

SERVICE MANUAL
PARTS LIST

MODEL : 4100QDC

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WHAT TO DO WHEN

CONDITION	CAUSE	HOW TO FIX	REFERENCE
1. Skipping stitches	1. Needle is not inserted properly. 2. Needle is bent or worn. 3. Incorrectly threaded. 4. Needle or thread are inappropriate for fabric being sewn. 5. Sewing on stretch fabric. 6. Inappropriate needle bar height. 7. Inappropriate needle to hook timing. 8. Inappropriate needle to hook clearance.	Insert the needle properly. Change the needle. Rethread. Use the recommended sewing needle and thread. Use a #11 blue tip needle. See mechanical adjustment "Needle bar height". See mechanical adjustment "Needle to hook timing". See mechanical adjustment "Clearance between needle and hook".	 p. 15 p. 14 p. 16
2. Fabric not moving	1. Incorrect feed dog height. 2. Feed dog is in down position. 3. Thread on bottom side of fabric is jammed. 4. Feed dog teeth are worn.	See mechanical adjustment "Feed dog height". Raise the feed dog level. Make sure to bring both needle and bobbin thread under the foot when starting sewing. Change the feed dog.	p. 18

WHAT TO DO WHEN

CONDITION	CAUSE	HOW TO FIX	REFERENCE
3. Breaking upper thread	<ol style="list-style-type: none"> 1. Initial sewing speed is too fast. 2. Thread path is incorrect. 3. Needle is bent or dull. 4. Upper thread tension is too strong. 5. Needle size is inappropriate for fabric. 6. Needle eye is worn. 7. Needle hole in needle plate is worn or burred. 	<p>Start with medium speed.</p> <p>Thread the machine correctly.</p> <p>Replace with a new needle.</p> <p>Adjust needle thread tension correctly.</p> <p>Use appropriate needle for fabric and thread in use.</p> <p>Change the needle.</p> <p>Repair the hole or replace the needle plate.</p>	p. 22
4. Breaking bobbin thread	<ol style="list-style-type: none"> 1. Incorrectly threaded bobbin. 2. Too much thread is wound on the bobbin. 3. Lint is stuck inside the bobbin holder. 4. Thread quality is too low. 5. Thread is jamming around the bobbin. 	<p>Thread bobbin correctly.</p> <p>Adjust the position of bobbin winder stopper.</p> <p>Clean the bobbin holder.</p> <p>Change to a high quality sewing thread.</p> <p>Clear out the jamming thread.</p>	
5. Needle breaks	<ol style="list-style-type: none"> 1. Needle is hitting the needle plate. 2. Needle is bent or worn. 3. Needle is hitting the hook. 4. The fabric moves while the needle is piercing it, or the needle zigzags while in fabric. 5. Fabric is being pulled too strongly while sewing. 	<p>See mechanical adjustment "Needle drop position".</p> <p>Change the needle.</p> <p>See mechanical adjustment "Clearance between needle and hook".</p> <p>See mechanical adjustment "Zigzag synchronization".</p> <p>Guide the fabric gently while sewing.</p>	<p>p. 13</p> <p>p. 16</p> <p>p. 19</p>

WHAT TO DO WHEN

CONDITION	CAUSE	HOW TO FIX	REFERENCE
6. Noisy operation	1. Backlash between hook gear and lower shaft gear is too great. 2. Lower shaft gear is loose. 3. Inappropriate belt tension. 4. Not enough oil.	See mechanical adjustment "Backlash (lower shaft gear)". Eliminate the looseness. See replacing DC motor and adjusting motor belt tension. Oil moving parts.	p. 17 p. 31 p. 38
7. Deformation pattern	1. Inappropriate feed balance. 2. Inappropriate zigzag synchronization. 3. Upper thread tension is too strong.	See mechanical adjustment "Stretch stitch feed balance". See mechanical adjustment "Zigzag synchronization". See mechanical adjustment "Needle thread tension".	p. 21 p. 19 p. 22

SELF DIAGNOSTIC TESTS

PREPARATION:

- Turn off the power switch.
- Shift the bobbin winder spindle to the left.
- Raise the feed dog.
- Shift the speed control lever to the left.
- Remove the presser foot and raise the presser foot lifter.
- Turn the handwheel toward you to raise the needle to its highest position.
- Plug the foot control to the machine.

NOTE:

- Be careful: The sewing machine may start running by its own while in test mode.
- Turn off the power switch before replacing any parts.
- Repeat the diagnostic test until the problems has been resolved.

Turn on the power switch. If any of following problems occur, take the recommended actions in the order they are shown.

• THE MACHINE DOES NOT RESPOND WHEN THE POWER SWITCH IS TURNED ON.

1. Check each connector connection.
2. Replace the machine socket.
3. Replace the printed circuit board "A".
4. Replace the power supply cord.
5. Replace the power transformer.

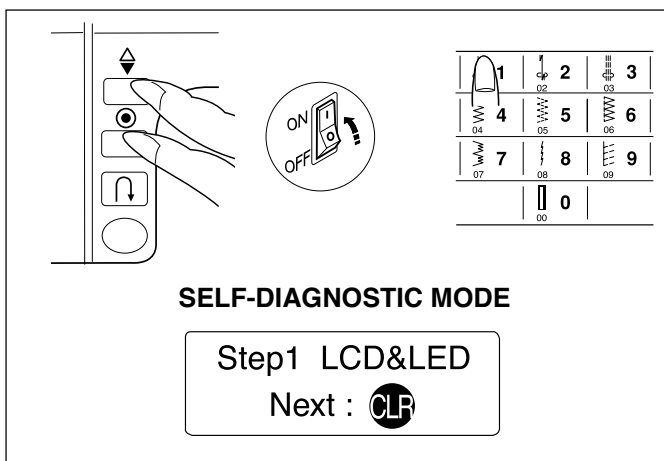
• THE SEWING MACHINE LIGHT DOES NOT LIGHT UP.

1. Replace the lamp.
2. Replace the circuit board "A".

• THE LCD SCREEN DOES NOT DISPLAY.

1. Replace the printed circuit board "A".

SELF-DIAGNOSTIC TEST:



Turn the power switch on while pressing the reverse button & auto-lock button. Then press the 01 button within 3 seconds to enter the self-diagnostic mode.



The standard mode shows up if you do not press the 01 button within 3 seconds.

Turn the power switch off and start over again.

SELF DIAGNOSTIC TESTS

	TESTS	CORRECT RESULTS	DEFECTIVE RESULTS / REPLACEMENT AND ADJUSTMENT
1) LCD & LED	Turn the power switch on while pressing the reverse button & auto-lock button. Then press the 01 button within 3 seconds to enter the self-diagnostic mode.	<ul style="list-style-type: none"> The display shows "Self check start". LCD and led blinks. Beeps when enter the LCD & LED check mode. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Step1 LCD&LED Next : CLR </div> <p>Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> Does not enter the self-diagnostic mode. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the touch panel. Replace the board A.
2) KEYS	Press the keys in order as described below. 1 Reverse stitch button 2 Auto-lock button 3 Up/down needle position button 4 Mode key 5 Stitch width key "+" 6 Stitch width key "-" 7 Stitch length key "+" 8 Stitch length key "-" Press the rest of keys in order from left to right, starting from the highest column to the lowest column.	<ul style="list-style-type: none"> The display shows "Key" and the machine beeps. Beeps when enter the key check mode. Beeps when buttons or keys are pressed. The display shows the name of pressed button or key. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Step2 Key ----- </div> <p>Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> Does not display the name of button or does not beep when buttons are pressed. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the touch panel. Replace the board A.
3) BOBBIN WINDER SPINDLE	Move the bobbin winder to the right. Move the bobbin winder to the left.	<ul style="list-style-type: none"> The display shows "Switch" and the machine beeps. The display shows "ON" and beeps when bobbin winder is moved to the right. The display shows "OFF" and beeps when bobbin winder is moved to the left. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Step3 Switch SP : OFF </div> <p>Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> Does not display the name of button or does not beep when buttons are pressed. <p>REPLACE:</p> <ul style="list-style-type: none"> Adjust the bobbin winder switch. Replace the board A.
4) BUTTONHOLE SENSOR	Lower the buttonhole lever. Pull, and push the buttonhole lever, then check the display.	<ul style="list-style-type: none"> The display shows "Sensor" and the machine beeps. When the buttonhole lever is pulled, the screen displays "BH:H". <p>When the buttonhole lever is positioned in center, the screen displays "BH:L".</p> <p>When the buttonhole lever is pushed, the screen displays "BH:H".</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Step4 Sensor BH:H BS:L FS:L </div>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> The display does not change or show the correct results when the buttonhole lever is pulled or pushed. <p>REPLACE OR ADJUST:</p> <ul style="list-style-type: none"> Adjusting the buttonhole lever position. Replace the board A.
UPPER-SHAFT SENSOR	Turn the handwhell toward you to move the needle from highest to the lowest position. Check the screen.	<p>When needle is in the highest position, the screen shows: [BS:H FS:L]</p> <p>When needle is in the lowest position, the screen shows: [BS:L FS:H]</p> <p>When needle is in neither the highest nor the lowest positions. [BS:L FS:L] Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> The display does not change or show the correct results when the needle is moved. <p>REPLACE OR ADJUST:</p> <ul style="list-style-type: none"> Adjust the zigzag synchronization. Replace the board A.

SELF DIAGNOSTIC TESTS

	TESTS	CORRECT RESULTS	DEFECTIVE RESULTS / REPLACEMENT AND ADJUSTMENT
5) VELOCITY SENSOR (DC MOTOR)	Turn the handwheel clockwise one complete turn.	<ul style="list-style-type: none"> The display shows "Velosen". Beep sound. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">Step5 VeloSen 000</p> </div> <ul style="list-style-type: none"> The value should be 365 to 375 when the handwheel is rotated once. <p>Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> The value does not change. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the DC motor. Replace the board A.
6) SLIDE VOLUME	Set the speed control to the leftmost position. Then slide the speed control lever from left to right, then return to left.	<ul style="list-style-type: none"> The display shows "Volume" and the machine beeps. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">Step6 Volume 255</p> </div> <ul style="list-style-type: none"> When the speed control lever is at left, the screen displays "000" to "010". When the speed control lever is at right, the screen displays "255" to "250". <p>Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> The value does not change. The value does not match with the correct results. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the DC motor. Replace the board A.
7) FOOT CONTROL	Depress the foot control fully, then release the foot control.	<ul style="list-style-type: none"> The display shows "Footcont" and the machine beeps. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">Step7 FootCont 210</p> </div> <ul style="list-style-type: none"> When the foot control is not depressed, the screen should display "000" to "016". When the foot control is depressed fully, the screen should display "210" to "200". <p>Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> The value does not change. The value decreases when the foot control is de pressed. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the foot control. Replace the board A.
8) ZIGZAG WIDTH MOTOR	Turn the handwhell toward you to move the needle to the height position. Press the memory key.	<ul style="list-style-type: none"> The display shows "Stm" and the machine beeps. The needle moves to the center. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">Step8 Stm  BM Phase</p> </div>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> Display does not change. The needle does not move. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the zigzag width motor. Replace the board A.
FEED MOTOR	Turn the handwheel toward you to move the needle to the lower position. Press the memory key.	<ul style="list-style-type: none"> The feed dog moves to the center. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">Step8 Stm  FM Phase</p> </div> <p>Press CLR button to proceed to the next step.</p>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> Display dose not change. The feed dog does not move. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the feed motor. Replace the board A.
9) DC MOTOR	Depress the foot control to check the sewing speed.	<ul style="list-style-type: none"> The display shows "SewMotor" and the machine beeps. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">Step9 SewMotor</p> </div>	<p>DEFECTIVE RESULTS:</p> <ul style="list-style-type: none"> The motor does not start, or rotates unstably. <p>REPLACE:</p> <ul style="list-style-type: none"> Replace the DC motor. Replace the board A.

* Press the CLR button to return to "step 1". End the self diagnostic tests.

SERVICE ACCESS (1)

FACE COVER

TO REMOVE:

1. Open the face cover.
2. Remove the setscrews (A).

TO INSTALL:

3. Follow the above procedure in reverse.

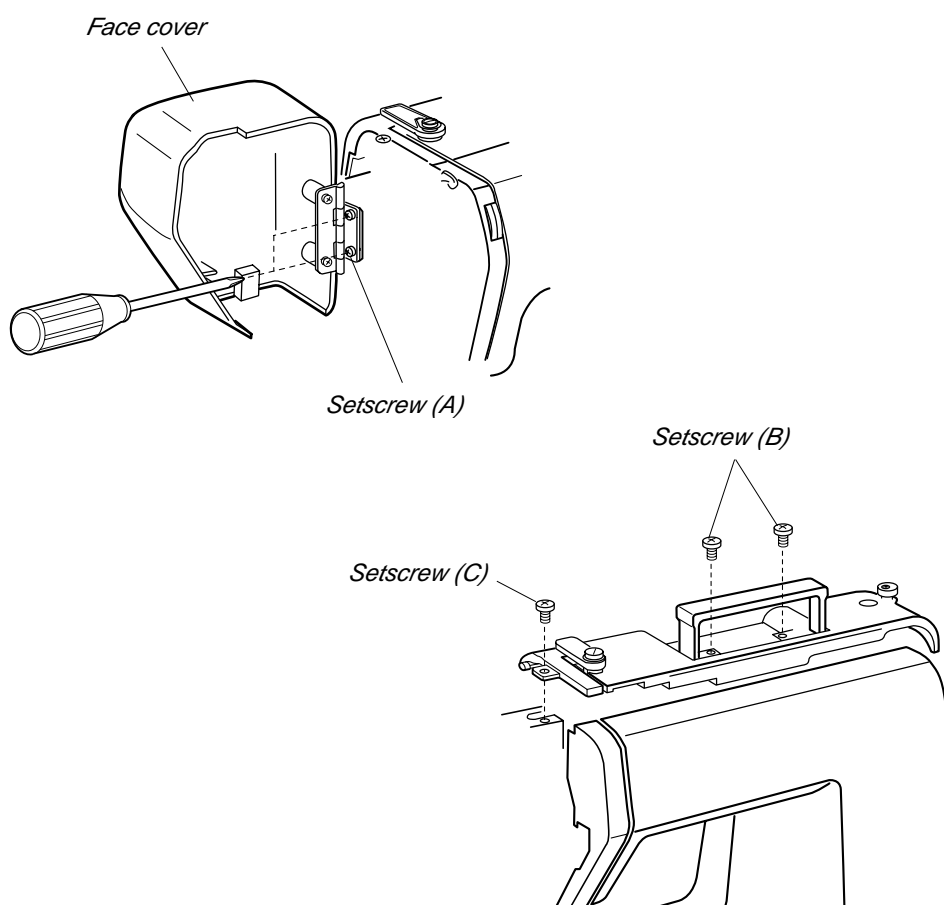
TOP COVER

TO REMOVE:

1. Remove the face cover.
2. Remove the setscrew (B), (C), and remove the top cover.

TO INSTALL:

3. Follow the above procedure in reverse.



SERVICE ACCESS (3)

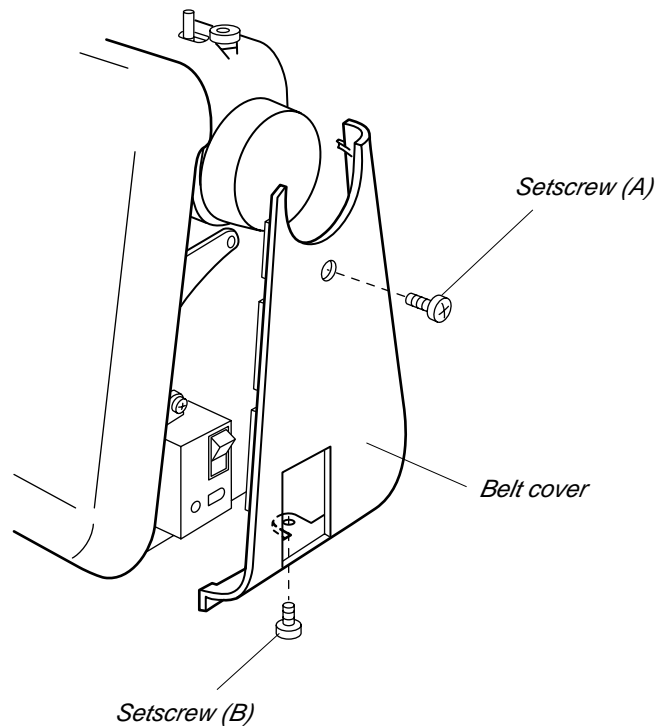
BELT COVER

TO REMOVE:

1. Remove the setscrew (A), (B), and remove the belt cover.

TO INSTALL:

2. Install the belt cover with the setscrew (A) and (B).



SERVICE ACCESS (2)

BASE

TO REMOVE:

1. Remove the 4 setscrews (A) and the 2 setscrews (B), remove the base.

TO INSTALL:

2. Place the part C (concave part in the illustration) between the base and the arm leg.
Install the base with the 4 setscrews (A) and the 2 setscrews.

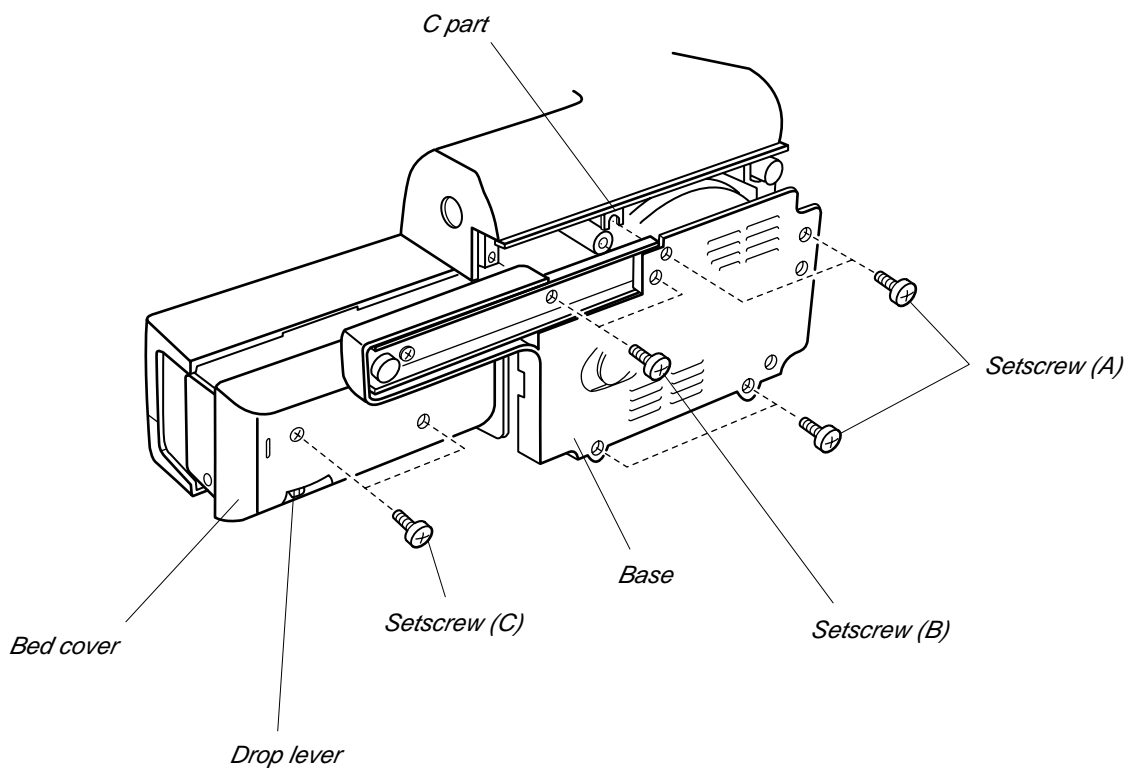
BED COVER

TO REMOVE:

1. Set the drop lever to the left and remove the 2 setscrews (C), remove the bed cover.

TO INSTALL:

2. Set the drop lever to the left and install the bed cover.
Secure it in place with the 2 setscrews (C).



SERVICE ACCESS (4)

FRONT COVER

TO REMOVE:

1. Remove the top cover and belt cover (see pages 7 and 8).
2. Loosen the setscrews (A), (B), (C), (D) and (E), then remove the setscrews (F) and (G).
3. Disconnect all the connectors of printed circuit board "A".

NOTE:

To loosen the setscrew (D), remove the setscrew (G) and the lamp holder.

Access the setscrew (D) through the hole (H).

NOTES: TO DISCONNECT THE CONNECTORS:

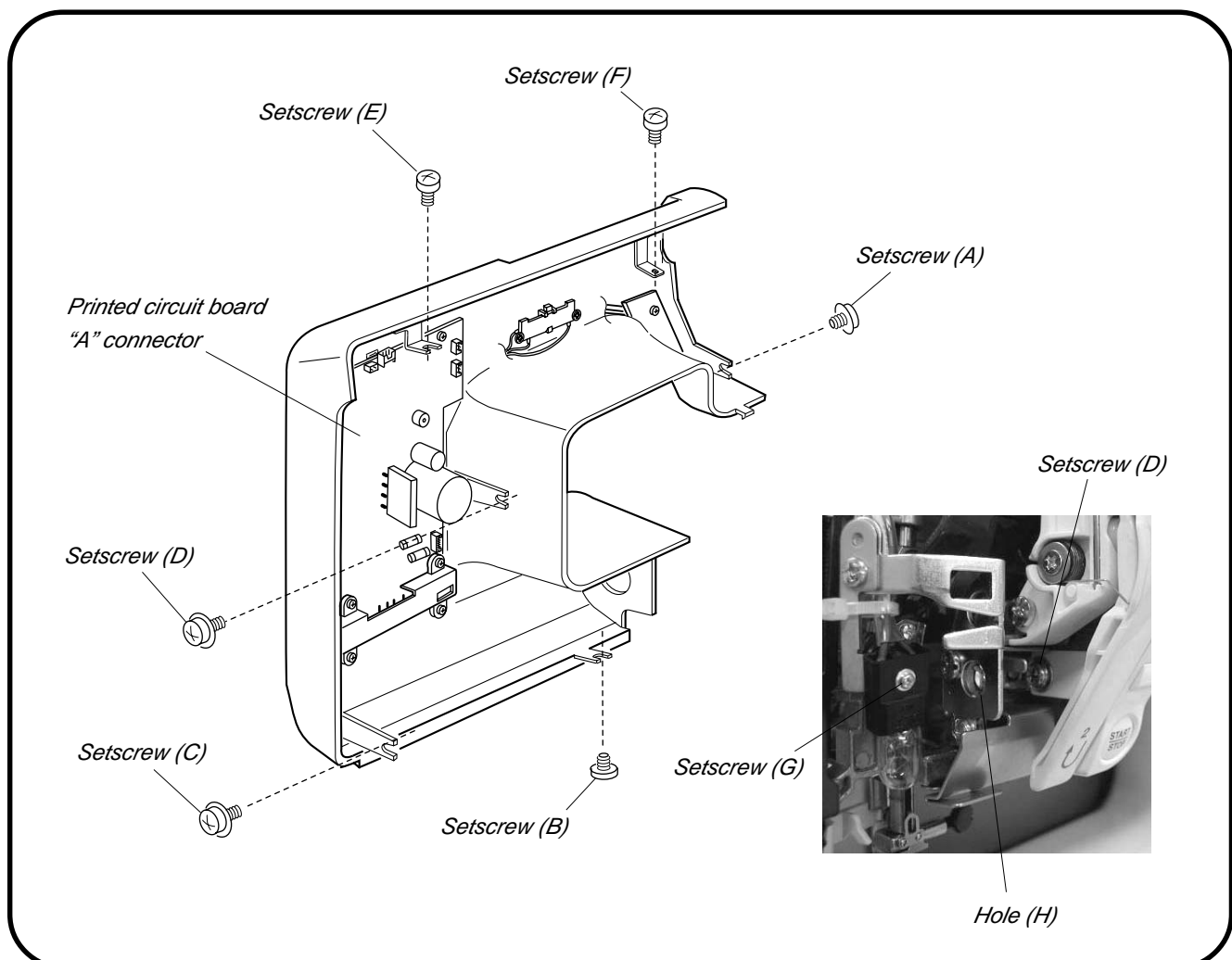
Grasp the connector directly with your fingers and pull. Do not pull on the lead wire, as this may damage the contact sleeve inside the connector.

TO INSTALL:

4. To install the front cover, follow the above procedure in reverse.

NOTES: TO CONNECT THE CONNECTORS:

1. Be sure that the color of each connector corresponds to the color of the connector post on the printed circuit board (PCB) to which it is connected.
2. Insert the connector at the right angle. Then push it straight down until it locks in place.



SERVICE ACCESS (5)

REAR COVER

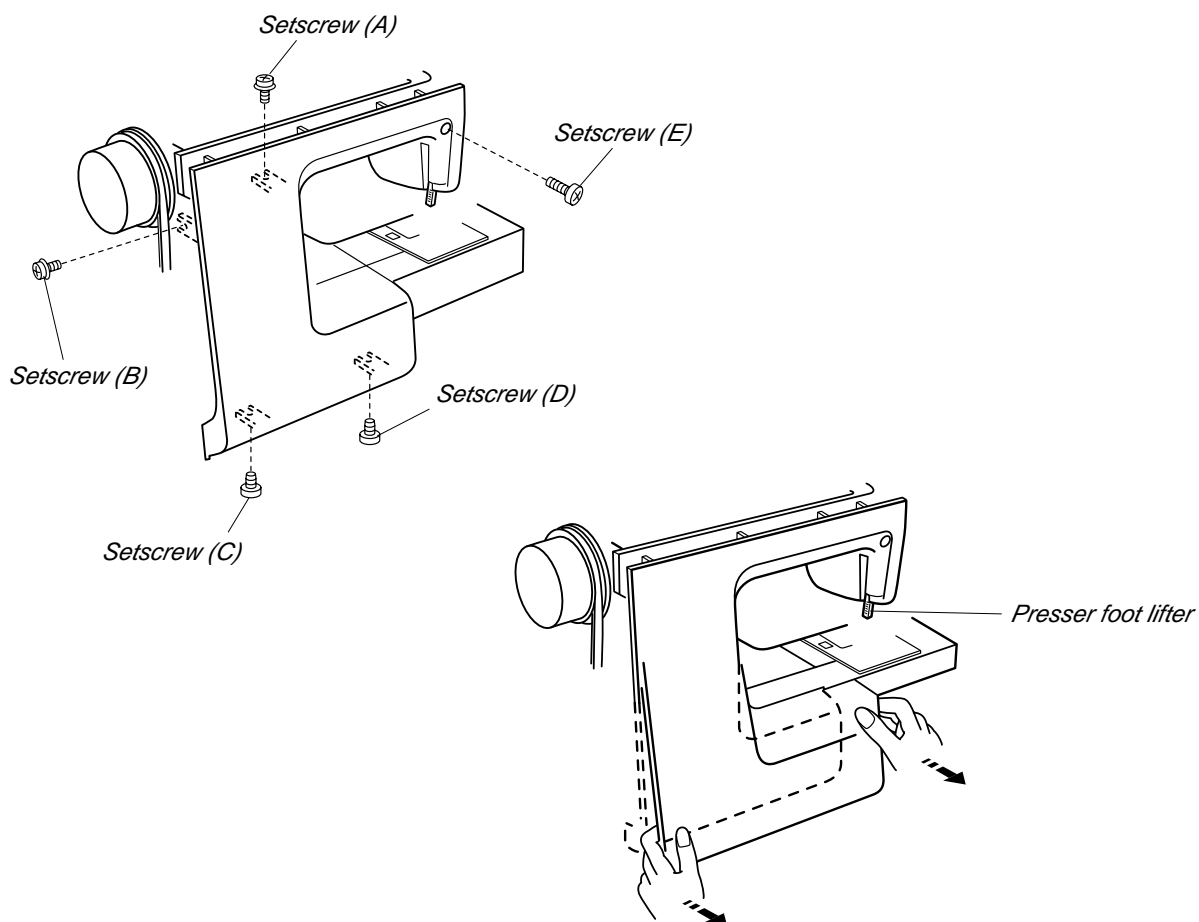
TO REMOVE:

1. Remove the top cover and belt cover (see pages 7 and 8).
2. Loosen the setscrews (A), (B), (C), and (D), then remove the setscrew (E).

* To remove the cover, detach the presser foot lifter section first, with the presser foot lifter in the down position.

TO INSTALL:

3. Follow the above procedure in reverse.



SERVICE ACCESS (6)

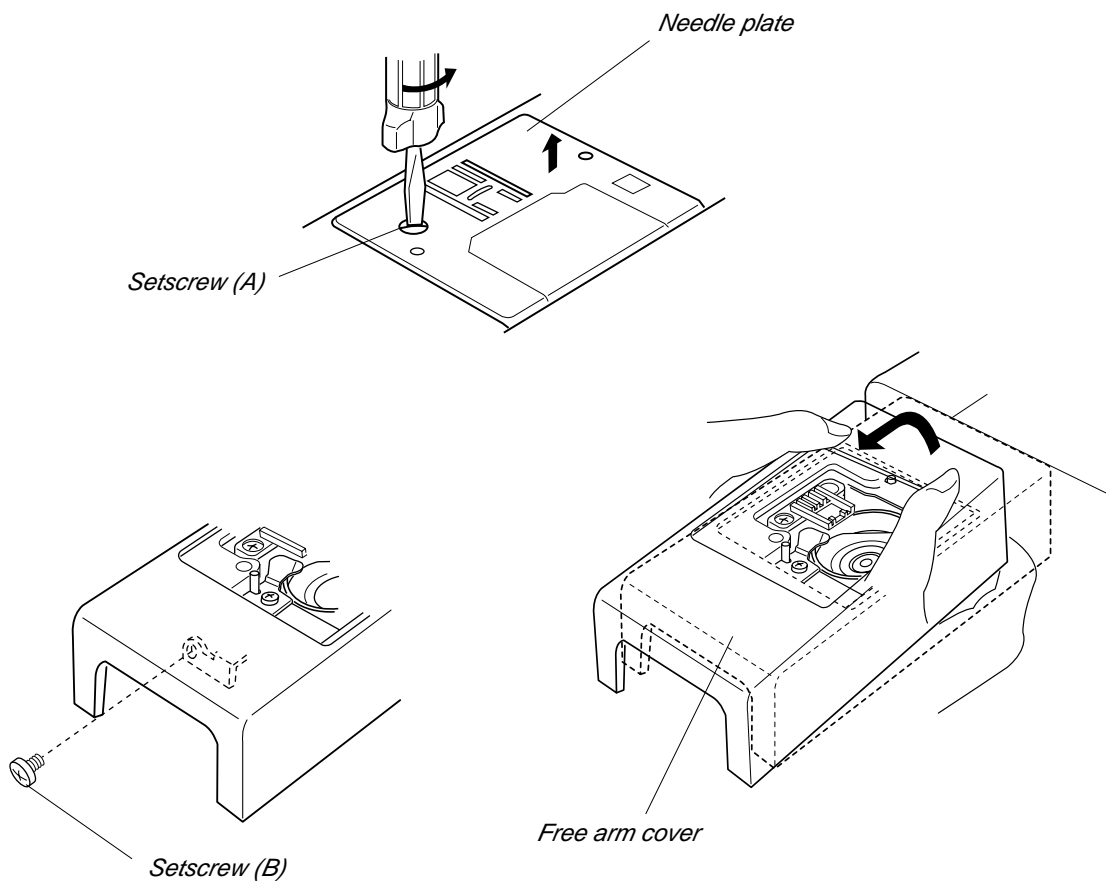
FREE ARM COVER

TO REMOVE:

1. Remove setscrew (A) and the needle plate.
2. Remove the bed cover (see page 9).
3. Remove setscrew (B) and the free arm cover.

TO INSTALL:

4. Follow the procedure above in reverse.



MECHANICAL ADJUSTMENT

NEEDLE DROP POSITION

Set the stitch pattern at "⌘"; the standard needle drop position should be at the center of the needle plate hole.

When the needle swings in maximum zigzag width "⌘", the distance between both ends of the needle hole in the needle plate and the needle should be 0.2 mm or more. If not, adjust as follows.

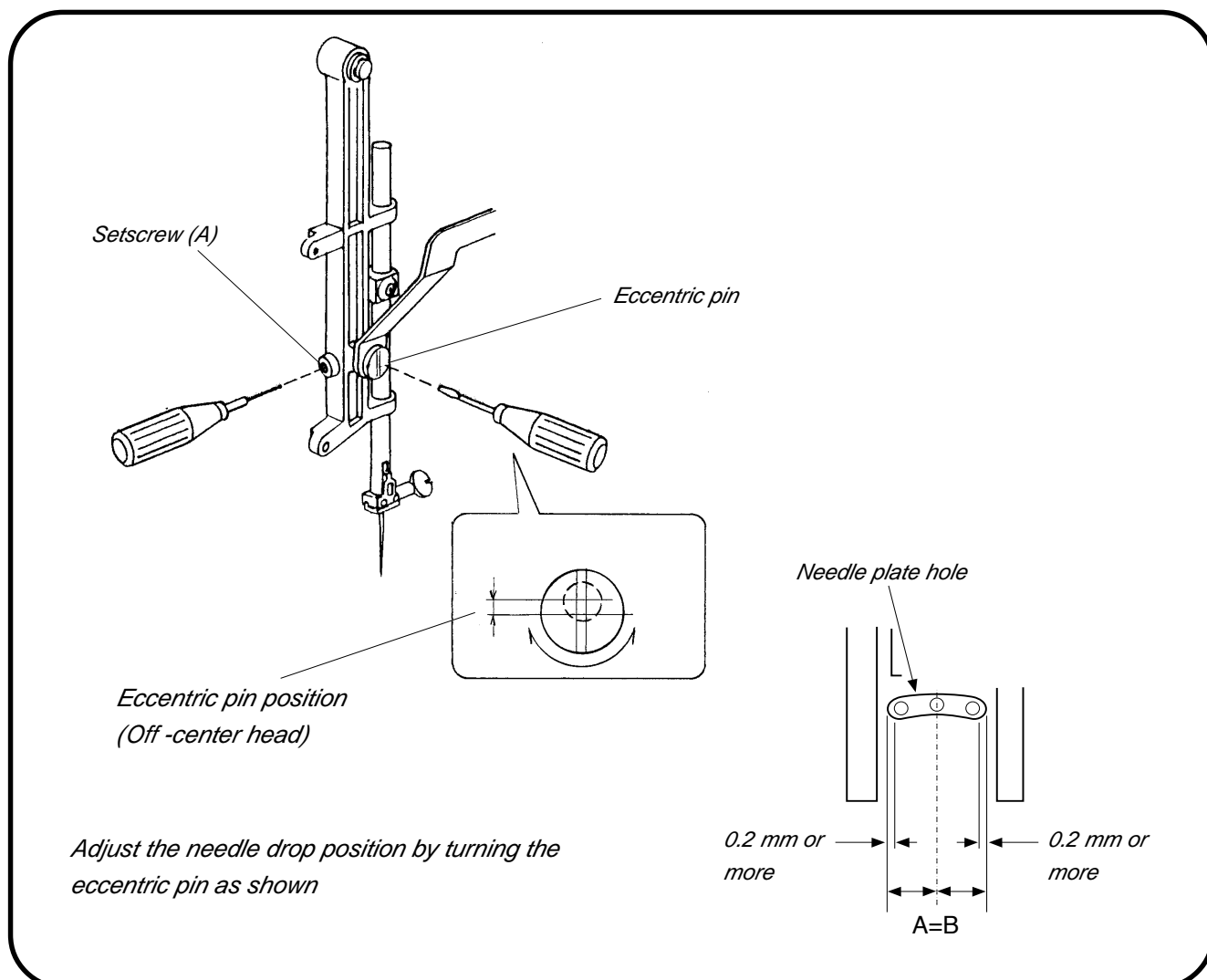
ADJUSTMENT PROCEDURE:

1. Turn on the power switch, set the stitch pattern at straight "⌘" and the zigzag width at maximum "⌘" then check the needle drop position.
2. If the needle drop position is not in the center of the needle plate hole when the straight stitch is selected, or if the clearance between the needle and edge of the needle plate hole on both side is less than 0.2 mm when the stitch pattern is set to maximum zigzag width, open the face cover and loosen the setscrew (A), then adjust the needle drop position by turning the eccentric pin.

NOTE:

Make sure the eccentric pin is positioned with its off-center head facing downward.

3. When you have finished adjusting the needle drop position, tighten the setscrew.

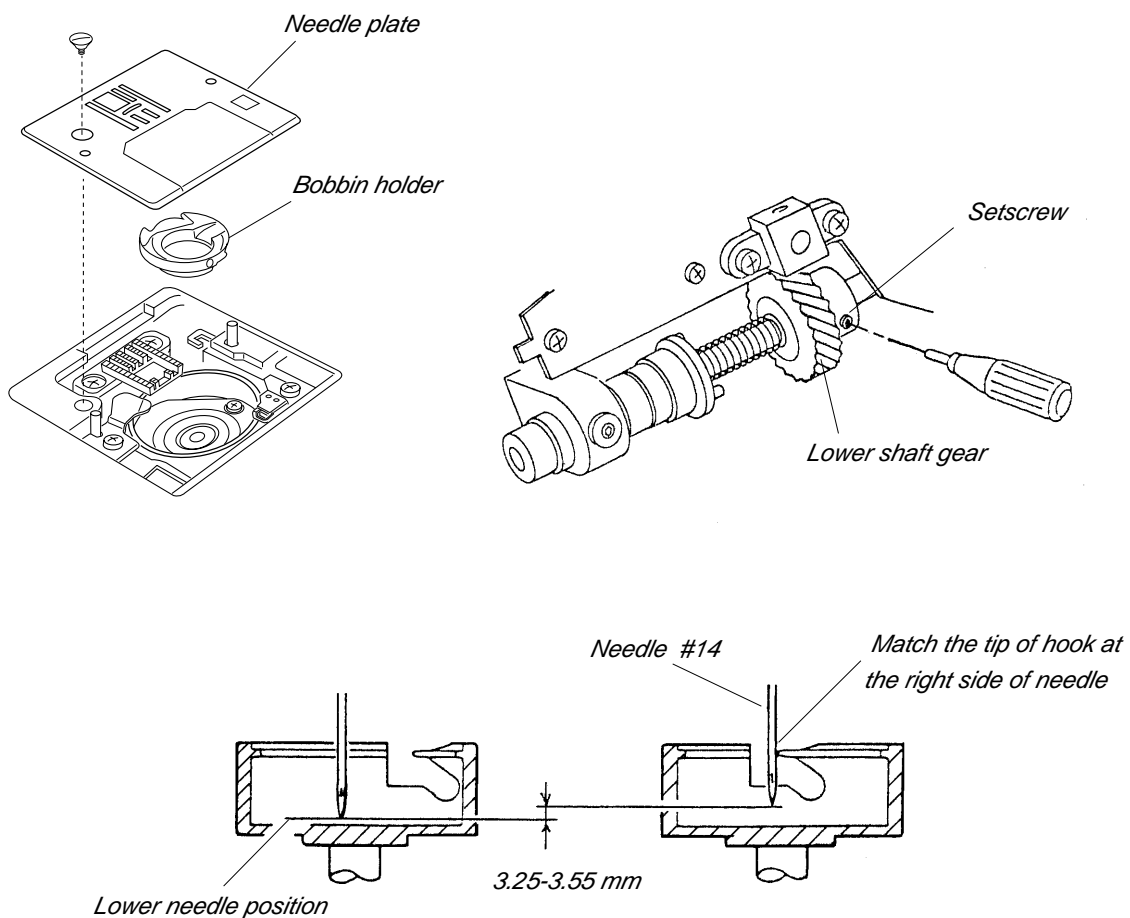


MECHANICAL ADJUSTMENT

NEEDLE TO HOOK TIMING

When the machine is set the straight stitch pattern no.11 (left needle position), the amount of ascending travel of the needle bar from its lowest position to the position where the tip of the hook meets the right side of the needle should be 3.25 - 3.55 mm.


1. Remove the needle plate and bobbin holder.
2. Turn on the power switch, set the straight stitch pattern no.11 (left needle position).
3. Remove the bed cover.
4. Turn the handwheel toward you, and set the needle bar at the lowest position.
5. Loosen the setscrews on the lower shaft timing gear.
6. Raise the needle bar 3.4 mm from the lowest position of the needle bar.
7. Turn the lower shaft timing gear until the tip of hook meets with the right side of needle.
8. Tighten the setscrews on the lower shaft timing gear.
9. Attach the bed cover, bobbin holder and needle plate.

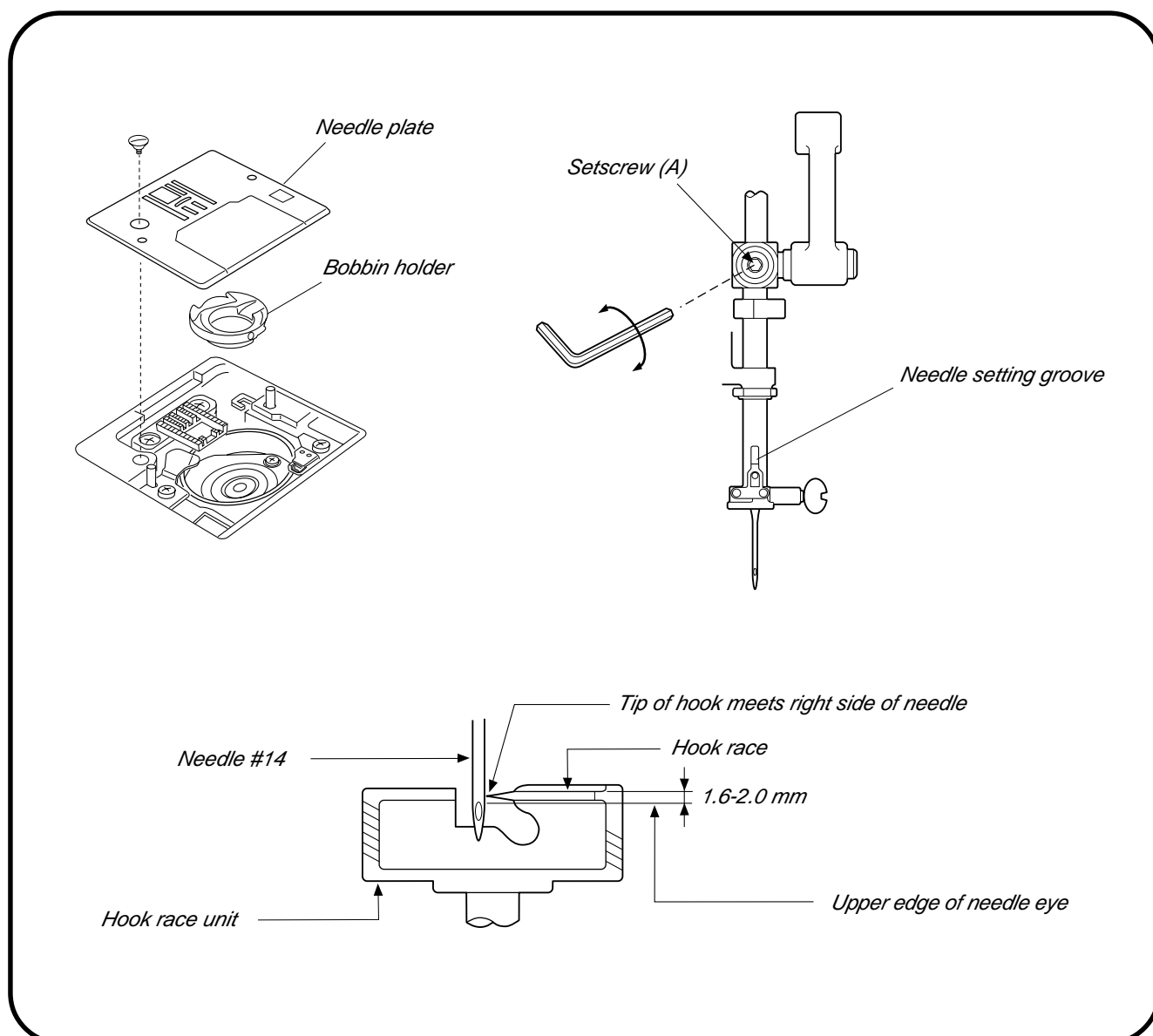


MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

The distance between the upper edge of needle eye and the tip of the hook should be in the range of 1.6-2.0 mm when the tip of hook meets the right side of the needle in ascending travel of needle from its left and lowest position.

1. Remove the needle plate and bobbin holder.
2. Turn on the power switch.
3. Select the pattern  (simple zigzag). (Maximum zigzag width)
4. Turn the handwheel toward you until the tip of hook meets the right side of the needle.
5. Loosen the setscrew (A).
6. Adjust the height of the needle bar by moving the needle bar upward or downward without turning it. (Make sure that the needle setting groove of the needle bar is in the front).
7. Tighten the setscrew (A).
8. Insert the bobbin holder, then attach the needle plate.




MECHANICAL ADJUSTMENT

NEEDLE CLEARANCE TO HOOK

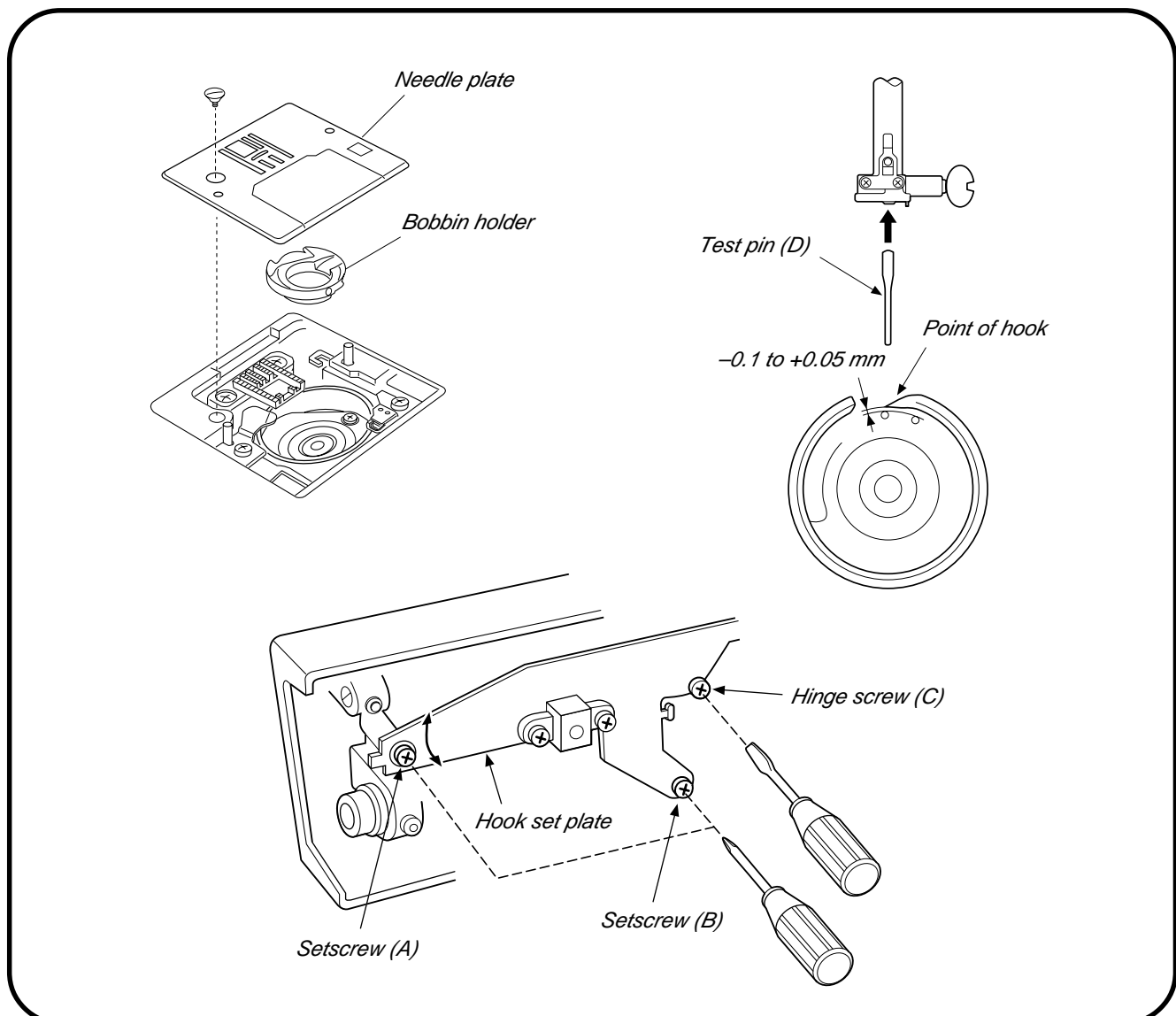
The clearance between the needle and the tip of hook should be -0.1 to $+0.05$ mm.

PREPARATION:

1. Remove the needle plate, bobbin holder, and bed cover, and replace the needle with the test pin (D).
2. Turn the power switch on, and select pattern "  " (simple zigzag). (Maximum zigzag width)

ADJUSTMENT PROCEDURE:

1. Loosen the setscrews (A), (B), (C), then slightly tighten the hinge screw (C).
2. Turn the handwheel toward you, and adjust the clearance between test pin and the point of the hook in the left and right needle position to -0.1 to $+0.05$ mm by moving the hook set plate up or down.
3. Tighten the setscrews (A), (B), (C).
4. Check the backlash of the hook drive gear and lower shaft gear. If the backlash is too great or not enough, adjust the backlash in accordance with "to adjust the backlash of hook drive gear and lower shaft gear".
5. Attach the bed cover, needle plate and bobbin holder, and remove the master needle.



MECHANICAL ADJUSTMENT

BACKLASH (BETWEEN LOWER SHAFT GEAR AND HOOK GEAR)

Jog the hook race back and forth to check rotary play.

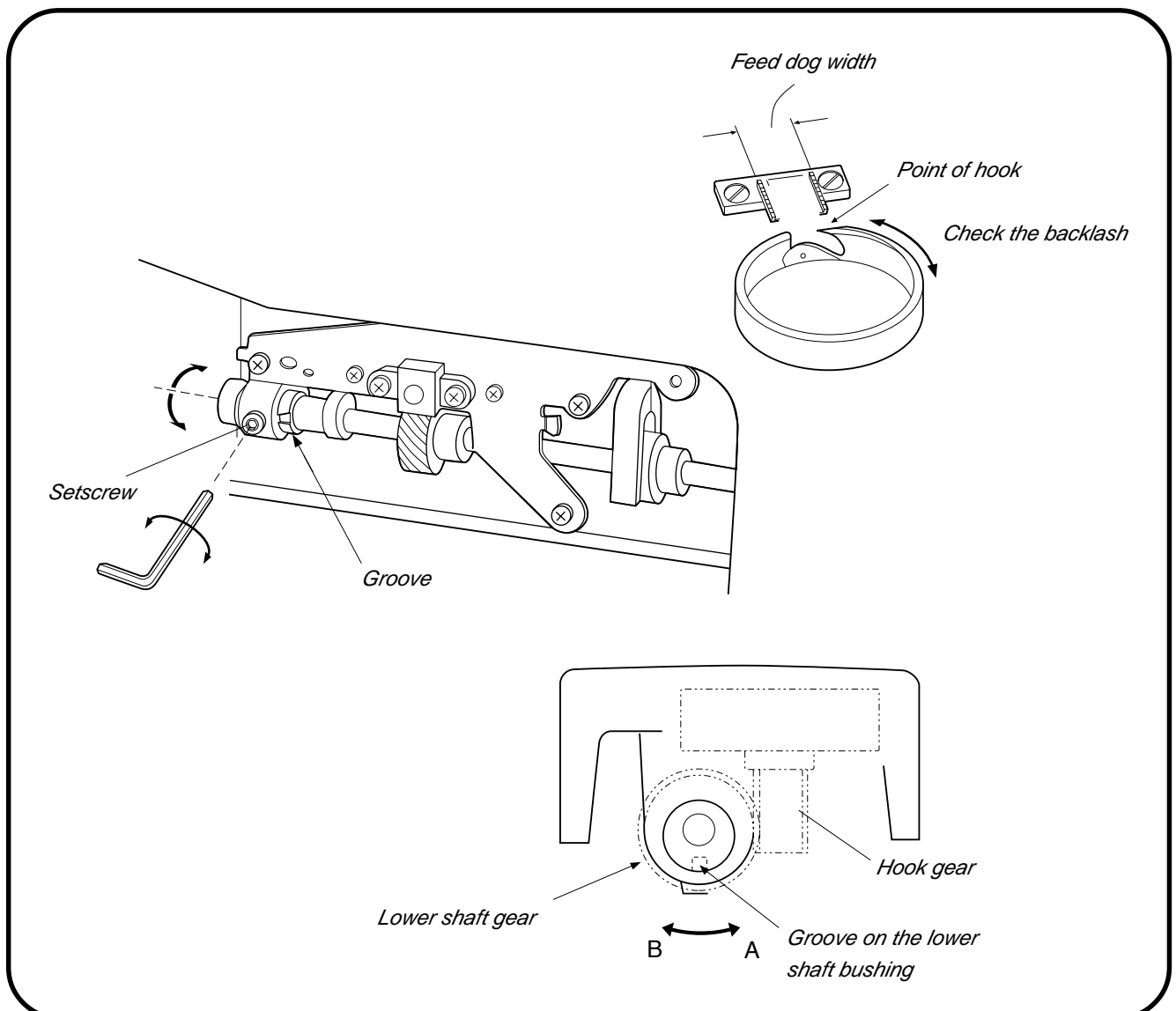
The standard play should be 0.8 mm (0.03") or less when the hook point is within the feed dog width. If play excess 0.8 mm, adjust as follows.

ADJUSTMENT:

1. Remove the bed cover (see page 9).
2. Loosen the setscrew.
3. Turn the lower shaft bushing (eccentric bushing) clockwise (B) if there is too much play in the hook.
Turn the lower shaft bushing (eccentric bushing) counterclockwise (A) if there is too little play in the hook.
4. Tighten the setscrew securely after adjustment and install the bed cover.

NOTE:

After adjusting the backlash, be sure to check the needle to hook timing and the feed dog height.

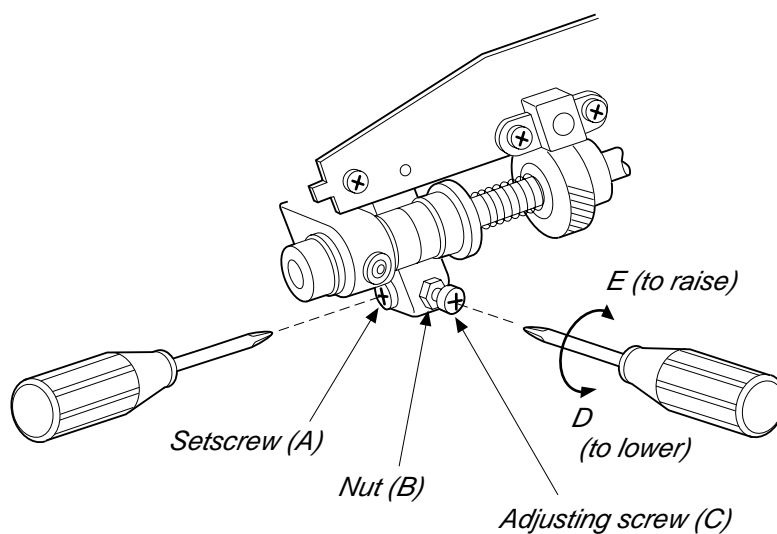
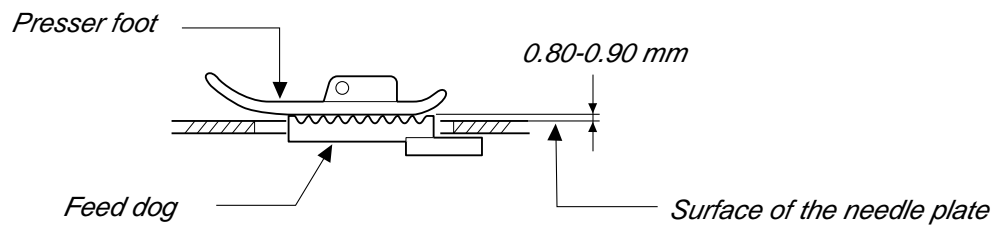


MECHANICAL ADJUSTMENT

FEED DOG HEIGHT

The highest position of the feed dog should be between 0.8 to 0.9 mm from the surface of the needle plate when the presser foot is lowered.

1. Lower the presser foot.
2. Turn on the power switch.
3. Remove the bed cover.
4. Turn the handwheel toward you to set the feed dog at the highest position.
5. Loosen the setscrew (A) and nut (B).
6. Adjust the feed dog height by turning the adjusting screw (C).
7. Tighten the nut (B) and setscrew (A).

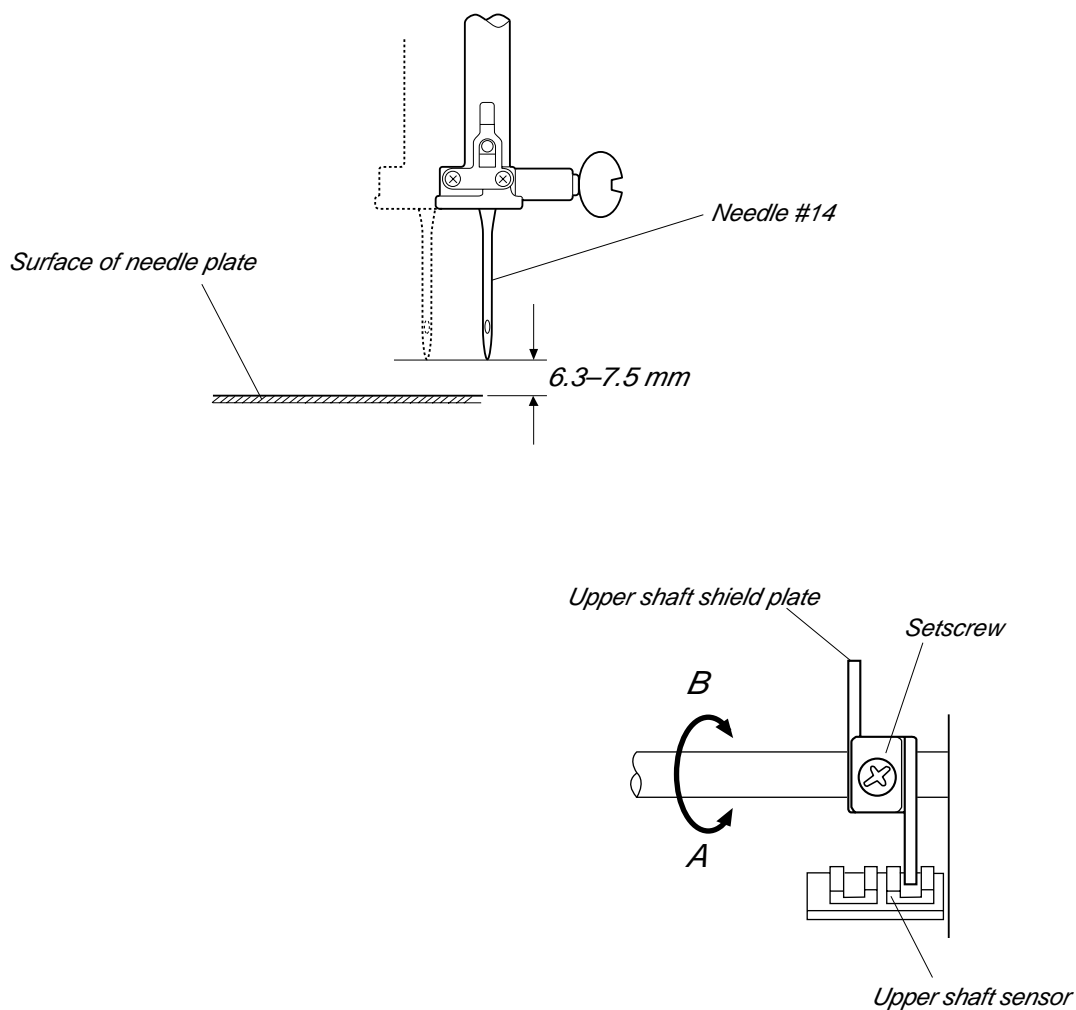


MECHANICAL ADJUSTMENT

ZIGZAG SYNCHRONIZATION

The needle should start swing between 6.3 to 7.5 mm above the surface of the needle plate when the machine is set for zigzag stitching.

1. Remove the front cover (see page 10).
2. Turn on the power switch, select the pattern no. 04 and set the machine at the maximum zigzag width.
3. Turn the handwheel toward you slowly with your hand until the needle start to swing. Loosen the setscrew and turn the upper shaft shield plate in the direction of;
 - * A. If the swing point is higher than 7.5 mm.
 - * B. If the swing point is lower than 6.3 mm.
4. Position the upper shaft shield plate as close as possible to the left. (It should not touch the upper shaft sensor).
5. Check the swing point by turning the handwheel, then tighten the setscrew.
6. Attach the front cover.



MECHANICAL ADJUSTMENT

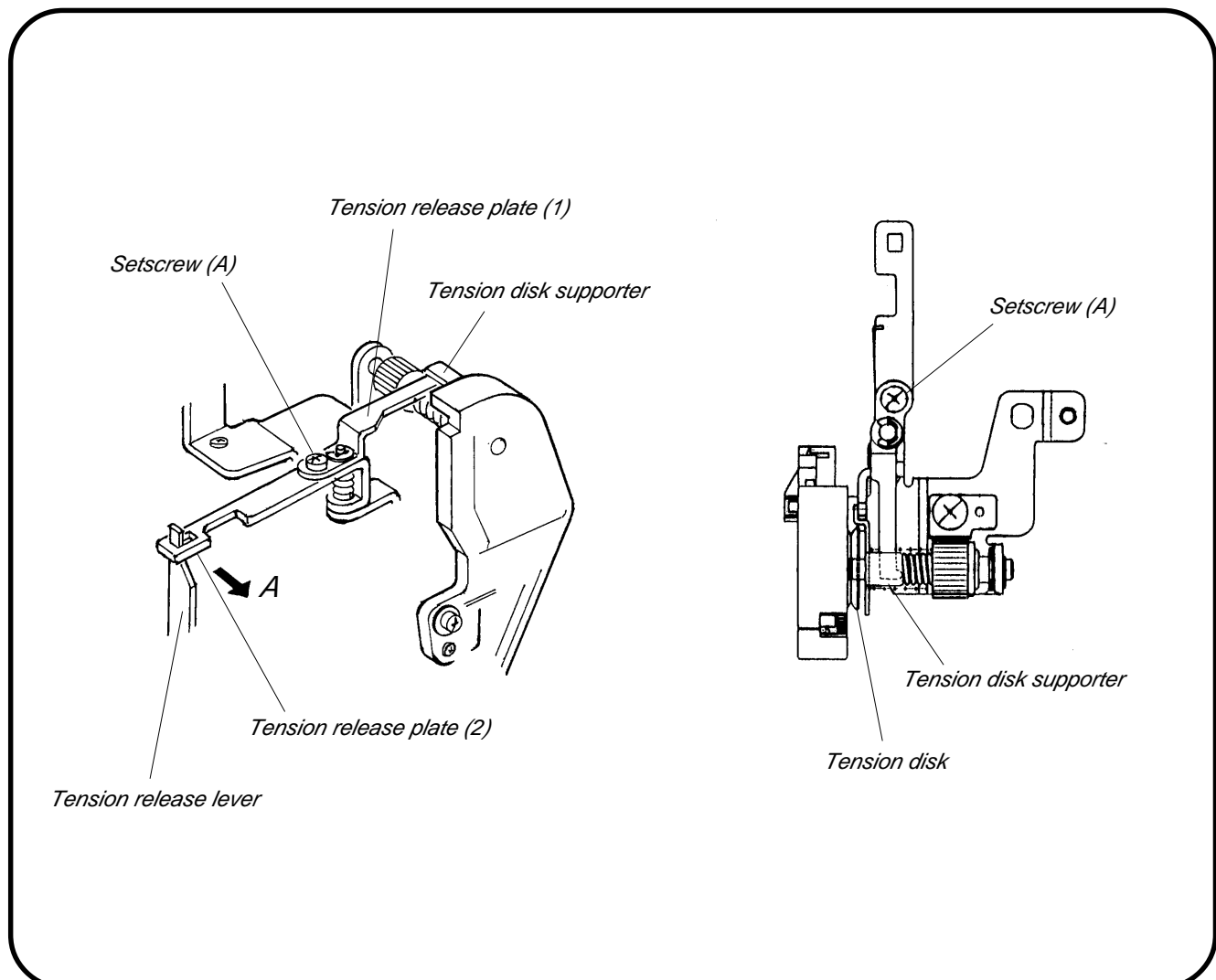
TENSION RELEASE MECHANISM

CORRECT SETTING:

When the presser foot lifter is raised, the tension disk supporter should move approximately 1 mm and the tension disk opens.

TO ADJUST:

1. Remove the top cover, belt cover and front cover (see pages 7, 8 and 10).
2. Lower the presser foot lifter, and set the thread tension dial at "9".
Then loosen the setscrew (A).
3. While pushing the tension release plate (2) in the direction of "A", move the tension release plate (1) until it touches tension disk supporter.
In this condition, tighten the setscrew (A).
4. Raise the presser foot lifter, and check the tension release mechanism.
5. Set the thread tension dial at "0".
Lower the presser foot lifter.
Move the tension release plate (2) back and forth. In this condition, the tension disk supporter should not move.
6. Attach the top cover, belt cover and front cover.



MECHANICAL ADJUSTMENT

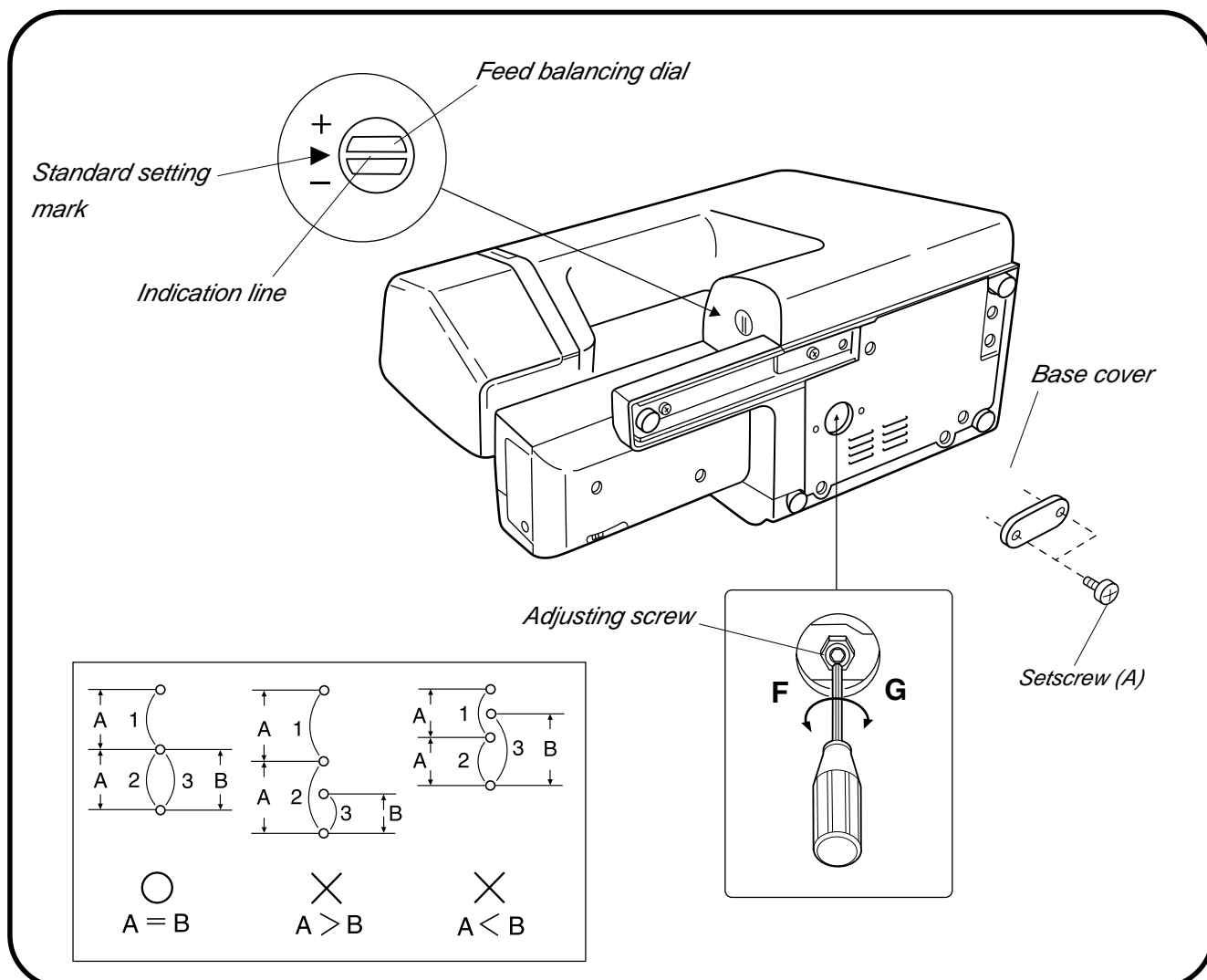
STRETCH STITCH FEED BALANCE

When a stretch stitch pattern is sewn with the feed balancing dial position set at the standard setting mark "▶", the stitch pattern should look like the one marked with a "○" (A=B) in the diagram below.

If forward and backward feeding is unbalanced (A.B or A,B), adjust as follows.

ADJUSTMENT PROCEDURE:

1. Turn the power switch on and select the stitch pattern "||||".
2. Set the slit of the feed balancing dial to the standard setting mark "▶" on the front cover.
3. Put a piece of paper under the presser foot and lower it.
Turning the handwheel toward you, and check the needle mark at "A" and "B".
4. Remove the setscrew (A) and base cover.
5. If $A > B$, turn the adjusting screw counterclockwise "C".
6. When $A < B$, turn the adjusting screw clockwise "D".
7. Attach the base cover.



MECHANICAL ADJUSTMENT

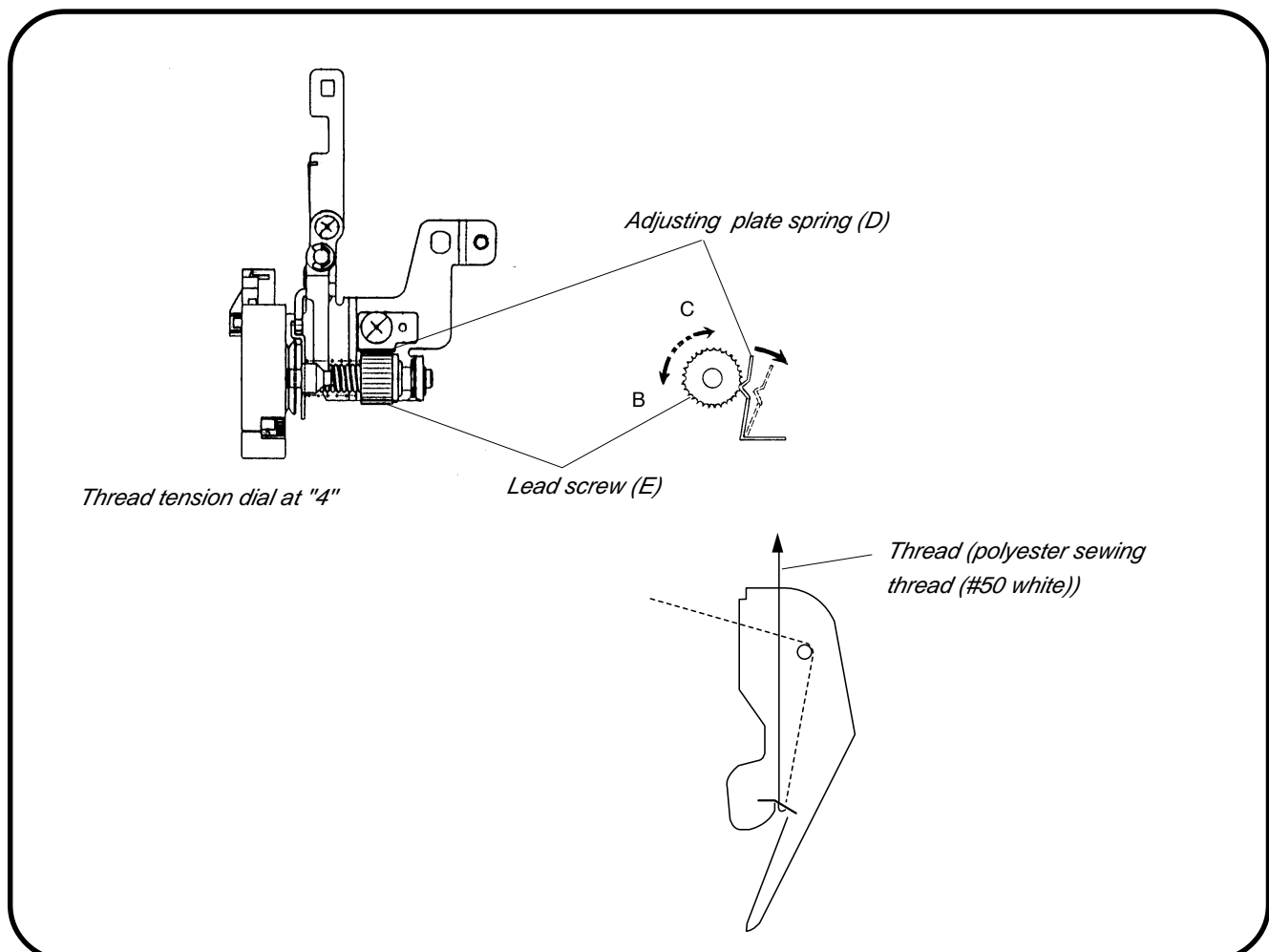
NEEDLE THREAD TENSION

TO CHECK:

1. The standard tension should be 75 to 90 grams when the tension dial is set at "4", measured by a #50 white polyester thread being pulled at approximately 110 mm/sec. If the tension is out of the standard range, adjust as follows.

ADJUSTMENT PROCEDURE:

1. Remove the front cover unit (see page 10).
2. Pull the adjusting plate spring (D) away from the lead screw (E) and adjust it by turning the lead screw (E).
 - *When the tension is strong, turn the lead screw in direction "B".
 - *When the tension is weak, turn the lead screw in the direction "C".
3. Attach the front cover unit.



ADJUSTING BUTTONHOLE LEVER POSITION

BUTTONHOLE LEVER

TO ADJUST THE BUTTONHOLE LEVER GUIDE:

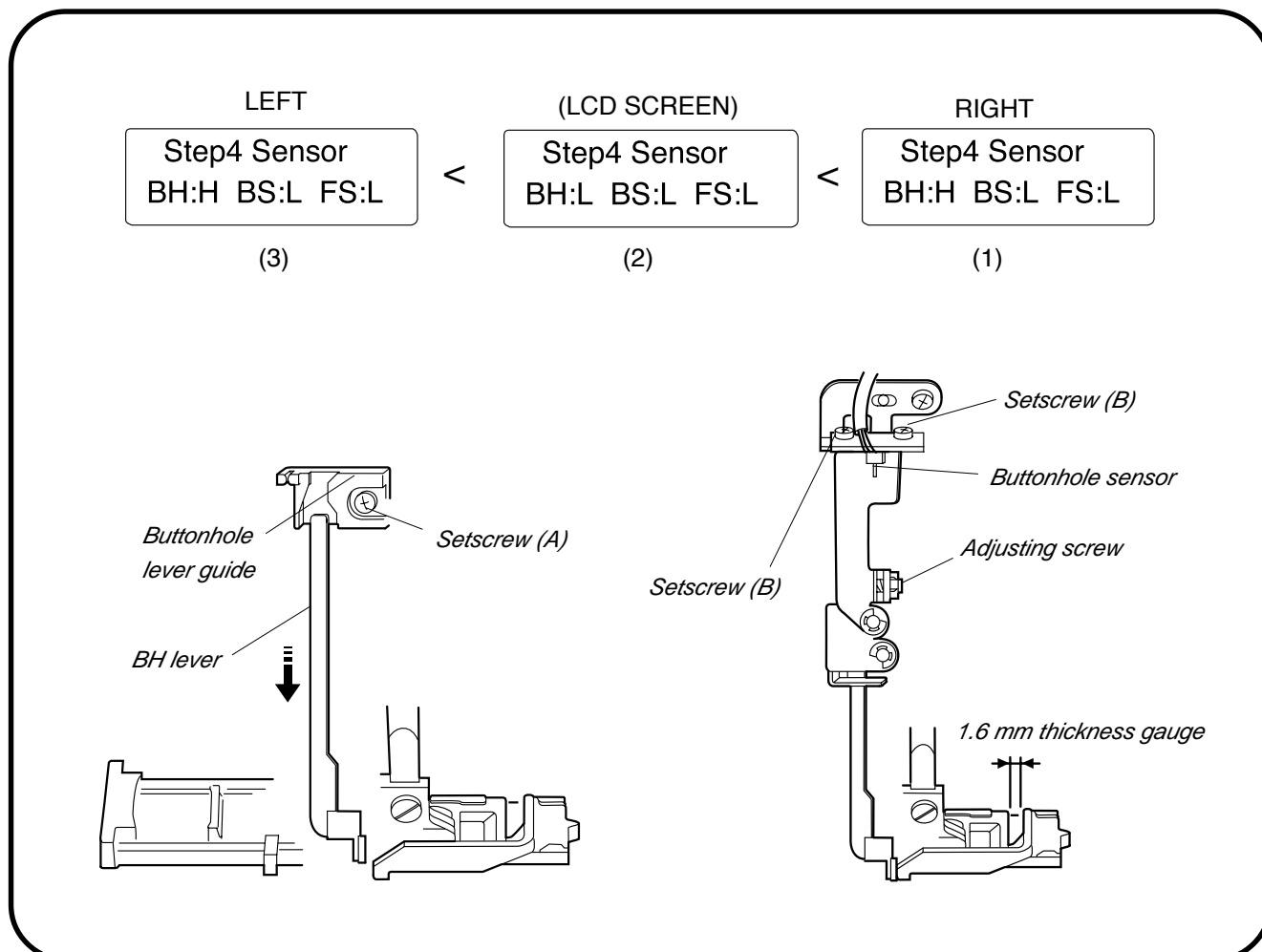
1. Enter adjusting mode, by turning the power switch on while pressing the "Reverse" and "Auto-lock" buttons. Press the #4 key within 3 seconds.
The LCD screen shows "BH sensor [H] or [L]".
2. Open the face cover and loosen setscrew (A).
3. Lower the buttonhole lever. Position the buttonhole lever guide so the screen displays "L".
Tighten setscrew (A).

TO ADJUST THE BUTTONHOLE SENSOR POSITION:

4. Attach the buttonhole foot (R).
5. Lower the buttonhole lever to its lowest position, and insert a 1.6 mm thickness gauge into the buttonhole foot.
6. Turn the adjusting screw to the left until the screen display changes from "L" to "H".
7. Then, turn the adjusting screw to the right until the screen display changes from "H" to "L".
8. Check if the LCD screen shows "H" when the 1.4 mm thickness gauge is inserted and "L" when the 1.8 mm thickness gauge is inserted.
9. Turn off the power switch.

NOTE

If there is any lint in the buttonhole sensor slit, remove the setscrew (B), clean out with a swab.



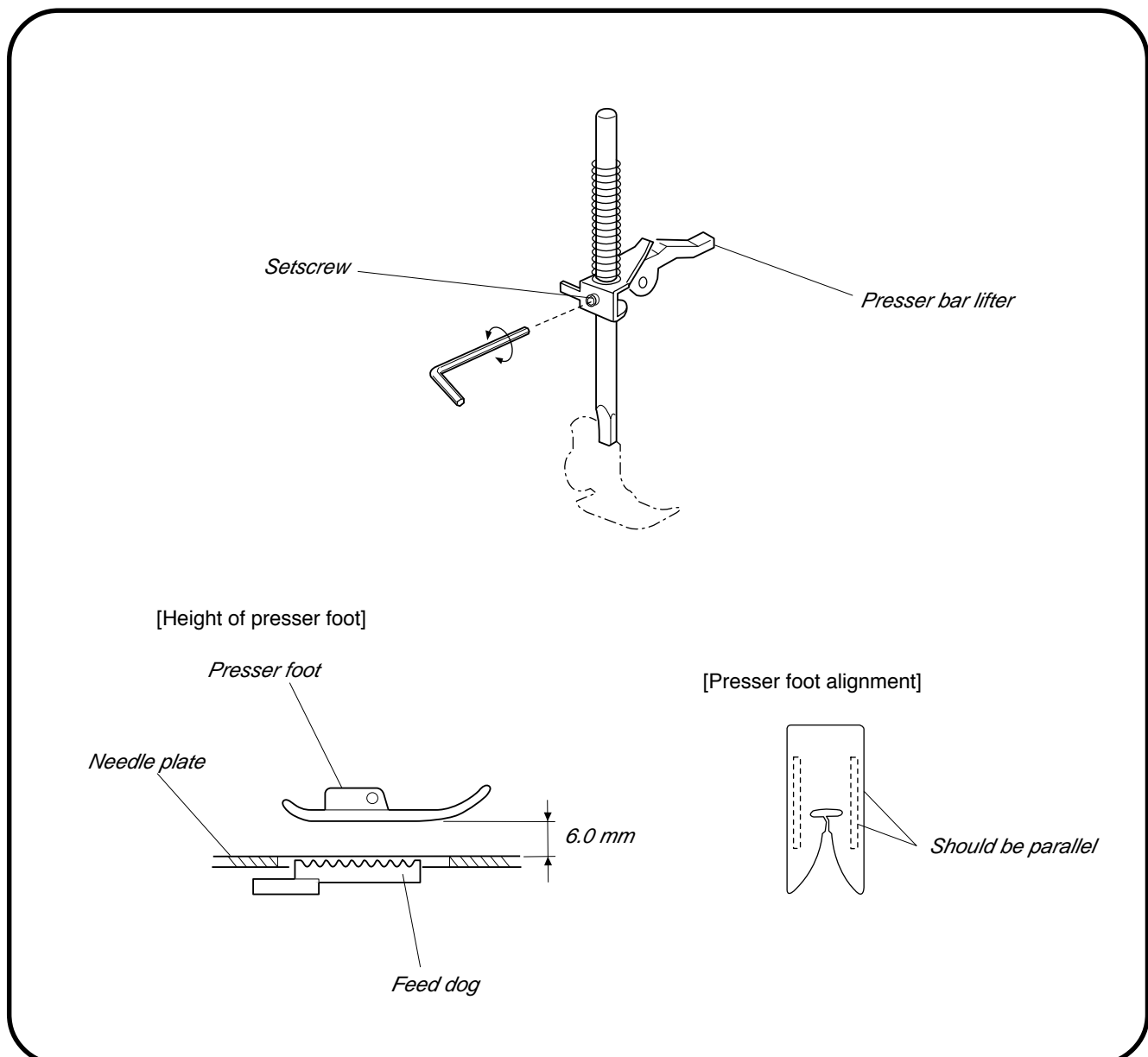
MECHANICAL ADJUSTMENT

PRESSER BAR HEIGHT AND ALIGNMENT

When the presser foot is raised, the clearance between the presser foot and the needle plate should be 5.7 to 6.3 mm.

When the presser foot is lowered, the edge of the foot and the feed dog window on the needle plate should be parallel.

1. Open the face cover and raise the presser foot.
Loosen the setscrew to adjust the presser foot height (6.0 mm) and the presser foot alignment.
2. Tighten the setscrew firmly.



MECHANICAL ADJUSTMENT

NEEDLE THREAD TENSION UNIT

TO REMOVE:

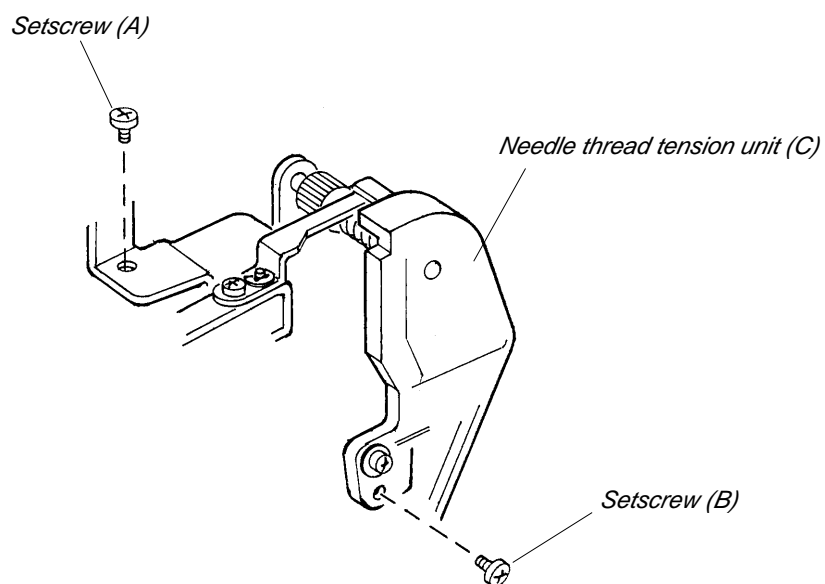
1. Remove the front cover (see page 10).
2. Remove setscrews (A) and (B) and the needle thread tension unit (C).

TO ATTACH:

1. Reverse this procedure.

NOTE:

After changing the needle thread tension unit, check the mechanical adjustment, "Tension release mechanism".



MECHANICAL ADJUSTMENT

REPLACEMENT AND ADJUSTMENT OF THE NEEDLE THREADER PLATE

If the hook of the threader plate is damaged, change or adjust the part as follows:

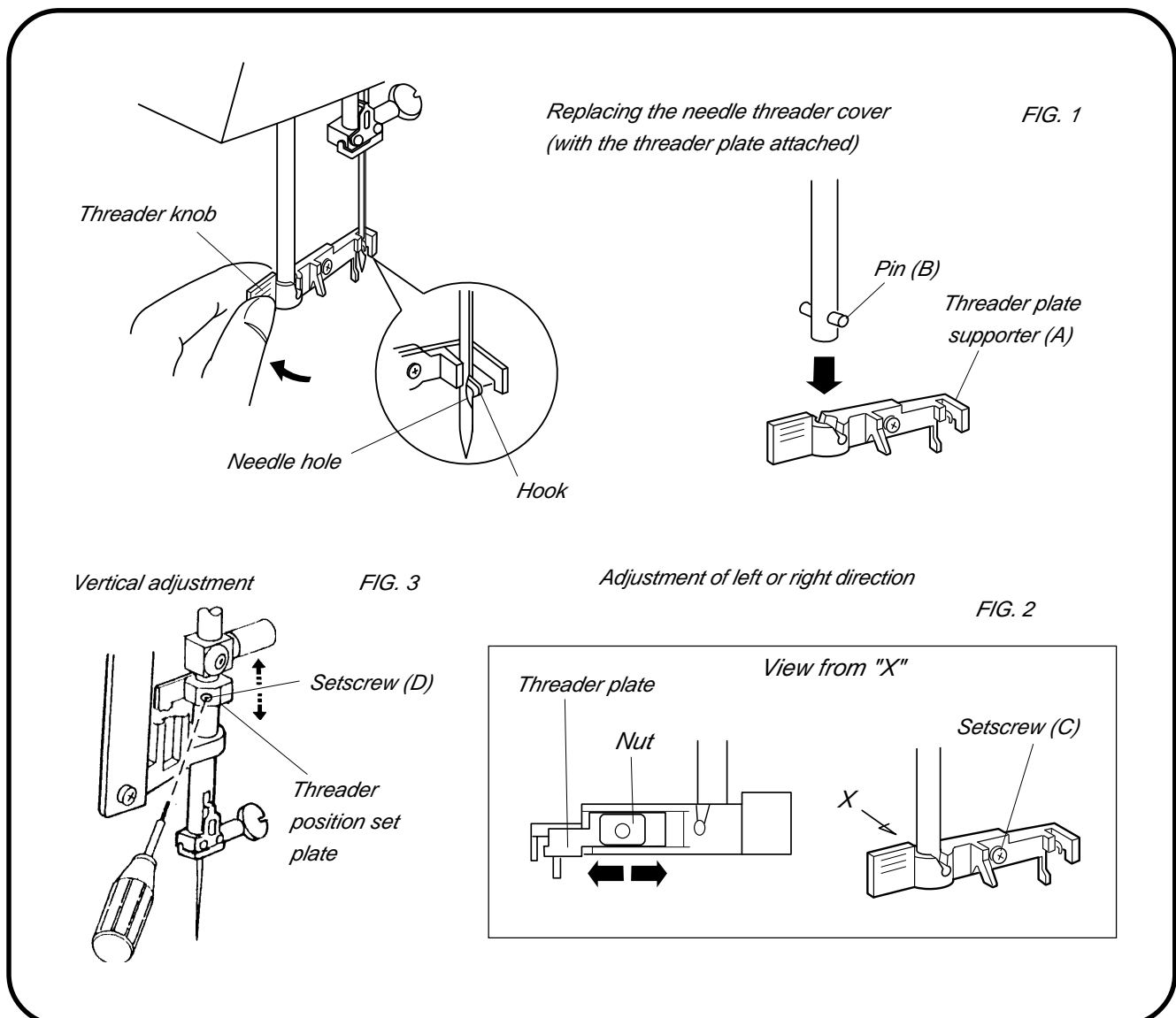
TO CHANGE THE THREADER PLATE:

TO REMOVE:

1. Push down the needle threader knob and pull the needle threader plate (A) down to remove it (see FIG 1).
2. To install the needle threader plate, line the groove up with the pin (B) and push it up to snap fit.

TO ADJUST THE THREADER PLATE POSITION:

1. If the hook on the threader plate thrusts or hits against the left or right side of the needle eye, loosen setscrew (C) and adjust the hook position (FIG 2).
2. If the hook on the threader plate thrusts or hits against the top or bottom side of the needle eye, loosen setscrew (D) and adjust the hook position (FIG.3)



REPLACING PRINTED CIRCUIT BOARD A

TO REMOVE:

1. Remove the front cover (see page 10).
2. Unplug the connectors from the board "A".
3. Remove the 4 setscrews and remove board "A".

NOTE: TO DISCONNECT THE CONNECTORS:

1. Grasp the connector directly with your fingers and pull.
Do not pull on the lead wire, as this may damage the contact sleeve inside the connector.
2. When disconnecting the machine socket and power transformer connectors, pull them while pushing them toward the a board to unlock them.

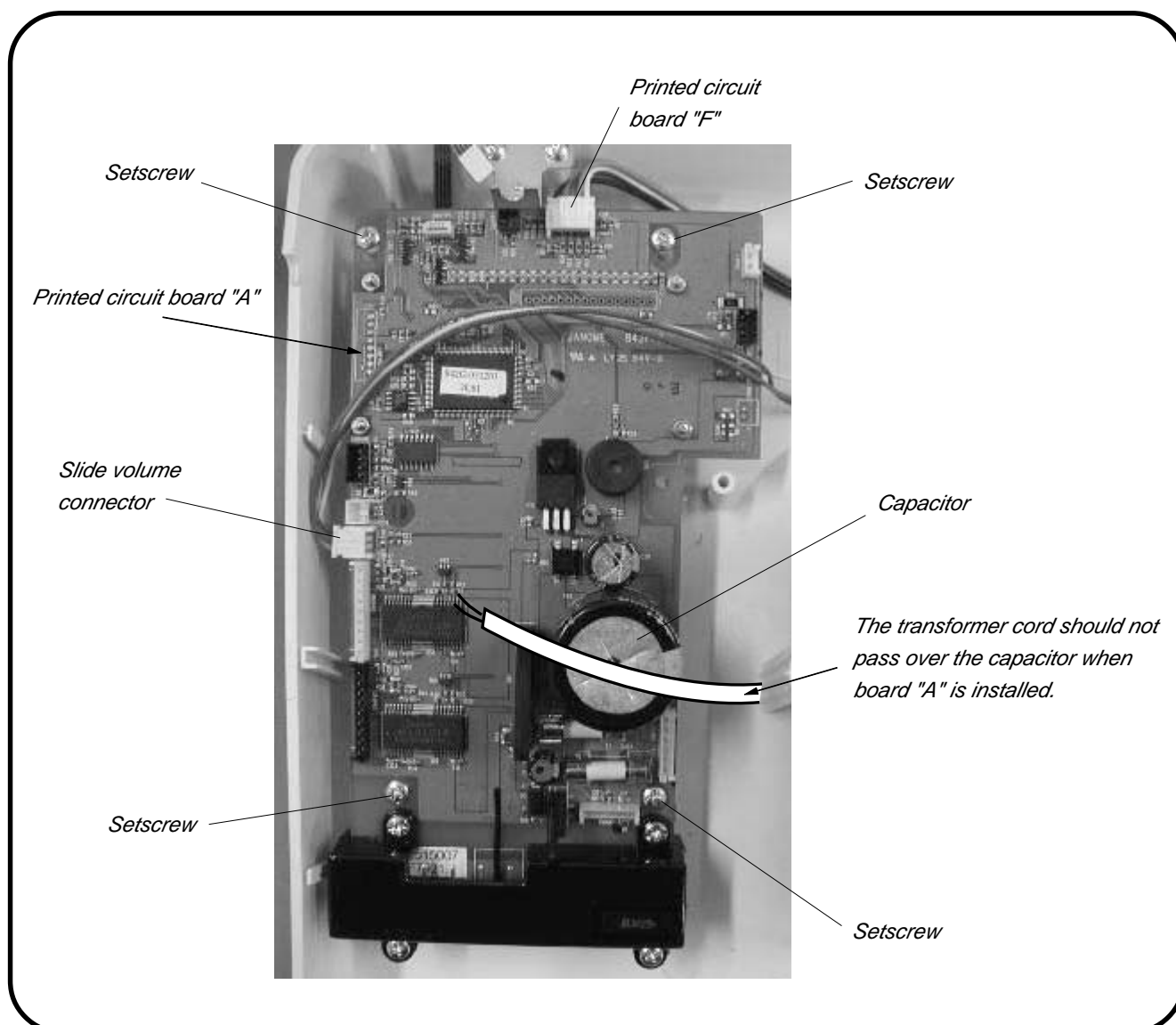
TO INSTALL:

4. To install, follow the above procedure in reverse.

NOTE:

The transformer wire should not pass over the capacitor when board "A" is installed.

If the cord is resting on the capacitor, it may interfere the pattern selector button after the front cover is installed.

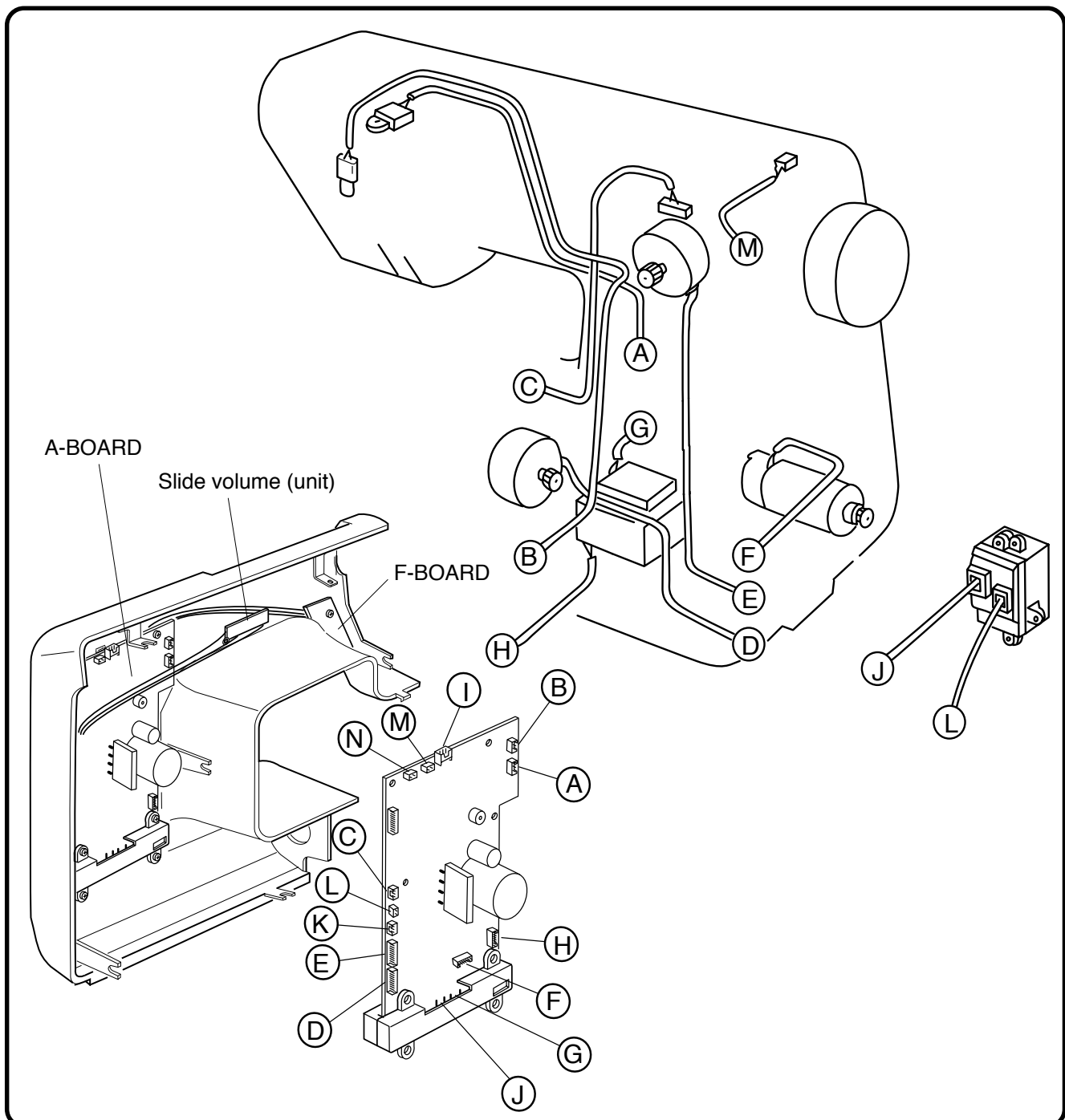


CONNECTOR DIAGRAM

REFER TO THE DIAGRAM FOR LOCATING THE CONNECTOR POST ON THE CIRCUIT BOARD

EACH CONNECTOR SHOULD BE CONNECTED AS FOLLOWS;

- | | |
|---|---|
| A : Buttonhole sensor (BLK) | H : Power transformer (secondary circuit) (WHT) |
| B : Sewing light (WHT) | I : Printed circuit board "F" (WHT) |
| C : Upper shaft sensor (BLK) | J : Machine plug (primary circuit) (WHT) |
| D : Feed motor (BLK) | K : Slide volume (WHT) |
| E : Zigzag width motor (WHT) | L : Machine plug (secondary circuit) (WHT) |
| F : DC motor (WHT) | M : Bobbin winder switch (BLK) |
| G : Power transformer (primary circuit) (BLK) | N : Touch panel (WHT) |



REPLACING SLIDE VOLUME AND PRINTED CIRCUIT BOARD F

REPLACING THE SLIDE VOLUME

TO REMOVE:

1. Remove the front cover unit (see page 10).
2. Unplug the slide volume connector.
3. Remove the 3 CS rings and remove the side volume.

TO INSTALL:

4. To install the slide volume, follow the above procedure in reverse.
 - * Secure the lead wire on the board using the cs rings, as shown.
 - * Check to ensure that the slide volume moves smoothly back and forth.

REPLACING PRINTED CIRCUIT BOARD "F"

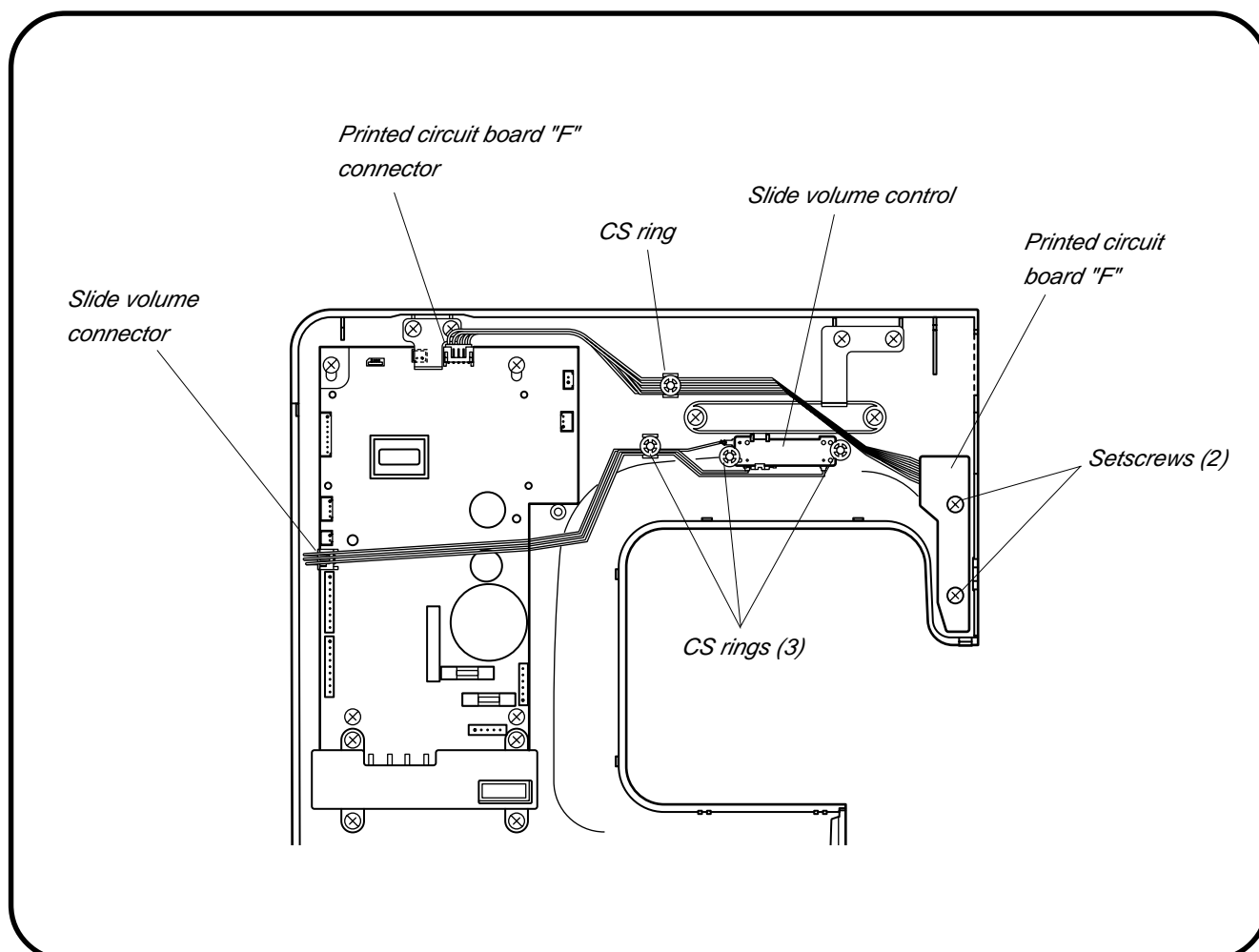
TO REMOVE:

5. Remove the front cover unit (see page 10).
6. Unplug the printed circuit board "F" connector and remove the cs ring.
7. Remove the two setscrews and remove the printed circuit board "F".

TO INSTALL:

To install the printed circuit board "F". Follow the above procedure in reverse.

- * Secure the lead wire on the board using the cs ring, as shown.
- * Each button (needle up/down button, start/stop button, reverse button) should "Click" when pressed.



REPLACING TOUCH PANEL

TO REMOVE:

1. Remove the front covers (see page 10).
2. Remove the 4 setscrews and remove the touch panel supporter.
3. Remove the touch panel.

The touch panel is fixed with the double-faced tape.

TO INSTALL:

4. To install, follow the above procedure in reverse.

NOTES:

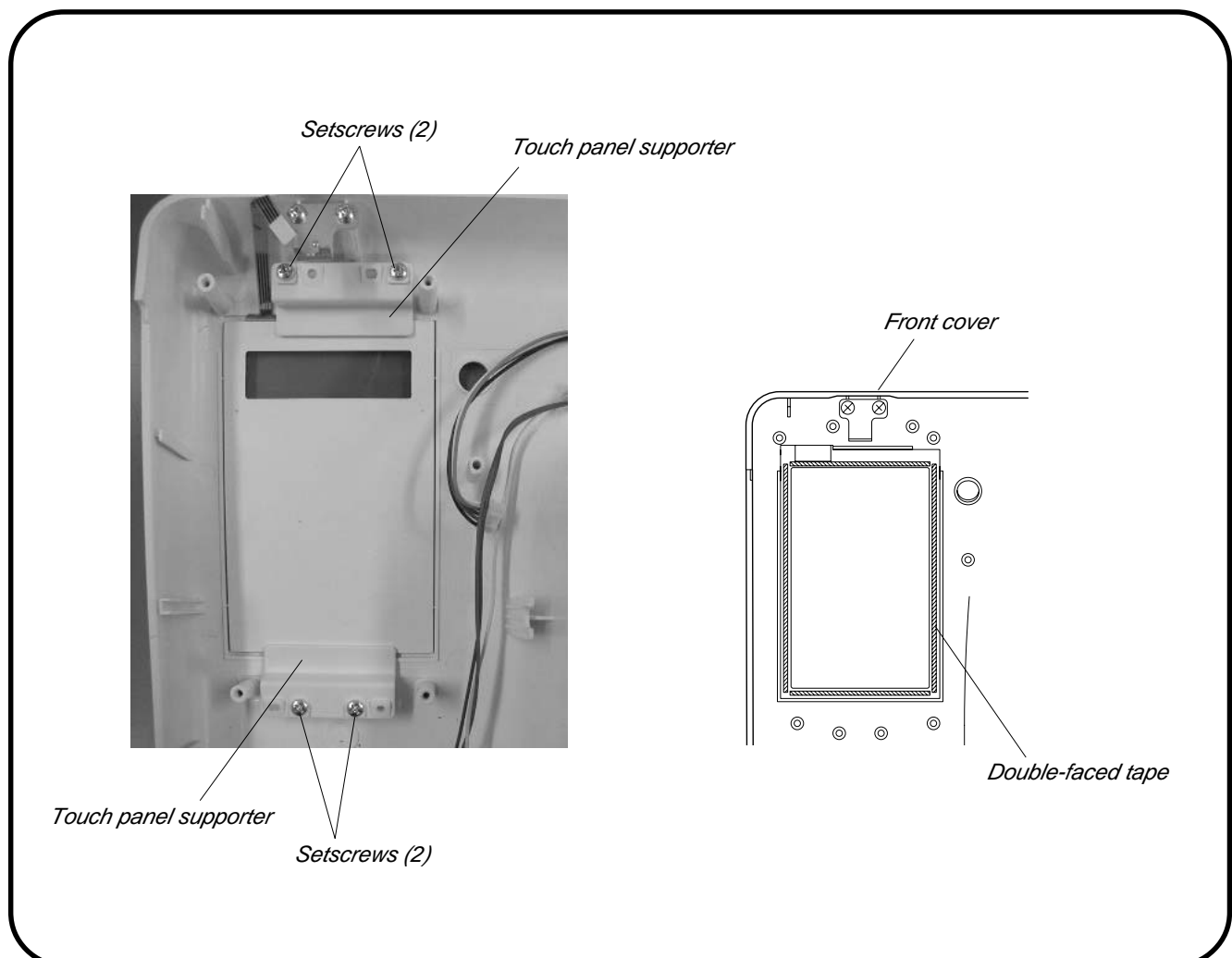
The double-faced tape is stuck to the front cover.

After changing the touch panel, check the self diagnostic tests.

Touch panel is comprised of the following two parts.

*842-510-002 Touch panel (unit)

*842-084-002 touch panel sheet



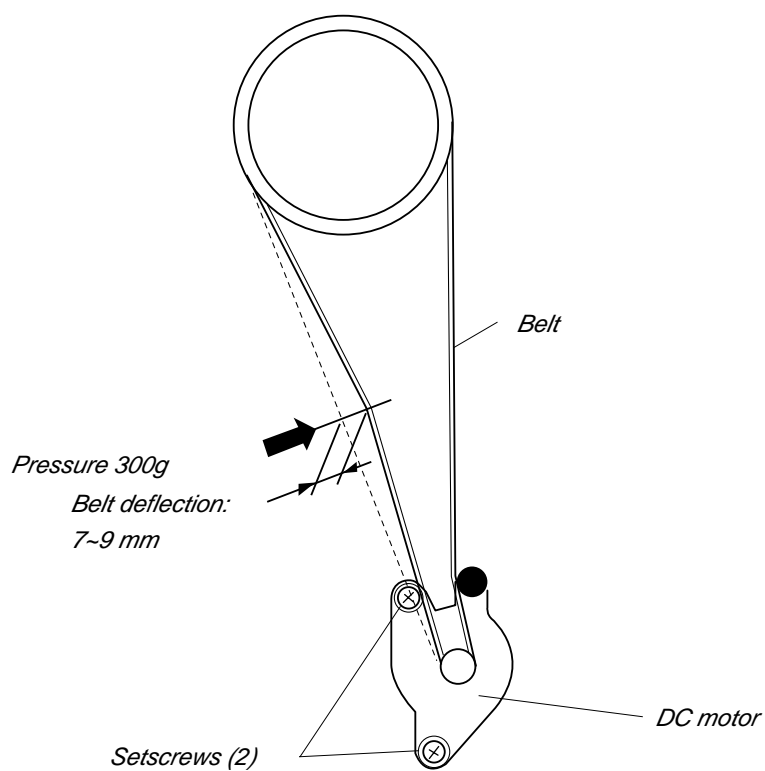
REPLACING DC MOTOR AND ADJUSTING MOTOR BELT TENSION

TO REMOVE:

1. Remove the front and rear covers (see page 10 and 11).
2. Remove the two setscrews, then remove the DC motor and belt.

TO INSTALL:

3. Lightly tighten the two screws.
4. Put the motor belt on the pulley and adjust the belt deflection to about 7 to 9 mm by pressing the middle of the motor belt with your finger (with approximately 300 grams of pressure). Then, tighten the screws firmly.
5. Install the front and rear covers.



REPLACING THE FUSES

REPLACING THE FUSES

TO REMOVE:

1. Remove the front cover (see page 10).
2. Remove the four setscrews and remove the cover on printed circuit board "A".
3. Remove the fuse (pry it out with a screwdriver).

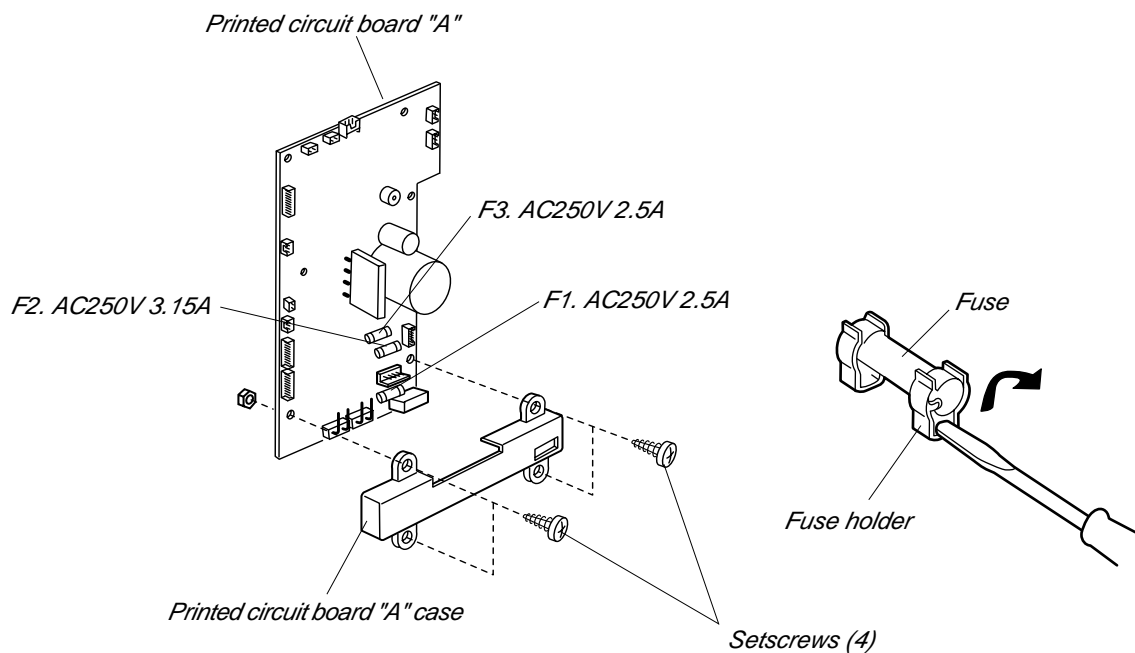
TO INSTALL:

4. Follow the above procedure in reverse.

FUSE NO.	PART NO.	TYPE/SPECIFICATION
F1, F3	000-144-605	TSD-2.5A-250V 5.2 X 20 MM 2.5 A TIME-LAG FUSE
F2	000-182-904	3.15A-250V 5.2 X 20 MM 3.15A TIME-RUG FUSE

NOTE

1. Replace the printed circuit board "A" if you notice any browning, discoloration, or other abnormalities.
2. Only install fuses with the correct rating.
3. If the fuse is loose, bend the fuse holder inward to secure the fuse.



REPLACING MACHINE SOCKET (UNIT)

REPLACING THE MACHINE SOCKET

TO REMOVE:

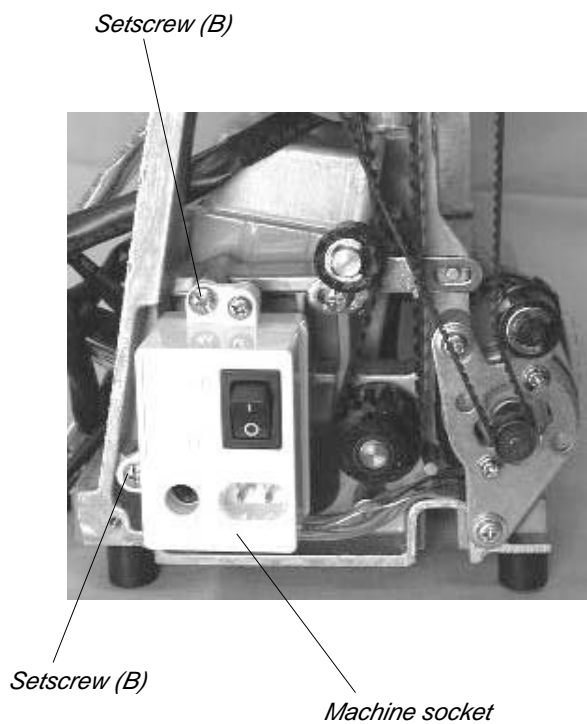
1. Remove the front and rear cover (see page 10 and 11).
2. Remove the two screws and remove the machine socket.

TO INSTALL:

3. To install the machine socket, follow the above procedure in reverse.

NOTE

Pull out the cord in front of the arm to prevent it from contacting with the lower shaft or other moving parts, and secure it to the feed motor cord with a binder.



REPLACING THE TRANSFORMER

REPLACING THE TRANSFORMER

TO REMOVE:

1. Remove the front cover (see page 10).
2. Remove the two setscrews and remove the transformer.
Cut off the binder.

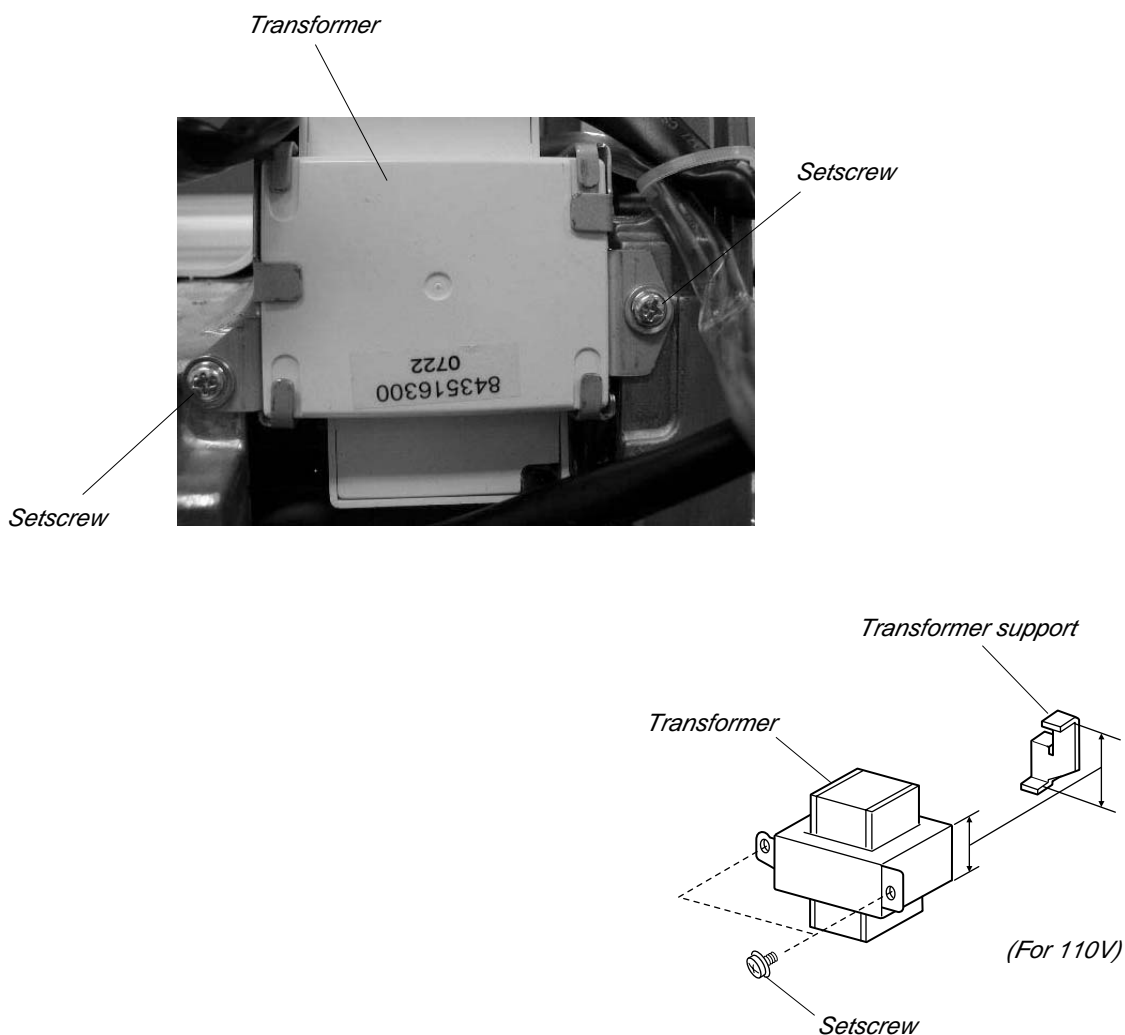
TO INSTALL:

3. To install the transformer, follow the above procedure in reverse.

NOTE

Place the rear end of the transformer on the transformer support (for 110V).

Slide the two transformer wire tubes to the side of transformer and secure them to the zigzag stepping motor wire so they will not come in contact with any moving parts.



REPLACING THE ZIGZAG WIDTH MOTOR

REPLACING THE ZIGZAG WIDTH MOTOR

TO REMOVE:

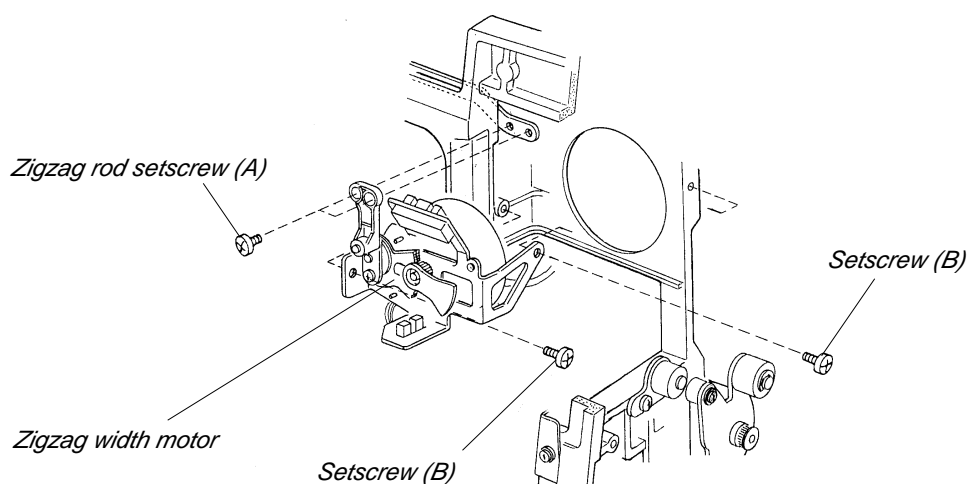
1. Remove the front and rear cover (see page 10 and 11).
2. Remove the two zigzag rod setscrews (A). Disconnect the connector from the board "A".
3. Remove the two setscrews (B) and remove the zigzag width motor.

TO INSTALL:

4. To install the zigzag width motor, follow the above procedure in reverse.

NOTE

1. The setscrew of zigzag rod should be tightened to 5~7 kg of torque.
2. Check to ensure that the upper shaft sensor mounted on the zigzag width motor does not interfere with the upper shaft shield plate.
3. Adjust the needle drop position (see page 13).



REPLACING THE FEED STITCH MOTOR

REPLACING THE FEED MOTOR

TO REMOVE:

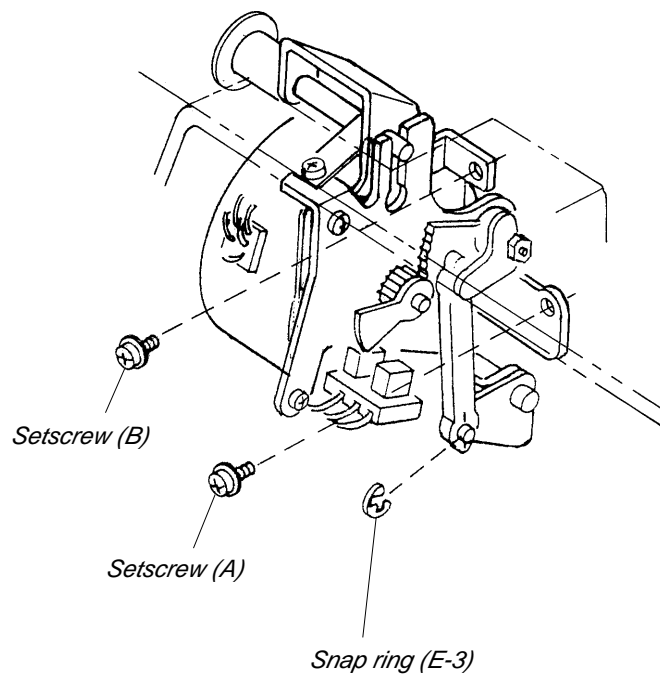
1. Remove the front cover and rear covers (see page 10 and 11).
2. Remove the snap ring (E-3). Disconnect the connector from the board "A".
3. Remove the two setscrews (A), (B) and remove the feed motor.

TO INSTALL:

4. To install the feed motor, follow the above procedure in reverse.

NOTE

Adjust the stretch stitch pattern feed balance (see page 21).



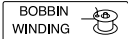
ADJUSTING THE BOBBIN WINDER SWITCH

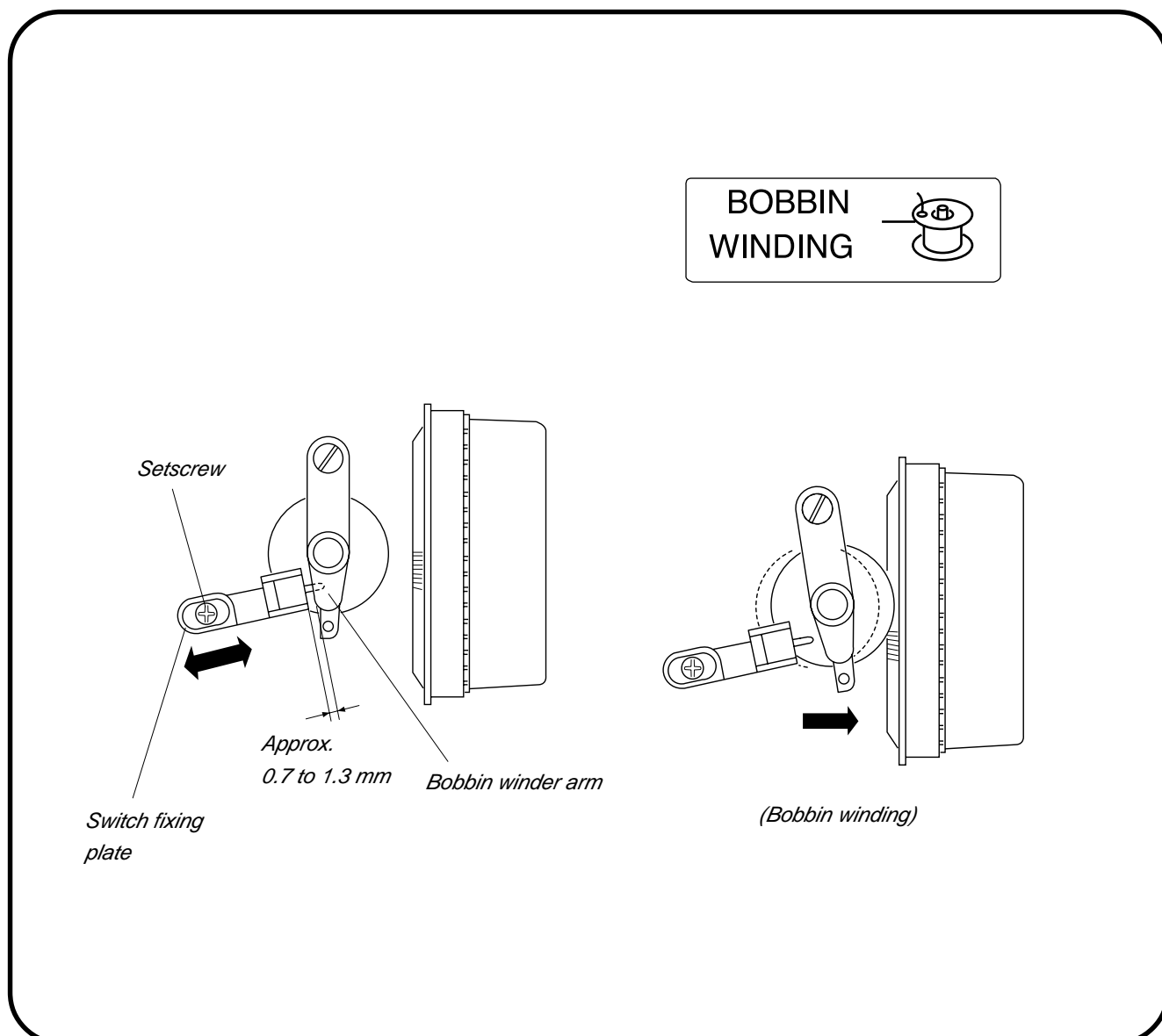
TO ADJUST THE BOBBIN WINDING SWITCH

1. Remove the front cover (see page 10).
2. Set the bobbin winder arm in the sewing position and loosen the setscrew.
Adjust the clearance between the bobbin winder arm and the switch fixing plate to $\square 0.7$ to 1.3 mm.
3. Tighten the setscrew.
4. Install the front cover.

TO CONFIRM:

Turn the power switch on.

The LCD displays  when the bobbin winder spindle is set the bobbin winding position, and displays sewing stitch pattern selection when the bobbin winder is returned to the sewing position.



OILING

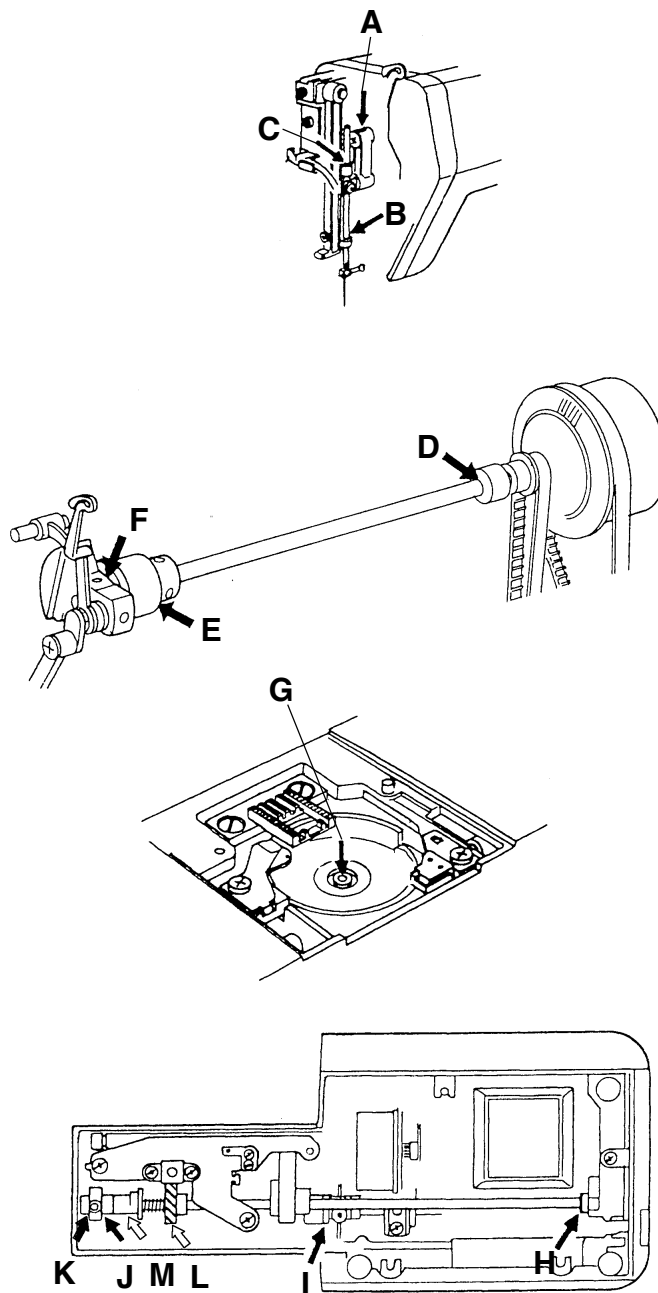
Factory lubricated parts will provide years of household sewing without routine oiling, but you should still check for possible lubrication needs whenever servicing machines.

OIL:

Use good quality sewing machine oil at the points (A, B, C, D, E, F, G, H, I, J & K) indicated by the black arrows.

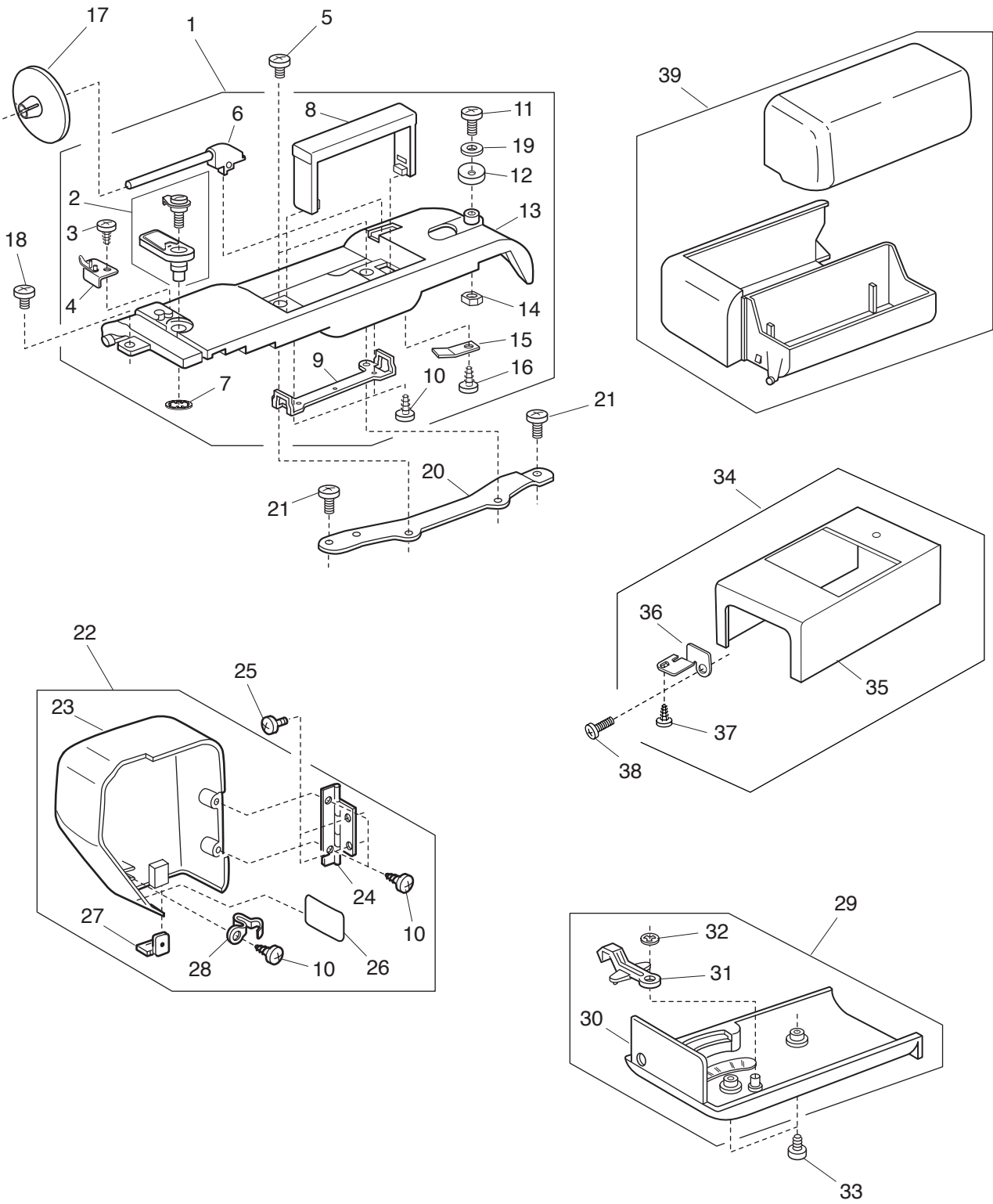
GREASE:

Use white grease such as molycote em-40m at the points (L & M) indicated by the white arrows.



PARTS LIST

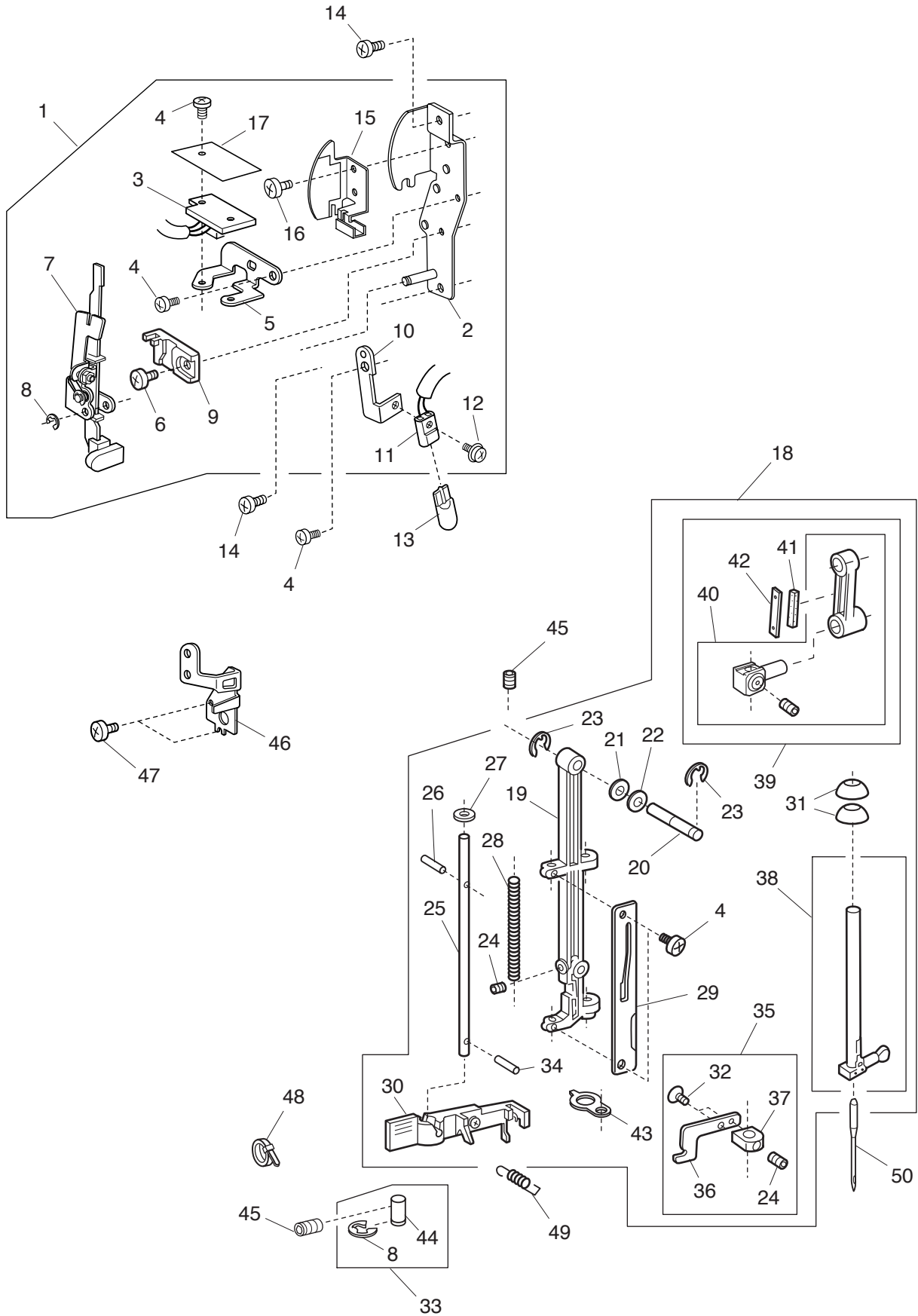
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	828603308	Top cover (unit)
2	650503702	Thread guide (unit)
3	000162001	Setscrew 2.6x5 (B)
4	827503005	Top cover thread guide (unit)
5	000103107	Setscrew 4x14
6	505067005	Spool pin
7	000014409	Snap ring CS-8
8	827014004	Handle
9	827015005	Set plate
10	000161206	Setscrew 3x10 (B)
11	000103107	Setscrew 4x14
12	735016307	Bobbin winder stopper
13	828008031	Top cover
14	000061205	Nut 4-3-7
15	822018003	Spool pin spring
16	000107318	Setscrew 3x8 (B)
17	822020503	Spool holder (large)
18	810220003	Setscrew
19	000071013	Washer
20	827016110	Top cover set plate
21	000081005	Setscrew 4x8
22	842602242	Face plate (unit)
23	842002800	Face plate
24	366501102	Face plate hinge (unit)
25	000077503	Setscrew 4x6
26	827099003	Face plate sticker
27	840602006	Thread cutter (unit)
28	731067002	Face plate spring
29	827602108	Bed cover (unit)
30	827004104	Bed cover
31	753005000	Drop lever
32	000013903	Snap ring CS-5
33	000101703	Setscrew 4x12
34	659601007	Free arm cover (unit)
35	659001001	Free arm cover
36	756004008	Free arm cover set plate
37	000120203	Setscrew 3x8 (B)
38	000101404	Setscrew 4x6
39	842501000	Extension table (unit)

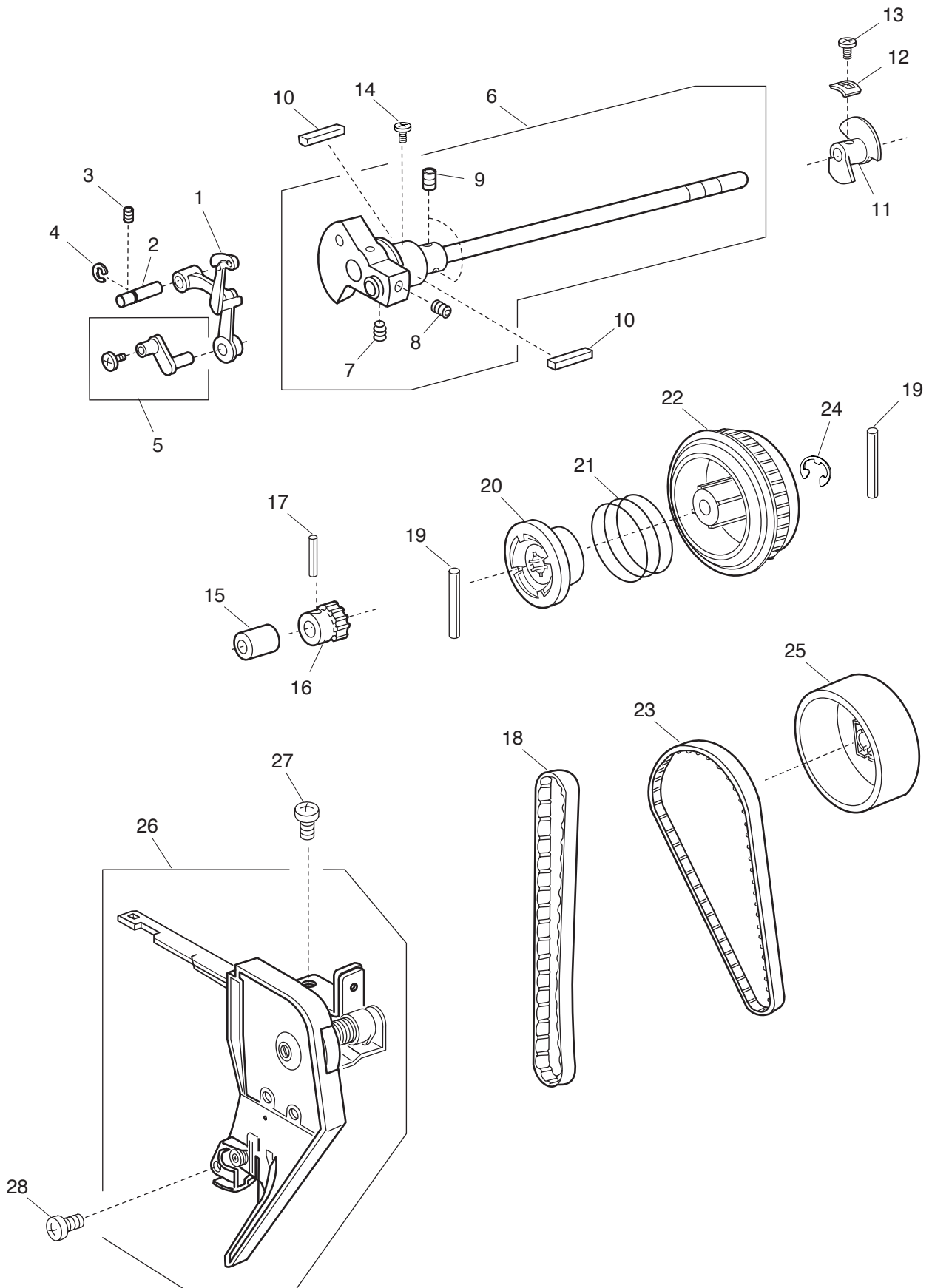
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	843623208	Front base plate (unit)
2	827028012	Front base plate
3	843502004	Printed circuit board E-1 (unit)
4	000101105	Setscrew 3x4
5	843009006	BH lever supporter plate
6	000103808	Setscrew 3x5
7	843625004	BH lever (unit)
8	000002105	Snap ring E-3
9	830057010	BH lever guide
10	843055007	Lamp set plate
11	843508000	Lamp socket (unit)
12	000115308	Setscrew TP 2x8
13	000026002	Wedge base lamp 12V 5W
14	000081005	Setscrew 4x8
15	827029013	Cord guide plate
16	652203004	Setscrew 3x3.5
17	845029008	Insulation paper
18	843642100	Needle bar supporter (unit)
19	827026009	Needle bar supporter
20	730022002	Needle bar supporter pin
21	673022002	Spring washer
22	000070609	Washer
23	000002507	Snap ring E-4
24	000111902	Hexagonal socket screw 3x4
25	840036003	Threader shaft
26	000122906	Guide pin
27	734107004	Washer
28	827091005	Threader shaft spring
29	653036029	Threader guide plate
30	639643009	Threader plate (unit)
31	827098002	Washer
32	000097602	Setscrew 2x4
33	842625001	Supporter guide plate pin (unit)
34	000003508	spring pin
35	734625003	Threader set plate (unit)
36	734101008	Threader set plate
37	734102009	Threader base plate
38	653503309	Needle bar (unit)
39	843652000	Needle bar conn. Stud comp. (unit)
40	639516002	Needle bar conn. Stud (unit)
41	650040005	Felt
42	650041006	Felt set spring
43	829027006	Supporter guide plate
44	827083004	Pin
45	000111201	Hexagonal socket screw 4x4
46	843038004	Lamp set plate
47	000101507	Setscrew 3.5x5
48	000053008	Cord binder
49	756063005	Supporter spring
50	102408089	Needle HAI-14

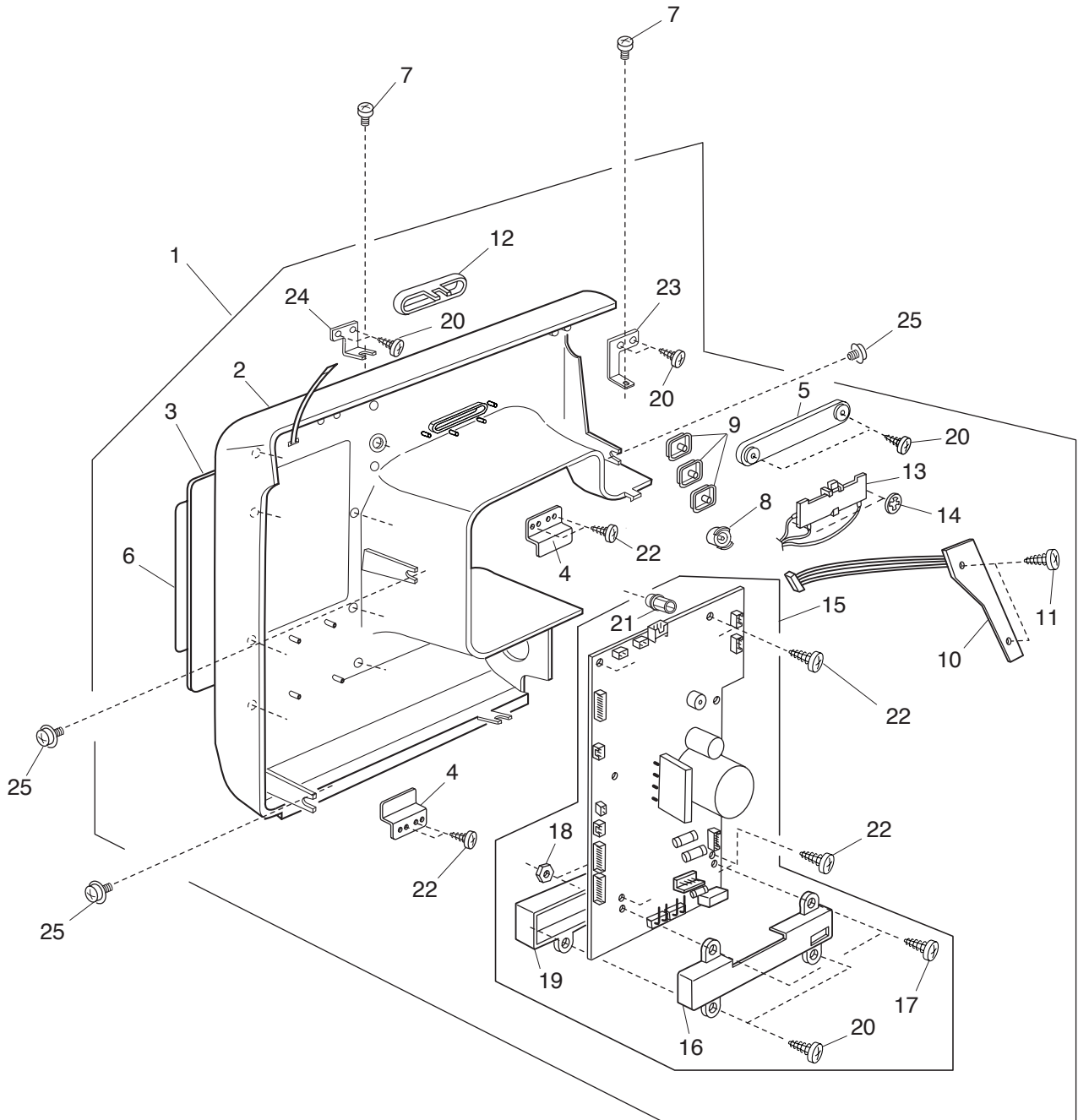
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	820511108	Thread take-up lever
2	650062003	Thread take-up lever pin
3	000111201	Hexagonal socket screw 4x4
4	000002806	Snap ring E-6
5	843543007	Needle bar crank pin (unit)
6	843643101	Upper shaft (unit)
7	000111706	Hexagonal socket screw 5x8
8	000110901	Hexagonal socket screw 5x4
9	000111304	Hexagonal socket screw 5x5
10	731384008	Felt
11	830095010	Upper shaft shielding plate
12	820102009	Washer
13	000081005	Setscrew 4x8
14	000172602	Setscrew 5x8
15	673062004	Upper shaft bushing
16	756017004	Upper shaft gear
17	000020501	Spring pin 3x22
18	650071005	Timing belt
19	000024206	Spring pin 3x30
20	502064003	Clutch ring
21	502065004	Clutch spring
22	844050016	Belt wheel
23	653139012	Timing belt
24	000030205	Snap ring E-8
25	844077008	Handwheel
26	842511003	Thread tension (unit)
27	000101404	Setscrew 4x6
28	000101703	Setscrew 4x12

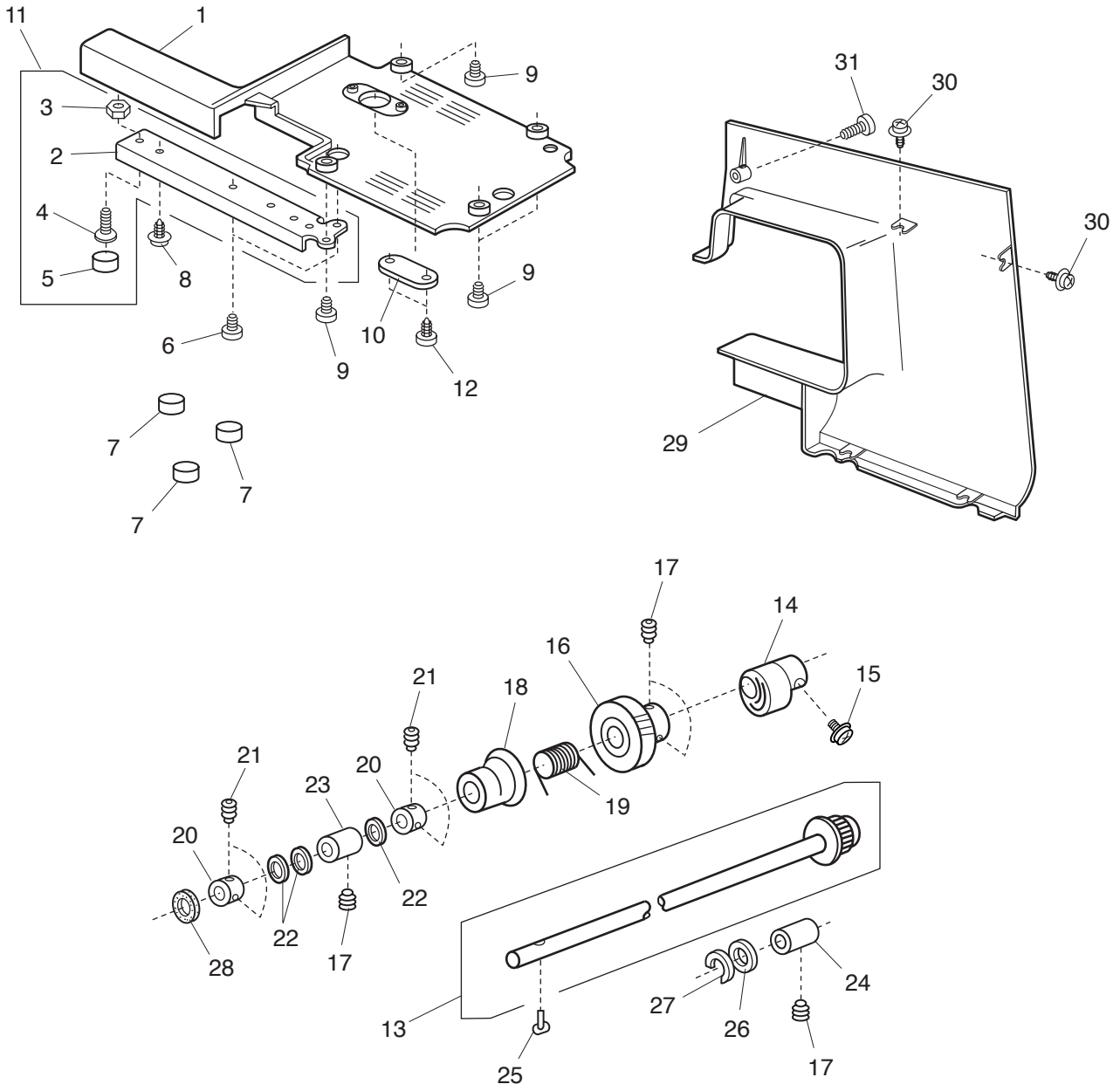
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	842635200	Front cover (unit)
2	842080307	Front cover
3	842510002	Touch panel (unit)
4	842099000	Touch panel supporter
5	751273005	Slide volume knob
6	842100005	Touch panel sheet
7	000101404	Setscrew 4x6
8	842048233	Button
9	842049005	Button
10	842512004	Printed circuit board F (unit)
11	000161103	Setscrew 3x6 (B)
12	841017001	Slide volume lever
13	653507255	Slide volume (unit)
14	000014306	Snap ring CS-3
15	842641047	Printed circuit board A (unit)
16	843021107	Board A case
17	000066705	Setscrew 3x8
18	000060857	Nut 3-1-5.5
19	843020106	Board A case cover
20	000120203	Setscrew 3x8 (B)
21	842071006	Adjusting dial
22	000161206	Setscrew 3x10 (B)
23	842014001	Front cover set plate (front)
24	841019003	Front cover set plate (rear)
25	000115607	Setscrew TP 4x8

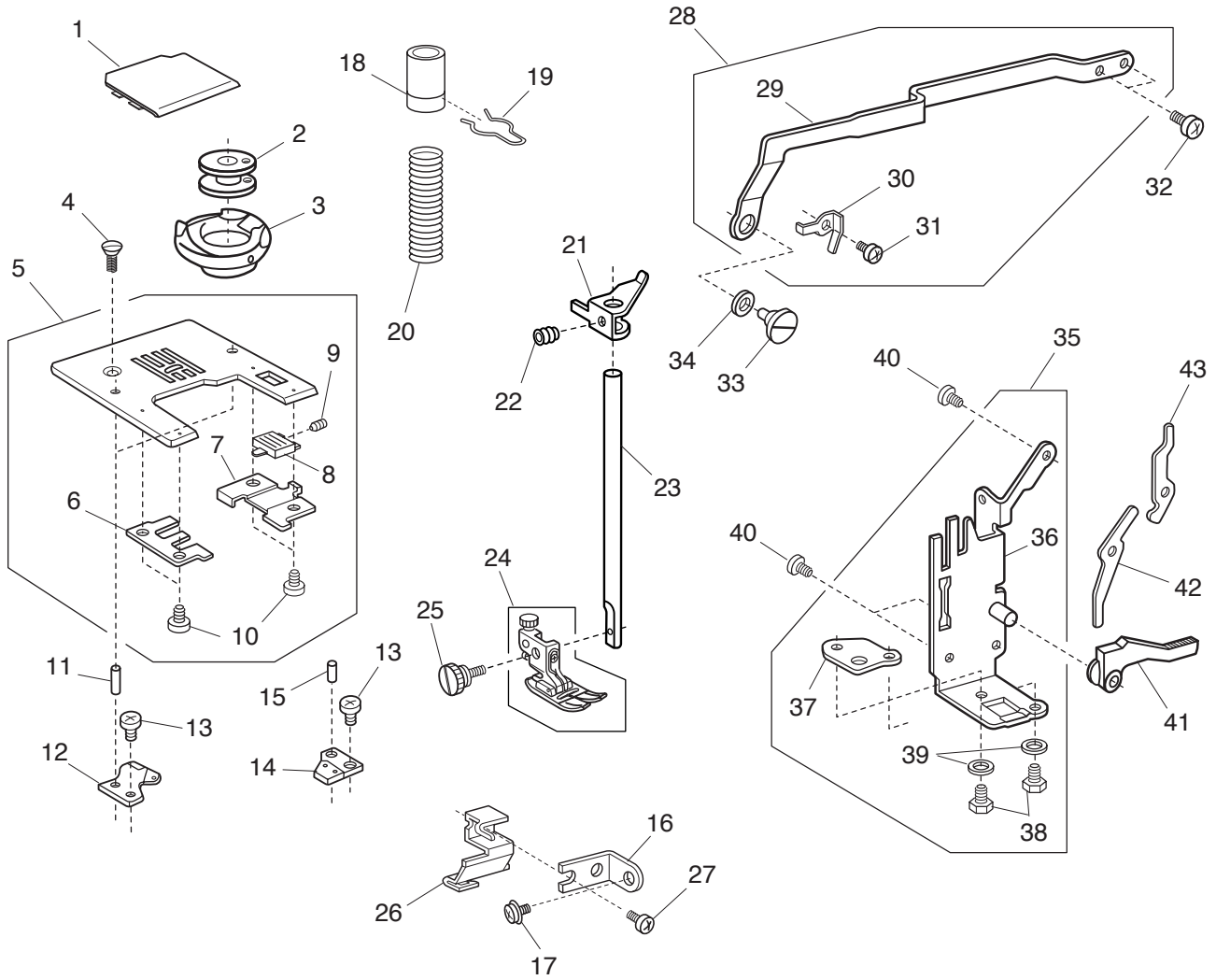
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	827003000	Base plate
2	827002102	Arm leg
3	000061412	Nut 5-3-8
4	000097901	Setscrew 5x18
5	735002001	Rubber base
6	000066808	Setscrew 6x14
7	647009002	Bed rubber base
8	000161206	Setscrew TP 3x10 (B)
9	000103509	Setscrew 4x10
10	824058001	Base cover
11	827601107	Arm leg (unit)
12	000107318	Setscrew 3x8 (B)
13	751612206	Lower shaft (unit)
14	751148000	Feed cam
15	000115009	Setscrew 3x8
16	650955002	Lower shaft gear
17	000111304	Hexagonal socket screw 5x5
18	753183025	Feed lifting cam
19	686035008	Feed lifting cam spring
20	820166001	Ring
21	000111201	Hexagonal socket screw 4x4
22	000038502	Washer
23	650078002	Lower shaft bushing (front)
24	650079003	Lower shaft bushing (rear)
25	820161006	Feed lifting pin
26	822070003	Felt (1)
27	822112008	Felt holder (1)
28	735143005	Felt
29	842001407	Rear cover
30	000115205	Setscrew TP 4x6
31	000104119	Setscrew 4x20

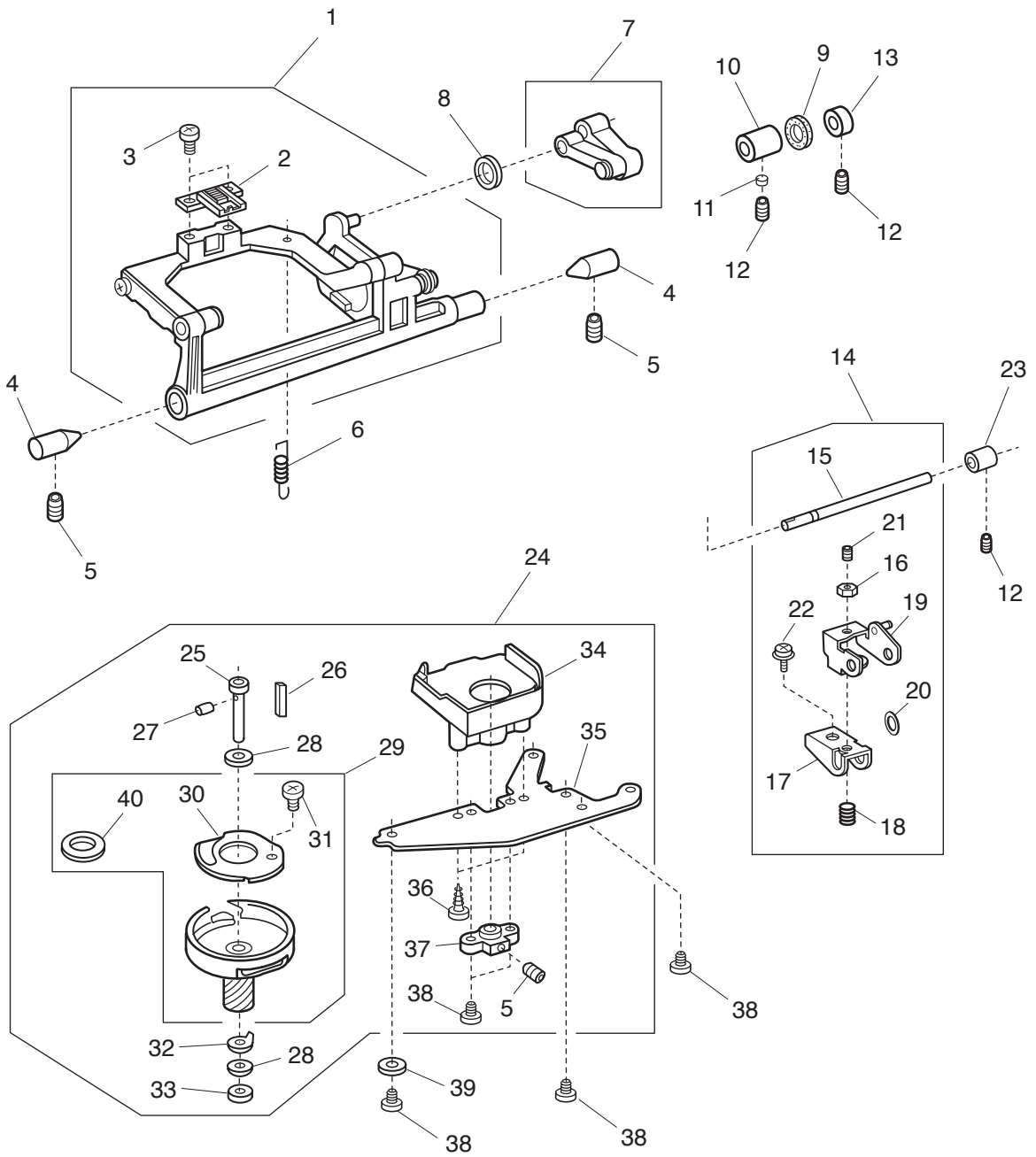
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	750036012	Hook cover plate
2	102261103	Bobbin
3	627569209	Bobbin holder (unit)
4	681009101	Needle plate set screw
5	756604107	Needle plate (unit)
6	752005007	Hook cover plate holder (left)
7	825015010	Hook cover plate holder (right)
8	825016000	Hook cover plate holder release button
9	825017001	Hook cover plate holder spring
10	820374004	Setscrew 2x2.3
11	000122504	Pin D3x10CH
12	827011001	Bobbin holder stopper
13	810220003	Setscrew
14	627567001	Bobbin holder stopper (unit)
15	000122700	Pin D2.5x6-LC
16	827037003	Front panel set plate
17	000115205	Setscrew 4x6
18	802021007	Bushing
19	802022008	Snap retainer
20	730026006	Presser bar spring
21	735028003	Presser bar supporter
22	000111500	Hexagonal socket screw 4x8
23	827021004	Presser bar
24	829515006	Zigzag foot (unit)
25	647112009	Setscrew
26	827036002	Arm thread guide
27	000081005	Setscrew 4x8
28	827622012	Zigzag rod (unit)
29	827055018	Zigzag rod
30	827088009	Zigzag rod spring
31	820373003	Setscrew 2x3
32	000078319	Setscrew 3x6
33	678084007	Eccentric pin
34	653037008	Washer
35	827608012	Presser base plate (unit)
36	827020014	Presser base plate
37	827082003	Foot regulating plate
38	000066303	Hexagonal bolt 4x6
39	000070908	Washer 4
40	000081005	Setscrew 4x8
41	735029004	Presser foot lifter
42	827022005	Tension release lever (1)
43	827023006	Tension release lever (2)

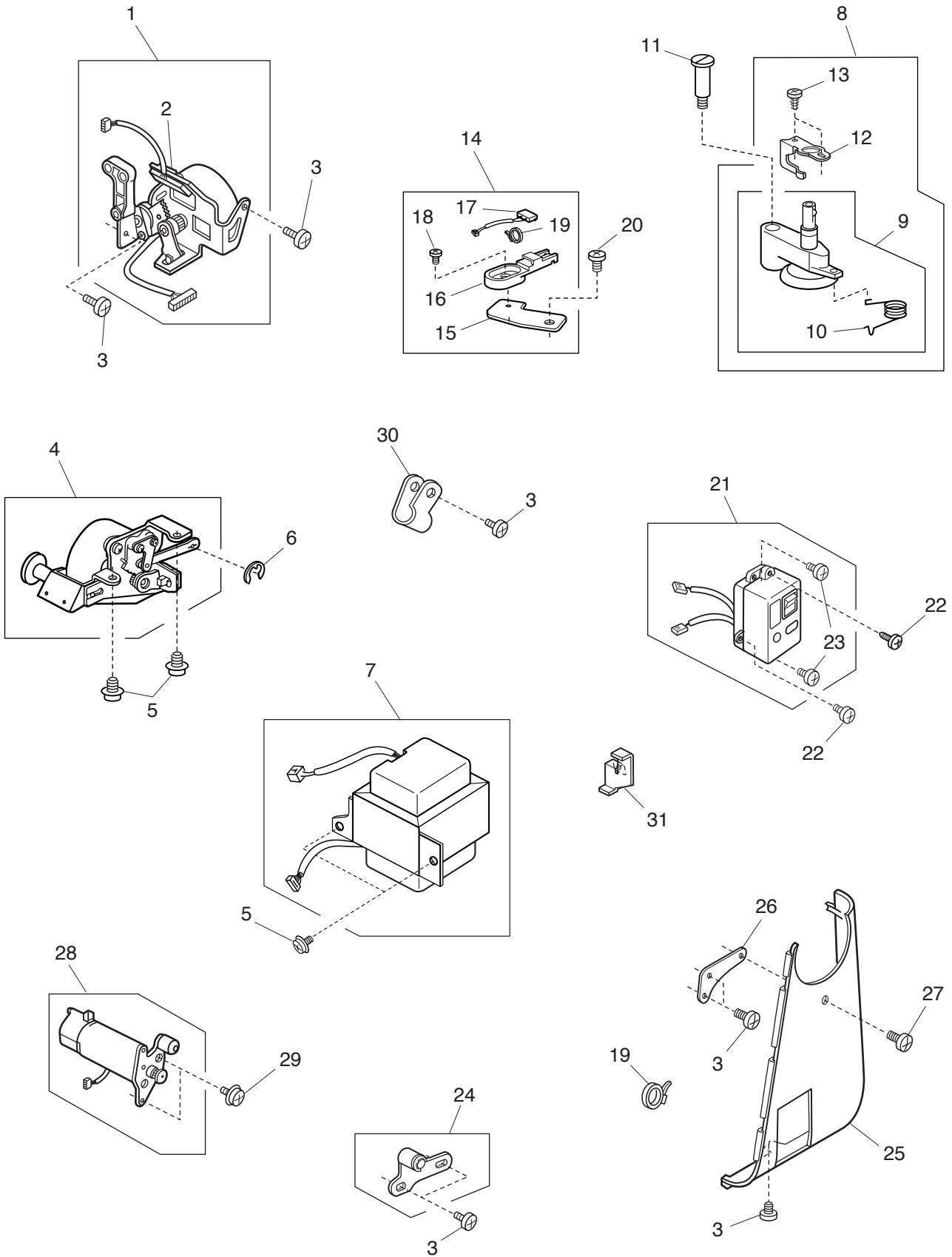
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	834527100	Feed rock shaft (unit)
2	840005003	Feed dog
3	000104005	Setscrew 3.5x8
4	738055008	Center pin
5	000111304	Hexagonal socket screw 5x5
6	650085002	Spring
7	650612004	Feed adjuster (unit)
8	000036603	Washer
9	823110009	Felt
10	625144002	Feed shaft bushing (front)
11	650175000	Screw base
12	000111201	Hexagonal socket screw 4x4
13	820387000	Ring
14	842640002	Feed shaft (unit)
15	840006004	Feed shaft
16	000160102	Adjustable nut 4
17	842098009	Feed adjusting arm (2)
18	589040002	Spring
19	842097008	Feed adjusting arm (1)
20	810207004	Spring washer
21	000176307	Hexagonal socket screw 4x8
22	000115906	Setscrew TP 3x12
23	650092002	Feed shaft bushing (rear)
24	827614033	Shuttle race (unit)
25	820123006	Shuttle race shaft
26	820124007	Oil string (1)
27	820125008	Oil string (2)
28	000038409	Washer
29	650623008	Shuttle body (unit)
30	627191000	Hook bottom plate
31	820374004	Setscrew 2x2.3
32	627192001	Washer
33	625102008	Washer
34	827040009	Hook gear cover
35	823106002	Shuttle race set plate
36	000107204	Setscrew 3x12 (B)
37	650094004	Shuttle race shaft base
38	000081005	Setscrew 4x8
39	000070506	Washer
40	627190010	Magnet

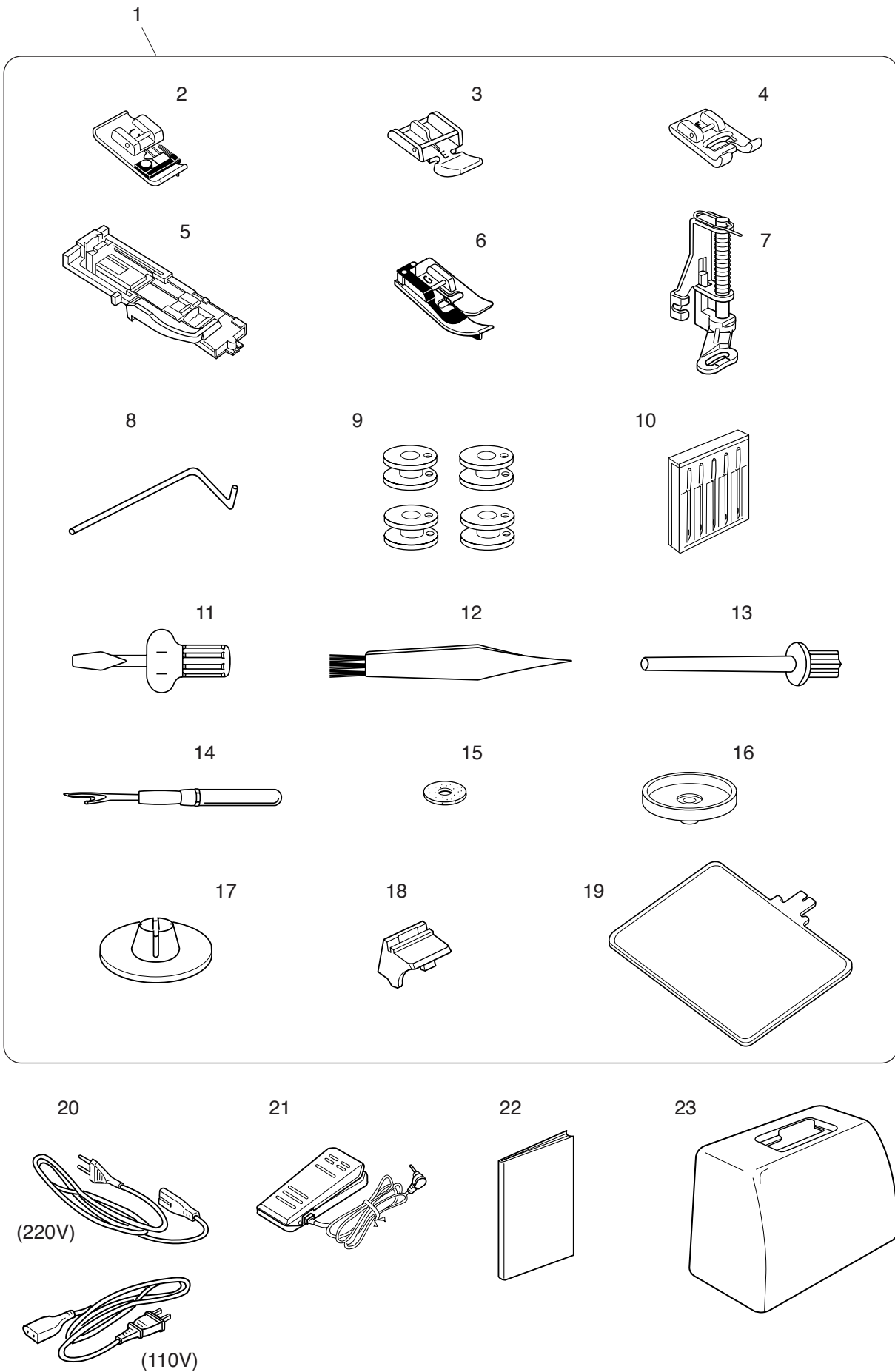
PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	843608104	Stepping motor (unit)
2	843505007	Printed circuit board P (unit)
3	000081005	Setscrew 4x8
4	843606205	Feed motor (unit)
5	000115205	Setscrew TP 4x6
6	000002105	Snap ring E-3
7	843516300	Transformer (unit) (220V)
	843512306	Transformer (unit) (110V)
8	844628033	Bobbin winder (unit)
9	827506008	Bobbin winder (unit)
10	823119008	Bobbin winder arm spring
11	652093009	Setscrew
12	844075039	Clutch releasing arm
13	000120203	Setscrew 3x8 (B)
14	842629005	Switch base plate (unit)
15	842066008	Switch base plate
16	827100008	Switch set plate
17	753507203	Buttonhole select switch
18	000103808	Setscrew 3x5
19	000053008	Cord binder
20	000101404	Setscrew 4x6
21	841515004	Machine socket (unit) (220V)
	841514003	Machine socket (unit) (110V)
22	000103509	Setscrew 4x10
23	000121204	Setscrew 4x8 (B)
24	652611009	Idler (unit)
25	828064002	Belt cover
26	827085017	Belt cover set plate
27	000104119	Setscrew 4x20
28	843615300	Motor (unit)
29	000115700	Setscrew TP 4x10
30	000188209	Nylon clip
31	829020009	Transformer supporter (110V)

PARTS LIST



PARTS LIST

KEY NO.	PARTS NO.	DESCRIPTION
1	842870069	Accessory set
2	822801001	Overedge foot
3	829801002	Zipper foot
4	822804118	Satin foot
5	753801004	Automatic buttonhole foot
6	825817009	Blind hem foot
7	822820006	Bastig foot
8	802422002	Quilter
9	102261103	Bobbin
10	540401026	Needle case (unit)
11	820832005	Large screw driver
12	802424004	Lint brush
13	625031500	Additional spool pin
14	647808009	Seam ripper/buttonhole opener
15	102403109	Spool pin felt
16	829803004	Spool stand
17	822019509	Small spool holder
18	842808000	Quick reference chart base
19	842809403	Quick reference chart
20	830335004	Power supply cord (220V)
	653524007	Power supply cord (110V)
21	033570318	Foot control
22	842800286	Instruction book
23	479701093	Carrying cover