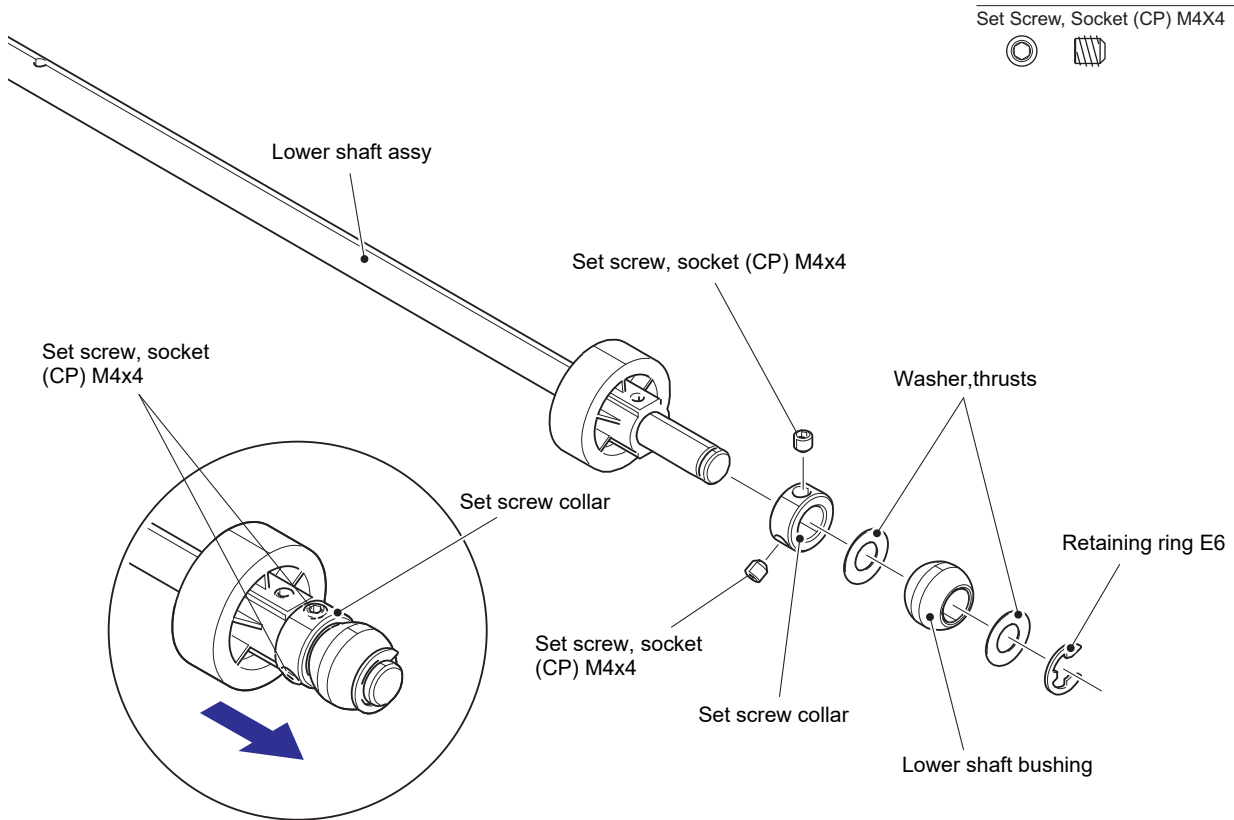


3 Attachment of Lower shaft assy

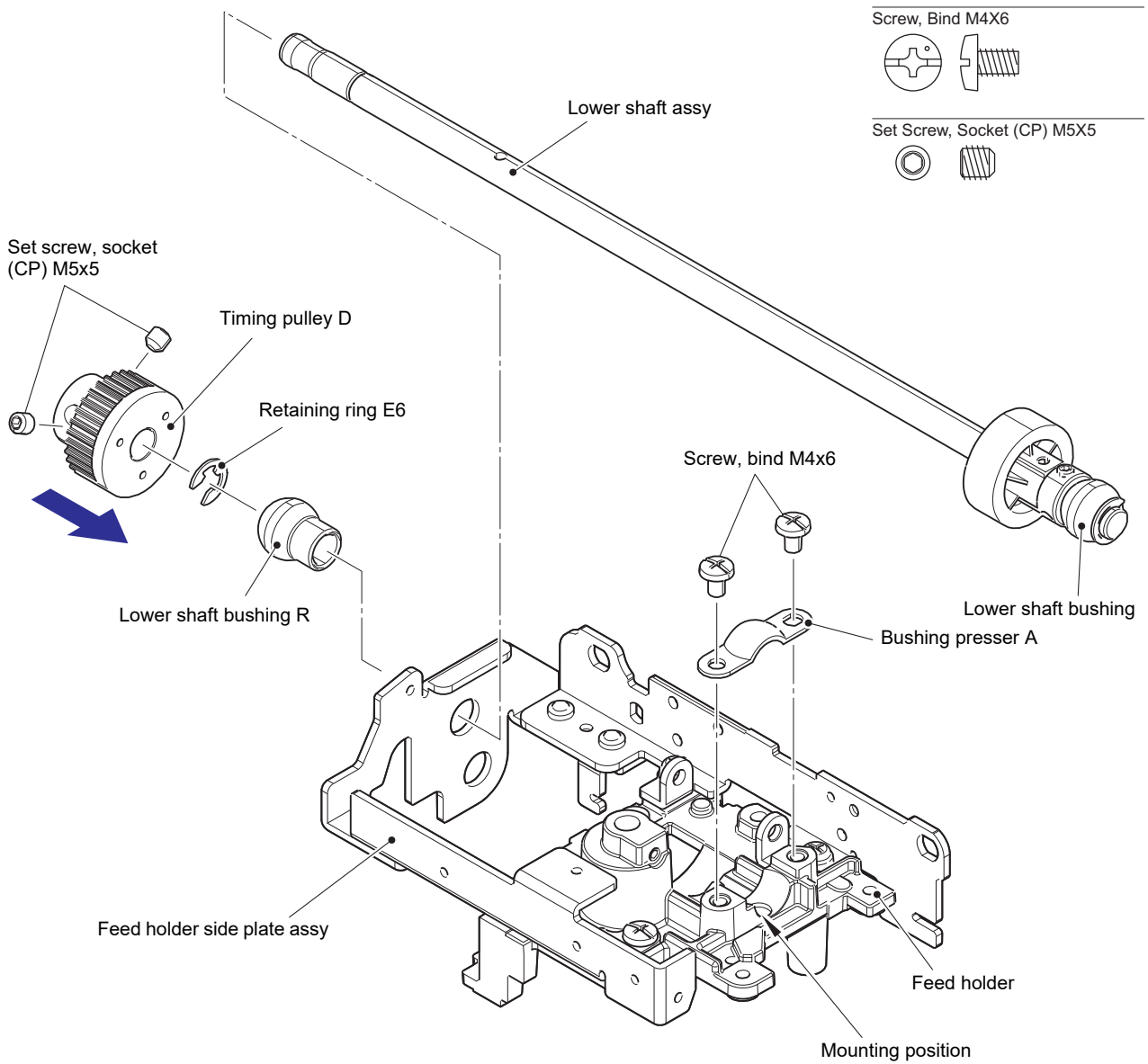
1. Set the set screw collar, the washer, thrust, the lower shaft bushing and the washer, thrust to the lower shaft assy, and attach the retaining ring E6 to the lower shaft assy.
2. Tighten the two screws (set screw, socket (CP) M4x4) to the set screw collar while pushing the direction of the arrow.

***Key point**

- Check that the lower shaft bushing is not wobbled, and it moves smoothly.



3. Insert the lower shaft assy into the hole of feed holder side plate assy, and set the lower shaft bushing to the mounting position of feed holder. Attach the bushing presser A to the feed holder with the two screws (screw, bind M4x6).
4. Set the lower shaft bushing R to the lower shaft assy, and attach the retaining ring E6. Set the timing pulley D to the lower shaft assy, and then tighten the two screw (set screw, socket (CP) M5x5) to the timing pulley D while pushing the direction of the arrow.



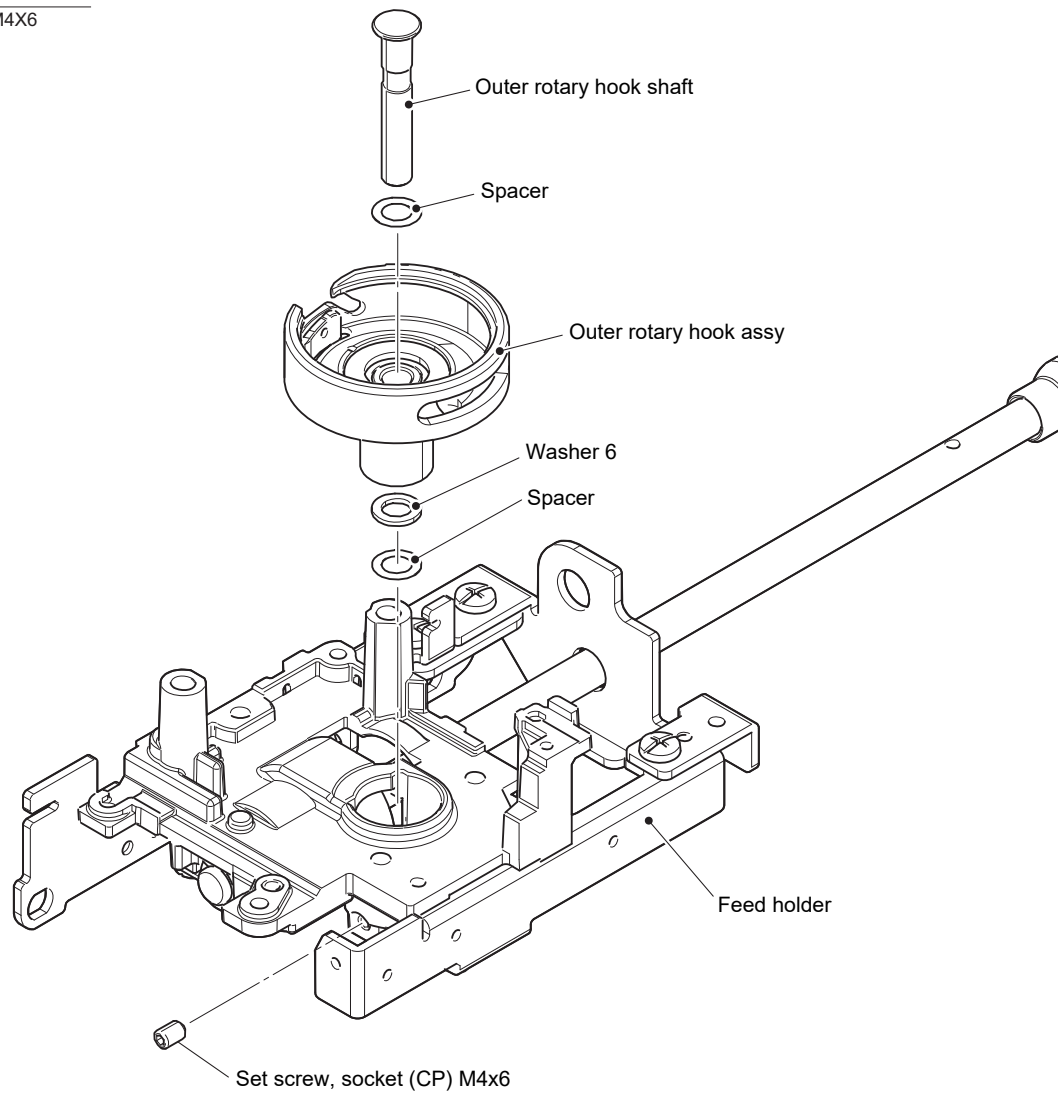
Application of
Assembly

Application of
Assembly

4 Attachment of Outer rotary hook assy

1. Insert the outer rotary hook shaft into the spacer, outer rotary hook assy, washer 6, the spacer and feed holder, and then tighten the screw (set screw, socket (CP) M4x6) temporarily.

Set Screw, Socket (CP) M4X6

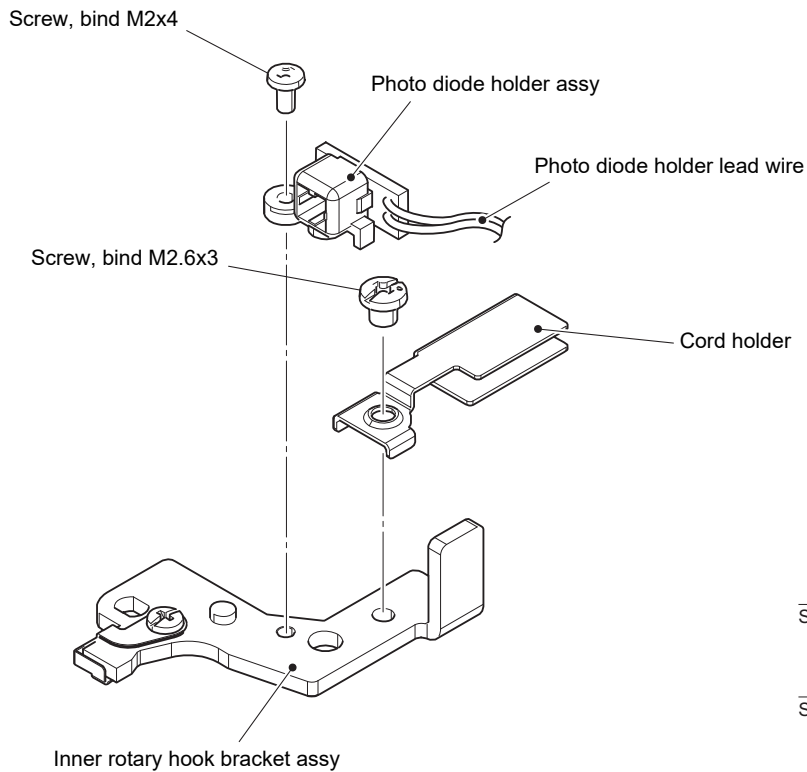


5 Assembly of Inner rotary hook bracket assy

1. Attach the photo diode holder assy to the inner rotary hook bracket assy with the screw (screw, bind M2x4).
2. Set the PLTSW lead wire and the photo diode holder lead wire to the cord holder, and attach the cord holder to the inner rotary hook bracket assy with the screw (screw, bind M2.6x3).

***Key point**

- Refer to "Wiring of Feed module".



6 Attachment of Inner rotary hook bracket assy, Inner rotary hook assy and Needle plate A assy

1. Align the boss of inner rotary hook bracket assy with the positioning hole of feed holder, and set the inner rotary hook bracket assy to the feed holder, and then tighten the screw (screw, bind M3x8) temporarily.

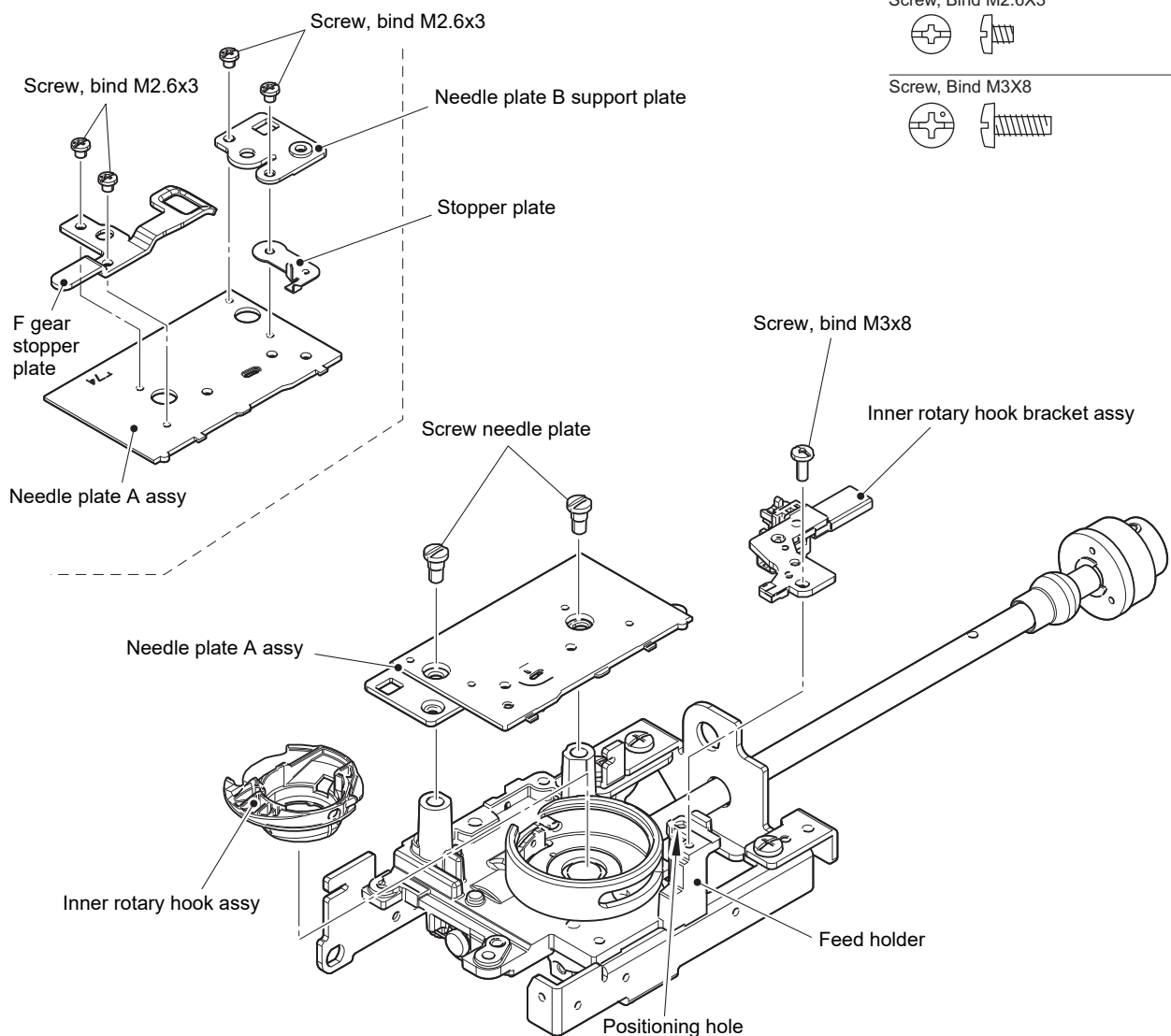
***Key point**

- Fully tighten the screw after performing "**Adjustment of Inner rotary hook bracket position**".

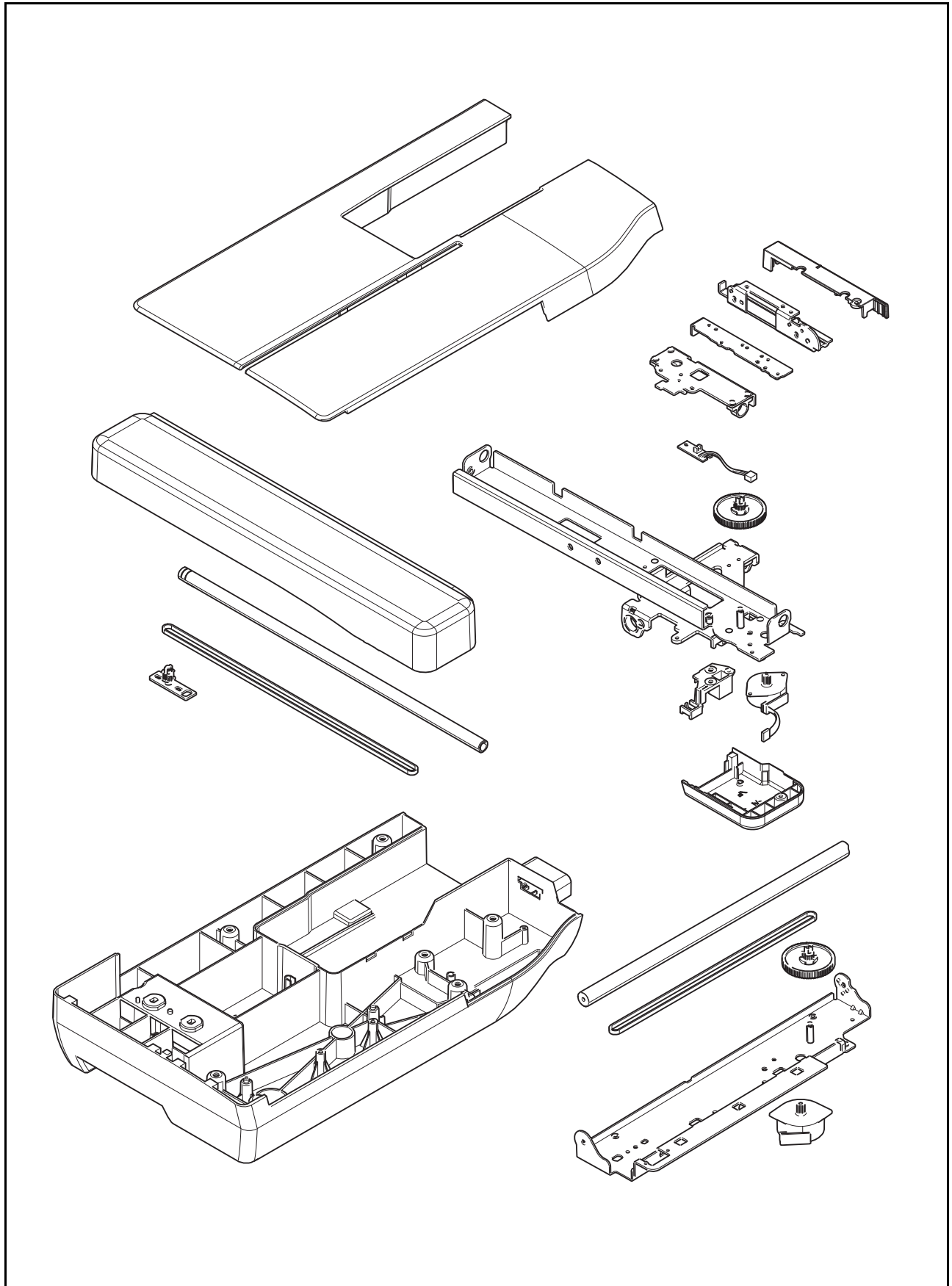
2. Attach the F gear stopper plate to the needle plate A assy with the two screws (screw, bind M2.6x3). Attach the stopper plate and the needle plate B support plate to the needle plate A assy with the two screws (screw, bind M2.6x3).
3. Attach the needle plate A assy to the feed holder with the two screws (screw needle plate).
4. Set the inner rotary hook assy.

***Key point**

- Refer to "**Wiring of Feed module**".



Embroidery unit location diagram



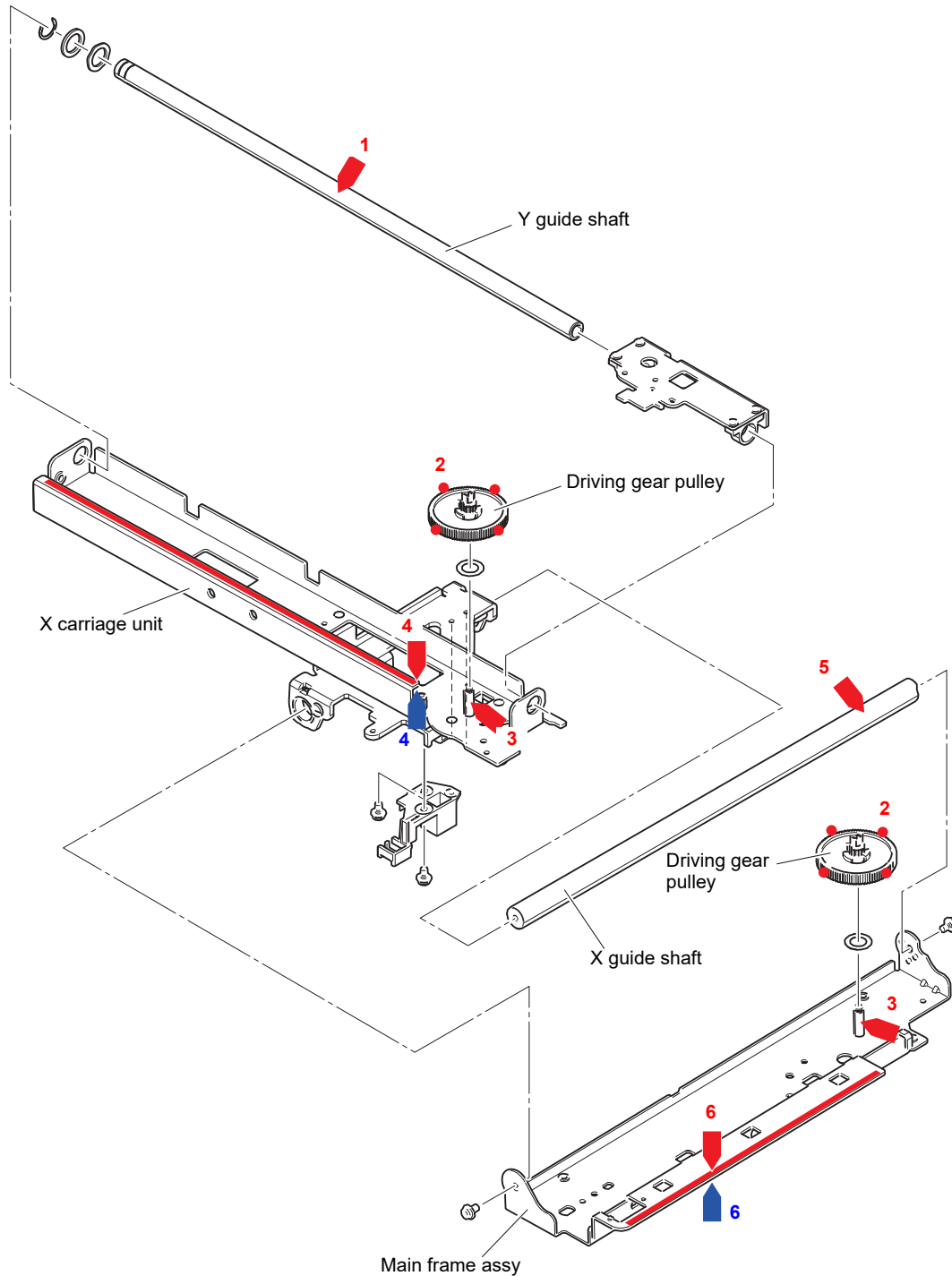
Application of
Assembly

Application of
Assembly

1 Lubrication

Lubrication point			Lubricating oil type	Quantity of lubrication
1	Y guide shaft	1 place	OILER	Light covering
2	Driving gear pulley	8 places	MOLYKOTE EM30L	Small Bead
3	Shaft	2 places	MOLYKOTE EM30L	Small Bead
4	X carriage unit *	1 place	EPNOC AP(N) 0	Light covering
5	X guide shaft	1 place	OILER	Light covering
6	Main frame assy *	1 place	EPNOC AP(N) 0	Light covering

* Grease on the both sides.



Application of
Assembly

Application of
Assembly

2 Assembly of Main frame assy

1. Attach the E code supporter to the main frame assy with the screw (screw, pan (S/P washer) M4x8).
2. Attach the driving gear pulley to the shaft of main frame assy.

***Key point**

- Check that the two hooks of driving gear pulley hang on the groove of shaft of main frame assy.

3. Set the tension pulley assy to the main frame assy, and tighten the two screws (screw, pan (S/P washer) M4x8) temporarily. Hang the timing belt 40S2M530 on the tension pulley assy and the driving gear pulley.

***Key point**

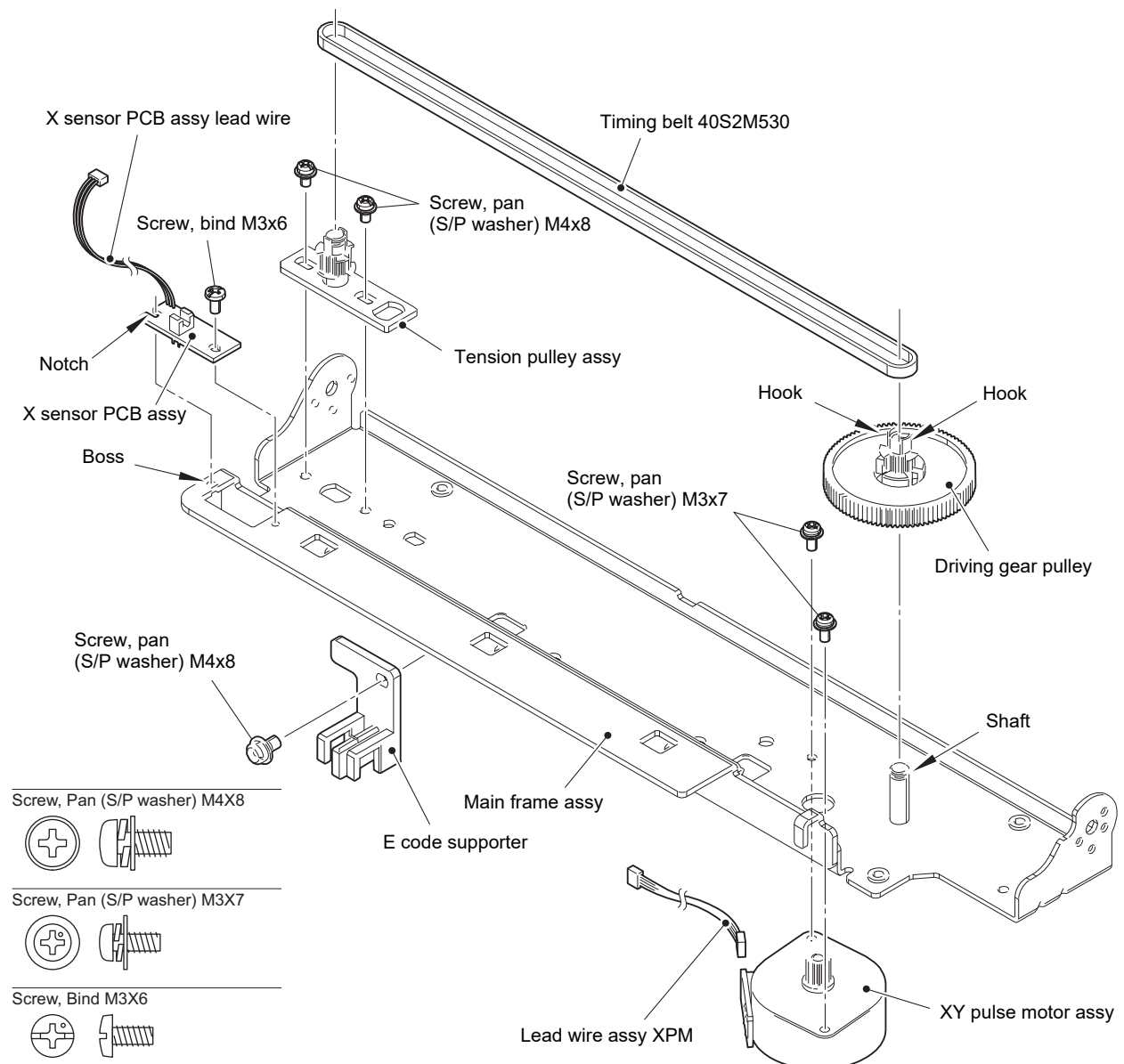
- Fully tighten the screw after performing "[Adjustment of Belt tension \(embroidery unit\)](#)".

4. Connect the lead wire assy XPM to the XY pulse motor assy, and attach the XY pulse motor assy to the main frame assy with the two screws (screw, pan (S/P washer) M3x7).

5. Align the notch of X sensor PCB assy with the boss of main frame assy, and attach the X sensor PCB assy to the main frame assy with the screw (screw, bind M3x6). Pass the X sensor PCB assy lead wire through the securing fixtures.

***Key point**

- Refer to "[Wiring of Main frame assy](#)".



3 Attachment of Timing belt 40S2M660 and Y slider

1. Attach the driving gear pulley to the shaft of X carriage unit.

***Key point**

- Check that the two hooks of driving gear pulley hang on the groove of shaft of X carriage unit.

2. Set the tension pulley assy to the X carriage unit, and tighten the two screws (screw, pan (S/P washer) M4x8) temporarily. Hang the timing belt 40S2M660 on the tension pulley assy and driving gear pulley.

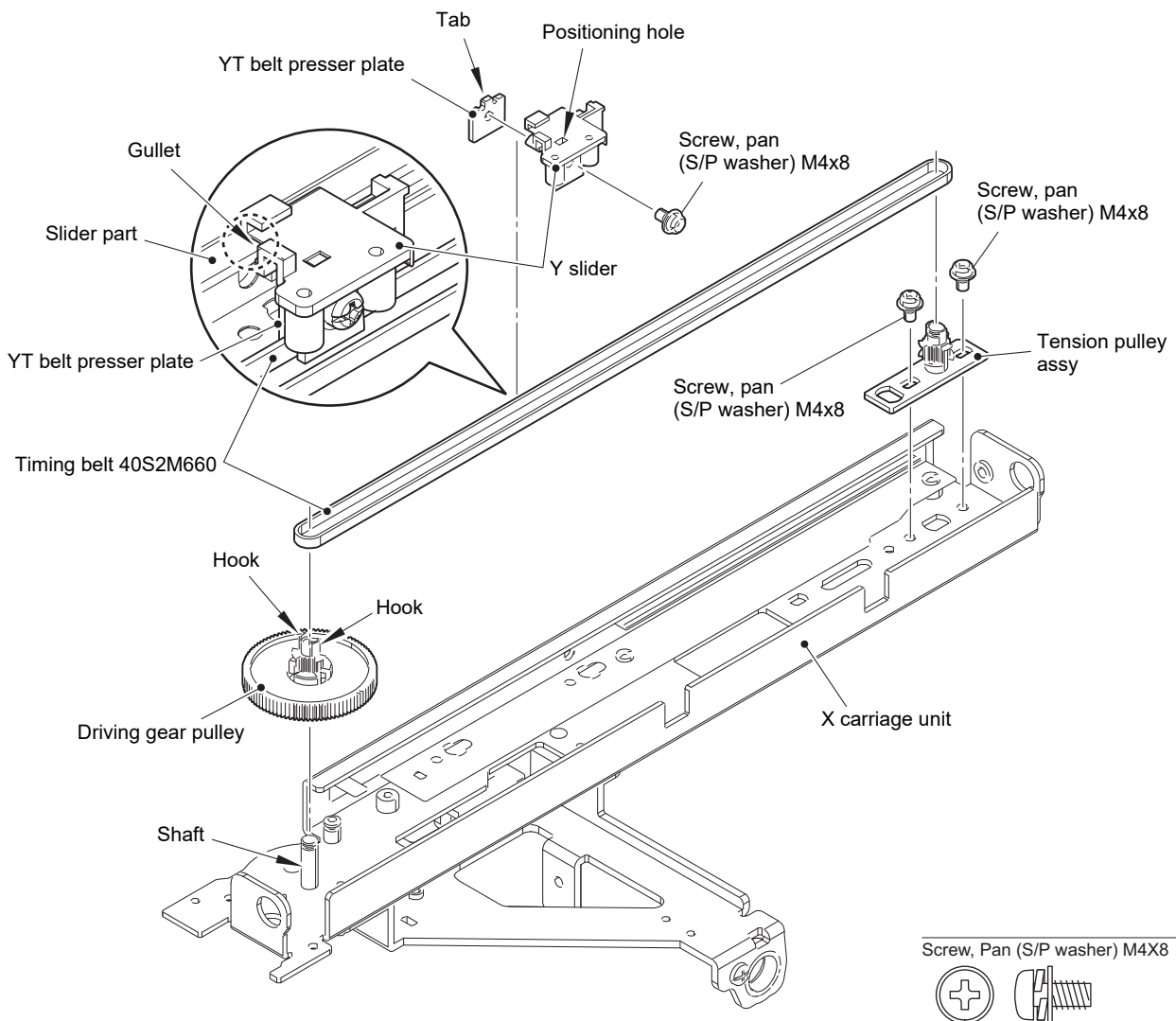
***Key point**

- Fully tighten the screw after performing "**Adjustment of Belt tension (embroidery unit)**".

3. Set the YT belt presser plate and the Y slider to the timing belt 40S2M660 with the screw (screw, pan (S/P washer) M4x8), then engage the gullet of Y slider with the slider part of X carriage unit.

***Key point**

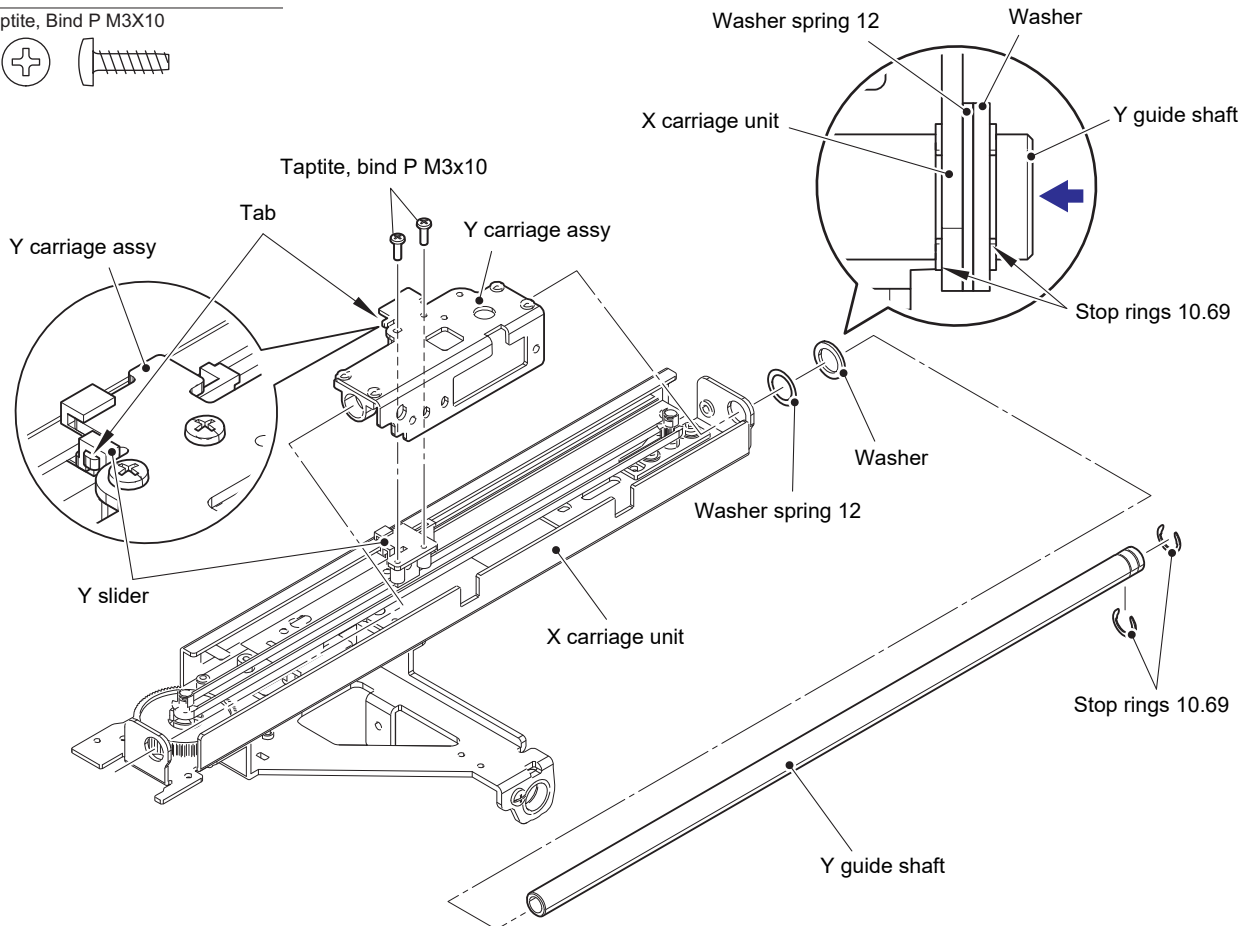
- Check that the tab of YT belt presser plate is inserted into the positioning hole of Y slider.
- Check that the gear teeth of Y slider is engaged with the gear teeth of timing belt 40S2M660.



4 Attachment of Y carriage assy

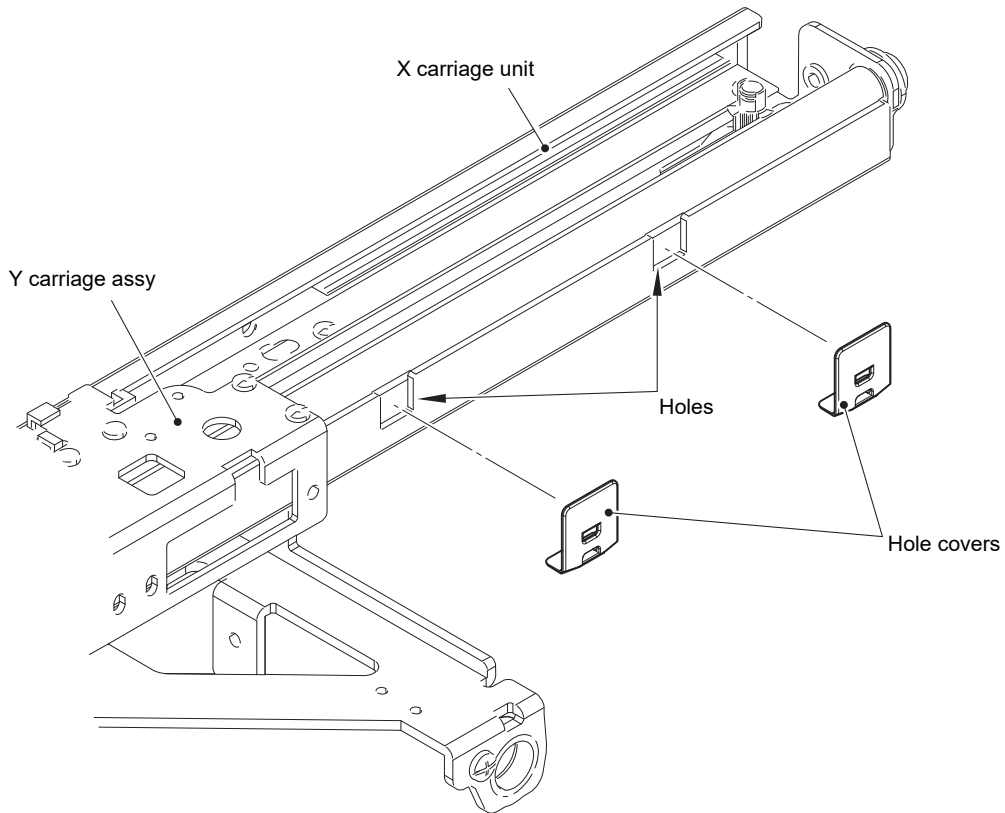
1. Attach the stop ring 10.69 to the groove on outside of Y guide shaft. Insert the Y guide shaft into the washer, the washer spring 12, the X carriage unit, the Y carriage assy and the X carriage unit, then attach the stop ring 10.69 to the Y guide shaft while pushing the Y guide shaft to the direction of the arrow.
2. Slide the Y carriage assy to insert the tab of Y carriage assy into the positioning hole of Y slider, and secure it with the two screws (taptite, bind P M3x10).

Taptite, Bind P M3X10



5 Attachment of Hole cover and Flexible flat cable:SML2CD-6

1. Slide the Y carriage assy to come in sight of two holes. Attach the hole cover to the X carriage unit. (two locations)



Application of
Assembly

Application of
Assembly

- Slide the Y carriage assy to come in sight of two positioning holes.
- Set the FFC support to the flexible flat cable:SML2CD-6, and attach the FFC support to the Y carriage assy with the two screws (screw, bind M3x6).

***Key point**

- Refer to "[Wiring of Bending of Flexible flat cable:SML2CD-6](#)".

- Set the cord clip "A" to the flexible flat cable:SML2CD-6, attach the cord clip "A" to the X carriage unit, and set the cord clip "B" to the X carriage unit.

***Key point**

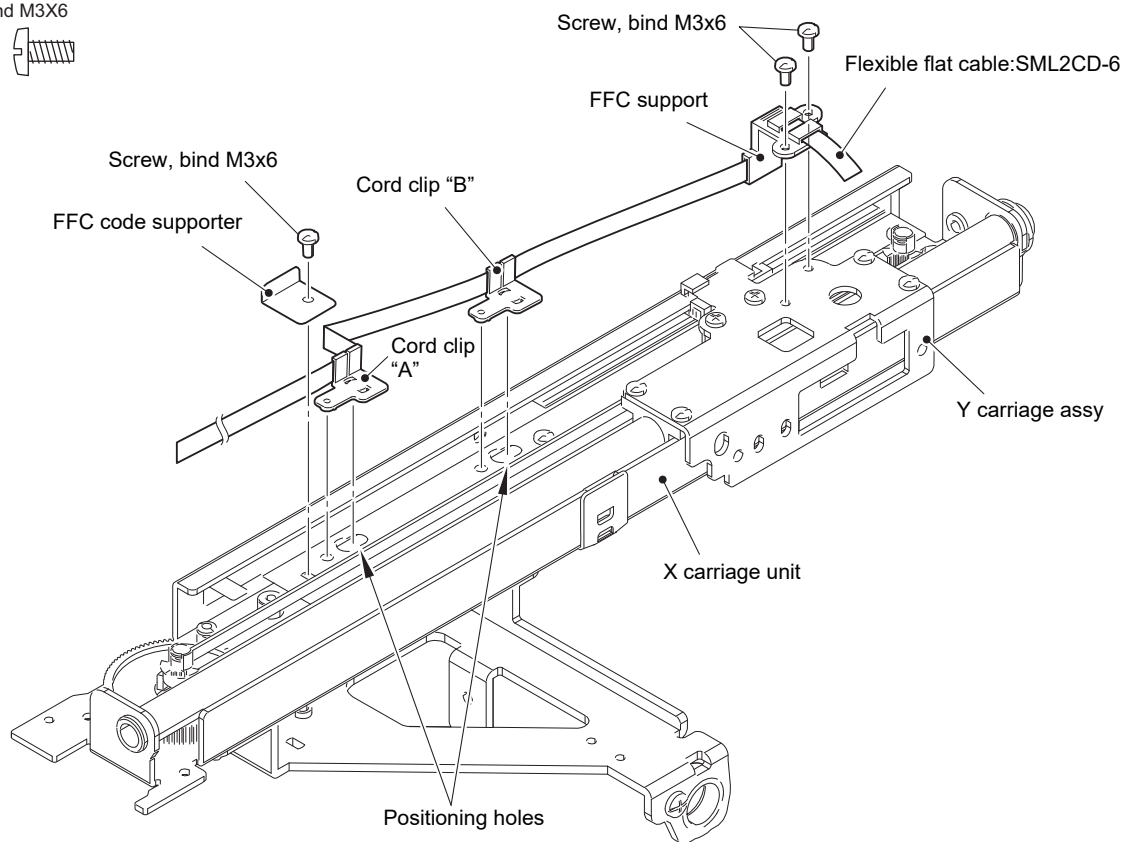
- Be sure to press down the flexible flat cable:SML2CD-6 by the cord clip "B".

- Attach the FFC code supporter to the X carriage unit with the screw (screw, bind M3x6).

***Key point**

- Be sure to press down the flexible flat cable:SML2CD-6 by the FFC code supporter.
- Refer to "[Wiring of X carriage unit \(Frame PCB assy\)](#)".

Screw, Bind M3X6



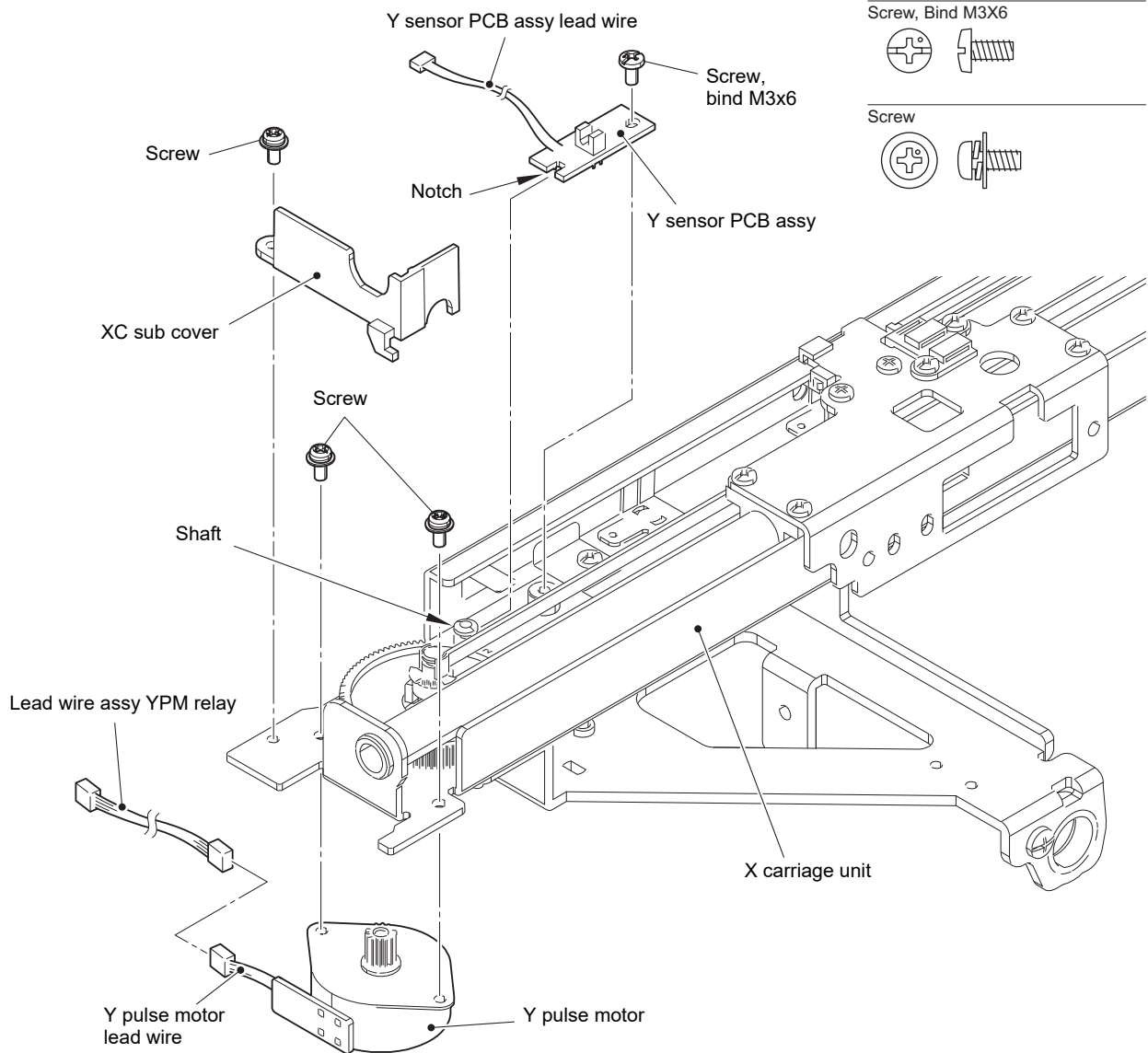
6 Attachment of Y sensor PCB assy and Y pulse motor

1. Set the notch of Y sensor PCB assy to the shaft of X carriage unit, and attach the Y sensor PCB assy to the X carriage unit with the screw (screw, bind M3x6). Pass the Y sensor PCB assy lead wire through the securing fixtures.
2. Connect the lead wire assy YPM relay to the Y pulse motor lead wire, and attach the Y pulse motor to the X carriage unit with the two screws (screw).

***Key point**

- Refer to "[Wiring of E code supporter](#)".

3. Attach the XC sub cover to the X carriage unit with the screw (screw).

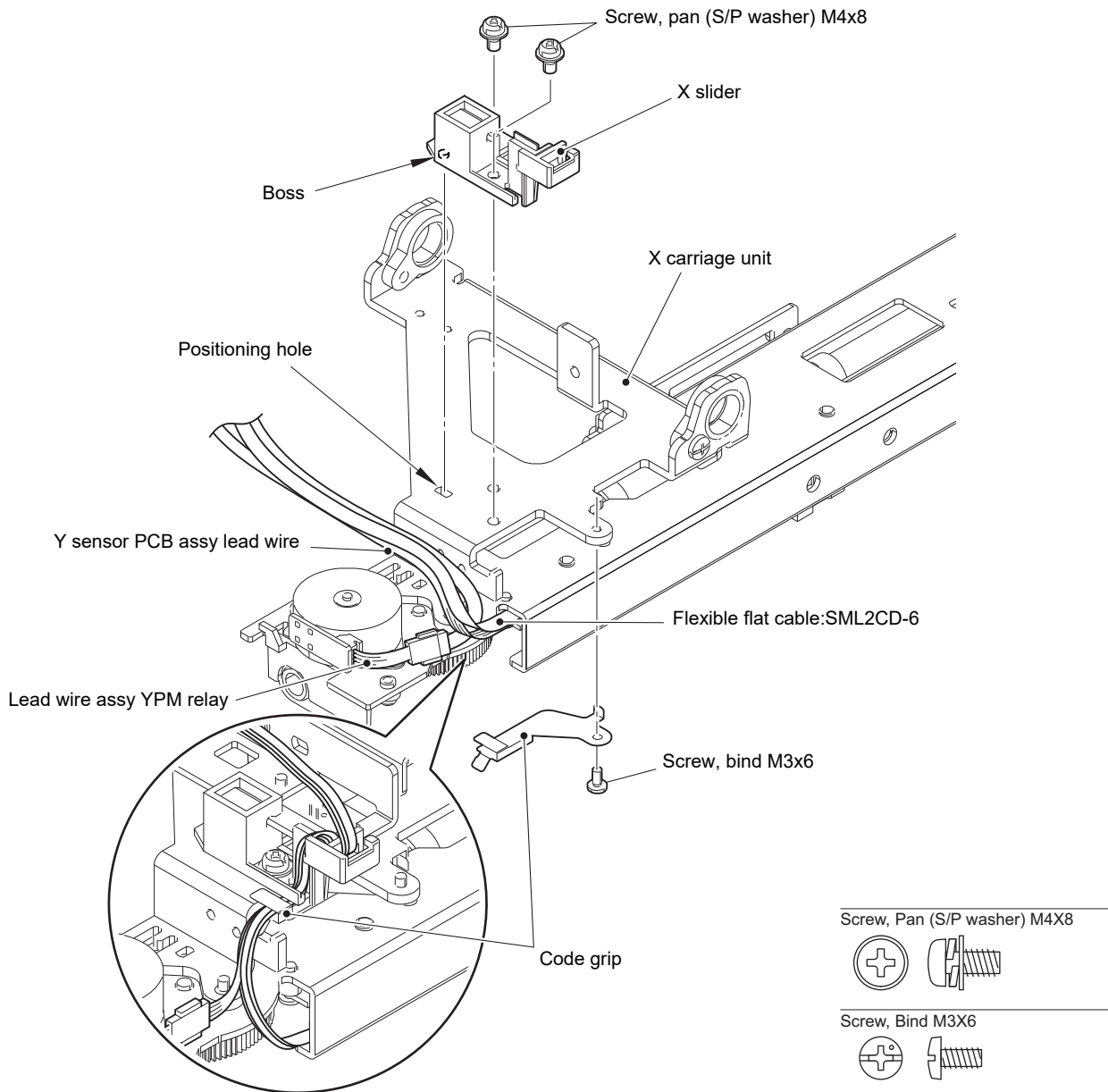


7 Attachment of X slider

1. Align the boss of X slider with the positioning hole of X carriage unit, and attach the X slider to the X carriage unit with the two screws (screw, pan (S/P washer) M4x8).
2. Pass the flexible flat cable:SML2CD-6, the Y sensor PCB assy lead wire and the lead wire assy YPM relay through the securing fixtures, set the code grip to them, and attach the code grip to the X carriage unit with the screw (screw, bind M3x6).

***Key point**

- Refer to "Wiring of E code supporter".

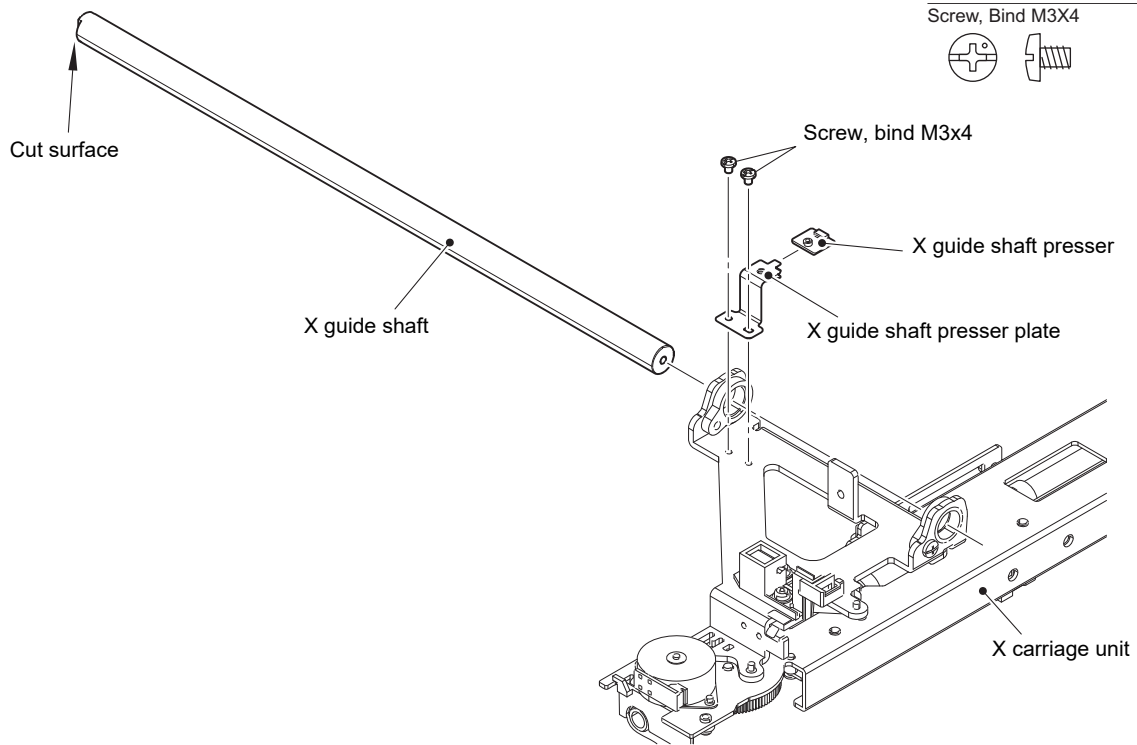


8 Attachment of X carriage unit

1. Insert the X guide shaft into the attachment holes of X carriage unit.

***Key point**

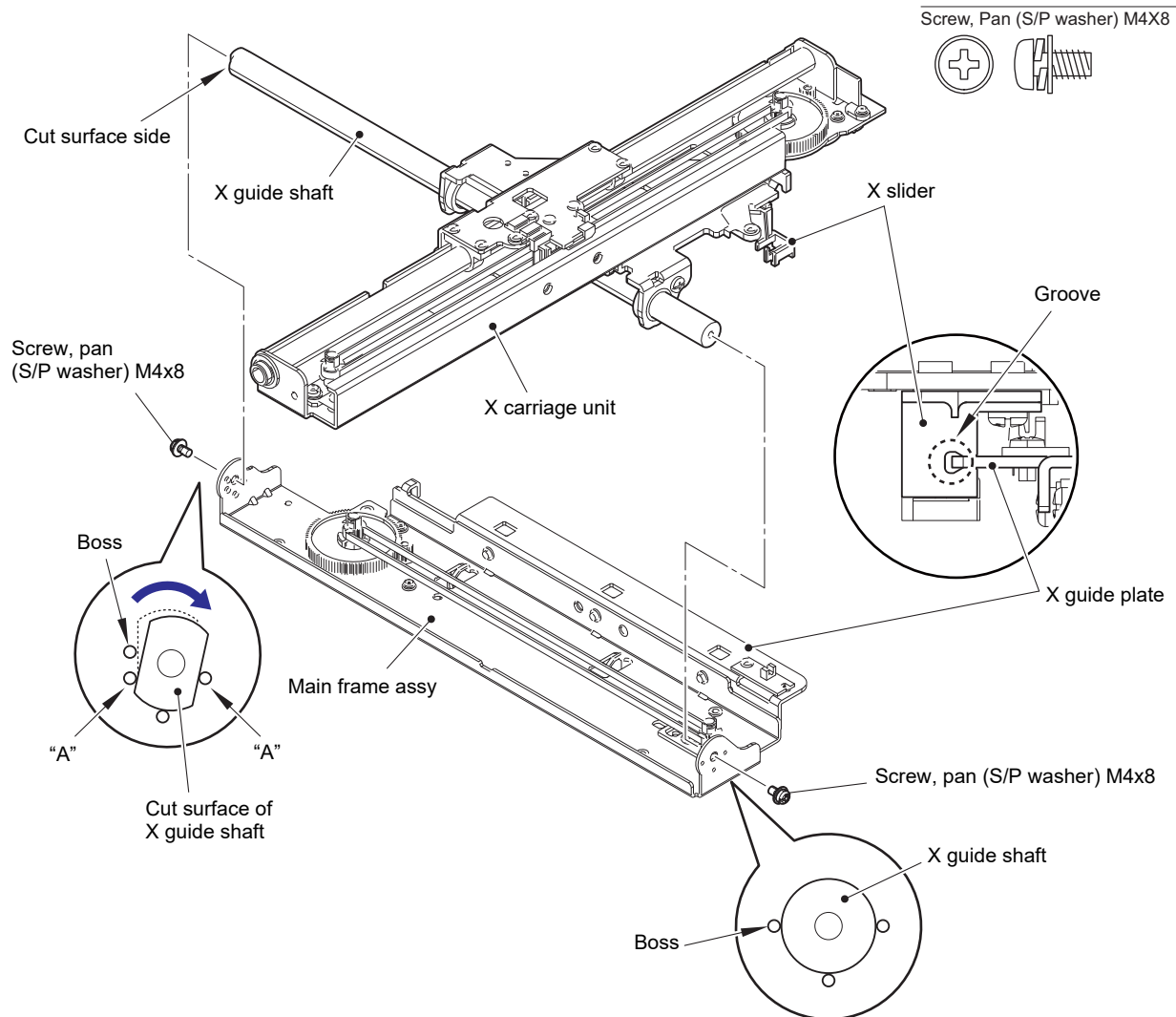
- Make sure that the cut surface of X guide shaft is on the left side as shown in the figure below.
2. Attach the X guide shaft presser plate to the X carriage unit with the two screws (screw, bind M3x4).
 3. Attach the X guide shaft presser to the X guide shaft presser plate.



4. Set the groove of X slider to the X guide plate.
5. Set the X guide shaft to the main frame assy, and then secure it with the two screws (screw, pan (S/P washer) M4x8).

***Key point**

- Make sure that the cut surface of X guide shaft is aligned with four bosses on the main frame assy, and it comes in contact with the two of those bosses shown as "A".
- Make sure that the another side of X guide shaft is in between three bosses on the main frame assy.



Application of
Assembly

Application of
Assembly

6. Attach the X belt presser to the X carriage unit with the screw (screw, pan (S/P washer) M4x8).

***Key point**

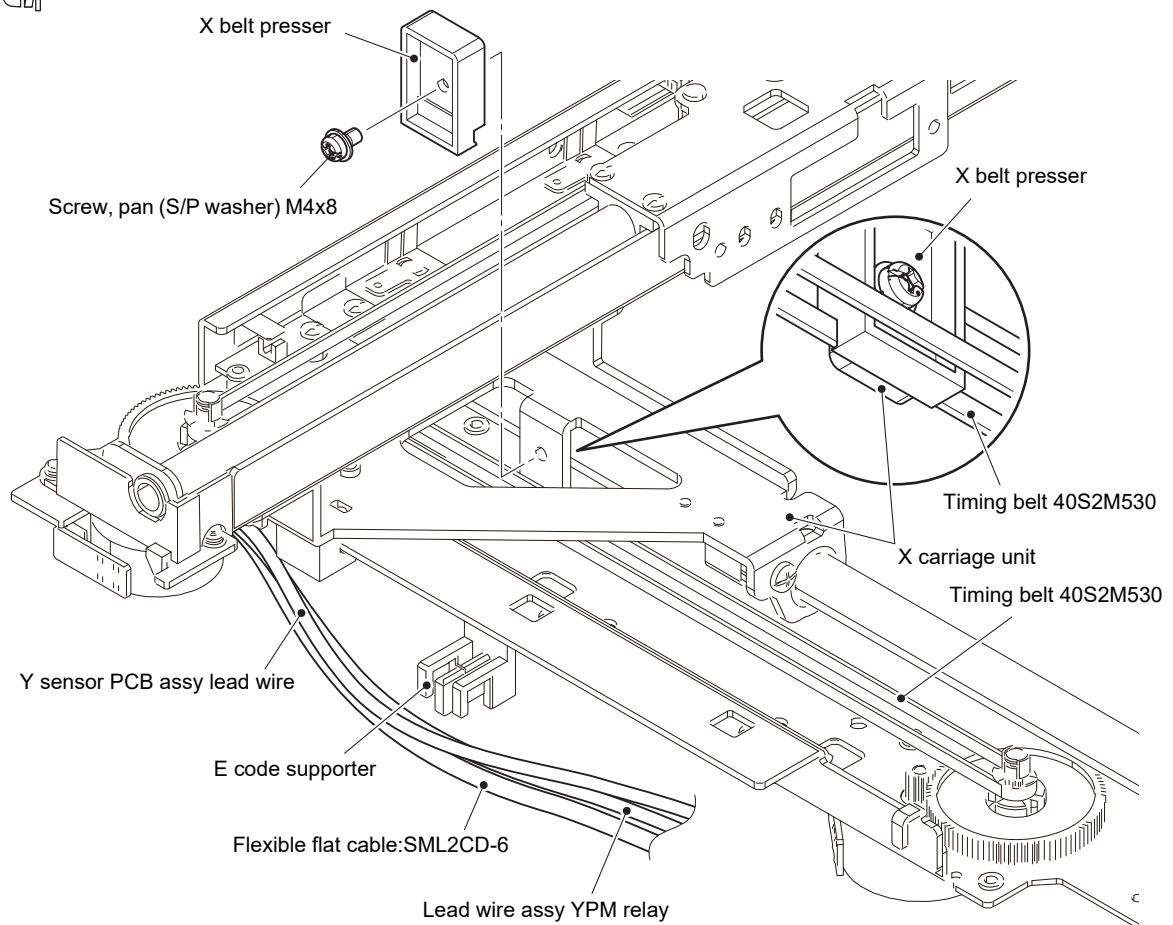
- Press the timing belt 40S2M530 with the X belt presser, and then check that the gear teeth of X belt presser is engaged with the gear teeth of timing belt 40S2M530.

7. Set the flexible flat cable:SML2CD-6, the Y sensor PCB assy lead wire and the lead wire assy YPM relay to the E code supporter.

***Key point**

- Refer to "Wiring of E code supporter".

Screw, Pan (S/P washer) M4X8

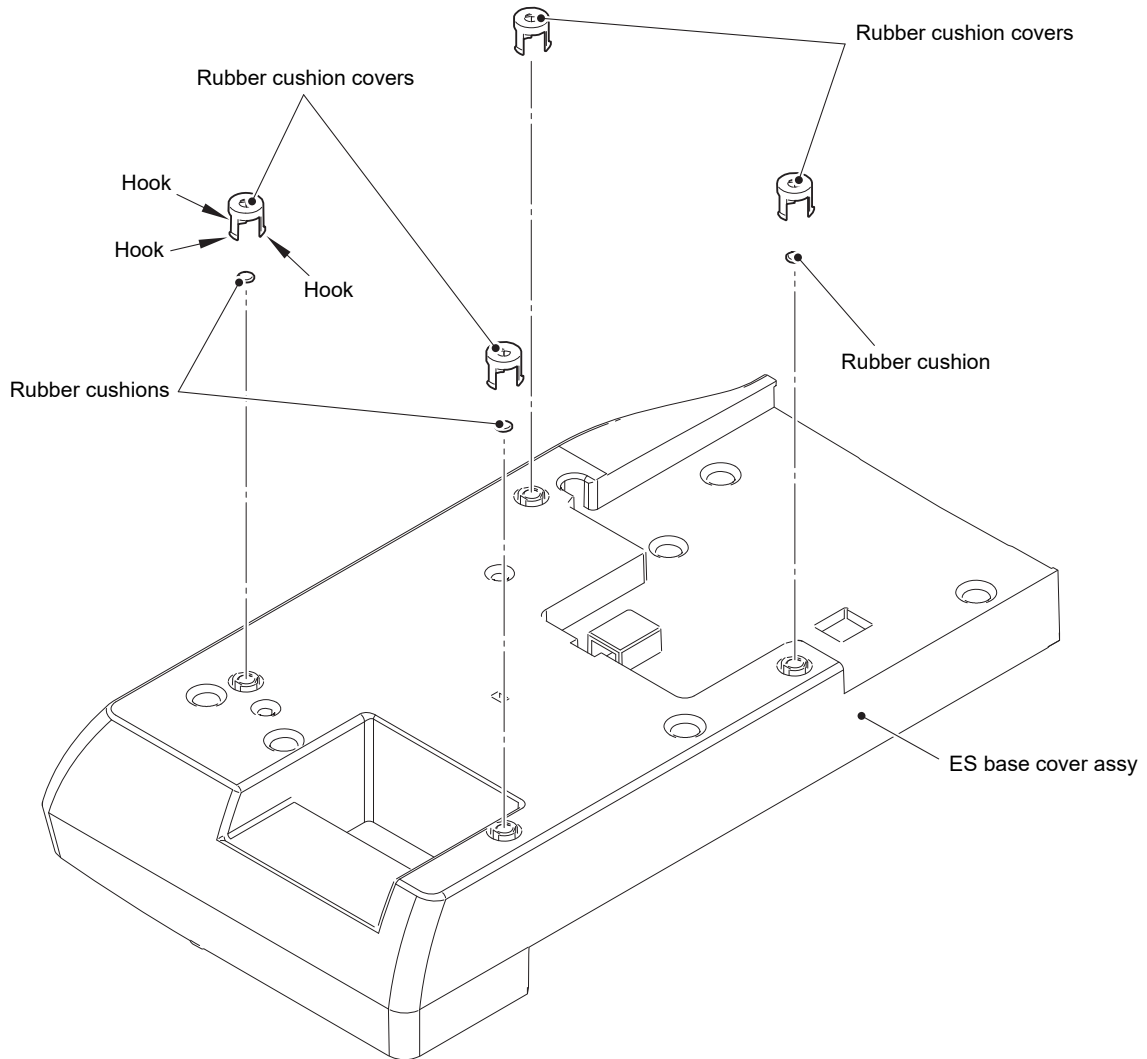


9 Attachment of Rubber cushion

1. Attach the rubber cushion to the ES base cover assy. (three locations)
2. Attach the rubber cushion cover to the ES base cover assy. (four locations)

***Key point**

- Check that the three hooks of rubber cushion cover hang on the groove of ES base cover assy.



10 Attachment of Lock release lever

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

***Key point**

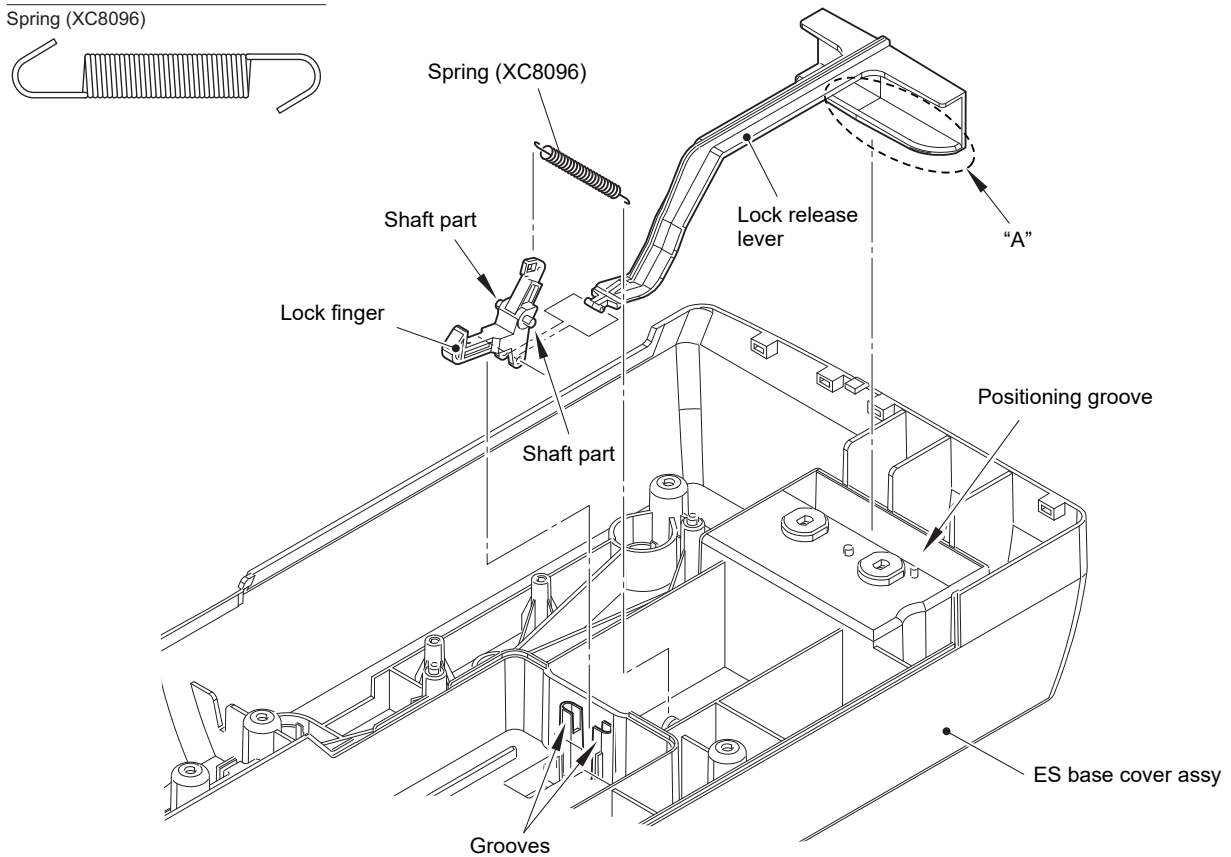
- Engage the two bosses of lock release lever with the two positioning holes the lock finger.

2. Attach the lock release lever to the ES base cover assy.

***Key point**

- Check that the "A" part of lock release lever insert into the positioning groove.
- Insert the two shaft parts of lock finger into the two grooves of ES base cover assy.

3. Hang the hook of spring (XC8096) on the lock release lever and the ES base cover assy.

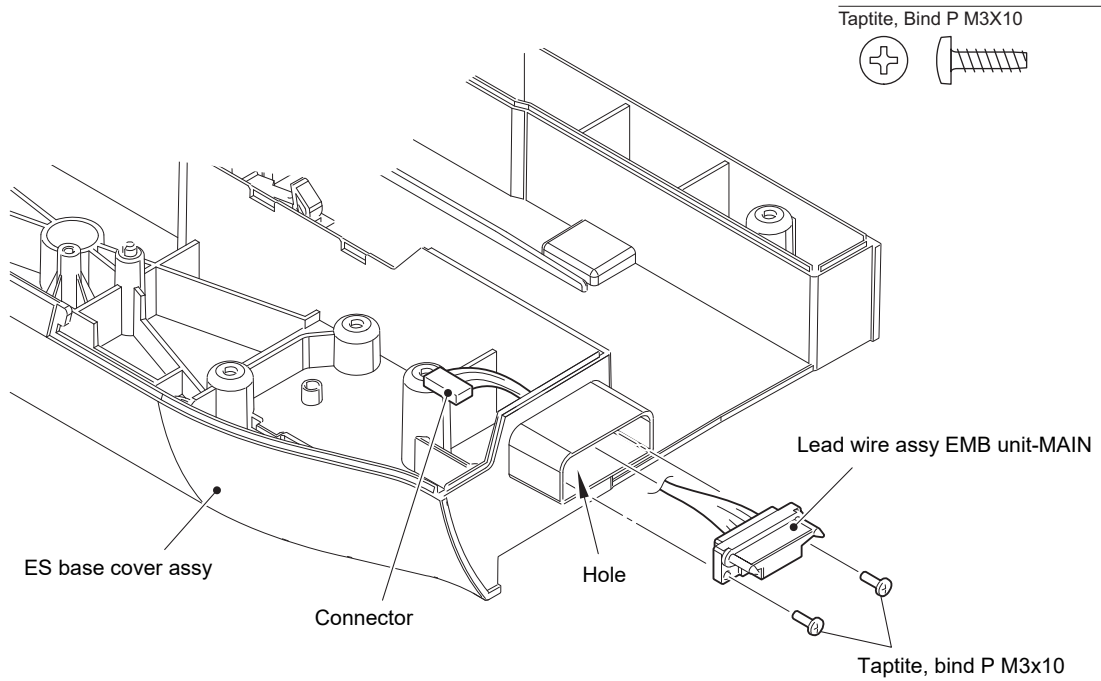


11 Attachment of Lead wire assy EMB unit-MAIN

1. Attach the lead wire assy EMB unit-MAIN to the ES base cover assy with the two screws (taptite, bind P M3x10).

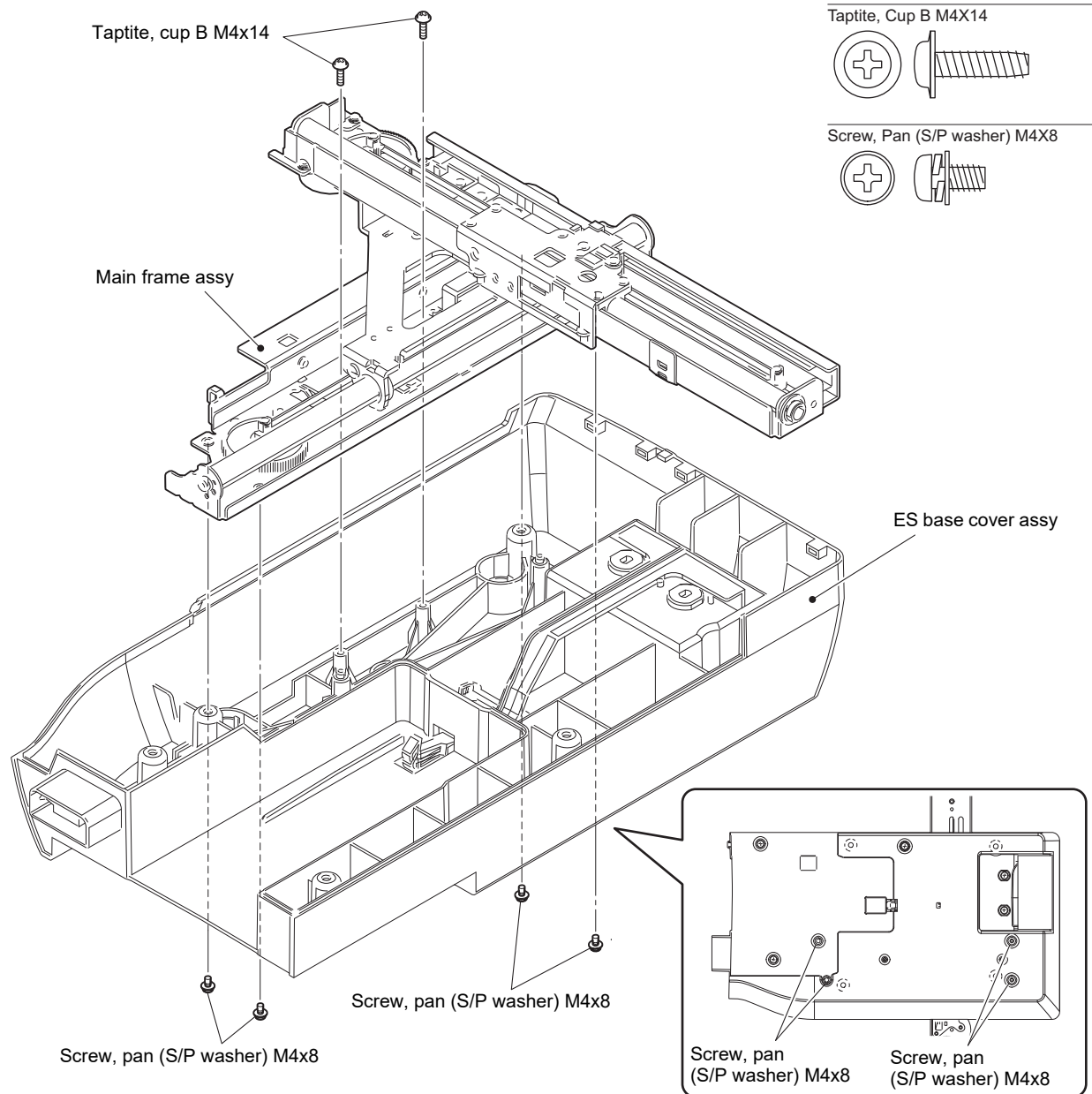
***Key point**

- Insert the connector of lead wire assy EMB unit-MAIN into the hole of ES base cover assy from the outside.



12 Attachment of ES base cover assy

1. Attach the ES base cover assy to the main frame assy with the two screws (taptite, cup B M4x14). Tighten the four screws (screw, pan (S/P washer) M4x8) to the bottom side of ES base cover assy.



Application of
Assembly

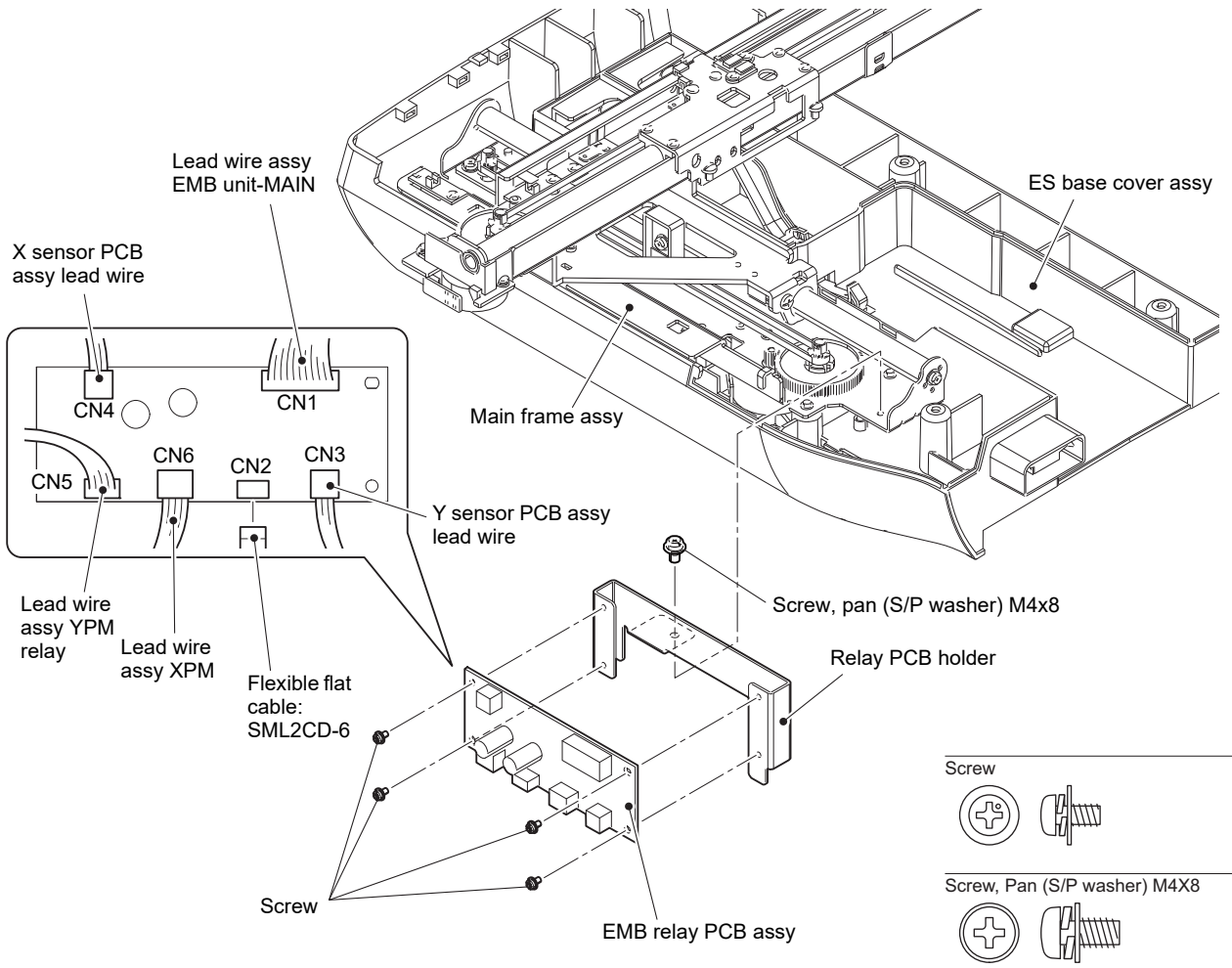
Application of
Assembly

13 Attachment of EMB relay PCB assy

1. Attach the EMB relay PCB assy to the relay PCB holder with the four screws (screw).
2. Connect the flexible flat cable:SML2CD-6 to the CN2, the X sensor PCB assy lead wire to the CN4, the lead wire assy XPM to the CN6, the lead wire assy EMB unit-MAIN to the CN1, the lead wire assy YPM relay to the CN5 and the Y sensor PCB assy lead wire to the CN3. Attach the relay PCB holder to the ES base cover assy with the screw (screw, pan (S/P washer) M4x8).

***Key point**

- Refer to "Wiring of EMB relay PCB assy".



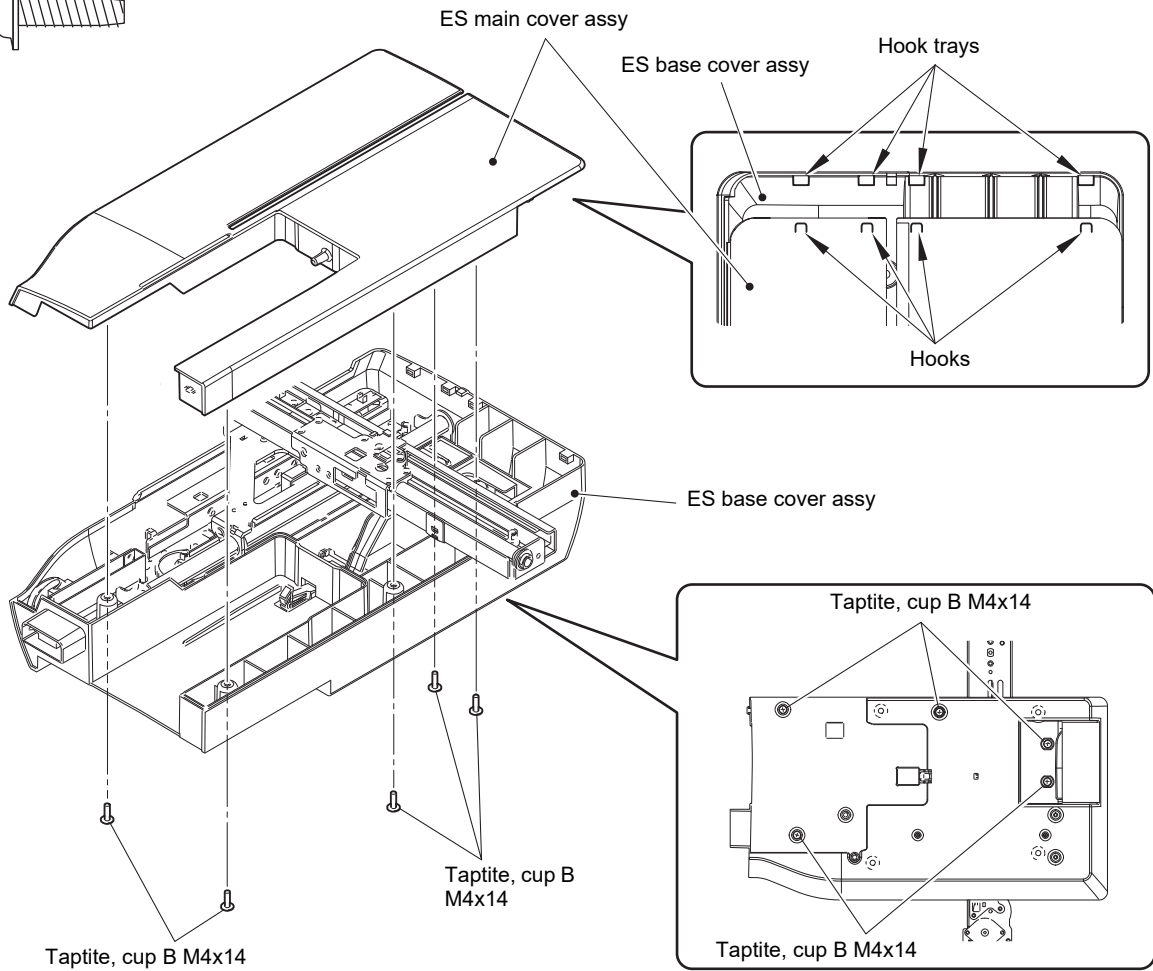
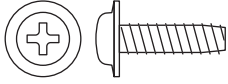
Application of
Assembly

Application of
Assembly

14 Attachment of ES main cover assy

1. Insert the four hooks of ES main cover assy into the four hook trays of ES base cover assy, and set the ES main cover assy to the ES base cover assy. Tighten the five screws (taptite, cup B M4x14) to the bottom side of ES base cover assy.

Taptite, Cup B M4X14



Application of
Assembly

Application of
Assembly

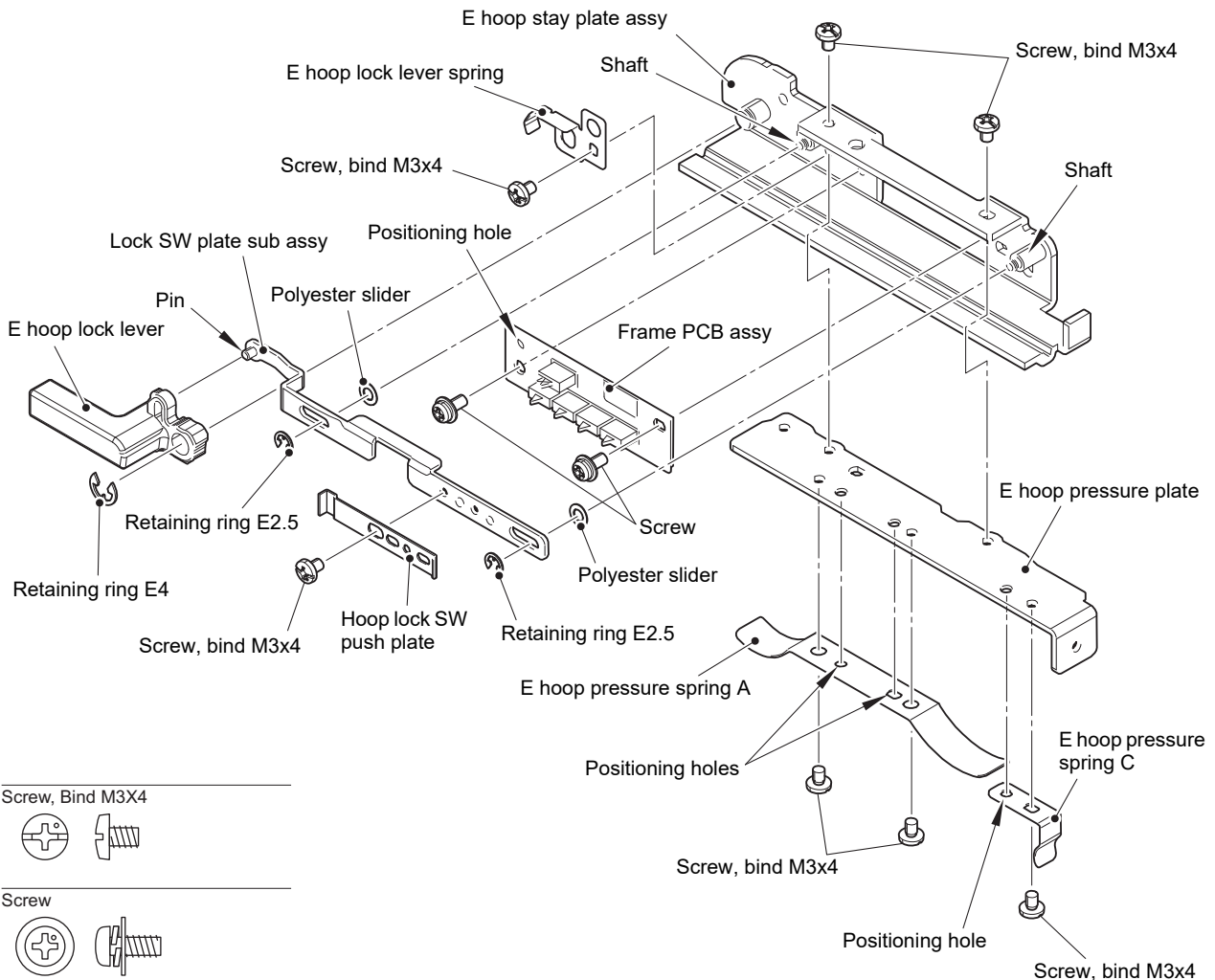
15 Assembly of E hoop stay plate assy

1. Attach the E hoop lock lever spring to the E hoop stay plate assy with the screw (screw, bind M3x4).
2. Align the positioning hole of frame PCB assy with the boss of E hoop stay plate assy, and attach the frame PCB assy to the E hoop stay plate assy with the two screws (screw).
3. Set the two polyester sliders and the lock SW plate sub assy to the two shafts of E hoop stay plate assy, and attach the two retaining rings E2.5.
4. Align the positioning groove of E hoop lock lever with the pin of lock SW plate sub assy, set the E hoop lock lever to the E hoop stay plate assy, and attach the retaining ring E4.
5. Attach the hoop lock SW push plate to the lock SW plate sub assy with the screw (screw, bind M3x4).

***Key point**

- Check if the switch of frame PCB assy works by moving E hoop lock lever.

6. Align the positioning hole of E hoop pressure spring C with the boss of E hoop pressure plate, and attach the E hoop pressure spring C to the E hoop pressure plate with the screw (screw, bind M3x4). Align the two positioning holes of E hoop pressure spring A with the two bosses of E hoop pressure plate, and attach the E hoop pressure spring A to the E hoop pressure plate with the two screws (screw, bind M3x4). Attach the E hoop pressure plate to the E hoop stay plate assy with the two screws (screw, bind M3x4).



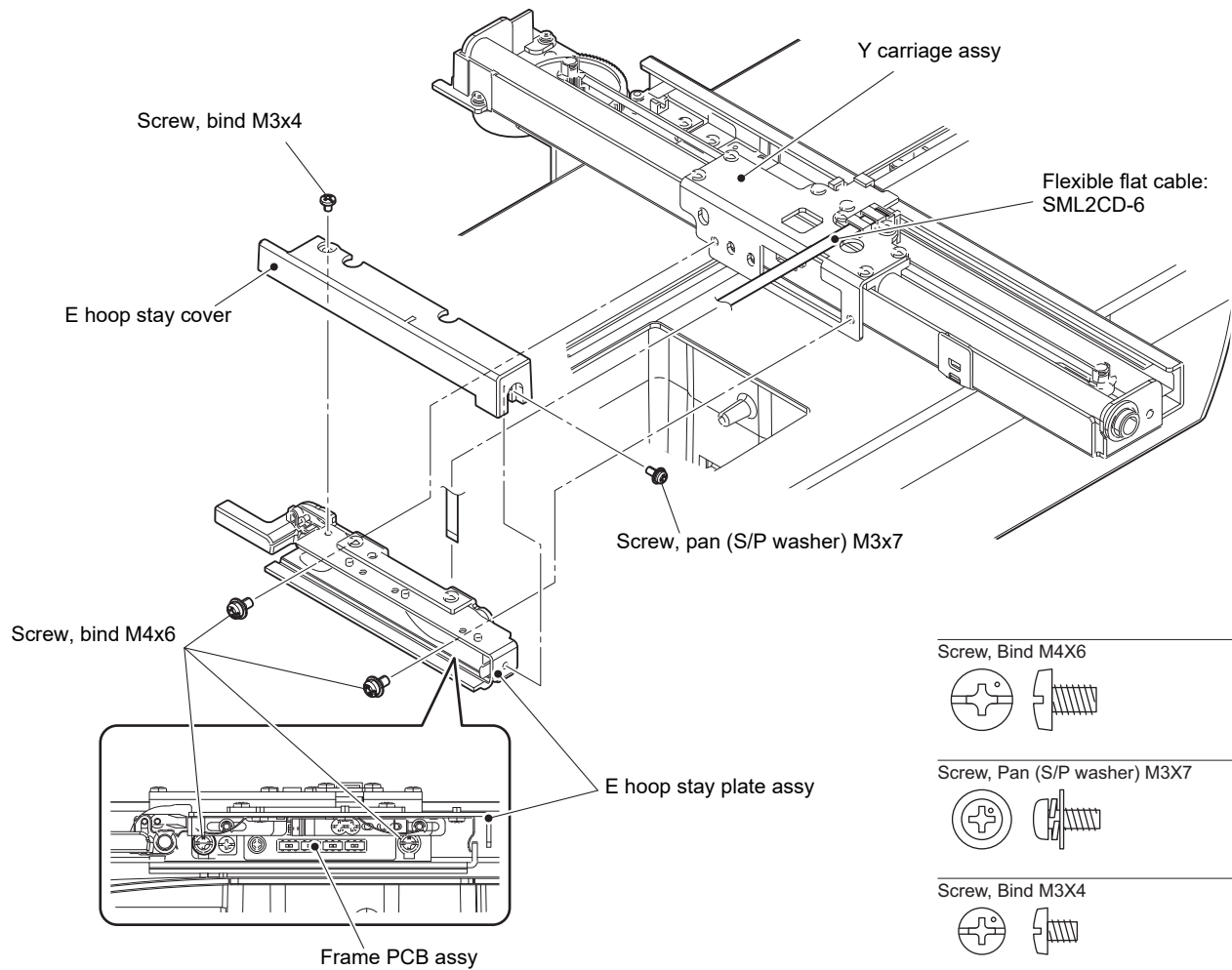
16 Attachment of E hoop stay plate assy

1. Connect the flexible flat cable:SML2CD-6 to the frame PCB assy of E hoop stay plate assy, and then attach the E hoop stay plate assy to the Y carriage assy with the two screws (screw, bind M4x6).

***Key point**

- Refer to "Wiring of X carriage unit (Frame PCB assy)".

2. Set the E hoop stay cover to the E hoop stay plate assy, and secure it with the screw (screw, pan (S/P washer) M3x7) and the screw (screw, bind M3x4).

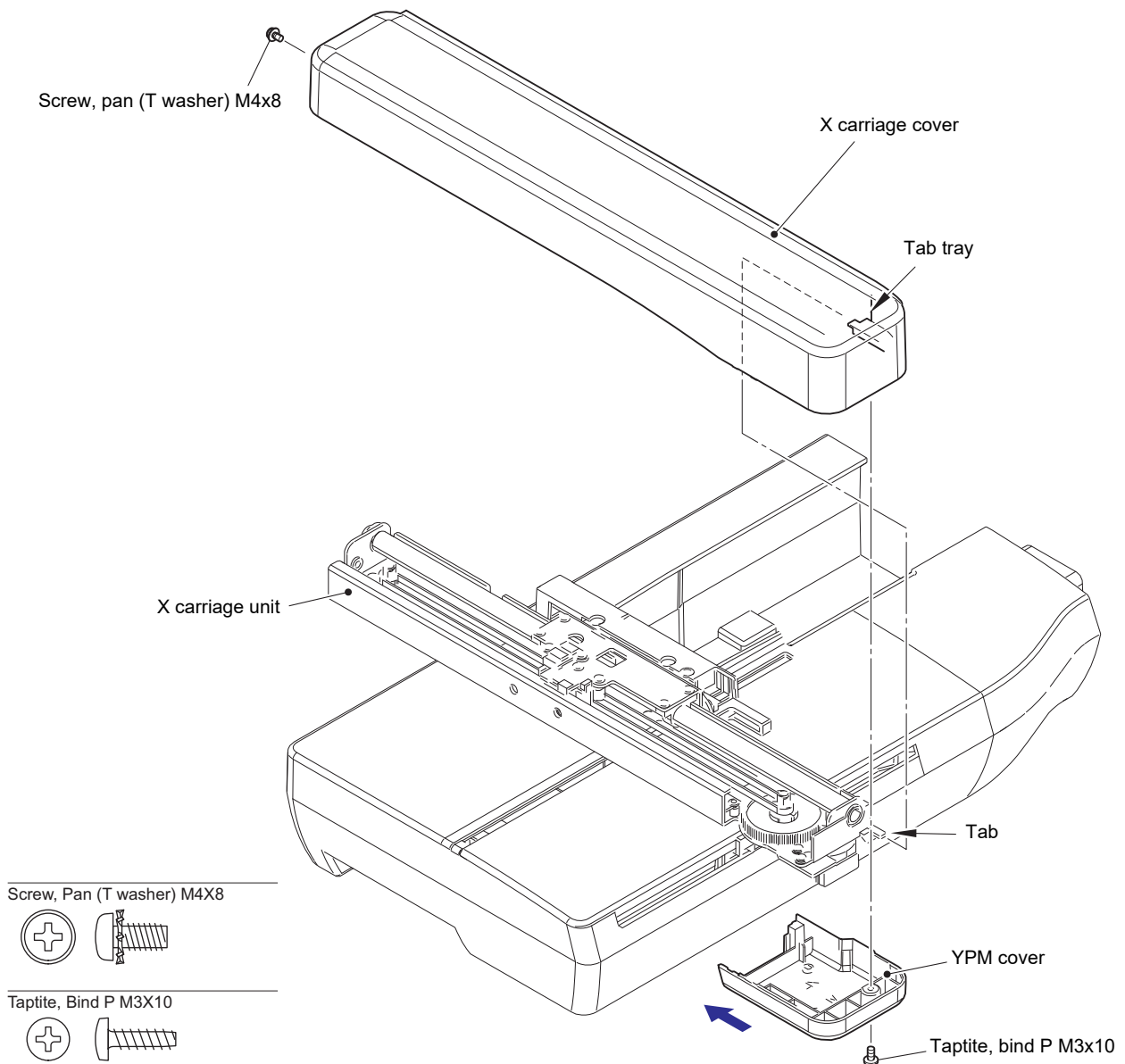


Application of
Assembly

Application of
Assembly

17 Attachment of X carriage cover and YPM cover

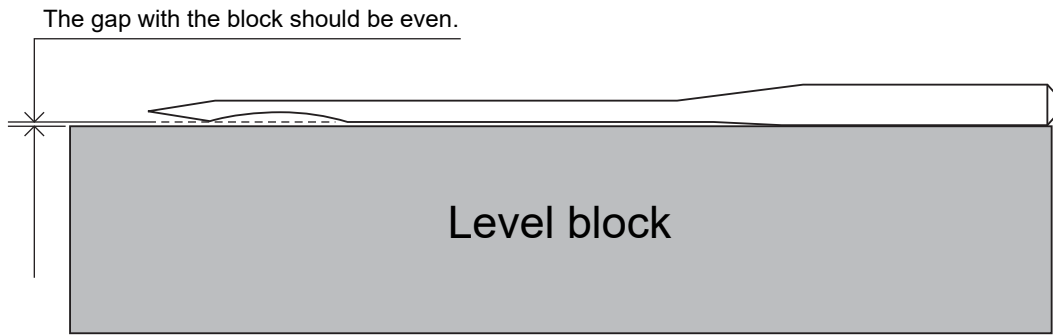
1. Insert the tab of X carriage unit into the tab tray of X carriage cover, and attach the X carriage cover to the X carriage unit with the screw (screw, pan (T washer) M4x8).
2. Set the YPM cover to the X carriage cover, slide the YPM cover to the direction of the arrow, and secure it with the screw (taptite, bind P M3x10).



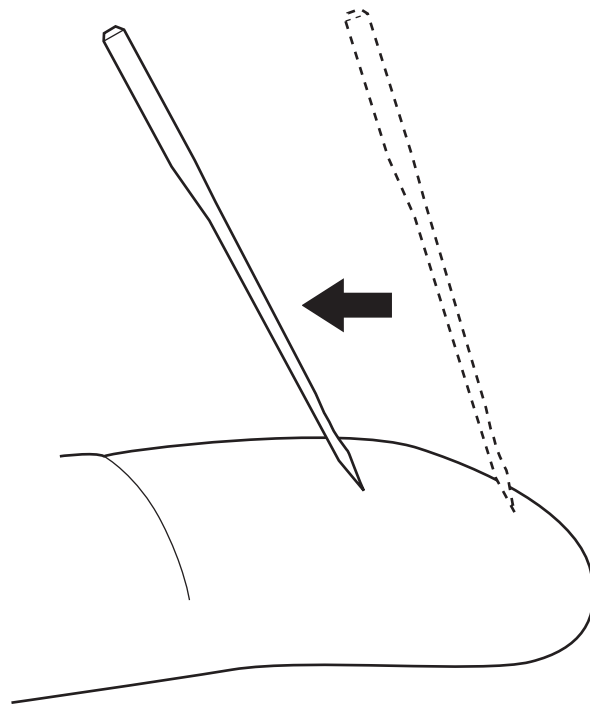
4 Adjustment

Inspection	Needle point damage.....	4 - 2
Test Mode	Start test mode.....	4 - 3
Adjustment	Touch panel	4 - 4
	Timing belt tension	4 - 5
	Timing belt and belt support upper/lower clearance ...	4 - 6
	Motor belt tension	4 - 7
	Fine tension	4 - 8
	Upper thread tension	4 - 9
	Front/back position of needle and presser foot ...	4 - 10
	Right/left position of needle and presser foot ...	4 - 11
	Needle bar rising	4 - 12
	Needle bar height.....	4 - 13
	Needle clearance	4 - 14
	Needle threader	4 - 15
	Presser bar height.....	4 - 16
	Fabric thickness setting	4 - 17
	Inner rotary hook bracket position.....	4 - 19
	Lower thread winding.....	4 - 20
	Lower thread tension (inner rotary hook assy) ...	4 - 21
	Belt tension (embroidery unit)	4 - 22
	X carriage height (embroidery unit).....	4 - 23
	Embroidery center position (embroidery unit) ...	4 - 24

1. Put a needle on the level block, and check the needle is not bent.





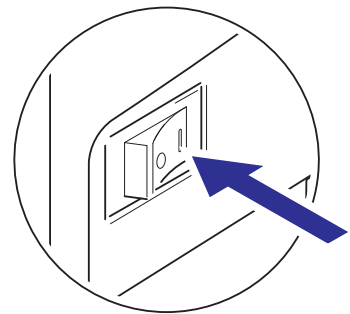
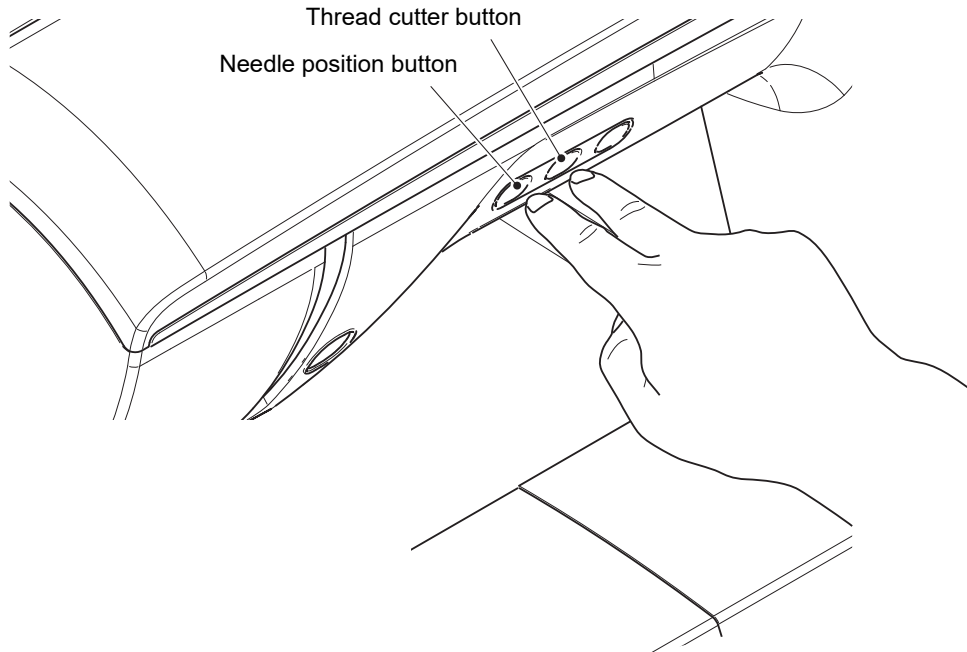
2. Slide a needle on your finger and check it moves smoothly.





Adjustment

Adjustment

Turn on the machine while pressing  (Needle position button) and  (Thread cutter button) to start (test mode selection screen appears).



01. SERIAL NUMBER	05. CLEARANCE CK	1 / 6  
02. THICKNESS SET	06. FEED DOG POS	
03. PATTERN ADJ	07. FOOT HEIGHT	
04. 3POINT N DROP	08. EMB POSITION	

Test mode selection screen

Adjustment

Adjustment

[Standard]

“SUCCESS” should be displayed after touching five “+” on touch panel setting screen by touch pen in numerical order.

[Adjustment]

1. Turn off the machine.
2. Turn on the machine while touching screen by touch pen or fingers.

***Key point**

- Keep touching the screen until touch panel setting screen appears.

3. Touch five “+” on screen by touch pen in numerical order.
 - Setting is completed once “SUCCESS” appears on the screen. Go to procedure 4.
 - Try procedure 3 again if “ERROR” appears on the screen.

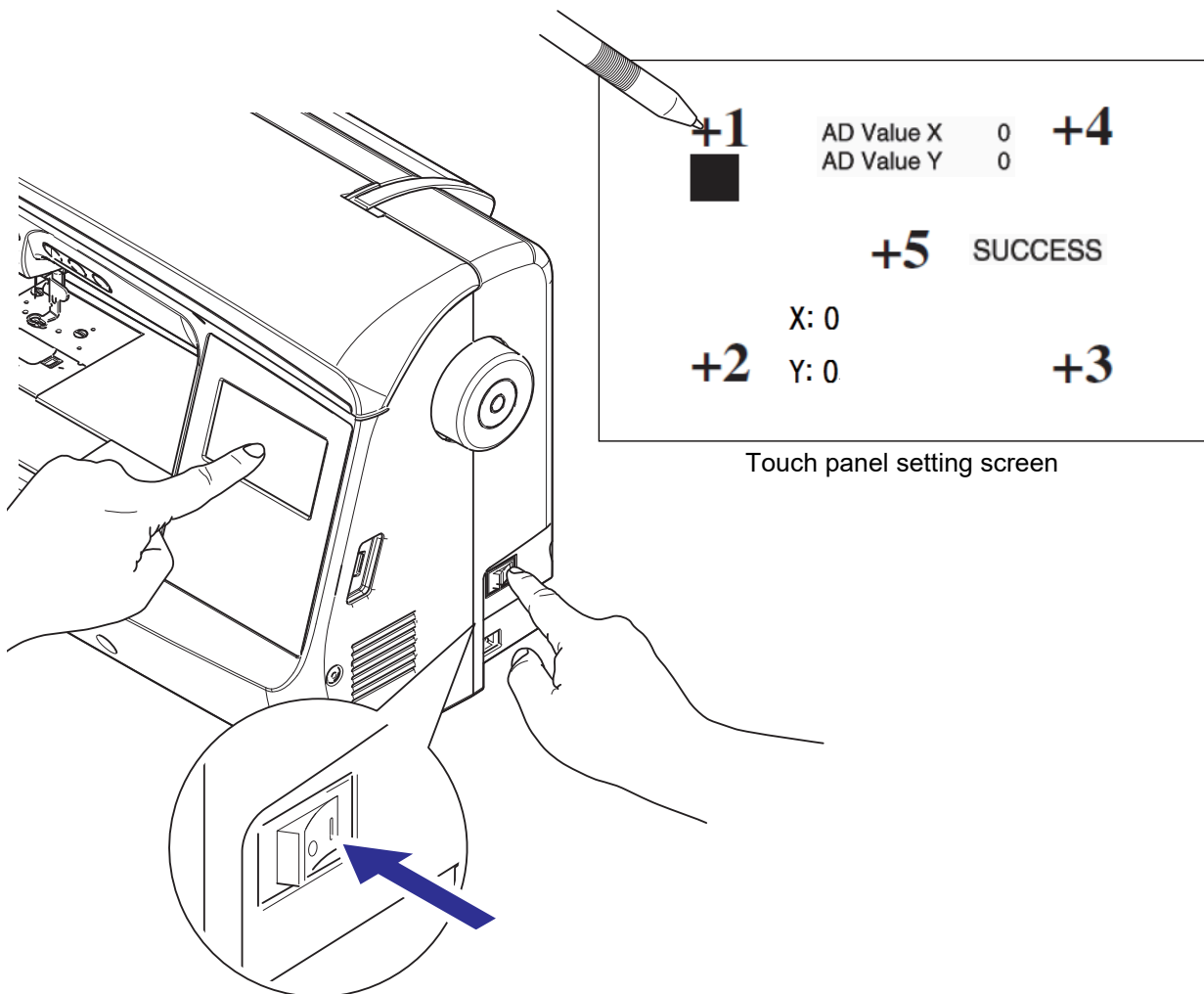
***Note**

- Use the provided touch pen when you press marks on the screen.
Do not use sharp or hard objects to avoid scratch on the touch panel.

4. Turn off the machine.

***Key point**

- Turn on the machine after adjustment to check if the position touched by touch pen is properly recognized by the machine.

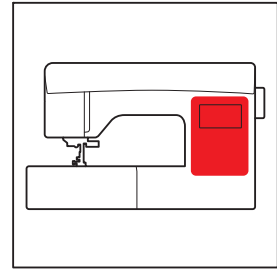


[Standard]

3.5 ± 0.5 mm (3 to 4 mm) slack should be made by pushing the timing belt at the middle of upper shaft pulley shaft and tension pulley shaft with a force of 1.96 N (200 gf).

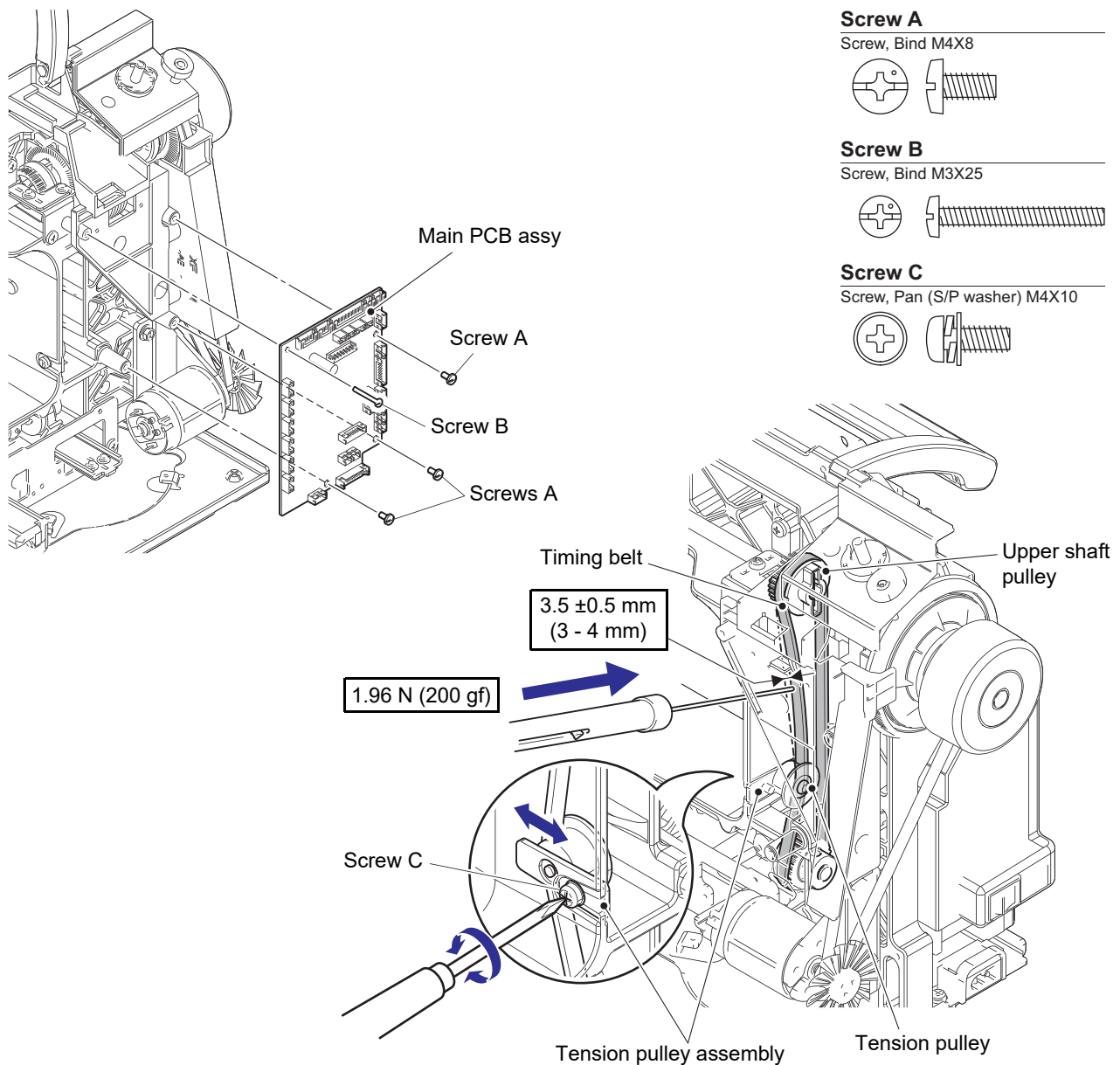
[Adjustment]

1. Remove the front cover assy and the rear cover. (Refer to "2-7" / "2-8".)
2. Remove the 3 screws A and screw B of the main PCB assy to remove it from the machine.
3. Loosen the screw C of the tension pulley assembly.
4. Move the tension pulley assembly back and forth to adjust the tension of the timing belt.
5. Tighten the screw C of the tension pulley assembly to secure the tension pulley assembly to the arm bed.



XC2277001

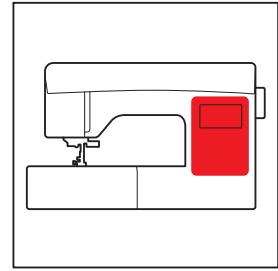
Push pull gauge (5N)



[Standard]

The clearance between the timing belt and the belt support upper adjust of belt support upper should be 0.1 to 0.3 mm.

The clearance between the timing belt and the belt support lower adjust should be 0.1 to 0.3 mm.

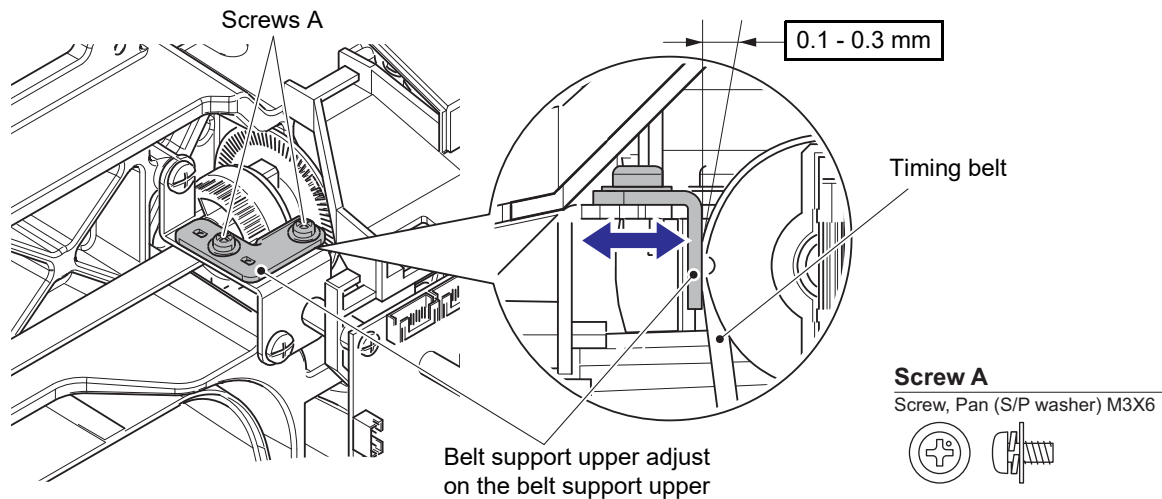


[Adjustment]

1. Remove the front cover assy. (Refer to "2-7".)
2. Loosen the 2 screws A of the belt support upper adjust on the belt support upper.
3. Move the belt support upper adjust on the belt support upper back and forth to adjust the clearance between the timing belt and the belt support upper adjust on the belt support upper.

***Key point**

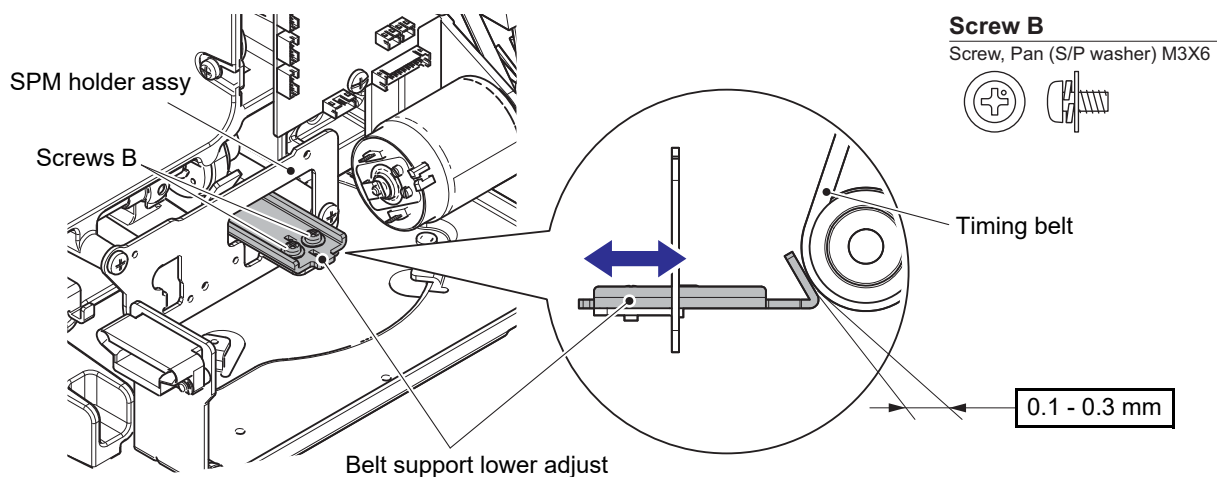
- The clearance between the timing belt and the belt support upper adjust of belt support upper should be 0.1 to 0.3 mm.
4. Tighten the 2 screws A of the belt support upper adjust on the belt support upper to secure the belt support upper adjust on the belt support upper to the belt support upper.



5. Loosen the 2 screws B of the belt support lower adjust.
6. Move the belt support lower adjust back and forth to adjust the clearance between the timing belt and the belt support lower adjust.

***Key point**

- The clearance between the timing belt and the belt support lower adjust should be 0.1 to 0.3 mm.
7. Tighten the 2 screws B of the belt support lower adjust to secure the belt support lower adjust to the SPM holder assy.

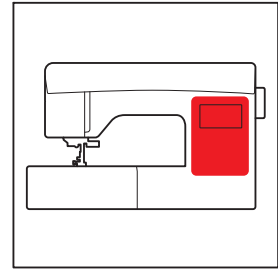


[Standard]

4.5 ± 0.5 mm (4 to 5 mm) slack should be made by pushing the motor belt at the middle of timing pulley shaft and motor T-pulley shaft with a force of 0.98 N (100 gf).

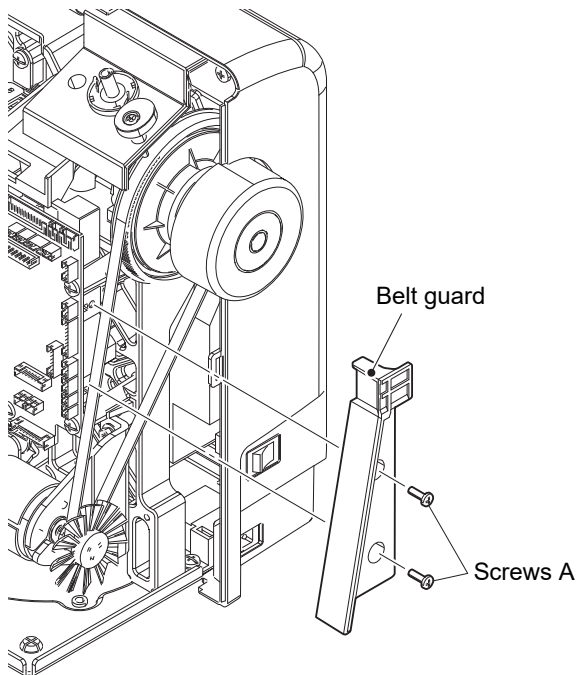
[Adjustment]

1. Remove the front cover Assy. (Refer to "2-7".)
2. Remove the 2 screws A to remove the belt guard.
3. Loosen the 2 screws B of the motor holder.
4. Move the motor holder up and down to adjust the tension of the motor belt.
5. Tighten the 2 screws B of the motor holder to secure the motor holder to the arm bed.



XC2277001

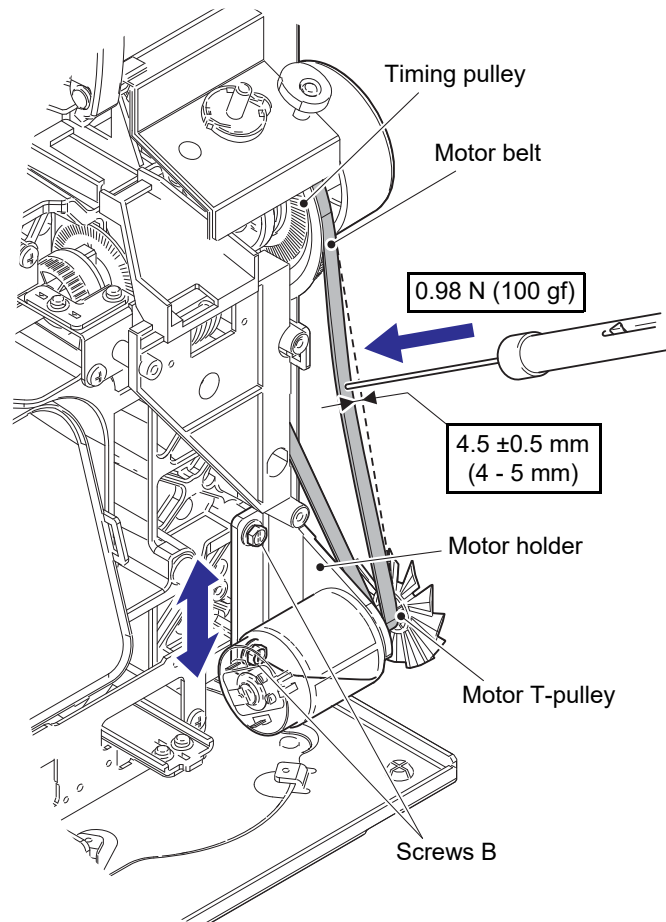
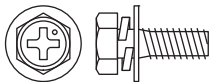
Push pull gauge (5N)

**Screw A**

Taptite, Bind B M3X10

**Screw B**

Upset 4X12DB



[Standard]

Start test mode, pass the schappe spun thread #60 through tension plate from thread guide and pull it slowly by tension gauge. The tension should be adjusted in 0.06 to 0.09 N (6 to 9 gf).

[Adjustment]

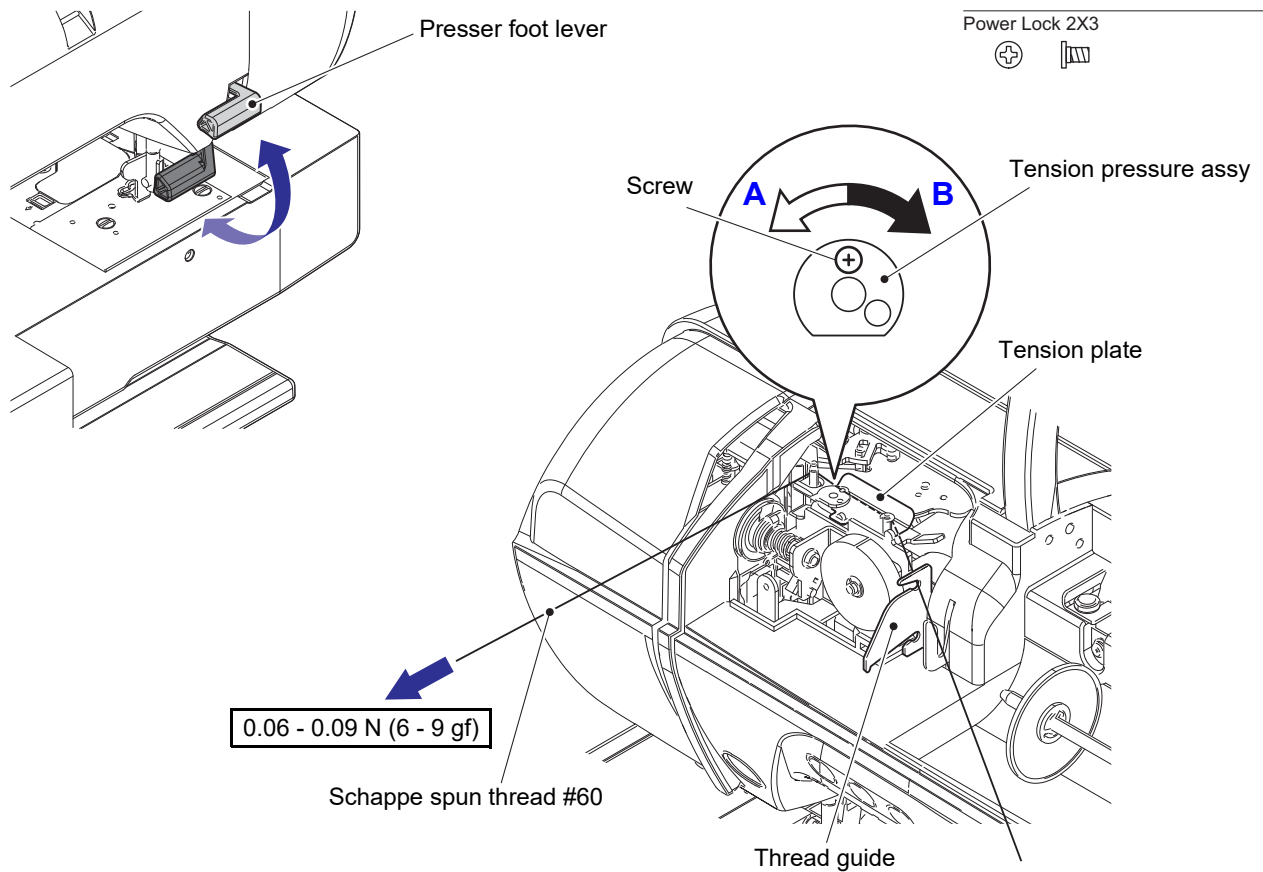
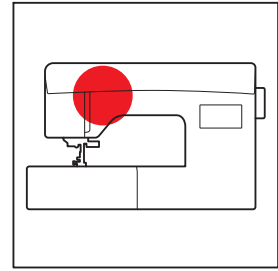
1. Remove the front thread guard cover. (Refer to "2-6".)
2. Start the test mode.
3. Raise the presser foot lever.
4. Pass the schappe spun thread #60 through the thread guide and then tension plate.
5. Lower the presser foot lever.
6. Pull the thread slowly by the tension gauge, and check the thread tension.
7. Adjust the thread tension by turning the screw of the tension pressure assy.

***Key point**

- Loosen the screw (turn to the direction of "A"). → The thread tension gets looser.
- Tighten the screw (turn to the direction of "B"). → The thread tension gets tighter.

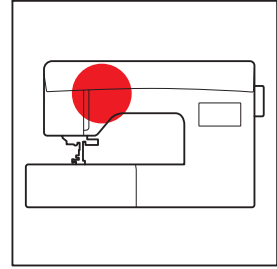
XA9152001

Tension gauge 10 (0.1N)



[Standard]

Start test mode, pass the schappe spun thread #60 through the thread guide, tension plate, tension disk A/B and plate assembly, and pull it slowly by tension gauge. The tension should be adjusted in 0.34 to 0.44 N (35 to 45 gf).



[Adjustment]

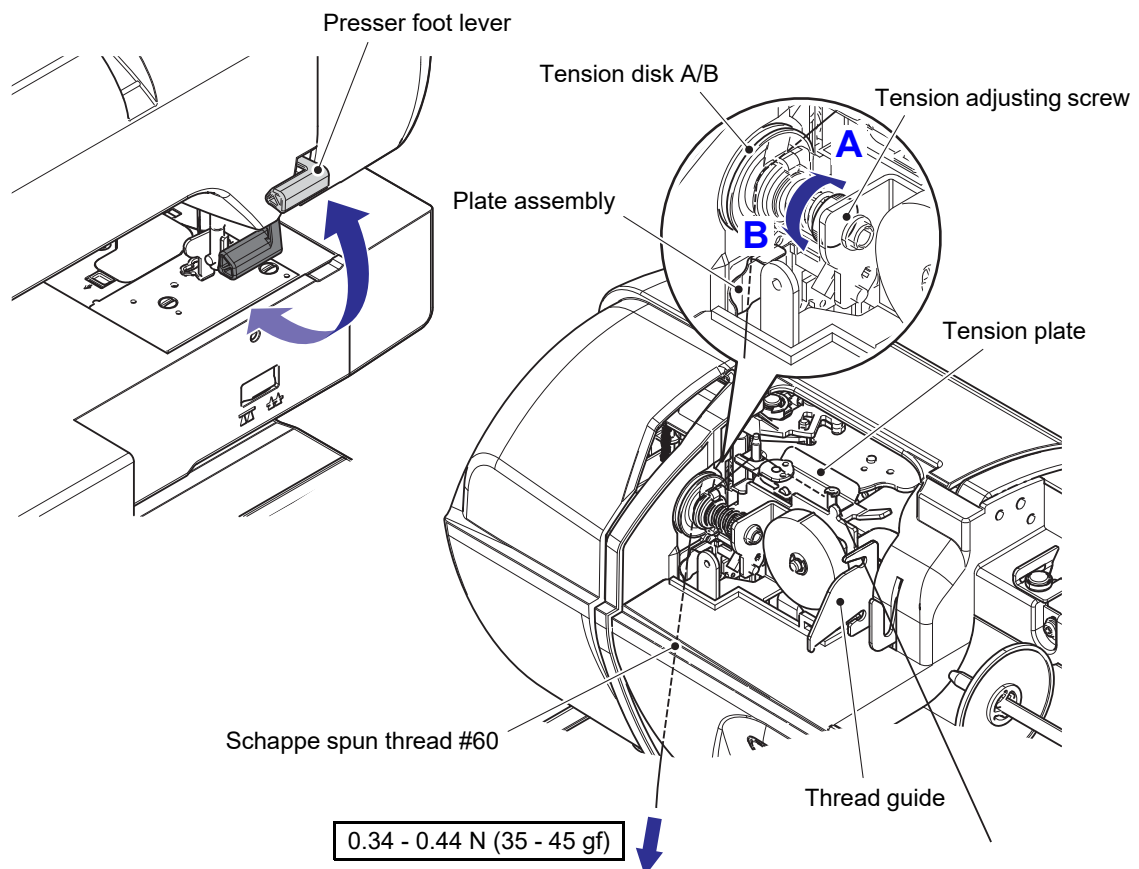
1. Remove the front thread guard cover. (Refer to "2-6".)
2. Start the test mode.
3. Raise the presser foot lever.
4. Pass the schappe spun thread #60 through the thread guide, tension plate, tension disk A/B and plate assembly in this order.
5. Lower the presser foot lever.
6. Pull the thread slowly by the tension gauge, and check the thread tension.
7. Adjust the thread tension by turning the tension adjusting screw.

***Key point**

- Loosen the tension adjusting screw (turn to the direction of "A"). → The thread tension gets tighter.
 - Tighten the tension adjusting screw (turn to the direction of "B"). → The thread tension gets looser.
8. After adjustment, apply a small amount of the thread locker to tension adjusting screw.

XA9154001

Tension gauge 50 (0.5N)

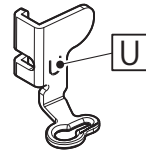


[Standard]

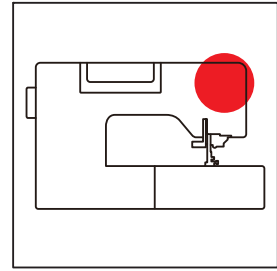
The needle point should be dropped in the longitudinal center of the presser foot hole.

[Adjustment]

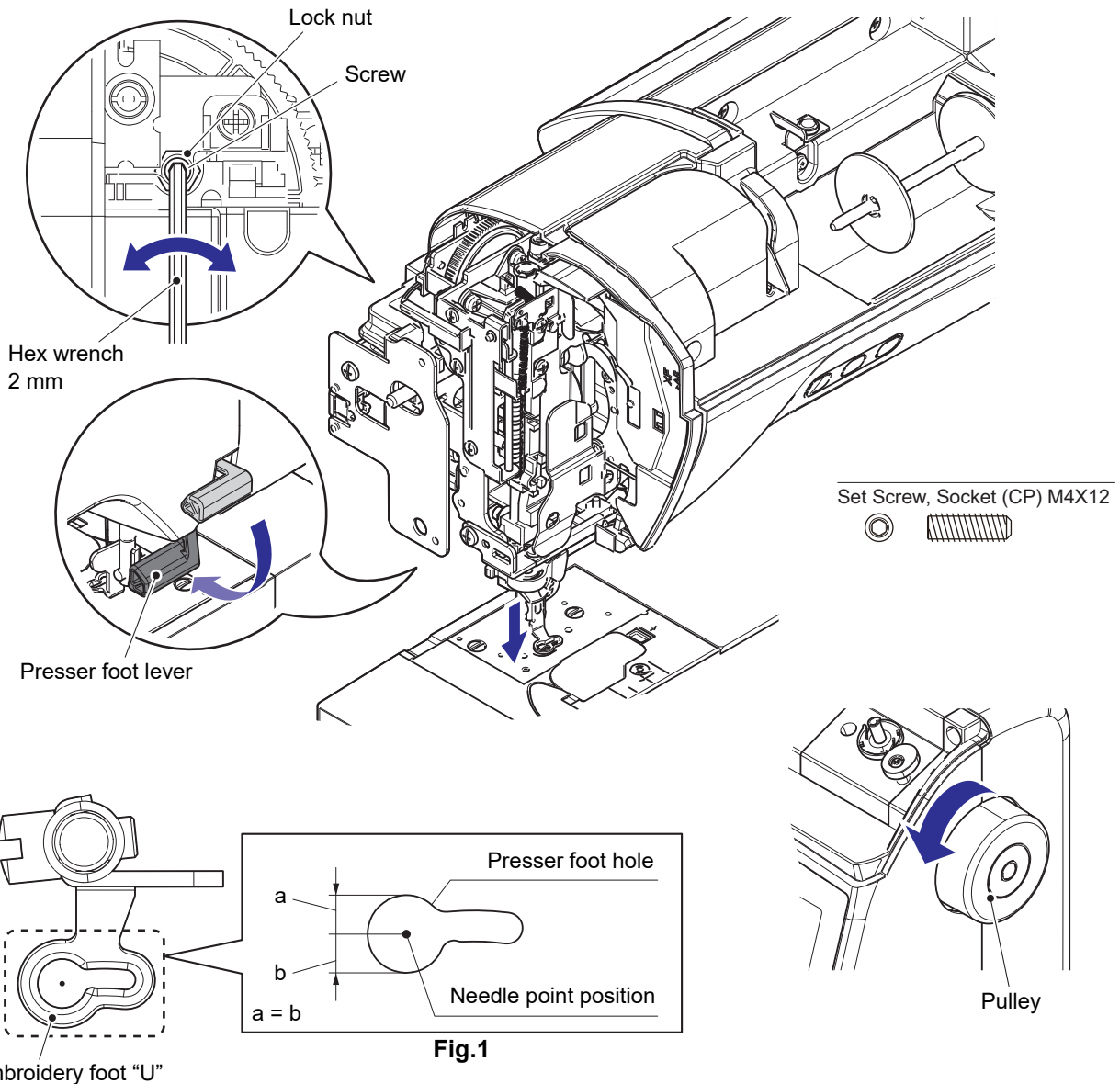
1. Remove the face plate assy. (Refer to "2-6").
2. Attach the embroidery foot "U".
3. Attach the size 75/11 needle.
4. Lower the presser foot lever.
5. Turn the pulley by hand, put the needle point into the embroidery foot "U" hole, and check the position of the needle point.
6. Raise the presser foot lever to raise the presser foot.
7. Adjust the position of the needle point by turning the screw. (Fig.1)
8. Lower the presser foot lever to lower the presser foot, and check the position of the needle point.



Embroidery foot "U"

***Key point**

- If the lock nut is loosened after adjustment, tighten the lock nut to secure the screw.

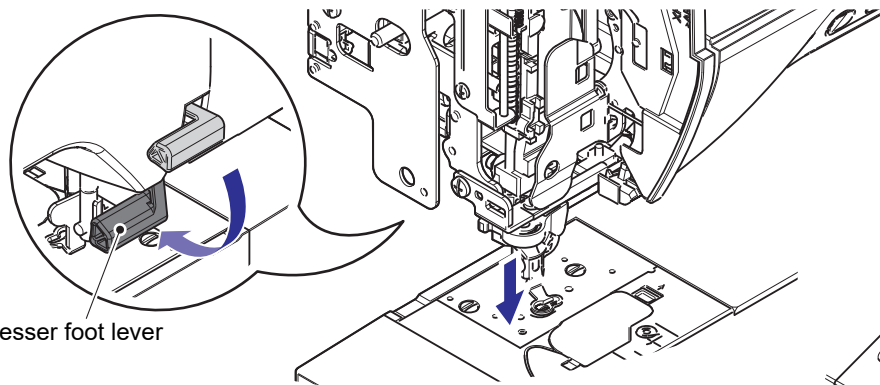
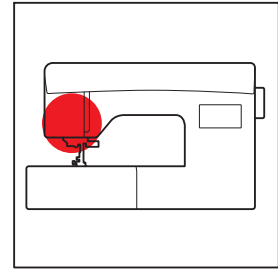
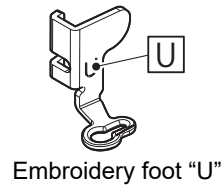


[Standard]

The needle point should be dropped in the lateral center of the presser foot hole.

[Adjustment]

1. Remove the face plate assy. (Refer to "2-6").
2. Attach the embroidery foot "U".
3. Attach the size 75/11 needle.
4. Lower the presser foot lever.
5. Turn the pulley by hand, put the needle point into the embroidery foot "U" hole, and check the position of the needle point. (Fig.1)
6. Raise the presser foot lever to raise the presser foot.
7. Loosen the screw of the needle holder guide assy.
8. Adjust the position of the needle point by moving the needle holder guide assy left or right. (Fig.2)
9. Tighten the screw of the needle holder guide assy to secure the needle holder guide assy to the needle supporter arm base.
10. Lower the presser foot lever to lower the presser foot, and check the position of the needle point.



Presser foot lever

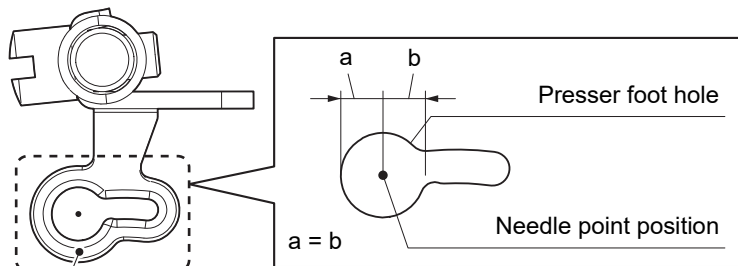
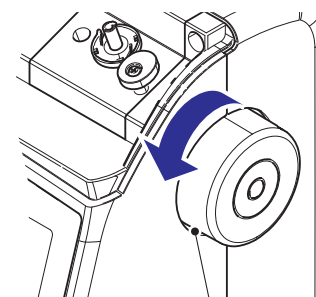


Fig.1

Embroidery foot "U"



Pulley

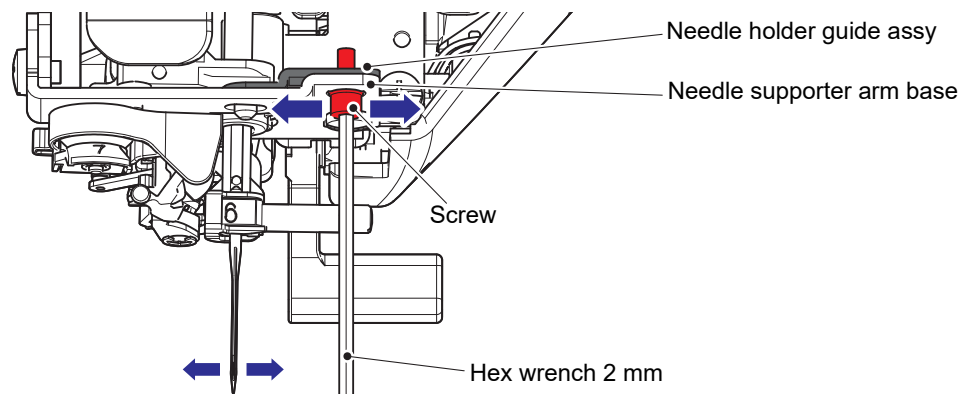
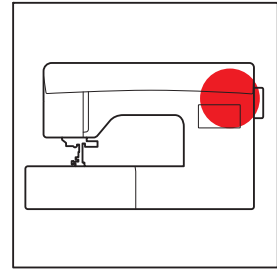


Fig.2

[Standard]

The right edge of the needle should be coincided with the outer rotary hook point when raising needle bar 2.77 ± 0.2 mm (2.67 to 2.97 mm) up from its lowest.



[Adjustment]

1. Remove the front cover assy. (Refer to "2-7".)
2. Remove the presser foot.
3. Remove the needle plate B assy, the needle plate A assy and the inner rotary hook assy.
4. Attach the size 75/11 needle.
5. Turn the pulley by hand to the front, and raise the needle bar 2.77 mm up from its lowest position. (Fig.1)
6. Loosen the 2 screws of the timing pulley D. (Fig.2)
7. Turn the outer rotary hook assy by hand in the direction of the arrow, and adjust the right edge of the needle to be coincided with the outer rotary hook assy point. (Fig.3)
8. Tighten the 2 screws of the timing pulley D to secure the timing pulley D to the lower shaft assy.

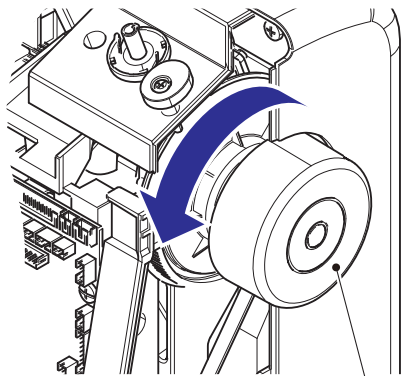


Fig.1

Pulley

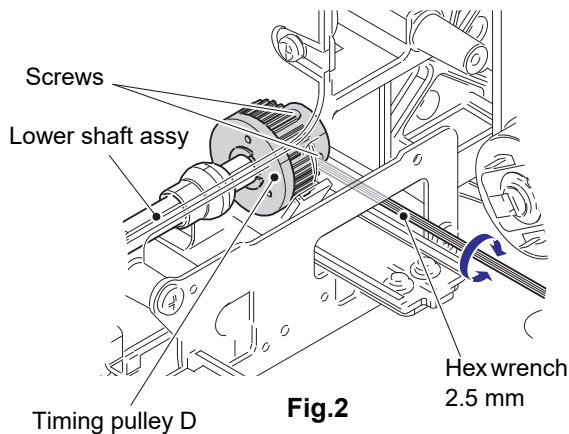
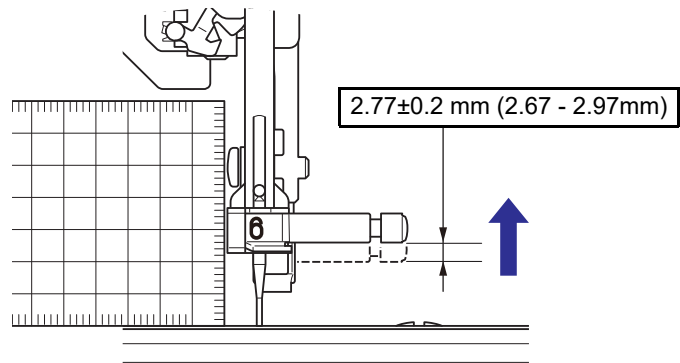


Fig.2

Timing pulley D

Screws

Lower shaft assy

Hex wrench
2.5 mm

Set Screw, Socket (CP) M5X5

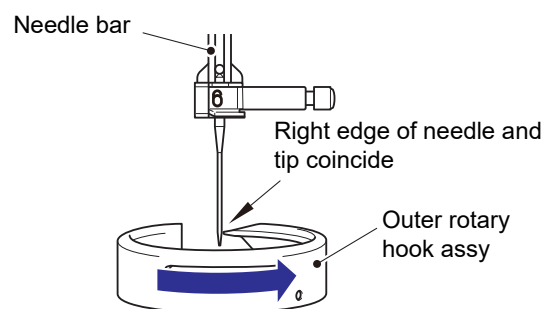


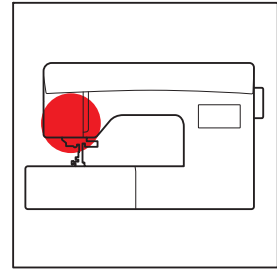
Fig.3

Needle bar

Right edge of needle and
tip coincideOuter rotary
hook assy

[Standard]

The gap between the top of needle eye and the lower end of the outer rotary hook point should be 1.52 ± 0.2 mm (1.32 to 1.72 mm) when the right edge of the needle is coincided with the outer rotary hook.

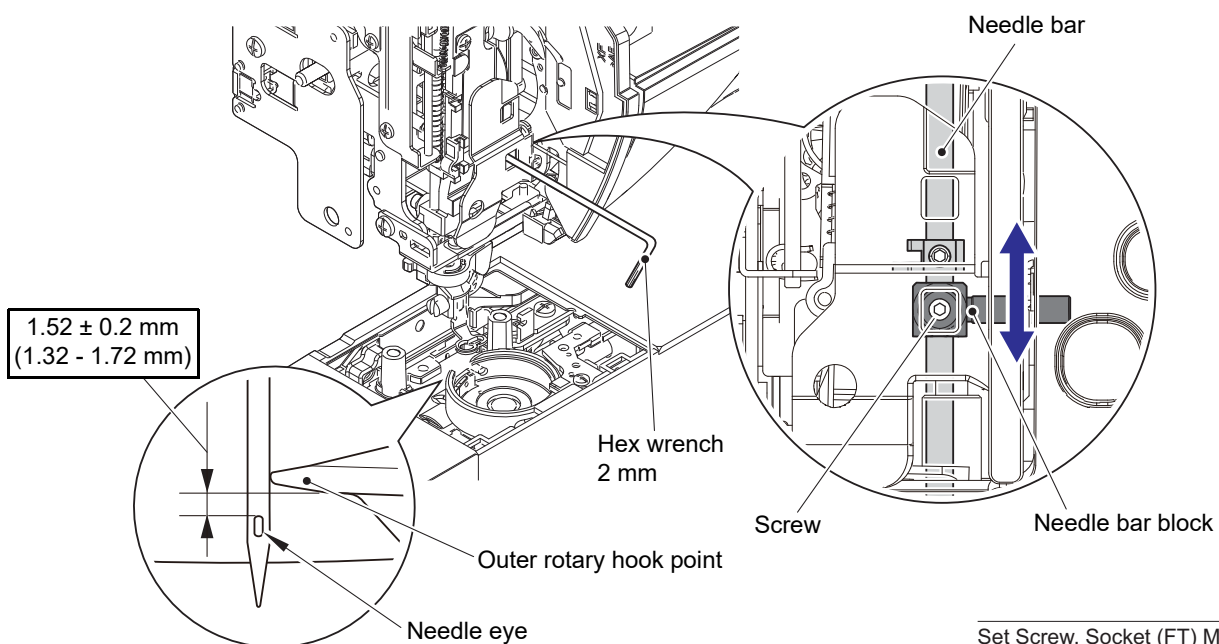
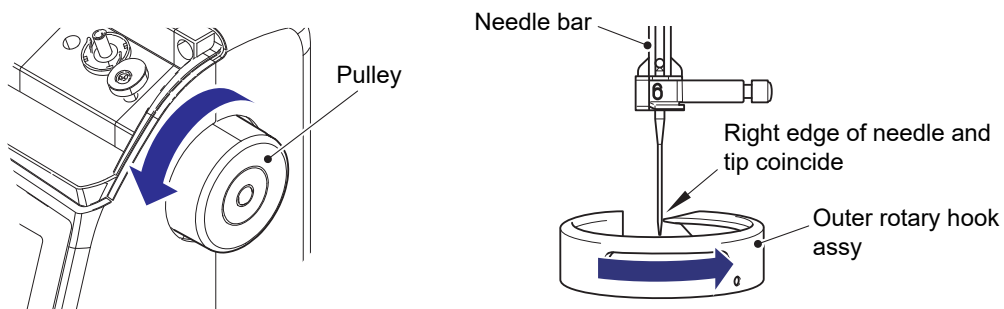


[Adjustment]

1. Remove the face plate assy. (Refer to "2-6".)
2. Remove the presser foot.
3. Remove the needle plate B assy, the needle plate A assy and the inner rotary hook assy.
4. Attach the size 75/11 needle.
5. Turn the pulley by hand to the front, and adjust the right edge of the needle to be coincided with the tip of outer rotary hook assy.
6. Loosen the screw of the needle bar block.
7. Move the needle bar assy up and down, and adjust the gap between the top of needle eye and the lower end of the outer rotary hook point.
8. Tighten the screw of the needle bar block to secure the needle bar block to the needle bar.

***Key point**

- Be sure to operate "4-15 Needle threader" adjustment after this adjustment.

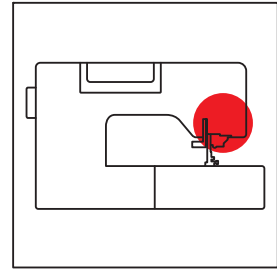


Set Screw, Socket (FT) M4X4



[Standard]

The clearance between the scarf of the needle and the outer rotary hook point should be 0.25 mm or less when the rear side of the needle is coincided with the outer rotary hook.



[Adjustment]

1. Remove the face plate assy. (Refer to "2-6".)
2. Remove the presser foot.
3. Remove the needle plate B assy, the needle plate A assy and the inner rotary hook assy.
4. Attach the size 75/11 needle.
5. Turn the pulley by hand until the outer rotary hook point coincides with the rear side of the needle.
6. Loosen the screw of the adjusting screw.
7. Adjust the clearance between the scarf of the needle and the outer rotary hook point by turning the adjusting screw.

***Key point**

- Loosen the adjusting screw (turn to the direction of "A"). → Move the needle to rear side. (needle clearance gets smaller.)
- Tighten the adjusting screw (turn to the direction of "B"). → Move the needle to front side. (needle clearance gets larger.)

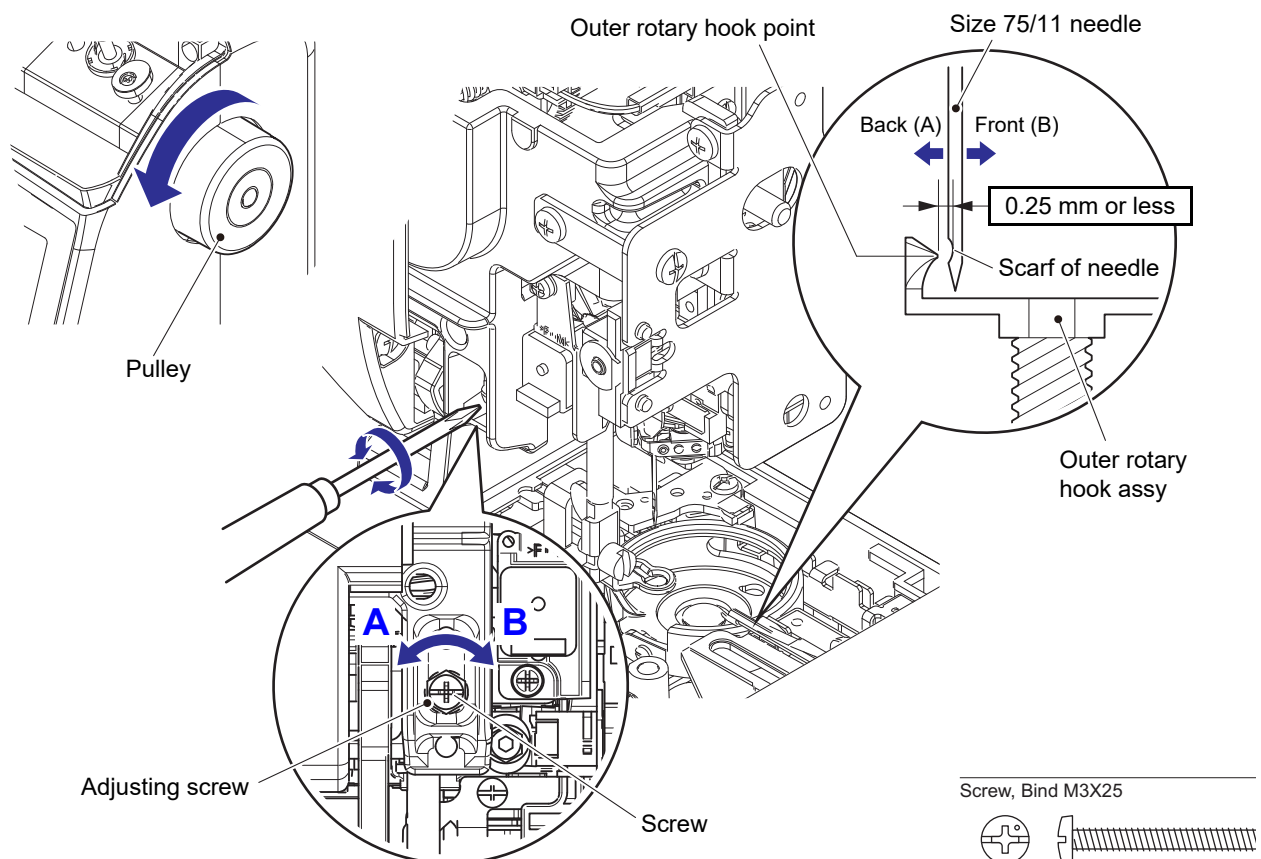
8. Tighten the screw of the adjusting screw to secure the adjusting screw.

***Key point**

- When tightening the screw of the adjusting screw, keep the adjusting screw from moving.

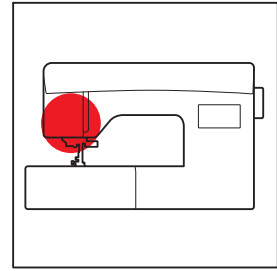
XE2396001

Box screw driver 7




[Standard]

When passing the threader hook into the needle eye, clearance between the upper edge of the threader hook and the upper edge of the needle eye should be 0 mm.

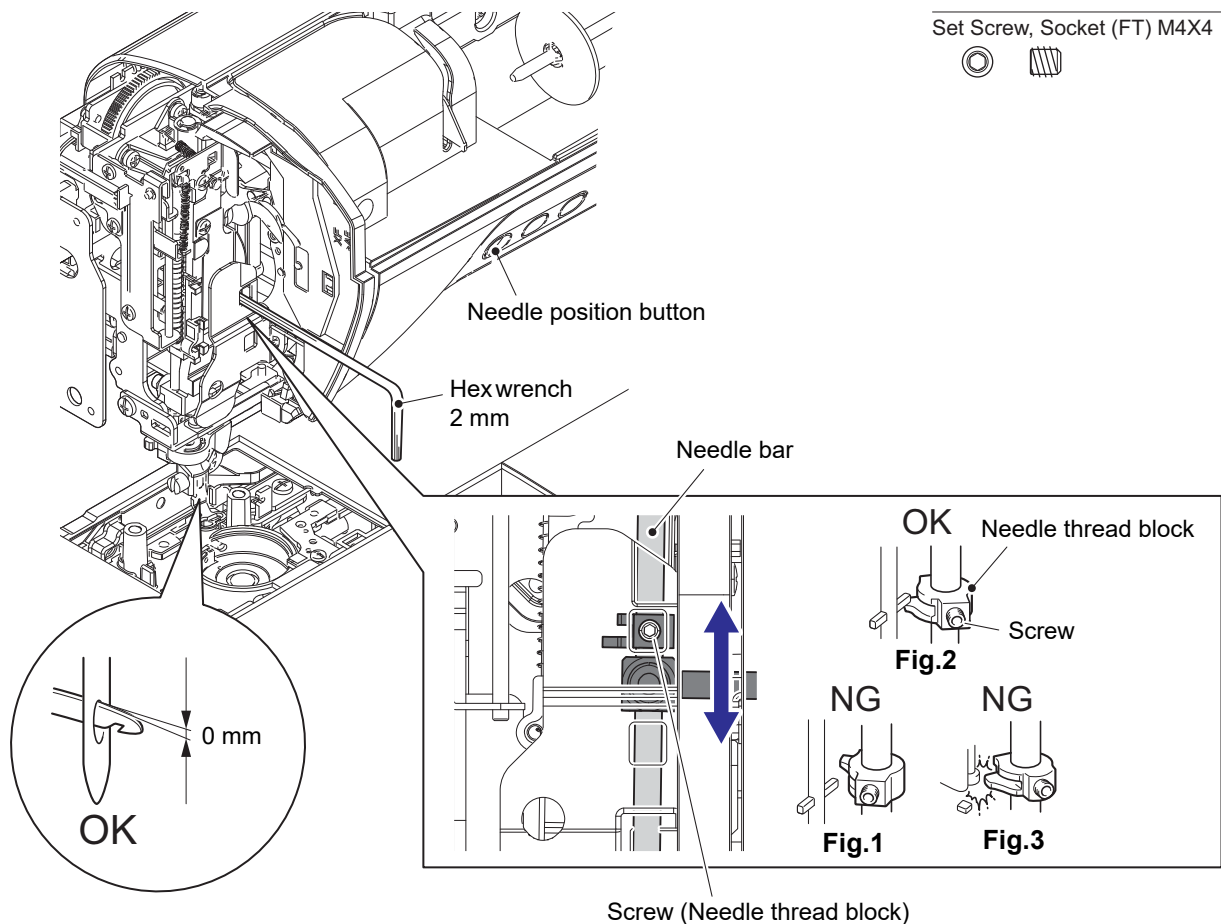


[Adjustment]

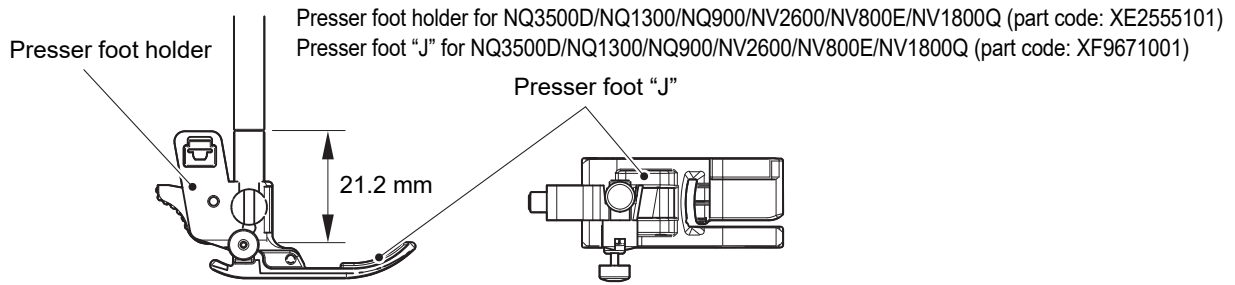
1. Remove the face plate assy. (Refer to "2-6").
2. Attach the size 75/11 needle.
3. Turn on your sewing machine.
4. Press  (Needle position button) to raise the needle bar to its highest position.
5. Loosen the screw of the needle thread block.
6. Adjust the clearance between the upper edge of the threader hook and the upper edge of the needle eye by moving the needle thread block up and down.
7. Tighten the screw of the needle thread block to secure the needle thread block to the needle bar.
8. After adjusting the clearance, pass the threader hook into the needle eye and check the clearance between the upper edge of the threader hook and the upper edge of the needle eye.

***Key point**

- Be sure to tighten the screw of the needle thread block slightly to the left when it is seen from the front. (Fig.2)
- In case the position of the screw is too left, the hook doesn't turn. (Fig.1)
- In case the position of the screw is too right, the needle thread block contacts the needle bar supporter assy and get damaged. (Fig.3)



This adjustment requires optional "presser foot holder" and "presser foot "J"" below (not included in this model).



[Standard]

When raising the presser foot lever, clearance between the upper surface of the needle plate A Assy and bottom surface of the presser foot should be 7 to 7.5 mm.

The presser foot should be in parallel with the needle plate A Assy.

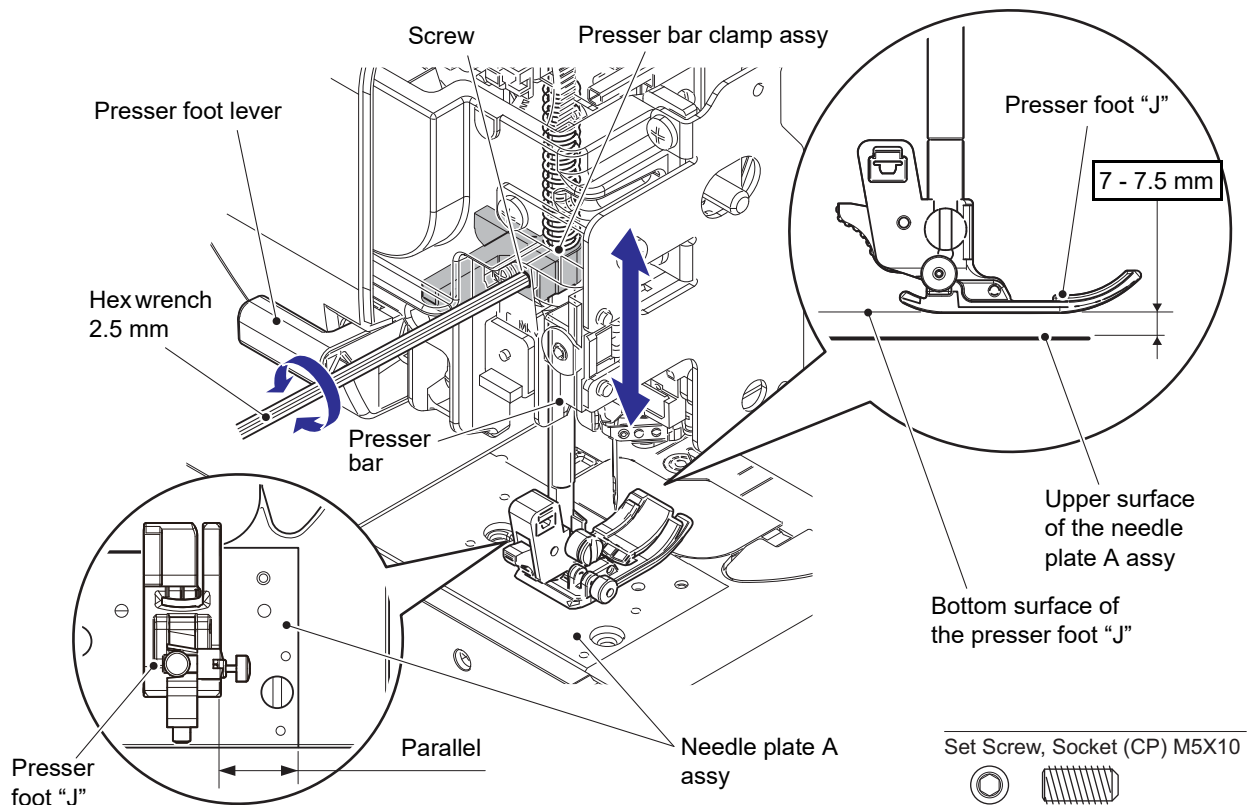
[Adjustment]

1. Remove the face plate Assy. (Refer to "2-6".)
2. Remove the embroidery foot "Q", and attach the presser foot holder and the presser foot "J".
3. Start the test mode.
4. Raise the presser foot lever.
5. Loosen the screw of the presser bar clamp Assy.
6. Adjust the clearance between the upper surface of the needle plate A Assy and the bottom surface of the presser foot "J" by moving the presser bar up and down.

***Key point**

- Make sure that the presser foot "J" is in parallel with the edge of the needle plate A Assy.

7. Tighten the screw of the presser bar clamp Assy to secure the presser bar clamp Assy to the presser bar.



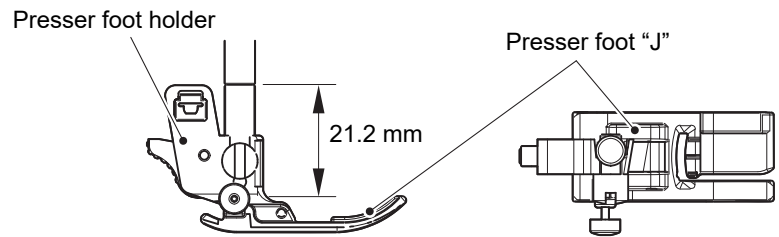
This adjustment requires optional "presser foot holder" and "presser foot "J"" below (not included in this model).

Part name	Part code
Presser foot holder	XE2555101
Presser foot "J"	XF9671001

***Note**

These parts are included in these models.



→ NQ3500D/NQ1300/NQ900/NV2600/NV800E/NV1800Q etc.




[Standard]


Perform the fabric thickness setting for 0 mm and 3 mm fabric in test mode #02.

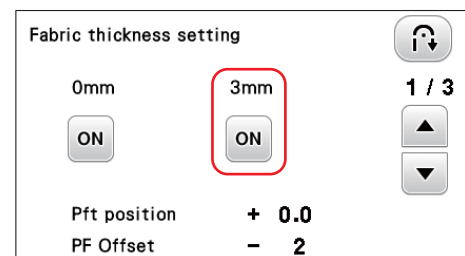
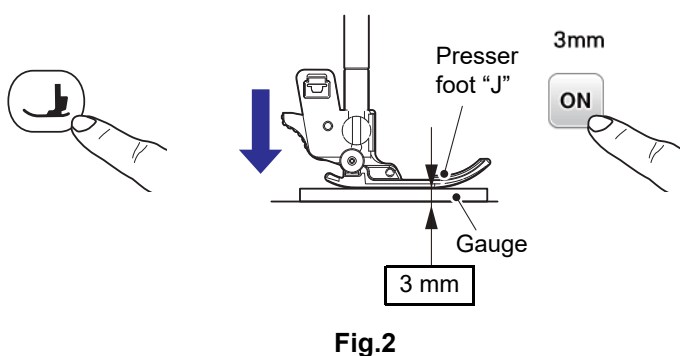
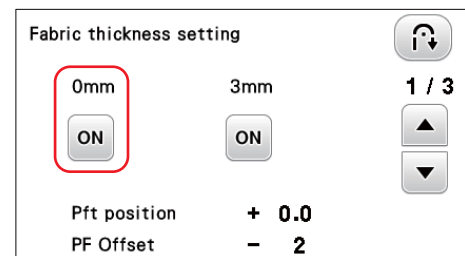
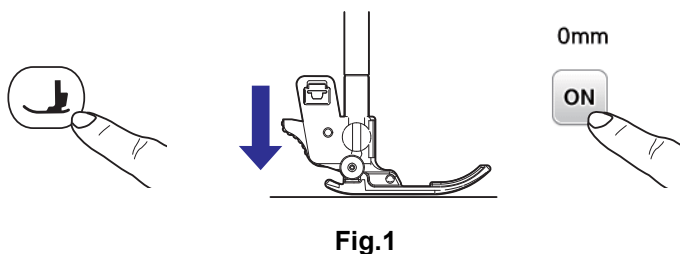
[Adjustment]

1. Remove the needle and embroidery foot to attach the presser foot holder.
2. Attach the presser foot "J" and lower the presser foot lever.
3. Start the test mode and select #02 (Fabric thickness setting mode).
4. Press  (Presser foot lifter button) to lower the presser foot "J", and then press the  button below "0 mm". (Fig.1)

***Key point**

- Use  (Presser foot lifter button) to lift or lower the presser foot "J" in the subsequent procedures. Move the lever slowly when you use the presser foot lever. If the presser foot "J" hits the needle plate strongly, the correct adjustment may be interrupted.

5. Lift the presser foot "J" and insert the 3 mm gauge between the needle plate and presser foot "J".
6. Lower the presser foot "J" and press the  button below "3 mm". (Fig.2)



<To next page>

<From previous page>

7. Lift the presser foot "J" and remove the gauge.
8. Press the **ON** button next to "Start" on the screen (2nd page). (Fig.3)
→ Presser foot "J" rises by 2 mm from the needle plate surface.
9. Press the **▲** button next to "0.1 mm" to lift the presser foot "J" until the 3 mm gauge can go through between the needle plate and presser foot "J" smoothly. (Fig.4)

***Note**

- Do not push the gauge in while lifting the presser foot "J".

***Key point**

- Return to the procedure 8 if you lifted the presser foot "J" higher than 3 mm up.

10. Press the **ON** button next to "SET" while leaving the gauge between the needle plate and presser foot "J". (Fig.5)

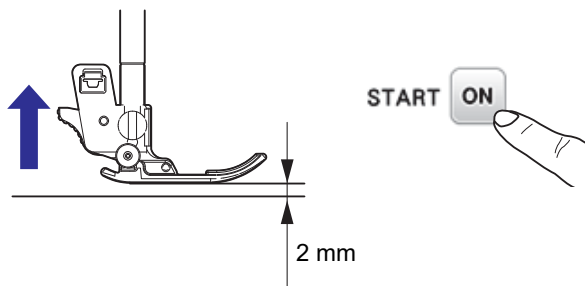


Fig.3

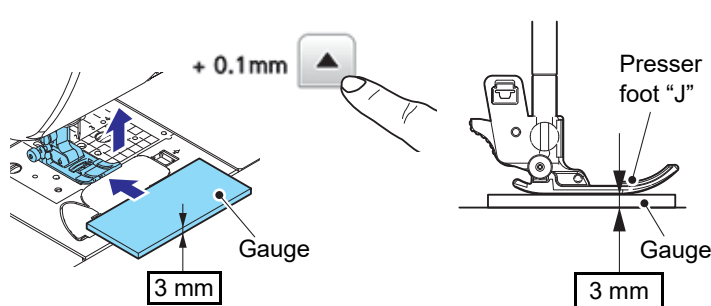
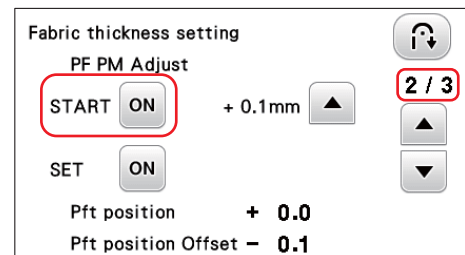


Fig.4

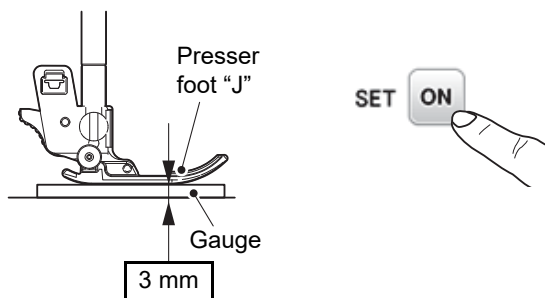
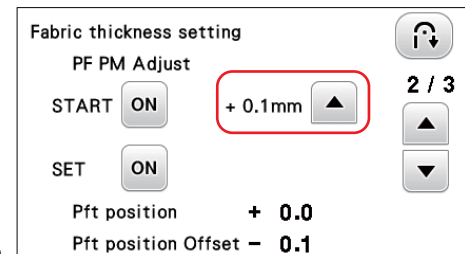
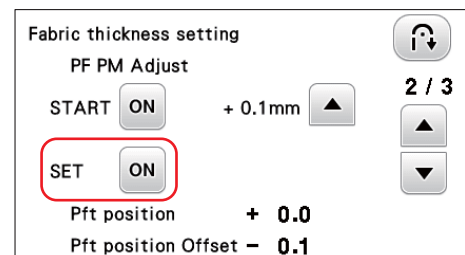
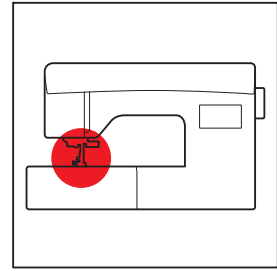


Fig.5



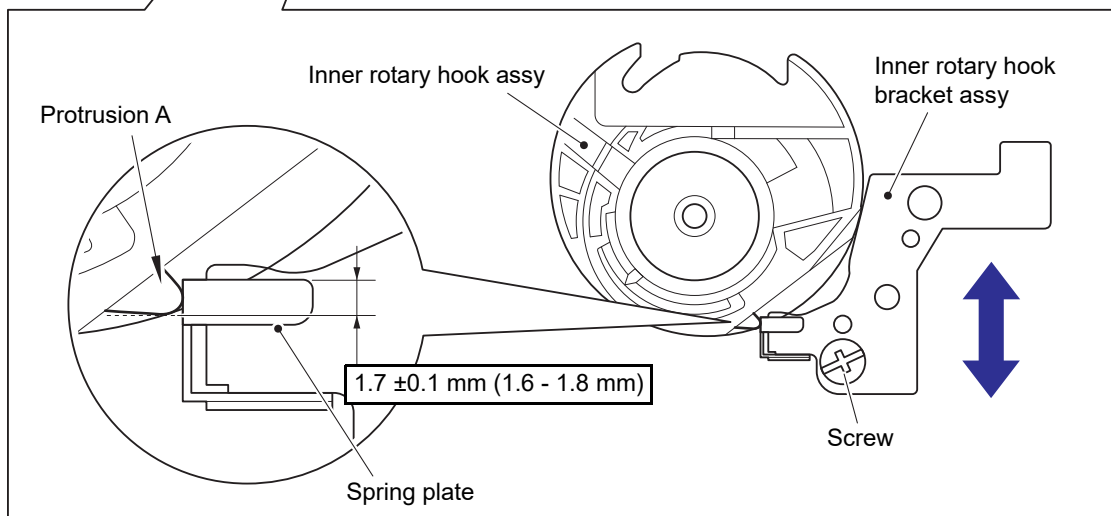
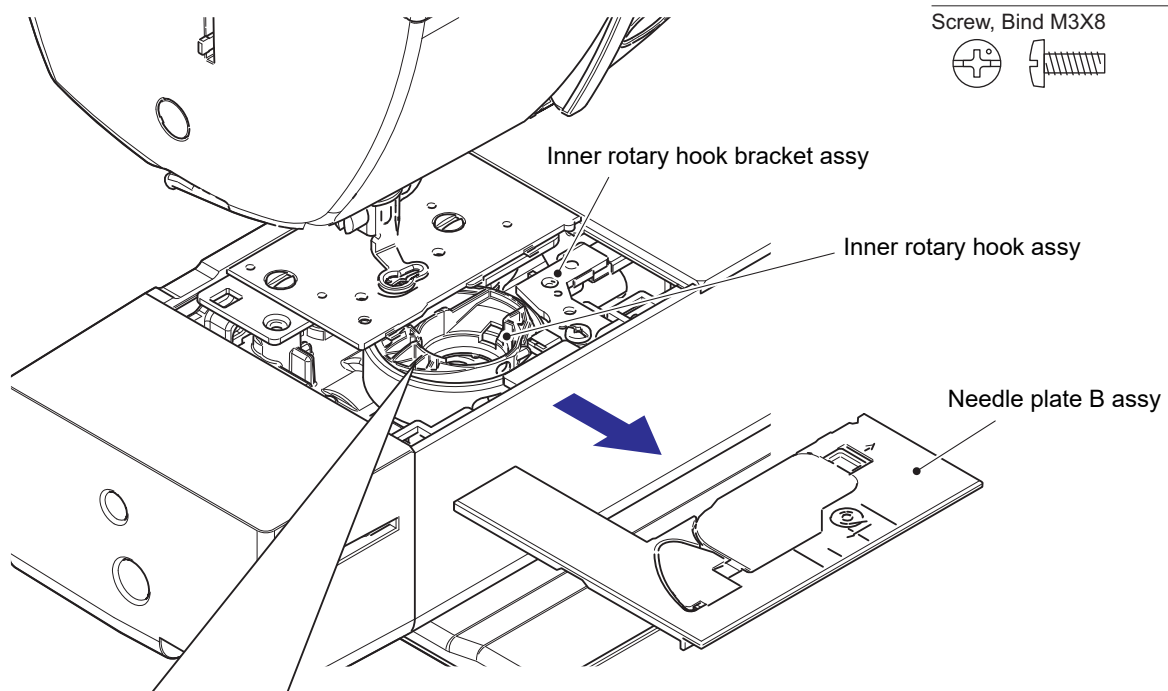
[Standard]

The overlap between the spring plate of the inner rotary hook bracket assy and the protrusion A of the inner rotary hook assy in the front/back direction should be 1.7 ± 0.1 mm (1.6 to 1.8 mm).



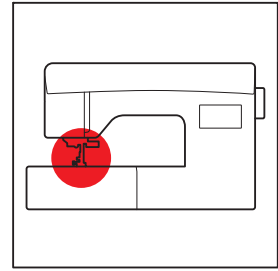
[Adjustment]

1. Remove the needle plate B assy.
2. Set the inner rotary hook assy into the outer rotary hook assy.
3. Loosen the screw of the inner rotary hook bracket assy.
4. Move the position of the inner rotary hook bracket assy (forward and back), and adjust the overlap between the spring plate of the inner rotary hook bracket assy and the protrusion A of the inner rotary hook assy.
5. Tighten the screw of the inner rotary hook bracket assy to secure the inner rotary hook bracket assy to the stopper plate block assy.



[Standard]

- The thread is wound to the bobbin uniformly.
- The amount of the thread wound to the bobbin is the outside diameter of the bobbin of 80 to 90%.



[Adjustment]

1. Attach the front cover and the rear cover when they are removed.
2. Set an empty bobbin to your sewing machine, wind the thread and check the winding status.
3. Loosen the screw A of the bobbin winder guide assy.
4. Move the bobbin winder guide assy up and down to adjust it so that the thread is wound to the bobbin uniformly.

***Key point**

- When the winding is biased toward the upper side of the bobbin, move the bobbin winder guide assy down. (See a in Fig.1)
 - When the winding is biased toward the lower side of the bobbin, move the bobbin winder guide assy up. (See b in Fig.1)
5. Tighten the screw A of the bobbin winder guide assy.

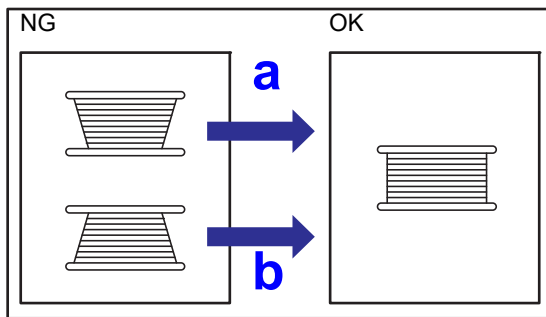
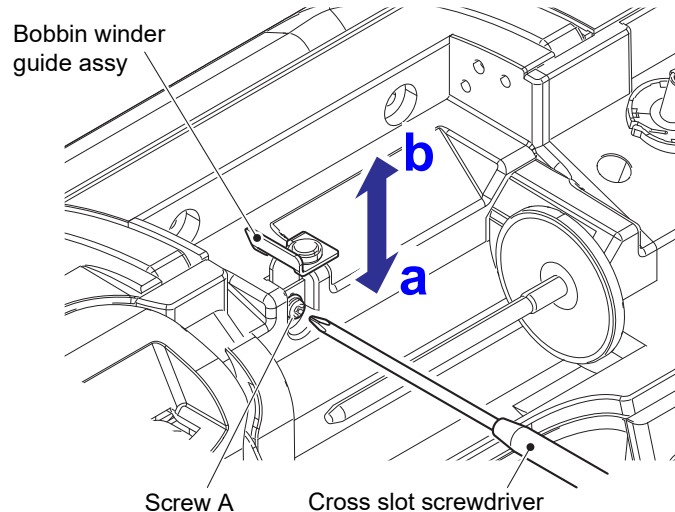
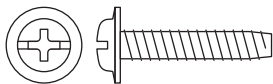


Fig.1

Screw A

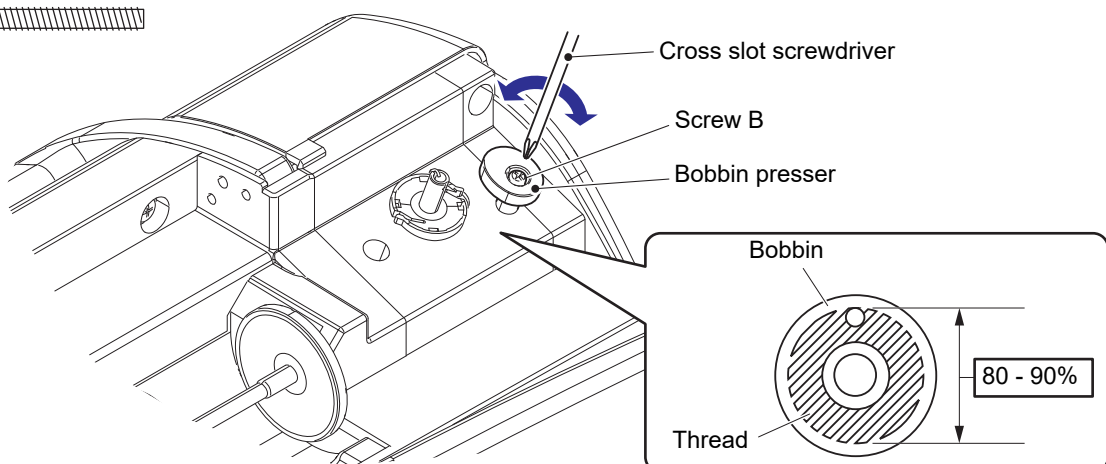
Taptite, Cup P M3X7



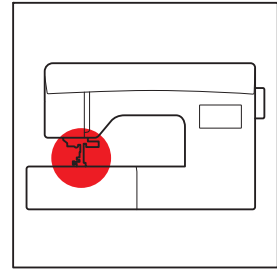
6. Loosen the screw B of the bobbin presser.
7. Move the bobbin presser left and right to adjust the amount of the thread wound to the bobbin.
8. Tighten the screw B of the bobbin presser to secure the bobbin presser.

Screw B

Screw, Pan (S/P washer) M3X25



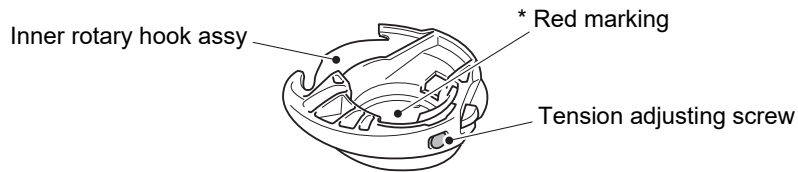
The lower thread tension shown in this adjustment is factory set. Its optimum value may vary depending on conditions of use by user.



[Standard]

When the schappe spun thread #90 is pulled from the inner rotary hook assy* slowly with the tension gauge, the thread tension should be 0.17 to 0.25 N (17 to 25 gf).

* Inner rotary hook assy for utility stitching with red marking on the center of the bottom surface.

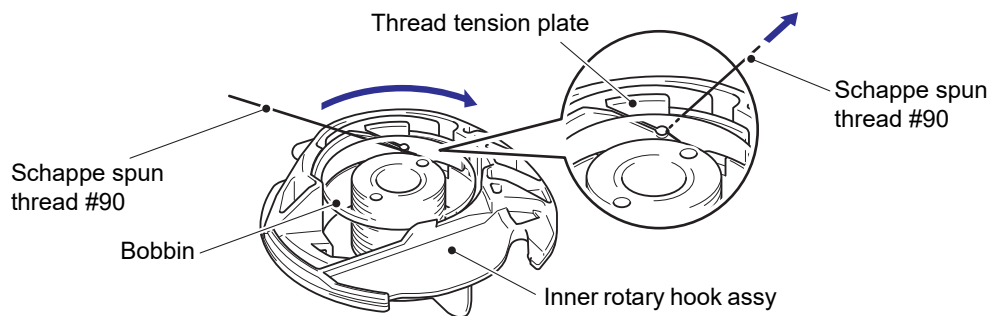


[Adjustment]

1. Remove the needle plate B assy.
2. Remove the inner rotary hook assy.
3. Set the bobbin (with the schappe spun thread #90) in the inner rotary hook assy, and pass the thread through the groove of the thread tension plate.

***Key point**

- Pass the thread fully into the back of the groove of the thread tension plate.



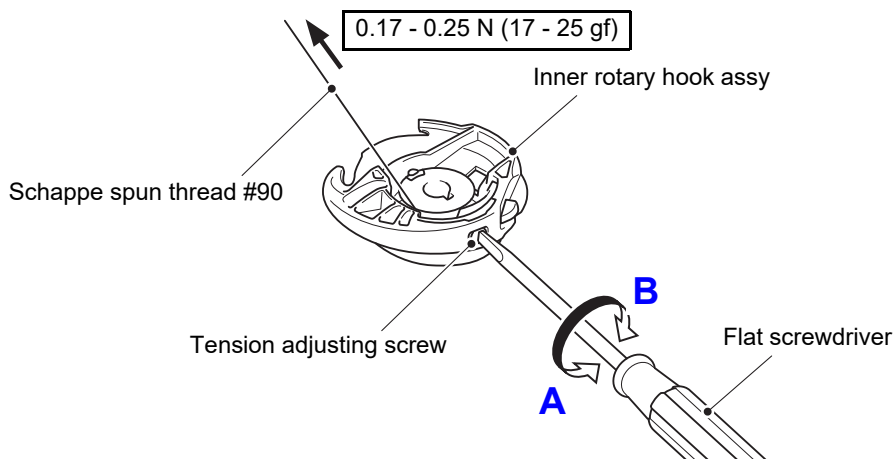
4. Pull the thread slowly from the inner rotary hook assy with the tension gauge, and check the thread tension.
5. Adjust the thread tension by turning the tension adjusting screw of the inner rotary hook assy.

***Key point**

- Loosen the screw (turn to the direction of "A"). → The thread tension gets looser.
- Tighten the screw (turn to the direction of "B"). → The thread tension gets tighter.

XA9153001

Tension gauge 30 (0.3N)



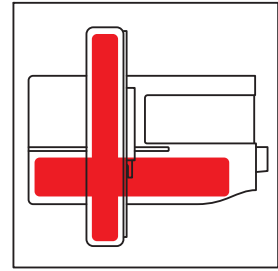
■ X timing belt

[Standard]

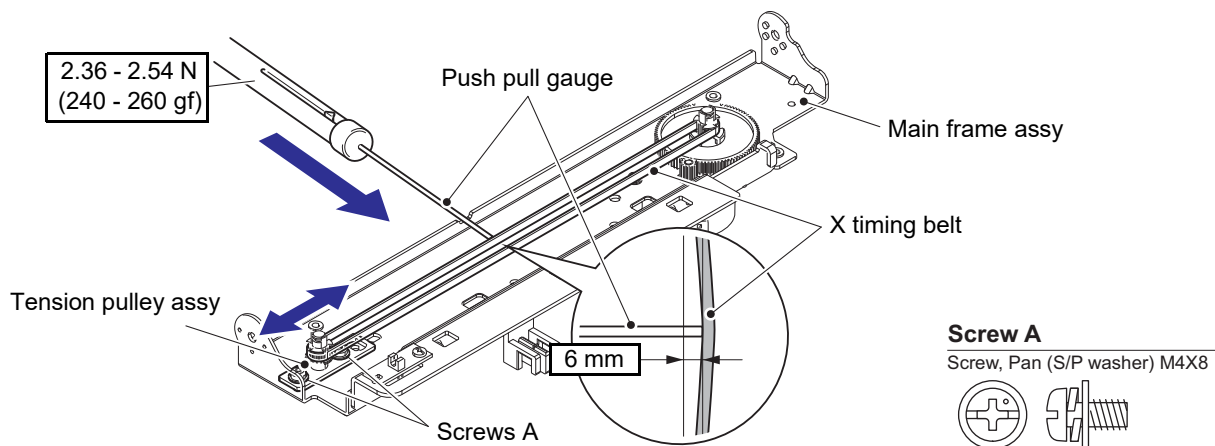
The pushing force to make 6 mm slack at the center of the X timing belt should be 2.36 to 2.54 N (240 to 260 gf).

[Adjustment]

1. Loosen the 2 screws A of the tension pulley assy.
2. Move the tension pulley assy right and left to adjust the X timing belt tension.
3. Tighten the 2 screws A of the tension pulley assy to secure the tension pulley assy to the main frame assy.



XC2277001	Push pull gauge (5N)
-----------	----------------------



■ Y timing belt

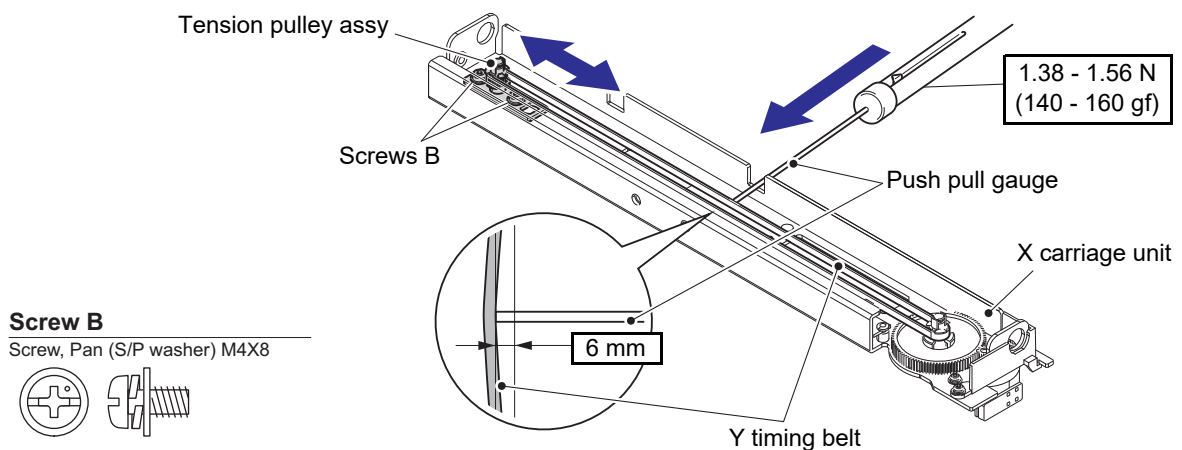
[Standard]

The pushing force to make 6 mm slack at the center of the Y timing belt should be 1.38 to 1.56 N (140 to 160 gf).

[Adjustment]

1. Loosen the 2 screws B of the tension pulley assy.
2. Move the tension pulley assy right and left to adjust the Y timing belt tension.
3. Tighten the 2 screws B of the tension pulley assy to secure the tension pulley assy to the X carriage unit.

XC2277001	Push pull gauge (5N)
-----------	----------------------



[Standard]

The clearance between the ES main cover assy and the E hoop stay plate assy should be 3.5 ± 0.2 mm (3.3 to 3.7 mm).

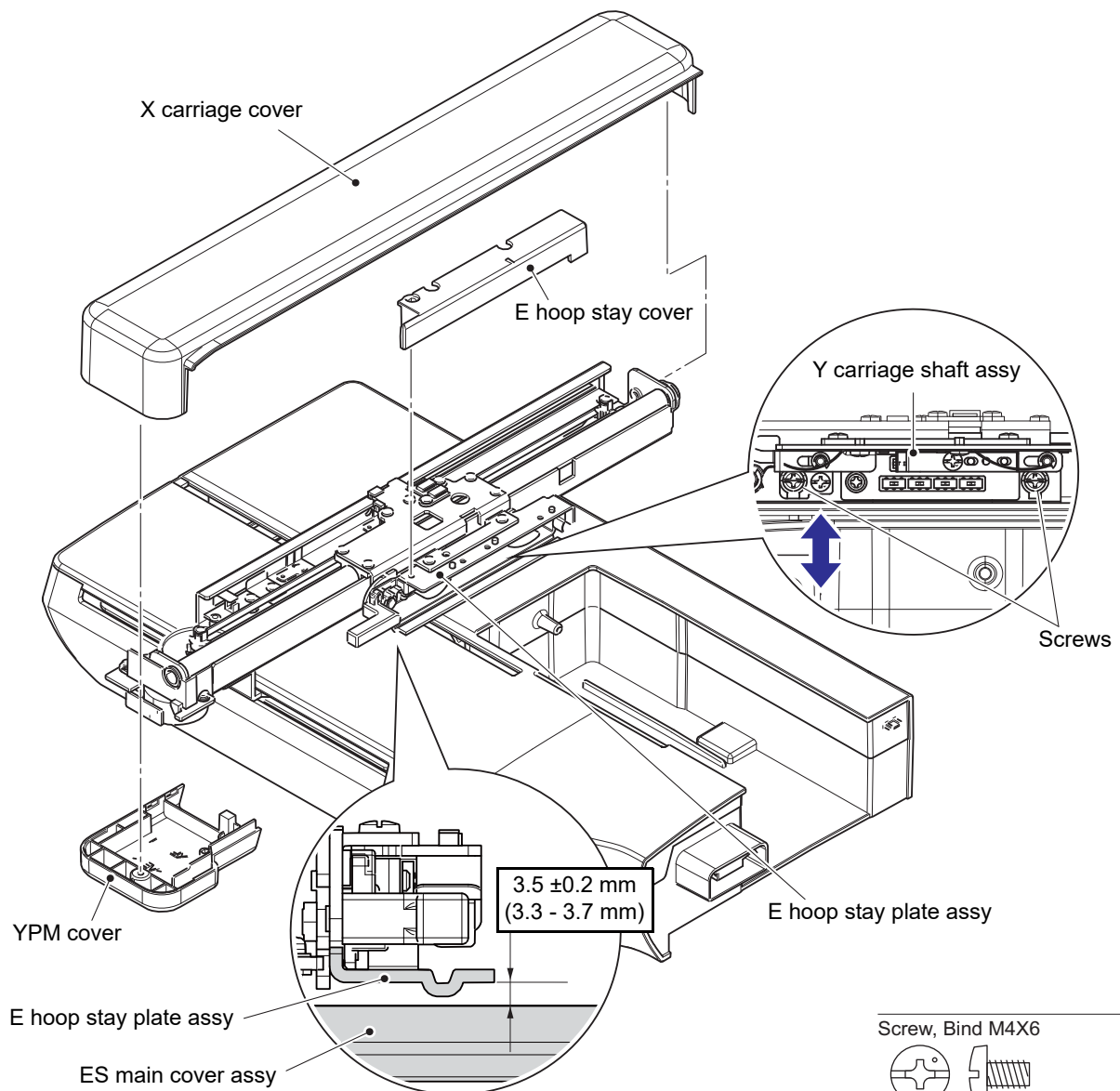
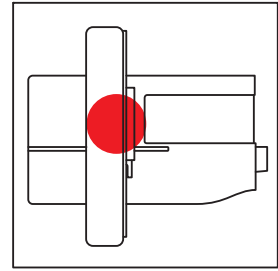
[Adjustment]

1. Attach the embroidery unit to the machine.


***Note**

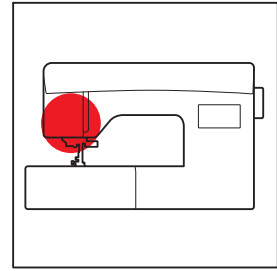
- Be sure to remove the embroidery frame from the embroidery unit.

2. Turn on the machine, and press the **OK** button on the screen (carriage moves automatically).
3. Turn off the machine.
4. Remove the embroidery unit from the machine.
5. Remove the X carriage cover and the YPM cover from the embroidery unit. (Refer to "3-69".)
6. Remove the E hoop stay cover from the embroidery unit. (Refer to "3-70".)
7. Loosen the 2 screws of the E hoop stay plate assy.
8. Adjust the clearance between the ES main cover assy and the E hoop stay plate assy by moving the E hoop stay plate assy up and down.
9. Tighten the 2 screws of the E hoop stay plate assy to secure the E hoop stay plate assy to the Y carriage shaft assy.



[Standard]

In the test mode #23, the needle point should drop into the center of embroidery sheet hole when the needle is lowered by pressing the  button on the screen.



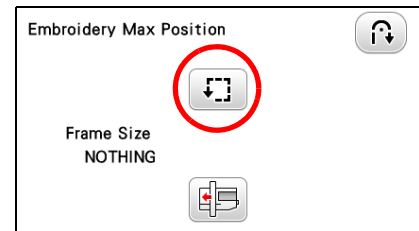
[Adjustment]


1. Remove the presser foot.
2. Attach the size 75/11 needle.
3. Turn off the machine, and then attach the embroidery unit to the machine.

***Note**

- Be sure to remove the embroidery frame from the embroidery unit beforehand.

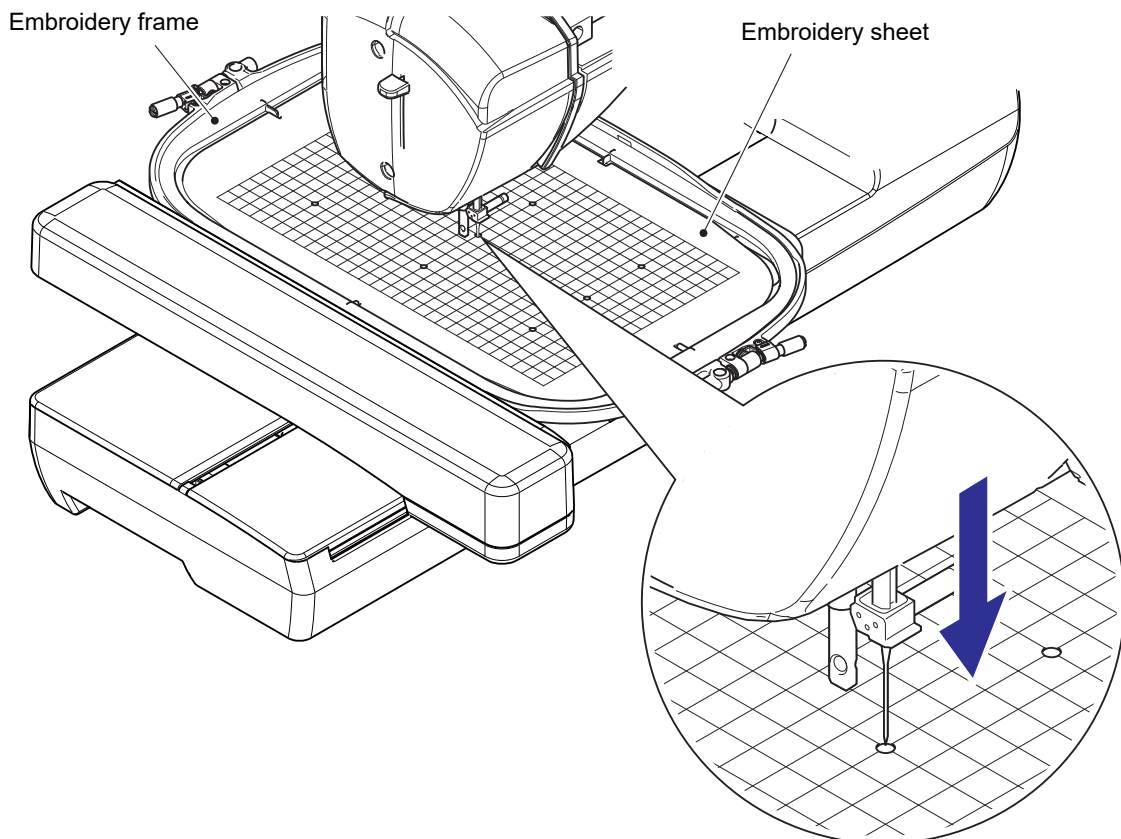
4. Start the test mode, and then select the #23 (Embroidery Max Position mode).
5. Attach the extra large embroidery frame (180 x 130 mm, 7 x 5 inch) to the embroidery unit.
6. Put the embroidery sheet on the embroidery frame.



7. Press the  button on the screen (carriage moves automatically).
8. Turn the pulley by hand to drop the needle point to the embroidery sheet and check the position of the needle point. (Adjustment completed)

***Key point**

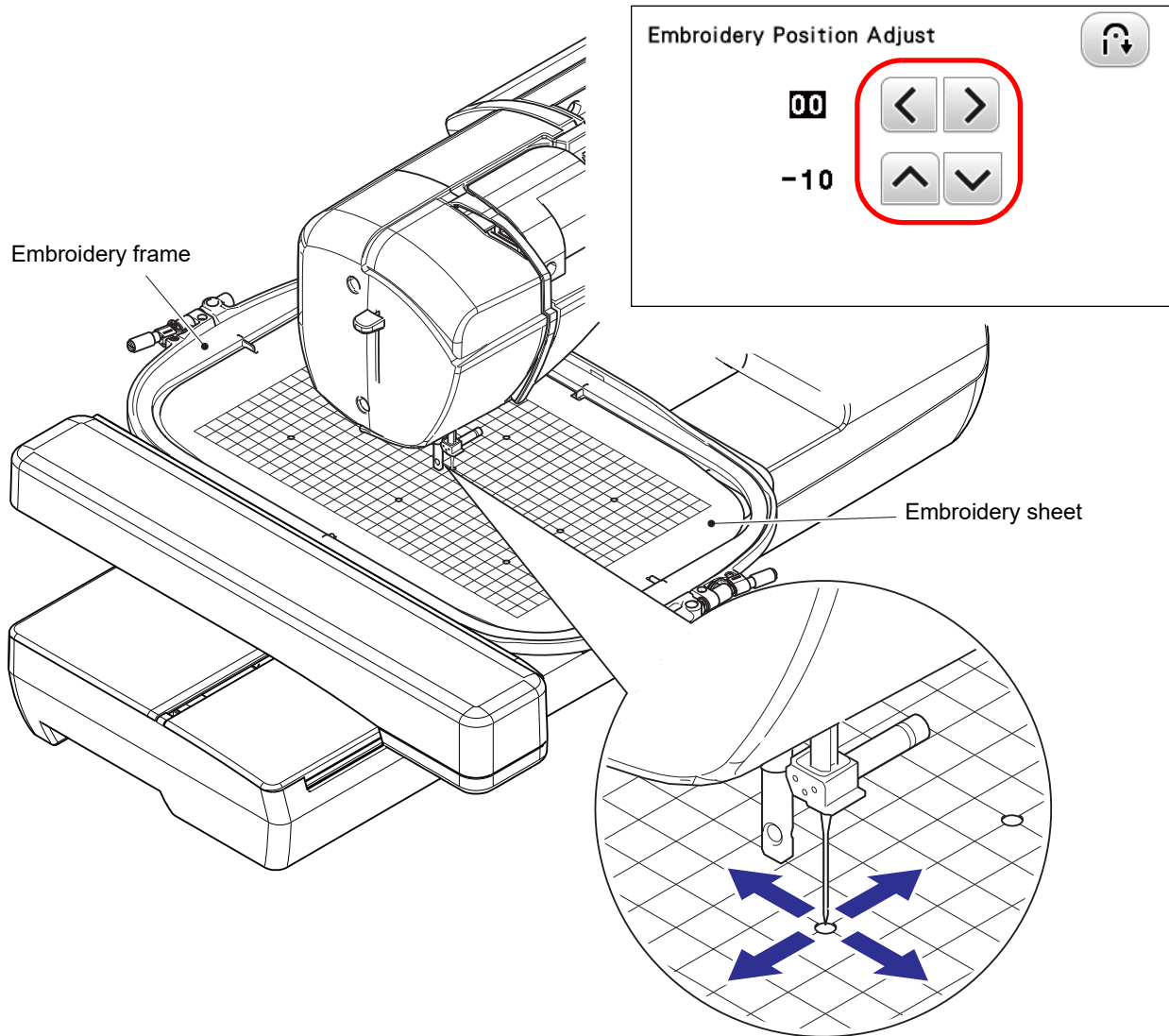
- To adjust the needle point position, refer to the next page.



<To next page>

<From previous page>

- If the needle point doesn't drop into the hole on the center of the embroidery sheet, adjust the needle point position according to procedures below.
1. Select the #08 (Embroidery Position Adjust mode).
 2. Press the position adjustment button on the screen to adjust the needle point position.
 3. Turn off the machine to input the set value to the machine.
 4. Remove the embroidery frame.
 5. Go back to procedure 4 on the previous page and check the needle point position.

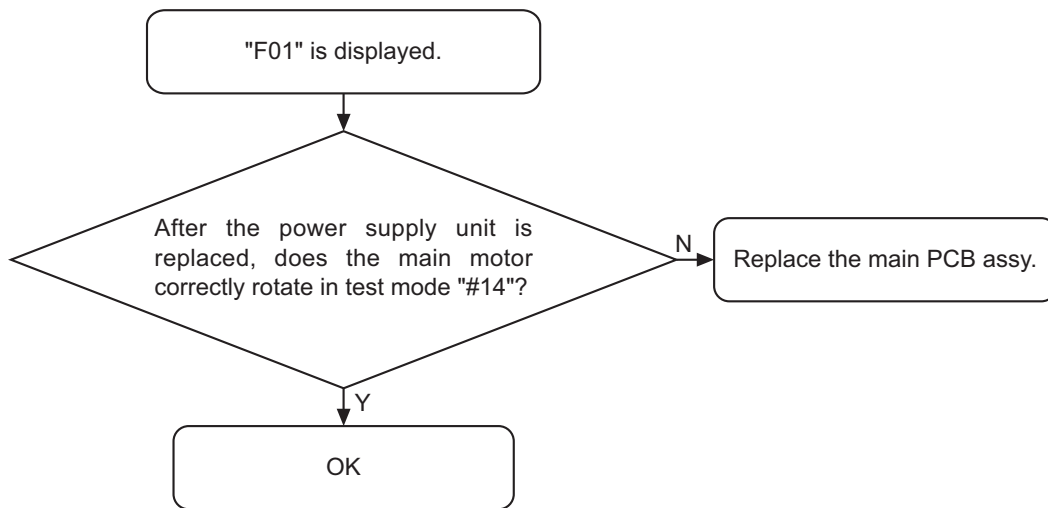


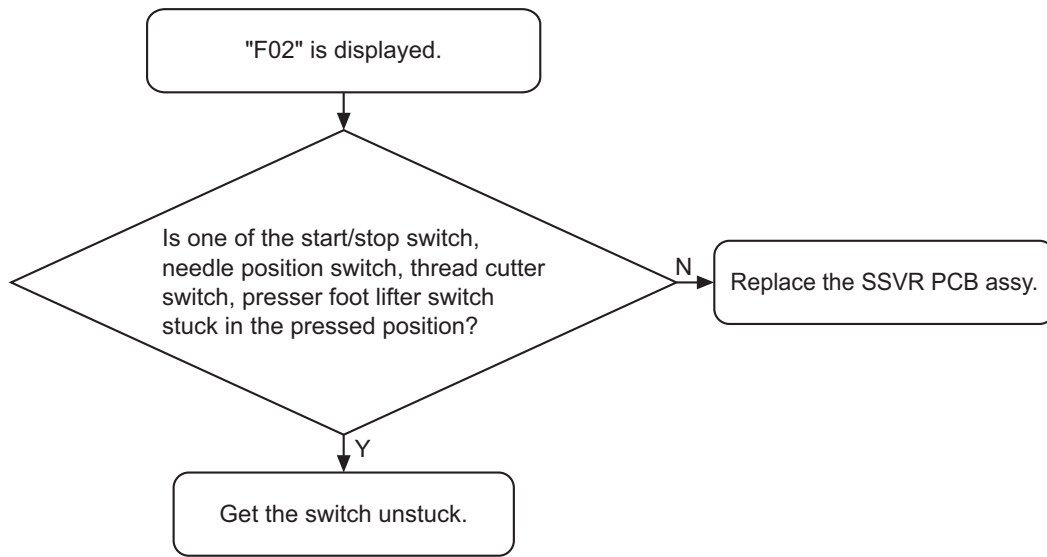
5 Troubleshooting for Electronic Parts

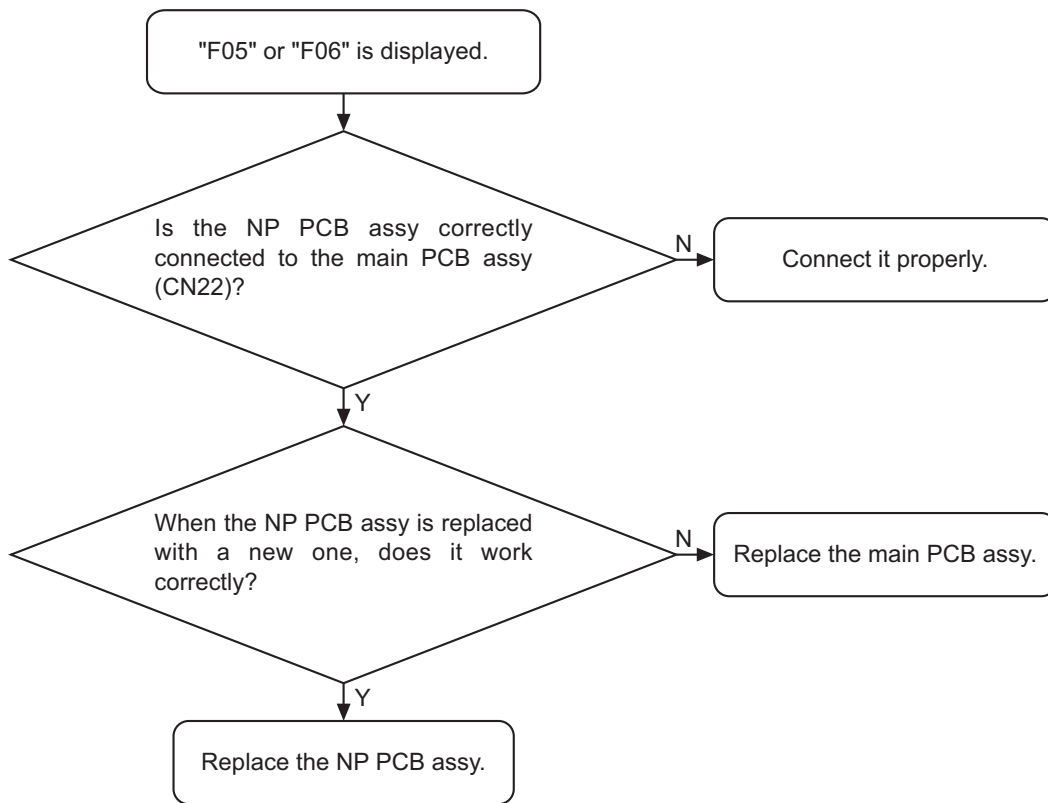
Error message list	5 - 2
Error is displayed	5 - 3
Replacement of main PCB assy or panel PCB assy	5 - 6
Display position of parts code of PCB	5 - 7

If any message listed below is displayed on the screen of the machine, an error might have been occurred in the machine.
Identify the location with the problem by following the procedures in the reference page and repair it.

#	Error Message	Refer to:
F01	MAIN MOTOR SPEED	(5 - 3)
F02	NP SW ON	(5 - 4)
↑	TC SW ON	(5 - 4)
↑	PFT SW ON	(5 - 4)
F05	SPEED SENSOR	(5 - 5)
F06	NP SENSOR BREAK	(5 - 5)







Do not replace the main PCB assy and panel PCB assy simultaneously.

The setting data required to run the sewing machine correctly is stored in both the main PCB assy and panel PCB assy. When either PCB assy is replaced, the setting data will be automatically copied from the other to the new PCB assy.

If you replace the main PCB assy and panel PCB assy simultaneously, the setting data stored in the sewing machine cannot be copied to the new PCBs, resulting in malfunction of the sewing machine. When both PCB assies need to be replaced, be sure to replace them one at a time.

When the main PCB assy or panel PCB assy is replaced, the setting data stored in the sewing machine will be automatically copied to the new PCB. However, the screen shown in Fig. 1 may appear depending on the new PCB. In that event, follow the steps below to complete copying correctly.

1. Select "Main PC Board" 1 when the main PCB assy was replaced, or select "Panel PC Board" 2 when the panel PCB assy was replaced. (Fig. 1)
"COPYING *** To Machine" appears on the screen and the machine starts copying the setting data stored in the machine automatically.

***Note 1**

- Do not select a PCB other than from the one that has been replaced.
The setting data stored in the sewing machine cannot be copied correctly, resulting in malfunction of the sewing machine.

***Note 2**

- Do not turn OFF the power of the sewing machine while the "COPYING *** To Machine" is displayed. Do not touch any button or touch panel of the sewing machine.
The setting data stored in the sewing machine cannot be copied correctly, resulting in malfunction of the sewing machine.

2. When copying the setting data is completed, the sewing machine restarts automatically.
* Replacement of the PCB assy is completed.

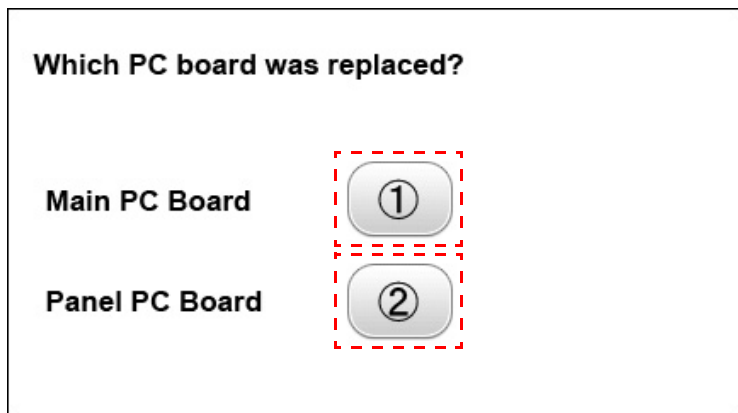
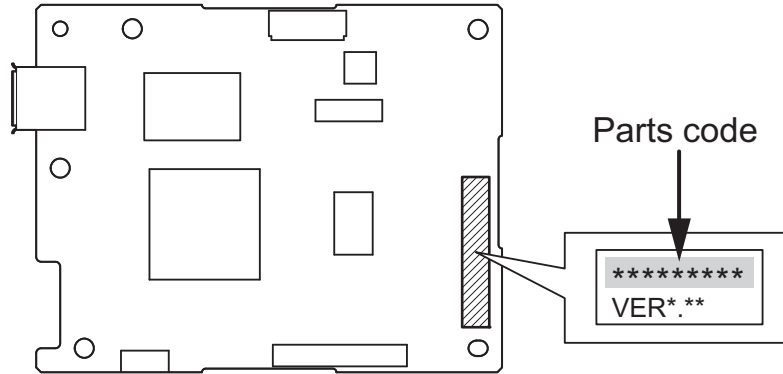


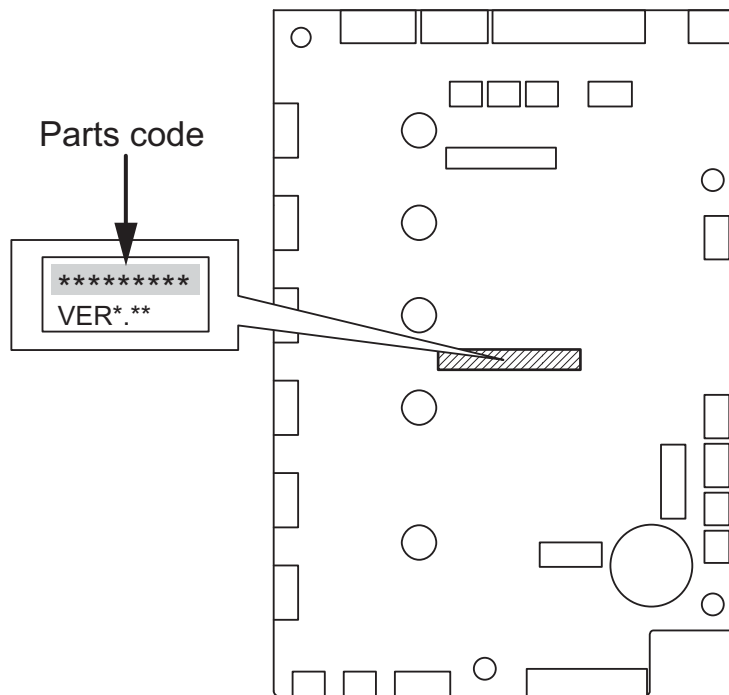
Fig. 1

* Check the part code of the PCB in the parts list and replace it with an appropriate PCB.

■ Panel PCB



■ Main PCB



6 Maintenance

How to reset counter of the maintenance	6 - 2
Necessary grease & oil	6 - 3
Maintenance point.....	6 - 4

When the operating time of the machine reaches 500 hours, the maintenance message (MSG) will be displayed on the LCD. And then do the maintenance according to the instructions of 6-4 to 6-7, and finally reset the hour counter according to the following instructions.

***Key point**

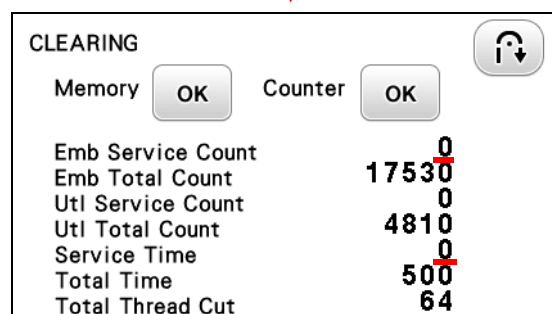
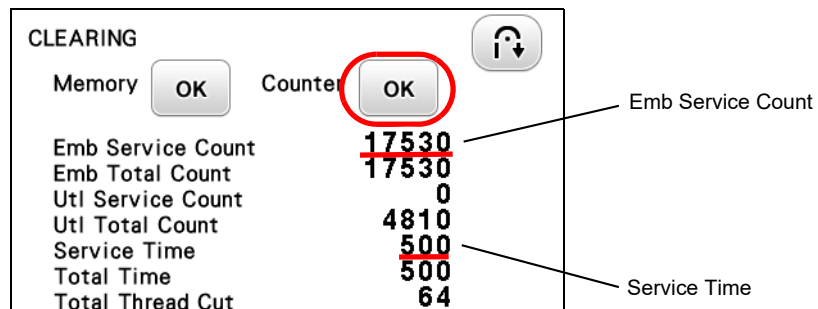
- The MSG (shown right) will appear on the LCD when the machine is turned on after an hour counter reaches 500 hours.
- The MSG appears up to 3 times, and will not come up when the machine is turned on from the 4th time.
- If an hour counter is still not reset (any maintenance has not been done) at 500 hours, the MSG will come up again at 600 hours and 700 hours (also up to 3 times each).
- If an hour counter reaches 1000 hours, the MSG will appear on the LCD every time when the machine is turned on until the hour counter is reset.

Preventive maintenance is recommended.

OK

How to reset counter

1. Start the test mode, and then select the #19 (Clearing memory/Clearing counter mode).
2. Reset the “Emb Service Count” and “Service Time” by pressing the **OK** button next to the “Counter” on the screen.



Grease



1) Name: MOLYKOTE EM30L
Part #: XC8385001



2) Name: EPNOC AP(N) 0
Part #: XC8387001



3) Name: MOLYKOTE M DISPERSION
Part #: XC8386001

Oil



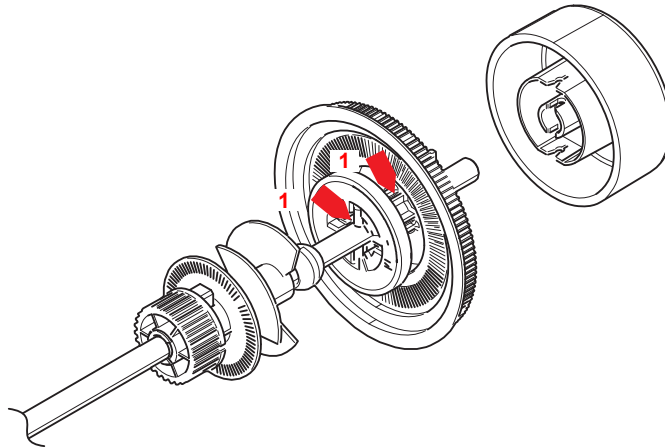
4) Name: FBK OIL RO 100
Part #: XC8388001



5) Name: OILER
Part #: XZ0206051

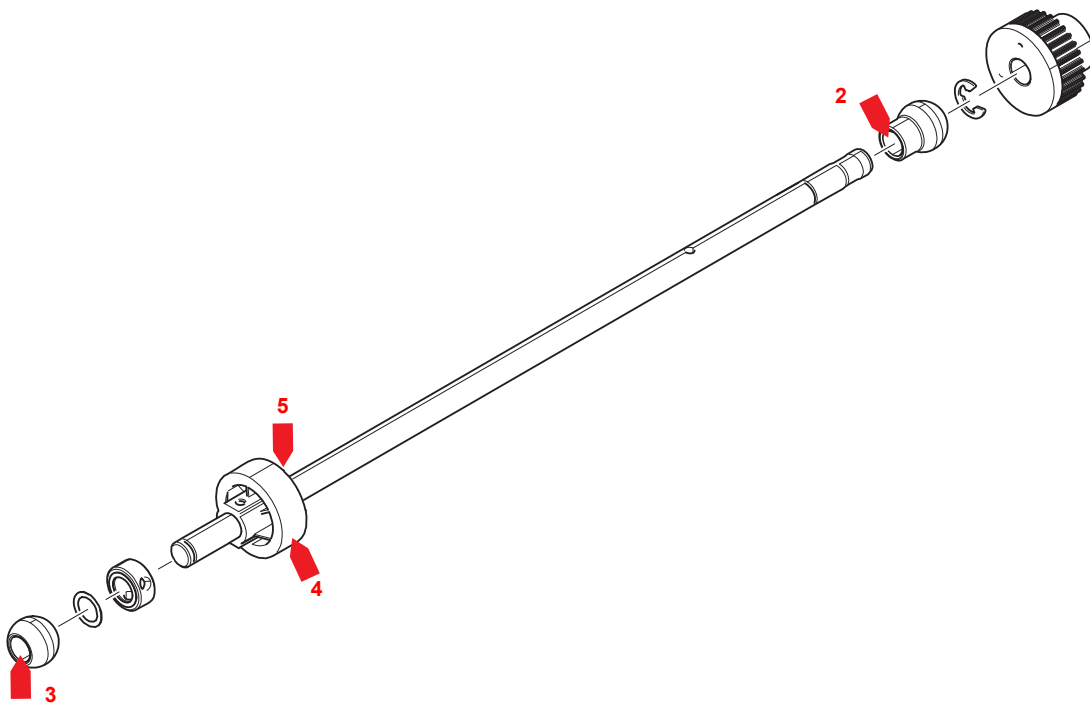
- The circle in the illustration of the below figure shows the lubrication area, and the arrow shows the lubrication position.

1. Upper shaft unit



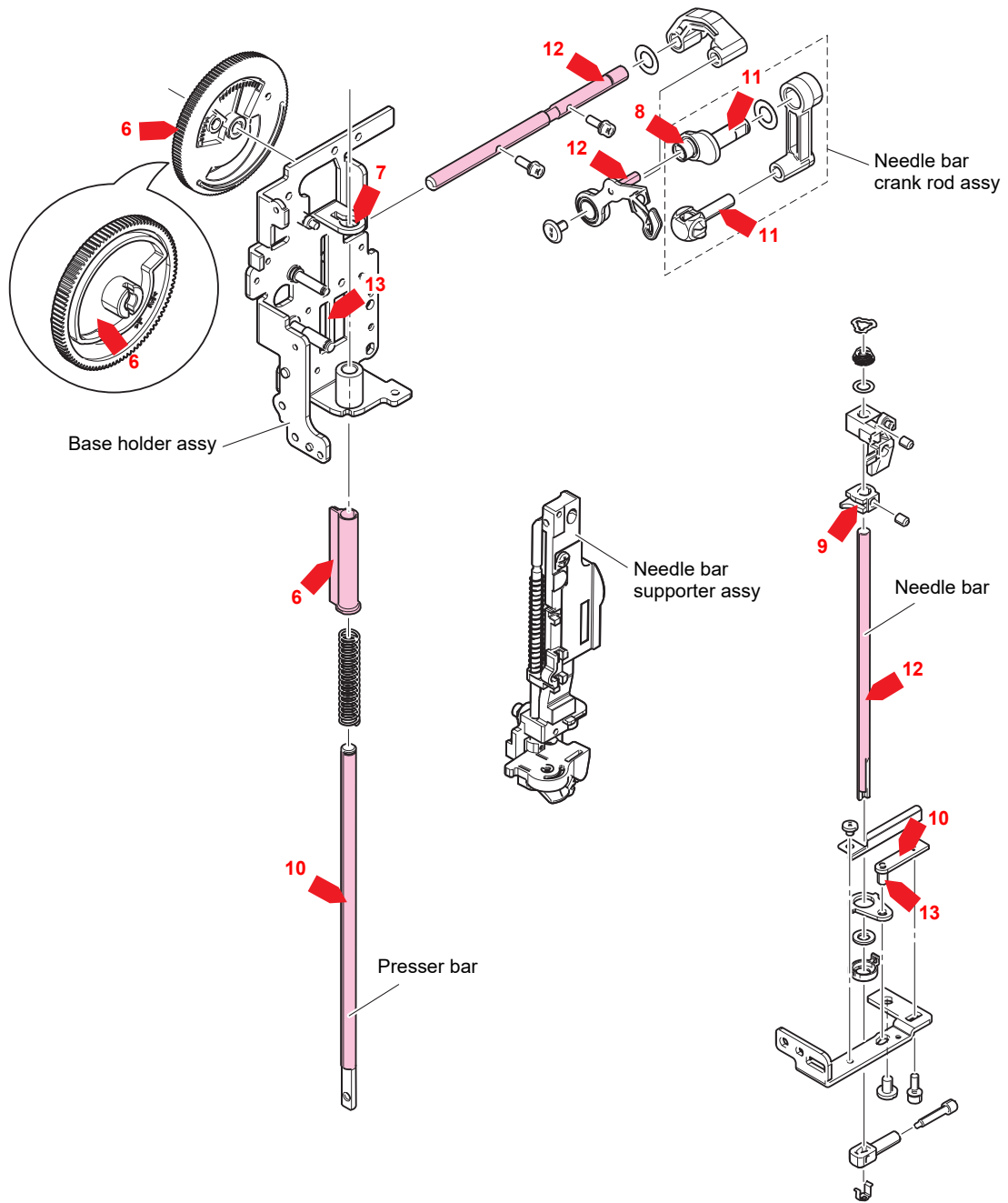
	Grease/Oil (Parts code)	Spread
1	MOLYKOTE EM30L (XC8385001)	Small bead

2. Lower shaft unit



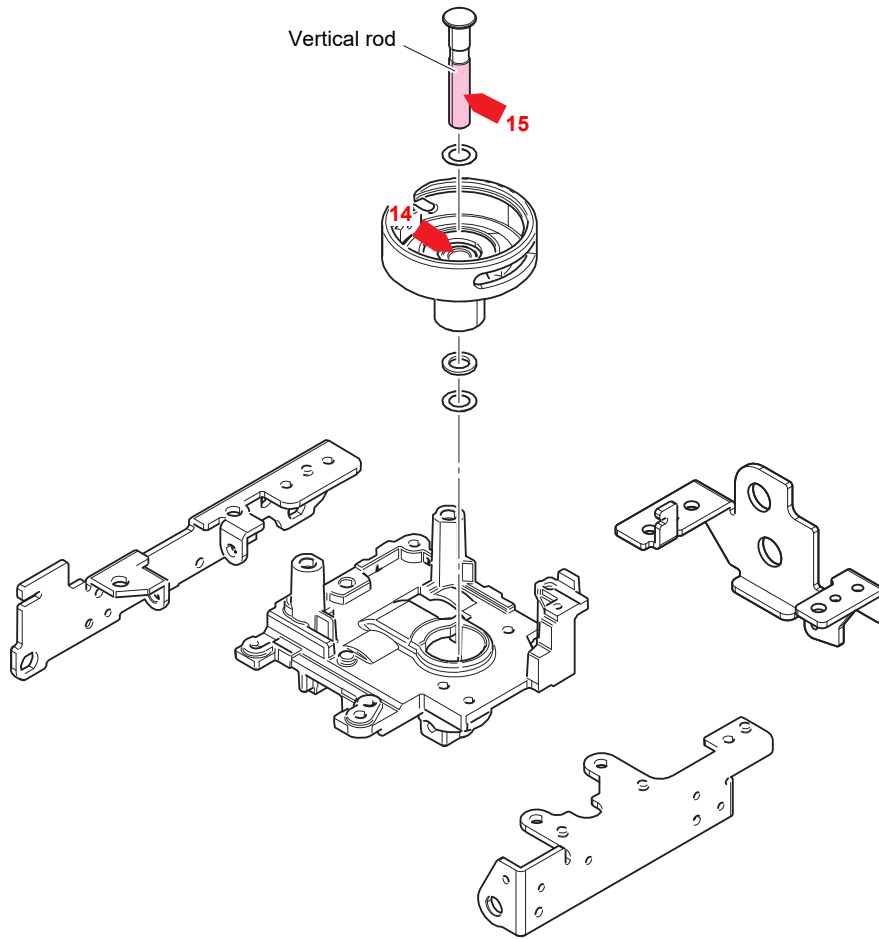
	Grease/Oil (Parts code)	Spread		Grease/Oil (Parts code)	Spread
2	FBK OIL RO 100 (XC8388001)	1 - 2 drops	4	MOLYKOTE EM30L (XC8385001)	Small bead
3	FBK OIL RO 100 (XC8388001)	2 - 3 drops	5	EPNOC AP(N) 0 (XC8387001)	Small bead

3. Needle bar module



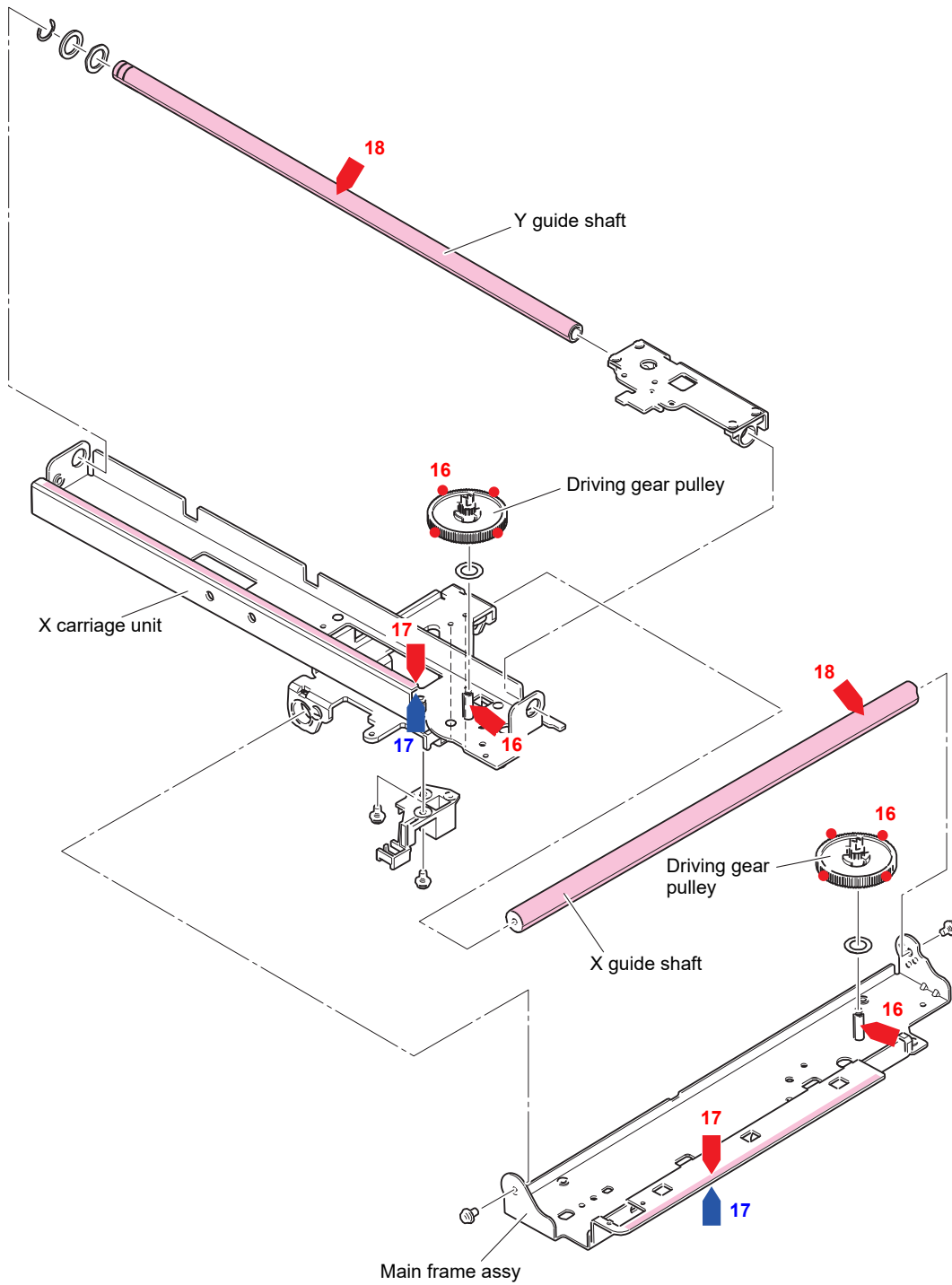
	Grease/Oil (Parts code)	Spread		Grease/Oil (Parts code)	Spread
6	MOLYKOTE EM30L (XC8385001)	Thinly all surface	10	FBK OIL RO 100 (XC8388001)	1 - 2 drops
7	MOLYKOTE EM30L (XC8385001)	Rice-grain size	11	MOLYKOTE M DISPERSION (XC8386001)	1 - 2 drops
8	MOLYKOTE EM30L (XC8385001)	Small bead	12	OILER (XZ0206051)	Rice-grain size
9	EPNOC AP(N) 0 (XC8387001)	Light covering	13	EPNOC AP(N) 0 (XC8387001)	Rice-grain size

4. Feed module



	Grease/Oil (Parts code)	Spread		Grease/Oil (Parts code)	Spread
14	MOLYKOTE EM30L (XC8385001)	Small Bead	15	OILER (XZ0206051)	Rice-grain size

5. Embroidery unit



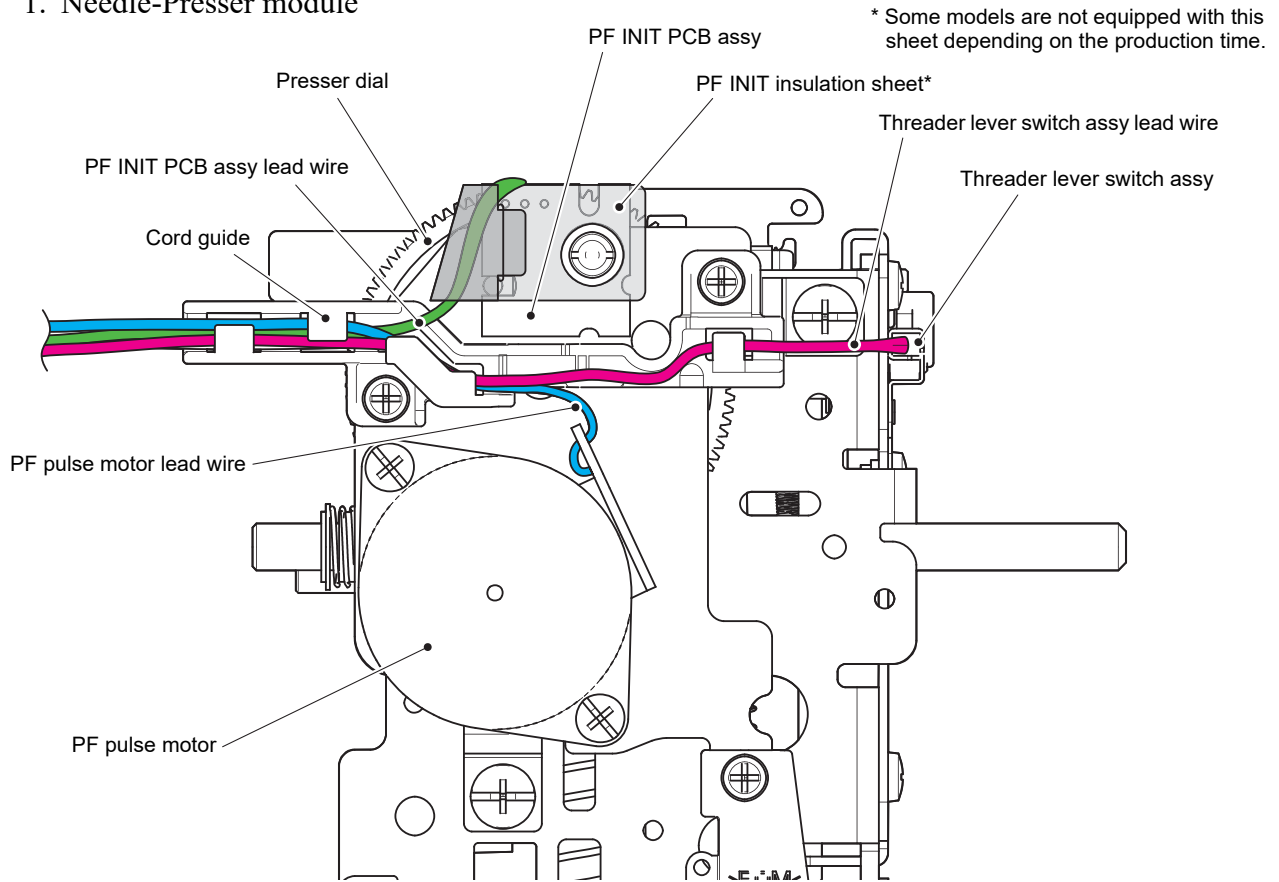
	Grease/Oil (Parts code)	Spread		Grease/Oil (Parts code)	Spread
16	MOLYKOTE EM30L (XC8385001)	Small Bead	18	OILER (XZ0206051)	Light covering
17	EPNOC AP(N) 0 (XC8387001)	Light covering			

- EPNOC AP(N) 0 in the following rations.
Grease on the both sides.

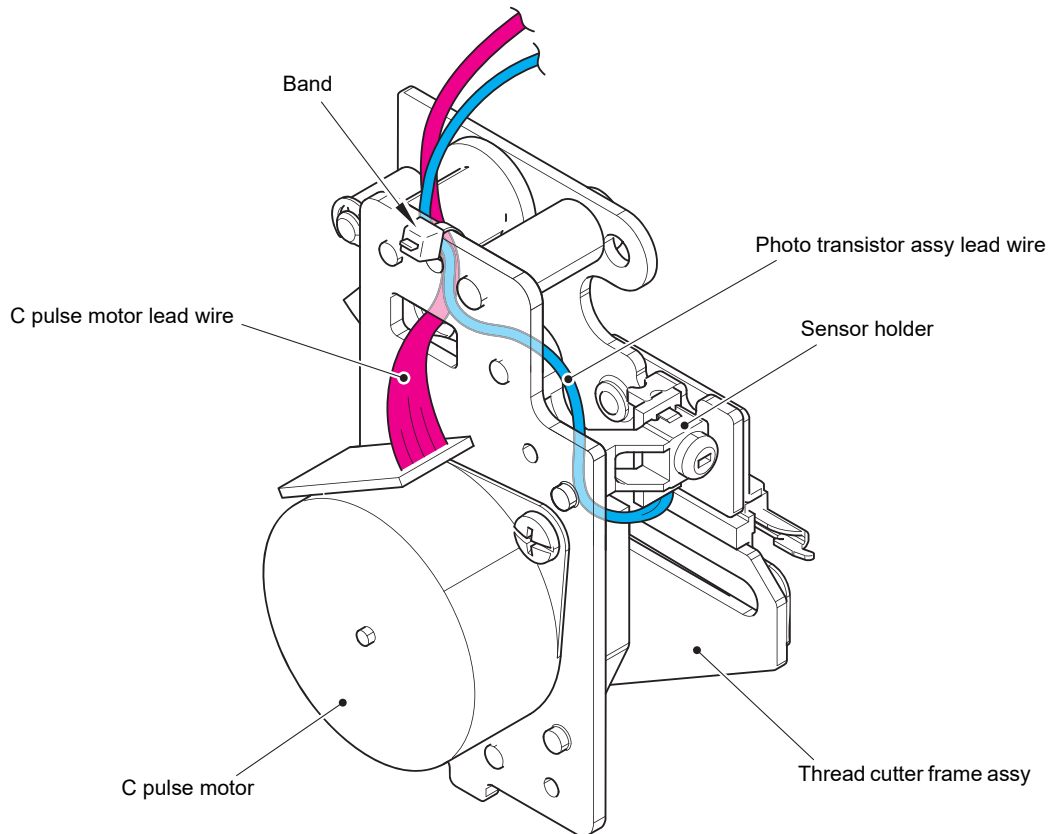
7 Special Instructions of Wiring

Module wiring	7 - 2
Main body wiring	7 - 5
Front cover wiring	7 - 13
Embroidery unit wiring	7 - 16

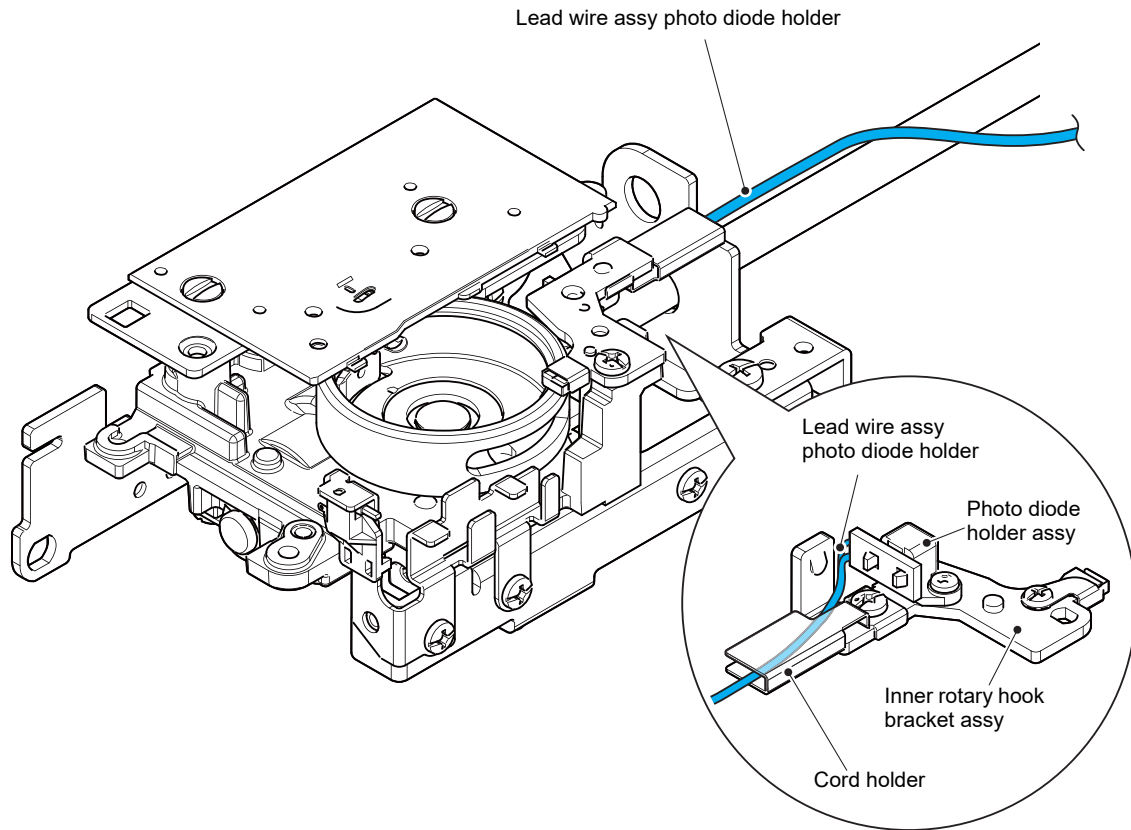
1. Needle-Presser module



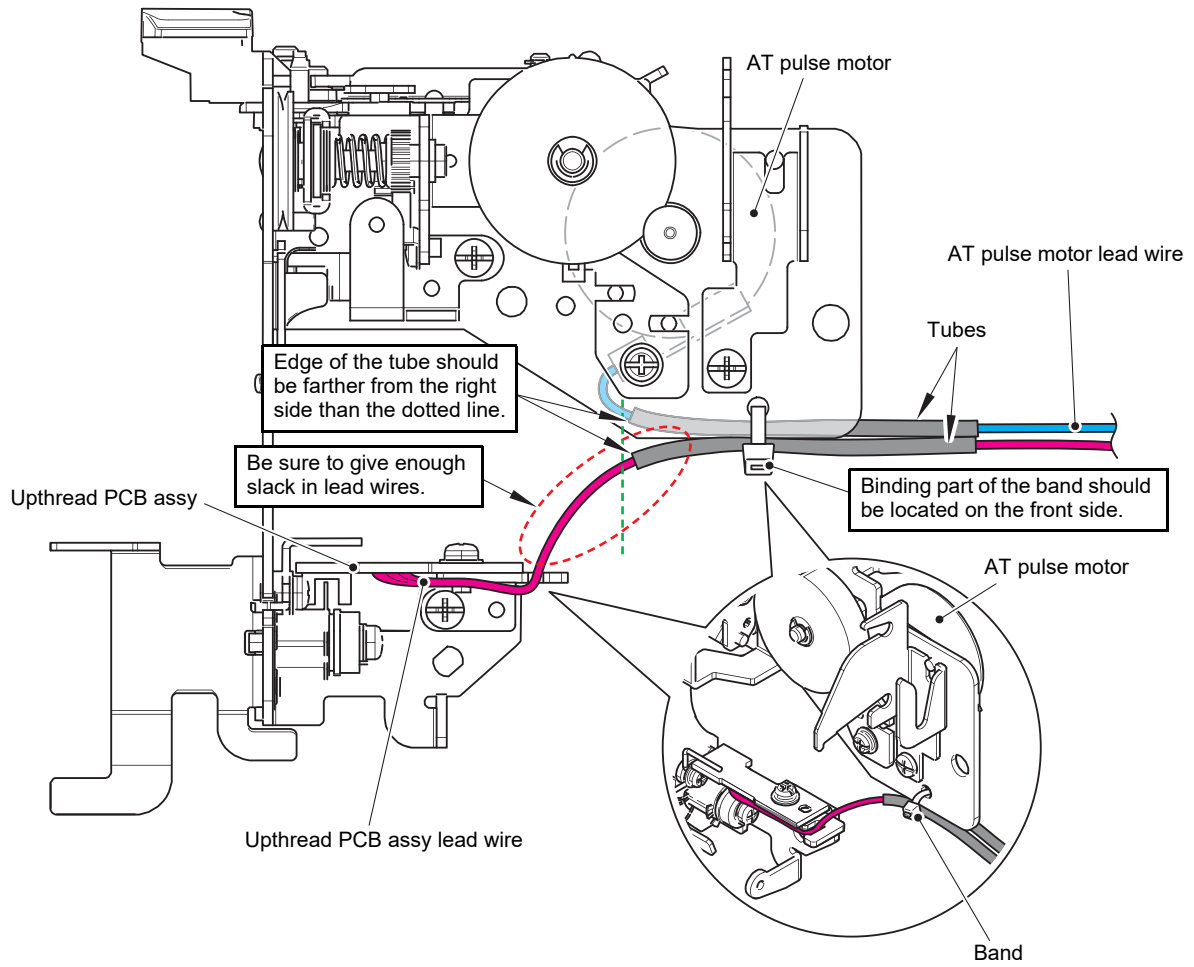
2. Thread cutter module



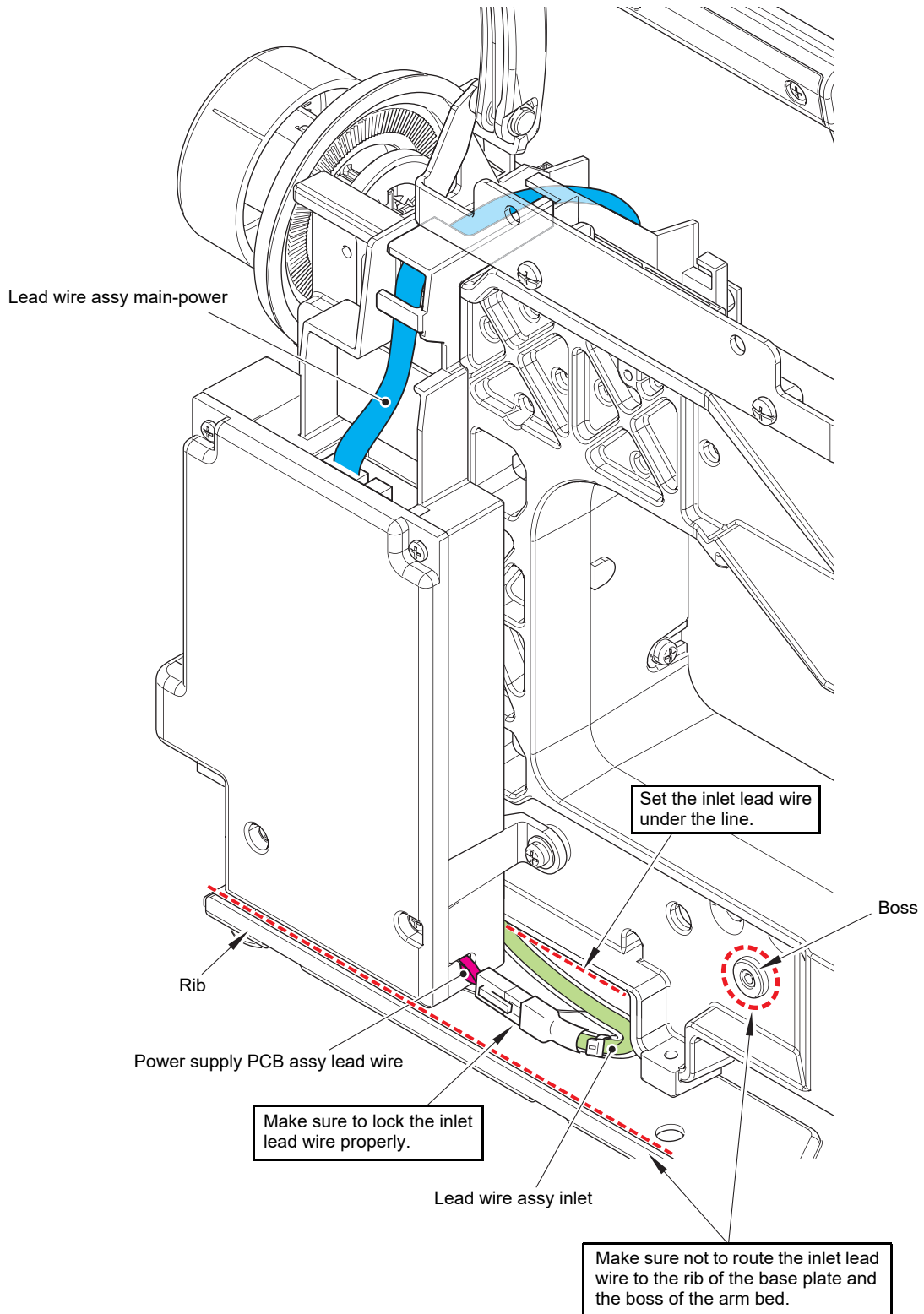
3. Feed module



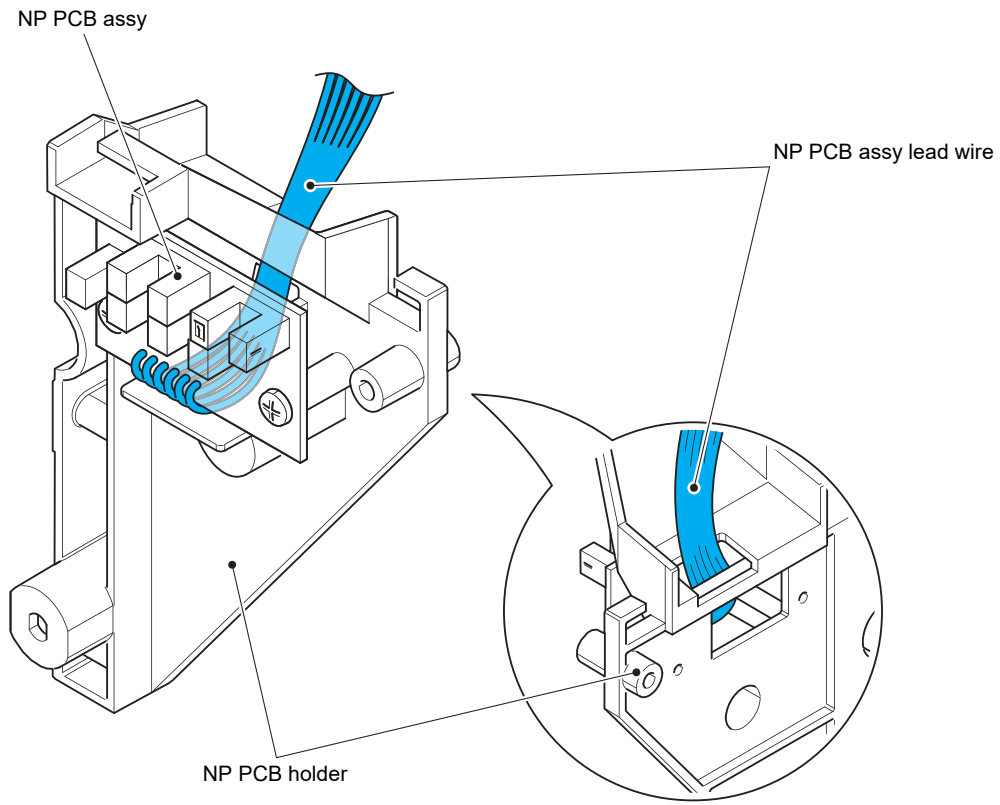
4. Needle thread module



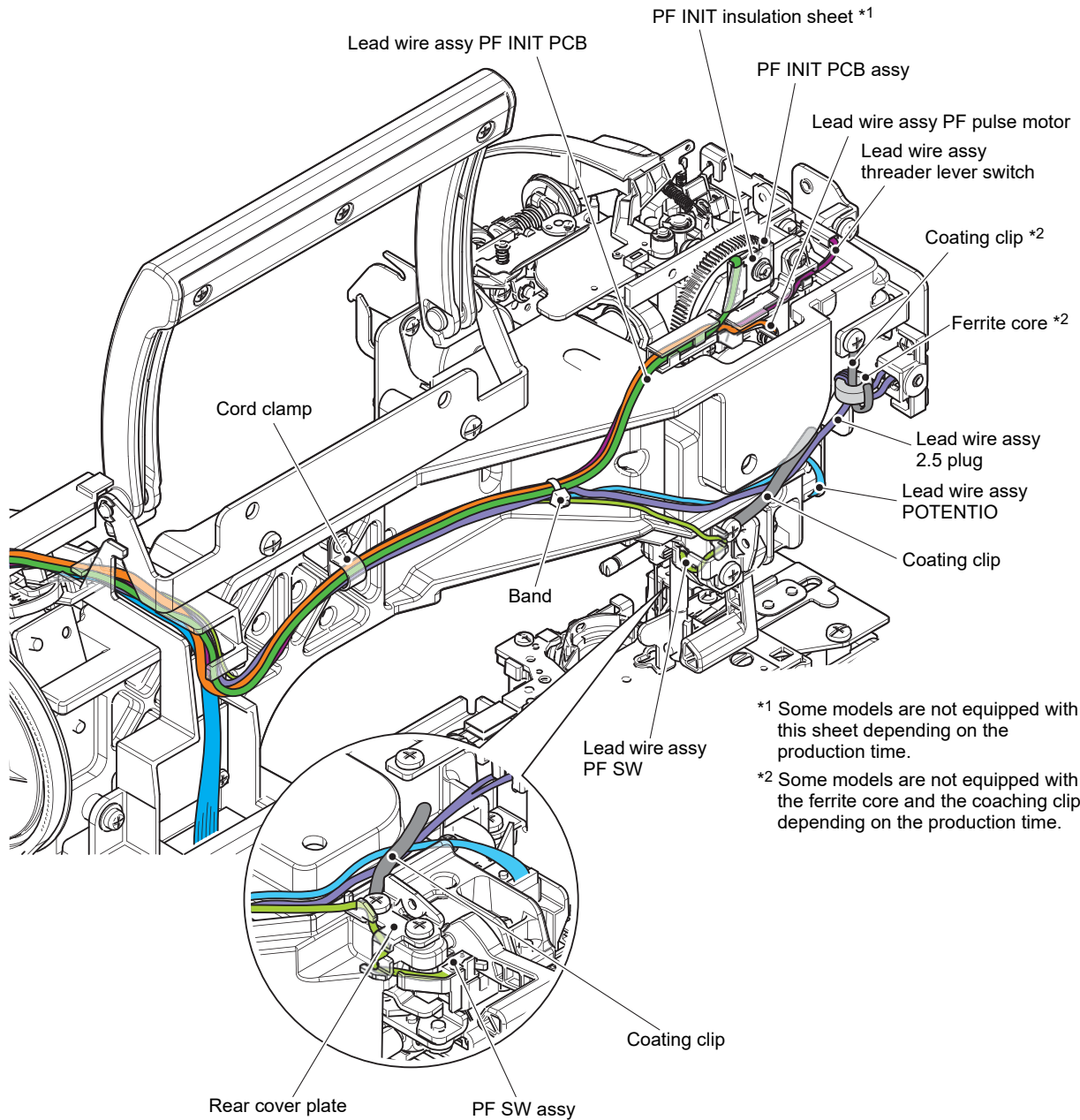
1. Power unit



2. NP PCB assy



3. Presser module



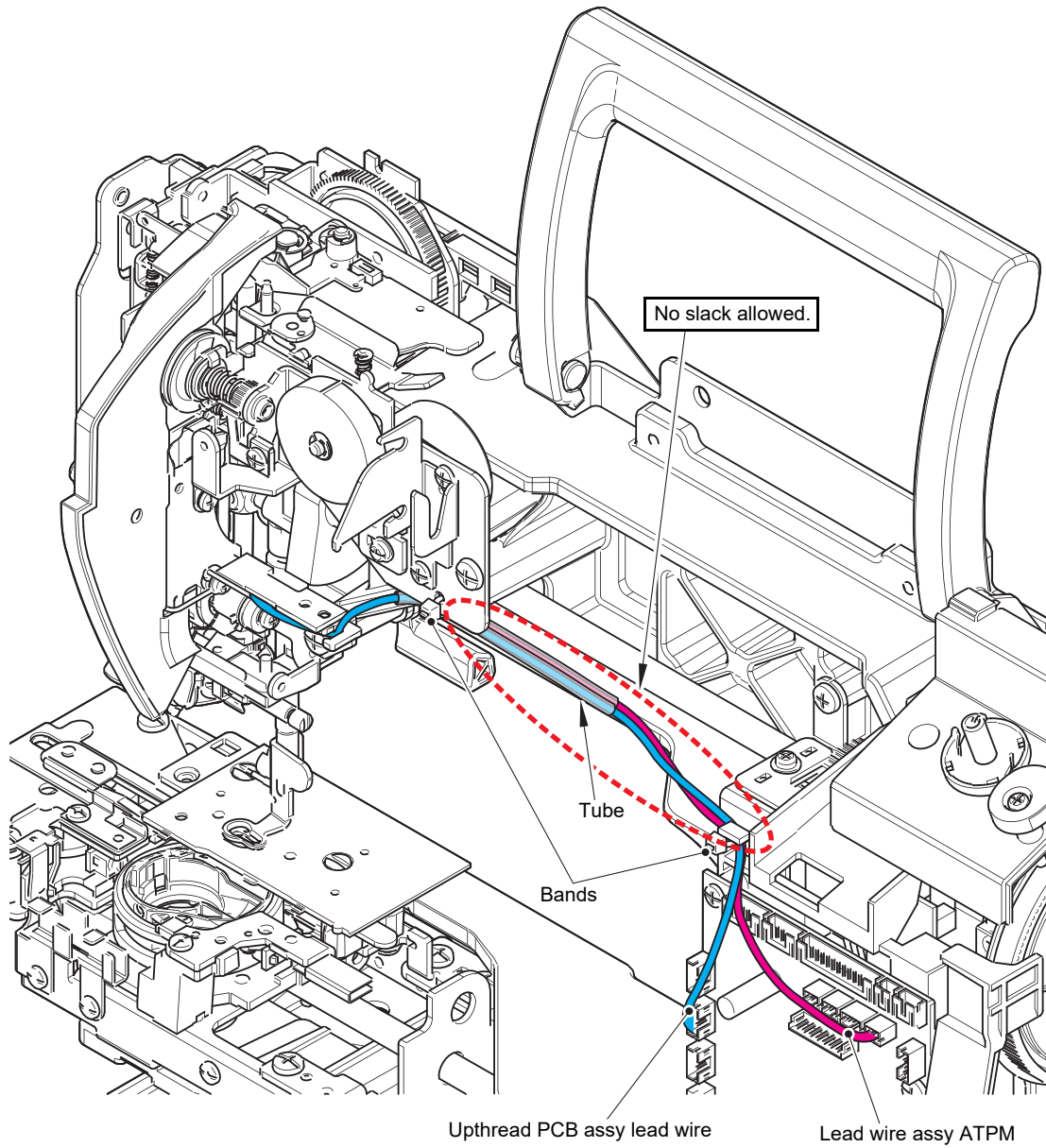
*1 Some models are not equipped with this sheet depending on the production time.

*2 Some models are not equipped with the ferrite core and the coaching clip depending on the production time.

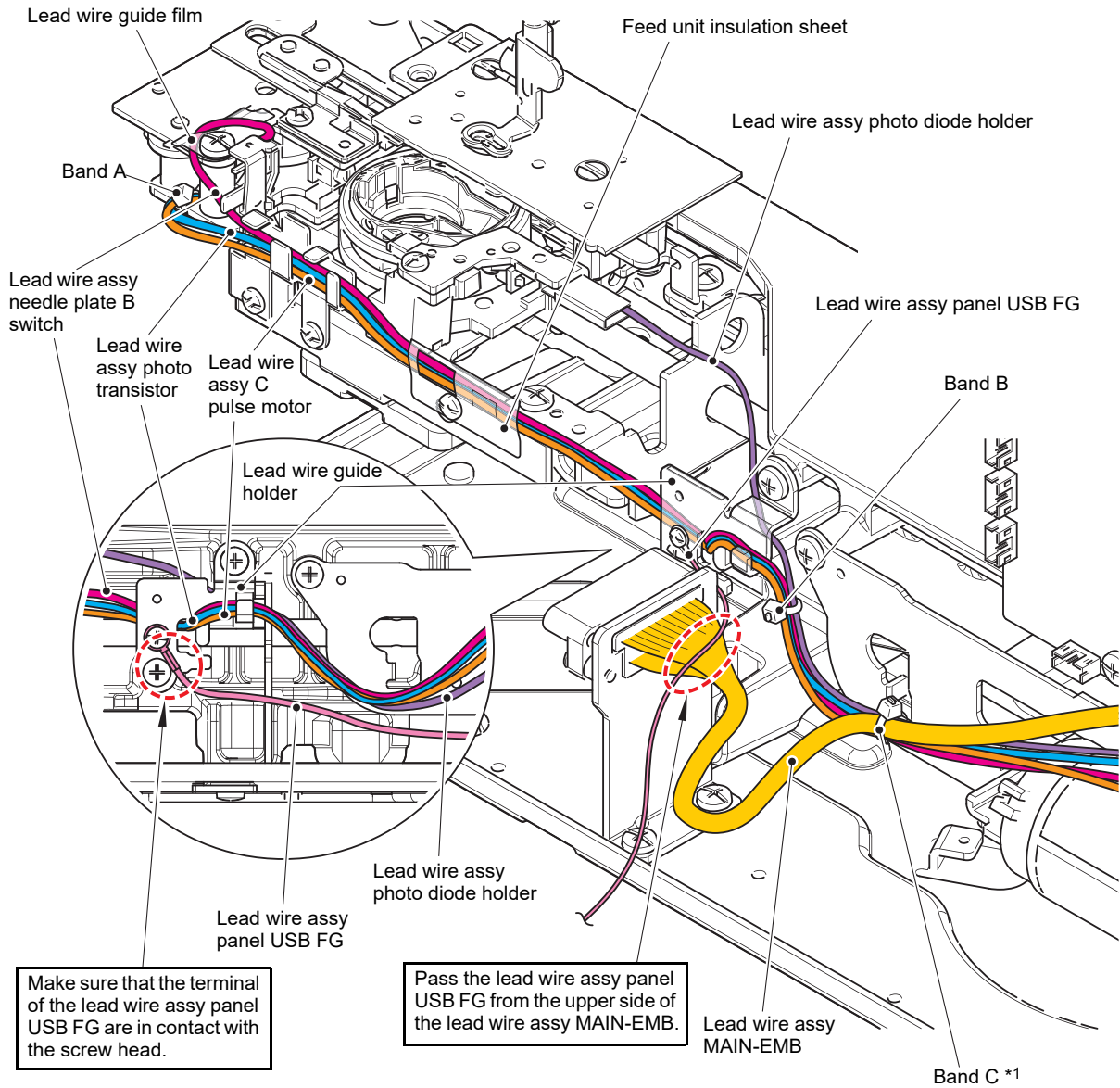
- Lead wires to be bound with the band and cord clamp:
- Lead wire assy PF INIT PCB
 - Lead wire assy threader lever switch
 - Lead wire assy 2.5 plug
 - Lead wire assy POTENTIO
 - Lead wire assy PF SW
 - Lead wire assy PF pulse motor

- Lead wires to be secured with coating clip:
- Lead wire assy 2.5 plug
 - Lead wire assy POTENTIO

4. Thread unit



5. Thread cutter module / Feed module



Make sure that the terminal of the lead wire assy panel USB FG are in contact with the screw head.

Pass the lead wire assy panel USB FG from the upper side of the lead wire assy MAIN-EMB.

*1 Some models are bounded with the coaching clip depending on the production time.

- Lead wires to be bound with band A:
- Lead wire assy C pulse motor
 - Lead wire assy photo transistor

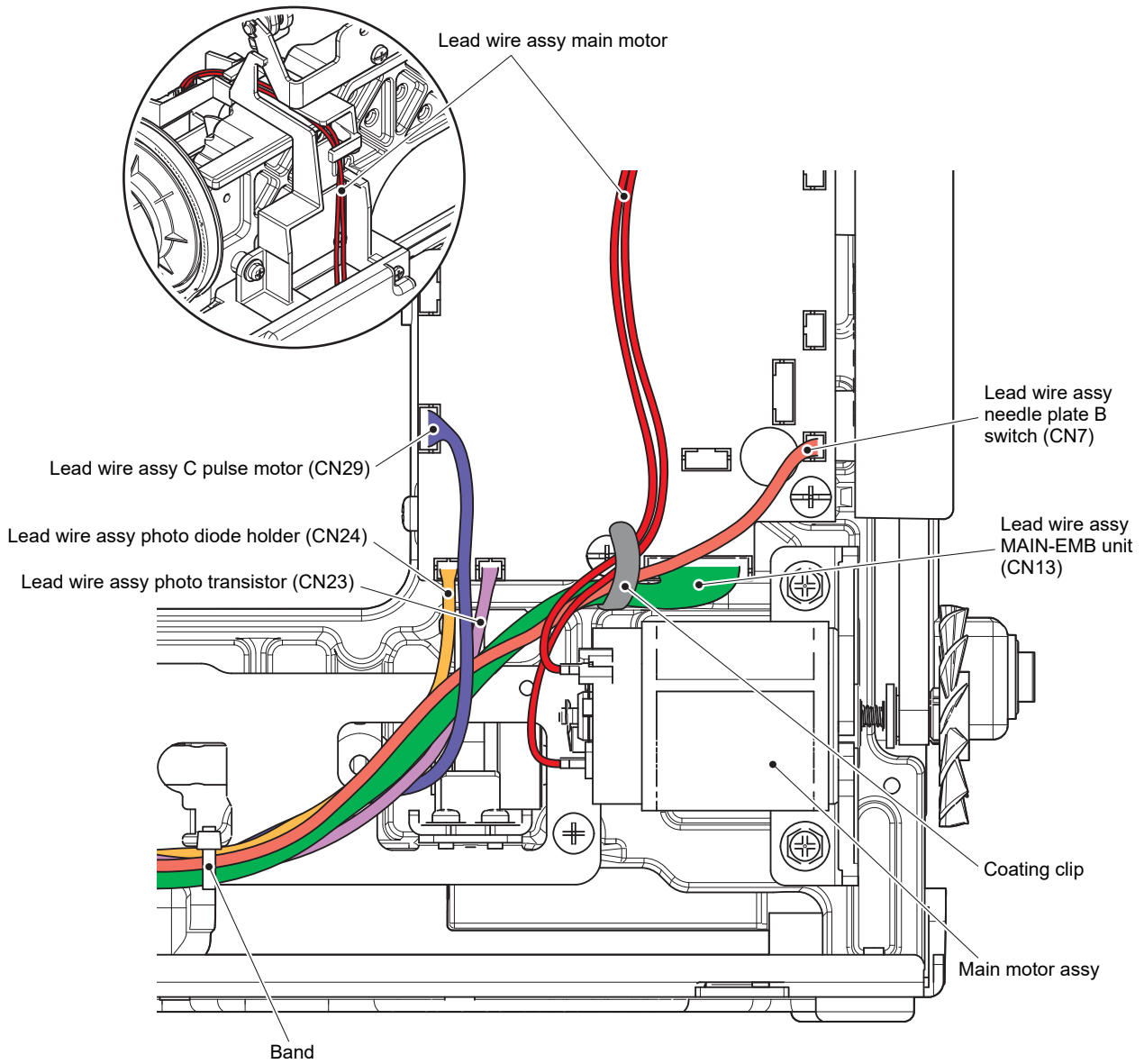
- Lead wires to be bound with band B:
- Lead wire assy C pulse motor
 - Lead wire assy photo transistor
 - Lead wire assy photo diode holder
 - Lead wire assy needle plate B switch

- Lead wires to be bound with band C:
- Lead wire assy C pulse motor
 - Lead wire assy photo transistor
 - Lead wire assy photo diode holder
 - Lead wire assy MAIN-EMB
 - Lead wire assy needle plate B switch

Special Instructions
of Wiring

Special Instructions
of Wiring

6. Lower side of Main PCB



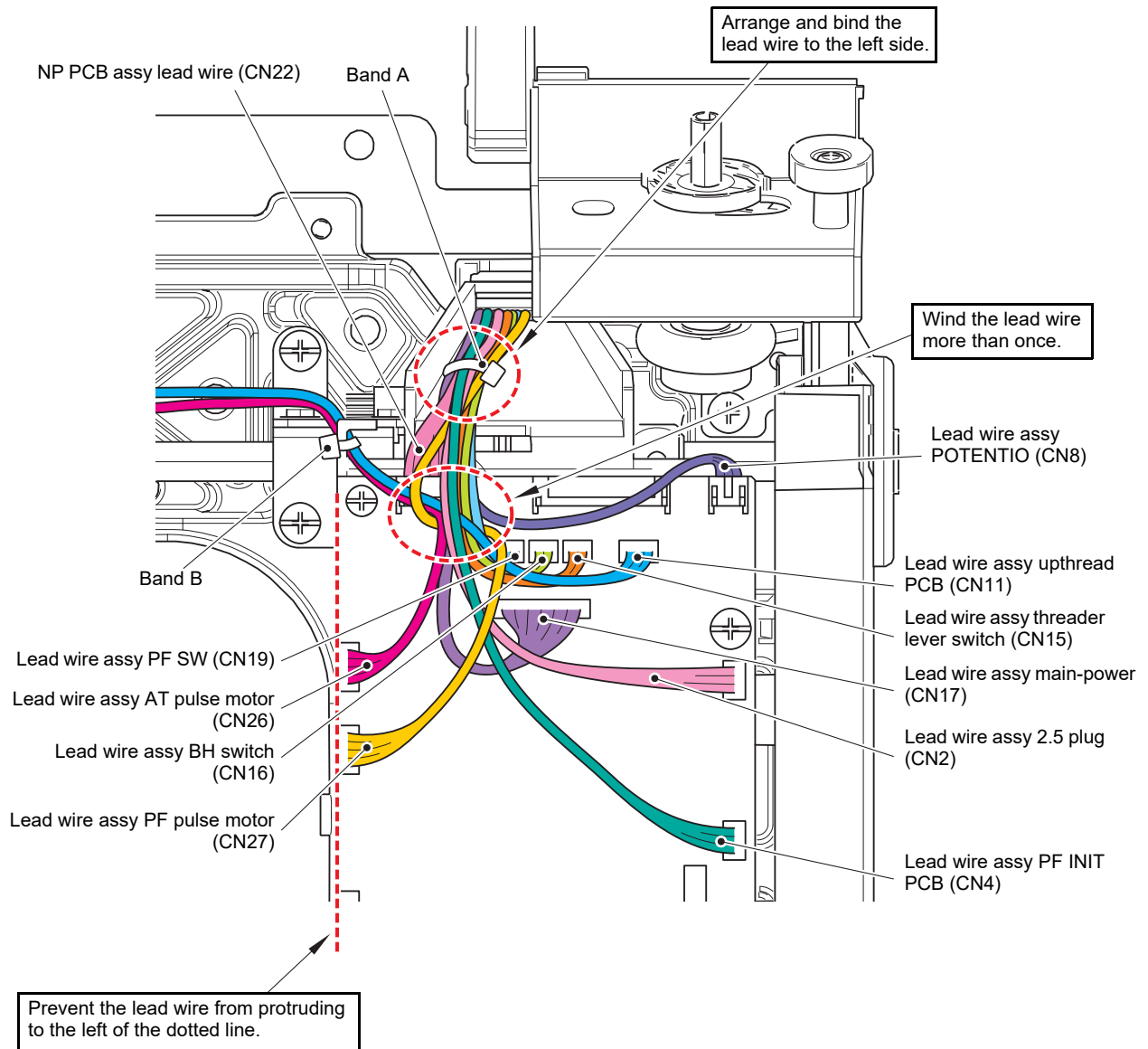
Lead wires to be bound with band:

- Lead wire assy photo diode holder (CN24)
- Lead wire assy photo transistor (CN23)
- Lead wire assy needle plate B switch (CN7)
- Lead wire assy MAIN-EMB (CN13)
- Lead wire assy C pulse motor (CN29)

Lead wires to be secured with coating clip:

- Lead wire assy needle plate B switch (CN7)
- Lead wire assy MAIN-EMB (CN13)
- Lead wire assy main motor

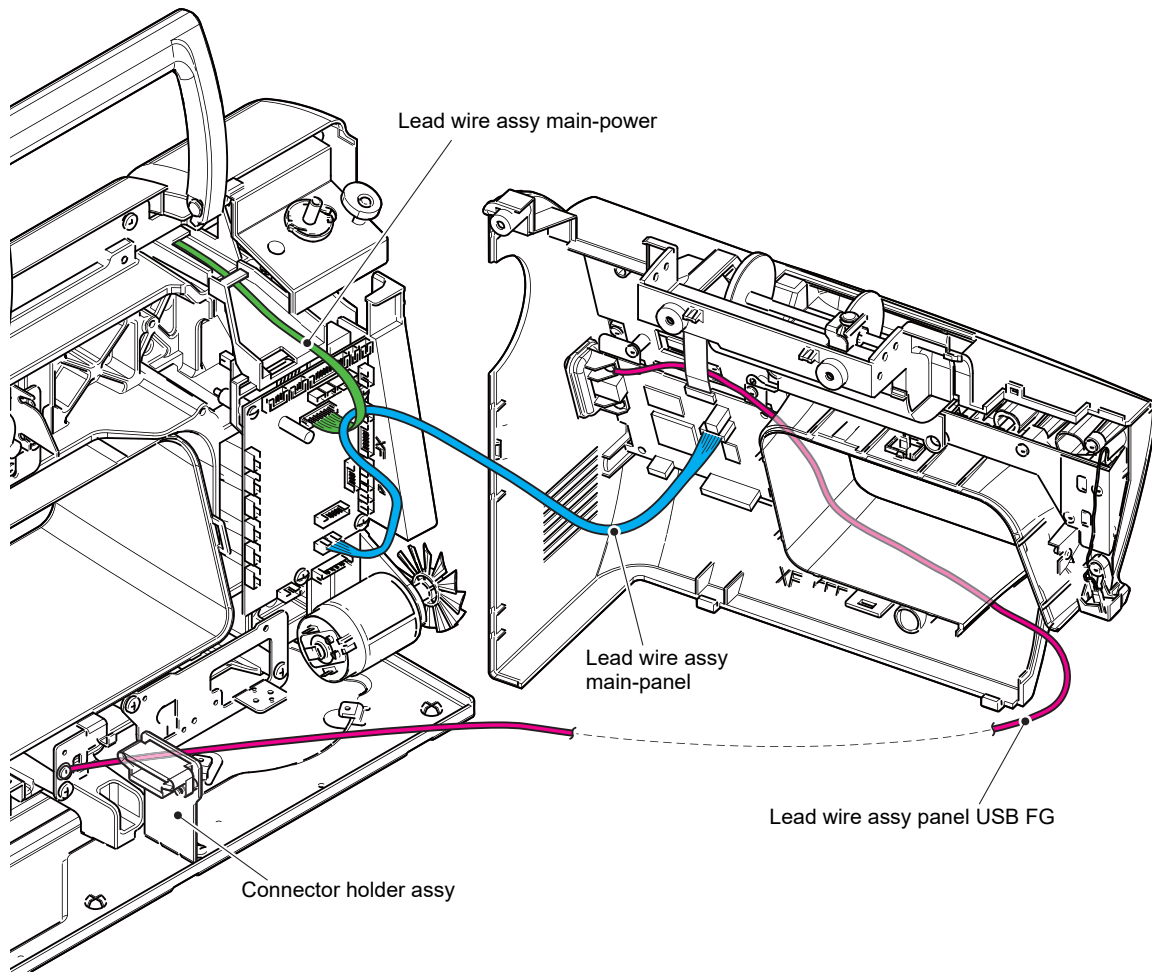
7. Upper side of Main PCB



- Lead wires to be bound with band A:
- Lead wire assy PF pulse motor (CN27)
 - Lead wire assy PF SW (CN19)
 - Lead wire assy threader lever switch (CN15)
 - Lead wire assy POTENTIO (CN8)
 - Lead wire assy 2.5 plug (CN2)
 - Lead wire assy main-power (CN17)
 - Lead wire assy PF INIT PCB (CN4)
 - Lead wire assy NP PCB (CN22)
 - Lead wire assy BH switch (CN16)

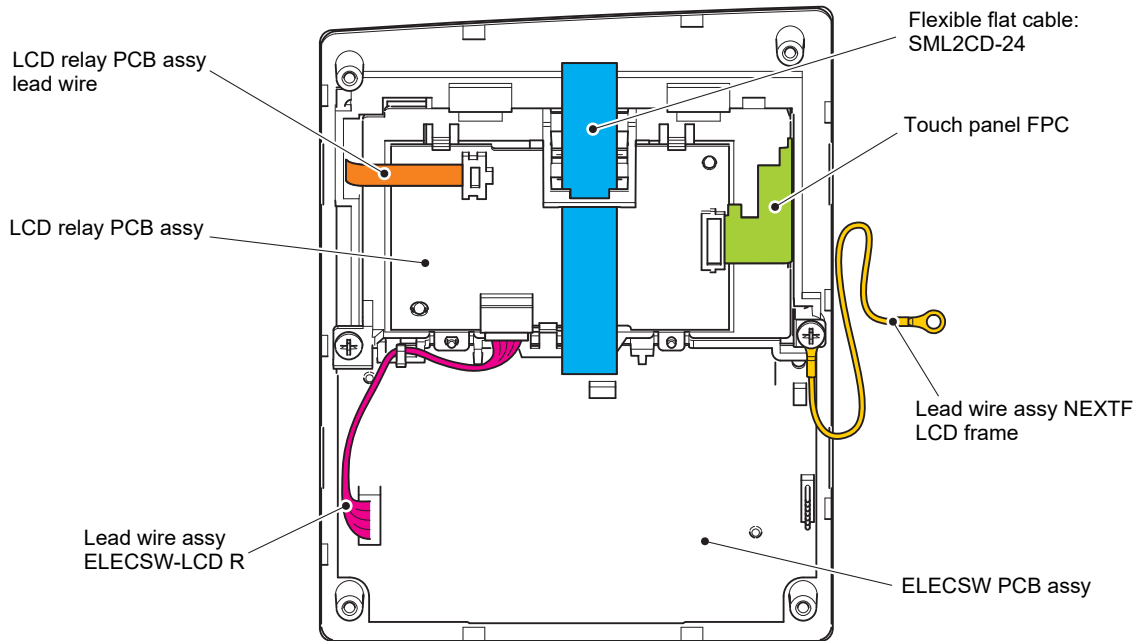
- Lead wires to be bound with band B:
- Lead wire assy upthread PCB (CN11)
 - Lead wire assy AT pulse motor (CN26)

8. Lead wire assy main-panel

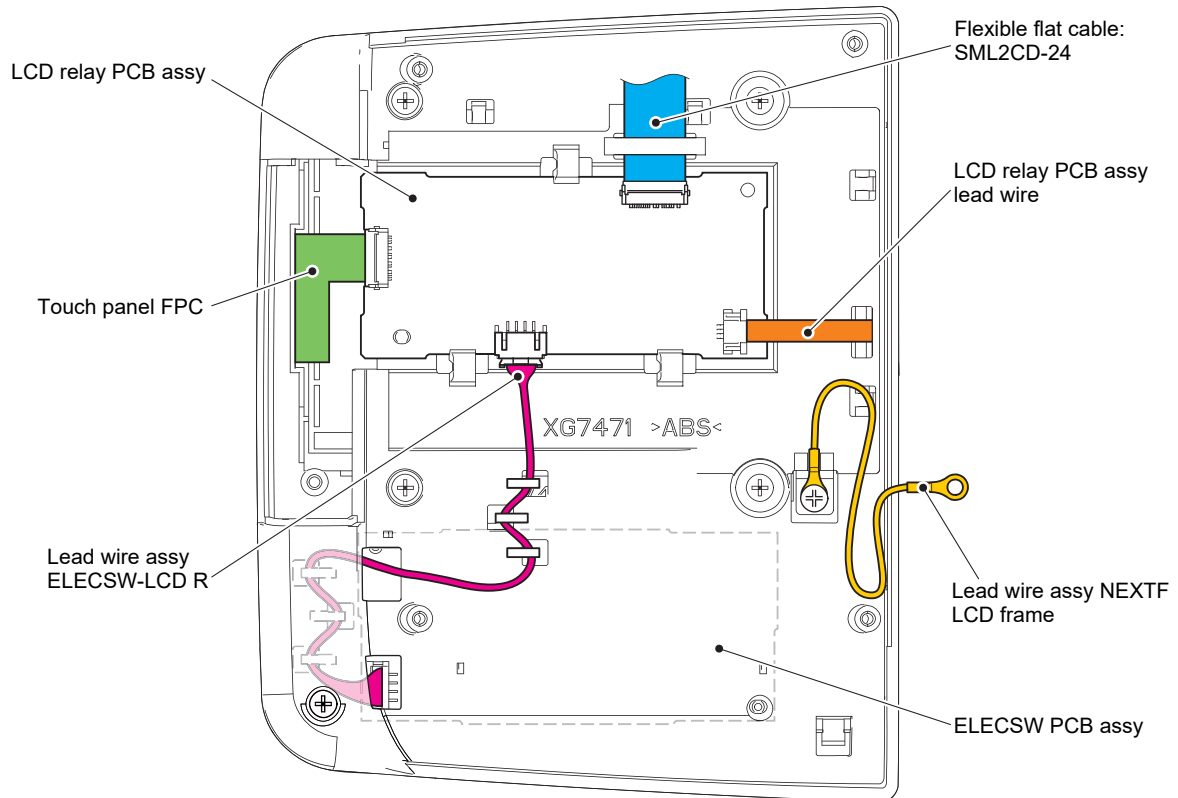


1. LCD unit supply assy

■ Small LCD type

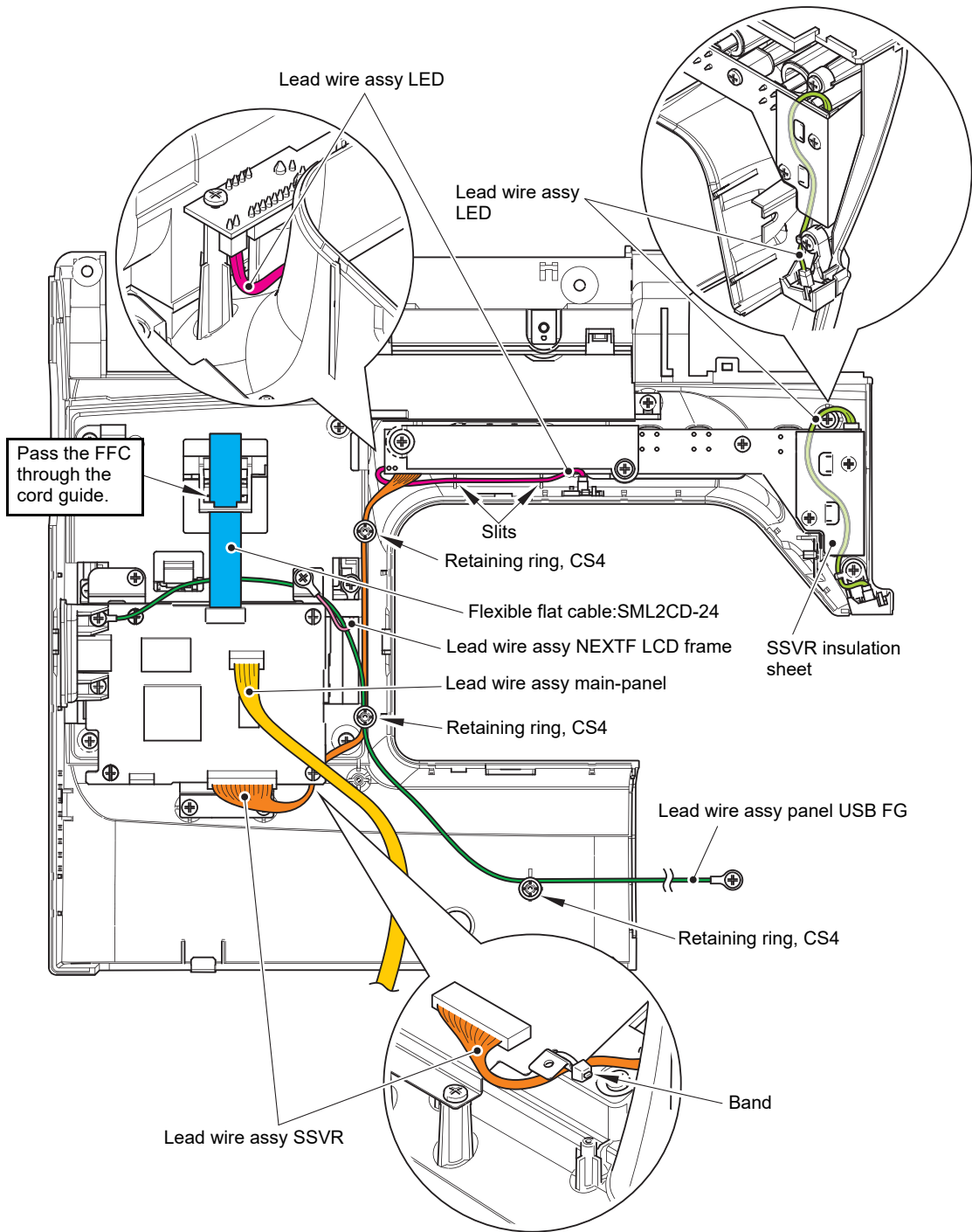


■ Large LCD type

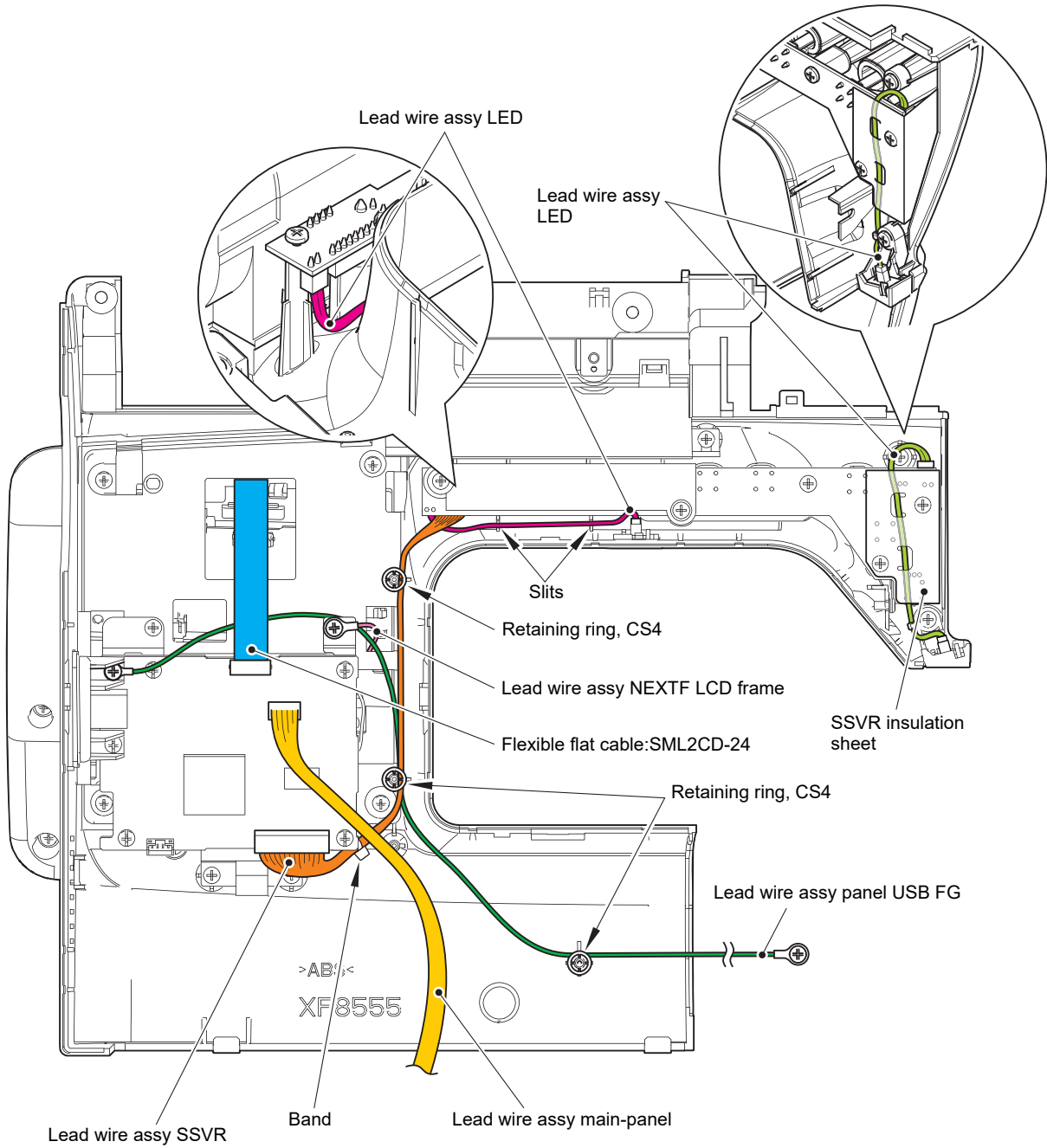


2. Front cover assy

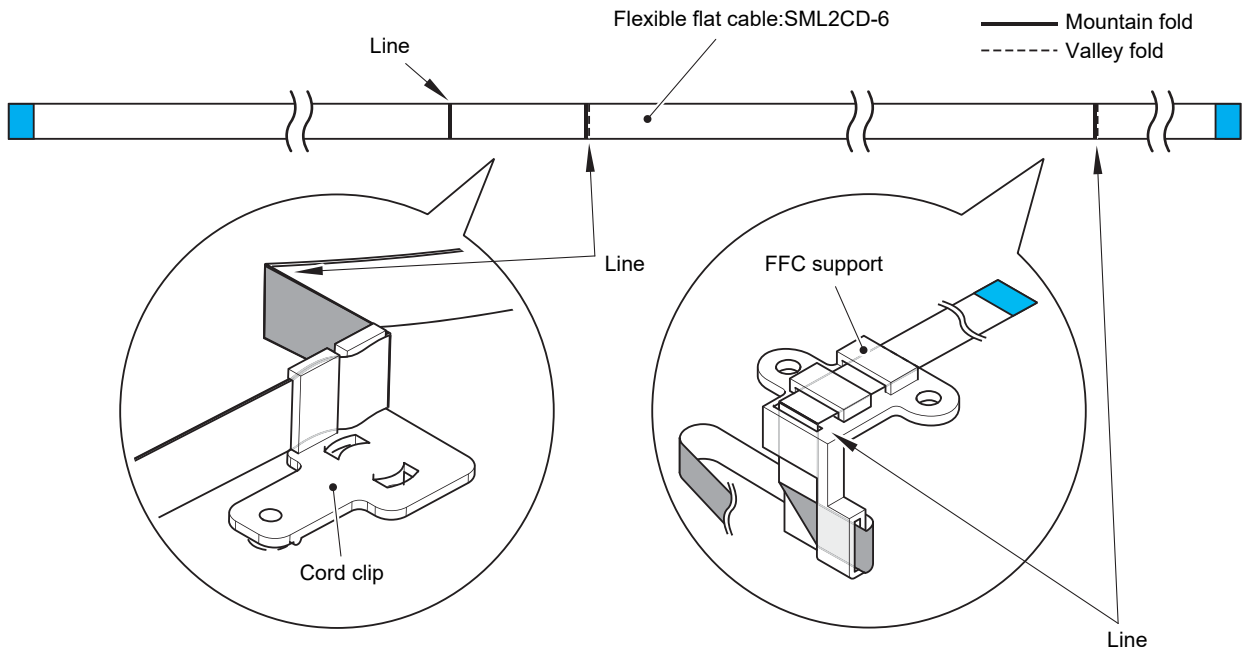
- Small LCD type <In case of large LCD type, refer to next page>



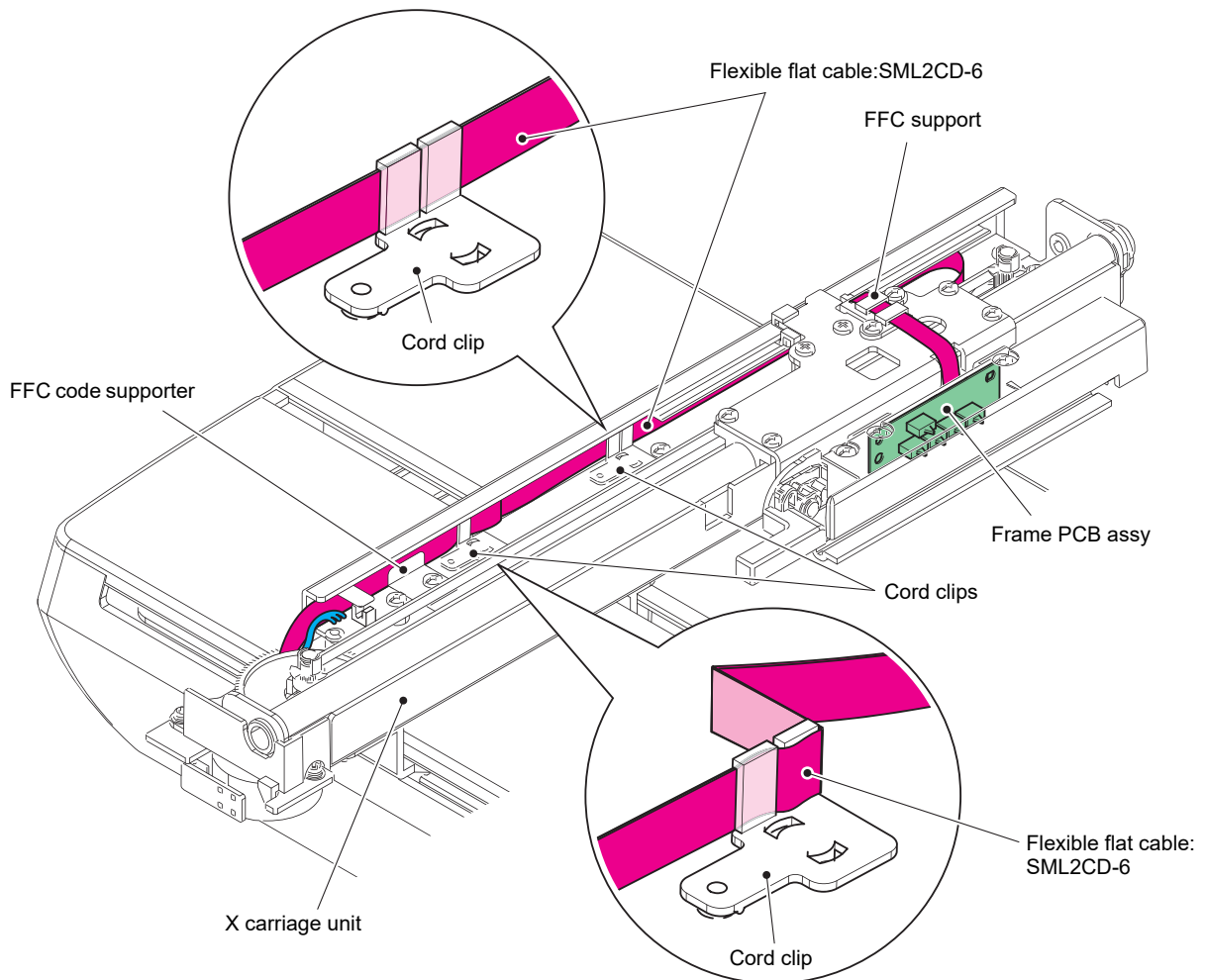
■ Large LCD type <In case of small LCD type, refer to previous page>



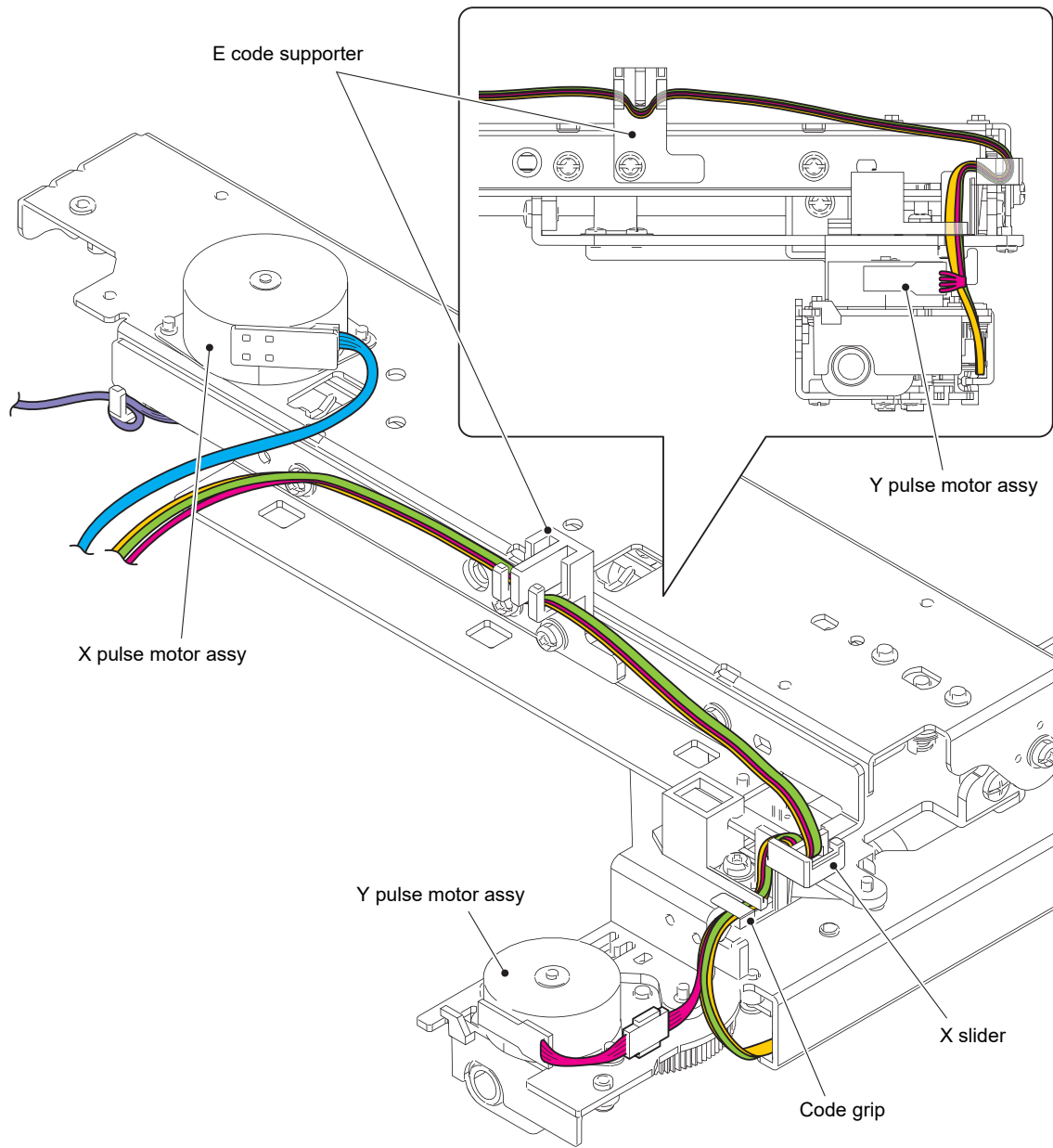
1. Bending of Flexible flat cable:SML2CD-6



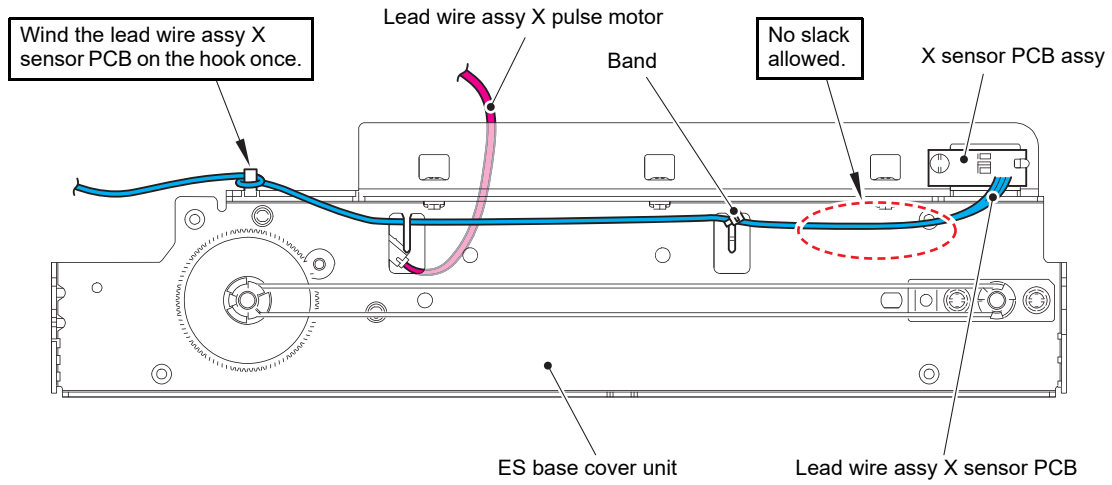
2. X carriage unit (Frame PCB assy)



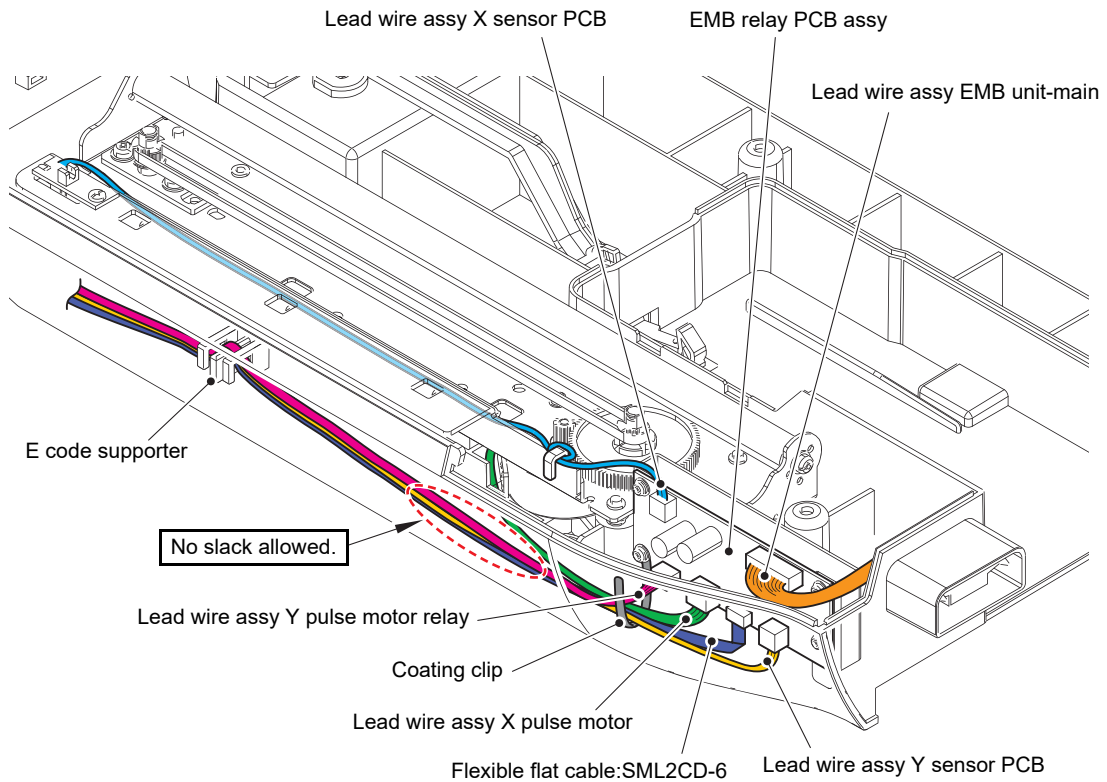
3. E code supporter



4. Main frame assy



5. EMB relay PCB assy



brother