

# Z-8550A

# Z-8560A

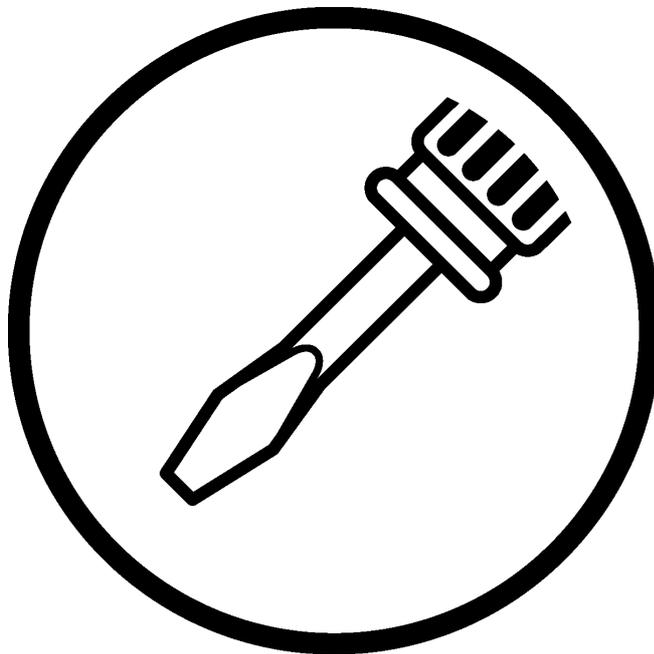
SERVICE MANUAL

---

Please read this manual before making any adjustments.

---

ELECTRONIC DIRECT DRIVE ZIGZAG LOCK STITCHER  
ELECTRONIC DIRECT DRIVE ZIGZAG LOCK STITCHER  
WITH THREAD TRIMMER



This service manual is intended for Z-8550A, Z-8560A; be sure to read the Z-8550A, Z-8560A instruction manual before this manual.

Carefully read the "SAFETY INSTRUCTIONS" 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 almost certainly result in death or severe injury.
 <b>CAUTION</b>	The instructions which follow this term indicate situations where failure to follow the instructions could cause injury when using the machine or physical damage to equipment and surroundings.

### 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 can result in severe injury.

### CAUTION

#### Environmental requirements



Use the sewing machine in an area which is free from sources of strong electrical noise such as high-frequency welders. 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 electrical 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 more than 50 kg. The installation should be carried out by two or more people.



Do not connect the power cord until installation is complete. The machine may operate if the treadle is depressed by mistake, which could result in injury.



Turn off the power switch before inserting or removing the plug, otherwise damage to the control box could result.



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.



When securing the cords, do not bend the cords excessively or fasten them too hard with staples, otherwise there is the danger that fire or electric shocks could occur.



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



Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.



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.

## 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. The machine may operate if the treadle is depressed by mistake, which could result in injury.
  - When threading the needle
  - When replacing the bobbin and needle
  - When not using the machine and when leaving the machine unattended
-  If the actuator is pressed by mistake when using the correction sewing function, the needle will move in a zigzag motion while the machine is operating, and injury may result.
-  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.
-  Never touch the knife on the face plate when opening the thread takeup guard cover at times such as when taking up slack in the thread, otherwise 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.
-  Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.
-  If an error occurs in machine, 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. The machine may operate if the treadle is depressed by mistake, which could result in injury.
-  Do not directly touch sharp objects such as the tip of the rotary hook when cleaning the rotary hook, otherwise injury may result.
-  When removing the needle plate, auxiliary needle plate and knife unit, use a screwdriver that matches the size of the screw heads.  
If a screwdriver with a size that does not match is used, it may damage the screw heads and cause personal injury or damage to the sewing articles.
-  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.
-  Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.
-  Use only the proper replacement parts as specified by Brother.

# ⚠ CAUTION

## Maintenance and inspection

- |   |  |
|---|--|
| <p> Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.</p> <p> Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.</p> <p> 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 treadle is depressed by mistake, which could result in injury.</p> <ul style="list-style-type: none"> <li>• When carrying out inspection, adjustment and maintenance</li> <li>• When replacing consumable parts such as the rotary hook</li> </ul> <p> Turn off the power switch before inserting or removing the plug, otherwise damage to the control box could result.</p> <p> If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.</p> <p> Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.</p> | <p> Never touch the knife on the face plate when opening the thread takeup guard cover, otherwise injury may result.</p> <p> 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.</p> <p> When removing the needle plate, auxiliary needle plate and knife unit, use a screwdriver that matches the size of the screw heads. If a screwdriver with a size that does not match is used, it may damage the screw heads and cause personal injury or damage to the sewing articles.</p> <p> Use only the proper replacement parts as specified by Brother.</p> <p> Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.</p> |
|---|--|

### [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

	<b>⚠ CAUTION</b>
	Moving parts may cause injury.
	Operate with safety devices. Turn off main switch before threading, changing bobbin and needle, cleaning etc.

Safety devices:  
 (A) Finger guard  
 (B) Thread take-up guard cover

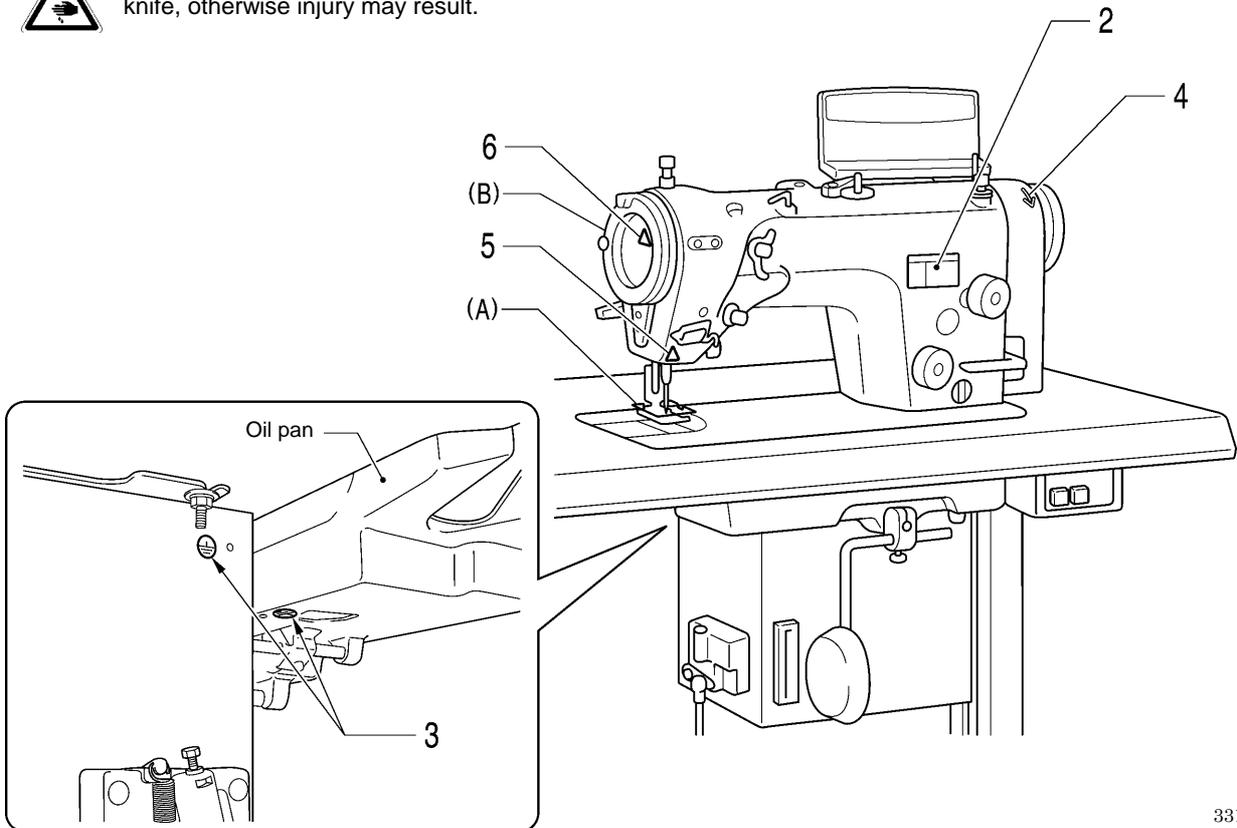
3

<b>PE</b>	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.

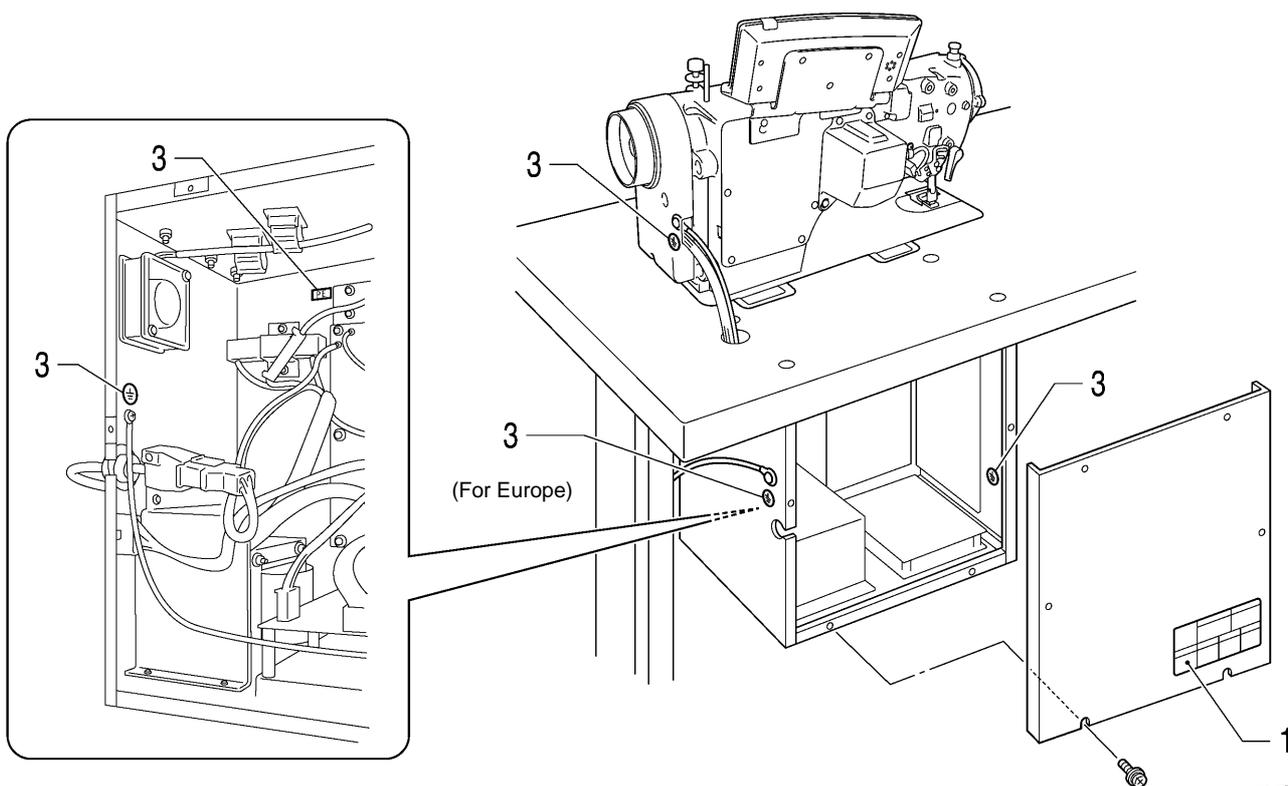
4  Direction of operation

5  If the actuator is pressed by mistake when using the correction sewing function, the needle will move in a zigzag motion while the machine is operating, and injury may result.

6  Do not touch the thread takeup or the knife, otherwise injury may result.



3316M



3317M

# CONTENTS

<b>1. MACHINE SPECIFICATIONS</b> .....	1	<b>5. MECHANICAL DESCRIPTIONS</b> .....	32
<b>2. SEWING PATTERN</b> .....	2	5-1. Needle bar and thread take-up mechanisms....	32
<b>3. FUNCTION SETTINGS</b> .....	3	5-2. Lower shaft and shuttle race mechanisms .....	33
3-1. Setting memory switches.....	3	5-3. Zigzag mechanism.....	34
3-2. List of memory switch settings .....	4	5-4. Presser foot mechanism .....	35
3-3. Data initialization .....	14	5-5. Feed mechanism .....	37
3-3-1. Resetting the settings to their defaults ..	14	5-6. Lubrication mechanism .....	40
3-3-2. When data is initialized automatically....	16	5-7. Thread trimmer mechanism (8560A only) .....	42
3-4. Error history checking method.....	17	5-8. Tension release mechanism.....	43
3-4-1. Error history checking method.....	17	5-9. Thread wiper mechanism	
3-4-2. Error history display examples .....	18	(8560A only, optional device) .....	45
3-5. Software version checking method .....	18	<b>6. DISASSEMBLY</b> .....	46
3-5-1. Version update checking method .....	18	6-1. Covers.....	47
3-6. Checking input and output.....	19	6-2. Presser foot mechanism .....	48
3-6-1. Input and output checking method .....	19	6-3. Needle bar mechanism.....	48
3-6-2. Input and output check list.....	19	6-4. Zigzag mechanism.....	49
3-7. DIP switch setting method.....	21	6-5. Rotary hook mechanism .....	51
3-8. Needle zigzag home position adjustment		6-6. Lubrication mechanism.....	52
procedure .....	22	6-7. Feed mechanism .....	52
<b>4. USING CF CARDS</b> .....	23	6-8. Thread trimmer mechanism (8560A only) .....	53
4-1. Precautions when handling CF cards		6-9. Thread wiper mechanism	
(commercially available).....	23	(8560A only, optional device) .....	54
4-2. Structure of a CF card folder .....	23	<b>7. ASSEMBLY</b> .....	55
4-3. Preparation for reading/writing data .....	24	7-1. Thread wiper mechanism (8560A only) .....	55
4-4. Reading additional sewing data into the sewing		7-2. Feed mechanism .....	56
machine .....	25	7-3. Lubrication mechanism.....	57
4-5. Writing additional sewing data to CF cards.....	26	7-4. Zigzag mechanism.....	58
4-6. Reading memory switch data into the sewing		7-5. Needle bar mechanism.....	59
machine .....	27	7-6. Rotary hook mechanism .....	60
4-7. Writing memory switch data to a CF card.....	28	7-7. Presser foot mechanism .....	61
4-8. Updating the control program version .....	29	7-8. Covers.....	62
4-8-1. Control program version updating		7-9. Thread wiper mechanism	
procedure .....	29	(8560A only, optional device) .....	63
4-8-2. Restoring the control program if an error		<b>8. CHANGING THE FEED AMOUNT TO LONG</b>	
occurs during version updating .....	30	<b>STITCH SPECIFICATIONS</b>	
4-9. Writing error log data to CF cards .....	31	<b>(from 2.0mm to 5.0mm)</b> .....	64

<b>9. ADJUSTMENTS .....</b>	<b>67</b>	10-2. Applying grease .....	86
9-1. Actuator position .....	67	10-3. Resetting the cumulative operating time.....	87
9-2. Adjusting the safety switch position.....	68	<b>11. ELECTRICAL MECHANISM .....</b>	<b>88</b>
9-3. Thread tension spring.....	69	11-1. Precautions while carrying out adjustments ...	88
9-4. Presser foot height .....	70	11-2. Control box internal configuration .....	89
9-5. Feed dog height.....	70	11-3. Description of fuses .....	90
9-6. Feed dog angle.....	71	11-3-1. Power supply P.C. board	
9-7. Feed dog forward/back and		(fuses and fuse resistors) .....	90
sideways position .....	71	11-3-2. Main P.C. board	
9-8. Feed amounts for reverse stitching and		(fuses and fuse resistors) .....	91
condense stitching.....	72	11-4. Description of connectors .....	92
9-9. Needle and feed timing.....	72	11-4-1. Connector positions.....	92
9-10. Needle bar height .....	73	11-5. Troubleshooting .....	94
9-11. Needle zigzag forward/back position .....	74	11-5-1. Troubleshooting procedure .....	94
9-12. Needle zigzag sideways position .....	75	11-5-2. Diagnosis flowchart .....	95
9-13. Needle zigzag load.....	76	11-5-3. Remedy .....	97
9-14. Needle and rotary hook timing .....	76	11-6. Wiring diagrams.....	101
9-15. Bobbin case holder bracket position .....	77	<b>12. TREADLE UNIT.....</b>	<b>103</b>
9-16. Adjusting the rotary hook lubrication amount....	78	12-1. Types .....	103
9-17. Adjusting the presser foot floating amount		12-2. Standard setting values .....	104
(minute lifting amount).....	79	12-3. Standard settings	
9-18. Adjusting the treadle.....	79	for treadle depression stroke .....	105
9-19. Adjusting the quick reverse device		<b>13. STANDING OPERATION PEDAL ....</b>	<b>107</b>
(8550A-A31, 8560A).....	80	13-1. Installing the foot plug .....	107
9-20. Adjusting the tension release during thread		13-2. Connectors.....	108
trimming (8560 only).....	81	<b>14. TROUBLESHOOTING.....</b>	<b>109</b>
9-21. Adjusting the position of the thread trimming		<b>15. ERROR CODES .....</b>	<b>114</b>
cam (8560A only) .....	82	<b>16. SEGMENT DISPLAY DEFINITION</b>	
9-22. Adjusting the tension of the plate spring		<b>TABLE .....</b>	<b>117</b>
(8560A only) .....	83		
9-23. Adjusting the thread trailing length after			
thread trimming (8560A only).....	83		
9-24. Adjusting the thread wiper			
(8560A only, optional device).....	84		
<b>10. APPLYING GREASE</b>			
<b>(When “GrEASEUP” appears).....</b>	<b>85</b>		
10-1. To continue sewing temporarily without			
applying grease .....	85		

# 1. MACHINE SPECIFICATIONS



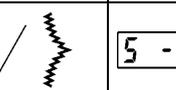
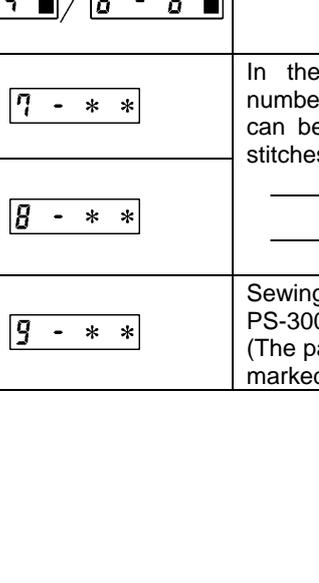
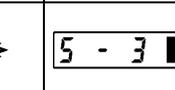
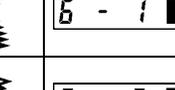
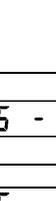
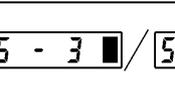
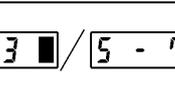
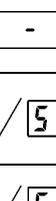
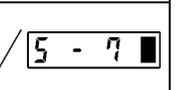
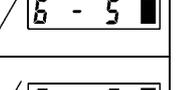
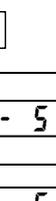
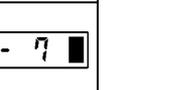
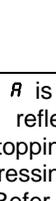
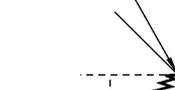
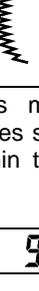
	8550A		8560A
	0	A	3
Thread trimmer	-	-	○
Upper thread feeding device	-	-	○
Back tack/condense device *1	-	○	○

SPECIFICATIONS	8550A	8560A
	-031, -A31	-331
Use	For light-weight to medium-weight materials	
Max. stitch length	2.0mm *2	
Max. sewing speed	5,000rpm *3	
Sewing pattern	14 patterns of eight types built-in (Up to 99 different types of custom-made patterns can be added *4)	
Max. zigzag width	10 mm (Factory default 8 mm)	
Thread take-up lever	Rotary thread take-up	
Needle bar stroke	33.3mm	
Feed dog height	1mm	
Presser foot height	Lifting lever	6mm
	Knee lifter	10mm
Presser foot pressure	10-30N	
Needle	Schmets 134SUK Nm70/10	
Motor	AC servo motor (4-pole, 450W)	
Control box power supply voltage	Single-phase: 100 V; 3-phase: 200 V Maximum electric power consumption: 400 VA	
Control circuit	Microprocessor	

- \*1... Used for sewing condensed stitches and backtack stitches.
- \*2... If replacing gauge parts and then changing the maximum feed amount setting, the maximum setting is 5 mm. (Refer to "8. CHANGING THE FEED AMOUNT TO LONG STITCH SPECIFICATIONS".)
- \*3... At the time of shipment from the factory, the maximum sewing speed is set to 4,000 rpm. If using a sewing speed higher than this, use the memory switches to change the setting. (Ask the place of purchase for details.)  
Furthermore, the maximum sewing speed may be limited by the type of sewing pattern and the zigzag width. (Refer to "6-2-3. Setting the zigzag width" of the instruction manual.)
- \*4... The maximum number of custom-made patterns that can be stored is 99 patterns with a total of 49,500 stitches, at 500 stitches or less per pattern.  
(Custom patterns can be created using the PS-300B (option device) and are saved into the control box using commercially-available CF cards. Ask the place of purchase for details.)

## 2. SEWING PATTERN

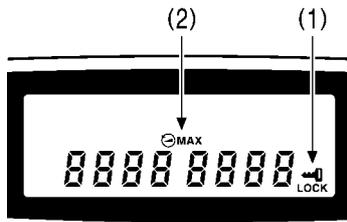
- This sewing machine is equipped with the following built-in sewing patterns. Select the pattern number from the operation panel to use a pattern. (Refer to "6-2-2. Setting the sewing pattern" of the instruction manual.)
- Different zigzag widths and zigzag lengths can be set for each sewing pattern. (Refer to "5-6. Adjusting the stitch length", "6-2-3. Setting the zigzag width" of the instruction manual.)

		Sewing pattern	Pattern no. (Main display)	Notes
Straight stitch				
Plain zigzag				
2-step zigzag				
3-step zigzag				
Scallop (left)	Crescent scallop (24 stitches)		 / 	<p>If <math>R</math> is set in the column marked with <math>\blacksquare</math>, a reflection pattern can be sewn by stopping the sewing machine and then pressing the actuator. (Refer to "6-2-2. Setting the sewing pattern" of the instruction manual.)</p> <p>&lt;Reflection pattern&gt;</p>  <p>Press the actuator</p> <p>Sewing pattern</p> <p>Sewing direction</p> <p>(Reflection)</p> <p>1276M</p>
	Even scallop (12 stitches)		 / 	
	Standard scallop (24 stitches)		 / 	
	Even scallop (24 stitches)		 / 	
Scallop (right)	Crescent scallop (24 stitches)		 / 	
	Even scallop (12 stitches)		 / 	
	Standard scallop (24 stitches)		 / 	
	Even scallop (24 stitches)		 / 	
Blind stitch (left)				<p>In the columns marked with *, the number of stitches sewn in a straight line can be set within the range of 1 to 99 stitches.</p>  (No. of stitches) 1430M
Blind stitch (right)				
Custom made pattern		-		<p>Sewing patterns created using the PS-300B (optional device) can be sewn. (The pattern number is set in the columns marked with *.)</p>

3320M-3333M  
3334M-3348M

# 3. FUNCTION SETTINGS

## 3-1. Setting memory switches



- If the icon (1) on the LOCK key is on, release the lock before carrying out the following operations.
- If the icon (2) on the MAX key is on, press the MAX key to return the main display to the stitch number display (orange).

2238M

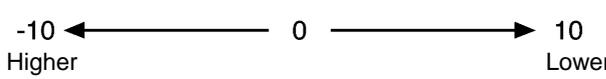
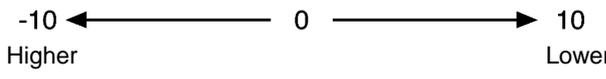
<b>1</b>		<ul style="list-style-type: none"> <li>• The main display will change to green and memory switch setting mode will be enabled.</li> </ul>	2239M
<b>2</b>	<p>Memory switch No. selection</p>	<ul style="list-style-type: none"> <li>• Select the memory switch number for the value to be changed while referring to the "List of memory switch settings".</li> </ul>	2240M
<b>3</b>	<p>Changing the setting value</p>	<ul style="list-style-type: none"> <li>• Change the number within the setting range while referring to "List of memory switch settings".</li> </ul>	2241M
<b>4</b>	<p>(Press for 2 seconds or more.)</p>	<ul style="list-style-type: none"> <li>• The buzzer will sound for approximately 1 second, and the setting value will be accepted.</li> <li>• The main display will return to the stitch number display (orange).</li> </ul>	2242M

**NOTE:**

- If the treadle is depressed before the ENTER key is pressed, the main display will return to an orange display and the setting value will not be changed.
  - If the memory switch number is changed after the setting value has been changed but before the ENTER key is pressed, the setting value will not be changed.
- Press the ENTER key for each memory switch number to accept the setting values.

### 3-2. List of memory switch settings

#### Memory switch No. 0 - 15

No.	Initial value	Setting range	Setting details
0	0 (degrees)	-10 - 10 (degrees)	Needle up stop position setting  0212B
1	0 (degrees)	-10 - 10 (degrees)	Needle down stop position setting  0212B
2	0	0 - 1	Depressing treadle forward when treadle is depressed backward (thread trimming) 0: Disabled (Enabled after treadle is returned to neutral position and then depressed forward) 1: Enabled
3	1	0 - 1	Power supply voltage drop check (reset detection) function 0: None 1: Enabled, [Err 95] displayed when voltage drops.
4	0	0 - 1	Buzzer (electronic sound) during panel operation 0: Yes 1: None
5	0	-	[Do not change this setting.]
6	0	0 - 1	Piercing force boosting operation 0: Yes 1: None
7	0	0 - 1	End backtacking speed 0: Limited by speed bar key setting 1: Not limited by speed bar key setting
9	0	0 - 1	End backtacking sewing speed 0: Speed can be set independently from start backtacking speed 1: Speed is set to start backtacking speed
12	0	0 - 1	Presser foot condition when treadle is returned to neutral position after thread trimming 0: Presser foot is lowered (it is not lowered when DIP switch 1 is OFF) 1: Presser foot is not lowered
13	0	0 - 1	Presser foot condition when operation stops at the neutral treadle position 0: Presser foot is not lifted 1: Presser foot is lifted
14	0	0 - 1	Actuator function 0: Operates as a reverse stitch switch during sewing, and as a correction stitch switch when sewing is stopped 1: Thread trimming switch
15	0	0 - 1	Deceleration stop control when treadle is returned to neutral position 0: Deceleration stop control without single stitch advance 1: Above control is not carried out

### 3. FUNCTION SETTINGS

#### Memory switch No. 16 - 30

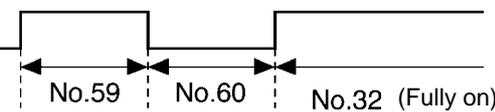
No.	Initial value	Setting range	Setting details
16	3 (minutes)	0 - 30 (minutes)	Overtime function 0: None 1-30: After continuous operation for the set length of time, operation stops and [Err 190] is displayed.
17	1	0 - 3	Correction stitch function (correction stitch icon [when off/when on] operation) 0: Half stitch correction sewing / Single stitch correction sewing 1: No correction sewing / Single stitch correction sewing 2: Reverse correction sewing (reverse feed) / Single stitch correction sewing 3: Forced single stitch sewing after thread trimming / Single stitch sewing
18	50 (ms)	10 - 200 (ms)	Thread wiping and presser foot lifting timing after thread is trimmed and sewing stops <span style="float: right;">2245M</span> 
19	50 (ms)	10 - 200 (ms)	
20	50 (ms)	10 - 200 (ms)	
21	0	0 - 1	Start backtacking operation 0: Stitch Nos. A, B (N backtacks) 1: Stitch Nos. A, B, A, B (N backtacks doubled)
22	0	0 - 1	End backtacking operation 0: Stitch Nos. C, D 1: Stitch Nos. C, D, C, D (N backtacks doubled)
26	0	0 - 1	Speed when changing to end backtacking 0: Speed decelerates to low speed, then end backtacking starts 1: Speed decelerates to end backtacking speed, then end backtacking starts (allows shortening of cycle time)
27	0	0 - 1	Continuous backtacking operation 0: Stitch Nos. A, B, C, D 1: Stitch Nos. A, B x D times
28	0	0 - 1	Feed direction when sewing is stopped immediately after start backtacking is complete 0: Quick reverse solenoid turns off and feed returns to normal direction, then stops 1: After sewing stops, the quick reverse solenoid turns off (if No. 31 is set to "0", sewing starts again when the treadle is depressed slightly) <span style="float: right;">2246M</span>
30	150 (ms)	0 - 500 (ms)	Delay time for motor to start when presser foot is lifted and sewing machine starts operating when automatic presser foot lifting is being used

## Memory switch No. 31 - 46

No.	Initial value	Setting range	Setting details
31	0	0 - 1	Stopping while start backtacking is in progress, and speed during start backtacking 0: When the treadle is returned to the neutral position, start backtacking ends, sewing stops and the sewing speed becomes the start backtacking (constant) speed 1: When the treadle is returned to the neutral position, start backtacking can be stopped before it is finished, and the speed during start backtacking becomes the speed corresponding to the treadle depression amount (low speed - start backtacking speed)
32	300 (ms)	10 - 990 (ms)	Fully on time for presser foot lifter solenoid
33	0	0 - 1	Fixed stitch function using actuator switch 0: None 1: Yes
35	0	0 - 1	Presser foot soft down mode 0: Automatic mode (Adjustment required using No. 39) 1: Manual mode (Adjustment required using No. 38)
36	180 (seconds) (3 minutes)	0 - 240 (seconds)	Presser foot lift time 0: No timer function (is not lowered) 1-240: Presser foot is lowered after set time has elapsed
37	0	0 - 1	Model setting for automatic presser foot lifter 0: Solenoid type (Duty while chopping can be varied using No. 115) 1: Pneumatic type (Duty while chopping can be varied using No. 116)
38	40 (ms)	20 - 120 (ms)	Delay time from presser foot lowering command until presser foot lifter solenoid momentarily turns on (only enabled when No. 35 is set to "0")
39	12	10 - 12	Sensing voltage constant from presser foot lowering command until presser foot lifter solenoid momentarily turns on (only enabled when No. 35 is set to "0") If it is set to "10", the response will be fastest and the operating noise will be loudest.
40	0	0 - 1	Operation when presser foot is lifted and lowered using knee switch This setting is only enabled when DIP switch No. 1 is set to "OFF". 0: Presser foot cannot be lifted or lowered by depressing the treadle backward 1: The above operation is possible.
41	0	0 - 1	Presser foot lifting after treadle is returned to neutral position so sewing stops, and is then depressed backward to the 1 <sup>st</sup> step 0: Possible 1: Not possible When No. 42 is set to "1", this function operates as though set to "0".
42	0	0 - 1	Operation when treadle is depressed backward 0: Thread trimming operation 1: Thread trimming operation is disabled (presser foot is lifted when treadle is depressed backward) (The default setting for standard specifications is "1", and the default setting for other specifications is "0".)
44	0	0 - 2	Operation when standing operation variable speed pedal is on 0: Sewing speed is in accordance with treadle depression amount 1: Operation is at the sewing speed set by the speed bar key (constant speed) 2: Operation is at end backtacking speed
45	80 (ms)	0 - 500 (ms)	Delay time for motor to start when standing operation pedal turns on.
46	0	0 - 1	Operation during standing operation when AUTO function is on 0: Sewing stops before finished when presser lifter pedal turns on (momentary stop operation) 1: Above function is disabled

### 3. FUNCTION SETTINGS

#### Memory switch No. 47 - 60

No.	Initial value	Setting range	Setting details
47	0	0 - 1	Operation during standing operation when AUTO function is on 0: When high-speed pedal on, sewing is momentarily stopped, and it is resumed when pedal turns off. 1: Above function is disabled This function is disabled when No. 49 is set to "1".
48	0	0 - 1	Thread trimming pedal operation during standing operation after thread trimming 0: Presser foot can be lifted and lowered 1: Above operation is disabled (only possible using presser foot lifter pedal)
49	0	0 - 1	Alternating operation of standing operation pedal and treadle (Does not include operation of presser foot lifter pedal. In the case of simultaneous operation, the standing operation pedal has priority.) 0: Treadle operation is disabled after standing operation pedal has been used 1: Treadle operation is still enabled after standing operation pedal has been used (alternating operation is possible)
51*	0	0 - 1	Correction sewing using actuator switch after thread trimming 0: Forbidden (switch operation disabled) 1: Possible
52	2 (stitches)	1 - 99 (stitches)	Number of slow start stitches
53*	10 (stitches)	0 - 100 (stitches)	Counting units for stitch counter display 0: No counting operation 1-100: Display counts down by the set number of stitches
54*	1	0 - 2	Stitch counter warning operation (when (!) icon is displayed) 0: Starting using treadle is always enabled 1: Starting using treadle prevented (thread trimming is possible when treadle is depressed backward) 2: Operation using treadle fully prevented when treadle is returned to neutral position and sewing stops
55	0	0 - 1	Operation when treadle is depressed backward or knee switch operation when presser foot is lifted 0: Presser foot lifts when treadle is returned to neutral position 1: Presser foot lowers when treadle is returned to neutral position
56	0	0 - 1	Function for preventing accidental forward depression of the treadle to cause the needle bar to move after the treadle has been depressed backward and is then returned to the neutral position 0: Yes 1: None
57	0	0 - 1	Operation when treadle is depressed forward to the 1 <sup>st</sup> step when the presser foot is lifted 0: Presser foot is lowered 1: Presser foot is not lowered
58	0	0 - 1	Presser foot soft lift function 0: None 1: Yes (Settings for No. 59 and No. 60 are required.)
59	0 (ms)	0 - 150 (ms)	Presser foot soft lift timer setting (When No. 58 is set to "1")  
60	0 (ms)	0 - 99 (ms)	

2247M

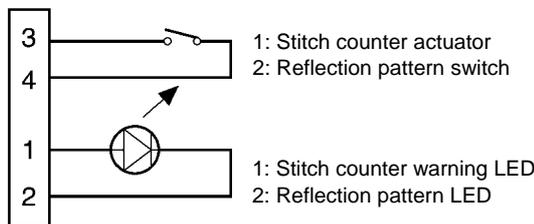
\* : Settings indicated with \* are enabled after the power is turned off and then back on again.

**Memory switch No. 68 - 69**

No.	Initial value	Setting range	Setting details
68	0	0 - 1	Seam matching function during automatic backtacking (Used when you would like seams to be accurately matched when using automatic backtacking; No. 78 sets the stop position and No. 79 can be used to change the time until restart.) 0: No stopping when material feed direction is changed 1: Momentarily stops when material feed direction is changed
69	1	0 - 3	Actuator (optional part) function 0: Function is disabled 1: Stitch counter actuator 2: Sewing speed actuator 3: Option actuator (When set to "2", reflection pattern sewing using the sewing machine actuator switch is disabled. Correction sewing is enabled.)

**<When set to stitch counter actuator>**

Connect to connector P17 (OPT\_SW) on the main circuit board.



2249M

- When the number of stitches displayed in the stitch counter reaches “-0”, the stitch counter warning LED illuminates. (This is the same function as the “!” con display on the operation panel.)
- When the stitch counter actuator is pressed, the stitch counter warning LED switches off and treadle operation is enabled. (This is the same operation as when the RESET switch is pressed.)

**Memory switch No. 74 - 79**

No.	Initial value	Setting range	Setting details
74	15 degrees	-345 - 345 (degrees)	Quick reverse solenoid on timing during start backtacking/continuous backtacking
75	-30 degrees	-345 - 345 (degrees)	Quick reverse solenoid off timing during start backtacking/continuous backtacking
76	-30 degrees	-345 - 345 (degrees)	Quick reverse solenoid off timing during end backtacking
77	15 degrees	-345 - 345 (degrees)	Quick reverse solenoid on timing during end backtacking (Enabled when No. 22 or No. 26 is set to “1”)
78	180 (degrees)	0 - 350 (degrees)	Momentary stopping position when material feed direction is changed (Enabled when No. 68 is set to “1”) The stopping position is the angle from when the needle up signal turns on.
79	100 (ms)	10 - 500 (ms)	Momentary stopping time when material feed direction is changed (Quick reverse mechanism switches at stopping position. After the stopping time has elapsed, sewing starts again automatically.)

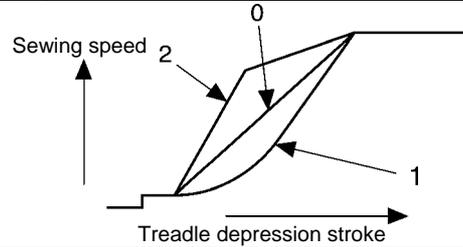
**<Settings for memory switch No. 74 - 77>**

- When set to negative (-) settings with the initial values as a reference, the quick reverse solenoid ON/OFF timing will become faster. If the seams are too short immediately before changing occurs, change the setting in the (-) direction.
- When set to positive (+) settings with the initial values as a reference, the quick reverse solenoid ON/OFF timing will become slower. If the seams are too short immediately after changing occurs, change the setting in the (+) direction.

### 3. FUNCTION SETTINGS

#### Memory switch No. 80 - 88

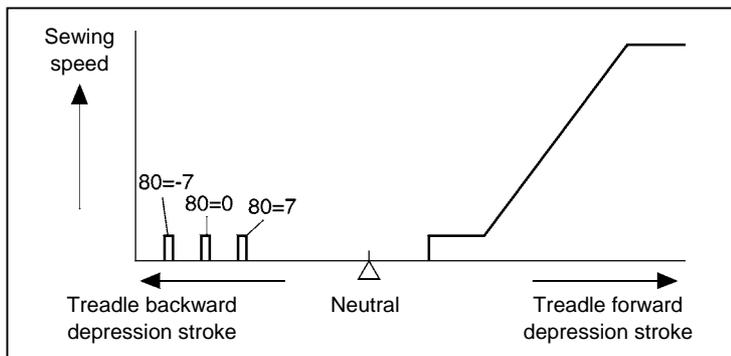
No.	Initial value	Setting range	Setting details
80*	0	-7 - 7	Backward depression on (thread trimming) point for treadle
81*	0	-5 - 5	Backward depression 1 <sup>st</sup> step on (presser foot lifting) point for treadle
82*	0	-5 - 5	Forward depression 1 <sup>st</sup> step on (presser foot lowering) point for treadle
83*	0	-5 - 5	Forward depression on (starting) point for treadle
84*	0	-5 - 5	Variable speed range starting point for treadle
85*	0	-6 - 6	High speed range reaching point for treadle
86*	0	-2 - 2	Variable speed range starting point for standing operation variable speed pedal
87*	0	-2 - 2	High speed range reaching point for standing operation variable speed pedal
88*	0	0 - 2	Treadle speed curve 0: Constant 1: Curves downward 2: Curves upward



2257M

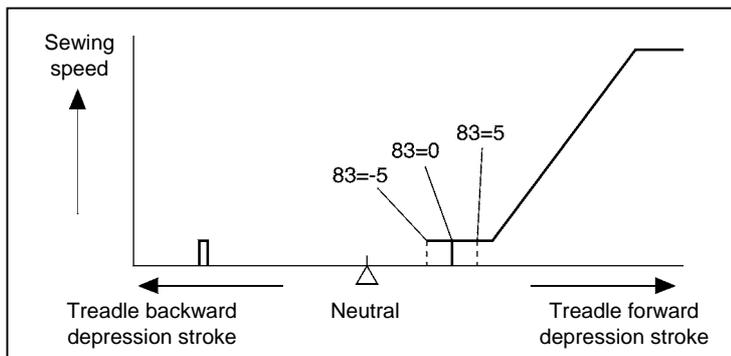
\* : Settings indicated with \* are enabled after the power is turned off and then back on again.

When the neutral position for the treadle is taken as "0", depressing the treadle forward results in (+) values and depressing the treadle backward results in (-) values, and these are added to or subtracted from the standard setting value.



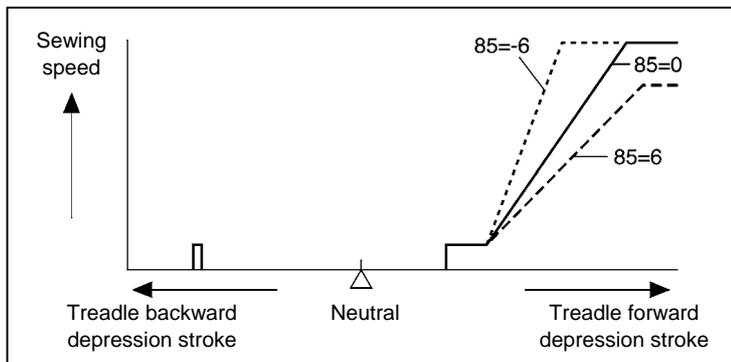
(Ex. 1) No. 80 setting

2258M



(Ex. 2) No. 83 setting

2259M



(Ex. 3) No. 85 setting

2260M

## Memory switch No. 90 - 110

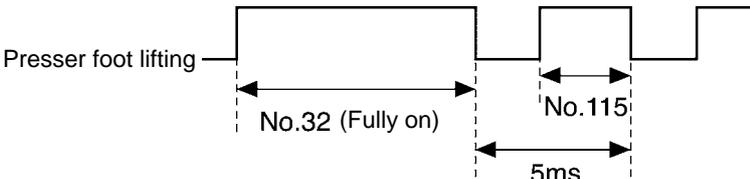
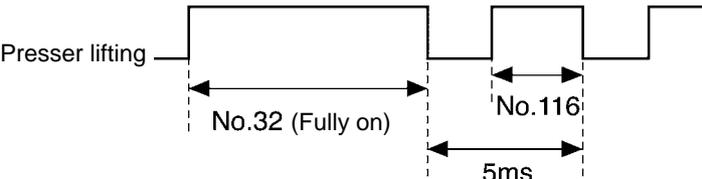
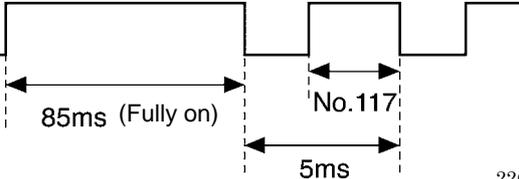
No.	Initial value	Setting range	Setting details
90	160 (rpm)	150 - INCH (rpm)	Thread trimming speed (TRIM)
91	220 (rpm)	150 - 300 (rpm)	Low speed (INCH)
92	1400 (rpm)	500 - 2500 (rpm)	Stop improvement position (POS) [Do not change this setting.]
93	300 (rpm)	INCH - 1000 (rpm)	Slow speed (SLOW)
94	3000 (rpm)	INCH - 3000 (rpm)	Start backtacking limit speed (SBL) (Upper limit for start backtacking speed setting)
96	1200 (rpm)	INCH - 3000 (rpm)	End backtacking speed (EBT)
98	HIL (rpm)	INCH - HIL (rpm)	Automatic sewing speed (AUTO)
99	(*1)	INCH - 5000 (rpm)	Maximum sewing speed limit speed (HIL) (*2)
101	8.0 (mm)	3.0 - 10.0 (mm)	Maximum zigzag width setting
102	0	0 - 1	Backtack zigzag width setting 0: Cannot be changed 1: Can be changed
103	0	0 - 1	Backtack selection when plain zigzag is selected 0: Plain zigzag 1: 3-step zigzag
104	0	0 - 2	Pattern reset when treadle is depressed backward 0: Starts from next pattern 1: Returns to start of patterns only if patterns 5 to 9 are selected 2: Returns to start of patterns when plain, 2-step or 3-step zigzag is selected (patterns 2 to 9) (Plain, 2-step and 3-step zigzag will be sewn at the position set by No. 105.)
105	0	0 - 1	Sewing start position when plain, 2-step or 3-step zigzag is selected When stopped at left      Free      When stopped at right 0: Left edge      Left edge      Right edge 1: Right edge      Right edge      Left edge This setting is enabled when No. 104 is set to "2".
106	0	0 - 2	Blind stitch sewing start position 0: Zigzag section 1: Plain stitch section 2: Specified by the number of stitches
108	0	0 - 1	Sewing machine motor operation when [UP] is displayed 0: Disabled (hand operation only) 1: Operates (enabled when treadle depressed backward and half-stitch key is pressed)
109	1	0 - 1	Needle zigzagging when treadle depressed backward 0: Disabled 1: Enabled
110	0	0 - 1	Sewing patterns with changed sewing pitch (T stitches) 0: Not possible 1: Possible

\*1: Setting is read from machine head detection switch.

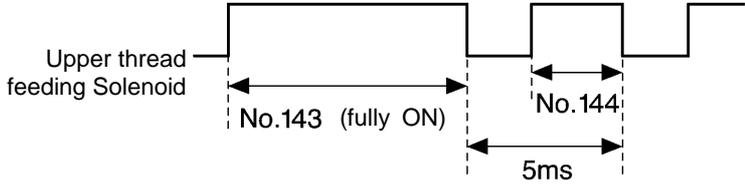
\*2: This is the upper limit setting for the maximum sewing speed. Refer to "7-6. Setting the maximum sewing speed" of the instruction manual for details on the maximum sewing speed settings.

### 3. FUNCTION SETTINGS

#### Memory switch No. 111 - 123

No.	Initial value	Setting range	Setting details
111	1000 (rpm)	500 - 2000	Limit speed for sewing patterns with changed sewing pitch (T stitches) Needle lifting and needle lowering are carried out at low speed when No. 110 is set to "1".
112	1	0 - 1	Low speed limit when sewing machine motor starts 0: No limit 1: When not at the needle up or needle down position, the needle bar speed is limited to low speed until the needle up or needle down position
113	0	0 - 1	Changing speed using speed bar while sewing machine motor is operating 0: Can be changed 1: Cannot be changed
114	0	0 - 1	Operation when auto function is on (fixed stitch/name label sewing) 1: Automatic thread trimming is not carried out after fixed stitch/name label sewing is complete 0: Automatic thread trimming is carried out after fixed stitch/name label sewing is complete
115	1.0 (1.0 ms)	0.1 - 4.9 (0.1 - 4.9 ms)	On time for solenoid-type presser lifter solenoid during chopping  Enabled when No. 37 is set to "0". 2264M
116	2.5 (2.5 ms)	0.1 - 4.9 (0.1 - 4.9 ms)	On time for pneumatic-type presser lifter solenoid during chopping  Enabled when No. 37 is set to "1" 2265M
117	1.1 (1.1 ms)	0.1 - 4.9 (0.1 - 4.9 ms)	On time for quick reverse solenoid during chopping  2266M
118	85 (85 ms)	40 - 100 (40 - 100 ms)	Fully on time for quick reverse solenoid
119	1	0 - 2	Correction level when 2-step zigzag direction is reversed ("0" means no correction) * Enabled when zigzag width setting is 4.0, 4.2, ...
120	2	0 - 3	Correction level when 3-step zigzag direction is reversed ("0" means no correction) * Enabled when zigzag width setting is 4.8 or higher
121	1	0 - 2	Correction level when 2-step zigzag direction is reversed ("0" means no correction) * Enabled when zigzag width setting is 4.1, 4.3, ...
123	45 (degrees)	30 - 90 (degrees)	Servo lock release rotation angle [Do not change this setting.]

Memory switch No. 125 - 148

No.	Initial value	Setting range	Setting details
125	0	0 - 1	Servo lock operation 0: None 1: When stopped 2: When presser foot lifting signal is on
126	1 (seconds)	0 - 120 (seconds)	Servo lock timer setting 0: No timer operation 1-120: Timer operation (1-120 seconds)
127	100 (hours)	0 - 500 (hours)	Time from when grease-up time warning is output until an error is output
128	0	0 - 3	Flicker reduction function (if fluorescent light is flickering) 0: None 1: "Medium" flicker reduction effect 2: "Small" flicker reduction effect 3: "Large" flicker reduction effect
129	0	-3 - 2	Gain during motor acceleration [Do not change this setting.]
130	0	-3 - 2	Gain during motor deceleration [Do not change this setting.]
131	700 (hours)	0 - 1200 (hours)	Grease-up time
137	20 (degrees)	0 - 40 (degrees)	Thread trimmer on timing (* ) Angle from needle drop signal
138	40 (degrees)	0 - 120 (degrees)	Upper thread feeding on timing (* ) Angle from needle drop signal
139	40 (ms)	0 - 40 (ms)	Thread trimmer off timing (* ) Time from needle up stop
140	40 (ms)	0 - 100 (ms)	Upper thread feeding off timing (* ) Time from needle up stop
141	30 (ms)	5 - 60 (ms)	Quick reverse solenoid on response time for T stitches
142	30 (ms)	5 - 60 (ms)	Quick reverse solenoid off response time for T stitches
143	30 (ms)	0 - 60 (ms)	Upper thread feeding solenoid fully on time (* ) No chopping when set to "0"
144	1.0 (1.0 ms)	0.1 - 4.9 (0.1 - 4.9 ms)	On time for upper thread feeding solenoid during chopping 
145	1	0 - 1	Needle up stop position error display function after thread trimming 0: None 1: Yes ([Err 111] is displayed.)
146	4	4 - 14	Needle zigzag sync position (angle from needle up stop signal turning off x 8 degrees)
147	0	0 - 5 (degrees)	Needle zigzag sync delay
148	1	0 - 1	Machine head fan 0: Stopped 1: Operating (stops when machine head is tilted back and when an error occurs)

0123B

### 3. FUNCTION SETTINGS

---

#### Memory switch No. 132 - 135

The following memory switch numbers are used for displaying maintenance information.

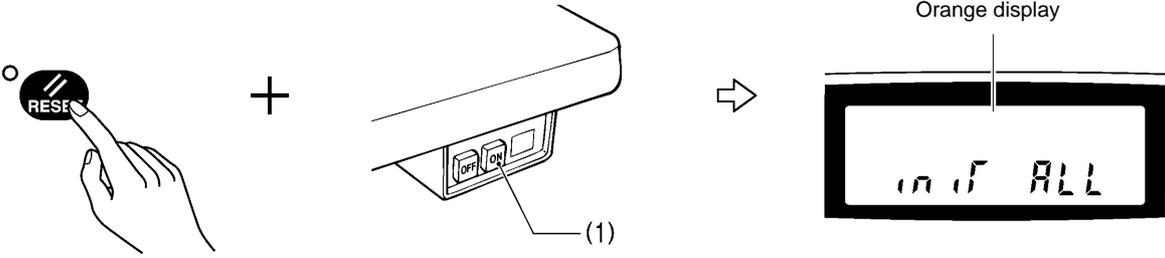
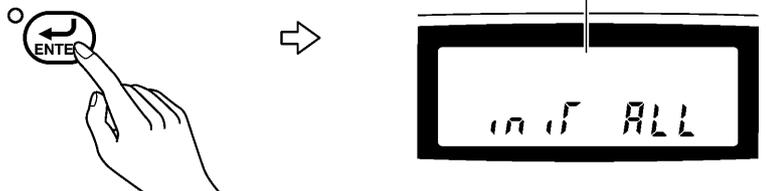
No.	Explanation of display details
132	Cumulative power on time (Actual time = Displayed time x 10 hours)
133	Cumulative running time (Actual time = Display xxxx x 10 hours)
135	ROM version (x.xxx)

### 3-3. Data initialization

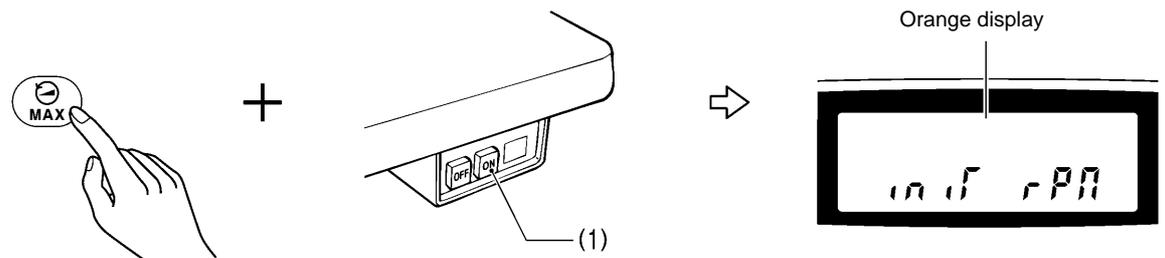
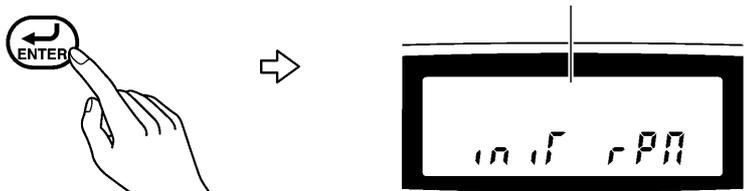
Initialization of memory data refers to returning all operation panel setting data (including data that has been set using memory switches) to the factory default settings.

#### 3-3-1. Resetting the settings to their defaults

##### <Initialization of all setting data>

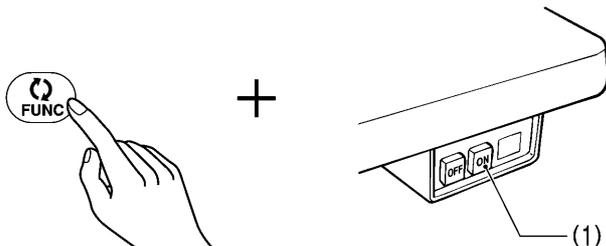
<p><b>1</b></p>	<p>While holding down the RESET key on the operation panel, turn on the power switch (1).</p>  <p>Orange display</p> <p>3457M</p>
<p><b>2</b></p>	 <p>Green display</p> <p>The operation panel settings will be returned to their factory defaults. After this, operation panel and treadle operation will be possible.</p> <p>3458M</p>

##### <Initialization of speed data only>

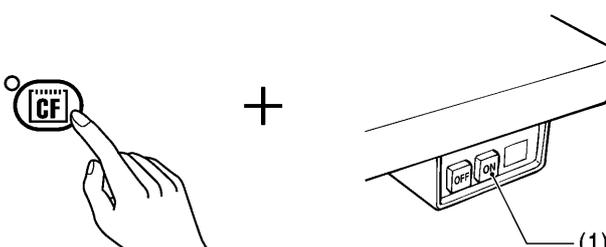
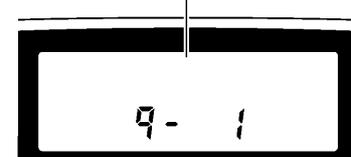
<p><b>1</b></p>	<p>While holding down the MAX key on the operation panel, turn on the power switch (1).</p>  <p>Orange display</p> <p>0170B</p>
<p><b>2</b></p>	 <p>Green display</p> <p>The speed data will be set to the speed data for the machine head detection unit. After this, operation panel and treadle operation will be possible.</p> <p>0171B</p>

### 3. FUNCTION SETTINGS

#### <Initialization of memory switch setting data only>

<b>1</b>	<p>While holding down the FUNC key on the operation panel, turn on the power switch (1).</p> 	<p>Orange display</p>  <p>0172B</p>
<b>2</b>		<p>Green display</p>  <p>The memory switch setting data will be initialized. After this, operation panel and treadle operation will be possible.</p> <p>0173B</p>

#### <Initialization of custom patterns only>

<b>1</b>	<p>While holding down the CF key on the operation panel, turn on the power switch (1).</p> 	<p>Orange display</p>  <p>0174B</p>
<b>2</b>		<p>Green display</p>  <p>The custom pattern data in the internal memory will be displayed. * If there is no custom pattern data in the internal memory, the buzzer will sound twice.</p> <p>0175B</p>

#### Deleting all custom pattern data

Press and hold the RESET key. After this, press the ENTER key. The initial display will appear.

### 3-3-2. When data is initialized automatically

All setting data will be initialized automatically at the following times.

- When the power switch is turned on for the first time
- When the power switch is turned on for the first time after the control box has been replaced
- When the power switch is turned on for the first time after the sewing machine for the current control box has been replaced with a machine having different speed specifications

The operation panel and treadle cannot be used for approximately 4 seconds in all these cases.

After approximately 4 seconds, "iniT rPM" will appear in green in the main display. This indicates that the sewing machine's speed settings have been initialized.

**NOTE:**

If any of the settings relating to the sewing machine's sewing speed are different from the setting data in the machine head detection unit when the power switch is turned on, the data will be initialized automatically.

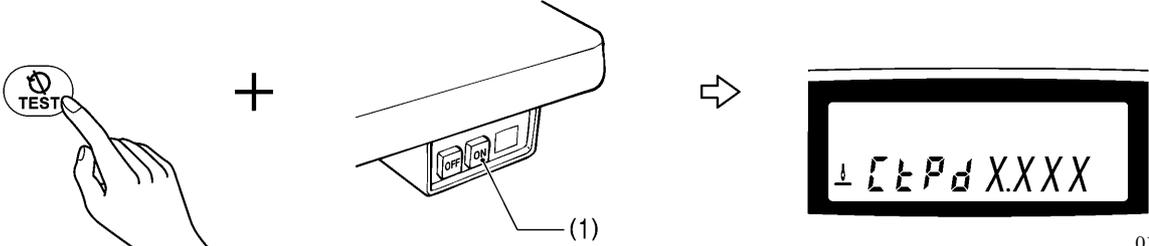
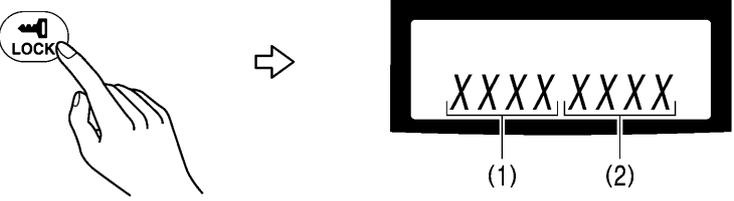
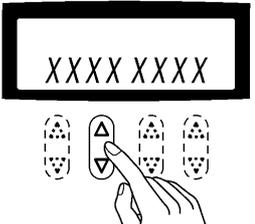
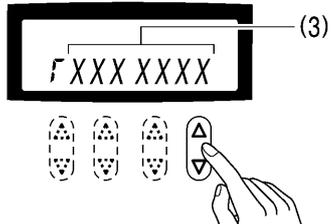
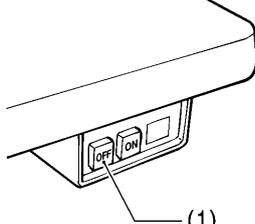
After the initialization is complete, "iniT rPM" will appear in green in the main display.

After this, operation panel and treadle operation will be possible.

### 3-4. Error history checking method

#### 3-4-1. Error history checking method

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

<p><b>1</b></p>	<p>While holding down the TEST key on the operation panel, turn on the power switch (1).                  * After the following display appears, keep the TEST key pressed down until the buzzer makes a short beep.</p>  <p style="text-align: right;">0176B</p>
<p><b>2</b></p>	 <p>The error history order number (1) and the error code (2) will appear in the main display.                  (Refer to “3-4-2. Error history display examples” for details on reading the display.)</p> <p style="text-align: right;">0177B</p>
<p><b>3</b></p>	<p>To switch the error history display in order of errors</p>  <p>The error history will switch in order of the errors.</p> <p style="text-align: right;">0178B</p>
<p><b>4</b></p>	<p>To display the time stamp for the error history that is currently being displayed</p>  <p>The time stamp will be displayed.                  * The last seven digits (3) show the time stamp (1 hour). The time displayed is the cumulative time since the power was turned on.</p> <p style="text-align: right;">0179B</p>
<p><b>5</b></p>	<p>To return to the normal operating mode</p> <p>Set the power switch (1) to OFF.</p>  <p style="text-align: right;">0180B</p>

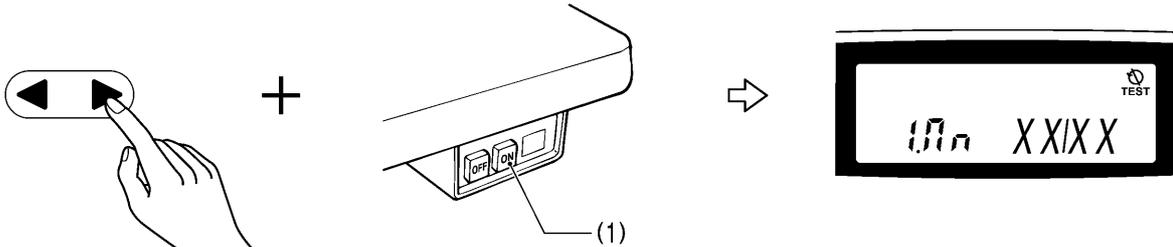
### 3-4-2. Error history display examples

Setting items	Main display (1)	Main display (2)
If there is no error history	[000]	[E---
Error [E110] is displayed first.	[001]	[E110]

## 3-5. Software version checking method

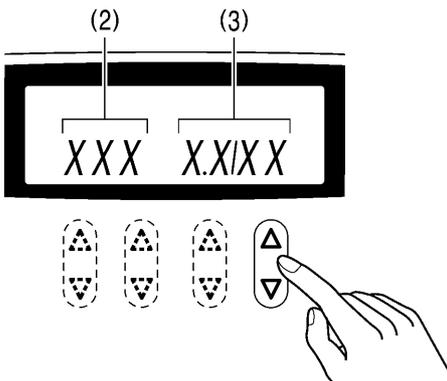
### 3-5-1. Version update checking method

**1** While pressing the [Speed ▶] key on the operation panel, turn on the power switch (1).  
 \* After the following display appears, keep the [Speed ▶] key pressed down until the buzzer makes a short beep.



0181B

**2** Select the program that you would like to check the version for.



The display switches between a symbol (2) to indicate the program and the current version (3) each time the key is pressed.  
 \* The programs indicated by the symbols (2) are as follows.

Symbol (2)	Program
1MN	Main program
2 MT	Motor program
3 PL	Panel program
4 iP	IPL program

0182B

**3** When the TEST key is pressed, the mode returns to normal operation mode.



0183B

### 3-6. Checking input and output

Use this to check for any malfunctions of the operation panel keys, circuit boards or sensors, and for checking for broken cords and for adjusting sensor positions.

You can check whether the CPU is correctly reading the signals from keys and sensors.

#### 3-6-1. Input and output checking method

<b>1</b>	<p>While holding down the TEST key on the operation panel, turn on the power switch (1).</p> <p>* After the following display appears, keep the TEST key pressed down until the buzzer makes a short beep.</p>
<b>2</b>	Check the responses from the keys and sensors while referring to "3-6-2. Input and output check list".
<b>3</b>	To return to normal operation mode, turn the power switch off and then turn it back on again.

0176B

#### 3-6-2. Input and output check list

##### Needle position, zigzag position and switch operation

Operation block		Operation panel indicator block	Check item and checking method
Needle position signal	Needle up signal - ON	Needle up icon	Needle up signal ON/OFF position for upper shaft motor; Turn the pulley by hand.
	Needle down signal - ON	Needle down icon	Needle down signal ON/OFF position for upper shaft motor; Turn the pulley by hand.
Needle zigzag position signal	Z phase signal - ON	Zigzag width/reference line LED	Home position signal ON/OFF position for needle zigzag motor Signal should turn ON/OFF near the needle bar center position when the needle bar is turned by hand to the left and right.
	A phase signal - ON	Left stop LED	A phase ON/OFF position for needle zigzag motor Signal should turn ON/OFF when the needle bar is turned by hand to the left and right.
	B phase signal - ON	Right stop LED	B phase signal ON/OFF position for needle zigzag motor Signal should turn ON/OFF when the needle bar is turned by hand to the left and right.
Switch	Actuator switch - ON	Correction stitch icon	Correction stitch icon should turn ON when the actuator switch is pressed.
	Machine head tilt detection Switch - ON	TEST icon	When the machine head is tilted back, the TEST icon turns ON.
	Knee switch - ON	Slow start icon	When the knee switch is pressed, the slow start icon turns ON.

**Treadle unit and standing operation pedal operation**

Operation block		Operation panel indicator block	
Treadle unit	Forward depression - ON	Plain zigzag LED	Forward depression ON signal position Depress the treadle unit forward.
	Forward depression - ON (1 <sup>st</sup> step - ON is when DIP switch No. 2 is ON)	3-step zigzag LED	Presser foot ON signal position Depress the treadle unit forward gently.
	Backward depression to 1 <sup>st</sup> step - ON	Scallop left LED	Presser foot ON signal position Depress the treadle backward gently.
	Backward depression - ON	Scallop right LED	Backward depression ON signal position Depress the treadle backward firmly.
Standing operation pedal	High-speed switch - ON	Plain zigzag LED	High-speed switch ON signal position Turn on high-speed switch for standing operation pedal.
	Low-speed switch - ON	CF LED	Low-speed switch ON signal position Turn on low-speed switch for standing operation pedal.
	Thread trimming switch - ON	Scallop right LED	Thread trimming switch ON signal position Turn on thread trimming switch for standing operation pedal.
	Presser foot Switch - ON	Slow start icon	Presser foot switch ON signal position Turn on presser foot switch for standing operation pedal.

**Solenoids (only enable for EZ - 40 panel)**

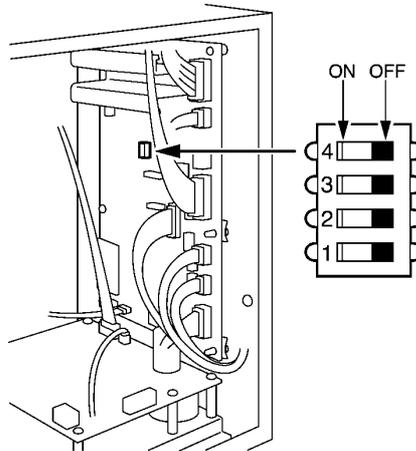
Operation block	Operating details
End backtack key	Thread trimmer solenoid operates.
Continuous backtack key	Thread wiper solenoid operates.
Start backtack key	Quick reverse solenoid operates.
Fixed stitch/name label key	Presser foot solenoid operates.
P1 key	Upper thread feeding solenoid operates.
P2 key	Option solenoid operates.

### 3-7. DIP switch setting method

## ⚠ DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the cover of the control box. Touching areas where high voltages are present can result in severe injury.



3579M

1	Presser foot position when the treadle is returned to the neutral position after thread trimming	ON	Presser foot lowers (models for Europe)
		OFF	Presser foot stays lifted (models for other than Europe) (*1)
2	Presser foot lowering when treadle is depressed to 1 <sup>st</sup> step (*2)	ON	Enabled (models for Europe)
		OFF	Disabled (models for other than Europe)
3	Operation panel key lock	ON	Key lock function available
		OFF	Key lock function not available
4		-	Always set to OFF (*3)

(\*1) If the knee switch is used to momentarily lower the presser foot, the presser foot cannot be raised by operating the treadle when the sewing machine has stopped.

In such cases, the presser foot can only be lifted and lowered using the knee switch.

(\*2) Adjustment of the treadle unit is required when changing this function.

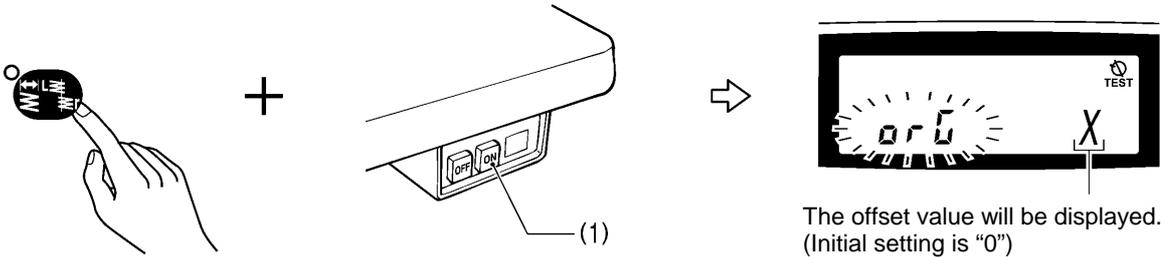
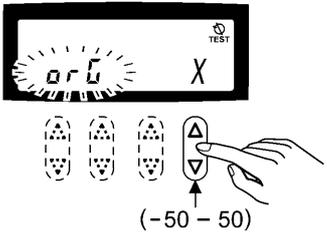
Change the hooking position of the spring inside the treadle unit, and set the depression stroke. (Refer to "12. TREADLE UNIT".)

(\*3) When set to ON, treadle operation is disabled, so it should always be set to OFF.

If it is set to ON, [DIP SW4] (green) and [Err 101] (orange) will appear alternately in the main display of the operation panel.

## 3-8. Needle zigzag home position adjustment procedure

### OPERATION PROCEDURE

<p><b>1</b></p>	<p>While pressing the [zigzag width/zigzag reference line position] key on the operation panel, turn on the power switch (1).</p>  <p>The offset value will be displayed. (Initial setting is "0")</p> <p style="text-align: right;">0185B</p>
<p><b>2</b></p>	<p>Move the needle bar to the needle up stop position, and then press and hold the RESET key for 2 seconds or more.</p>  <p>Home position detection will be carried out, and then the needle bar will stop at the currently-recorded position. After detection is complete, the [orG] display will stop flashing and illuminate steadily.</p> <ul style="list-style-type: none"> <li>* If [Err 200] appears, it indicates that there is a problem with the needle zigzag motor home position.</li> <li>* If [UP] appears, turn the pulley by hand to move the needle bar to the needle up stop position, and then press the RESET key once more. Home position detection will be carried out.</li> </ul> <p style="text-align: right;">0186B</p>
<p><b>3</b></p>	<p>Use the home position checking tool, and press the [ <math>\Delta</math> / <math>\nabla</math> ] keys to change the offset value (-50 - 50) so that the needle is at the home position.</p>  <p>The needle bar will move in accordance with the setting value. When the setting has been changed, the [orG] display will change from illuminated to flashing.</p> <p style="text-align: right;">0187B</p>
<p><b>4</b></p>	<p>Move the needle bar to the needle up stop position, and then press the RESET key.</p>  <p>Home position detection will be carried out. After detection is complete, the [orG] display will stop flashing and illuminate steadily.</p> <ul style="list-style-type: none"> <li>* If [UP] appears, turn the pulley by hand to move the needle bar to the needle up stop position, and then press the RESET key once more. Home position detection will be carried out.</li> </ul> <p style="text-align: right;">0186B</p>
<p><b>5</b></p>	<p>Repeat steps 3 and 4 to set the needle to the home position.</p>
<p><b>6</b></p>	<p>Press the TEST key.</p>  <p>The [TEST] display and the [zigzag width/zigzag reference line position] indicator will switch off. The setting will be written to the machine head memory and adjustment mode will be exited.</p> <p style="text-align: right;">0183B</p>

#### NOTE:

If the TEST key is pressed while [orG] is flashing, [Err 202] will appear. Press the TEST key once more to exit adjustment mode. Repeat the procedure from step 3.

## 4. USING CF CARDS

### 4-1. Precautions when handling CF cards (commercially available)

- Use CF cards with a capacity of 32, 64, 128 or 256 MB.
- Do not attempt to disassemble or modify the CF cards.
- Do not forcibly bend, drop or scratch CF cards or place heavy objects on top of them.
- Do not allow them to come into contact with liquids such as water, oil, solvents or drinks.
- Use and store the cards in places that are free from strong magnetic fields and electronic interference.
- Do not use or store the cards in places which are subject to vibration, shocks, direct sunlight, dust from items such as thread scraps, high humidity, sudden changes in temperature, or strong magnetic fields from equipment such as speakers.
- Do not subject the memory cards to vibration or shocks or remove them from the sewing machine while data reading or writing is in progress.
- The data on the CF cards may become lost or corrupted due to some malfunction or accident. It is recommended that you make backups of important data.
- Be sure to turn off the power for the sewing machine before inserting and removing CF cards.
- CF cards are already formatted at the time of purchase, so do not reformat them.
- The recommended CF cards are commercially-available ones from SanDisk or HAGIWARA SYS-COM. CF cards from other manufacturers can be used, but different formatting methods may mean that loading from or writing to such cards may not be possible.

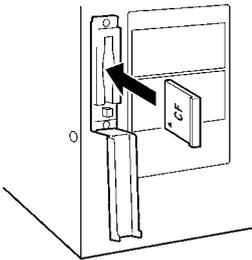
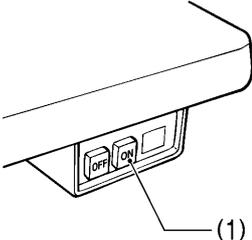
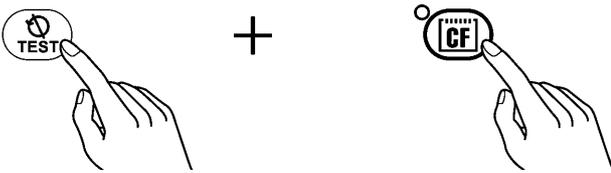
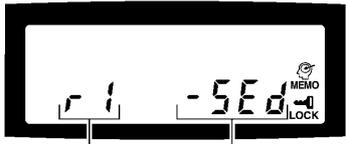
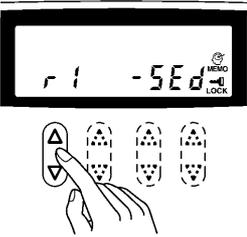
For more information, refer to the documentation provided with the CF card.

- \* This product is compatible with CF cards that have been formatted using the FAT16 method. Cards that have been formatted using the FAT32 method cannot be used.
- \* CF™ is a trademark of SanDisk Corporation.
- \* Company names and product names appearing in this manual are trademarks or registered trademarks of the respective owners. However, no TM or other similar symbols appear in the main text of this manual.

### 4-2. Structure of a CF card folder

```
\BROTHER\ISM\ISMSYS\ISM04MN.MOT : Control program
\BROTHER\ISM\ISMDD00\ISMMSW.SEW : Memory switch data
\ISMHST.SEW : Error log data
\ISMS0901.SEW : Additional sewing data P No. = 91
\ISMS0902.SEW : Additional sewing data P No. = 92
⋮
\ISMS0999.SEW : Additional sewing data P No. = 99
```

## 4-3. Preparation for reading/writing data

1	<p>With the power turned off, insert the CF card into the CF slot.</p>  <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Make sure the CF card is facing the correct way.</li> <li>• Always be sure to keep the cover closed except when inserting and removing the CF card. If this is not done, dust may get inside and cause problems with operation.</li> </ul>	4453Q	
2	<p>Turn on the power switch (1).</p> 	 <p>MEMO icon illuminates. * If no valid data can be found on the CF card, the MEMO icon will not illuminate.</p>	0188B
3	<p>While pressing the TEST key, press the CF key to switch to CF card read/write mode.</p> 	 <p>The mode number will appear in (1) of the main display, and the symbol name for that mode will appear in (2). * The initial mode is additional sewing data reading mode (r1). (Refer to the &lt;Read/write mode list&gt;.)</p>	0189B
4	<p>Select the mode.</p> 	<p>The mode changes each time the key is pressed.</p>	0190B

## &lt;Read/write mode list&gt;

Mode No.	Symbol name	Setting items
r 1	[-SEd]	Additional sewing data is read from the CF card into the sewing machine. *
w 2	[SEd-]	Additional sewing data is written from the sewing machine to the CF card.
r 3	[-MEM]	Memory switch settings are read from the CF card to the sewing machine.
w 4	[MEM-]	Memory switch settings are written from the sewing machine to the CF card.
r 7	[-Sys]	Control programs are read from the CF card and used to update the firmware version.
w 8	[LoG-]	Error log data is written from the sewing machine to the CF card.

\* The additional sewing data that can be use with this sewing machine is data that has been created for the Z-8550A/Z-8560A.

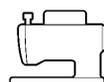
### 4-4. Reading additional sewing data into the sewing machine



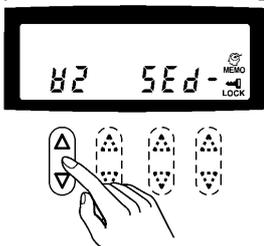
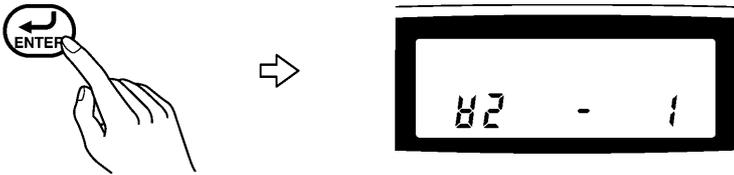
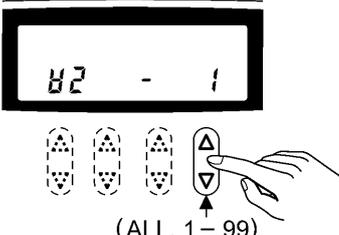
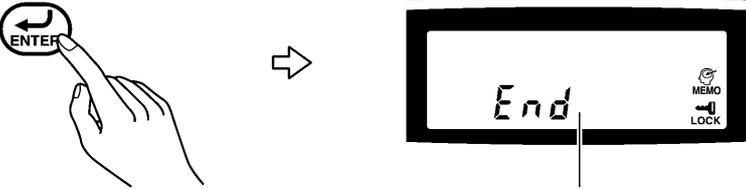
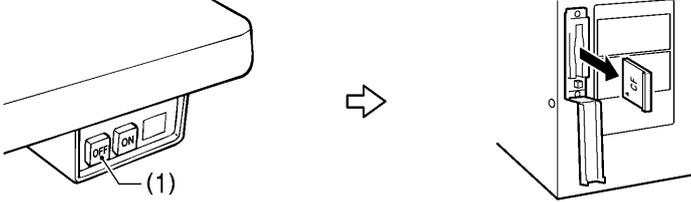
0197B

<p><b>1</b></p>	<p>Carry out steps 1 to 3 in “4-3. Preparation for reading/writing data”.</p>
<p><b>2</b></p>	<p>Select [r 1] in CF data read/write mode.</p>
<p>0191B</p>	
<p><b>3</b></p>	
<p>0192B</p>	
<p><b>4</b></p>	<p>Select the program numbers to be read (ALL, 1-99).</p>
<p>* If [ALL] is displayed, all additional sewing data will be read at once.</p>	
<p>0193B</p>	
<p><b>5</b></p>	<p>The buzzer will sound and the selected sewing data will be read from the CF card and copied into the sewing machine's internal memory. When [End] is displayed, the process is complete.</p>
<p>Reading complete</p>	
<p>0194B</p>	
<p><b>6</b></p>	<p>Press the TEST key to exit read/write mode.</p>
<p>0195B</p>	
<p><b>7</b></p>	<p>Set the power switch (1) to OFF and remove the CF card.</p>
<p>0196B</p>	

### 4-5. Writing additional sewing data to CF cards



0211B

1	Carry out steps 1 to 3 in "4-3. Preparation for reading/writing data".
2	<p>Select [w 2] in CF data read/write mode.</p> 
3	
4	<p>Select the program numbers to be written (ALL, 1 - 99).</p>  <p>(ALL, 1 - 99)</p> <p>* If [ALL] is displayed, all additional sewing data will be read at once.</p>
5	<p>The buzzer will sound and the selected sewing data will be copied from the internal memory onto the CF card. When [End] is displayed, the process is complete.</p>  <p>Writing complete</p>
6	<p>Press the TEST key to exit read/write mode.</p> 
7	<p>Set the power switch (1) to OFF and remove the CF card.</p> 

0198B

0199B

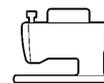
0200B

0194B

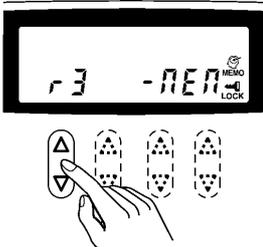
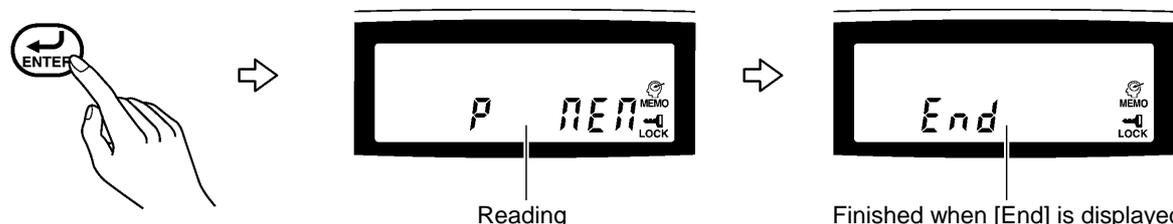
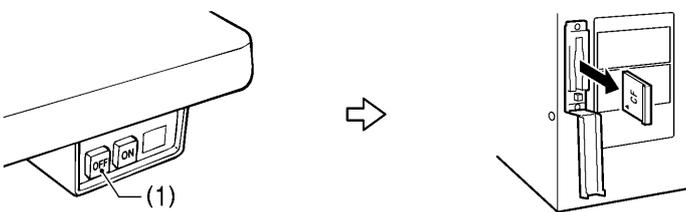
0195B

0196B

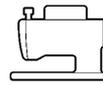
### 4-6. Reading memory switch data into the sewing machine



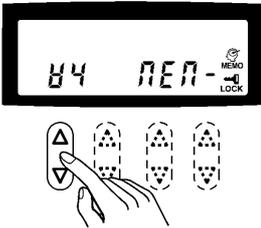
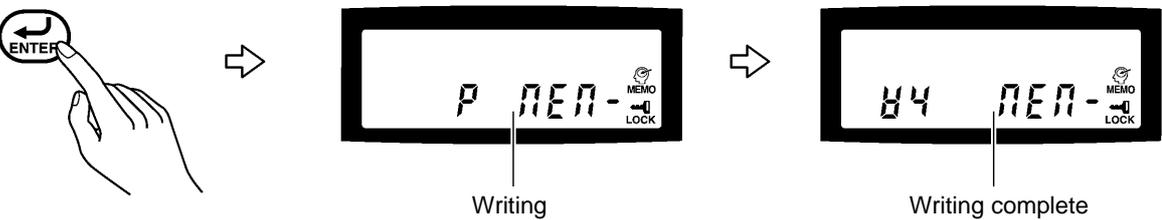
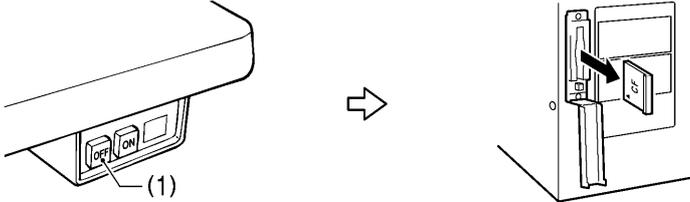
0197B

<p><b>1</b></p>	<p>Carry out steps 1 to 3 in "4-3. Preparation for reading/writing data".</p>
<p><b>2</b></p>	<p>Select [r 3] in CF data read/write mode.</p>  <p style="text-align: right;">0202B</p>
<p><b>3</b></p>	<p>The buzzer will sound and the memory switch data will be loaded from the CF card and copied into the sewing machine's internal memory.</p>  <p style="text-align: center;">Reading</p> <p style="text-align: center;">Finished when [End] is displayed.</p> <p style="text-align: right;">0203B</p>
<p><b>4</b></p>	<p>Set the power switch (1) to OFF and remove the CF card.</p>  <p style="text-align: right;">0196B</p>

### 4-7. Writing memory switch data to a CF card



0211B

<p><b>1</b></p>	<p>Carry out steps 1 to 3 in “4-3. Preparation for reading/writing data”.</p>
<p><b>2</b></p>	<p>Select [w 4] in CF data read/write mode.</p> 
<p><b>3</b></p>	<p>The buzzer will sound and the memory switch data will be copied from the internal memory onto the CF card.</p> 
<p><b>4</b></p>	<p>Press the TEST key to exit read/write mode.</p> 
<p><b>5</b></p>	<p>Set the power switch (1) to OFF and remove the CF card.</p> 

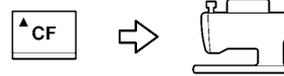
0204B

0205B

0195B

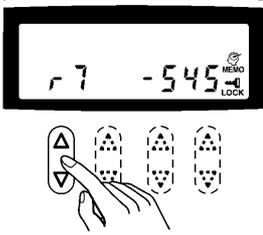
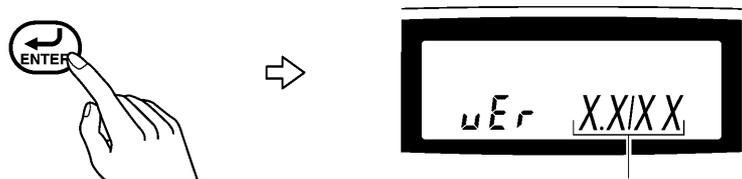
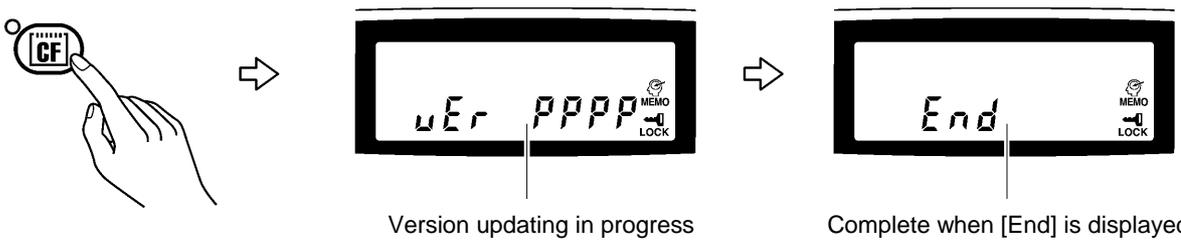
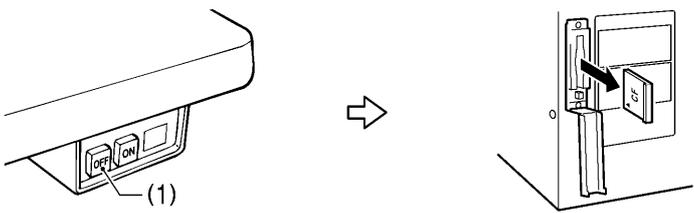
0196B

## 4-8. Updating the control program version



0197B

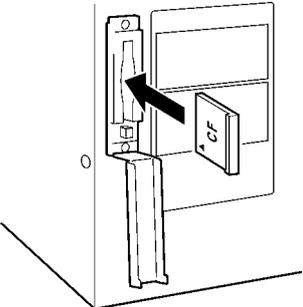
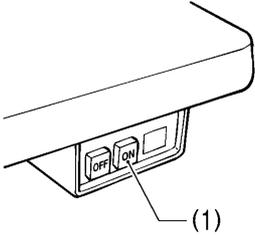
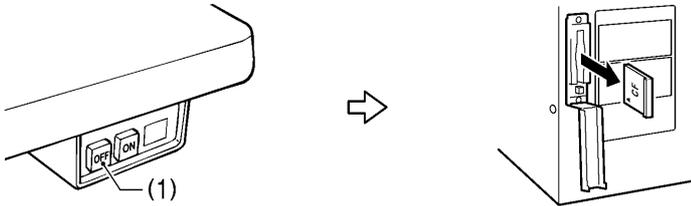
### 4-8-1. Control program version updating procedure

1	Carry out steps 1 to 3 in "4-3. Preparation for reading/writing data".
2	<p>Select [r 7] in CF data read/write mode.</p>  <p style="text-align: right;">0206B</p>
3	 <p style="text-align: center;">Version number for control program saved on CF card</p> <p style="text-align: right;">0207B</p>
4	 <p style="text-align: center;">Version updating in progress</p> <p style="text-align: center;">Complete when [End] is displayed</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>* Version updating takes a maximum of 60 seconds. (The time taken will vary depending on the manufacturer and storage capacity of the CF card being used.)</li> <li>* Never remove the CF card or turn off the power switch while reading of the CF card is in progress.</li> <li>* If the filename and folder name for the control program are incorrect, error [Err 421] will be displayed.</li> </ul> <p style="text-align: right;">0208B</p>
5	<p>Set the power switch (1) to OFF and remove the CF card.</p>  <p style="text-align: right;">0196B</p>

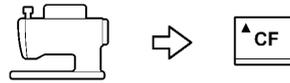
### 4-8-2. Restoring the control program if an error occurs during version updating

If the version updating did not complete normally, such as because of a power outage, the sewing machine will not operate correctly.

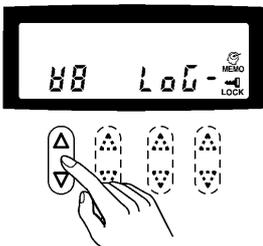
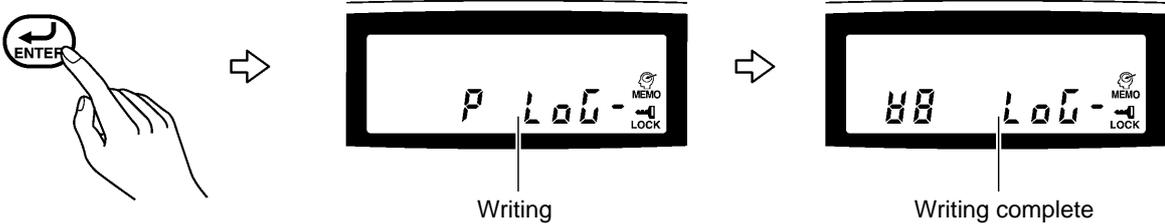
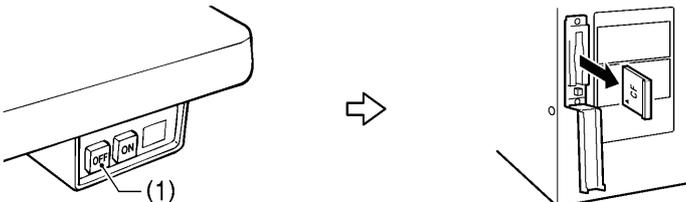
If this happens, restore the control program by the following procedure.

<p><b>1</b></p>	<p>Insert the CF card containing the control program data into the CF card slot.</p>  <p style="text-align: right;">4453Q</p>
<p><b>2</b></p>	<p>Set the power switch (1) to ON.</p>  <p>The operation panel will switch off and the version updating will be carried out. When the power turns back on, the updating is complete.</p> <p style="text-align: right;">0216B</p>
<p><b>3</b></p>	<p>Set the power switch (1) to OFF and remove the CF card.</p>  <p style="text-align: right;">0196B</p>

4-9. Writing error log data to CF cards



0211B

<p><b>1</b></p>	<p>Carry out steps 1 to 3 in “4-3. Preparation for reading/writing data”.</p>
<p><b>2</b></p>	<p>Select [w 8] in CF data read/write mode.</p>  <p style="text-align: right;">0209B</p>
<p><b>3</b></p>	<p>The buzzer will sound and the error log data will be copied from the internal memory onto the CF card.</p>  <p style="text-align: right;">0210B</p>
<p><b>4</b></p>	<p>Press the TEST key to exit read/write mode.</p>  <p style="text-align: right;">0195B</p>
<p><b>5</b></p>	<p>Set the power switch (1) to OFF and remove the CF card.</p>  <p style="text-align: right;">0196B</p>

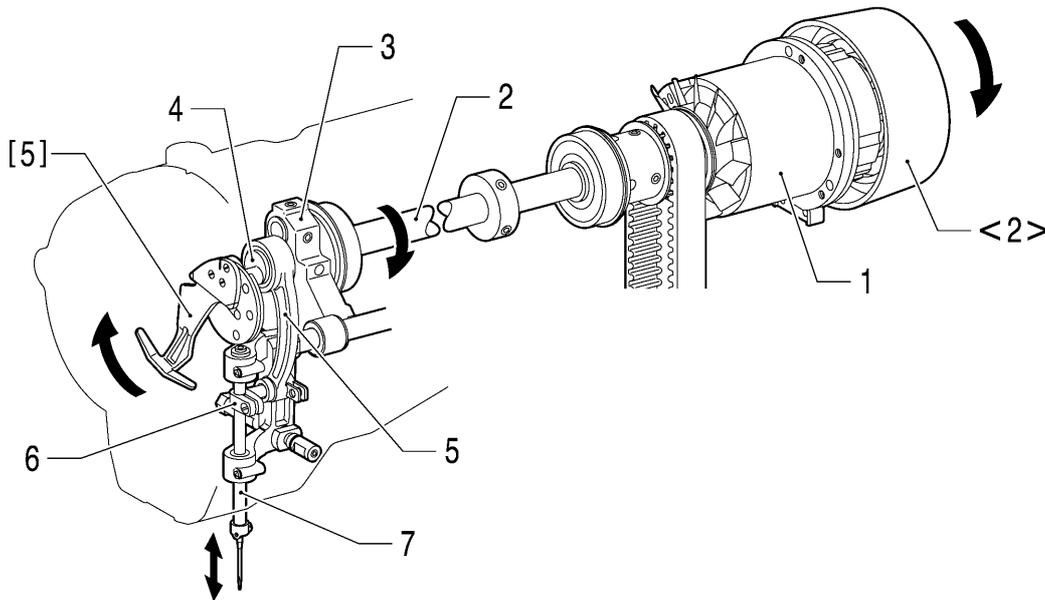
# 5. MECHANICAL DESCRIPTIONS

Each mechanism operates in the order of the numbers shown in the illustration.

\* <number> and [number] indicate the flow of operations that occur separately from each other.

\* (number) indicates only the names of parts. (They are not part of the indication of operation flow.)

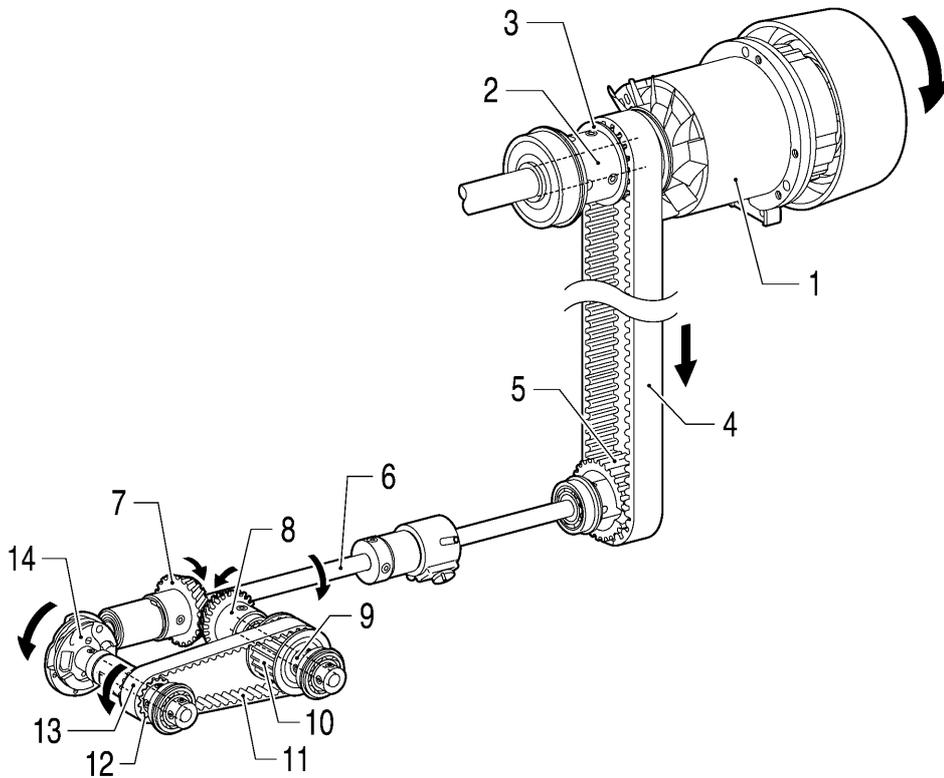
## 5-1. Needle bar and thread take-up mechanisms



1109B

- 1. Motor
  - 2. Upper shaft
  - 3. Thread take-up crank
  - 4. Needle bar connecting rod shaft
  - 5. Needle bar connecting rod
  - 6. Needle bar clamp
  - 7. Needle bar
- <2> Pulley
- [5] Rotary thread take-up lever

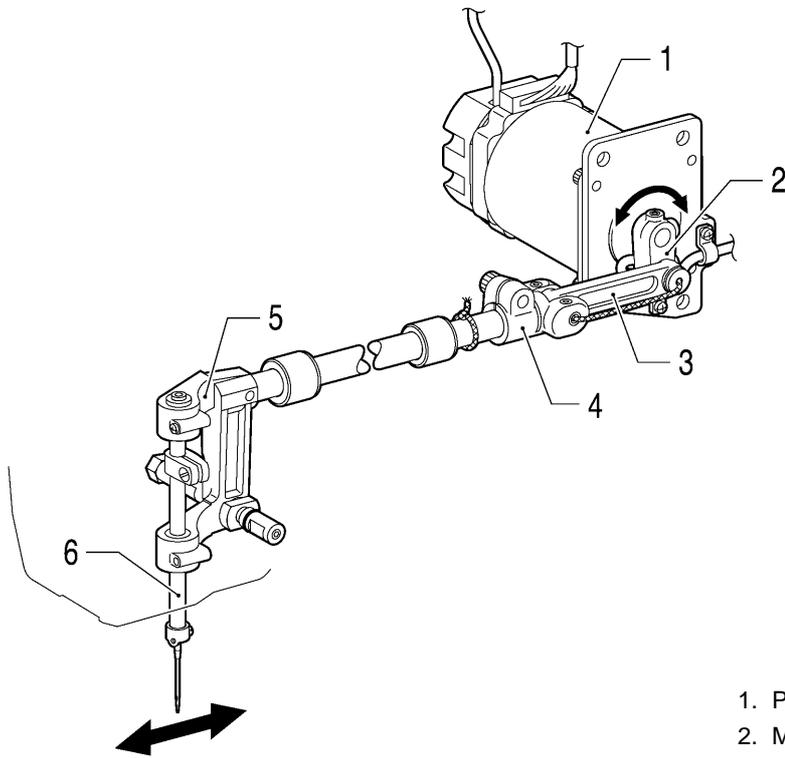
5-2. Lower shaft and shuttle race mechanisms



0074B

- 1. Motor
- 2. Upper shaft
- 3. Timing pulley U
- 4. Timing belt
- 5. Timing pulley D
- 6. Lower shaft
- 7. Bevel gear
- 8. Bevel gear
- 9. Rotary hook driving shaft
- 10. Timing pulley 39
- 11. Timing belt
- 12. Timing pulley 26
- 13. Rotary hook shaft
- 14. Rotary hook

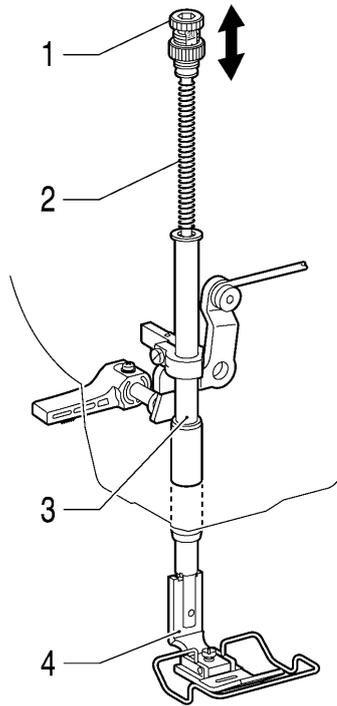
### 5-3. Zigzag mechanism



1. Pulse motor
2. Motor lever
3. Zigzag connecting rod
4. Zigzag joint
5. Needle bar base
6. Needle bar

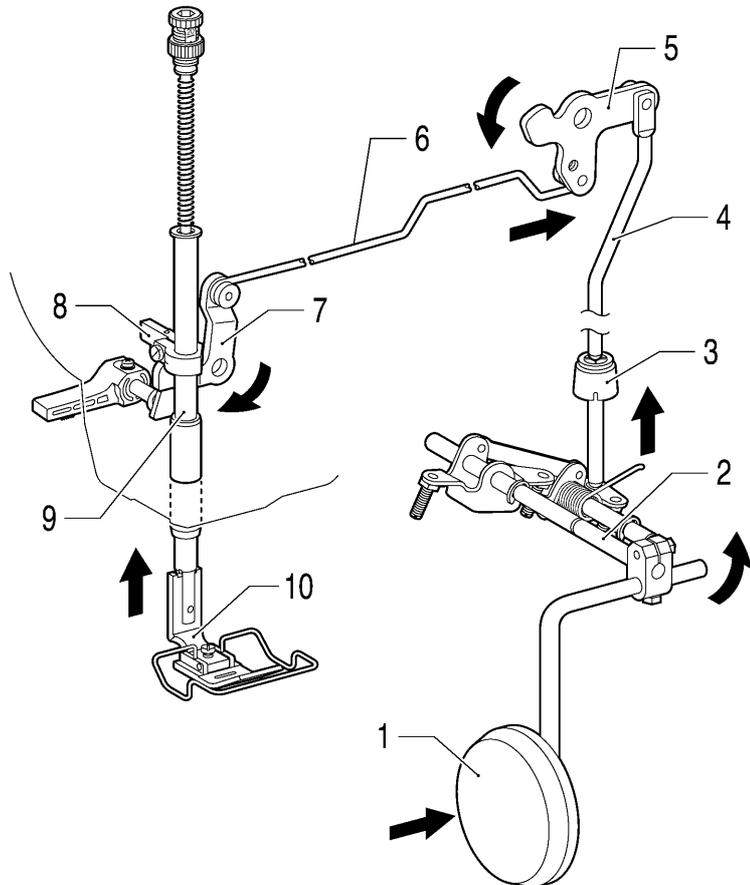
1110B

### 5-4. Presser foot mechanism

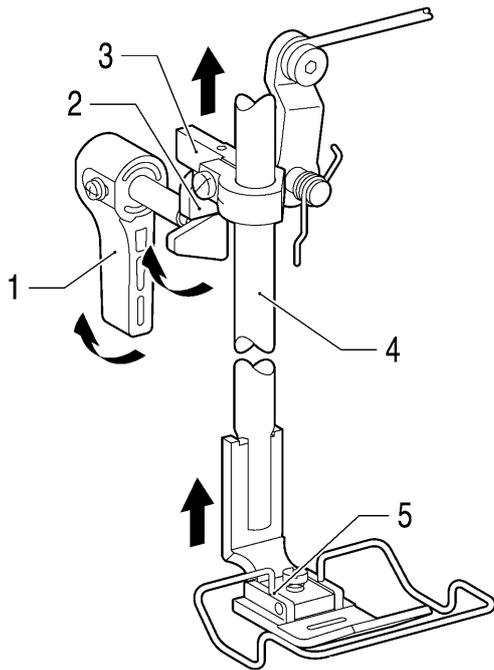


- 1. Presser adjusting screw
- 2. Presser bar spring
- 3. Presser bar
- 4. Presser foot

1111B



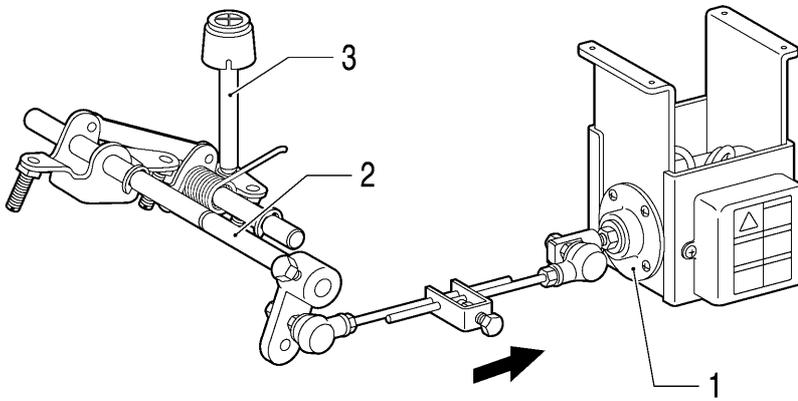
1112B



- 1. Lifting lever
- 2. Presser bar lifter lever
- 3. Presser bar bracket
- 4. Presser bar
- 5. Presser foot

1113B

<For options>

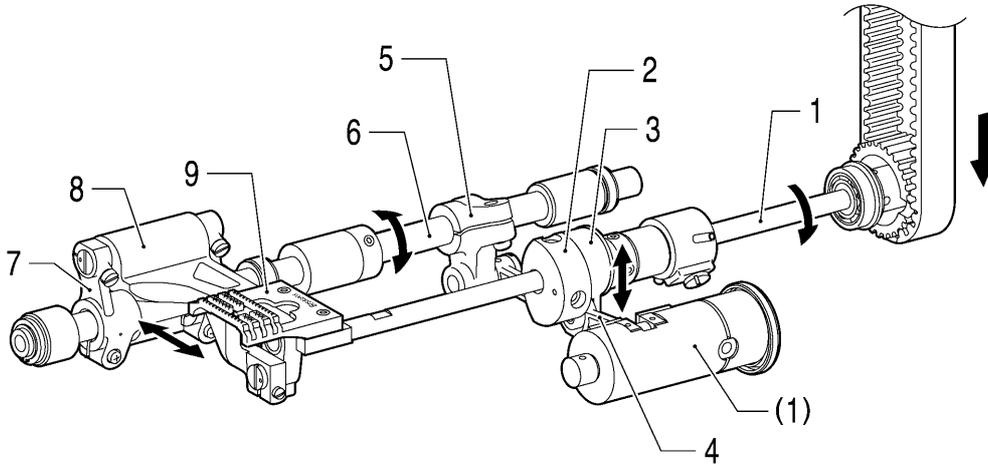


- 1. Presser foot lifter solenoid set
- 2. Knee lifter shaft L
- 3. Knee lifter complying bar assembly

0079B

## 5-5. Feed mechanism

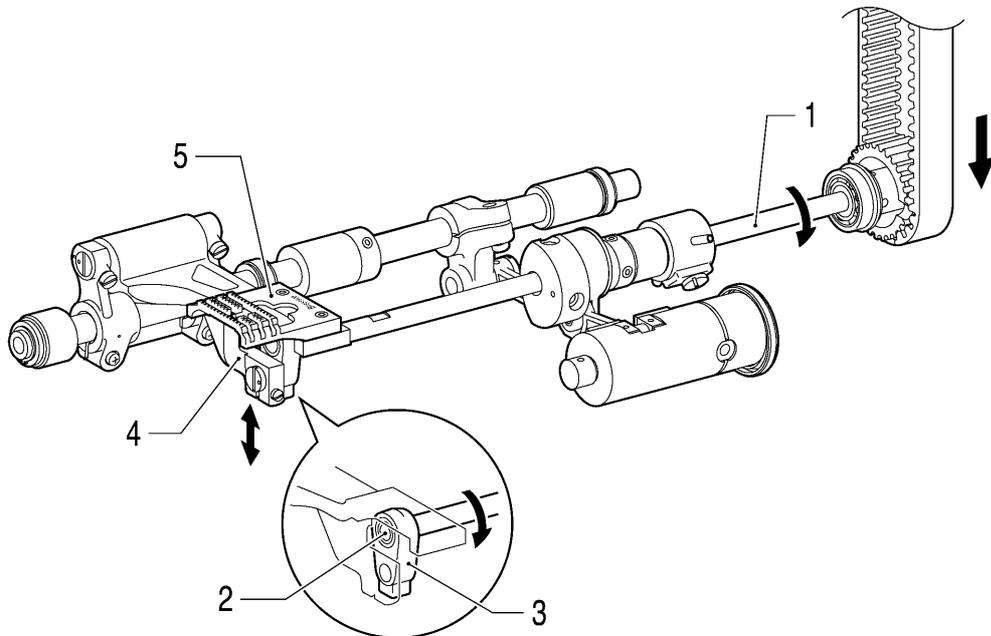
[Forward/back movement]



1114B

- |                                |                                     |
|--------------------------------|-------------------------------------|
| 1. Lower shaft                 | 7. Feed rocker bracket arm          |
| 2. Level feed eccentric wheel  | 8. Feed bar                         |
| 3. Feed driving connecting rod | 9. Feed dog (forward/back movement) |
| 4. Side connecting rod         |                                     |
| 5. Feed rocker arm             |                                     |
| 6. Feed rocker shaft           | (1) Feed regulator                  |

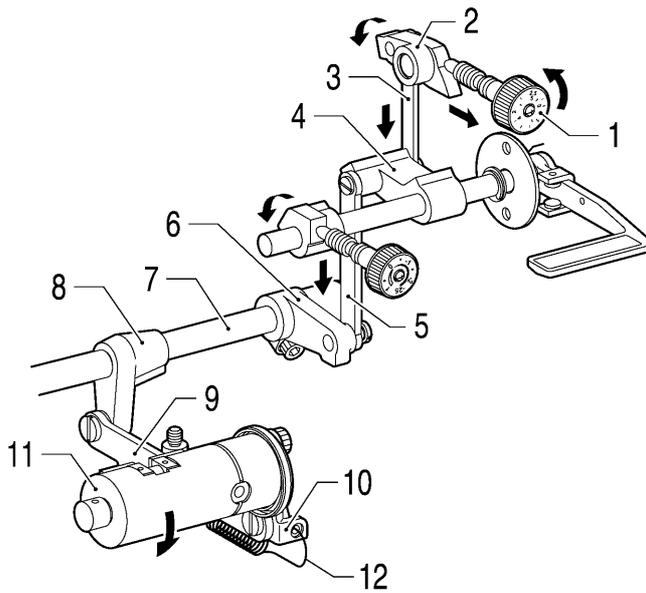
[Up/down movement]



1115B

- |                                   |
|-----------------------------------|
| 1. Lower shaft                    |
| 2. Lower shaft tip (eccentricity) |
| 3. Feed lifting link              |
| 4. Feed bar                       |
| 5. Feed dog (up/down movement)    |

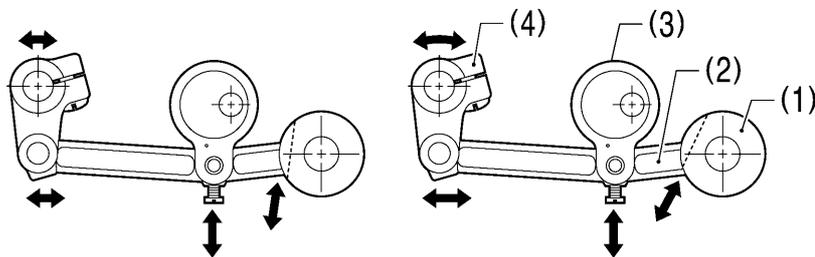
<Dial feed mechanism>



1. Stitch length dial 5
2. Feed regulator
3. Connecting rod U
4. Feed adjusting lever U
5. Connecting rod D
6. Feed adjusting lever D
7. Feed regulator shaft
8. Feed connecting lever
9. Feed regulator connecting rod
10. Feed regulator lever
11. Feed regulator
12. Feed regulator spring

1116B

Adjusting the stitch length dial changes the angle of the feed regulator.



- (1) Feed regulator
- (2) Side connecting rod
- (3) Feed driving connecting rod
- (4) Feed rocker arm

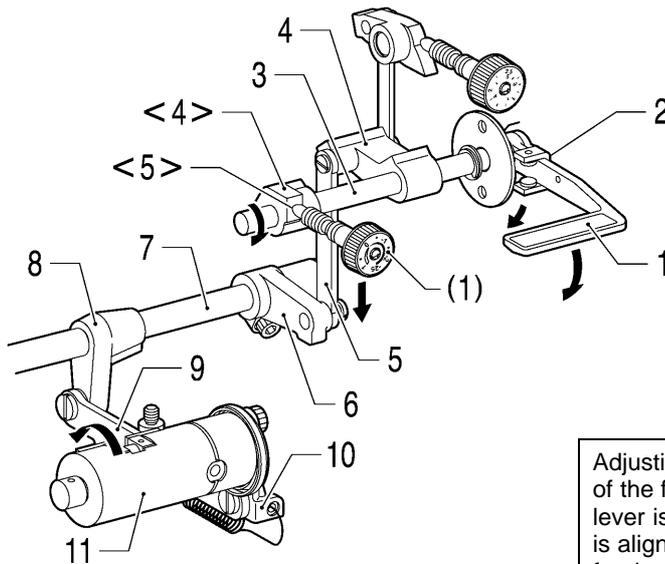
0084B

Changing the angle of the feed regulator causes the amount of horizontal feed movement to change.

(Continued on next page)

## 5. MECHANICAL DESCRIPTIONS

### <Backtacking mechanism>



Adjusting the condense dial changes the angle of the feed regulator when the reverse stitching lever is pushed down. When the condense dial is aligned with the - side scale, the angle of the feed regulator increases and feed is reversed.

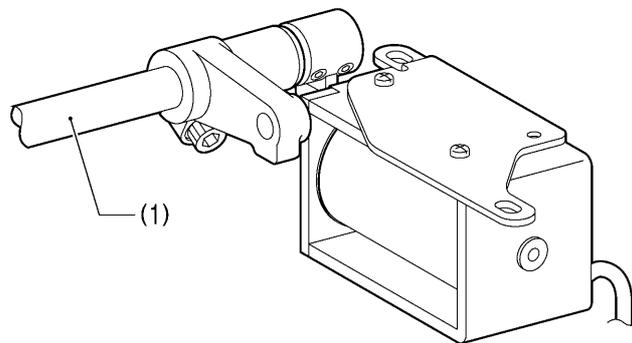
1117B

1. Reverse stitching lever
2. Lever guide
3. Reverse lever shaft



- |                                  |                              |
|----------------------------------|------------------------------|
| 4. Feed adjusting lever U        | <4> Condense regulator       |
| 5. Connecting rod D              | (Touching tip of screw)      |
| 6. Feed adjusting lever D        | <5> Feed regulating stud tip |
| 7. Feed regulator shaft          |                              |
| 8. Feed connecting lever         | (1) Condense dial 5          |
| 9. Feed regulator connecting rod |                              |
| 10. Feed regulator lever         |                              |
| 11. Feed regulator               |                              |

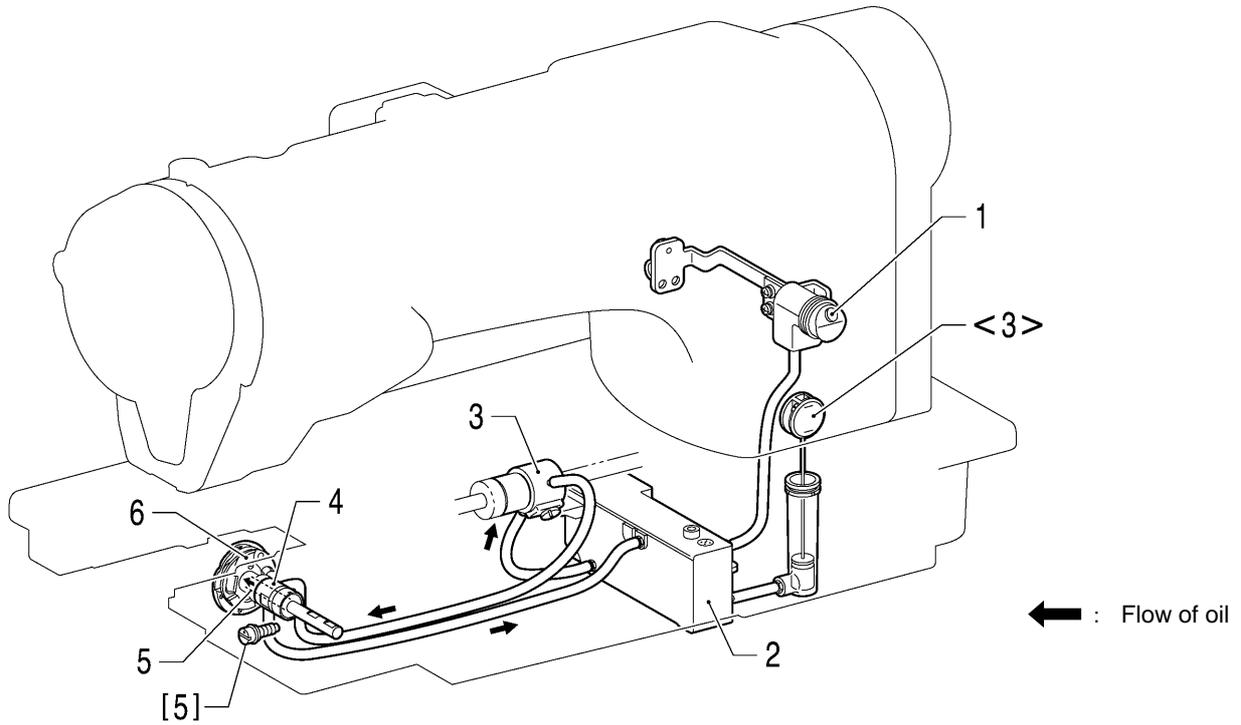
### <8550A-A31, 8560A>



(1) Feed regulator shaft

0083B

### 5-6. Lubrication mechanism

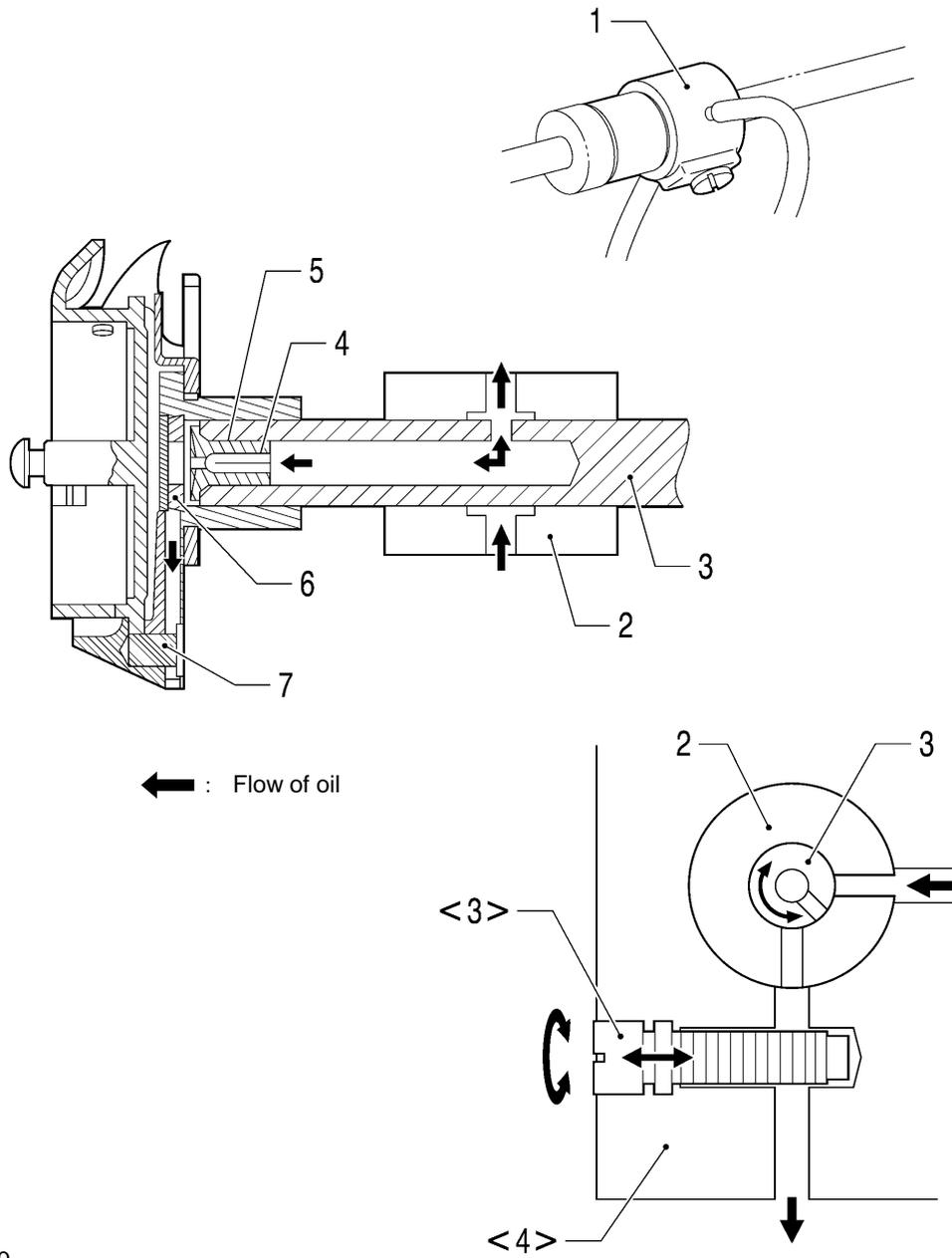


1176B

- 1. Oil feeding
- 2. Oil tank
- 3. Plunger pump      <3> Oil gauge window
- 4. Rotary hook shaft bush
- 5. Rotary hook shaft      [5] Adjusting screw
- 6. Rotary hook

(Continued on next page)

5. MECHANICAL DESCRIPTIONS

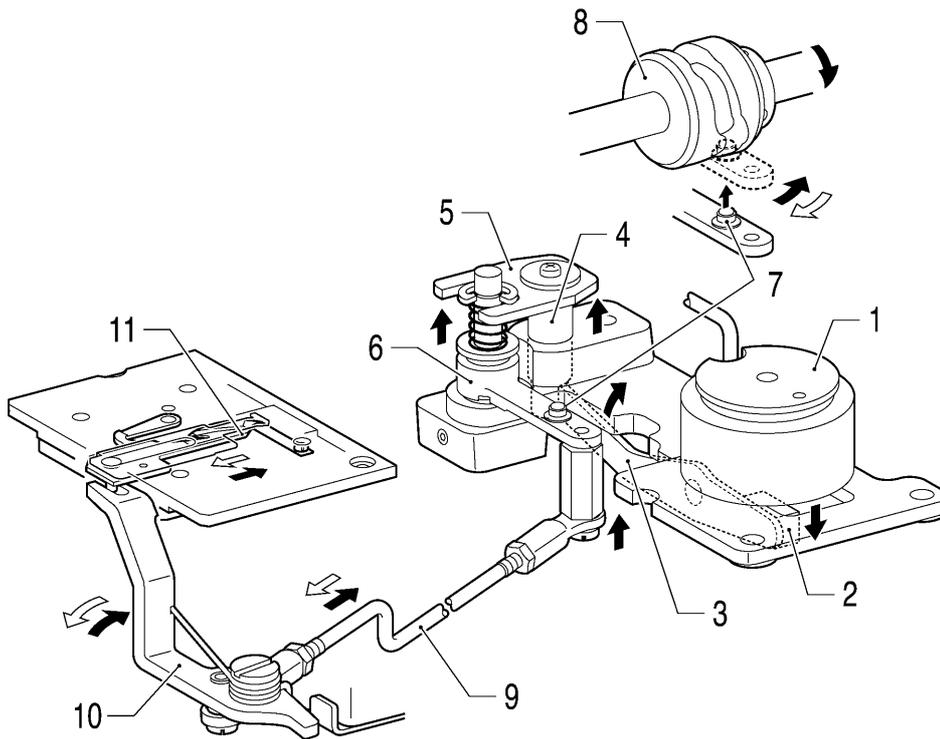


1119B

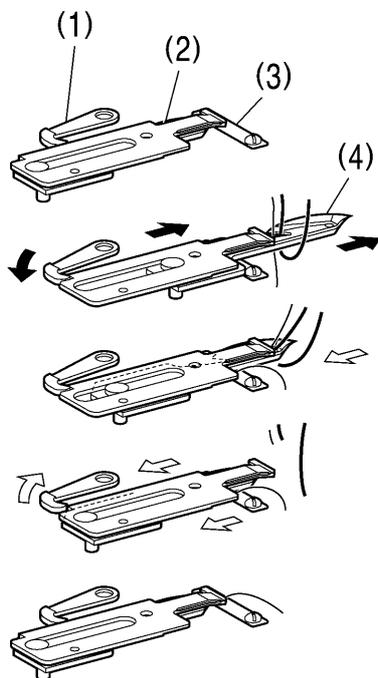
0090B

- 1. Plunger pump
- 2. Rotary hook shaft bush
- 3. Rotary hook shaft
- 4. Felt
- 5. Screw
- 6. Lubricating felt
- 7. Wick felt
- <3> Adjusting screw  
(Adjusts the size of the outlet.)
- <4> Bed

5-7. Thread trimmer mechanism (8560A only)



0091B

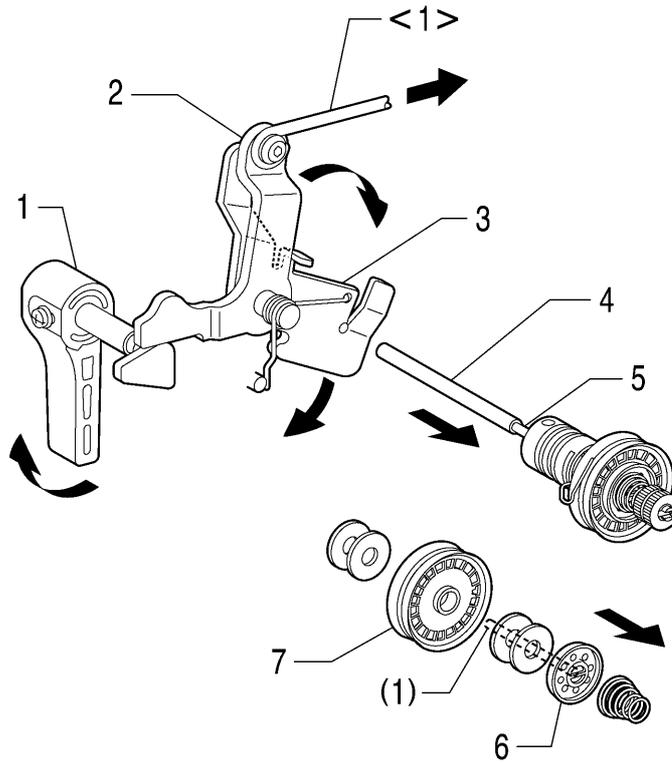


- 1. Thread trimmer solenoid
- 2. Solenoid joint
- 3. Solenoid lever
- 4. Driving rod
- 5. Thread trimmer driving rod plate
- 6. Main lever assembly
- 7. Roller
- 8. Thread trimmer cam
- 9. Knife driving rod
- 10. Thread trimmer driving lever
- 11. Movable knife

- (1) Fixed knife clutch
- (2) Fixed knife
- (3) Plate spring
- (4) Movable knife

0092B

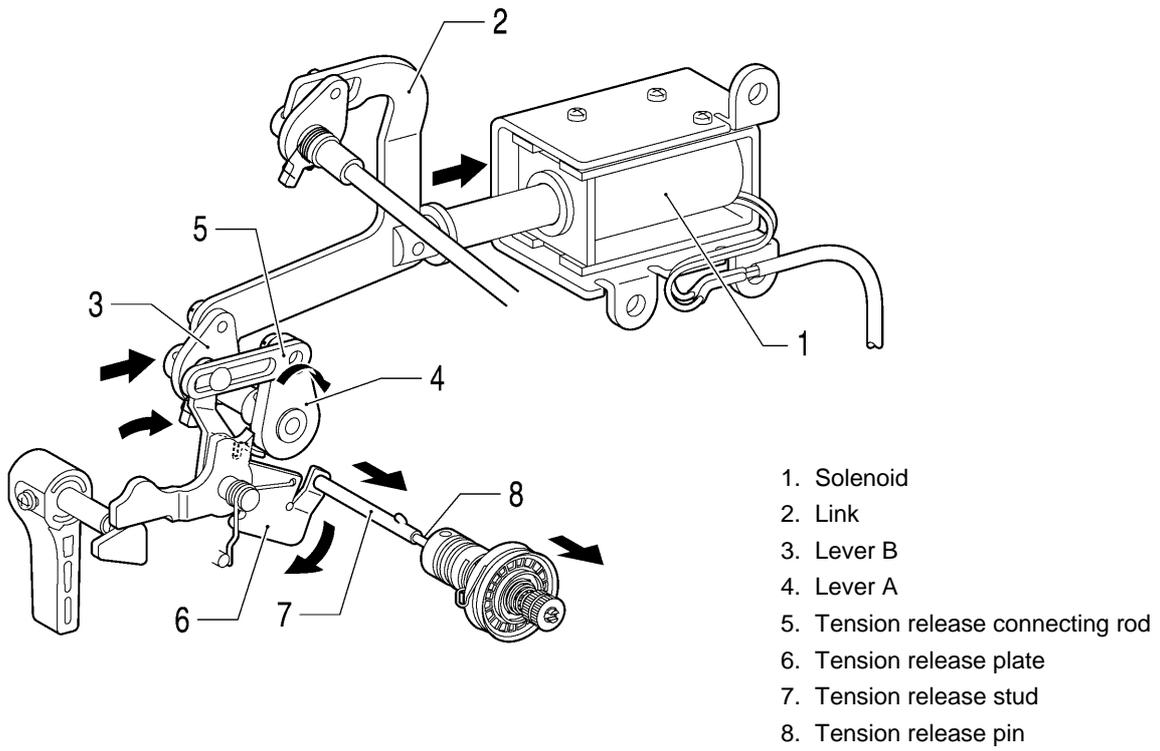
5-8. Tension release mechanism



1120B

- 1. Lifting lever
  - <1> Knee lifter connecting rod  
(Press the knee switch.)
  - 2. Presser bar lifter lever
  - 3. Tension release plate
  - 4. Tension release stud
  - 5. Tension release pin  
(Press the tension disc presser.)
  - 6. Tension disc presser
  - 7. Rotary disc
- (1) Tension release pin

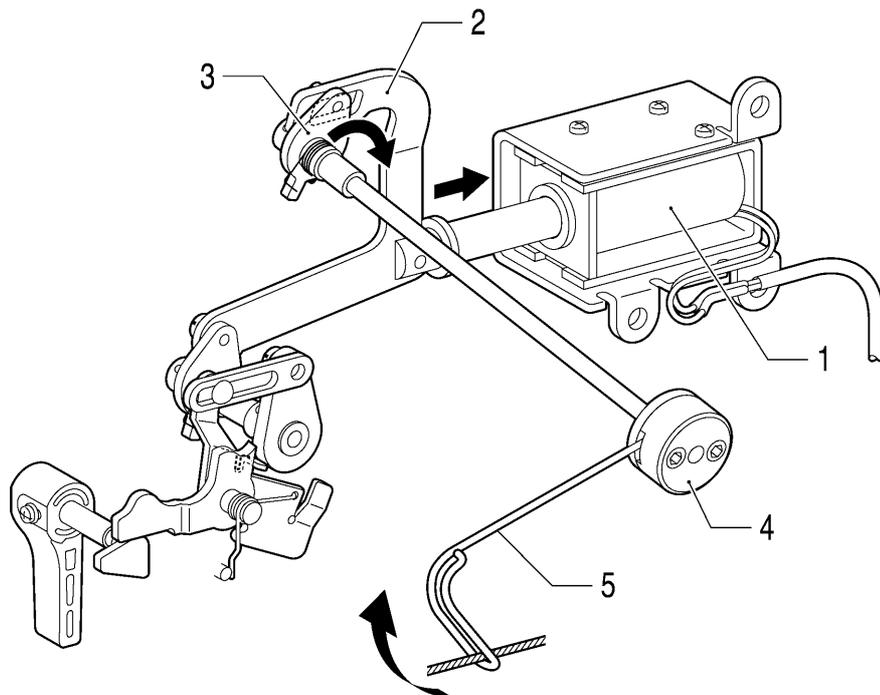
<During thread trimming (8560A only)>



1121B

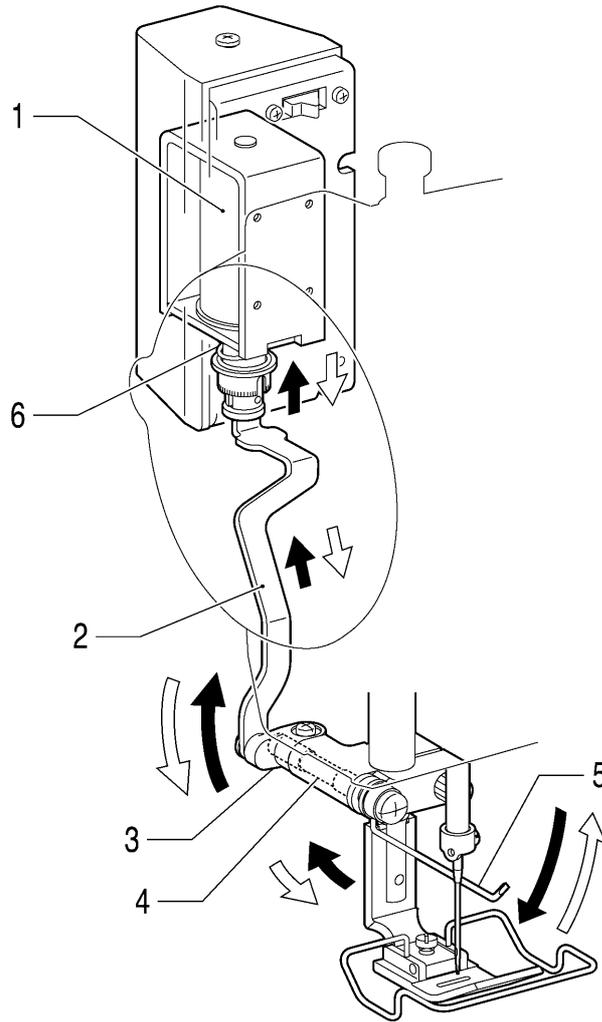
<Upper thread feeding mechanism (8560A only)>

- 1. Solenoid
- 2. Link
- 3. Lever B  
(Tension release is delayed  
by the length of the slot)
- 4. Base
- 5. Wire



1122B

5-9. Thread wiper mechanism (8560A only, optional device)



- 1. Thread wiper solenoid
- 2. Thread wiper rod
- 3. Thread wiper lever
- 4. Thread wiper crank shaft
- 5. Thread wiper
- 6. Thread wiper spring

1123B

## 6. DISASSEMBLY

### 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 can result in severe injury.

### CAUTION



Disassembly should only be carried out by a qualified technician.



Turn off the power switch before carrying out disassembly. If the treadle is depressed by mistake, the sewing machine might start operating and injury could result.



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. If the oil and grease get into your eyes or onto your skin, inflammation can result.

Furthermore, do not drink or eat the lubricating oil or grease. They may cause diarrhea or vomiting. Keep the oil out of the reach of children.



Use only the proper replacement parts as specified by Brother.



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.

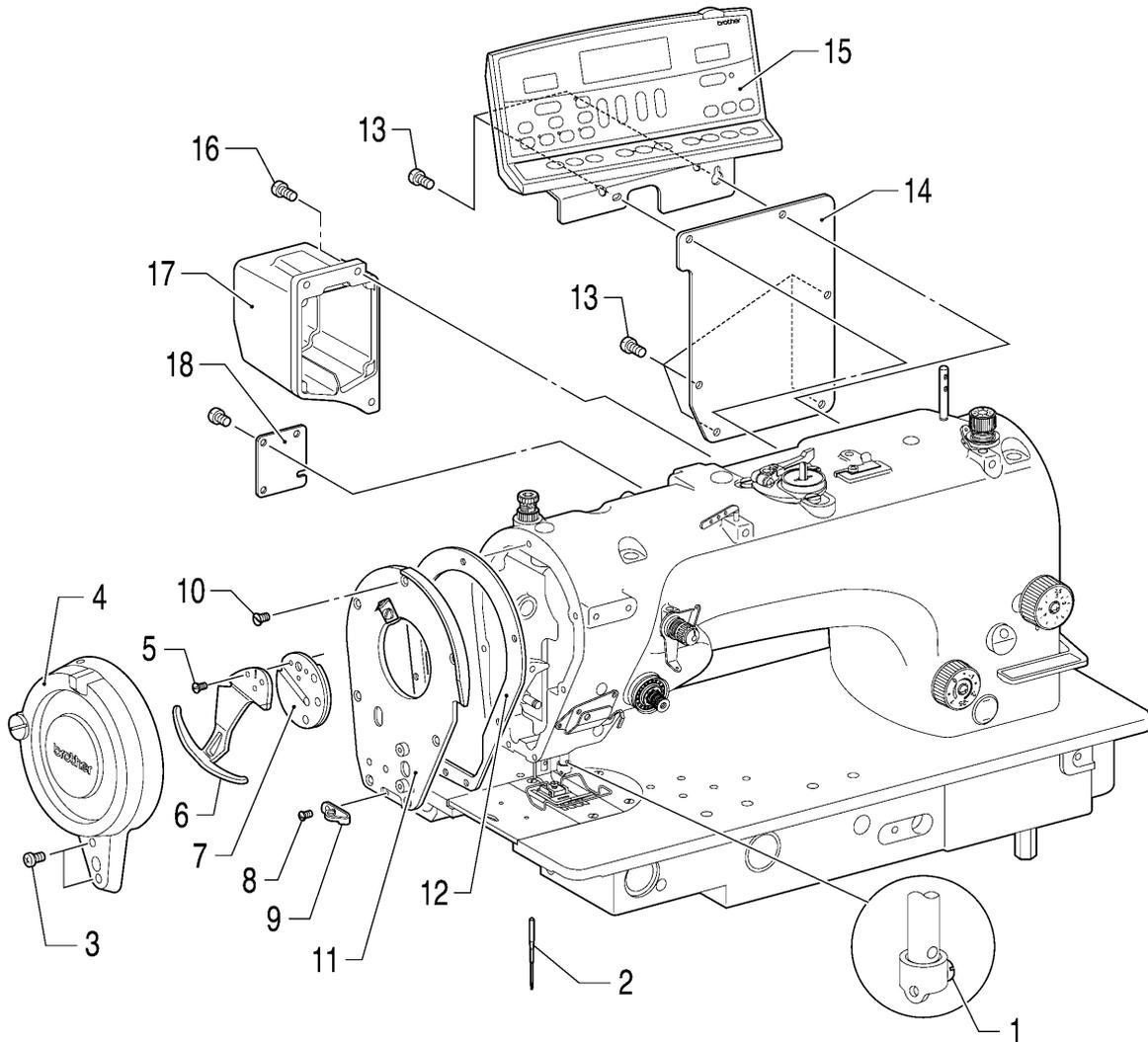


Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

Disassemble the parts in the order shown in the illustration.

\* (number) indicates only the names of parts. (It does not indicate the disassembly order.)

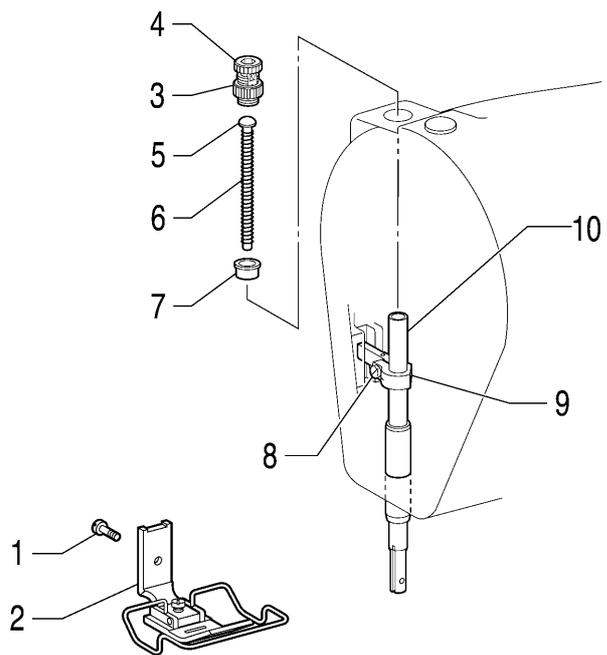
### 6-1. Covers



1124B

- |                                  |                          |
|----------------------------------|--------------------------|
| 1. Screw (Loosen)                | 10. Flat screws [7 pcs]  |
| 2. Needle                        | 11. Face plate           |
| 3. Screws [2 pcs]                | 12. Face plate packing   |
| 4. Thread take-up guard assembly | 13. Screws [6 pcs]       |
| 5. Flat screws [3 pcs]           | 14. Rear cover           |
| 6. Rotary thread take-up lever   | 15. Panel                |
| 7. Rotary take-up mounting plate | 16. Screws [3 pcs]       |
| 8. Flat screw                    | 17. Pulse motor cover    |
| 9. Thread guide                  | 18. Window plate (8550A) |

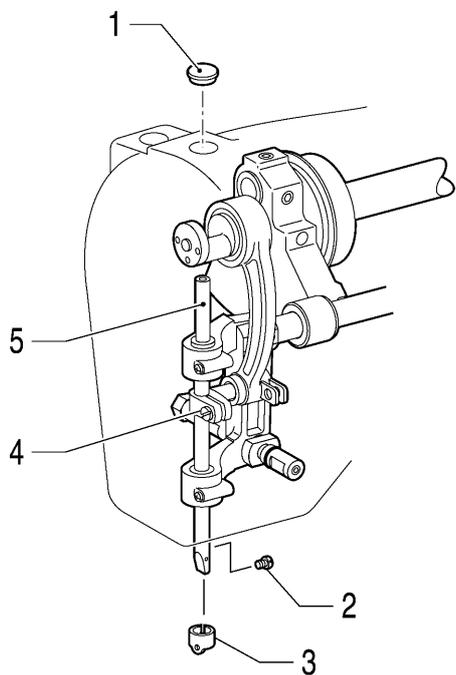
### 6-2. Presser foot mechanism



1. Screw
2. Presser foot
3. Adjusting screw nut  
(Loosen)
4. Presser adjusting screw
5. Spring guide
6. Spring
7. Spring guide collar
8. Screw (Loosen)
9. Presser bar bracket
10. Presser bar

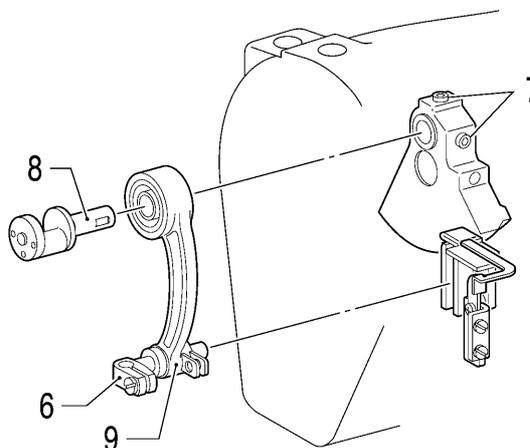
1125B

### 6-3. Needle bar mechanism



1. Rubber cap
2. Screw
3. Thread guide
4. Screw (Loosen)
5. Needle bar
6. Needle bar clamp
7. Set screws [2 pcs]  
(Loosen)
8. Needle bar connecting rod shaft
9. Needle bar connecting rod

1126B



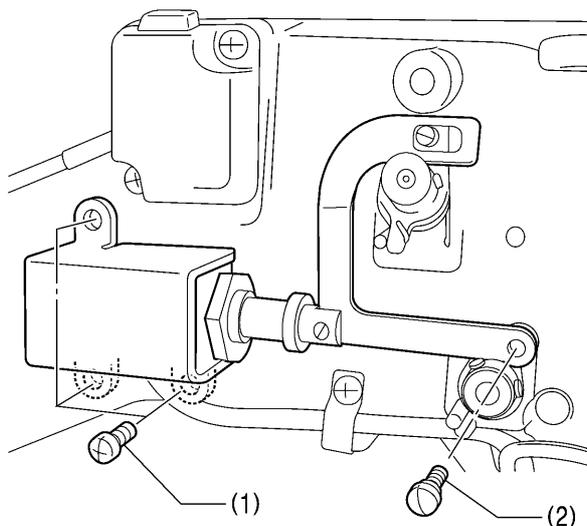
0100B

### 6-4. Zigzag mechanism

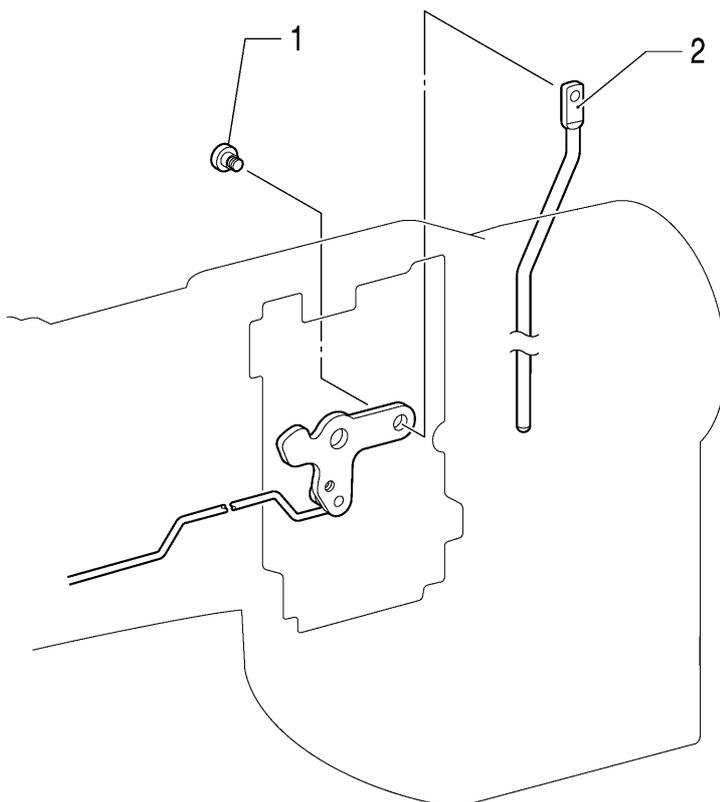
<For the 8560A>

Remove the solenoid before doing this.

- (1) Screws [3 pcs]
- (2) Shoulder screw

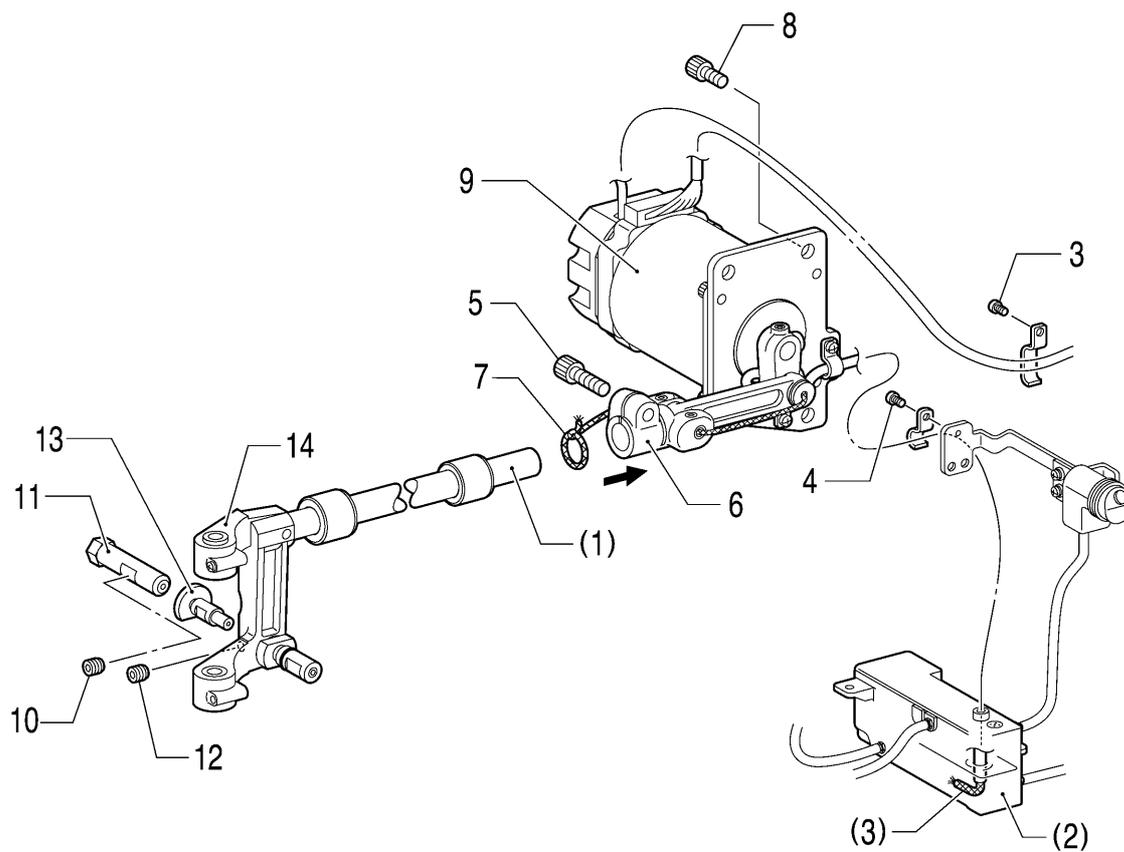


1127B



- 1. Shoulder screw
- 2. Knee lifter bar

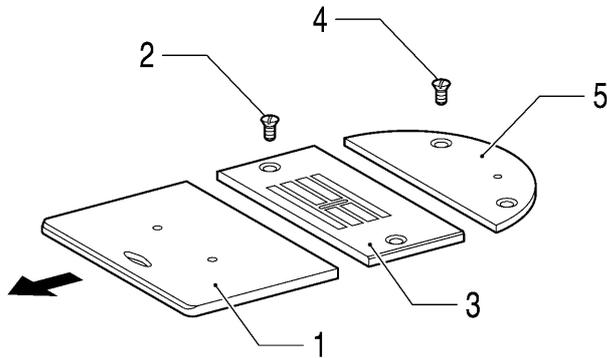
0102B



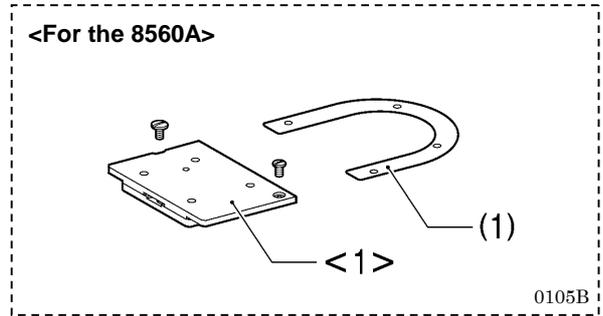
- 3. Screw
- 4. Screw
- 5. Bolt (Loosen)
- 6. Zigzag joint  
(Pull out in the direction of the arrow.)
- 7. Wick  
(Remove from needle bar base.)
- 8. Bolts [3 pcs]
- 9. Pulse motor assembly
- 10. Set screw (Loosen)
- 11. Needle bar base guide R
- 12. Set screw (Loosen)
- 13. Needle bar base guide pin (Loosen)
- 14. Needle bar base
- (1) Needle bar base shaft
- (2) Oil tank
- (3) Wick

0103B

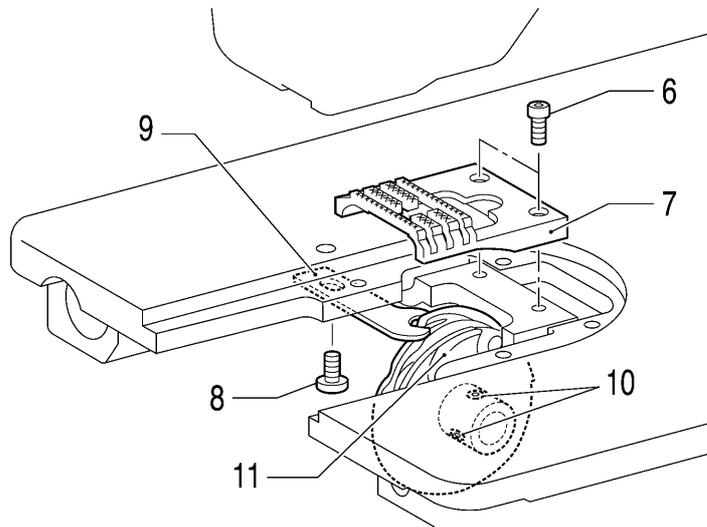
### 6-5. Rotary hook mechanism



0104B



0105B



0106B

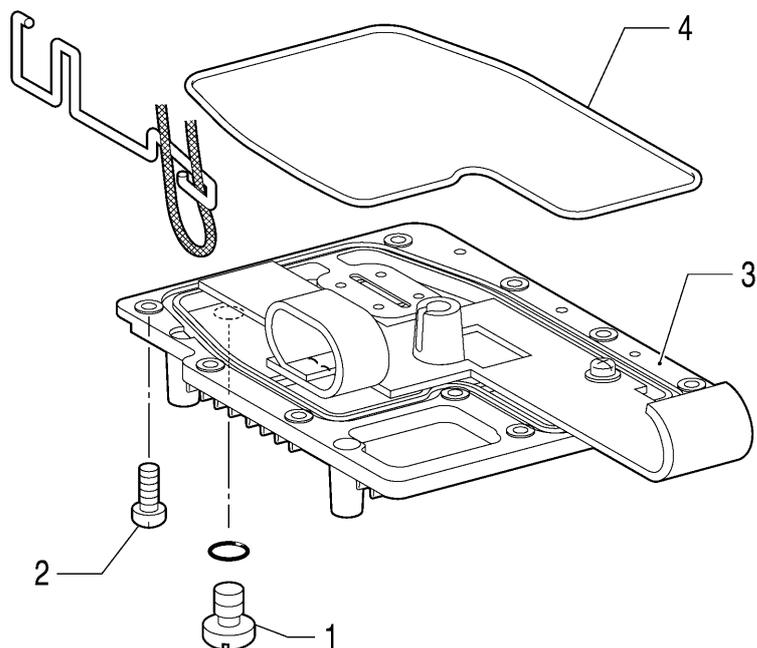
1. Slide plate (8550A)      <1> Knife unit (8560A)



- 2. Flat screws [2 pcs]
- 3. Needle plate
- 4. Flat screws [2 pcs]
- 5. Auxiliary needle plate
- 6. Screws [2 pcs]
- 7. Feed dog
- 8. Scw
- 9. Bobbin case holder position bracket
- 10. Set screws [2 pcs] (Loosen)
- 11. Rotary hook

- (1) Needle plate spacer (8560A)

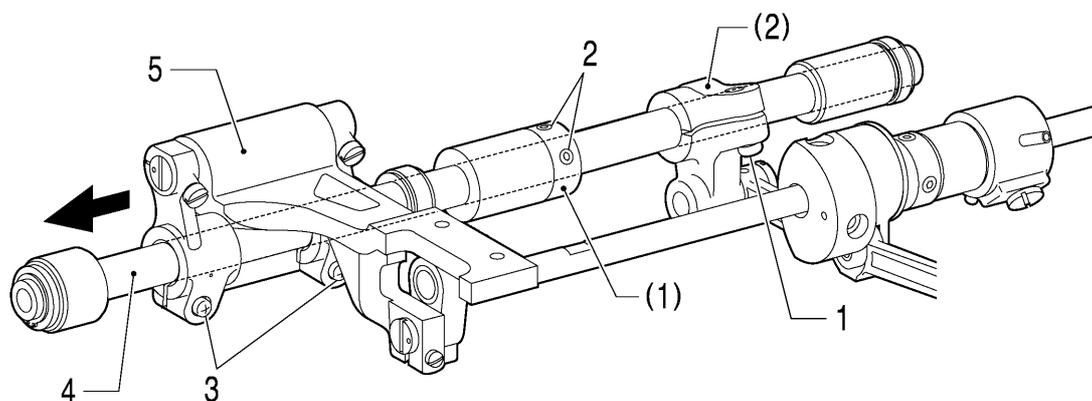
## 6-6. Lubrication mechanism



1. Screw  
(Drain the oil from inside the gearbox.)
2. Screws [9 pcs]
3. Bed bottom cover assembly
4. Bottom cover packing

0107B

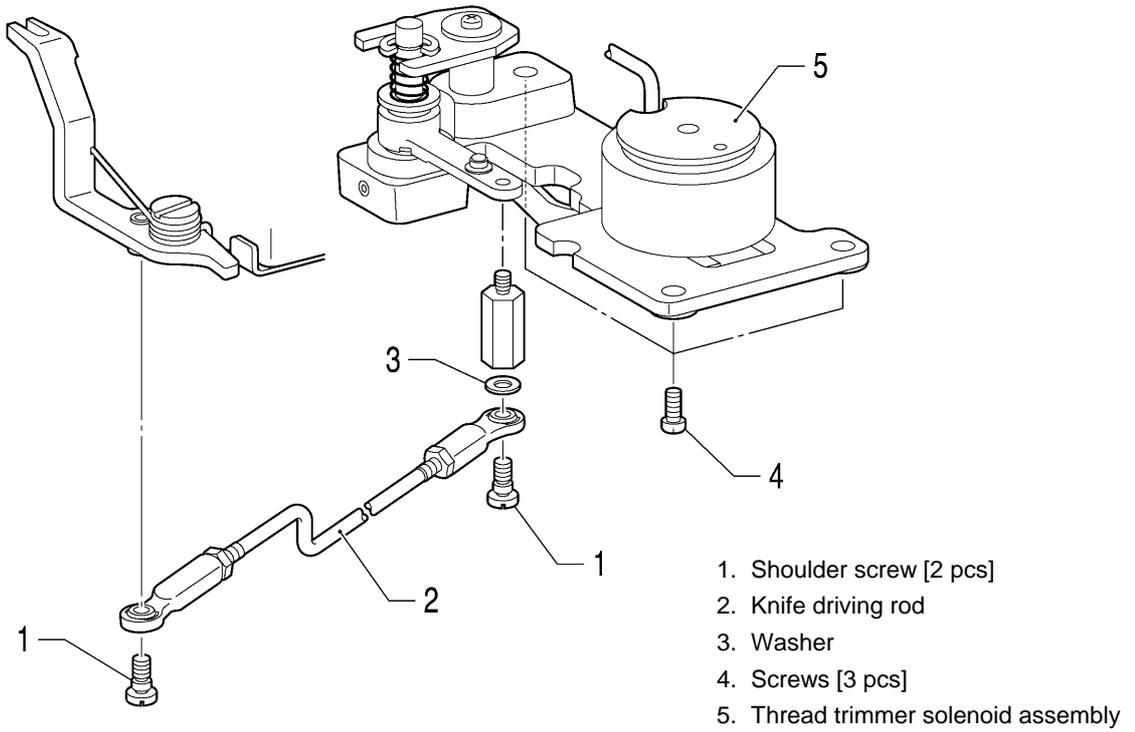
## 6-7. Feed mechanism



0108B

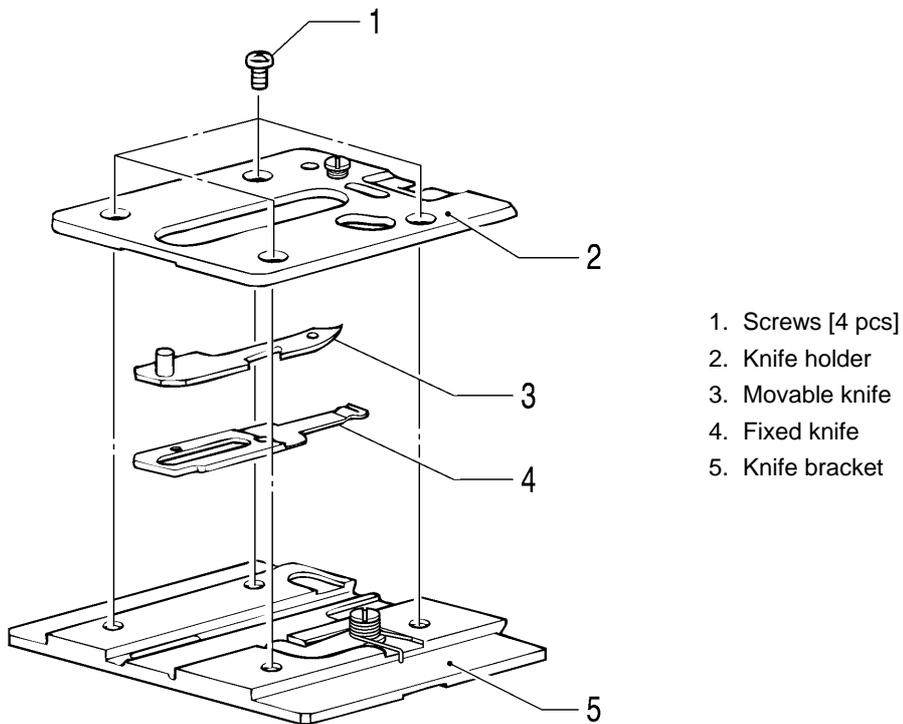
1. Screw (Loosen)
  2. Set screws [2 pcs] (Loosen)
  3. Screws [2 pcs] (Loosen)
  4. Feed rocker shaft (Pull out to the left.)
  5. Feed bar set
- (1) Set screw collar
  - (2) Feed rocker arm

6-8. Thread trimmer mechanism (8560A only)



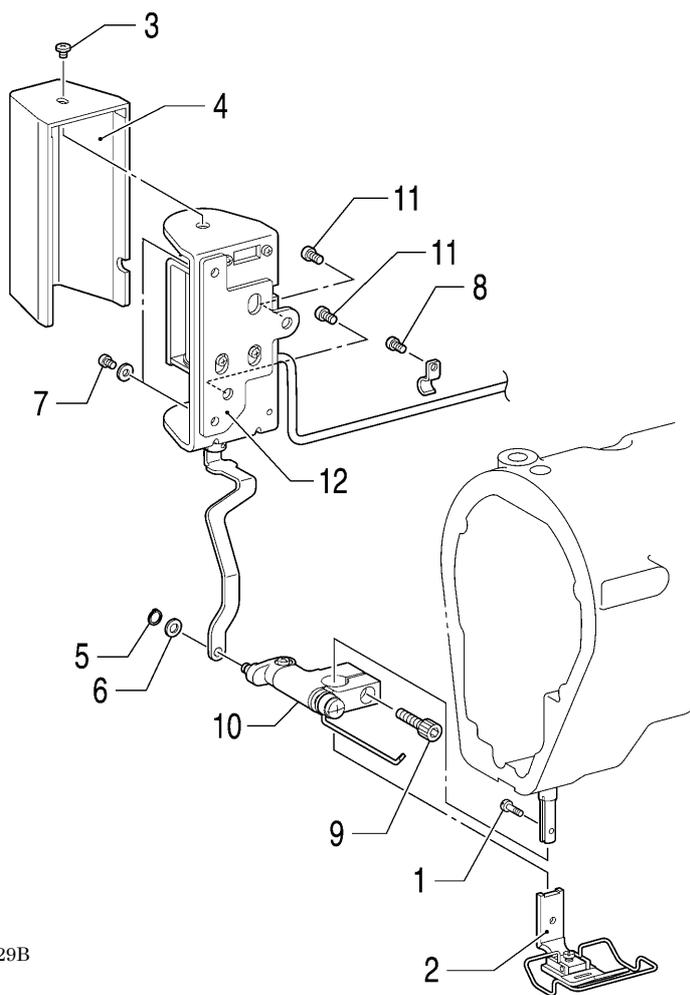
1128B

<Knife unit>

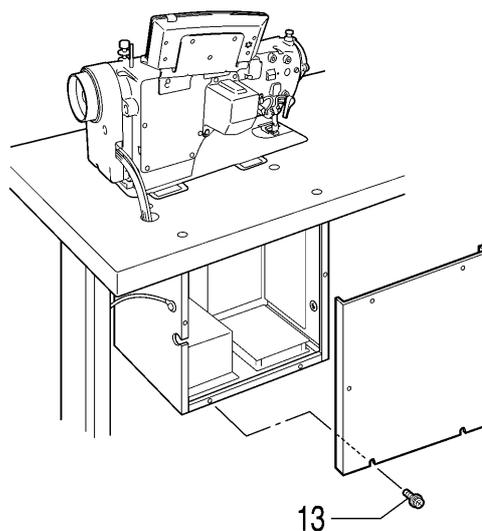


0110B

### 6-9. Thread wiper mechanism (8560A only, optional device)

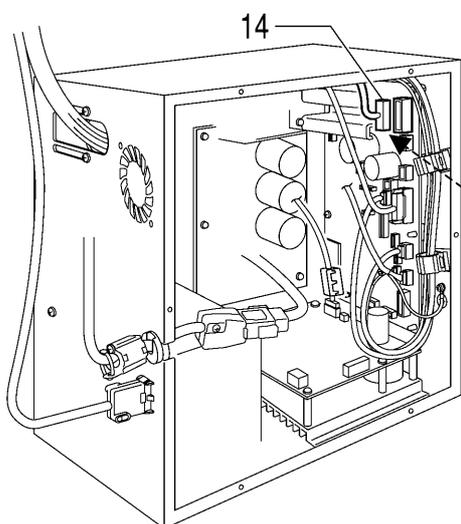


1129B

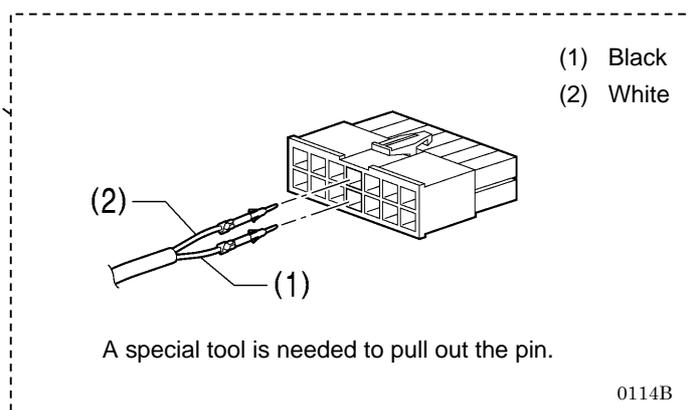


1130B

1. Screw
2. Presser foot
3. Screw
4. Solenoid cover
5. Retaining ring
6. Washer
7. Screws [2 pcs]
8. Screw
9. Bolt
10. Wiper bracket
11. Screws [2 pcs]
12. Thread wiper base
13. Screws [6 pcs]
14. 14-pin machine connector



1131B



0114B

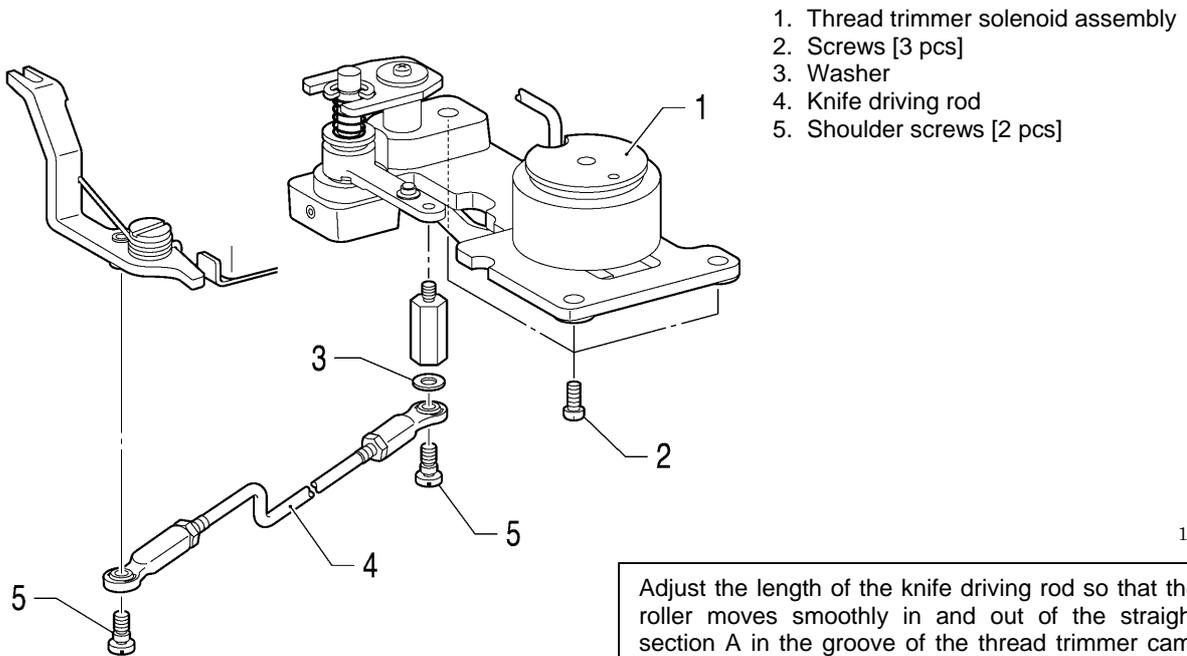
# 7. ASSEMBLY

Assemble each part in the order shown in the illustration.

\* (number) indicates only the names of parts. (It does not indicate the assembly order.)

**IMPORTANT:** Be sure to apply grease in the required locations when reassembling, and also once every two years.

## 7-1. Thread wiper mechanism (8560A only)

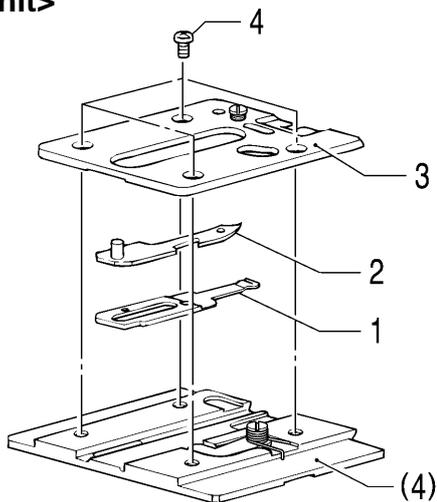


- 1. Thread trimmer solenoid assembly
- 2. Screws [3 pcs]
- 3. Washer
- 4. Knife driving rod
- 5. Shoulder screws [2 pcs]

1132B

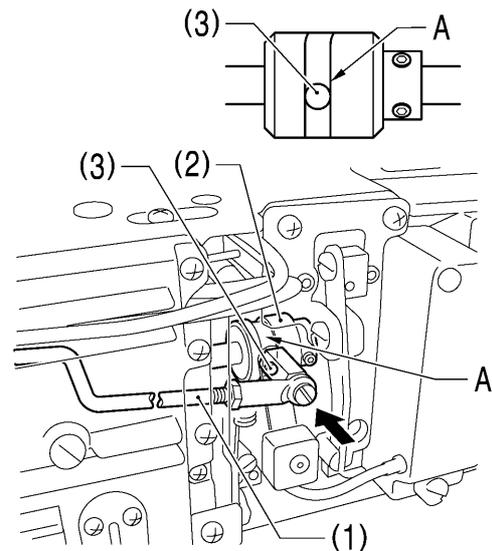
Adjust the length of the knife driving rod so that the roller moves smoothly in and out of the straight section A in the groove of the thread trimmer cam. After assembling, carry out the adjustments in "9-21. Adjusting the position of the thread trimming cam".

### <Knife unit>



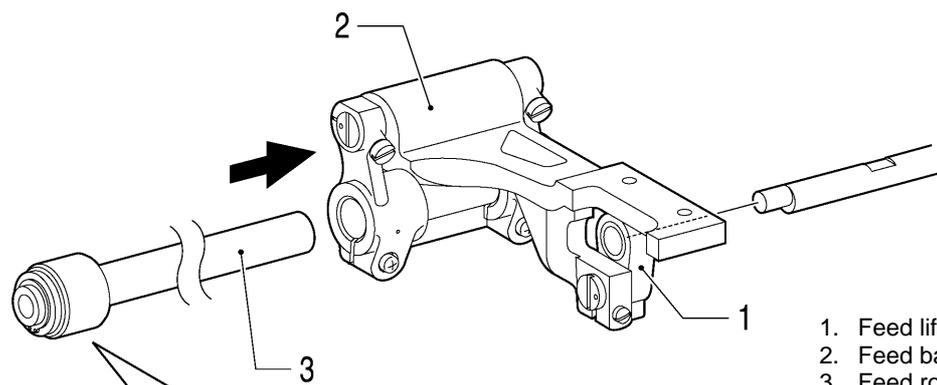
0117B

- 1. Fixed knife
- 2. Movable knife
- 3. Knife holder
- 4. Screws [4 pcs]
- (1) Knife driving rod
- (2) Thread trimmer cam
- (3) Roller
- (4) Knife bracket



1177B

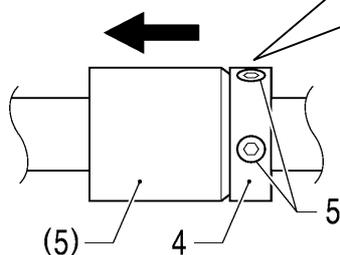
### 7-2. Feed mechanism



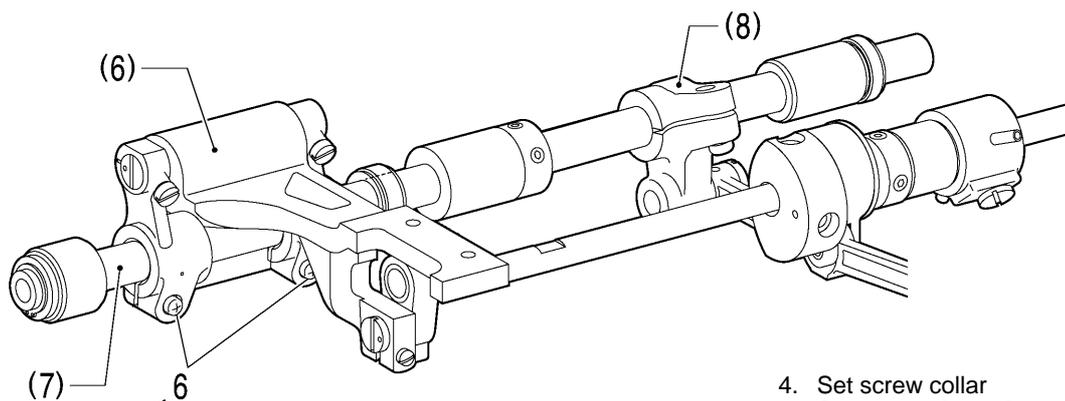
- 1. Feed lifting link
- 2. Feed bar set
- 3. Feed rocker shaft  
(Insert from the left all the way to the right.)
- (1) Spacer
- (2) Bush L
- (3) Feed rocker shaft
- (4) Retaining ring

0118B

Push all the way to the left until it touches, then tighten the set screw.



0119B

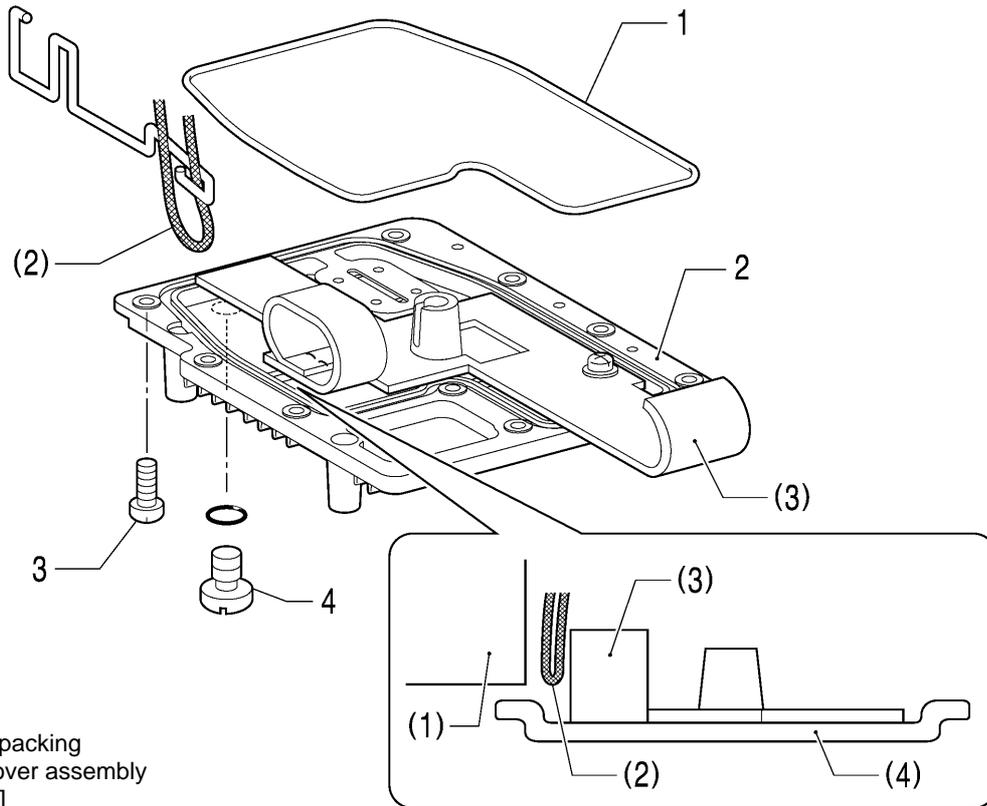


- 4. Set screw collar
- 5. Set screws [2 pcs]
- 6. Screws [2 pcs]  
(Temporarily tighten)
- (5) Bush M
- (6) Feed bar set
- (7) Feed rocker shaft
- (8) Feed rocker arm

Tighten after adjusting the feed dog.  
Refer to "9-7. Feed dog forward/back and sideways position".

0120B

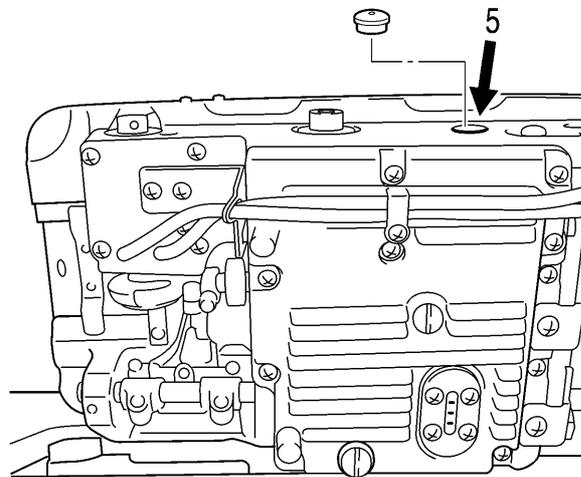
### 7-3. Lubrication mechanism



0121B

- 1. Bottom cover packing
- 2. Bed bottom cover assembly
- 3. Screws [9 pcs]
- 4. Screw
- 5. (Add lubricating oil [approx. 120 ml].)

- (1) Bed
- (2) Wick
- (3) Felt
- (4) Bed bottom cover



1134B

### 7-4. Zigzag mechanism

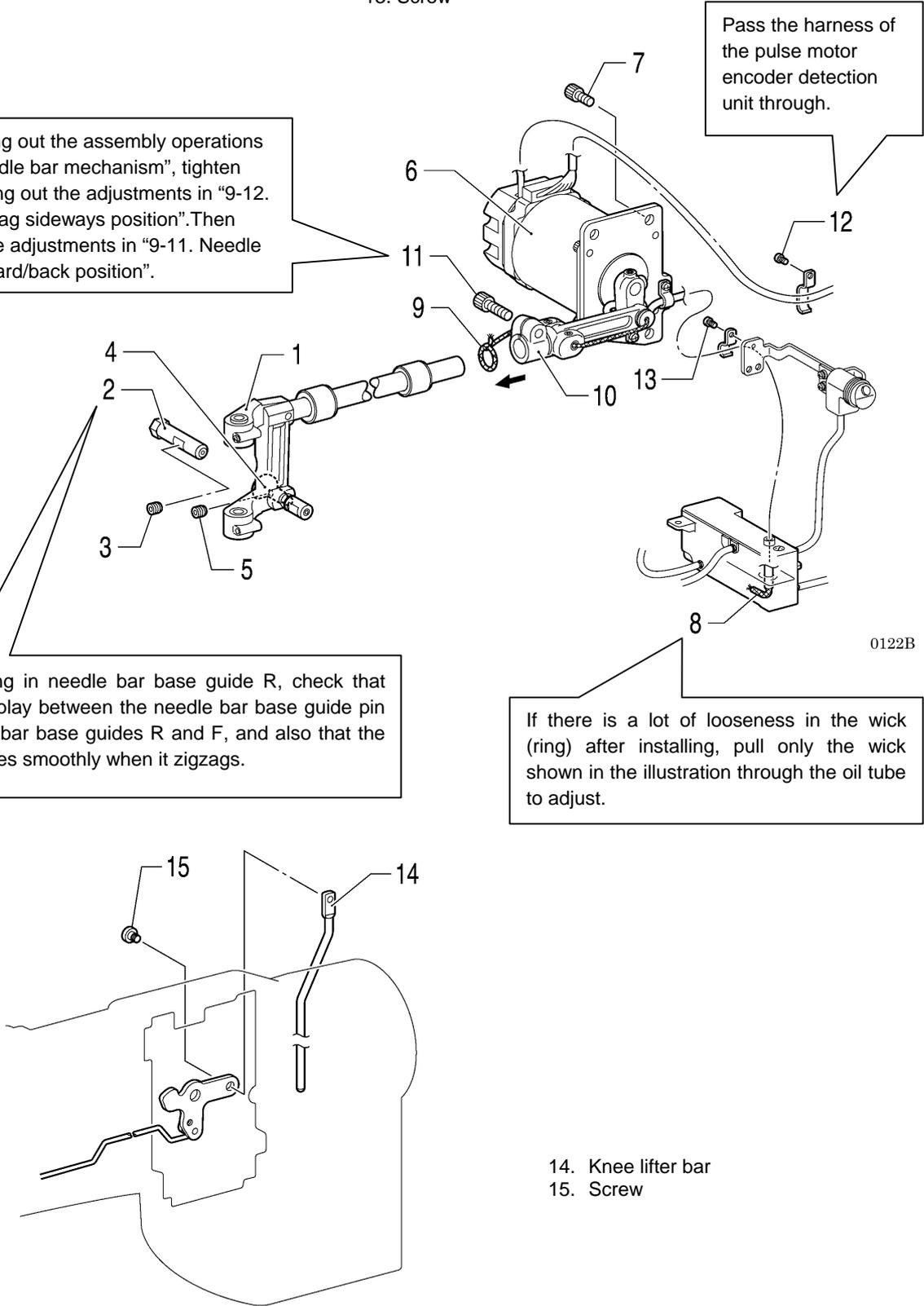
- 1. Needle bar base  
(With needle bar base guide pin inserted)
- 2. Needle bar base guide R
- 3. Set screw
- 4. Needle bar base guide pin
- 5. Set screw
- 6. Pulse motor assembly
- 7. Bolts [3 pcs]
- 8. Wick  
(Pull in oil tank.)
- 9. Wick (ring)  
(Pass the shaft through the ring.)
- 10. Zigzag joint (Pass the shaft through.)
- 11. Bolt (Temporarily tighten)
- 12. Screw
- 13. Screw

After carrying out the assembly operations in "7-5. Needle bar mechanism", tighten while carrying out the adjustments in "9-12. Needle zigzag sideways position". Then carry out the adjustments in "9-11. Needle zigzag forward/back position".

After pushing in needle bar base guide R, check that there is no play between the needle bar base guide pin and needle bar base guides R and F, and also that the needle moves smoothly when it zigzags.

If there is a lot of looseness in the wick (ring) after installing, pull only the wick shown in the illustration through the oil tube to adjust.

Pass the harness of the pulse motor encoder detection unit through.

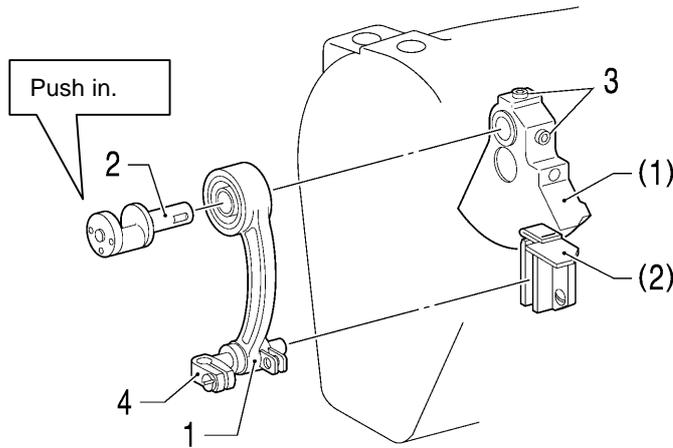


0123B

0122B

- 14. Knee lifter bar
- 15. Screw

### 7-5. Needle bar mechanism

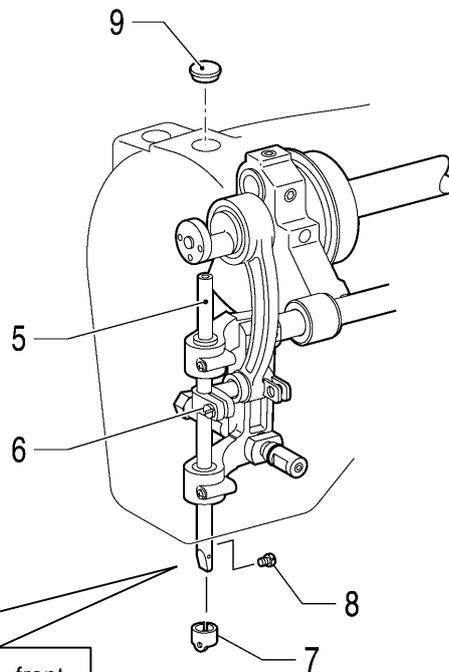


- 1. Needle bar connecting rod
- 2. Needle bar connecting rod shaft
- 3. Screws [2 pcs]
- 4. Needle bar clamp

- (1) Thread take-up crank
- (2) Felt

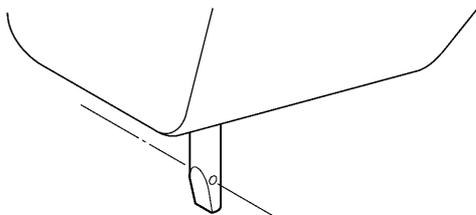
0124B

- 5. Needle bar
- 6. Screw (Temporarily tighten)
- 7. Thread guide
- 8. Screw
- 9. Rubber cap



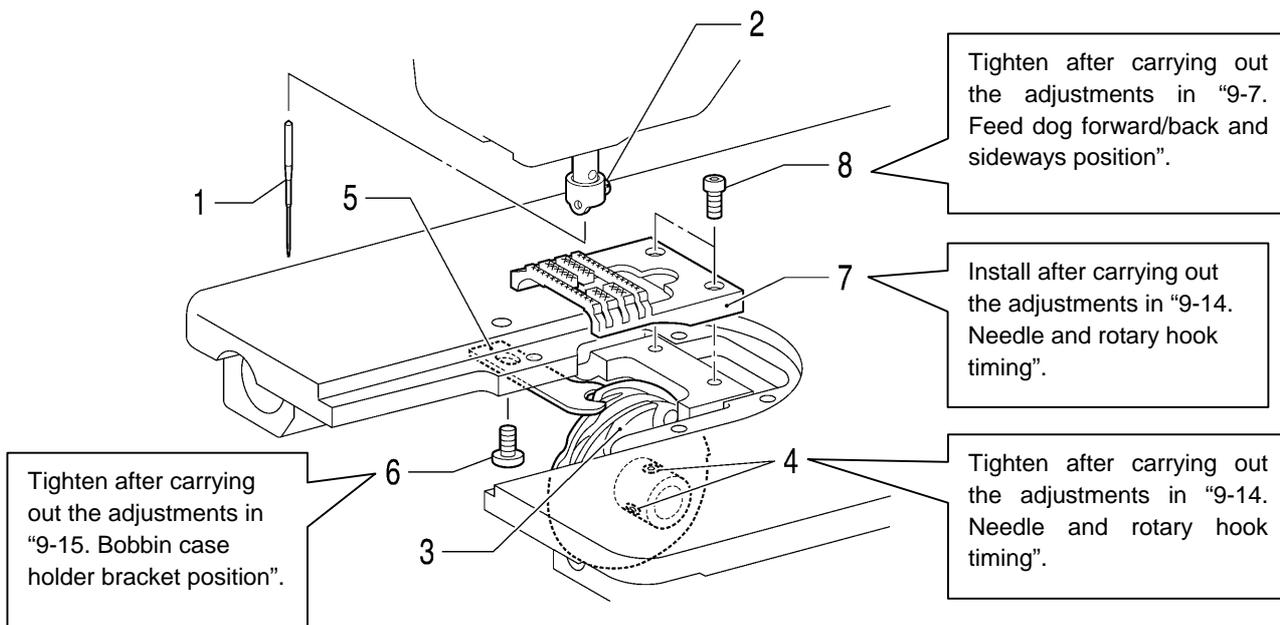
1135B

Face the needle check hole toward the front.  
Tighten the screws after carrying out the adjustment in "9-10. Needle bar height".



0126B

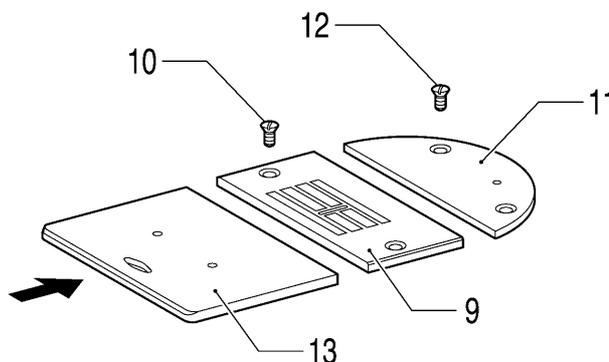
### 7-6. Rotary hook mechanism



- 1. Needle
- 2. Screw
- 3. Rotary hook
- 4. Set screws [2 pcs] (Temporarily tighten)
- 5. Bobbin case holder position bracket
- 6. Screw (Temporarily tighten)
- 7. Feed dog
- 8. Screws [2 pcs] (Temporarily tighten)

1136B

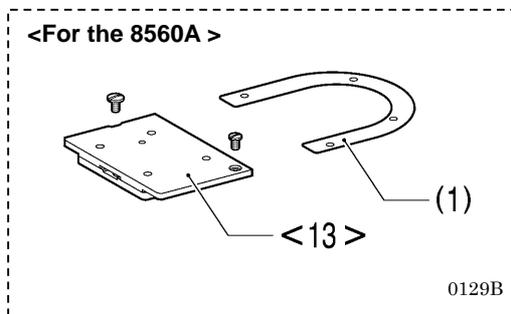
- 9. Needle plate
- 10. Flat screws [2 pcs]
- 11. Auxiliary needle plate
- 12. Flat screws [2 pcs]



- 13. Slide plate (8550A)      <13> Knife unit (8560A)

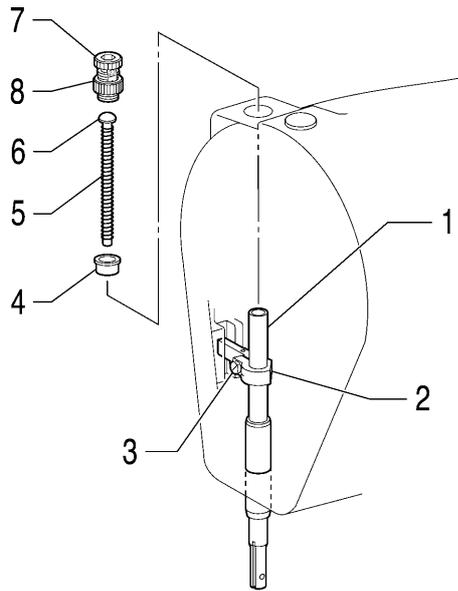
(1) Needle plate spacer (8560A)

0128B



0129B

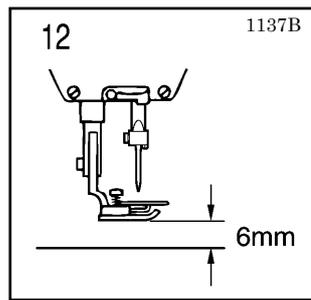
7-7. Presser foot mechanism



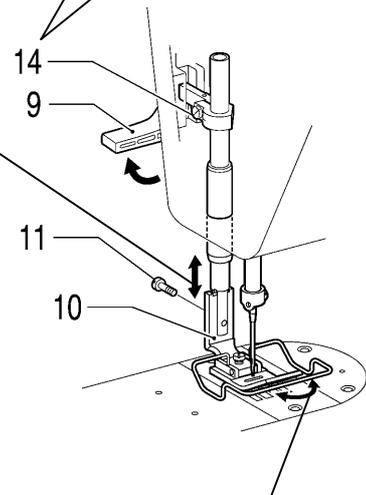
- 1. Presser bar
- 2. Presser bar bracket
- 3. Screw  
(Temporarily tighten)
- 4. Spring guide collar
- 5. Presser bar spring
- 6. Spring guide
- 7. Presser adjusting screw
- 8. Adjusting screw nut

0130B

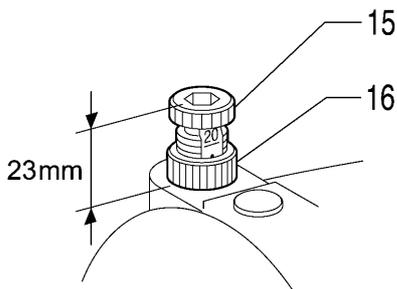
Loosen once, and then tighten after adjusting 12 and 13.



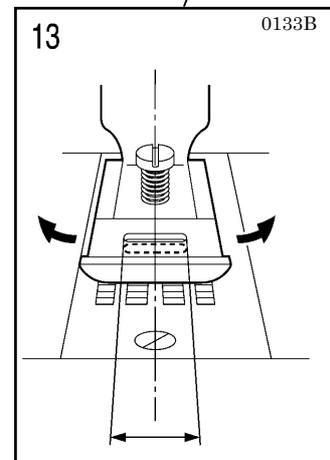
- 9. Lifting lever (Lift up)
- 10. Presser foot
- 11. Screw
- 12. (Adjust the height)
- 13. (Align the hole positions)
- 14. Screw
- 15. Presser adjusting screw
- 16. Adjusting screw nut



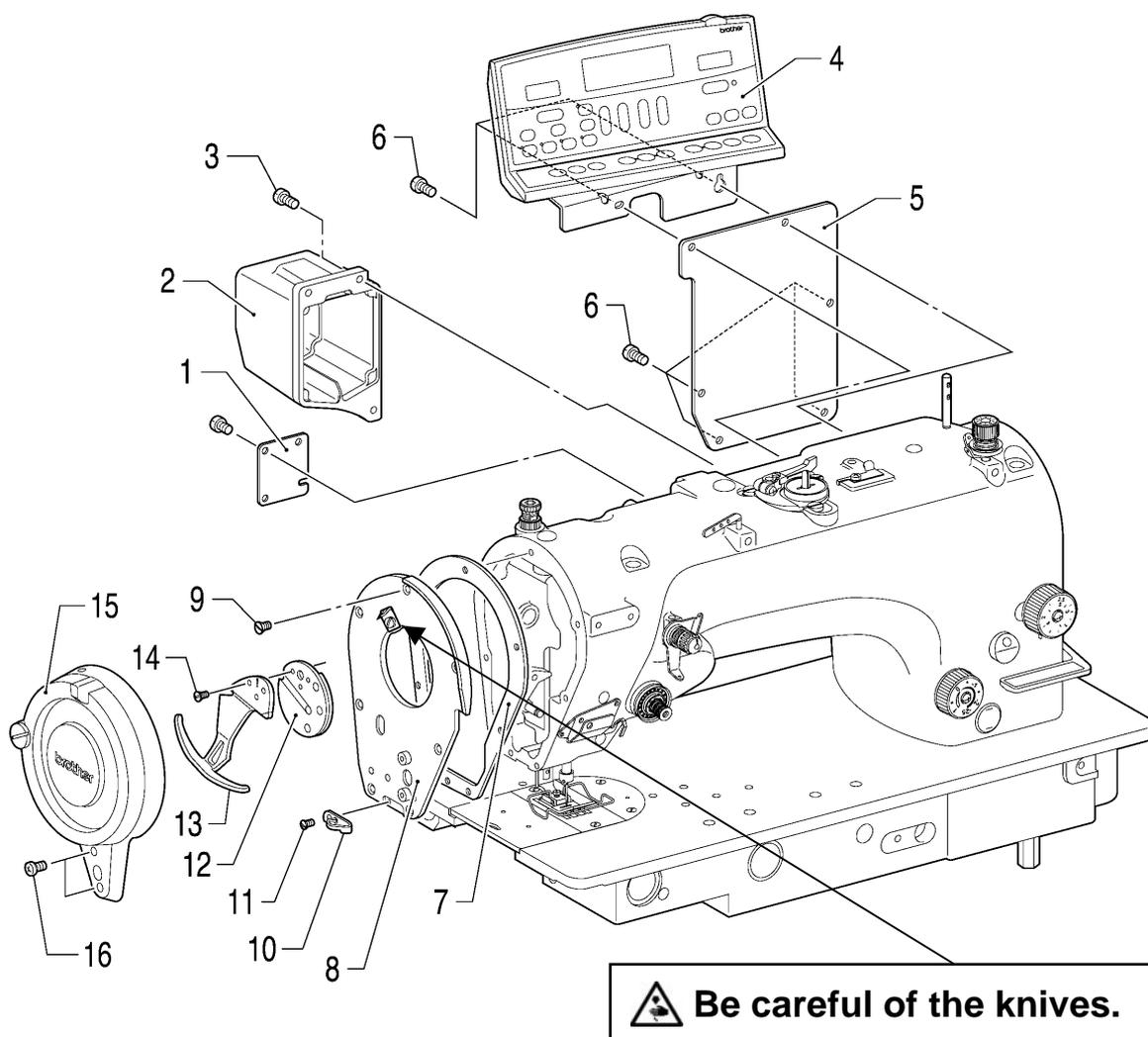
1138B



1139B



## 7-8. Covers

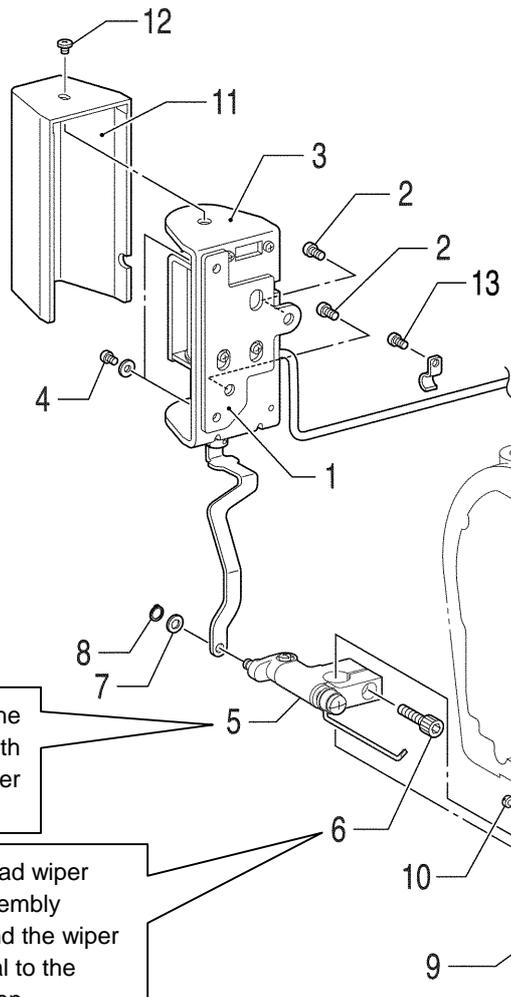


- |                         |                                   |
|-------------------------|-----------------------------------|
| 1. Window plate (8550A) | 10. Thread guide                  |
| 2. Pulse motor cover    | 11. Flat screw                    |
| 3. Screws [3 pcs]       | 12. Rotary take-up mounting plate |
| 4. Panel                | 13. Rotary thread take-up lever   |
| 5. Rear cover           | 14. Flat screws [3 pcs]           |
| 6. Screws [6 pcs]       | 15. Thread take-up guard assembly |
| 7. Face plate packing   | 16. Screws [2 pcs]                |
| 8. Face plate           |                                   |
| 9. Flat screws [7 pcs]  |                                   |

1140B

### 7-9. Thread wiper mechanism (8560A only, optional device)

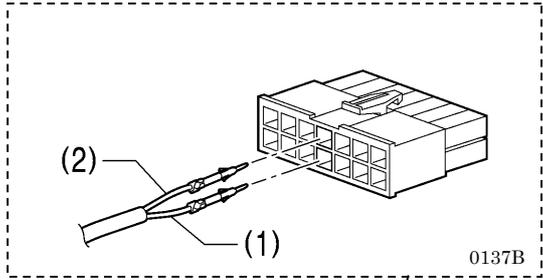
After assembling, carry out the adjustments in "9-24. Adjusting the thread wiper".



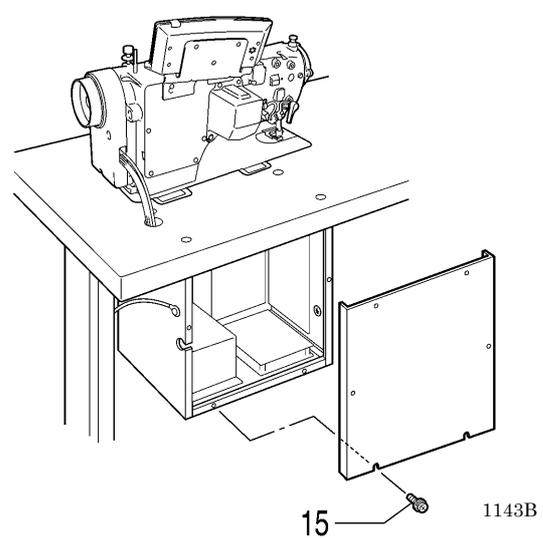
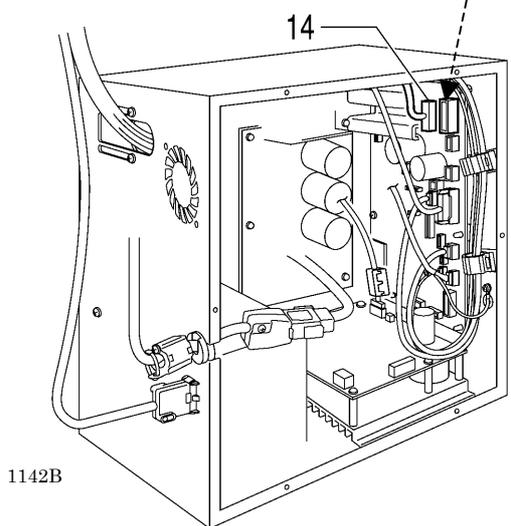
- 1. Thread wiper base
- 2. Screws [2 pcs]
- 3. Solenoid setting plate
- 4. Screws [2 pcs]
- 5. Wiper bracket
- 6. Bolt
- 7. Washer
- 8. Retaining ring
- 9. Presser foot
- 10. Screw
- 11. Solenoid cover
- 12. Screw
- 13. Screw (Secure the harness.)

Align the bottom of the presser bar bushing with the bottom of the wiper bracket.

Check that the thread wiper connecting rod assembly moves smoothly and the wiper bracket is horizontal to the arm, and then tighten.



- 14. 14-pin machine connector
- 15. (Secure with the 6 screws.)
- (1) Black
- (2) White



1141B

1142B

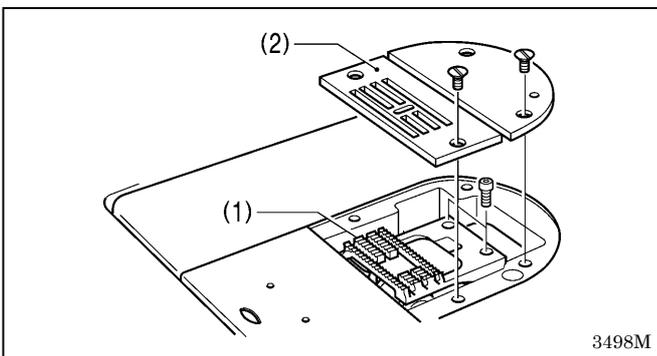
15

1143B

## 8. CHANGING THE FEED AMOUNT TO LONG STITCH SPECIFICATIONS (from 2.0mm to 5.0mm)

### ⚠ CAUTION

-  Replacement of parts should only be carried out by a qualified technician.
-  Turn off the power switch and disconnect the power cord before carrying out this operation. The machine may operate if the treadle is depressed by mistake, which could result in injury.
-  When removing the needle plate and the auxiliary needle plate, use a screwdriver that matches the size of the screw heads. If a screwdriver that does not match the size of the screw heads is used, it may damage the screw heads and result in injury to the operator or damage to the articles being sewn.
-  Use only the proper replacement parts as specified by Brother.

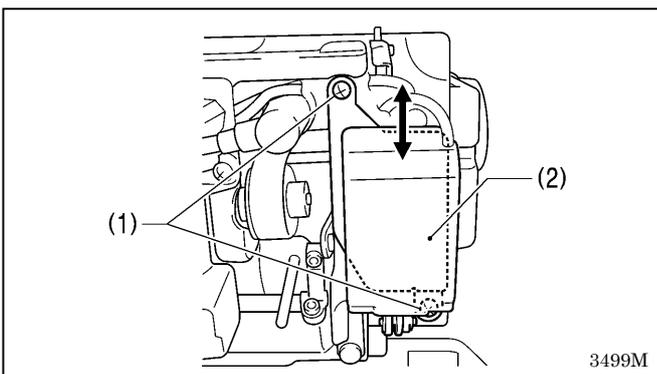


1. Replace the feed dog (1) and needle plate (2) with the ones for long stitches.
2. After this, change the maximum feed amount as described below.

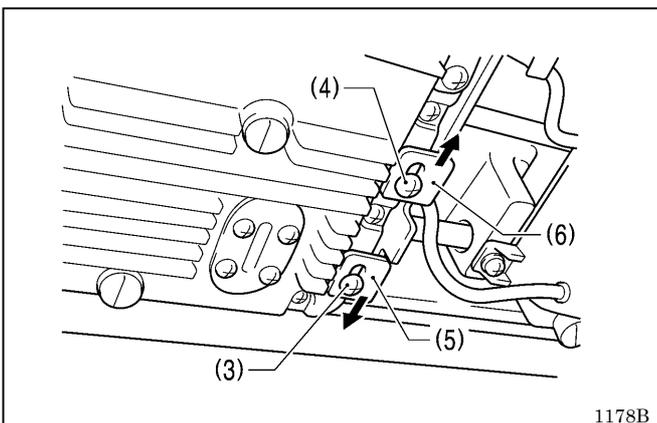
### Changing the maximum feed amount

If the feed dog has been replaced by one that does not match the feed amount that is currently being used, the feed dog may touch the needle plate if the stitch length dial or condense dial are mistakenly set to settings that are larger than the maximum feed amount for the feed dog, and this could cause problems such as damage or noise.

In order to prevent dial setting errors such as this, change the maximum feed amount setting for the sewing machine to match the maximum feed amount for the feed dog.



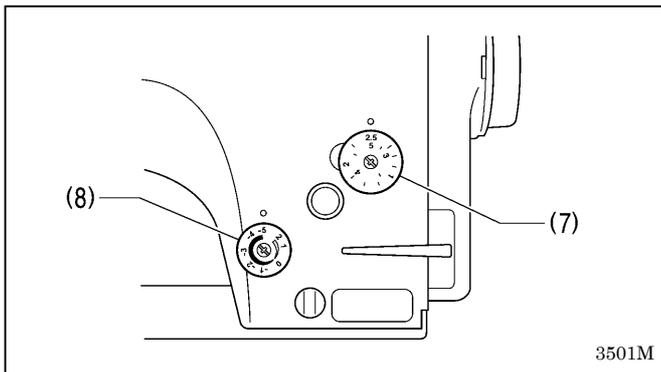
1. Tilt back the machine head.
2. For sewing machine models and specifications other than 8550A-031, loosen the two screws (1) so that the quick reverse solenoid (2) can be moved up and down.



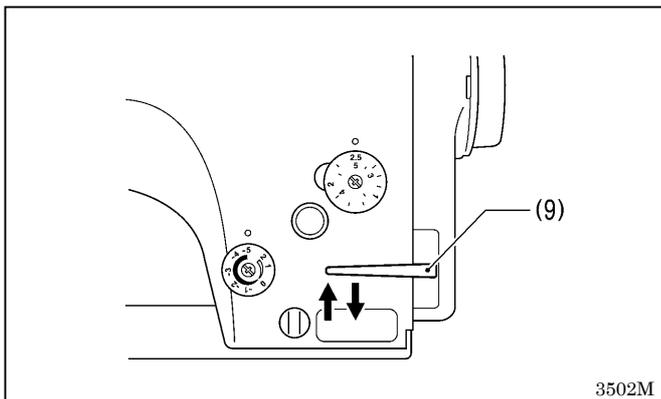
3. Loosen the screws (3) and (4).
4. Move the stopper (5) down as far as possible, and move the stopper (6) up as far as possible.

(Continued on next page)

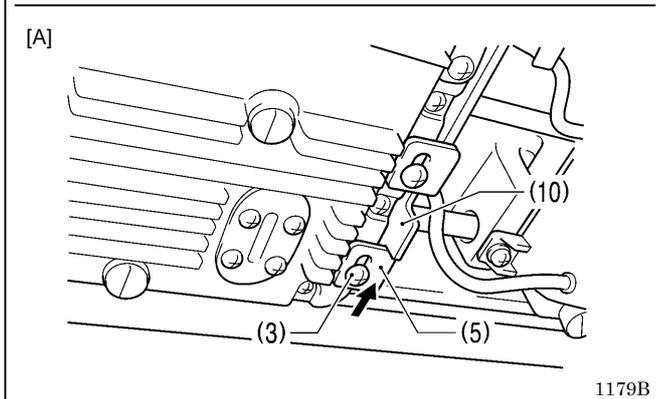
## 8. CHANGING THE FEED AMOUNT TO LONG STITCH SPECIFICATIONS (from 2.0mm to 5.0mm)



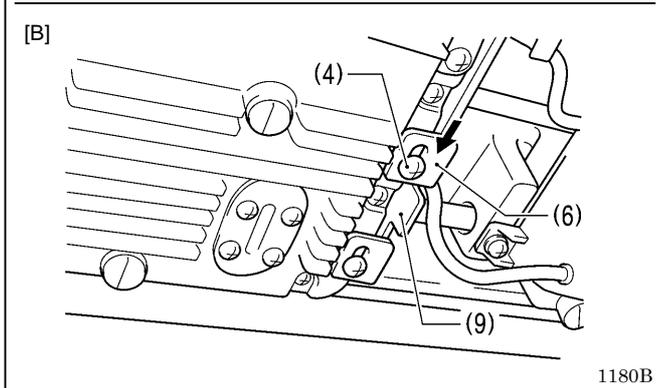
- Turn the stitch length dial (7) and the condense dial (8) to the maximum feed amount for the feed dog being used. (Set the condense dial (8) to a negative number.)



- Check that the feed dog does not touch the needle plate both when the reverse stitching lever (9) is not lowered and when it is lowered. If it touches, adjust the forward/back installation position (centering) of the feed dog.

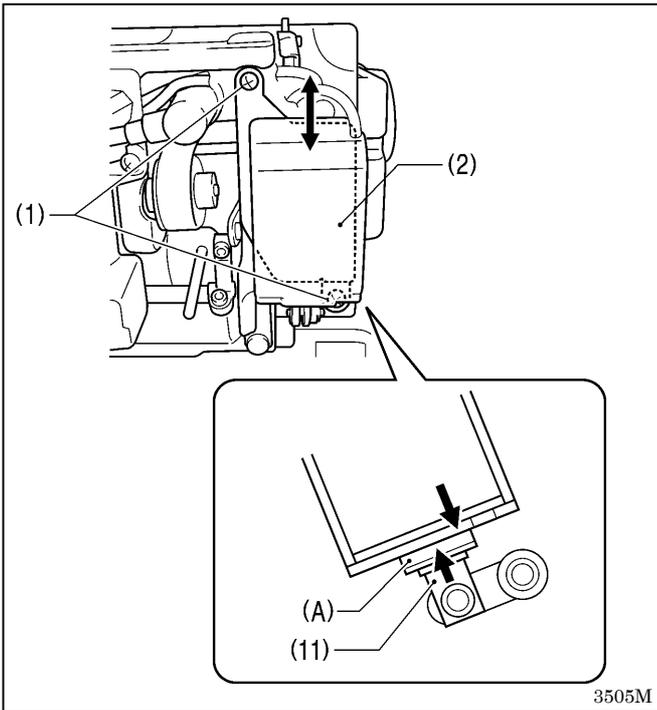


- Without lowering the reverse stitching lever (9), move the stopper (5) up until it touches F-regulator connecting rod (10), and then tighten the screw (3). [Fig. A]



- With the reverse stitching lever (9) lowered all the way, move the stopper (6) down until it touches the F-regulator connecting rod (10), and then tighten the screw (4). [Fig. B]

## 8. CHANGING THE FEED AMOUNT TO LONG STITCH SPECIFICATIONS (from 2.0mm to 5.0mm)

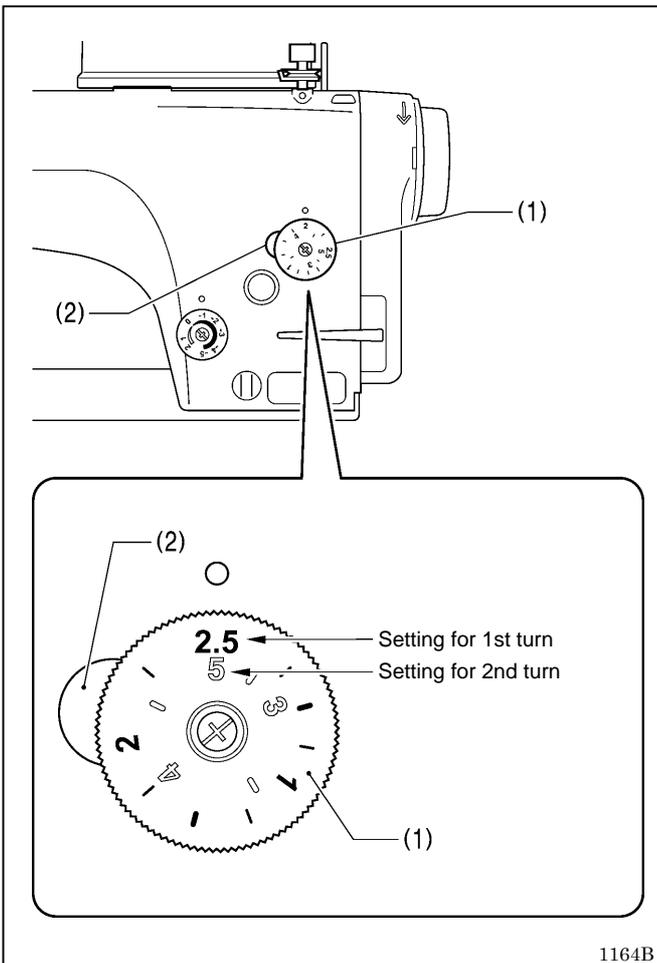


- For sewing machine models and specifications other than 8550A-031, push the reverse stitching lever (9) down all the way (so that the plunger (11) of the quick reverse solenoid has moved to its highest position), and then tighten the two screws (1) at the position where the quick reverse solenoid (2) is touching to top of section (A) of the plunger (11).

### Turning the stitch length dial (1) to a setting greater than 2.5

In this case, replace gauge parts such as the feed dog with parts for using with a feed amount of more than 2.0 mm.

In addition, change the maximum feed amount setting while referring to page 64, and then adjust the stitch length dial (1) as described below.



- Turn the stitch length dial (1) all the way to "2.5".
- After this, push the left lever (2) while turning the stitch length dial (1) so that it can be turned a second time. When the stitch length dial (1) is turned a second time, the settings will be those on the inside of the scale (3-5).

\* When turning the dial from a larger number to a smaller number, it can be turned to the second time setting without pushing the left lever (2).

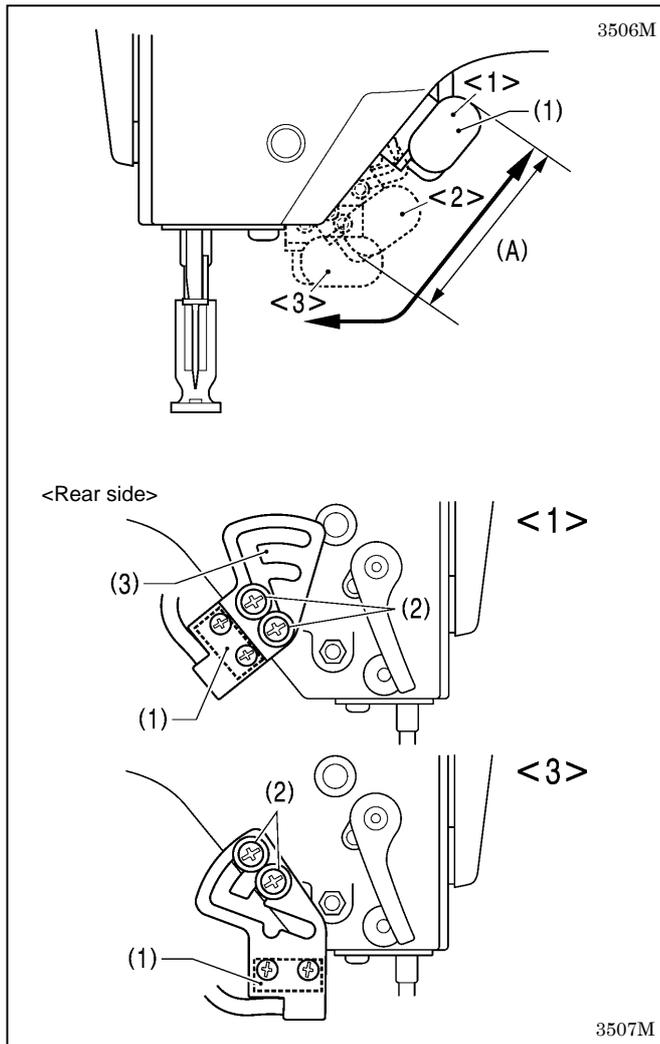
# 9. ADJUSTMENTS

## 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 at the following times.  
The machine may operate if the treadle is depressed by mistake, which could result in injury.
  - When carrying out inspection, adjustment and maintenance
  - When replacing consumable parts such as the rotary hook and knives
-  If the power switch and air need to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

-  Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.
-  Do not touch the face plate knives when opening the thread take-up guard cover. If they are touched, injury may result.
-  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.
-  When removing the needle plate, auxiliary needle plate and knife unit, use a screwdriver that matches the size of the screw heads. If a screwdriver that does not match the size of the screw heads is used, it may damage the screw heads and result in injury to the operator or damage to the articles being sewn.

### 9-1. Actuator position



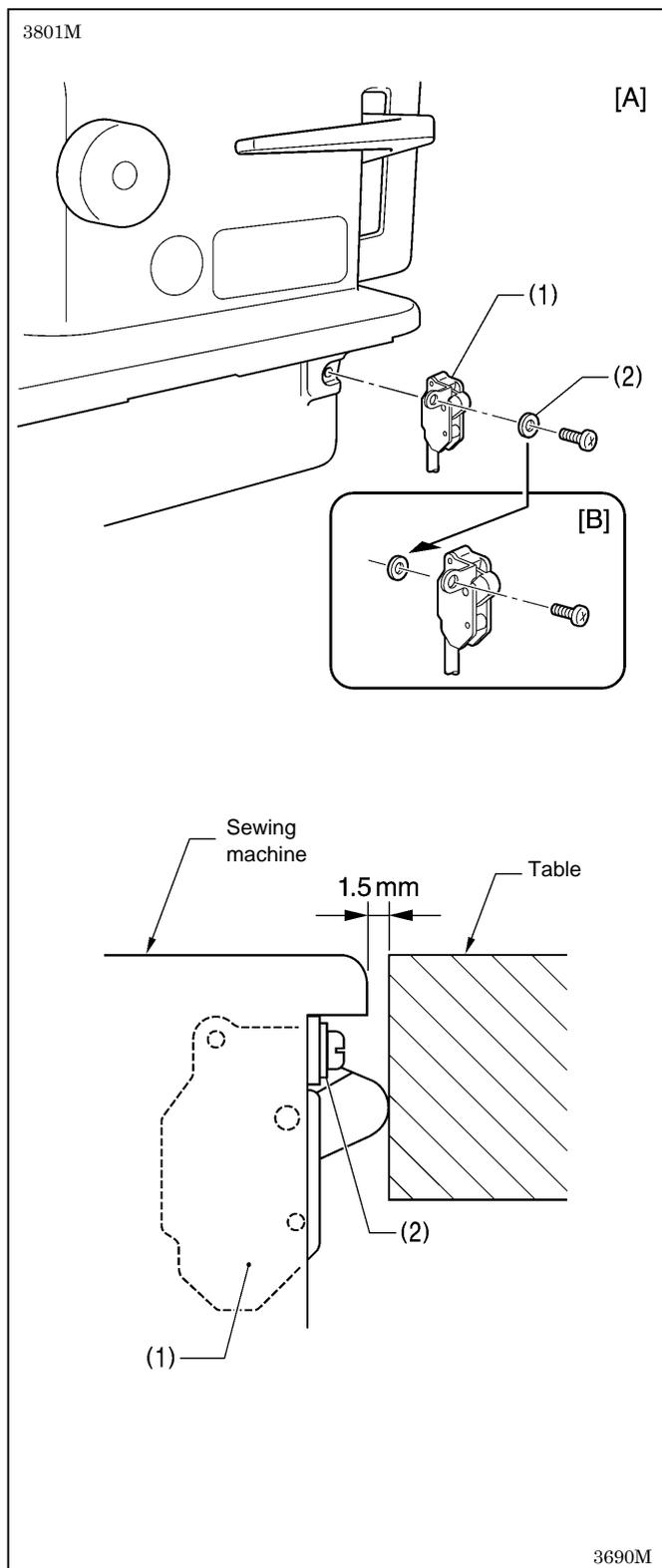
The installation position of the actuator (1) can be adjusted as shown in the illustration. Adjust so that it is in a position where it is easy to operate.

**NOTE:**

If using a thread wiper device (option), adjust the position of the actuator (1) within the range of (A) so that it does not touch the thread wiper.

1. Loosen the two screws (2).
2. Move the switch installation plate (3) to move the actuator (1) to the desired position.
3. Tighten the two screws (2).

## 9-2. Adjusting the safety switch position



The safety switch (1) is normally installed as shown in figure [A].

However, if the processing method used for the table leaves too much space between the machine bed and the table hole, it may adversely affect the operation of the safety switch (1).

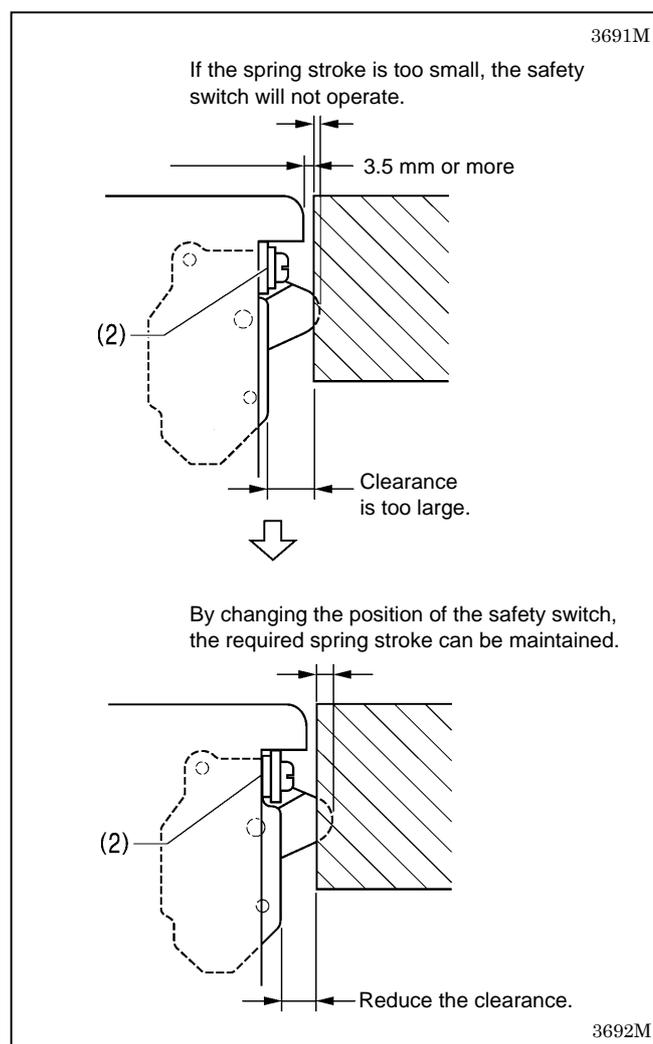
### <Adjustment method>

The standard amount of clearance between the machine bed and the table hole is 1.5 mm.

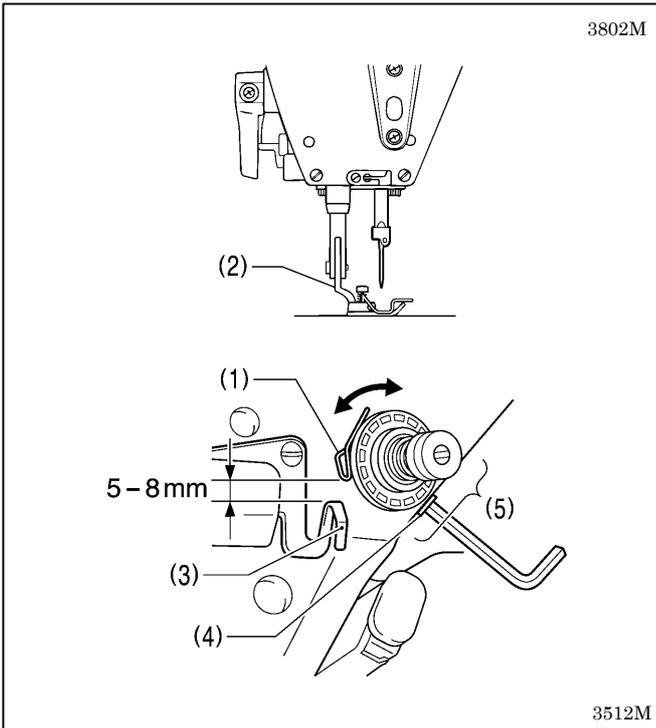
If the clearance is 3.5 mm or more, install the safety switch (1) so that the washer (2) is on the machine bed side as shown in Figure [B].

\* If the position cannot be satisfactorily adjusted in this way, add more washers of the same thickness.

### <Safety switch operation>



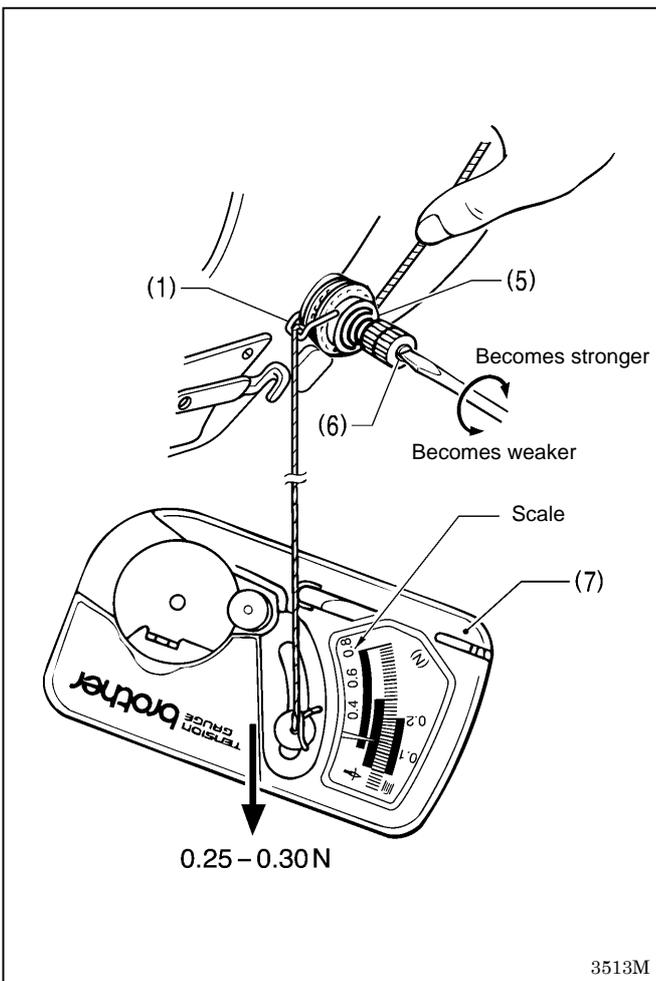
### 9-3. Thread tension spring



#### <Thread tension spring position>

The standard position of the thread tension spring (1) is 5-8 mm above the surface of the thread guide (3) when the presser foot (2) is lowered.

1. Lower the presser foot (2).
2. Loosen the set screw (4).
3. Turn the thread tension bracket (5) to adjust the spring position.
4. Securely tighten the set screw (4).



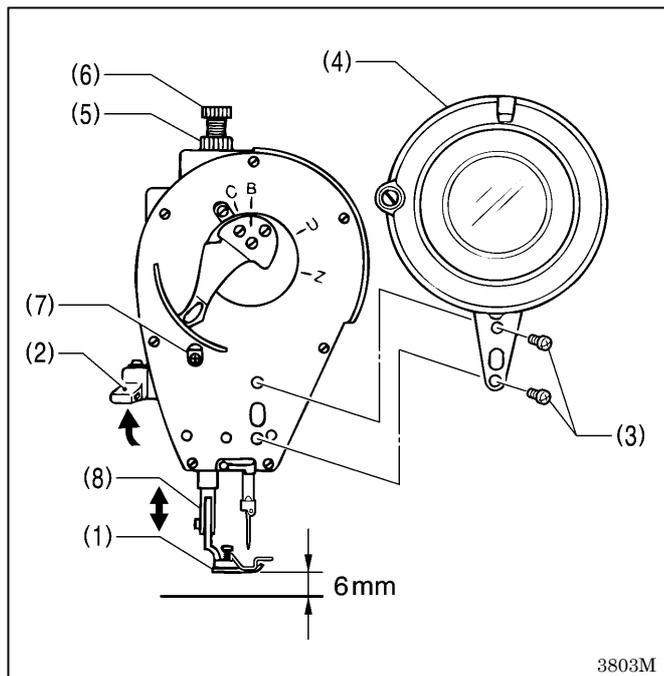
#### <Thread take-up spring tension>

The standard tension of the thread tension spring (1) is 0.25 to 0.30 N.

1. Press the upper thread slightly above the thread tension bracket (5) with a finger to stop the thread spooling out.
2. Pull the upper thread down until the thread tension spring (1) starts to move down, and measure the tension of the thread tension spring (1) at this point.
3. Insert the tip of a screwdriver into the groove in the thread tension stud (6) and turn it to adjust the tension of the thread tension spring (1).

**NOTE:** If using a tension gauge (7) (sold separately) to measure the tension, take the reading from the scale on the side of the red line.

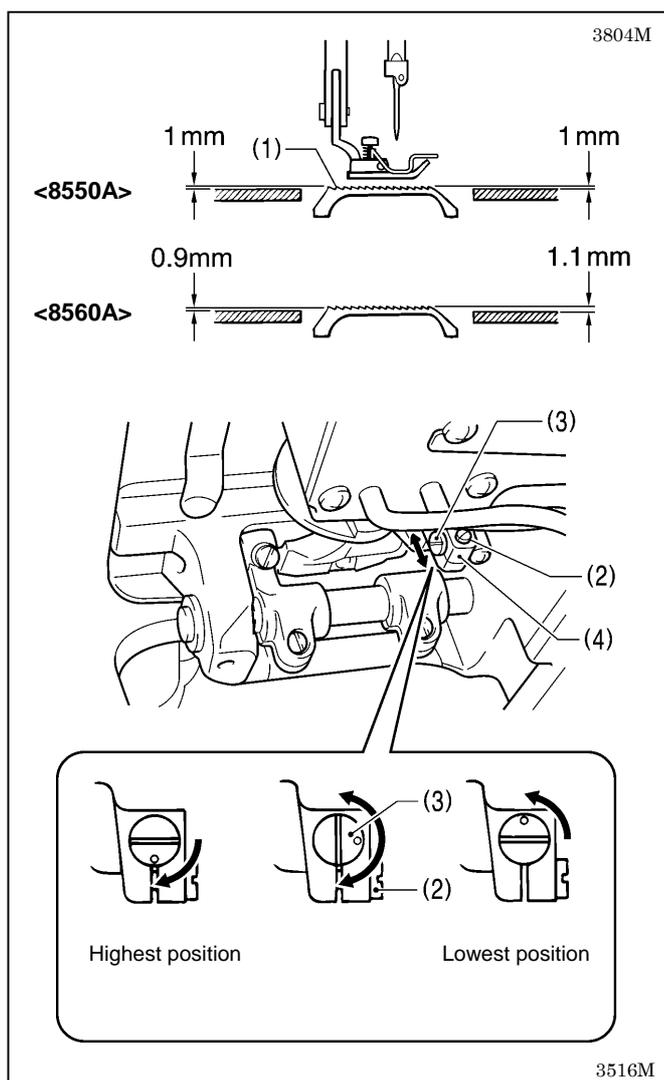
### 9-4. Presser foot height



The standard height of the presser foot (1) is 6 mm when the presser foot (1) is raised by means of the lifting lever (2).

1. Loosen the two screws (3) and then remove the thread take-up guard (4).
2. Loosen the nut (5) of the presser adjusting screw (6), and then turn the presser adjusting screw (6) so that there is no pressure applied to the presser foot.
3. Raise the presser foot (1) by using the lifting lever (2).
4. Loosen the screw (7) and move the presser bar (8) up and down to adjust the height of the presser foot (1) to 6 mm.
5. Tighten the screw (7).
6. Adjust the presser foot pressure using the presser adjusting screw (6), and then tighten the nut (5).
7. Install the thread take-up guard (4) with the two screws (3).

### 9-5. Feed dog height

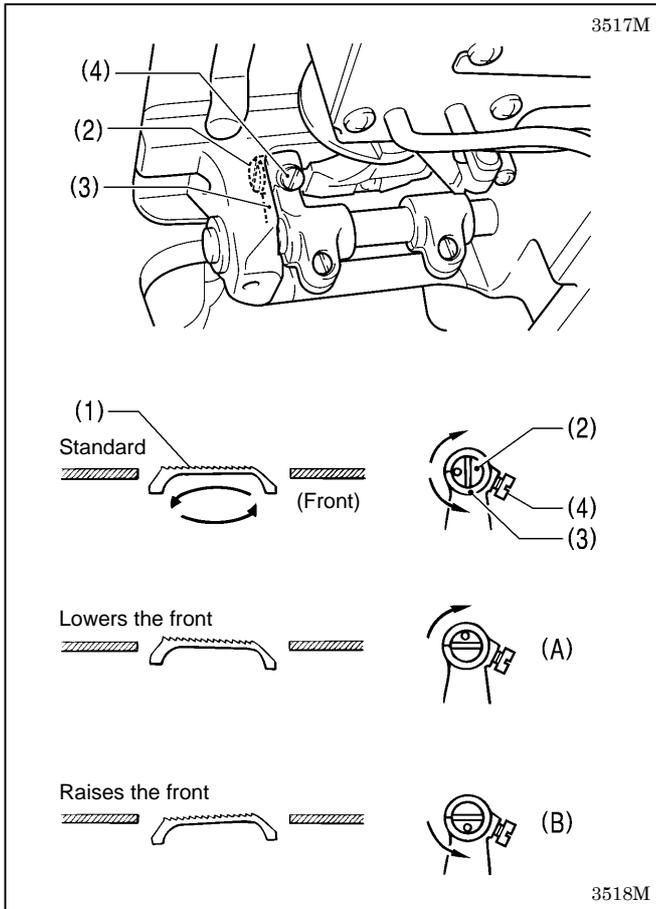


The standard height of the feed dog (1) when it is raised as far as possible above the surface of the needle plate is as given below.

<8550A>	1 mm	
<8560A>	At the front	1.1 mm
	At the back	0.9 mm

1. Turn the machine pulley to move the feed dog (1) to its highest position above the needle plate.
2. Tilt back the machine head.
3. Loosen the screw (2).
4. Turn the pin (3) to move the feed bar (4) up and down in order to adjust the height.
5. Tighten the screw (2).

### 9-6. Feed dog angle



The standard angle for the feed dog (1) is for the top of the needle plate to be parallel with the top of the feed dog (1) (for the 8550A) or raised slightly at the side closest to the operator (for the 8560A) when the feed dog (1) is raised to its highest position above the needle plate. (With the  $\bigcirc$  mark on the feed bracket shaft (2) aligned with the mark on the feed rocker bracket arm (3)).

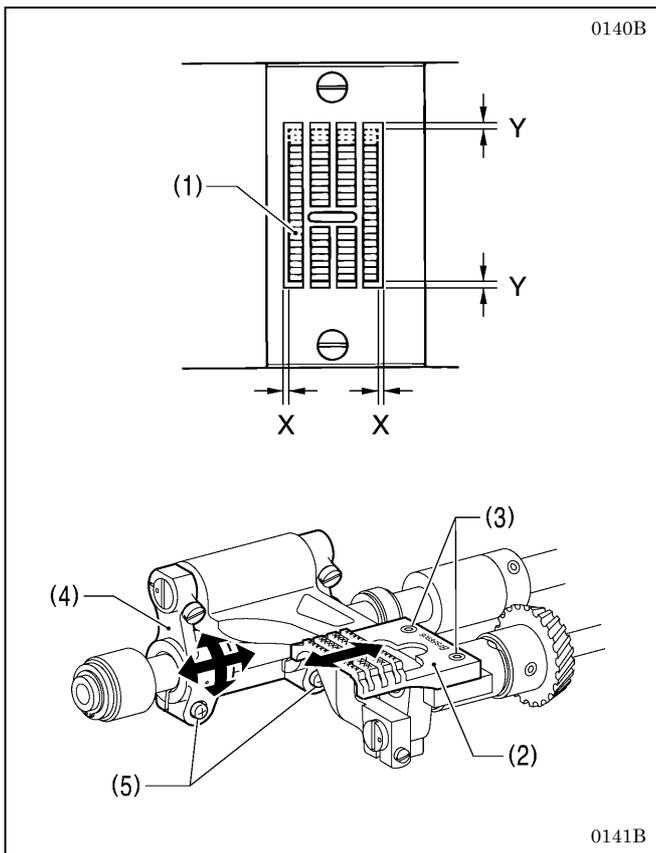
1. Turn the machine pulley to move the feed dog (1) to its highest position above the needle plate.
2. Tilt back the machine head.
3. Loosen the set screw (4).
4. Turn the feed bracket shaft (2) in the direction of the arrow within a range of 90° with respect to the standard position.

- In order to prevent puckering, lower the front of the feed dog (1). (Fig. A)
- In order to prevent the material from slipping, raise the front of the feed dog (1). (Fig. B)

5. Securely tighten the set screw (4).

\* When the angle of the feed dog (1) is adjusted, the height and forward/back position of the feed dog (1) will also change and will need to be readjusted.

### 9-7. Feed dog forward/back and sideways position



Adjust the sideways clearances X between the feed dog (1) and the needle plate so that they are approximately equal. Adjust so that the clearances Y between the front and back of the feed dog (1) and the needle plate are approximately equal when the machine pulley is turned until the feed plate (2) is moved to its furthest forward position and also when it is moved to its furthest back position.

#### <Sideways clearance X adjustment>

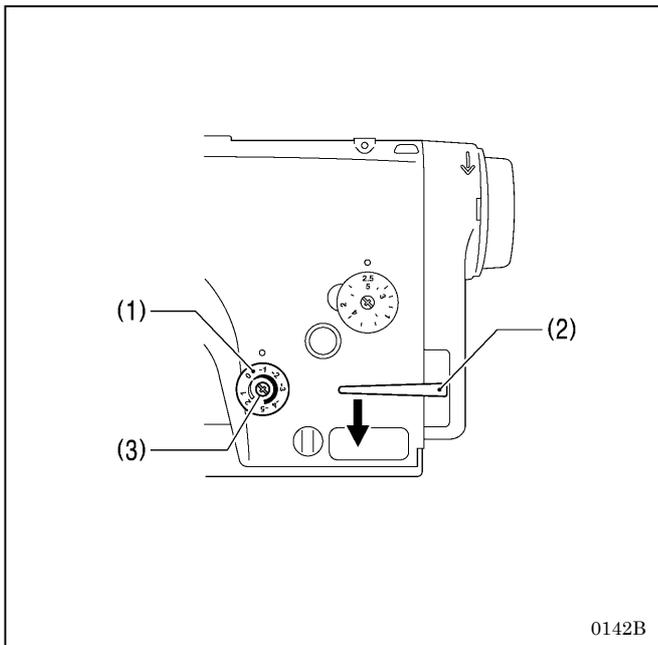
Loosen the two screws (3) of the feed dog (1), and adjust the position of the feed dog (1).

If adjustment is not possible using this method, adjust using the following method.

#### <Forward/back clearance Y and sideways clearance X adjustment>

Loosen the two screws (5) of the feed rocker bracket arm (4) and adjust the position of the feed dog.

## 9-8. Feed amounts for reverse stitching and condense stitching

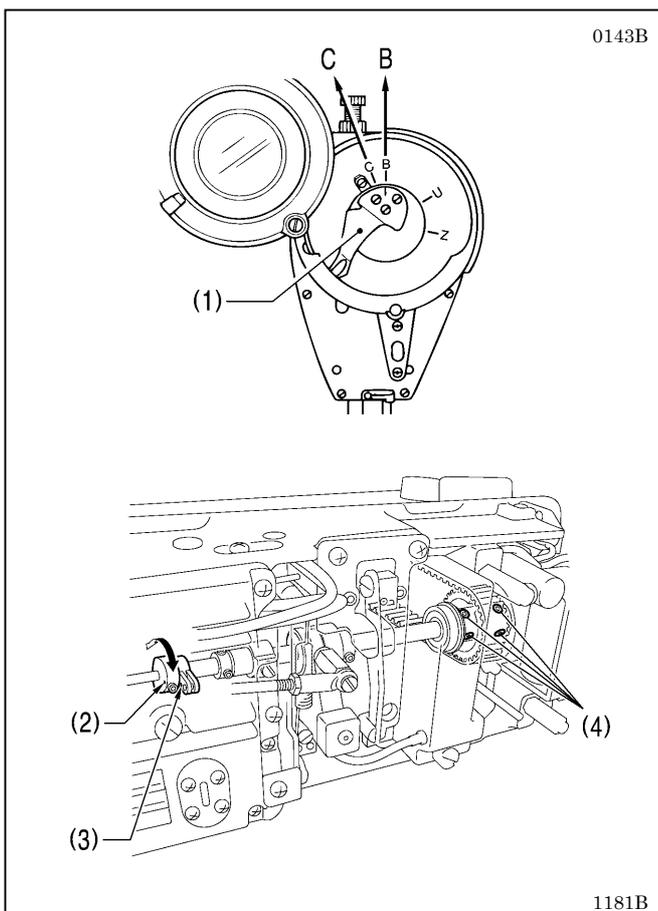


The feed amounts for reverse stitching and condense stitching are set using the condense dial (1).

If the stitch length for the finished stitches differs greatly from the scale, carry out the following adjustment. (The scale is intended as a guide.)

1. Set the condense dial (1) to "0".
2. With the reverse stitching lever (2) pushed down, turn the machine pulley about 10 times and check that the material feed amount is zero.  
If the feed amount is not zero, carry out the adjustments in steps 3. and 4. below.
3. Move the condense dial (1) slightly to the left or right from the "0" position on the scale.  
Repeat the check in step 2. above, and find the position where the material feed amount is zero.
4. At the position where the material feed amount is zero, loosen the screw (3), turn only the dial of the condense dial (1) to align it with the "0" position on the scale, and then secure it by tightening the screw (3).

## 9-9. Needle and feed timing



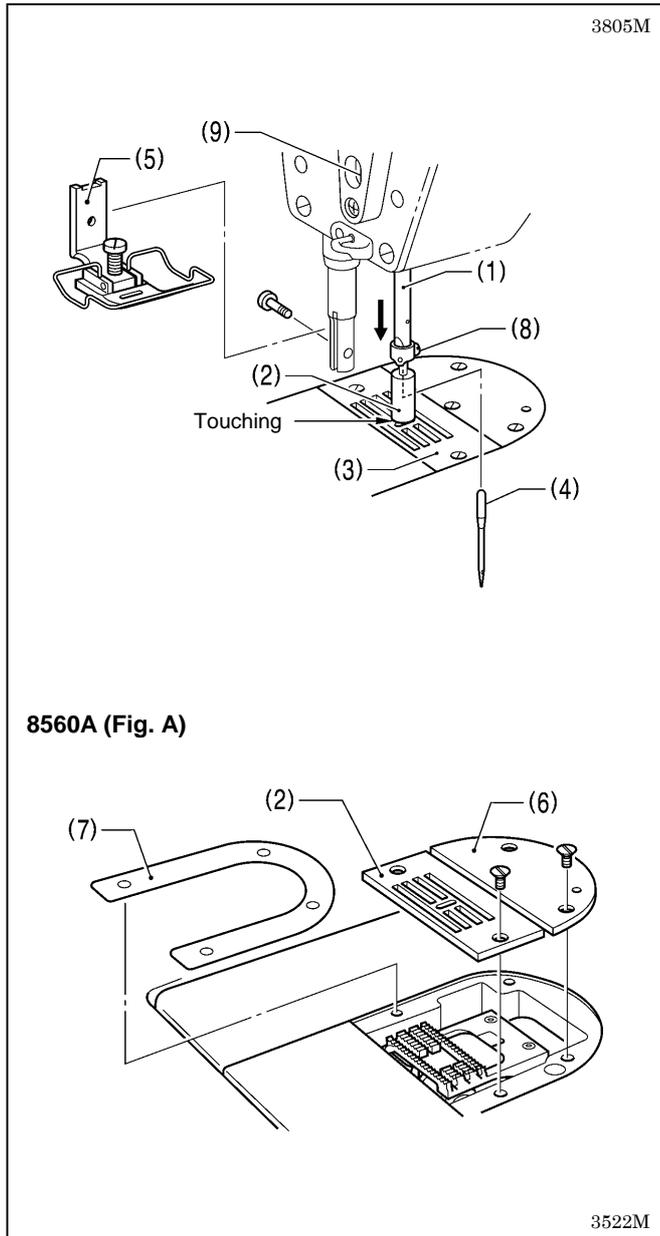
Adjust so that the  $\bigcirc$  mark on the level feed eccentric wheel (2) is aligned with the  $\bigcirc$  mark on the feed driving connecting rod (3) when the reference line on the thread take-up lever (1) is aligned with the mark ("B" for the 8550A, "C" for the 8560A) on the face plate.

1. Tilt back the machine head.
2. Align the reference line on the thread take-up lever (1) with the "B" mark (for the 8550A) or the "C" mark (for the 8560A) on the face plate.
3. Loosen the four set screws (4).
4. Turn the level feed eccentric wheel (2) to align the  $\bigcirc$  mark with the  $\bigcirc$  mark on the feed driving connecting rod (3).
5. Securely tighten the four set screws (4).

\* After the needle and feed timing has been adjusted, also carry out the adjustment in "9-14. Needle and rotary hook timing".

For the 8560A, also carry out the adjustment in "9-21. Adjusting the position of the thread trimming cam".

## 9-10. Needle bar height



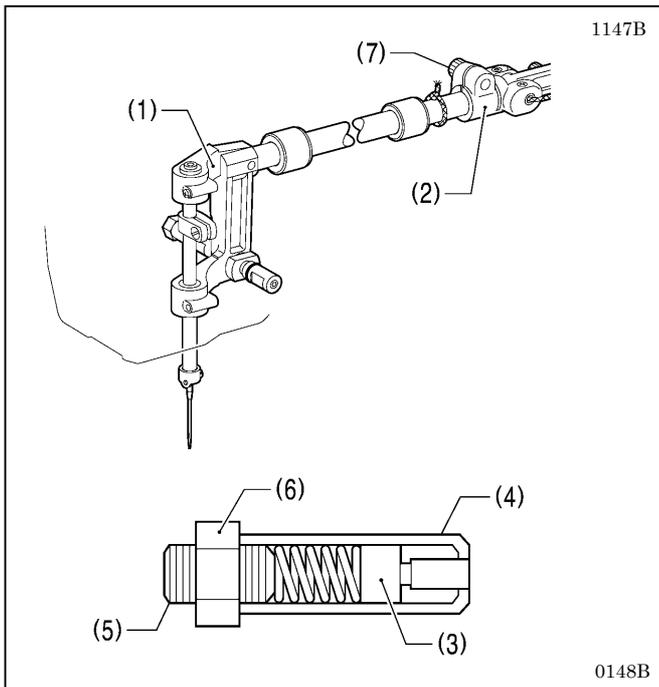
With the accessory needle bar height gauge (2) installed to the needle bar (1), adjust so that the needle bar height gauge (2) is touching the top of the needle plate (3) when the needle bar (1) is at its lowest position.

1. Remove the needle (4) and the presser foot (5).

**For the 8560A (Refer to Fig. A)**

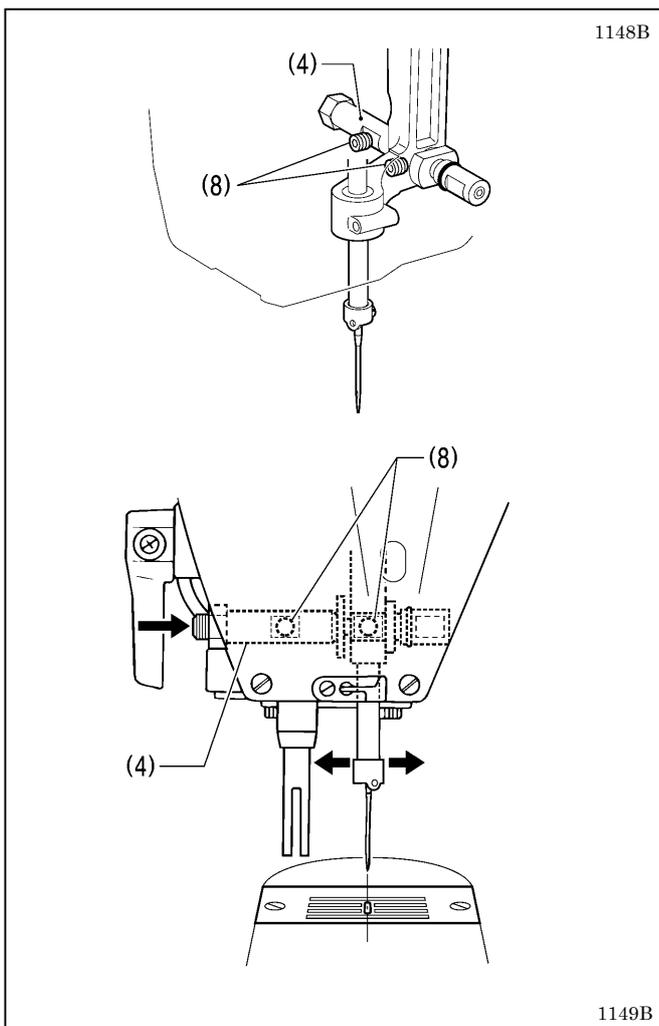
- 1) Remove the needle plate (3) and then the auxiliary needle plate (6).
- 2) Remove the needle plate spacer (7).
- 3) Place the needle plate (3) onto the needle plate installation surface.
2. Install the accessory needle bar height gauge (2) to the needle bar (1), and then tighten it with the set screw (8).
3. Loosen the screw (9).
4. Move the needle bar up or down to adjust so that the needle bar height gauge (2) is touching the top of the needle plate (3) when the machine pulley is turned so that the needle bar (1) is at its lowest position.
5. Securely tighten the screw (9).
6. Remove the needle bar height gauge (2).
7. For the 8560A, install the needle plate spacer (7), needle plate (3) and auxiliary needle plate (6).
8. Install the presser foot (5) and the needle (4).

### 9-11. Needle zigzag forward/back position



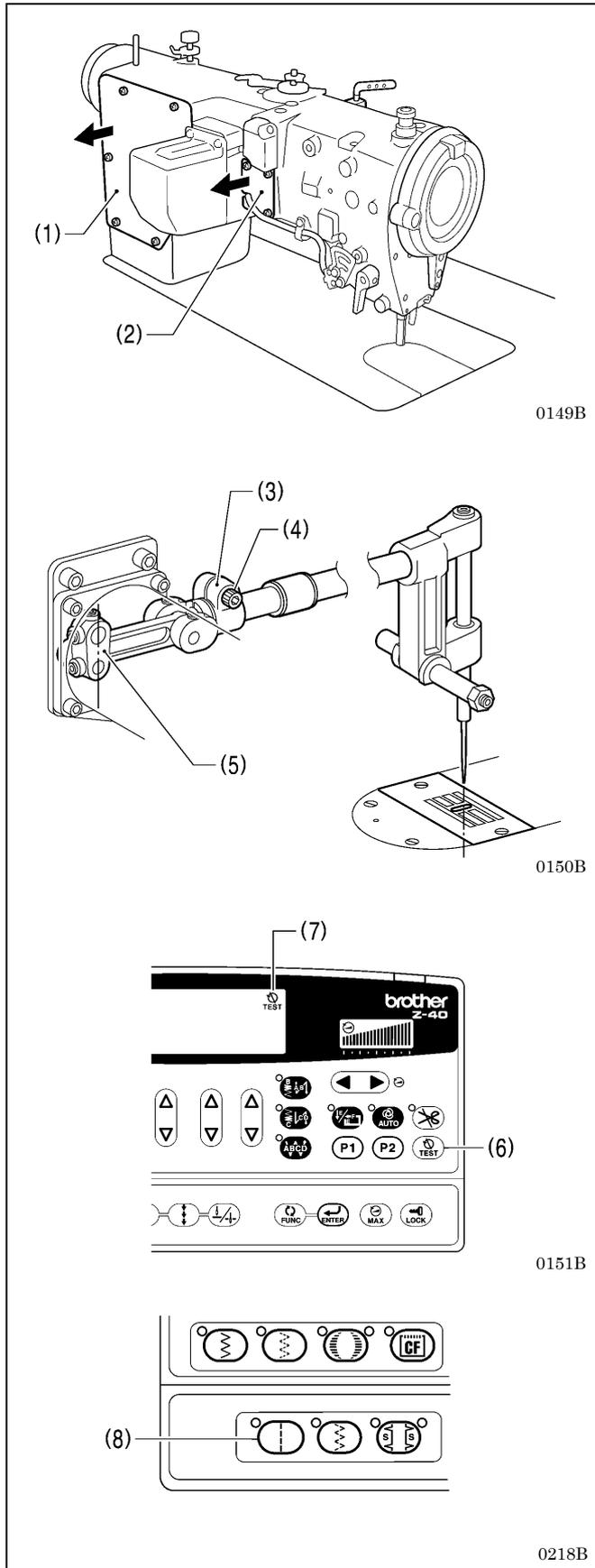
Adjust so that the following are obtained.

- The needle is in the center of the needle hole in the forward/back direction.
  - There is no play in the needle bar in the forward/back direction.
  - When the power switch is turned off, the needle bar can be moved smoothly sideways by hand.
- \* Carry out adjustment with the sewing machine set to the following conditions.
- With the needle bar base assembly (1) and the zigzag joint (2) not secured.
  - With the screw (5) and nut (6) loosened so that the needle bar base presser pin (3) is further in than needle bar base guide R (4) as shown in the illustration.
  - With the bolt (7) loosened.



1. Remove the presser foot. (Keep it removed while adjustment is being carried out.)
  2. Loosen the two set screws (hexagonal hole, 2.5 mm width across flats) (8) and then push needle bar base guide R (4) to adjust the position. Turn the machine pulley and check that the needle drops into the center of the needle hole.
  3. Securely tighten the set screw (8).
- \* After adjusting, check that there is no forward/back play in the needle bar, and also check that the needle bar can be smoothly moved sideways by hand when the power switch is turned off.
- \* After adjusting, carry out the adjustment in "9-12. Needle zigzag sideways position".

## 9-12. Needle zigzag sideways position

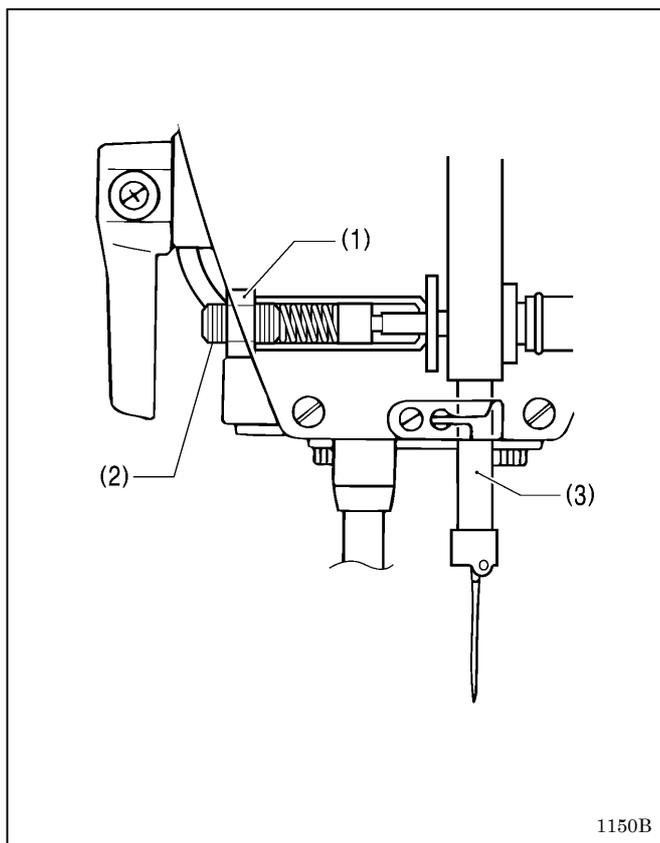


Adjust the position of the needle so that it is in about the center of the slot in the needle hole when the power is turned on and the zigzag width and zigzag base line position have both been set to 0 mm at the operation panel.

\* When the straight stitch key on the operation panel is pressed, the zigzag width will be set to 0.0 mm.

1. Turn off the power switch.
2. Remove the presser foot, rear cover (1) and window plate (2) and also the solenoid for the 8560A). (Keep them removed while adjustment is being carried out.)
3. Loosen the bolt (4) of the zigzag joint (3) and adjust the needle position. In addition, set the motor lever (5) so that the longer part is vertical.
4. Turn on the power switch.  
\* If "UP" is displayed, turn the machine pulley until the display disappears.
5. Press the TEST key (6) on the operation panel and check that the TEST icon (7) illuminates.  
(For safety purposes, be sure to carry out this step. It prevents the motor from operating even if the treadle is depressed.)
6. Press the straight stitch key (8) on the operation panel.
7. Adjust the position of the needle so that it is at the center of the needle hole (slot).
8. Securely tighten the bolt (4).  
\* When tightening the bolt (4), be careful not to apply too much pressure to it or to twist the zigzag joint (3).
9. Press the TEST key (6) on the operation panel (the TEST icon (7) will switch off) to return the sewing machine to normal sewing mode.
10. Turn off the power switch.

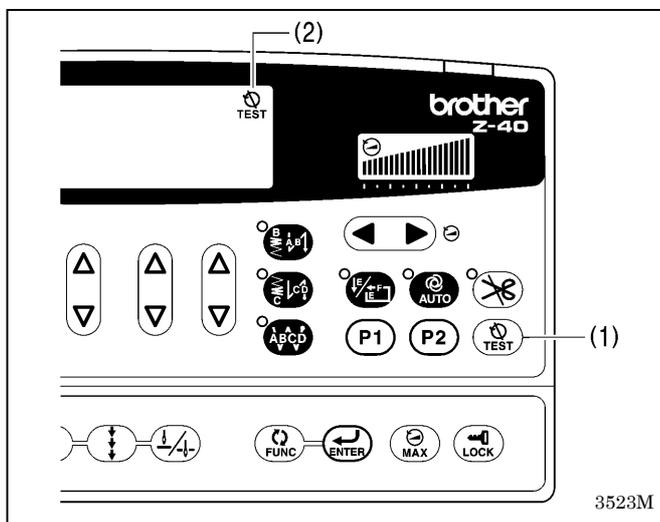
### 9-13. Needle zigzag load



This adjusts the resistance load for needle zigzagging.

1. Turn off the power switch.
  2. Loosen the nut (1).
  3. Tighten the screw (2) to increase the needle zigzag load.
    - \* Adjust so that the load is 12-15 N.m when the needle bar (3) moves sideways.
  4. Securely tighten the nut (1).
    - \* Be careful not to turn the screw (2) at this time.
- \* After adjusting, check the needle zigzag load again.

### 9-14. Needle and rotary hook timing



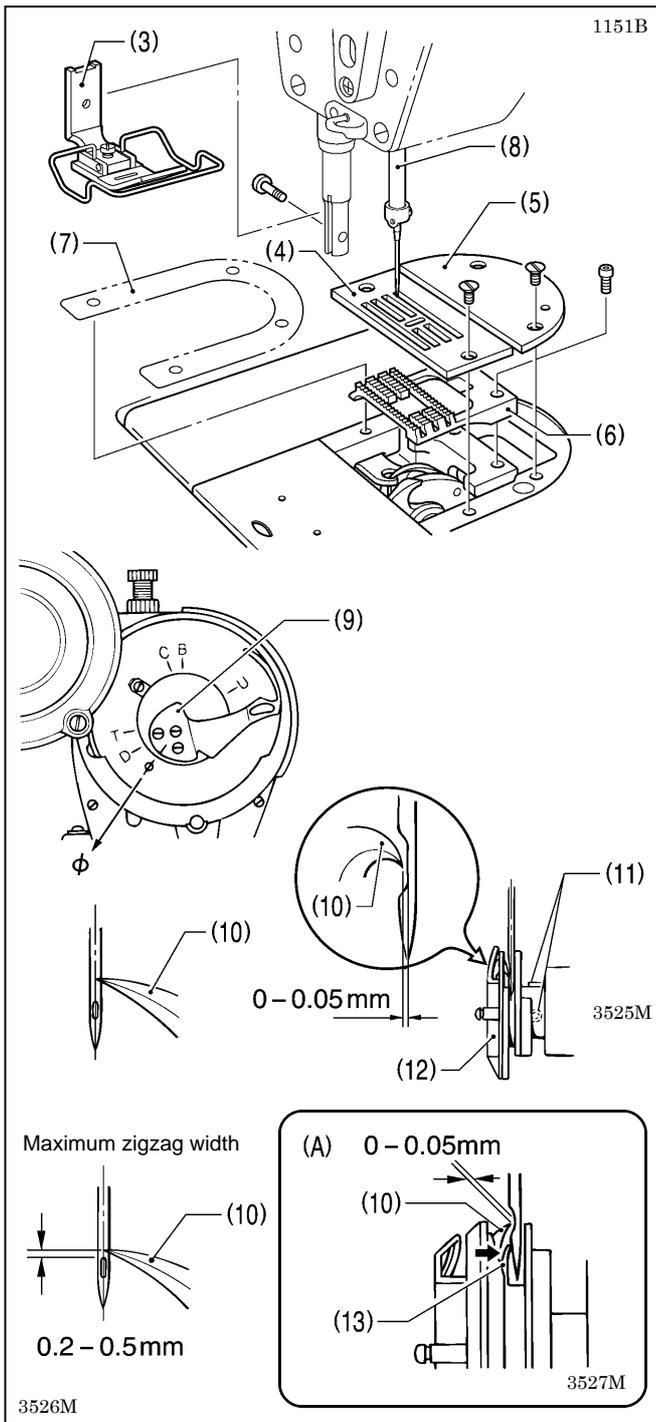
1. Turn on the power switch.
2. Press the TEST key (1) and check that the TEST icon (2) illuminates.
 

(For safety purposes, be sure to carry out this step. It prevents the motor from operating even if the treadle is depressed.)
3. Set both the zigzag width and the zigzag base line position to "0".
 

(Refer to "6-2-4. Setting the zigzag base line position" and "6-2-5. Setting the zigzag stop position" of the Instruction Manual.)

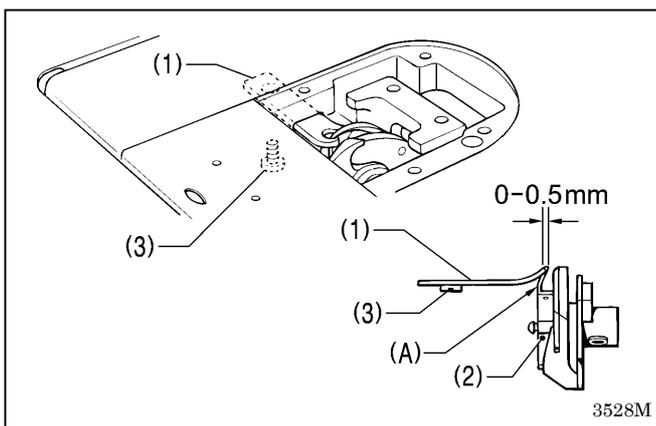
(Continued on next page)

## 9. ADJUSTMENTS



4. Remove the presser foot (3), needle plate (4), auxiliary needle plate (5), feed dog (6) and needle plate spacer (7) (8560A only).
5. Turn the machine pulley to raise the needle bar (8) from its lowest position until the reference line on the thread take-up lever (9) is aligned with the Ø mark on the face plate, and then check the following.
  - The tip of the rotary hook (10) should be aligned with the center of the needle.
  - The distance from the tip of the rotary hook (10) to the needle should be 0 to 0.05 mm.
6. If the above settings are not correct, loosen the two set screws (11) and adjust the position of the rotary hook (12). After adjusting, securely tighten the two screws (11).
7. Set the zigzag width to the maximum setting (8 mm).
8. Turn the machine pulley to move the needle to its furthest left position so that the tip of the rotary hook (10) is aligned with the center of the needle, and check that the distance from the upper edge of the needle hole to the tip of the rotary hook (10) is 0.2 to 0.5 mm at this time.
  - \* If the distance is not correct, carry out the adjustment in "9-10. Needle bar height".
9. If needle deflection occurs when sewing material with joints, bend the needle guard (13) as shown in the illustration (A) so that it touches the needle.
  - \* After this, check that the clearance between the tip of the rotary hook (10) and the needle is 0 to 0.05 mm.
10. Press the TEST key (1). The TEST icon (2) will switch off. (The mode will return to normal sewing mode.) Turn off the power switch and continue the adjustment.

### 9-15. Bobbin case holder bracket position



Adjust so that the end of the bobbin case holder position bracket (1) is 0 to 0.5 mm back from end (A) of the inner rotary hook (2).

\* The end of the bobbin case holder position bracket (1) must never extend to the right of end (A) of the inner rotary hook (2).

1. Loosen the screw (3) and adjust the position of the bobbin case holder position bracket (1).
2. Securely tighten the screw (3).

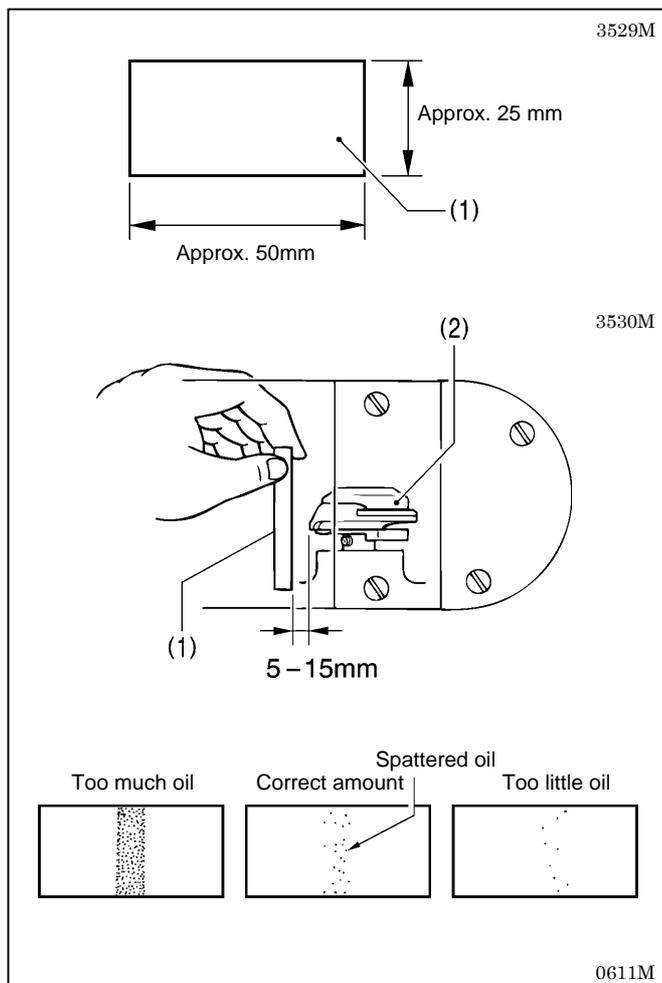
## 9-16. Adjusting the rotary hook lubrication amount

### CAUTION



Be careful not to touch your fingers or the lubrication amount check sheet against moving parts such as the rotary hook or the feed mechanism when checking the amount of oil supplied to the rotary hook. If they are touched, injury may result.

Use the following procedure to check the amount of oil being supplied to the rotary hook after replacing the rotary hook or when changing the sewing speed.

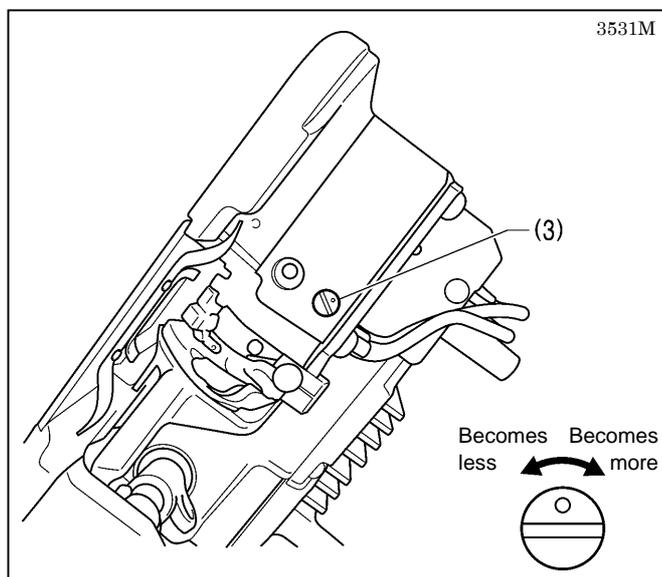


#### <Checking the lubrication amount>

1. Remove the thread from all points from the thread take-up lever to the needle.
2. Use the lifting lever to lift the presser foot.
3. Run the machine at the normal sewing speed for approximately 1 minute without sewing any material (following the same start/stop pattern as when actually sewing).
4. Place the lubrication amount check sheet (1) to the left of the rotary hook (2) and hold it there. Then run the sewing machine at the normal sewing speed for 10 seconds. (Any type of paper can be used as the lubrication amount check sheet (1).)
5. Check the amount of oil which has spattered onto the sheet.

\* Be sure to repeat this operation three to four times to check average lubrication amounts.

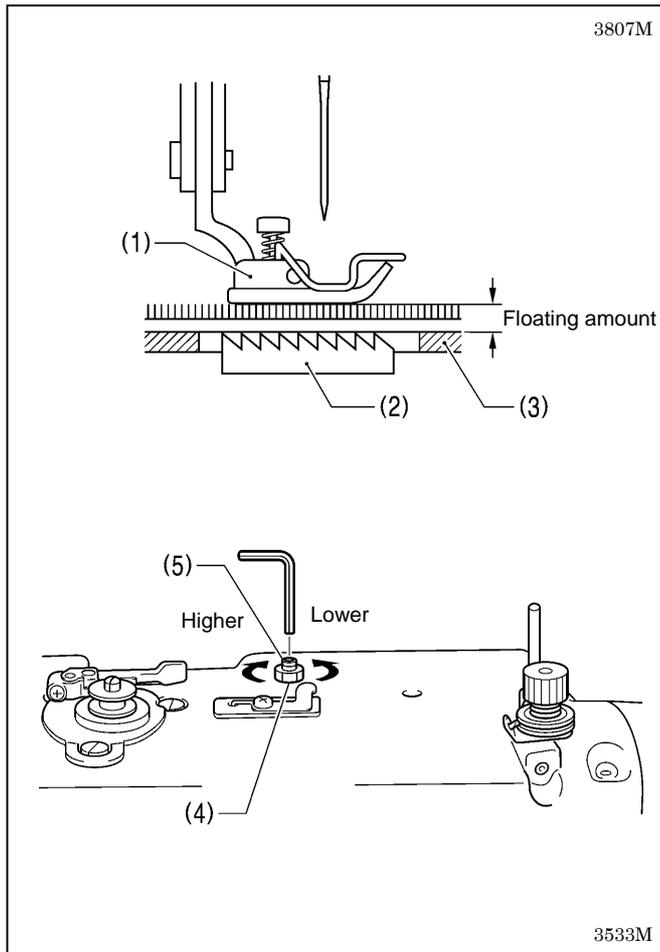
\* If adjustment is necessary, carry out the following operations in <Adjusting the lubrication amount>.



#### <Adjusting the lubrication amount>

1. Tilt back the machine head.
2. Turn the adjusting screw (3) to adjust the lubrication amount.
  - If the rotary hook adjusting screw (3) is turned clockwise, the lubrication amount becomes greater.
  - If the rotary hook adjusting screw (3) is turned counterclockwise, the lubrication amount becomes smaller.
3. Check the lubrication amount again according to the procedure given in <Checking the lubrication amount> above.
  - \* Turn the rotary hook adjusting screw (3) and check the lubrication amount repeatedly until the lubrication amount is correct.

### 9-17. Adjusting the presser foot floating amount (minute lifting amount)



When sewing stretch materials and materials with long pile, you can make minute adjustments to the floating amount for the presser foot (1) in accordance with the material.

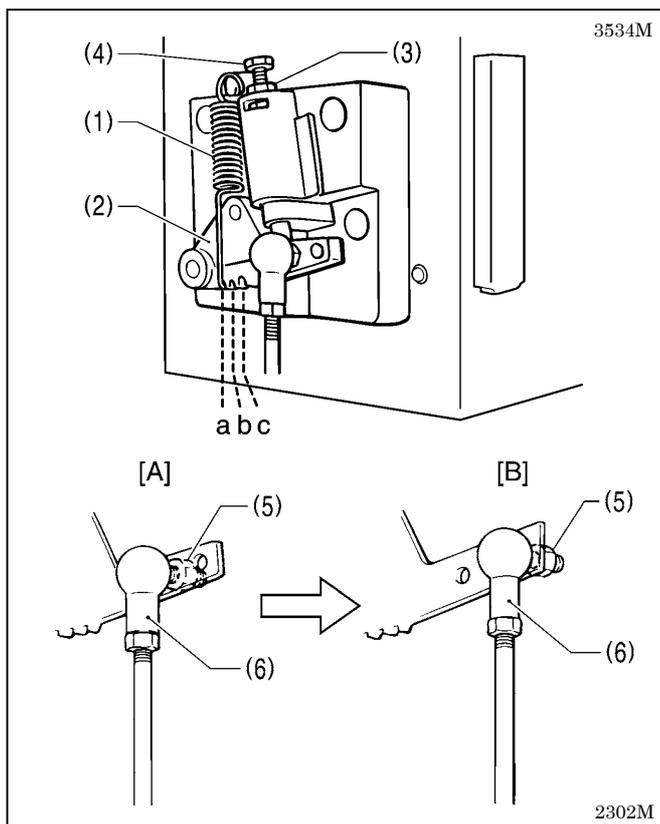
1. Turn the sewing machine pulley by hand to move the feed dog (2) below the needle plate (3).
2. Use the lifting lever to lower the presser foot (1).
3. Loosen the nut (4).
4. Use a hexagon wrench to turn the adjusting screw (5) to adjust the floating amount.

- To raise the presser foot (1) ...Turn the adjusting screw (5) clockwise.
- To lower the presser foot (1) ...Turn the adjusting screw (5) counterclockwise.

5. Tighten the nut (4).

\* After making the adjustment, sew a piece of material to check the floating amount.

### 9-18. Adjusting the treadle



#### <Forward depression sensitivity adjustment>

If the machine starts running at low speed when your foot is simply resting on the treadle, or if the treadle pressure is felt to be too weak, adjust the position (a to c) at which the treadle spring (1) is hooked onto the treadle lever (2).

\* a is the weakest position, and it becomes gradually stronger at b and c respectively.

#### <Backward depression sensitivity adjustment>

1. Loosen the nut (3) and turn the bolt (4).

\* When the bolt (4) is tightened, the treadle operation becomes heavier, and when it is loosened, the operation becomes lighter.

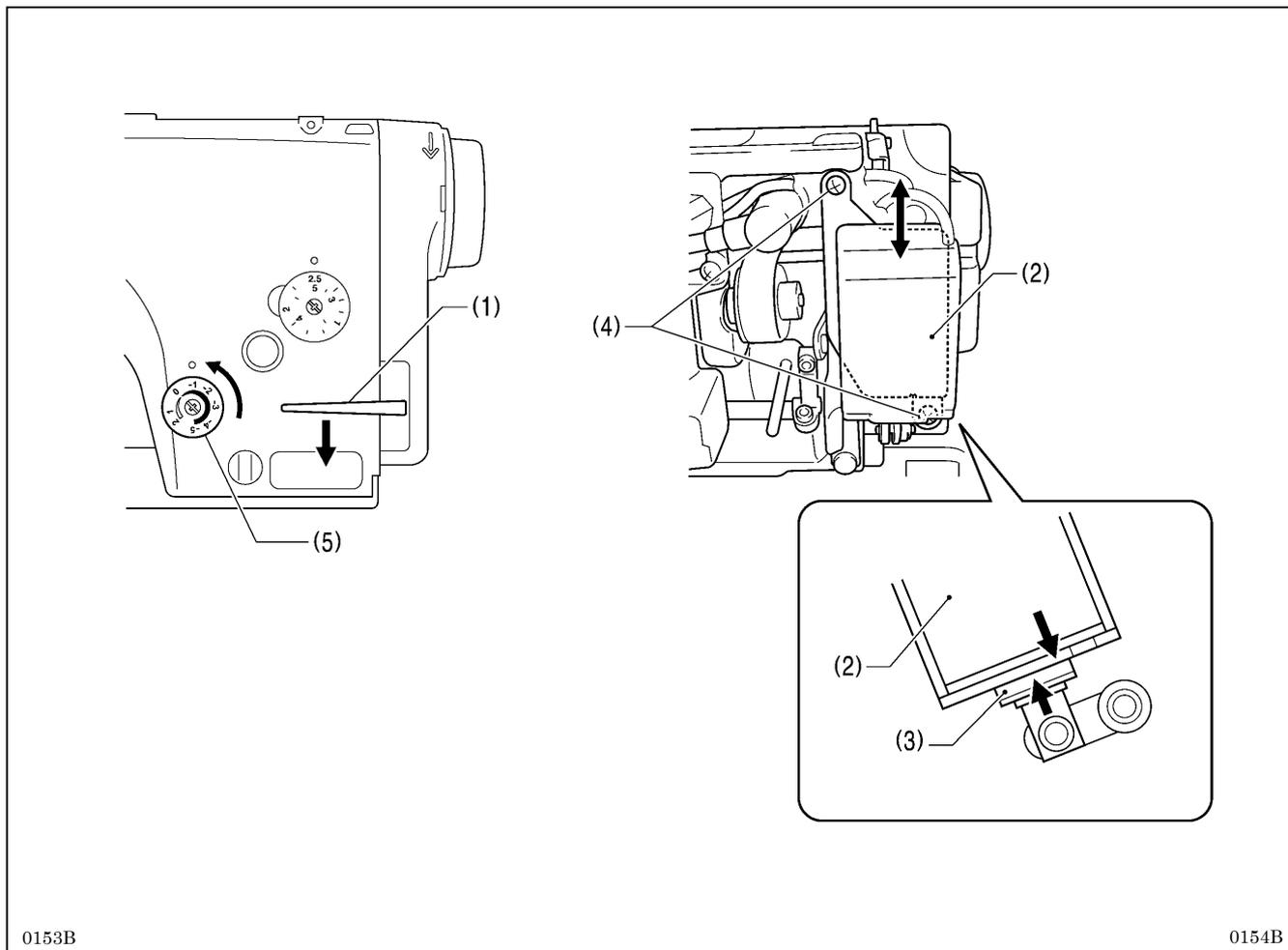
2. Tighten the nut (3).

#### <Adjusting the treadle stroke>

Remove the nut (5), and then move the connecting rod joint (6) from the position in figure A to the position in figure B. The treadle stroke will then be increased by approximately 30 %.

At this time, the treadle forward and backward depression sensitivity will change, so readjust if necessary.

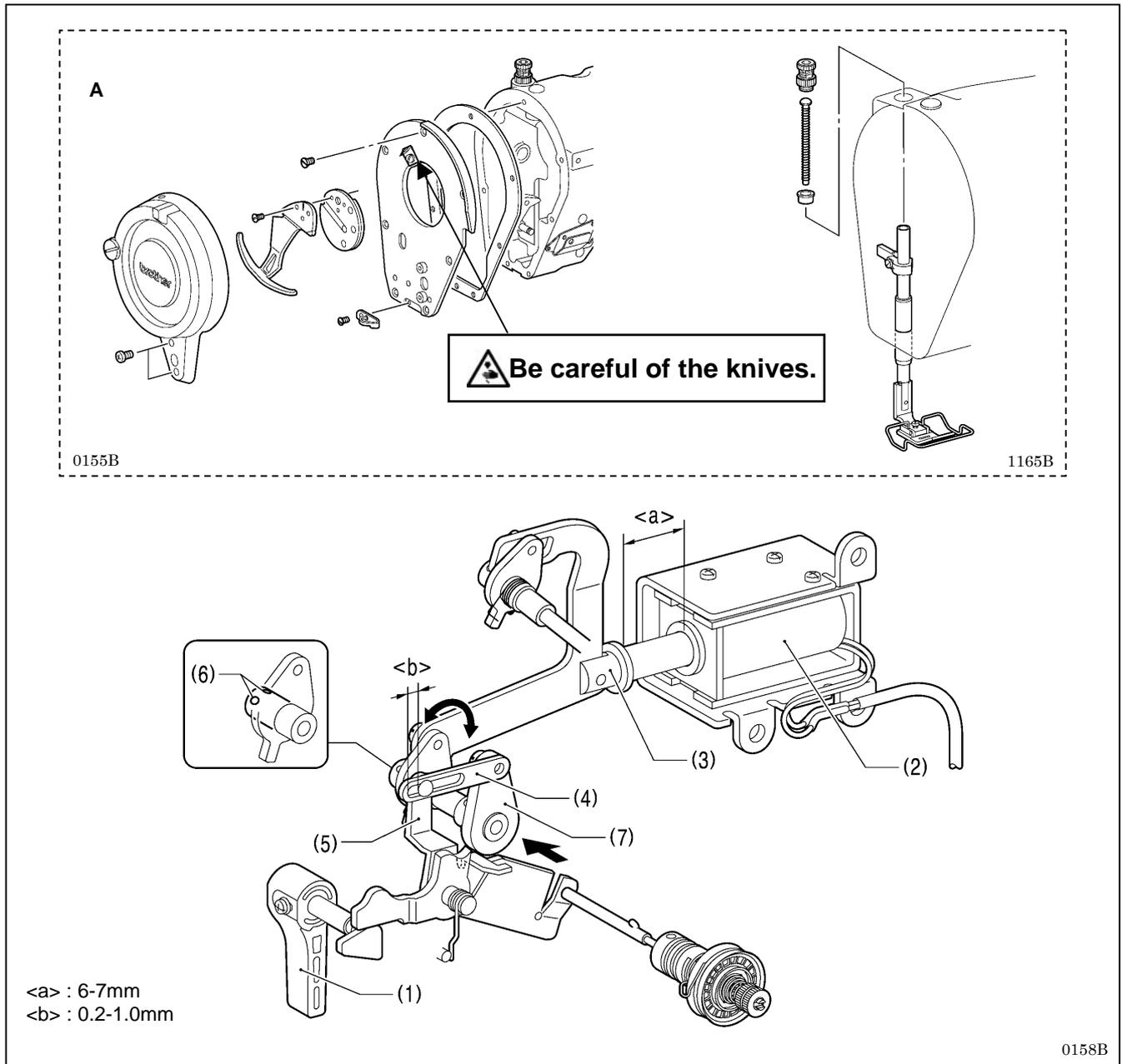
## 9-19. Adjusting the quick reverse device (8550A-A31, 8560A)



Adjust so that the plunger rubber (3) touches the bottom of the quick reverse solenoid (2) when the reverse stitching lever (1) is lowered to its lowest position while the feed amount is at the maximum setting.

1. Turn the condense dial (5) counterclockwise to its maximum setting.
2. Loosen the two screws (4).
3. Move the quick reverse solenoid (2) up or down to adjust.
4. Securely tighten the two screws (4).

9-20. Adjusting the tension release during thread trimming (8560A only)

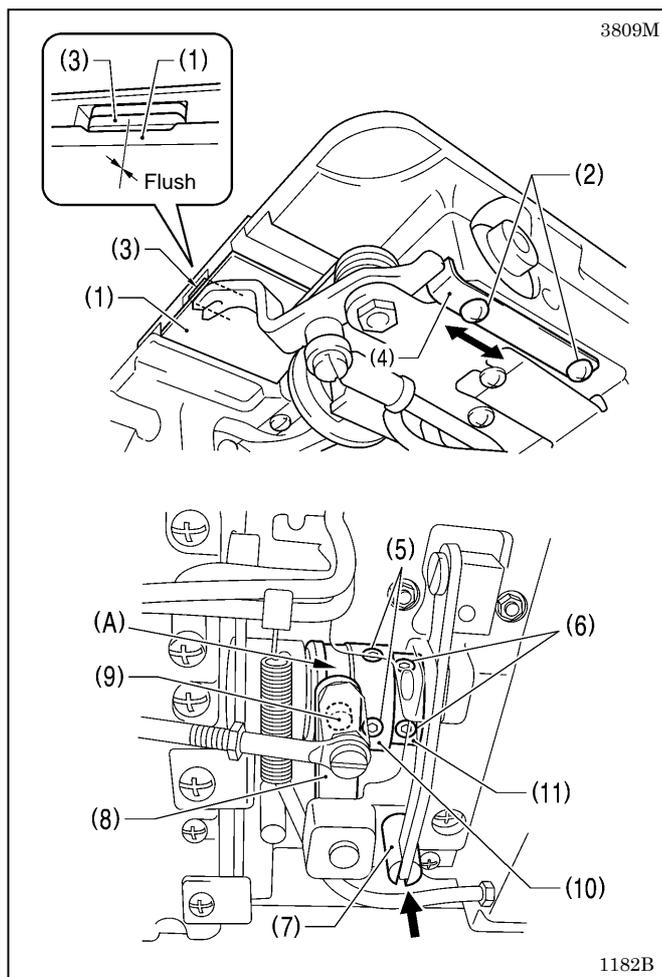


The tension release mechanism operates during thread trimming.

When the lifting lever (1) is lowered and the distance <a> for the plunger (3) of the solenoid (2) becomes 6 to 7 mm, the tension discs begin to loosen. Carry out adjustment by the following procedure.

1. Remove all of the parts shown in Figure A. (Keep them removed while adjustment is being carried out.)
2. Lower the lifting lever (1).
3. Adjust the tension release connecting rod (4) and the crimping pin of the tension release plate (5) so that the distance <b> is 0.2 to 1.0 mm.
  - \* Loosen the two set screws (6), and move the lever (7) to adjust distance <b>.
  - (It is easier to adjust if you touch the tension release connecting rod (4) against the crimping pin and then adjust to the distance shown in the illustration.)
4. While gently pushing the lever (7) toward the rear, tighten the two set screws (6).
5. Push in the plunger (3) of the solenoid (2) to the position shown in the illustration, and check the tension release start timing.

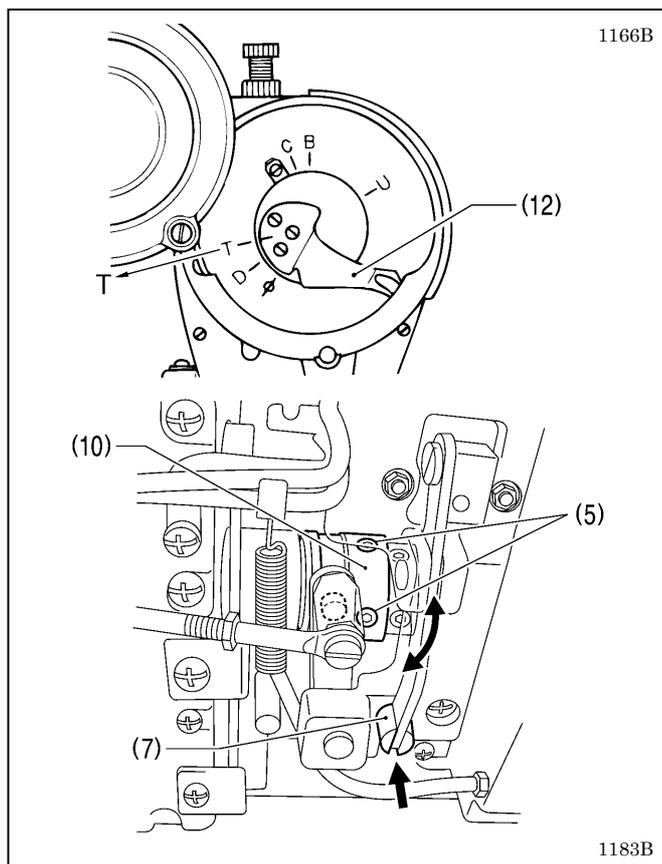
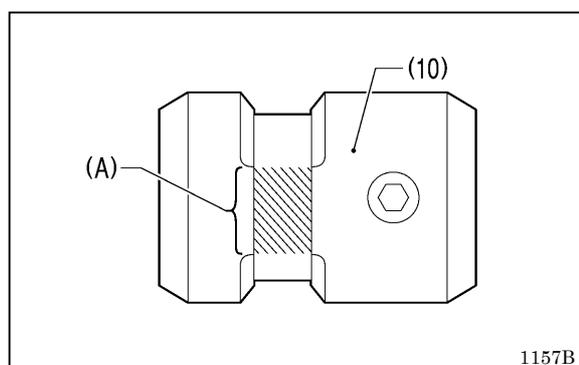
## 9-21. Adjusting the position of the thread trimming cam (8560A only)



The knife unit (1) should already be installed in the correct way when the following adjustments are carried out.

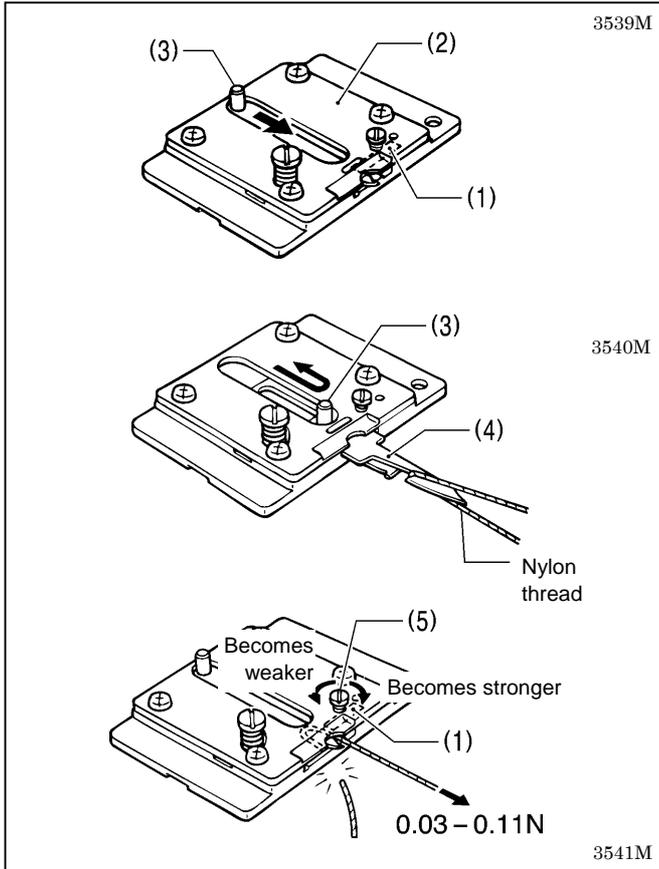
**<Horizontal position adjustment>**

1. Tilt back the machine head.
2. Loosen the two screws (2).
3. Move the stopper (4) to adjust so that the edge of the movable knife (3) is aligned with the edge of the knife unit (1).
4. Securely tighten the two screws (2).
5. Loosen the two set screws (5) and the two set screws (6).
6. While pushing the thread trimming driving rod (7) by hand, adjust the horizontal position of the thread trimming cam (10) so that the roller (9) of the main lever (8) moves smoothly in and out of the unbevelled straight section (A) of the groove in the thread trimming cam (10).
7. Provisionally tighten the two set screws (5).
8. Place the set screw collar (11) firmly against the thread trimming cam (10), and then securely tighten the two set screws (6).

**<Rotating direction adjustment>**

1. While still pushing thread trimming driving rod (7) by hand, turn the machine pulley slowly by hand toward you until the reference line on the thread take-up lever (12) is aligned with the T mark on the face plate. Adjust the position of the thread trimming cam (10) so that the knife begins to move at this point.
2. Securely tighten the two set screws (5).
3. While still pushing the thread trimming driving rod (7) by hand, turn the machine pulley slowly by hand toward you until the reference line on the thread take-up lever (12) is aligned with the T mark on the face plate. Check that the knife begins to move at this point.

### 9-22. Adjusting the tension of the plate spring (8560A only)

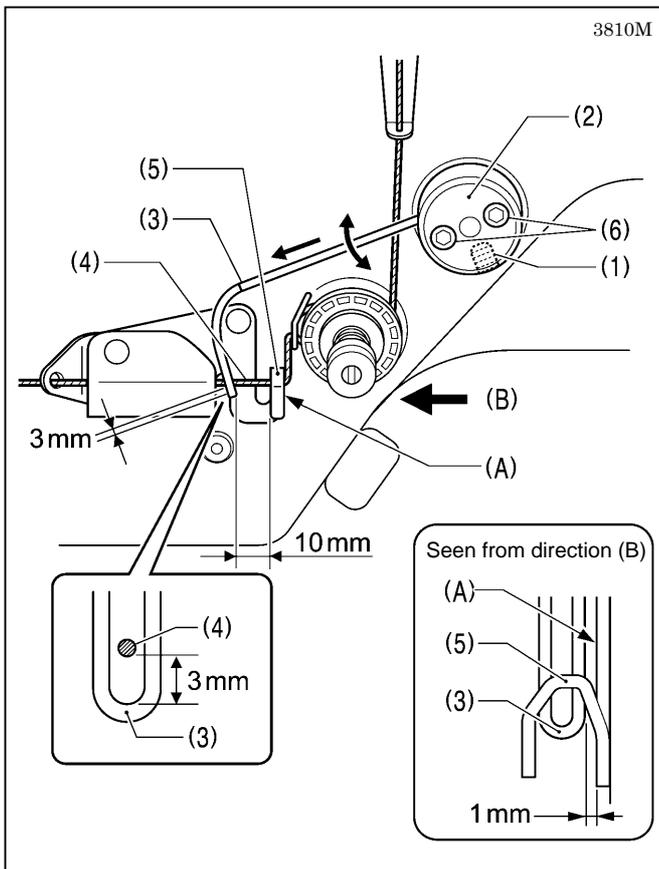


Adjust the tension of the plate spring (1) so that the tension is 0.03 to 0.11 N when the plate spring (1) is pulling the lower thread (nylon thread: 100D 1 X 3 (Z)) after thread trimming.

1. Remove the knife unit (2). (Refer to “11-1. Fixed knife and movable knife (8560A only)” of the Instruction Manual.)
2. Move the knob (3) to slide out the movable knife (4), and then hook the thread as shown in the illustration.
3. Return the movable knife (4) to trim the thread. After this, measure the tension of the lower thread presser spring (1) while it is pulling the lower thread.
4. Turn the screw (5) to adjust the tension of the plate spring (1) to 0.03 to 0.11 N.

**NOTE:** If using a tension gauge (sold separately) to measure the tension, take the reading from the scale on the side of the red line.

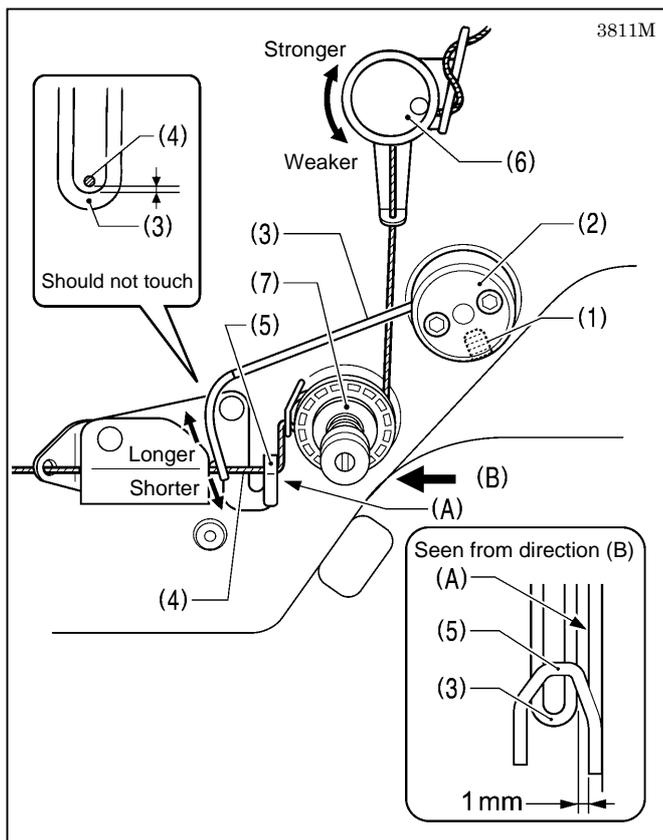
### 9-23. Adjusting the thread trailing length after thread trimming (8560A only)



#### <Standard position for upper thread feeding device>

The standard position for the upper thread feeding device is as shown in the illustration.

1. Loosen the set screw (1).
2. Turn the base (2) so that the end of the wire (3) is at a position 3 mm below the position where the upper thread (4) passes.
3. Tighten the set screw (1).
  - \* At this time, keep the end of the wire (3) 1 mm away from surface (A) of the thread guide (5).
4. Loosen the two bolts (6).
5. Move the wire (3) to the left or right so that the end of the wire (3) is 10 mm from the top-left edge of the thread guide (5).
6. Tighten the bolts (6).



**<Adjusting the upper thread trailing amount>**

The standard trailing length for the upper thread is 50-60 mm. If adjustment is necessary, adjust the position of the wire e as described below.

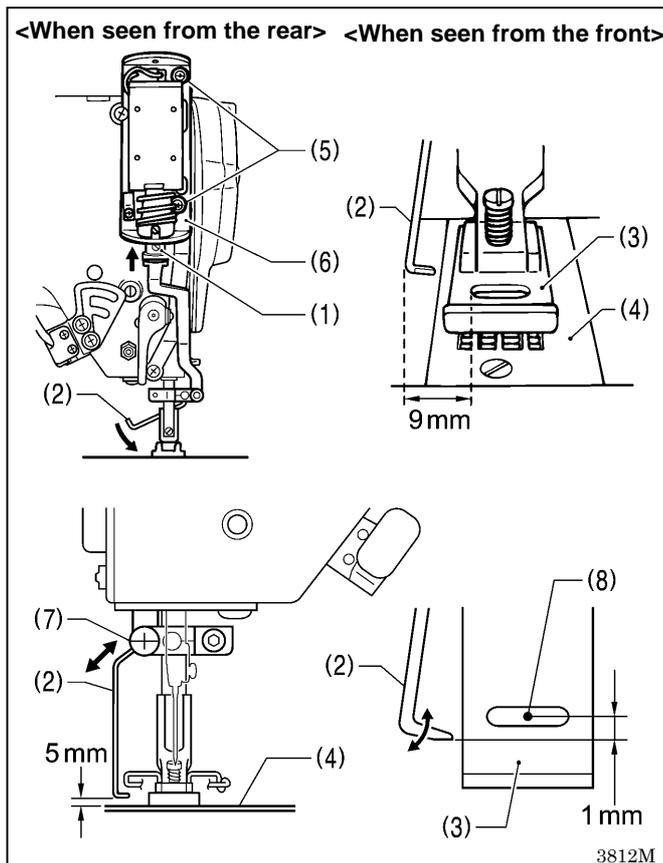
1. Loosen the set screw (1).
  2. Turn the base (2) to adjust the vertical position of the end of the wire (3).
    - To increase the upper thread trailing amount, raise the position of the wire (3) without letting it touch the upper thread (4).
    - To decrease the upper thread trailing amount, lower the position of the wire (3) without letting it touch the thread guide (5).
  3. After adjusting, tighten the set screw (1).
- \* At this time, keep the end of the wire (3) 1 mm away from surface (A) of the thread guide (5).

**NOTE:**

If the tension of the pre-tension (6) is too strong, it will be more difficult to adjust the upper thread trailing amount. The pre-tension (6) should be adjusted to as weak a tension as possible while still allowing the rotary disc (7) to rotate smoothly.

\* The thread tension will change at this time, so be sure to re-adjust the upper thread tension. (Refer to "9-1. Adjusting the thread tension" of the Instruction Manual.)

**9-24. Adjusting the thread wiper (8560A only, optional device)**



**<Horizontal position adjustment>**

- The front corner of the thread wiper (2) should be positioned 9 mm away from the left edge of the needle hole of the presser foot (3) (or the needle hole of the needle plate (4)) when the solenoid plunger (1) is pushed up as far as it will go.
- Loosen the two screws (5) and move the setting plate (6) up or down to adjust.

**<Height adjustment>**

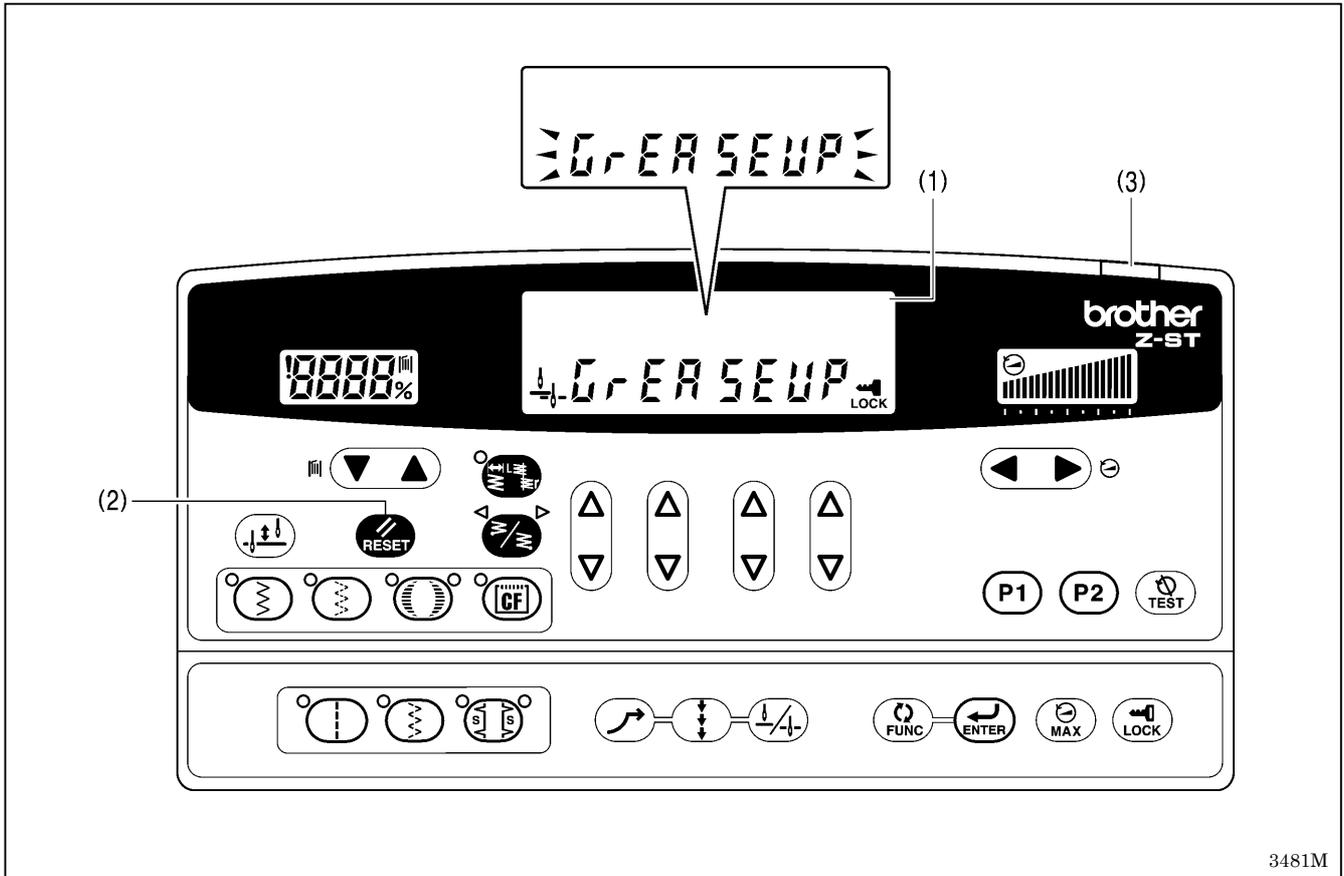
- Adjust so that the distance from the bottom edge of the thread wiper (2) to the top of the needle plate (4) is 5 mm.
- Loosen the screw (7) and move the thread wiper (2) up or down to adjust.

**<Forward/back adjustment>**

- Adjust so that the edge of the thread wiper (2) is positioned 1 mm forward of the needle tip (8).
- Loosen the screw (7), and then turn the thread wiper (2) to adjust.

## 10. APPLYING GREASE (When "GrEASEUP" appears)

If "GrEASEUP" flashes on the main display (1) 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 treadle is depressed.)  
Apply grease while referring to the following page.



### 10-1. To continue sewing temporarily without applying grease

1. Press the RESET key (2).
2. The main display (1) will change to zigzag width/zigzag base line position display mode, and sewing will be possible when the treadle is depressed.  
(The power indicator (3) will flash.)

**NOTE:**

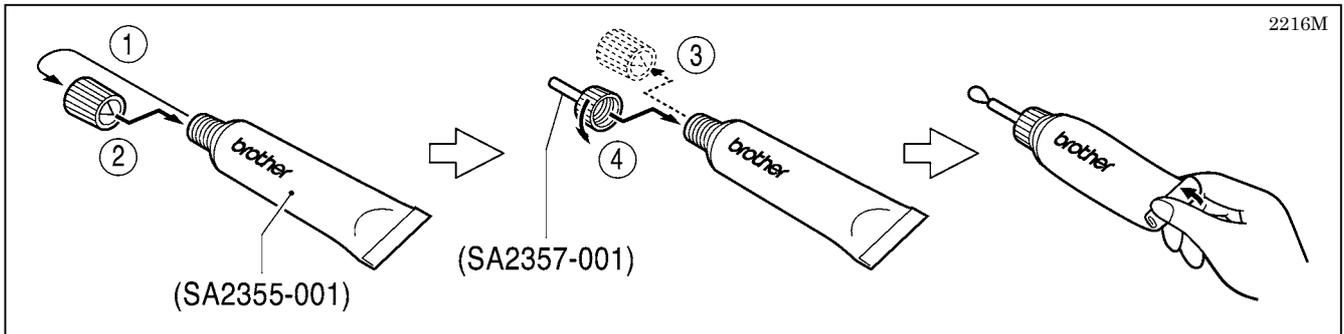
- The "GrEASEUP" notification will continue to appear and the power indicator (3) will flash each time the power switch is turned on until you apply grease and reset the cumulative operating time (refer to pages 86 - 87).
- If you continue to use the sewing machine after the "GrEASEUP" notification appears without applying grease (or without carrying out the reset procedure), "Err100" 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.

## 10-2. Applying grease

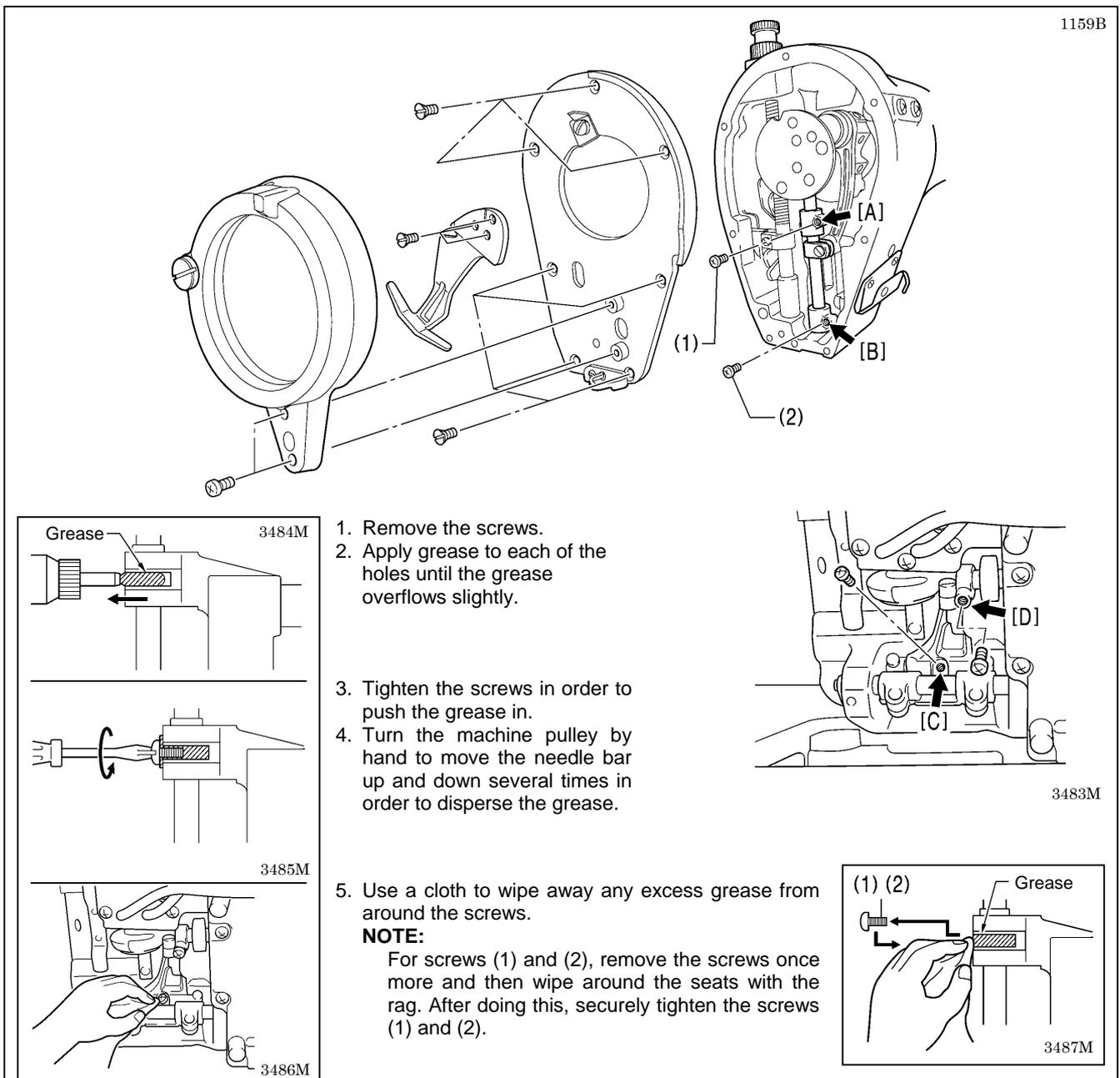
Use Brother-specified <GREASE (SA2355-001)>.

### 1. Using the tube



### 2. Applying grease

1. Turn the power switch to "OFF".
2. Apply grease in the places indicated by arrows [A] to [G] below.

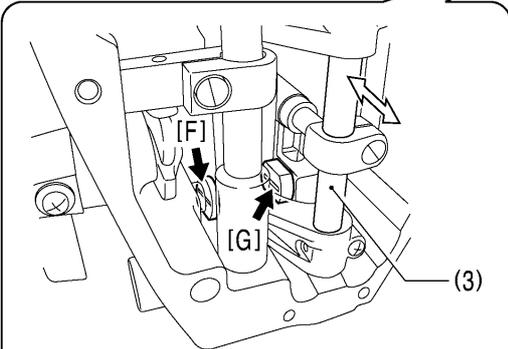
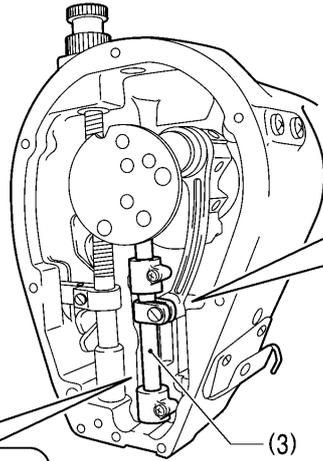


1. Remove the screws.
2. Apply grease to each of the holes until the grease overflows slightly.
3. Tighten the screws in order to push the grease in.
4. Turn the machine pulley by hand to move the needle bar up and down several times in order to disperse the grease.

5. Use a cloth to wipe away any excess grease from around the screws.
- NOTE:**  
For screws (1) and (2), remove the screws once more and then wipe around the seats with the rag. After doing this, securely tighten the screws (1) and (2).

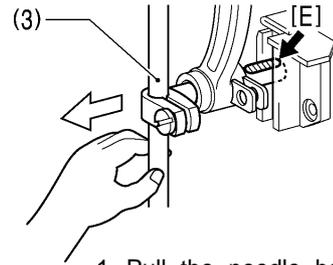
## 10. APPLYING GREASE (When "GrEASEUP" appears)

Use the tip of a long brush or similar to apply approx 1g of grease to the places indicated by arrows [E] to [G].



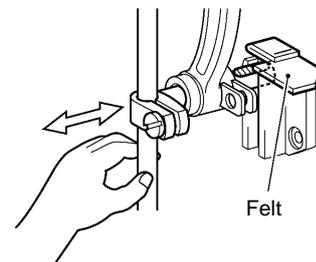
After applying approximately 1g of grease to the groove, move the needle bar (3) back and forth with your finger to spread the grease.

2. Apply approx 1g of grease.



1. Pull the needle bar (3) forward with your finger.

3. Turn the machine pulley to gently apply the grease onto the felt.

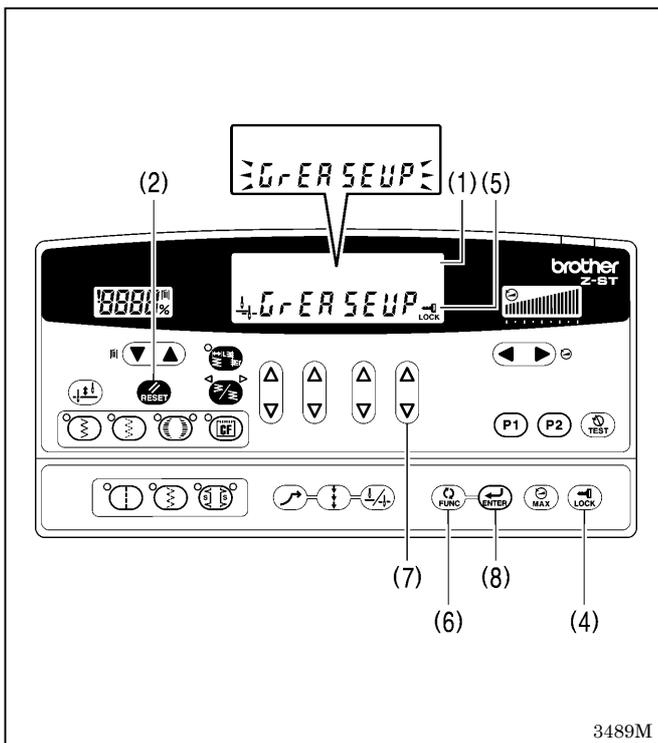


4. Move the needle bar (3) back and forth with your finger to spread the grease.

3488M

After applying grease in the places indicated by arrows [A] to [G] above, carry out the reset operation described below.

### 10-3. Resetting the cumulative operating time



3489M

After the grease has been applied, carry out the following procedure to reset the cumulative time between grease applications.

1. Turn the power switch to "ON". "GrEASEUP" will flash in the main display (1) and the buzzer will sound.
2. Press the RESET key (2). The main display (1) will switch to zigzag width/zigzag base line position display mode.
3. Press and hold the LOCK key (4) for 2 seconds or more. The lock icon (5) will switch off and the lock will be released.
4. Press the FUNC (Function) key (6). "n.134 xxx" will appear in green in the main display (1). (xxx represents the time between grease applications.)
5. Press the rightmost key (7). The "▽" will change to "0".
6. Press and hold the ENTER key (8) for two seconds or more.  
A long beep will sound and the main display (1) will switch to zigzag width/zigzag base line position display mode.
7. Depress the treadle to run the sewing machine for 1 second or more.
8. Turn the power switch to "OFF". (This completes the reset procedure.)

# 11. ELECTRICAL 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 cover of the control box. Touching areas where high voltages are present can result in severe injury.

### 11-1. Precautions while carrying out adjustments

Be sure to note the following cautions when opening the control box to carry out inspections and adjustments.

#### **Electric shocks**

High voltages can remain in large-capacity capacitors for up to 5 minutes in some circumstances, even when the power has been turned off. Accordingly, wait at least 5 minutes after turning off the power before carrying out the following operations.

- Opening and closing the control box
- Replacing fuses
- Inserting and disconnecting connectors
- Measuring resistance values
- Any other tasks that may involve touching components inside the control box

Some inspection items require the control box to be open when the power is turned on and voltages are measured.

At such times, be extremely careful never to touch anywhere other than the specified locations. In addition, note that high voltages may remain for up to 5 minutes after the power is turned off.

#### **Injury**

The fan inside the control box turns while the power is turned on, so be careful not to get anything caught in it.

Be careful not to touch metallic objects such as the heat sink and cover when connecting and disconnecting connectors and making measurements.

## 11-2. Control box internal configuration

### Main P.C. board

Secured to the side. This is the P.C. board that controls sewing machine operation. There is 1 fuse on this P.C. board.

### PMD P.C. board

Secured to the base plate. This is the P.C. board that drives the needle zigzag pulse motor.

### Power supply P.C. board

Secured to the rear. This P.C. board generates the voltages that are required for control, and drives the main shaft motor. There are 3 fuses on this P.C. board.

### Cooling fan

This fan cools the inside of the control box.

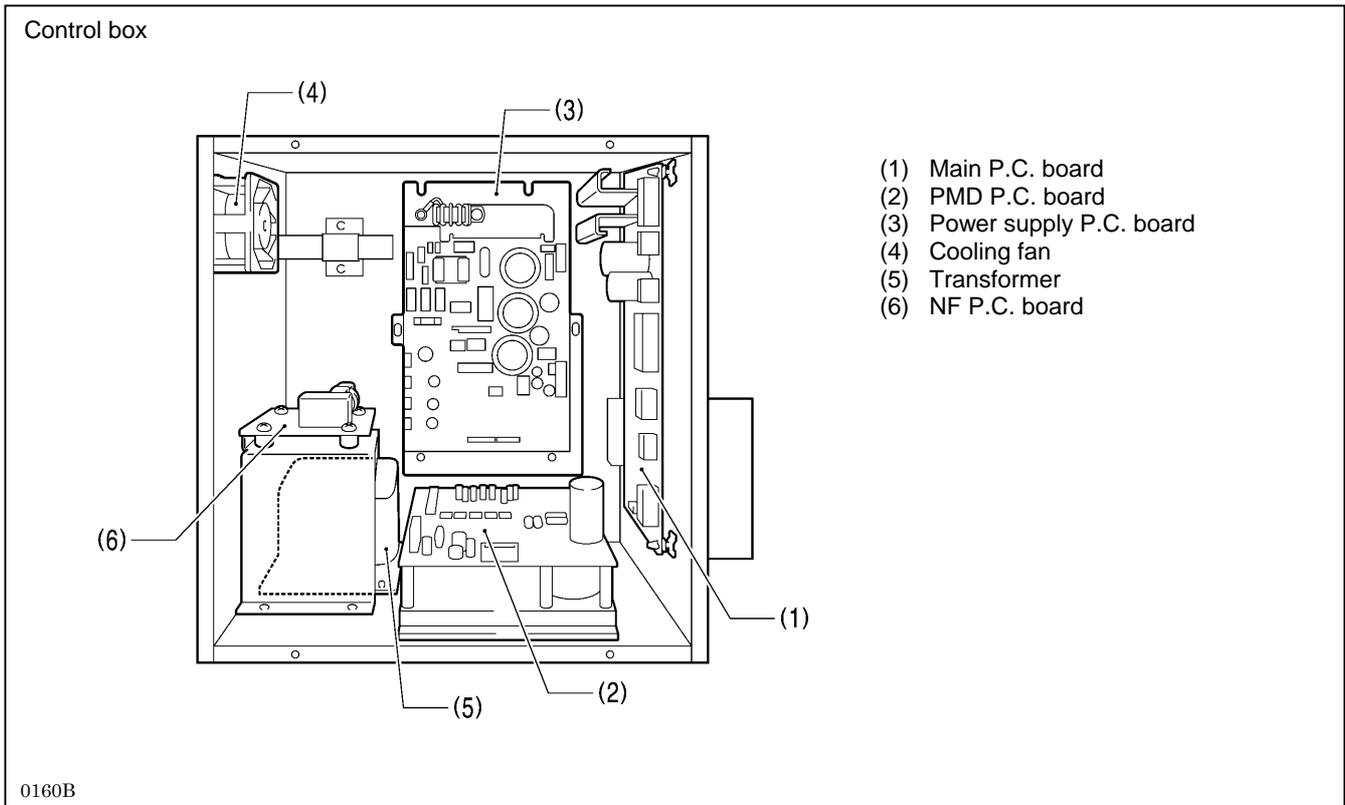
The filters at the air intake slots in the cover and base plate should be cleaned about once a month.

### Transformer (Two types are available depending on the power supply voltage specifications.)

This breaks down the power supply voltage into the voltages that are required for control operations.

### NF P.C. board (Models for Europe only)

This eliminates the electrical interference that is generated by the power supply fan.



### 11-3. Description of fuses

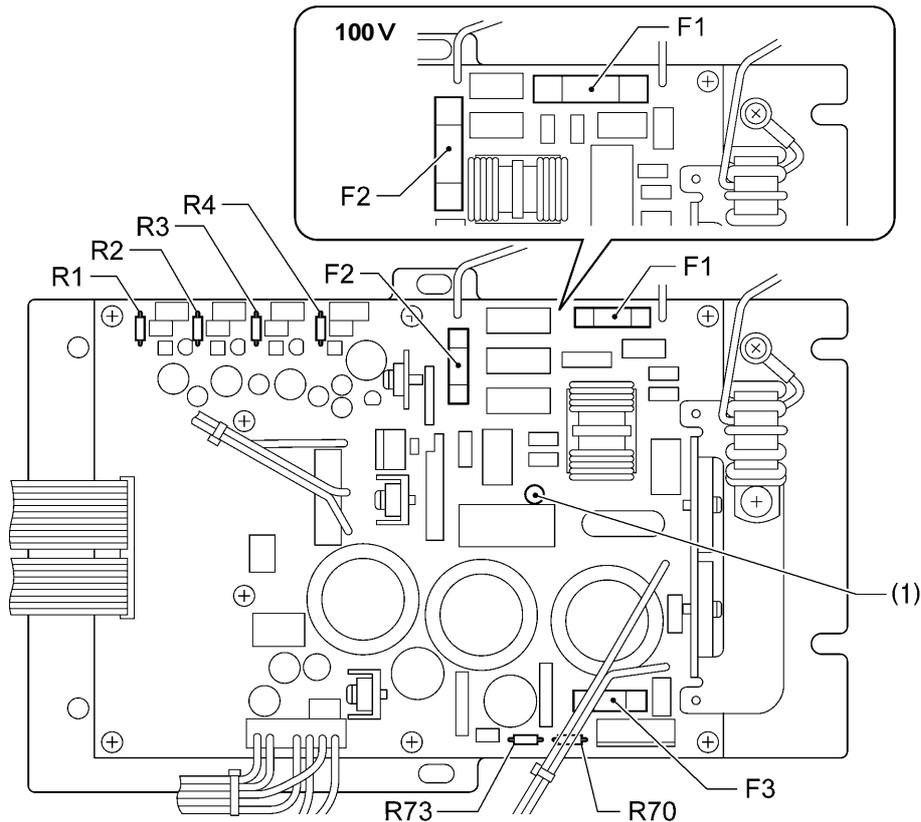
#### 11-3-1. Power supply P.C. board (fuses and fuse resistors)

When replacing the fuses and fuse resistors, be sure to use the parts specified below.

If the components on the P.C. boards are damaged, the fuses may blow again soon even after they have been replaced.

No.	Part name	Parts code	Symptom when fuse blows
F1, F2	200 V system Fuse 10A (Glass tube fuse 10A-250V)	J 04417-001	Power does not turn on and red LED (1) on power supply P.C. board does not illuminate.
	100 V system Fuse 20A (Glass tube fuse 20A-250V)	J 02585-001	Power does not turn on and red LED (1) on power supply P.C. board does not illuminate.
F3	Fuse 5A (Glass tube fuse 5A-250V)	J 04418-001	Needle zigzag motor does not operate and [Err 200] is displayed.
R70	Fuse resistor 1/2W 0.47 Ω	J 04415-001	Needle zigzag motor does not operate and [Err 200] is displayed.
R73	Fuse resistor 1/2W 0.22 Ω	J 02754-001	Needle zigzag motor does not operate and [Err 200] is displayed.
R1, R2, R3	Fuse resistor 1/4W 0.47 Ω	J 04482-001	Sewing machine motor does not operate and [Err 130] is displayed.
R4	Fuse resistor 1/2W 0.47 Ω	J 04415-001	Sewing machine motor does not operate and [Err 130] is displayed.

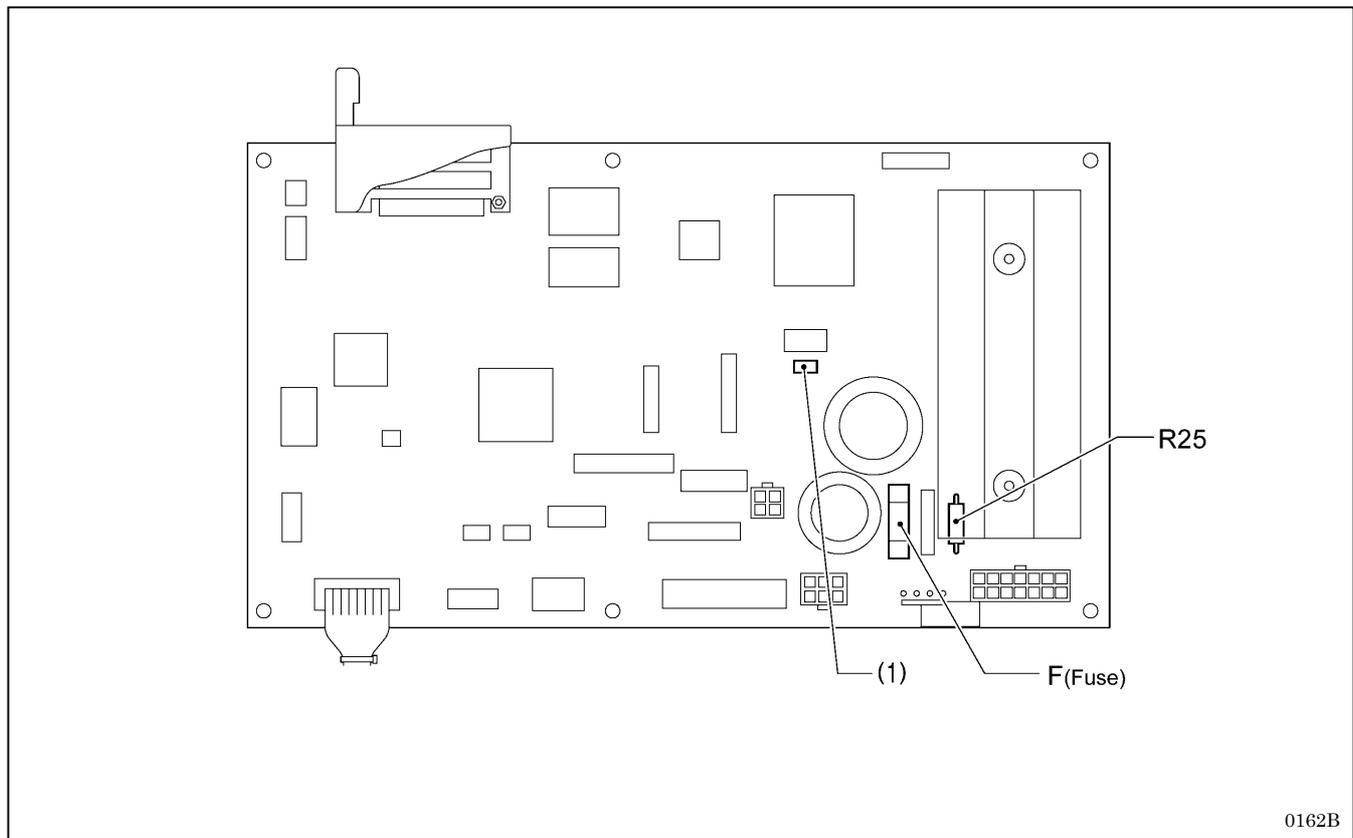
\* The diagram of the power supply P.C. board shown below is for the 200 V systems. The power supply P.C. board for 100 V systems are the same as the one for 200 V systems except for the section indicated in the diagram.



0161B

11-3-2. Main P.C. board (fuses and fuse resistors)

No.	Part name	Parts code	Symptom when fuse blows
F	Fuse 8A (Glass tube fuse 8A-250V)	J04502-001	[Err 790] is displayed when the sewing machine starts.
R25	Fuse resistor 1/2W 0.22 Ω	J02754-001	Power does not turn on and green LED (1) does not illuminate.



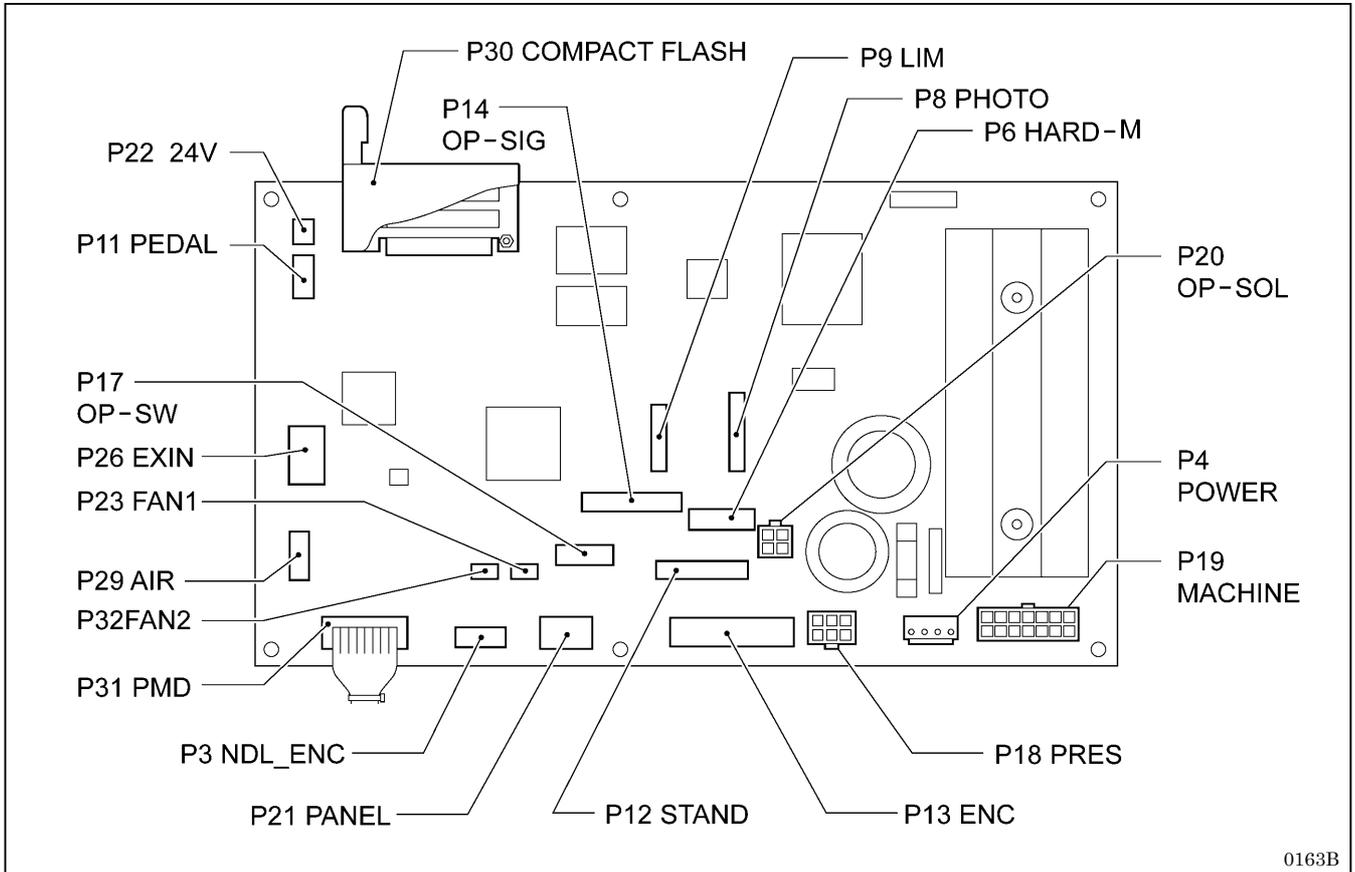
0162B

## 11-4. Description of connectors

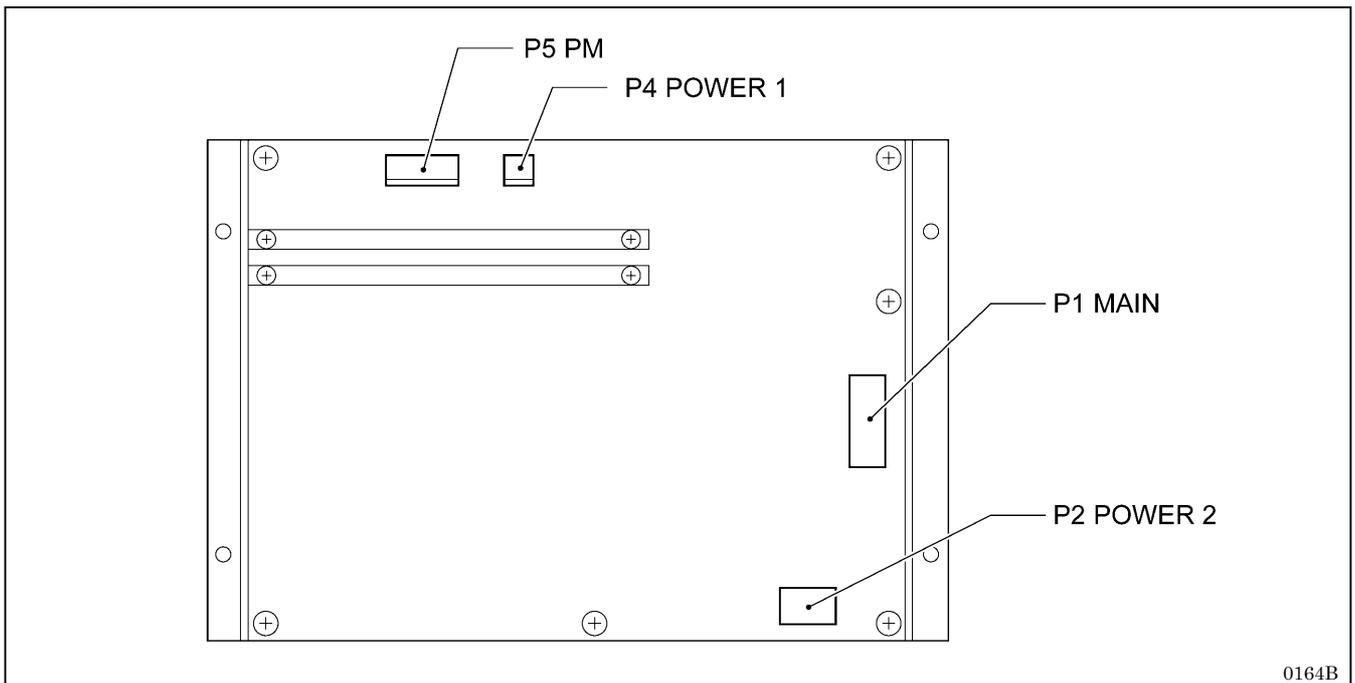
A large number of problems are often caused by connectors that are not inserted correctly or which are contacting poorly. As a result, check that all connectors are inserted correctly and that the pins and wires are crimped properly before carrying out problem diagnosis.

### 11-4-1. Connector positions

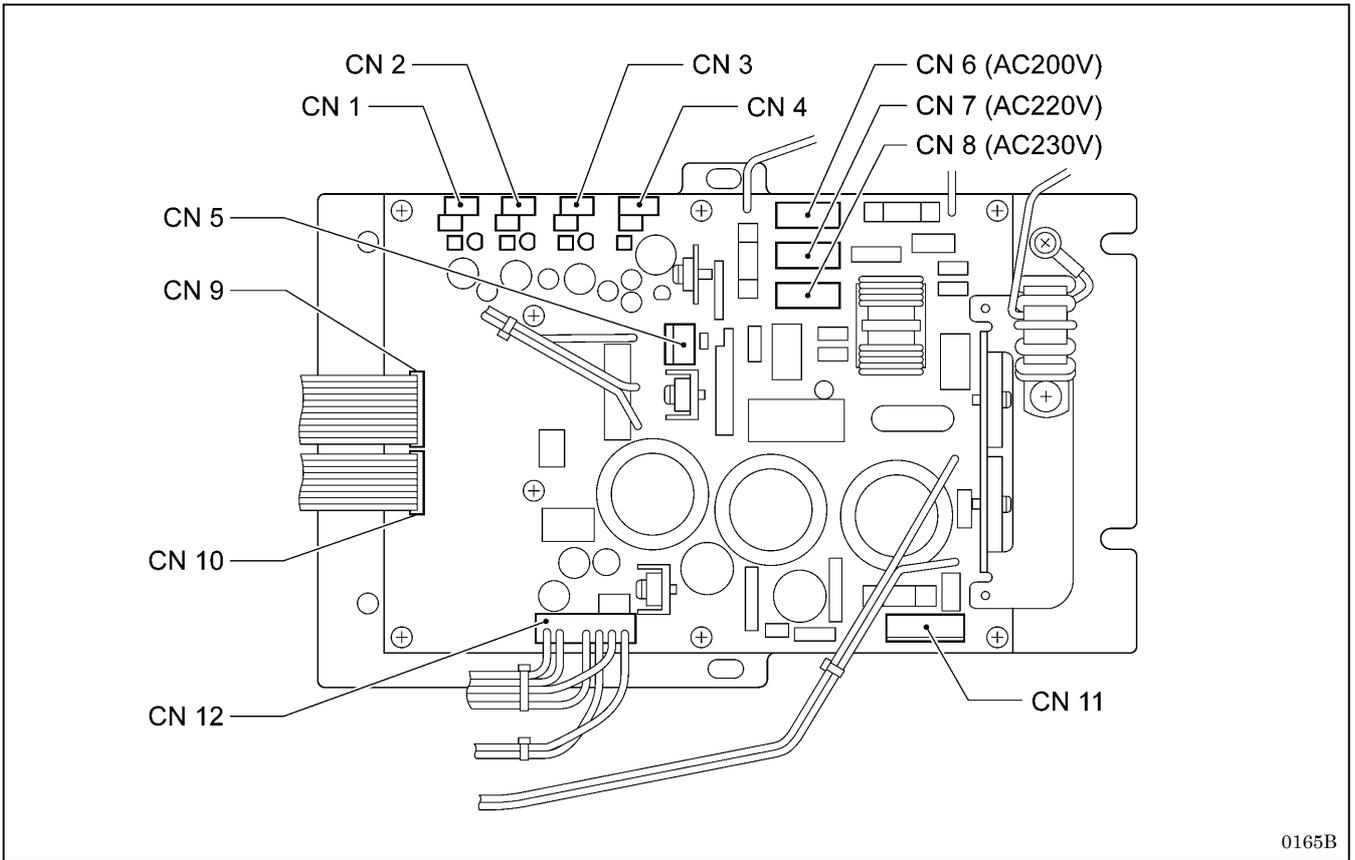
#### Main P.C. board



#### PMD P.C. board



Power supply P.C. board

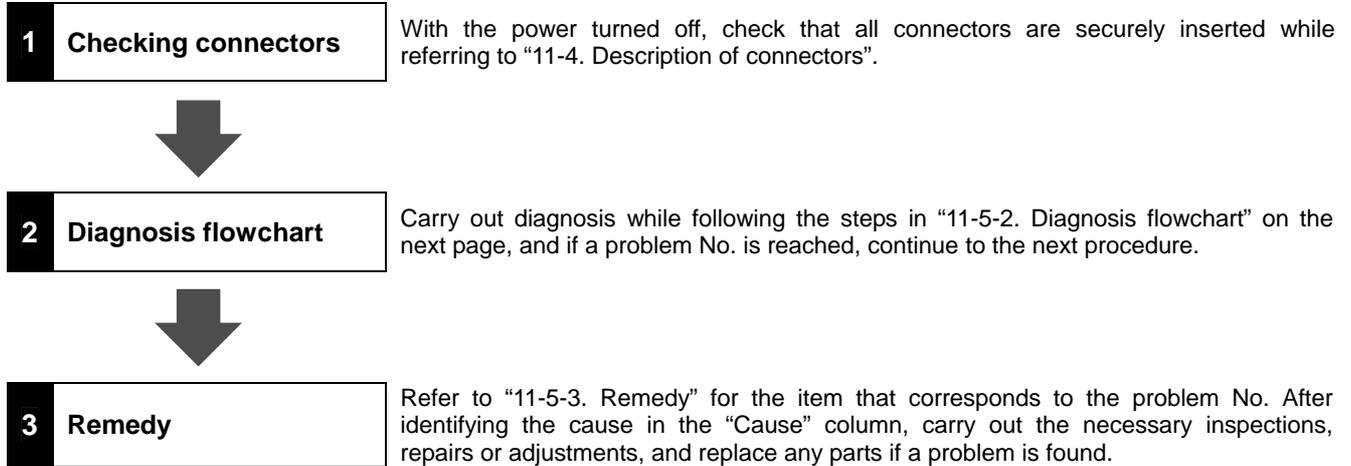


0165B

## 11-5. Troubleshooting

### 11-5-1. Troubleshooting procedure

Carry out troubleshooting by following the procedure given below.

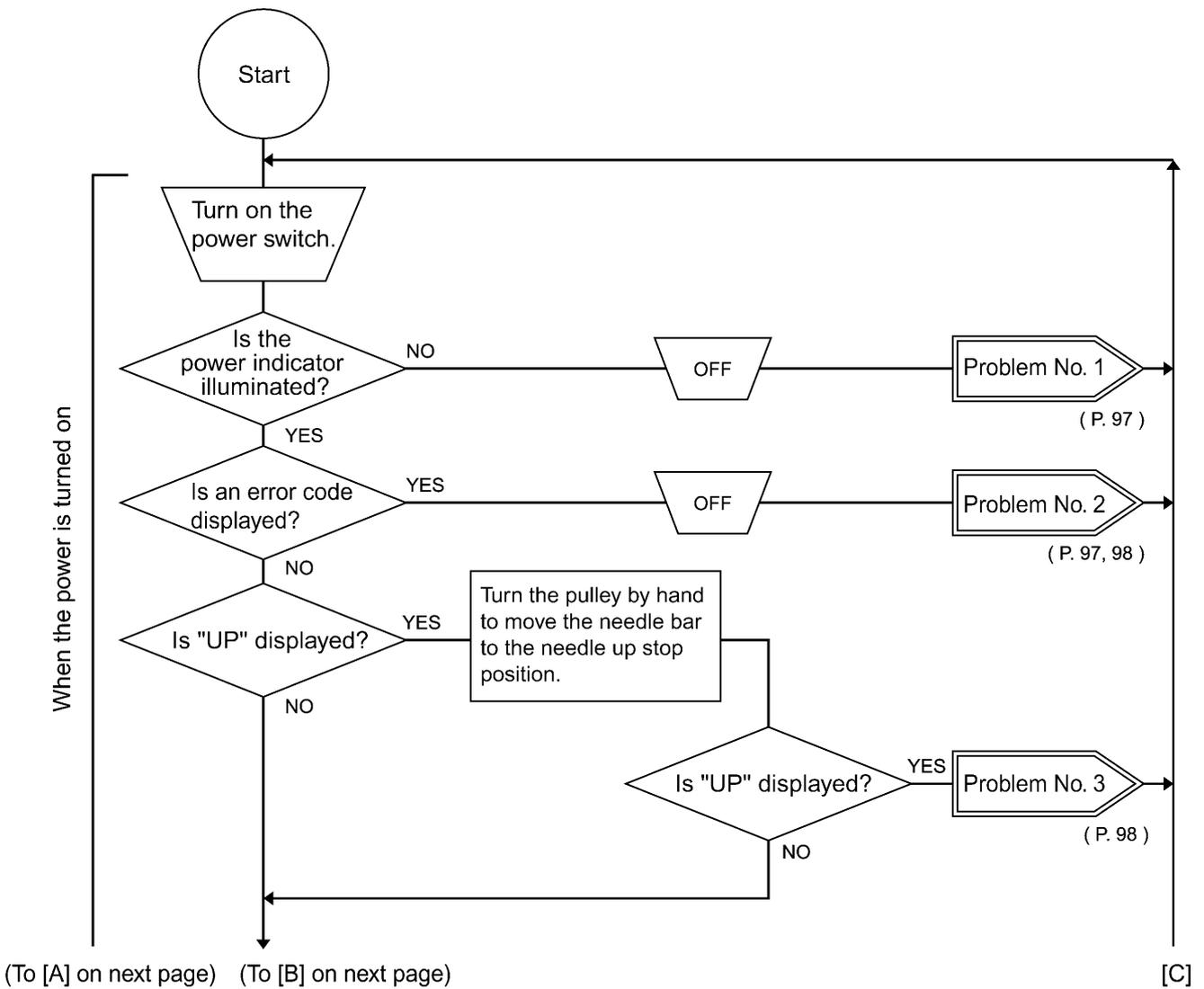
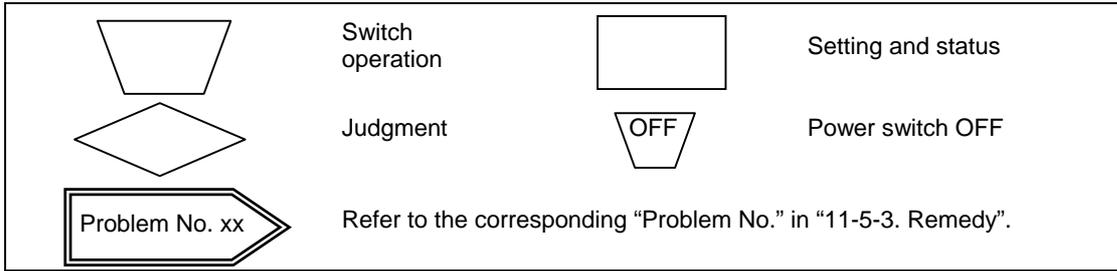


**NOTE:**

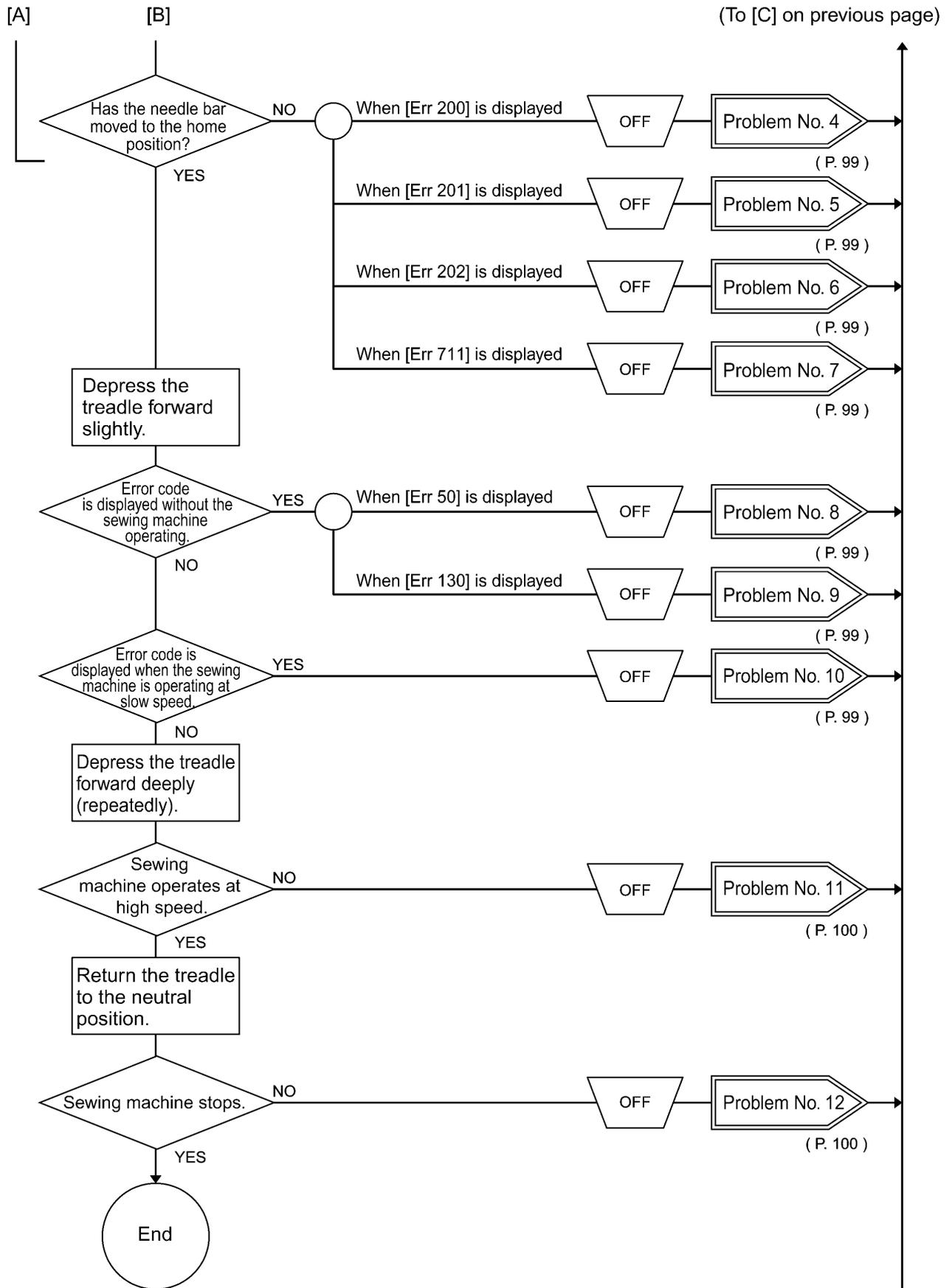
When replacing the fuses, be sure to use a fuse with the same material and rating.

11-5-2. Diagnosis flowchart

Description of symbols



0303B



0304B

### 11-5-3. Remedy

If a problem No. is reached while carrying out the diagnosis steps in “11-5-2. Diagnosis flowchart”, refer to the table for the corresponding number. After identifying the cause in the “Cause” column, carry out the steps in the “Inspection/Remedy/Adjustment” column, and if a malfunction is found, replace the parts specified in “Replacement if a malfunction”.

**Problem No. 1**

The power indicator (red) on the power supply P.C. board does not illuminate when the power switch is turned on.

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
1. If the red LED on the power supply P.C. board is not illuminated: Malfunction of power supply P.C. board or transformer	Check the power cord. • Is fuse F1 or F2 on the power supply P.C. board blown? • Is the primary coil of the transformer burnt out?	If fuse F1 or F2 is blown, replace the power supply P.C. board or transformer.
2. If the red LED on the power supply P.C. board is illuminated: Malfunction of transformer, main P.C. board or panel assembly	1) Check if the secondary coil of the transformer is burnt out or if there is an open circuit.	Transformer
	If the power indicator (green) on the main P.C. board is not illuminated: 2) Check if fuse resistor R25 on the main P.C. board is blown.	Main P.C. board
	If the power indicator (green) on the main P.C. board is illuminated: 3) (Replace the part(s) indicated at right.)	Main P.C. board or panel assembly

**Problem No. 2**

An error code is displayed when the power switch is turned on.

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
1. When [Err 740] is displayed: The cooling fan for the oil pan is disconnected or not operating, or the cooling fan inside the control box is not operating.	1) Check if thread scraps are blocking the cooling fans (for oil pan and control box).	DC fan motor assembly
	2) Check that connector P23 (FAN1) and connector P32 (FAN2) are inserted into the main P.C. board.	
2. When [Err 65] is displayed: One of the keys on the operation panel is still depressed.	Check that connector P21 (PANEL) is inserted into the main P.C. board.	Panel assembly
3. When [Err 95] is displayed: Power switch was turned on while treadle was depressed.	Return the treadle to the neutral position and turn the power switch off and back on again to check.	Treadle unit
4. When [Err 90] is displayed: Poor connection for treadle unit connector	Check that connector P11 (PEDAL) is inserted into the main P.C. board.	Treadle unit

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
5. When [Err 91] is displayed: Problem with treadle unit settings	Repeat the standard settings for the treadle unit. (Refer to "12-3. Standard settings for treadle depression stroke".)	-
6. When [Err 450] is displayed: Problem with machine head memory data; Model selection cannot be loaded	(Replace the part(s) indicated at right.)	Machine head memory unit
7. When [Err 452] is displayed: Machine head memory cannot be verified.	Check that connector P6 (HEAD-M) is inserted into the main P.C. board.	Machine head memory unit
8. When [Err 403] is displayed: Poor connection between main P.C. board and PMD P.C. board	1) Check that connector P31 (PMD) is inserted into the main P.C. board and that connector P1 (MAIN) is inserted into the PMD P.C. board.	Harness, PMD P.C. board, main P.C. board
	2) Check if there is a harness short-circuit.	Harness
9. When [Err 401] or [Err 411] is displayed: Main P.C. board communication error	Turn the power switch off and back on again.	Main P.C. board
10. When [Err 700] is displayed: Abnormal rise in power supply voltage	Check that the power supply voltage at the wall outlet is within the range of the specification voltage +/- 10%.	-
11. When [Err 705] is displayed: Abnormal drop in power supply voltage	Check that the power supply voltage at the wall outlet is within the range of the specification voltage +/- 10%.	-
12. When [Err 101] is displayed: DIP switch No. 4 on the main P.C. board is ON	Set DIP switch No. 4 to OFF and then turn the power switch off and back on.	-
13. When [Err 200] is displayed: Needle zigzag motor is not connected	Check that connector P5 (PMD) is inserted into the PMD P.C. board.	Needle zigzag motor or PMD P.C. board
14. When [Err 131] is displayed: Encoder cord of sewing machine motor is not connected.	Check that connector P13 (ENC) is inserted into the main P.C. board.	Sewing machine motor or main P.C. board

**Problem No. 3**

"UP" is displayed when the power switch is turned on.

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
Malfunction of encoder P.C. board in sewing machine motor	1) Turn the pulley to move the needle bar to the needle up stop position.	Encoder P.C. board in sewing machine motor
	2) Check if the needle up signal remains on.	

## 11. ELECTRICAL MECHANISM

### Problem No. 4, 5, 6, 7

Needle bar does not move to the home position and an error code is displayed when the power switch is turned on.

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
1. When [Err 200] is displayed: <ul style="list-style-type: none"> <li>Needle zigzag motor cannot move to home position</li> <li>Encoder cord of needle zigzag motor is not connected.</li> </ul>	Check that connector P3 (ENC) is inserted into the main P.C. board.	Encoder P.C. board in needle zigzag motor
2. When [Err 201] is displayed: Problem with needle zigzag motor or problem with sliding resistance	1) Check if there is too much or too little needle zigzag sliding resistance. (Check if there is variation in the load.)	-
	2) Adjust the sliding resistance within the range of 1.2 kgf to 1.5 kgf.	
3. When [Err 202] is displayed: Problem with home position adjustment data for needle zigzag motor	Check the home position adjustment.	-
4. When [Err 711] is displayed: Abnormal current detected in needle zigzag motor	(Replace the part(s) indicated at right.)	PMD P.C. board

### Problem No. 8, 9

Sewing machine motor does not operate and an error code is displayed when treadle is depressed forward.

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
1. When [Err 50] is displayed: Sewing machine safety switch operation detected	Adjust the operation of the safety switch. (Check the gap between the sewing machine and the table.)	-
2. When [Err 130] is displayed: Sewing machine motor does not operate	Check that the sewing machine motor cord is inserted into the side of the control box.	Power supply P.C. board or main P.C. board

### Problem No. 10

Sewing machine motor operates but an error code is displayed when the treadle is depressed forward.

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
When [Err 132] is displayed: Problem with A phase encoder signal of sewing machine motor	(Replace the part(s) indicated at right.)	Motor or encoder P.C. board

**Problem No. 11**

Error code is displayed while sewing machine is operating.

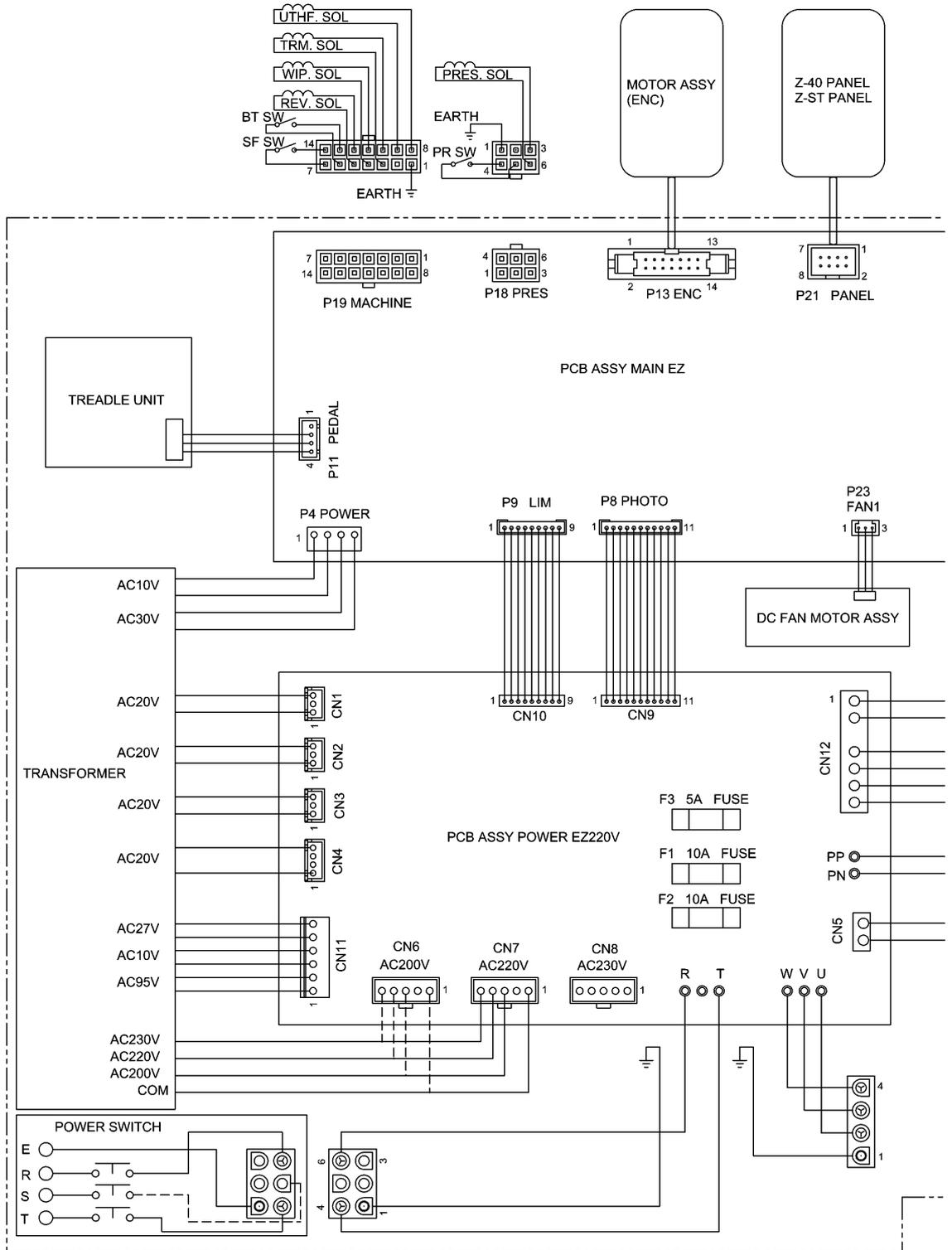
Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
When [Err 710] is displayed while sewing machine is operating: Abnormal current detected in sewing machine motor	(Replace the part(s) indicated at right.)	Power supply P.C. board

**Problem No. 12**

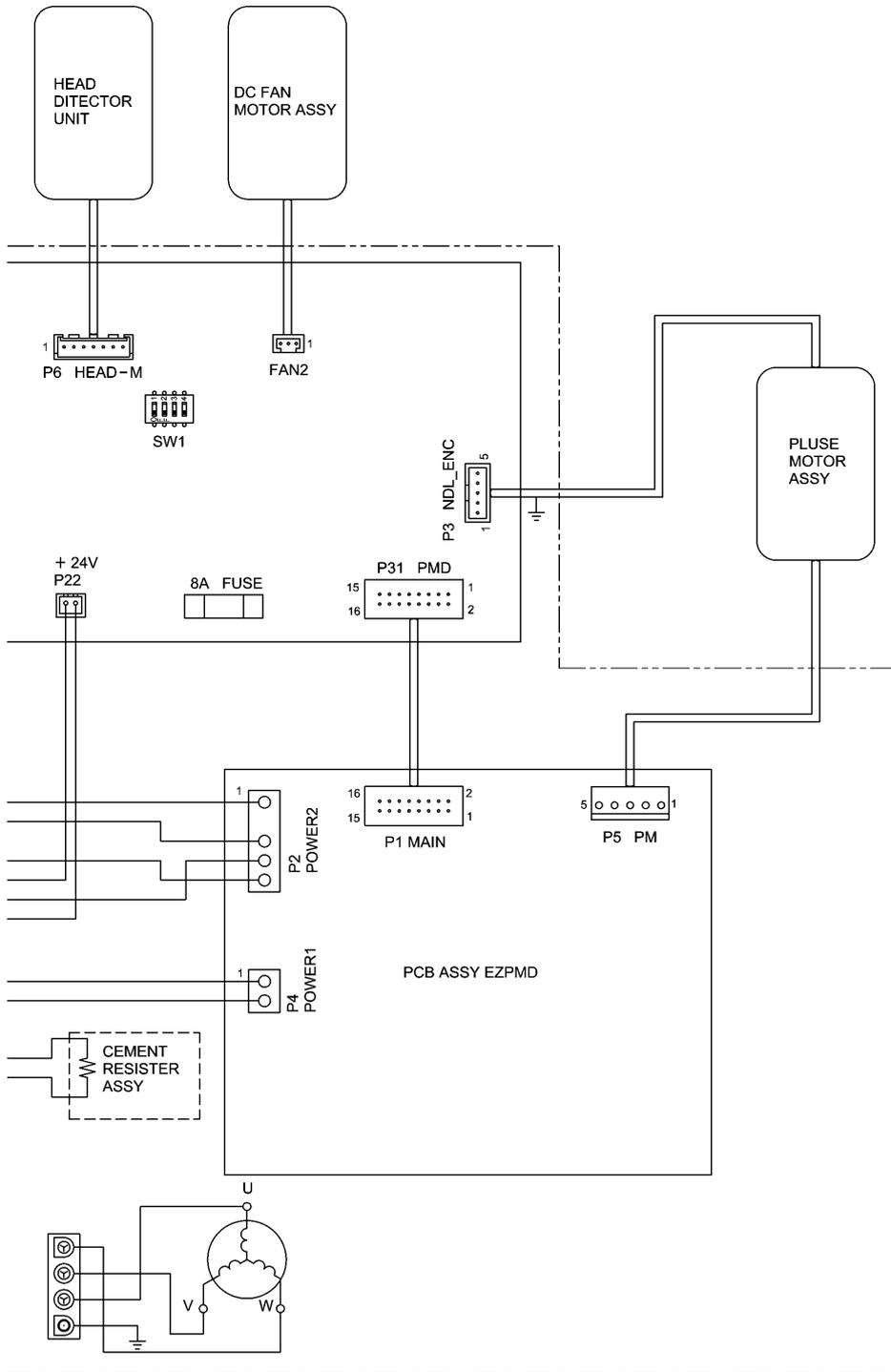
Sewing machine does not stop correctly (needle down stop or needle up stop).

Cause	Inspection/Remedy/Adjustment	Replacement if a malfunction
1. Needle stop position for sewing machine motor cannot be verified.	Try carrying out the procedures in "3-6. Checking input and output".	-
2. Stop position for needle zigzag motor cannot be verified	(If the needle zigzag stop position key is on, stopping will be delayed when 3-step zigzags are sewn.)	-

11-6. Wiring diagrams



0124B

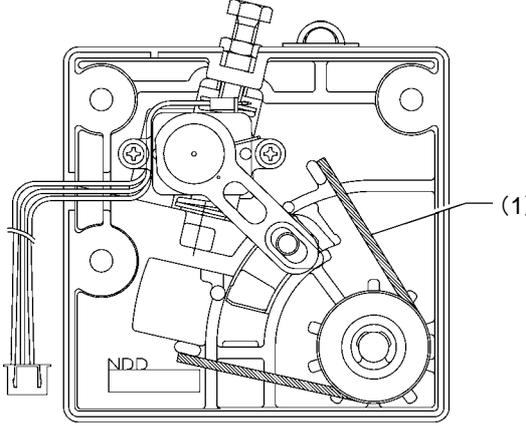
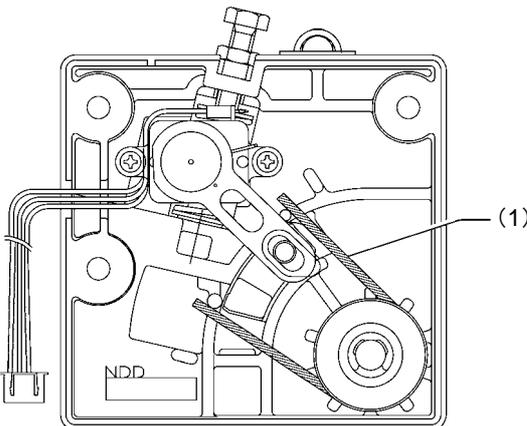


0125B

# 12. TREADLE UNIT

## 12-1. Types

- Two types of treadle unit are available: a type which controls the automatic presser foot lifter and a type which does not control it.
- It is possible to switch between the two specifications by <A> Changing the hooking position of the spring (1) inside the treadle unit; <B> setting DIP switch No. 2; and <C> setting the treadle depression stroke.

SPECIFICATIONS	Treadle unit -G	Treadle unit -H
Operation	Does not control the automatic presser foot lifter	Controls the automatic presser foot lifter
<A> Difference in spring position	[a]  1839M	[b]  1840M
<B> DIP switch setting	DIP switch No. 2: OFF <When treadle is depressed forward> Presser foot control signal is not output while treadle is being depressed.	DIP switch No. 2: ON <When treadle is depressed forward> Automatic presser foot lifting signal is output immediately before the depression force suddenly changes.
<C> Signal setting	Make the settings in "12-3. Standard settings for treadle depression stroke". Set the "Neutral position", "Maximum forward depression position" and "Maximum backward depression position".	Make the settings in "12-3. Standard settings for treadle depression stroke". Set the "Neutral position", "Maximum forward depression position" and "Maximum backward depression position". The modulation position for the depression force at the first step is set automatically.
<D> Depression force	<When depressing forward or depressing backward> The depression force hardly changes at all from the start of depression until the maximum depression.	<When depressing forward or depressing backward> The depression force suddenly changes at a point between the start of depression and the maximum depression.
<E> Depression signal	<When depressed forward> Sewing machine starts. <When depressed backward> Sewing machine starts. (*1)	<When depressing forward or depressing backward> Automatic presser foot lifting signal is output immediately before the depression force suddenly changes, and the sewing machine starts at the point after the force suddenly changes.

(\*1) The presser foot lifting signal is output while the treadle is being depressed backward. However, if DIP switch No. 1 is set to OFF, the presser foot lifting signal is not output while the treadle is being depressed backward after the knee switch has been used to lift the presser foot.  
In addition, if memory switch No. 41 is set to "1", the presser foot lifting signal is no longer output while the treadle is being depressed backward.

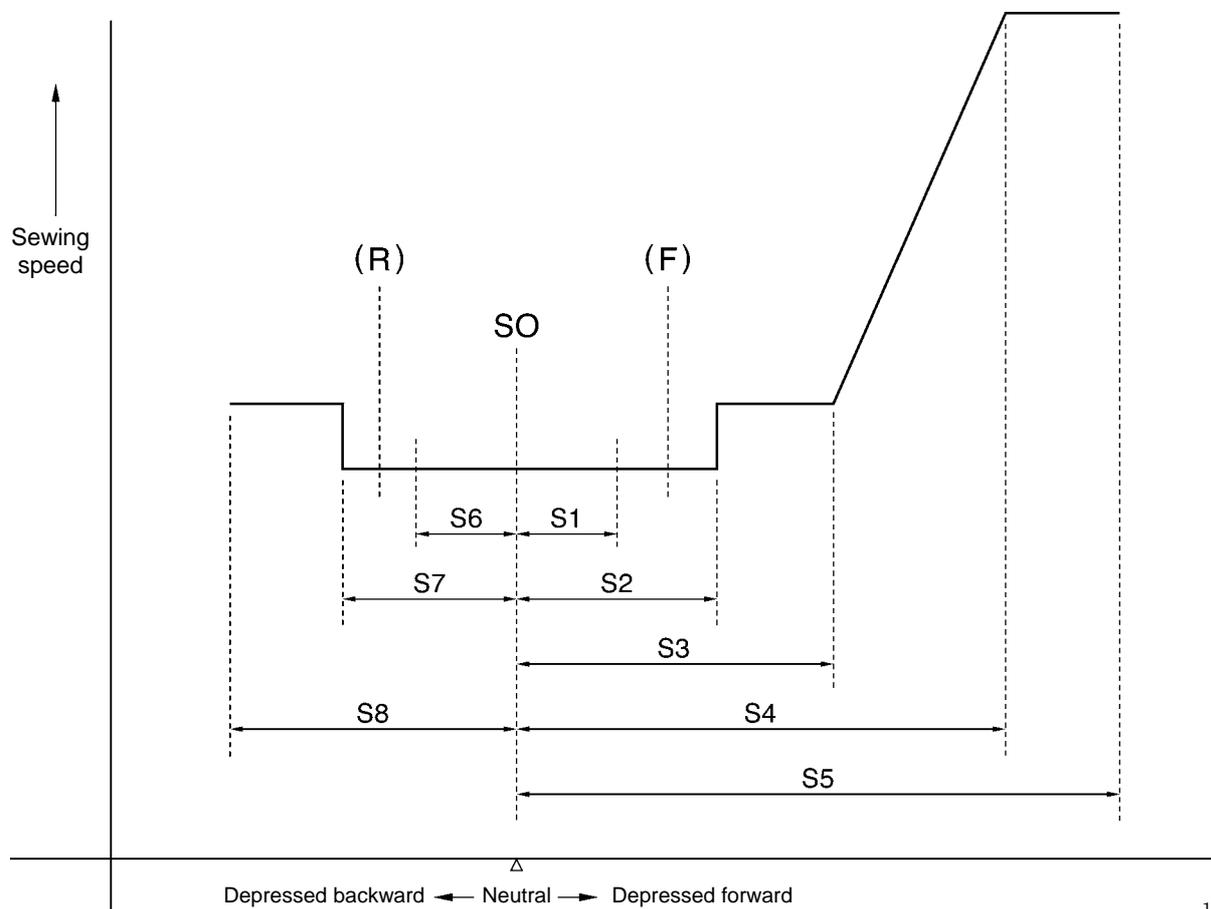
## 12-2. Standard setting values

Function No.	Signal (Diagram below)	SPECIFICATIONS	Treadle unit -G		Treadle unit -H	
		Operation	Automatic presser foot lifting does not occur		Automatic presser foot lifting occurs	
		Spring position setting	No modulation at 1 <sup>st</sup> step forward or backward (Figure [a] on previous page)		Modulation at 1 <sup>st</sup> step forward and backward (Figure [b] on previous page)	
		Function	Length from S0 (mm)	Force (N)	Length from S0 (mm)	Force (N)
-	S0	Neutral point	0	-	0	-
82	S1	Forward automatic presser foot lifting point	-	-	2 (*1)	10
83	S2	Low speed operation starting point	3	10	5	25
84	S3	Speed change starting point	6	-	7	-
85	S4	Maximum speed arrival point	S5-1	-	S5-1	-
-	S5	Maximum forward depression point	14.5	12	14.5	32
81	S6	Backward automatic presser foot lifting point	-	-	2 (*2)	14
80	S7	Thread trimming operation point	5	22	5	35
-	S8	Maximum backward depression point	8	28	8	43

(\*1) Enabled when DIP switch No. 1 is set to "ON" and memory switch No. 13 is set to "1".

(\*2) Enabled when memory switch No. 12 is set to "0".

- When the connecting rod installation position is on the inside, the setting value is the amount of movement when the treadle is depressed forward or backward.
- For treadle unit -H, the point (F) where the forward depression force changes is in between S1 and S2, and the point (R) where the backward depression force changes is between S6 and S7.



1841M

### 12-3. Standard settings for treadle depression stroke

## ! DANGER

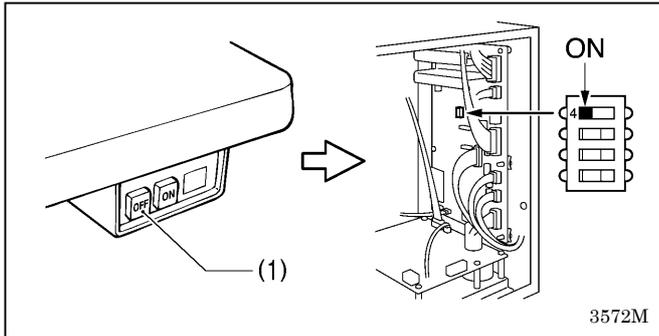


Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the cover of the control box. Touching areas where high voltages are present can result in severe injury.

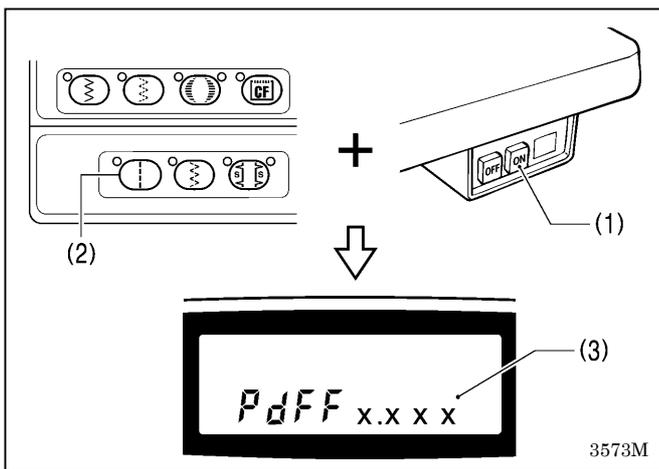
Carry out the following reset procedure if the specifications for the treadle unit have been changed or if the treadle unit or main P.C. board has been replaced.

The following procedure sets the operating positions for the treadle depression strokes to the standard values.

#### 1) Entering signal settings

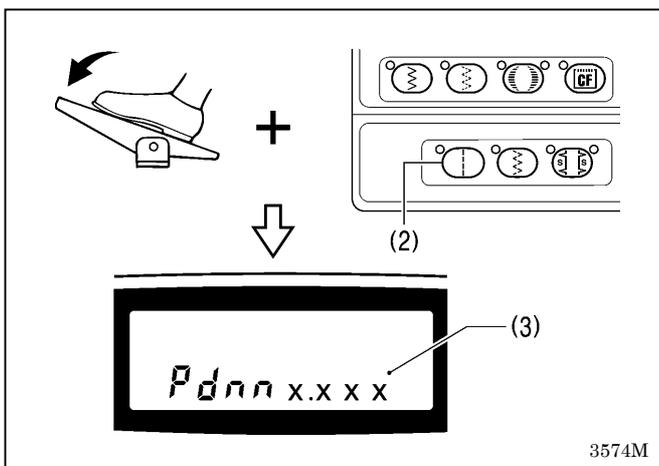


1. Set the power switch (1) to OFF.
2. Set DIP switch No 4 to "ON".



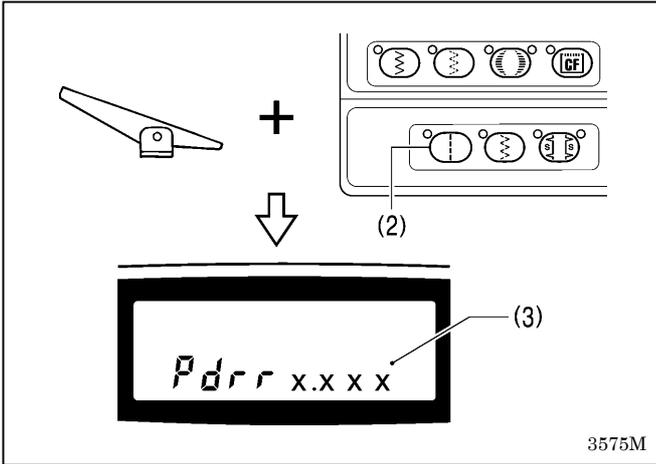
3. While pressing the straight stitch key (2), turn on the power switch (1).  
"PdFF x.xxx" will appear in the main display (3).  
(x.xxx indicates the depression voltage.)

#### 2) Storing the maximum forward depression amount



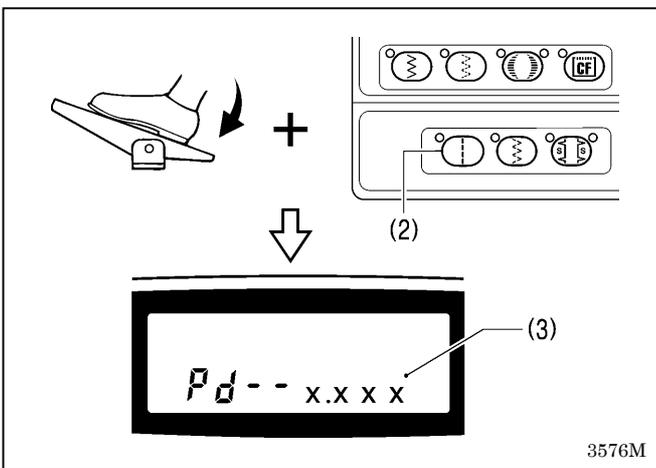
- Press the straight stitch key (2) while the treadle is at the point of maximum forward depression.  
"Pdnn x.xxx" will appear in the main display (3).

3) Storing the neutral position



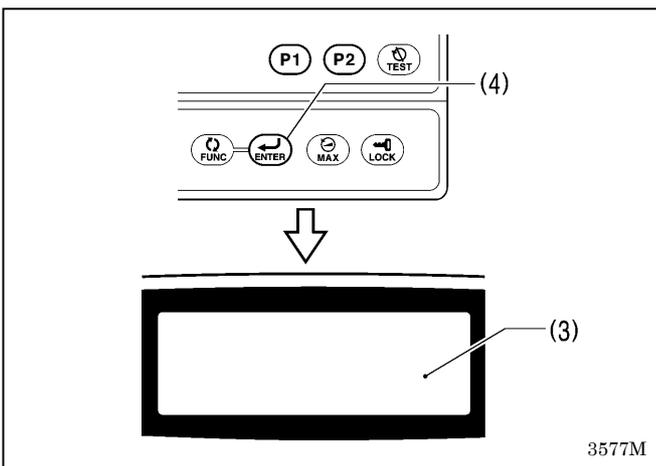
Press the straight stitch key (2) while your foot is released from the treadle.  
 "Pdr r x.xxx" will appear in the main display (3).

4) Storing the maximum backward depression amount



Press the straight stitch key (2) while the treadle is at the point of maximum backward depression.  
 "Pd-- x.xxx" will appear in the main display (3).

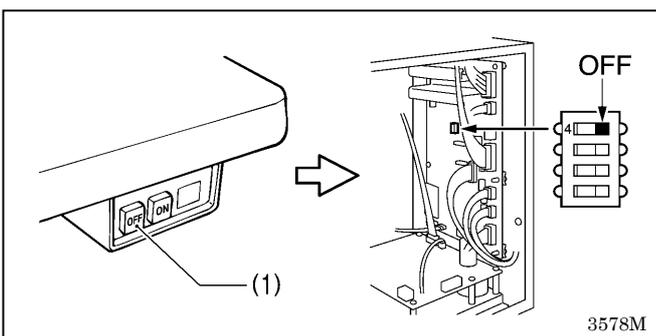
5) Ending the settings



1. Press the ENTER key (4).  
 The buzzer will sound and the main display (3) will switch off.

**NOTE:**

If you do not press the ENTER key (4), the settings will not be stored.

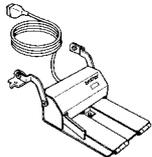
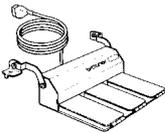
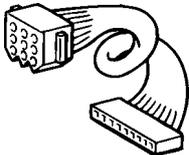


2. Set the power switch (1) to OFF.  
 3. Set DIP switch No. 4 to "OFF".

# 13. STANDING OPERATION PEDAL

The CDD foot plug assembly (J04099-001, sold separately) is required.

<Related table parts>

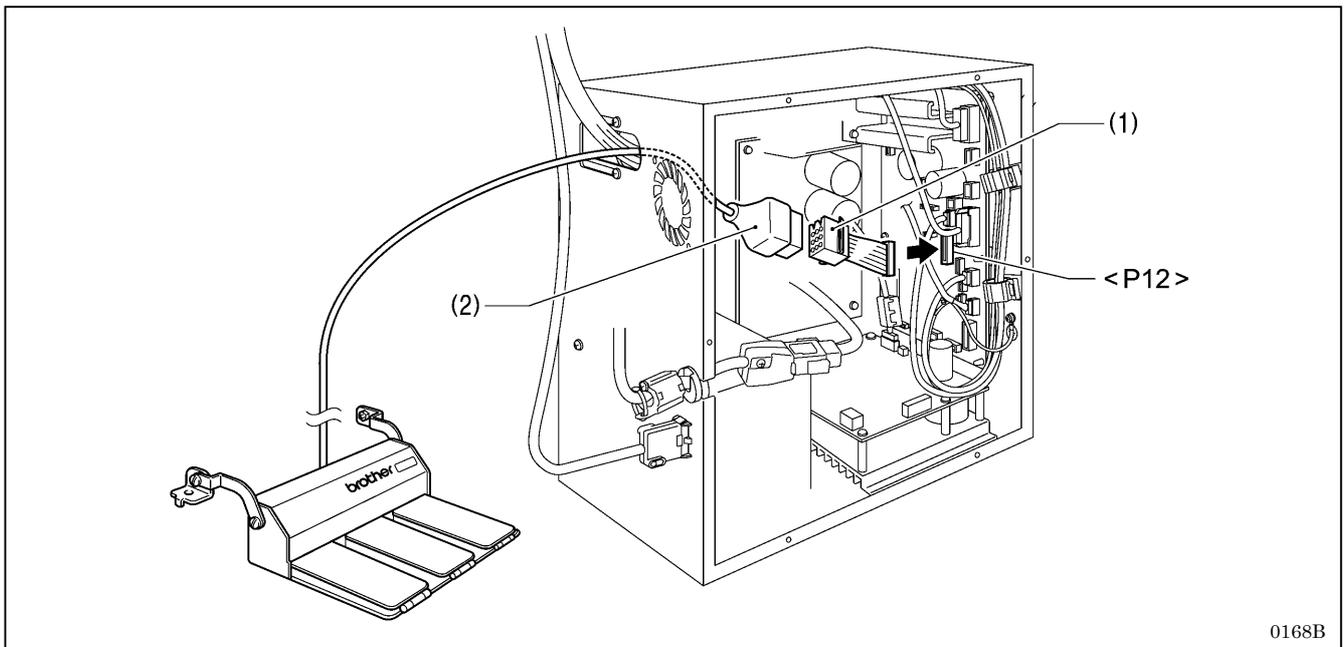
Part name		Code No.
	0772M	Variable-speed standing operation pedal 40 #6 (2 pedals + kick pedal) J80081-040
	0773M	Variable-speed standing operation pedal 3 #40 (3 pedals) J80380-040
		Standing operation pedal 3 with 2-step speed (3 pedals) J80630-001
	1144M	CDD foot plug assembly J04099-101

## 13-1. Installing the foot plug

### DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the cover of the control box. Touching areas where high voltages are present can result in severe injury.



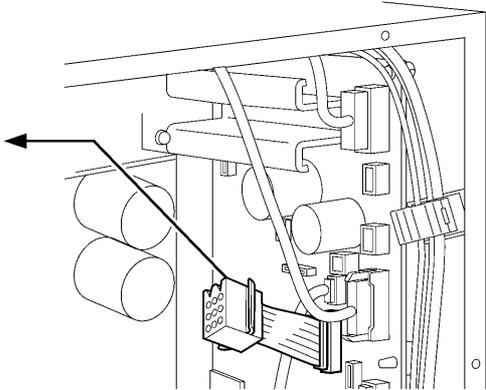
1. Insert the foot plug (1) into connector <P12> on the main P.C. board.
2. Connect the connector (2) of the standing operation pedal to the foot plug (1).

0168B

### 13-2. Connectors

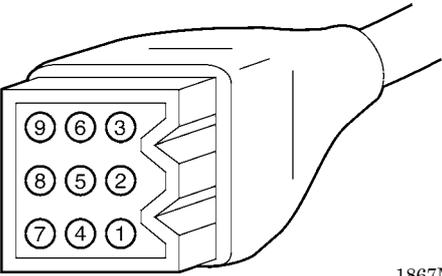
<At foot plug>

No.	Standing operation pedal 9P connector
1	DC+8V
2	High-speed switch
3	Thread trimming switch
4	SOV
5	Spare
6	Low-speed switch
7	Presser foot switch
8	Variable speed input
9	Ground



0220B

<At pedals>

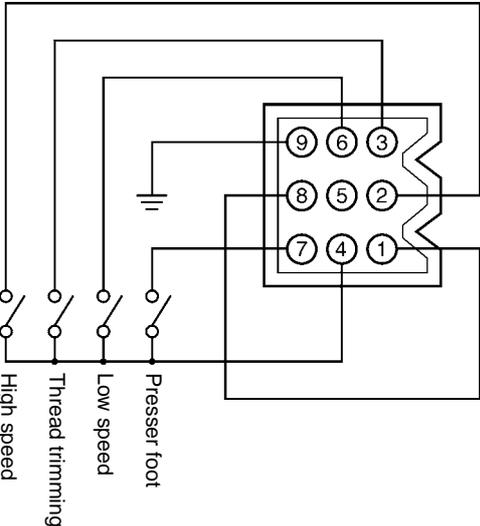


1867M

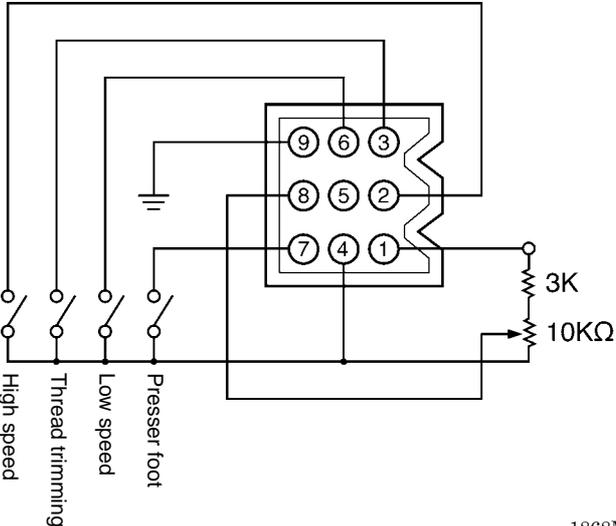
**NOTE:**  
Connector types

Name of manufacturer	Connector No.	Connector pins
MOLEX	1292P	1380TL

<A> Two-step pedal



<B> Variable speed pedal



1868M

# 14. TROUBLESHOOTING

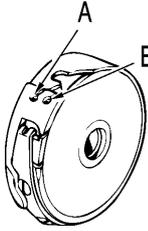
- Please check the following points before calling for repairs or service.
- If the following remedies do not fix the problem, turn off the power switch and consult a qualified technician or the place of purchase.

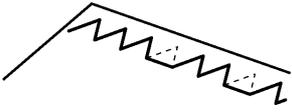
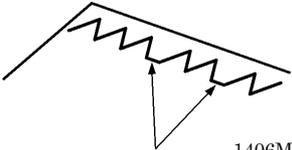
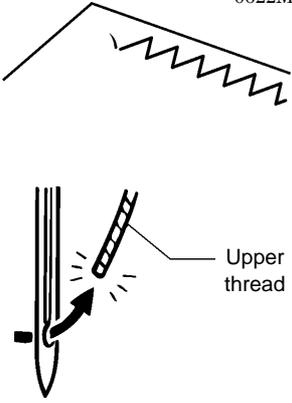
**⚠ DANGER**

**⚡** 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 can result in severe injury.

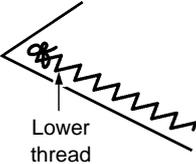
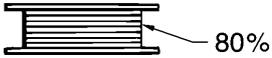
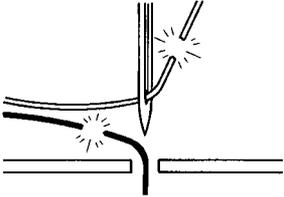
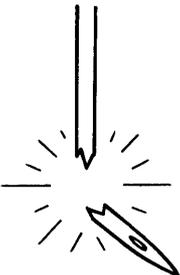
**⚠ CAUTION**

**⚡** Turn off the power switch and disconnect the power cord before carrying out troubleshooting. The machine may operate if the treadle is depressed by mistake, which could result in injury.

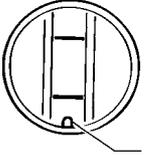
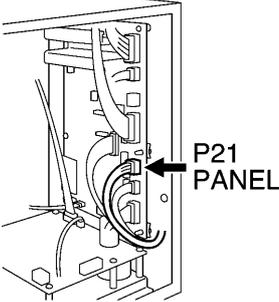
	Problem	Possible cause	Page
1	<p>Upper thread is not tight.</p>  <p style="text-align: right;">0573M</p>	<ul style="list-style-type: none"> <li>• Is the upper thread tension too weak, or is the lower thread tension too strong? Adjust the upper thread tension or lower thread tension.</li> <li>• Was the thread threaded through the thread guide of the bobbin case in accordance with the type and thickness of the sewing article's material. Use thread guide A or B in accordance with the material being sewn.</li> </ul>  <p style="text-align: right;">3556M</p>	<p>Instruction manual</p> <p>Instruction manual</p>
2	<p>Lower thread is not tight.</p>  <p style="text-align: right;">0574M</p>	<ul style="list-style-type: none"> <li>• Is the lower thread tension too weak, or is the upper thread tension too strong? Adjust the lower thread tension or upper thread tension.</li> <li>• Was the thread threaded through the thread guide of the bobbin case in accordance with the type and thickness of the sewing article's material. Use thread guide A or B in accordance with the material being sewn.</li> </ul>  <p style="text-align: right;">3556M</p>	<p>Instruction manual</p> <p>Instruction manual</p>

3	Problem	Possible cause	Page
	<p>Skipped stitches occur while sewing.</p>  <p>0621M</p>	<ul style="list-style-type: none"> <li>• Is the needle tip bent? Is the needle tip blunt? If the needle tip is bent or broken, replace the needle.</li> <li>• Is the needle properly installed? If it is incorrect, install the needle correctly.</li> <li>• Is the machine properly threaded? If it is incorrect, thread the thread correctly.</li> <li>• Is the presser foot pressure too weak? Adjust the presser foot pressure.</li> <li>• Is the needle too thin? Replace the needle with a needle that is one rank thicker.</li> <li>• Is the presser foot too high? Adjust the height of the presser foot.</li> <li>• Is the needle and rotary hook timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook.</li> <li>• Is the thread take-up spring too weak? Adjust the tension of the thread take-up spring.</li> </ul>	<p>Instruction manual Instruction manual Instruction manual</p> <p>70 73 76 - 77 69</p>
	<p>Flattened zigzags appear in the stitch during intermittent sewing. (8550A)</p>  <p>1406M</p>	<ul style="list-style-type: none"> <li>• Has the treadle been depressed backward? Do not press the treadle backward when the sewing machine is stopped. (When memory switch No. 109 is set to "1", needle zigzagging also occurs when the treadle is depressed backward, in order to prevent a flattened zigzag from being sewn if the treadle is depressed backward by mistake.)</li> <li>• Does the treadle move too easily when it is depressed backward? Adjust the force required to depress the treadle backward so that it is a bit heavier.</li> </ul>	<p>79</p>
	<p>Skipped stitches at sewing start Thread unravelling at sewing start</p>  <p>0622M</p> <p>Upper thread</p> <p>0623M</p>	<ul style="list-style-type: none"> <li>• Is the thread take-up spring tension too strong? Reduce the tension of the thread take-up spring.</li> <li>• Is the thread take-up spring operating range too large? Lower the position of the thread take-up spring.</li> <li>• Is the needle too thick? Try using a needle with a count that is one lower than the current needle.</li> </ul> <p>&lt;8550A&gt;</p> <ul style="list-style-type: none"> <li>• Is the needle bar at the needle up stop position at the sewing start? Set the needle bar to the needle up stop position at the sewing start.</li> <li>• Is the length of the upper thread trailing from the needle hole too short? Pull about 50 mm of thread through the needle hole at the sewing start.</li> </ul> <p>&lt;8560A&gt;</p> <ul style="list-style-type: none"> <li>• Is the trailing length of the upper thread too short after thread trimming? Adjust the upper thread feeding device.</li> <li>• Are the threads not being trimmed cleanly? Sharpen the fixed knife with a whetstone, or replace the fixed knife. Replace the movable knife.</li> <li>• Is the length of thread trailing out from the bobbin case after thread trimming too short? If the bobbin is spinning loosely, replace the anti-spin spring in the bobbin case. Adjust the tension of the lower thread presser spring.</li> <li>• Is the needle up stop position too high? Adjust the needle up stop position.</li> <li>• Is the sewing speed too fast at the sewing start? Use the slow start feature.</li> </ul>	<p>69 69</p> <p>Instruction manual Instruction manual</p> <p>84</p> <p>Instruction manual</p> <p>Instruction manual 83</p> <p>Instruction manual</p>



Problem	Possible cause	Page
<p>9 Lower thread is tangled at the sewing start. Spinning of bobbin during thread trimming</p>  <p style="text-align: right;">0628M</p>	<ul style="list-style-type: none"> <li>Is the bobbin spinning direction correct when the lower thread is being pulled? Set the bobbin so that it turns in the opposite direction to the rotary hook.</li> <li>Is there too much thread wound onto the bobbin? The bobbin winding amount should not be more than 80%.</li> <li>Is the anti-spin spring attached? (8560A) Attach the anti-spin spring.</li> <li>Is the bobbin turning smoothly? If the bobbin is not turning smoothly, replace the bobbin.</li> <li>Is a bobbin other than the light-alloy bobbins specified by Brother being used? (8560A) Use only bobbins which are specified by Brother.</li> </ul>  <p style="text-align: right;">3557M</p>	<p>Instruction manual</p> <p>Instruction manual</p> <p>Instruction manual</p> <p>Instruction manual</p>
<p>10 Upper and lower threads are breaking.</p>  <p style="text-align: right;">0471M</p>	<ul style="list-style-type: none"> <li>Is the needle bent or is the needle tip broken? Replace the needle if it is bent or broken.</li> <li>Is the needle properly installed? If it is incorrect, install the needle correctly.</li> <li>Is the machine properly threaded? If it is incorrect, thread the thread correctly.</li> <li>Is the rotary hook sufficiently lubricated? If the oil gauge is down to the lower reference line in the oil gauge window, add more oil.</li> <li>Is the upper or lower thread tension too weak or too strong? Adjust the upper thread or lower thread tension.</li> <li>Is the upper thread may be loose because the thread take-up spring operating range is too small? Adjust the position of the thread take-up spring.</li> <li>Is the needle and rotary hook timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook.</li> <li>Is the thread too thick for the needle? Use the correct needle or the correct thread.</li> <li>Is the rotary hook, bobbin case, thread take-up lever or some other part in the thread path damaged? Repair the damage, or replace the part with a new one.</li> </ul>	<p>Instruction manual</p> <p>Instruction manual</p> <p>Instruction manual</p> <p>Instruction manual</p> <p style="text-align: center;">69</p> <p style="text-align: center;">73</p> <p style="text-align: center;">76 - 77</p>
<p>11 Broken needles</p>  <p style="text-align: right;">0469M</p>	<ul style="list-style-type: none"> <li>Is the material being pushed or pulled with excessive force during sewing?</li> <li>Is the needle properly installed? If it is incorrect, install the needle correctly.</li> <li>Is the needle bent, is the needle tip broken, or is the needle hole blocked? Replace the needle.</li> <li>Is the needle and rotary hook timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook.</li> </ul> <div style="border: 1px solid black; padding: 5px;"> <p><b>Caution</b></p> <ul style="list-style-type: none"> <li>It is extremely dangerous to leave any pieces of broken needle sticking in the material. If the needle breaks, search for all pieces until the whole of the needle is found again.</li> <li>Furthermore, we recommend that through steps be taken to account for such needles to comply with product liability regulations.</li> </ul> </div>	<p>Instruction manual</p> <p style="text-align: center;">73</p> <p style="text-align: center;">76 - 77</p>

## 14. TROUBLESHOOTING

Problem		Possible cause	Page
12	Incorrect thread trimming (8560A) (Upper and lower threads are both not being trimmed)	<ul style="list-style-type: none"> <li>Is the fixed knife or movable knife damaged or worn? Replace the fixed knife or the movable knife.</li> <li>Is the thread trimming timing incorrect? Adjust the rotating direction of the thread trimming cam.</li> </ul>	Instruction manual 82
13	Incorrect thread trimming (8560A) (Upper thread or lower thread is not being trimmed)	<ul style="list-style-type: none"> <li>Is the needle properly installed? If it is incorrect, install the needle correctly.</li> <li>Is the fixed knife or movable knife blunt? Replace the fixed knife or the movable knife.</li> <li>Do skipped stitches occur during sewing? Refer to "Skipped stitches during sewing".</li> </ul>	Instruction manual Instruction manual 110
14	The thread wiper does not wipe the thread. (8560A)	<ul style="list-style-type: none"> <li>Is the length of thread trailing from the needle hole too long after thread trimming? Adjust the upper thread feeding device.</li> </ul>	84
15	Oil gauge (1) is not visible in oil gauge window.  2195M	<ul style="list-style-type: none"> <li>Is the oil tank empty? Fill the oil tank with oil.</li> </ul>	Instruction manual
16	Machine does not operate at high speed.	<ul style="list-style-type: none"> <li>Is the sewing speed setting or backtack speed setting incorrect? Use the sewing speed control keys to set the high speed.</li> </ul>	Instruction manual
17	Machine stops during sewing.	<ul style="list-style-type: none"> <li>Is the fixed stitch key turned on? (8560A) Press the fixed stitch key so that the indicator turns off.</li> <li>Is the power supply voltage too low? Check the power supply. (If the power cord is too long or too many appliances are being run from a single outlet, this may cause voltage drops which will in turn cause the reset function to activate and stop the machine, even if the power supply itself is normal.)</li> </ul>	Instruction manual
18	Nothing appears on the operation panel display.	<ul style="list-style-type: none"> <li>Is the operation panel connector 8P inside the control box disconnected? Insert the connector securely.</li> </ul>  3558M	Instruction manual
19	"GrEASEUP" flashes on the operation panel when the power is turned on.	<ul style="list-style-type: none"> <li>This display is to notify you that it is time to apply grease. Apply grease.</li> </ul>	85

# 15. ERROR CODES



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the cover of the control box. Touching areas where high voltages are present can result in severe injury.

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.

## <Switch-related errors>

Code	Cause and remedy
Err 50	Tilted back sewing machine has been detected. Check the operation of the safety switch. Turn off the power before tilting back the machine head.
Err 65	Operation panel key was being pressed or actuator switch was being pressed while the power was turned on, or malfunction of a key. Turn off the power switch and check.
Err 90	Poor connection of treadle unit cord. Turn off the power switch and check.
Err 91	Problem with standard setting of treadle stroke. Readjust the treadle stroke to the standard setting.
Err 95	Treadle was being depressed when power was turned on. Turn off the power switch, set the treadle to the neutral position and then turn the power back on.

## <Upper shaft motor-related errors>

Code	Cause and remedy
Err 100	Turn off the power and apply grease, and then carry out the reset operation.
Err 101	DIP switch No.4 inside the control box is set to ON. Turn off the power and set DIP switch No.4 to OFF.
Err 111	Needle bar does not stop in the needle up position and thread wiper cannot operate. Check the needle bar position.
Err 130	Sewing machine motor does not operate. Motor 4P connector is not connected correctly, sewing machine is locked, or malfunction of control devices. Turn off the power switch, and check the motor 4P connector or turn the pulley and check if it turns stiffly.
Err 131	Encoder connector (P13) of sewing machine motor is not connected correctly, or malfunction of encoder P.C. board. Turn off the power switch and check.
Err 132	Sewing machine motor is operating abnormally. Malfunction of encoder P.C. board, or encoder connector (P13) of sewing machine motor is not connected correctly. Turn off the power switch and check.
Err 150	Sewing machine motor is overheating abnormally. Displayed when the temperature protection has been activated. After the temperature has dropped, turn the power back on.
Err 151	Temperature sensor of sewing machine motor is not connected correctly. Turn off the power switch and check.
Err 190	Sewing machine motor has operated continuously for 3 minutes or more. Sewing machine motor overtime error. Turn off the power switch and then turn the power back on again.
Err 191	Thread trimmer solenoid overtime error. (Thread trimming was not completed.)

## <Feed mechanism-related errors>

Code	Cause and remedy
Err 200	Needle zigzag motor home position cannot be detected. Needle zigzag motor connector is not connected correctly to the needle zigzag encoder connector, or problem with needle zigzag motor. Turn off the power switch and check.
Err 201	Needle zigzag motor stopped due to a problem. Turn off the power switch, move the needle bar sideways and check that it does not move stiffly.
Err 202	Problem with needle zigzag motor home position adjustment data. Re-adjust the home position.

## 15. ERROR CODES

### <Communication and memory-related errors>

Code	Cause and remedy
Err 401	Communication error with motor CPU was detected when the power was turned on. Turn off the power switch and then turn the power back on again.
Err 403	Connection error with needle zigzag PMD P.C. board detected when power was turned on. Turn off the power switch, and then check that connector P1 on the PMD P.C. board and connector P31 on the main P.C. board are properly connected.
Err 411	Communication error with motor CPU detected. Turn off the power switch and then turn the power back on again.
Err 413	Communication error with needle zigzag PMD P.C. board detected. Turn off the power switch and then turn the power back on again.
Err 420	No CF card is inserted.
Err 421	Program number on CF is invalid, or no data exists. Change program No.
Err 422	Error occurred while reading CF card. Check the data on the CF card.
Err 424	Insufficient free space on CF card. Use a different CF card.
Err 425	Error occurred while writing to CF card. Use the specified type of CF card.
Err 427	R/W key unneeded error
Err 430	Problem with flash ROM data on main P.C. board. Turn off the power switch and then turn the power back on again.
Err 440	Data cannot be backed up to EEPROM. Turn off the power switch and then turn the power back on again.
Err 441	Data cannot be read from EEPROM. Turn off the power switch and then turn the power back on again.
Err 442	Incorrect data initialized into EEPROM. Turn off the power switch and then turn the power back on again.
Err 450	Problem with data in machine head memory. (Model selection cannot be read.) Turn off the power switch and then turn the power back on again.
Err 452	Machine head memory is not connected. Turn off the power switch and then turn the power back on again.
Err 474	Internal memory is full and copying is not possible.

### <Data editing-related errors>

Code	Cause and remedy
Err 510	Problem with sewing data. (Invalid code in sewing data.) For additional data, re-read the data from the CF card.
Err 512	Number of stitches exceeds allowed maximum.

## &lt;P.C. board-related errors&gt;

Code	Cause and remedy
Err 700	Abnormal rise in power supply voltage. Turn off the power switch and check the power supply voltage.
Err 701	Abnormal rise in sewing machine motor power supply voltage. Turn off the power, and then check the voltage. Problem with power supply P.C. board.
Err 705	Abnormal drop in power supply voltage. Turn off the power switch and check the power supply voltage.
Err 710	Abnormal current detected in sewing machine motor. Turn off the power switch, and then check if there are any problems with the sewing machine. Problem with power supply P.C. board.
Err 711	Abnormal current detected in needle zigzag motor. Turn off the power switch, move the needle bar sideways and check that it does not move stiffly. Problem with PMD P.C. board.
Err 740	Cooling fan connector is not connected correctly, or fan is not operating. Alternatively, the oil pan fan is not connected correctly, or the fan is not operating. Turn off the power switch and check.
Err 790	Blown solenoid fuse has been detected. Turn off the power switch and check. (8A fuse on main P.C. board)
Err 791	Abnormal current detected in sewing machine solenoid. Turn off the power switch and check the resistances of the solenoids. Problem with main P.C. board.

## NOTE:

## S-7200A error code comparison table

Error code		Error details
S-7200A	Z-8550A/8560A	
Err 1	Err 701	Overvoltage (450 V power supply voltage is over 450 V, or regeneration ON caused it to rise above 450 V)
Err 2	Err 710	Overcurrent (Alarm signal detected in ARM IPM)
Err 3	Err 131	Sewing machine motor encoder (If UVW pole pattern in encoder is an unrecognized pattern)
Err 4	Err 130	Lock detected (If either needle up or needle down signal is not input for 3 seconds)
Err 5	Err 50	Machine head tilt detection (if the machine head detection switch does not turn on when the treadle is depressed forward)
Err 6	Err 95	Voltage drop (If treadle is depressed forward when power is turned on)
Err 8	Err 190	Sewing machine motor overtime (when motor has been run continuously for 3 minutes or more)
Err 9	Err 150	Sewing machine motor abnormal overheating (if temperature sensor inside sewing machine motor exceeds the specified temperature)
Err 10	Err 791	Solenoid overcurrent detection (If solenoid overcurrent detection has operated)
Err 11	Err 151	Problem with sewing machine motor temperature sensor (e.g. open circuit in temperature sensor)
Err 12	Err 790	Blown solenoid fuse (If solenoid power supply + E1 is 0 V)
Err 13	Err 90	Treadle is not connected correctly (If treadle voltage is outside the specified range)
Err 14	Err 450	Machine head detection problem (If data in machine head detection unit is outside the specified values)
Err 15	Err 132	Problem with sewing machine motor operation (If sewing machine motor speed exceeds 5500 rpm when needle up or needle down signal is detected)
Err 16	Err 191	Thread trimmer solenoid overtime (if thread trimmer solenoid operating time exceeds 0.8 sec.)
Err 20	Err 91	Problem with treadle setting (If treadle position data is outside the specified range)
Err 100	Err 100	Grease-up warning
Err 101	Err 101	If DIP switch No. 4 is ON

# 16. SEGMENT DISPLAY DEFINITION TABLE

## LCD display character list

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				

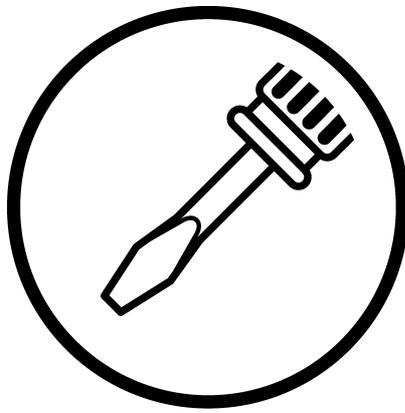
### <Additional special symbols>

+	-	[	]	_	↑	↓	←	→	OFF
ON	.	—	=						

0169B



**brother**®



SERVICE MANUAL

**BROTHER INDUSTRIES, LTD.** <http://www.brother.com/>  
15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561, Japan. Phone: 81-52-824-2177

Printed in Japan

Z-8550A, 8560A  
I5120896B  
2006. 12. B (1)