

# KE-430F BE-438F

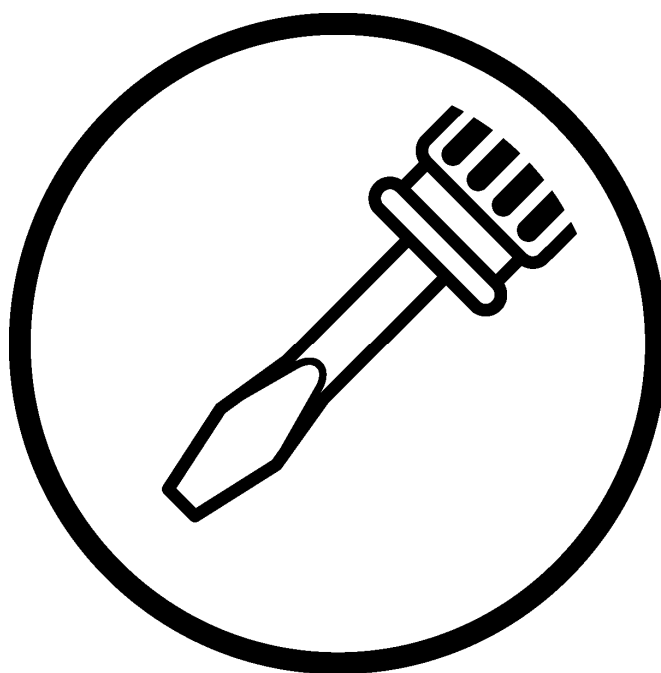
SERVICE MANUAL

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Please read this manual before making any adjustments.

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ELECTRONIC DIRECT DRIVE LOCKSTITCH BAR TACKER  
ELECTRONIC DIRECT DRIVE LOCKSTITCH BUTTON SEWER



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**brother**<sup>®</sup>

This service manual is intended for KE-430F and BE-438F; be sure to read the KE-430F/BE-438F instruction manual before this manual.

Carefully read the "SAFETY INSTRUCTIONS" below and the whole of this manual to understand this product before you start maintenance.

As a result of research and improvements regarding this product, some details of this manual may not be the same as those for the product you purchased.

If you have any questions regarding this product, please contact a Brother dealer.




# SAFETY INSTRUCTIONS

## [1] Safety indications and their meanings

This service manual and the indications and symbols that are used on the machine itself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people.


The meanings of these indications and symbols are given below.

### Indications

 <b>DANGER</b>	The instructions which follow this term indicate situations where failure to follow the instructions will result in death or serious injury.
 <b>WARNING</b>	The instructions which follow this term indicate situations where failure to follow the instructions could result in death or serious injury.
 <b>CAUTION</b>	The instructions which follow this term indicate situations where failure to follow the instructions may result in minor or moderate injury.

### Symbols




..... This symbol (  ) indicates something that you should be careful of. The picture inside the triangle indicates the nature of the caution that must be taken.  
(For example, the symbol at left means "beware of injury".)



..... This symbol (  ) indicates something that you must not do.



..... This symbol (  ) indicates something that you must do. The picture inside the circle indicates the nature of the thing that must be done.  
(For example, the symbol at left means "you must make the ground connection".)

## [2] Notes on safety

### **DANGER**



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present will result in serious injury from electric shocks.

### **WARNING**



Do not allow any liquids to get onto this sewing machine, otherwise fire, electric shocks or operating problems could occur.



If any liquid gets inside the sewing machine (machine head or control box), immediately turn off the power and disconnect the power plug from the electrical outlet, and then contact the place of purchase or a qualified technician.

### **CAUTION**

#### **Environmental requirements**



Use the sewing machine in an area which is free from sources of strong electrical noise such as electrical line noise or static electric noise. Sources of strong electrical noise may cause problems with correct operation.



Any fluctuations in the power supply voltage should be within  $\pm 10\%$  of the rated voltage for the machine. Voltage fluctuations which are greater than this may cause problems with correct operation.



The power supply capacity should be greater than the requirements for the sewing machine's power consumption. Insufficient power supply capacity may cause problems with correct operation.



The ambient temperature should be within the range of 5°C to 35°C during use. Temperatures which are lower or higher than this may cause problems with correct operation.



The relative humidity should be within the range of 45% to 85% during use, and no dew formation should occur in any devices. Excessively dry or humid environments and dew formation may cause problems with correct operation.



In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet. Lightning may cause problems with correct operation.

#### **Installation**



Machine installation should only be carried out by a qualified technician.



Contact your Brother dealer or a qualified electrician for any electrical work that may need to be done.



The sewing machine weighs approximately 57 kg. The installation should be carried out by two or more people.



Do not connect the power cord until installation is complete, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.



Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, after tilting back the machine head, do not push the face plate side or the pulley side from above, as this may cause the machine head to topple over, which may result in personal injury or damage to the machine.



Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.



All cords should be secured at least 25 mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples, otherwise there is the danger that fire or electric shocks may occur.



Install the safety covers to the machine head and motor.













If using a work table which has casters, the casters should be secured in such a way so that they cannot move.





Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhoea. Keep the oil out of the reach of children.

## CAUTION









### Sewing

-  This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.
-  The sewing machine should not be used for any applications other than sewing.
-  Be sure to wear protective goggles when using the machine.  
If goggles are not worn, there is the danger that if a needle breaks, parts of the broken needle may enter your eyes and injury may result.
-  Turn off the power switch at the following times, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.
  - When replacing the needle and bobbin
  - When not using the machine and when leaving the machine unattended
-  Use threading mode or turn off the power first in order to carry out threading.
-  If using a work table which has casters, the casters should be secured in such a way so that they cannot move.
-  Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.
-  Do not touch any of the moving parts or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.
-  If an error occurs in machine operation, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest Brother dealer or a qualified technician.
-  If the machine develops a problem, contact your nearest Brother dealer or a qualified technician.

### Cleaning

-  Turn off the power switch before carrying out cleaning, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.
-  Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result.  
Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhoea.  
Keep the oil out of the reach of children.

### Maintenance and inspection

-  Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.
-  Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.
-  Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.
  - When carrying out inspection, adjustment and maintenance
  - When replacing consumable parts such as the rotary hook
-  If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.
-  Hold the machine head with both hands when tilting it back or returning it to its original position.  
Furthermore, after tilting back the machine head, do not push the face plate side or the pulley side from above, as this could cause the machine head to topple over, which may result in personal injury or damage to the machine.
-  When replacing parts and installing optional accessories, be sure to use only genuine Brother parts.  
Brother will not be held responsible for any accidents or problems resulting from the use of non-genuine parts.
-  If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.
-  To prevent accidents and problems, do not modify the machine yourself.  
Brother will not be held responsible for any accidents or problems resulting from modifications made to the machine.

### [3] Warning labels

The following warning labels appear on the sewing machine.  
Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest Brother dealer.

1

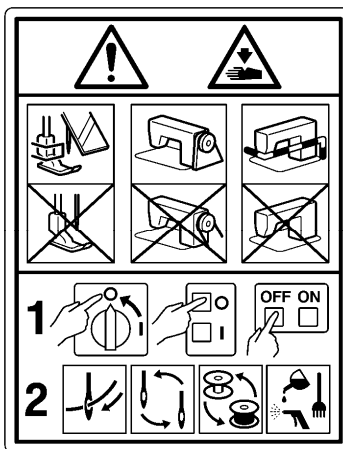
	<b>▲ 危険</b>		<b>▲ 危険</b>	
	高電圧部分にふれて、大けがをすることがある。 電源を切り、5分たってからカバーをはずすこと。		触摸高压电部分, 会导致受伤。 在切断电源5分钟后, 再开启盖罩。	
<b>▲ DANGER</b>	<b>▲ GEFAHR</b>	<b>▲ DANGER</b>	<b>▲ PELIGRO</b>	
Hazardous voltage will cause injury. Turn off main switch and wait 5 minutes before opening this cover.	Hochspannung verletzungsgefahr! Bitte schalten sie den hauptschalter aus und warten sie 5 minuten, bevor sie diese abdeckung öffnen.	Un voltage non adapte provoque des blessures. Eteindre l'interrupteur et attendre 5 minutes avant d'ouvrir le capot.	Un voltaje inadecuado puede provocar las heridas. Apagar el interruptor principal y esperar 5 minutos antes de abrir esta cubierta.	

2



Touching areas where high voltages are present can result in severe injury.  
Turn off the power before removing the cover.

3



**CAUTION**

Moving parts may cause injury.

Operate with safety devices\* installed.

Turn off the power before carrying out operations such as threading, changing the needle, bobbin, knives or hook, cleaning and adjusting.

\*Safety devices

- Eye guard
- Finger guard
- Solenoid cover
- Thread take-up cover
- Side cover
- Rear cover, etc.

6



Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

7



Direction of operation

4



Be careful to avoid injury from the moving thread take-up.

8



Do not hold, otherwise problems with operation or injury may occur.

5



Be careful not to get your hands caught when returning the machine head to its original position after it has been tilted.

9

**brother**  
Lubricating Oil for Machining

**▲ CAUTION**

Lubricating oil may cause inflammation to eye and skin.  
Wear protective glasses and gloves.

Swallowing oil can cause diarrhoea and vomiting.  
Do not swallow.

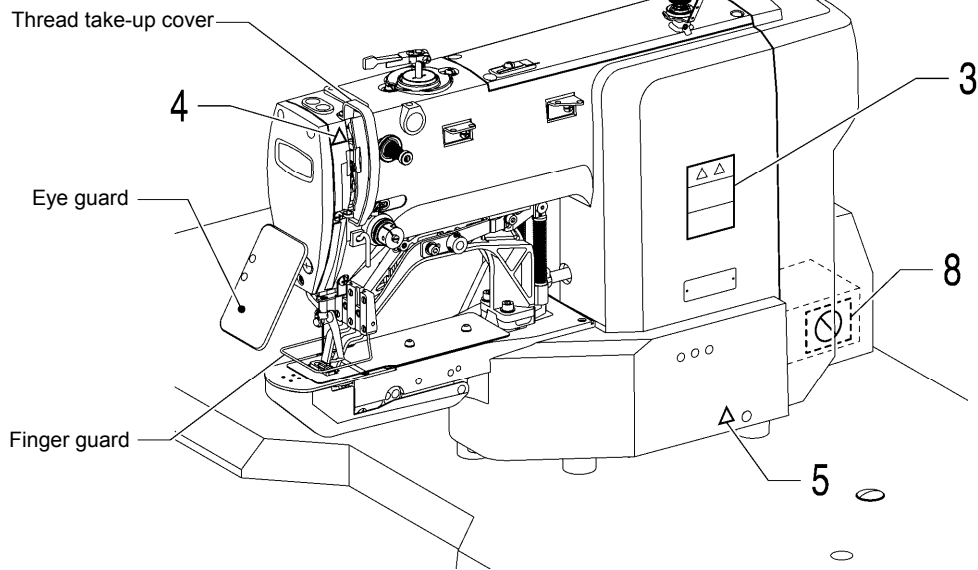
Keep away from children.

**FIRST AID**

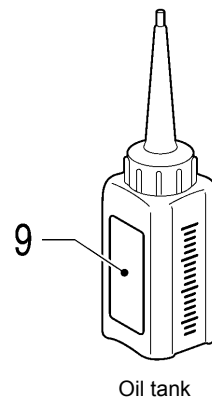
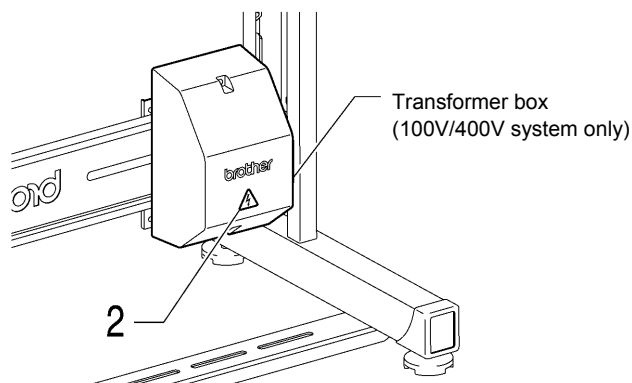
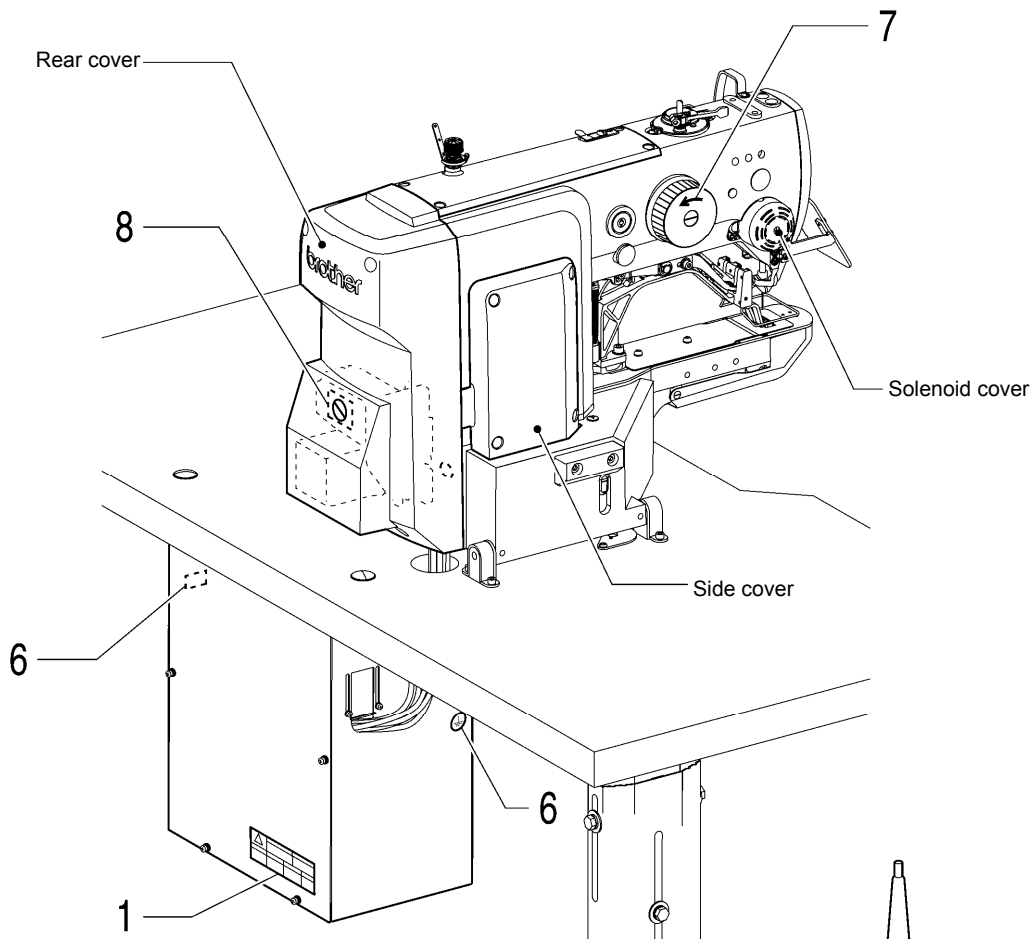
Eye contact :  
-Rinse with plenty of cold water.  
-Seek medical help.

Skin contact :  
-Wash with soap and water.

If swallowed :  
-Seek medical help immediately.



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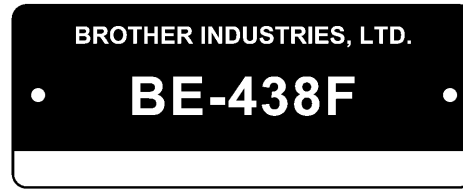
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# 1. SPECIFICATIONS



3	Medium-weight materials
5	Heavy-weight materials
K	Knitted materials
F	Foundation garments

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2278B

	KE-430F Electronic direct drive lockstitch bar tacker	BE-438F Electronic direct drive lockstitch button sewer
Stitch formation	Single needle lock stitch	
Maximum sewing speed	3,200 sti/min	2,700 sti/min
Pattern size (X x Y)	40 x 30 mm max.	6.4 x 6.4 mm max.
Dimensions of buttons that can be sewn	Outer diameter of button 8 - 30 mm (*1)	
Feed mechanism	Y-θ intermittent feed mechanism (pulse-motor driven mechanism)	
Stitch length	0.05 - 12.7 mm	0.05 - 6.4 mm
Number of stitches	Refer to "List of Sewing Patterns" on the CD instruction manual for the number of stitches in sewing patterns which have already been entered.	
Maximum stitch number	Approx. 5,000 stitches (1 pattern)	
Work clamp lifter	Pulse-motor driven mechanism	
Work clamp height Button clamp height	17 mm max.	13 mm max.
Starting method	Foot switch or 2-pedal foot switch (option)	
Hook	Shuttle hook (shuttle hook 2, optional)	Shuttle hook
Digital tension set	Standard equipment	
Thread wiper device	Standard equipment	
Thread trimmer device	Standard equipment	
Thread nipper device	-03, -0K, -0F specifications: Standard equipment ; -05 specifications: Option	Option
Data storage method	Flash memory (Any sewing pattern can be added using SD card)	
Data recording media	SD card (*2)	
Number of cycle programs	Up to 30 can be registered (up to 50 steps each)	
Number of stored data	89 sewing patterns are set already (Up to a maximum of 512 additional types of sewing patterns. Total number of stitches of stored data which can be added is within 500,000.) (*3)	64 sewing patterns are set already
Motor	AC servo motor 550 W	
Weights	Machine head: approx. 57 kg, Operation panel: approx. 0.4 kg Control box: approx. 9 kg	
Power source	Single-phase 110V / 220V / 230V, 3-phase 220V / 380V / 400V 400VA	

\*1 Use the optional button clamp B (S03634-101) for diameters of 20 mm or greater.

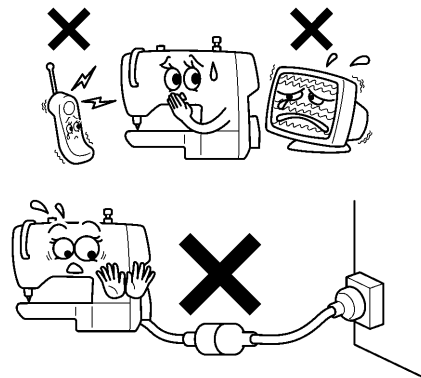
\*2 No guarantees of operation can be given for any media. Use one with a capacity of 2GB or less.

\*3 The number of sewing patterns and the number of stitches that can be recorded will vary depending on the number of stitches in each sewing pattern.

## 2. NOTES ON HANDLING

### About the machine set-up location

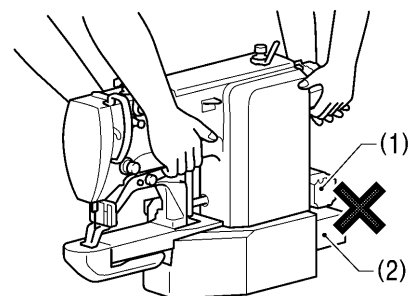
- Do not set up this sewing machine near other equipment such as televisions, radios or cordless telephones, otherwise such equipment may be affected by electronic interference from the sewing machine.
- The sewing machine should be plugged directly into an AC wall outlet. Operation problems may result if extension cords are used.



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### Carrying the machine

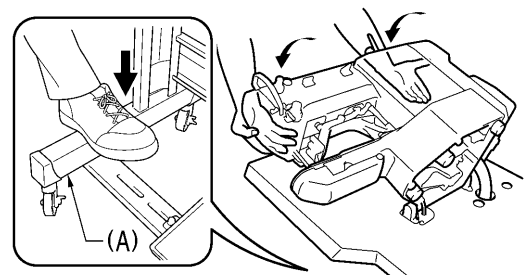
- The machine should be carried by the arm by two people as shown in the illustration.
- When holding the machine head, do not hold it by the pulse motor (1) or the solenoid (2), otherwise it may damage the pulse motor (1) or the solenoid (2).



2517B

### Tilting back the machine head

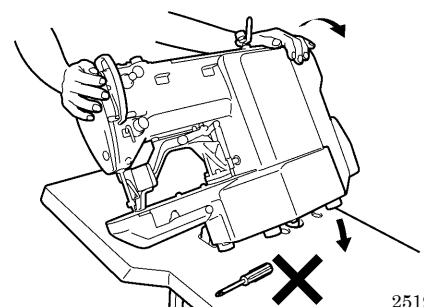
1. Pack away any tools which are near the table.
  2. Secure the foot (A) so that the table will not move, and then pull the arm with both hands to tilt back the machine head.
- \* While supporting the arm with both hands, gently lower it.



2518B

### Returning the machine head to the upright position

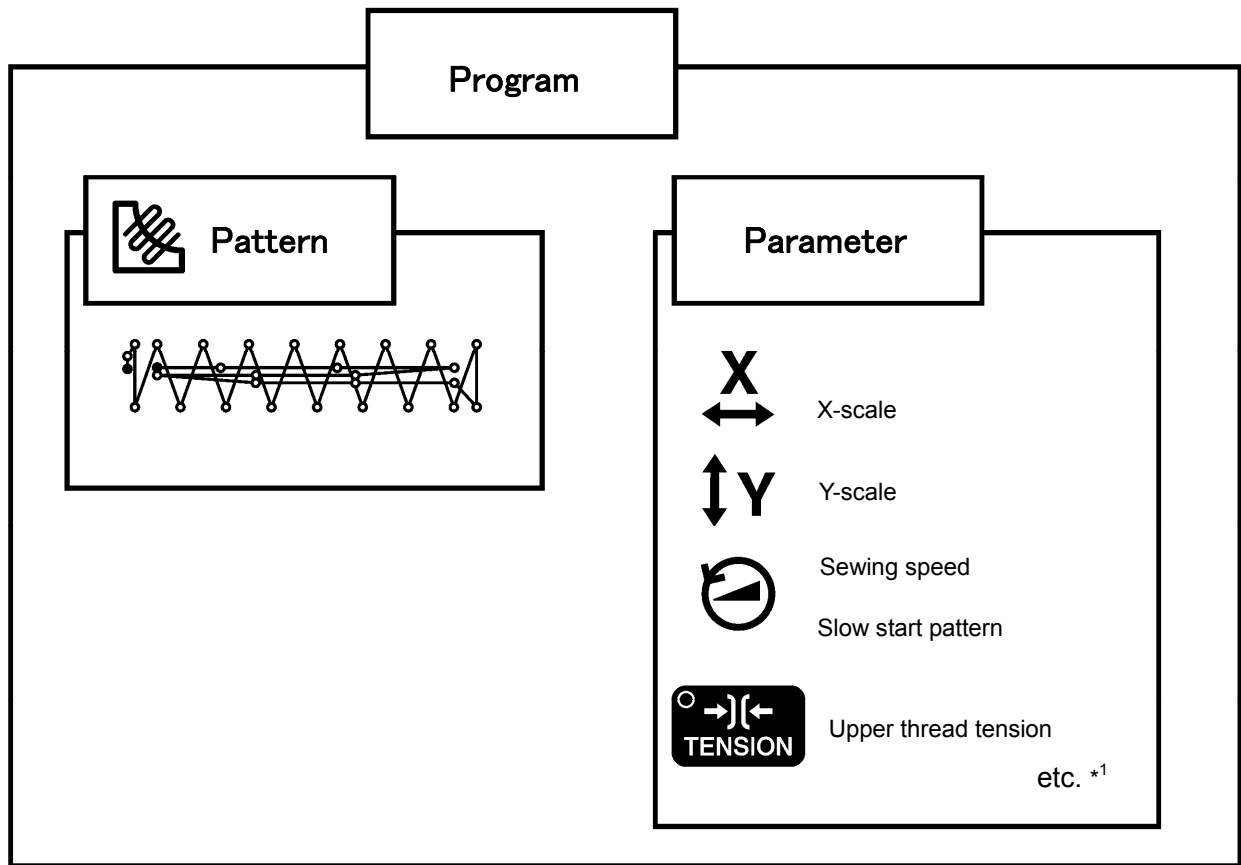
1. Pack away any tools which are near the table.
2. While supporting the arm with both hands, gently return the machine head to its original position.



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## 3. RELATIONSHIP BETWEEN PROGRAMS AND PATTERNS

Programs specify the way that patterns (stitches) are to be sewn (parameters).



2590B

### <Programming method>

1. Use a standard pattern which has been registered in the actual sewing machine (430F: No. 1 to 89, 438F: 1 to 64) <sup>\*2</sup>, and save the pattern that you want to sew into that program number.
2. Set the parameters (such as X-scale, Y-scale, sewing speed and upper thread tension). This completes the program.

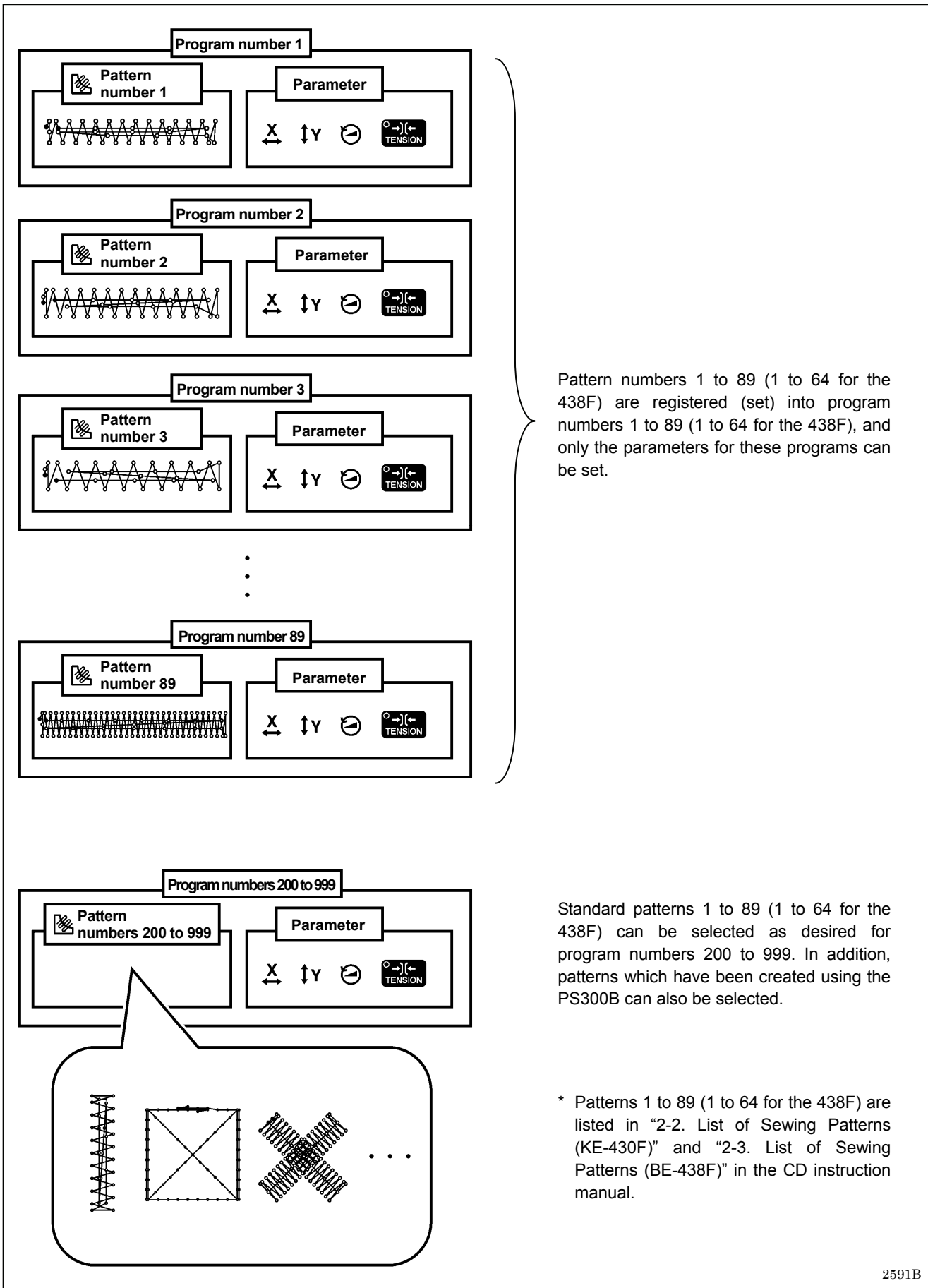
\* When actually sewing, select the program number and then start sewing.

\*1 Depending on the memory switch settings, the height of the work clamp/button clamp can also be set by means of parameters.

\*2 The PS300B can be used to create patterns and load them into actual sewing machines.

### 3. RELATIONSHIP BETWEEN PROGRAMS AND PATTERNS

- This sewing machine contains programs numbered 1 to 89 (1 to 64 for the 438F) which contain standard patterns, and can also be programmed with additional programs numbered from 200 to 999.



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### 3. RELATIONSHIP BETWEEN PROGRAMS AND PATTERNS

- After a program has been finished, you can revise the program by changing the setting details.
- You can organize the use of program numbers so that, for instance, programs with the same pattern but different sizes or upper thread tensions to suit the material being sewn are preset. (Refer to “5-2. Program setting method” in the CD instruction manual.)

Example:

**Program No. 200**

- Pattern: No. 50
- X- and Y-scale: 150%
- Sewing speed: 2700 sti/min
- Upper thread tension: 100
- ⋮

**Program No. 201**

- Pattern: No. 50
- X- and Y-scale: 100%
- Sewing speed: 1000 sti/min
- Upper thread tension: 30
- ⋮

**Program No. 202**

- Pattern: No. 50
- X- and Y-scale: 50%
- Sewing speed: 2700 sti/min
- Upper thread tension: 200
- ⋮

2592B

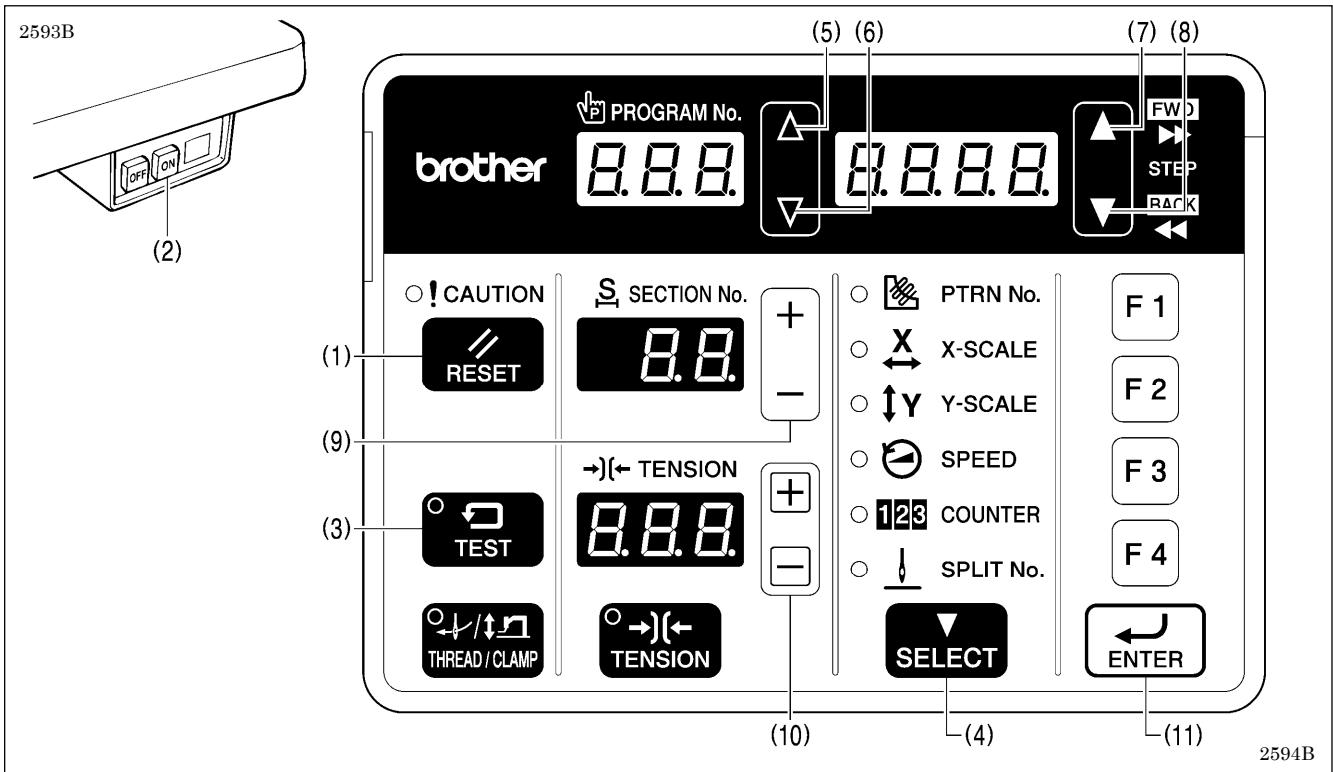
The following table shows restrictions for sewing program numbers, pattern numbers and parameters.






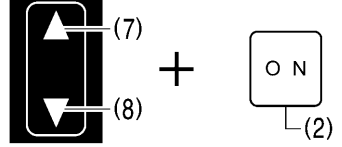
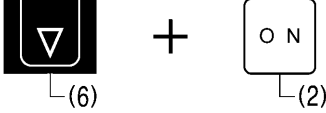
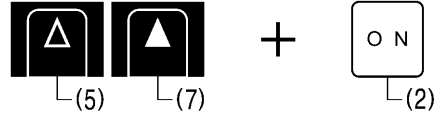
	Standard programs				Additional available patterns	Initial value	
	Preset		Not preset		Set by user		
Model	430F	438F	430F	438F	430F / 438F	430F	438F
Sewing program No.	1 - 89	1 - 64	90 - 199	65 - 199	200 - 999 (800 programs)	/	
Pattern No.	1 - 89	1 - 64	/		1 - 999		
	Fixed at same number as sewing program				Number set when program is created (512 programs from 200 to 999)	/	
Parameter	X-scale (%)	20 - 200					
	Y-scale (%)	20 - 200				100	
	Sewing speed (sti/min)	430F: 200 - 3200 / 438F: 200 - 2700				2700	2300
	Slow start pattern	Lo1 - 9				Lo8	Lo7
	X parallel movement amount (mm) When memory switch No. 465 is set to 3	-9.9 - 9.9				0.0	
	Y parallel movement amount (mm) When memory switch No. 465 is set to 3	-9.9 - 9.9				0.0	
	Work clamp/button clamp height (high) (mm) When memory switch No. 470 is set to ON.	430F: 10 - 17 / 438F: 6 - 13				14	10
	Work clamp/button clamp height (medium) (mm) When memory switch No. 470 is set to ON.	430F: 1 - 17 / 438F: 1 - 13				1	1
Upper thread tension setting value	0 - 300				75		

# 4. FUNCTION SETTINGS

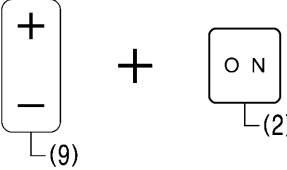
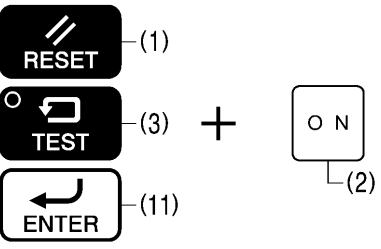
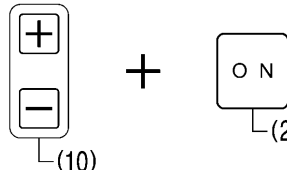
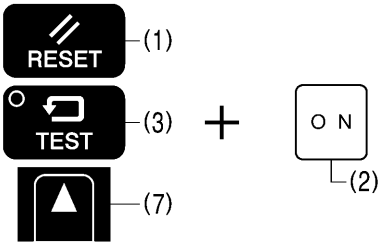
## 4-1. List of special functions when power is turned on

This list shows the key operations for using special functions.



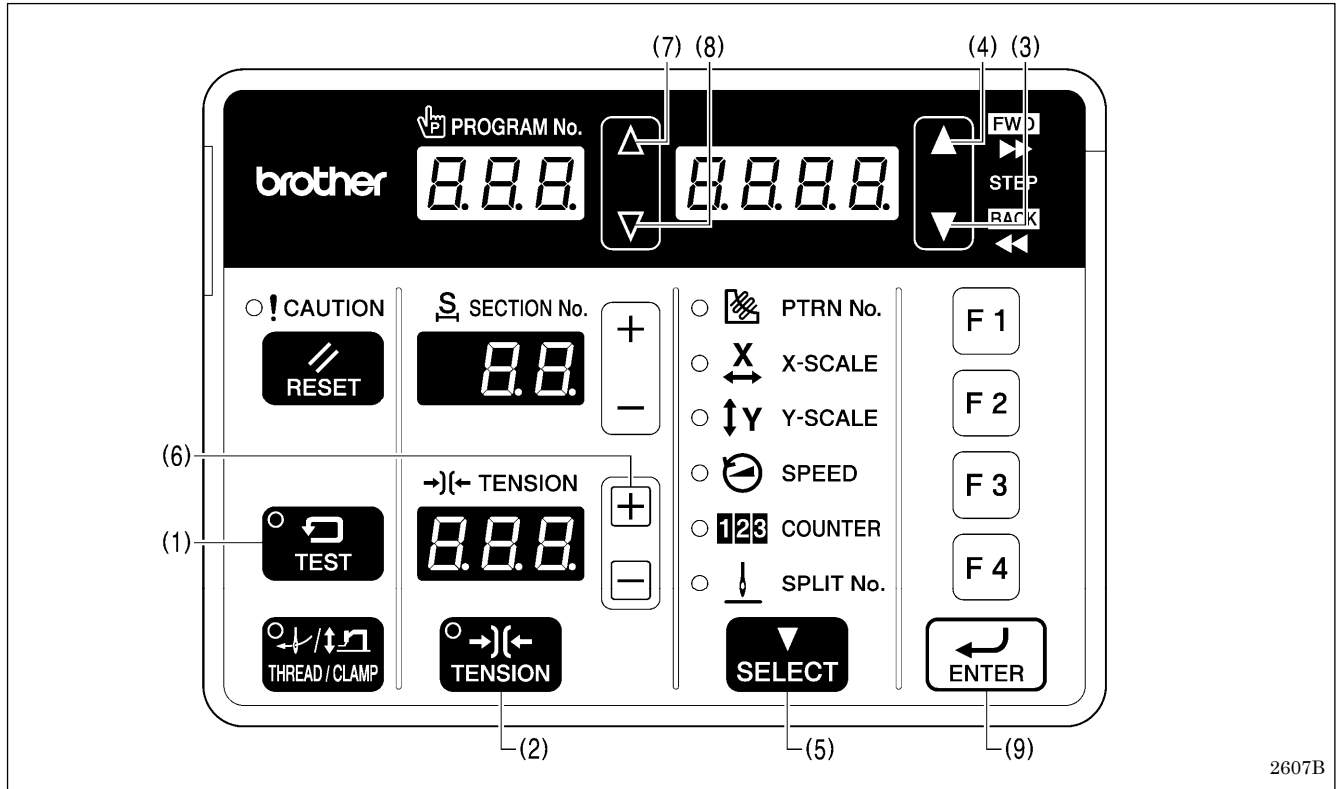
<p><b>1</b> Data initialization function <span style="float: right;">2595B</span></p>  <p style="text-align: center;">Refer to the CD Instruction Manual.</p>	<p><b>5</b> Software version display function <span style="float: right;">2599B</span></p>  <p style="text-align: center;">Refer to "4-9. Confirming software version".</p>
<p><b>2</b> Memory switch setting mode (Advanced) <span style="float: right;">2596B</span></p>  <p style="text-align: center;">Refer to "4-3. Setting memory switches (Advanced)".</p>	<p><b>6</b> Error log display function <span style="float: right;">2600B</span></p>  <p style="text-align: center;">Refer to "4-6. Checking the error history".</p>
<p><b>3</b> Input check function <span style="float: right;">2597B</span></p>  <p style="text-align: center;">Refer to "4-7. Input checking method".</p>	<p><b>7</b> Home position adjusting mode <span style="float: right;">2601B</span></p>  <p style="text-align: center;">Refer to "11-18. Adjusting the home position".</p>
<p><b>4</b> Output check function <span style="float: right;">2598B</span></p>  <p style="text-align: center;">Refer to "4-8. Output checking method".</p>	<p><b>8</b> Treadle position adjustment mode <span style="float: right;">2602B</span></p>  <p style="text-align: center;">Refer to "11-22. Setting method for standard depression strokes (Foot switch)".</p>






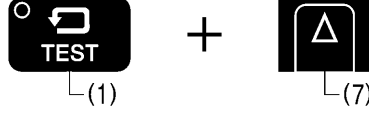
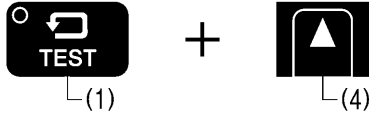



<p><b>9</b></p>	<p><b>Main shaft motor standard position adjustment mode</b> <span style="float: right;">2603B</span></p>  <p>Refer to "11-19. Adjusting the main shaft motor standard position".</p>	<p><b>11</b> <b>Protect setting mode</b> <span style="float: right;">2605B</span></p>  <p>Refer to "4-10. Protection settings".</p>
<p><b>10</b></p>	<p><b>Digital tension output correction mode</b> <span style="float: right;">2604B</span></p>  <p>Refer to "11-20. Correcting the digital tension output".</p>	<p><b>12</b> <b>Version update</b> <span style="float: right;">2606B</span></p>  <p>Refer to "7-13. Updating the control program version".</p>

## 4-2. List of advanced functions

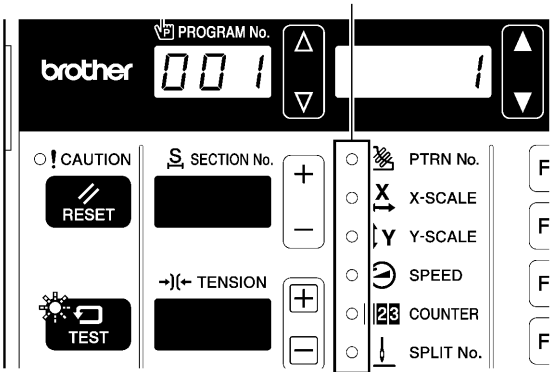

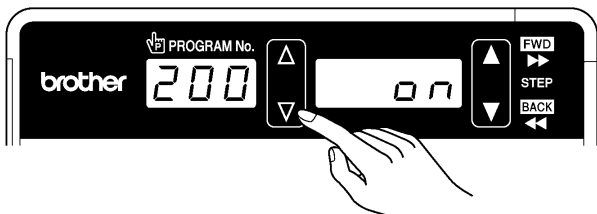

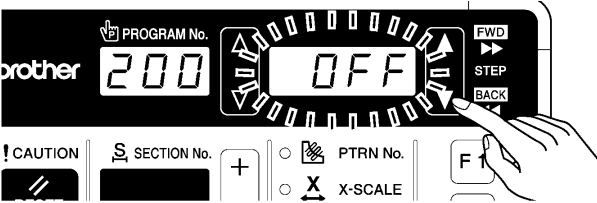


This list shows the key operations for using advanced functions.



2607B

<p><b>1</b></p>	<p><b>Memory switch setting mode (Standard)</b> 2608B</p>  <p>Refer to the CD Instruction Manual.</p>	<p><b>5</b></p>	<p><b>Cycle program setting mode</b> 2612B</p>  <p>Refer to the CD Instruction Manual.</p>
<p><b>2</b></p>	<p><b>Lower thread counter setting mode</b> 2609B</p>  <p>Refer to the CD Instruction Manual.</p>	<p><b>6</b></p>	<p><b>Pattern data editing mode</b> 2613B</p>  <p>Refer to "5-3. Switching to pattern editing mode".</p>
<p><b>3</b></p>	<p><b>Production counter setting mode</b> 2610B</p>  <p>Refer to the CD Instruction Manual.</p>	<p><b>7</b></p>	<p><b>Parallel movement mode</b> 2614B</p>  <p>Refer to "6. X and Y parallel movement of sewing patterns".</p>
<p><b>4</b></p>	<p><b>Program mode</b> 2611B</p>  <p>Refer to the CD Instruction Manual.</p>	<p><b>8</b></p>	<p><b>SD data read/write mode</b> 2615B</p>  <p>Refer to "7-3. Preparation for reading and writing data".</p>

### 4-3. Setting memory switches (Advanced)

<p><b>1</b></p>	<p><b>Change the mode to memory switch setting mode.</b></p> <p>All indicators switch off</p> 	<p>While pressing the TEST key and the SELECT key, turn on the power switch.</p>  <ul style="list-style-type: none"> <li>The memory switch number will be displayed in the PROGRAM No. display and the setting value for that number will be displayed in the menu display.</li> </ul> <p style="text-align: right;">2420B 2616B</p>
<p><b>2</b></p>	<p><b>Select the memory switch that you would like to change the setting for.</b></p>  <p>If you would like to display only the numbers of memory switches that have been changed from default settings</p>  <p style="text-align: right;">2422B</p>	<p>Press the <math>\Delta</math> or <math>\nabla</math> key to select the memory switch number.</p> <p>While pressing the SELECT key, press the <math>\Delta</math> or <math>\nabla</math> key (1).</p> <ul style="list-style-type: none"> <li>The numbers of memory switches that have been changed from default settings will appear in order.</li> </ul> <p style="text-align: right;">2423B</p>
<p><b>3</b></p>	<p><b>Change the memory switch setting.</b></p> 	<p>Press the <math>\blacktriangle</math> or <math>\blacktriangledown</math> key to change the setting value.</p> <ul style="list-style-type: none"> <li>The flashing display means that the setting has not yet been applied.</li> <li>You can make the initial setting appear in the display by pressing the RESET key.</li> </ul> <p style="text-align: right;">2424B</p>
<p><b>4</b></p>	<p><b>Apply the changed setting.</b></p>  <p style="text-align: right;">2414B</p>	<p>Press the ENTER key.</p> <ul style="list-style-type: none"> <li>The menu display will change from flashing to illuminated, and this means that the parameter setting has been applied.</li> <li>If you press the <math>\Delta</math> or <math>\nabla</math> key (1) or the TEST key without pressing the ENTER key, you can cancel the parameter changes.</li> </ul>
<p><b>5</b></p>	<p>Repeat steps 2 to 4 above to set each memory switch.</p>	
<p><b>6</b></p>	<p><b>Exit setting mode.</b></p>  <p>TEST indicator switches off</p> <p style="text-align: right;">2404B</p>	<p>Press the TEST key.</p> <ul style="list-style-type: none"> <li>The changes will be memorized and the sewing machine will switch to home position detection standby.</li> </ul>

### 4-4. List of memory switches

**NOTE:**

In standard memory switch setting mode (refer to the CD Instruction Manual), the bottom two digits only display memory switch Nos. 00 to 49. The bottom two digits do not display memory switch Nos. 50 to 99.

**Work clamp/button clamp settings (001 – 099)**

No.	Setting range	Initial value	Setting units	Setting details
001	OFF, 1 – 2	1	1	Work clamp/button clamp lift timing when sewing is complete OFF: Does not lift automatically. 1: Lifts at the final stitch position. 2: Lifts after moving to the sewing start position.
051	ON/OFF	OFF	-	Work clamp/button clamp operation before moving to the sewing start position ON: The work clamp/button clamp can operate vertically even before moving to the sewing start position. OFF: The work clamp/button clamp cannot operate vertically before moving to the sewing start position.
052	ON/OFF	OFF	-	Work clamp/button clamp operation during pause (split program) ON: The work clamp/button clamp cannot rise automatically during a pause (split program). OFF: The work clamp/button clamp can rise automatically during a pause (split program).
060	0 – 3000 (ms)	0	10	Time after the work clamp/button clamp drops until the upper shaft starts rotating
070	1 – 2	1	1	Type of foot switch used 1: Foot switch 2: 2-pedal foot switch (option)
071	1 – 2	1	1	Foot switch operating mode * Enabled when No. 070 is set to "1". (Refer to page 22.) 1: (1st step) Drop → (2nd step) Start 2: (1st step) Drop to intermediate height → (2nd step) Drop and start
072	1 – 5	1	1	2-pedal foot switch operating mode * Enabled when No. 070 is set to "2". (Refer to page 23.) 1: (Work clamp switch 1st step) Drop, (Start switch) Start 2: (Work clamp switch 1st step) Drop to intermediate height → (Work clamp switch 2nd step) Drop, (Start switch) Start 3: (While work clamp switch depressed to 1st step) Work clamp/button clamp rises, (Start switch) Start 4: (Work clamp switch 1st step) Drop → (Work clamp switch 2nd step) Start 5: (Work clamp switch 1st step) Drop to intermediate height → (Work clamp switch 2nd step) Drop and start

Sewing machine motor settings (100 – 199)

No.	Setting range	Initial value	Setting units	Setting details
100	ON/OFF	ON	-	Slow start pattern setting method ON: Follows the slow start patterns for each program. (Refer to “5-2. Program setting method” in the CD Instruction Manual.) OFF: The sewing speed for the first 1 - 5 stitches is set by memory switch Nos. 151 – 155.
150	ON/OFF	OFF	-	Highest needle position stop ON: When the upper shaft stops, the motor operates in reverse to return the needle bar close to its highest position. <b>NOTE:</b> When the motor operates in reverse to raise the needle, the thread take-up will stop at a position which is lower than its normal stopping position. As a result, the thread take-up will rise slightly at the sewing start. This may result in the thread pulling out under certain conditions. OFF: Disabled
151	430F: 200 – 3200 (sti/min) 438F: 200 – 2700 (sti/min)	*1	100	1st stitch sewing speed at the sewing start * Enabled when No. 100 is set to “OFF”.
152	430F: 200 – 3200 (sti/min) 438F: 200 – 2700 (sti/min)	*1	100	2nd stitch sewing speed at the sewing start * Enabled when No. 100 is set to “OFF”.
153	430F: 200 – 3200 (sti/min) 438F: 200 – 2700 (sti/min)	*1	100	3rd stitch sewing speed at the sewing start * Enabled when No. 100 is set to “OFF”.
154	430F: 200 – 3200 (sti/min) 438F: 200 – 2700 (sti/min)	*1	100	4th stitch sewing speed at the sewing start * Enabled when No. 100 is set to “OFF”.
155	430F: 200 – 3200 (sti/min) 438F: 200 – 2700 (sti/min)	*1	100	5th stitch sewing speed at the sewing start * Enabled when No. 100 is set to “OFF”.
156	430F: 400 – 3200 (sti/min) 438F: 400 – 2700 (sti/min)	*1	100	Sewing speed for 5th stitch before the sewing end
157	430F: 400 – 3200 (sti/min) 438F: 400 – 2700 (sti/min)	*1	100	Sewing speed for 4th stitch before the sewing end
158	430F: 400 – 3200 (sti/min) 438F: 400 – 2700 (sti/min)	*1	100	Sewing speed for 3rd stitch before the sewing end
159	430F: 400 – 3200 (sti/min) 438F: 400 – 2700 (sti/min)	*1	100	Sewing speed for 2nd stitch before the sewing end

\*1: The initial value will vary depending on the specifications. (Refer to “Initial values for each application” on the following page.)

#### 4. FUNCTION SETTINGS

Initial values for each application

No.	KE-430F-03	KE-430F-05	KE-430F-0K	KE-430F-0F	BE-438F
151	800	1500	400	800	400
152	1200	2000	800	1200	400
153	2500	2500	1200	2500	600
154	3200	3200	2500	3200	900
155	3200	3200	3200	3200	2700
156	3200	3200	3200	3200	2700
157	3200	3200	3200	3200	2700
158	3200	3200	3200	3200	2700
159	2400	2700	2400	2400	2700

No.	Setting range	Initial value	Setting units	Setting details
161	ON/OFF	OFF	-	Effective hammer operation when needle does not pierce ON: Enabled OFF: Disabled
162	ON/OFF	OFF	-	Regulation of sewing speed changes due to sewing pitch changes ON: Restricted (Speed is fixed at the minimum sewing speed for the maximum pitch of the sewing data.) * Set to ON if there may be a problem with sewing speed changes as a result of pitch changes. OFF: Not restricted (Sewing speed varies depending on sewing pitch of the sewing data.)
163	430F: 1200 – 3200 (sti/min)	3200	100	Sewing speed limit value * When setting the sewing speed, the speed will be limited by this value.
	438F: 1200 – 2700 (sti/min)	2700		
164	ON/OFF	OFF	-	Thread trimming operation prevention ON: All thread trimming operations are disabled. OFF: Thread trimming is carried out in accordance with the sewing data.
165	-20 – 20 (degrees)	0	1	Stop position at highest needle position stop –: Becomes higher +: Becomes lower
166	10 – 500 (ms)	150	10	Delay time until reverse operation starts during highest needle position stop operation
167	ON/OFF	OFF	-	Servo lock operation ON: Used OFF: Not used
168	OFF, 1 – 120 (seconds)	OFF	1	Servo lock timer setting * Enabled when No. 167 is set to "ON". OFF: No timer operation 1 to 120: Timer operation (1 to 120 secs.)
169	30 – 89 (degrees)	45	1	Servo lock release rotation angle * Enabled when No. 167 is set to "ON".
170	430F: 0 – 2800 (sti/min)	0	100	Lowers the allowable speed for the sewing pitch by the amount set. However, the minimum allowable speed value is 400 sti/min.
	438F: 0 – 2300 (sti/min)			
171	ON/OFF	ON	-	Automatic needle lifter operation ON: If the needle bar is not at the needle up stop position during work clamp/button clamp home position detection, it moves automatically to the needle up stop position. OFF: An "UP" error is displayed without the needle bar moving automatically. (No. 655 can also be used to ignore this sensor.)

## Feed settings (200 – 299)

No.	Setting range	Initial value	Setting units	Setting details
200	ON/OFF	430F:OFF	-	<p>Single stitch test feed</p> <p>ON: During test feeding, the mechanism moves one stitch at a time when the foot switch is depressed to the 2nd step (for a 2-pedal foot switch, when the start switch is depressed). In addition, when the test indicator is illuminated, test feeding will move forward one stitch at a time when the machine pulley is turned by hand.</p> <p>OFF: During test feeding, sewing starts and automatically continues to the last stitch when the foot switch is depressed to the 2nd step (for a 2-pedal foot switch, when the start switch is depressed).</p>
		438F:ON		
250	ON/OFF	OFF	-	<p>Home position detection at the sewing end</p> <p>ON: At the sewing end, the work clamp/button clamp will detect the home position and then move to the sewing start position.</p> <p>OFF: At the sewing end, the work clamp/button clamp will move to the sewing start position.</p>
251	1 – 5	3	1	<p>Feeding speed</p> <p>1: 100 mm/s (Slow)</p> <p>2: 200 mm/s</p> <p>3: 300 mm/s</p> <p>4: 400 mm/s</p> <p>5: 500 mm/s (Fast)</p>
252	ON/OFF	OFF	-	<p>High-speed test feed method</p> <p>* Enabled when No. 200 is set to "OFF".</p> <p>ON: High-speed feeding starts at the same time test feeding starts.</p> <p>OFF: Normally slow, but becomes faster when the foot switch is depressed to the 1st step (for a two-pedal foot switch, when the work clamp switch is depressed).</p>
253 *1	0 – 2	0	1	<p>Moving method to the sewing start point</p> <p>0: Depress the foot switch to the 2nd step (for a two-pedal foot switch, depress the start switch) while the program number is flashing.</p> <p>1: Press the RESET key while the program number is flashing.</p> <p>2: Press the special external input switch (option input (IN3)) while the program number is flashing.</p>
260	-80 – 80 (degrees)	*2	1	<p>Changes the overall feed timing</p> <p>-: Feed timing becomes earlier.</p> <p>+: Feed timing becomes later.</p>
261	-80 – 80 (degrees)	*2	1	<p>Changes the feed timing for the 1st stitch at the sewing start</p> <p>-: Feed timing becomes earlier.</p> <p>+: Feed timing becomes later.</p>
262	-80 – 80 (degrees)	*2	1	<p>Changes the feed timing for the 2nd stitch at the sewing start</p> <p>-: Feed timing becomes earlier.</p> <p>+: Feed timing becomes later.</p>
263	-80 – 80 (degrees)	*2	1	<p>Changes the feed timing for the 3rd stitch at the sewing start</p> <p>-: Feed timing becomes earlier.</p> <p>+: Feed timing becomes later.</p>
264	-80 – 80 (degrees)	*2	1	<p>Changes the feed timing for the 3rd stitch before the sewing end</p> <p>-: Feed timing becomes earlier.</p> <p>+: Feed timing becomes later.</p>
265	-80 – 80 (degrees)	*2	1	<p>Changes the feed timing for the 2nd stitch before the sewing end</p> <p>-: Feed timing becomes earlier.</p> <p>+: Feed timing becomes later.</p>
266	-80 – 80 (degrees)	*2	1	<p>Changes the feed timing for the 1st stitch before the sewing end</p> <p>-: Feed timing becomes earlier.</p> <p>+: Feed timing becomes later.</p>

\*1: This is not initialized during initialization mode.

\*2: The initial value will vary depending on the specifications. (Refer to "Initial values for each application" on the following page.)

#### 4. FUNCTION SETTINGS

Initial values for each application

No.	KE-430F-03	KE-430F-05	KE-430F-0K	KE-430F-0F	BE-438F
260	-15	-15	-15	-15	10
261	45	50	45	45	-80
262	45	45	45	45	-50
263	45	45	45	45	-50
264	0	25	0	0	0
265	35	35	35	35	15
266	35	0	35	35	15

No.	Setting range	Initial value	Setting units	Setting details
267	OFF, 1 – 99 (stitches)	OFF	1	If the overall feed timing (setting No. 260) has been changed from the default value, this specifies the effective number of stitches. OFF: No limit 1 to 99: When the specified number of stitches from the sewing start is exceeded, the feed timing returns to the standard timing.
268	0 – 2	1	1	Changes the overall feed timing reference. 0: [Feed start reference] Makes the timing uniform at the start of feed. 1: [Needle up reference] Changes the timing at the start of feed so that the feed moves half the feed width when the needle bar is at its highest position. 2: [Feed end reference] Makes the timing uniform at the end of feed.
269	0 – 2	430F: 0	1	Changes the feed timing reference for the first three stitches at the sewing start. 0: [Feed start reference] Makes the timing uniform at the start of feed. 1: [Needle up reference] Changes the timing at the start of feed so that the feed moves half the feed width when the needle bar is at its highest position. 2: [Feed end reference] Makes the timing uniform at the end of feed.
		438F: 1		
270	0 – 2	2	2	Moving method to the sewing start point after the program is changed * However, operation for the "0" setting is always carried out when No. 273 is set to ON. 0: Moves to sewing start position and then stops. 2: Home position detection is carried out, then moves to the sewing start position and stops.
271	ON/OFF	OFF	-	Work clamp/button clamp standby position ON: For the 430F, the center of the sewing area is the standby position (escape point). For the 438F, the front is the standby position (escape point). OFF: The sewing start position becomes the standby position.
272	ON/OFF	OFF	-	Reduced feed noise ON: Enable (Operating speed is limited to 2500 sti/min.) OFF: Disable
273	ON/OFF	OFF	-	Start switch operation after program is changed ON: Moves to sewing start position and starts (program No. illuminates) OFF: Only moves to sewing start position (program No. flashes)



## Operation panel settings (300 – 399)

No.	Setting range	Initial value	Setting units	Setting details
300	ON/OFF	OFF	-	Production counter display ON: Production counter display OFF: Lower thread counter display
352	ON/OFF	OFF	-	Production counter counting units ON: Counted for each cycle program. OFF: Counted for each item of sewing data. * Counted for each individual split when No. 451 is set to "ON".
353	ON/OFF	OFF	-	Lower thread counter counting operation ON: Counted at the sewing start. OFF: Counted at the sewing end.

## Program settings (400 – 499)

No.	Setting range	Initial value	Setting units	Setting details
401	ON/OFF	OFF	-	Button hole distance display * Enabled when No. 402 is set to "ON" and (for the BE-438F) when pattern No. 1 to 64 (buttonhole data) is selected. ON: X-scale and Y-scale will be displayed as button hole distances (mm). OFF: X-scale and Y-scale will be displayed as pattern outer dimensions (mm).
402	ON/OFF	OFF	-	X-scale/Y-scale mm display * The mm display may vary from actual sewing dimensions. ON: Displayed as mm. OFF: Displayed as %.
404	ON/OFF	ON	-	Display for program numbers 1 to 89 (1 to 64 for BE-438F) ON: Program numbers 1 to 89 (1 to 64 for the BE-438F) are displayed during program number selection operations. OFF: Program numbers 1 to 89 (1 to 64 for the BE-438F) are skipped during program number selection operations so that these numbers cannot be selected. * If no other programs have been recorded, the setting will return to "ON".
405	ON/OFF	ON	-	Cycle program No. display (C01 to C30) ON: Cycle program numbers are displayed during program number selection operations. OFF: Cycle program numbers are skipped during program number selection operations so that these numbers cannot be selected.
406	0 – 3	0	1	Program numbers switched by F keys 0: When the F1 to F4 keys are pressed, operation switches to program numbers 1 to 4. 1: When the F1 to F4 keys are pressed, operation switches to program numbers 201 to 204. 2: When the F1 to F4 keys are pressed, operation switches to cycle program numbers C01 to C04. 3: When the F1 to F4 keys are pressed, operation switches to the program number which has been pre-assigned to the respective key. Assignment to F1 key: Memory switch No. 407 Assignment to F2 key: Memory switch No. 408 Assignment to F3 key: Memory switch No. 409 Assignment to F4 key: Memory switch No. 410

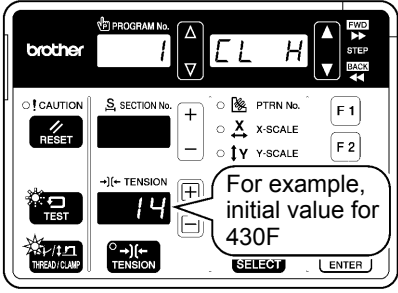
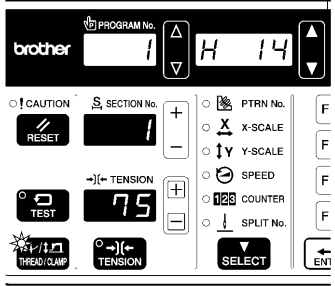
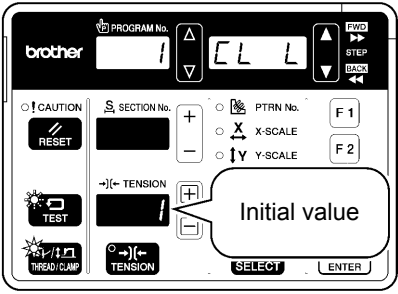
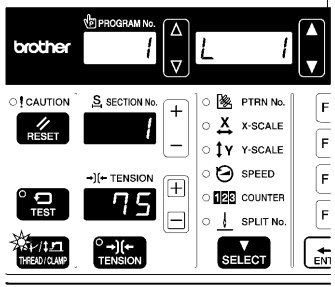
#### 4. FUNCTION SETTINGS

No.	Setting range	Initial value	Setting units	Setting details
407	1 – 999, C01 – C30	1	-	Program No. assigned to the F1 key * Enabled when No. 406 is set to “3”.
408	1 – 999, C01 – C30	2	-	Program No. assigned to the F2 key * Enabled when No. 406 is set to “3”.
409	1 – 999, C01 – C30	3	-	Program No. assigned to the F3 key * Enabled when No. 406 is set to “3”.
410	1 – 999, C01 – C30	4	-	Program No. assigned to the F4 key * Enabled when No. 406 is set to “3”.
451	ON/OFF	OFF	-	Split mode selection ON: Independent split mode OFF: Continuous split mode
460	0.0 – 40.0 (mm)	430F: 40.0	0.1	X direction sewing area limitation
		438F: 6.4		
461	0.0 – 30.0 (mm)	430F: 40.0	0.1	Y direction sewing area limitation
		438F: 6.4		
462	0 – 8	0	1	Enlargement/reduction reference point 0: Center of sewing frame 1: Sewing start point 2: Center of pattern 3: Front of pattern center 4: Back of pattern center 5: Back-left corner of sewing area 6: Front-left corner of sewing area 7: Back-right corner of sewing area 8: Front-right corner of sewing area
463	ON/OFF	OFF	-	Enlargement/reduction of bar tacking ON: Bar tacking stitch lengths (pitch less than approx. 1 mm) are also enlarged or reduced. OFF: Bar tacking stitch lengths (pitch less than approx. 1 mm) are not enlarged or reduced.
465	1 – 3	1	1	Setting parallel movement amount for sewing pattern 1: The parallel movement amount for the currently-selected program can be set in parallel movement mode. The movement amount is initialized when the power is turned off and when the program number, pattern number, X-scale or Y-scale is changed. 2: The parallel movement amount for the currently-selected program can be set in parallel movement mode. The movement amount is retained when the power is turned off, but is initialized when the program number, pattern number, X-scale or Y-scale is changed. 3: The movement amount can be set for each program using parameters. The movement amount is retained when the power is turned off and when the program number, X-scale or Y-scale is changed, but is initialized when the pattern number is changed.
469	ON/OFF	OFF	-	Tension value setting ON: A common tension value is set for all programs. * Uniform correction operations are not possible. OFF: Set separately for each program.
470	ON/OFF	OFF	-	Work clamp/button clamp height setting for each program ON: Work clamp/button clamp height is set separately for each program. OFF: A common work clamp/button clamp height is set for all programs. * The work clamp/button clamp height is set by Nos. 471 and 472.
471	430F: 10 – 17 (mm)	14	1	Work clamp/button clamp raise position setting * Enabled when No. 470 is set to “OFF”.
	438F: 6 – 13 (mm)	10		

No.	Setting range	Initial value	Setting units	Setting details
472	430F: 1 – 17 (mm)	1	1	Work clamp/button clamp intermediate drop position setting * Enabled when No. 470 is set to “OFF”.
	438F: 1 – 13 (mm)			

<Work clamp lifting height>

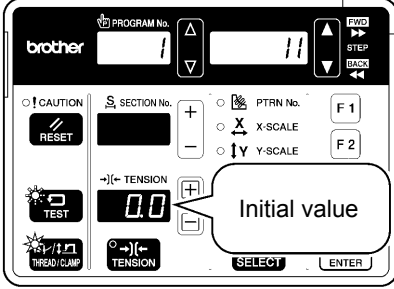
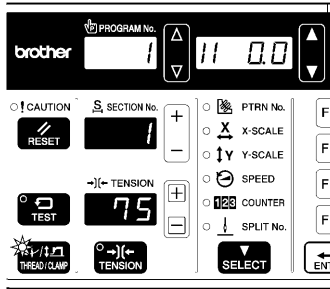
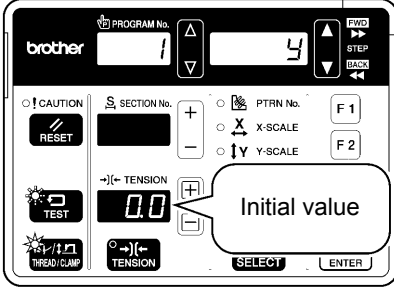
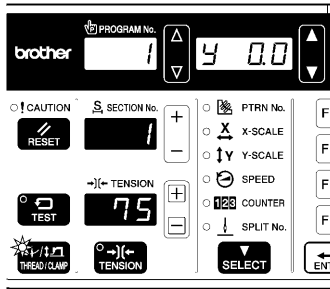
\* When memory switch No. 470 is set to “ON”, the following parameters are displayed during program mode and sewing standby mode.

Item	Setting range and initial value	Display during program mode	Display during sewing standby mode
Work clamp/button clamp height (raised)	430F : 10 – 17mm 438F : 6 – 13mm Setting units: 1mm  (Initial settings are: 430F: 14mm, 438F: 10mm)	 <p style="text-align: right;">2780B</p>	 <p style="text-align: right;">2781B</p>
Work clamp/button clamp height (intermediate drop)	430F : 1 – 17mm 438F : 1 – 13mm Setting units: 1mm  (Initial setting is 1mm)  * This is displayed when memory switch No. 071 is set to “2” or when memory switch No. 072 is set to “2” or “5”.	 <p style="text-align: right;">2782B</p>	 <p style="text-align: right;">2783B</p>

## 4. FUNCTION SETTINGS

### <X and Y parallel movement amounts>

\* When memory switch No. 465 is set to "3", the following parameters are displayed during program mode and sewing standby mode.

Item	Setting range and initial value	Display during program mode	Display during sewing standby mode
<p>X parallel movement amount</p>	<p>-9.9 – 9.9mm Setting units: 0.1mm (Initial setting is 0.0mm)  + direction: Work clamp/button clamp moves to the left.</p>	 <p style="text-align: right;">2784B</p>	 <p style="text-align: right;">2785B</p>
<p>Y parallel movement amount</p>	<p>-9.9 – 9.9mm Setting units: 0.1mm (Initial setting is 0.0mm)  + direction: Work clamp/button clamp moves forward.</p>	 <p style="text-align: right;">2786B</p>	 <p style="text-align: right;">2787B</p>

## Device settings (500 – 599)

No.	Setting range	Initial value	Setting units	Setting details
500	ON/OFF	OFF	-	Thread nipper operation ON: Used * However, all of the following conditions must be satisfied. Memory switch No. 100 = ON Memory switch No. 566 = ON Slow start speed is Lo8 or Lo9 Sewing speed is 1500 sti/min. or more OFF: Not used
550	OFF, 100 – 2000 (ms)	OFF	100	Output continue time for needle cooler device when sewing machine is stopped OFF: Needle cooler device is not used 100 to 2000: Output is continued for the specified time.
551	OFF, 1 – 3 (stitches)	430F-03:OFF 430F-05:1 430F-0K:OFF 430F-0F:OFF 438F:OFF	1	Upper thread tension release at the sewing start * Only enabled when the thread nipper is not operating. OFF: Not released 1 to 3: Released during the specified number of stitches.
554 *1	ON/OFF	OFF	-	Use of the thread breakage sensor (available by special order) ON: Used OFF: Not used
555 *1	ON/OFF	OFF	-	Sewing start sensing sensitivity for thread breakage sensor (available by special order) ON: 10 stitches at sewing start OFF: 5 stitches at sewing start
566 *2	ON/OFF	430F-03:ON 430F-05:OFF 430F-0K:ON 430F-0F:ON 438F:OFF	-	Thread nipper device installation ON: Installed * The thread nipper device only operates when all of the following conditions are satisfied. Memory switch No. 100 = ON Memory switch No. 500 = ON Slow start speed is Lo8 or Lo9 Sewing speed is 1500 sti/min. or more OFF: Not installed <b>NOTE:</b> If the thread nipper device is installed, do not set this to "OFF". If this is not observed, damage may occur.
567	ON/OFF	OFF	-	Upper thread tension during feeding while upper shaft is stopped ON: Not released OFF: Released
580	-80 – 115 (degrees)	0	5	Nip timing offset for thread nipper device
581	-160 – 110 (degrees)	0	5	Release timing offset for thread nipper device

\*1: These functions can be used if the main PCB version is 1.5.00 or later.

\*2: This is not initialized during initialization mode.

#### 4. FUNCTION SETTINGS

No.	Setting range	Initial value	Setting units	Setting details
582	ON/OFF	ON	1	Upper thread tension tightening at the sewing start ON: Enabled OFF: Disabled
583	-150 – 150 (degrees)	0	5	Upper thread tension change (tightening) angle offset at the sewing start
584	-110 – 40 (degrees)	0	5	Upper thread tension release angle offset at the sewing end
585	0 – 500	470	1	Upper thread tension value (tightening) at the sewing start
587	0 – 300	0	1	Upper thread tension value (release) at the sewing start
588	0 – 50 (ms)	35	1	Thread trimmer solenoid ON timing
589	0 – 50 (ms)	20	1	Thread trimmer solenoid ON time
590	5 – 10	5	1	Thread trimmer solenoid holding force
591	0 – 300 (degrees)	430F: 270	5	Specified final speed output angle offset
		438F: 260		
592	200 – 700 (sti/min)	600	100	Last stitch sewing speed for upper shaft motor
593	0 – 15 (ms)	8	1	Speed change delay until thread nipper operation is complete * If the thread nipper device is not to operate, set to "0".
594	-160 – 20 (degrees)	0	5	Needle up stop signal output angle offset

#### Error processing settings (600 – 699)

No.	Setting range	Initial value	Setting units	Setting details
650 *1 *2	0 – 2	0	1	Error release method when operation has stopped 0: Press the RESET key on the operation panel. 1: Press the STOP switch (available by special order). 2: Press the external input switch (EXIN2).
651 *2	ON/OFF	OFF	-	Needle stop position when sewing is interrupted by the STOP switch (available by special order) ON: Needle stops in the up position. OFF: Needle stops in the down position.
652 *2	ON/OFF	OFF	-	Thread trimming operation when sewing is paused ON: Thread trimming is not carried out when the pause is canceled. OFF: Thread trimming is carried out when the pause is canceled.
654 *2	ON/OFF	OFF	-	Use of STOP switch (available by special order) ON: Used OFF: Not used
655	ON/OFF	OFF	-	Disables needle up stop position monitoring. ON: Disabled OFF: Enabled (If the needle up stop position is incorrect, "UP" will be displayed.)
657	OFF, 2 – 30 (seconds)	OFF	2	Time from error occurring to buzzer stopping OFF: Buzzer does not stop. 2 – 30: Buzzer stops after the specified time.

\*1: This is not initialized during initialization mode.

\*2: These functions can be used if the main PCB version is 1.5.00 or later.

**Maintenance settings (700 – 799)**

No.	Setting range	Initial value	Setting units	Setting details
750	ON/OFF	OFF	-	Continuous operation mode (for administrator) ON: Continuous operation is repeated while the foot switch is being depressed to the 2nd step (for a 2-pedal foot switch, while the start switch is being depressed). <b>NOTE:</b> This setting is for use by an administrator in test running mode. It is dangerous to set it to "ON" for normal sewing, so it should always be set back to "OFF" after use. OFF: Disabled
751	0 – 3000 (ms)	200	10	Continuous operation cycle time adjustment timer (for administrator) * Enabled when No. 750 is set to "ON".
752	0 – 99	0	1	Sewing machine ID code (for specifying SD card folder)
756	ON/OFF	ON	-	Thread winding speed limit ON: Upper limit is limited to 2000 sti/min. * If the speed specified at the operation panel exceeds 2000 sti/min, thread winding will be limited to 2000 sti/min. OFF: Upper limit is not limited to 2000 sti/min. * Thread winding is carried out at the speed specified at the operation panel.

**Specification and destination settings (800 – 899)**

No.	Setting range	Initial value	Setting units	Setting details
850 *1	430F-03: 3, 5, K, F	3	-	Specification code setting <b>* The 438F has only -03 specifications.</b> 3: -03 specifications (medium-weight material) 5: -05 specifications (heavy-weight material) K: -0K specifications (knitted wear) F: -0F specifications (foundation garments)
	430F-05: 3, 5, K, F	5		
	430F-0K: 3, 5, K, F	K		
	430F-0F: 3, 5, K, F	F		
	438F-03: 3	3		

\*1: This is not initialized during initialization mode.

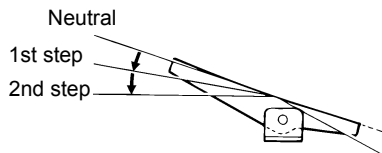
**Unique settings for each model (900 – 999)**

No.	Setting range	Initial value	Setting units	Setting details
951	OFF, 1 – 2	OFF	1	Eyelet bar tack closing device (old 432 series) OFF: Disable 1: Eyelet bar tacker closing device operates after the work clamp has dropped. 2: Eyelet bar tack closing device operates at the sewing start.

### 4-5. Setting the foot switch operation mode

• **When using a foot switch**

The following table describes the operation of the work clamp/button clamp during sewing standby mode when using the foot switch.



4441Q

1. Set memory switch No. 070 to "1".
2. Use memory switch No. 071 to select the desired operation mode from the following.

\* In the following table, the term "work clamp" refers to the work clamp/button clamp.

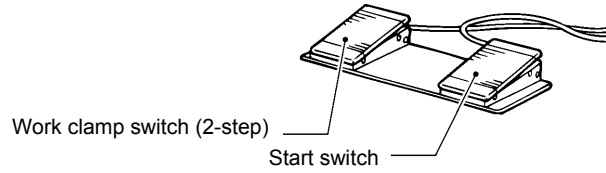
Setting value No. 071	Foot switch				
	Neutral	1st step	2nd step	Neutral	1st step
	Neutral	Depress Release	1st step	Depressed further	2nd step
1	Work clamp raised	→ ←	Work clamp maximum drop	→	Sewing machine start
2	Work clamp raised	→ ←	Work clamp intermediate drop	→	Work clamp maximum drop + sewing machine start

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• When using a 2-pedal foot switch (option)

The following table describes the operation of the work clamp/button clamp during sewing standby mode when using a 2-pedal foot switch.



4923Q

1. Set memory switch No. 070 to "2".
2. Use memory switch No. 072 to select the desired operation mode from the following.

\* In the following table, the term "work clamp" refers to the work clamp/button clamp.

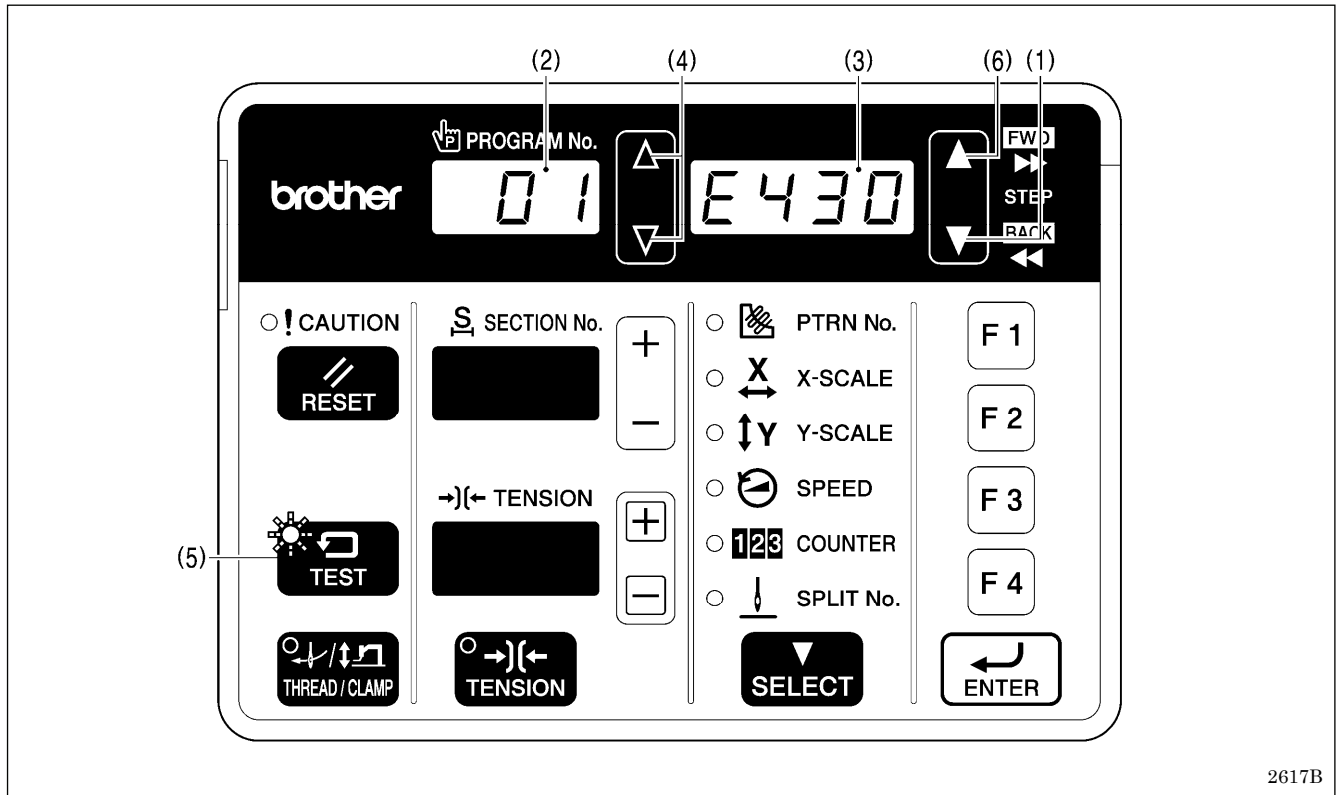
Setting value No. 072	Work clamp switch (left side)					Start switch (right side)
	Neutral	1st step	2nd step			
	Neutral	Depress Release	1st step	Depressed further Release slightly	2nd step	
1	Work clamp raised Work clamp maximum drop *1 Work clamp raised	→ ←	Work clamp maximum drop Work clamp raised	→ ←		Sewing machine start *1
2	Work clamp raised Work clamp maximum drop *1 Work clamp raised	→ ←	Work clamp intermediate drop Work clamp intermediate drop Work clamp maximum drop Work clamp raised	→ ←	Work clamp maximum drop	Sewing machine start *1
3	Work clamp maximum drop *1	→ ←	Work clamp raised			Sewing machine start *1
4	Work clamp raised	→ ←	Work clamp maximum drop	→	Sewing machine start	
5	Work clamp raised	→ ←	Work clamp intermediate drop	→	Work clamp maximum drop + sewing machine start	

\*1 Enabled when the work clamp switch is at neutral and the work clamp/button clamp is fully lowered.

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## 4-6. Checking the error history

The past error history can be checked by the following procedure.



2617B

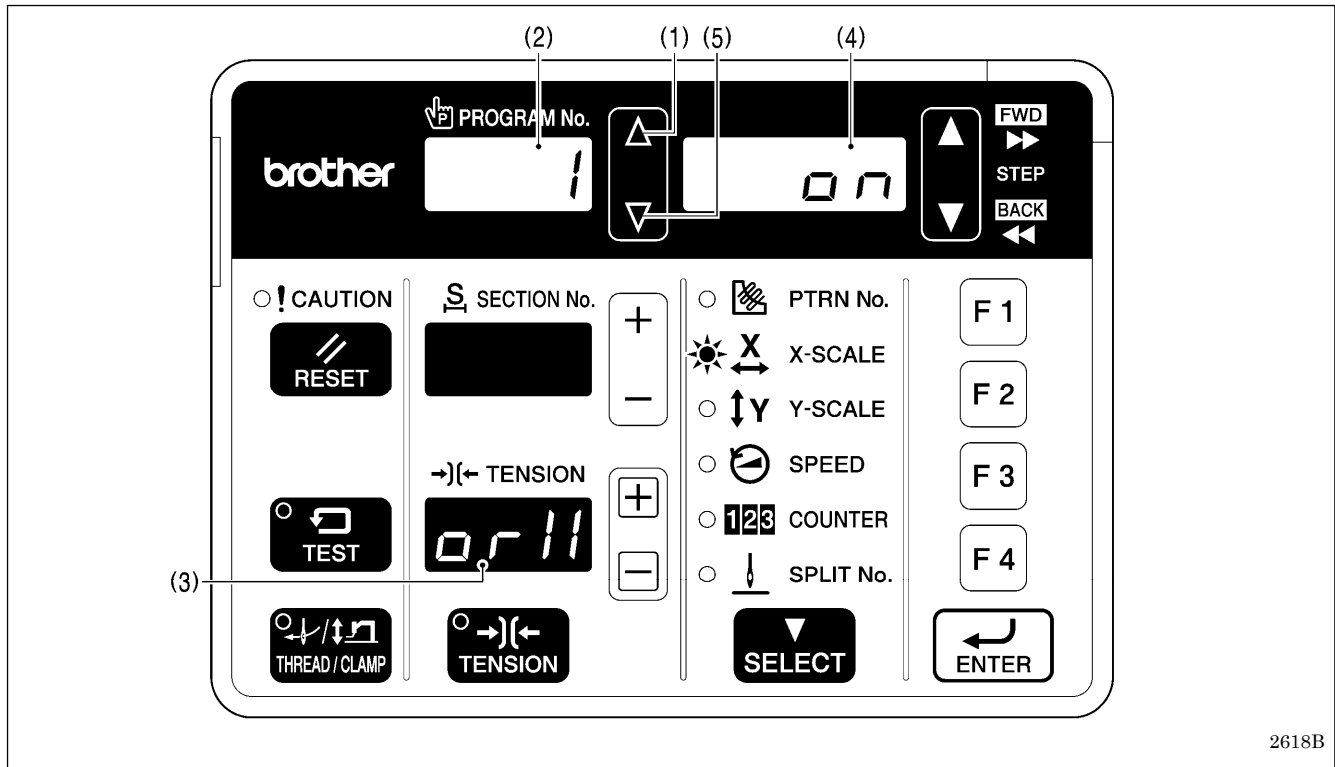
1. While pressing the ▼ key (1), turn on the power switch.  
The error history number will appear in the PROGRAM No. display (2) and the error code will appear in the menu display (3).  
**NOTE:**  
E025, E035, E065, E705 and error codes which can be reset do not remain in the error history, and so they will not be displayed.
2. Press the ▲ or ▼ key (4) to change the order of the error history number.  
The history stores 99 entries (01 to 99) in order starting from the most recent. No. 01 is the most recent entry. (If there are no error codes, "E---" will be displayed.)  
The production counter when the error occurred will appear in the PROGRAM No. display (2) and the menu display (3) in units of 100 stitches while the ▲ key (6) is being pressed.
3. Press the TEST key (5) to return to the normal display. The sewing machine will switch to home position detection standby.

### 4-7. Input checking method

This is used at the following times.

- When you would like to check for problems with the operation panel
- When you would like to check for broken cords
- When you would like to adjust a sensor position

This lets you check if the CPU is reading signals from the keys and the sensors correctly.



1. While pressing the  $\Delta$  key (1), turn on the power switch.  
The item number will appear in the PROGRAM No. display (2), the item name will appear in the tension display (3), and the input status will appear in the menu display (4).
2. Press the  $\Delta$  key (1) or the  $\nabla$  key (5) to select the desired item number.
3. Refer to the input check list to check the key and sensor responses.
4. When returning to normal operation, turn power off and then on again.

#### < Input check list >

Item No.	Item name	Input status	Check items and checking methods
[ 1 ]	[orX]	[ on ] / [ oFF ]	X-feed motor home position sensor position Move the work clamp/button clamp manually in the X direction. Left = ON, right = OFF.
[ 2 ]	[EnX]	[-999] - [ 999 ]	X-feed motor encoder counter value Move the work clamp/button clamp manually in the X direction. Right = down, and left = up. * When the power is turned on, the position will be "0".
[ 3 ]	[orY]	[ on ] / [ oFF ]	Y-feed motor home position sensor position Move the work clamp/button clamp manually in the Y direction. Back = ON, and forward = OFF.
[ 4 ]	[EnY]	[-999] - [ 999 ]	Y-feed motor encoder counter value Move the work clamp/button clamp manually in the Y direction. * Back = down, and forward = up. * When the power is turned on, the position will be "0".

#### 4. FUNCTION SETTINGS

Item No.	Item name	Input status	Check items and checking methods
[ 5]	[orP]	[ on] / [ oFF]	Work clamp motor home position sensor position Remove the side cover and raise the work clamp/button clamp manually. * ON when raised, OFF when lowered.
[ 6]	[EnP]	[-999] – [ 999]	Work clamp motor encoder counter value Remove the side cover and raise the work clamp/button clamp manually. * Back = down, and forward = up. * When the power is turned on, the position will be "0".
[ 7]	[dEG]	[ 000] – [ 359]	Upper shaft 360 rotation segment signal Turn the pulley by hand. * The forward direction (the direction of the arrow) = up.
[ 8]	[ UP]	[ on] / [ oFF]	Needle up signal Turn the pulley by hand. * ON in the needle up region, OFF in any other region.
[ 9]	[voL]	[ ***]	Shows the input voltage.
[ 10]	[PnL]	[*] / [ oFF]	Operation panel key input check The key name will be displayed while a key is pressed.
		* ON display	Key name
		[rESt]	RESET key
		[tESt]	TEST key
		[tHrE]	THREAD/CLAMP key
		[ tEn]	TENSION key
		[SELE]	SELECT key
		[UP-M]	▲ key
		[dn-M]	▼ key
		[UP-S]	SECTION + key
		[dn-S]	SECTION - key
		[UP-t]	TENSION + key
		[dn-t]	TENSION - key
		[ F1]	Function key F1
		[ F2]	Function key F2
		[ F3]	Function key F3
		[ F4]	Function key F4
		[ Ent]	ENTER key
[ 11]	[FtA]	[ 0] – [ 255]	Foot switch analog value Depress the foot switch. * When depressed forward, the value increases. * Should normally display somewhere around 102 when at the neutral position.
[ 12]	[FtS]	[bAck] / [oFF] / [CLnP] / [Strt]	Foot switch signal bAck: Depressed backward oFF : Neutral CLnP : 1st step (Work clamp signal) Strt : 2nd step (Start signal)
[ 13]	[CL1]	[ on] / [ oFF]	Work clamp switch 1st step for 2-step foot switch Depress the work clamp switch to the 1st step.
[ 14]	[CL2]	[ on] / [ oFF]	Work clamp switch 2nd step for 2-step foot switch Depress the work clamp switch to the 2nd step.
[ 15]	[Stt]	[ on] / [ oFF]	Start switch for 2-step foot switch Depress the start switch.

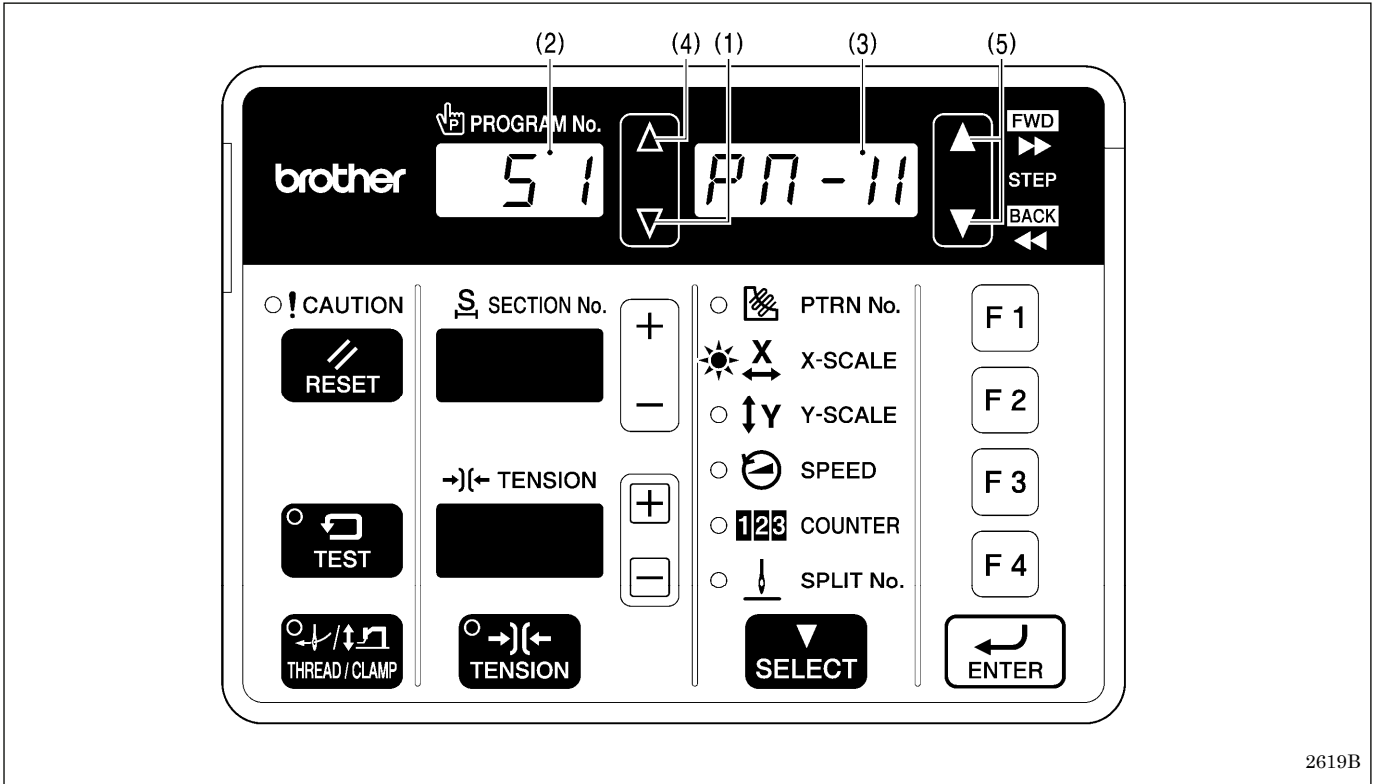
Item No.	Item name	Input status	Check items and checking methods
[ 16]	[EMC]	[ no] / [ oFF] / [ on]	Stop switch (option) * [ no] is displayed when not connected.
[ 17]	[HEd]	[ on] / [ oFF]	Machine head switch [ oFF] is displayed when the machine head is tilted back.
[ 18]	[orn]	[ on] / [ oFF]	Thread nipper home position sensor Press the ▲ key to move the thread nipper in the home position direction. Press the ▼ key to move the thread nipper in the retract direction. * [ on] is displayed for the retract direction.
[ 19]	[Enn]	[-999] – [ 999]	Thread nipper motor encoder counter value Press the ▲ key to move the thread nipper in the home position direction. Press the ▼ key to move the thread nipper in the retract direction. * Retract direction = down, home direction = up * When the power is turned on, the position will be “0”.
[ 20]	[in1]	[ on] / [ oFF]	Option input (IN1)
[ 21]	[in2]	[ on] / [ oFF]	Option input (IN2)
[ 22]	[in3]	[ on] / [ oFF]	Option input (IN3)
[ 23]	[in4]	[ on] / [ oFF]	Option input (IN4)
[ 24]	[in5]	[ on] / [ oFF]	Option input (IN5)
[ 25]	[in6]	[ on] / [ oFF]	Option input (IN6)
[ 26]	[in7]	[ on] / [ oFF]	Option input (IN7)
[ 27]	[in8]	[ on] / [ oFF]	Option input (IN8)
[ 28]	[in9]	[ on] / [ oFF]	Option input (IN9)
[ 29]	[i10]	[ on] / [ oFF]	Option input (IN10)

### 4-8. Output checking method

This is used at the following times.

- When you would like to check for problems with the operation panel
- When you would like to check for a problem with the drive mechanism
- When you would like to check for broken cords

You can check whether the signals being output by the CPU are driving the mechanisms correctly.



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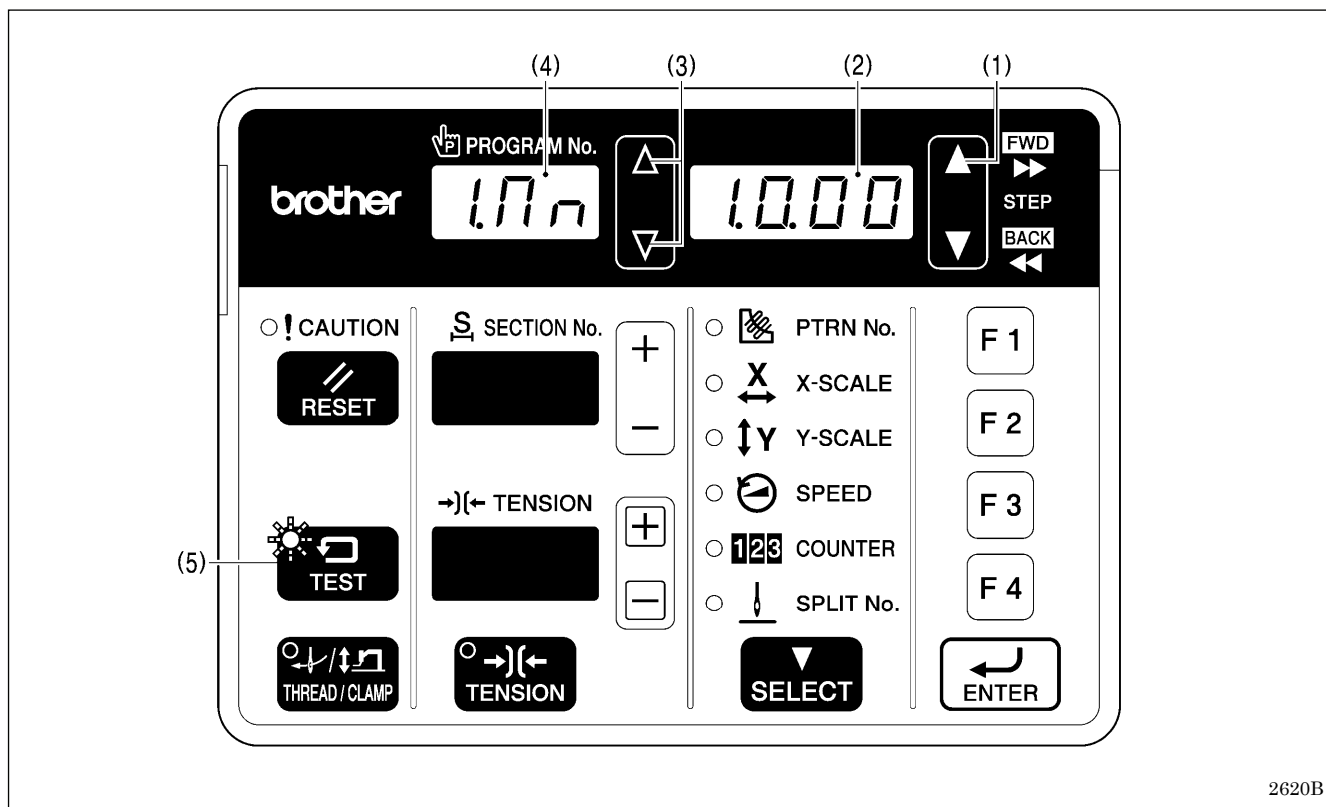
1. While pressing the  $\nabla$  key (1), turn on the power switch.  
The item number will appear in the PROGRAM No. display (2), and the item name will appear in the menu display (3).
2. Press the  $\Delta$  key (4) or the  $\nabla$  key (1) to select the desired item number.
3. For item numbers 51 to 54, press the  $\blacktriangle$  or  $\blacktriangledown$  key (5) to check the operation.  
\* The operation for that check item will be carried out while the key is being pressed.
4. For item numbers 55 onward, depress the foot switch to the 2nd step. (For a 2-pedal foot switch, depress the start switch.)  
\* The operation for that check item will be carried out while the foot switch is being depressed.
5. When returning to normal operation, turn power off and then on again.

Item No.	Item name	Operation
[ 51 ]	[PM-X]	When the $\blacktriangle$ key is pressed, the work clamp/button clamp will move to the left. When the $\blacktriangledown$ key is pressed, the work clamp/button clamp will move to the right.
[ 52 ]	[PM-y]	When the $\blacktriangle$ key is pressed, the work clamp/button clamp will move forward. When the $\blacktriangledown$ key is pressed, the work clamp/button clamp will move back.
[ 53 ]	[PM-P]	When the $\blacktriangle$ key is pressed, the work clamp/button clamp will lift. When the $\blacktriangledown$ key is pressed, the work clamp/button clamp will drop.
[ 54 ]	[PM-n]	When you press the $\blacktriangle$ key, the thread nipper moves toward the home position. When you press the $\blacktriangledown$ key, the thread nipper moves toward the retract position.

Item No.	Item name	Operation
[ 55]	[CL-r]	The valve for the right work clamp turns on. (*)
[ 56]	[CL-L]	The valve for the left work clamp turns on. (*)
[ 57]	[Foot]	The valve for the stepping foot turns on. (*)
[ 58]	[FLiP]	Inner clamping valve is turned ON (*)
[ 59]	[CooL]	Needle cooler valve is turned ON. (*)
[ 60]	[7SEG]	Panel indicators illuminate in sequence, and then the 7-segment display turns on one digit at a time. Blank → 0 → 1 → 2 . . . . → 8 → 9 → 8. → Blank
[ 61]	[ CUt]	Thread trimmer solenoid is turned ON for the specified period. Remove the rear cover and check the operation.
[ 62]	[dtEn]	The digital tension solenoid is turned ON for the specified period.
[ 63]	[ WiP]	The external wiper solenoid is turned ON for the specified period. (*)
[ 64]	[oP 1]	Option output 1 turns on. (*)
[ 65]	[oP 2]	Option output 2 turns on. (*)
[ 66]	[oP 3]	Option output 3 turns on. (*)
[ 67]	[oP 4]	Option output 4 turns on.
[ 68]	[oP 5]	Option output 5 turns on.
[ 69]	[oP 6]	Option output 6 turns on.
[ 70]	[oP 7]	Option output 7 turns on.
[ 71]	[oP 8]	Option output 8 turns on.
[ 72]	[oP 9]	Option output 9 turns on.
[ 73]	[oP10]	Option output 10 turns on.
[ 74]	[oP11]	Option output 11 turns on.
[ 75]	[oP17]	Option output 17 turns on.
[ 76]	[oP18]	Option output 18 turns on.
[ 77]	[oP19]	Option output 19 turns on.
[ 78]	[oP20]	Option output 20 turns on.

\* Cannot be used with the KE-430F and BE-438F.

### 4-9. Confirming software version



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1. If you turn on the power while pressing the ▲ key (1), the software version will be displayed in the menu display (2).
2. The PROGRAM No. display (4) will change as follows each time the ▲ or ▼ key (3) is pressed.

PROGRAM No. display (4)	Software	Menu display (2) example
[1.Mn]	Main control program	[1.0.00]
[2.Mt]	Motor control program	[1.00]
[3.PL]	Panel control program	[1.00]
[4.in]	Main IPL	[1.00]
[5.it]	Motor IPL	[1.00]
[6.iL]	Panel IPL	[1.00]

3. Press the TEST key (5) to return to the normal display. The sewing machine will switch to home position detection standby.



## 4-10. Protection settings

There are two ways which can be used to switch to protect setting mode: **Method A** (which does not require an SD card) and **Method B** (which requires an SD card).

If you want to set up the sewing machine so that these modes cannot be distinguished, it is recommended that you set the method to Method B.

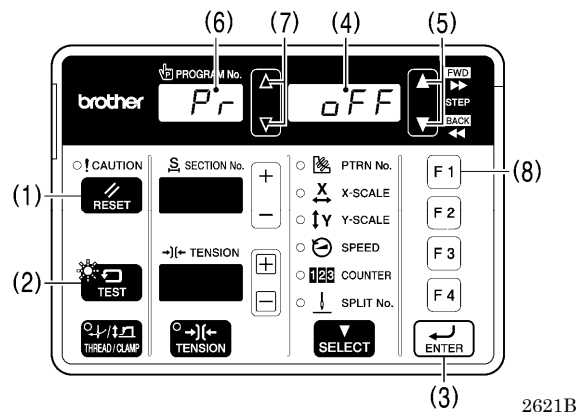
\* If using an SD card, read the section titled “7-1. Notes on handling SD cards (commercially available)”.

### • Method A

1. While pressing the RESET key (1) and the TEST key (2) and the ENTER key (3), turn on the power switch.

\* The previous protection level (OFF, 1 to 7) will appear in the menu display (4).

\* The protection level is set to OFF at the time of shipment from the factory.



\* If a beeping sound is heard and “Pr” “diFF” is displayed, it means that the method has been set to **method B**. In this case, start by means of **method B**. (Refer to the next page.)

2. Press the ▲ or ▼ key (5) to select the protection level.

Protection level	Details
OFF	Nothing is disallowed.
1 – 6	Certain operations are disallowed depending on the protection level. * Protected items have been preset for each level. Refer to “Table of protection levels and corresponding protected items” on page 33.
7	You can change the protection setting for each of the 21 items individually. * Set to ON (disallowed) or OFF (allowed) for each item. * All items are set to OFF at the time of shipment from the factory.

3. Press the ENTER key (3) to store the protection level.

\* If setting to a protection level other than level 7, proceed to step 4. If setting to level 7, proceed to step 5.

4. Press the TEST key (2).

\* The display will return to the normal display and the sewing machine will change to home position standby.

5. The item number will appear in the PROGRAM No. display (6), and the setting (ON/OFF) will appear in the menu display (4).

6. Press the ▲ or ▼ key (7) to select the item number (1 to 21). (Refer to page 33.)

7. Press the ▲ or ▼ key (5) to change the setting (ON/OFF).

8. Press the ENTER key (3) to store the setting (ON/OFF).

9. Repeat steps 6 to 8 above for each item, and then press the TEST key (2).

\* The protect setting mode will be exited and the sewing machine will change to home position standby.

\* If you would like to return to protection level setting (2 above), press the F1 key (8).

## 4. FUNCTION SETTINGS

### • Method B

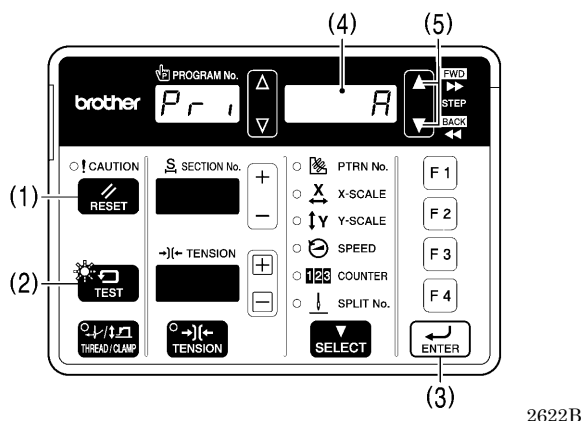
Have an SD card ready.

\* The SD card is only used at the step of selecting protect setting mode, so any type of SD card can be used as long as it can be accessed. In addition, if making the setting two or more times, a different SD card from the one used before can be used.

1. Insert the SD card, and then while pressing the RESET key (1) and the TEST key (2) and the ENTER key (3), turn on the power switch.

\* The previous starting method (A or b) will be displayed in the menu display.

\* The method is set to A at the time of shipment from the factory.



2. Press the ▲ or ▼ key (5) to select the next starting method.

Starting method	Details
A	Protect setting mode can be started using either Method A or Method B.
B	Protect setting mode can only be started using Method B.

3. Press the ENTER key (3) to store the starting method.

4. For the method of operation from this point onward, refer to steps 2 to 9 in "Method A" (previous page).

Table of protection levels and corresponding protected items

× : Operation disallowed

Item No.	Protection details	Level																											
		OFF	1	2	3	4	5	6	7 (Individual settings)																				
									1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Data initialization		×	×	×	×	×	×	×																				
2	Memory switch (Advanced)									×																			
3	Memory switch (Standard)		×	×	×	×	×	×			×																		
4	<Home position, upper shaft reference> position adjustment													×															
5	Program No.		×	×	×	×	×							×															
6	XY enlarge change during wait (Possible if 100% or less)							×						×															
7	XY enlarge/reduce change during wait		×	×	×	×									×														
8	Sewing speed during wait		×	×	×											×													
9	Slow start during wait		×	×	×												×												
10	Work clamp/button clamp height during wait		×	×														×											
11	Tension during wait		×	×															×										
12	Lower thread counter change during wait		×																	×									
13	Production counter clear during wait		×																		×								
14	Lower thread counter setting mode																					×							
15	Production counter setting mode																						×						
16	Program setting mode		×	×	×	×	×																×						
17	Cycle program setting mode		×	×	×	×	×																	×					
18	Pattern data editing mode																									×			
19	Data read/write mode																										×		
20	Sewing start after pause using the STOP switch (available by special order)																											×	
21	Parallel movement mode																												×

# 5. EDITING PATTERN DATA

## 5-1. Tension information in pattern data

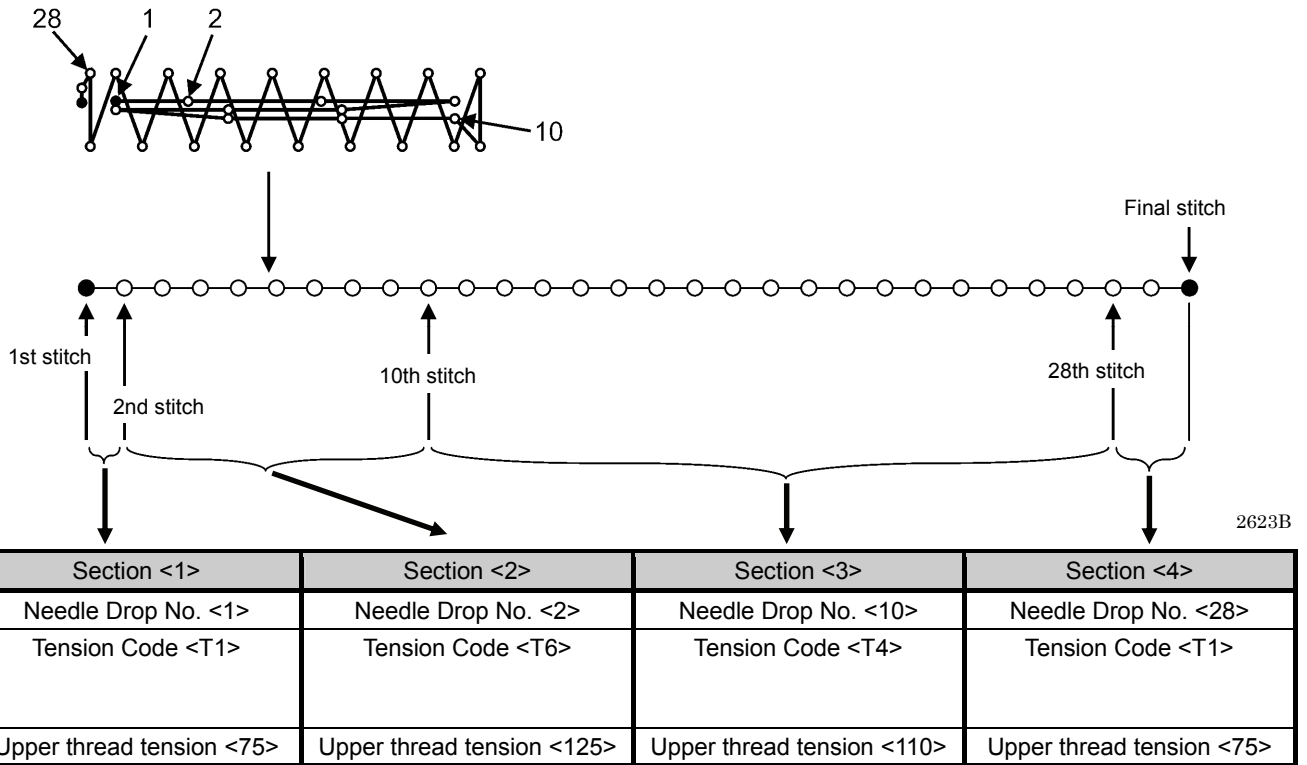
Tension codes are recorded in the pattern data to provide tension information.

The tension codes indicate the type of tension (T1 to T9).

In addition, the units which tension codes are divided into are called sections, and sequential numbers are assigned to them starting from the first stitch. Up to a maximum of 99 sections are possible.

\* The tension values for the tension codes are set in program mode for each program.

Example: Pattern No. 200



Example: When sewing program No. 900 into which pattern No. 200 has been programmed

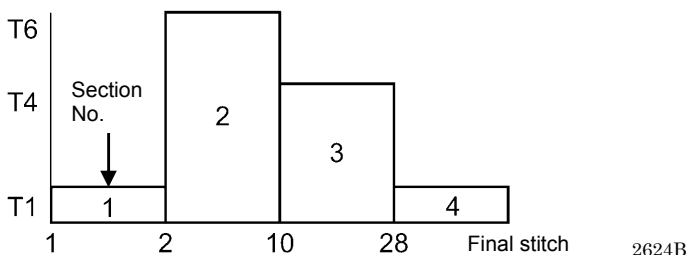
Example: Editing in pattern editing mode

Pattern No. 200		
Needle Drop No.	Section No.	Tension Code
1st stitch	1	T1
2nd stitch (to 9th stitch)	2	T6
10th stitch (to 27th stitch)	3	T4
28th stitch (to final stitch)	4	T1

Example: Program mode editing

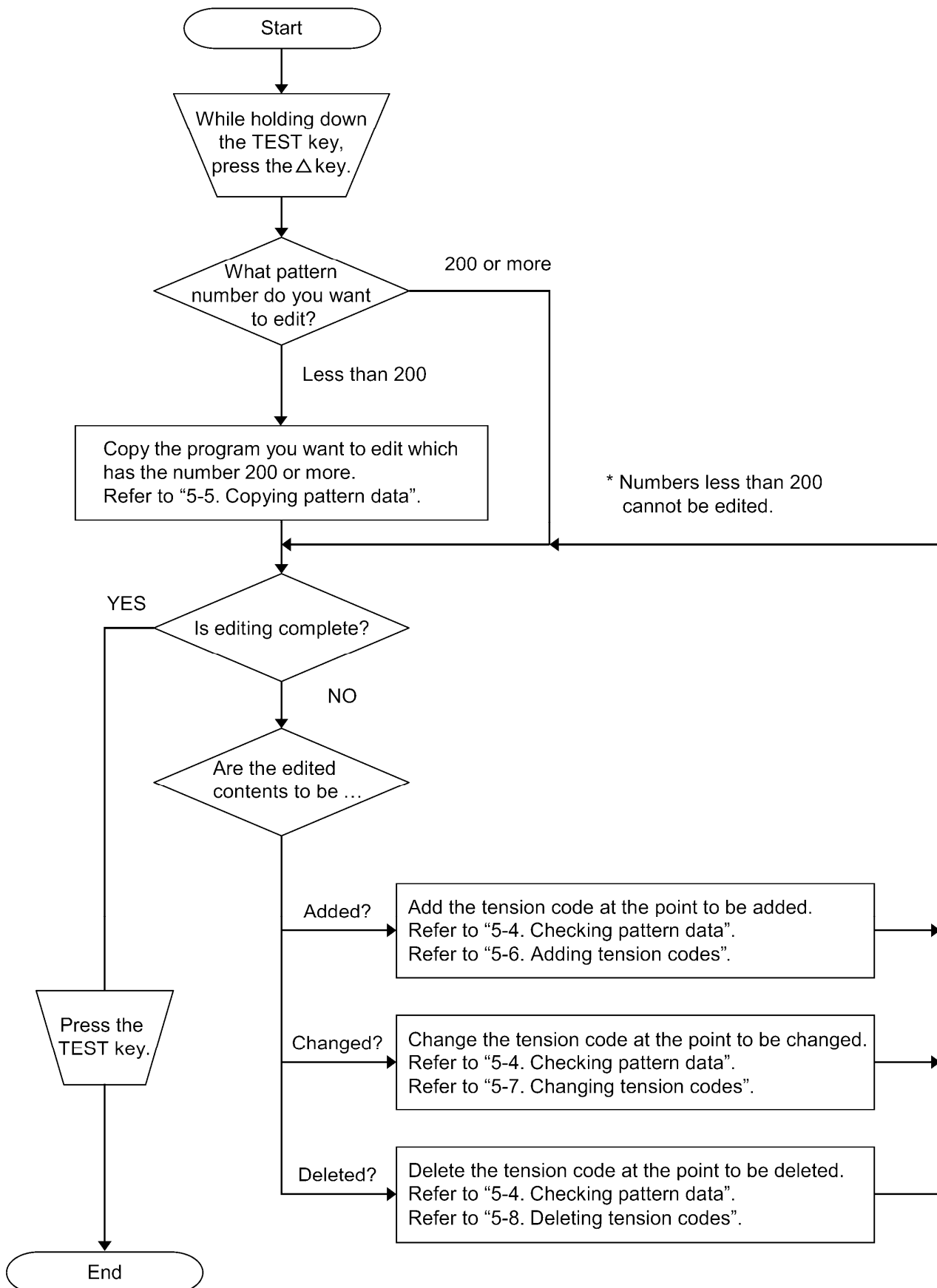
Program No. 900	
Pattern No.	200
X-scale	100
Y-scale	100
Sewing speed	2700
Slow start pattern	Lo8
Upper thread tension T1	75
Upper thread tension T4	110
Upper thread tension T6	125

Tension Code

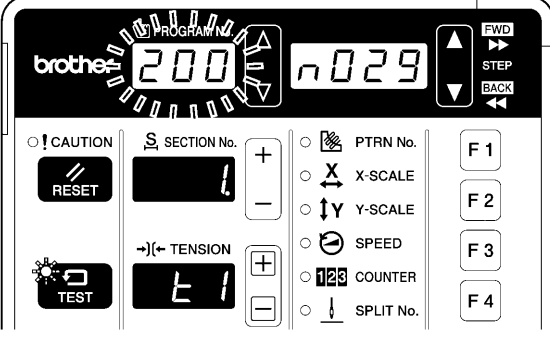

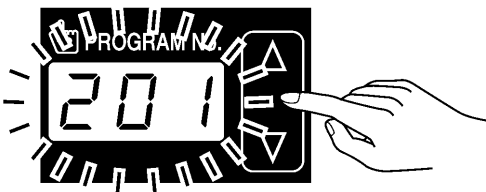
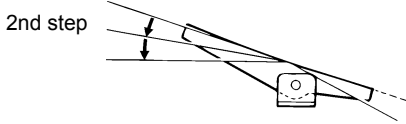


\* Of all the tension codes (T1 to T9), only the tension codes which have been programmed into pattern No. 200 will be displayed.

## 5-2. Work flowchart

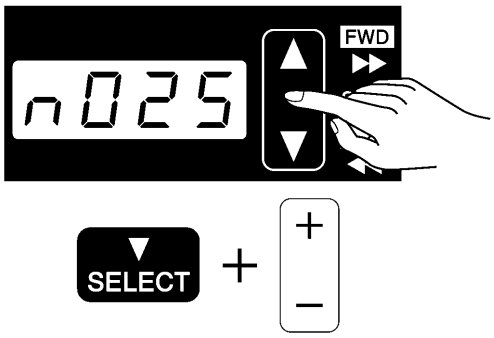



### 5-3. Switching to pattern editing mode

<p>1</p>		<p>While pressing the TEST key, press the <math>\Delta</math> key.</p>  <ul style="list-style-type: none"> <li>• The pattern number will flash in the PROGRAM No. display.</li> <li>• The number of stitches remaining until the final stitch will be displayed in the menu display.</li> <li>• The section number will be displayed in the section No. display. "." means the start of a section.</li> <li>• The tension code will be displayed in the tension display.</li> </ul> <p style="text-align: right;">2626B 2627B</p>
<p>2</p>	 <p style="text-align: right;">2628B</p>	<p>Press the <math>\Delta</math> or <math>\nabla</math> key to select the desired pattern number.</p> <p>* Only the pattern numbers which are currently registered will be displayed.</p>
<p>3</p>	 <p style="text-align: right;">4441Q</p>	<p>Depress the foot switch to the 2nd step.</p> <ul style="list-style-type: none"> <li>• Home position detection will be carried out.</li> <li>• The pattern number will be changed to illuminated.</li> </ul> <p>From this point on, the condition is referred to as pattern editing mode.</p>

### 5-4. Checking pattern data

You can check the tension information (section numbers and tension codes) in pattern data.

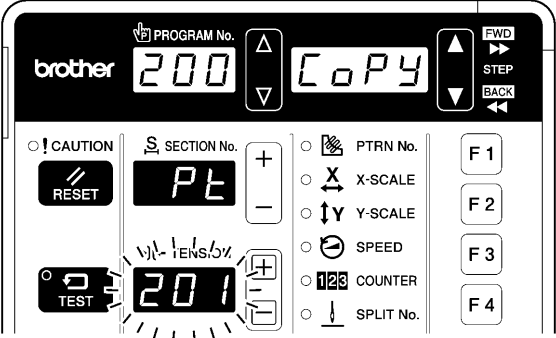






<p>1</p>		<p>Carry out steps 1 to 3 in "5-3. Switching to pattern editing mode" to switch to pattern editing mode.</p> <p>When you press the <math>\Delta</math> or <math>\nabla</math> key, the work clamp/button clamp will move one stitch at a time.</p> <ul style="list-style-type: none"> <li>• The section number and tension code and the number of stitches remaining until the final stitch are displayed at the current position.</li> </ul> <p>While holding down the SELECT key, press the SECTION [+ -] key to automatically move the work clamp/button clamp to the beginning of a section.</p> <p>+ : Moves in the forward direction - : Moves in the reverse direction</p> <p style="text-align: right;">2629B 2630B</p>
<p>2</p>	<p>End pattern editing mode</p>  <p style="text-align: center;">TEST indicator switches off</p>	<p>Press the TEST key.</p> <ul style="list-style-type: none"> <li>• The display will return to the normal display and the sewing machine will change to home position standby.</li> </ul> <p style="text-align: right;">2404B</p>

## 5-5. Copying pattern data

Editing (adding, changing or deleting) of the tension codes within pattern data is limited to pattern numbers within the range of 200 to 999.

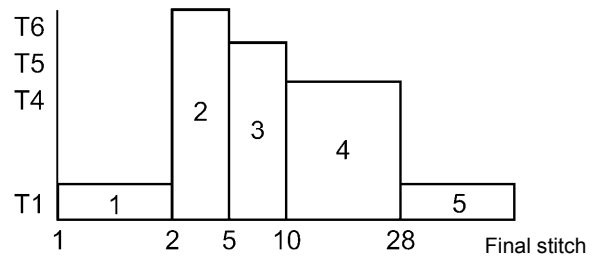
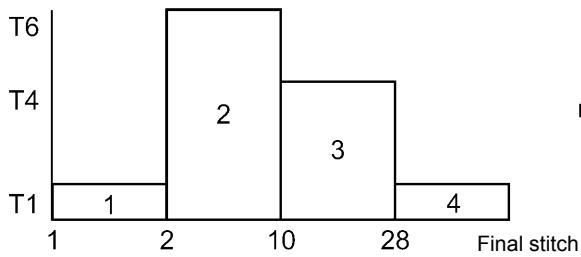
Because of this, if you would like to edit pattern data which has already been registered, you will need to copy the pattern to a number that is 200 or higher.

\* If you would like to delete pattern data which has already been registered, this can be done using initialization mode. Refer to "6-7. Resetting all settings to their defaults" in the CD Instruction Manual.

1		<p>Carry out steps 1 to 3 in "5-3. Switching to pattern editing mode" to switch to pattern editing mode. Press the F1 key and the F4 key at the same time.</p> <p style="text-align: center;">  </p> <ul style="list-style-type: none"> <li>• The pattern number which is to be copied will be displayed in the PROGRAM No. display.</li> <li>• "Copy" will be displayed in the menu display.</li> <li>• "Pt" will be displayed in the section No. display.</li> <li>• The pattern number for the copy destination will be displayed in the tension display.</li> </ul> <p style="text-align: right;">2631B 2632B</p>
2	 <p style="text-align: center;">For example, if copying to pattern No. 204.</p> <p style="text-align: right;">2633B</p>	<p>Press the TENSION (   ) keys to select the pattern number for the copy destination.</p> <p>* Only patterns numbers which have not yet been recorded will be displayed.</p>
3	<p style="text-align: center;">         or   </p> <p style="text-align: right;">2414B 2634B</p>	<p>To do the copying, press the ENTER key.</p> <ul style="list-style-type: none"> <li>• The pattern will be copied and the sewing machine will then return to pattern editing mode.</li> </ul> <p>If you would like to return to pattern editing mode without copying the pattern, press the RESET key.</p>

## 5-6. Adding tension codes

<If adding a T5 code at the 5th stitch in section 2>



2639B

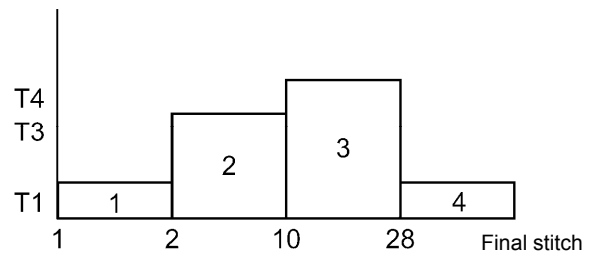
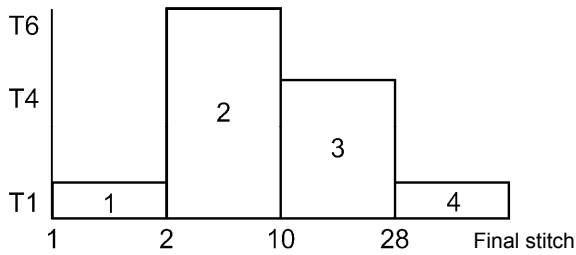
<b>1</b>		<p>Carry out steps 1 to 3 in “5-3. Switching to pattern editing mode” to switch to pattern editing mode. Press the ▲ or ▼ key to move the work clamp/button clamp to the desired position.</p> <p>* Move it to a position other than the start of the section (so that “.” is not displayed).</p>
<b>2</b>	<p>For example, tension code T5</p>	<p>Press the TENSION ( + - ) keys to select the desired tension code (T1 to T9).</p> <ul style="list-style-type: none"> <li>The tension code will flash.</li> </ul>
<b>3</b>		<p>To add a tension code, press the ENTER key.</p> <ul style="list-style-type: none"> <li>A new tension code will be added and the sewing machine will return to pattern editing mode. As well as this, a section will be added and the numbers for subsequent sections will be incremented by 1.</li> </ul> <p>If you would like to return to pattern editing mode without adding a tension code, press the ▲ or ▼ key.</p> <p>If you would like to end pattern editing mode without adding a tension code, press the TEST key.</p>

2414B 2638B 2404B

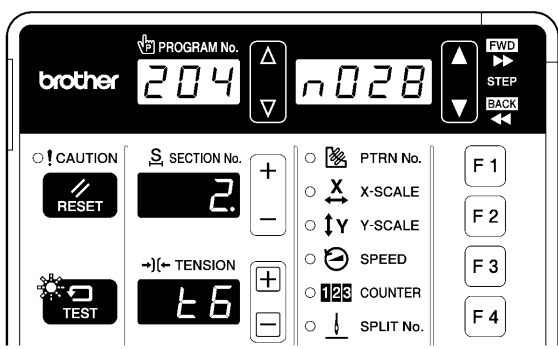
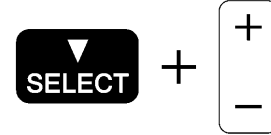
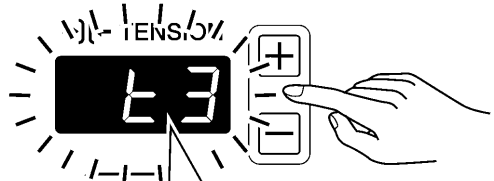



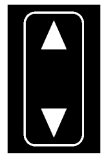



### 5-7. Changing tension codes

<If changing T6 to T3 in section 2>

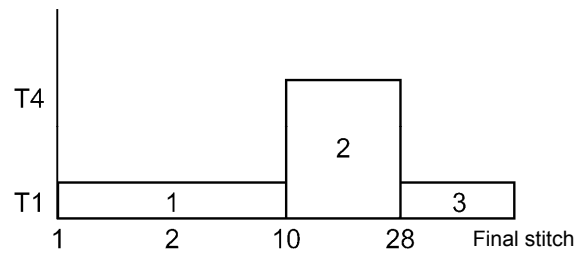
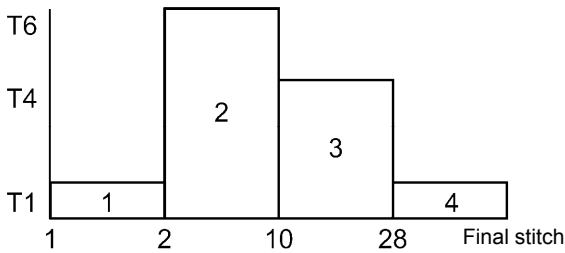


2642B

<b>1</b>	 <p>Carry out steps 1 to 3 in “5-3. Switching to pattern editing mode” to switch to pattern editing mode. While pressing the SELECT key, press the SECTION [+ -] keys. Each time a key is pressed, the work clamp/button clamp automatically moves to the start of the next or the previous section.</p> <div style="text-align: center;">  </div> <p>Move the work clamp/button clamp to the start of the section you would like to change.</p>	<p>2630B 2641B</p>	
<b>2</b>	 <p>For example, change the tension code to T3 in section 2.</p>	<p>Press the TENSION (   ) keys to select the desired tension code (T1 to T9).</p> <ul style="list-style-type: none"> <li>• The tension code will flash.</li> </ul>	<p>2640B</p>
<b>3</b>	<div style="text-align: center;">  <p>or</p>  <p>or</p>  </div>	<p>To change the tension code, press the ENTER key.</p> <ul style="list-style-type: none"> <li>• The tension code will be changed and the sewing machine will then return to pattern editing mode.</li> </ul> <p>If you would like to return to pattern editing mode without changing a tension code, press the ▲ or ▼ key.</p> <p>If you would like to end pattern editing mode without changing a tension code, press the TEST key.</p>	<p>2414B 2638B 2404B</p>

### 5-8. Deleting tension codes

<Deleting section 2>




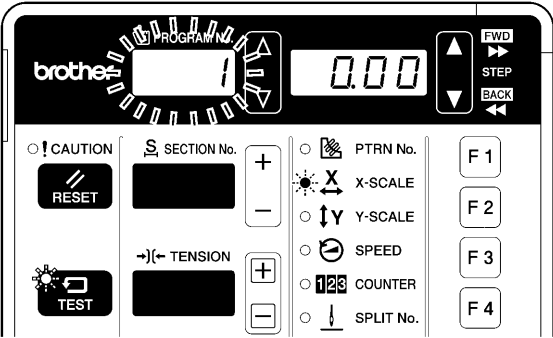

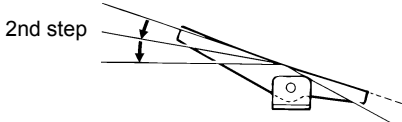
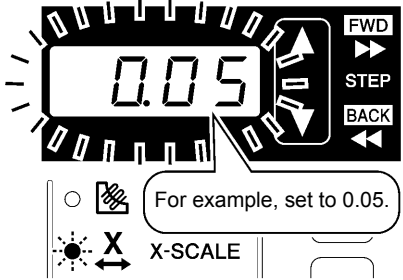

2647B

<b>1</b>		<p>Carry out steps 1 to 3 in “5-3. Switching to pattern editing mode” to switch to pattern editing mode. While pressing the SELECT key, press the SECTION [+ -] keys. Each time a key is pressed, the work clamp/button clamp automatically moves to the start of the next or the previous section.</p> <p style="text-align: center;">  +  </p> <p>Move the work clamp/button clamp to the start of the section you would like to delete.</p> <p style="text-align: right;">2630B 2641B</p>
<b>2</b>		<p>While pressing a TENSION key, press the RESET key. The delete selection display will appear.</p> <ul style="list-style-type: none"> <li>• The TEST indicator will turn off.</li> <li>• “dEL” will be displayed in the menu display.</li> </ul> <p style="text-align: center;">  +  </p> <p style="text-align: right;">2643B 2644B</p>
<b>3</b>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>SECTION No. 2</p> <p>TENSION T6</p> <p>For example, when an individual section is selected Tension code T6</p> </div> <div style="text-align: center;"> <p>SECTION No. AL</p> <p>TENSION ---</p> <p>For example, when all sections are selected</p> </div> </div> <p style="text-align: center; margin-top: 10px;"> </p>	<p>When you press the SECTION [+ -] keys, the delete selection display will switch between all sections and an individual section.</p> <p style="text-align: center;"> </p> <p style="text-align: right;">2645B 2646B</p>
<b>4</b>	<p style="text-align: center;"> </p> <p style="text-align: center;">or</p> <p style="text-align: center;"> </p> <p style="text-align: right;">2414B 2634B</p>	<p>To delete the section, press the ENTER key.</p> <ul style="list-style-type: none"> <li>• The specified tension code will be deleted and the sewing machine will return to pattern editing mode. As well as this, the section will also be deleted and the numbers for subsequent sections will be decremented by 1.</li> <li>* The tension code in section 1 is the only tension code which cannot be deleted.</li> </ul> <p>If you would like to return to pattern editing mode without deleting the tension code, press the RESET key.</p>

## 6. X AND Y PARALLEL MOVEMENT OF SEWING PATTERNS

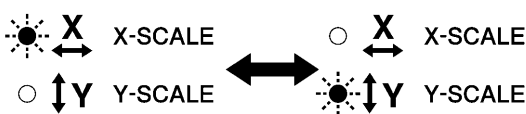

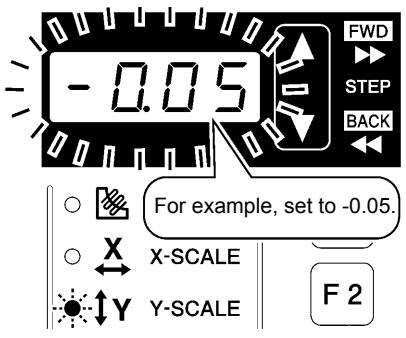


The work clamp/button clamp can be moved to any desired position so that sewing patterns which have already been programmed can be moved in parallel directions forward, back or to the left or right.

Use this when you would like to correct the sewing position with respect to the work clamp/button clamp.

1	 <p>For example, program No. 1</p>	<p>Press the <math>\Delta</math> or <math>\nabla</math> key to select the program number.</p> <p>* If a cycle program has been selected, the following operation cannot be carried out. Select a program from 1 to 999.</p>
2		<p>While holding down the TEST key, press the <math>\nabla</math> key to switch to parallel movement mode.</p>  <p>• The amount of parallel movement in the horizontal direction which has currently been set will be displayed in the menu display in mm units.</p> <p>* The sewing machine will not switch to parallel movement mode if memory switch No. 465 is set to "3". Set it to "1" or "2".</p>
3	 <p>2nd step</p>	<p>Depress the foot switch to the 2nd step.</p> <ul style="list-style-type: none"> <li>• Home position detection will be carried out.</li> <li>• The pattern number will change to illuminated.</li> </ul>
4	 <p>For example, set to 0.05.</p> <p>X-SCALE</p>	<p>Each time the <math>\Delta</math> or <math>\nabla</math> key is pressed, the work clamp/button clamp will move by 0.05 mm.</p> <ul style="list-style-type: none"> <li>• In X-scale parallel movement mode, the work clamp/button clamp will move to the left when the <math>\Delta</math> key is pressed, and to the right when the <math>\nabla</math> key is pressed.</li> <li>• The range of movement is a maximum of -9.95 mm to +9.95 mm. However, the sewing pattern cannot be moved outside the sewing area.</li> </ul>
5	<p><b>Confirm the movement amount.</b></p> 	<p>Press the ENTER key.</p> <ul style="list-style-type: none"> <li>• The amount of parallel movement in the horizontal direction will be confirmed, and the menu display will change to illuminated.</li> </ul>

(Continued on next page.)

6. X AND Y PARALLEL MOVEMENT OF SEWING PATTERNS

<p>6</p>	<p><b>X-scale Parallel movement mode</b></p>  <p><b>Y-scale Parallel movement mode</b></p>	<p>Press the SELECT key so that the Y-scale indicator flashes.</p>  <p>2401B</p> <p>* When the SELECT key is pressed, the X-SCALE indicator and the Y-SCALE indicator will flash alternately.</p>
<p>7</p>	 <p>For example, set to -0.05.</p> <p>F 2</p>	<p>Each time the ▲ or ▼ key is pressed, the work clamp/button clamp will move by 0.05 mm.</p> <ul style="list-style-type: none"> <li>In Y-scale parallel movement mode, the work clamp/button clamp will move forward when the ▲ key is pressed, and backward when the ▼ key is pressed.</li> <li>The range of movement is a maximum of -9.95 mm to +9.95 mm. However, the sewing pattern cannot be moved outside the sewing area.</li> </ul>
<p>8</p>	<p><b>Confirm the movement amount</b></p> 	<p>Press the ENTER key.</p> <ul style="list-style-type: none"> <li>The amount of parallel movement in the vertical direction will be confirmed, and the menu display will change to illuminated.</li> </ul>
<p>9</p>	<p><b>Ending parallel movement mode</b></p>  <p>TEST indicator switches off</p>	<p>Press the TEST key.</p> <ul style="list-style-type: none"> <li>The display will return to the normal display and the sewing machine will change to home position standby.</li> <li>If you would like to return to step 4, press the SELECT key instead of the TEST key.</li> </ul>

NOTE:

- If you change the program number, the pattern number, the X-scale or the Y-scale, the movement amount which has been stored will be reset.
- When the power switch is turned off, the movement amount which has been stored will be reset. However, if memory switch No. 465 is set to "2", the movement amount will remain stored and will not be reset.

## 7. USING SD CARDS

### 7-1. Notes on handling SD cards (commercially available)

- Use an SD card or a multimedia card with a capacity of 2GB or less.
- Do not disassemble or alter SD cards.
- Do not bend, drop, scratch or place heavy objects on top of the SD cards.
- Do not allow the SD cards to become wet, such as with water, oil, solvents, drinks or any other liquids.
- Do not use or store the SD cards in a locations exposed to strong static electricity or electrical interference.
- Do not use or store the SD cards in a locations exposed to vibrations or impacts, direct sunlight, extreme dust (or lint), high temperatures, high humidity, severe temperature fluctuations, or strong magnetic forces (such as from speakers).
- Do not subject the SD cards to vibration or shocks or remove them from the sewing machine while data reading or writing is in progress.
- Data on the SD cards may be lost or damaged due to some malfunction or accident. We recommend backing up important data.
- The SD cards that you purchased is already formatted. We recommend that the SD cards not be reformatted.
- The recommended SD cards are those sold by SanDisk and Panasonic. Cards from other manufacturers may use different formatting methods and may not work correctly as a result.

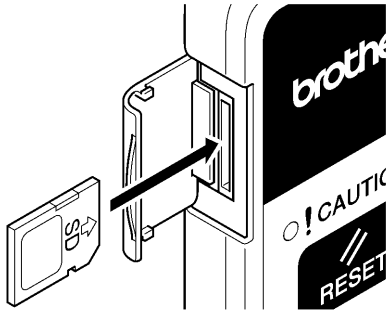
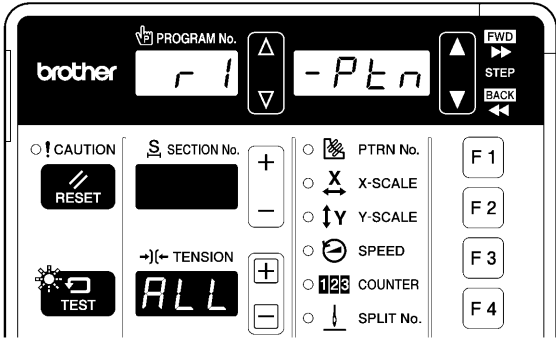
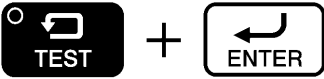
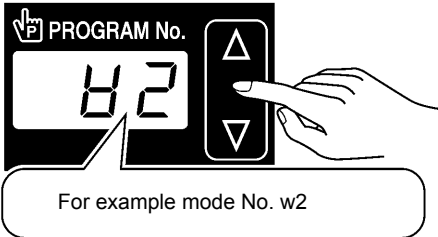
For additional information, refer to the instruction manual included with the SD cards that you have purchased.

- \* This product is compatible with SD cards that have been formatted using the FAT16/32 method. Cards that have been formatted using other formatting methods cannot be used.
- \* All other company and product names mentioned in this instruction manual are trademarks or registered trademarks of their respective companies. However, the explanations for markings such as TM are not clearly described within the text.

### 7-2. Structure of an SD card folder

Data type	Folder name	File name
Control program	\BROTHER\ISM\ISMSYS\	ISM08MN.BVP (Main control program) ISM08MT.BVP (Motor control program) ISM08PL.BVP (Panel control program)
Pattern data	\BROTHER\ISM\ISMDA**\ * '***' represents the value for memory switch No. 752. If storing additional pattern data from other sewing machines in the same SD card, change the name of the folder.	ISM0***.sew * '****' represents the pattern data number.
Memory switch	Same as above	ISMMSW.SEW
Parameter	Same as above	ISMUPG.SEW
Cycle program	Same as above	ISMCYC.SEW
Error log	\BROTHER\ISM\ISMLDT\	Stores the files which relate to error logs.

### 7-3. Preparation for reading and writing data

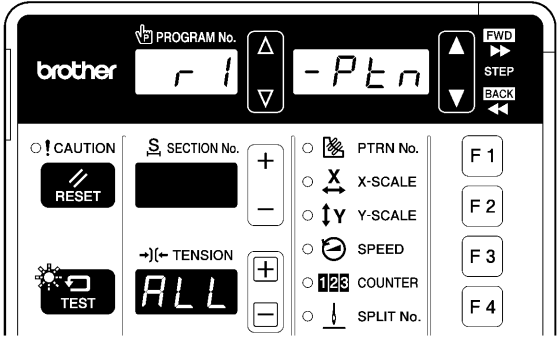
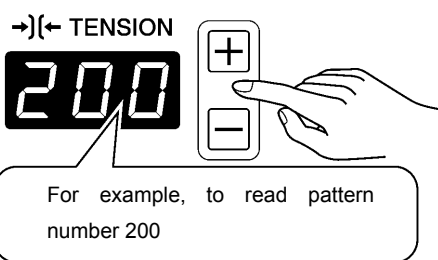
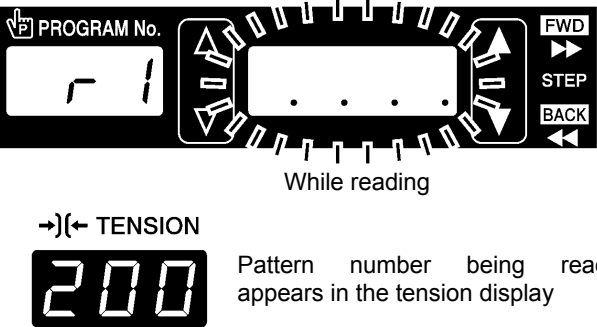



<p>1</p>		<p>Insert the SD card into the SD slot.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Make sure the SD card is facing the correct way.</li> <li>• The cover should be closed at all times except when the SD card is inserted and removed, otherwise dust may cause trouble</li> </ul>
<p>2</p>	<p>Turn on the power switch.</p>	
<p>3</p>	<p><b>Switching to SD data read/write mode</b></p>  <p>TEST indicator flashes</p>	<p>While pressing the TEST key, press the ENTER key.</p>  <p>2652B</p> <ul style="list-style-type: none"> <li>• “sd” will appear in the PROGRAM No. display and “read” will appear in the menu display while the SD card is being read.</li> <li>• Once reading of the SD card is complete, the mode number will appear in the PROGRAM No. display and the setting for that mode number will appear in the menu display.</li> <li>• The initialization mode is additional pattern data read mode. (Refer to “Read/write mode list” below.)</li> </ul>
<p>4</p>		<p>Press the <math>\Delta</math> or <math>\nabla</math> key to select the mode.</p>

**[Read/write mode list]**

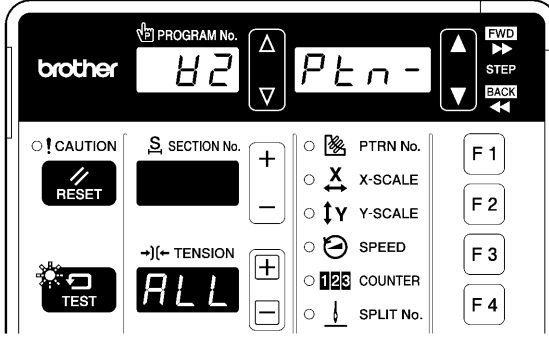
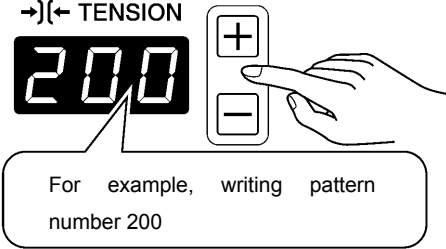
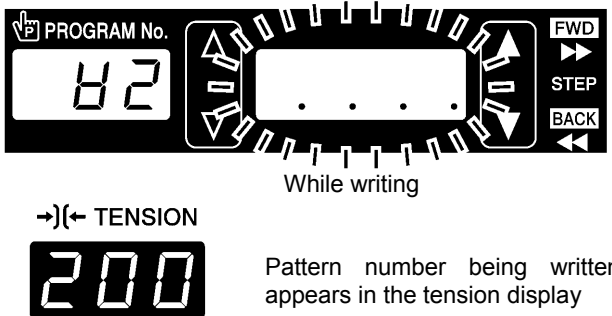



PROGRAM No. display	Menu display	Setting items
r 1	[-Ptn]	Reads additional pattern data from the SD card. *
w 2	[Ptn-]	Writes additional pattern data to the SD card.
r 3	[-MEM]	Memory switch settings are read from the SD card.
w 4	[MEM-]	Memory switch settings are written to the SD card.
r 5	[-PrG]	Reads sewing program data and cycle program data from the SD card.
w 6	[PrG-]	Writes sewing program data and cycle program data to the SD card.
r 7	[-ALL]	Reads all sewing machine data (sewing program data, cycle program data, memory switch settings and additional pattern data) from the SD card.
w 8	[ALL-]	Writes all sewing machine data (sewing program data, cycle program data, memory switch settings and additional pattern data) to the SD card.
W9	[LoG-]	Error log data is written to the SD card.

\* The additional pattern data that can be used with this sewing machine is data which has been created for the KE-430F/BE-438F or for the KE-430D/BE-438D.

## 7-4. Reading additional pattern data


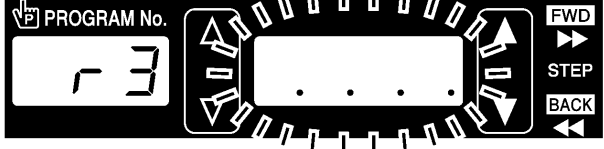



1	 <p style="text-align: right;">2651B</p>	<p>Select the “ r 1 ” SD data read/write mode. (Refer to “7-3. Preparation for reading and writing data”.)</p> <ul style="list-style-type: none"> <li>The number of the additional pattern data in the SD card folder will appear in the tension display. (The initial value displayed is “ALL”.)</li> </ul>
2	 <p>For example, to read pattern number 200</p> <p style="text-align: right;">2656B</p>	<p>Press the <math>\oplus</math> or <math>\ominus</math> key to select the number for the additional pattern that you would like to be read (ALL, 200 to 999).</p> <ul style="list-style-type: none"> <li>When “ALL” is displayed, all of the additional pattern data will be read at once.</li> <li>The additional pattern numbers displayed will only be those that are in the SD card folders. (If there is no data on the card, “ALL” will be the only thing displayed.)</li> </ul>
3	 <p style="text-align: center;">While reading</p> <p>Pattern number being read appears in the tension display</p> <p style="text-align: right;">2657B 2658B</p>	<p>Press the ENTER key.</p>  <p style="text-align: right;">2414B</p> <ul style="list-style-type: none"> <li>The buzzer will sound and the selected pattern data will be read from the folder on SD card and copied into the sewing machine’s memory.</li> <li>If no additional pattern data exists, an error buzzer will sound.</li> </ul>
4	 <p style="text-align: right;">2654B</p>	<p>When the display returns to the status in step 1, reading of the additional pattern data is complete.</p> <ul style="list-style-type: none"> <li>If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul>
5	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p style="text-align: right;">2404B</p>	<p>Press the TEST key.</p> <p>* To sew a pattern that you want to add, register a program while referring to “5-2. Program setting method” in the CD Instruction Manual.</p>

### 7-5. Writing additional pattern data to an SD card


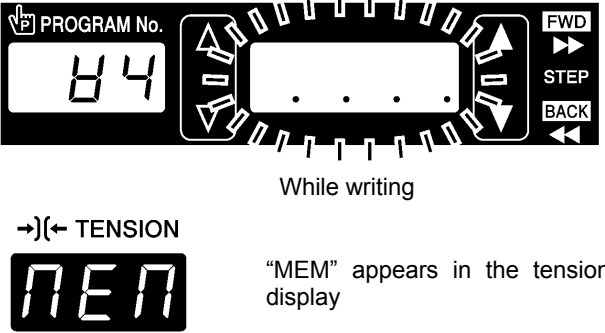



<p>1</p>	 <p>2901B</p>	<p>Select the “w2” SD data read/write mode. (Refer to “7-3. Preparation for reading and writing data”.)</p> <ul style="list-style-type: none"> <li>The numbers for the additional pattern data in the sewing machine memory will appear in the tension display. (The initial value displayed is “ALL”.)</li> </ul>
<p>2</p>	 <p>For example, writing pattern number 200</p> <p>2656B</p>	<p>Press the <math>\oplus</math> or <math>\ominus</math> key to select the number for the additional pattern that you would like to write (ALL, 200 to 999).</p> <ul style="list-style-type: none"> <li>When “ALL” is displayed, all of the additional pattern data will be read at once.</li> <li>The additional pattern numbers displayed will only be those that are in the sewing machine memory. (If there is no data in the memory, “ALL” will be the only thing displayed.)</li> </ul>
<p>3</p>	 <p>While writing</p> <p>Pattern number being written appears in the tension display</p> <p>2660B 2658B</p>	<p>Press the ENTER key.</p>  <p>2414B</p> <ul style="list-style-type: none"> <li>The buzzer will sound and the selected pattern data will be written to the SD card.</li> <li>If no additional pattern data exists, an error buzzer will sound.</li> </ul>
<p>4</p>	 <p>2659B</p>	<p>When the display returns to the status in step 1, writing of the additional pattern data is complete.</p> <ul style="list-style-type: none"> <li>If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul>
<p>5</p>	<p>Ending read/write mode</p>  <p>TEST indicator switches off</p> <p>2404B</p>	<p>Press the TEST key.</p>



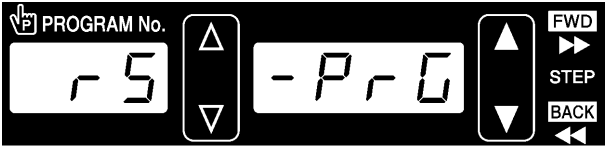
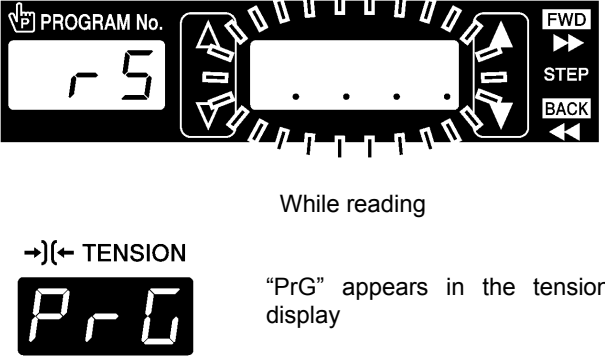



## 7-6. Reading memory switch data

1	 <p style="text-align: right;">2661B</p>	<p>Select the "r3" SD data read/write mode. (Refer to "7-3. Preparation for reading and writing data".)</p>
2	 <p style="text-align: center;">While reading</p> <p>→)(← TENSION</p> <p><b>MEM</b></p> <p>"MEM" appears in the tension display</p> <p style="text-align: right;">2662B 2663B</p>	<p>Press the ENTER key.</p>  <p style="text-align: right;">2414B</p> <ul style="list-style-type: none"> <li>• The buzzer will sound and the memory switch data will be read from the SD card and stored in the sewing machine memory, and the memory switch settings will then be applied.</li> <li>• If no memory switch data exists, an error buzzer will sound.</li> </ul>
3	 <p style="text-align: right;">2661B</p>	<p>When the display returns to the status in step 1, reading of the memory switch data is complete.</p> <ul style="list-style-type: none"> <li>• If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul>
4	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p style="text-align: right;">2404B</p>	<p>Press the TEST key.</p>


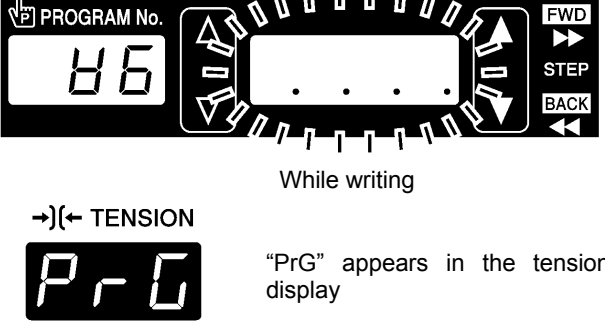



### 7-7. Writing memory switch data to the SD card

<p>1</p>	 <p style="text-align: right;">2664B</p>	<p>Select the “w4” SD data read/write mode. (Refer to “7-3. Preparation for reading and writing data”.)</p>
<p>2</p>	 <p style="text-align: center;">While writing</p> <p>→)(← TENSION MEM</p> <p style="text-align: center;">“MEM” appears in the tension display</p> <p style="text-align: right;">2902B 2663B</p>	<p>Press the ENTER key.</p>  <p style="text-align: right;">2414B</p> <ul style="list-style-type: none"> <li>• The buzzer will sound and the memory switch data will be copied to the SD card.</li> </ul>
<p>3</p>	 <p style="text-align: right;">2664B</p>	<p>When the display returns to the status in step 1, writing of the memory switch data is complete.</p> <ul style="list-style-type: none"> <li>• If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul>
<p>4</p>	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p style="text-align: right;">2404B</p>	<p>Press the TEST key.</p>


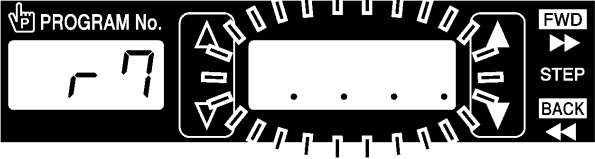



## 7-8. Reading program data

1		<p>Select the "r5" SD data read/write mode. (Refer to "7-3. Preparation for reading and writing data".)</p> <p>2665B</p>
2	 <p>While reading</p> <p>→)(← TENSION PrG</p> <p>"PrG" appears in the tension display</p> <p>2903B 2668B</p>	<p>Press the ENTER key.</p>  <p>2414B</p> <ul style="list-style-type: none"> <li>• The buzzer will sound and the sewing program data and cycle program data will be read from the SD card and stored in the sewing machine's memory, and the sewing programs and cycle programs will then be set.</li> <li>• If no program data or cycle program data exists, an error buzzer will sound.</li> </ul>
3		<p>When the display returns to the status in step 1, reading of the program data is complete.</p> <ul style="list-style-type: none"> <li>• If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul> <p>2665B</p>
4	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p>2404B</p>	<p>Press the TEST key.</p>


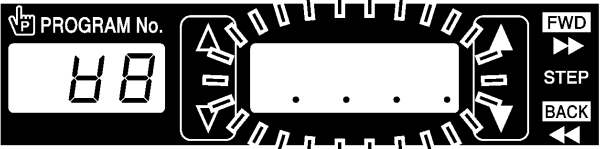




### 7-9. Writing program data to an SD card

<p>1</p>		<p>Select the “w6” SD data read/write mode. (Refer to “7-3. Preparation for reading and writing data”.)</p> <p style="text-align: right;">2666B</p>
<p>2</p>	 <p style="text-align: center;">While writing</p> <p>→){← TENSION</p> <p><b>PrG</b></p> <p>“PrG” appears in the tension display</p> <p style="text-align: right;">2667B 2668B</p>	<p>Press the ENTER key.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">2414B</p> <ul style="list-style-type: none"> <li>• The buzzer will sound and the memory switch data will be copied to the SD card.</li> </ul>
<p>3</p>	 <p style="text-align: right;">2666B</p>	<p>When the display returns to the status in step 1, writing of the program data is complete.</p> <ul style="list-style-type: none"> <li>• If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul>
<p>4</p>	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p style="text-align: right;">2404B</p>	<p>Press the TEST key.</p>


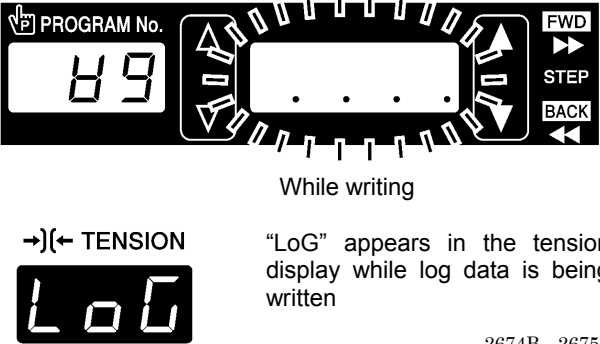



## 7-10. Reading sewing machine data

1		<p>Select the "r7" SD data read/write mode. (Refer to "7-3. Preparation for reading and writing data".)</p> <p>2669B</p>
2	 <p>While reading</p> <p>→)(← TENSION <b>MEM</b></p> <p>"MEM" appears in the tension display while memory switch settings are being read, the pattern number appears while additional pattern data is being read, and "PrG" appears while program data is being read</p> <p>2670B 2663B</p>	<p>Press the ENTER key.</p>  <p>2414B</p> <ul style="list-style-type: none"> <li>• The buzzer will sound and the sewing program data, cycle program data, memory switch settings and additional pattern data will be read from the SD card and stored in the sewing machine's memory.</li> <li>• If no program data or cycle program data exists, an error buzzer will sound.</li> </ul>
3		<p>When the display returns to the status in step 1, reading of the sewing machine data is complete.</p> <ul style="list-style-type: none"> <li>• If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul> <p>2669B</p>
4	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p>2404B</p>	<p>Press the TEST key.</p>

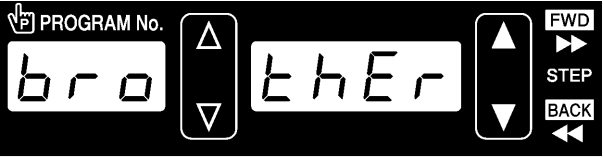





### 7-11. Writing sewing machine data to an SD card

<p>1</p>	 <p style="text-align: right;">2671B</p>	<p>Select the “w8” SD data read/write mode. (Refer to “7-3. Preparation for reading and writing data”.)</p>
<p>2</p>	 <p style="text-align: center;">While writing</p>  <p>→)({← TENSION</p> <p>“MEM” appears in the tension display while memory switch settings are being written, the pattern number appears while additional pattern data is being written, and “PrG” appears while program data is being written</p> <p style="text-align: right;">2672B 2663B</p>	<p>Press the ENTER key.</p>  <p style="text-align: right;">2414B</p> <ul style="list-style-type: none"> <li>• The buzzer will sound and the sewing program data, cycle program data, memory switch settings and additional pattern data will be read from the SD card and stored in the sewing machine's memory.</li> </ul>
<p>3</p>	 <p style="text-align: right;">2671B</p>	<p>When the display returns to the status in step 1, writing of the sewing machine data is complete.</p> <ul style="list-style-type: none"> <li>• If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul>
<p>4</p>	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p style="text-align: right;">2404B</p>	<p>Press the TEST key.</p>

### 7-12. Writing error log data and memory switch log data to an SD card

<p>1</p>	 <p style="text-align: right;">2673B</p>	<p>Select the “w9” SD data read/write mode. (Refer to “7-3. Preparation for reading and writing data”.)</p>
<p>2</p>	 <p style="text-align: center;">While writing</p> <p>→)(← TENSION <b>LoG</b></p> <p style="text-align: right;">2674B 2675B</p>	<p>Press the ENTER key.</p>  <p style="text-align: right;">2414B</p> <ul style="list-style-type: none"> <li>• The buzzer will sound and the error log data and memory switch log data will be copied to the SD card.</li> </ul>
<p>3</p>	 <p style="text-align: right;">2673B</p>	<p>When the display returns to the status in step 1, writing of the log data is complete.</p> <ul style="list-style-type: none"> <li>• If you would like to use any other read/write modes, press the <math>\Delta</math> or <math>\nabla</math> key to select the mode and then run it.</li> </ul>
<p>4</p>	<p><b>Ending read/write mode</b></p>  <p>TEST indicator switches off</p> <p style="text-align: right;">2404B</p>	<p>Press the TEST key.</p>

### 7-13. Updating the control program version

1	Place the control program that you would like to update into the folder of the SD card as specified in “7-2. Structure of a SD card folder”.												
2	With the power switch turned off, insert the SD card into the SD card slot. (Refer to step 1 in “7-3. Preparation for reading and writing data”.)												
3	<p>While holding down the RESET, TEST and ▲ keys, turn on the power switch.</p>   <p>2677B</p> <p>The same “bro”, “ther”, “-F” (may vary depending on specifications) and “430” (“438” as appear in the PROGRAM No. display, menu display, section No. display and tension display will appear. Keep holding down the keys until you hear a beep.</p>  <p>2676B</p>												
4	<p>“1.Mn” will appear in the PROGRAM No. display and “*.*.*” (control program version stored on the SD card) will appear in the menu display.</p> <p>2678B</p>												
5	<p>Press the ▲ or ▼ key to select the program to be updated.</p> <table border="1" data-bbox="837 1310 1444 1467"> <thead> <tr> <th>Control program</th> <th>PROGRAM No. display</th> <th>Menu display</th> </tr> </thead> <tbody> <tr> <td>Main</td> <td>[1.Mn]</td> <td>[*.*.*]</td> </tr> <tr> <td>Motor</td> <td>[2.Mt]</td> <td>[*.*]</td> </tr> <tr> <td>Panel</td> <td>[3.PL]</td> <td>[*.*]</td> </tr> </tbody> </table> <p>• If there is no program to be updated which is stored on the SD card, “----” will appear in the menu display.</p> <p>2679B</p>	Control program	PROGRAM No. display	Menu display	Main	[1.Mn]	[*.*.*]	Motor	[2.Mt]	[*.*]	Panel	[3.PL]	[*.*]
Control program	PROGRAM No. display	Menu display											
Main	[1.Mn]	[*.*.*]											
Motor	[2.Mt]	[*.*]											
Panel	[3.PL]	[*.*]											
6	<p>Press the ENTER key.</p>  <p>2414B</p> <p>• The buzzer will sound and updating of the program version will start. • When “End” appears in the menu display, updating is complete. • To continue updating another program, return to step 5 and select the next program to be updated.</p>  <p>→)(← TENSION</p>  <p>“WAIT” will appear in the menu display and the value in the tension display will increment while the program version is being updated.</p> <p>2680B 2681B</p>												
7	Turn off the power switch.												

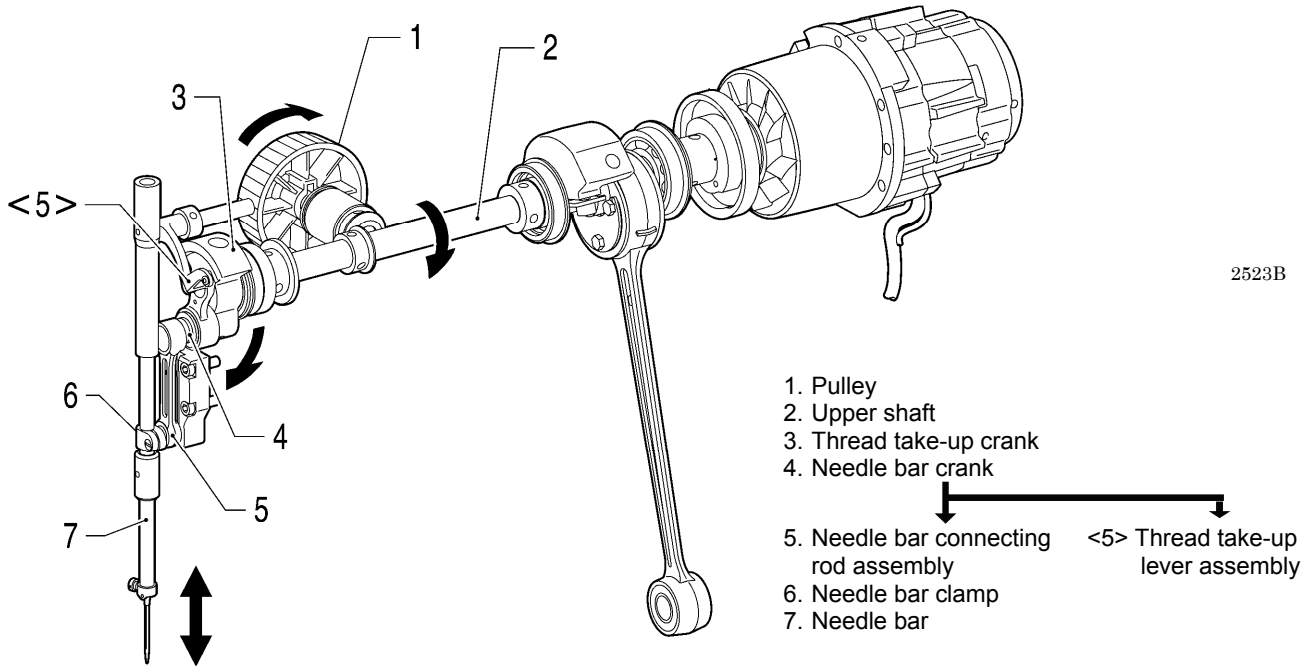


# 8. MECHANICAL DESCRIPTIONS

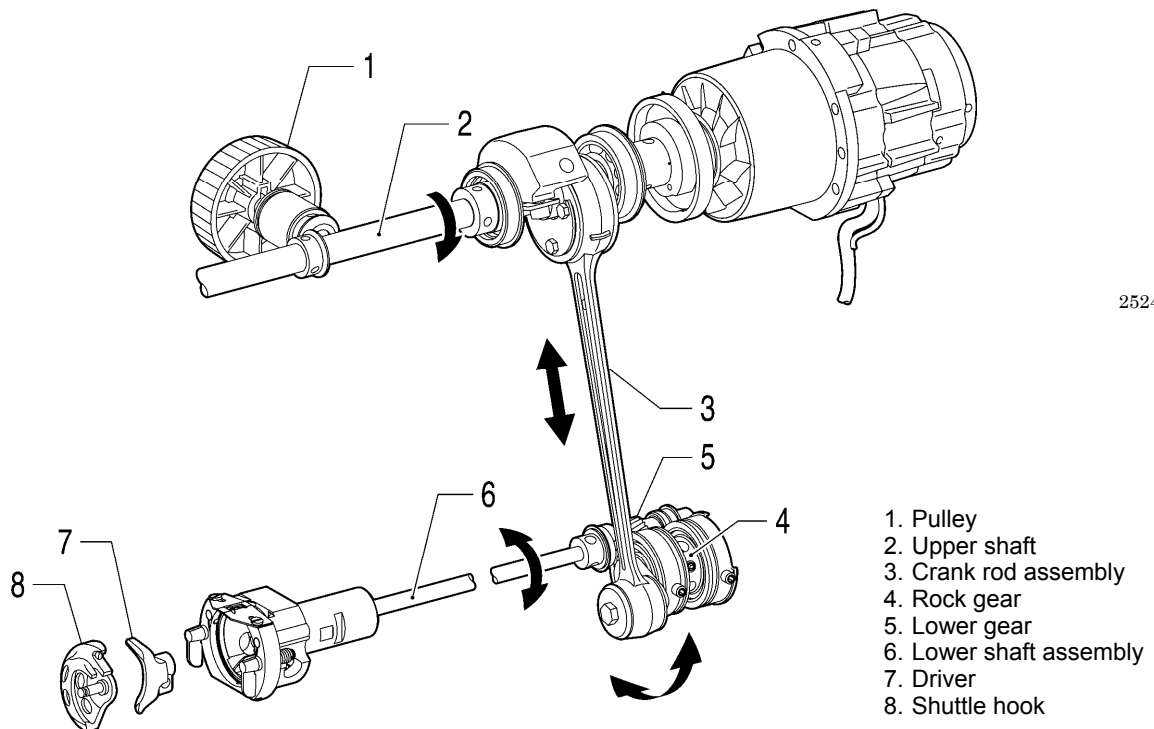
The mechanisms operate in the order of the numbers given in the illustrations.

\* <number> and [number] indicates the flow of each operations given.  
 \* (number) indicates part names only. (They do not represent the flow of operations.)

## 8-1. Needle bar and thread take-up mechanisms

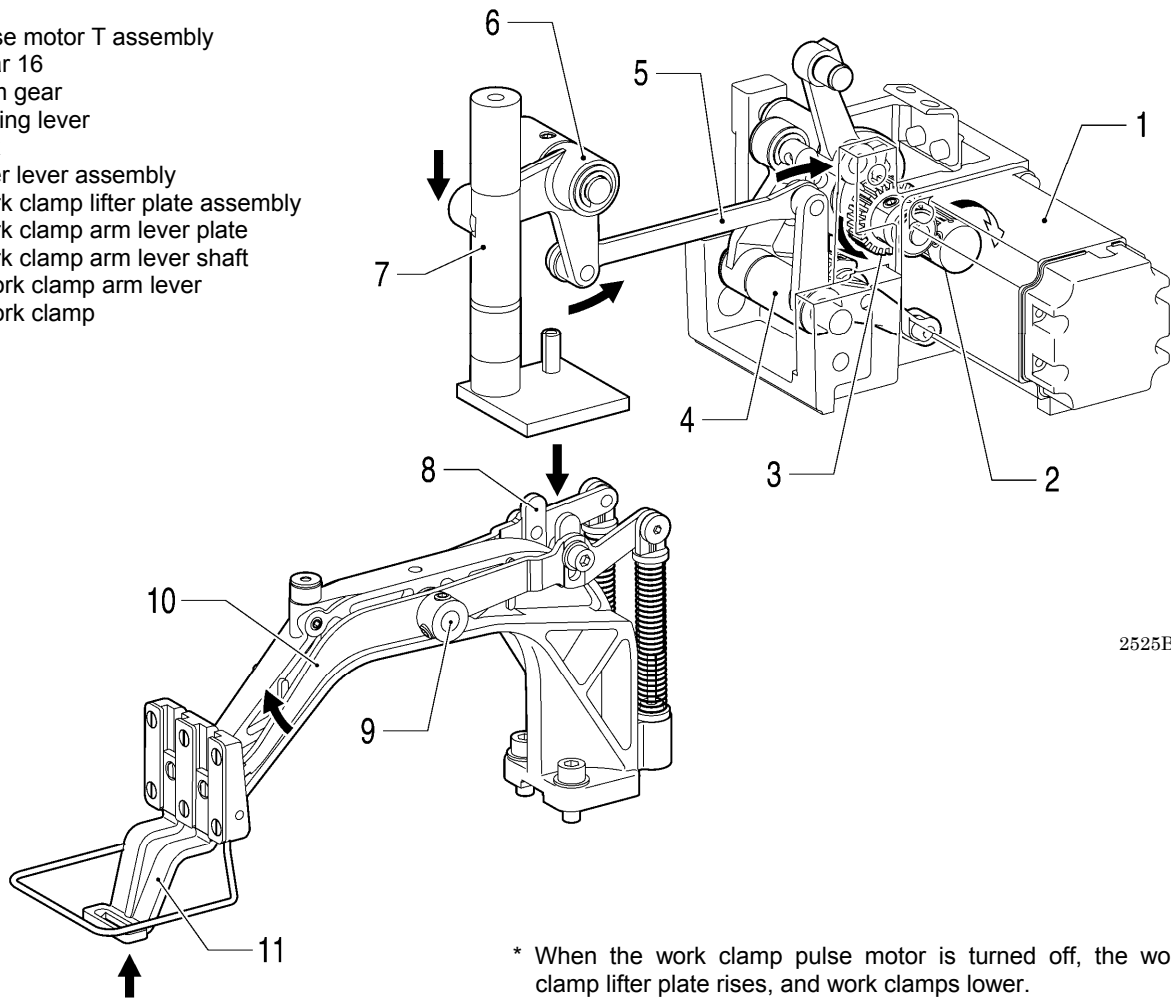


## 8-2. Lower shaft and shuttle race mechanisms



### 8-3. Work clamp lifter mechanism

1. Pulse motor T assembly
2. Gear 16
3. Cam gear
4. Driving lever
5. Link
6. Lifter lever assembly
7. Work clamp lifter plate assembly
8. Work clamp arm lever plate
9. Work clamp arm lever shaft
10. Work clamp arm lever
11. Work clamp

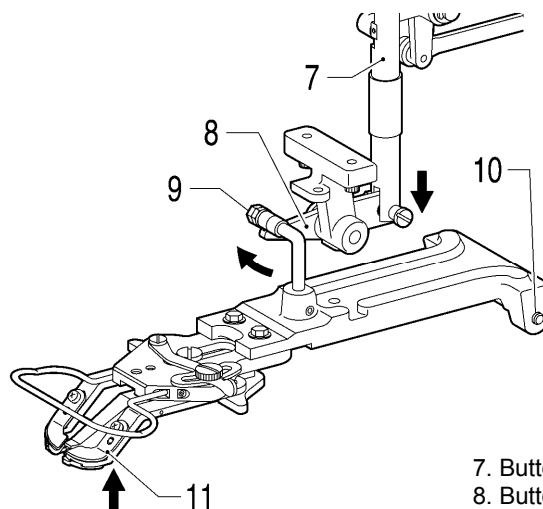


2525B

\* When the work clamp pulse motor is turned off, the work clamp lifter plate rises, and work clamps lower.

BE-438F

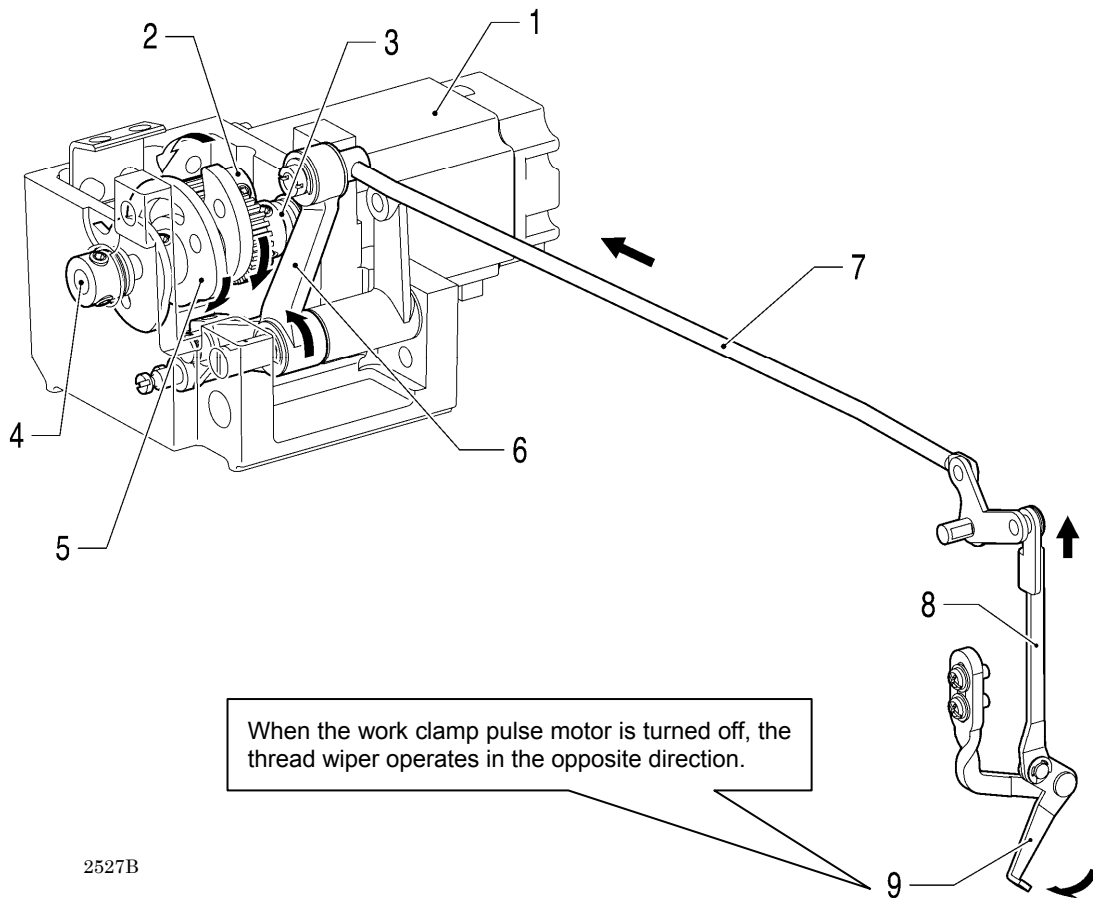
2526B



7. Button clamp rod
8. Button clamp lever
9. Button clamp holder hook assembly
10. Button clamp holder shaft
11. Button clamp

\* When the work clamp pulse motor is turned off, the button clamp rod rises, and button clamps lower.

## 8-4. Thread wiper mechanism



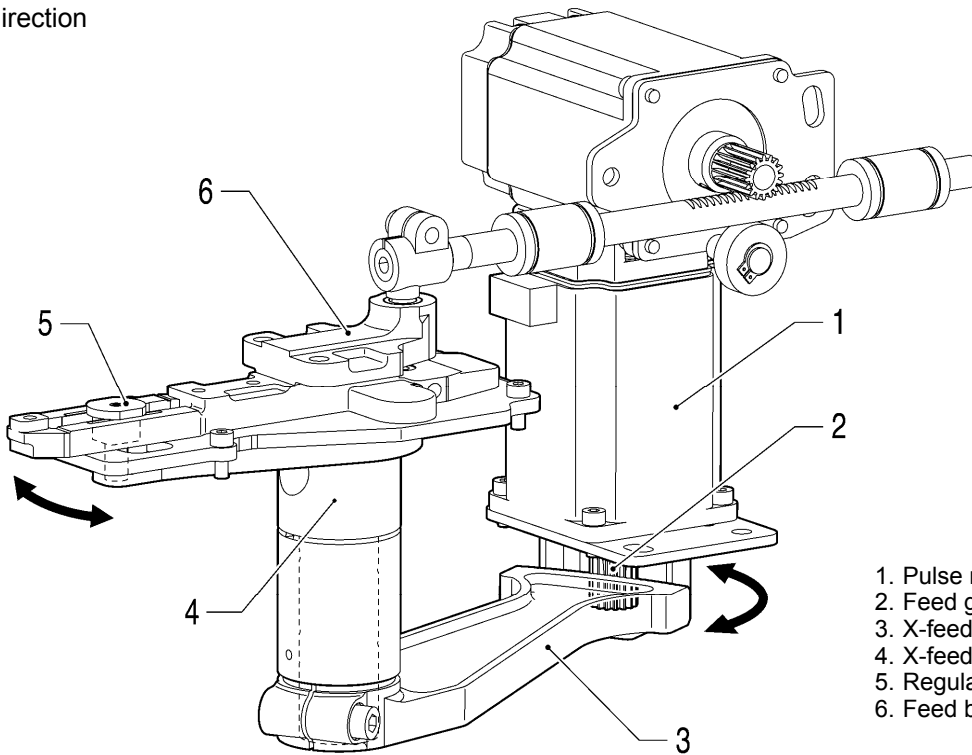
2527B

1. Pulse motor T assembly
2. Gear 16
3. Cam gear
4. Cam shaft
5. Thread wiper cam
6. Thread wiper driving lever
7. Thread wiper rod assembly
8. Connecting plate
9. Thread wiper arm assembly

### 8-5. Feed mechanism

Sewing patterns are created through combinations of X and Y movements.

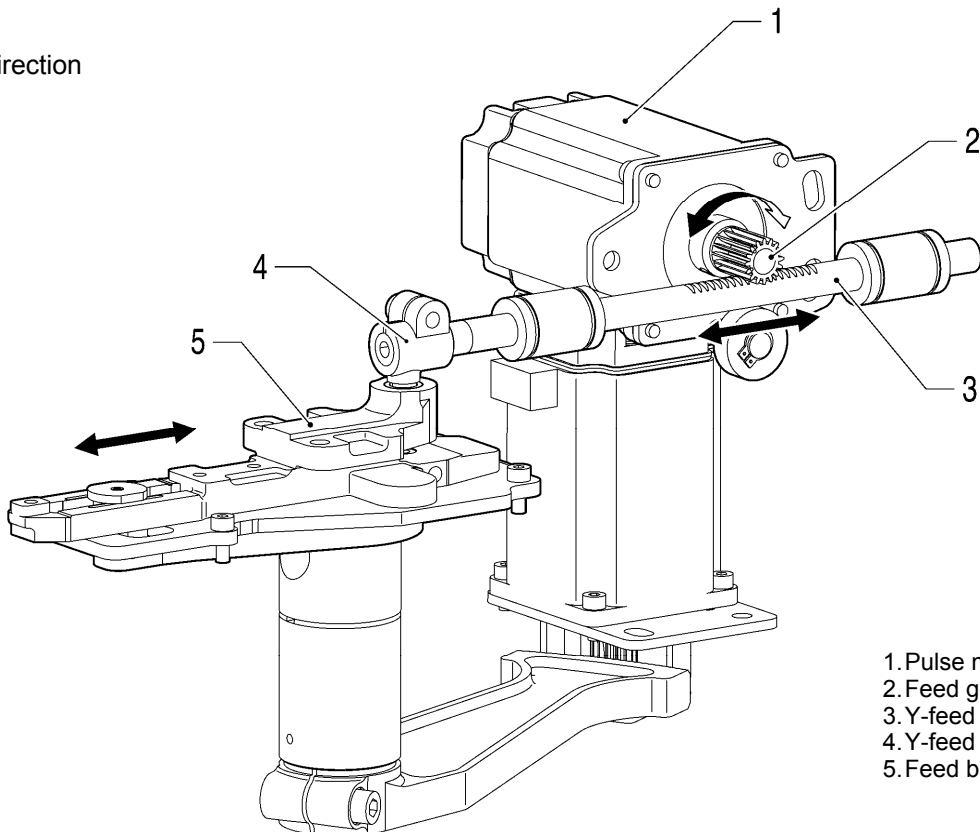
X direction



2528B

- 1. Pulse motor X assembly
- 2. Feed gear
- 3. X-feed gear
- 4. X-feed lever
- 5. Regulator block assembly
- 6. Feed bracket sub assembly

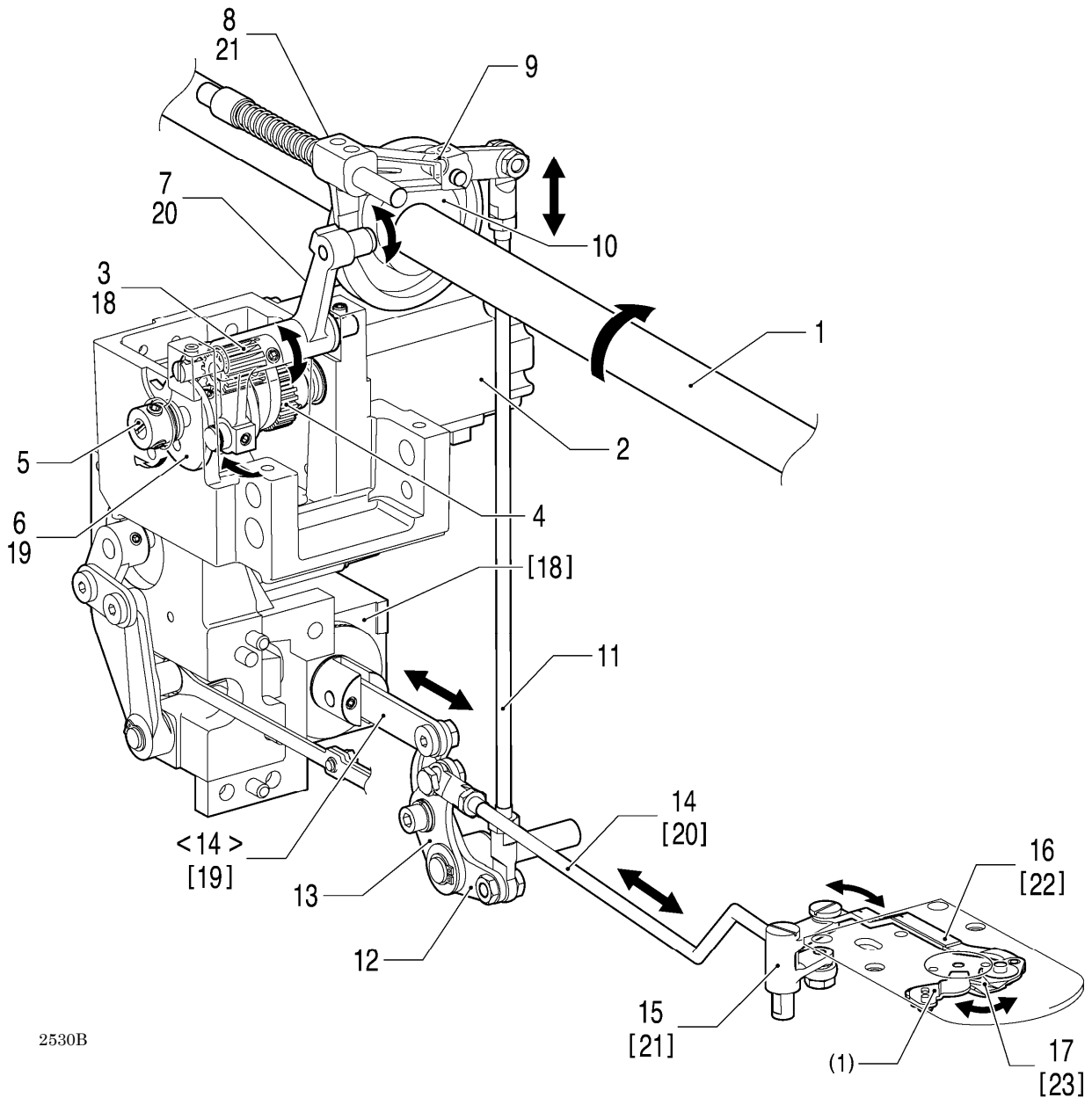
Y direction



2529B

- 1. Pulse motor Y assembly
- 2. Feed gear
- 3. Y-feed rack shaft
- 4. Y-feed rack shaft clamp
- 5. Feed bracket sub assembly

### 8-6. Thread trimmer mechanism

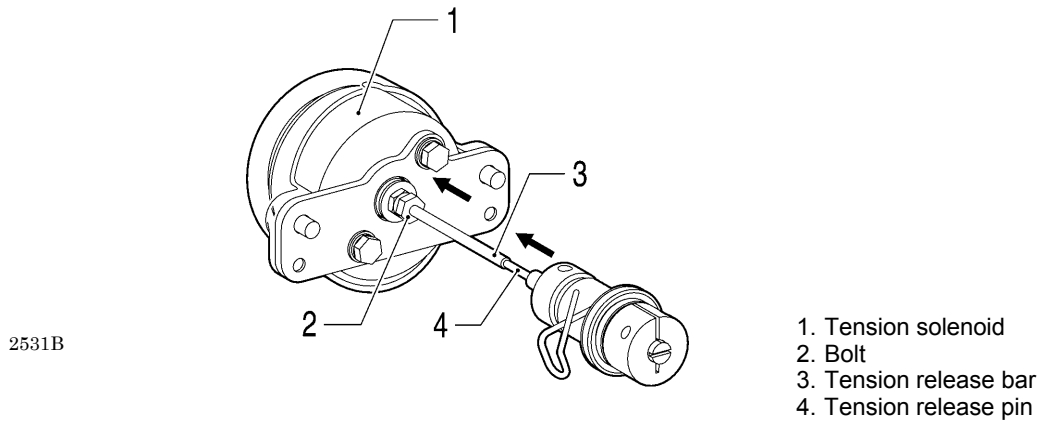


2530B

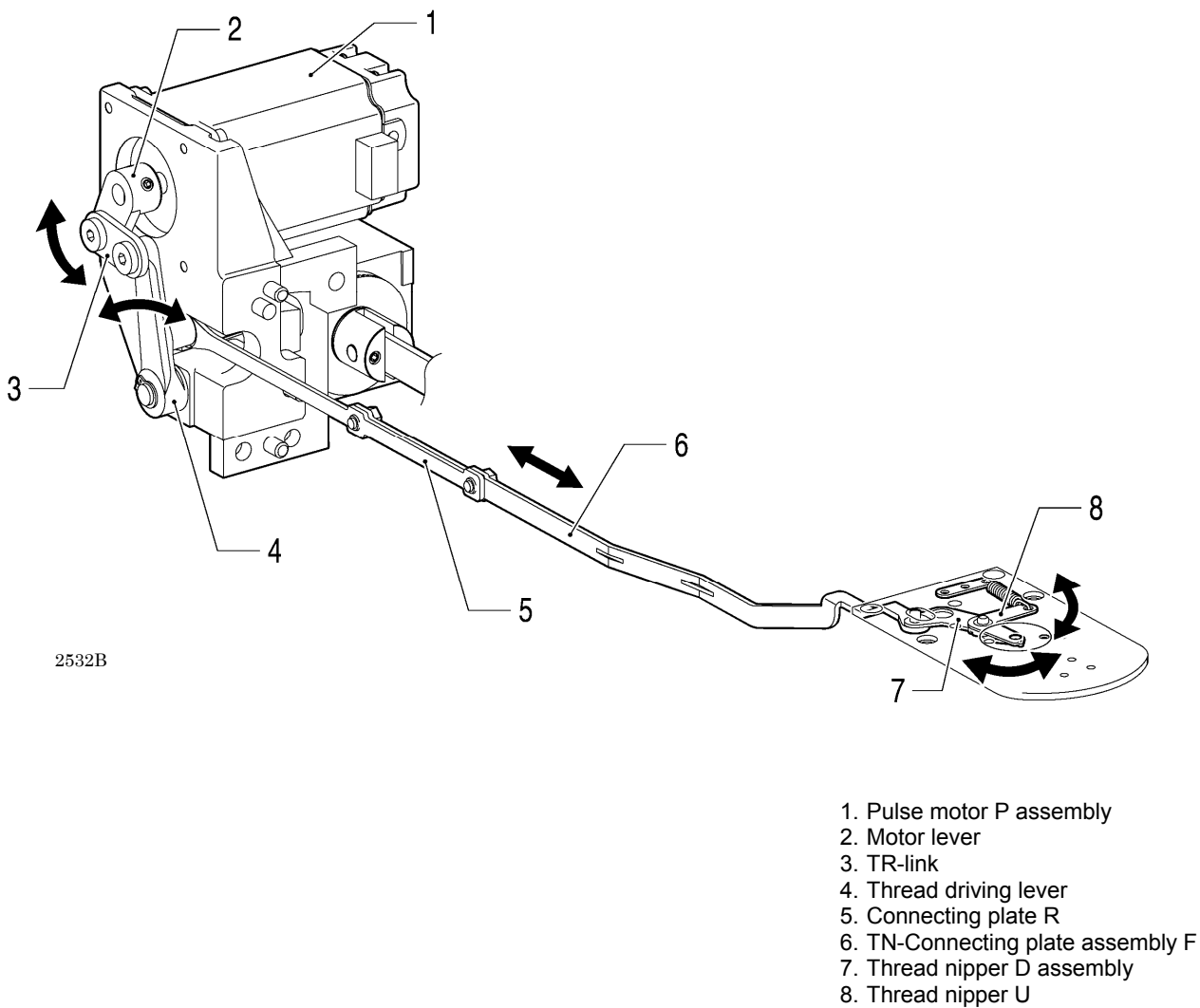
- 1. Upper shaft
- 2. Pulse motor T assembly
- 3. Gear 16
- 4. Cam gear
- 5. Cam shaft
- 6. Thread trimmer driving cam
- 7. Cam lever thread trimmer
- 8. Thread driving lever
- 9. Thread trimmer collar
- 10. Thread trimmer cam
- 11. Thread trimmer rod V assembly
- 12. Thread trimmer lever V

- 13. Thread trimmer lever H
  - 14. Thread trimmer rod H assembly
  - 15. Movable knife lever
  - 16. Movable knife connecting plate
  - 17. Movable knife
- <Pulse motor ON>
- 18. Gear
  - 19. Thread trimmer driving cam
  - 20. Cam lever thread trimmer
  - 21. Thread trimmer collar
- <Thread trimmer solenoid ON>
- [18] Thread trimmer solenoid assembly
  - [19] Thread trimmer link
  - [20] Thread trimmer rod H assembly
  - [21] Movable knife lever
  - [22] Movable knife connecting plate
  - [23] Movable knife
- <14> Thread trimmer link (1) Fixed knife

8-7. Tension release mechanism



8-8. Thread nipper mechanism (KE-430F -03, -0F, -0K specifications only)



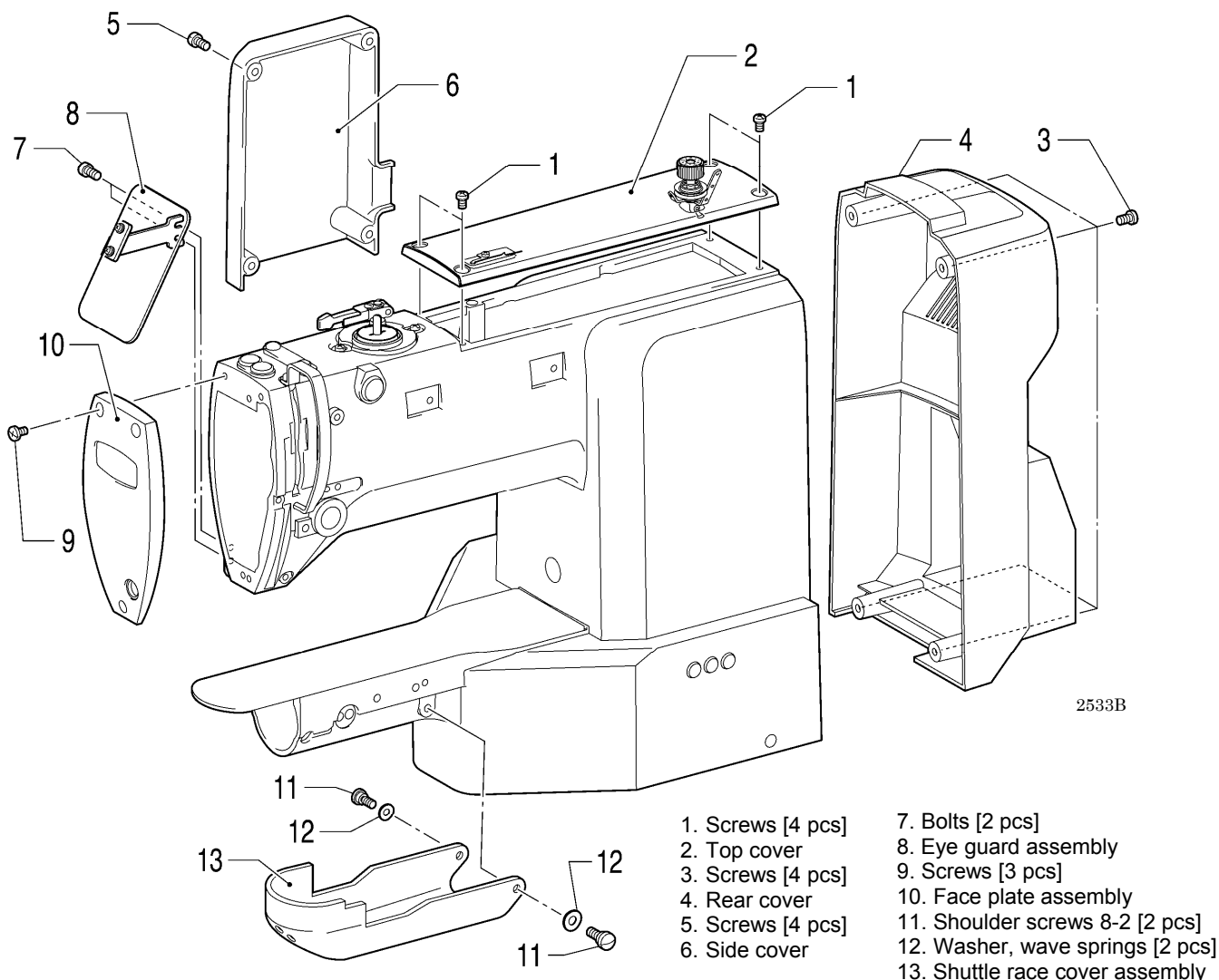
## 9. DISASSEMBLY

### ⚠ CAUTION

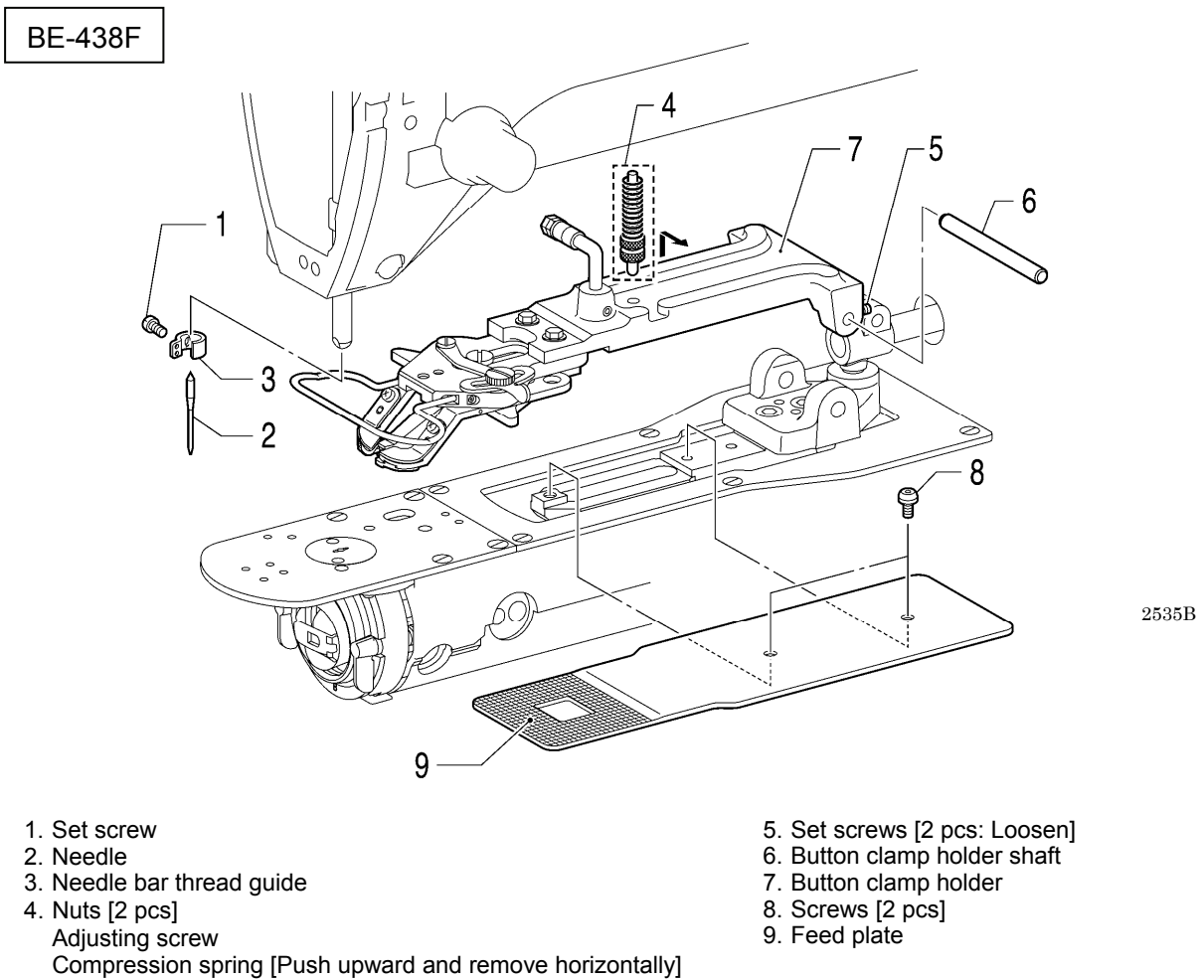
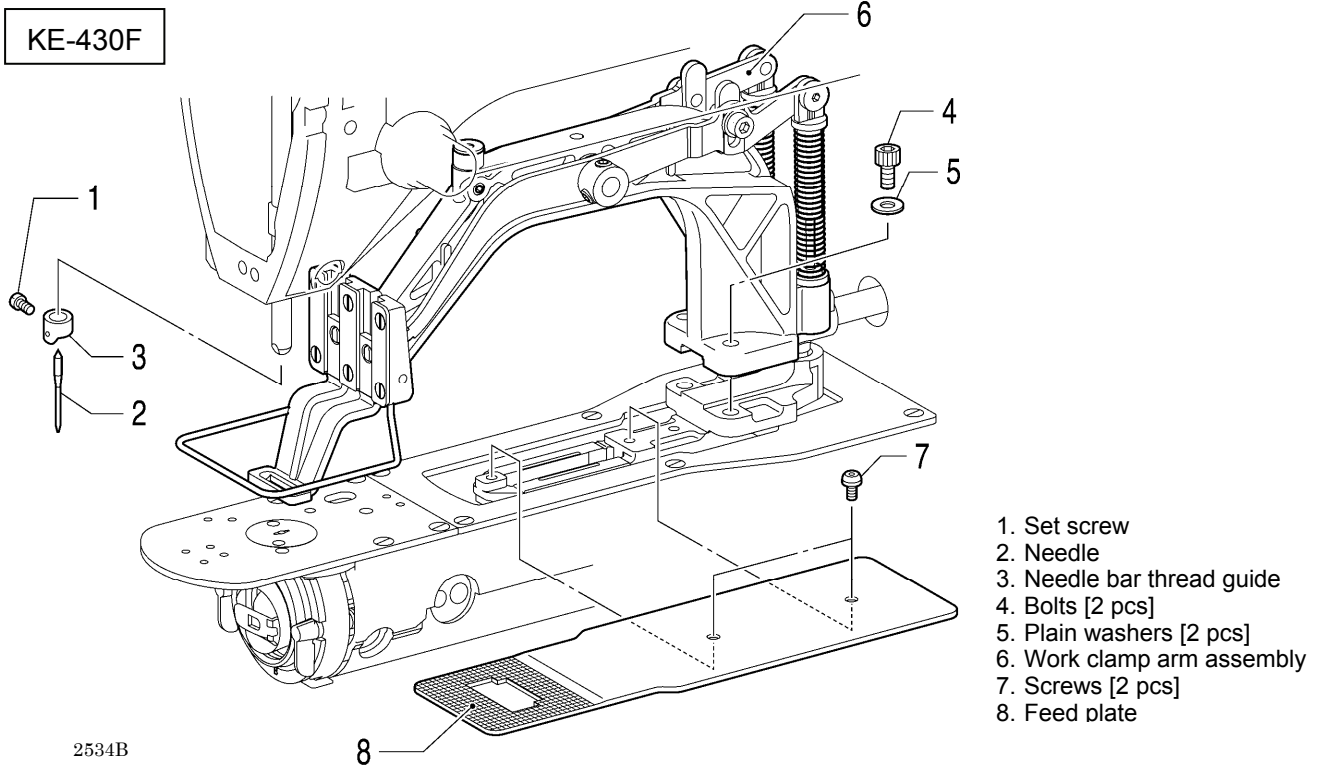
- ⊘
 Disassembly should only be carried out by a qualified technician.
- ⚠
 Turn off the power switch before disassembly, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.
- ⊘
 Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhea. Keep the oil out of the reach of children.
- !
 When replacing parts and installing optional accessories, be sure to use only genuine Brother parts. Brother will not be held responsible for any accidents or problems resulting from the use of non-genuine parts.
- !
 If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.
- ⊘
 To prevent accidents and problems, do not modify the machine yourself. Brother will not be held responsible for any accidents or problems resulting from modifications made to the machine.

Disassemble each part in order of the numbers.

### 9-1. Covers

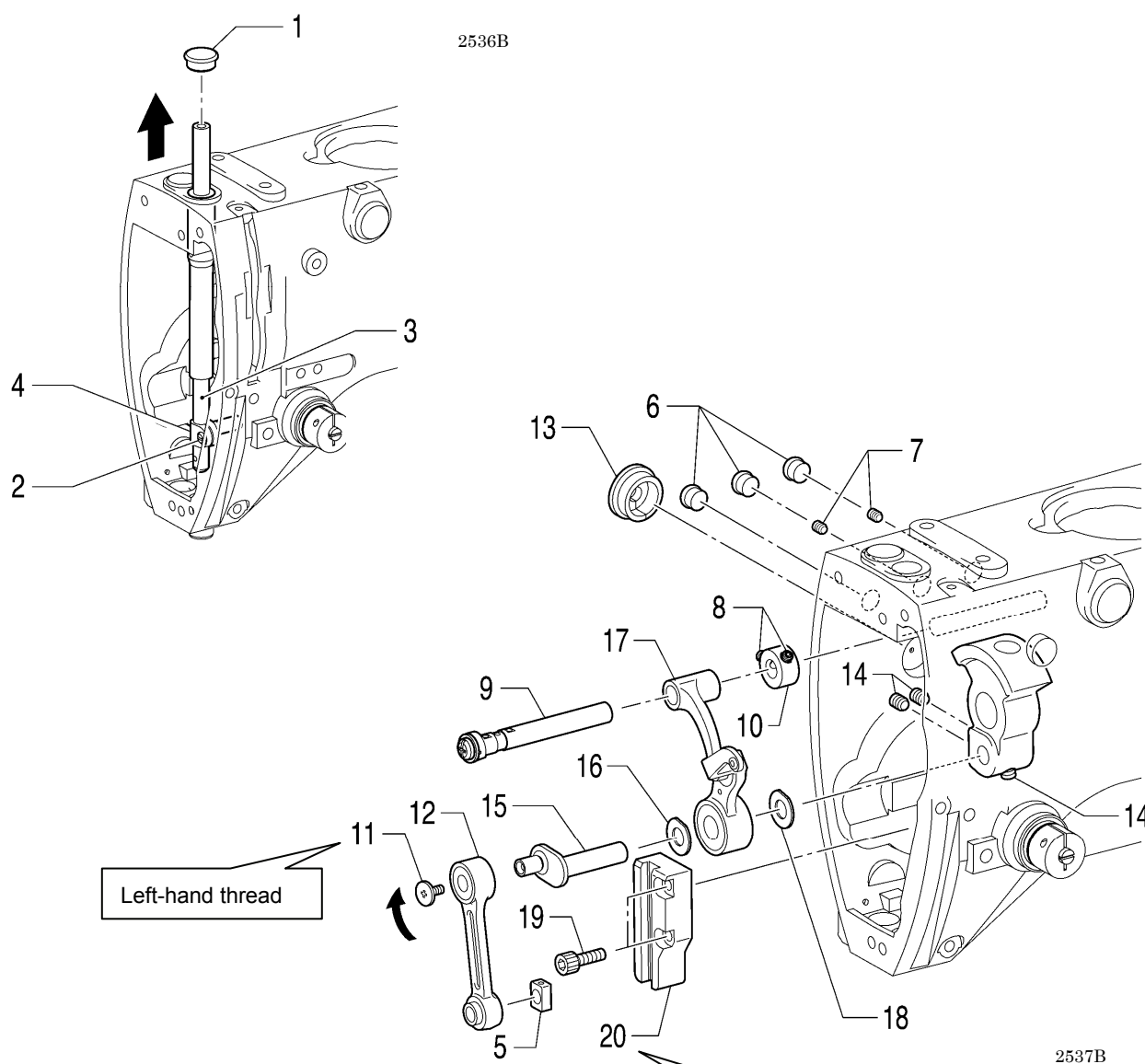


## 9-2. Work clamp arm mechanism



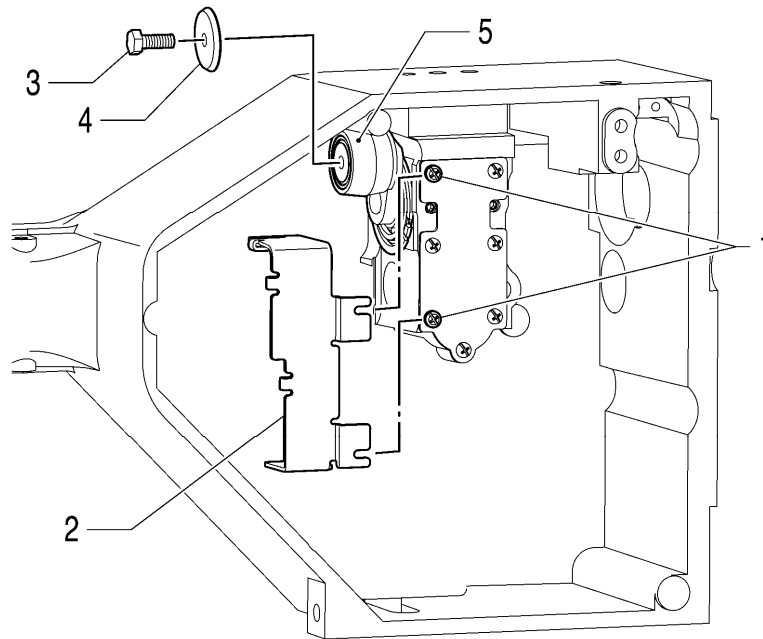


## 9-3. Needle bar mechanism



- |                               |  |
|-------------------------------|--|
| 1. Rubber cap                 | 11. Screw [Loosen]                     |
| 2. Screw                      | 12. Needle bar connecting rod assembly |
| 3. Needle bar [Pull out]      | 13. Rubber cap                         |
| 4. Needle bar clamp           | 14. Set screws [3 pcs: Loosen]         |
| 5. Slide block                | 15. Needle bar crank                   |
| 6. Rubber caps [3 pcs]        | 16. Washer                             |
| 7. Set screws [2 pcs: Loosen] | 17. Thread take-up lever assembly      |
| 8. Set screws [2 pcs: Loosen] | 18. Washer                             |
| 9. Thread take-up support     | 19. Bolts [2 pcs]                      |
| 10. Set screw collar          | 20. Slide block guide                  |

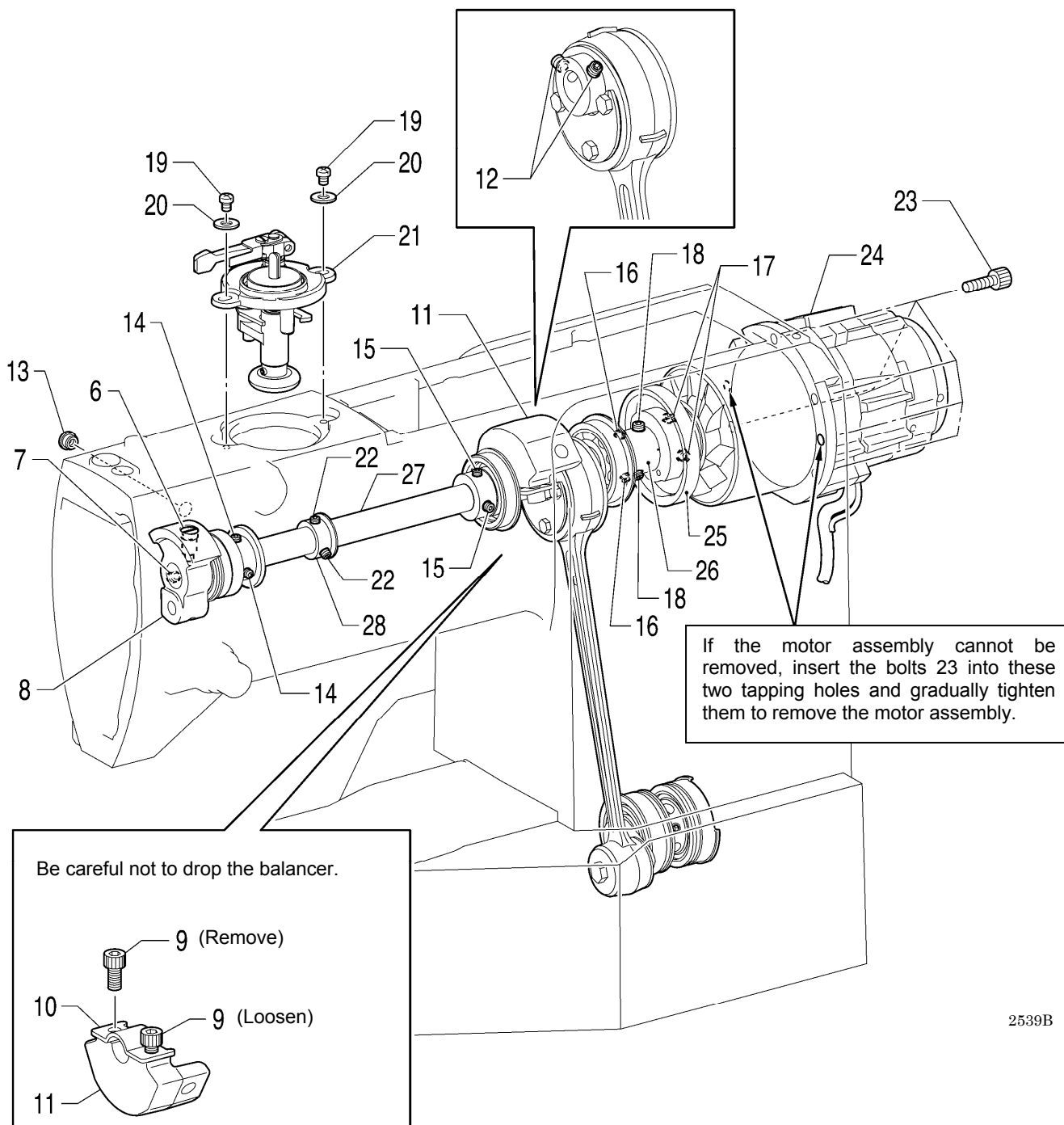
### 9-4. Upper shaft mechanism



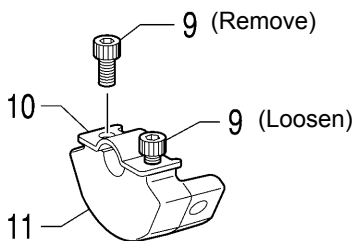
2538B

- 1. Screws [2 pcs]
- 2. Grease support F
- 3. Bolt
- 4. Crank rod washer
- 5. Crank rod base

(Continued on next page.)



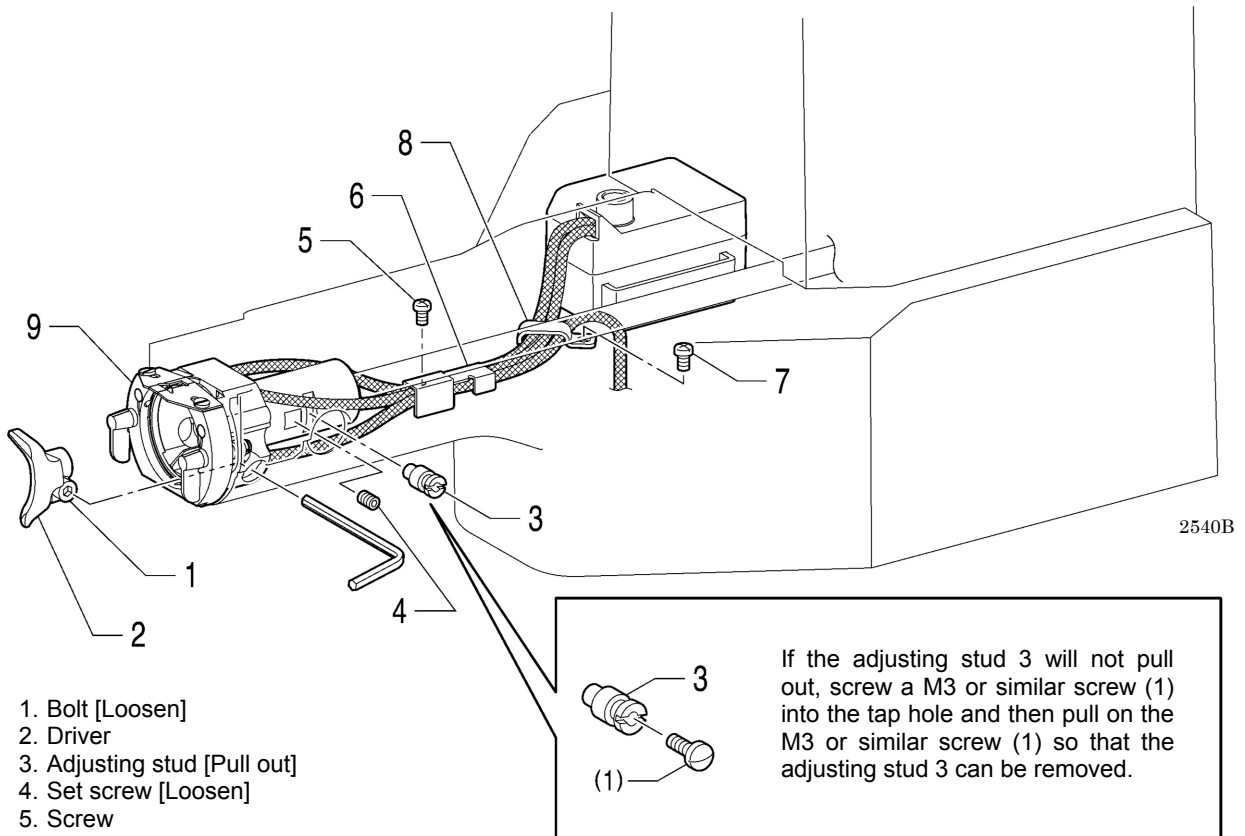
Be careful not to drop the balancer.



- |   |                                |
|---|--------------------------------|
| 6. Screw                                      | 17. Set screws [2 pcs: Loosen] |
| 7. Set screw [Loosen]                         | 18. Set screws [2 pcs: Loosen] |
| 8. Thread take-up crank                       | 19. Screws [2 pcs]             |
| 9. Bolts [2 pcs]<br>(Remove one, loosen one.) | 20. Plain washers [2 pcs]      |
| 10. Balancer plate                            | 21. Bobbin winder unit         |
| 11. Balancer                                  | 22. Set screws [2 pcs: Loosen] |
| 12. Set screws [2 pcs: Loosen]                | 23. Bolts [4 pcs]              |
| 13. Rubber cap                                | 24. Motor assembly             |
| 14. Set screws [2 pcs: Loosen]                | 25. Thread trimmer cam         |
| 15. Set screws [2 pcs: Loosen]                | 26. Joint assembly             |
| 16. Set screws [2 pcs: Loosen]                | 27. Upper shaft                |
|   | 28. Pulley gear R              |

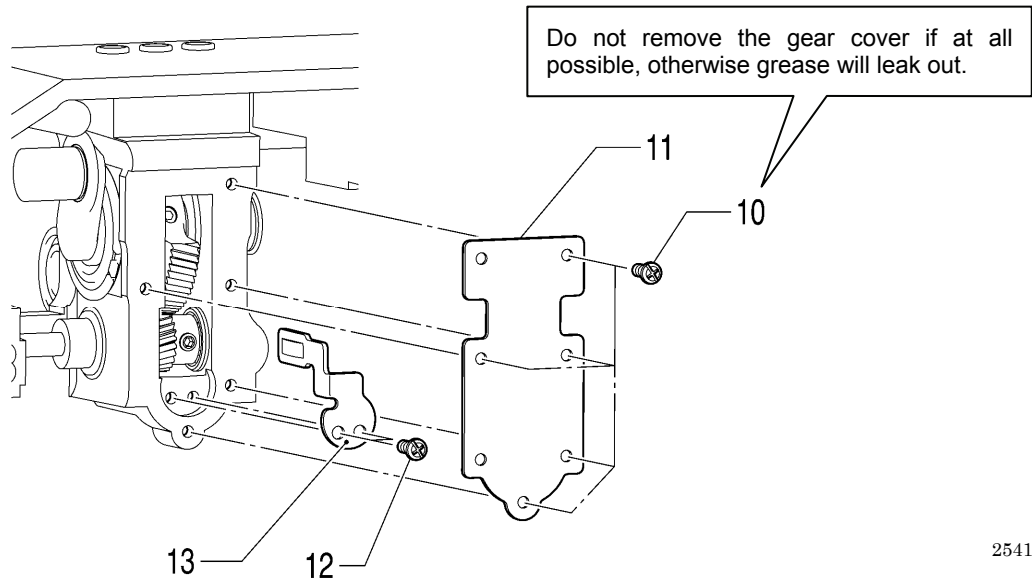
2539B

### 9-5. Lower shaft mechanism



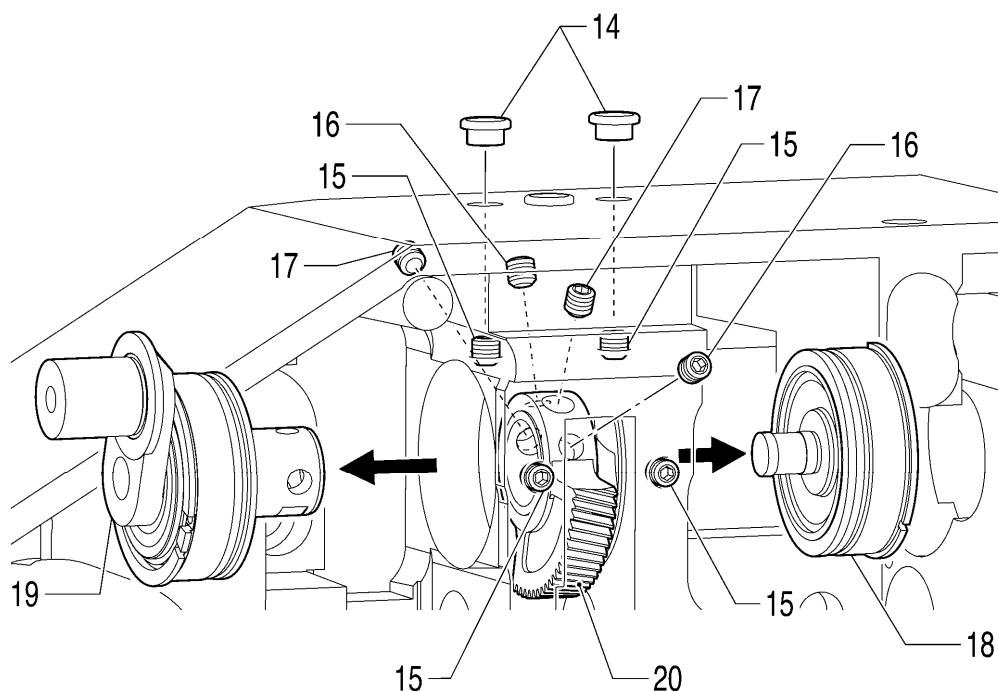
- 1. Bolt [Loosen]
- 2. Driver
- 3. Adjusting stud [Pull out]
- 4. Set screw [Loosen]
- 5. Screw
- 6. Oil tube support
- 7. Screw
- 8. Cord holder U3
- 9. Shuttle race base assembly

If the adjusting stud 3 will not pull out, screw a M3 or similar screw (1) into the tap hole and then pull on the M3 or similar screw (1) so that the adjusting stud 3 can be removed.



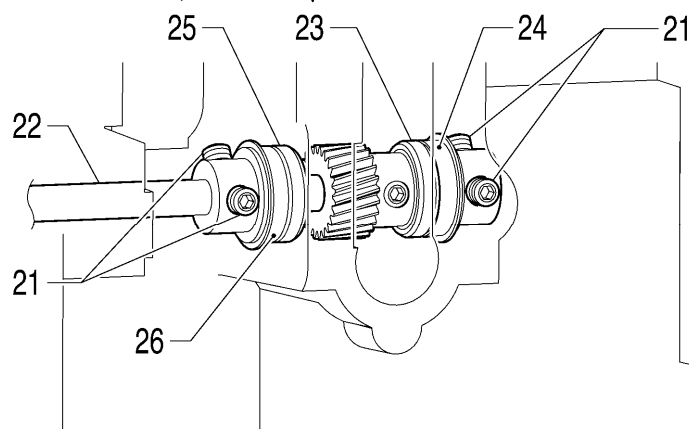
- 10. Screws [5 pcs]
- 11. Gear cover
- 12. Screws [2 pcs]
- 13. Positioning plate

(Continued on next page.)



2547B

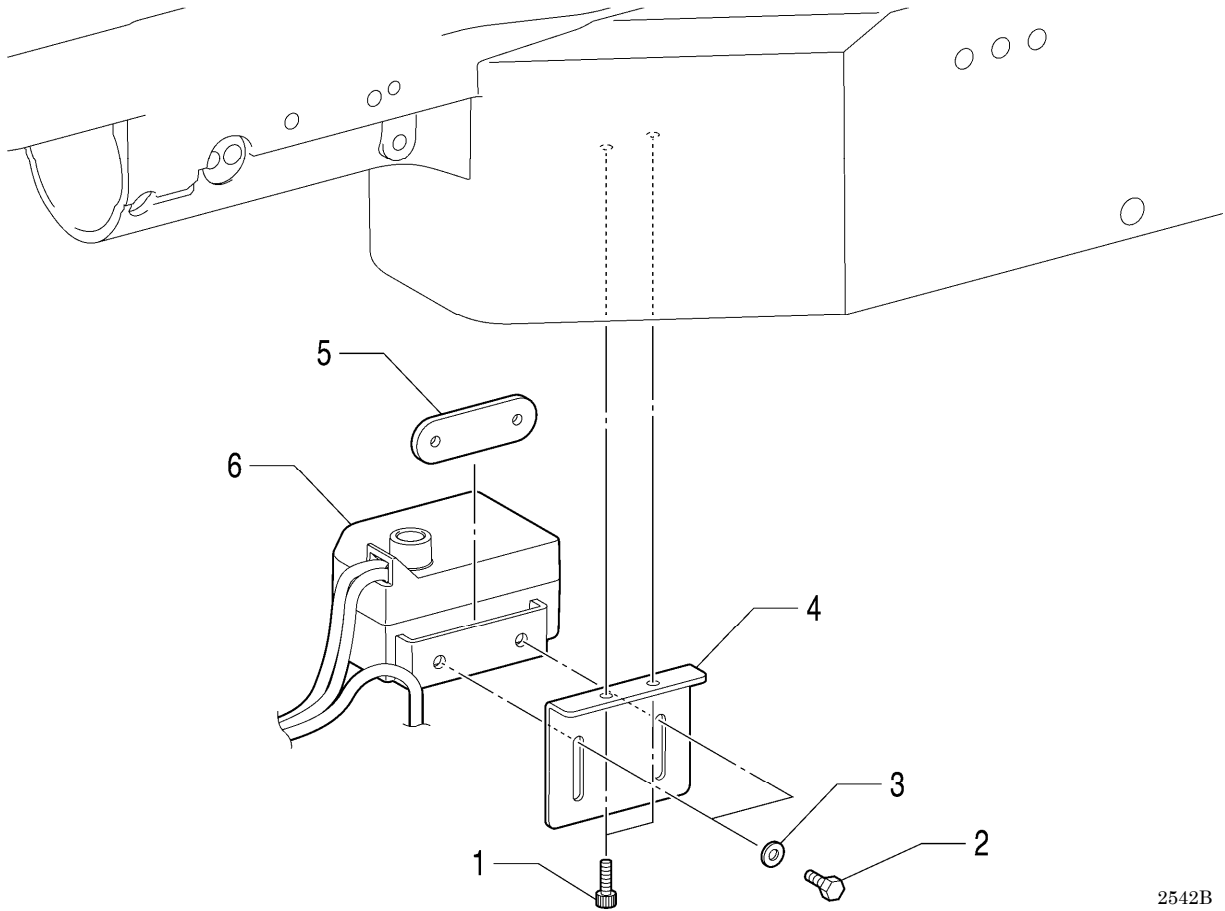
The rubber seal and the oil seal cannot be reused, so have new parts ready for use.



2549B

- |   |  |
|---|--|
| 14. Rubber caps [2 pcs]                     | 22. Lower shaft assembly   |
| 15. Set screws [4 pcs: Loosen]              | 23. Rubber seal L  |
| 16. Set screws [2 pcs]                      | 24. Bearing bush assembly<br>(Tap out the rubber seal L 23 and the bearing bush together toward the rear.) |
| 17. Set screws [2 pcs]                      | 25. Oil seal   |
| 18. Rock gear shaft R [Pull backward]       | 26. Bearing bush assembly<br>(Tap out the oil seal 25 and the bearing bush together toward the front.)     |
| 19. Rock gear shaft assembly [Pull forward] |  |
| 20. Rock gear                               |  |
| 21. Set screws [4 pcs: Loosen]              |  |

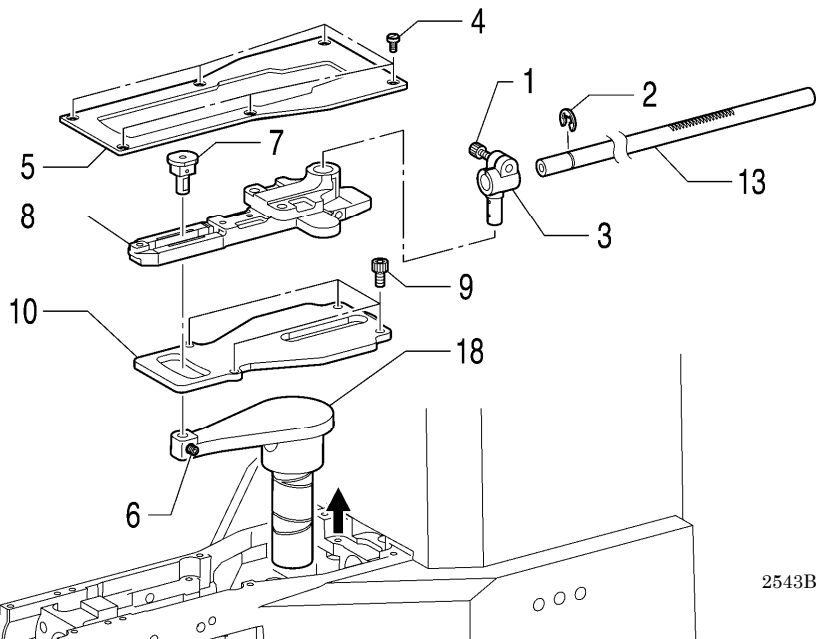
## 9-6. Lubrication



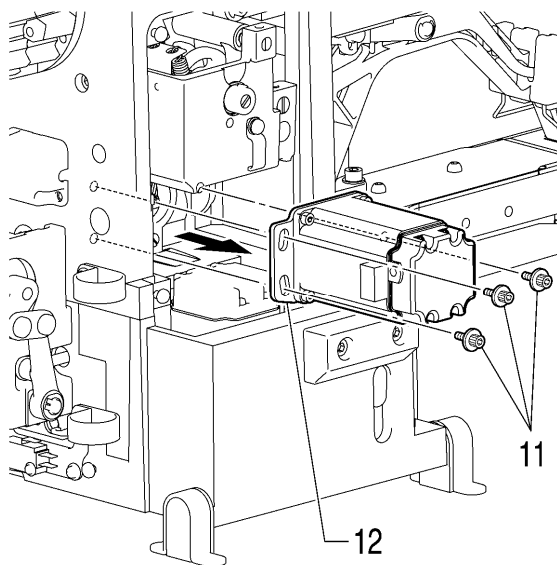
2542B

- 1. Bolts [2 pcs]
- 2. Bolts [2 pcs]
- 3. Plain washers [2 pcs]
- 4. Oil tank plate
- 5. Oil tank nut
- 6. Oil tank assembly

### 9-7. Feed mechanism

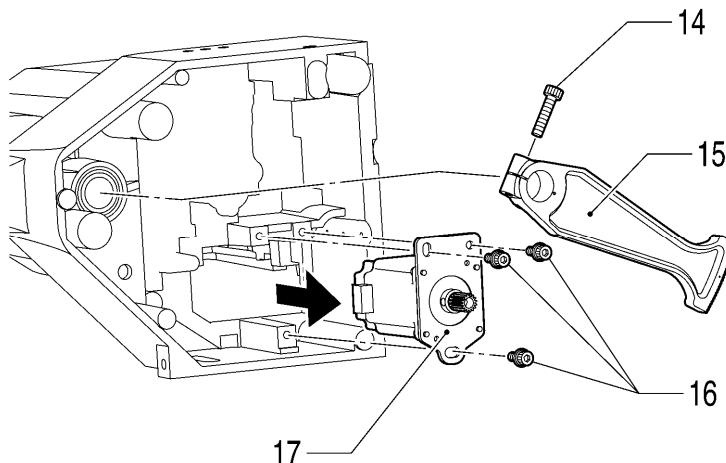


2543B



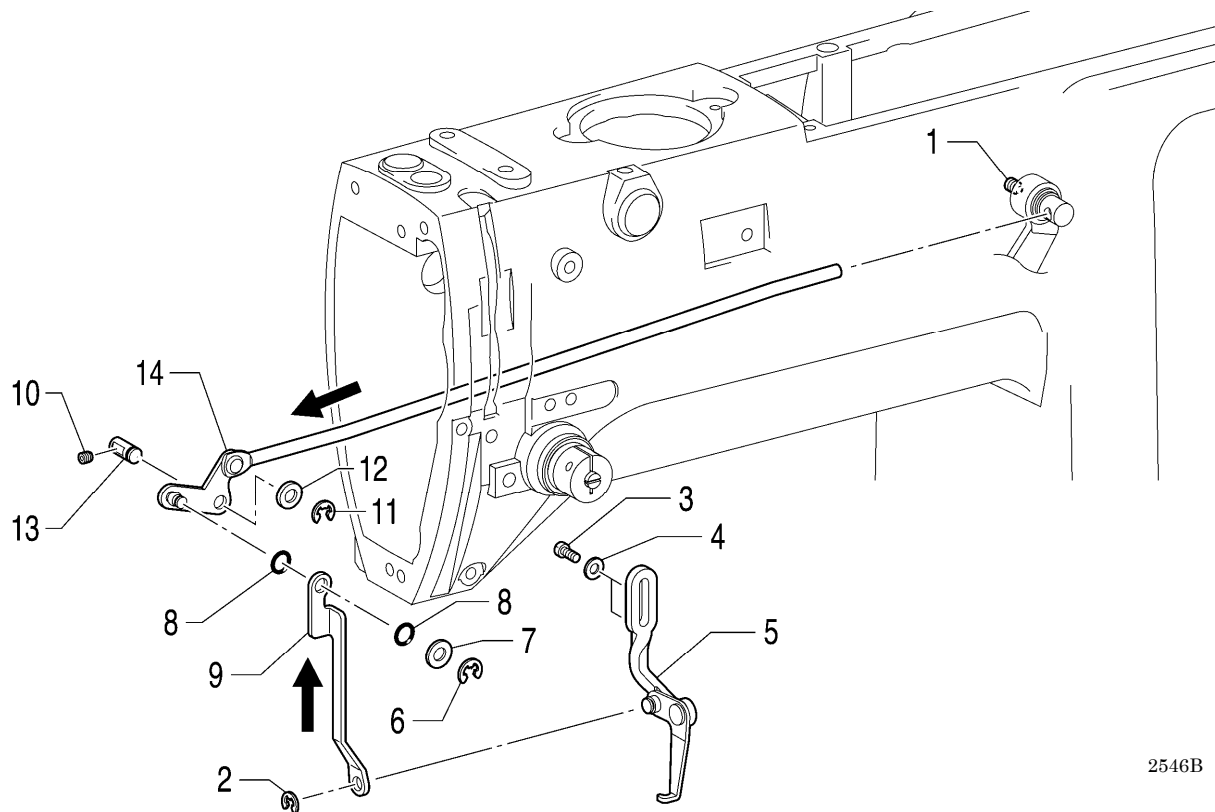
2544B

- 1. Set screw [Loosen]
- 2. Retaining ring, E
- 3. Y-feed rack shaft cramp [Pull upward]
- 4. Screws [6 pcs]
- 5. Feed bracket cover
- 6. Set screw [Loosen]
- 7. Regulator block assembly
- 8. Feed bracket sub assembly
- 9. Bolts [4 pcs]
- 10. Feed bracket support plate
- 11. Bolt sockets (S/P washers) [3 pcs]
- 12. Y-motor setting plate [Pulse motor Y assembly]
- 13. Y-feed rack shaft
- 14. Bolt
- 15. X-feed gear
- 16. Bolt sockets (S/P washers) [3 pcs]
- 17. X-motor setting plate [Pulse motor X assembly]
- 18. X-feed lever [Pull upward]



2545B

## 9-8. Thread wiper mechanism

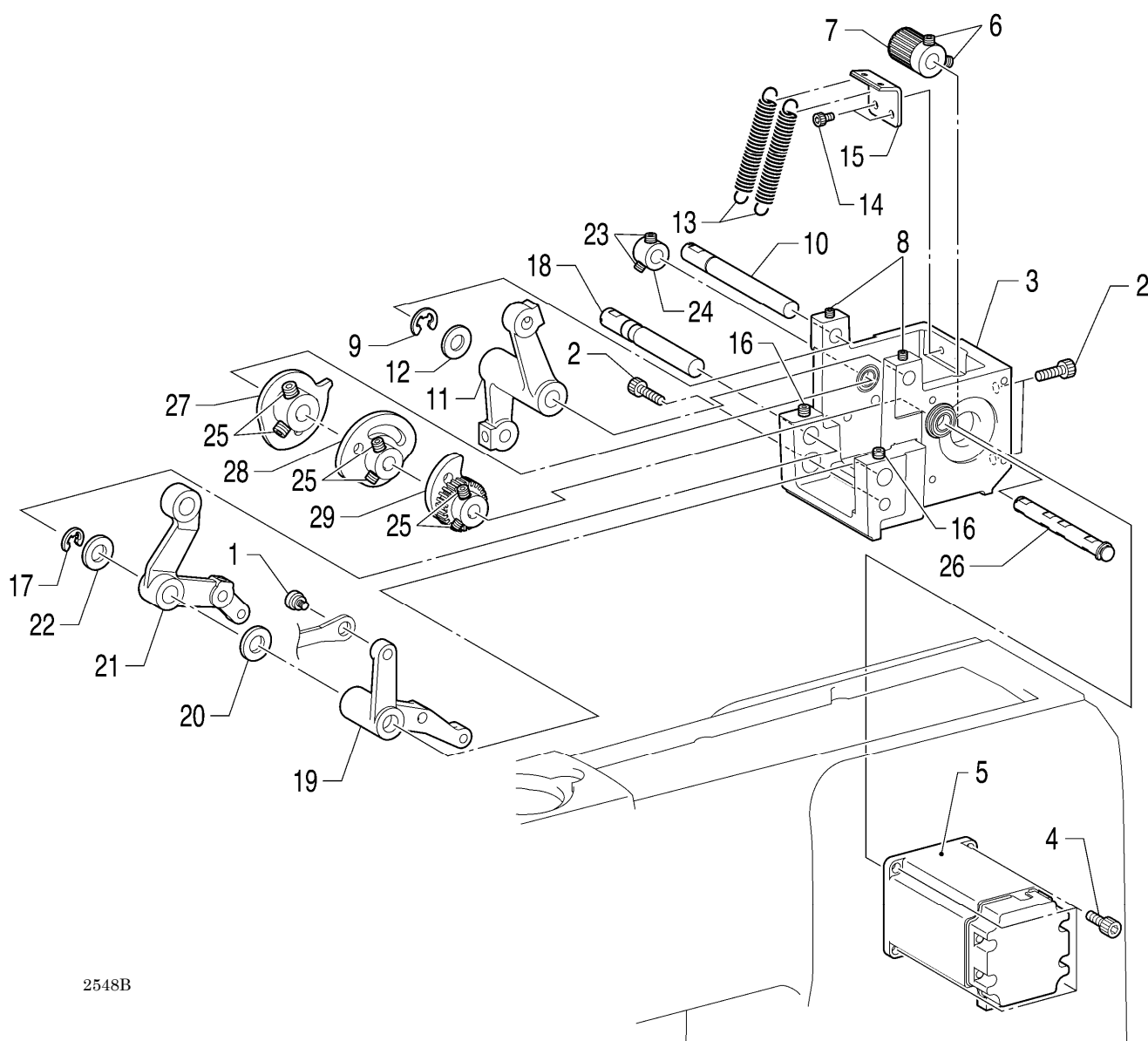


2546B

1. Set screw [Loosen]
2. Retaining ring, E
3. Screws [2 pcs]
4. Plain washers [2 pcs]
5. Thread wiper arm assembly
6. Retaining ring, E
7. Plain washer
8. O rings [2 pcs]
9. Connecting plate [Pull upward]
10. Set screw [Loosen]
11. Retaining ring, E
12. Plain washer
13. Wiper shaft
14. Thread wiper rod assembly [Pull forward]



## 9-9. Work clamp lifter mechanism

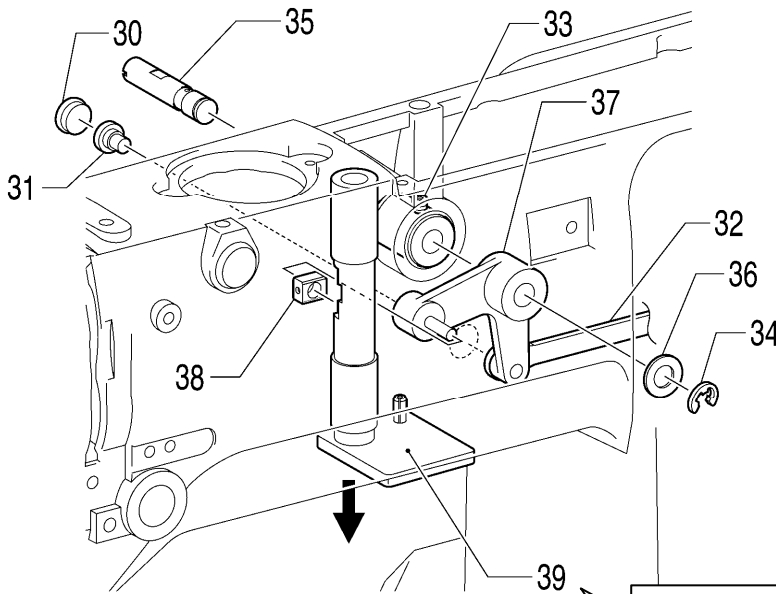


2548B

- |                                  |                                |                                |
|----------------------------------|--------------------------------|--------------------------------|
| 1. Link shoulder screw           | 11. Cam lever thread trimmer   | 21. Thread wiper driving lever |
| 2. Bolts [3 pcs]                 | 12. Plain washer               | 22. Plain washer               |
| 3. Motor bracket assembly        | 13. Springs [2 pcs]            | 23. Set screws [2 pcs: Loosen] |
| 4. Bolts [4 pcs]                 | 14. Bolts [2 pcs]              | 24. Set screw collar           |
| 5. Pulse motor T assembly        | 15. Spring hook                | 25. Set screws [6 pcs: Loosen] |
| 6. Set screws [2 pcs: Loosen]    | 16. Set screws [2 pcs: Loosen] | 26. Cam shaft                  |
| 7. Gear 16                       | 17. Retaining ring, E          | 27. Cam gear                   |
| 8. Set screws [2 pcs: Loosen]    | 18. Lever shaft                | 28. Thread wiper cam           |
| 9. Retaining ring, E             | 19. Drive lever w-clamp lifter | 29. Thread trimmer driving cam |
| 10. Driving thread trimmer shaft | 20. Plain washer               |                                |

(Continued on next page.)

KE-430F

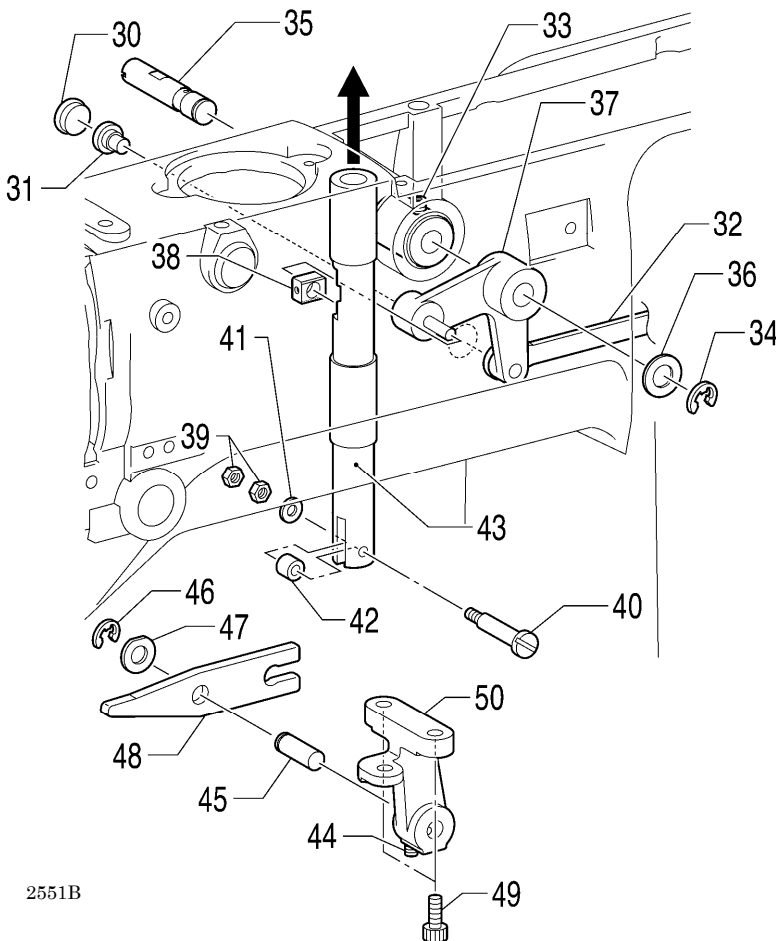


- 30. Rubber cap
- 31. Link shoulder screw
- 32. Link
- 33. Set screw [Loosen]
- 34. Retaining ring, E
- 35. Lever shaft
- 36. Plain washer
- 37. Lifter lever assembly
- 38. Needle bar guide slide block
- 39. Work clamp lifter plate assembly

2550B

**NOTE:**  
Hold the work clamp lifter plate when removing the lifter lever assembly 37, otherwise the work clamp lifter plate assembly may fall down.

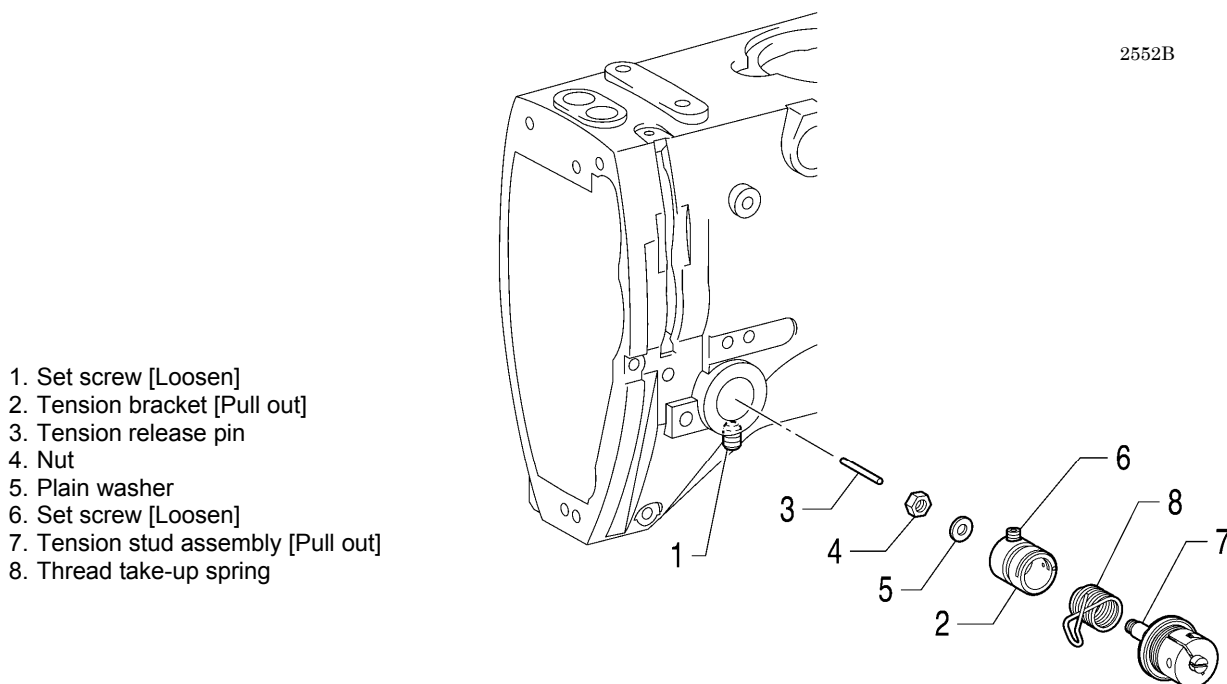
BE-438F



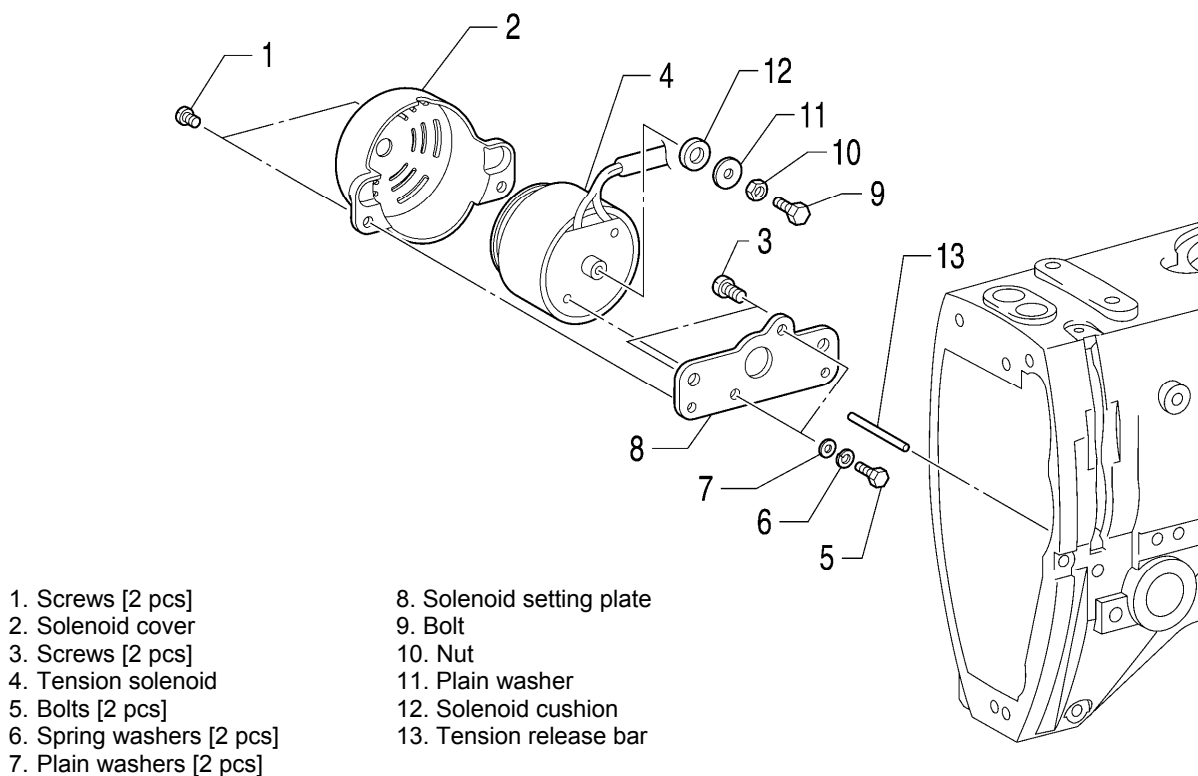
- 30. Rubber cap
- 31. Link shoulder screw
- 32. Link
- 33. Set screw [Loosen]
- 34. Retaining ring, E
- 35. Lever shaft
- 36. Plain washer
- 37. Lifter lever assembly
- 38. Needle bar guide slide block
- 39. Nuts [2 pcs]
- 40. Button clamp roller shaft
- 41. Plain washer
- 42. Roller
- 43. Button clamp rod [Pull upward]
- 44. Set screw [Loosen]
- 45. Button clamp lever shaft [Pull out]
- 46. Retaining ring, E
- 47. Plain washer
- 48. Button clamp lever
- 49. Bolts [2 pcs]
- 50. Button clamp lever holder

2551B

## 9-10. Threading mechanism

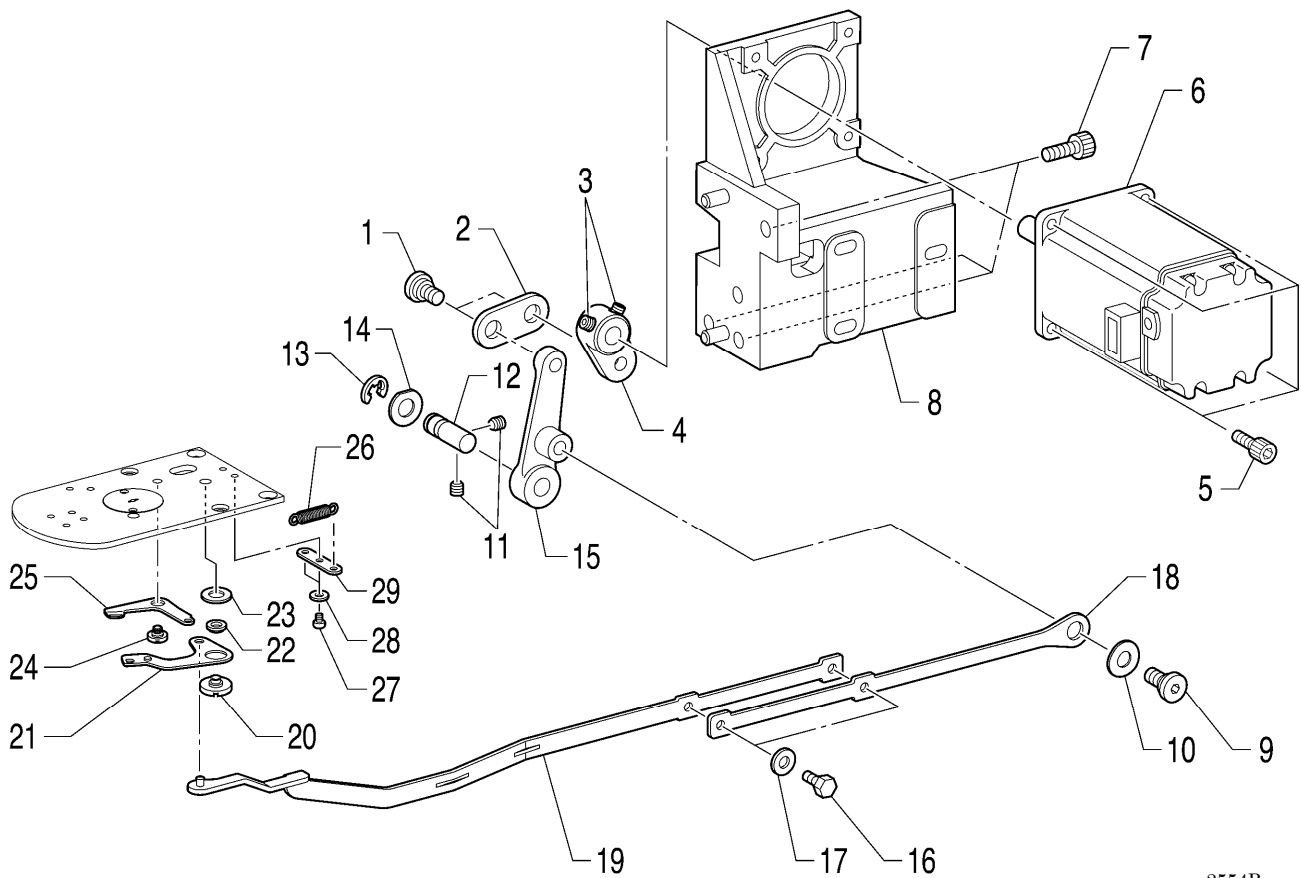


## 9-11. Tension release mechanism



2553B

9-12. Thread nipper mechanism (KE-430F -03, -0F, -0K specifications only)

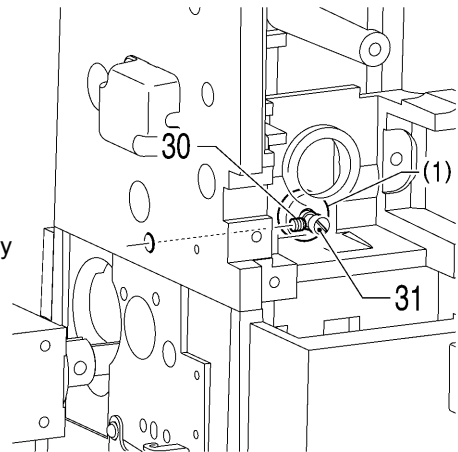


2554B

- 1. Link shoulder screws [2 pcs]
- 2. TR-Ling
- 3. Set screws [2 pcs: Loosen]
- 4. Motor lever
- 5. Bolts [4 pcs]
- 6. Pulse motor P assembly
- 7. Bolts [3 pcs]
- 8. Motor bracket rear assembly
- 9. Link shoulder screw
- 10. Washer, wave spring
- 11. Set screws [2 pcs: Loosen]
- 12. Thread nipper lever shaft
- 13. Retaining ring, E
- 14. Washer
- 15. Thread nipper lever
- 16. Bolts [2 pcs]

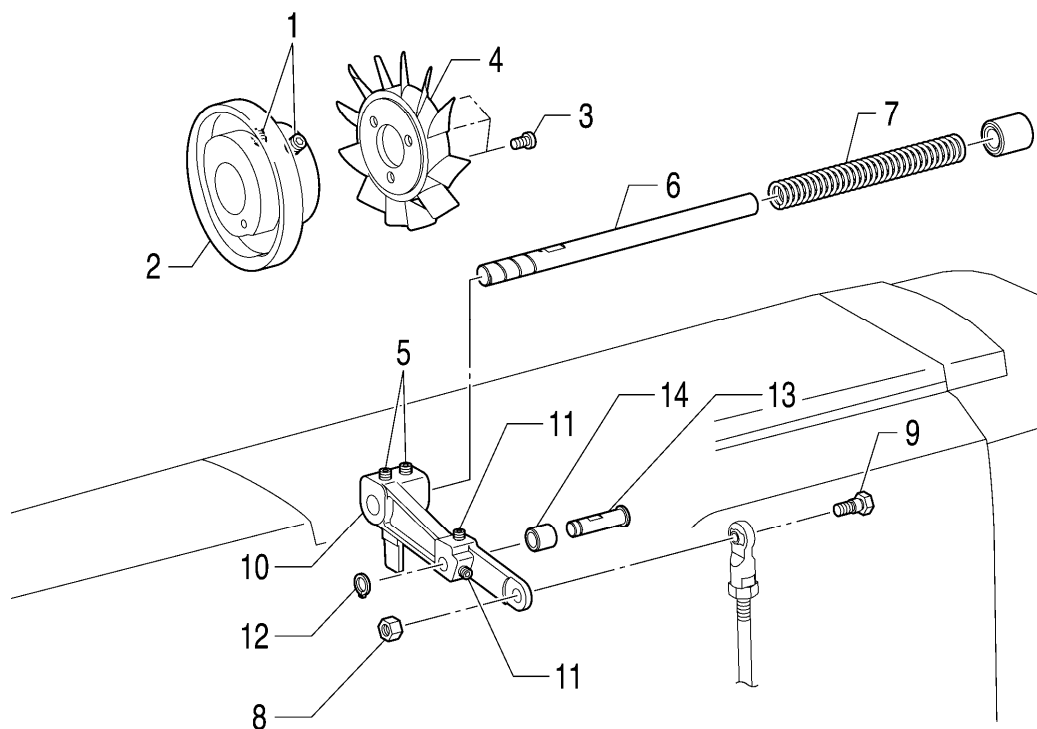
- 17. Washers [2 pcs]
- 18. TN-connecting plate R
- 19. TN-connecting plate F assembly
- 20. Shoulder screw
- 21. Thread nipper D assembly
- 22. Collar
- 23. Spacer
- 24. Shoulder screw, 6-0.9
- 25. Thread nipper U
- 26. Spring
- 27. Screws [2 pcs]
- 28. Plain washers [2 pcs]
- 29. Spring hook plate
- 30. Set screw [Loosen]
- 31. Eccentric shaft

(The ball bearing (1) can be removed at the same time.)

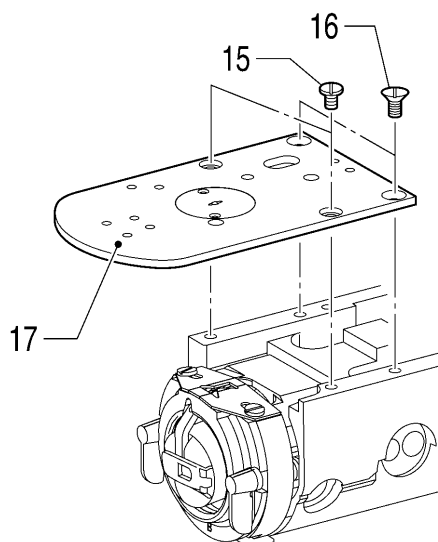


2584B

## 9-13. Thread trimmer mechanism



2555B

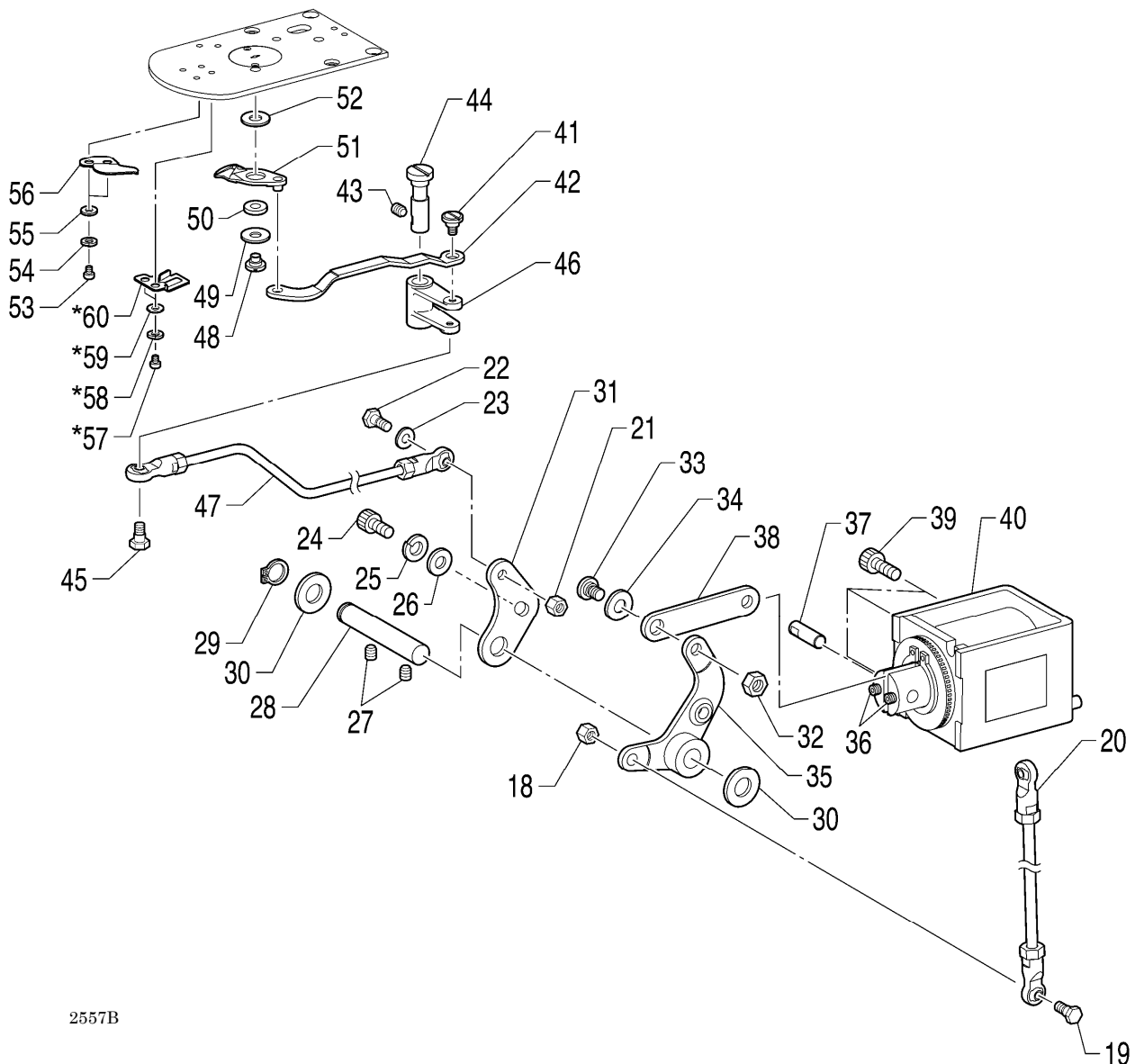


2556B

1. Set screws [2 pcs: Loosen]
2. Thread trimmer cam
3. Screws [3 pcs]
4. Fan
5. Set screws [2 pcs: Loosen]
6. Guide shaft
7. Spring
8. Nut
9. Shoulder screw B
10. Driving lever
11. Set screws [2 pcs: Loosen]
12. Retaining ring, C
13. Collar shaft
14. Thread trimmer collar
15. Screws [2 pcs]
16. Flat screws [2 pcs]
17. Needle plate

(Continued on next page.)

## 9. DISASSEMBLY

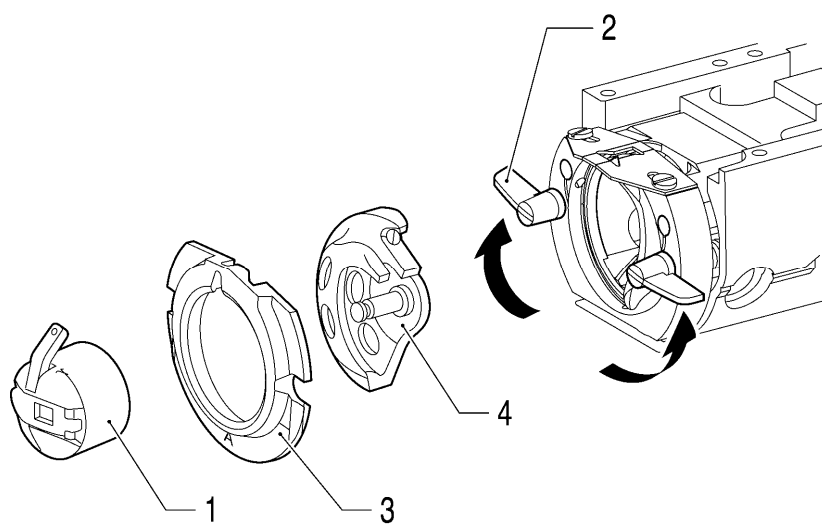


2557B

- |                                   |                                      |   |
|-----------------------------------|--------------------------------------|---|
| 18. Nut                           | 33. Thread trimmer lever V           | 47. Thread trimmer rod H assembly               |
| 19. Shoulder screw B              | 34. Washer, wave spring              | 48. Movable knife shoulder screw                |
| 20. Thread trimmer rod V assembly | 35. Nut                              | 49. Thrust washer                               |
| 21. Nut                           | 36. Solenoid shaft                   | 50. Movable knife collar                        |
| 22. Shoulder screw B              | 37. Thread trimmer link              | 51. Movable knife assembly                      |
| 23. Washer, wave spring           | 38. Set screws [2 pcs: Loosen]       | 52. Movable knife spacer                        |
| 24. Bolt                          | 39. Bolts [3 pcs]                    | 53. Screws [2 pcs]                              |
| 25. Spring washer                 | 40. Thread trimmer solenoid assembly | 54. Spring washers [2 pcs]                      |
| 26. Plain washer                  | 41. Shoulder screw                   | 55. Plain washers [2 pcs]                       |
| 27. Set screws [2 pcs: Loosen]    | 42. Connecting plate 6-1.8           | 56. Fixed knife                                 |
| 28. Thread trimmer lever shaft    | 43. Set screw [Loosen]               | * 57. Screws [2 pcs] [KE-430F only]             |
| 29. Retaining ring, C             | 44. Movable knife lever shaft        | * 58. Spring washers [2 pcs] [KE-430F only]     |
| 30. Washers [2 pcs]               | 45. Shoulder screw 6.35-6            | * 59. Plain washers [2 pcs] [KE-430F only]      |
| 31. Thread trimmer lever H        | 46. Movable knife lever              | * 60. Bobbin thread clamp spring [KE-430F only] |
| 32. Link shoulder screw           |                                      |   |

For the BE-438F, parts marked with \* are supplied as accessories. Install them if necessary.







## 9-14. Shuttle hook mechanism



1. Bobbin case assembly
2. Shuttle race base setting claw  
[Open to right and left]
3. Shuttle race base
4. Shuttle hook

# 10. ASSEMBLY

## ⚠ CAUTION

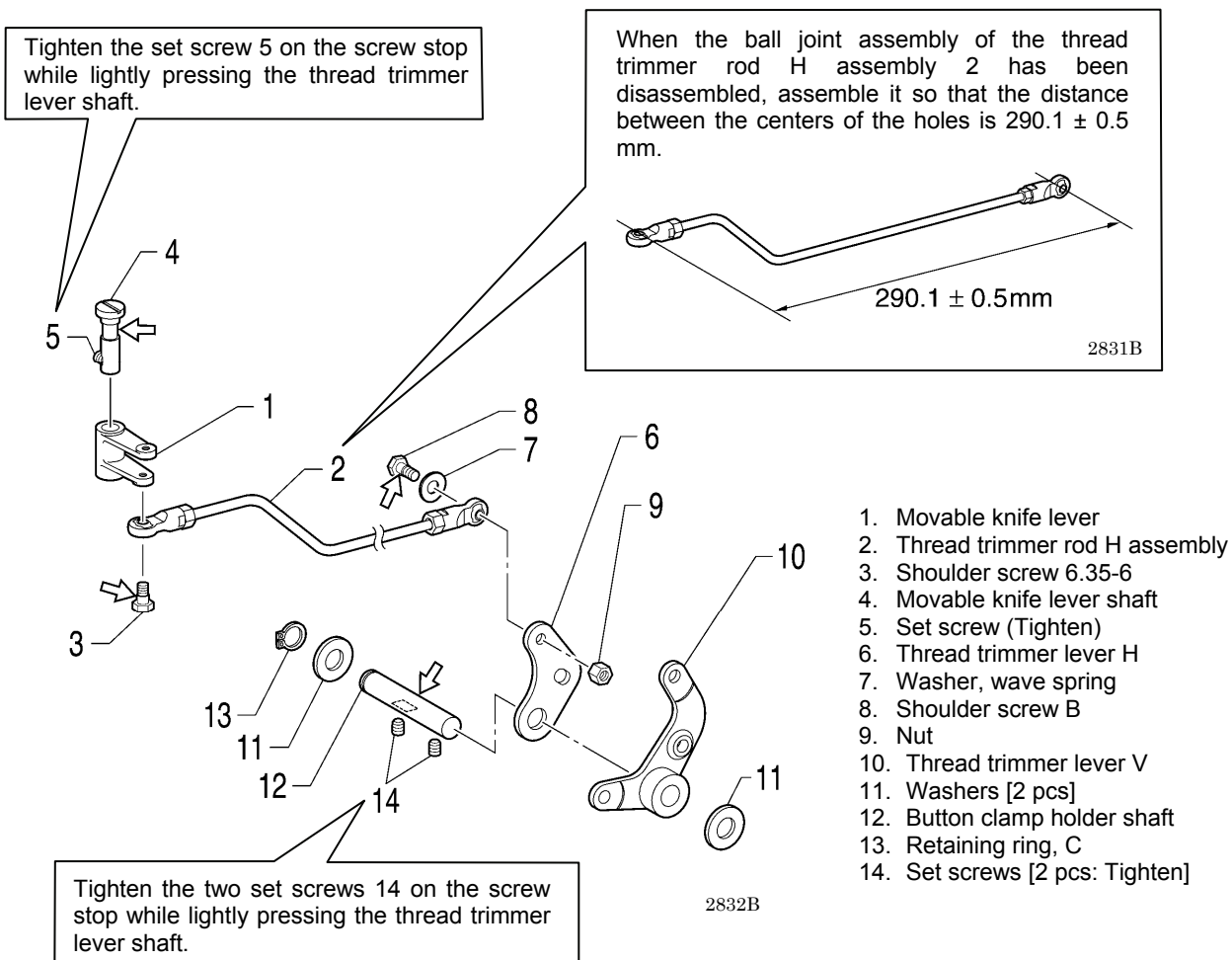
-  Disassembly should only be carried out by a qualified technician.
-  Turn off the power switch before disassembly, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.
-  Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhea. Keep the oil out of the reach of children.
-  When replacing parts and installing optional accessories, be sure to use only genuine Brother parts. Brother will not be held responsible for any accidents or problems resulting from the use of non-genuine parts.
-  If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.
-  To prevent accidents and problems, do not modify the machine yourself. Brother will not be held responsible for any accidents or problems resulting from modifications made to the machine.

Assemble each part in order of the numbers.

- \* (number) indicates part names only. (The numbers do not indicate the order of assembly.)
- \* Apply grease to the required places when reassembling the parts and once every two years.

### 10-1. Thread trimmer mechanism (1)

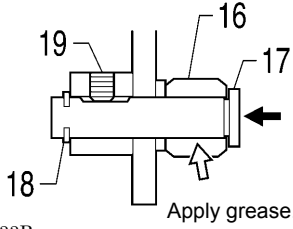
Apply grease to the portions indicated by the white arrows.



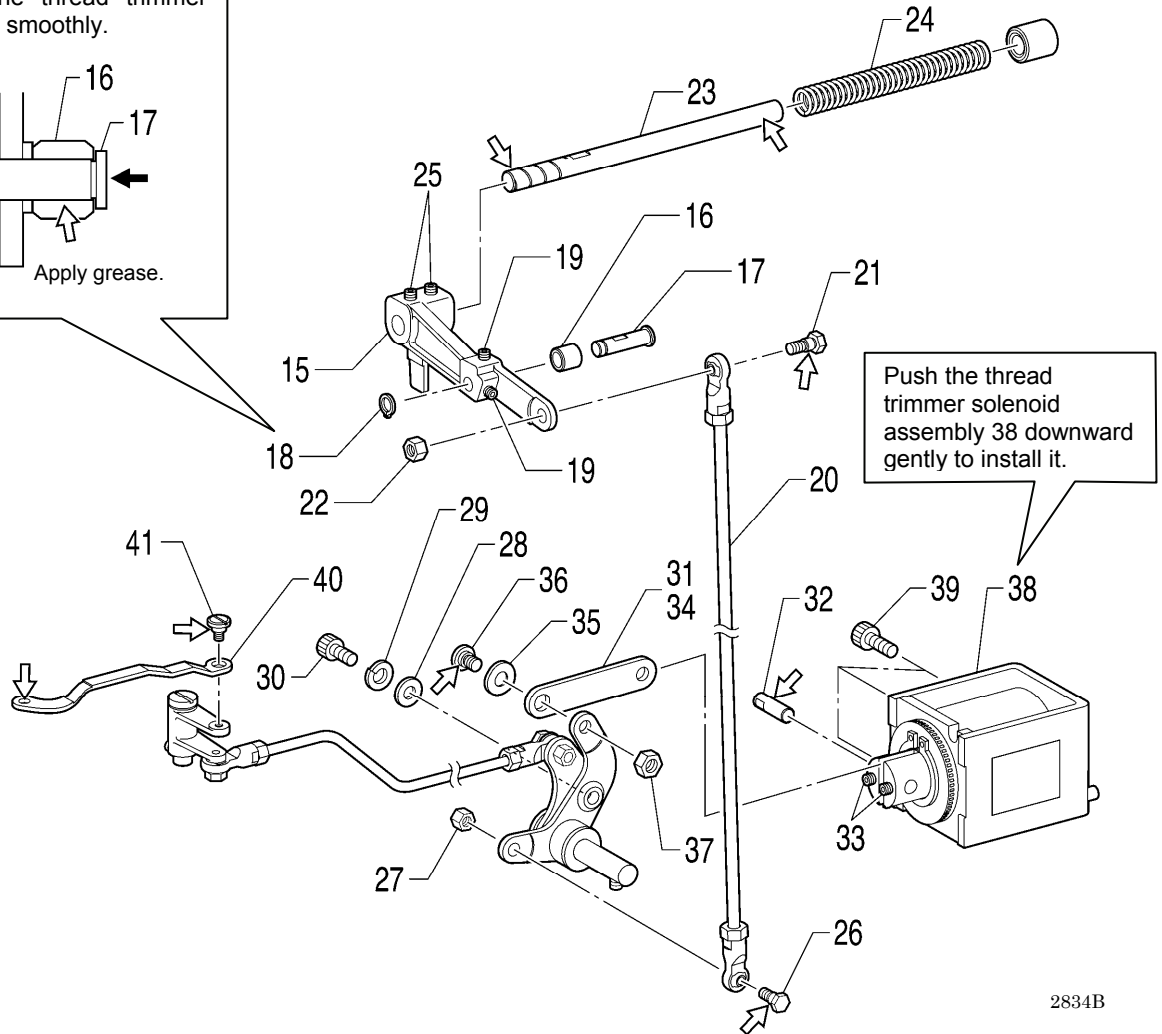
(Continued on next page.)



Tighten the two set screws 19 on the screw stop while lightly pressing the collar shaft 17 in the direction shown in the illustration. Check that the thread trimmer collar 16 turns smoothly.



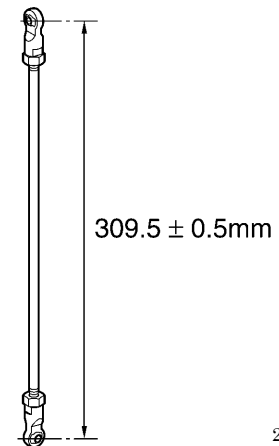
2833B



2834B

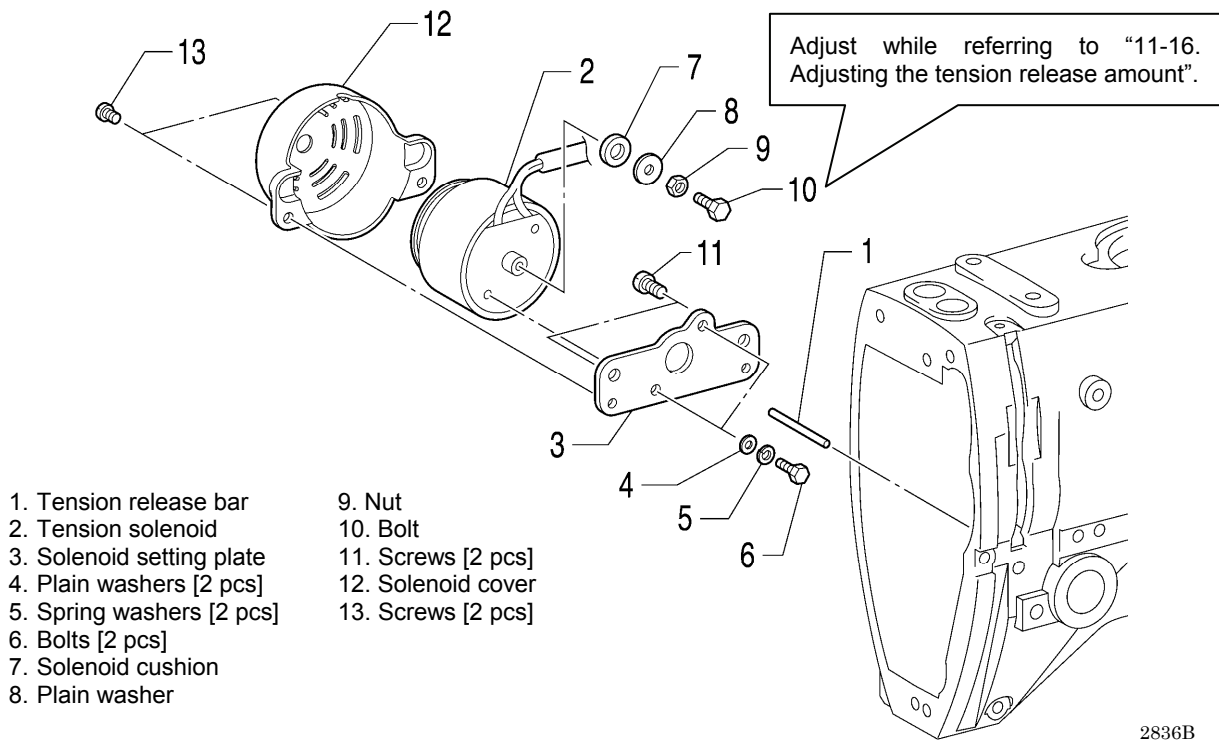
- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| 15. Driving lever                 | 28. Plain washer                     |
| 16. Thread trimmer collar         | 29. Spring washer                    |
| 17. Collar shaft                  | 30. Bolt                             |
| 18. Retaining ring, C             | 31. Thread trimmer link              |
| 19. Set screws [2 pcs: Tighten]   | 32. Solenoid shaft                   |
| 20. Thread trimmer rod V assembly | 33. Set screws [2 pcs: Tighten]      |
| 21. Shoulder screw B              | 34. Thread trimmer link              |
| 22. Nut                           | 35. Washer, wave spring              |
| 23. Guide shaft                   | 36. Link shoulder screw              |
| 24. Spring                        | 37. Nut                              |
| 25. Set screws [2 pcs: Tighten]   | 38. Thread trimmer solenoid assembly |
| 26. Shoulder screw B              | 39. Bolts [3 pcs]                    |
| 27. Nut                           | 40. Connecting plate                 |
|                                   | 41. Shoulder screw, 6-1.8            |

When the ball joint assembly of the thread trimmer rod V assembly 20 has been disassembled, assemble it so that the distance between the centers of the holes is  $309.5 \pm 0.5$  mm.



2835B

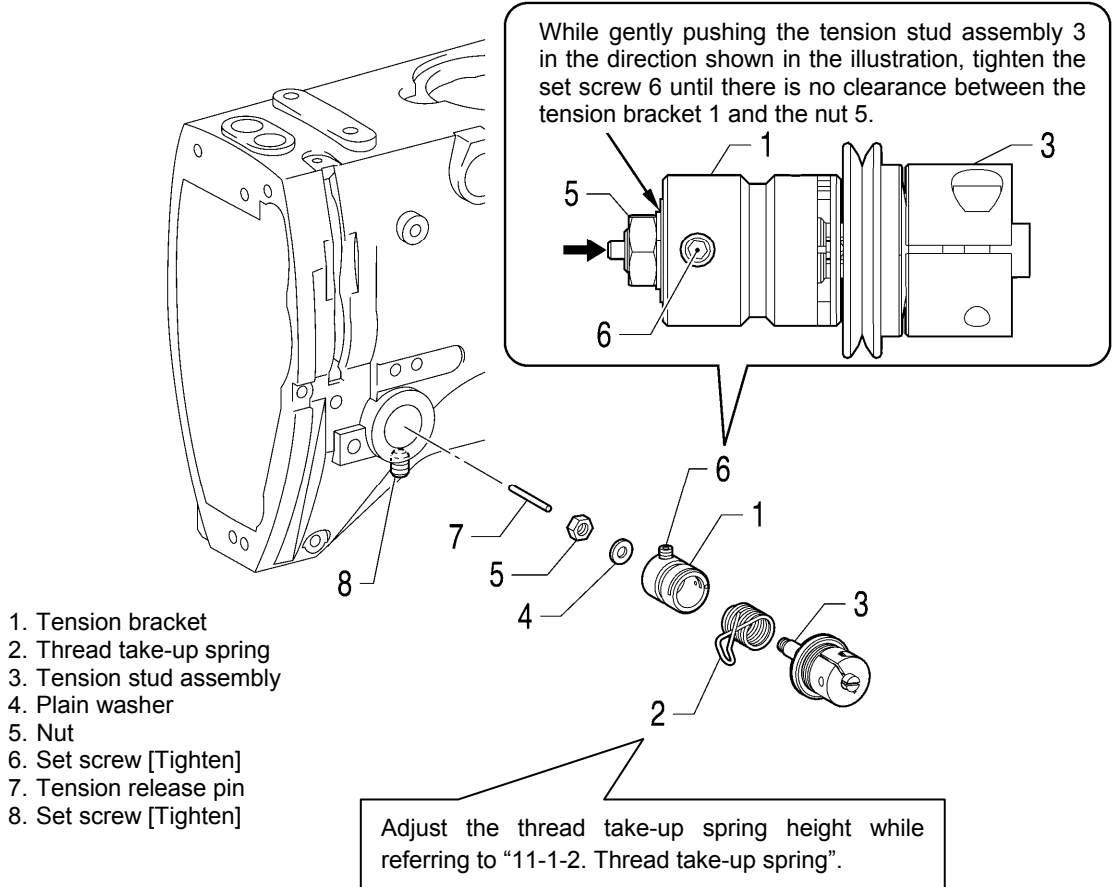
### 10-2. Tension release mechanism



- 1. Tension release bar
- 2. Tension solenoid
- 3. Solenoid setting plate
- 4. Plain washers [2 pcs]
- 5. Spring washers [2 pcs]
- 6. Bolts [2 pcs]
- 7. Solenoid cushion
- 8. Plain washer
- 9. Nut
- 10. Bolt
- 11. Screws [2 pcs]
- 12. Solenoid cover
- 13. Screws [2 pcs]

2836B

### 10-3. Threading mechanism

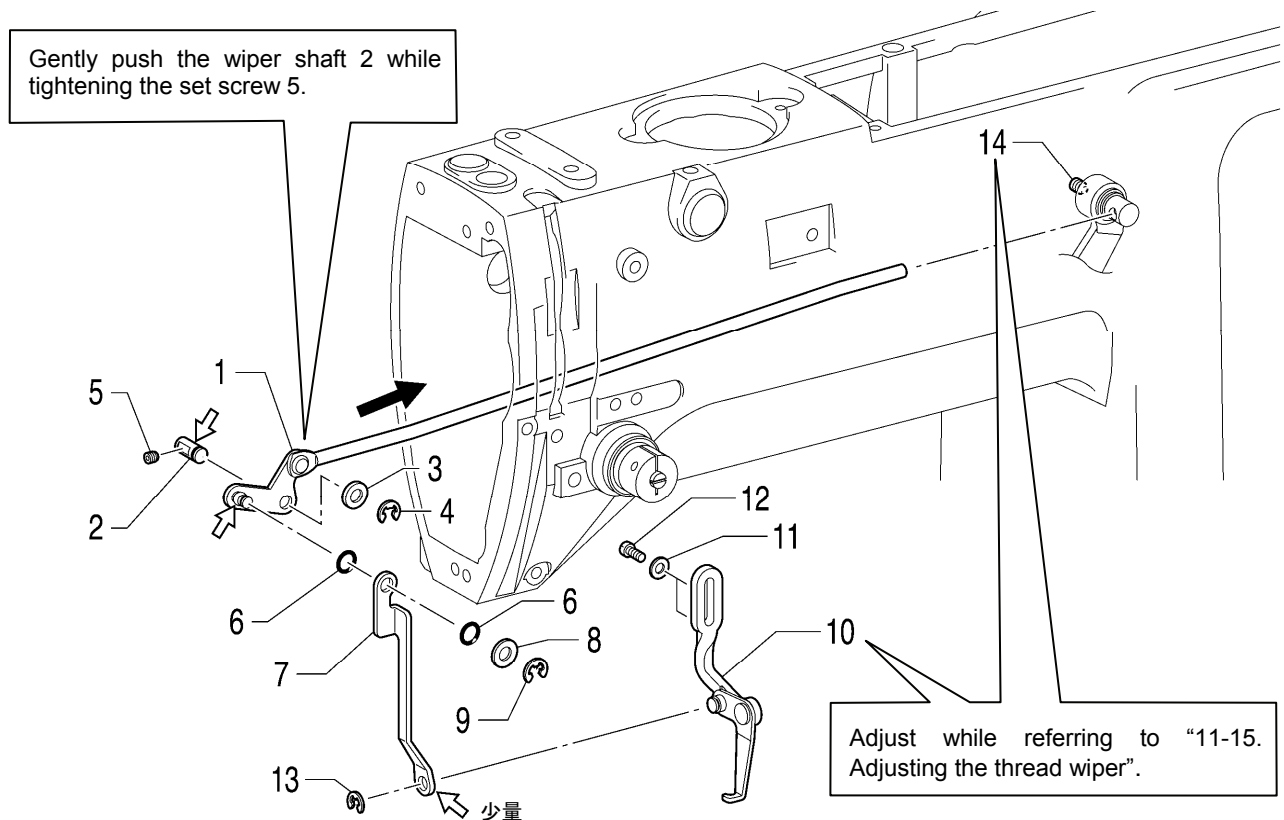


- 1. Tension bracket
- 2. Thread take-up spring
- 3. Tension stud assembly
- 4. Plain washer
- 5. Nut
- 6. Set screw [Tighten]
- 7. Tension release pin
- 8. Set screw [Tighten]

2837B

## 10-4. Thread wiper mechanism

Apply grease to the portions indicated by the white arrows.

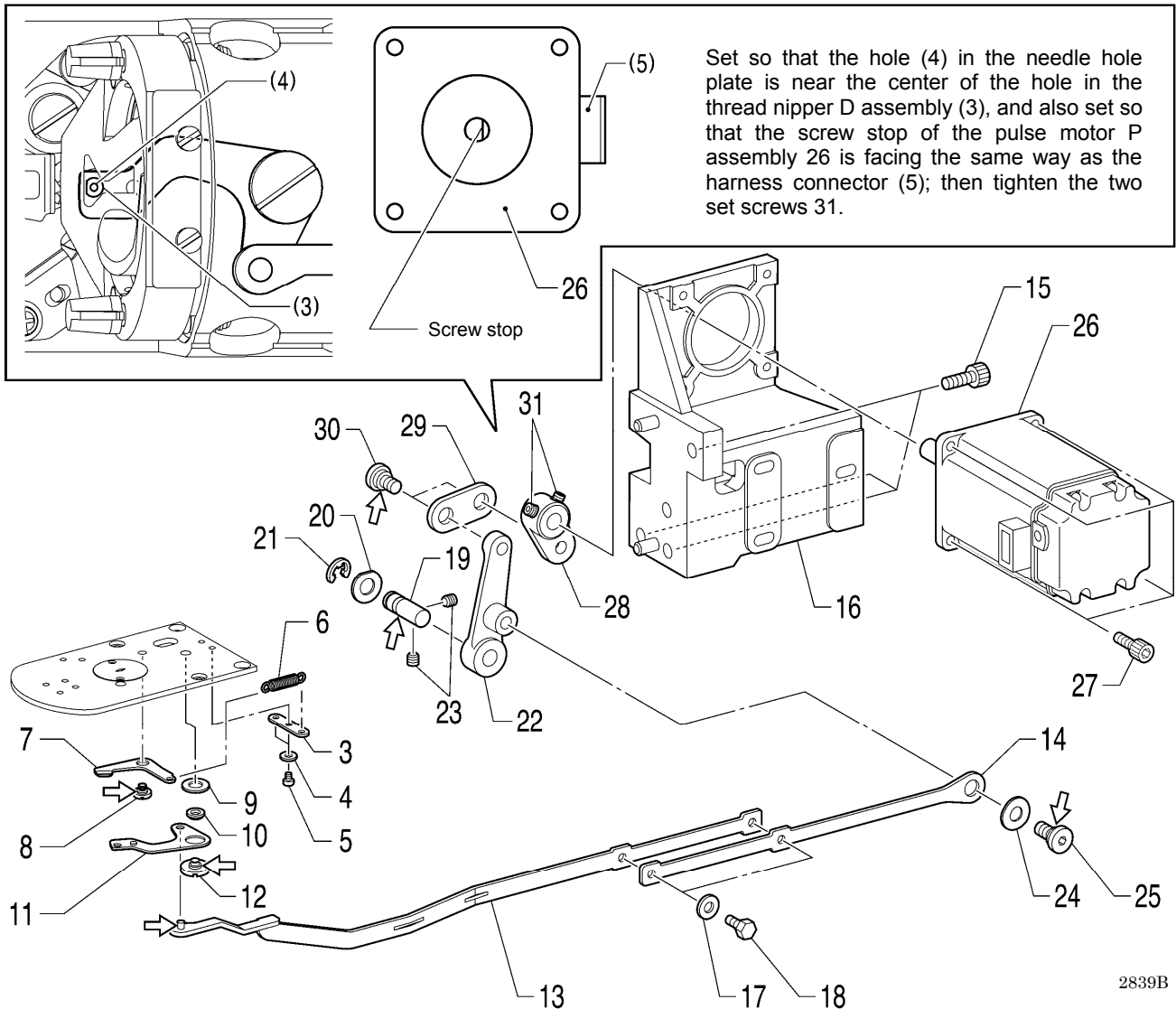


2838B

1. Thread wiper rod assembly [Insert from the front]
2. Wiper shaft
3. Plain washer
4. Retaining ring, E
5. Set screw [Tighten]
6. O rings [2 pcs]
7. Connecting plate
8. Plain washer
9. Retaining ring, E
10. Thread wiper arm assembly
11. Plain washers [2 pcs]
12. Screws [2 pcs]
13. Retaining ring, E
14. Set screw [Tighten]

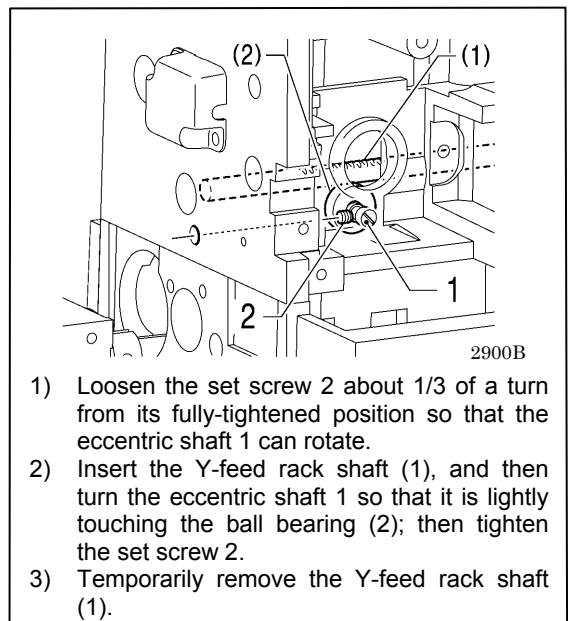
### 10-5. Thread nipper mechanism

Apply grease to the portions indicated by the white arrows.



2839B

- |   |                                  |
|---|----------------------------------|
| 1. Eccentric shaft (Install the ball bearing (2) at the same time.) | 18. Bolts [2 pcs]                |
| 2. Set screw [Tighten]  | 19. Lever shaft                  |
| 3. Spring hook plate  | 20. Washer                       |
| 4. Plain washers [2 pcs]  | 21. Retaining ring, E            |
| 5. Screws [2 pcs]   | 22. Thread nipper lever          |
| 6. Spring extension   | 23. Set screws [2 pcs: Tighten]  |
| 7. Thread nipper U  | 24. Washer, wave spring          |
| 8. Shoulder screw, 6-0.9  | 25. Link shoulder screw          |
| 9. Thread nipper spacer   | 26. Pulse motor P assembly       |
| 10. Thread nipper collar  | 27. Bolts [4 pcs]                |
| 11. Thread nipper D assembly  | 28. Motor lever                  |
| 12. Thread nipper shoulder screw                                    | 29. TR-Link                      |
| 13. TN-connecting plate F assembly                                  | 30. Link shoulder screws [2 pcs] |
| 14. TN-connecting plate R   | 31. Set screws [2 pcs: Tighten]  |
| 15. Bolts [3 pcs]   |                                  |
| 16. Motor bracket rear assembly                                     |                                  |
| 17. Washers [2 pcs]   |                                  |



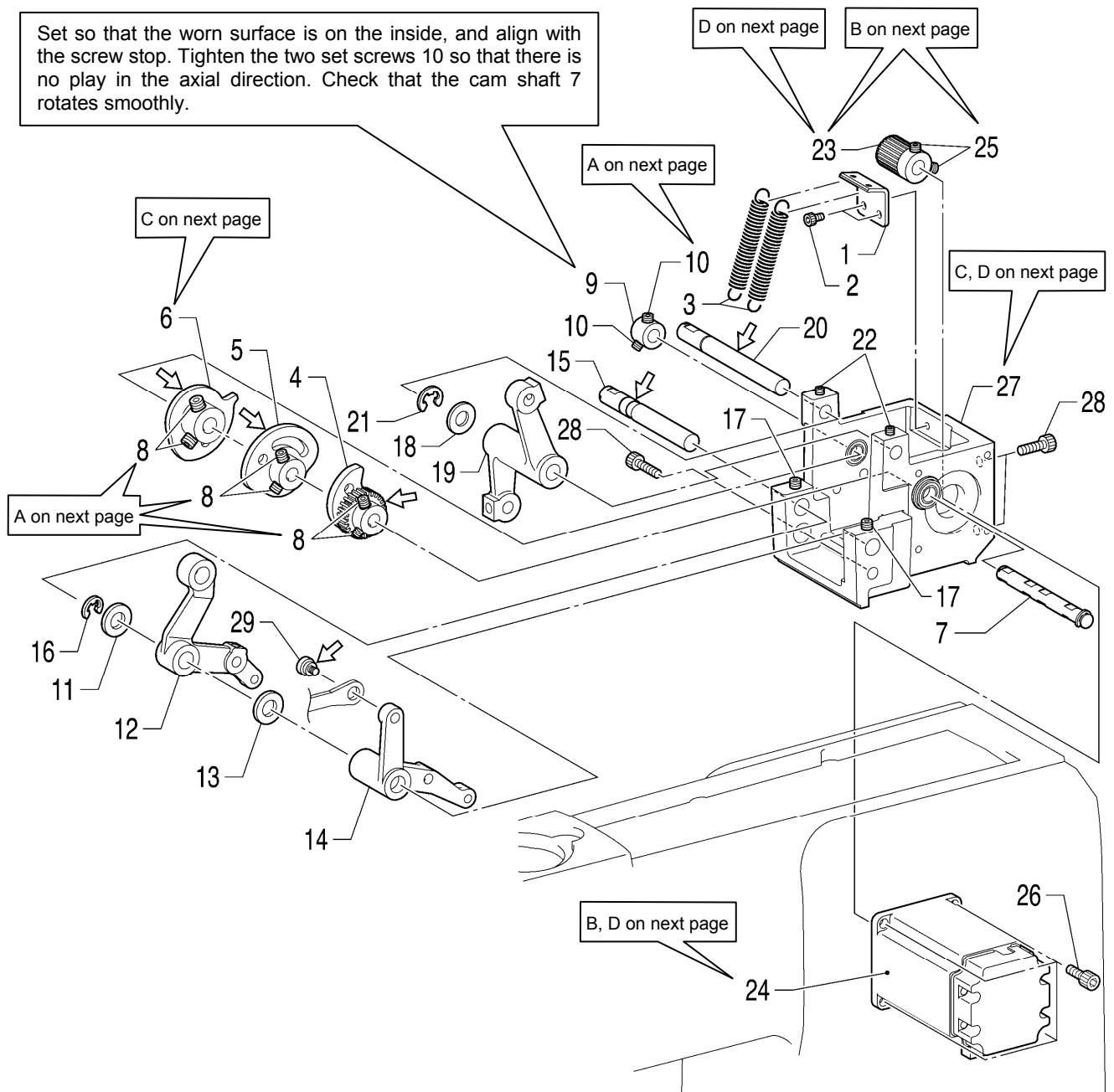
2900B

- 1) Loosen the set screw 2 about 1/3 of a turn from its fully-tightened position so that the eccentric shaft 1 can rotate.
- 2) Insert the Y-feed rack shaft (1), and then turn the eccentric shaft 1 so that it is lightly touching the ball bearing (2); then tighten the set screw 2.
- 3) Temporarily remove the Y-feed rack shaft (1).

## 10-6. Work clamp lifter mechanism

Apply grease to the portions indicated by the white arrows.

\* Refer to the next page for the points to note during reassembly.



1. Spring hook
2. Bolts [2 pcs]
3. Springs [2 pcs]
4. Cam gear
5. Thread wiper cam
6. Thread trimmer driving cam
7. Cam shaft
8. Set screws [6 pcs: Tighten]
9. Set screw collar
10. Set screws [2 pcs: Tighten]

11. Plain washer
12. Thread wiper driving lever
13. Plain washer
14. Drive lever w-clamp lifter
15. Lever shaft
16. Retaining ring, E
17. Set screws [2 pcs: Tighten]
18. Plain washer
19. Cam lever thread trimmer
20. Driving thread trimmer shaft

21. Retaining ring, E
22. Set screws [2 pcs: Tighten]
23. Gear 16
24. Pulse motor T assembly
25. Set screws [2 pcs: Tighten]
26. Bolts [4 pcs]
27. Motor bracket assembly
28. Bolts [3 pcs]
29. Link shoulder screw

2840B

(Continued on next page.)

**A**

7 Reference line  
Align 4  
10 8

2863B

Set the first set screws 8 and 10 in the clockwise direction to the screw stop position.

**B**

0.5 mm  
24  
23 25  
(Screw stop side)

2841B

Set so that the clearance between drive gear 16 23 and the edge of the pulse motor T assembly 24 is 0.5 mm.

Set the first two set screws 25 in the clockwise direction to the screw stop position.

**C**

The cam gear 6 also has a slot c in it, so make sure the correct hole is used.

Motor bracket  
c  
6  
b a  
b a  
27

2864B

Align the positions of hole a in the cam gear 6 and hole b in the motor bracket 27.

**D**

23 27 24  
2865B  
2842B

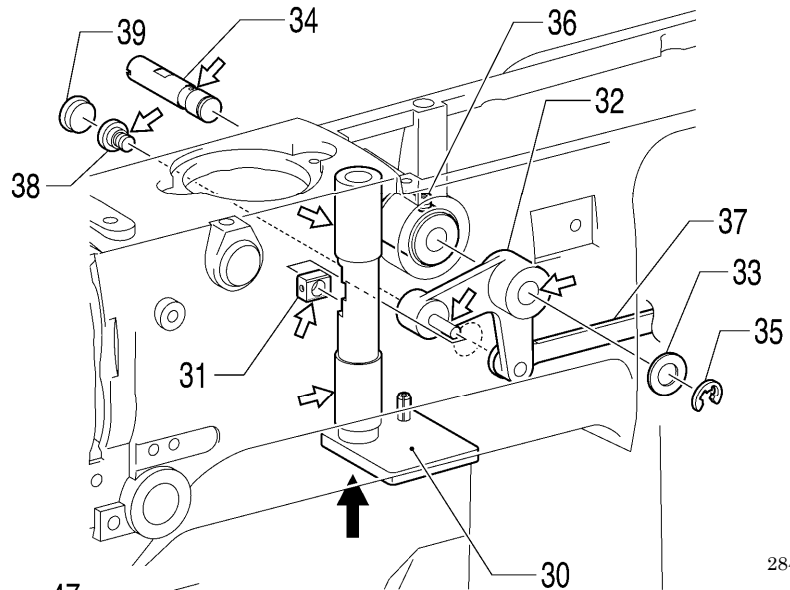
Make sure the harness connector is facing the correct way.

- 1) While maintaining the condition in C, install drive gear 16 23 to the motor bracket 27 so that the index mark is facing directly upward. Make sure that the harness connector is facing the correct way at this time.
- 2) Engage drive gear 16 23 and the cam gear 6, and while taking up the backlash (play), install the pulse motor T assembly 24.

(Continued on next page.)

KE-430F

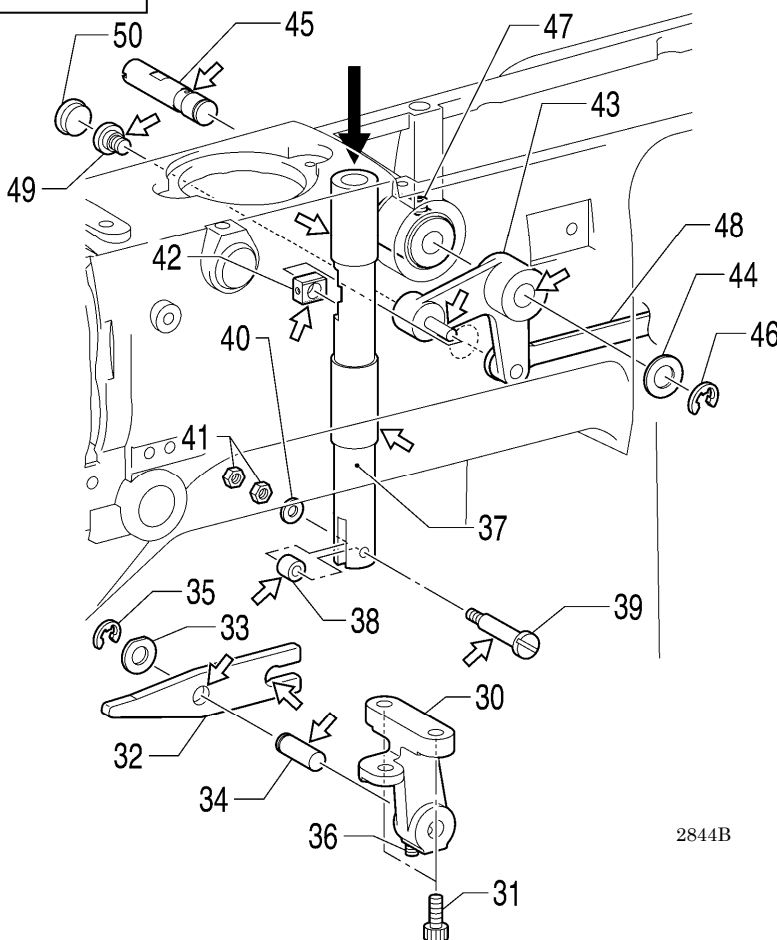
- 30. Work clamp lifter plate assembly
- 31. Needle bar guide slide block
- 32. Lifter lever assembly
- 33. Plain washer
- 34. Lever shaft
- 35. Retaining ring, E
- 36. Set screw [Tighten]
- 37. Link
- 38. Link shoulder screw
- 39. Rubber cap



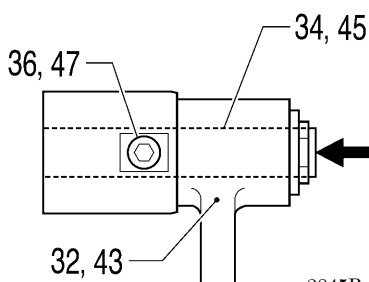
2843B

BE-438F

- 30. Button clamp lever holder
- 31. Bolts [2 pcs]
- 32. Button clamp lever
- 33. Plain washer
- 34. Button clamp lever shaft
- 35. Retaining ring, E
- 36. Set screw [Tighten]
- 37. Button clamp roller shaft
- 38. Roller
- 39. Button clamp roller shaft
- 40. Plain washer
- 41. Nuts [2 pcs]
- 42. Needle bar guide slide block
- 43. Lifter lever assembly
- 44. Plain washer
- 45. Lever shaft
- 46. Retaining ring, E
- 47. Set screw [Tighten]
- 48. Link
- 49. Link shoulder screw
- 50. Rubber cap



2844B



2845B

Align the set screw 36 (430F) or 47 (438F) with the screw stop on the lever shaft 34 (430F) or 45 (438F), and then tighten the set screw while gently pushing the lifter lever assembly 32 (430F) or 43 (438F) so that there is no play in it.

Check that the lifter lever assembly 32 (430F) or 43 (438F) moves smoothly.

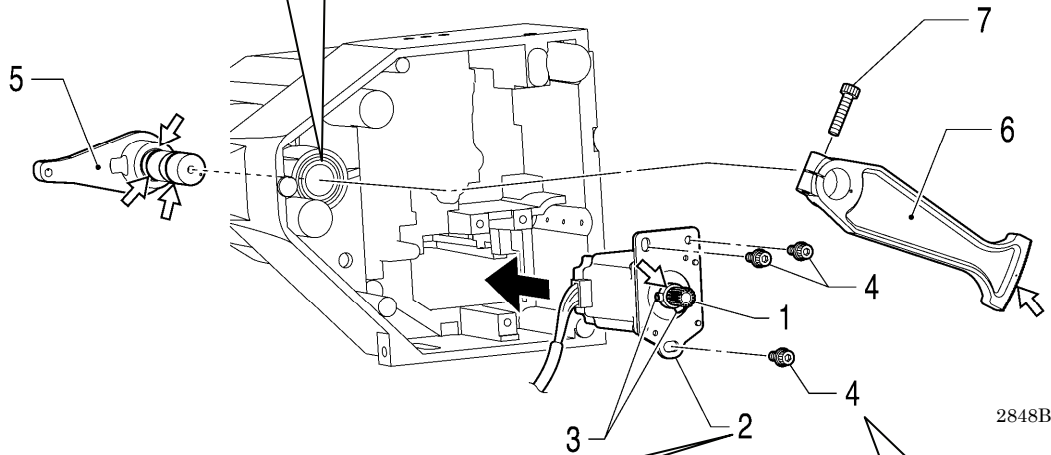
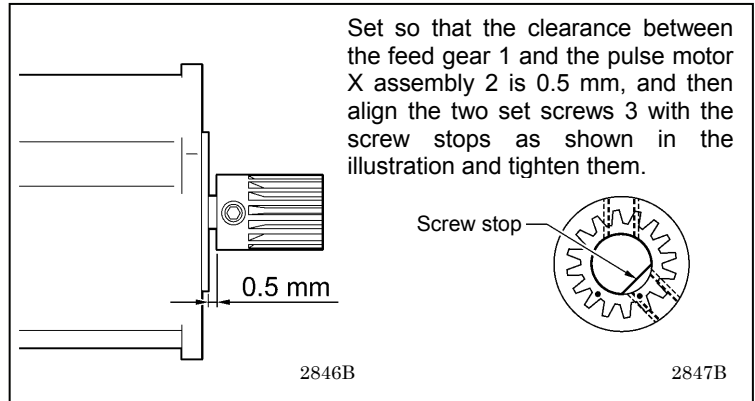
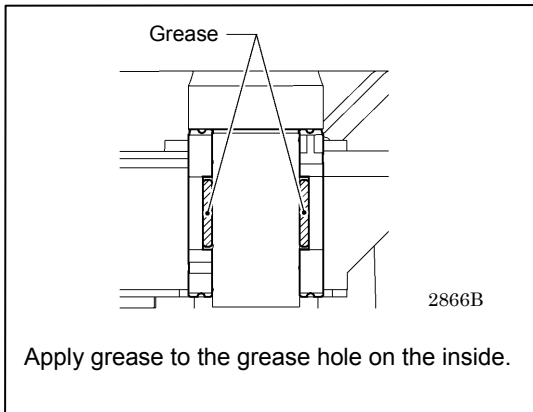
**NOTE:**

When the work clamp lifter plate assembly 30 (430F)/button clamp rod 37 (438F) is lowered, the needle bar guide slide block 31 (430F) or 42 (438F) moves away, so hold the work clamp lifter plate assembly 30 (430F)/button clamp rod 37 (438F) in place until the link shoulder screw 38 (430F) or 49 (438F) is tightened.



### 10-7. Feed mechanism

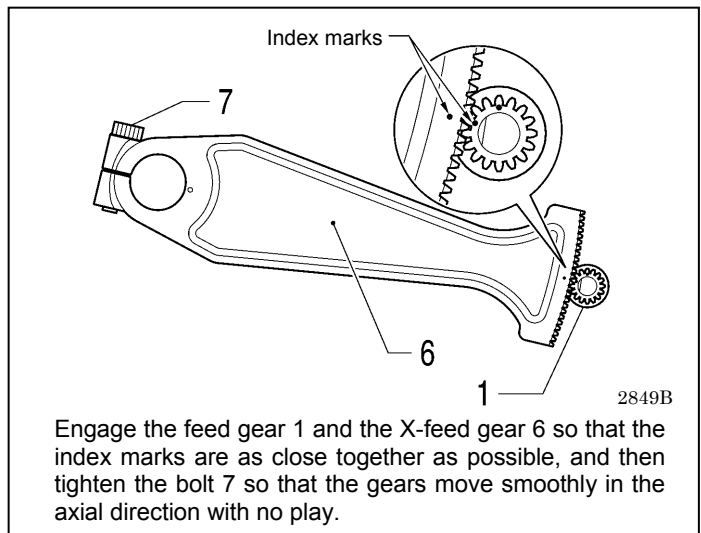
Apply grease to the portions indicated by the arrows.



Make sure that the harness faces correctly.

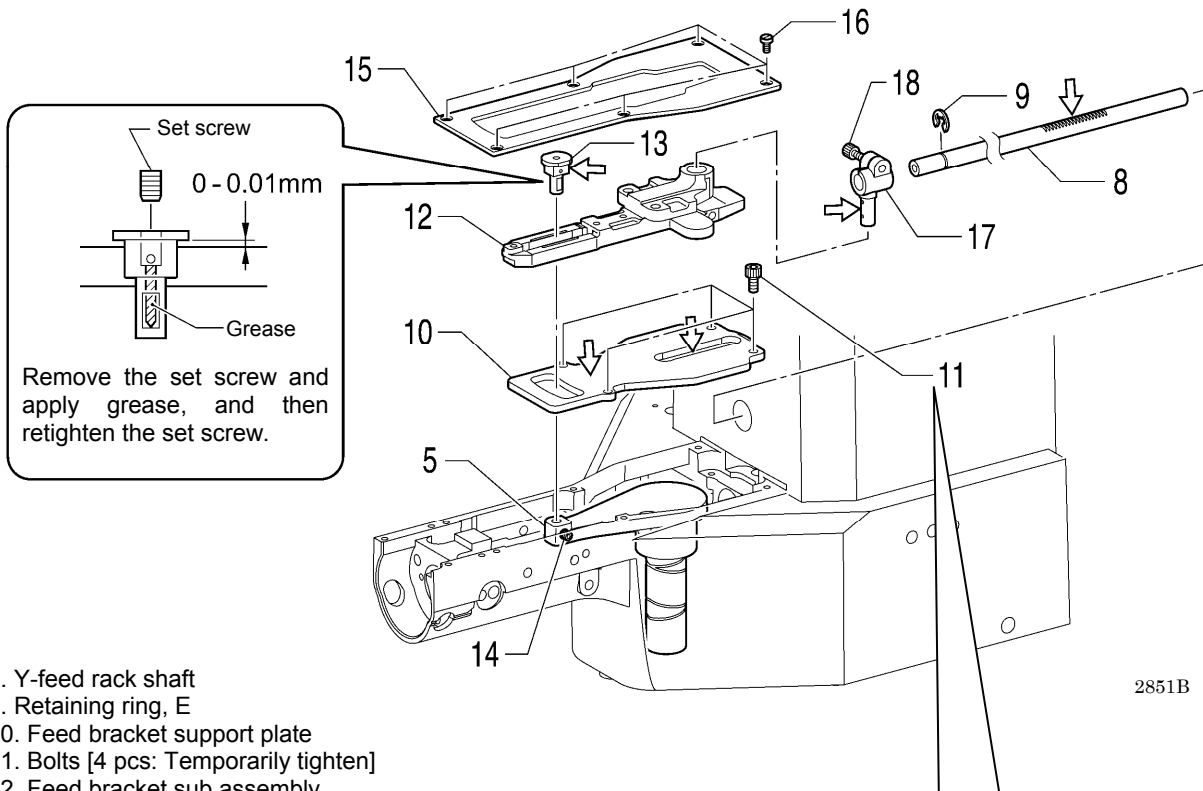
Adjust the X-motor setting plate 2 so that the backlash amount (play) of the feed gear 1 is 0 to 0.05 mm, and then tighten the bolts with washer 4.

- 1. Feed gear
- 2. X-motor setting plate [Pulse motor X assembly]
- 3. Set screws [2 pcs: Tighten]
- 4. Bolt sockets (S/P washers) [3 pcs]
- 5. X-feed lever
- 6. X-feed gear
- 7. Bolt



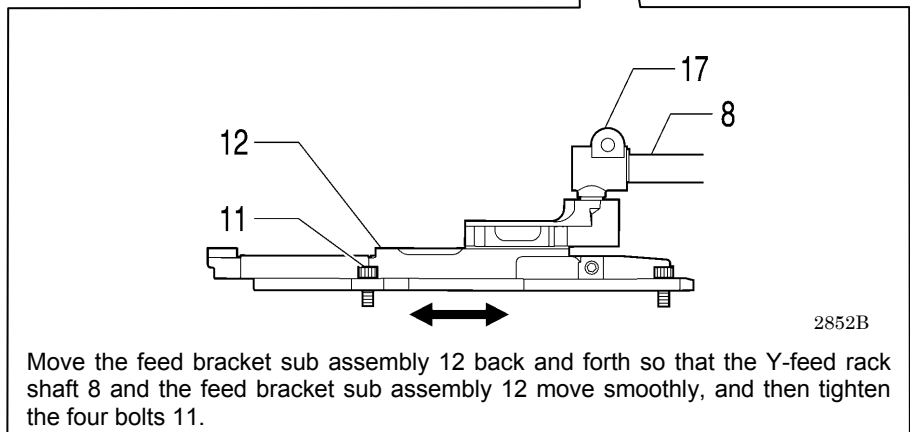
(Continued on next page.)





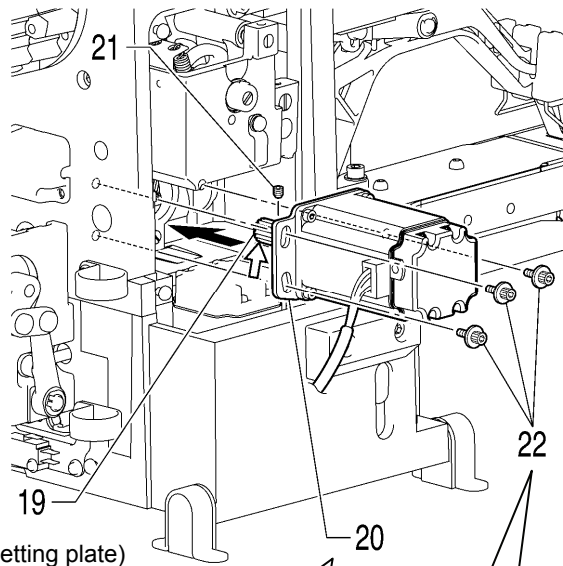
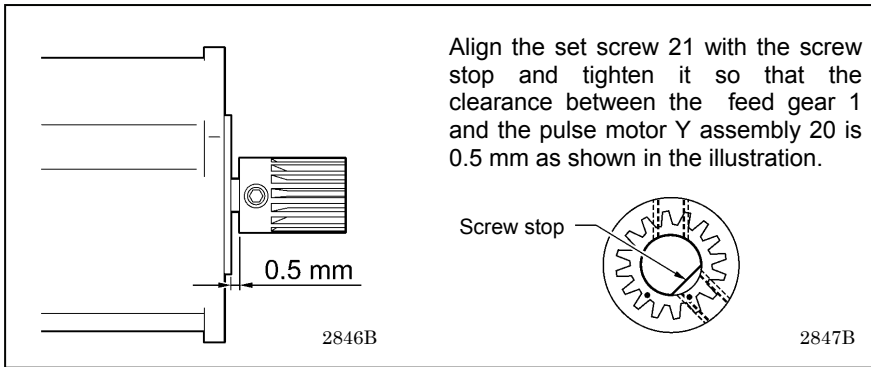
- 8. Y-feed rack shaft
- 9. Retaining ring, E
- 10. Feed bracket support plate
- 11. Bolts [4 pcs: Temporarily tighten]
- 12. Feed bracket sub assembly
- 13. Regulator block assembly
- 14. Set screw
- 15. Feed bracket cover
- 16. Screws [6 pcs]
- 17. Y-feed rack shaft cramp
- 18. Bolt

2851B



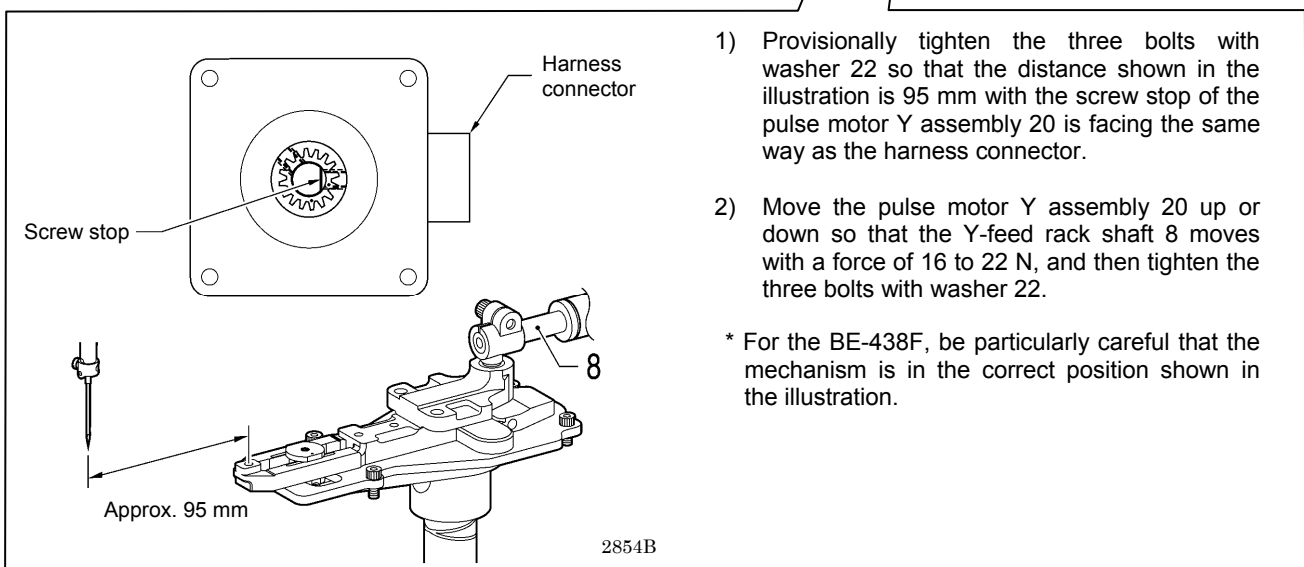
Move the feed bracket sub assembly 12 back and forth so that the Y-feed rack shaft 8 and the feed bracket sub assembly 12 move smoothly, and then tighten the four bolts 11.

(Continued on next page.)



- 19. Feed gear
- 20. Pulse motor Y assembly (Y-motor setting plate)
- 21. Set screws [2 pcs]
- 22. Bolt sockets (S/P washers)  
[3 pcs: Temporarily tighten]

Make sure that the harness faces correctly.



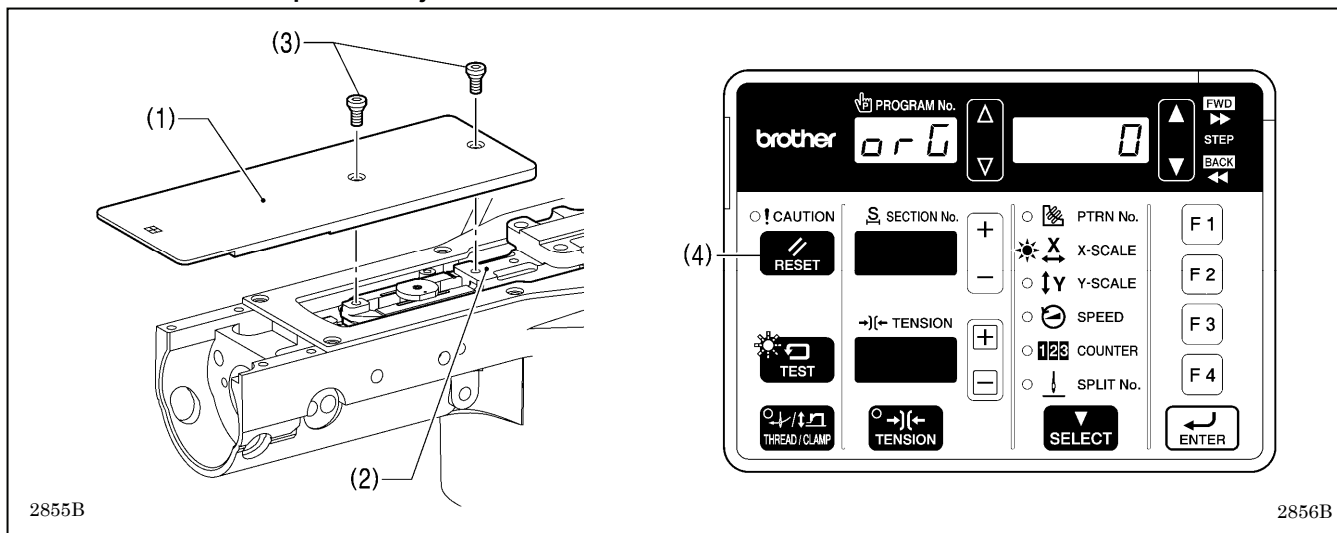
- 1) Provisionally tighten the three bolts with washer 22 so that the distance shown in the illustration is 95 mm with the screw stop of the pulse motor Y assembly 20 is facing the same way as the harness connector.
- 2) Move the pulse motor Y assembly 20 up or down so that the Y-feed rack shaft 8 moves with a force of 16 to 22 N, and then tighten the three bolts with washer 22.

\* For the BE-438F, be particularly careful that the mechanism is in the correct position shown in the illustration.

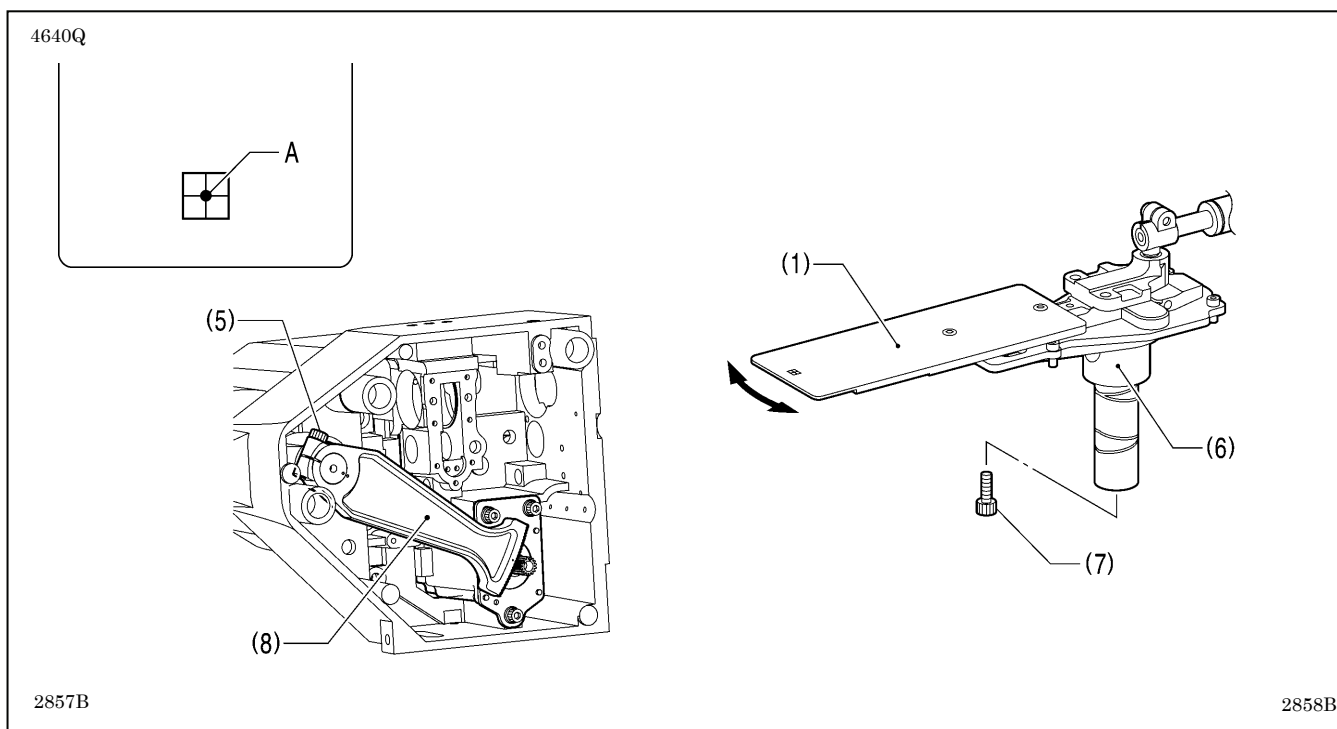
After installing, carry out the steps in "Feed mechanism home position adjustment" on the following page.

(Continued on next page.)

<Feed mechanism home position adjustment>



1. Install the home position standard plate (1) to the feed bracket sub assembly (2) with the two screws (3).
2. Gently tilt back the machine head.
3. Switch the sewing machine to home position adjustment mode. (See "11-18-1. X- and Y-feed motor home positions".)
4. Press and hold the RESET key (4) for 2 seconds or more.  
 \* The offset value will be cleared and reset to " 0".



5. Turn the pulley by hand in the direction of the arrow and check at what point the needle drops to the home position standard plate. If the needle does not drop to point (A), carry out the following adjustments.  
**NOTE:**  
 Be careful not to let the needle touch the home position standard plate.
6. Loosen the bolt (5) and move the home position standard plate (1) to the left or right to adjust so that the needle drops to point A.  
 \* If play occurs in the axial direction, tighten the M6 or similar bolt (7) on the X-feed lever (6), and adjust while pulling the M6 or similar bolt (7).
7. Tighten the bolt (5).
8. Turn off the power switch and check that there is no play in the X-feed gear (8) in the axial direction.
9. Make fine adjustments while referring to "11-18-1. X- and Y-feed motor home positions".

### 10-8. Upper shaft mechanism

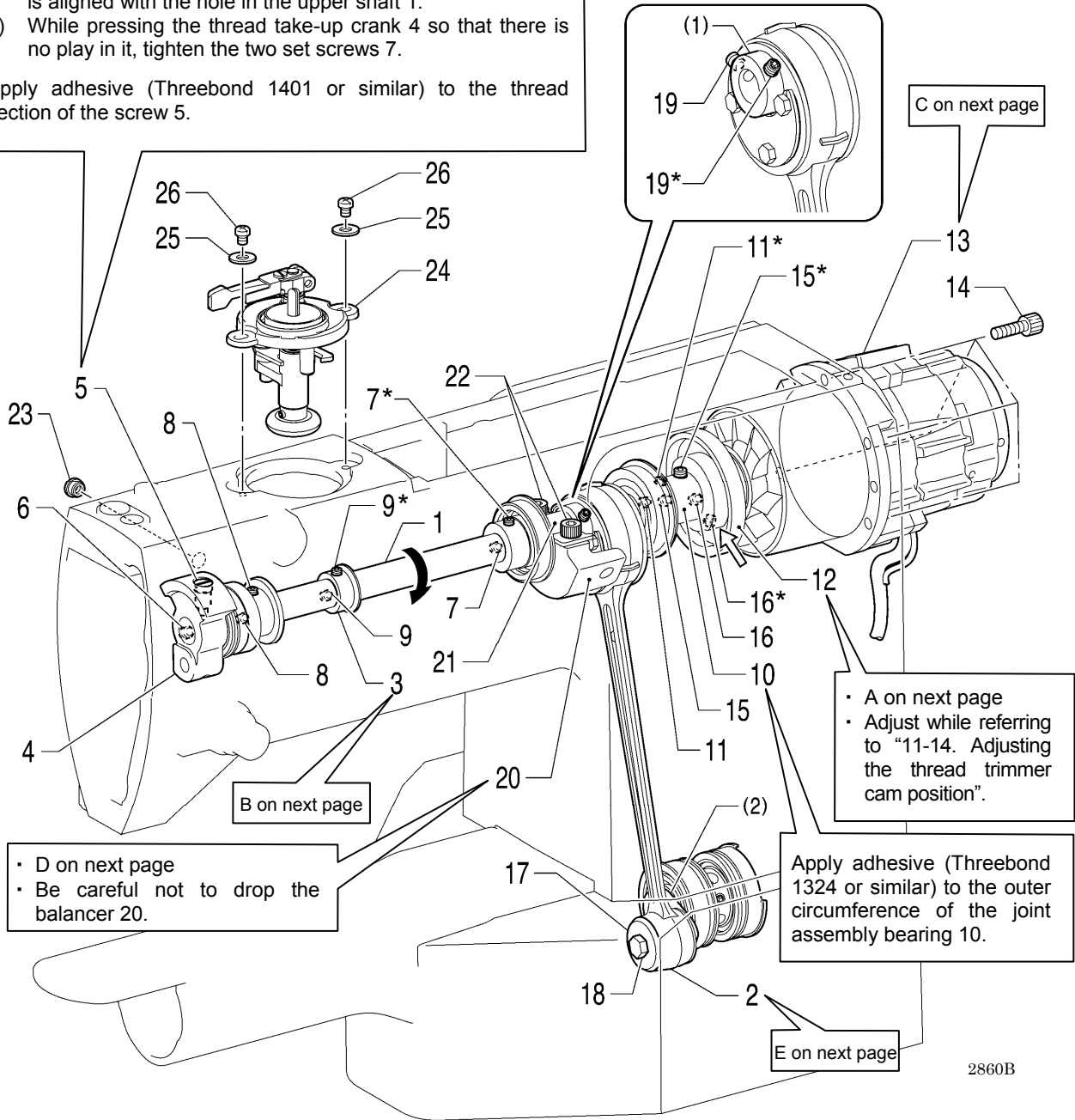
Apply grease <GREASE BZL-300P> specified by Brother to the portions indicated by the white arrows.

\* 17, 18 and 19 should be installed after carrying out the installations in "10-10. Lower shaft mechanism".

\* Set screws marked with \* in the illustration are on the screw stop side.

\* Refer to the next page for the points to note during reassembly.

1) Tighten the screw 5 of the thread take-up crank 4 so that it is aligned with the hole in the upper shaft 1.  
 2) While pressing the thread take-up crank 4 so that there is no play in it, tighten the two set screws 7.  
 Apply adhesive (Threebond 1401 or similar) to the thread section of the screw 5.



- |                                |                                 |                              |
|--------------------------------|---------------------------------|------------------------------|
| 1. Upper shaft                 | 11. Set screws [2 pcs: Tighten] | 21. Balancer plate           |
| 2. Crank rod base              | 12. Thread trimmer cam          | 22. Bolts [2 pcs]            |
| 3. Pulley gear R               | 13. Motor assembly              | 23. Rubber cap               |
| 4. Thread take-up crank        | 14. Bolts [4 pcs]               | 24. Bobbin winder unite      |
| 5. Screw                       | 15. Set screws [2 pcs: Tighten] | 25. Plain washers [2 pcs]    |
| 6. Set screw [Tighten]         | 16. Set screws [2 pcs: Tighten] | 26. Screws [2 pcs]           |
| 7. Set screws [2 pcs: Tighten] | 17. Crank rod washer            |                              |
| 8. Set screws [2 pcs: Tighten] | 18. Bolt                        |                              |
| 9. Set screws [2 pcs: Tighten] | 19. Set screws [2 pcs: Tighten] |                              |
| 10. Joint assembly             | 20. Balancer                    |                              |
|                                |                                 | (1) Eccentric wheel          |
|                                |                                 | (2) Rock gear shaft assembly |

(Continued on next page.)

**A**

2859B

Tighten the set screw so that the screw stop a on the motor shaft is in the same phase as the screw stop b on the upper shaft 1.  
Tighten the set screw so that the screw stop c on the thread trimmer cam 12 is at a phase of approximately 180 degrees from the screw stop a on the motor shaft.

**B**

2868B

Install pulley gear R 3 so that it is aligned with the reference line on the upper shaft 1.

**C**

2891B

With the motor assembly 13 provisionally installed, turn it in the direction of the arrow and then tighten the four bolts 14.

**D**

2892B

With the edge of the balancer 20 pushed up against the edge of the cam (1), tighten the two bolts 22. In addition, check that there are gaps at section d (crank rod assembly 2 and balancer 20).

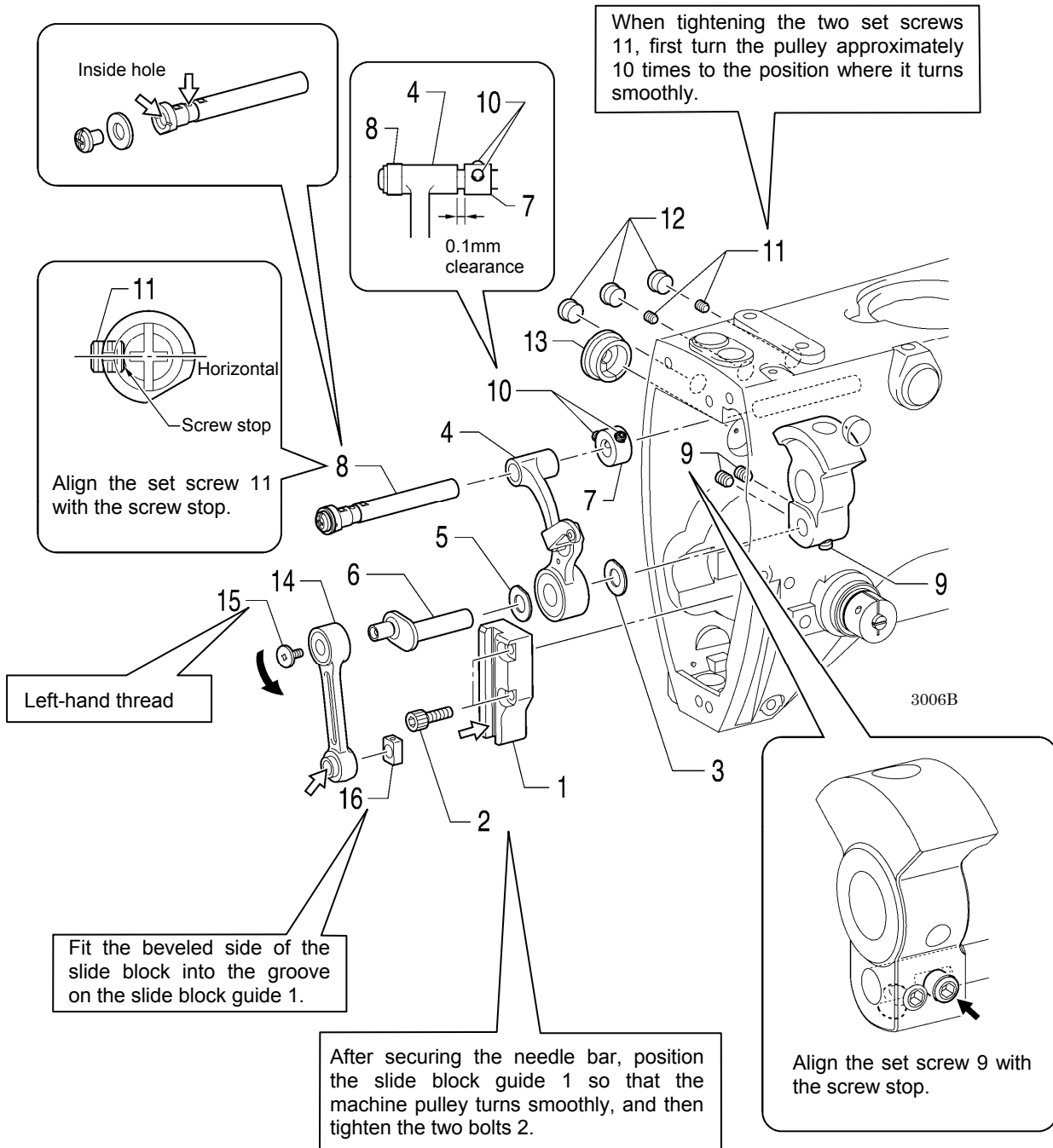
**E**

2893B

- 1) Apply grease to the rock gear shaft assembly (2).
- 2) Tighten the two set screws 19 so that there are gaps of 0.2 mm at both the front and rear of the crank rod assembly 2.

### 10-9. Needle bar mechanism

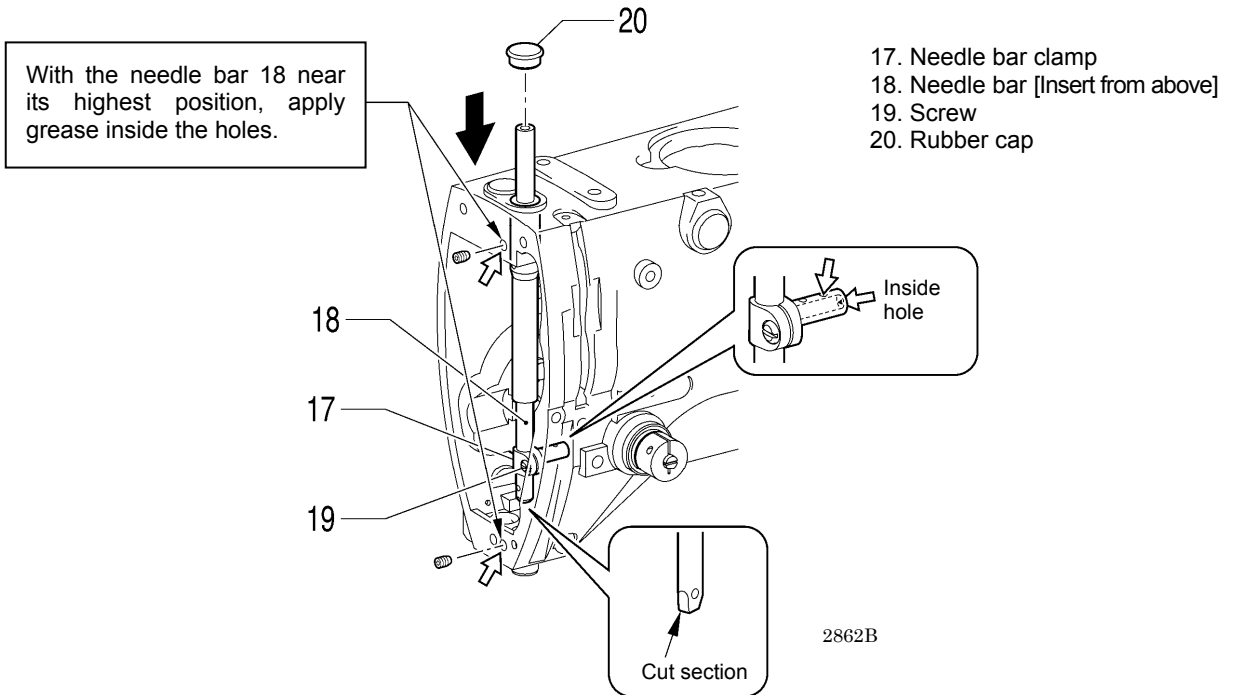
Apply grease <GREASE BZL-300P> specified by Brother to the portions indicated by the white arrows.



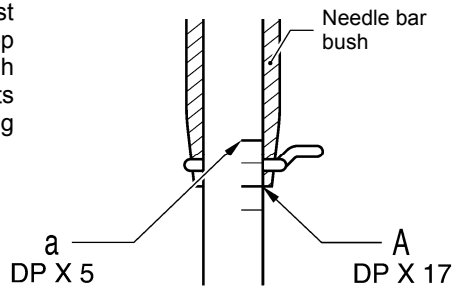
- 1. Slide block guide
- 2. Bolts [2 pcs: Temporarily tighten]
- 3. Washer
- 4. Thread take-up lever assembly
- 5. Washer
- 6. Needle bar crank
- 7. Set screw collar
- 8. Thread take-up support shaft assembly

- 9. Set screws [3 pcs: Tighten]
- 10. Set screws [2 pcs: Tighten]
- 11. Set screws [2 pcs: Tighten]
- 12. Rubber caps [3 pcs]
- 13. Rubber cap
- 14. Needle bar connecting rod assembly
- 15. Screw [Tighten]
- 16. Slide block

(Continued on next page.)



Align the needle bar 18 so that reference line A (the second lowest reference line on the needle bar 18) or reference line a (top reference line) is aligned with the lower edge of the needle bar bush when the machine pulley is turned to lower the needle bar 18 to its lowest position, and then set the cut section so that it is facing forward and tighten the screw 19.

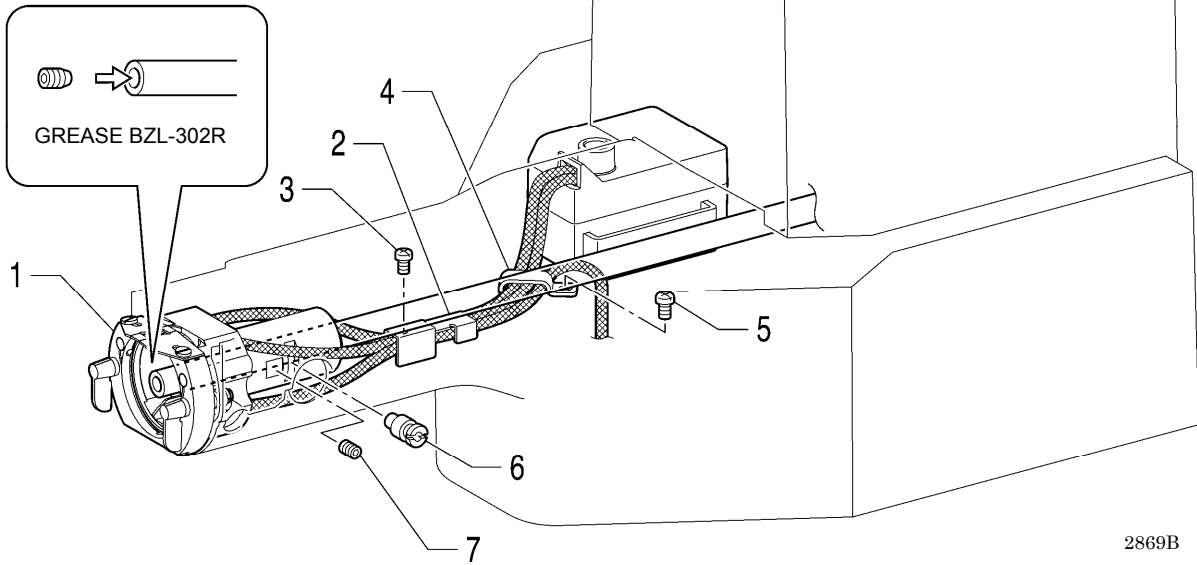
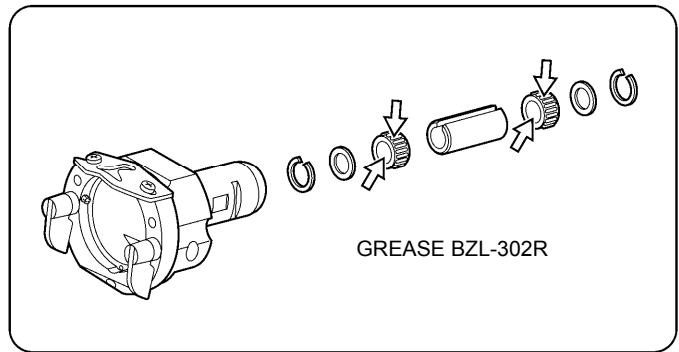


4647Q

## 10-10. Lower shaft mechanism

Apply grease < GREASE BZL-300P > or < GREASE BZL-302R > specified by Brother to the portions indicated by the white arrows.

1. Shuttle race base assembly
2. Oil tube support
3. Screw
4. Cord holder U3
5. Screw
6. Adjusting stud
7. Set Screw [Tighten]

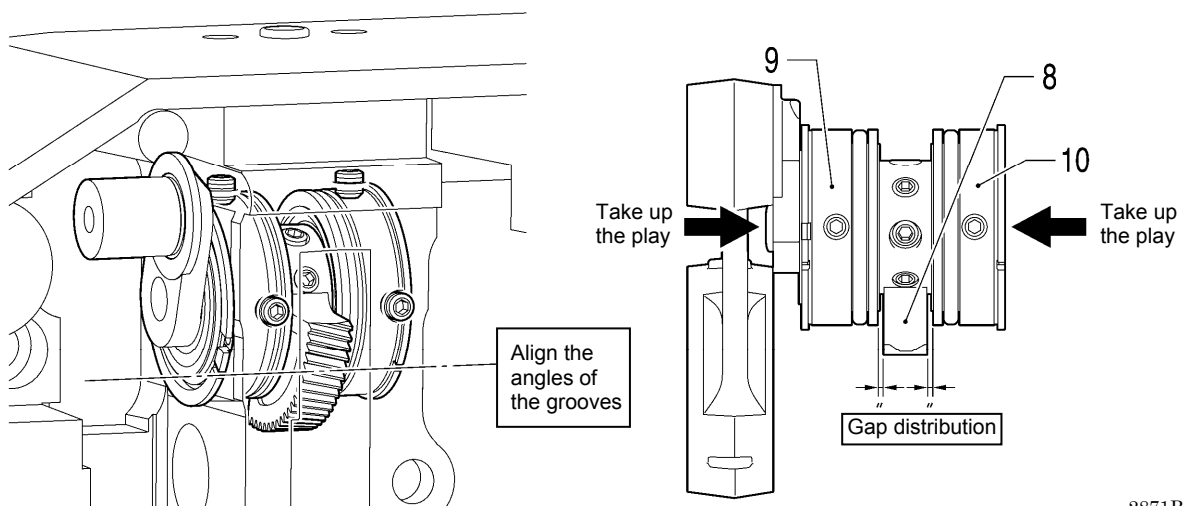
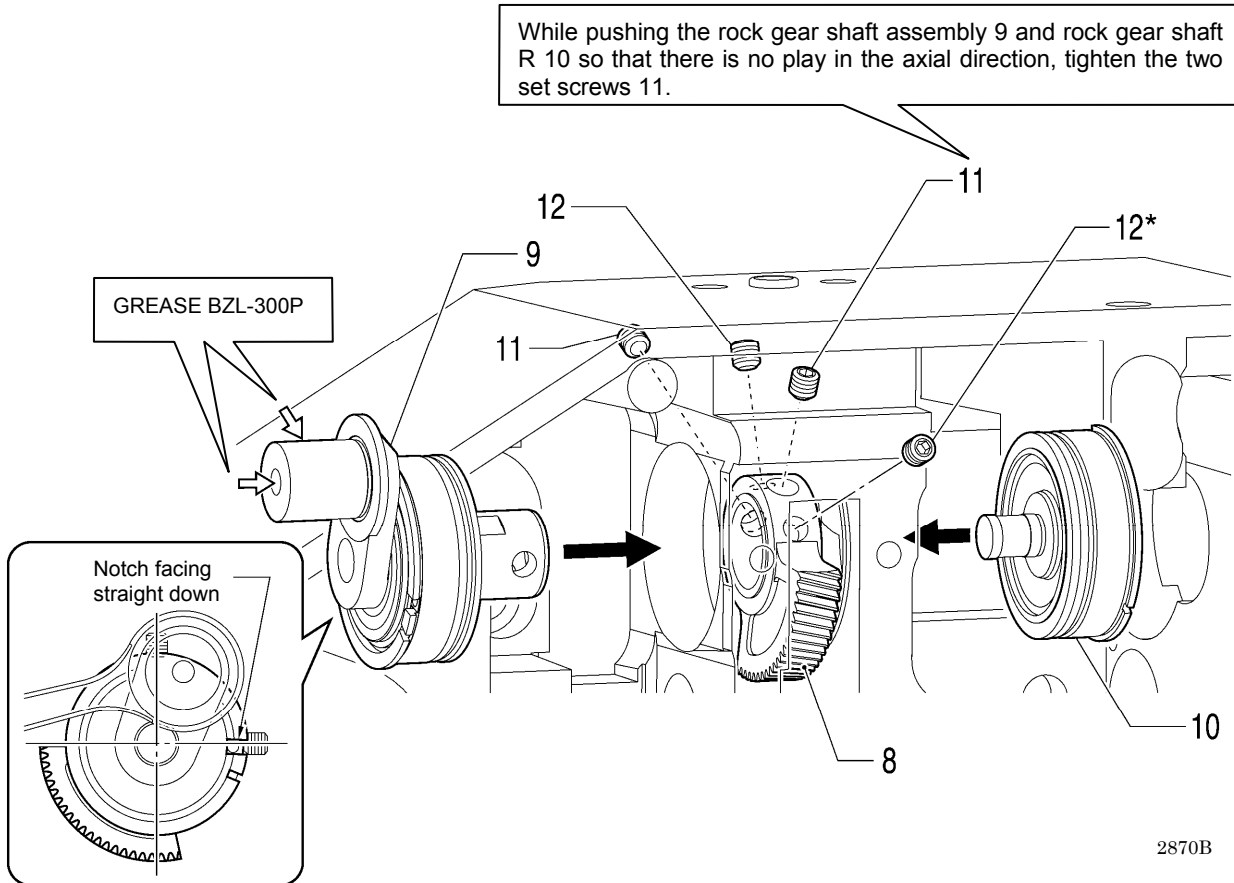


2869B

(Continued on next page.)

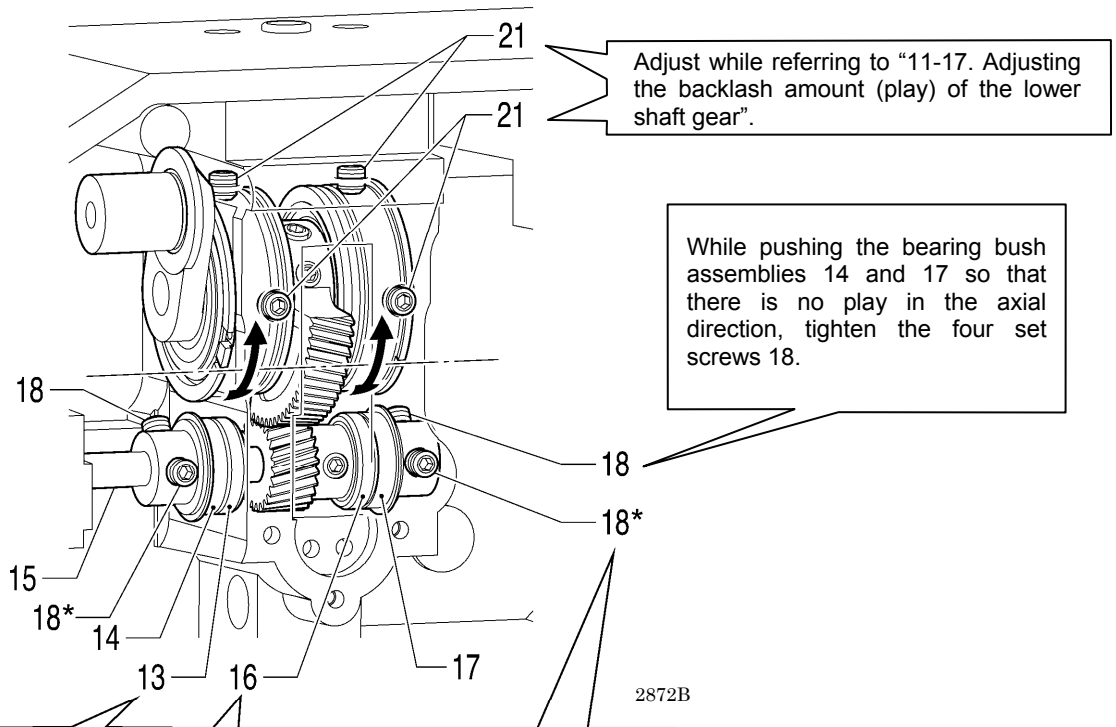


\* Set screws marked with \* in the illustration are on the screw stop side.



- 8. Rock gear
- 9. Rock gear shaft assembly
- 10. Rock gear shaft R
- 11. Set screws [2 pcs: Tighten]
- 12. Set screws [2 pcs: Tighten]

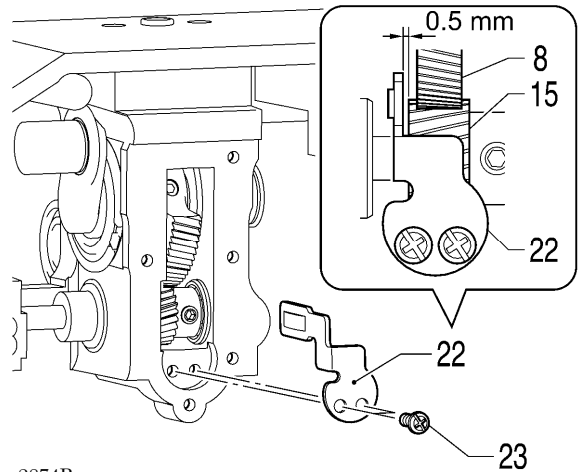
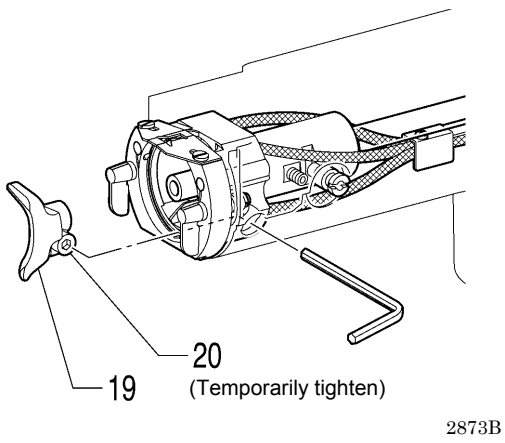
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**Gap distribution**

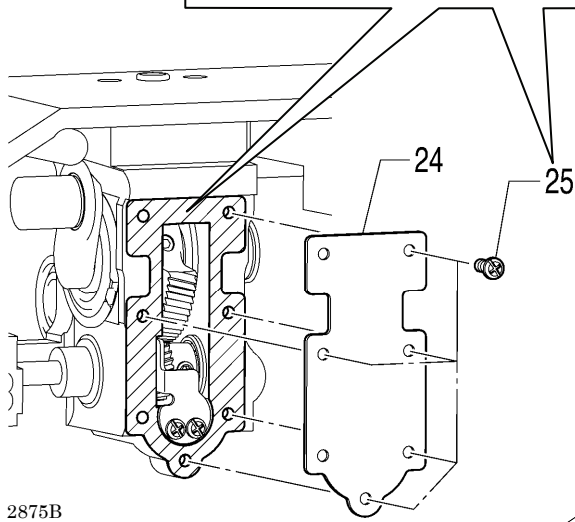
13. Oil seal  
 14. Bearing bush assembly  
 15. Lower shaft assembly  
 16. Rubber seal L  
 17. Bearing bush assembly  
 18. Set screws [4 pcs: Tighten]  
 19. Driver  
 20. Bolt [Temporarily tighten]  
 21. Set screws [4 pcs]  
 22. Positioning plate  
 23. Screws [4 pcs]

- 1) The oil seal 13 and rubber seal L 16 cannot be reused, so have new parts ready for use.
- 2) Make sure that the installation directions for the oil seal 13 and rubber seal L 16 are correct.
- 3) Apply grease (BZL-500 grease) to the outer circumferences of the oil seal 13 and rubber seal L 16 when inserting the oil seal 13 and rubber seal L 16 into the holes in the bed.



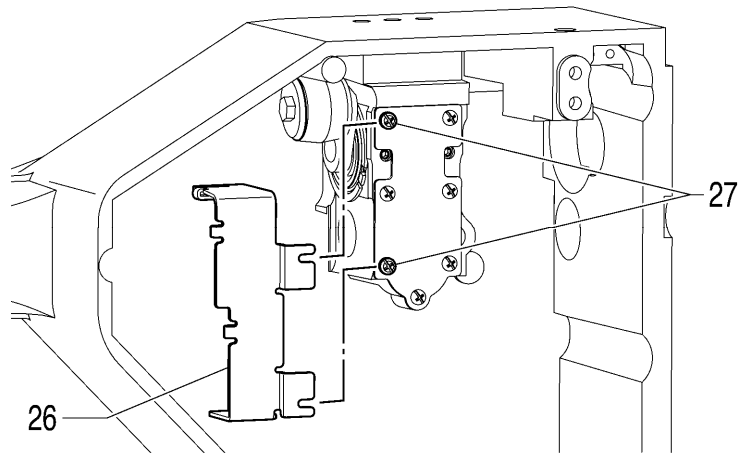
(Continued on next page.)

After applying sealant (Threebond 1215) to the shaded area, install the gear cover 24 by tightening the five screws 25 at a torque of 1 Nm.



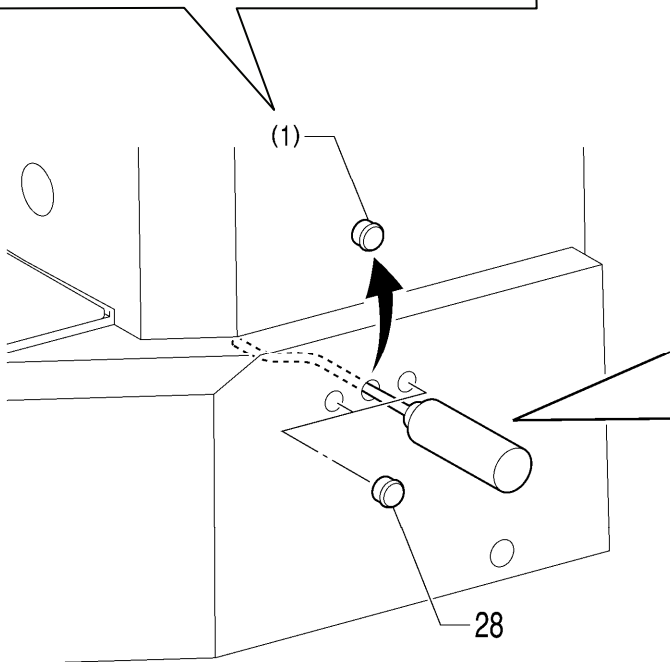
2875B

- 24. Gear cover
  - 25. Screws [5 pcs]
  - 26. Grease support F
  - 27. Screws [2 pcs]
  - 28. Rubber caps [2 pcs]
- (1) Rubber cap



2876B

Remove the rubber cap (1) and apply grease, and then reinstall the rubber cap (1).



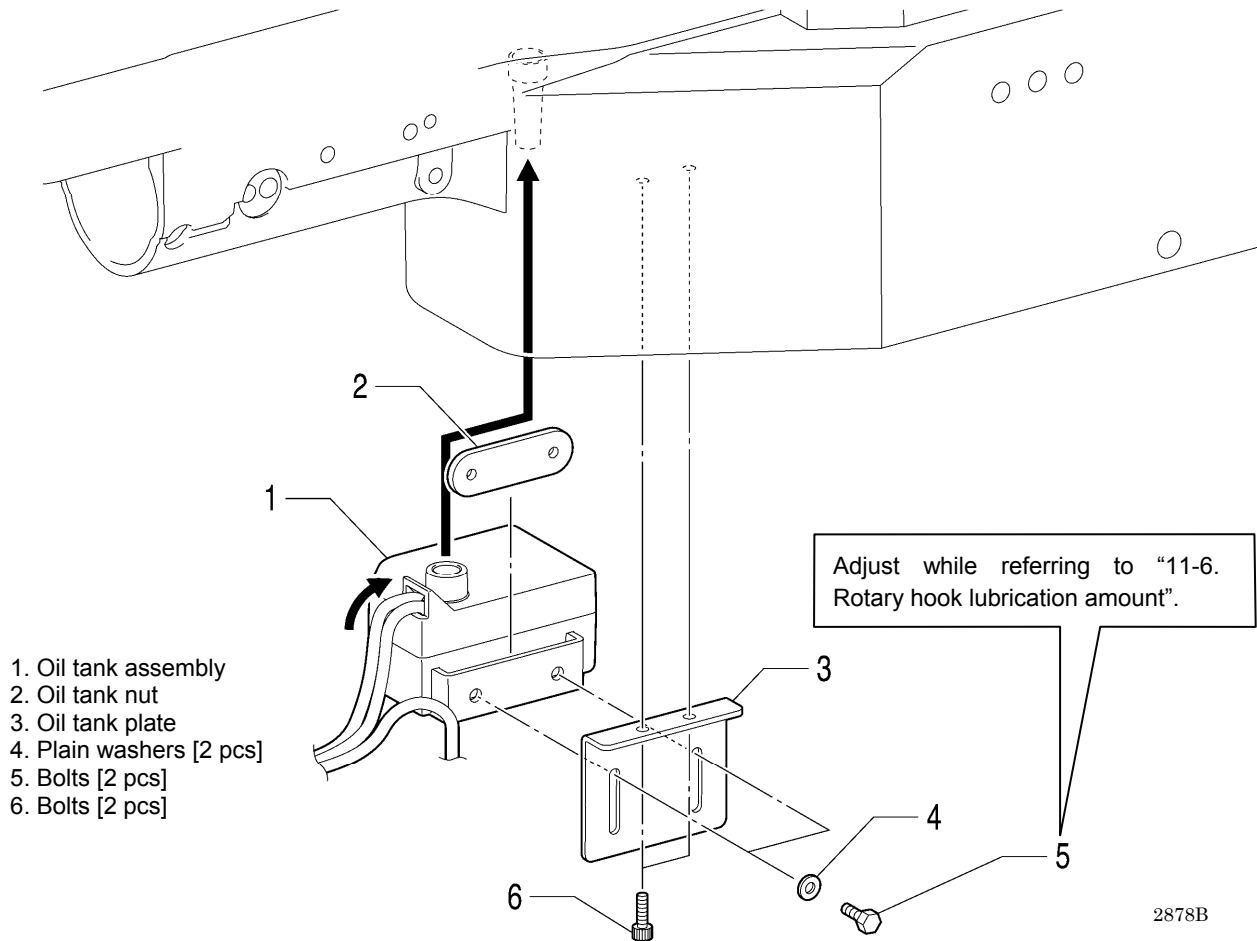
- 1) Turn the pulley to set the needle bar to near its lowest position.
- 2) Insert the grease nozzle (3) into the gear box as far as the lower shaft gear (2), and apply 16g of grease (BZL-500 grease).

16g of grease

Insert as far as this

2877B

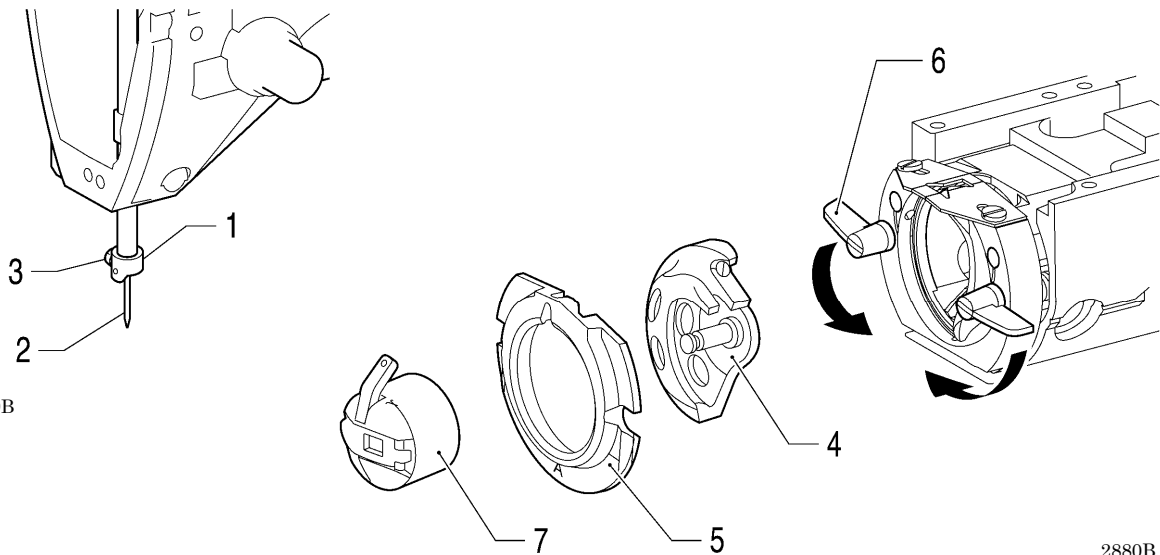
### 10-11. Lubrication



- 1. Oil tank assembly
- 2. Oil tank nut
- 3. Oil tank plate
- 4. Plain washers [2 pcs]
- 5. Bolts [2 pcs]
- 6. Bolts [2 pcs]

2878B

### 10-12. Shuttle hook mechanism



2879B

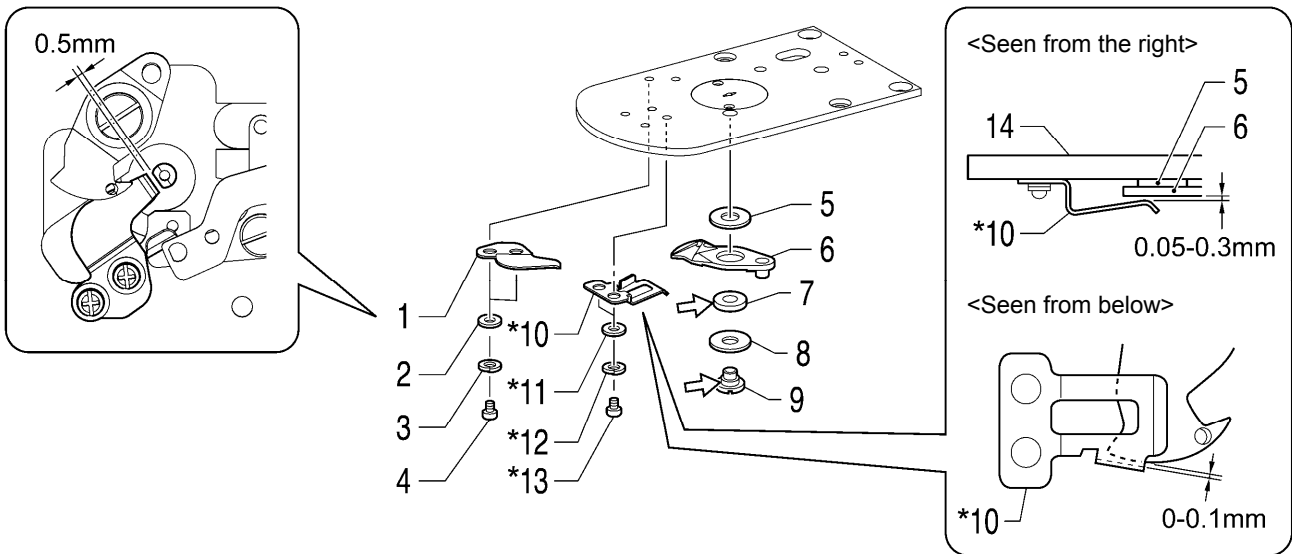
2880B

- 1. Needle bar thread guide
- 2. Needle
- 3. Set screw
- 4. Shuttle hook
- 5. Shuttle race base
- 6. Shuttle race base setting claw [Close]
- 7. Bobbin case assembly

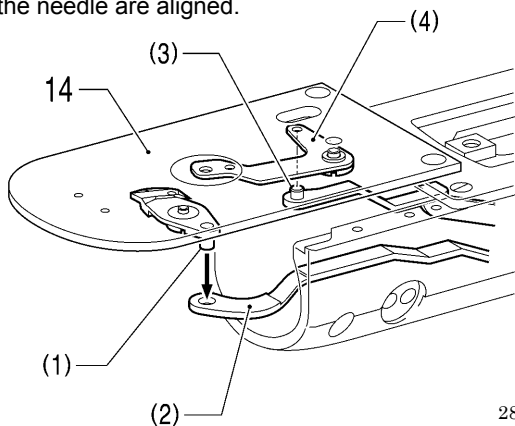
After installing the shuttle hook 4, carry out the adjustments in "11-3. Adjusting the needle bar lift amount and the driver needle guard" and "11-4. Adjusting the needle clearance".

### 10-13. Thread trimmer mechanism (2)

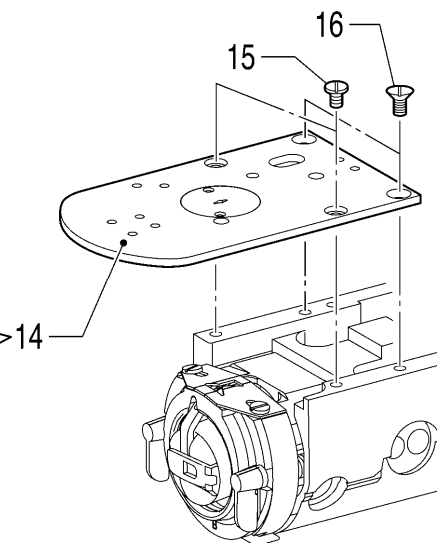
Apply grease to the portions indicated by the white arrows.



- 1) Apply grease to the pin (1) of the movable knife, and then insert it into the hole in the movable knife connecting plate (2), and then while inserting the pin (3) of TN-connecting plate assembly F into the hole in the thread nipper D assembly (4), install the needle plate 14.
- 2) Check that the center of the needle hole and the tip of the needle are aligned.



2883B



2881B

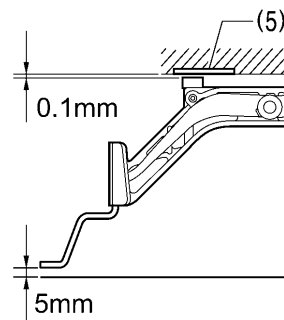
2882B

- |                           |   |
|---------------------------|---|
| 1. Fixed knife            | 9. Movable knife shoulder screw                 |
| 2. Plain washers [2 pcs]  | * 10. Bobbin thread clamp spring [KE-430F only] |
| 3. Spring washers [2 pcs] | * 11. Plain washers [2 pcs] [KE-430F only]      |
| 4. Screws [2 pcs]         | * 12. Spring washers [2 pcs] [KE-430F only]     |
| 5. Movable knife spacer   | * 13. Screws [2 pcs] [KE-430F only]             |
| 6. Movable knife assembly | 14. Needle plate                                |
| 7. Movable knife collar   | 15. Screws [2 pcs]                              |
| 8. Thrust collar          | 16. Flat screws [2 pcs]                         |

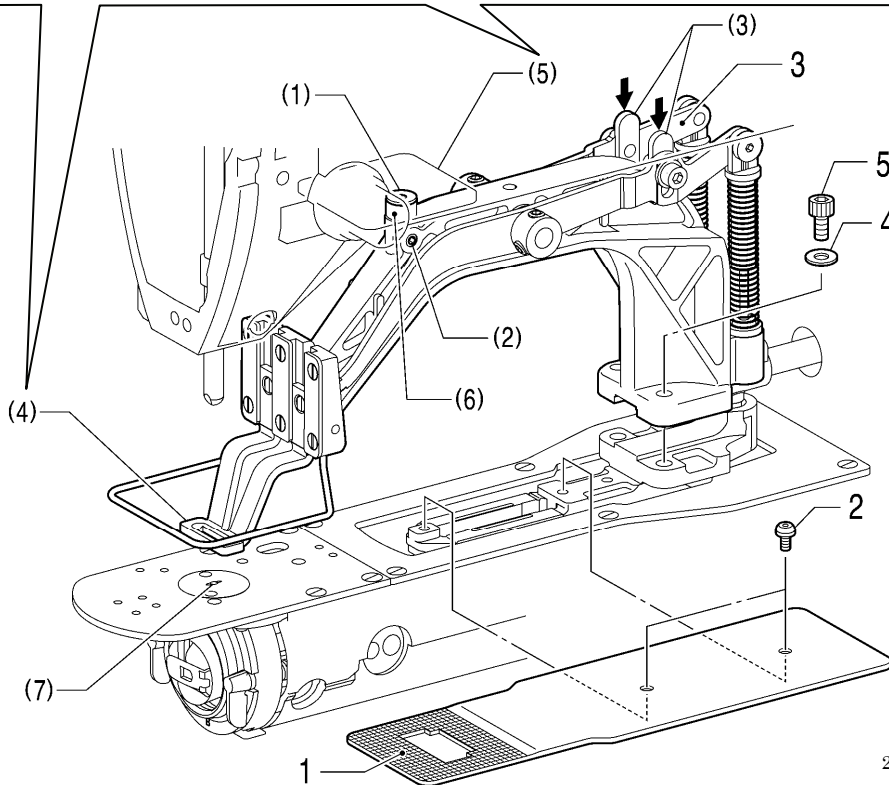
For the BE-438F, parts marked with \* are supplied as accessories. Install them if necessary.

### 10-14. Work clamp arm mechanism (KE-430F)

Push the work clamp arm lever plate (3) in the direction of the arrow to raise the work clamp (4) by about 5 mm, set so that there is a clearance of 0.1 mm between the underside of the work clamp arm support plate (5) and the slider (1), and then secure the slider (1) of the work clamp support shaft (6) with the set screw (2).



2885B



- 1. Feed plate
- 2. Screws [2 pcs]
- 3. Work clamp arm assembly
- 4. Plain washers [2 pcs]
- 5. Bolts [2 pcs]

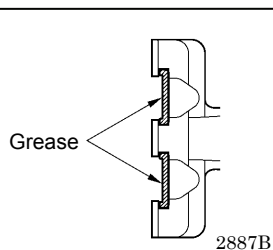
- (1) Slider
- (2) Set screw
- (3) Work clamp arm lever plate
- (4) Work clamp
- (5) Work clamp arm support plate
- (6) Support shaft
- (7) Needle hole

2884B

After installing, carry out test feeding and check that the needle hole (7) is not inside the work clamp (4) and the frame of the feed plate 1. If the needle hole (7) is inside the frame, adjust the position of the work clamp arm assembly 3 and the feed plate.

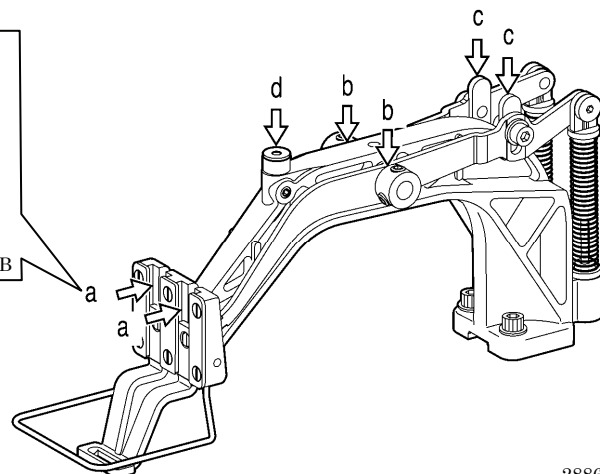
#### Apply grease to all sliding parts during assembly.

It is recommended that you use commercially-available SHIN NISSEKI Power Knock WB2 as the grease to be applied to the sliding part of the work clamp.



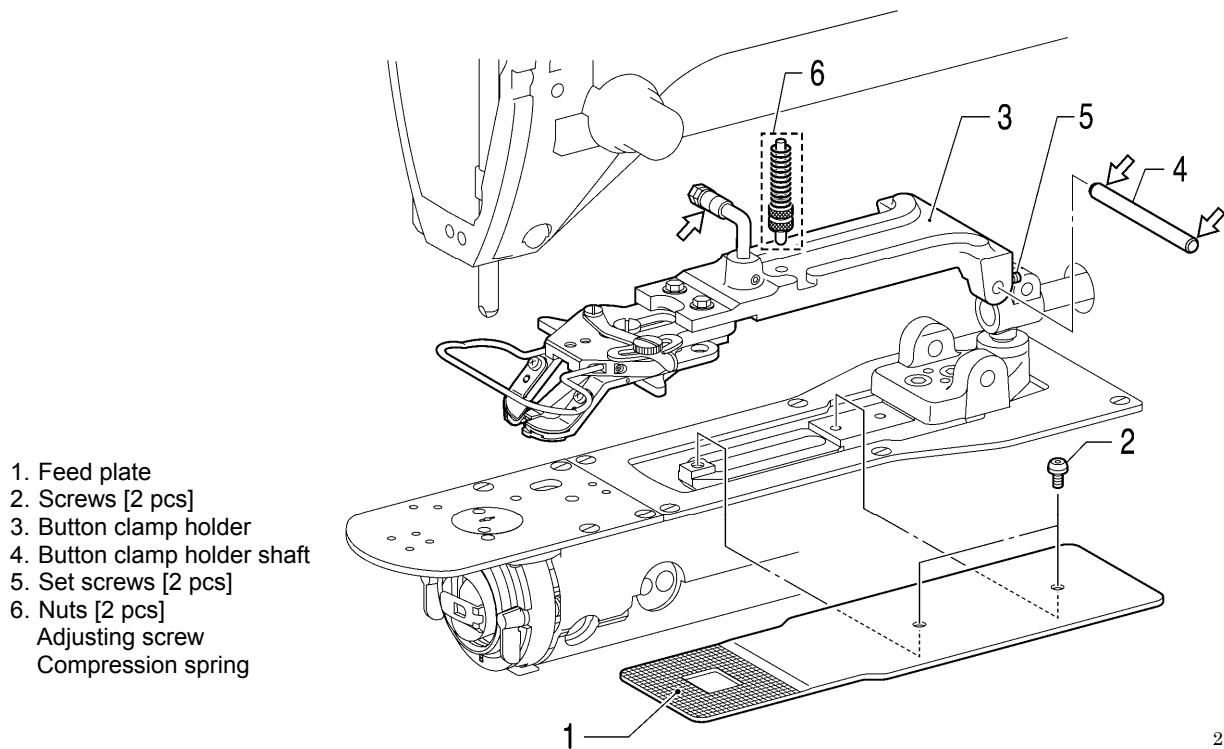
2887B

- a. Sliding portion of the work clamp (Apply small amount of grease.)
- b. Sliding portion of the work clamp arm lever shaft and the work clamp arm levers R and L
- c. Round portion of the work clamp arm lever plate
- d. Slider of work clamp support shaft



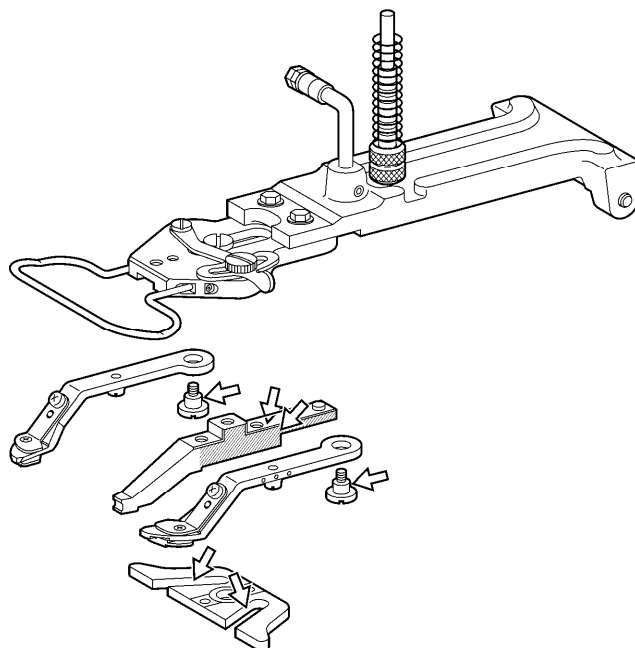
2886B

## 10-15. Work clamp arm mechanism (BE-438F)

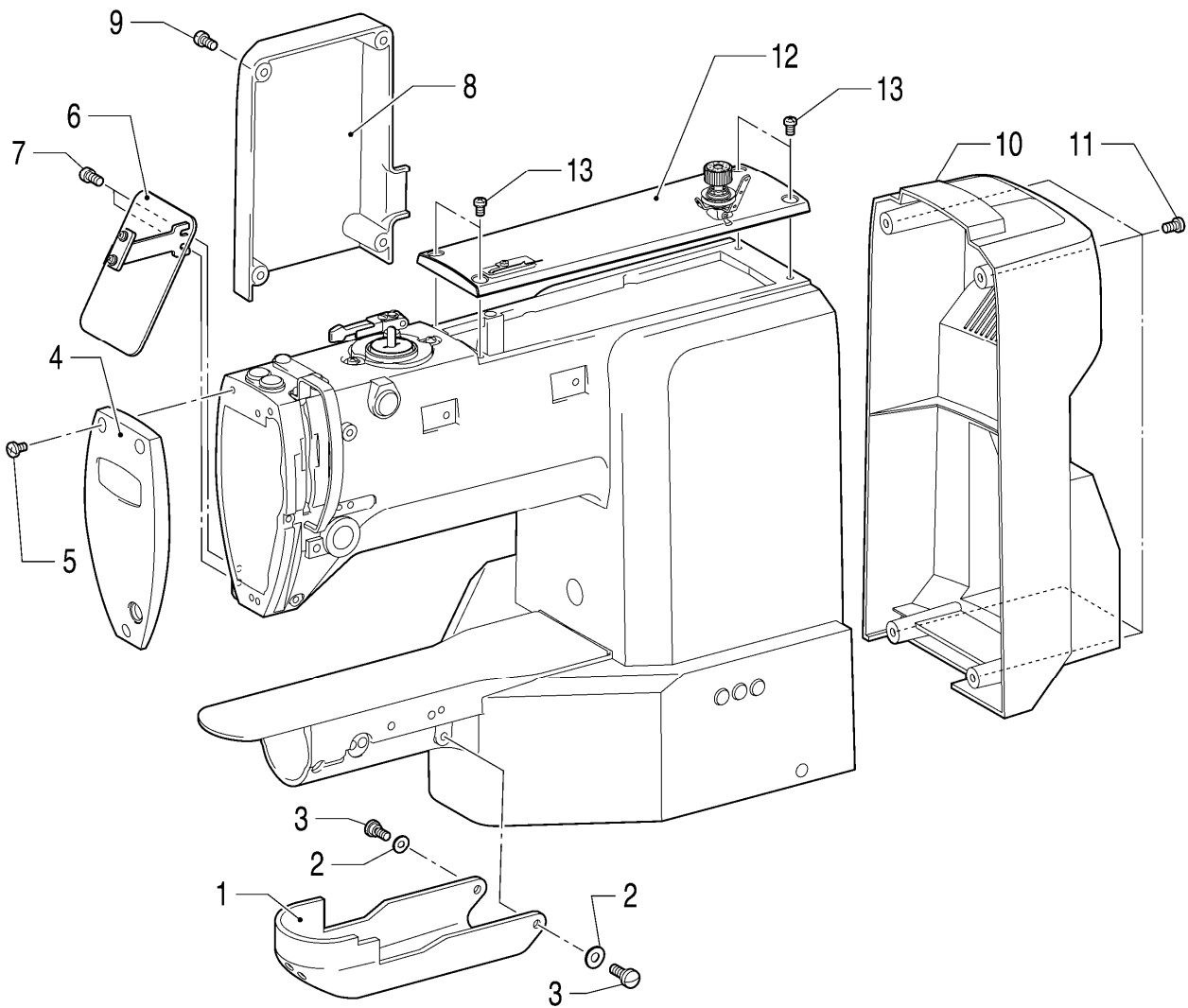


After installing, check that the needle passes into the button hole without touching the button. (Refer to "11-13. Adjusting the position of the button clamp (BE-438F)".)

Apply grease to the portions indicated by the arrows during assembly.



10-16. Covers









2890B

- |                                 |                    |
|---------------------------------|--------------------|
| 1. Shuttle race cover assembly  | 8. Side cover      |
| 2. Washer, wave spring [2 pcs]  | 9. Screws [4 pcs]  |
| 3. Shoulder screws, 8-2 [2 pcs] | 10. Rear cover     |
| 4. Face plate assembly          | 11. Screws [4 pcs] |
| 5. Screws [3 pcs]               | 12. Top cover      |
| 6. Eye guard assembly           | 13. Screws [4 pcs] |
| 7. Bolts [2 pcs]                |                    |



# 11. ADJUSTMENT

## CAUTION

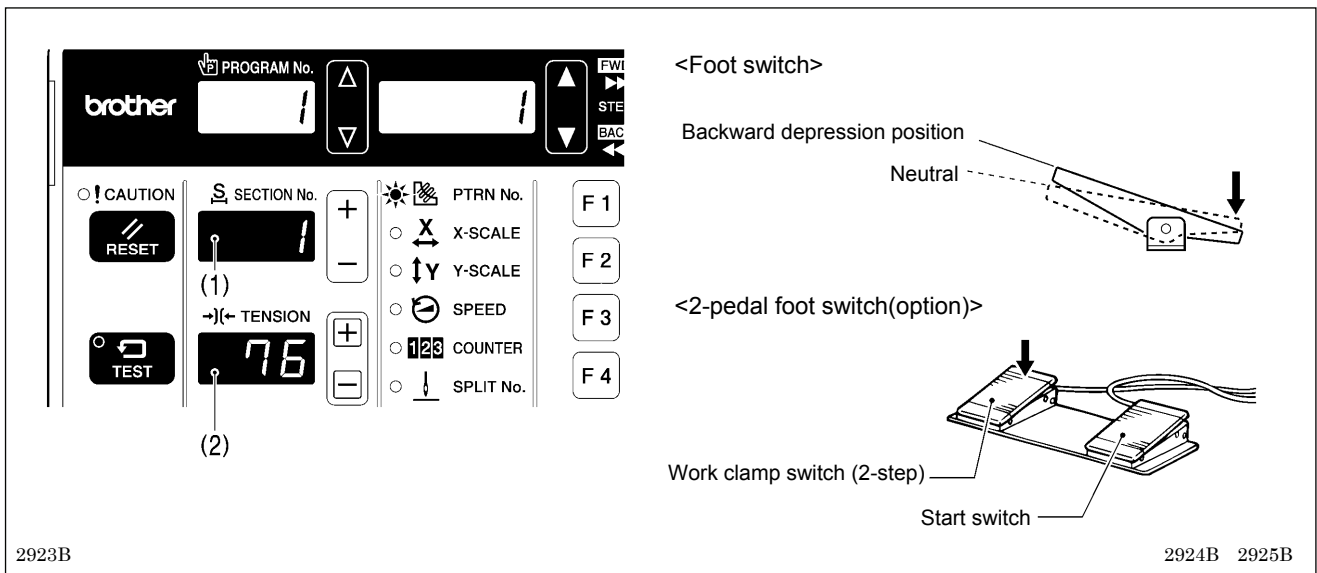
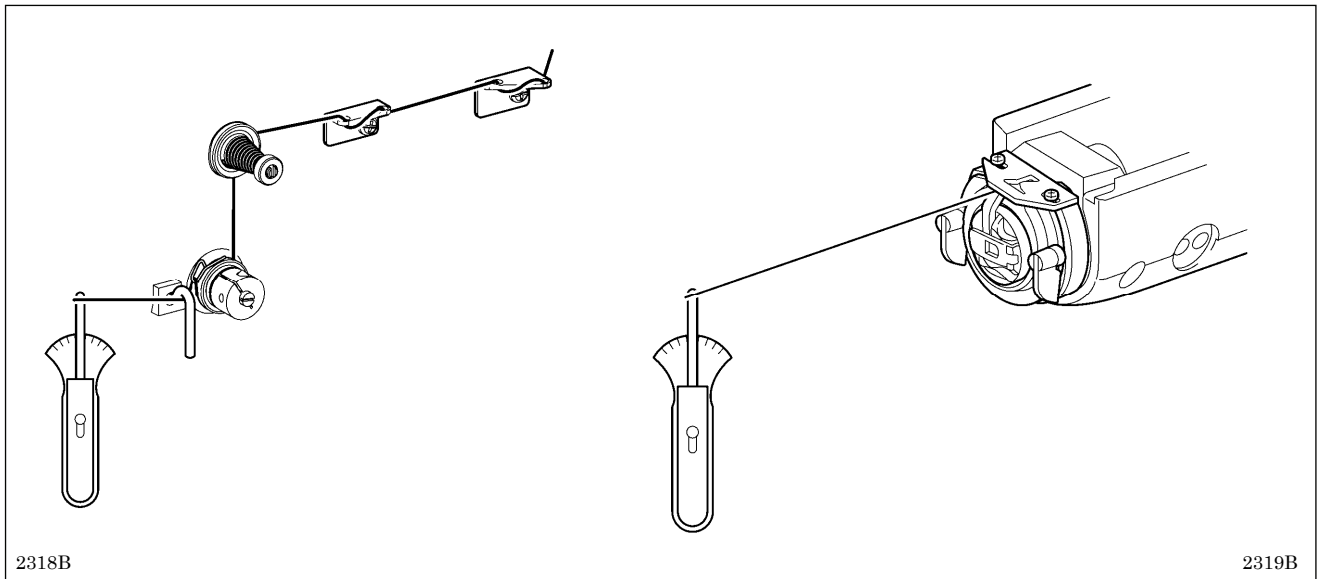
-  Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.
-  Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.
-  Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.
  - When carrying out inspection, adjustment and maintenance
  - When replacing consumable parts such as the rotary hook
-  Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, after tilting back the machine head, do not push the face plate side or the pulley side from above, as this may cause the machine head to topple over, which may result in personal injury or damage to the machine.
-  If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.
-  If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

### 11-1. Standard thread tension

Use	KE-430F				BE-438F
	Medium-weight materials (-03)	Knitted wear (-0K)	Foundation garments (-0F)	Heavy-weight materials (-05)	
Upper thread	#50 or equivalent	#60 or equivalent	#60 or equivalent	#30 or equivalent	#60 or equivalent
Lower thread	#50 or equivalent	#80 or equivalent	#60 or equivalent	#50 or equivalent	#60 or equivalent
Upper thread tension (N) [Tension value]	0.8 - 1.2 [80 - 120]* <sup>1</sup>			1.2 - 1.8 [70 - 130]* <sup>1</sup>	0.5 - 1.2 [50 - 150]* <sup>1</sup>
Lower thread tension (N)	0.2 - 0.3				0.2 - 0.3
Pre-tension (N)	0.05 - 0.3				0.1 - 0.4
Needle	DP x 5 #14	DP x 5 #9	DP x 5KN #11	DP x 17NY #19	DP x 17NY #12

\*1: This is the tension value when the pretension is 0.05 N.

11-1-1. Upper and lower thread tension



<Operating the upper thread tension>

• When using a foot switch

In the sewing standby condition and during test operation standby, the thread tension in the TENSION display (2) which has been set for the section appearing in the SECTION No. display (1) on the operation panel will be output while the foot switch is being depressed backward.

When the foot switch is returned to the neutral position, the thread tension will be released.

\* If the work clamp/button clamp is lowered when the foot switch is returned to the neutral position, the thread tension output will be maintained.

• When using a 2-pedal foot switch (option)

In the sewing standby condition and during test operation standby, the thread tension which has been set in the SECTION No. 1 (sewing start section) will be output while the work clamp/button clamp is lowered (while the work clamp switch is being depressed) regardless of the section which appears in the SECTION No. display (1) on the operation panel.

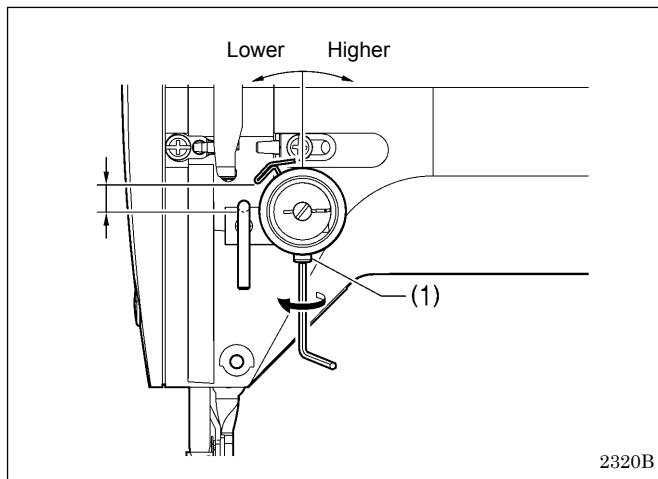
When the work clamp switch is released, the thread tension will be released.

\* If the work clamp/button clamp is lowered when the work clamp switch is released, the thread tension output will be maintained.

\* The above operations are enabled when memory switch No. 072 is set to "1" or "2".

### 11-1-2. Thread take-up spring

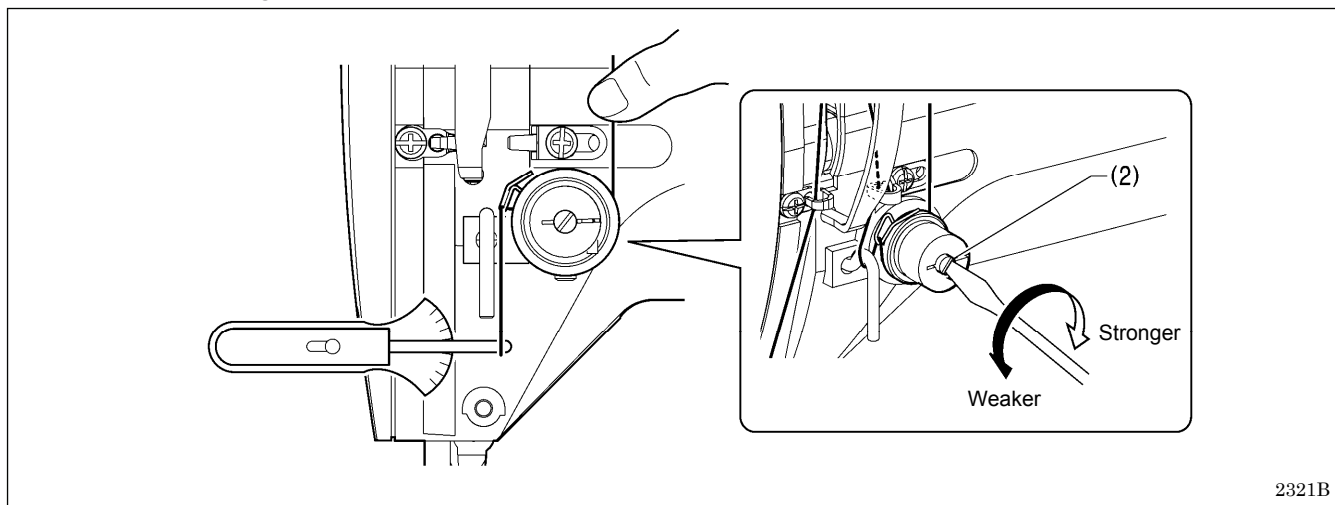
Use	KE-430F				BE-438F
	Medium-weight materials (-03)	Knitted wear (-0K)	Foundation garments (-0F)	Heavy-weight materials (-05)	
Thread take-up spring height (mm)	6 - 11				6 - 11
Thread take-up spring tension (N)	0.2 - 0.4		0.6 - 1.0		0.15 - 0.35



**<Thread take-up spring height>**

Loosen the set screw (1) and turn the tensioner body to adjust the thread take-up spring height.

**<Thread take-up spring tension>**

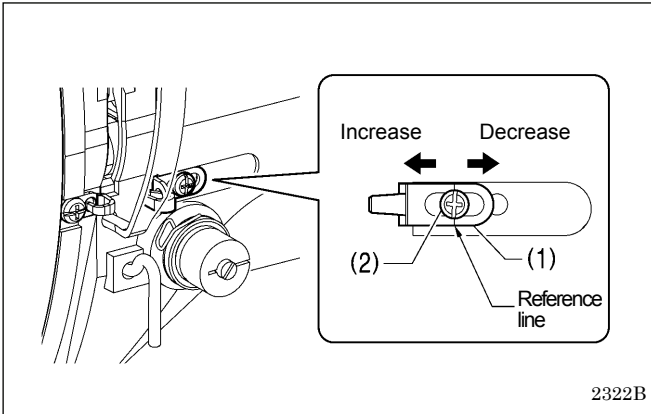


Adjust by turning the shaft (2) with a screwdriver.

**NOTE:**

When the spring height (stroke) is great or the spring tension is insufficient, it may cause the thread end length to vary after thread trimming.

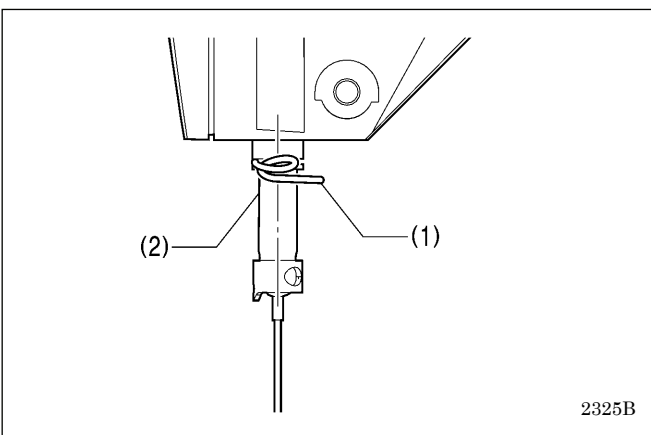
### 11-1-3. Arm thread guide C



The standard position of arm thread guide C (1) is when the screw (2) is aligned with the position of the reference line. To adjust the position, loosen the screw (2) and then move arm thread guide C (1).

- When sewing heavy-weight materials, move arm thread guide C (1) to the left. (The thread take-up amount will increase.)
- When sewing light-weight materials, move arm thread guide C (1) to the right. (The thread take-up amount will decrease.)

### 11-1-4. Needle bar bush thread guide D

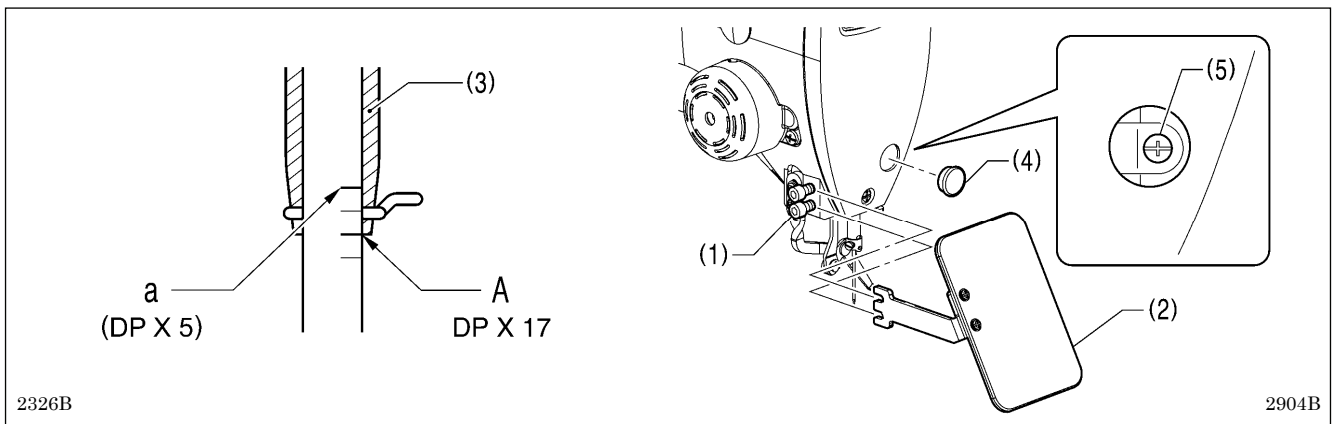


Check that needle bar bush thread guide D (1) is at the middle of the needle bar (2).

**NOTE:**

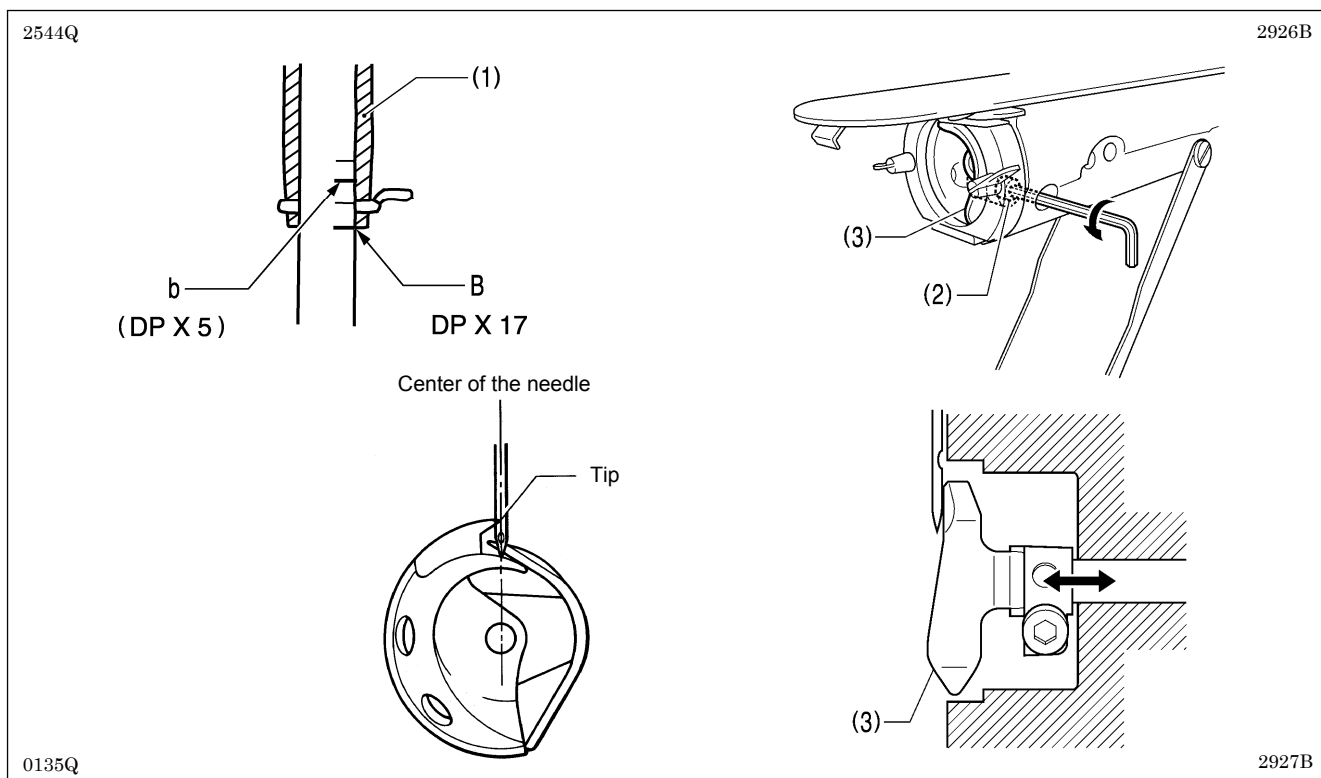
If needle bar bush thread guide D (1) is not in the correct position, the thread may pull out or skipped stitches may occur.

## 11-2. Adjusting the needle bar height



1. Loosen the two bolts (1), and then remove the eye guard assembly (2).
  2. Turn the pulley in the direction of the arrow to move the needle bar to the lowest position. Then remove the rubber cap (4), loosen the screw (5) and then move the needle bar up or down to adjust so that the second reference line from the bottom of the needle bar (reference line A) is aligned with the lower edge of the needle bar bush (3).
- \* If using a DP x 5 needle, use the highest reference line (reference line a).

### 11-3. Adjusting the needle bar lift amount and the driver needle guard



1. Turn the pulley in the direction of the arrow to raise the needle bar from the lowest position until the lowest reference line on the needle bar (reference line B) is aligned with the lower edge of the needle bar bush (1).

\* If using a DP x 5 needle, align with reference line b which is the second reference line from the top.

**NOTE:**

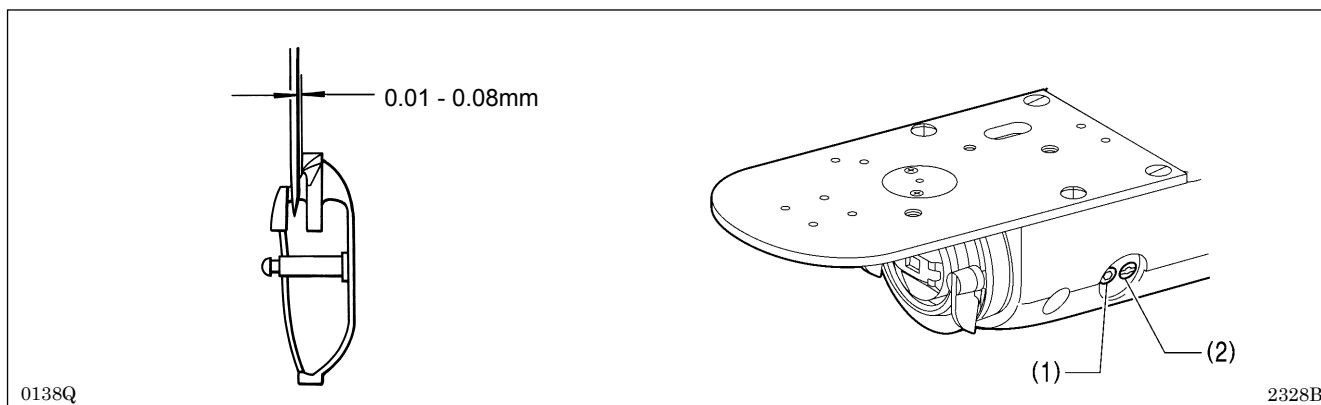
Check that the wiper and the needle do not touch when lowering the needle bar. If the wiper is in a position where it will touch the needle, move the wiper to the right by hand so that it does not touch the needle.

2. Loosen the bolt (2).
3. Move the driver (3) back and forth to adjust so that it is touching the needle when the tip of the rotary hook is aligned with the center of the needle, and then tighten the bolt (2).

**NOTE:**

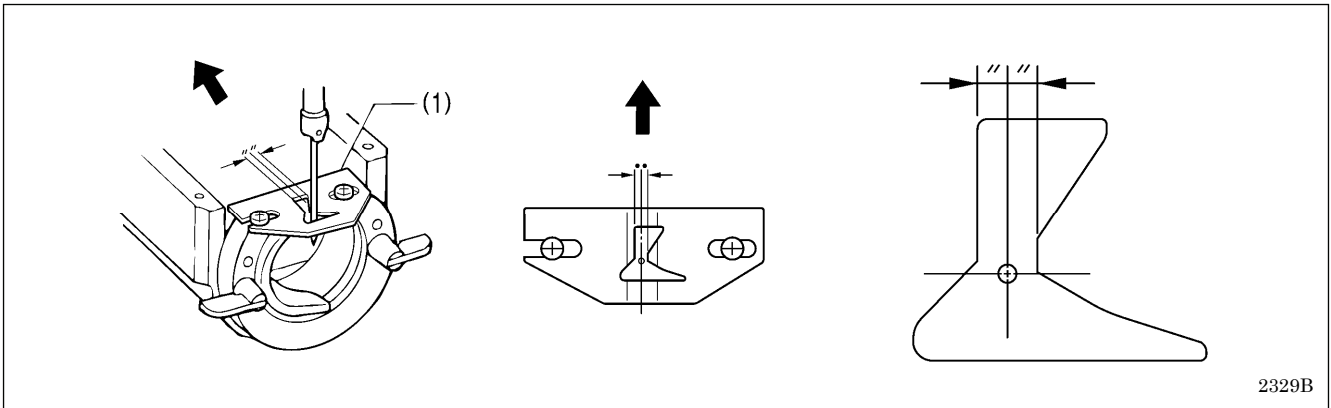
If the needle contact pressure from the driver (3) is too great, skipped stitches may occur. On the other hand, if the driver (3) is not touching the needle, the tip of the inner rotary hook will obstruct the needle, resulting in an excessively high amount of friction.

### 11-4. Adjusting the needle clearance



Turn the pulley in the direction of the arrow to align the tip of the rotary hook with the needle center line. Then loosen the set screw (1) and turn the rotary hook adjustment shaft (2) to adjust so that the clearance between the tip of the needle and the rotary hook is 0.01 to 0.08 mm.

### 11-5. Adjusting the shuttle race thread guide

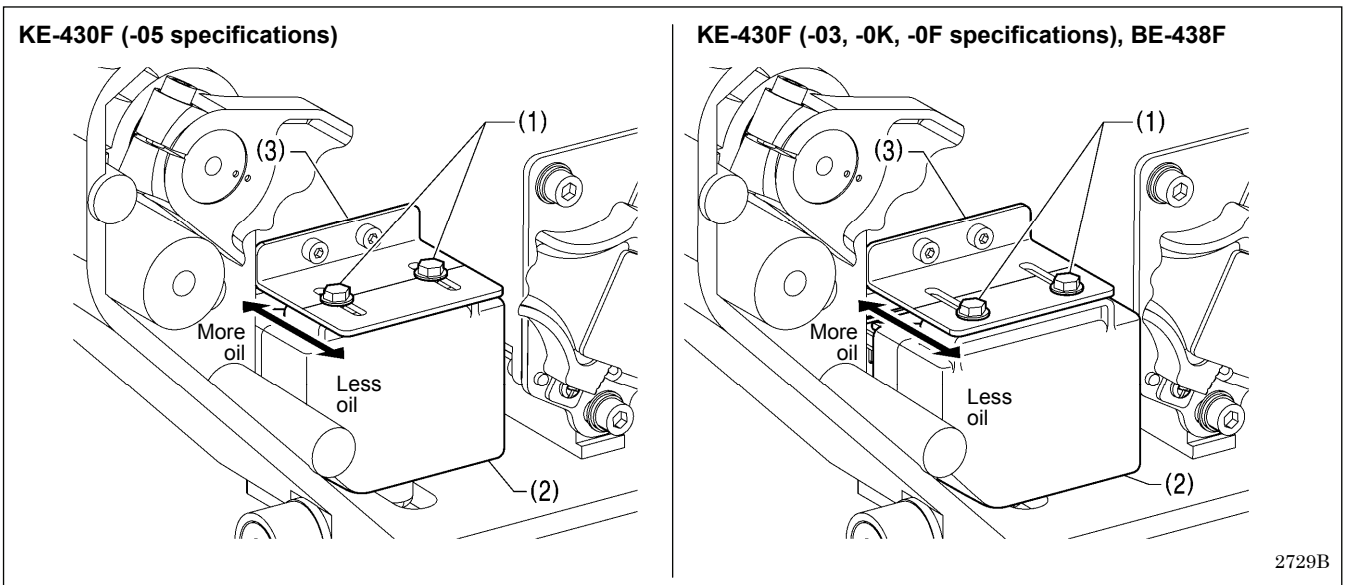


Install the shuttle race thread guide (1) by pushing it in the direction of the arrow so that the needle groove is aligned with the center of the needle plate hole.

**NOTE:**

If the shuttle race thread guide is in the wrong position, thread breakages, soiled thread or thread entanglements may occur.  
The position of the shuttle race thread guide is adjusted at the time of shipment from the factory. It should not be changed if at all possible.

### 11-6. Rotary hook lubrication amount



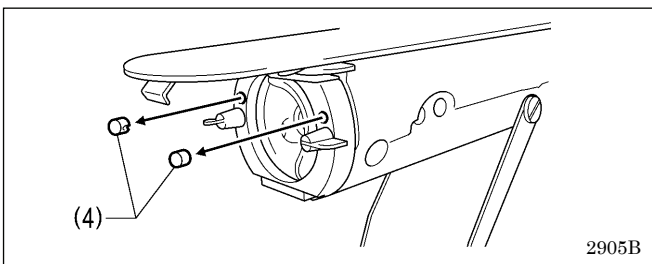
1. Tilt back the machine head.
2. Loosen the two bolts (1), and then adjust by moving the oil tank assembly (2) up or down.

**KE-430F (-05 specifications)**

The standard position is when the centers of the two bolts (1) are aligned with the reference line on the oil tank plate (3).

**KE-430F (-03, -0K, -0F specifications), BE-438F**

The standard position is when the oil tank assembly (2) is as far forward as possible as shown in the illustration.

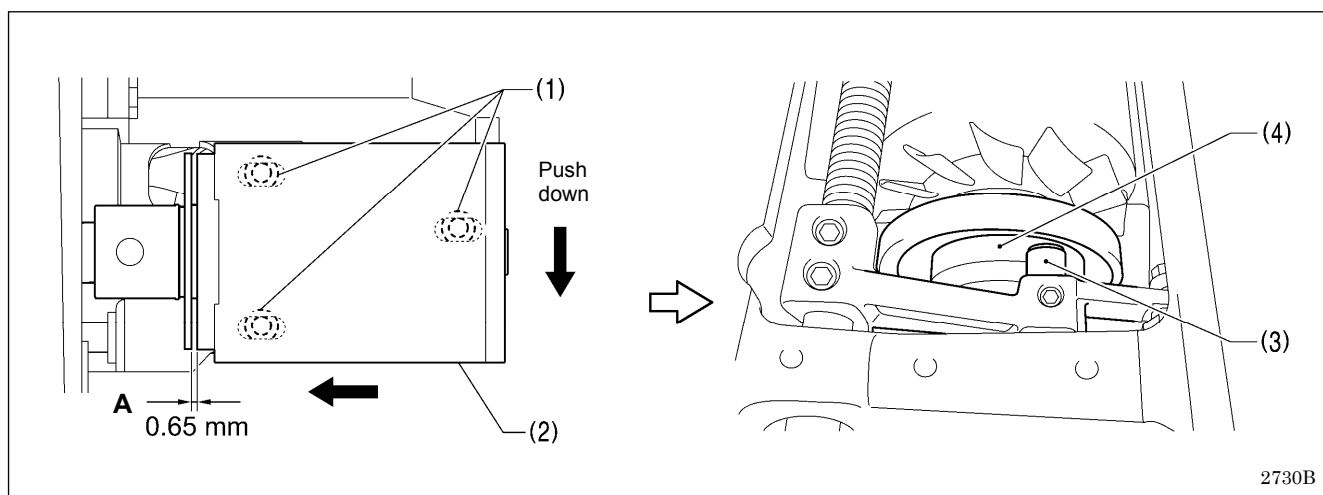


**<If you would like to increase the lubrication amount further>**

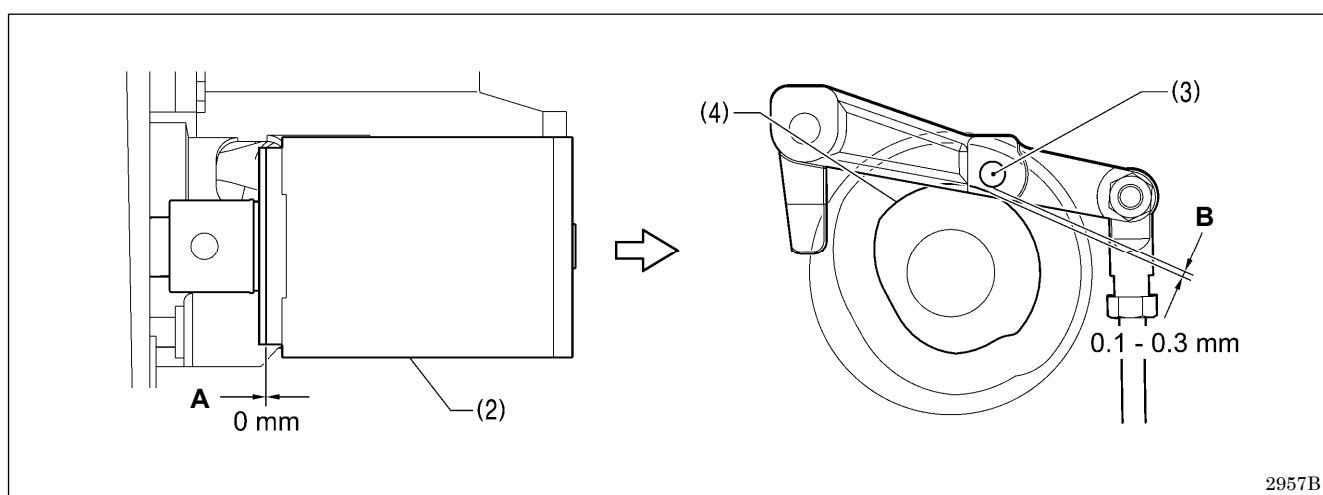
Remove the two rubber caps 5.5 (4).

\* Keep the two rubber caps 5.5 (4) safely so that they do not get lost.

## 11-7. Adjusting the thread trimming

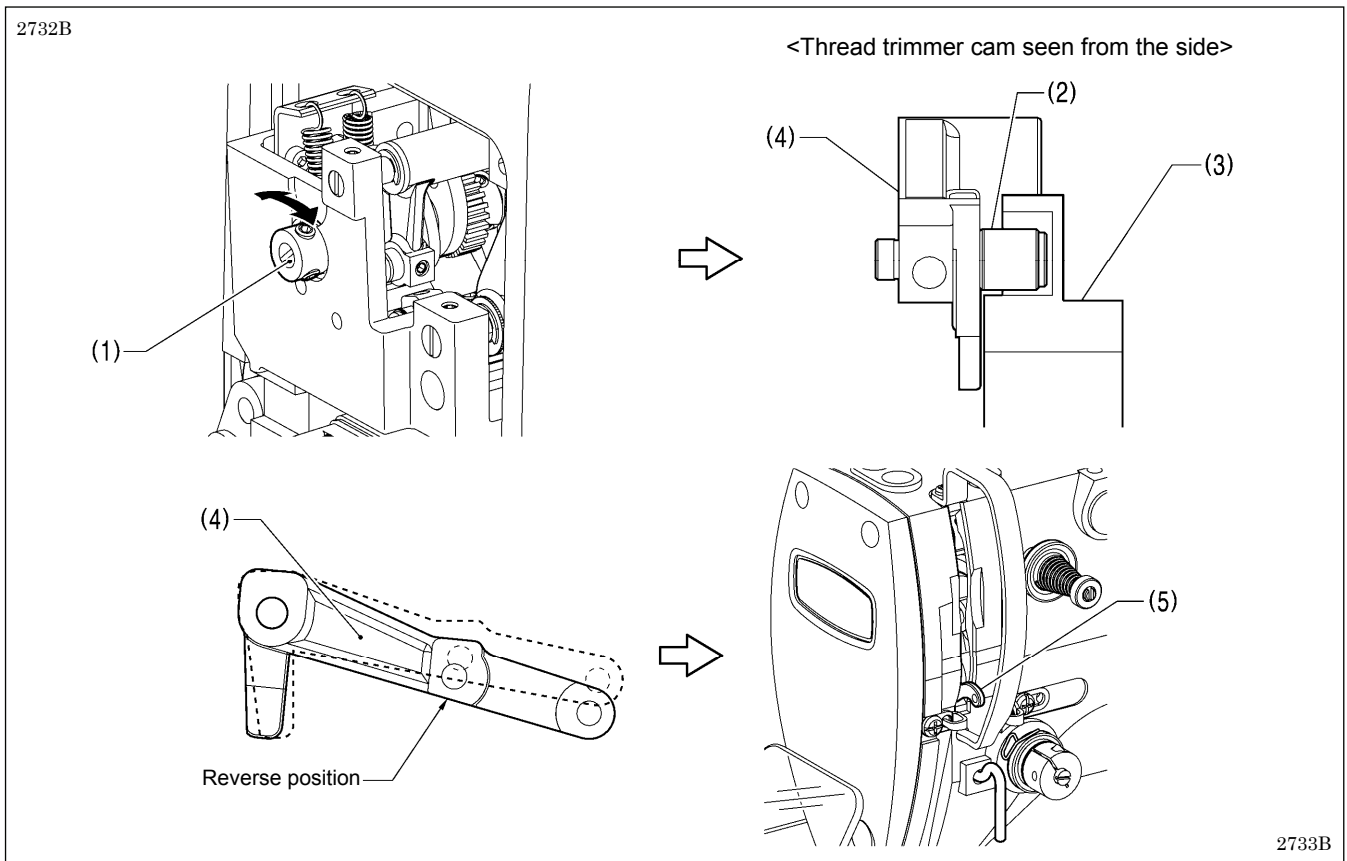


1. Remove the top cover, side cover and rear cover.
2. Turn the pulley in the direction of the arrow to move the needle bar to its lowest position.
3. Loosen the three bolts (1), and then set the clearance (section A) between the rubber and the plunger to 0.65 mm. While holding them in this position, move the thread trimmer solenoid assembly (2) back and forth.
4. Set the thread trimmer collar (3) so that it is touching against the outside of the thread trimmer cam (4), and then while pushing the thread trimmer solenoid assembly (2) down, tighten the three bolts (1).
5. Install the top cover, side cover and rear cover.

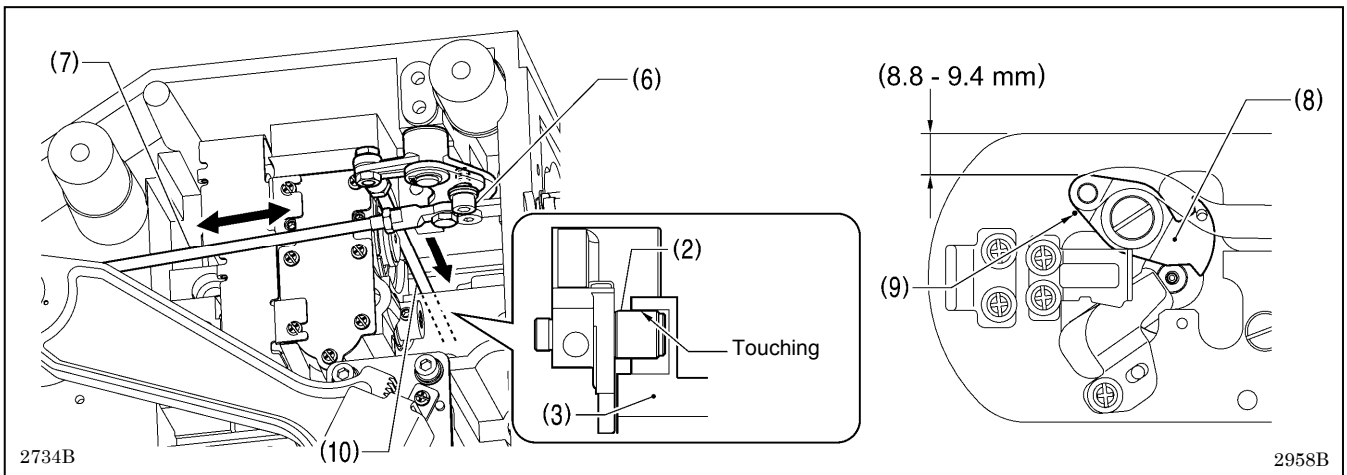


\* Set so that the clearance (section A) is 0 mm, and then check that there is a clearance of 0.1 to 0.3 mm between the thread trimmer collar (3) and the outside of the thread trimmer cam (4) (section B).

### 11-8. Adjusting the position of the movable knife



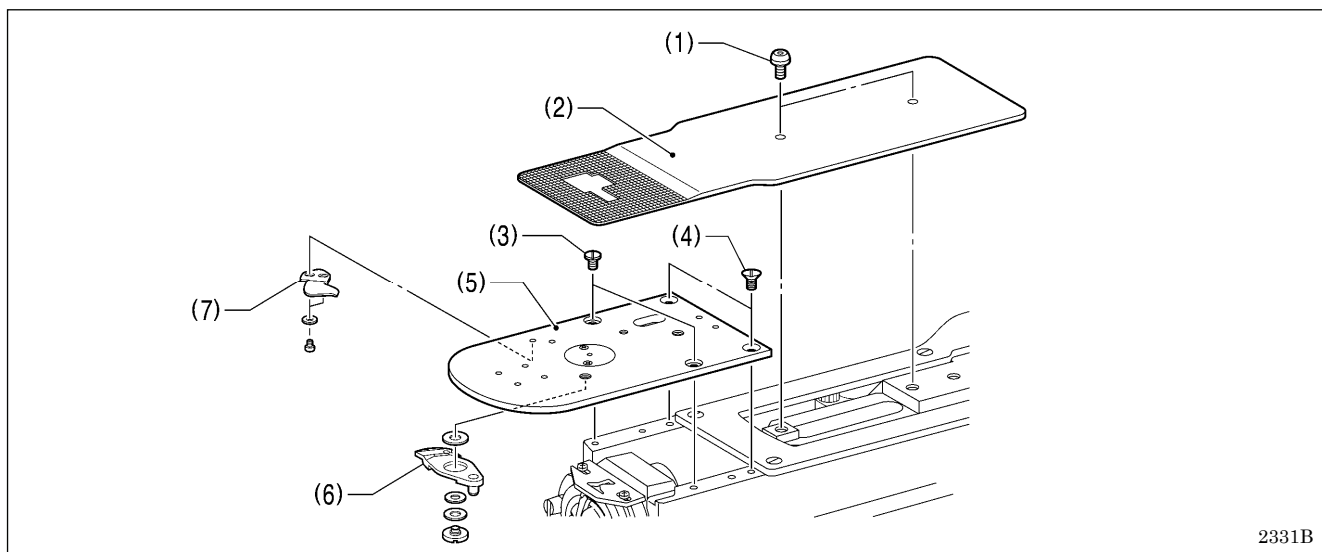
1. Remove the top cover and the side cover.
2. Turn the pulley by hand in the direction of the arrow to move the needle bar to its lowest position, and then turn the cam shaft (1) so that the thread trimmer collar (2) goes into the groove in the thread trimmer cam (3).
3. Tilt back the machine head.
4. With the thread trimmer collar (2) inserted into the groove of the thread trimmer cam (3), turn the pulley by hand in the direction of the arrow to set the thread trimmer driving lever (4) to the reverse position (when the thread take-up (5) is close to its lowest position).



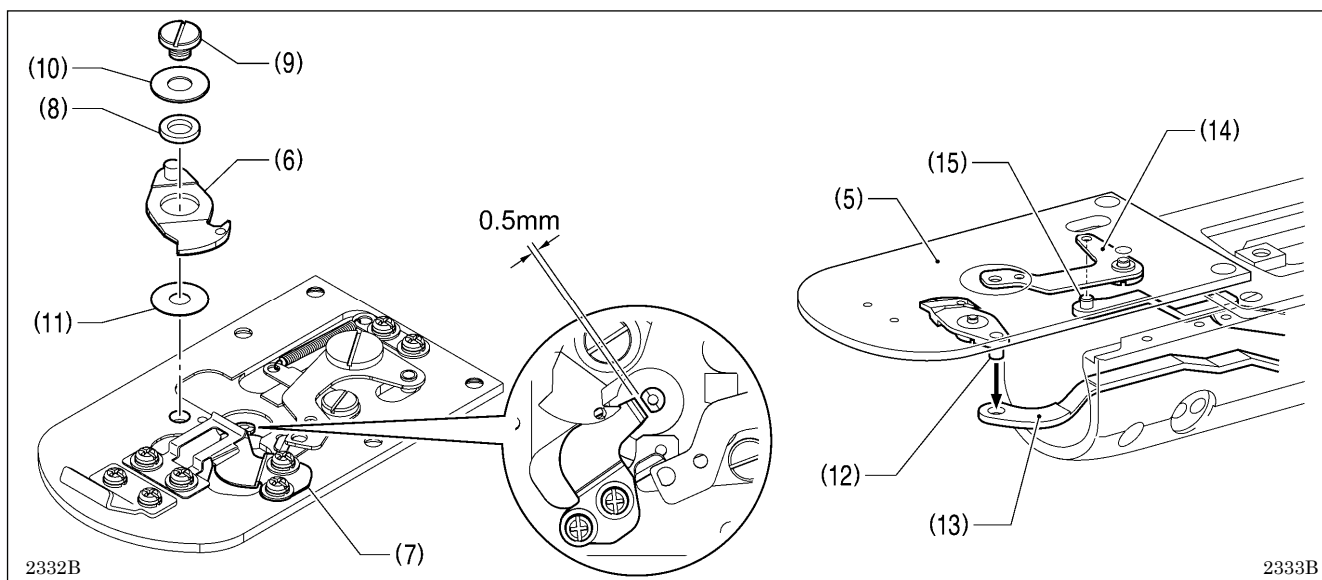
5. Loosen the bolt (6).
6. Move thread trimmer rod H assembly(7) back and forth to adjust so that the ridge line on the movable knife (8) is touching the edge of the index mark (9), and then while keeping the parts in this position, tighten the bolt (6).
7. Turn the pulley so that the thread trimmer driving lever (4) is in the reverse position, and then while pushing thread trimmer rod V assembly (10) in the direction of the arrow so that the thread trimmer collar (2) is touching the inside of the thread trimmer cam (3), check if the ridge line on the movable knife (8) is touching the edge of the index mark (9).
8. Return the machine head to its original position, and then install the top cover and the side cover.



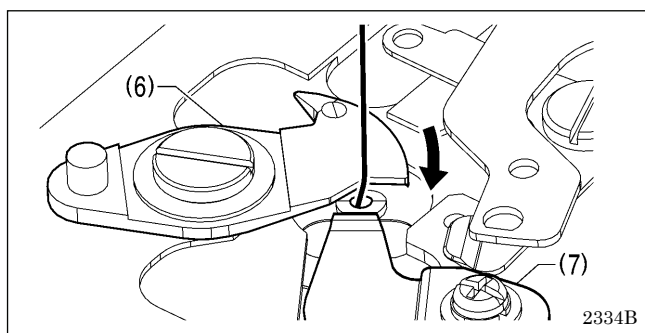
## 11-9. Replacing the movable knife and fixed knife



1. Open the shuttle race cover, remove the two screws (1), and then remove the feed plate (2).
2. Remove the two screws (3) and the two flat screws (4), and then remove the needle plate (5).
3. Remove the movable knife (6) and the fixed knife (7).



4. Install new fixed knife (7) in the position shown in the illustration.
5. Apply grease to the outside of the movable knife collar (8) and to the movable knife shoulder screw (9), and then install the new movable knife (6) together with the thrust washer (10) and movable knife spacer (11).
6. Check that the movable knife (6) and the fixed knife (7) cut the thread cleanly.
7. Apply grease to the pin (12) of the movable knife, and then insert it into the hole in the movable knife connecting plate (13), and then while inserting the pin (15) of TN-connecting plate assembly F into the hole in the thread nipper D assembly (14), install the needle plate (5).
8. Check that the center of the needle hole and the tip of the needle are aligned.



Select an accessory movable knife spacer (11) which allows the movable knife (6) to cross over the fixed knife (7) with a force that is as gentle as possible while still allowing the thread to be trimmed.

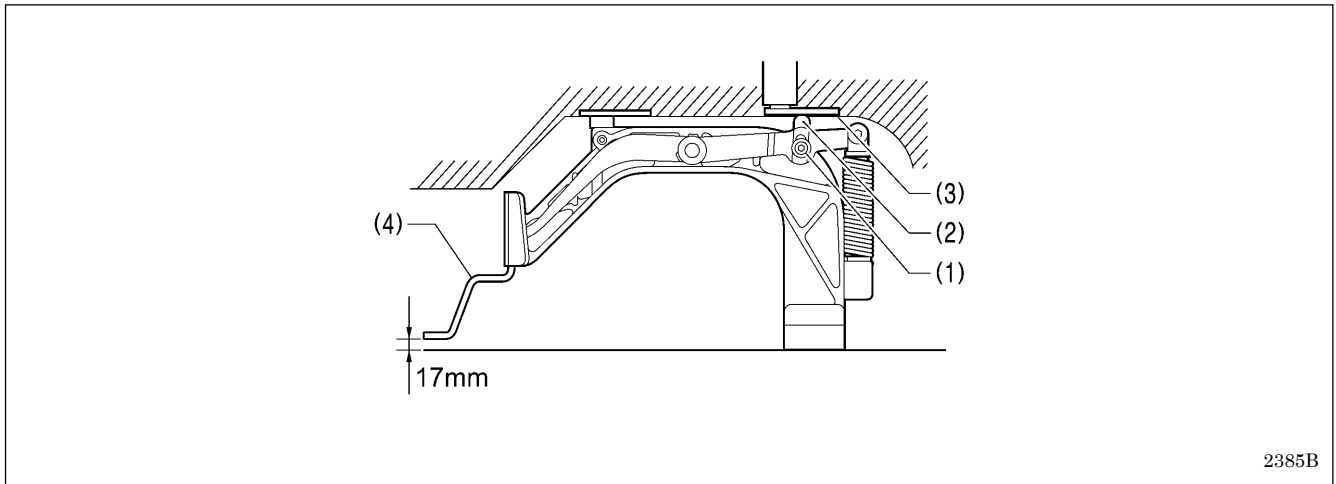
\* Move the movable knife (6) as shown in the illustration and check that it trims the thread cleanly.

**NOTE:**

If the movable knife spacer (11) is too thick, it will not be possible to trim the thread.

### 11-10. Adjusting the work clamp lift amount (KE-430F)

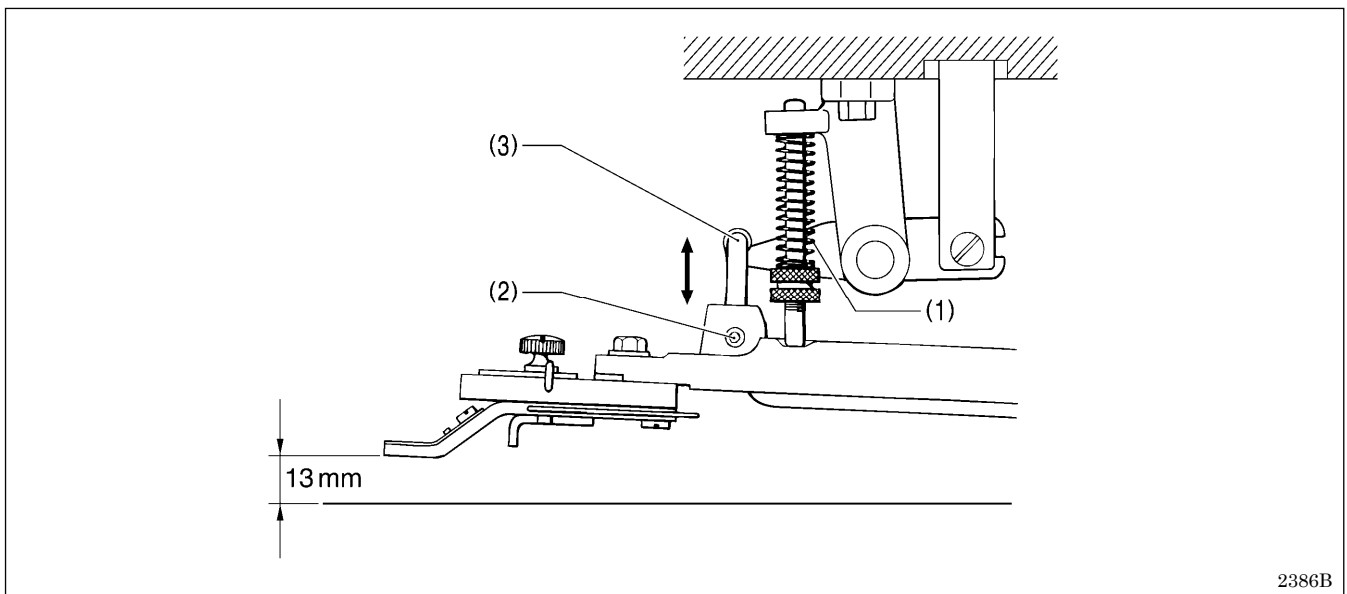
Adjust so that the actual maximum lift amount for the work clamp is 17 mm above the top of the needle plate when the maximum work clamp height has been set to 17 mm using the operation panel (refer to "Work clamp lifting height" on P.17).



1. Loosen the bolt (1) and move the work clamp arm lever plate (2) up or down to adjust.
2. Apply grease to the bottom of the work clamp lifter plate assembly (3), to the top of the work clamp arm lever plate (2) and to the sliding part of the work clamp (4) (grease is already applied at the time of shipment), and check that the movement becomes easier.

### 11-11. Adjusting the button clamp lift amount (BE-438F)

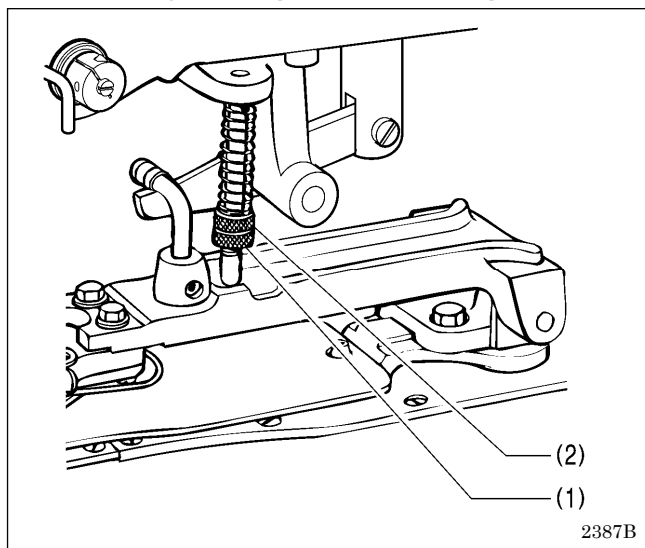
Adjust so that the actual maximum lift amount for the button clamp is 13 mm above the top of the needle plate when the maximum work clamp height has been set to 13 mm using the operation panel (refer to "Work clamp lifting height" on P.17).



Remove the compression spring (1), loosen the screw (2) and adjust the button clamp holder hook assembly (3) by moving it up and down.

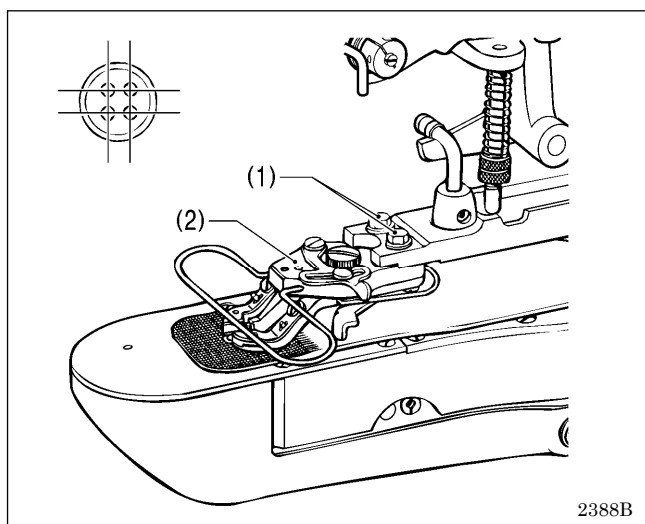
\* If the button clamp lift amount is too large, the button clamp will not be raised.

### 11-12. Adjusting the holding pressure (BE-438F)



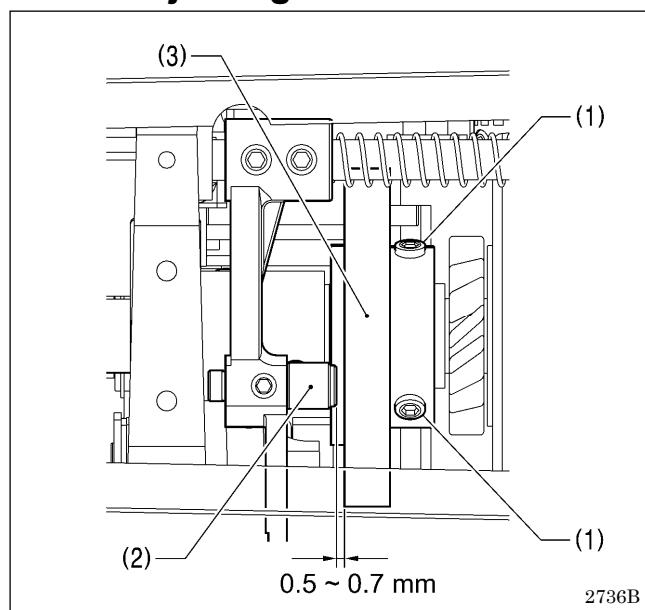
Loosen the nut (1) and turn the nut (2) to the point where it is just tight enough that the material will not slip out of place when it is slightly pulled (keeping pressure as slight as possible).

### 11-13. Adjusting the position of the button clamp (BE-438F)



1. Loosen the two bolts (1) and adjust the button clamp base (2) by moving it.
2. Carry out test feeding to check that the needle will go through the button hole with no contact.

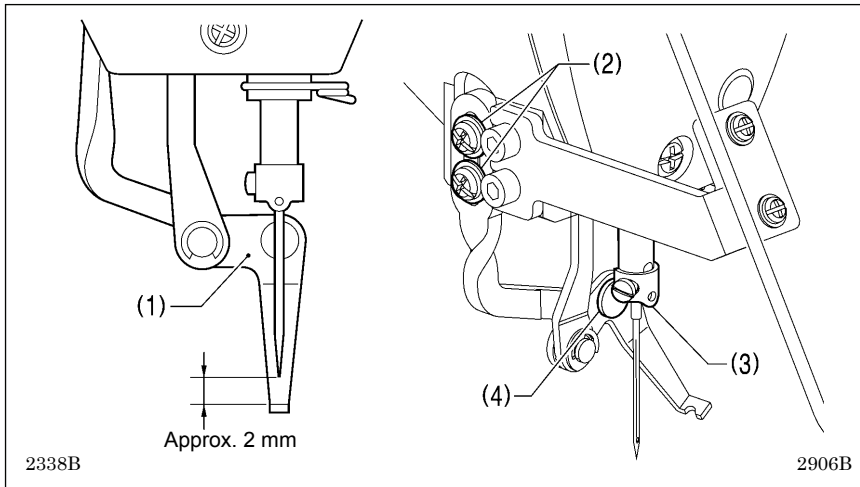
### 11-14. Adjusting the thread trimmer cam position



1. Remove the top cover.
2. Loosen the two set screws (1), and then adjust the position of the thread trimmer cam (3) so that the distance between the edge of the collar shaft (2) and the edge of the thread trimmer cam (3) is 0.5 - 0.7 mm. After adjusting, tighten the two set screws (1).

## 11-15. Adjusting the thread wiper

### <Thread wiper height adjustment>

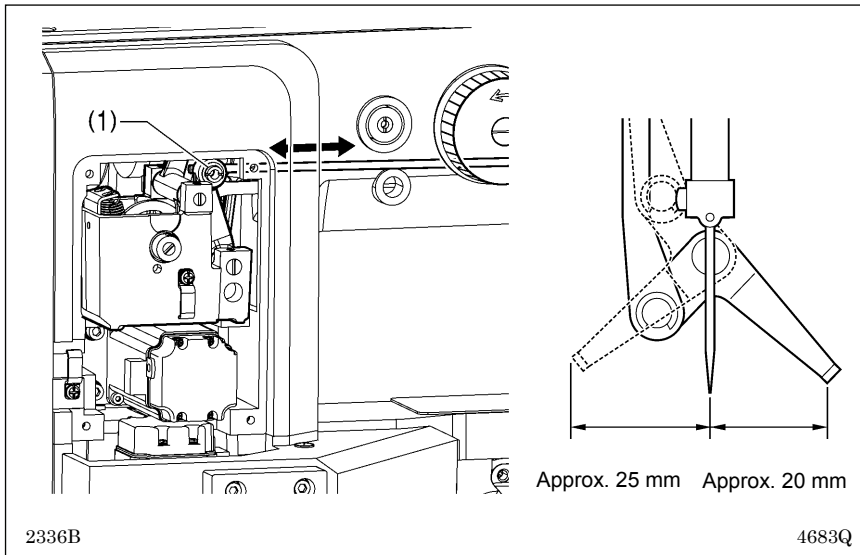


Loosen the two screws (2) and adjust the thread wiper (1) so that the clearance between the top of the thread wiper (1) and the tip of the needle is approximately 2 mm when the thread wiper (1) is aligned with the center of the needle at the needle bar stop position.

**NOTE:**

Check that the needle bar thread guide (3) and the thread wiper base shaft (4) are not touching at this time.

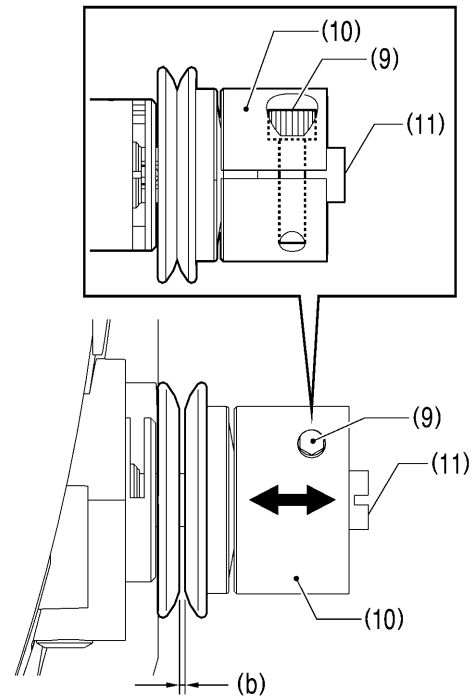
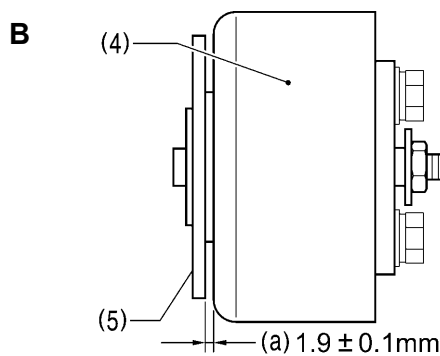
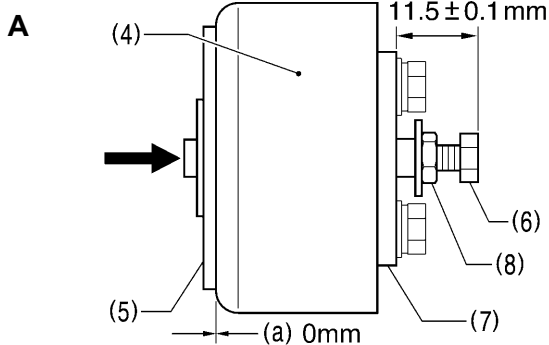
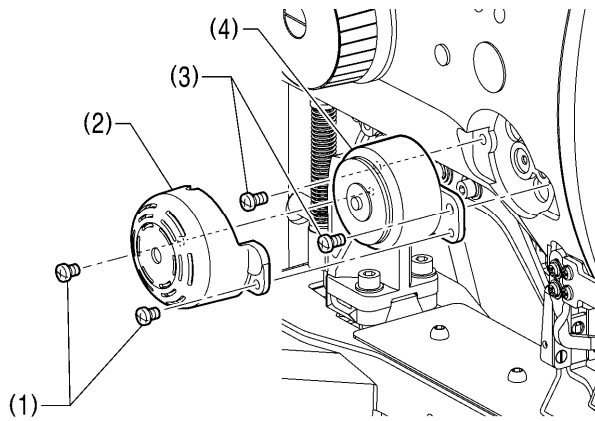
### <Thread wiper racking width adjustment>



1. Remove the side cover.
2. Loosen the set screw (1) and adjust so that the distance from the thread wiper to the center of the needle is as shown in the illustration.

## 11-16. Adjusting the tension release amount

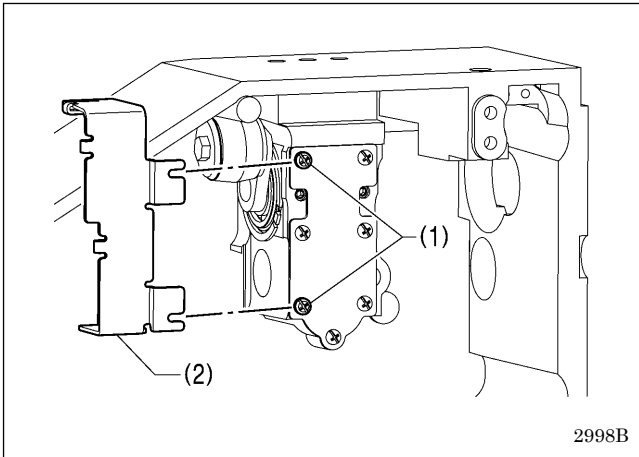
2737B

2738B  
2928B

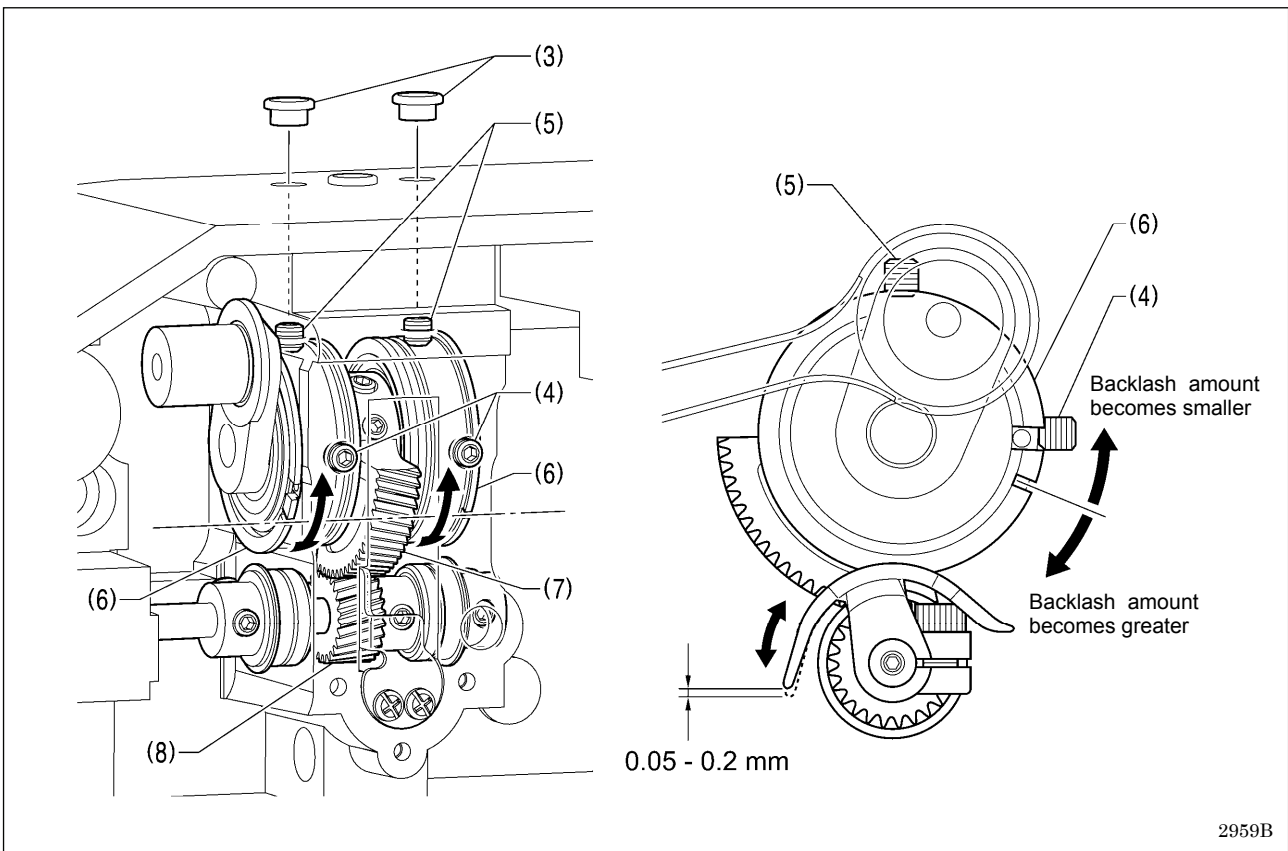
2739B

1. Remove the two screws (1), and then remove the solenoid cover (2).
2. Remove the two screws (3).
3. With the plunger (5) of the tension solenoid (4) pushed all the way in, loosen the nut (8) and turn the bolt (6) to adjust so that the end of the bolt (6) is 11.5 mm from the side of the solenoid setting plate (7). (Figure A)
4. With the tension solenoid (4) installed to the arm with the two screws (3), insert spacers or similar to operate the thread tension so that distance (a) is 1.9 ± 0.1 mm. (Figure B)
  - \* Select a spacer that can maintain the distance (a) without becoming bent when the tension solenoid (4) operates.
  - \* Refer to "11-1-1. Upper and lower thread tension" for details on operating the thread tension.
5. Loosen the bolt (9) and adjust the sideways position of the set collar (10) so that the opening amount (b) for the tension discs is 0 mm. After adjusting, retighten the bolt (9).
  - \* Make sure that the movement range for the set collar (10) does not pass the edge of the shaft (11) at this time.
6. Release the thread tension.
  - Check that the opening amount (b) for the tension discs is 0.8 to 1.5 mm.
7. Install the solenoid cover (2) with the two screws (1).

### 11-17. Adjusting the backlash amount (play) of the lower shaft gear



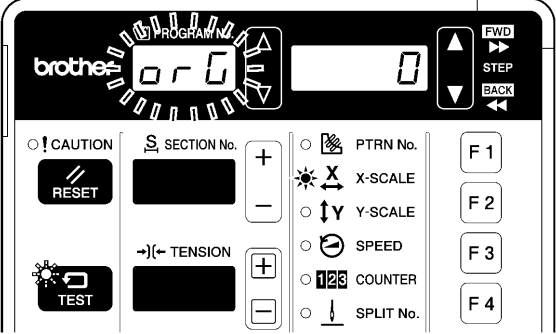




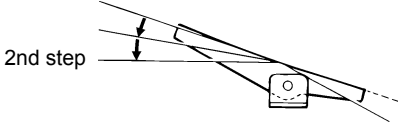

1. Tilt back the machine head.
2. Open the shuttle race base cover.
3. Remove the shuttle race base, shuttle hook and bobbin case.
4. Remove the two screws (with washer) (1), and then remove grease holder F (2).



5. Remove the two rubber caps (3).
6. Loosen the two set screws (4) and the two set screws (5).
7. Use the tip of a screwdriver or similar to adjust the front and back rock gear collars (6) so that the backlash amount (play) is 0.05 to 0.2 mm.
  - \* Alternately move the phase of the front and back rock gear collars (6) slightly to adjust so that the phase of the front and back rock gear collars (6) is about the same (within  $\pm 10$  degrees).
  - If the backlash amount (play) is small, it will result in wear in the rock gear (7) and the lower shaft gear (8).
  - If the backlash amount (play) is large, it will result in wear in the rock gear (7) and the lower shaft gear (8) and also result in increased noise during sewing.
8. First tighten the two set screws (4), and then tighten the two set screws (5).
9. Recheck that the backlash amount (play) which was adjusted in step 7 above is correct.
10. Install any parts which were removed from step 5 onward by carrying out the removal procedure in reverse.

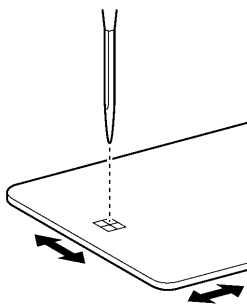
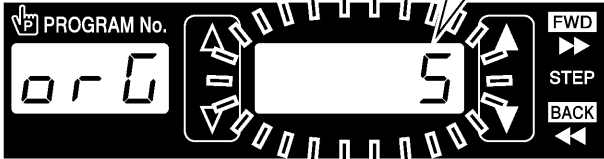


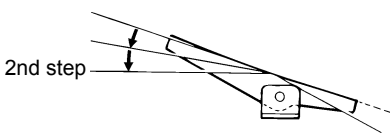



## 11-18. Adjusting the home position

### 11-18-1. X- and Y-feed motor home positions

1	<p>With the power switch turned off, turn the pulley in the direction of the arrow to set the needle to the needle up stop position (near the highest thread take-up position).</p>
2	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  </div> <div style="width: 45%;"> <p>While pressing the ▲▼ keys simultaneously, turn on the power switch.</p>  <ul style="list-style-type: none"> <li>• "orG" will flash in the PROGRAM No. display and the currently-recorded offset value will be displayed in the menu display.</li> </ul> <p style="text-align: right;">2788B 2789B</p> </div> </div>
3	<p>Press the SELECT key so that either the X-SCALE indicator or the Y-SCALE indicator illuminates.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  X-SCALE   Y-SCALE         </div> <div style="text-align: center;">  <p>SELECT</p> <p style="text-align: right;">2790B 2401B</p> </div> </div>
4	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;">  <p>2nd step</p> </div> <div style="width: 60%;"> <p>Depress the foot switch to the 2nd step (for a 2-pedal foot switch, depress the start switch). (*1)</p> <ul style="list-style-type: none"> <li>• Home position detection for the X-feed or Y-feed motor will be carried out based on the currently-displayed offset value.</li> <li>• "orG" will illuminate in the PROGRAM No. display.</li> <li>* If you press the RESET key for 2 seconds or more at this time, the offset value will be reset to "0" and home position detection for the X-feed or Y-feed motor will be carried out.</li> </ul> <div style="text-align: center;">  <p>RESET</p> <p style="text-align: right;">4441Q 2791B 2634B</p> </div> </div> </div>

(\*1) When "UP" appears in the menu display and the CAUTION indicator flashes and the buzzer sounds, turn the pulley in the direction of the arrow to move the needle bar to the up stop position (near the highest thread take-up position).

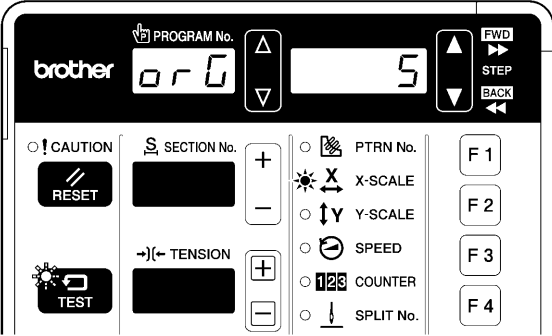



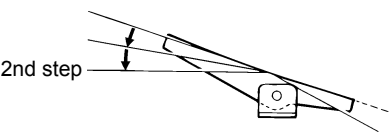

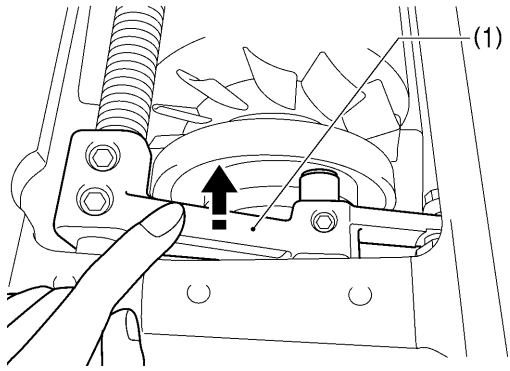
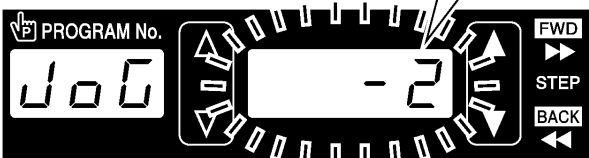
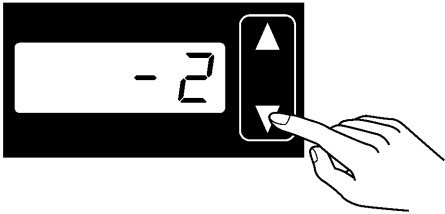
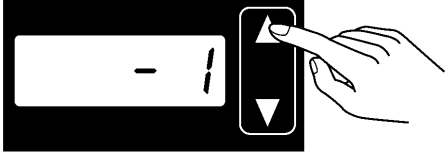
(Continued on next page.)

<p>5</p>	 <p>For example, if the offset value is 5</p>  <p>→)({← TENSION</p> 	<p>Use the home position standard plate and press the ▲ or ▼ keys to change the offset value (-50 to 50) so that the needle drops at the home position.</p>  <ul style="list-style-type: none"> <li>• The X-feed or Y-feed motor will operate according to the offset value.</li> <li>• The offset value in the menu display will flash, and “JoG” will illuminate in the TENSION display.</li> </ul> <p style="text-align: right;">2792B 2793B 2794B 2795B</p>
<p>6</p>	<p>2nd step</p>  <p>→)({← TENSION</p> 	<p>Depress the foot switch to the 2nd step (for a 2-pedal foot switch, depress the start switch) to provisionally confirm the offset value. (*1)</p> <ul style="list-style-type: none"> <li>• Feed motor home position detection will be carried out based on the currently-displayed offset value. Check the home position.</li> <li>• “JoG” will disappear from the TENSION display.</li> </ul> <p style="text-align: right;">4441Q 2796B</p>
<p>7</p>	<p>Repeat steps 5 and 6 to set the home position to the correct position.</p>	
<p>8</p>		<p>Press the ENTER key to confirm the offset value.</p> <ul style="list-style-type: none"> <li>• The offset value will illuminate in the menu display.</li> <li>* If the offset value has not been provisionally confirmed (if “JoG” is illuminated), the invalid buzzer will sound.</li> </ul> <p style="text-align: right;">2414B</p>
<p>9</p>	<p>End adjustment mode.</p>  <p>TEST indicator switches off</p>	<p>Press the TEST key.</p> <ul style="list-style-type: none"> <li>• The display will return to the normal display and the sewing machine will switch to home position detection standby.</li> </ul> <p style="text-align: right;">2404B</p>

(\*1) When “UP” appears in the menu display and the CAUTION indicator flashes and the buzzer sounds, turn the pulley in the direction of the arrow to move the needle bar to the up stop position (near the highest thread take-up position).

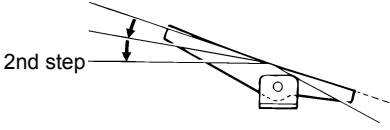




### 11-18-2. Work clamp lift motor home position



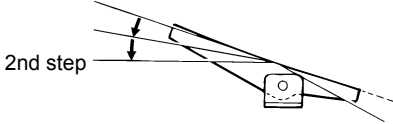

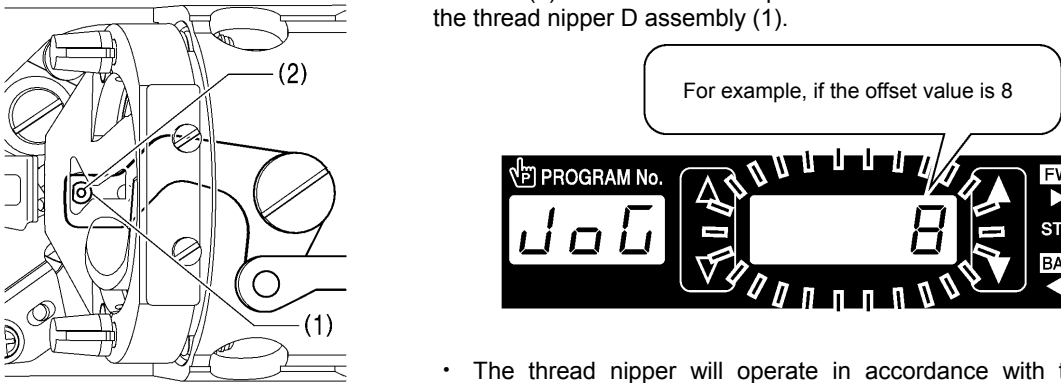
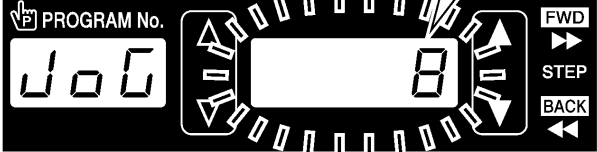
1	<p>With the power switch turned off, turn the pulley in the direction of the arrow to set the needle to the needle up stop position (near the highest thread take-up position).</p>
2	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  </div> <div style="flex: 1; padding-left: 20px;"> <p>While pressing the ▲ ▼ keys simultaneously, turn on the power switch.</p>  <ul style="list-style-type: none"> <li>• "orG" will flash in the PROGRAM No. display and the currently-recorded offset value will be displayed in the menu display.</li> </ul> <p style="text-align: right; font-size: small;">2797B 2789B</p> </div> </div>
3	<p>Press the SELECT key until the THREAD/CLAMP indicator illuminates.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: right; font-size: small;">2798B 2401B</p>
4	<p>Depress the foot switch to the 2nd step (for a 2-pedal foot switch, depress the start switch).</p> <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  <p>2nd step</p> </div> <div style="flex: 1; padding-left: 20px;"> <ul style="list-style-type: none"> <li>• Home position detection for the work clamp lift motor will be carried out based on the currently-displayed offset value.</li> <li>• "orG" will illuminate in the PROGRAM No. display.</li> <li>* If you press the RESET key for 2 seconds or more at this time, the offset value will be reset to "0" and home position detection for the work clamp lift motor will be carried out.</li> </ul>  <p style="text-align: right; font-size: small;">4441Q 2634B</p> </div> </div>
5	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  <p>(1)</p> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 10px auto;"> <p>For example, if the offset value is -2</p> </div>  </div> <div style="flex: 1; padding-left: 20px;"> <ol style="list-style-type: none"> <li>1. Remove the top cover. Press the ▼ key until the TR-driving lever (1) is at the position where it starts moving backward to set the offset value (-80 to 20). (The TR-driving lever (1) will operate according to the offset value.) The offset value in the menu display will flash, and "JoG" will illuminate in the TENSION display.</li> </ol>  <ol style="list-style-type: none"> <li>2. Press the ▲ key once to reduce the offset value by 1.</li> </ol>  <p style="text-align: right; font-size: small;">3007B 2800B 2801B 2899B</p> </div> </div>

(Continued on next page.)

## 11. ADJUSTMENT

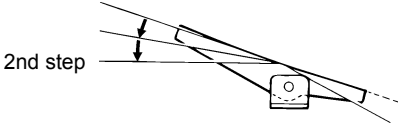
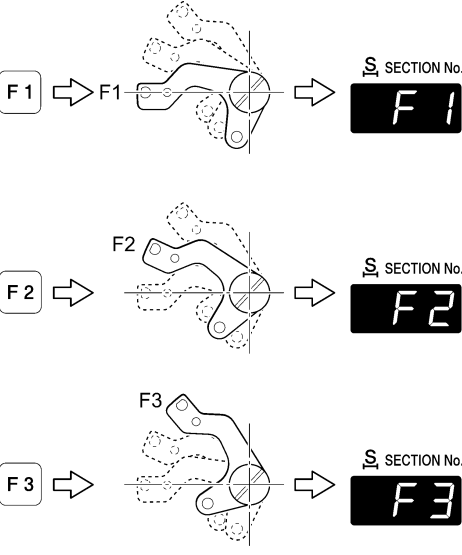
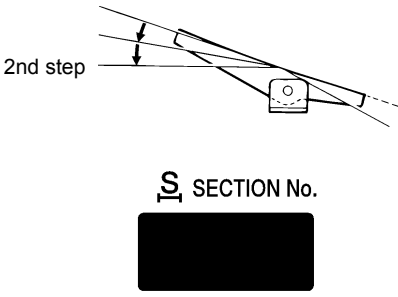


<p><b>6</b></p>	 <p>2nd step</p>	<p>Depress the foot switch to the 2nd step (for a 2-pedal foot switch, depress the start switch) to provisionally confirm the offset value.</p> <ul style="list-style-type: none"> <li>• Work clamp lift motor home position detection will be carried out based on the currently-displayed offset value. Check the home position.</li> <li>• “JoG” will disappear from the TENSION display.</li> </ul> <p style="text-align: right;">4441B</p>
<p><b>7</b></p>	<p>Repeat steps 5 and 6 to set the home position to the correct position.</p>	
<p><b>8</b></p>		<p>Press the ENTER key to confirm the offset value.</p> <ul style="list-style-type: none"> <li>• The offset value will illuminate in the menu display.</li> <li>* If the offset value has not been provisionally confirmed (if “JoG” is illuminated), the invalid buzzer will sound.</li> </ul> <p style="text-align: right;">2414B</p>
<p><b>9</b></p>	<p><b>End adjustment mode.</b></p>  <p style="text-align: center;">TEST indicator switches off</p>	<p>Press the TEST key.</p> <ul style="list-style-type: none"> <li>• The display will return to the normal display and the sewing machine will switch to home position detection standby.</li> </ul> <p style="text-align: right;">2404B</p>
<p><b>10</b></p>	<p>Turn off the power switch and install the top cover.</p>	

11-18-3. Thread nipper motor home position

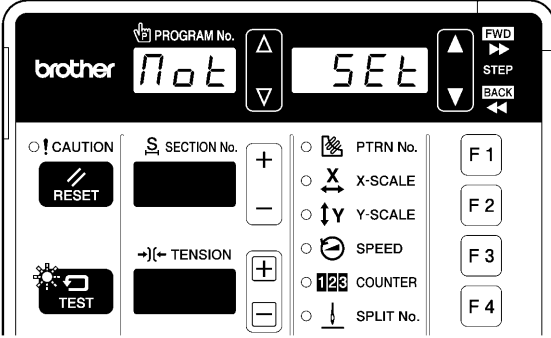
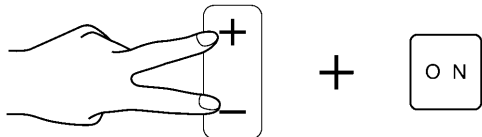
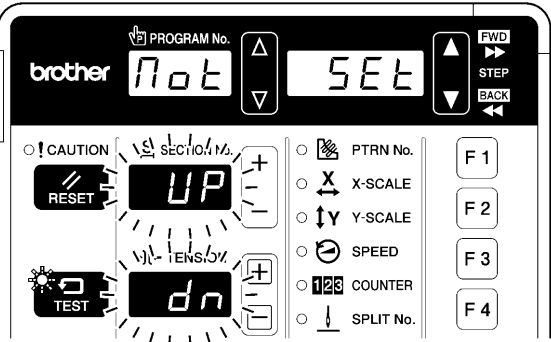
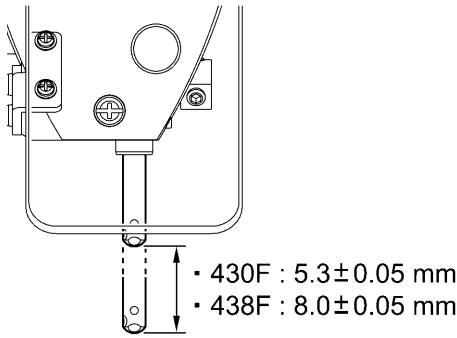
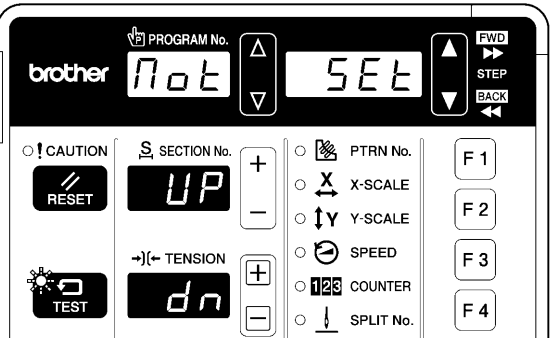

1	With the power switch turned off, turn the pulley in the direction of the arrow to set the needle to the needle up stop position (near the highest thread take-up position).
2	Open the shuttle race base cover and remove the shuttle race base, shuttle hook and bobbin case assembly.
3	<p>While pressing the ▲ ▼ keys simultaneously, turn on the power switch.</p>  <p>• "orG" will flash in the PROGRAM No. display and the currently-recorded offset value will be displayed in the menu display.</p> <p style="text-align: right;">2802B 2789B</p>
4	<p>Press the SELECT key until the TENSION indicator illuminates.</p>  <p style="text-align: right;">2803B 2401B</p>
5	<p>Depress the foot switch to the 2nd step.</p>  <p>• Home position detection for the thread nipper motor will be carried out based on the currently-displayed offset value.</p> <p>• "orG" will illuminate in the PROGRAM No. display.</p> <p>* If you press the RESET key for 2 seconds or more at this time, the offset value will be reset to "0" and home position detection for the thread nipper motor will be carried out.</p>  <p style="text-align: right;">4441Q 2634B</p>
6	<p>Press the ▲ or ▼ key to change the offset value (-50 to 50) so that the hole (2) in the needle hole plate is near the center of the hole in the thread nipper D assembly (1).</p>   <p>• The thread nipper will operate in accordance with the offset value.</p> <p>• The offset value in the menu display will flash, and "JoG" will illuminate in the TENSION display.</p> <p style="text-align: right;">2804B 2805B</p>

(Continued on next page.)

## 11. ADJUSTMENT


<p><b>7</b></p>	 <p>2nd step</p>	<p>Depress the foot switch to the 2nd step to provisionally confirm the offset value.</p> <ul style="list-style-type: none"> <li>• Thread nipper motor home position detection will be carried out based on the currently-displayed offset value. Check the home position.</li> <li>• “JoG” will disappear from the TENSION display.</li> </ul> <p style="text-align: right;">4441Q 2806B</p>
<p><b>8</b></p>		<p>Press the F1, F2 and F3 keys and check the respective positions.</p> <ul style="list-style-type: none"> <li>• When the F1 key is pressed, the thread nipper D assembly (1) will move to the home position. * “F1” will illuminate in the SECTION No. display.</li> <li>• When the F2 key is pressed, the thread nipper D assembly (1) will move to the thread nipping position. * “F2” will illuminate in the SECTION No. display.</li> </ul> <p>Check that the thread is being firmly held at this time. If the thread is not being held, adjust the home position (F1) so that the hole in the thread nipper D assembly (1) is not inside the hole (2) in the needle hole plate.</p> <ul style="list-style-type: none"> <li>• When the F3 key is pressed, the thread nipper D assembly (1) will move to the thread release position. * “F3” will illuminate in the SECTION No. display.</li> </ul> <p style="text-align: right;">2807B 2808B 2809B</p>
<p><b>9</b></p>		<p>Depress the foot switch to the 2nd step to return the thread nipper motor to the home position.</p> <ul style="list-style-type: none"> <li>• The SECTION No. display will stop illuminating.</li> </ul> <p style="text-align: right;">4441Q 2810B</p>
<p><b>10</b></p>	<p>Repeat steps 6 to 9 to set the home position.</p>	
<p><b>11</b></p>		<p>Press the ENTER key to confirm the offset value.</p> <ul style="list-style-type: none"> <li>• The offset value will illuminate in the menu display.</li> <li>* If the offset value has not been provisionally confirmed (if “JoG” is illuminated), the invalid buzzer will sound.</li> </ul> <p style="text-align: right;">2414B</p>
<p><b>12</b></p>	<p><b>End adjustment mode.</b></p>  <p>TEST indicator switches off</p>	<p>Press the TEST key.</p> <ul style="list-style-type: none"> <li>• The display will return to the normal display and the sewing machine will switch to home position detection standby.</li> </ul> <p style="text-align: right;">2404B</p>
<p><b>13</b></p>	<p>Turn off the power switch, install the shuttle race base, shuttle hook and bobbin case assembly, and then close the shuttle race base cover.</p>	

### 11-19. Adjusting the main shaft motor standard position

1	Remove the needle, the needle bar thread guide and the feed plate.
2	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  </div> <div style="width: 45%;"> <p>While pressing the [+ -] keys simultaneously, turn on the power switch.</p>  <ul style="list-style-type: none"> <li>• "Mot" will illuminate in the PROGRAM No. display and "Set" will illuminate in the menu display.</li> </ul> <p style="text-align: right;">2811B 2818B</p> </div> </div>
3	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  </div> <div style="width: 45%;"> <p>Turn the pulley one full turn in the direction of the arrow.</p> <ul style="list-style-type: none"> <li>• " UP" will flash in the SECTION No. display and " dn" will flash in the TENSION display.</li> <li>* If nothing is displayed, turn the pulley by hand until the displays appear.</li> </ul> <p style="text-align: right;">2813B</p> </div> </div>
4	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  <p>• 430F : 5.3±0.05 mm • 438F : 8.0±0.05 mm</p> </div> <div style="width: 45%;"> <p>Turn the pulley in the direction of the arrow to lower the needle bar from its highest position to the height shown in the illustration at left.</p> <p style="text-align: right;">2814B</p> </div> </div>
5	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  </div> <div style="width: 45%;"> <p>Press the ENTER key.</p>  <ul style="list-style-type: none"> <li>• " UP" will illuminate in the SECTION No. display and " dn" will illuminate in the TENSION display.</li> <li>* If the displays are still flashing, carry out step 4 once more.</li> </ul> <p style="text-align: right;">2414B 2815B</p> </div> </div>

(Continued on next page.)

## 11. ADJUSTMENT

<b>6</b>	<b>End adjustment mode.</b>   <p>TEST indicator switches off</p>	Press the TEST key. <ul style="list-style-type: none"><li>• The display will return to the normal display and the sewing machine will switch to home position detection standby.</li></ul> <p>2404B</p>
<b>7</b>	Turn off the power switch and install the needle, the needle bar thread guide and the feed plate.	

### 11-20. Correcting the digital tension output

- The procedure for correcting the tension (output) from the digital tension involves carrying out the procedure of measuring the actual upper thread tension and entering the measured value using the operation panel four times.
- The standard values for the four tensions for the digital tension vary for each measurement as shown in the table at right. By entering the actual measurement values each time, the digital tension output will be automatically corrected, and the tension that corresponds to the setting can then be obtained when sewing.

No. of measurement	Standard tension value for digital tension (gf)
1st	20
2nd	80
3rd	180
4th	330

**1**

1. Adjust the pretension to 5 to 7 gf (0.05 to 0.07 N).  
\* At this time, use the TOYOBO polyester #50 (white) thread which is recommended by Brother.

2. Thread the upper thread as shown in the illustration at left.

**NOTE:**  
Do not thread the thread through the thread take-up spring.

\* If you do not observe the above note, the digital tension output correction may not be carried out correctly.

2816B 2817B

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**2**

While pressing the **+** **-** keys simultaneously, turn on the power switch.

\* Keep pressing the **+** **-** key until the model name is displayed and the buzzer beeps once.

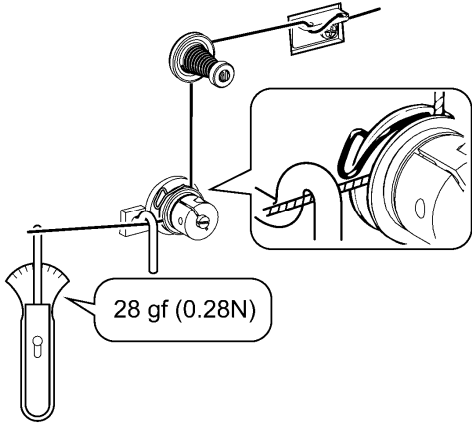
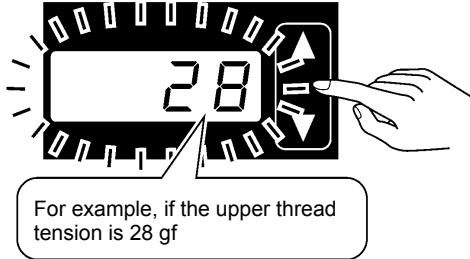


The tension discs will close, and "tEn" will illuminate in the PROGRAM No. display, " 1" will illuminate in the SECTION No. display, and a value from "0" to "39" will illuminate in the menu display respectively.

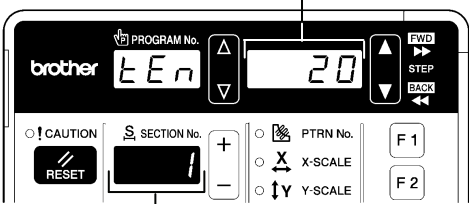
\* The value in the menu display may vary for individual sewing machines.

2819B 2818B

(Continued on next page.)

## 11. ADJUSTMENT

<p>3</p>		<p>Use a tension gauge to measure the upper thread tension as shown in the illustration at left. Press the ▲ or ▼ key to increase or decrease the value appearing in the menu display until it corresponds with the measurement value.</p>  <ul style="list-style-type: none"> <li>* Round off any decimal places in the measurement value.</li> <li>* The units for the measurement values which are input to the operation panel are "gf". If the values are measured using units of "N", convert using a factor of 1 N ≒ 100 gf.</li> <li>* The value will illuminate in the menu display, and it will change to flashing if it is increased or decreased.</li> </ul> <p style="text-align: right;">2820B 2821B</p>
<p>4</p>		<ol style="list-style-type: none"> <li>1. Press the ENTER key.</li> <li>2. Open the tension discs and then close them again.</li> </ol> <ul style="list-style-type: none"> <li>• "tEn" will illuminate in the PROGRAM No. display, the number of the measurement will illuminate in the SECTION No. display, and the allowable setting range will illuminate in the menu display. (Refer to the table below.)</li> <li>* The value in the menu display may vary for individual sewing machines.</li> </ul> <p><b>NOTE:</b> If you need to enter a value which is greater than the allowable setting range in the table, problems may occur with the digital tension. Refer to "11-16. Adjusting the tension release amount" and then repeat the procedure from step 1.</p> <p style="text-align: right;">2414B</p>
<p>5</p>	<p>Repeat steps 3 and 4 to set the 2nd to 4th measurements of the upper thread tension.</p>	
<p>6</p>		<p>When the ENTER key is pressed after the 4th measurement, "END" will appear in the menu display and the tension discs will open.</p> <p style="text-align: right;">2822B</p>
<p>7</p>	<p>Turn off the power switch.</p>	

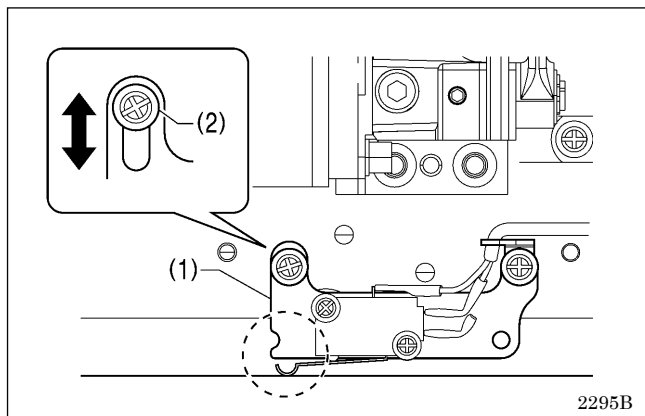
SECTION No. display	Standard value (gf)	Allowable setting range (gf)	Setting value
1st	20	[0~39]	
2nd	80	[40~119]	
3rd	180	[120~239]	
4th	330	[240~419]	

Number of measurement

2819B



### 11-21. Checking the machine head switch



1. Turn on the power switch.
2. Check that no error numbers appear on the operation panel.

**<If error [E050], [E051] or [E055] is displayed>**

If the machine head switch (1) is not turned on, error [E050], [E051] or [E055] will occur.

Use the screw (2) to adjust the installation position of the machine head switch as shown in the illustration.

### 11-22. Setting method for standard depression strokes (Foot switch)

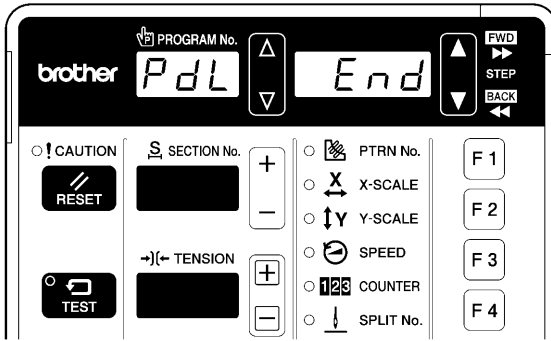
Use the following procedure to set the operating positions for the depression stroke.

<b>1</b>	<p><b>Signal setting entry</b></p>	<p>While pressing the <math>\Delta</math> and <math>\blacktriangle</math> key, turn on the power switch.</p> <ul style="list-style-type: none"> <li>• "PdL" will illuminate in the PROGRAM No. display and "1.Frt" will illuminate will illuminate in the menu display.</li> </ul>
<b>2</b>	<p><b>Memorizing the maximum forward position</b></p>	<p>With the foot switch depressed all the way forward, wait until the value in the TENSION display stabilizes and then press the ENTER key.</p> <p>* XXX indicates the treadle depression voltage.</p>
<b>3</b>	<p><b>Memorizing the neutral position</b></p>	<p>With your foot released from the foot switch, wait until the value in the TENSION display stabilizes and then press the ENTER key.</p>
<b>4</b>	<p><b>Memorizing the maximum backward position</b></p>	<p>With the foot switch depressed all the way backward, wait until the value in the TENSION display stabilizes and then press the ENTER key.</p>

(Continued on next page.)

## 11. ADJUSTMENT

### 5 Completion of setting



“ END” will be displayed in the menu display.

#### NOTE:

If the foot switch operations are not carried out correctly, “ END” will not be displayed and the buzzer will sound. After “1.Frt” is displayed in the menu display, repeat the operation from step 2.

2830B

### 6 Turn off the power switch.

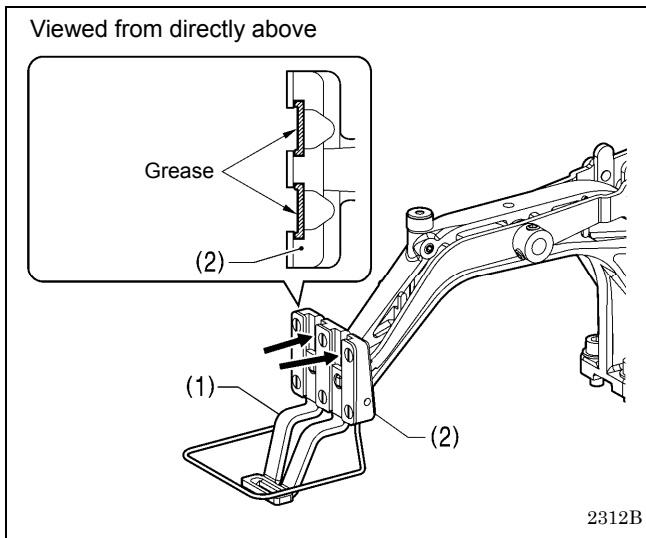
## 12. APPLYING GREASE

### ⚠ CAUTION



Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhoea.

### 12-1. Applying grease (Work clamp: KE-430F)



Periodically apply grease to the sliding parts of the work clamp (1) and the work clamp arm (2).

#### NOTE:

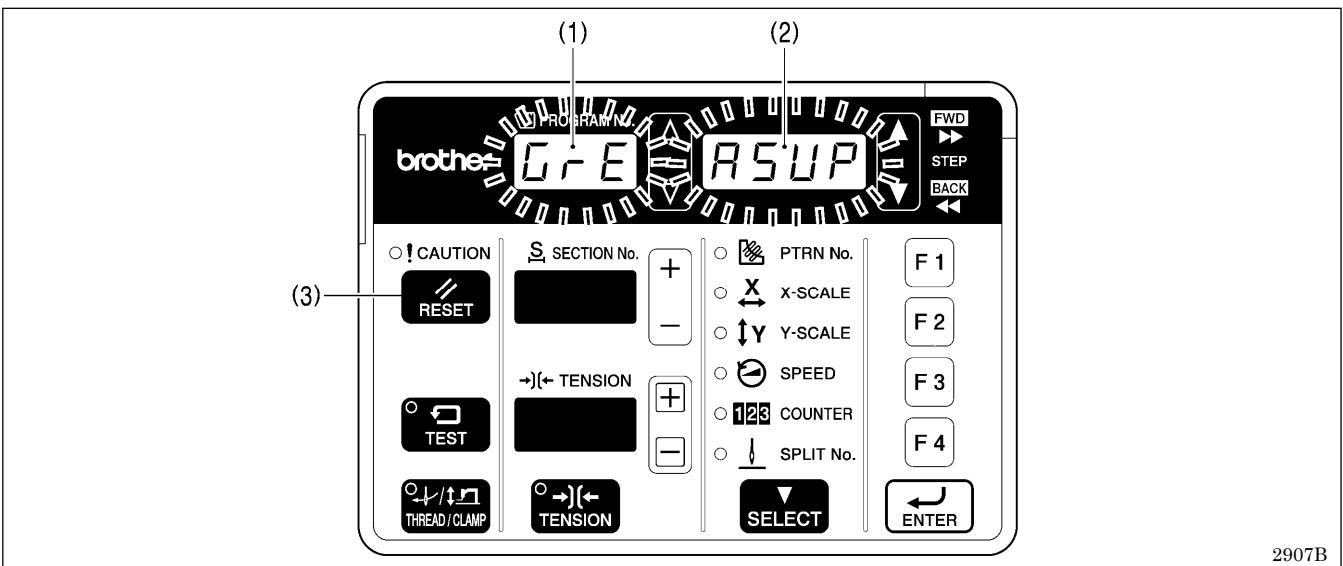
After replacing the work clamp (1), be sure to apply grease before using it.

\* It is recommended that you use commercially-available NIPPON OIL CORPORATION Powernoc WB 2 grease for the work clamp (1).

### 12-2. Applying grease (When “GREASEUP” appears)

If “GrE” and “AS.UP” flash on the PROGRAM No. display (1) and the menu display (2) respectively, and a buzzer sounds when the power switch is turned on, it means that grease needs to be applied. (The sewing machine will not operate at this time, even if the foot switch is depressed.)

Apply grease as required, while referring to the following for details.



<To continue sewing temporarily without applying grease>

1. Press the RESET key (3).
2. The PROGRAM No. display (1) and the menu display (2) will change to the normal displays, and sewing can be carried out by depressing the foot switch.

## 12. APPLYING GREASE

### NOTE:

- "GrE" and "AS.UP" will continue to be displayed each time the power is turned on until grease is applied and the notification is reset by carrying out the procedure on page 131.
- If you continue to use the sewing machine after the "GrE" and "AS.UP" notification appears without applying grease (or without carrying out the reset procedure), "E100" will appear after a certain period of time and the sewing machine will be forcibly prevented from operating for safety reasons.

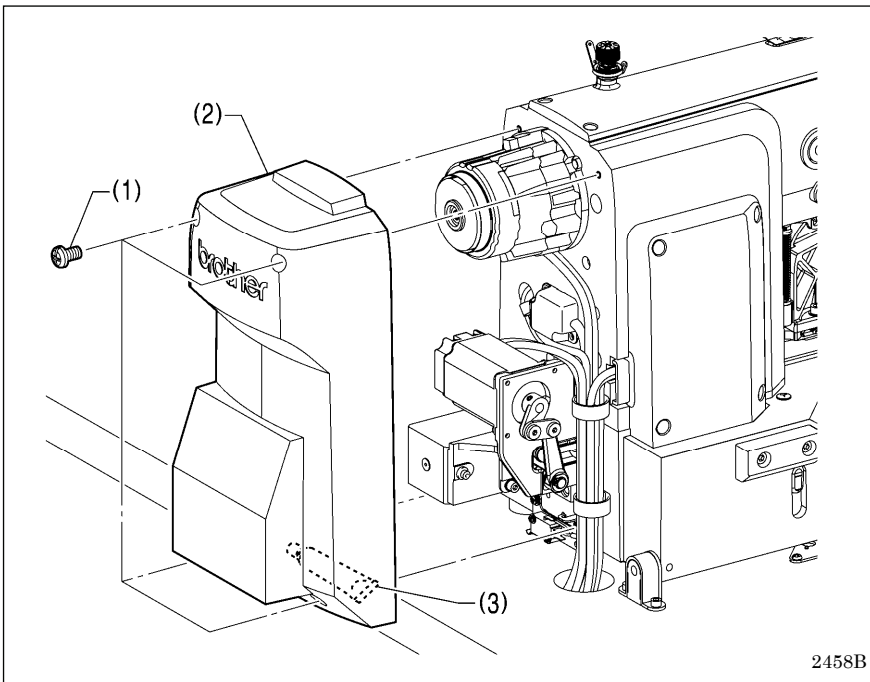
If this happens, apply grease and carry out the reset procedure.

- \* **If you continue to use the sewing machine after carrying out the reset procedure but without applying grease, problems with the sewing machine may result.**

### <Applying grease>

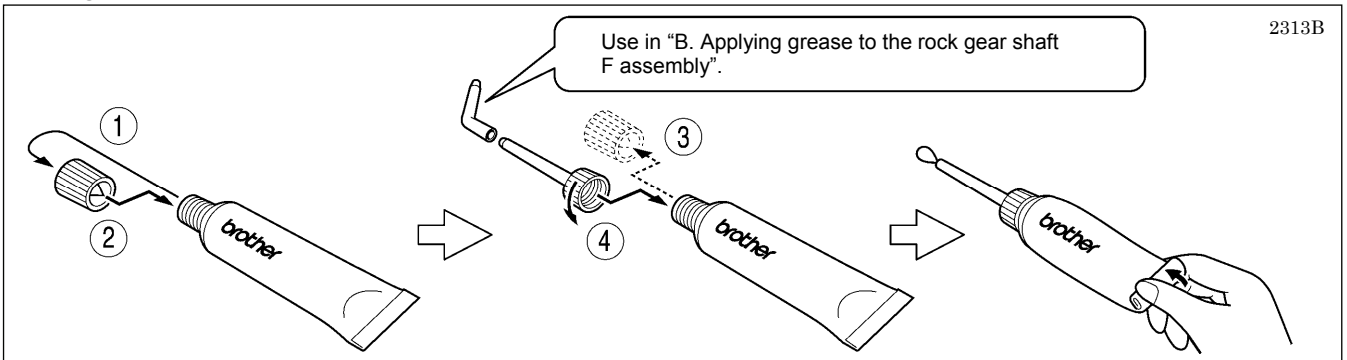
Use Brother-specified "Grease unit (SB1275-001)".

#### 1. Removing the grease assembly



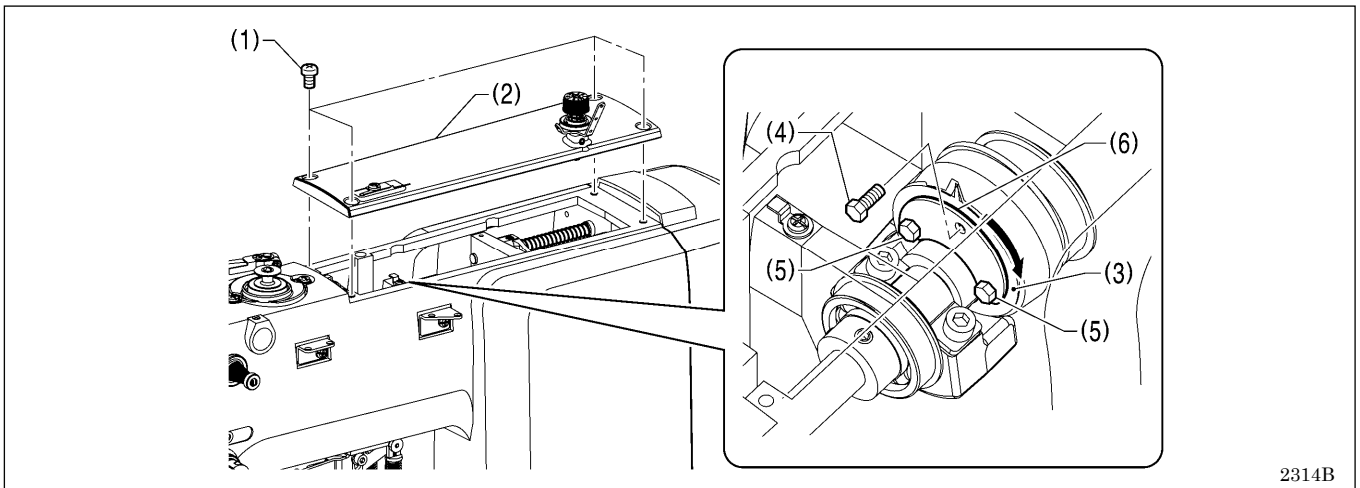
1. Remove the four screws (1), and then remove the rear cover (2).
2. Remove the grease assembly (3) from inside the rear cover (2).

#### 2. Using the tube



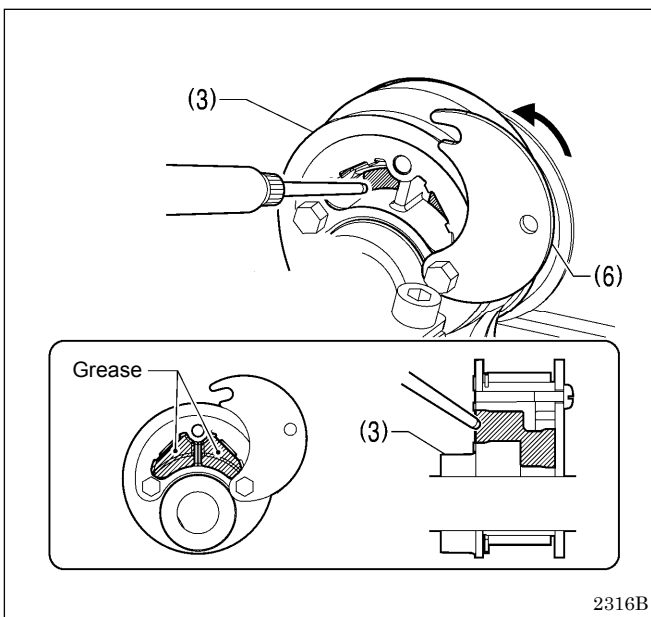
## 3. Applying grease

## &lt; A. Applying grease to the eccentric wheel &gt;



2314B

1. Turn off the power switch.
2. Remove the four screws (1), and then remove the top cover (2).
3. Remove the bolt (4) from the eccentric wheel (3).
  - \* Be careful not to drop the bolt (4) when removing it.
4. Loosen the two bolts (5), and slide the grease cover (6) in the direction of the arrow.
  - \* To prevent the bolts (5) from being dropped, do not remove them completely.



2316B

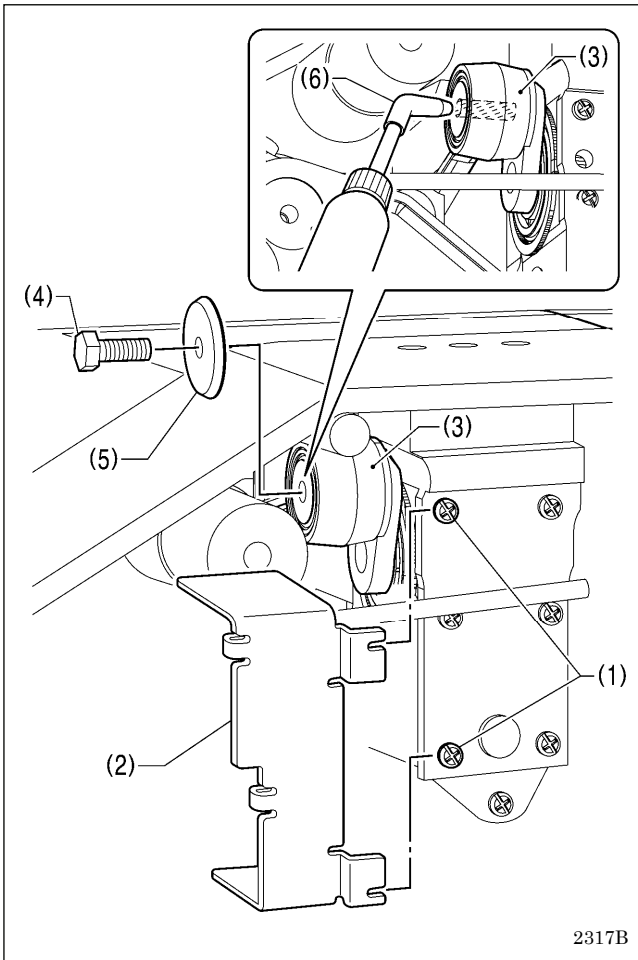
5. Wipe away any grease which is remaining inside the eccentric wheel (3).
6. Insert the grease nozzle into the holes in the eccentric wheel (3), and apply the grease.
  - \* Insert the grease nozzle into both holes to apply the grease, in order to make sure that the grease is applied evenly without missing any parts.
7. Check that enough grease has been applied so that it is overflowing slightly from the edges.
8. Return the grease cover (6) to its original position, and then secure it by tightening the bolt (4) and the two bolts (5).

**NOTE:**

Securely tighten the bolt (4) and the two bolts (5). If any of these bolts are loose, grease may leak out and problems with sewing machine operation such as seizing may occur.

## 12. APPLYING GREASE

### < B. Applying grease to the rock gear shaft F assembly >



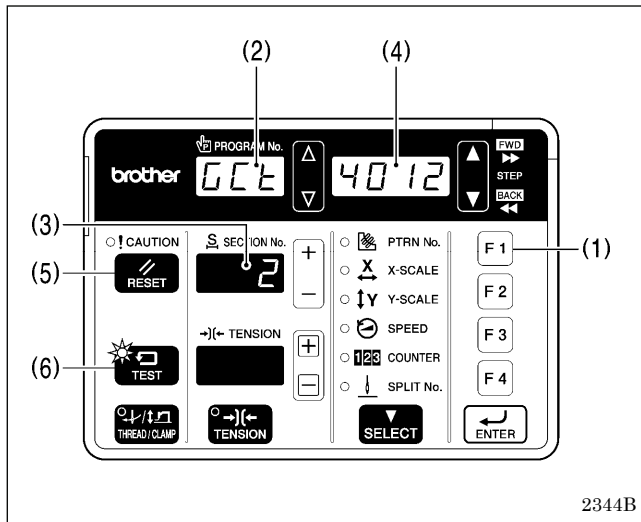
1. Tilt back the machine head.
2. Loosen the two screws (1), and then remove grease holder F (2).
3. Turn the pulley in the direction of the arrow to move the rock gear shaft F assembly (3) to the most forward position.
4. Remove the bolt (4) and the crank rod washer (5).
5. Insert the grease nozzle (6) into the hole in the rock gear shaft F assembly (3) as far as it will go as shown in the illustration, and apply grease until it is overflowing slightly from the edges.
6. Pull out the grease nozzle (6) while adding the grease.
7. Install the bolt (4) and the crank rod washer (5).
8. Install grease holder F (2) with the two screws (1).
9. Install the rear cover with the four screws.

#### NOTE:

- Once the grease tube has been opened, remove the nozzle from the tube, attach the cap securely and store the tube in a cool dark place.
- The grease should be used as quickly as possible.
- When using the grease again, remove any old grease from inside the nozzle first.

(Store the tube away carefully once the tube has been opened, otherwise the grease remaining inside the tube may deteriorate, and this may affect its lubricating performance.)

### <Resetting the grease up counter>



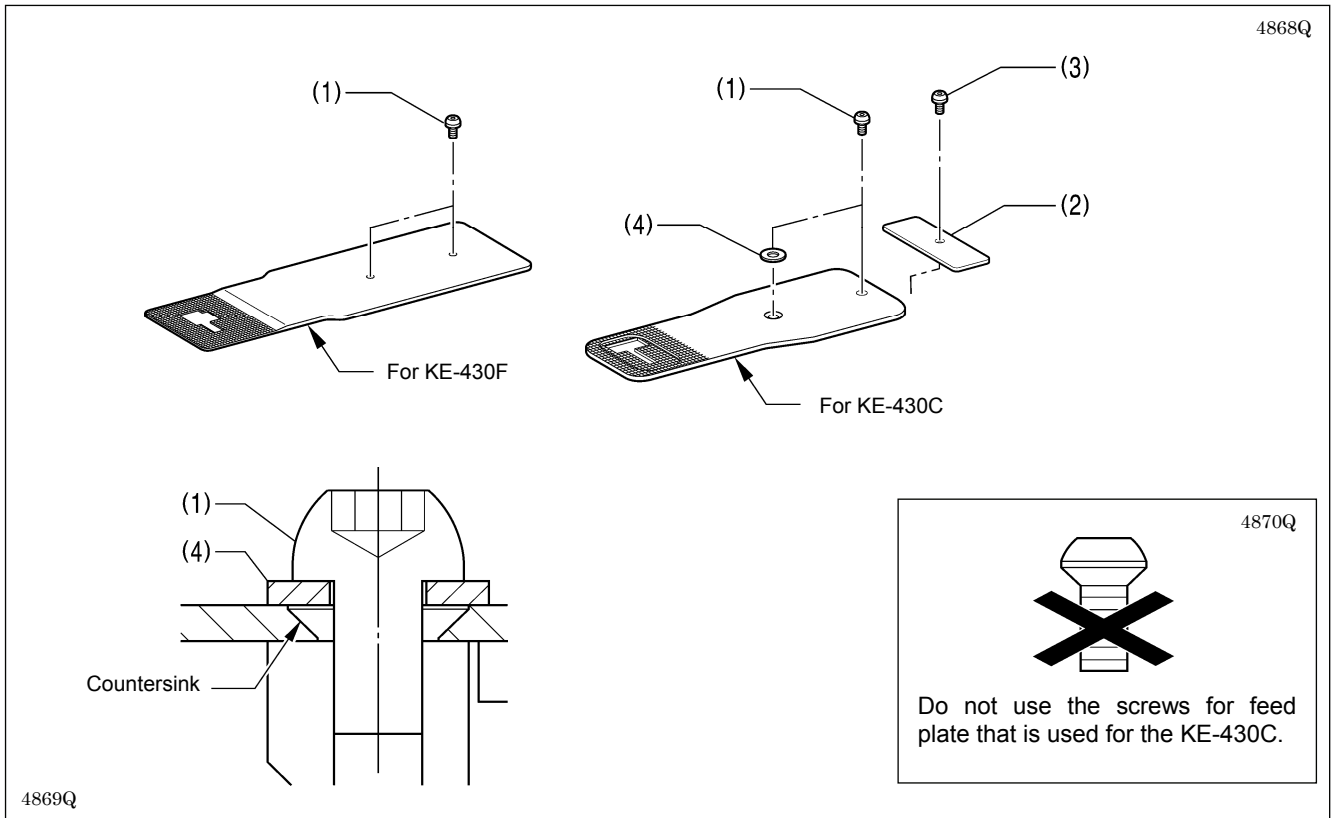
Once the grease has been applied, follow the procedure below to reset the cumulative number of stitches between grease applications.

1. While pressing the F1 key (1), turn on the power switch. "GCt" will appear in the PROGRAM No. display (2), and the cumulative number of stitches until grease should be applied will be displayed in the total of six columns in the section No. display (3) and the menu display (4) in units of 10,000 stitches.
2. Press and hold the RESET key (5) for 2 seconds or more. (This completes the reset procedure.)
3. When you press the TEST key (6), the displays will return to their normal displays.

# 13. HOW TO INSTALL THE FEED PLATE FOR KE-430C SERIES IN KE-430F AND BE-438F

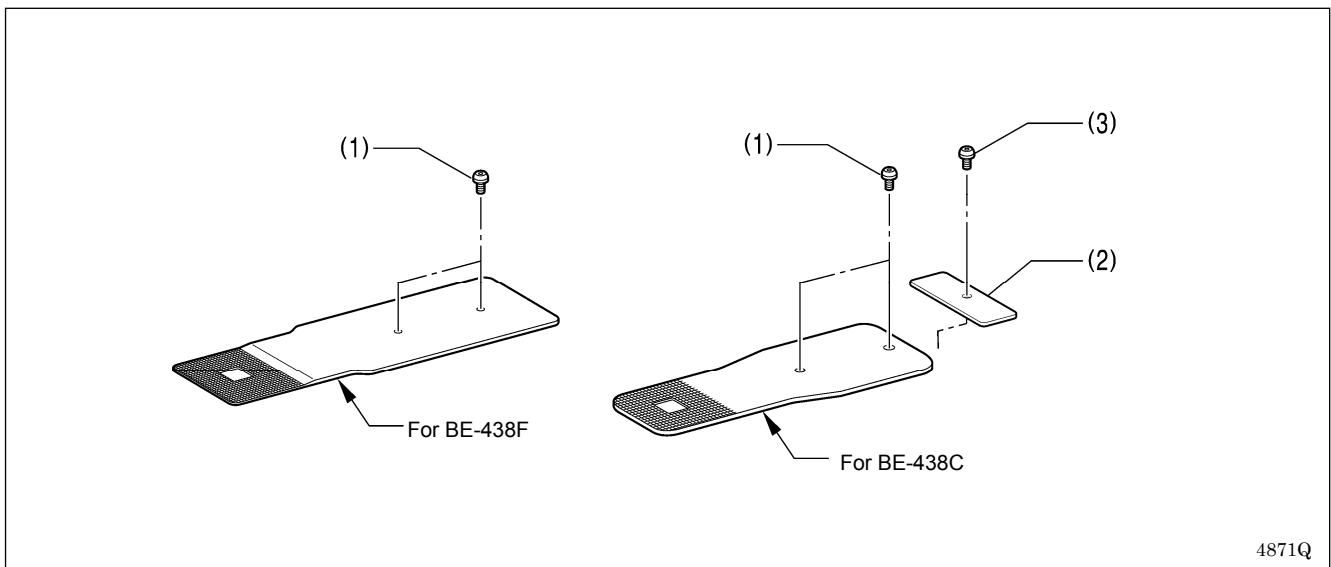
If using the feed plate for the KE-430C and BE-438C, install it as follows.

## <KE-430F>



Install using the two screws (1) and the accessory feed plate cover (2), screw (3) and washer (4) as shown in the illustration.

## <BE-438F>



Install using the two screws (1) and the accessory feed plate cover (2) and screw (3) as shown in the illustration.

# 14. INSTALLING THE 2-PEDAL FOOT SWITCH (OPTION)

The foot switch conversion harness (SB1565001) that is sold separately is required.

## ! DANGER

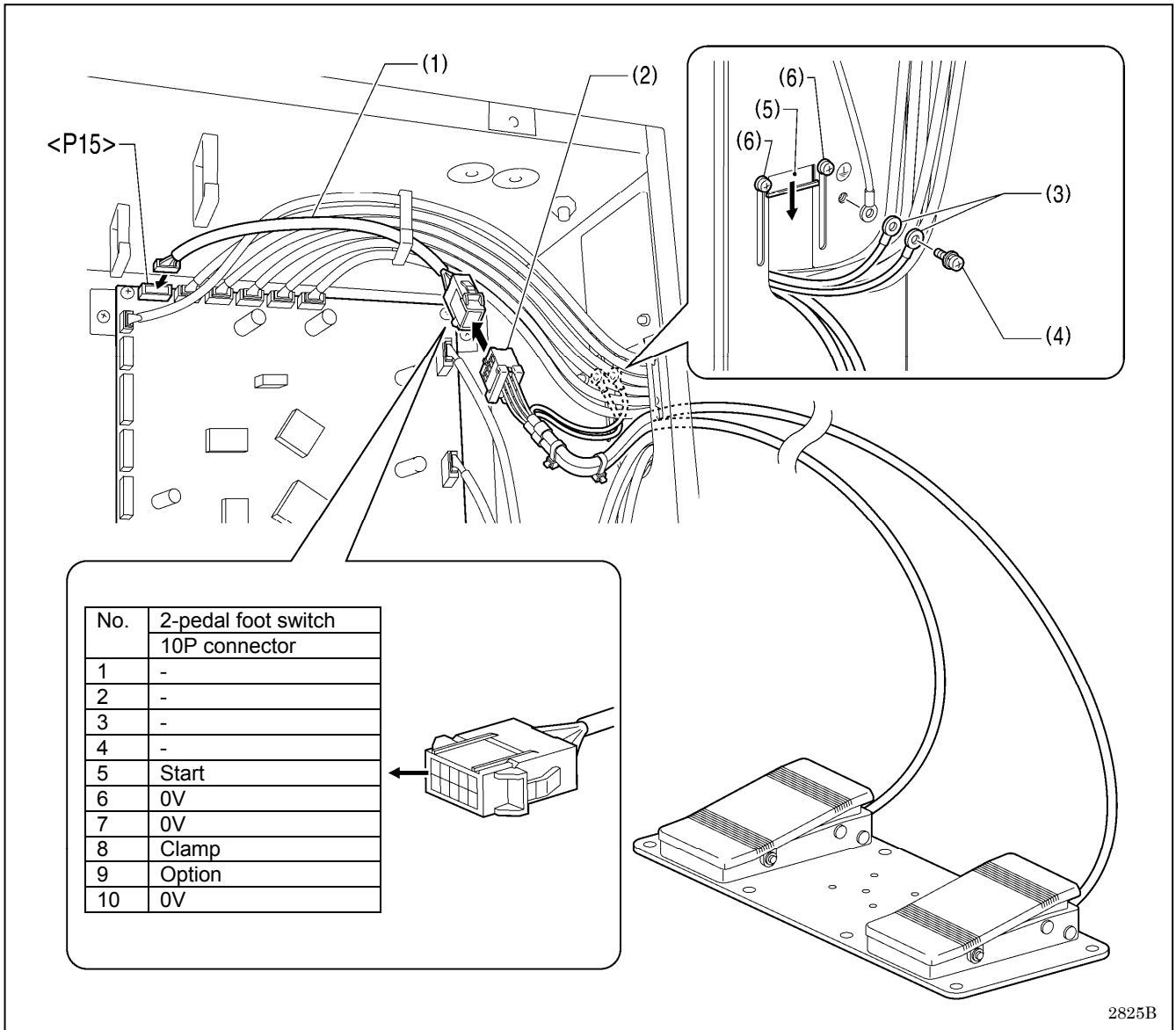


Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present will result in serious injury from electric shocks.



Be sure to connect the ground.

If the ground connection is not secure, you run a high risk of serious injury from electric shocks, and problems with correct operation will also occur.



1. Insert the foot switch conversion harness (1) into connector <P15> on the main PCB.
2. Connect the connector (2) for the 2-pedal foot switch to the foot switch conversion harness (1).
3. Temporarily remove the screw (4) from the ground terminal of the control box, and then connect the two ground wires (3) in the 2-pedal foot switch harness to the ground terminal and retighten the screw to the ground terminal.
4. Close the cord presser plate (5) in the direction of the arrow, and secure it by tightening the two screws (6).

**NOTE:**

- Make sure that the ground connections are secure in order to ensure safety.
- Close the cord presser plate (5) securely so that no foreign objects, insects or small animals can get inside the control box.



# 15. ELECTRIC MECHANISM

## DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present will result in serious injury from electric shocks.

### 15-1. Precautions at the time of adjustment

Pay attention to the following when opening the control box for maintenance.

#### Electric shock

Some large capacitors may have a high voltage remaining in them for up to 5 minutes after the power is turned off. To prevent electric shock, wait at least 5 minutes after the power is turned off before doing the following:

- Opening and closing the control box
- Replacing fuses
- Separating and joining connectors
- Measuring resistance
- Doing anything with a possibility of touching something inside the control box

Some adjustments require measuring the voltage while the power is turned on with the control box kept open.

In such a case, be careful not to touch any place other than that for the measurement. In addition, always keep in mind that a high voltage remains for about 5 minutes after power is turned off.

#### Injury

When separating or rejoining connectors, and measuring something, be careful not to cut your fingers on metal parts such as heat sinks and covers.

## 15-2. Components inside and outside the control box and in the operation panel

### Main PCB

Secured to the rear. This PCB drives the pulse motor and solenoids.

### Motor PCB

Secured to the side. This PCB drives the main shaft motor. There are two fuses on this PCB.

### Power PCB

Secured to the base. This PCB generates the voltages which are required for control operations.

### Conversion transformer box (100V, 110V, 380V, 400V AC specifications only)

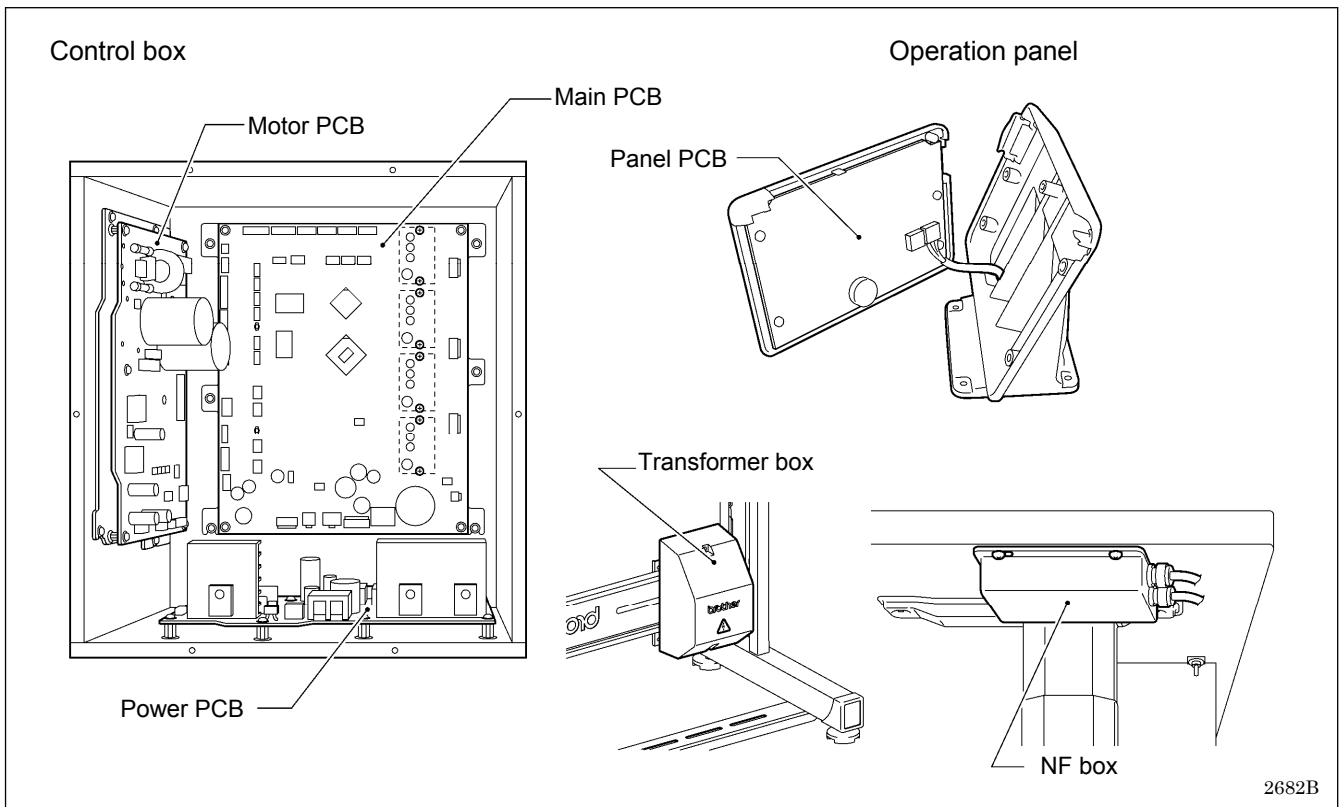
Steps-down the power supply voltage and generates the voltages that are required for the control box.

### NF box (For Europe)

Eliminates electrical noise that is transmitted along the power supply line.

### Panel PCB

Secured inside the operation panel. This PCB controls indications of the machine status and the input operation.

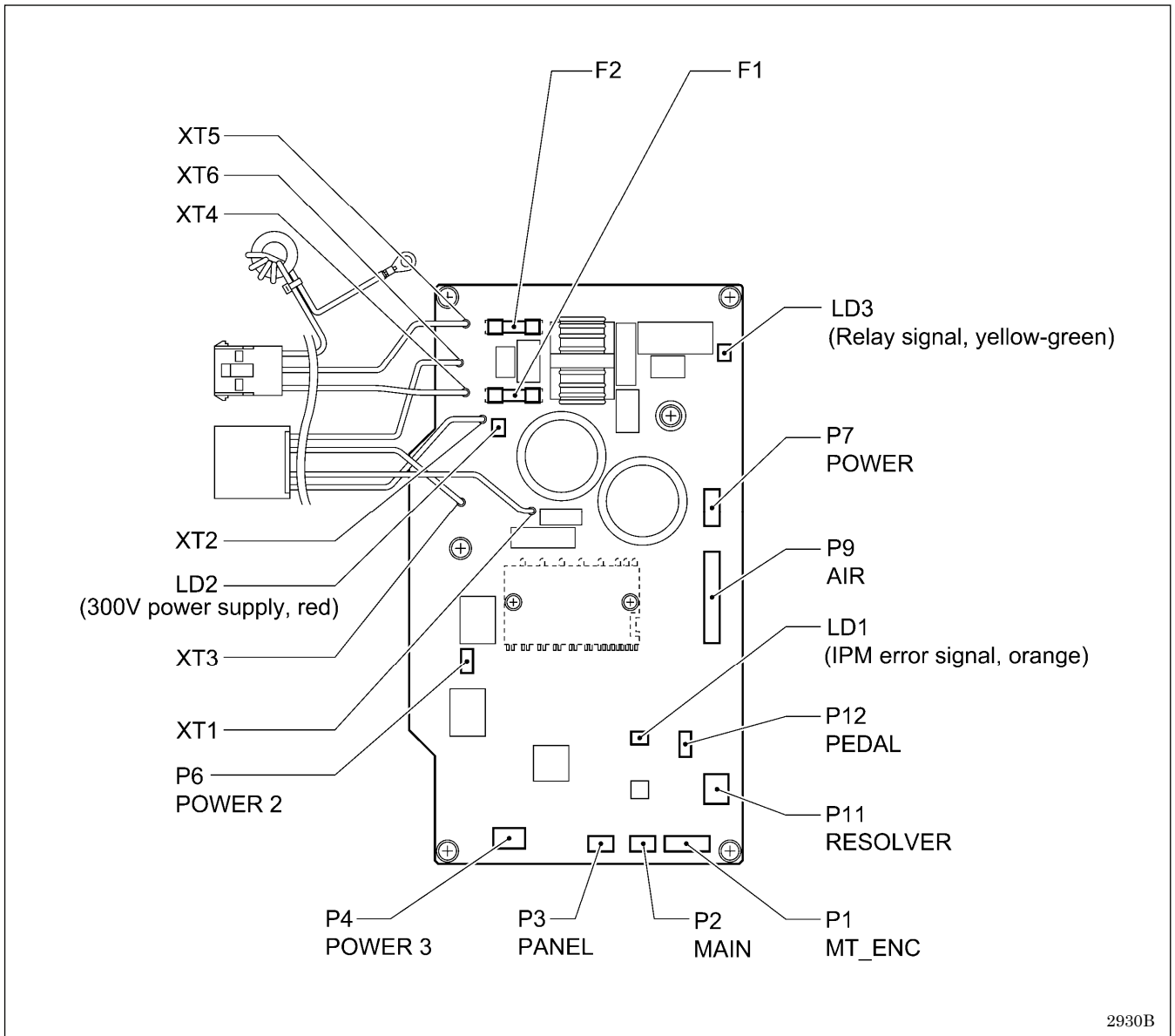


### 15-3. Fuse explanation

When replacing a fuse, be sure to use the specified ones listed below.  
 If a component on a PCB is damaged, the fuses may blow again soon even after they have been replaced.

No.	Part name	Part code	When a fuse has blown
F1 F2	Fuse 15AFB (glass tube fuse, 15A-250V)	A10193-001	The power indicator is not illuminated, and nothing operates.

#### Motor PCB

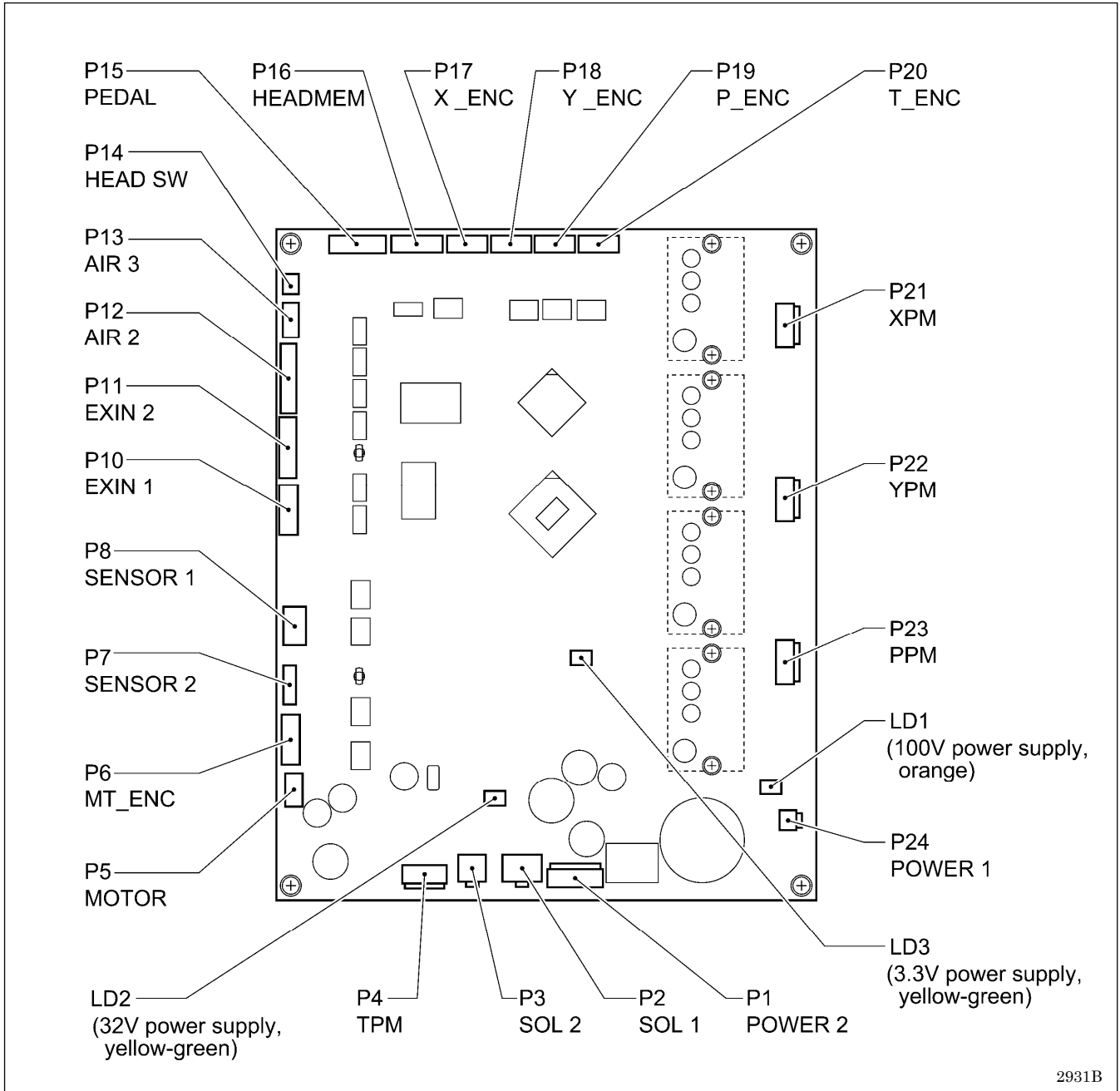


## 15-4. Connectors

Most of the machine trouble is due to connector problems including improper connection or sufficient contact. Therefore, be sure to check if each connector is correctly inserted and that there is no contact failure between pins and wires before starting troubleshooting procedures.

### 15-4-1. Connector positions

#### Main PCB

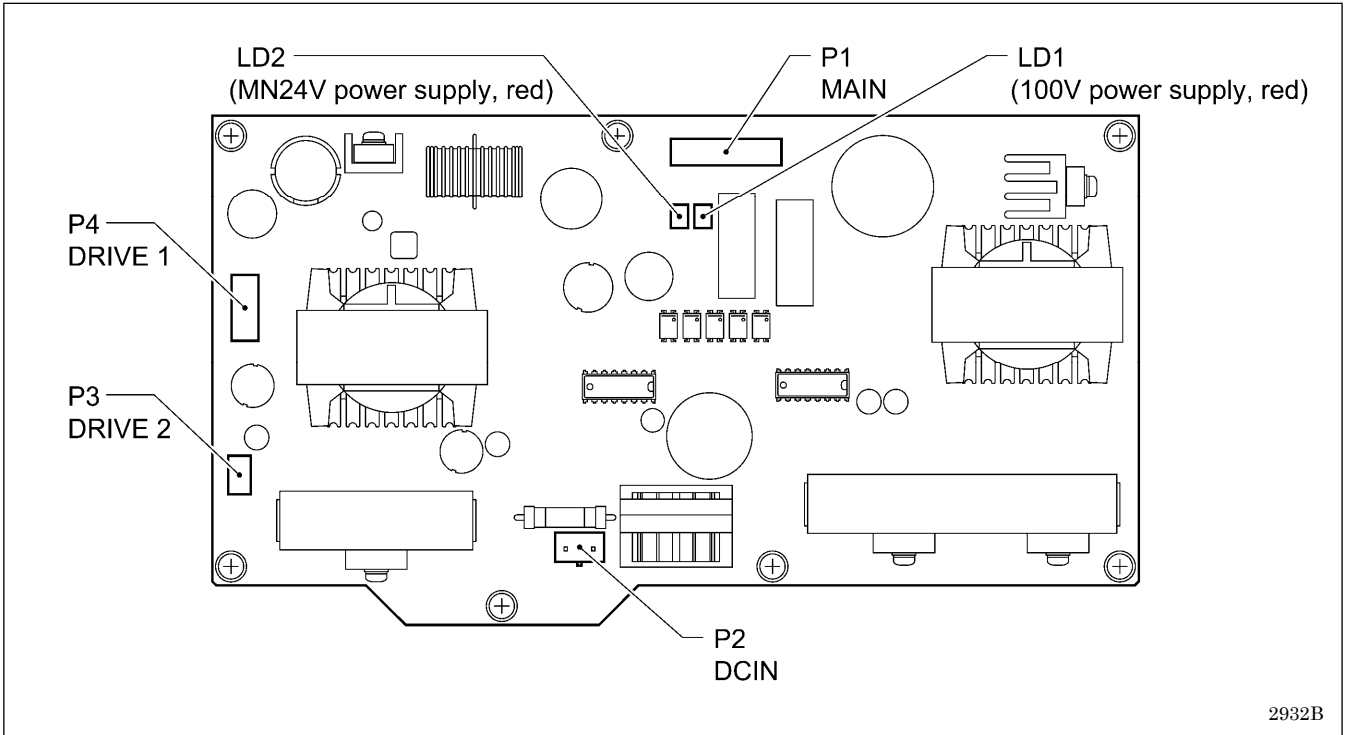


2931B

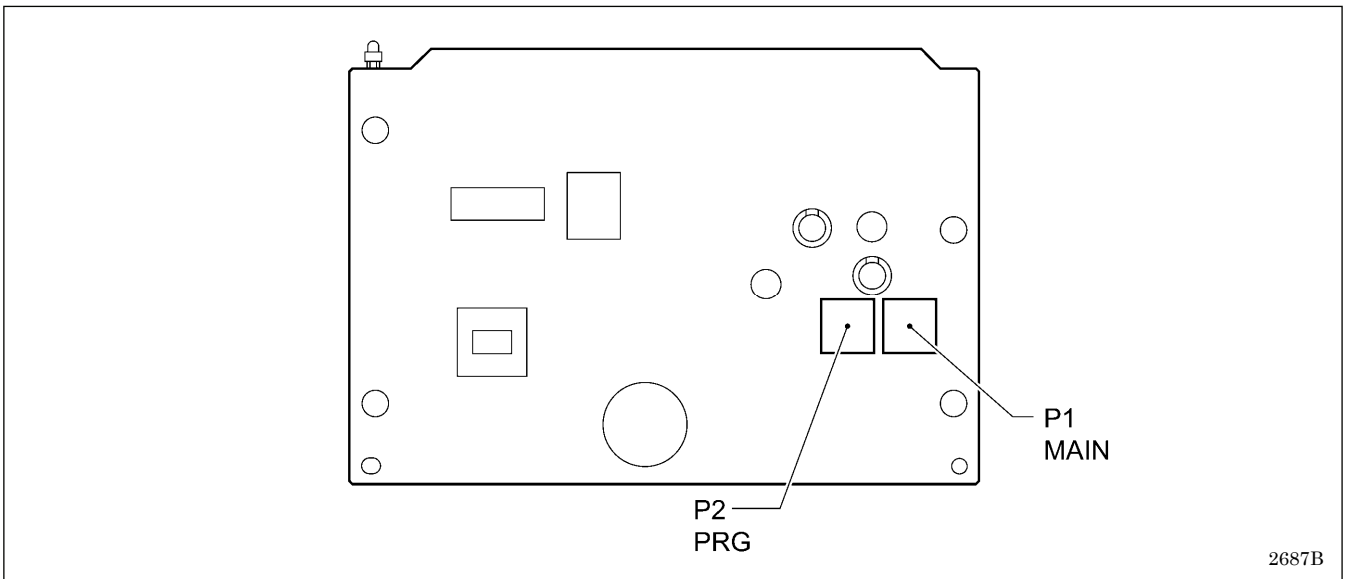
#### Motor PCB

(Refer to the diagram in "15-3. Fuse explanation".)

Power PCB



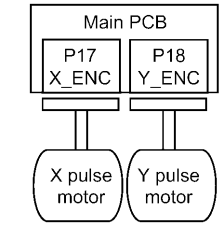
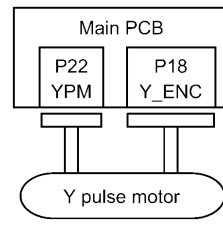
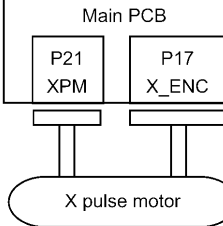
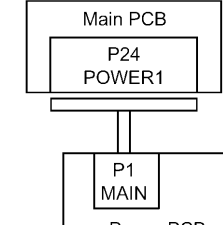
Panel PCB



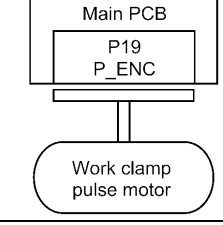
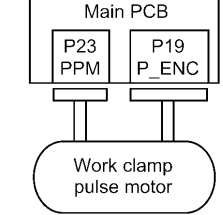
15-4-2. Contact failure

The connectors functions are divided into five categories. Some connectors may belong to more than one group. Be sure to investigate another category if a problem is not found in one category.

Feed mechanism

Problem	Connector No. and position
<ul style="list-style-type: none"> <li>The work clamp/button clamp operates for a moment but the home position is not detected correctly.</li> <li>Error E200 or E210 is displayed.</li> </ul>	 <p style="text-align: right;">2933B</p>
<ul style="list-style-type: none"> <li>Problem with work clamp/button clamp operation in the forward-back (Y) direction.</li> <li>Error E210, E211, E214, E215 or E216 is displayed.</li> </ul>	 <p style="text-align: right;">2934B</p>
<ul style="list-style-type: none"> <li>Problem with work clamp/button clamp operation in the sideways (X) direction.</li> <li>Error E200, E201, E204, E205 or E206 is displayed.</li> </ul>	 <p style="text-align: right;">2935B</p>
<ul style="list-style-type: none"> <li>The feed motor does not operate for home position detection immediately after the power is turned on.</li> <li>Error E300 is displayed.</li> </ul>	 <p style="text-align: right;">2936B</p>

Work clamp mechanism

Problem	Connector No. and position
<ul style="list-style-type: none"> <li>The work clamp pulse motor rotates but the home position is not detected correctly.</li> <li>Error E300 is displayed.</li> </ul>	 <p style="text-align: right;">2937B</p>
<ul style="list-style-type: none"> <li>The work clamp pulse motor does not rotate correctly.</li> <li>Error E300, E301, E330 or E331 is displayed.</li> </ul>	 <p style="text-align: right;">2938B</p>

**Thread trimmer mechanism**

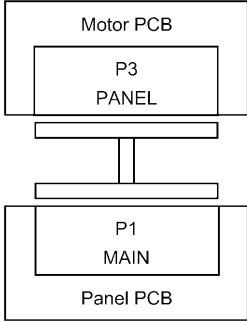
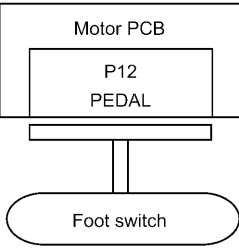
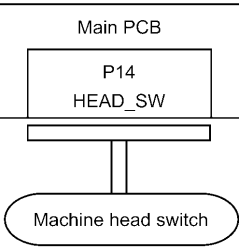
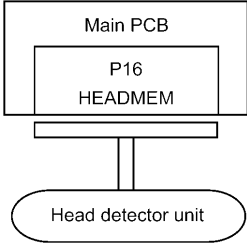
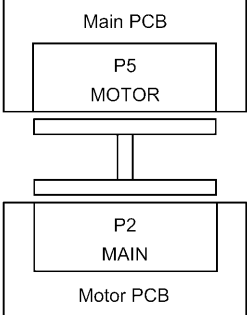
Problem	Connector No. and position
<ul style="list-style-type: none"> <li>• Thread trimming is not performed. (There is no error display.)</li> </ul>	<p style="text-align: right;">2939B</p>
<ul style="list-style-type: none"> <li>• Digital tension does not operate. (There is no error display.)</li> </ul>	<p style="text-align: right;">2940B</p>
<ul style="list-style-type: none"> <li>• Error E690 is displayed.</li> </ul>	<p style="text-align: right;">2941B</p>

**Sewing operation**

Problem	Connector No. and position
<ul style="list-style-type: none"> <li>• The power indicator is not illuminated, and nothing operates.</li> <li>• Machine operation is unstable.</li> </ul>	<p style="text-align: right;">2942B</p>
<ul style="list-style-type: none"> <li>• The main shaft motor does not operate correctly.</li> <li>• Error E130 is displayed.</li> </ul>	<p style="text-align: right;">2943B</p>

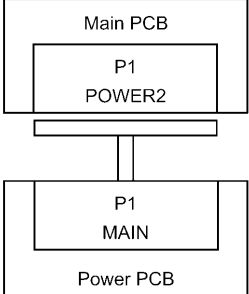
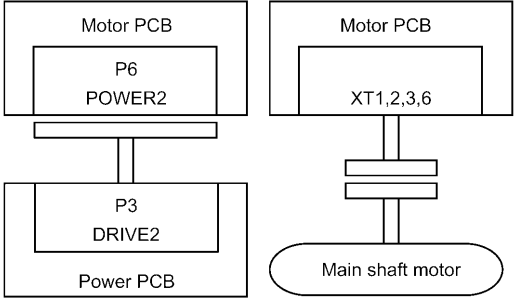
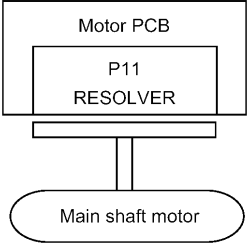
15. ELECTRIC MECHANISM

Others

Problem	Connector No. and position
<ul style="list-style-type: none"> <li>Panel indication is strange.</li> <li>The power indicator is not illuminated.</li> <li>Any operation panel key does not have any effect.</li> </ul>	 <p style="text-align: right;">2944B</p>
<ul style="list-style-type: none"> <li>The sewing machine does not operate when the foot switch is depressed. (No error display.)</li> </ul>	 <p style="text-align: right;">2945B</p>
<ul style="list-style-type: none"> <li>Error E055 is displayed after the power is turned on.</li> </ul>	 <p style="text-align: right;">2946B</p>
<ul style="list-style-type: none"> <li>Error E452 is displayed after the power is turned on.</li> </ul>	 <p style="text-align: right;">2947B</p>
<ul style="list-style-type: none"> <li>The machine does not start up with the "brother" display appearing.</li> </ul>	 <p style="text-align: right;">2948B</p>

(Continued on next page.)

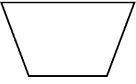
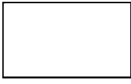
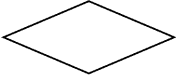





Problem	Connector No. and position
<ul style="list-style-type: none"> <li>• Only the power indicator illuminates.</li> <li>• Nothing appears on the operation panel display.</li> </ul>	 <p style="text-align: right;">2949B</p>
<ul style="list-style-type: none"> <li>• The sewing machine does not operate when the foot switch is depressed.</li> <li>• Error E130 is displayed.</li> </ul>	 <p style="text-align: right;">2950B</p>
<ul style="list-style-type: none"> <li>• Error E131 is displayed.</li> </ul>	 <p style="text-align: right;">2951B</p>

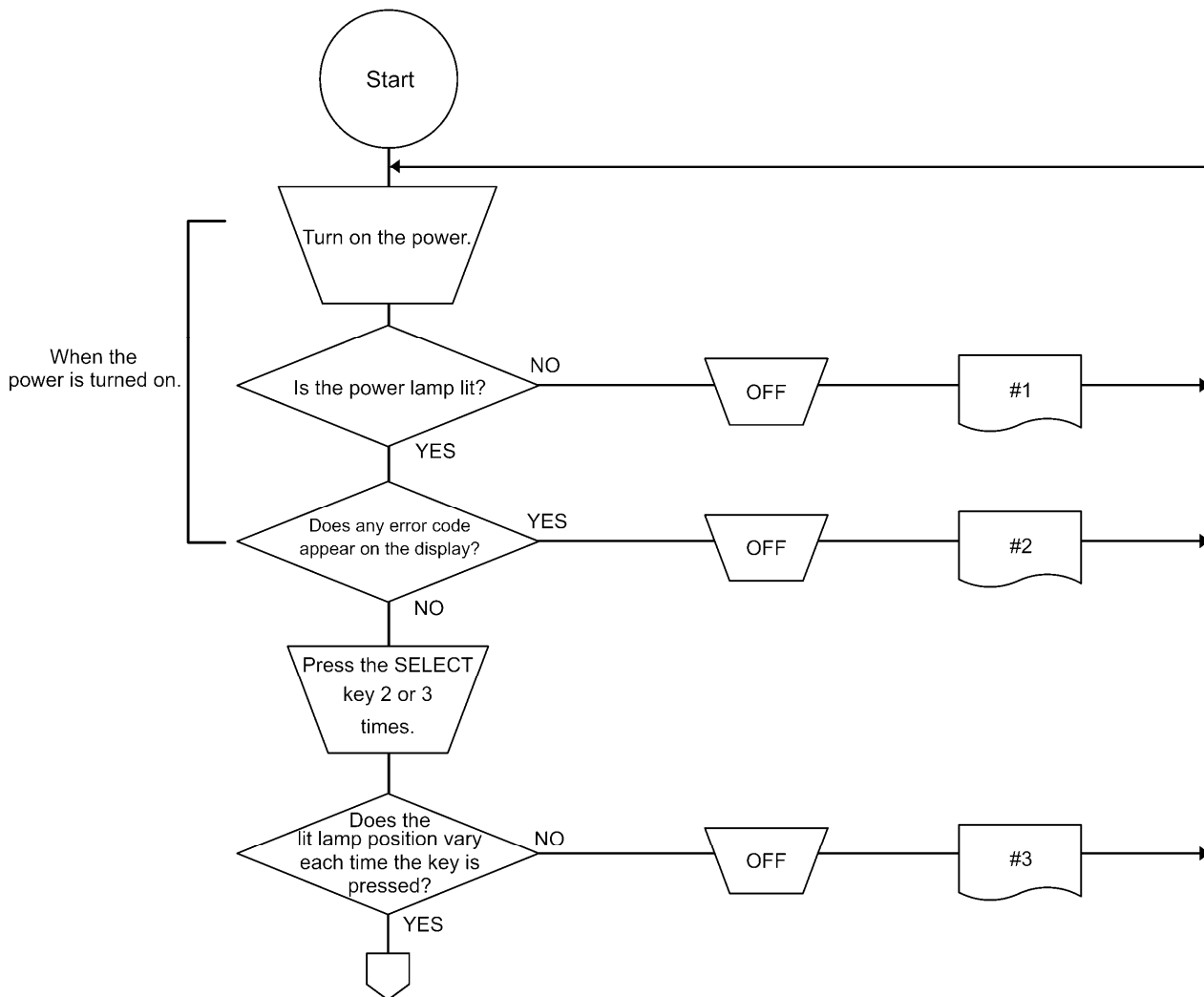
## 15-5. Troubleshooting

### 15-5-1. Troubleshooting flowchart

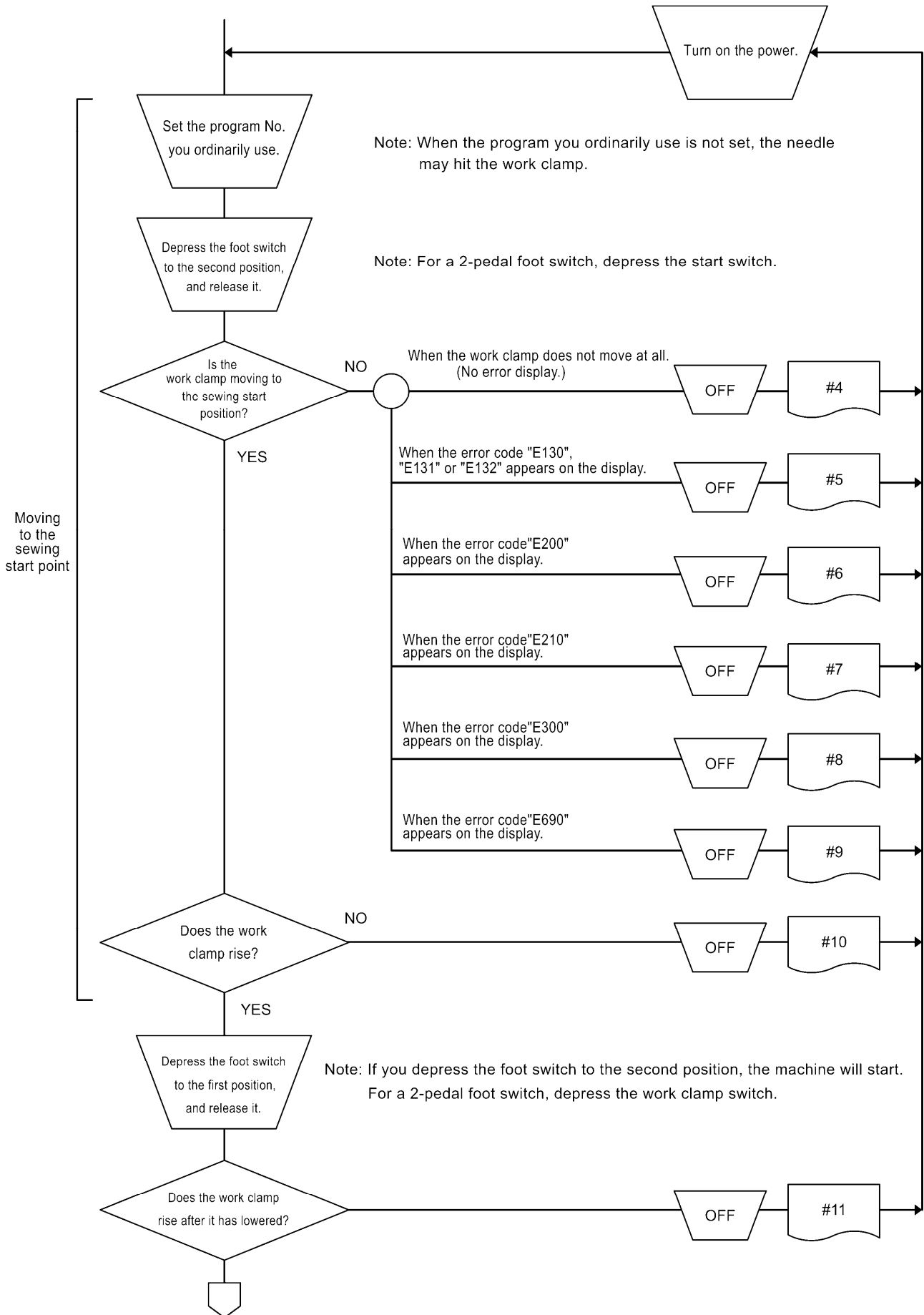
#### Symbols and their meanings

	Switch operation		Set-up operation or condition
	Yes-or-no decision-making process		The procedure to follow continues on the next page
	The error status number in the first column of the table of "15-5-2. Problem solution and measures"		Turning-off of the power switch

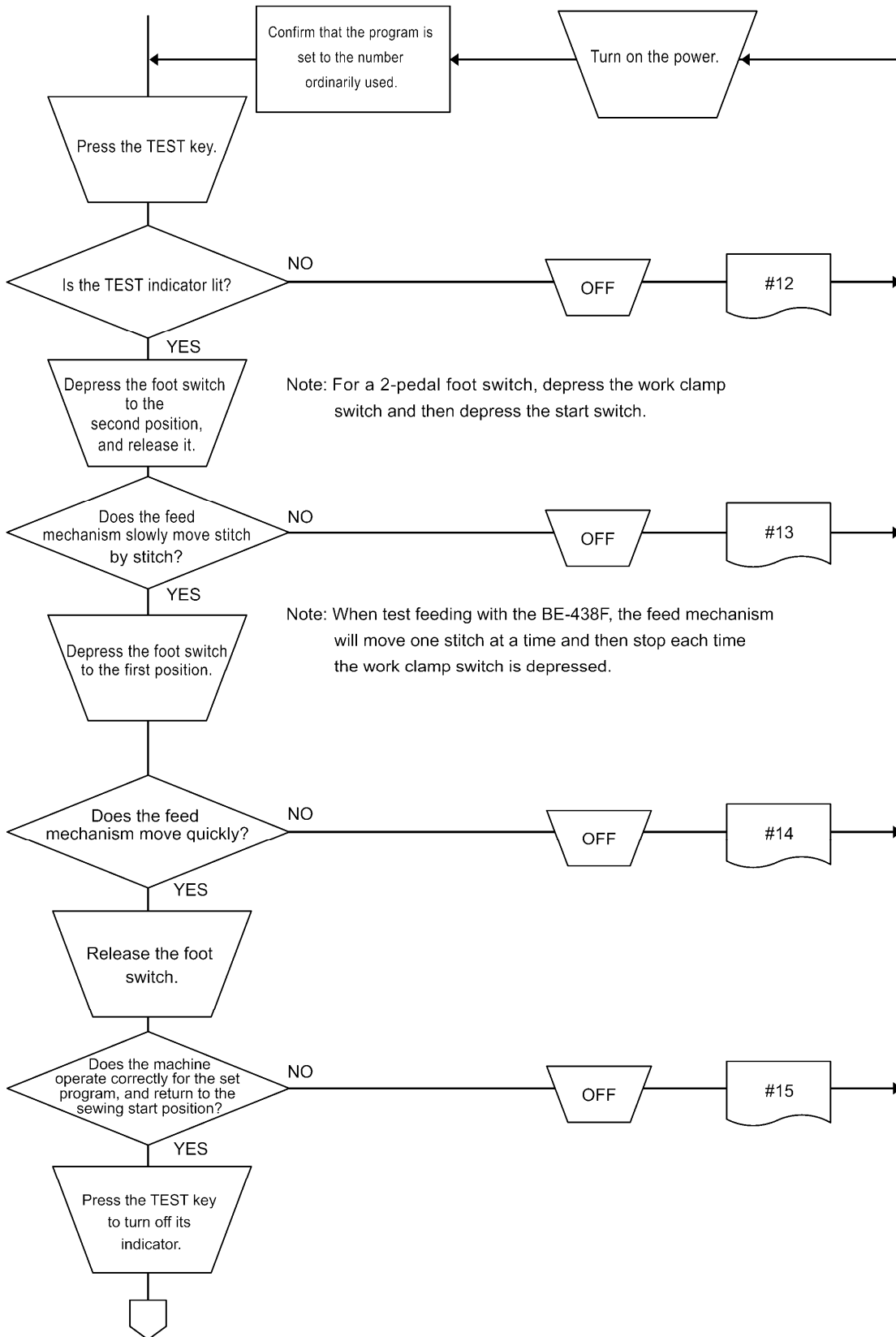
2707B

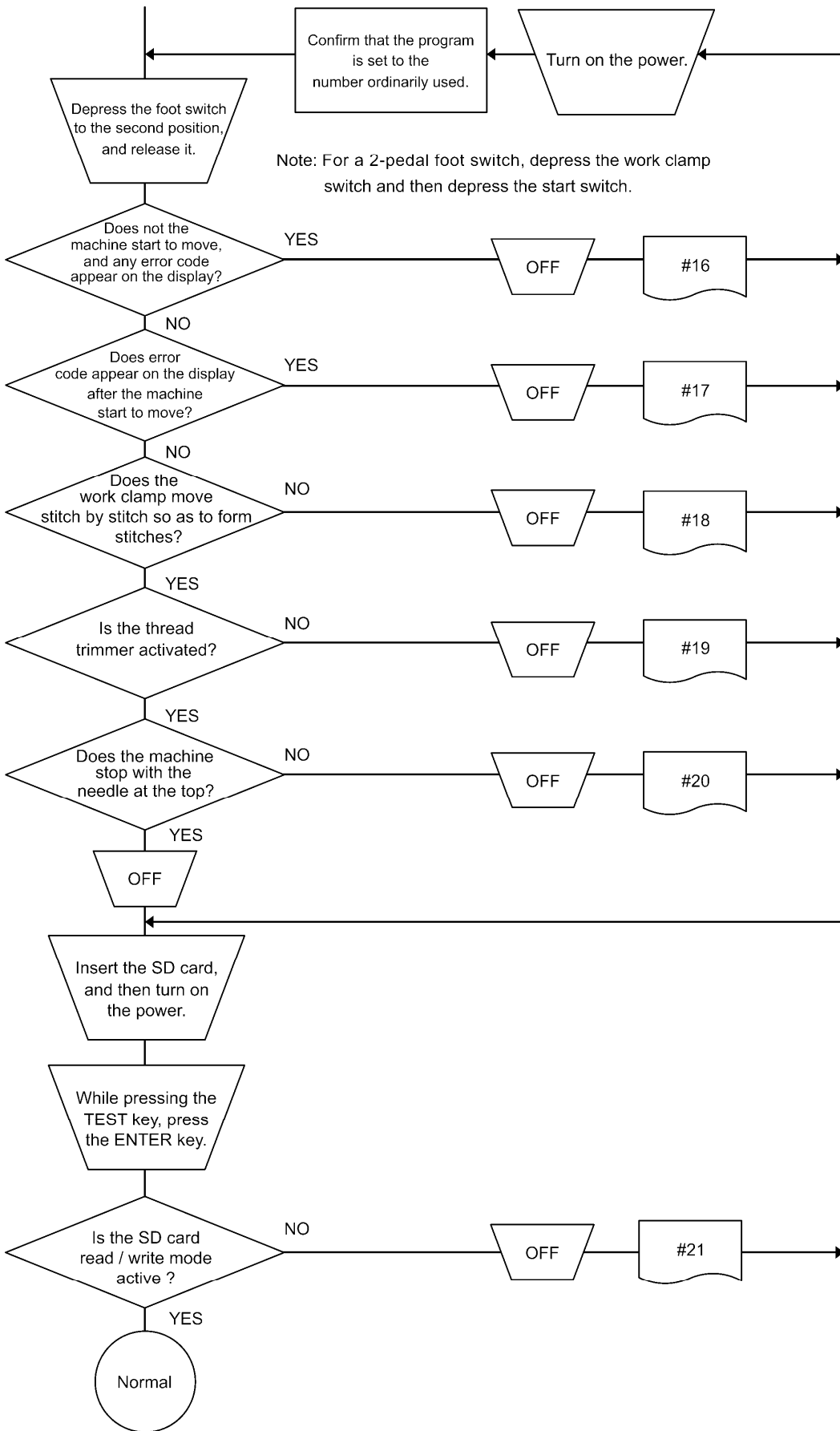


2952B



2953B





### 15-5-2. Problem solution and measures

#### **DANGER**



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present will result in serious injury from electric shocks.

1. Pay attention to the following when opening the control box for maintenance.

#### **Electrical shock**

Some large capacitors may have a high voltage remaining in them for up to 5 minutes after the power is turned off. To prevent electrical shock, wait at least 5 minutes after the power is turned off before doing the following:

- Opening and closing the control box
- Replacing fuses
- Separating and joining connectors
- Measuring resistance
- Doing anything with a possibility of touching something inside the control box

Some adjustments require measuring the voltage while the power is turned on with the control box kept open. In such a case, be careful not to touch any place other than that for the measurement. In addition, always keep in mind that a high voltage remains for about 5 minutes after power is turned off.

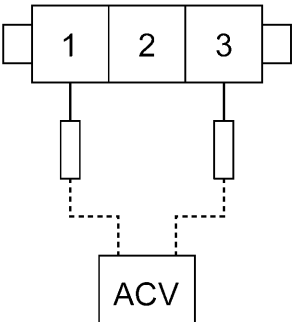
#### **Injury**

When separating or rejoining connectors, and measuring something, be careful not to cut your fingers on metal parts such as heat sinks and covers.

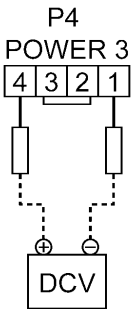
2. When replacing a fuse, be sure to use a new one of the same quality and capacity as the old one.

#### **Before adjustment**

1. While the power is turned off, check each connector is securely plugged in by referring to "15-4. Connectors".
2. Find the error status number in the troubleshooting flowchart.
3. From the applicable part of the flowchart, take the reference number to find the correspondingly numbered details of the problem in the following table.

Error status #1 The power indicator does not light when the power is turned on.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. (Check the LEDs)	<p>Turn on the power switch and check that the various LEDs illuminate in the following order.</p> <p>a. LD2 (red) on motor PCB does not illuminate. → # 1-2、 # 1-3、 # 1-4</p> <p>b. LD2 (red) on power PCB does not illuminate. → # 1-5、 # 1-6、 # 1-7、 # 1-8</p> <p>c. LD3 (green) on motor PCB does not illuminate. → # 1-9</p> <p>d. Power indicator on panel does not illuminate. → # 1-10</p>	
<p>2. Malfunction of power cord</p>  <p style="text-align: right;">2712B</p>	<p>Disconnect the power supply connector which links the power cord for the power switch and the motor PCB, turn on the power switch, and then measure the voltage between terminals 1 and 3 of the cord-side connector.</p> <p>OK if the voltage is the same as mains voltage.</p> <p>In addition, check that the power supply voltage at the wall outlet is within the range of the specification voltage +/- 10%.</p> <p>After inspecting, turn off the power switch and connect the power supply connector.</p>	
3. Blown fuse	<p>Remove fuses F1 and F2 from the motor PCB and check the continuity.</p> <p>OK if there is continuity.</p>	GFUSE15A (15A-250V)
4. Malfunction of motor PCB 1	<p>Remove P2 (DCIN) from the power PCB, turn the power back on, and then check LD2 (red) on the motor PCB.</p> <p>OK if illuminated.</p> <p>After checking, turn off the power switch, wait for five minutes or more, and then insert P2 into the power PCB.</p> <p>Turn the power back on, and then with P2 inserted into the power PCB, check the voltage between terminals 1 and 3 of P2.</p> <p>OK if 170 to 270 V DC.</p>	Motor PCB assembly
5. Malfunction of power PCB	<p>Disconnect connector P1 (POWER2) from the main PCB and connectors P4 (POWER3) and P6 (POWER2) from the motor PCB, and then turn on the power switch and check LD2 (red) on the power PCB.</p> <p>OK if illuminated.</p> <p>After checking, turn off the power switch, wait for one minute or more, and then insert P1 into the main PCB and P4 and P6 into the motor PCB.</p>	Power PCB assembly

(Continued on next page.)

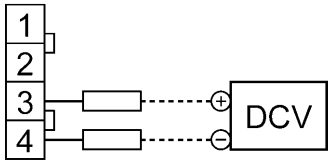
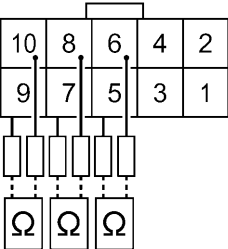
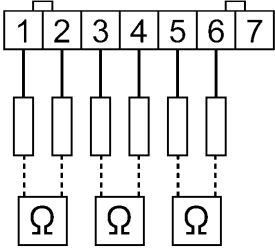
Error status #1 The power indicator does not light when the power is turned on.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
6. Malfunction of main PCB	<p>Disconnect connectors P4 (POWER3) and P6 (POWER2) from the motor PCB, and then turn on the power switch and check LD2 (red) on the power PCB. OK if illuminated. (LD1 (red) on power PCB does not illuminate)</p> <p>After checking, turn off the power switch, wait for one minute or more, and then insert P4 and P6 into the motor PCB.</p>	Main PCB assembly
7. Malfunction of main PCB 2	<p>Disconnect connector P1 (POWER2) from the main PCB and connectors P1 (MT-ENC), P2 (MAIN) and P3 (PANEL) from the motor PCB, and then turn on the power switch and check LD2 (red) on the power PCB. OK if illuminated.</p> <p>After checking, turn off the power switch, wait for one minute or more, and then insert P1 into the main PCB and P1, P2 and P3 into the motor PCB.</p>	Motor PCB assembly
8. Malfunction of panel PCB	<p>Disconnect connector P1 (POWER2) from the main PCB and connectors P1 (MT-ENC) and P2 (MAIN) from the motor PCB, and then turn on the power switch and check LD2 (red) on the power PCB. OK if illuminated.</p> <p>After checking, turn off the power switch, wait for one minute or more, and then insert P1 into the main PCB and P1 and P2 into the motor PCB.</p>	Panel PCB assembly Panel harness
9. Poor harness connection   <p style="text-align: right;">2713B</p>	<p>Check that connector P4 (POWER3) of the motor PCB is inserted, and then turn on the power switch and check the voltage between terminals 1 and 4 of P4. OK if approximately 24 V DC.</p>	Power PCB assembly
10. Malfunction of operation panel	Check that connector P3 (PANEL) of the motor PCB is inserted.	Operation panel assembly Panel PCB assembly Panel harness



Error status #2 Error code appears on the display when the power is turned on.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. If "E025" or "E035" is displayed, the foot switch is still depressed.	a. Check if the foot switch is still depressed. b. Check if there is a short-circuit in the harness. c. Check if connector P12 (PEDAL) is connected to the motor PCB. d. Reset the depression stroke for the foot switch while referring to "11-22. Standard setting for depression stroke (foot switch)".  * For a 2-pedal foot switch, the connector for the main PCB will be P15 (PEDAL).	Treadle unit   2-pedal foot switch assembly
2. If "E055" is displayed, there is a malfunction of the machine head switch.	a. Check if the machine head switch is off. b. Check if there is a broken wire in the harness. c. Check if connector P14 (HEAD-SW) is connected to the main PCB.	Switch assembly machine head
3. If "E065" is displayed, one of the keys on the operation panel is still depressed.	a. Check that there is no incorrect sensitivity when the surface of the panel sheet and the keys are pressed. b. Check that connector P3 (PANEL) is connected to the motor PCB, and that connector P1 (MAIN) is connected to the panel PCB.	Operation panel assembly Panel PCB assembly Panel harness
4. If "E131" is displayed, there is a poor connection of the synchronizer.	Check that connector P11 (RESOLVER) and P1 (MT-ENC) is connected to the motor PCB, and that connector P6 (MT-ENC) is connected to the main PCB.	
5. If "E400" and "E401" is displayed, there is a connection fault between the main PCB, motor PCB and the panel PCB.	a. Check LD3 (green) on the main PCB. OK if illuminated. b. Check LD3 (green) on the motor PCB. OK if illuminated. c. Check that connector P5 (MOTOR) is connected to the main PCB, and that connector P2 (MAIN) is connected to the motor PCB. d. Check that connector P3 (PANEL) is connected to the motor PCB, and that connector P1 (MAIN) is connected to the panel PCB. e. Check if there is a broken wire in the harness.	Main PCB assembly Motor PCB assembly Panel PCB assembly Connection harness Panel harness
6. If "E450" or "E452" is displayed, the machine head memory cannot be recognized.	a. Check if connector P3 (HEAD-M) is connected to the main PCB. b. Check if there is a broken wire in the harness.	
7. If "E700" is displayed, the power supply voltage is abnormally high.	a. Check that the power supply voltage at the mains is at the specification voltage plus or minus 10%. b. See #1-2.	
8. If "E705" is displayed, the power supply voltage is abnormally low.	a. Check that the power supply voltage at the mains is at the specification voltage plus or minus 10%. b. See #1-2.	

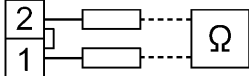
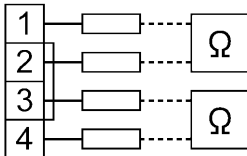
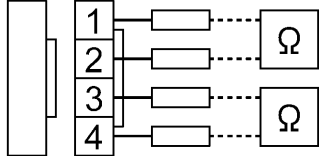
**15. ELECTRIC MECHANISM**

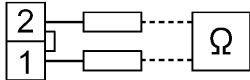
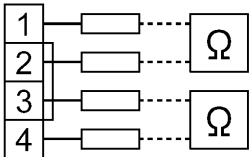
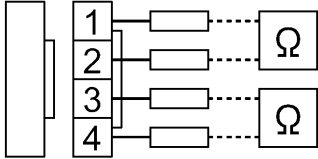
Error status #3 No keys on the operation panel are not activated.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Malfunction of panel PCB	Check that connector P3 (PANEL) is connected to the motor PCB, and that connector P1 (MAIN) is connected to the panel PCB.	Operation panel assembly Panel PCB assembly Panel harness
2. Main software not installed correctly	Carry out the restore operation by referring to "7-13. Updating the control program version".	

Error status #4 Work clamp does not return to the home position even after the foot switch is depressed.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Incorrect depression position adjustment	Adjust the position while referring to "11-22. Setting method for standard depression strokes (Foot switch)".	
2. Malfunction of treadle unit  P12 PEDAL    2714B	With the motor PCB connector P12 (PEDAL) connected, turn on the power and measure the voltage between pins 3-4 of the cord connector (No. 3 +, No. 4 -).  OK if the voltage is approximately 2 V at neutral, approximately 4 V when the foot switch is depressed as far as it will go, and approximately 0.5 V when it is depressed backward.	Foot switch
3. Malfunction of foot switch and cord (option)  Connector on the foot switch    2956B	(Check that the power is turned off.) Disconnect the foot switch from the foot switch adapter harness, and measure the voltage between pins 5-6 and 7-8 of the foot switch connector. (Check between pins 9-10 if using a 2-pedal foot switch.)  OK if the resistance is normally $\infty$ ohms but 0 ohms when depressed.	Foot switch
4. Malfunction of foot switch adapter harness (option)  P15 PEDAL    2716B	After checking the foot switch in step 3, connect the foot switch adapter harness to the foot switch and measure the voltage between pins 1-2 and 3-4 of connector P15 (PEDAL) of the main PCB. (Check between pins 5-6 if using a 2-pedal foot switch.) (Touch the ohmmeter against the lead wires without disconnecting the connector.)  OK if the resistance is normally $\infty$ ohms but 0 ohms when depressed.	Foot switch Foot switch cord

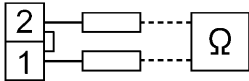
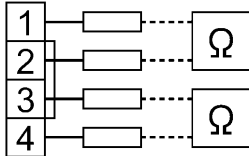
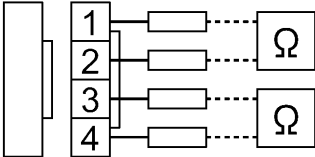
Error status #5 Error code appears on the display when the foot switch is depressed.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. If "E130", "E131" or "E132" is displayed, there is a poor connection of the synchronizer.	Refer to inspection #2-4.	
2. If "E130", "E131" or "E132" is displayed, there is a poor connection of the machine motor.	Check the connection of the relay connector between the machine motor and the motor PCB.	
3. If "E130", "E131" or "E132" is displayed, there is a blown fuse.	<p>a. Remove fuses F1 and F2 from the motor PCB and check the continuity. OK if there is continuity.</p> <p>b. If fuse F1 or F2 is blown, check the resistance values between each pin of the relay connector between the machine motor and the motor PCB and between each terminal of the fuses. OK if <math>\infty</math> ohms.</p> <p>c. If the fuses blow again after they are replaced, replace the motor PCB.</p>	<p>GFUSE15A (15A-250V)</p> <p>Motor PCB assembly</p>
4. If "E130", "E131" or "E132" is displayed, there is a malfunction of the motor PCB.	<p>a. Check the synchronizer input while referring to "4-7. Input checking method". OK if the signal turns on and off.</p> <p>b. If step a. (above) is OK, there is a malfunction of the motor PCB.</p>	<p>Resolver stator 430 assembly</p> <p>Motor PCB assembly</p>

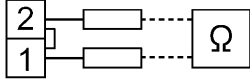
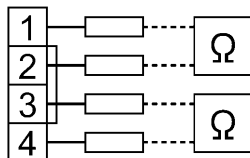
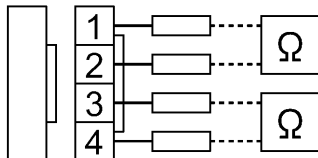
15. ELECTRIC MECHANISM

Error status #6 Error code appears on the display when the foot switch is depressed.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
<p>1. If the X feed does not move and "E200" is displayed, there is a malfunction of the power PCB.</p>	<p>Disconnect connectors P1 (POWER2) and P24 (POWER1) from the main PCB, and then turn on the power switch and check LD1 (red) on the power PCB. OK if illuminated.</p> <p>After checking, turn off the power switch, wait for one minute or more, and then insert P1 and P24 into the main PCB.</p>	Power PCB assembly
<p>2. If the X feed does not move and "E200" is displayed, there is a malfunction of the main PCB.</p> <p>P24 POWER 1</p>  <p>P21 XPM</p>  <p>2717B 2718B</p>	<p>a. Disconnect connector P24 (POWER1) from the main PCB, and check the continuity between terminals 1 and 2 of P24. OK if ∞ ohms.</p> <p>b. Disconnect connector P21 (XPM) from the main PCB, and check the continuity between terminals 1 and 2, 3 and 4 of P21. OK if ∞ ohms.</p> <p>c. Insert P21 and P24 into the main PCB, turn on the power switch and then check LD1 (red) on the power PCB. OK if illuminated.</p> <p>If LD1 is illuminated during the check in step 1 but it does not illuminate when P1 and P24 are connected, there is a malfunction of the main PCB.</p> <p>d. Check LD1 (orange) on the main PCB. OK if illuminated.</p>	Main PCB assembly
<p>3. If the X feed moves slightly and "E200" is displayed, there is a malfunction of the encoder.</p>	<p>a. Check that connector P17 (X-ENC) is inserted into the main PCB and that the color matches.</p> <p>b. Check the encoder input while referring to "4-7. Input checking method".</p>	Pulse motor X assembly Main PCB assembly
<p>4. If the X feed does not move and "E200" is displayed, there is a malfunction of the pulse motor and cord.</p> <p>P21 XPM</p>  <p>2719B</p>	<p>a. Disconnect the main PCB connector P21 (XPM) and measure the resistance between pins 1-2 and 3-4 of the cord connector. OK if 2-3 ohms.</p> <p>b. If step a. (above) is OK, there is a malfunction of the main PCB.</p>	Pulse motor X assembly Main PCB assembly

Error status #7 Error code appears on the display when the foot switch is depressed.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
<p>1. If the Y feed does not move and "E210" is displayed, there is a malfunction of the power PCB.</p>	<p>Disconnect connectors P1 (POWER2) and P24 (POWER1) from the main PCB, and then turn on the power switch and check LD1 (red) on the power PCB. OK if illuminated.</p> <p>After checking, turn off the power switch, wait for one minute or more, and then insert P1 and P24 into the main PCB.</p>	Power PCB assembly
<p>2. If the Y feed does not move and "E210" is displayed, there is a malfunction of the main PCB.</p> <p>P24 POWER 1</p>  <p>P22 YPM</p>  <p>2717B 2720B</p>	<p>a. Disconnect connector P24 (POWER1) from the main PCB, and check the continuity between terminals 1 and 2 of P24. OK if ∞ ohms.</p> <p>b. Disconnect connector P22 (YPM) from the main PCB, and check the continuity between terminals 1 and 2, 3 and 4 of P22. OK if ∞ ohms.</p> <p>c. Insert P22 and P24 into the main PCB, turn on the power switch and then check LD1 (red) on the power PCB. OK if illuminated.</p> <p>If LD1 is illuminated during the check in step 1 but it does not illuminate when P1 and P24 are connected, there is a malfunction of the main PCB.</p> <p>d. Check LD1 (orange) on the main PCB. OK if illuminated.</p>	Main PCB assembly
<p>3. If the Y feed moves slightly and "E210" is displayed, there is a malfunction of the encoder.</p>	<p>a. Check that connector P18 (Y-ENC) is inserted into the main PCB and that the color matches.</p> <p>b. Check the encoder input while referring to "4-7. Input checking method".</p>	Pulse motor Y assembly Main PCB assembly
<p>4. If the Y feed does not move and "E210" is displayed, there is a malfunction of the pulse motor and cord.</p> <p>P22 YPM</p>  <p>2721B</p>	<p>a. Disconnect the main PCB connector P22 (YPM) and measure the resistance between pins 1-2 and 3-4 of the cord connector. OK if 2-3 ohms.</p> <p>b. If step a. (above) is OK, there is a malfunction of the main PCB.</p>	Pulse motor Y assembly Main PCB assembly

15. ELECTRIC MECHANISM

Error status #8 Error code appears on the display when the foot switch is depressed.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
<p>1. If the work clamp pulse motor does not operate and "E300" is displayed, there is a malfunction of the power PCB.</p>	<p>Disconnect connectors P1 (POWER2) and P24 (POWER1) from the main PCB, and then turn on the power switch and check LD1 (red) on the power PCB. OK if illuminated.</p> <p>After checking, turn off the power switch, wait for one minute or more, and then insert P1 and P24 into the main PCB.</p>	Power PCB assembly
<p>2. If the work clamp pulse motor does not move and "E300" is displayed, there is a malfunction of the main PCB.</p> <p>P24 POWER 1</p>  <p>P23 PPM</p>  <p>2717B 2722B</p>	<p>a. Disconnect connector P24 (POWER1) from the main PCB, and check the continuity between terminals 1 and 2 of P24. OK if ∞ ohms.</p> <p>b. Disconnect connector P23 (PPM) from the main PCB, and check the continuity between terminals 1 and 2, 3 and 4 of P23. OK if ∞ ohms.</p> <p>c. Insert P23 and P24 into the main PCB, turn on the power switch and then check LD1 (red) on the power PCB. OK if illuminated.</p> <p>If LD1 is illuminated during the check in step 1 but it does not illuminate when P1 and P24 are connected, there is a malfunction of the main PCB.</p> <p>d. Check LD1 (orange) on the main PCB. OK if illuminated.</p>	Main PCB assembly
<p>3. If the work clamp pulse motor moves slightly and "E300" is displayed, there is a malfunction of the encoder.</p>	<p>a. Check that connector P19 (P-ENC) is inserted into the main PCB and that the color matches.</p> <p>b. Check the encoder input while referring to "4-7. Input checking method".</p>	Pulse motor P assembly Main PCB assembly
<p>4. If the work clamp pulse motor does not move and "E300" is displayed, there is a malfunction of the pulse motor and cord.</p> <p>P23 PPM</p>  <p>2723B</p>	<p>a. Disconnect the main PCB connector P23 (PPM) and measure the resistance between pins 1-2 and 3-4 of the cord connector. OK if 2-3 ohms.</p> <p>b. If step a. (above) is OK, there is a malfunction of the main PCB.</p>	Pulse motor P assembly Main PCB assembly

Error status #9 Error code appears on the display when the foot switch is depressed.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. If "E690" is displayed during home position detection, there is a malfunction of the thread nipper.	a. Check the position of the thread nipper driving lever. b. Remove any thread scraps from behind the needle plate.	
2. If "E960" is displayed during home position detection, the thread nipper home position adjustment is incorrect.	Adjust the home position while referring to "11-18-3. Thread nipper motor home position".	
3. If the thread nipper pulse motor does not operate and "E690" is displayed, there is a malfunction of the power PCB.	Disconnect connectors P1 (POWER2) and P24 (POWER1) from the main PCB, and then turn on the power switch and check LD1 (red) on the power PCB. OK if illuminated.  After checking, turn off the power switch, wait for one minute or more, and then insert P1 and P24 into the main PCB.	Power PCB assembly
4. If the thread nipper pulse motor does not move and "E690" is displayed, there is a malfunction of the main PCB.  <div style="display: flex; flex-direction: column; align-items: center;"> <div style="text-align: center;"> <p>P24 POWER 1</p>  </div> <div style="text-align: center; margin-top: 10px;"> <p>P4 TPM</p>  </div> <div style="margin-top: 10px;"> <p>2717B 2724B</p> </div> </div>	a. Disconnect connector P1 (POWER2) from the main PCB, and check the continuity between terminals 1 and 2 of P1. OK if ∞ ohms. b. Disconnect connector P4 (TPM) from the main PCB, and check the continuity between terminals 1 and 2, 3 and 4 of P4. OK if ∞ ohms. c. Insert P1 and P4 into the main PCB, turn on the power switch and then check LD1 (red) on the power PCB. OK if illuminated. If LD1 is illuminated during the check in step 1 but it does not illuminate when P1 and P24 are connected, there is a malfunction of the main PCB. d. Check LD2 (green) on the main PCB. OK if illuminated.	Main PCB assembly
5. If the thread nipper pulse motor moves slightly and "E690" is displayed, there is a malfunction of the encoder.	a. Check that connector P20 (T-ENC) is inserted into the main PCB and that the color matches. b. Check the encoder input while referring to "4-7. Input checking method".	Pulse motor T assembly Main PCB assembly
6. If the thread nipper pulse motor does not move and "E690" is displayed, there is a malfunction of the pulse motor and cord.  <div style="display: flex; flex-direction: column; align-items: center;"> <div style="text-align: center;"> <p>P4 TPM</p>  </div> <div style="margin-top: 10px;"> <p>2725B</p> </div> </div>	a. Disconnect the main PCB connector P4 (TPM) and measure the resistance between pins 1-2 and 3-4 of the cord connector. OK if 2-3 ohms. b. If step a. (above) is OK, there is a malfunction of the main PCB.	Pulse motor T assembly  Main PCB assembly

## 15. ELECTRIC MECHANISM

Error status #10 Work clamp does not rise.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Incorrect work clamp home position adjustment	a. Adjust the home position while referring to "11-18. Adjusting the home position". b. Check if the work clamp/button clamp is touching anything.	
2. Incorrect mechanism adjustment	Check if the work clamp arm moves smoothly.	Work clamp arm assembly

Error status #11 Work clamp does not lower.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Incorrect work clamp home position adjustment	a. Adjust the home position while referring to "11-18. Adjusting the home position". b. Check if the work clamp/button clamp is touching anything.	
2. Incorrect mechanism adjustment	Check if the work clamp arm moves smoothly.	Work clamp arm assembly

Error status #12 The TEST indicator does not light when the TEST key is pressed.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
Malfunction of panel PCB	Check that connector P3 (PANEL) is connected to the motor PCB, and that connector P1 (MAIN) is connected to the panel PCB.	Panel PCB assembly Panel harness

Error status #13 The feed mechanism does not slowly move stitch by stitch during test feeding.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Incorrect memory switch setting	Set memory switch No. 200 to OFF. (The default setting is ON for the BE-438F.)	
2. Malfunction of foot switch and cord	See #4.	

Error status #14 Quick feeding cannot be performed during test feeding.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
Malfunction of foot switch and cord	See #4.	

Error status #15 The machine does not operate correctly for the set program during test feeding.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
Malfunction of foot switch and cord	See #4.	



Error status #16 The machine does not operate during sewing, and the error code [E130], [E131] or [E132] appears on the display.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
Malfunction of synchronizer, machine motor, fuses or motor PCB.	Refer to steps 1 to 4 in #5.	

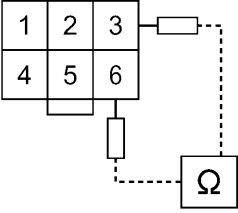
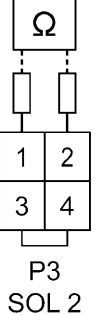
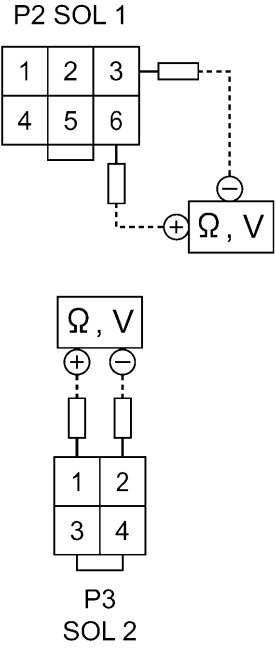
Error status #17 Error code appears on the display after the machine operates.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. If "E111", "E130", "E131", "E132" or "E133" is displayed after the sewing machine operates, there is a poor connection of the synchronizer.	Check that connectors P11 (RESOLVER) and P1 (MT-ENC) of the motor PCB and connector P6 (MT-ENC) of the main PCB are inserted.	
2. If "E111", "E130", "E131", "E132" or "E133" is displayed after the sewing machine operates, there is a poor connection of the machine motor.	Check the connection of the relay connector between the machine motor and the motor PCB.	
3. If "E111", "E130", "E131", "E132" or "E133" is displayed after the sewing machine operates, interference is causing operating errors.	Check that the ground wire is securely connected and that the sewing machine is not close to any equipment that generates strong electrical interference.	
4. If "E111", "E130", "E131", "E132" or "E133" is displayed after the sewing machine operates, there is a malfunction of the motor PCB.	Refer to steps 1 to 4 in #5.	Resolver stator assembly Motor PCB assembly
5. If "E111", "E130", "E132" or "E133" is displayed after the sewing machine operates, there is a malfunction of the motor PCB or of the machine motor.	If an error occurs after inspection steps 1 to 4 above have been carried out, there is a malfunction of the machine motor.	Motor 430 assembly
6. If "E121" is displayed after the sewing machine operates, there is a malfunction of a component.	Check if the blades of the fixed knife and movable knife are damaged or worn.	
7. If "E121" is displayed after the sewing machine operates, the home position is incorrectly adjusted.	Adjust the home position while referring to "11-18. Adjusting the home position".	
8. If "E121" is displayed after the sewing machine operates, there is a problem with the operation of the thread nipper pulse motor.	Refer to steps 3 to 6 in #9.	Power PCB assembly Main PCB assembly Pulse motor T assembly
9. If "E121" is displayed after the sewing machine operates, there is a problem with the operation of the work clamp pulse motor.	Refer to steps 3 to 4 in #8.	Main PCB assembly Pulse motor P assembly

(Continued on next page.)

## 15. ELECTRIC MECHANISM

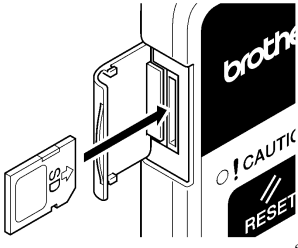
Error status #17 Error code appears on the display after the machine operates.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
10. If "E150" is displayed after the sewing machine operates, the motor is abnormally overheating.	a. Turn off the power and let the motor stand for 30 minutes or more. b. Turn the power back on, and OK if operation is normal. c. If the area around the motor is not hot, carry out steps 1 to 5 in #17. * Avoid repeated sewing of sewing data that contains 15 stitches or less.	Resolver stator 430 assembly Motor PCB assembly Motor 430 assembly

Error status #18 The machine cannot produce correct stitches.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Malfunction of synchronizer	Refer to step 1 in #17.	
2. If uneven seams are being sewn, there is a malfunction of the pulse motor or the mechanism is incorrectly adjusted.	a. Refer to step 4 in #6. b. If the uneven seams are due to insufficient work clamp pressure, adjust while referring to "11-10. Adjusting the work clamp lift amount (KE-430F)" or "11-11. Adjusting the button clamp lift amount (BE-438F)". c. If there is play in the feed mechanism, adjust the feed mechanism.	

Error status #19 The thread trimmer does not operate.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Incorrect memory switch setting	Set memory switch No. 164 to OFF. * If it is set to ON, thread trimming will not be carried out.	
2. Incorrect mechanism adjustment	Adjust the thread trimmer mechanism while referring to "11-14. Adjusting the thread trimmer cam position". * If it seems that the thread trimming mechanism is not operating properly, carry out steps 3 to 6 below.	
3. Poor connector connection	Check that main PCB connector P2 (SOL1) and P3 (SOL2) is connected.	
4. Malfunction of thread trimmer solenoid P2 SOL 1  2726B	Disconnect main PCB connector P2 (SOL1) and measure the resistance between pins 3-6 of the cord connector. OK if 6-8 ohms.	Thread trimmer solenoid assembly
5. Malfunction of tension solenoid  P3 SOL 2 2727B	Disconnect main PCB connector P3 (SOL2) and measure the resistance between pins 1-2 of the cord connector. OK if 6-8 ohms.	Tension solenoid
6. Malfunction of main PCB.  P2 SOL 1 P3 SOL 2 2728B	<ol style="list-style-type: none"> <li>Turn on the power switch and check LD2 (green) on the main PCB. OK if illuminated.</li> <li>Turn off the power switch, and with connector P2 (SOL1) disconnected from the main PCB, check the continuity between terminals 3 and 6 of connector P2 on the main PCB. OK if ∞ ohms.</li> <li>With connector P3 (SOL2) disconnected from the main PCB, check the continuity between terminals 1 and 2 of connector P3 on the main PCB. OK if ∞ ohms.</li> <li>With connector P2 (SOL1) inserted into the main PCB, turn on the power switch, carry out sewing and measure the voltage between terminals 3 and 6 of connector P2. OK if voltage is output momentarily at the sewing end.</li> <li>With main PCB connector P3 (SOL2) connected, turn on the power and carry out sewing, and measure the voltage between pins 1-2 of connector P3 (SOL2). OK if there is voltage output momentarily after sewing stops.</li> </ol>	Main PCB assembly

## 15. ELECTRIC MECHANISM

Error status #20 The machine does not stop at the needle up stop position. ("UP" is frequently displayed after sewing)		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. Incorrect adjustment	Adjust while referring to "11-18. Adjusting the home position".	
2. Problem with machine motor operation	Refer to steps 1 to 5 in #17	Resolver stator assembly Motor PCB assembly Motor 430 assembly

Error status #21 SD card read/write mode cannot be activated.		
Probable causes	Check/ repair/ adjust	Parts to be replaced
1. If "E420" is displayed, the SD card is incorrectly inserted.  2650B	a. Check the direction of insertion of the SD card. (Insert the card so that it matches the direction of the pattern on the card cover.)  b. Check the insertion of the SD card.	
2. If "E420" is displayed, the SD card is incorrectly formatted.	Check the format of the SD card. (Carry out 16-sector formatting.)	
3. Malfunction of SD card	Use a PC to check if the contents of the SD card can be read.	
4. Malfunction of operation panel	See #12.	Panel PCB assembly Panel harness

# 16. TABLE OF ERROR CODES

## DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present will result in serious injury from electric shocks.

If a malfunction should occur with the sewing machine, a buzzer will sound and an error code will appear in the display window. Follow the remedy procedure to eliminate the cause of the problem.

### Warnings displayed as symbols

Code	Cause and remedy
<b>CLdn</b>	The sewing machine started when the work clamp/button clamp was not lowered. First lower the work clamp/button clamp.
<b>UP</b>	The needle bar is not in the needle up stop position. Turn the pulley until this error display disappears.

### Switch-related errors

Code	Cause and remedy
<b>E010</b>	The STOP switch was pressed. Press the RESET key (*1) to clear the error.
<b>E011</b>	The STOP switch was pressed. Press the RESET key (*1) to clear the error. You can press the ▼ key to move the work clamp so that you can continue sewing.
<b>E012</b>	The STOP switch was pressed. Press the RESET key (*1) to clear the error, and then depress the foot switch to the 2nd step to carry out home position detection.
<b>E015</b>	The STOP switch was still being pressed when the power was turned on, or there is a problem with the STOP switch connection. Turn off the power, and then check that connector P9 on the main PCB is properly connected.
<b>E016</b>	Problem with the STOP switch connection when the power was turned on. Turn off the power, and then check that connector P9 on the main PCB is properly connected.
<b>E025</b>	The foot switch was depressed to the 2nd step when the power was turned on. (Start switch for a two-pedal foot switch). Turn off the power and check the foot switch.
<b>E035</b>	The foot switch was depressed to the 1st step when the power was turned on. (Work clamp switch for a two-pedal foot switch). Turn off the power and check the foot switch.
<b>E050</b>	Machine head tilting was detected after the power was turned on. Turn off the power, and then return the machine head to its original position. Check that connector P14 on the main PCB is properly connected.
<b>E051</b>	Machine head tilting was detected while the sewing machine was operating. Turn off the power, and then check that connector P14 on the main PCB is properly connected.
<b>E055</b>	Machine head tilting was detected when the power was turned on. Turn off the power, and then return the machine head to its original position. Check that connector P14 on the main PCB is properly connected.
<b>E065</b>	An operation panel key was still being pressed when the power was turned on, or key is faulty. Turn off the power and check the operation panel.

(\*1) If the main PCB version is 1.5.00 or later, press the key or switch which has been set by memory switch No. 650.

## 16. TABLE OF ERROR CODES

### Upper shaft motor-related errors

Code	Cause and remedy
E100	Sewing machine has continued to be used for a certain period after the "GREASEUP" notification appears without the grease being applied (without the reset procedure being carried out). Apply grease and then carry out the reset procedure. (Refer to the service manual for the reset procedure.)
E111	Upper shaft did not stop at the needle up stop position when the sewing machine stopped. Turn off the power, and then check that there are no problems with the thread trimming mechanism and the machine motor mechanism.
E121	Thread trimming was not completed. Turn off the power, and then check if the cutting edges of the fixed knife and movable knife are damaged or worn.
E130	Sewing machine motor stopped abnormally, or synchronizer is faulty. Turn off the power, and then turn the machine pulley to check if the machine has locked up. Check that connector P11 on the motor PCB and the 4-pin upper shaft motor connector are properly connected.
E131	Synchronizer is not connected correctly. Turn off the power, and then check that connector P11 on the motor PCB is properly connected.
E132	Problem detected with sewing machine motor operation. Turn off the power, and then check that connector P11 on the motor PCB is properly connected.
E133	Sewing machine motor stopping position is incorrect. Turn off the power, and then check that connector P11 on the motor PCB is properly connected.
E150	Sewing machine motor is overheating, or temperature sensor is faulty. Turn off the power, and then check the sewing machine motor. (When sewing data with a small number of stitches (15 stitches or less) is sewn repeatedly (short cycle operation), the upper shaft motor may overheat and the "E150" error code may be displayed.)

### Feed mechanism-related errors

Code	Cause and remedy
E200	X feed motor home position cannot be detected. Problem with X feed motor or poor X encoder connection. Turn off the power, and then check that connectors P17 and P21 on the main PCB are properly connected.
E201	X feed motor stopped abnormally. Turn off the power and check that there is no problem with the X feed direction.
E204	X feed motor stopped abnormally during sewing. Turn off the power and check that there is no problem with the X feed direction.
E205	X-feed motor stopped abnormally while moving to the sewing start position. Turn off the power and check that there is no problem with the X feed direction.
E206	X feed motor stopped abnormally during test feeding. Turn off the power and check that there is no problem with the X feed direction.
E210	Y feed motor home position cannot be detected. Problem with Y feed motor or poor Y encoder connection. Turn off the power, and then check that connectors P18 and P22 on the main PCB are properly connected.
E211	Y feed motor stopped abnormally. Turn off the power and check that there is no problem with the Y feed direction.
E214	Y feed motor stopped abnormally during sewing. Turn off the power and check that there is no problem with the Y feed direction.
E215	Y-feed motor stopped abnormally while moving to the sewing start position. Turn off the power and check that there is no problem with the Y feed direction.
E216	Y feed motor stopped abnormally during test feeding. Turn off the power and check that there is no problem with the Y feed direction.

### Work clamp-related errors

Code	Cause and remedy
E300	Work clamp home position cannot be detected. Problem with work clamp motor or poor work clamp encoder connection. Turn off the power, and then check that connectors P19 and P23 on the main PCB are properly connected.
E301	Work clamp/button clamp raised or lowered position cannot be detected. Turn off the power, and then check that there is no problem with the vertical work clamp/button clamp position.

## Communication and memory-related errors

Code	Cause and remedy
<b>E400</b>	Communication error detected between the main PCB and the panel PCB when the power was turned on. Turn off the power, and then check that connector P1 on the panel PCB and connector P3 on the motor PCB are properly connected.
<b>E401</b>	Communication error detected between the main PCB and the motor PCB when the power was turned on. Turn off the power, and then check that connector P5 on the main PCB and connector P2 on the motor PCB are properly connected.
<b>E410</b>	Communication error between main PCB and panel PCB detected. Turn off the power, and then turn it back on again.
<b>E411</b>	Communication error between main PCB and motor PCB detected. Turn off the power, and then turn it back on again.
<b>E420</b>	No media is inserted. Press the RESET key (*1) to clear the error.
<b>E421</b>	Data contents are incorrect and cannot be used, or no data. Press the RESET key (*1) to clear the error. Check that data for this pattern number is present in the media.
<b>E422</b>	Error occurred while reading from media. Press the RESET key (*1) to clear the error. Check the data in the media.
<b>E424</b>	Insufficient space in media. Press the RESET key (*1) to clear the error. Use different media.
<b>E425</b>	Error occurred while writing to media. Press the RESET key (*1) to clear the error. Use the specified type of media. Check if the media is write-protected and if it has enough free space.
<b>E427</b>	A pattern registered in a cycle program has been erased. Press the RESET key (*1) to clear the error. Re-register the cycle program, or add the pattern.
<b>E428</b>	A pattern registered in a program has been erased. Press the RESET key (*1) to clear the error. Re-register the program, or add the pattern.
<b>E430</b>	Data cannot be backed up to main PCB. Turn off the power, and then turn it back on again.
<b>E440</b>	Data memory error on main PCB. Turn off the power, and then turn it back on again.
<b>E450</b>	Model selection has not been loaded from the machine head memory. Turn off the power and check that connector P16 on the main PCB is properly connected.
<b>E452</b>	Machine head memory is not connected. Turn off the power, and then check that connector P16 on the main PCB is properly connected.
<b>E474</b>	Internal memory is full and copying is not possible. Press the RESET key (*1) to clear the error. Clear any unnecessary additional patterns.

(\*1) If the main PCB version is 1.5.00 or later, press the key or switch which has been set by memory switch No. 650.

## 16. TABLE OF ERROR CODES

### Data editing-related errors

Code	Cause and remedy
<b>E500</b>	The enlargement ratio setting caused the sewing data to extend outside the sewing area. Press the RESET key (*1) to clear the error. Set the enlargement ratio or the sewing area again.
<b>E502</b>	The enlargement ratio caused the data pitch to exceed the maximum pitch of 12.7 mm. Press the RESET key (*1) to clear the error. Set the enlargement ratio again.
<b>E510</b>	Error in pattern data. Press the RESET key (*1) to clear the error. Re-read the pattern data from the media, or recreate the pattern data.
<b>E511</b>	No end code has been input into pattern data. Press the RESET key (*1) to clear the error. Recreate the pattern data containing the end code, or change the pattern number being read.
<b>E512</b>	Number of stitches exceeds allowed maximum. Press the RESET (*1) key to clear the error. Change the number of the pattern being read.
<b>E581</b>	Memory switch file cannot be read correctly. Copy source model and copy destination model are incorrect. (Maybe the 430F is attempting to read data for the 438F.) Press the RESET key (*1) to clear the error. Read data for the same sewing machine model.
<b>E582</b>	Memory switch version does not match. Press the RESET (*1) key to clear the error. Read data for the same version.
<b>E583</b>	Parameter version does not match. Press the RESET key (*1) to clear the error. Read data for the same version.

(\*1) If the main PCB version is 1.5.00 or later, press the key or switch which has been set by memory switch No. 650.

### Device-related errors

Code	Cause and remedy
<b>E600</b>	Upper thread breakage occurred. Press the RESET key (*1) to clear the error.
<b>E690</b>	Thread nipper motor home position cannot be detected. Problem with thread nipper motor or poor thread nipper encoder connection. Turn off the power, and then clean underneath the needle plate to remove any dust and thread scraps. Check that connector P20 on the main PCB is properly connected.
<b>E692</b>	Thread nipper motor stopped abnormally. Check if the upper thread trailing length is too long. Turn off the power, and then clean underneath the needle plate to remove any dust and thread scraps. Check that connectors P20 and P4 on the main PCB are properly connected.

(\*1) If the main PCB version is 1.5.00 or later, press the key or switch which has been set by memory switch No. 650.



**PCB-related errors**

Code	Cause and remedy
<b>E700</b>	Abnormal rise in power supply voltage. Turn off the power and check the input voltage.
<b>E701</b>	Abnormal rise in sewing machine motor drive voltage. Turn off the power, and then check the voltage.
<b>E705</b>	Abnormal drop in power supply voltage. Turn off the power and check the input voltage.
<b>E710</b>	Abnormal current detected in sewing machine motor. Turn off the power, and then check if there are any problems with the sewing machine.
<b>E711</b>	Abnormal current detected in pulse motor. Turn off the power, and then check if there are any problems with the work clamp/button clamp operation.

**Version update errors**

Code	Cause and remedy
<b>E870</b>	No control program is present. Repeat the version update procedure.
<b>E880</b>	Version update requests cannot be received. Turn off the power, and then turn it back on again.
<b>E881</b>	Version updating did not complete normally. Turn off the power, and then repeat the version update procedure.
<b>E882</b>	Communication error between main PCB and panel PCB detected. Turn off the power, and then check that connector P1 on the panel PCB, connector P5 on the main PCB and connectors P2 and P3 on the motor PCB are properly inserted.
<b>E883</b>	No control program is present on the SD card. Check that the control program has been saved into the correct folder.
<b>E884</b>	There is a problem with the control program. Save the correct file onto the SD card.
<b>E885</b> <b>-887</b>	Version updating could not be carried out. Turn off the power, and then turn it back on again.

**If an error code that is not listed above appears or if carrying out the specified remedy does not solve the problem, contact the place of purchase.**

# 17. TROUBLESHOOTING

- Please check the following points before calling for repairs or service.
- If the following remedies do not fix the problem, turn off the power switch and consult a qualified technician or the place of purchase.

## CAUTION



Turn off the power switch and disconnect the power cord before carrying out troubleshooting, otherwise the machine may operate if the foot switch is depressed by mistake, which may result in injury.

Problem	Cause	Remedy	Ref.
<b>Work clamp does not rise. (KE-430F)</b>	Work clamp operation is sluggish.	Grease the sliding part of the work clamp.	P. 112
	Too much friction between work clamp lifter plate and work clamp arm lever plate.	Grease the work clamp lifter plate and work clamp arm lever plate.	P. 112
	Work clamp is contacting thread wiper.	Adjust the position of the thread wiper.	P. 114
<b>Button clamp does not rise. (BE-438F)</b>	Work clamp is contacting thread wiper.	Adjust the position of the thread wiper.	P. 114
<b>Work clamp lift amount is incorrect. (KE-430F)</b>	Incorrect position of work clamp arm lever plate	Adjust the work clamp lift amount.	P. 112
<b>Button clamp lift amount is incorrect. (BE-438F)</b>	Incorrect position of button clamp holder hook.	Adjust the button clamp lift amount.	P. 112
<b>Thread wiper does not operate correctly.</b>	The thread wiper is obstructing the needle.	Adjust the height of the thread wiper.	P. 114
		Adjust the operating distance of the thread wiper.	P. 114
	Thread wiper position is incorrect.	Adjust the operating distance of the thread wiper.	P. 114
<b>Lower thread winds to one side.</b>	Height of bobbin winder tension assembly is incorrect.	Adjust the height of the bobbin winder tension assembly.	CD Instruction manual
<b>Lower thread winding amount is incorrect.</b>	Bobbin presser position is incorrect.	Adjust the position of the bobbin presser.	CD Instruction manual
<b>Thread comes unthreaded.</b>	Stitches being skipped at the sewing start.	Refer to "Skipped stitches occur"	P. 169
	Uneven needle thread.	Adjust the sub-tension.	CD Instruction manual
	Needle thread is too short.	Use a thread nipper device.	CD Instruction manual

Problem	Cause	Remedy	Ref.
<b>Upper thread breaks.</b>	Upper thread tension is too strong.	Adjust the upper thread tension.	CD Instruction manual
	Needle is installed incorrectly.	Install the needle correctly.	CD Instruction manual
	Thread is too thick for the needle.	Use the correct thread for the needle.	P. 103
	Thread take-up spring tension and height are incorrect.	Adjust the tension and height of the thread take-up spring.	P. 105
	Damaged or burred rotary hook, needle hole plate or needle.	File smooth or replace the affected part.	
	Thread melting (synthetic thread)	Use the needle cooler.	CD Instruction manual
<b>Lower thread breaks.</b>	Lower thread tension is too strong.	Adjust the lower thread tension.	CD Instruction manual
	Corners of needle hole plate or bobbin case are damaged.	File smooth or replace the affected part.	
<b>Skipped stitches occur.</b>	Clearance between needle and rotary hook tip is too great.	Adjust the needle clearance.	P. 107
	Incorrect needle and rotary hook timing.	Adjust the needle bar lift amount.	P.107
	Driver is contacting needle more than is necessary.	Adjust the driver needle guard.	P. 107
	Needle is bent.	Replace the needle.	
	Needle is installed incorrectly.	Install the needle correctly.	CD Instruction manual
<b>Needle breaks.</b>	Needle is touching the rotary hook.	Adjust the needle clearance.	P. 107
		Adjust the needle bar lift amount.	P. 107
	Needle is bent.	Replace the needle.	
	Needle is too thin.	Use the correct needle for the material.	P. 103
	Needle is striking the button. (BE-438F)	Refer to "5-5. Checking the sewing pattern (BE-438F)" in the CD instruction manual.	CD Instruction manual
<b>Button breaks. (BE-438F)</b>	Needle is striking the button.	Refer to "5-5. Checking the sewing pattern (BE-438F)" in the CD instruction manual.	CD Instruction manual

## 17. TROUBLESHOOTING

Problem	Cause	Remedy	Ref.
Upper thread is not trimmed.	Movable knife is blunt.	Replace the movable knife.	P. 111
	Fixed knife is blunt.	Sharpen or replace the fixed knife.	P. 111
	Movable knife does not pick up the thread.	Adjust the position of the shuttle race thread guide.	P. 108
		Adjust the needle bar lift amount.	P. 107
	The movable knife does not pick up the thread because of skipped stitches at the sewing end.	Refer to "Skipped stitches occur".	P. 169
	Movable knife position is incorrect.	Adjust the position of the movable knife.	P. 110
	Sub-tension is too weak.	Turn the sub-tension nut to adjust the tension.	CD Instruction manual
Thread jamming.	Thread take-up spring tension and height are incorrect.	Adjust the tension and height of the thread take-up spring.	P. 105
	Incorrect needle and rotary hook timing.	Adjust the needle bar lift amount.	P. 107
	Shuttle race thread guide is not separating the threads.	Adjust the position of the shuttle race thread guide.	P. 108
Poor seam finish on reverse side of material.	Shuttle race thread guide is separating the threads insufficiently.	Adjust the position of the shuttle race thread guide.	P. 108
	Upper thread is not properly tight.	Adjust the upper thread tension.	CD Instruction manual
	Uneven needle thread.	Adjust the sub-tension.	CD Instruction manual
	Needle thread is too long.	Adjust the sub-tension. <b>&lt;When using the thread nipper device&gt;</b> Turn the tension nut to adjust the upper thread trailing length to 35 – 38 mm.	CD Instruction manual
	Needle is striking the button. (BE-438F)	Refer to "5-5. Checking the sewing pattern (BE-438F)" in the CD instruction manual.	CD Instruction manual
Incorrect thread tightness.	Upper thread tension is too weak.	Adjust the upper thread tension.	CD Instruction manual
	Lower thread tension is too weak.	Adjust the lower thread tension.	CD Instruction manual
	Thread take-up spring tension and height are incorrect.	Adjust the tension and height of the thread take-up spring.	P. 105
Machine does not operate when power is turned on and foot switch is depressed.	Machine head switch does not work.	Check if the machine head switch cord is disconnected.	CD Instruction manual
		Adjust the position of the switching plate.	P. 127
		Replace the machine head switch if it is broken.	

## 18. 7-SEGMENT DISPLAY LIST

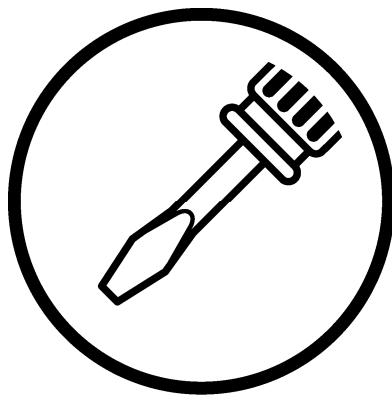
0	1	2	3	4	5	6	7	8	9
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K	L	M	N	O	P	Q	R	S	T
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