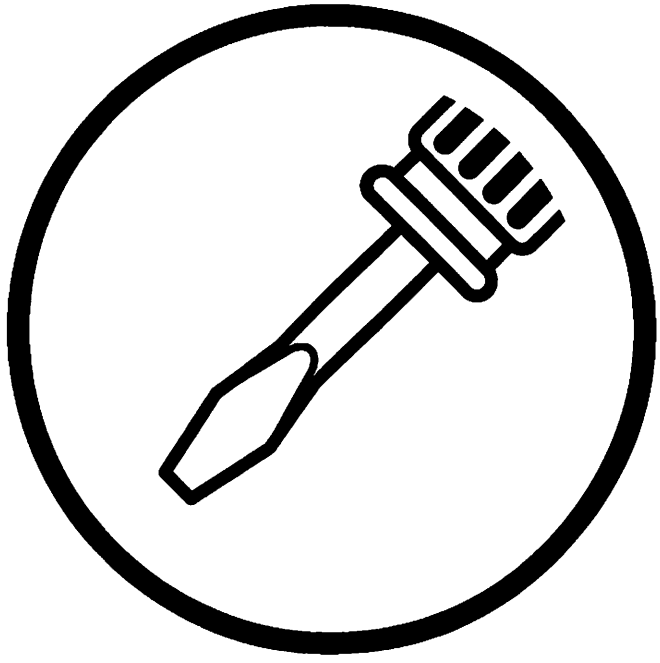
T-8420A, 8421A, 8422A
T-8720A, 8722A

SERVICE MANUAL

Please read this manual before making any adjustments.

TWIN NEEDLE LOCK STITCHER



brother

This service manual is intended for T-8420A, 8421A, 8422A, 8720A, 8722A; be sure to read the instruction manual before this manual.

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

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

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

SAFETY INSTRUCTIONS

1. Safety indications and their meanings

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

Indications

⚠ **DANGER**	The instructions which follow this term indicate situations where failure to follow the instructions will almost certainly result in death or severe injury.
⚠ **CAUTION**	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 ±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.
- Avoid exposure to direct sunlight during use. Exposure to direct sunlight may cause problems with correct operation.
- In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet. Lightning may cause problems with correct operation.

Installation

- Machine installation should only be carried out by a qualified technician.
- Contact your Brother dealer or a qualified electrician for any electrical work that may need to be done.
- The sewing machine weighs approximately 50 kg. The installation should be carried out by two or more people.
- Do not connent 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.
- All cords should be secured at least 25 mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples, otherwise there is the danger that fire or electric shocks 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 using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

- When threading the needle
- When replacing the bobbin and needle
- When not using the machine and when leaving the machine unattended

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

Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.

Do not touch any of the moving parts or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.

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.
When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

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.

Maintenance and inspection

Disassembly, assembly, maintenance and inspection of the sewing machine should only be carried out by a qualified technician.

Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.

Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook and knife

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

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 the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

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, otherwise injury may result.

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.

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.

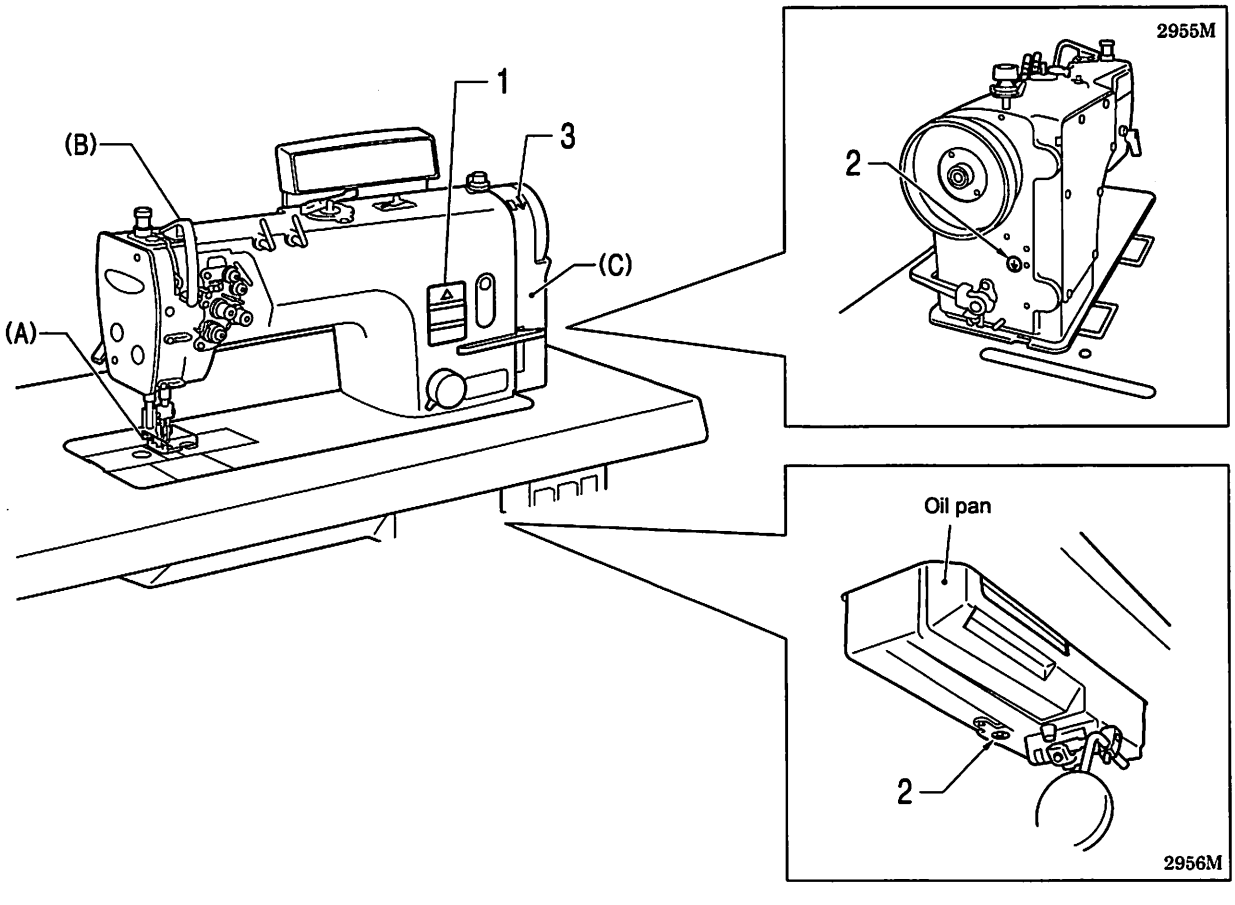
<T-8420A, 8720A>

1

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

2 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.

3 Direction of operation



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<T-8421A, 8422A, 8722A>

1

	⚠ 危 険	⚠ 危 险
	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。
⚠ DANGER	⚠ GEFAHR	⚠ DANGER / ⚠ PELIGRO
Hazardous voltage will cause injury. Turn off main switch and wait 5minutes 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

⚠ 注 意

触摸运动部分，易造成受伤。所以在装上安全保护装置后，再进行缝纫操作。在切断电源后，进行穿线，更换梭芯，机针和做清扫，调整工作。

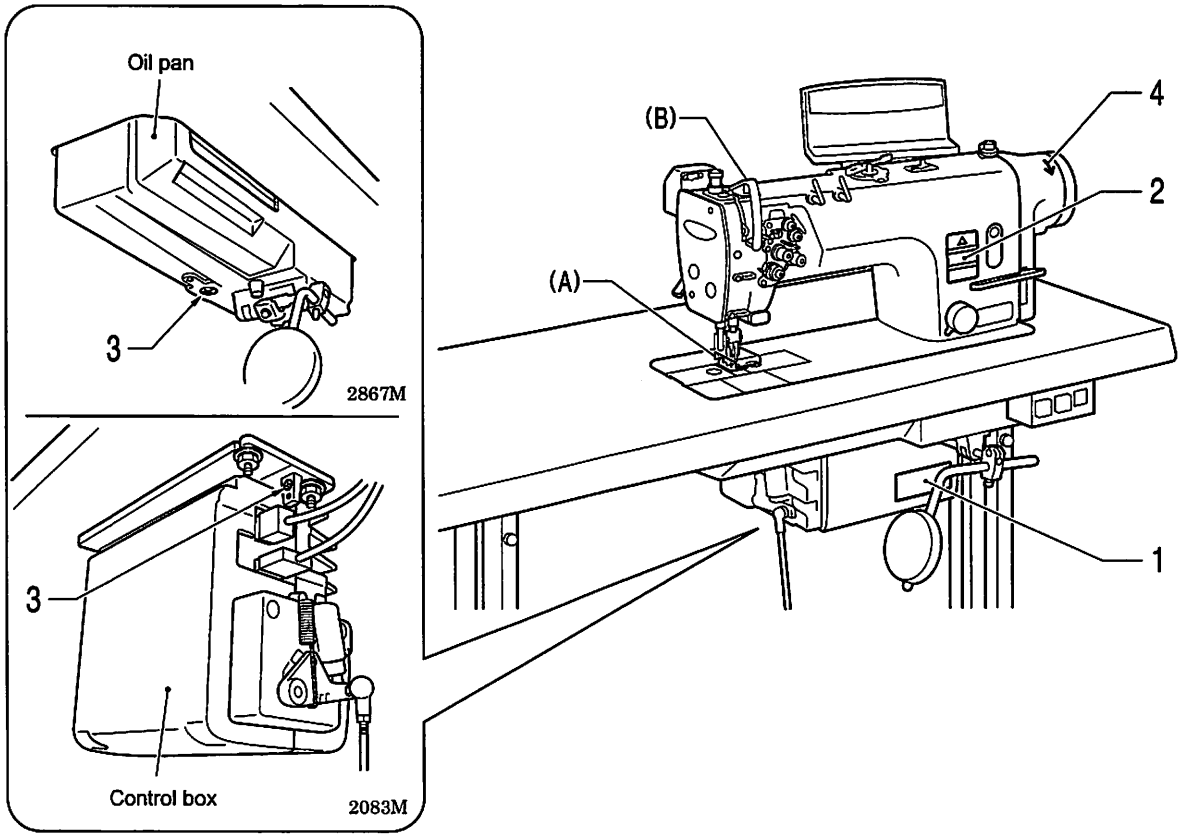
⚠ CAUTION

Moving parts may cause injury. Operate with safety devices. Turn off main switch before threading, changing bobbin and needle, cleaning etc.

3 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.

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

4 Direction of operation

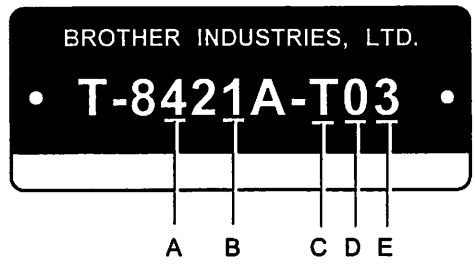


2868M

CONTENTS

1. MACHINE SPECIFICATIONS

< Model plate indications >



A	Rotary hook	4 Standard hook	7 Large hook

B	Thread trimmer	0 –	1	2 ○

C		0	4	T
	Quick reverse	–	○	○
	Thread wiper	–	○	–

D	Lubrication type	0 Minimum lubrication	3 Semi dry

E	Use	F For foundation	3 For light-weight and medium- weight materials	5 For heavy-weight materials

< List of models and specifications >

Standard hook

Thread trimmer	Motor	Lubrication type	Use
With thread trimmer	DD motor T-8422A	(Dry)*	(-□□3)
		Semi dry -□3□	-□□3, (-□□5)
		Minimum lubrication -□0□	-□□3, -□□5
Without thread trimmer	DD motor T-8421A	(Dry)*	(-□□3, -□□F)
		Semi dry -□3□	-□□F, -□□3, (-□□5)
		Minimum lubrication -□0□	(-□□F), -□□3, -□□5
	Under-table motor T-8420A	(Dry)*	(-□□3, -□□F)
		Semi dry -□3□	-□□F, -□□3, (-□□5)
		Minimum lubrication -□0□	-□□F, -□□3, -□□5

Large hook

Thread trimmer	Motor	Lubrication type	Use
With thread trimmer	DD motor T-8422A	Minimum lubrication -□0□	-□□3, -□□5
Without thread trimmer	Under-table motor T-8420A	Minimum lubrication -□0□	-□□3, -□□5

* ( ) types are not included in the specification lineup.
It is available from local dealers by special order or by installing optional parts.

< Drive motor >

	DD motor	Under-table motor
Installation position	Built into machine head	Installed under table (obtained locally)
Type	AC servo motor (4-pole, 550W)	Clutch motor, etc.
Control circuit	Microprocessor	–

< Gauge part widths (compatibility with bed and rotary hook base) >

Refer to the parts book for the availability of gauge parts for various specifications.

Model	Standard bed	Special order
T-8420A, 8421A	1.6 – 38.1 mm	Max. 77 mm
T-8422A		Max. 45 mm
T-8720A		Max. 68 mm
T-8722A		Max. 45 mm

< Specifications >

T-8420A (Standard hook, Without thread trimmer, Under-table motor)
T-8421A (Standard hook, Without thread trimmer, DD motor)

		-□□F	-□□3	-□□5
Use		For foundation	For light-weight and medium- weight materials	For heavy-weight materials
Max. sewing speed	(Dry)	3,000 rpm		–
	Semi dry	3,000 rpm		
	Minimum lubrication	4,000 rpm		3,000 rpm
Start backtacking and continuous backtacking speed		250 – 1,800 rpm (T-8421A only)		
End backtacking speed		1,000 rpm (T-8421A only)		
Max. stitch length		4 mm		5 mm
Presser foot height	Lifting lever	7 mm		
	Knee lifter	13 mm		
Feed dog height		1 mm		
Thread take-up stroke		51.9 mm Thread take-up lever No.3		56.8 mm Thread take-up lever No.5
Needle bar stroke		33.4 mm		
Presser foot pressure		7.5 – 58.5 N	10 – 78 N	
Rotary hook		Horizontal rotary hook (vertical axis) Standard hook		
Needle DP x 5 (Standard/Organ)		#11 (#9 – #14)	#14 (#11 – #16)	#22 (#14 – #22)
Feed mechanism		Needle feed / Lower feed (Can be switched)		
Arm pocket width		120 x 264 mm		
Weight	T-8420A	42.5 kg		
	T-8421A	46.5 kg		

T-8422A (Standard hook, With thread trimmer, DD motor)

		-□□3	-□□5
Use		For light-weight and medium- weight materials	For heavy-weight materials
Max. sewing speed	(Dry)	3,000 rpm	–
	Semi dry	3,000 rpm	
	Minimum lubrication	4,000 rpm	3,000 rpm
Start backtacking and continuous backtacking speed		250 – 1,800 rpm	
End backtacking speed		1,000 rpm	
Max. stitch length		4 mm	5 mm
Presser foot height	Lifting lever	7 mm	
	Knee lifter	13 mm	
Feed dog height		1 mm	
Thread take-up stroke		51.9 mm Thread take-up lever No.3	
Needle bar stroke		33.4 mm	
Presser foot pressure		10 – 78 N	
Rotary hook		Horizontal rotary hook (vertical axis) Standard hook	
Needle DP x 5 (Standard/Organ)		#14 (#11 – #16)	#22 (#14 – #22)
Feed mechanism		Needle feed / Lower feed (Can be switched)	
Arm pocket width		120 x 264 mm	
Weight		49.5 kg	

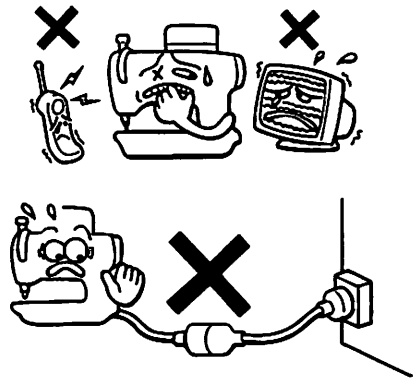
T-8720A (Large hook · Without thread trimmer, Under-table motor)
T-8722A (Large hook · With thread trimmer, DD motor)

		-□□3	-□□5
Use		For light-weight and medium- weight materials	For heavy-weight materials
Max. sewing speed	Minimum lubrication	3,000 rpm	
Start backtacking and continuous backtacking speed		250 – 1,800 rpm (T-8722A only)	
End backtacking speed		1,000 rpm (T-8722A only)	
Max. stitch length		7 mm	
Presser foot height	Lifting lever	7 mm	
	Knee lifter	13 mm	
Feed dog height		1 mm	
Thread take-up stroke		62.4 mm Thread take-up lever No.6	
Needle bar stroke		33.4 mm	
Presser foot pressure		10 – 78 N	
Rotary hook		Horizontal rotary hook (vertical axis) Large hook	
Needle DP x 5 (Standard/Organ)		#14 (#11 – #16)	#22 (#14 – #22)
Feed mechanism		Needle feed / Lower feed (Can be switched)	
Arm pocket width		120 x 264 mm	
Weight	T-8720A	42.5 kg	
	T-8722A	49.5 kg	

2. NOTES ON HANDLING

About the machine set-up location

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



2086M

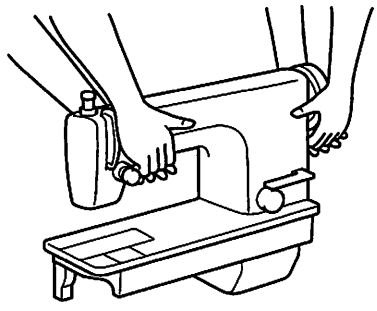
Carrying the machine

- The machine should be carried by the arm by two people as shown in the illustration.

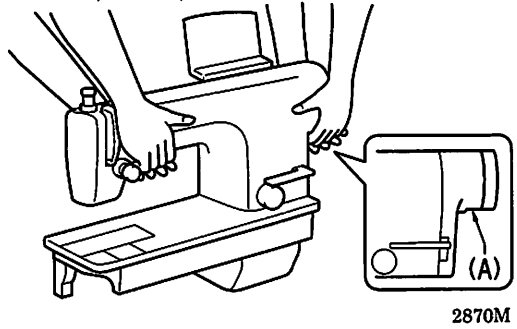
<T-8420A, 8720A>
Make sure that the machine pulley does not turn.

<T-8421A, 8422A, 8722A>
Hold the motor cover (A) by hand also so that the pulley does not rotate.

<T-8420A, 8720A> 2959M



<T-8421A, 8422A, 8722A >



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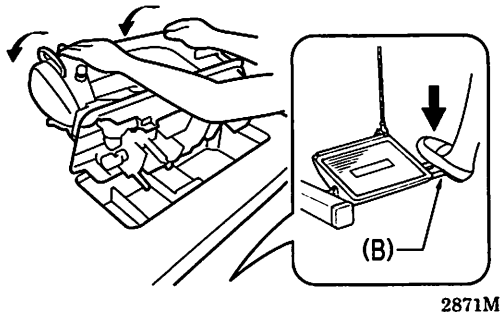
Tilting back the machine head

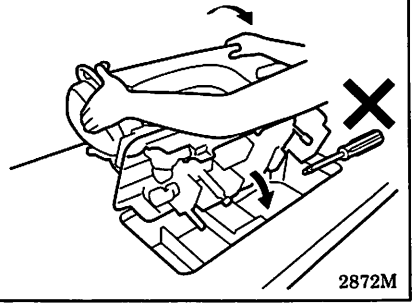
- Hold section (B) with your foot so that the table does not move, and then push the arm with both hands to tilt back the machine head.



2871M

Returning the machine head to the upright position

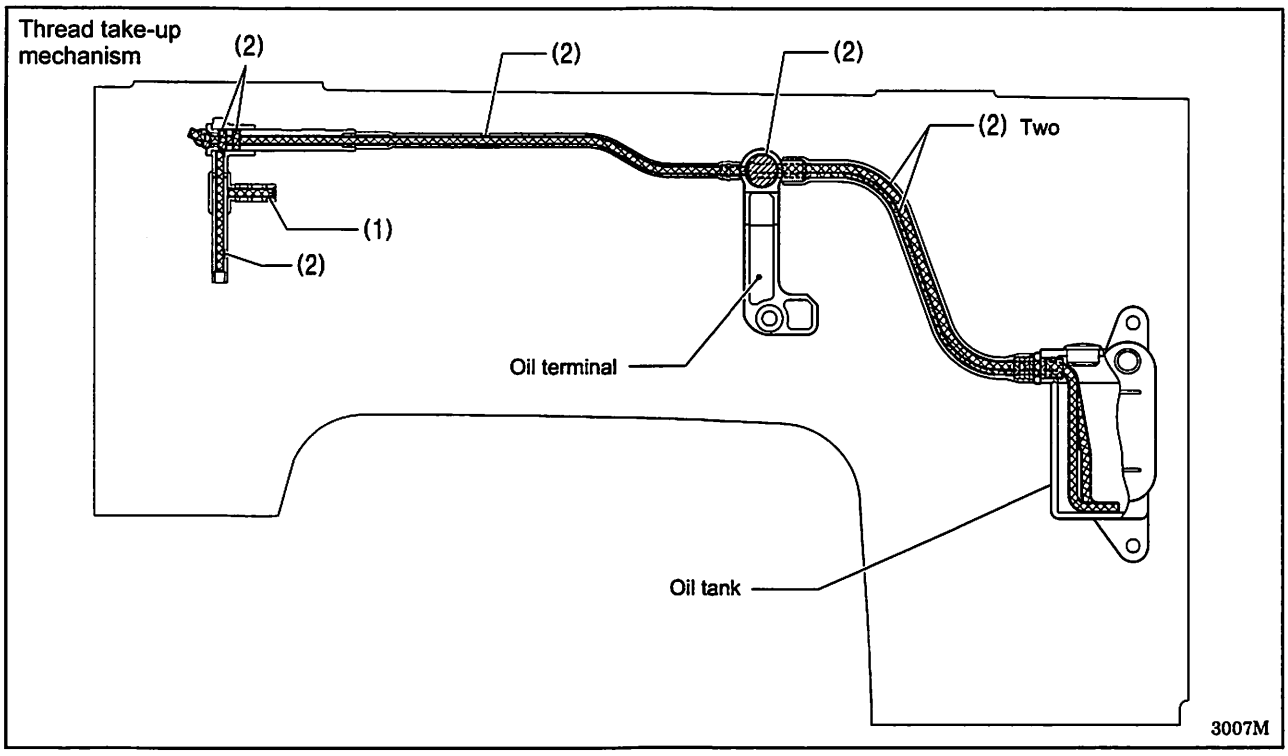
1. Clear away any tools, etc. which may be near the table holes.
2. While holding the face plate with your left hand, gently return the machine head to the upright position with your right hand.



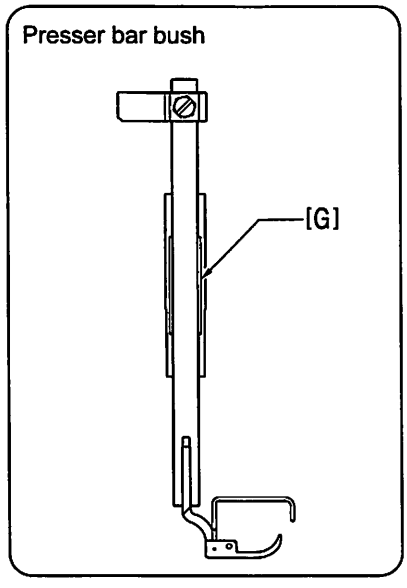
2872M

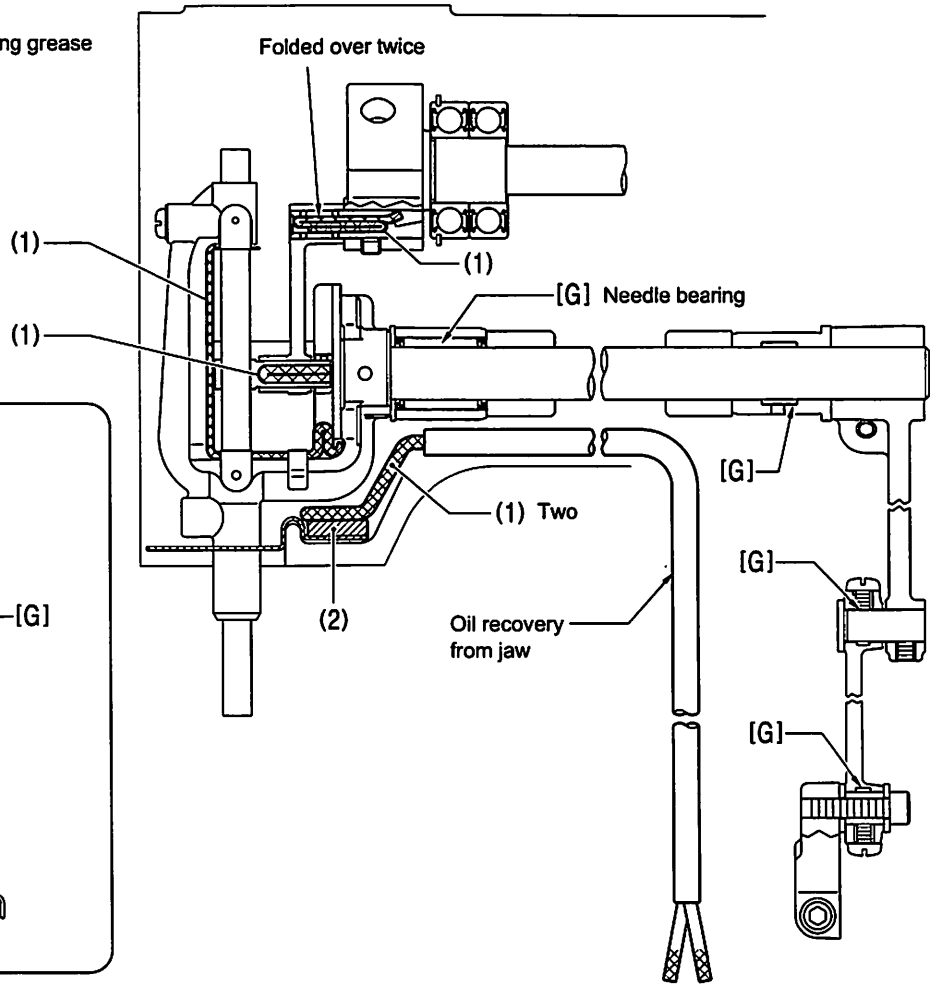
3. LUBRICATION SYSTEM

3-1. Needle bar and thread take-up, needle bar rocking mechanism and presser bar bushing (minimum lubrication type)



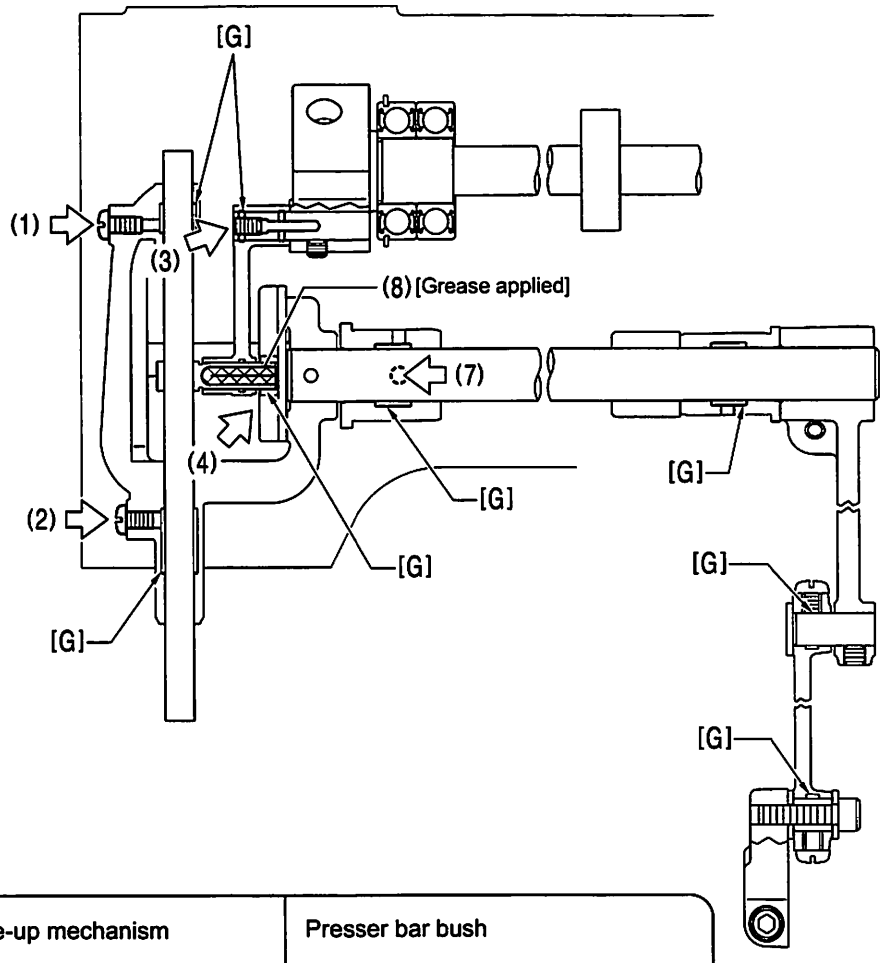
[G] Lubrication points requiring grease
(1) Wick
(2) Felt

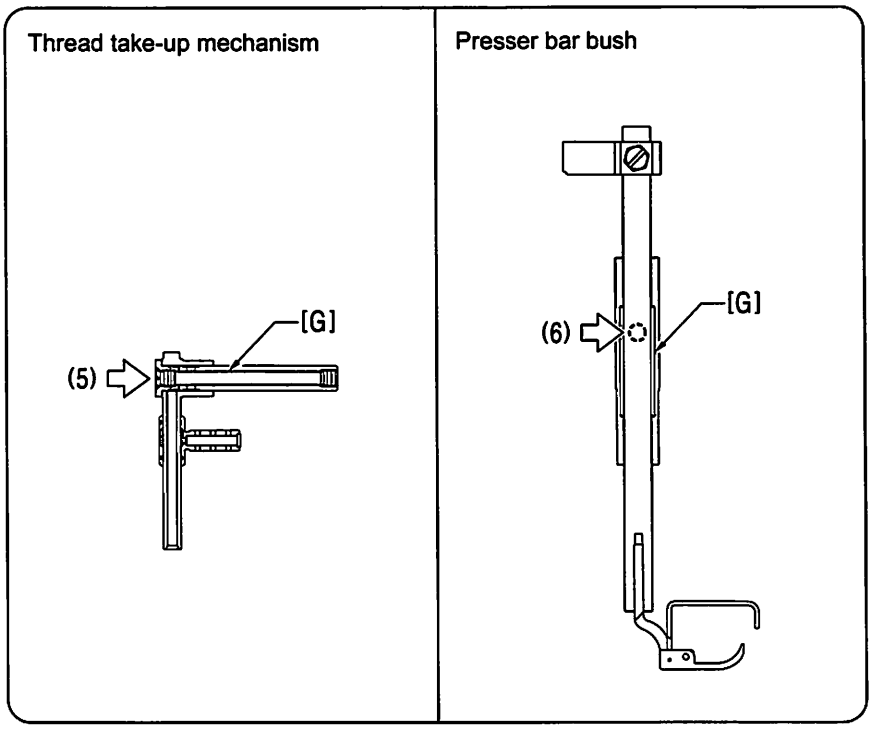




3-2. Needle bar and thread take-up, needle bar rocking mechanism and presser bar bushing (semi dry type)

[G] Lubrication points requiring grease
⇨ (1) to (7) require grease application.
(8) Wick

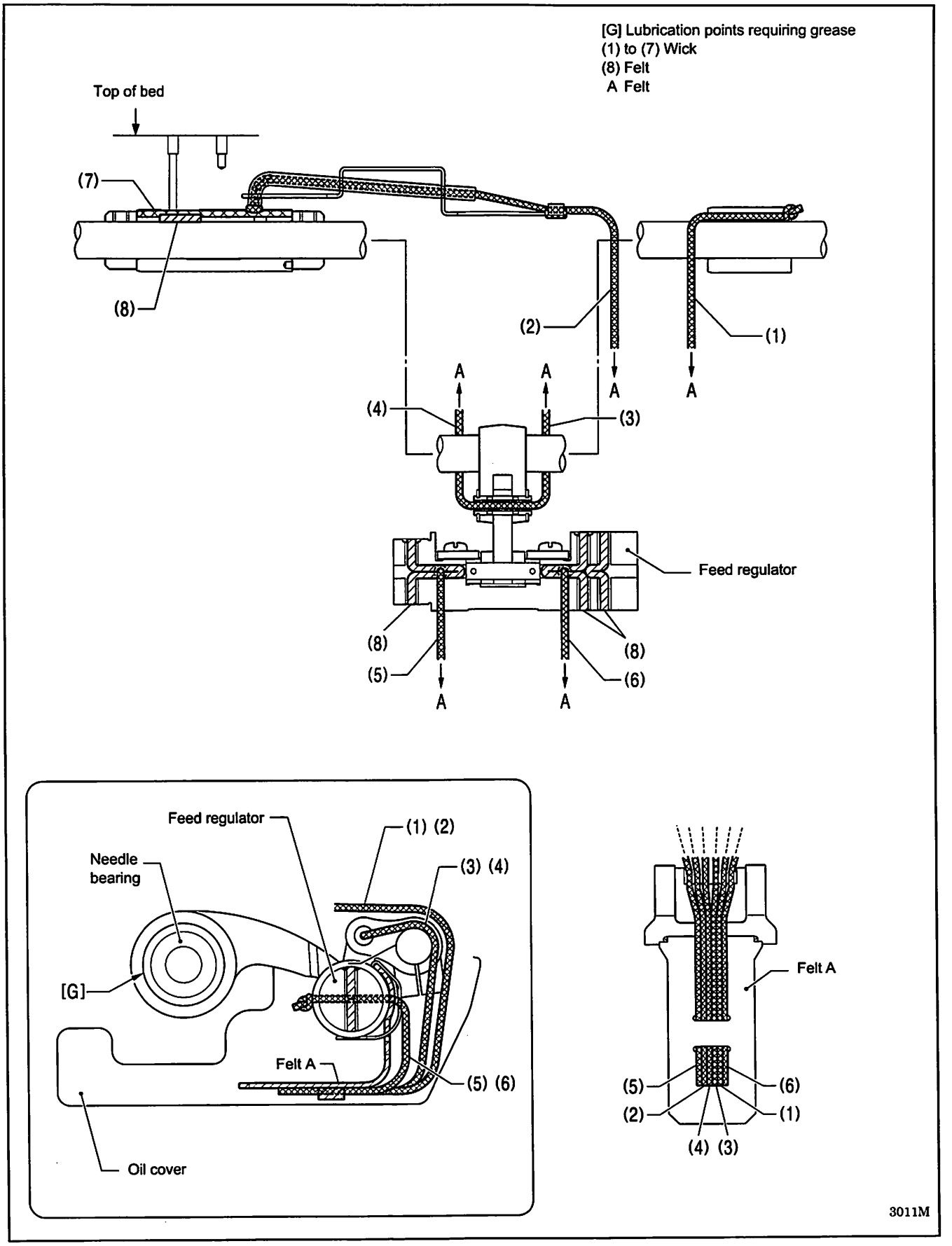




3009M
3010M

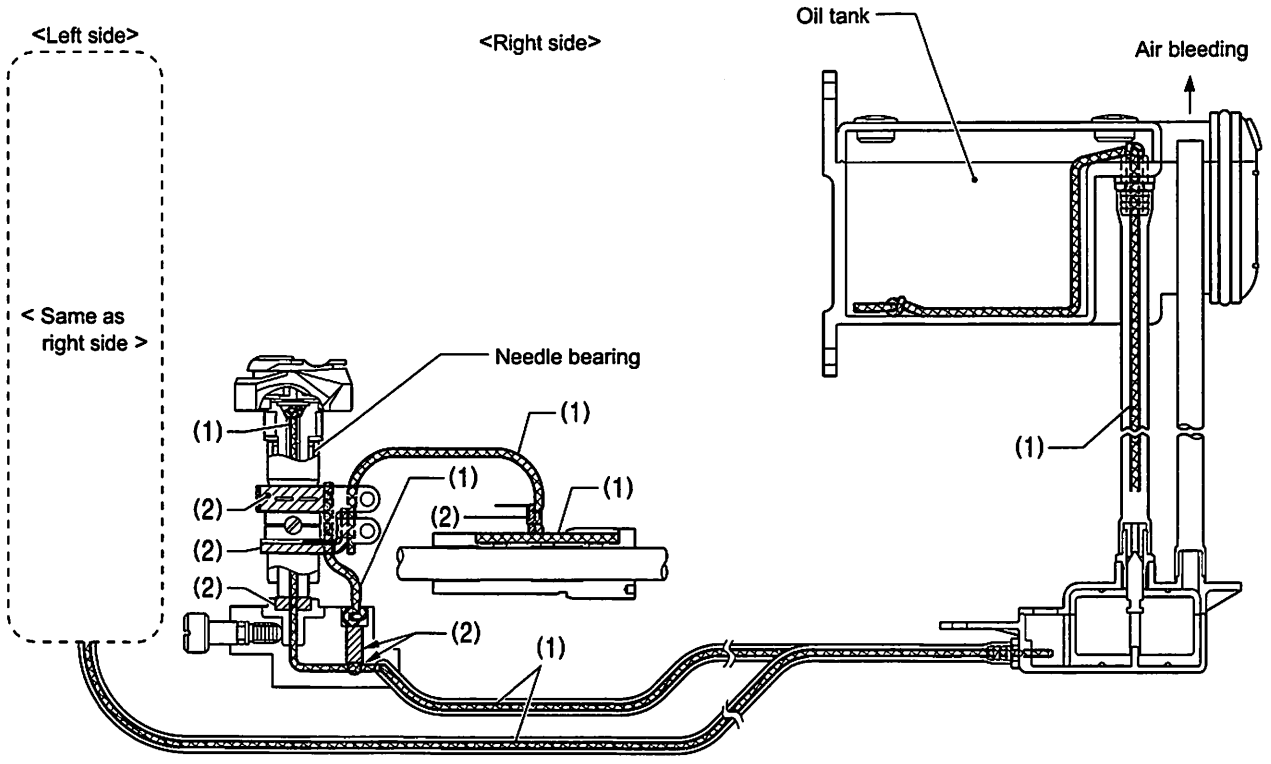
3-3. Feed regulator and feed rocker shaft bushing (both semi dry and minimum lubrication type)

The lubricating oil inside the oil cover is used for lubricating these parts.



3-4. Rotary hook base (both semi dry and minimum lubrication type)

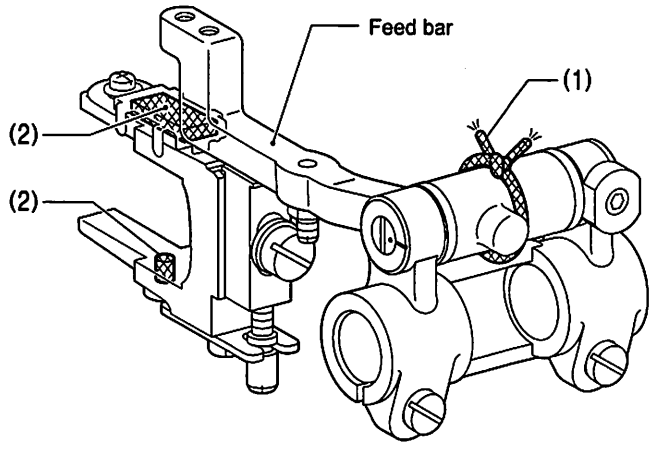
(1) Wick
(2) Felt



3012M

3-5. Feed bar (both semi dry and minimum lubrication type)

(1) Wick
(2) Felt



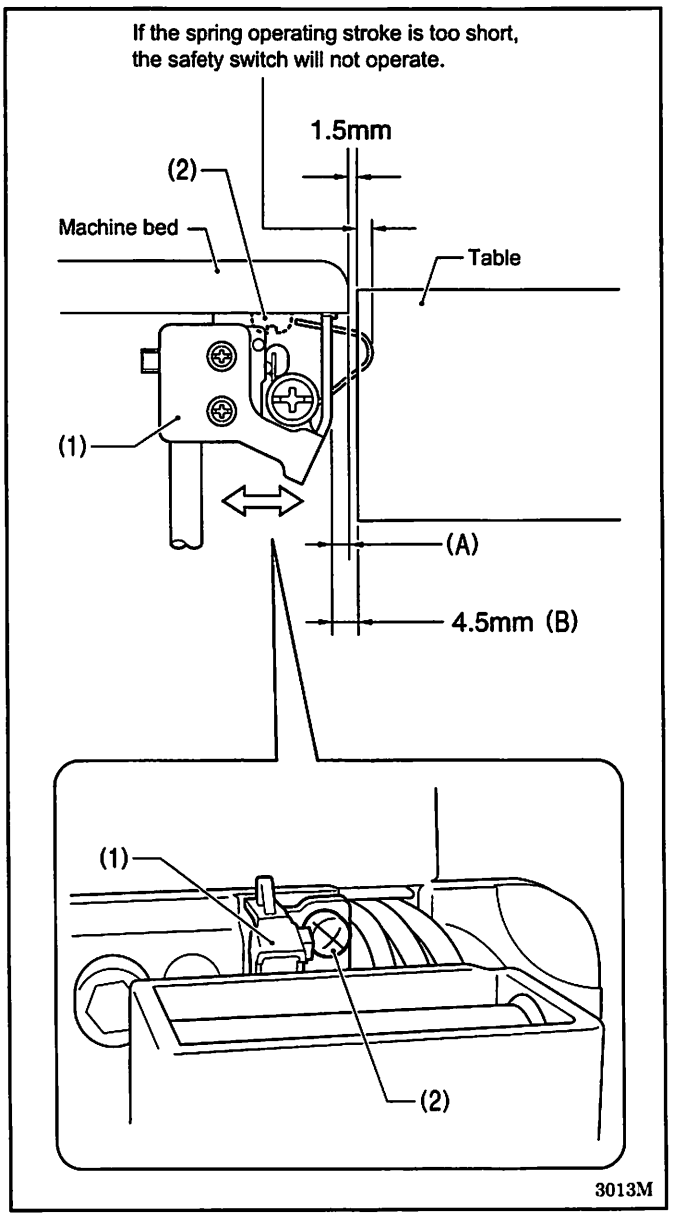
3098M

4. ADJUSTMENT

⚠ CAUTION

- Disassembly, assembly, 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.
- 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.
- 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.
- 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.
  When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.
  - When carrying out inspection, adjustment and maintenance
  - When replacing consumable parts such as the rotary hook and knife
- If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

4-1. Safety switch position (DD motor specifications: T-8421A, 8422A, 8722A)



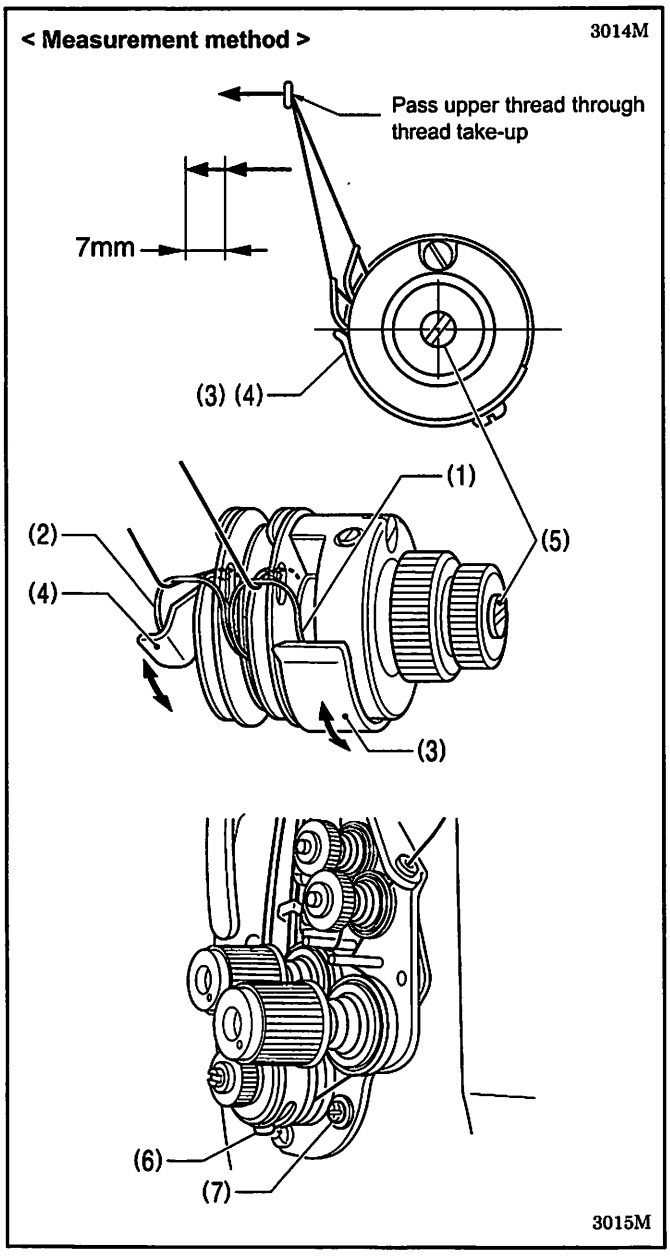
The standard installation position for the safety switch (1) is shown in the illustration at left.
At the time of shipment from the factory, dimension (A) is adjusted to 3 mm, and normally this does not need to be readjusted.
However, if the dimensions of the work table make it so that the gap between the machine bed and the table hole is wider or narrower than the standard gap (1.5 mm), it may have an adverse effect on the operation of the safety switch (1). If this happens, adjust as follows.

* If the operation of the safety switch (1) is affected in this way, the sewing machine will not start when the treadle is depressed.

< Adjustment method >

1. Loosen the screw (2).
2. Move the safety switch (1) to the left or right to adjust its position so that the gap (B) between the safety switch (1) and the table is 4.5 mm.
3. Tighten the screw (2).

4-2. Thread take-up amount for thread take-up spring



The standard thread take-up length for thread take-up springs R (1) and L (2) is 7 mm. You can adjust the thread take-up amounts by changing the heights of the stopper [right] (3) and the stopper [left] (4).

* The standard heights of the stopper [right] (3) and the stopper [left] (4) are when the are aligned with the tension stud (5).

< Adjustment method >

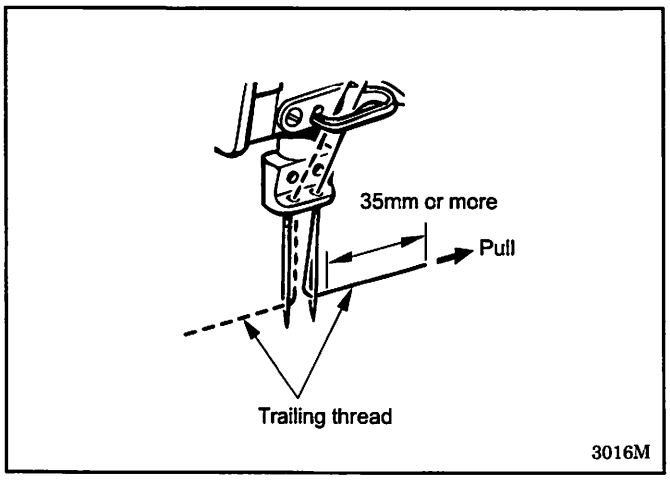
The thread take-up amount for a thread take-up spring decreases when the height of the stopper is increased.

Height of stopper [right] (3) [for right thread]

1. Loosen the screw (6), and then slide the stopper [right] (3) to adjust the thread take-up amount.
2. Tighten the screw (6).

Height of stopper [left] (4) [for left thread]

1. Loosen the screw (7), and then slide the stopper [left] (4) to adjust the thread take-up amount.
2. Tighten the screw (7).

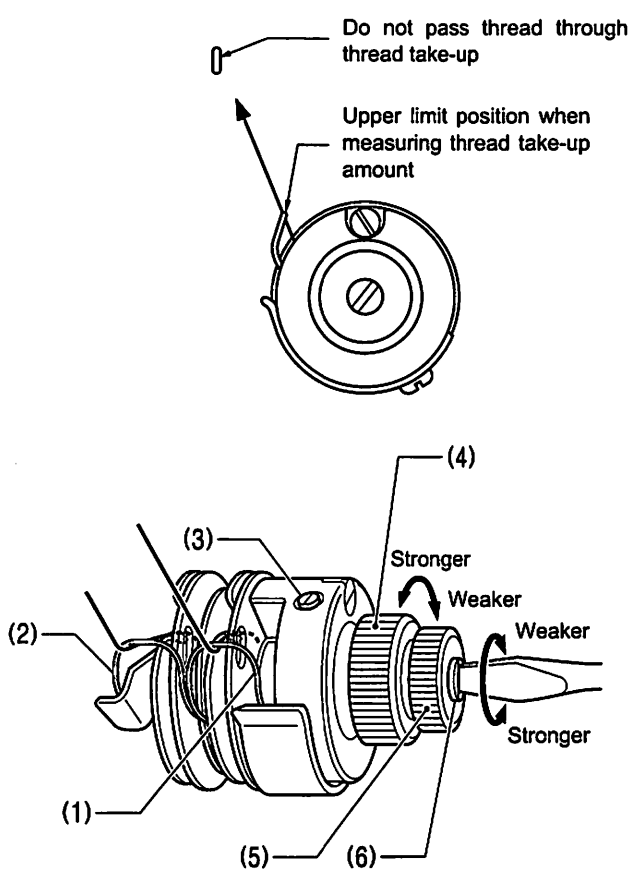


Note:

If using a thread trimming sewing machine, the trailing length for the left upper thread may become shorter after thread trimming because of the twist in the thread.
The trailing length is normal if the upper thread length is 35 mm when the thread is pulled from the needle hole. If the thread length is shorter than this, reduce the thread take-up amount of the thread take-up spring.
However, if using fine threads (such as #50 polyester thread or finer), reducing the thread take-up amount too much may cause the right upper thread to be cut too short, or it might result in thread trimming errors for the left upper thread.

4-3. Thread take-up spring tension

< Measurement method >



The standard tensions for the thread take-up spring R (1) and thread take-up spring L (2) are as follows depending on sewing machine specifications.

For foundation (-□□F)	0.25N
For light-weight and medium-weight materials (-□□3)	0.35N
For heavy-weight materials (-□□5)	0.70N

< Adjustment method >

Thread take-up spring R (1) [for right thread]

1. Loosen the set screw (3), and turn the adjusting thumb (4) to adjust the tension.
2. Tighten the set screw (3).

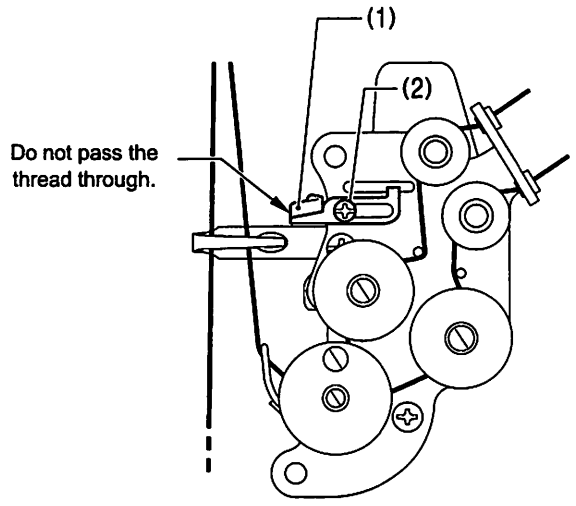
Thread take-up spring L (2) [for left thread]

1. Loosen the tension nut (5).
2. Use a small screwdriver to turn the tension stud (6) to adjust the tension.
3. Tighten the tension nut (5).

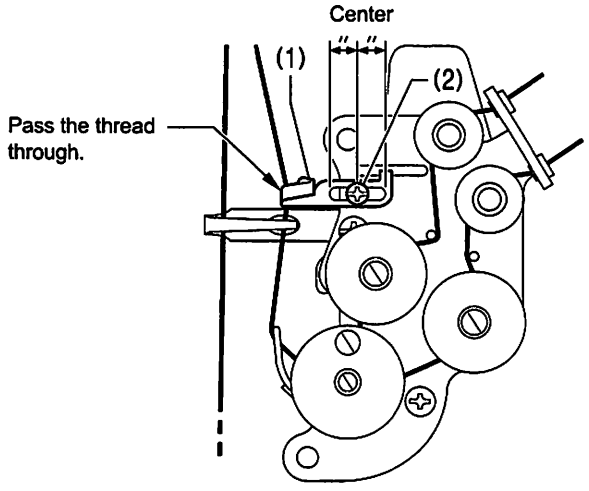
4-4. Thread take-up amount

<For non-foundation specifications>

2928M



<For foundation specifications>



2929M

The thread take-up amount is adjusted by how the thread is passed through the thread amount adjuster (1).

< Using the standard thread amount adjuster (1) >

For non-foundation specifications

Do not pass the thread through the thread amount adjuster (1). Loosen the screw (2) and slide the thread amount adjuster (1) to the right-side position.

For foundation specifications

Pass the thread through the thread amount adjuster (1). The standard position of the thread amount adjuster (1) is when the screw (2) is in the center of the adjustment range.

< Adjusting the thread take-up amount >

When the thread has been passed through the thread amount adjuster (1), the thread take-up amount becomes less when the thread amount adjuster (1) is moved to the right.

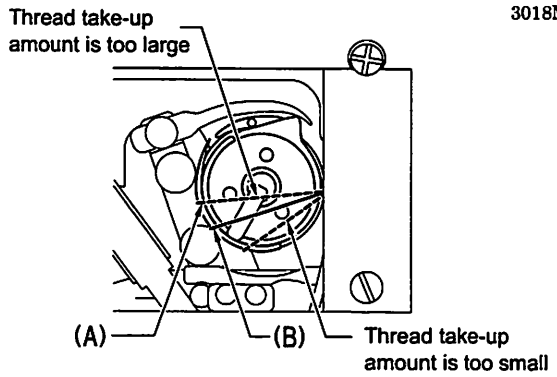
It is better not to pass the thread through the thread amount adjuster (1):

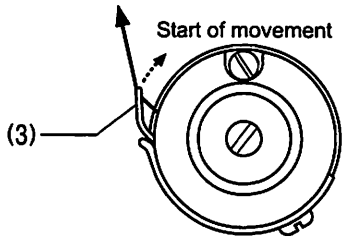
- When sewing heavy materials using a sewing machine with foundation specifications
- When the thread take-up amount is not enough, such as when the stitch length is increased

It is better to pass the thread through the thread amount adjuster (1):

- When sewing with slippery threads such as synthetic yarns
- When sewing light materials
- When sewing with a stitch length of 2 mm or less
- When sewing under any of the above three conditions and you would like to prevent skipped stitches, thread tightening problems such as looping, or thread breakages

3018M





3019M

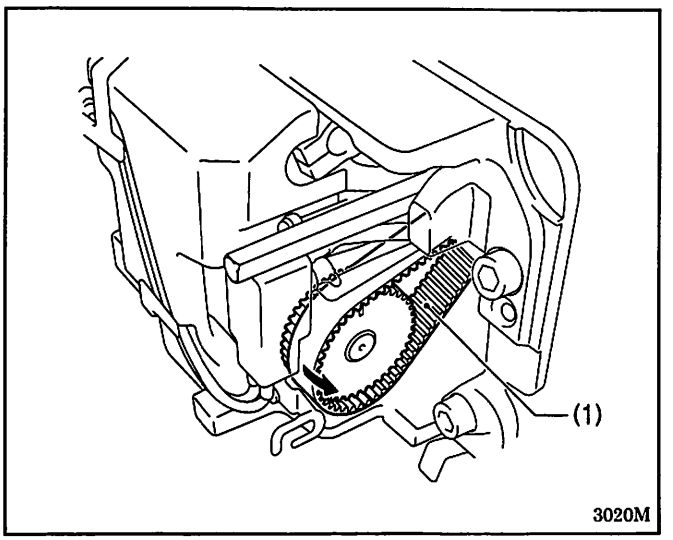
< Guide to adjustment >

The standard thread take-up amount is when the thread tension spring (3) starts to move when the loop is moved to point (B) which is slightly in front of point (A) where the rotary hook tip catches the upper thread loop and the rotary hook thread amount is at its maximum.

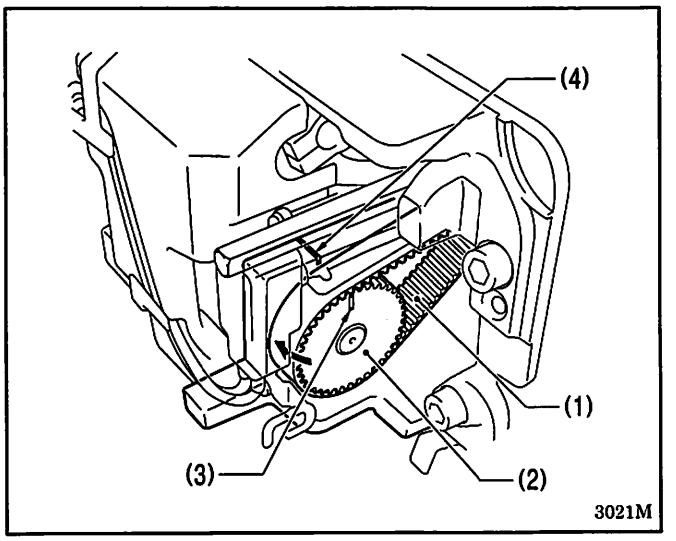
- If the thread take-up amount is too large, the thread tension spring (3) will not start to move even after point (A) is passed.
  ..... This can cause skipped stitches, poor thread tightening and thread breakages.
- If the thread take-up amount is too small, the thread take-up spring (3) will start moving before point (B).
  ..... This can cause thread breakages, overtightening of the upper thread and pulling of the seam.

The thread take-up amount required will vary depending on the type of thread, the thickness of the material and the stitch length, so adjust the thread take-up amount to suit the sewing conditions.

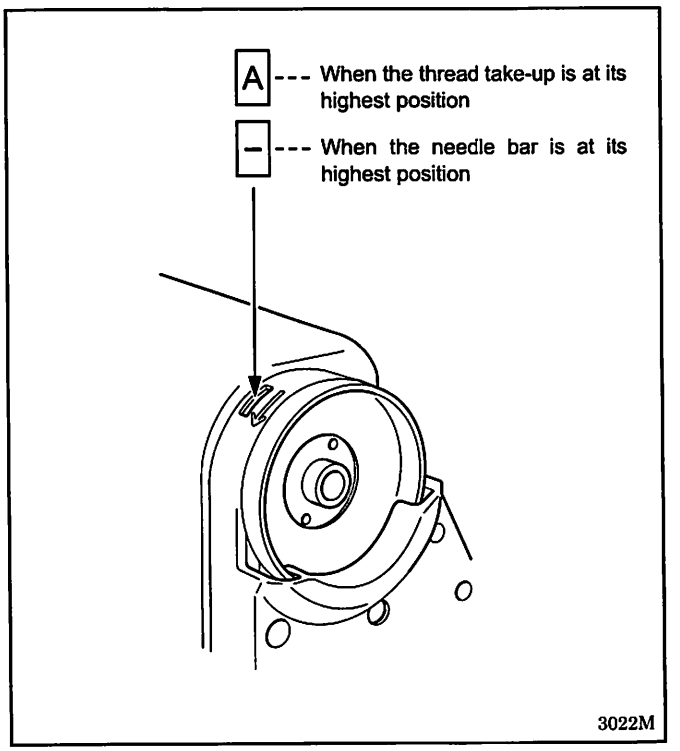
4-5. Upper shaft and lower shaft timing (Under-table motor specifications: T-8420A, 8720A)



1. Remove the needle.
2. Tilt back the machine head.
3. Remove the timing belt (1).
   (Gradually slide the timing belt (1) to the right while turning the machine pulley forward.)



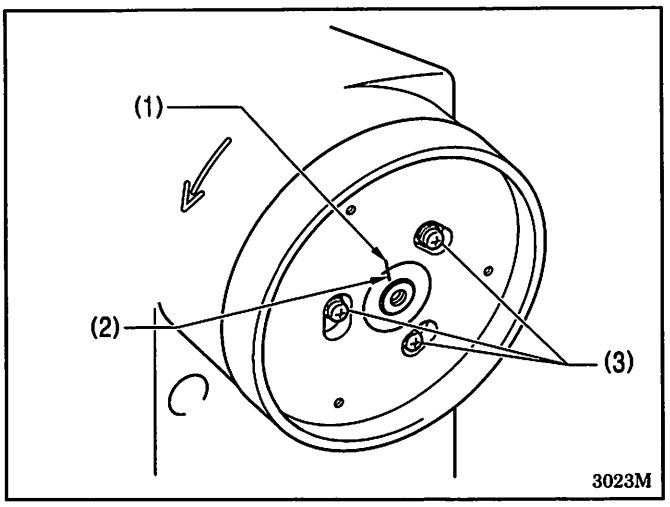
4. Place the timing belt (1) onto timing pulley D (2) so that the mark (3) on timing pulley D (2)is aligned with the bed reference line (4) when the thread take-up is at its highest position.
   (Place the timing belt (1) part of the way on and then gradually slide the timing belt (1) to the left while turning the machine pulley.)



< Adjustment method >

1. Check that the mark (3) on timing pulley D (2)is aligned with the bed reference line (4) when the thread take-up is at its highest position.
   Also at this time, check that the <A> mark on the machine pulley is visible in about the middle of the belt cover window.
2. Check that the <–> mark on the machine pulley is visible in about the middle of the belt cover window when the needle bar is at its highest position.
3. Install the needle.

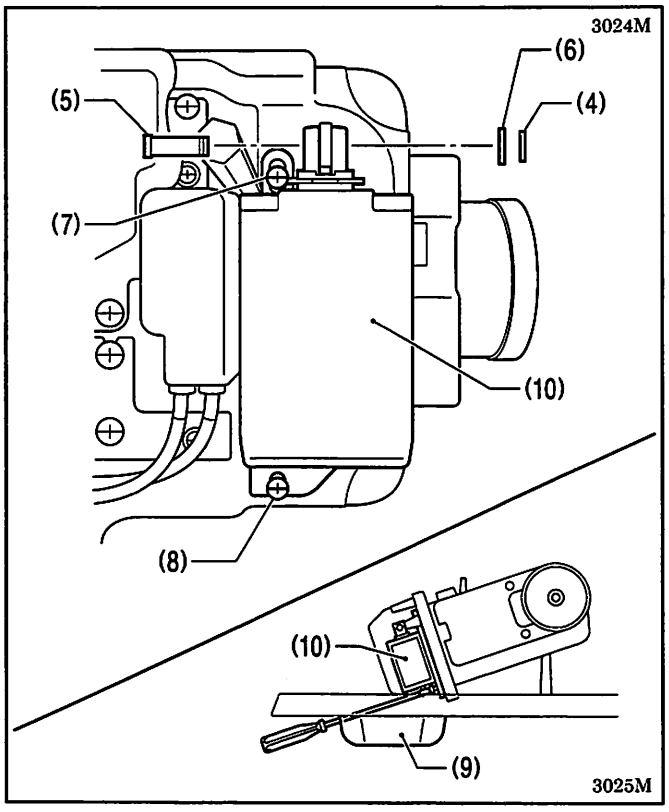
4-6. Upper shaft and lower shaft timing (DD motor specifications: T-8421A, 8422A, 8722A)



< Before adjusting >

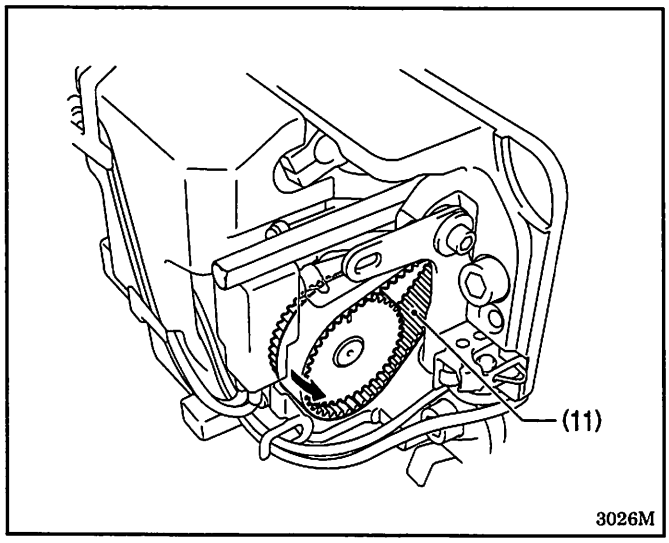
Check that the index mark (1) on the machine pulley and the index mark (2) on the pulley holder are aligned.

* If the index marks (1) and (2) are not aligned, loosen the screws (3) and align the index marks (1) and (2).

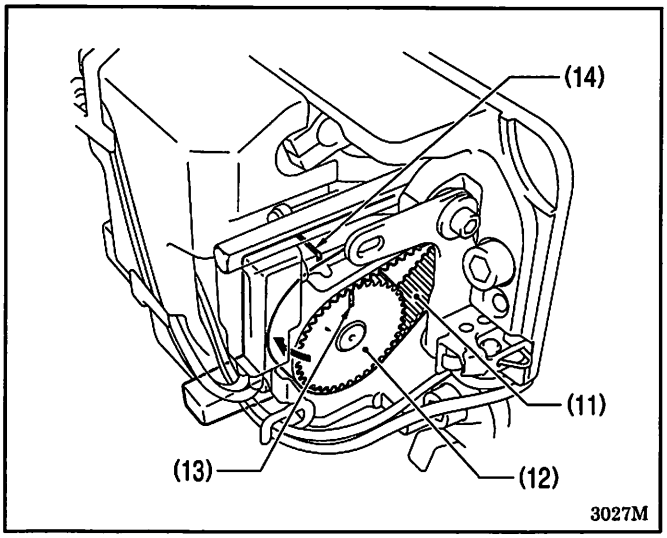


< Adjustment method >

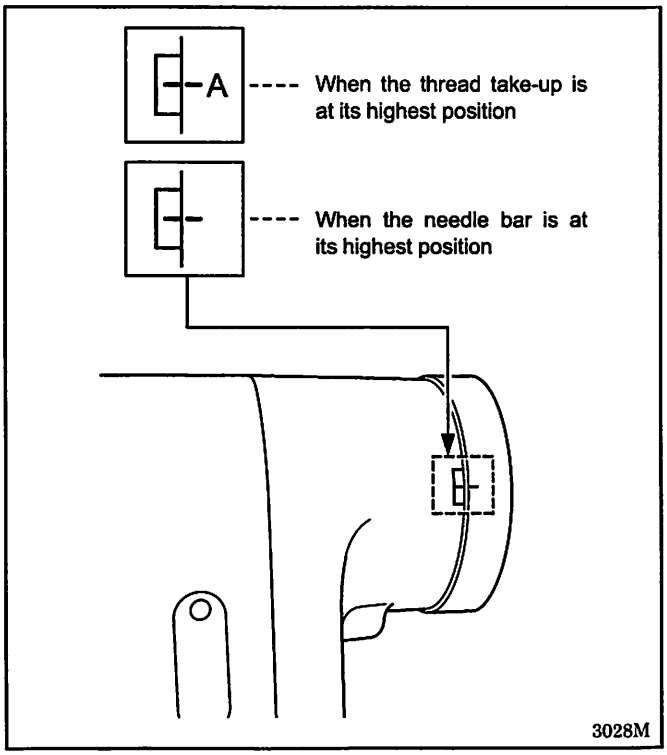
1. Remove the needle.
2. Tilt back the machine head.
3. Remove the retaining ring (4) and then remove the pin (5) and the washer (6).
4. Remove the screw (7), and loosen the screw (8).
   (The screw (7) can be loosened by inserting a screwdriver into the cut-away part in the oil pan (9) underneath the table.)
5. Remove the quick reverse solenoid (10).



6. Remove the timing belt (11).
   (Gradually slide the timing belt (11) to the right while turning the machine pulley forward.)



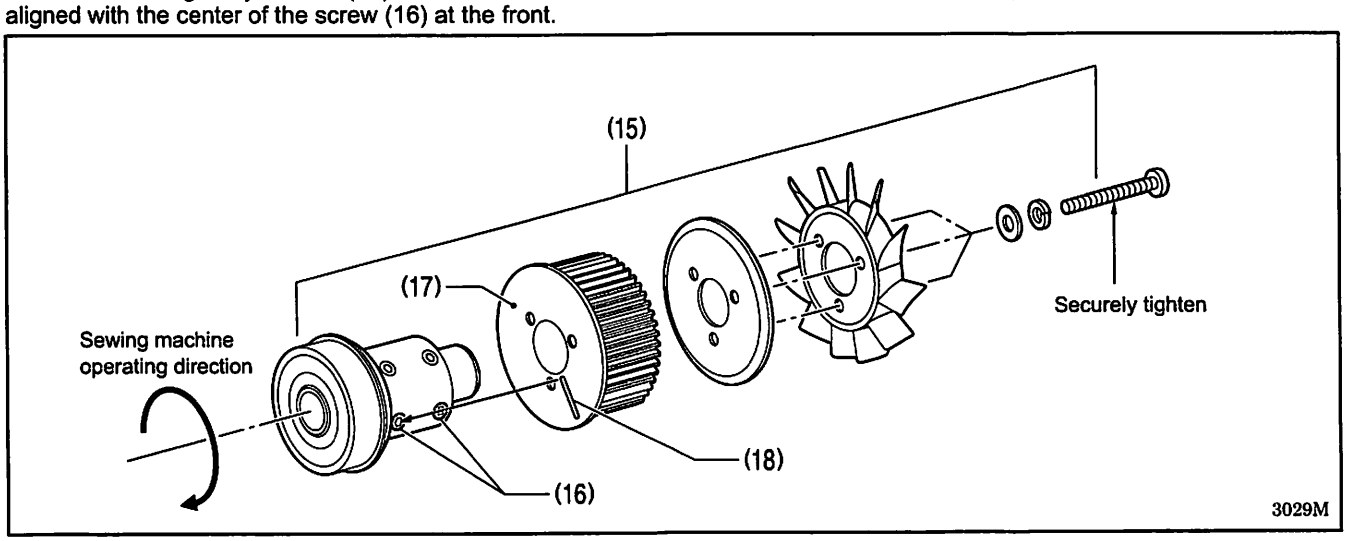
7. Place the timing belt (11) onto timing pulley D (12) so that the mark (13) on timing pulley D (12) is aligned with the bed reference line (14) when the thread take-up is at its highest position.
(Place the timing belt (11) part of the way on and then gradually slide the timing belt (11) to the left while turning the machine pulley.)



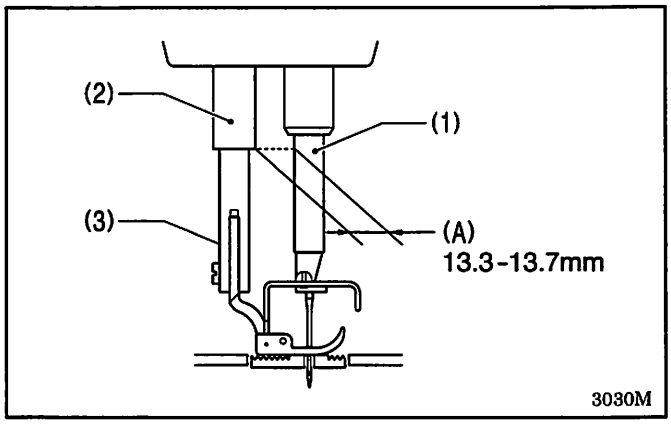
< Adjustment method >

1. Check that the mark (13) on timing pulley D (12)is aligned with the bed reference line (14) when the thread take-up is at its highest position.
Also at this time, check that the <A> mark on the machine pulley is visible in about the middle of the belt cover window.
2. Check that the <–> mark on the machine pulley is visible in about the middle of the belt cover window when the needle bar is at its highest position.
3. Install the quick reverse solenoid (10).
4. Install the needle.

Note:
When assembling the joint unit (15) after it has been disassembled, install so that the mark (18) on timing pulley U (17) is aligned with the center of the screw (16) at the front.



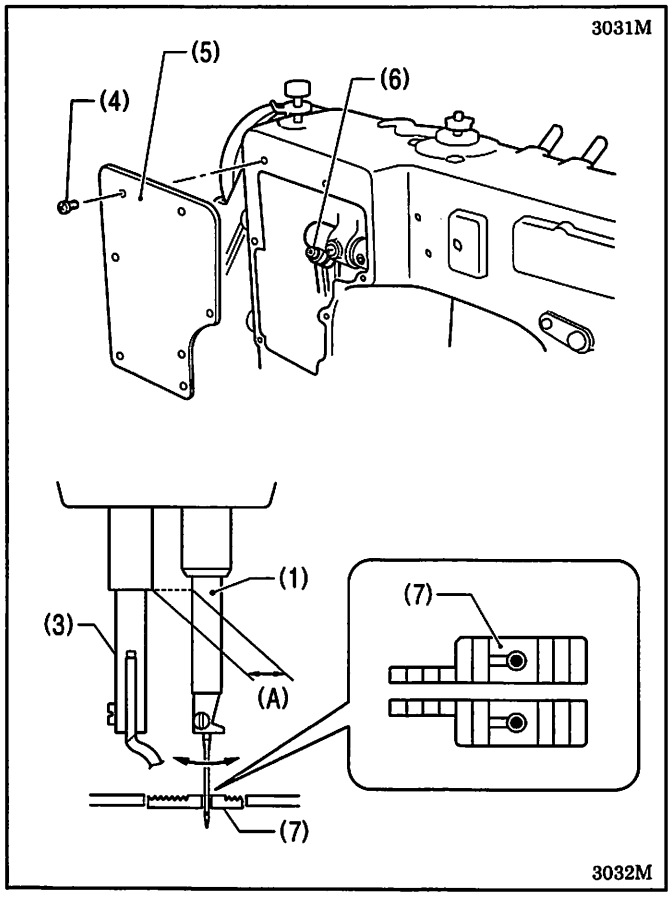
4-7. Needle drop forward-back position



< Checking method >

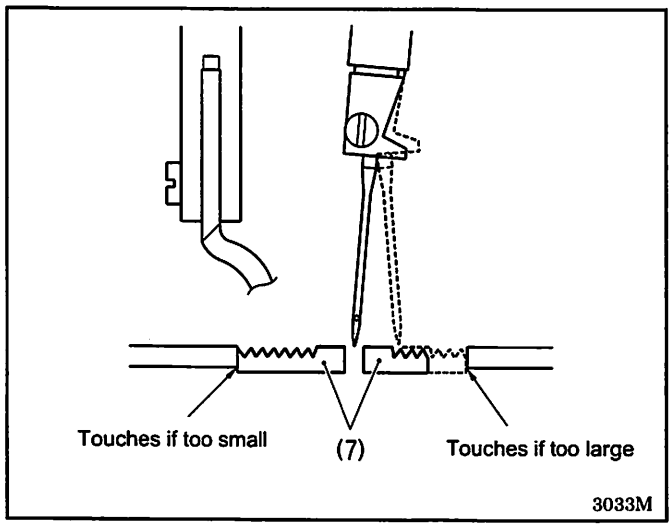
1. Set the stitch length dial to "0".
2. Move the needle bar (1) to its lowest position.
3. The gap between the needle bar (1) and the presser bar (3) should be 13.3–13.7 mm at the bottom edge of the presser bar bush (2).

If adjustment is necessary, follow the procedure below.



< Adjustment method >

1. Remove the seven screws (4) and then remove the rear cover (5).
2. Loosen the bolt (6).
3. Move the needle bar (1) forward or back so that the gap between the needle bar (1) and the presser bar (3) is 13.3–13.7 mm as described in <Checking method> above.
4. Tighten the bolt (6).
5. Check once more that the gap is 13.3–13.7 mm.
   (This is because the needle bar (1) may move when the bolt (6) is tightened.)
6. Install the rear cover (5).
7. Check that the needle goes into the middle of the needle hole in the feed dog (7).
   (The needle will actually be slightly to the front when it goes into the feed dog (7), and will be slightly to the back when it comes out.)
   The needle should not be touching the feed dog (7).
   * If the needle touches the feed dog, check the steps in "4-16. Feed dog position").



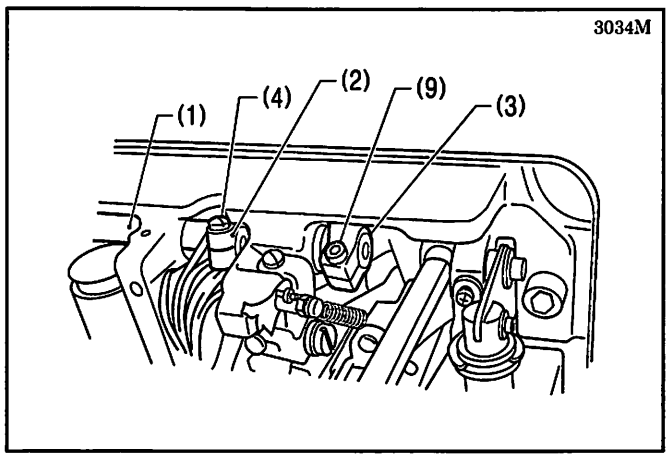
< Reference >

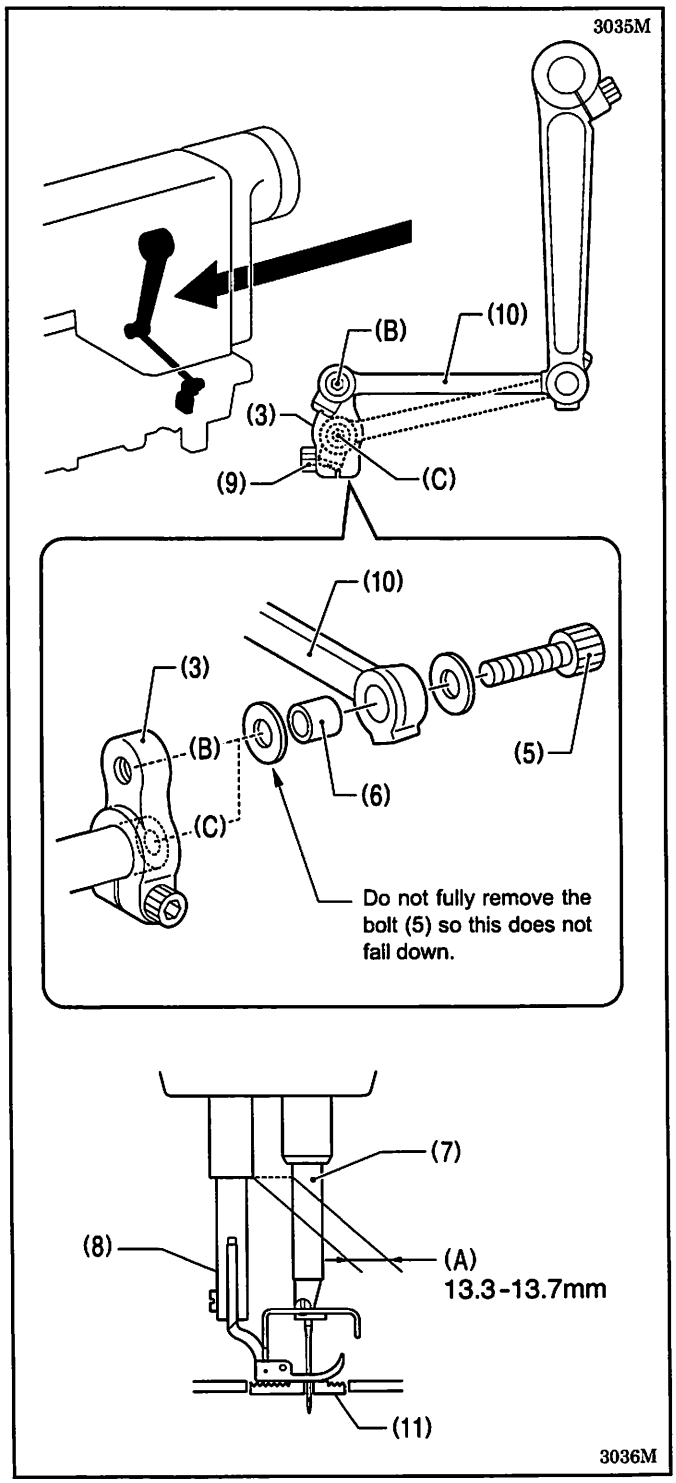
If distance (A) is too large

- The feed dog (7) will touch the needle when the stitch length dial is at the maximum setting
- Skipped stitches and needle breakages may occur.
- Lower thread trimming errors at the right side and upper thread trimming errors at the left side may occur.

If distance (A) is too small

- The feed dog (7) will touch the needle when the stitch length dial is at the maximum setting.
- Skipped stitches and needle breakages may occur.
- Lower thread trimming errors at the left side and upper thread trimming errors at the right side may occur.





Note:

When adjusting the needle drop forward-back position, do not move the feed rocker arm (2) and the needle bar rock arm (3) with respect to the feed rocker shaft (1).
If they are moved, they may cause interference between the various mechanisms, and the needle drop position may shift when changing to lower feed.

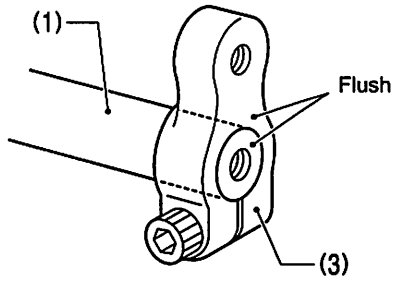
Realignment if these parts are accidentally moved

1. Set the stitch length dial to "0".
2. Tighten the screw (4) to secure the feed rocker arm (2) to the feed rocker shaft (1).
3. Move bolt (5) from (B) to (C).
   (Be careful not to pull bolt (5) out too far, otherwise the washer (6) may fall down.)
4. Check that the gap (A) between the needle bar (7) and the presser bar (8) is 13.3–13.7 mm.
   (If gap (A) is incorrect, adjust while referring to "Needle drop forward-back position" on the previous page.)
5. Move bolt (5) from (C) back to (B).
   (Be careful not to pull bolt (5) out too far, otherwise the washer (6) may fall down.)
6. Check once more that the gap (A) between the needle bar (7) and the presser bar (8) is 13.3–13.7 mm.

   If gap (A) is incorrect:
   1) Loosen the screw (9).
   2) Turn the needle bar rock arm (3) to adjust the gap (A) between the needle bar (7) and the presser bar (8) to 13.3–13.7 mm.
   3) Tighten the screw (9).
      (Be careful not to move the needle bar rock arm (3) sideways at this time. If it is moved sideways, the needle bar rocker link (10) may move out of alignment. Refer to "Needle bar rocker link sideways position" on the following page for details.)
   4) Check once more that the gap (A) between the needle bar (7) and the presser bar (8) is 13.3–13.7 mm.

7. Check that the needle goes into the middle of the needle hole in the feed dog (11).
   If the needle touches the feed dog (11), adjust the position of the feed dog (11) to match the needle position. (Refer to "4-16. Feed dog position".)

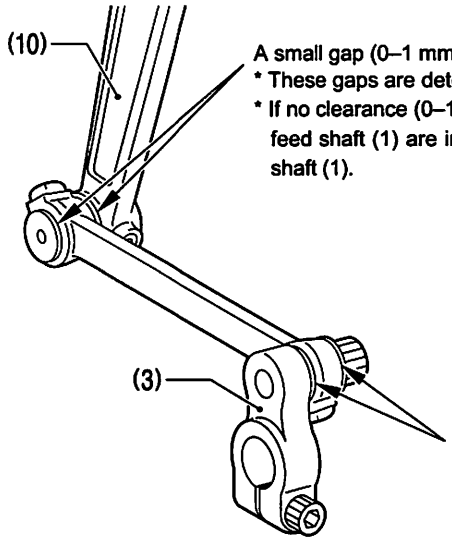
Needle bar rocker link sideways position



3037M

Install the needle bar rocker arm (3) so that it is flush with the feed rocker shaft (1).

* Refer to the following to check the sideways position of the needle bar rocker link (10).



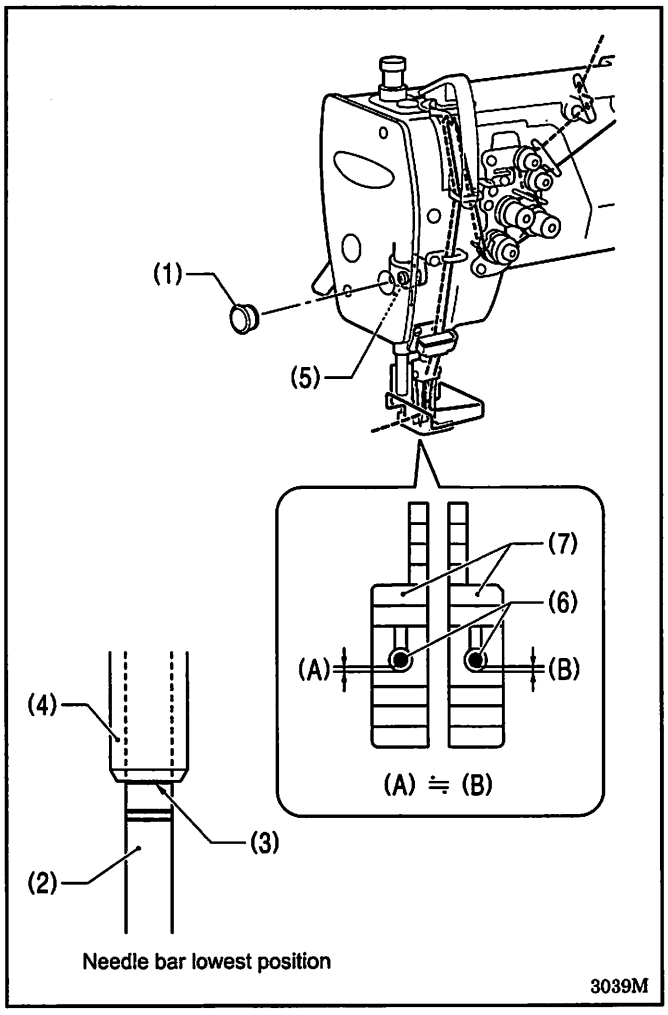
A small gap (0–1 mm) is necessary on both sides.

* These gaps are determined by the sideways position of the needle bar rocker arm (3).

* If no clearance (0–1 mm) can be obtained even though the needle bar rock arm (3) and the feed shaft (1) are installed flush, you will need to adjust the sideways position of the feed shaft (1).

3038M

4-8. Needle and rotary hook timing

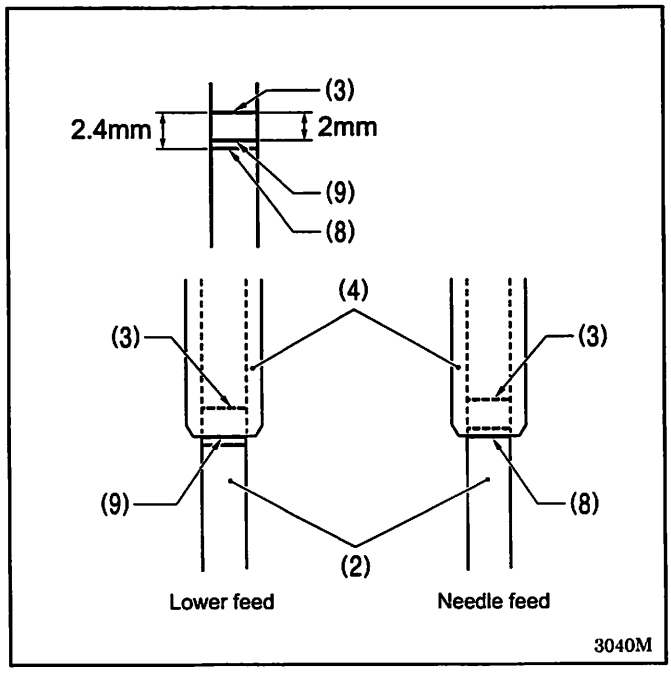


1. Set the stitch length dial to the actual length of the stitches to be sewn.

Standard stitch length

Specifications	Stitch length dial
-□□F	2
-□□3	2
-□□5	3

2. Remove the rubber cap (1).
3. Loosen the screw (5) and move the needle bar (2) up or down to adjust so that the top reference line (3) on the needle bar (2) is aligned with the bottom edge of the needle bar bracket (4) when the needle bar (2) is at its lowest position.
   (Be careful not to turn the needle bar (2) at this time.)
4. Securely tighten the screw (5).
5. At this time, the gaps (A) and (B) between the needle (6) and the front of the feed dog (7) should be about the same as each other.



6. Turn the machine pulley forward to raise the needle bar (2) until the reference line ((8) or (9), depending on the feed condition) on the needle bar (2) is aligned with the bottom edge of the needle bar base (4).
7. In this condition, secure the machine pulley with tape or similar, so that the needle bar (2) will not move.

The procedure up to this point determines the needle bar lift amount.

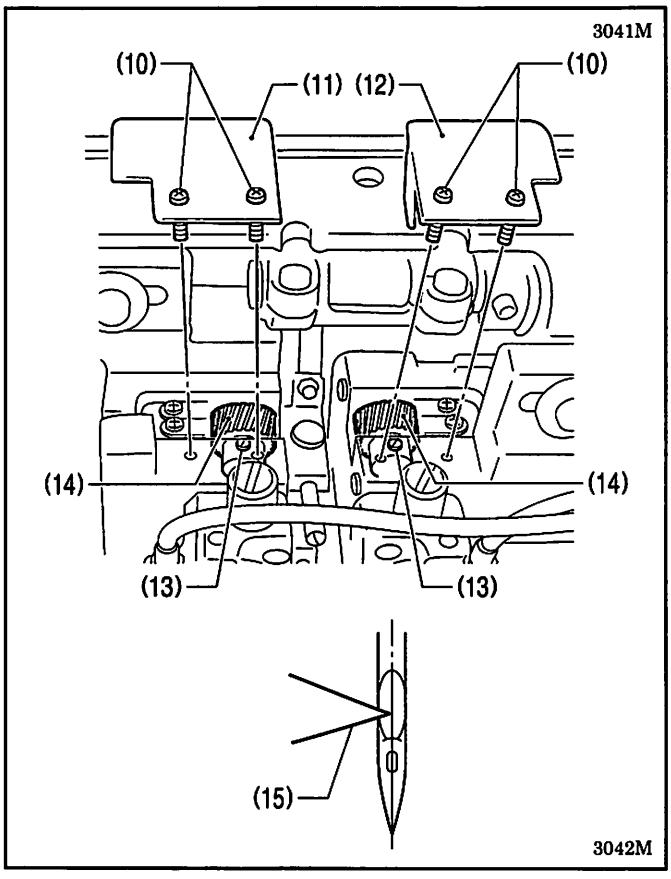
Note:

If the needle bar lift amount is too large

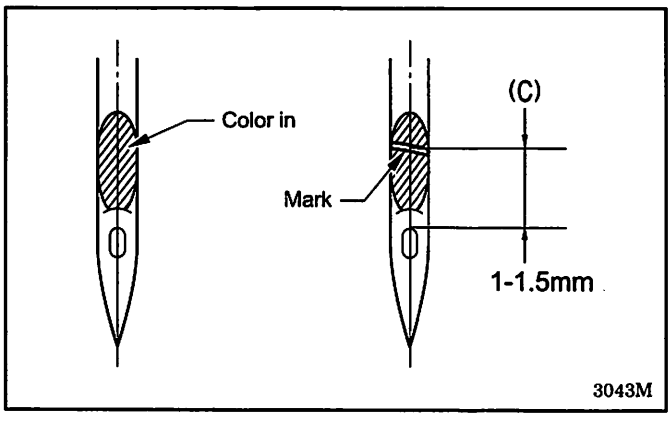
- It will cause poor tightening in the right thread.
- Both the left and right seams will become uneven, and skipped stitches or thread breakages will occur.
- Upper thread trimming errors may occur, or the upper thread may be cut too short (models with thread trimmer).
- The upper thread trailing length will be too long (models with thread trimmer).

If the needle bar lift amount is too small

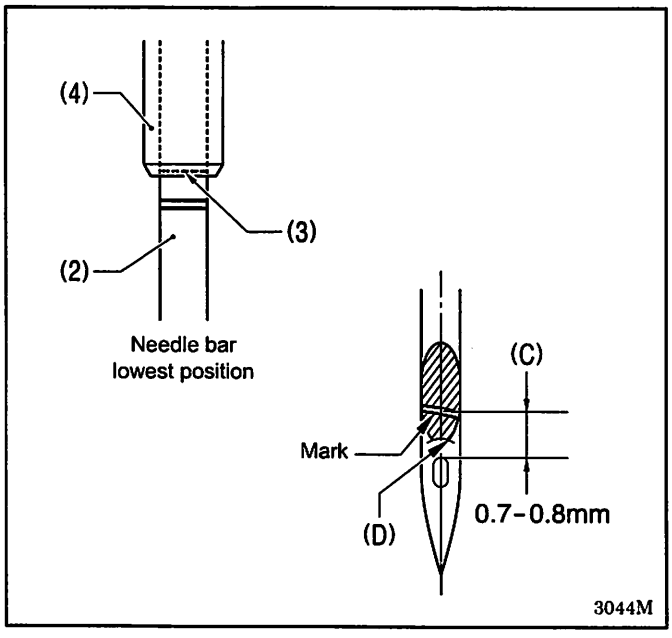
- Skipped stitches and thread breakages will occur.
- The upper thread trailing length will be too short (models with thread trimmer).



8. Loosen the screws (10), and then remove rotary hook base cover FL (11) and FR (12).
   (The screws (10) is designed so that they cannot be removed from the rotary hook base cover FL (11) and FR (12) to prevent them from being lost.)
9. Loosen the set screws (13) (three each at left and right).
   (However, be careful not to loosen them too much, otherwise the set screws (13) will touch the inside surface of the rotary hook base and the pinion gear (14) will not be able to turn. Loosen the set screws by the minimum amount which will still allow the rotary hook to move freely.)
10. Turn the rotary hook by hand to align the rotary hook tip (15) with the middle of the needle. (Do not turn the machine pulley at this time.)
11. Tighten the set screws (13).
    (Tighten the three set screws (13) a little bit at a time in order so that the pinion gear (14) does not become tilted.)
12. Remove the tape that is securing the machine pulley.



13. Use an oil-based marker pen to color in the hollow of the needle.
14. With the needle raised, turn the machine pulley forward while pushing the needle against the rotary hook tip (15) with your finger to make a mark from the rotary hook tip (15) in the hollow of the needle.
15. Check that the distance (C) from the intersection between the mark from the rotary hook tip (15) and the center line of the needle to the top edge of the needle hole is 1–1.5 mm.
    * If the distance is not 1–1.5 mm, loosen the screw (15) again and adjust the height of the needle bar.
    * If dimension (C) has been adjusted, the highest reference line (3) on the needle bar (2) may be hidden by the bottom edge of the needle bar base (4) when the needle bar is at its lowest position, but this is not a problem.



If using a thread such as polyester thread which does not easily form stable loops

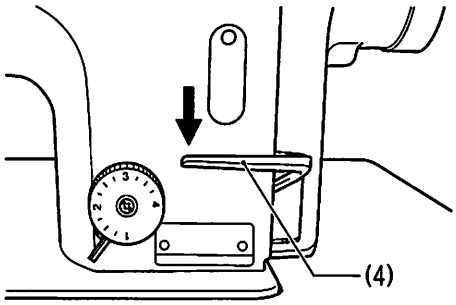
* If problems such as skipped stitches or upper thread breakages occur, set the above distance (C) to 0.7–0.8 mm to make it easier for the rotary hook tip (15) to catch the upper thread loop.

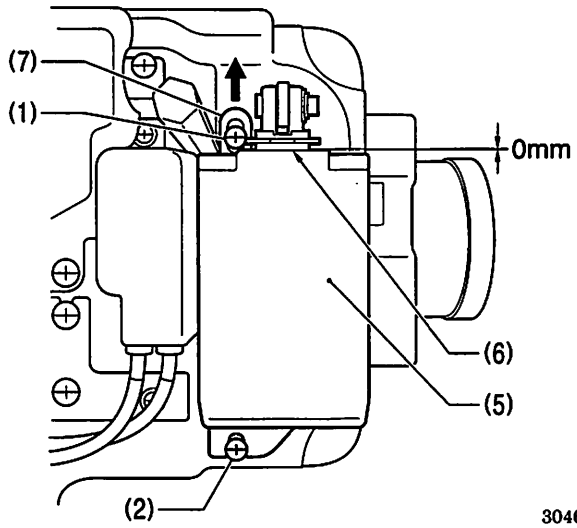
Note:

- When the stitch length is changed, distance (C) will also change, so re-check distance (C) at such times.
- During quick reverse operation, distance (C) for the left needle will become shorter, so do not set it to less than 0.7 mm, otherwise the rotary hook tip (15) may touch the projection (D) and this could damage the rotary hook tip (15).

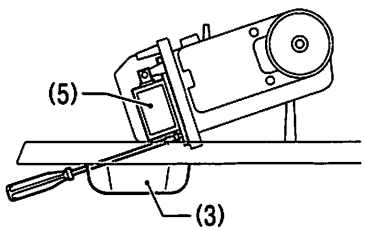
4-9. Quick reverse device (DD motor specifications: T-8421A, 8422A, 8722A)

3045M





3046M



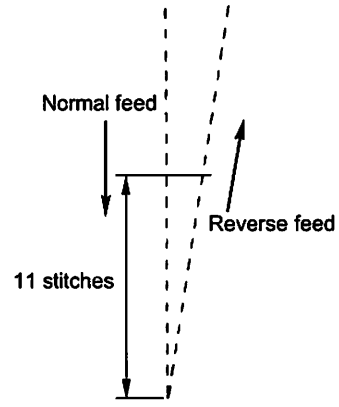
3047M

1. Set the stitch length dial 1/2 a step below the maximum setting.
   (For example, if the maximum setting is 4, set the stitch length dial to 3.5.)
2. Tilt back the machine head.
3. Loosen the screws (1) and (2).
   (The screw (2) can be loosened by inserting a screwdriver into the cut-away part in the oil pan (3) underneath the table.)
4. When the reverse lever (4) is fully lowered, move the solenoid bracket (7) so that there is no gap between the quick reverse solenoid (5) and the rubber stopper (6), and then tighten the screw (1).

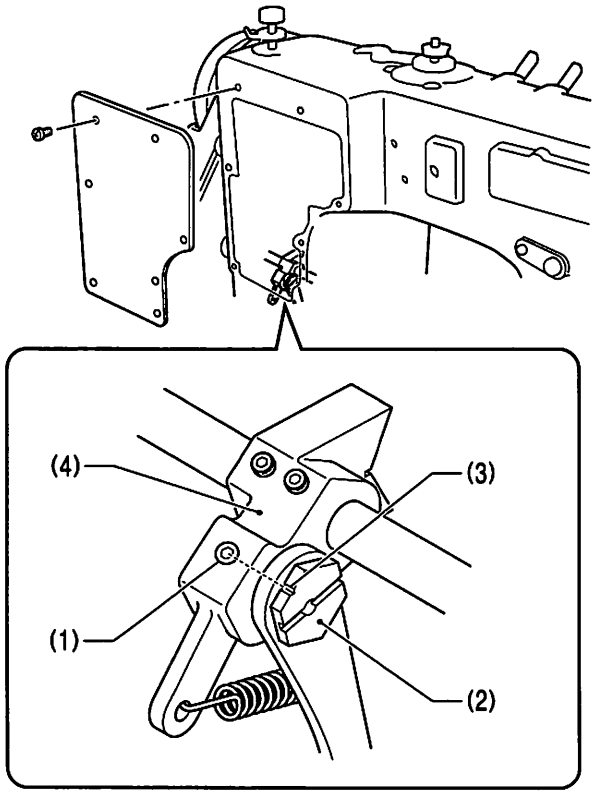
* If the gap mentioned above is too large, the operation of the quick reverse solenoid (5) will become sluggish.)

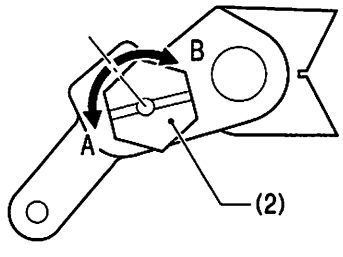
4-10. Unifying stitch lengths for normal feed and reverse feed

1822M



3048M





3049M

The following explains how to make the stitch lengths the same for normal feed and reverse feed.

1. Set the stitch length dial to the actual stitch length that is to be sewn.

Standard stitch lengths

Model	Specifications	Stitch length dial
T-8420A T-8421A T-8422A	-□□F	2
	-□□3, -□□5	3
T-8720A T-8722A	-□□3, -□□5	4

2. Turn the machine pulley by hand or run the sewing machine at low speed (220 rpm) and sew using normal feed and reverse feed (11 stitches each way).
3. If adjustment is necessary, carry out the following.
   1) Remove the rear cover.
   2) Loosen the set screw (1).
   3) Turn the eccentric shaft (2) within a range of 90 degrees to adjust.
   (If you turn the eccentric shaft more than 90 degrees, the adjustment will be reversed.)

   The standard position is when the index mark (3) on the eccentric shaft (2) is aligned with the set screw (1).

   - **If the stitch length is longer for normal feed than for reverse feed**

     Turn the eccentric shaft (2) in the direction of A.

   - **If the stitch length is shorter for normal feed than for reverse feed**

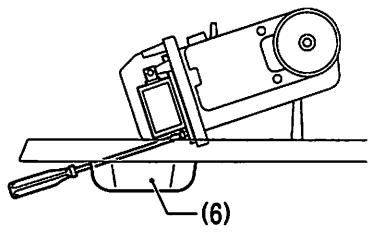
     Turn the eccentric shaft (2) in the direction of B.

4. After adjusting, securely tighten the set screw (1) while gently pushing the eccentric shaft (2) toward the feed regulator (4).

4-1 1. Rotary hook bases position

When changing the gauge part width, or when adjusting the clearance between the needle and the rotary hook tip, adjust the left and right movement of the rotary hook bases.

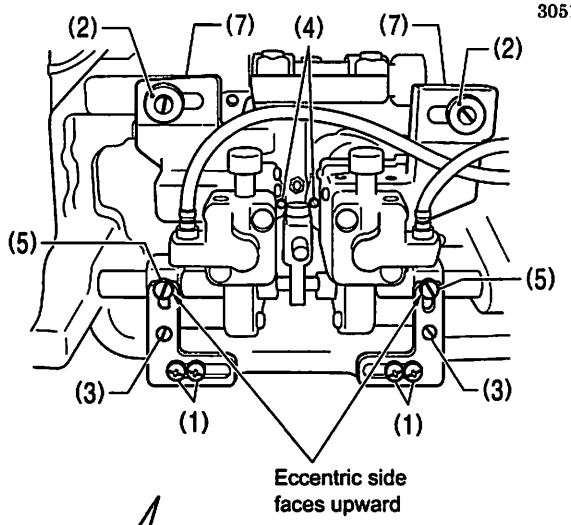
3050M



< If moving the position of the rotary hook bases by a large amount (about 1 mm or more at one side) >

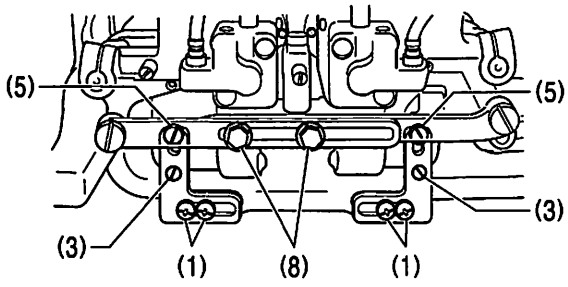
* When loosening or tightening the screws (1) to (5), insert a screwdriver into the cut-away part in the oil pan (6) underneath the table.)

3051M



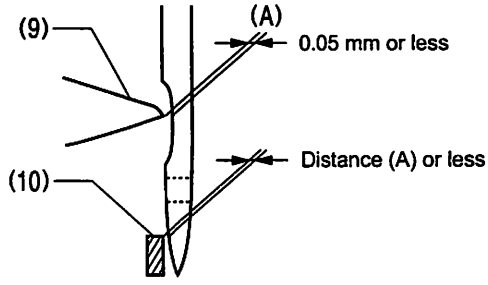
Eccentric side faces upward

Models with thread trimmer

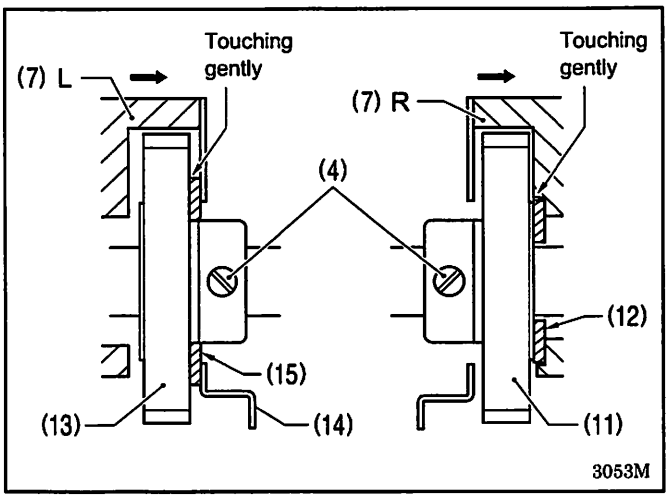


1. Tilt back the machine head.
2. Loosen the four screws (1).
3. Loosen the two screws (2) slightly so that the rotary hook base (7) can move.
4. Loosen the two screws (3).
5. Loosen the set screws (4) (three each at left and right).
   * Each group of three set screws (4) has one screw with a rounded tip that fits into the V-shaped screw stop in the lower shaft. Loosen the set screws only slightly so that they do not come out from the V-shaped screw stop.
6. If the sewing machine has a thread trimmer, loosen the two bolts (8).
7. Move the rotary hook base (7) to the left or right to its approximate position (when the rotary hook tip (9) is approximately 0.2 mm away from the needle in its final position), and then tighten the screws (1). At this time, the eccentric sides of the two needle upper positioning shafts (5) will be facing upward as shown in the illustration at left.
8. Turn the needle upper positioning shafts (5) to make fine adjustments to the left and right positions of the rotary hook bases (7) so that the clearance between the needle and the rotary hook tip (9) is 0.05 mm or less but so that they do not touch.
   At this time, the clearance between the needle and the needle guard (10) should be smaller than the clearance (A) between the needle and the rotary hook tip (9).
   * When the needle upper positioning shafts (5) are turned until they feel stiff, you can then move the rotary hook bases (7) easily by running your hand along them.
9. Tighten the screws (2) and (3).

3052M



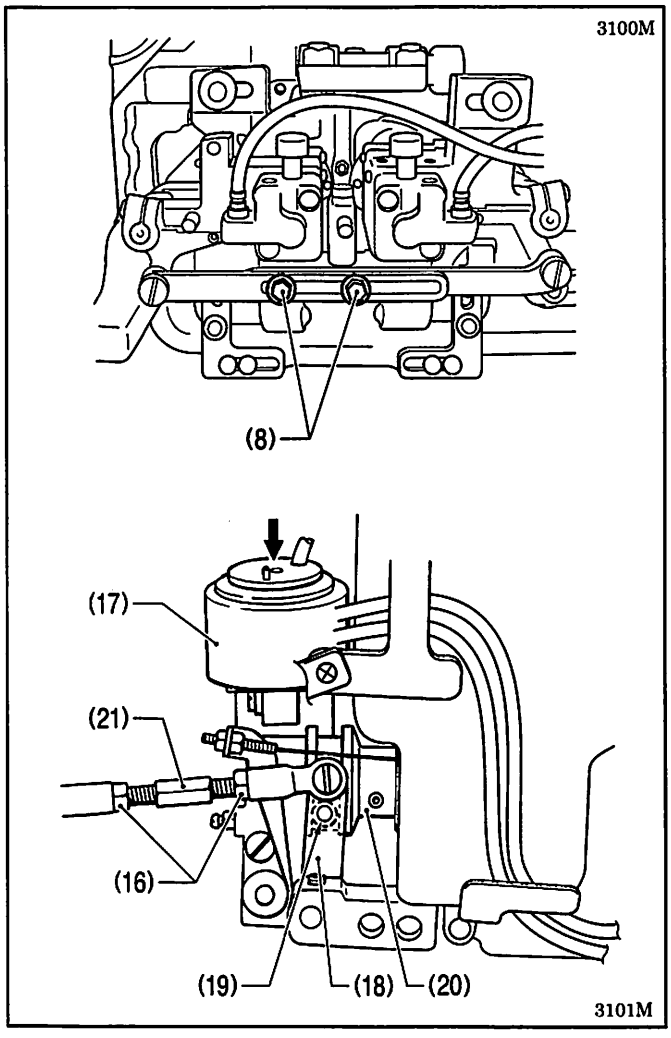
When the needle is bent toward the rotary hook tip (9), the needle and rotary hook tip (9) should not touch even if the needle and the needle guard (10) do touch.



10. Lastly, tighten the set screws (4) (three each at left and right).
At this time, push the right spiral gear (11) gently to the right (so that it gently touches the thrust washer (12) inside the rotary hook base (7)). Also push the left spiral gear (13) gently to the right (so that it gently touches the thrust washer (15) in between the spiral gear (13) and the cover (14)) when tightening the set screws.

Note:

After tightening the spiral gears (11) and (13), do not try and force the needle upper positioning shafts (5) to turn in order to make fine adjustments to the sideways positions of the rotary hook bases (7), otherwise damage may result.



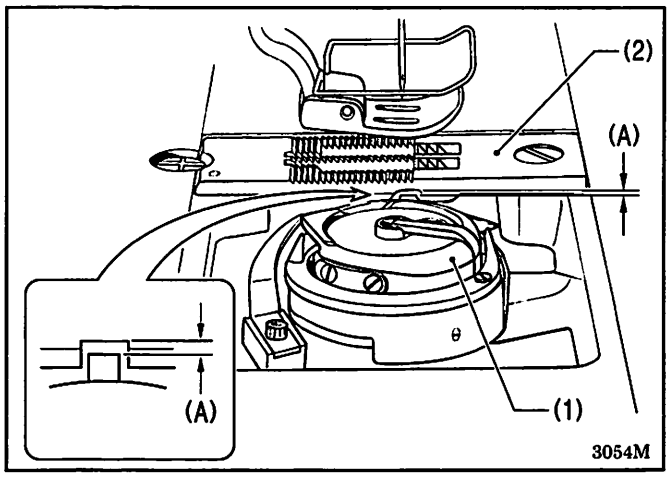
11. For thread trimming sewing machines
    1) Tighten the bolts (8).
    2) Lower the needle bar to its lowest position.
    3) Loosen the nut (16).
    4) Turn the adjusting connecting rod (21) to adjust so that the roller (19) of the main lever (18) goes into the groove in the thread trimmer cam (20) when the thread trimmer solenoid (17) is pressed.
    5) Tighten the nut (16).

< If moving the position of the rotary hook bases by a small amount (about 1 mm at one side) >

For example:
- When readjusting the clearance between the needle and the rotary hook tip
- When changing small-width gauge parts (such as 6.4 mm ← → 4.8 mm or 4.8 mm ← → 3.2 mm)

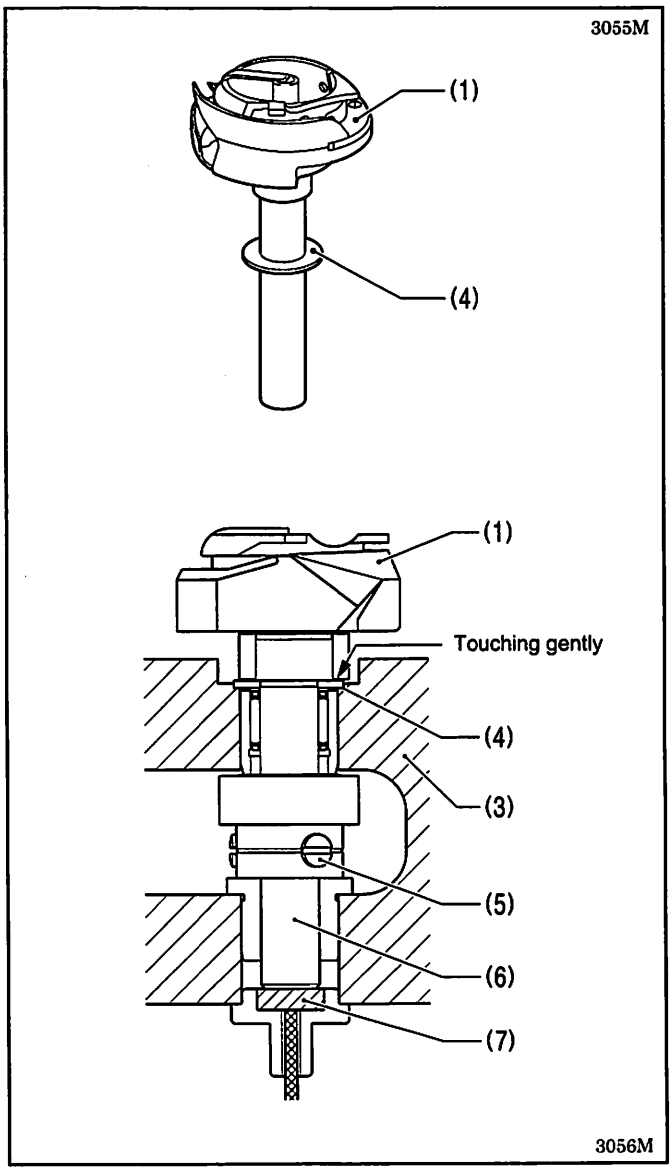
The amount of eccentricity in the needle upper positioning shafts (5) (refer to the illustration on the previous page) is 1.7 mm. Therefore, when adjusting the sideways movement of the rotary hook bases (7) to about 1 mm to one side, you do not need to loosen the screws (1). Carry out steps 1., 3., 4., 5., 6., 8., 9., 10. and 11. in "If moving the position of the rotary hook bases by a large amount" on the previous page.
(Steps 2. and 7. are not required.)

4-1 2. Clearance between rotary hook and needle plate



The clearance (A) between the rotary hook (1) and the needle plate (2) is adjusted as follows at the time of shipment from the factory.

Model	Distance (A)
Without thread trimming T-8420A T-8421A T-8720A	0.9 – 1.2 mm
With thread trimming T-8422A T-8722A	1.4 – 1.7 mm



- Check clearance (A) each time parts such as the rotary hook (1) and the needle plate (2) that affect clearance (A) are replaced.
- To adjust clearance (A), replace the thrust ring (4) that is in between the rotary hook (1) and the rotary hook base (3).
- Three types of thrust ring (4) are available. Measure the thickness of the thrust ring (4) that is currently being used, and replace it with a thrust ring (4) of the appropriate width.

Part code	Thickness
SA4444-001	0.8 mm
SA4038-001	1.0 mm
S09260-001	1.2 mm

- When replacing the rotary hook (1), loosen the three set screws (5). Be careful not to lose the thrust ring (4) at this time.

Note:

There is a piece of felt (7) for lubrication at the base of the rotary hook shaft (6). Gently press down on the rotary hook (1) when tightening the set screws (5) so that the rotary hook (1) does not lift up.

If the clearance is too large

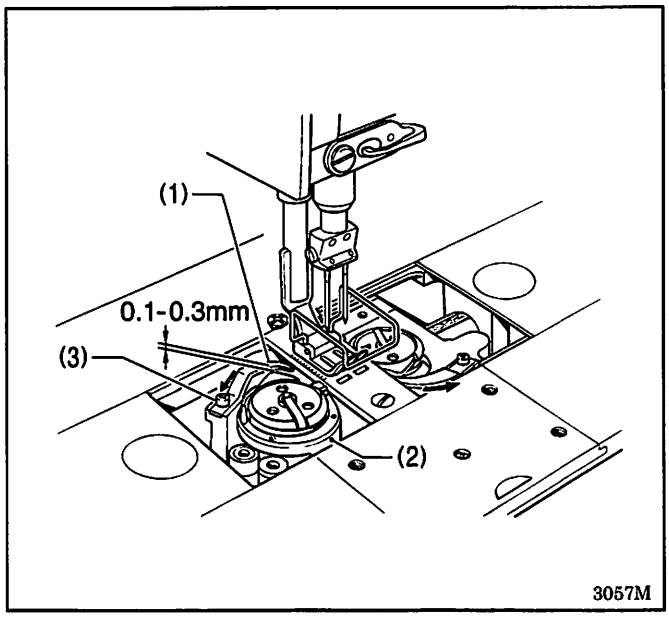
- The inner rotary hook may come out from the needle plate (2).

If the clearance is too small

- Poor thread tightening may occur.
- Lower thread trimming errors may occur (models with thread trimmer).
- The right upper thread may be cut too short (models with thread trimmer).

* These problems may occur particularly if the stitch length is large or when carrying out thread trimming during chaining-off.

4-1 3. Clearance between rotary hook and opener



1. Loosen the set screw (3) and move the opener (1) to the left or right to adjust so that the clearance between the rotary hook (2) and the opener (1) is 0.1–0.3 mm when the opener (1) is pulled as far as it will go in the direction of the arrow.
2. Tighten the set screw (3).

Note:

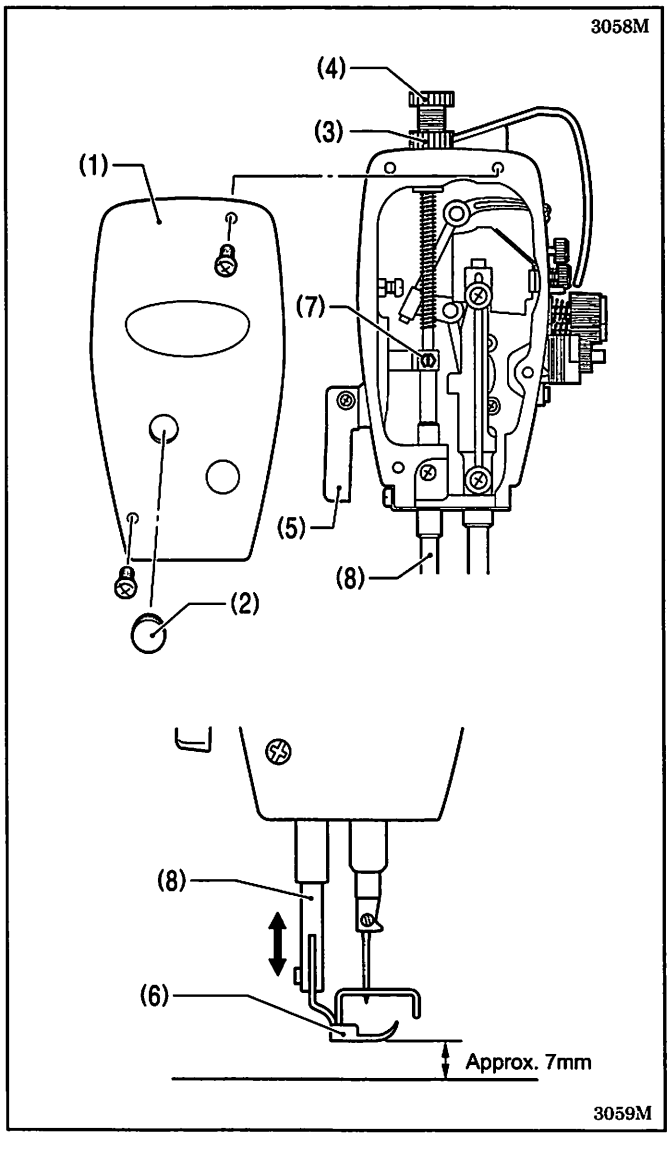
If the clearance is too large

- Upper thread trimming errors may occur (models with thread trimmer).
- The right upper thread may be cut too short (models with thread trimmer).

If the clearance is too small

- The rotary hook may become damaged.
- The opener (1) may become damaged.

4-1 4. Presser foot height

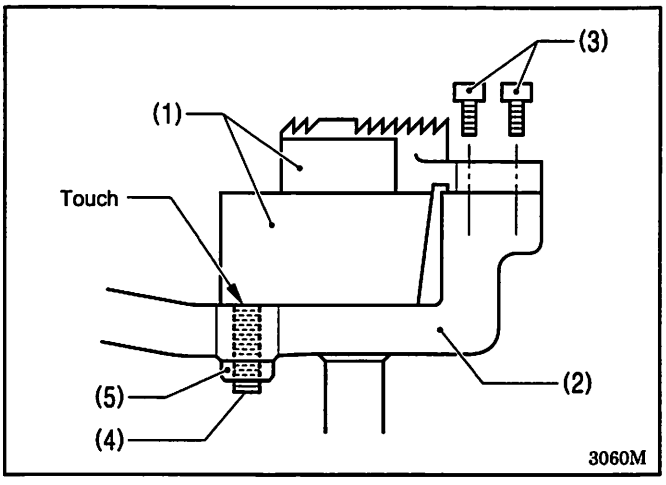


1. Remove the rear cover (1) and remove the rubber cap (2).
2. Loosen the nut (3) and loosen the presser adjusting screw (4).
3. Use the lifting lever (5) to raise the presser foot (6).
4. Loosen the screw (7) and move the presser bar (8) up or down to adjust so that the presser foot (6) is approximately 7 mm above the top of the needle plate.

   Note:
   Do not turn the presser bar (8) at this time.

5. Tighten the screw (7).
6. Turn the presser adjusting screw (4) to adjust the presser foot pressure, and then tighten the nut (3).

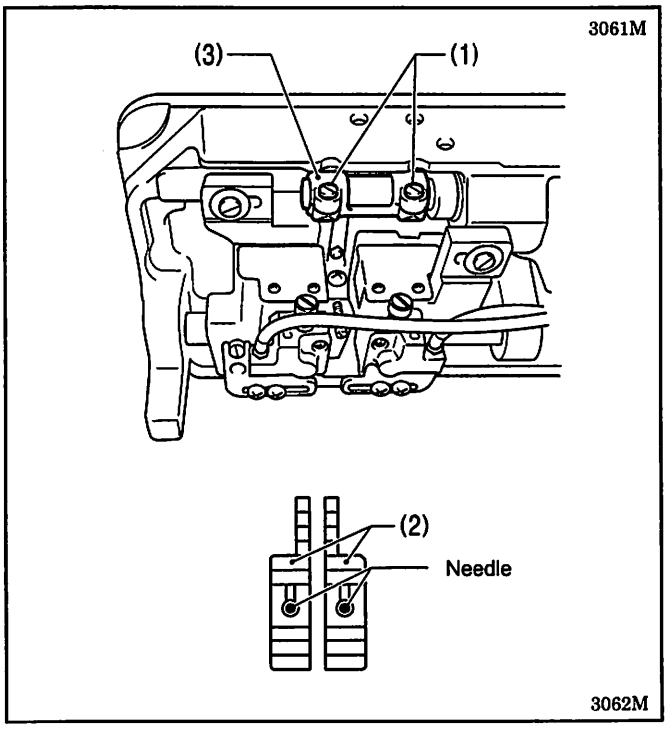
4-15. Installing the feed dog



1. Install the feed dog (1) to the feed bar (2) with the two screws (3).
2. Tighten the feed dog support set screw (4) so that the tip of the set screw (4) touches the bottom of the feed dog (1).
3. Tighten the nut (5) to secure the set screw (4).

* The set screw (4) is not used for installing the feed dog at an angle.

4-16. Feed dog position

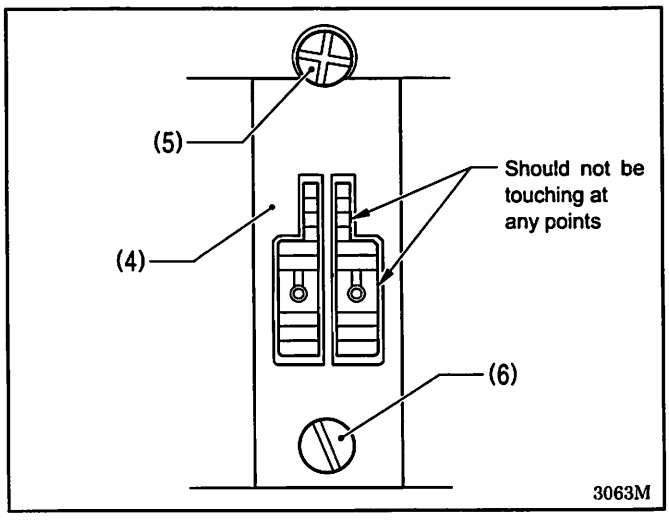


< Forward-back position adjustment >

Carry out this adjustment if the needle and the needle hole in the feed dog are not positioned correctly even though the clearance between the needle bar and the presser bar (13.3–13.7 mm) is correct.

1. Loosen the two screws (1).
2. Turn the feed rocker base arm (3) to adjust so that the needle drops into the middle of the needle hole in the feed dog (2).
   (The needle will actually be slightly to the front when it goes into the feed dog (2), and will be slightly to the back when it comes out.)
3. Tighten the screw (1).

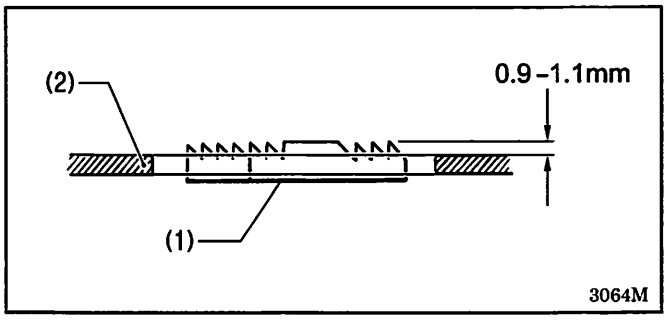
Note:
Do not overtighten the screw (1), otherwise it will damage the feed rocker base arm (3).



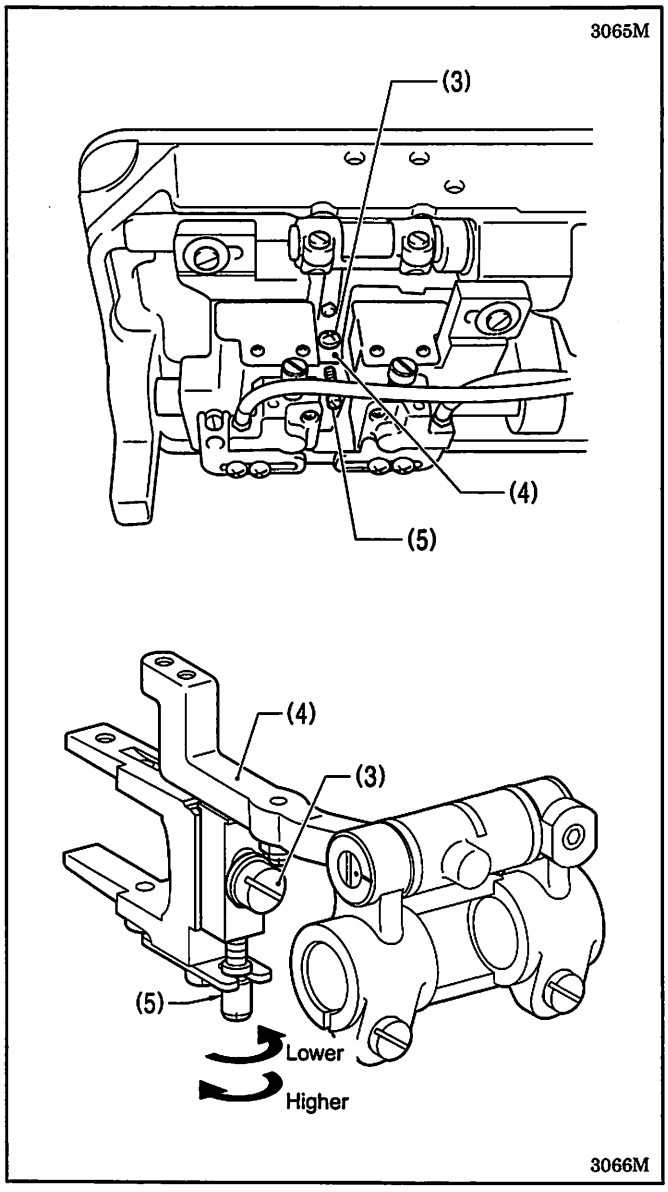
< Left-right position adjustment >

Adjust so that neither side of the feed dog touches the needle plate (4) when the needle plate (4) is secured to the bed with the screws (5) and (6).
If the needle plate and the feed dog are touching, loosen the screw (1) and move the feed rocker base arm (3) sideways to adjust.

4-17. Feed dog height



Turn the machine pulley forward until the feed dog (1) is at its highest position, and then adjust so that the feed dog (1)protrudes 0.9–1.1 mm from the top of the needle plate (2).



1. Tilt back the machine head.
2. Loosen the screw (3) just enough so that the feed bar (4) can slide.
3. Turn the height adjustment screw (5) as shown in the illustration to adjust the height of the feed dog (1).
4. Securely tighten the screw (3).
5. Recheck the height of the feed dog (1).

Note:

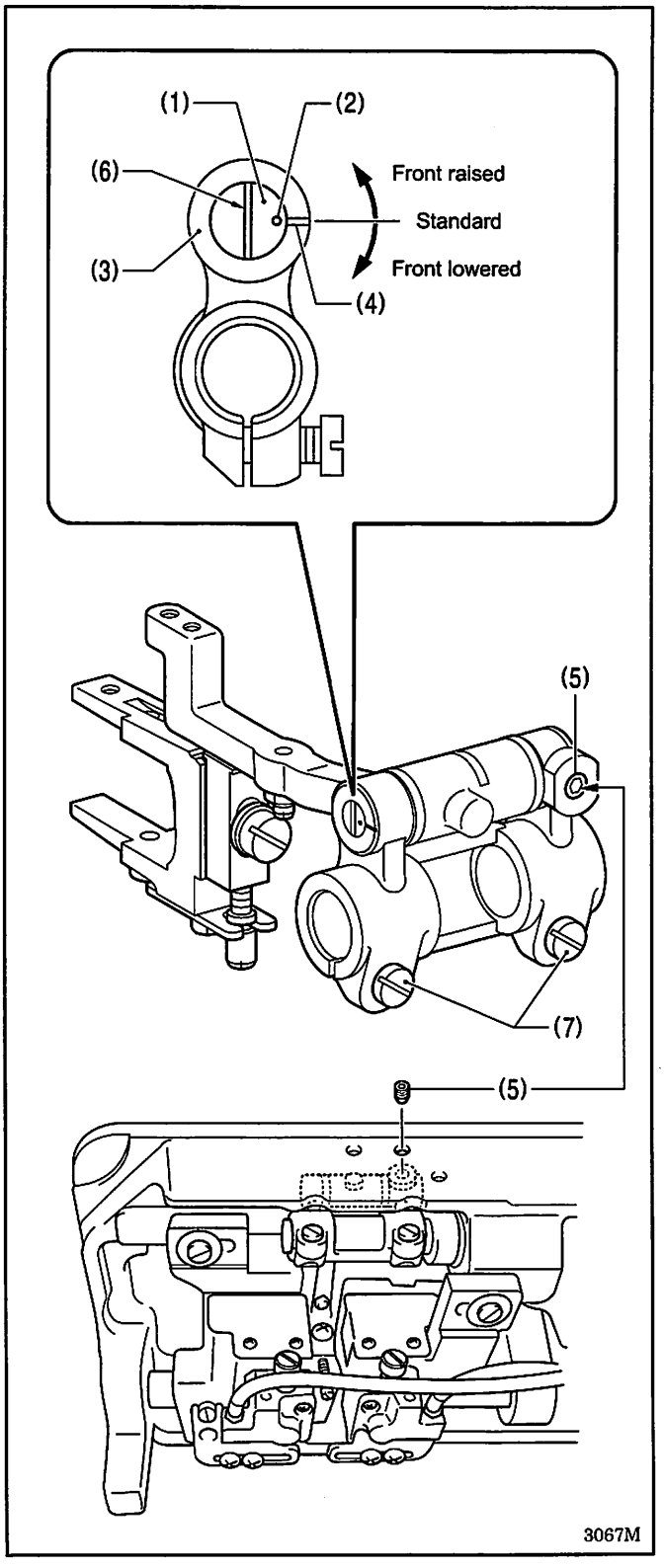
If the feed dog is too high

- The feed dog may touch the needle plate.
- The stitch length may become longer than the stitch length dial setting.
- Thread tightening may be poor when using thick threads.
- It may be difficult to obtain uniform stitch lengths for normal feed and reverse feed.
- Lower thread trimming errors may occur (models with thread trimmer).

If the feed dog is too low

- The stitch length may become shorter than the stitch length dial setting.
- It may be difficult to obtain uniform stitch lengths for normal feed and reverse feed.
- The feed dog may touch the movable knife (models with thread trimmer).
- Large variations in stitch length may occur at slow and fast sewing speeds.

4-18. Feed dog angle



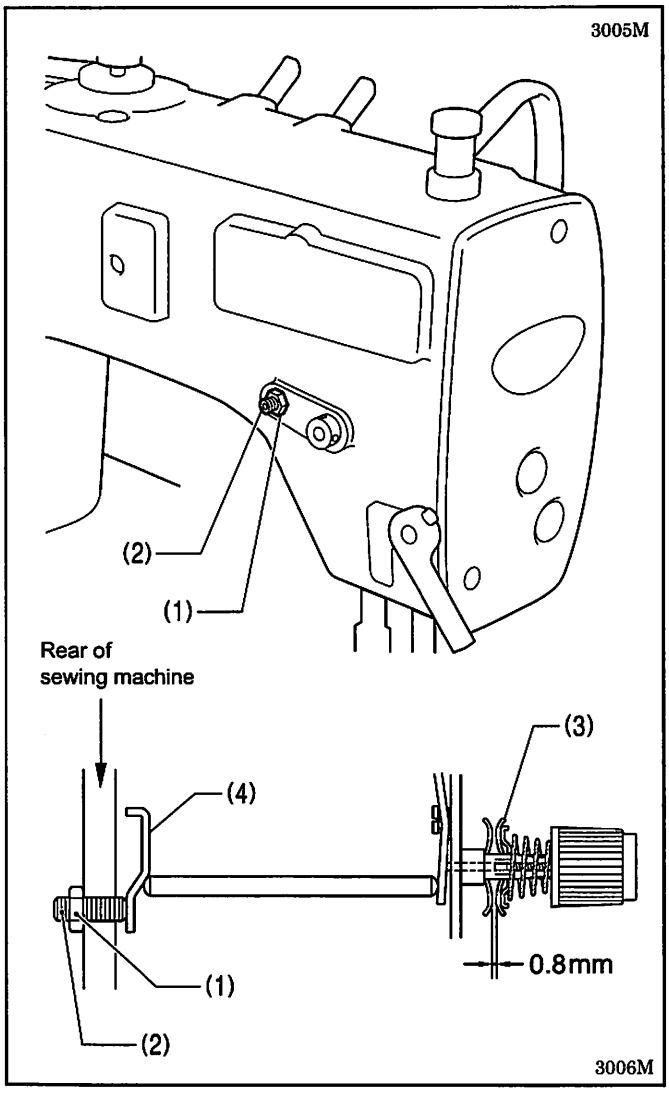
The standard angle for the feed dog is when the mark (2) on the feed bar shaft (1) is aligned with the reference line (4) on the feed rocker base arm (3).

1. Tilt back the machine head.
2. Loosen the set screw (5).
3. Insert a screwdriver into the slit (6) in the feed bar shaft (1), and turn it to make the adjustment.
4. Tighten the set screw (5).

* When the angle of the feed dog is adjusted, the forward-back position of the feed dog will change. Loosen the two screws (7) and adjust the forward-back position of the feed dog in accordance with the needle (for lower feed, in accordance with the needle plate).

* In addition, when the angle of the feed dog is adjusted, the height of the feed dog will also change, so readjust the height of the feed dog.

4-1 9. Tension release



Carry out adjustments as follows based on the status of the tension discs when presser foot is raised using the lifting lever.

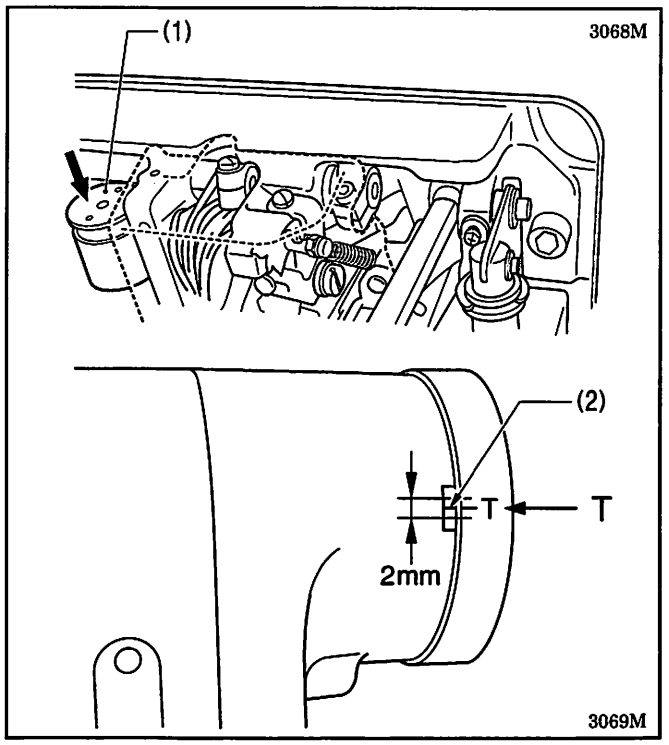
If the tension disc opening amount is smaller than 0.8 mm

1. Loosen the nut (1).
2. Tighten the set screw (2) to adjust the tension disc opening amount to 0.8 mm.
3. Tighten the nut (1).

If the tension disc opening amount is normal

Check that the tip of the set screw (2) is touching the underside of the tension release plate (4).

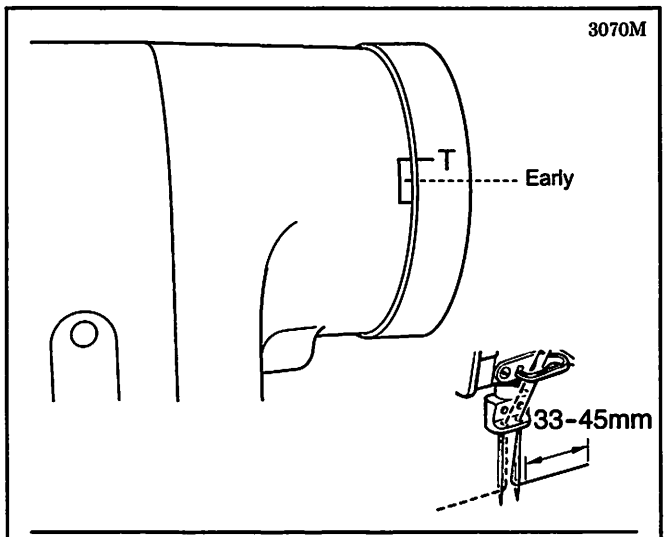
4-2 0. Thread trimming timing (Models with thread trimmer: T-8422A, 8722A)



< Checking method >

1. Remove the needles.
2. Tilt back the machine head.
3. While pressing the thread trimmer solenoid (1), turn the machine pulley forward until the machine pulley becomes stiff to turn (the point where the movable knife starts moving).
4. The "T" mark on the machine pulley must be aligned with the mark (2) on the motor cover.
   At this time, the allowable range for the "T" mark is within 2 mm from the center of the mark (2).

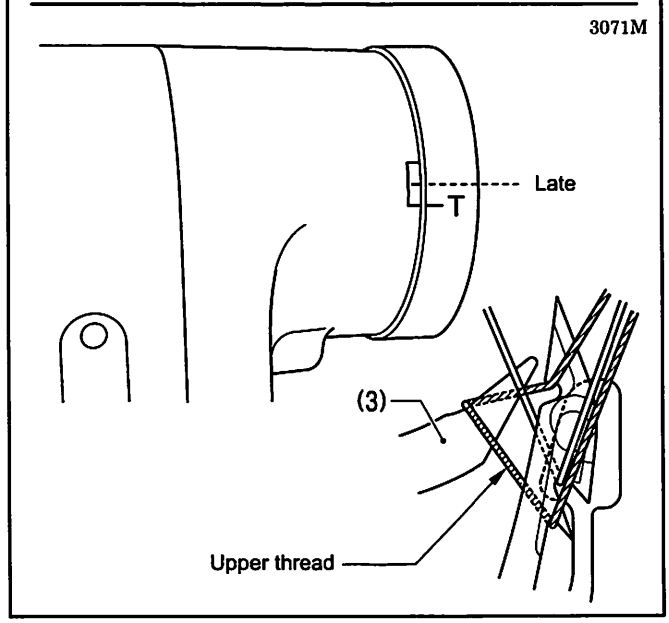
* Check the thread trimmer timing according to the position of the "T" mark when the movable knife makes its first slight movement.



Note:

If the thread trimming timing is too early

- If it is extremely early (4 mm or more), thread trimming errors will occur.
- The right upper thread may be cut extremely short.
- The upper thread trailing length will be too long after thread trimming.
  If the upper thread trailing length is too long, it will not be picked up by the pre-tension and the lower thread holding performance will become poorer.
  (The correct upper thread trailing length after thread trimming is 33–45 mm.)

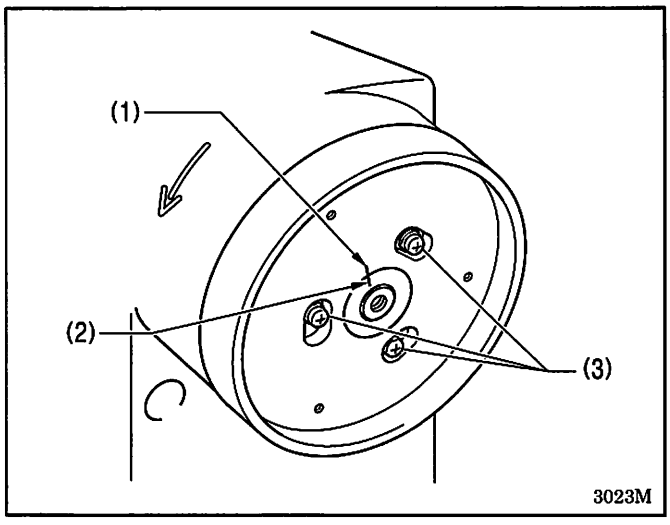


If the thread trimming timing is too late

- If it is extremely late (4 mm or more), thread trimming errors will occur.
- The upper thread trailing length will be too short after thread trimming (about 30 mm).

[Checking method]

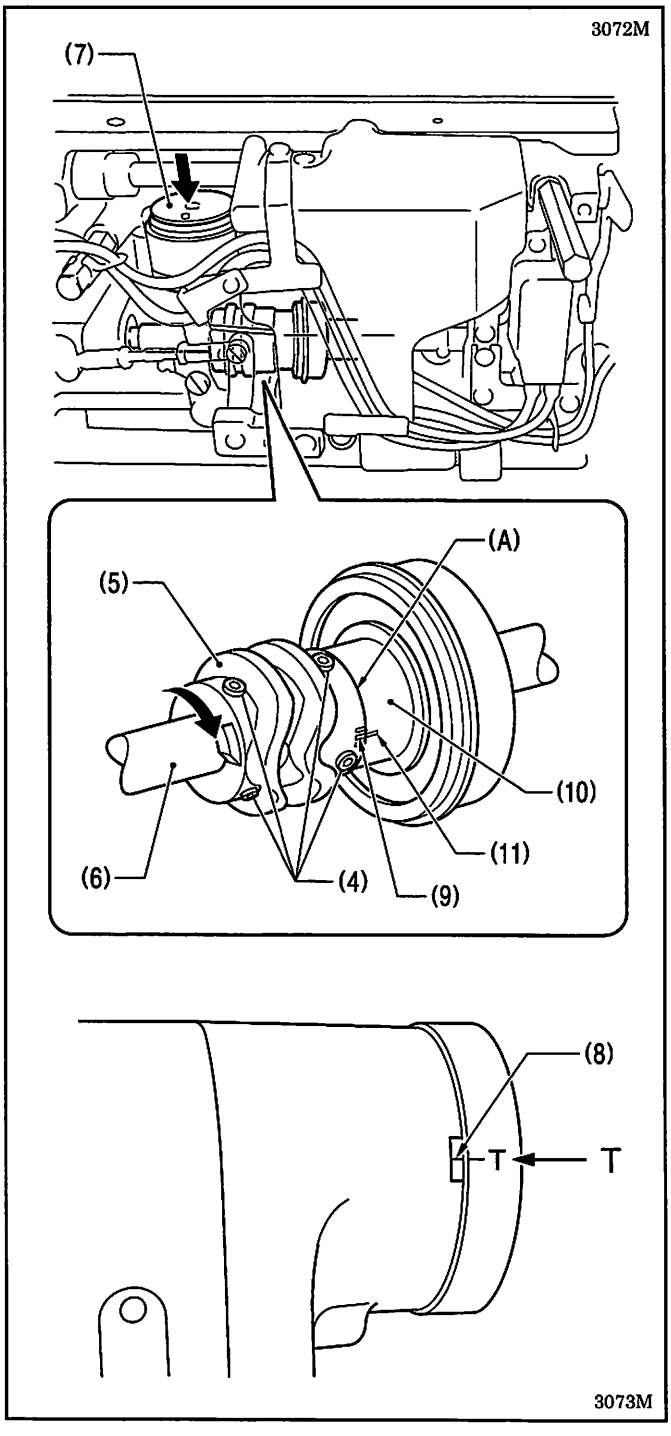
1. Open the slide plate.
2. Under actual sewing conditions, turn the machine pulley to cut the threads.
3. If thread trimming is normal, the thread will be trimmed when the upper thread is held by the loop spreader (3) of the rotary hook as shown in the illustration.
   If the thread trimming timing is late, the thread will come out of the loop spreader (3) when the thread is cut and the upper thread will be too short.



< Before adjusting >

Check that the index mark (1) on the machine pulley and the index mark (2) on the pulley holder are aligned.

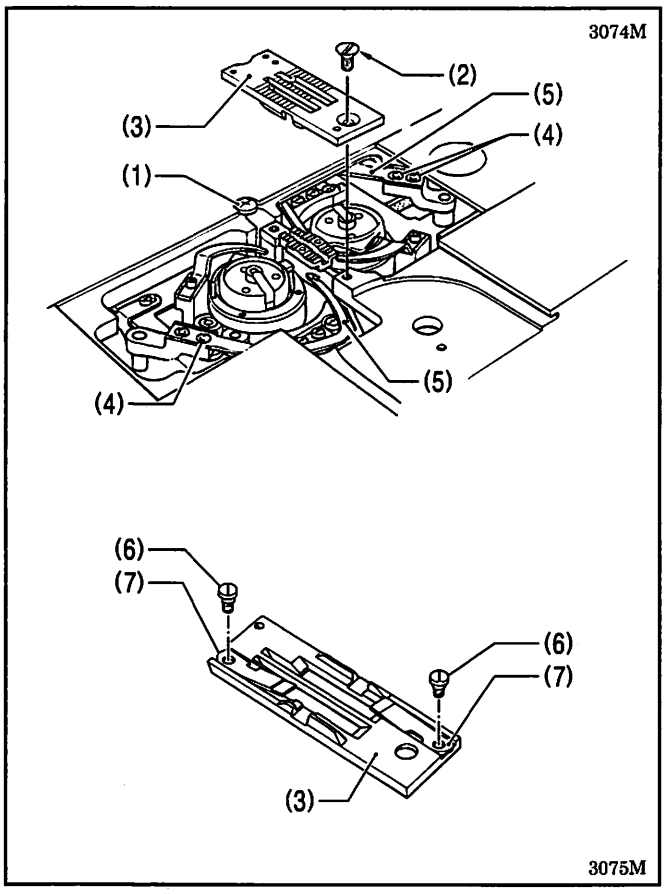
* If the index marks (1) and (2) are not aligned, loosen the screws (3) and align the index marks (1) and (2).



< Adjustment method >

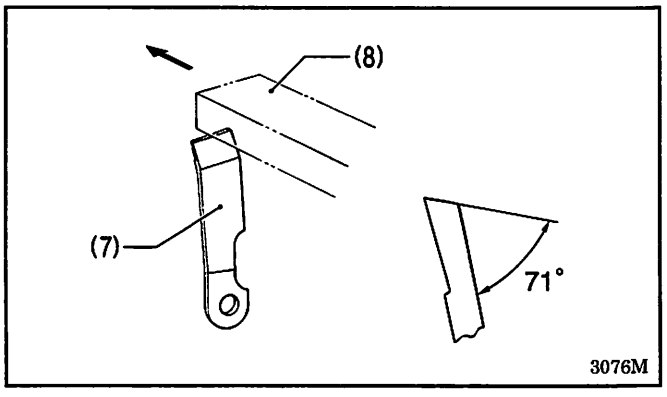
1. Loosen the four set screws (4).
   (Check that the thread trimmer cam (5) is free of the lower shaft (6).)
2. While pressing the thread trimmer solenoid (7), turn the thread trimmer cam (5) in the direction of the arrow until it starts to become stiff to turn.
3. Secure the thread trimmer cam (5) so that it cannot move, and then align the mark (8) on the motor cover with the "T" mark on the machine pulley.
4. At this position, tighten the four set screws (4).
   At this time, make sure that the thread trimmer cam (5) cannot move sideways (so that there is no gap at (A)).
5. Check that the mark (9) in the middle of the thread trimmer cam (5) is roughly aligned with the mark (11) on the ball bearing bush (10) at this time.
   * The same applies for lower feed. There are two marks (11) on the ball bearing bush (10) -- one for needle feed and one for lower feed -- and the second mark should be almost opposite the first.
6. Repeat the steps in "Checking method" on the previous page.

4-2 1. Replacing the fixed knife and movable knife (Models with thread trimmer: T-8422A, 8722A)



< Removal >

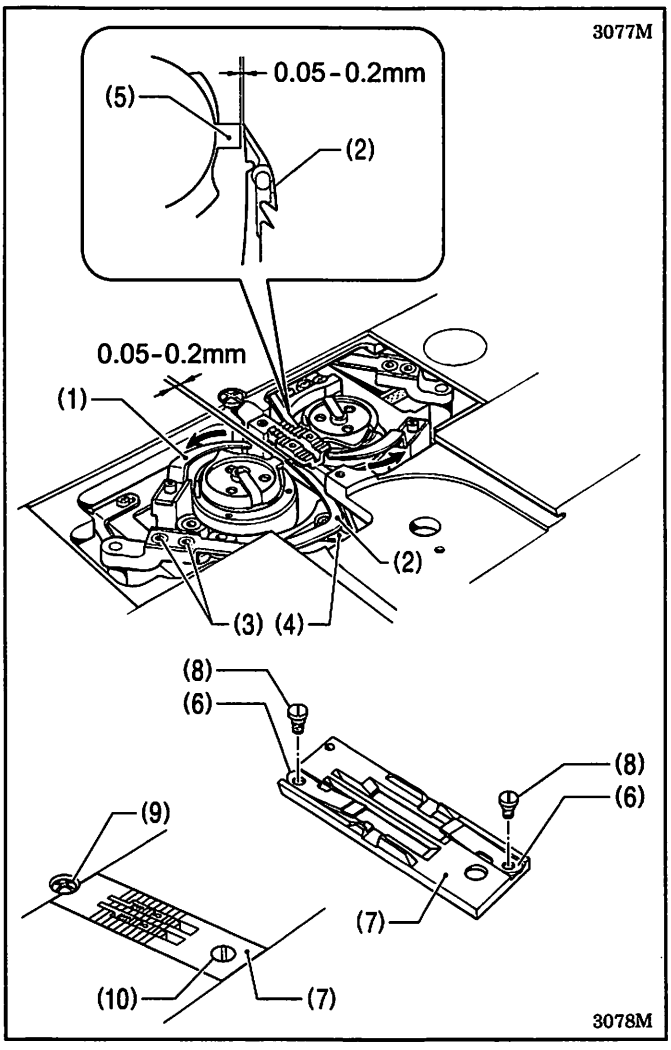
1. Remove the needles and raise the presser foot.
2. Loosen the screw (1), remove the pan screw (2), and then remove the needle plate (3).
3. Remove the screws (4) and then remove the movable knife (5).
   * Be careful not to damage the edge of the movable knife (5) when removing it.
4. Remove the shoulder screws (6) and then remove the fixed knife (7).



Sharpening the fixed knife

If the thread is not being cut easily, use a whetstone (8) to sharpen the fixed knife (7) as shown in the illustration.

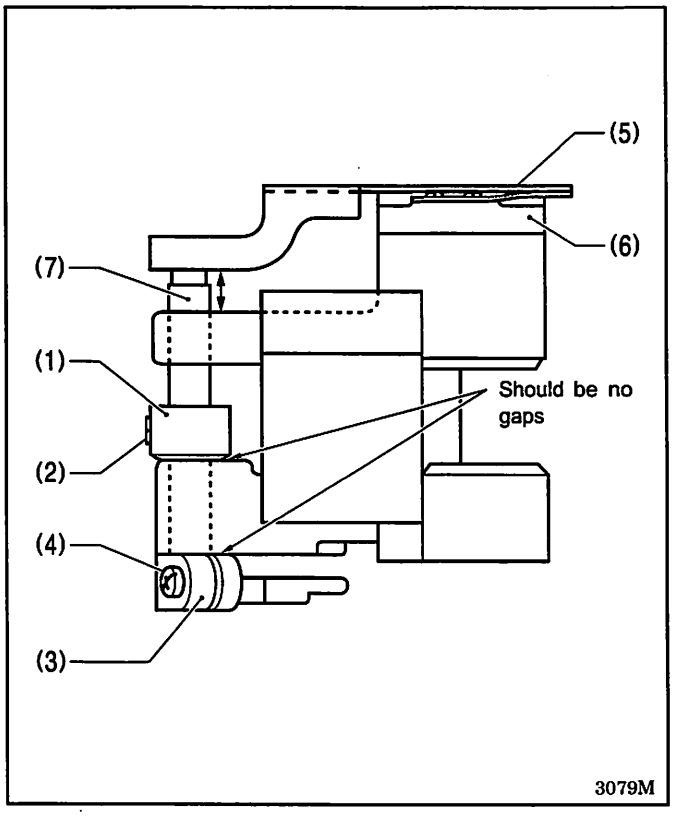
* The movable knife (5) cannot be sharpened using a normal whetstone, and so it should be replaced if needed.



< Installation >

1. Turn the machine pulley by hand until the opener (1) is being pulled as far as possible in the direction of the arrow, and then secure the machine pulley so it will not turn.
2. Provisionally install the movable knife (2) with the screws (3).
   * Install the movable knife (2) above the plate spring (4).
3. While pressing the top of the movable knife (2) with your finger, slide the movable knife (2) until the gap between the tip of the movable knife (2) and the stopper (5) is 0.05–0.2 mm, and then securely tighten the screws (3).
   * If the movable knife (2) and the stopper (5) are touching or if the gap is too large, thread trimming errors will result.
4. Install the fixed knife (6) to the needle plate (7) with the shoulder screws (8).
5. Install the needle plate (7) with the screw (9) and the pan screw (10).
6. Install the needles to the needle clamps and lower the presser foot.

4-2 2. Movable knife position (Models with thread trimmer: T-8422A, 8722A)



< Vertical position adjustment >

1. Remove the needle plate.
2. Loosen the set screw (2) of the set collar (1) and the screw (4) of the thread trimmer lever (3).
3. Move the movable knife lever (7) up or down to adjust so that the movable knife (5) gently touches the movable knife bracket (6).
4. Adjust the set collar (1) and the thread trimmer lever (3) so that there are no gaps between them and the rotary hook bases, and then tighten the set screw (2) and the screw (4).

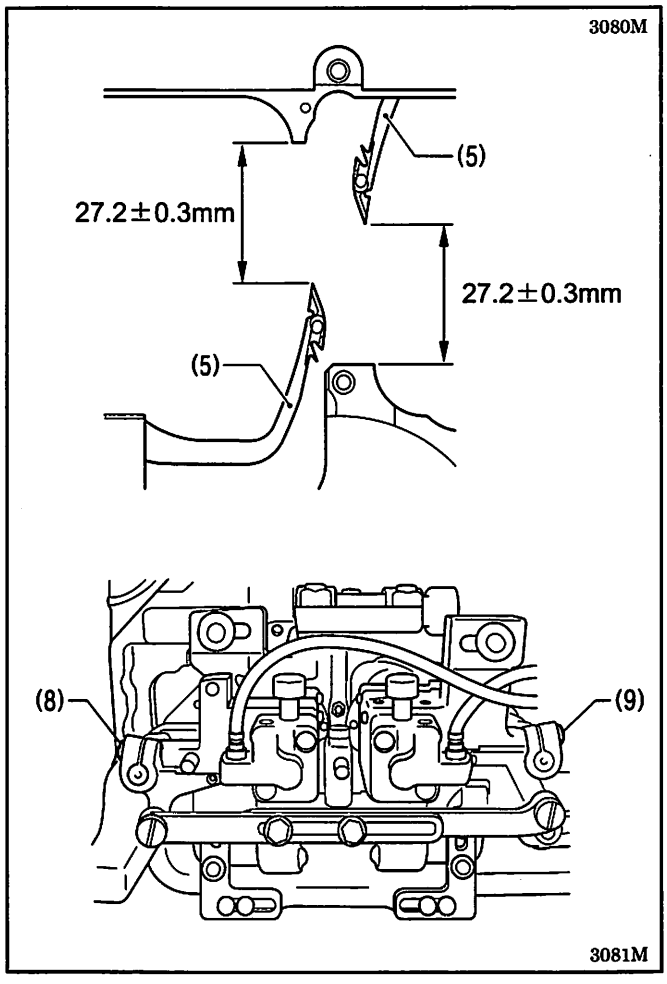
Note:

If the movable knife is below the movable knife bracket

- The operation of the thread trimming mechanism will become stiff and the sewing machine may stop.
- The threads will not be cut cleanly.

If the movable knife is above the movable knife bracket

- Thread trimming errors will occur.
- The movable knife will touch the sewing machine bed and the sewing machine will stop.
- Lower thread holding will become poor.



< Forward-back position adjustment >

The standard installation distances for the movable knife (5) are shown in the illustration.
If adjustment is necessary, loosen the screws (8) and (9) of the thread trimmer lever and move the movable knife (5) back and forth.

Note:

When adjusting the position of the movable knife, the installation distances shown in the illustration above should be within ± 0.5–1 mm.

If the movable knife is to the front (if the distances are smaller than the standard distances)

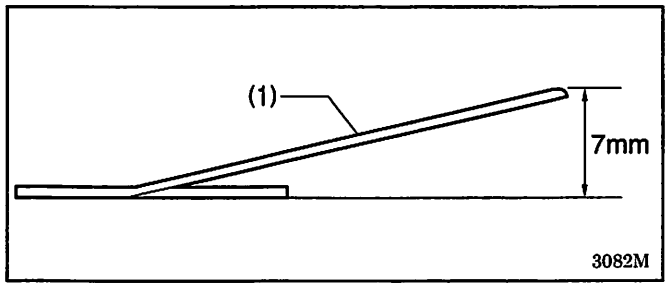
- If the movable knife is a long way to the front, upper thread trimming errors will occur.
- Lower thread holding will be poorer after thread trimming.
  Skipped stitches or thread pulling out will occur at the sewing start. (Take particular care of this on sewing machines with large-capacity rotary hooks.)
- The upper thread trailing length will be too short after thread trimming.
  At the right side in particular, the cut end of the upper thread will remain near the movable knife and it will cause the upper thread to be cut extremely short.

If the movable knife is to the back (if the distances are larger than the standard distances)

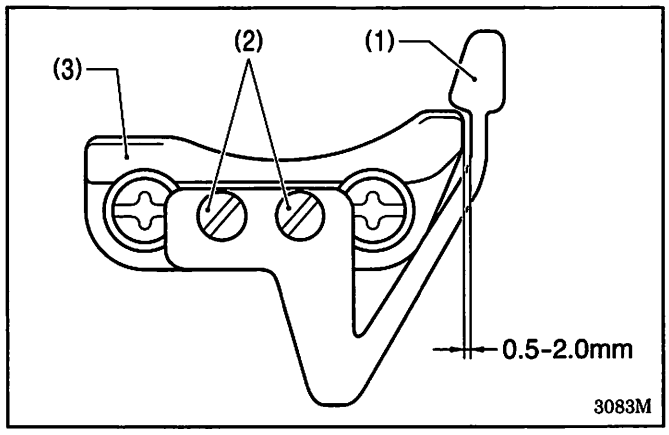
- Upper thread trimming errors will occur. In addition, if the movable knife is a long way to the back, lower thread trimming errors will occur.
- Lower thread holding will be poorer after thread trimming.
  Skipped stitches or thread pulling out will occur at the sewing start. (Take particular care of this on sewing machines with large-capacity rotary hooks.)
- The upper thread trailing length will be too long after thread trimming.
  If the upper thread trailing length is too long, it will not be picked up by the pre-tension and the lower thread holding performance will become poorer.
  (The correct upper thread trailing length after thread trimming is 33–45 mm.)
- When the article being sewn is removed after thread trimming, the end of the upper thread will be pressed by the plate spring because the upper thread trailing length is too long, and this will cause resistance.

4-2 3. Plate spring (Models with thread trimmer: T-8422A, 8722A)

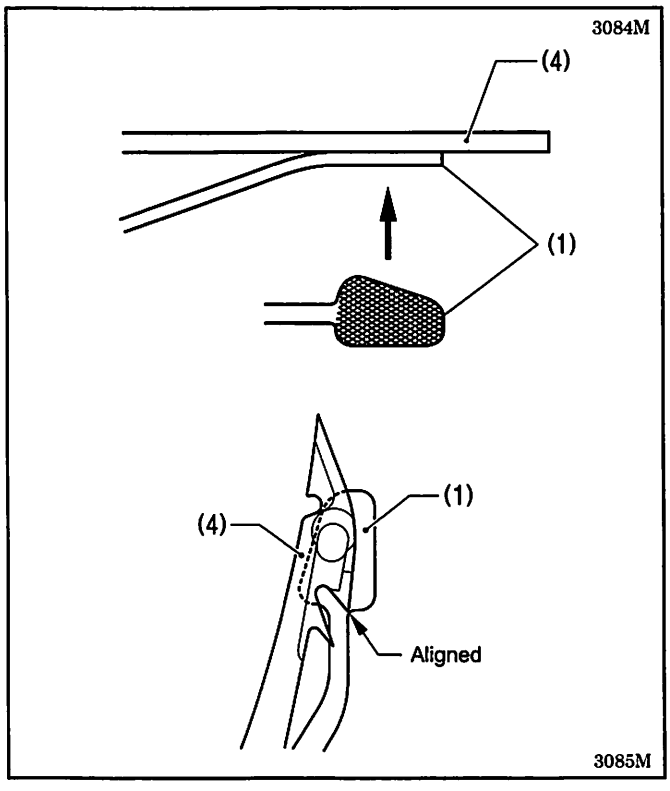
With twin needle sewing machines, the next article cannot be sewn unless the lower threads are held after thread trimming, so the plate spring adjustment must be carried out correctly.



When the movable knife is not installed, the correct height for the plate spring (1) is 7 mm.



The installation position for the plate spring (1) is shown in the illustration at left. Loosen the screw (2) and adjust the gap between the movable knife bracket (3) and the plate spring (1) to 0.5–2.0 mm.



When the movable knife is installed ...

- The end of the plate spring (1) touches flush against the underside of the movable knife (4). If it only touches at an angle, skipped stitches or thread pulling-out problems may occur.
  In particular, these problems may occur if the upper threads are finer than the lower threads.

- The standard positions of the movable knife (4) and the plate spring (1) are the positions where the hook tip of the movable knife (4) is roughly aligned with the rounded part of the plate spring (1).
  (Refer to "Forward-back position adjustment" for the movable knife on the previous page.)

Note:

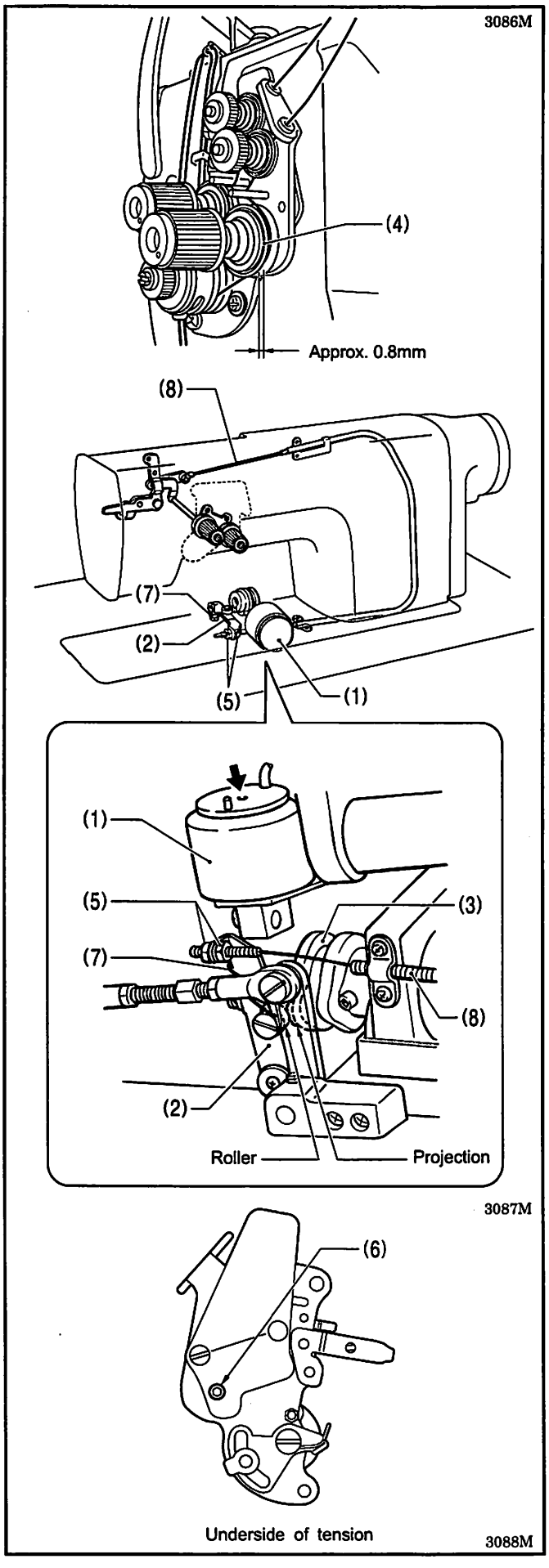
If the lower thread holding is too strong

- Skipped stitches or thread pulling-out problems will occur at the sewing start.

If the lower thread holding is too weak, or if it is uneven at both sides

- Skipped stitches will occur at the sewing start.

4-2 4. Tension release wire (Models with thread trimmer: T-8422A, 8722A)



If the upper thread trailing length is too short after thread trimming, or if the tension discs stay open, carry out the following adjustments.

* Lower the presser foot before making the adjustments.

If the upper thread trailing length is too short (the tension release wire does not operate sufficiently during thread trimming)

1. While pressing the thread trimmer solenoid (1), turn the machine pulley forward.
2. The tension discs (4) open by approximately 0.8 mm when the roller of the tension release lever (2) reaches the top of the projection on the thread trimmer cam (3).
3. If the tension discs (4) do not open by approximately 0.8 mm, turn the nut (5) to adjust.
   * If there is a difference between the opening amounts of the left and right tension discs (4), you can adjust using the set screw (6). After adjusting, secure the set screw (6) with adhesive.
4. Check that the tension discs (4) open when the roller of the tension release lever (2) reaches the top of the projection on the thread trimmer cam (3), and that they close when the roller is level.

If the tension discs remain open

1. Check that the tension release lever (2) is in its original position.
2. Check that the tension release lever spring (7) is not removed.
3. After carrying out the above checks, adjust using the nut (5).

* If adjustment is not possible, replace the tension release wire (8).

Note:

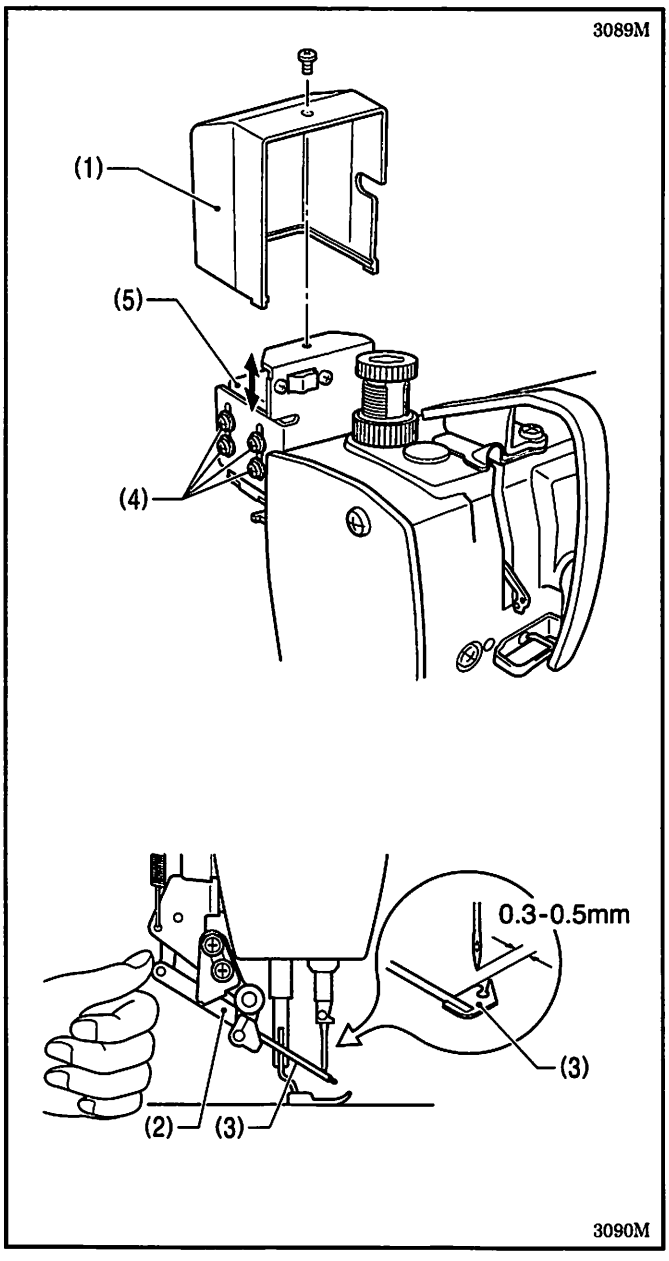
If the tension disc opening is too small

- The running of the thread will be sluggish when the thread is passing through the tension discs.
- The upper thread will pull out of the needle or the upper thread trailing length from the needle may be too short.

If the tension disc opening is too large

- Thread tightening problems will occur.
- Damage to parts will result.

4-2 5. Thread wiper (Models with thread trimmer:T-8422A, 8722A)



1. Stop the sewing machine in the needle up stop position.
2. Turn off the power switch.
3. Set the stitch length dial to "2".

< Forward-back position adjustment >

4. Remove the solenoid cover (1).
5. Loosen the screws (4) and move the solenoid (5) up or down to adjust so that the tip of the thread wiper (3) is 0.3–0.5 mm in front of the tip of the needle when the solenoid link (2) is pushed by hand as shown in the illustration.
6. Securely tighten the screws (4).
7. Install the solenoid cover (1).

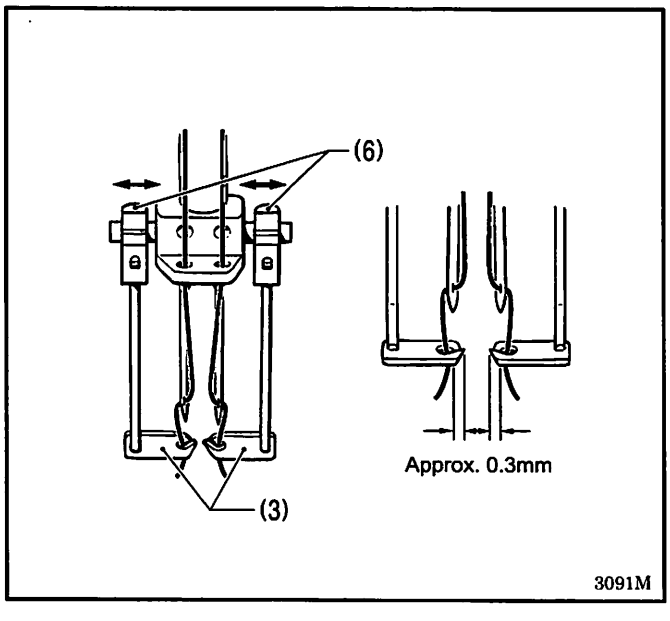
Note:

If the distance is too large

- The thread wiper (3) may touch the presser foot.

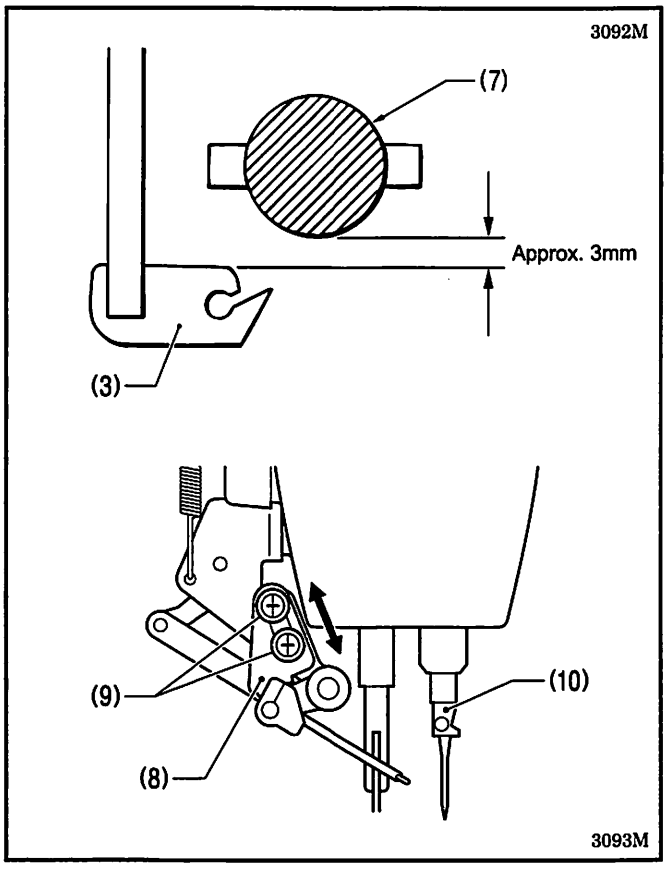
If the distance is too small

- Thread wiping errors will occur.



< Left-right position adjustment >

8. Pass the thread through the needle.
9. Loosen the screws (6) and move the thread wiper to the left or right to adjust so that the hooked parts of the thread wiper (3) securely hold the threads.
10. Securely tighten the screws (6).



< Return position forward-back adjustment >

11. Loosen the screws (8) and move the stopper (9) up or down to adjust so that the distance between the tip of the thread wiper (3) and the presser bar (7) is approximately 3 mm when the thread wiper (3) has returned.
12. Securely tighten the screws (8).

* The tip of the thread wiper (3) may not hold some types of thread, so bring the thread wiper (3) close to the needle so that the thread can still be pulled out from the material cleanly. In addition, check that the needle set screw does not touch the needle wiper (3).

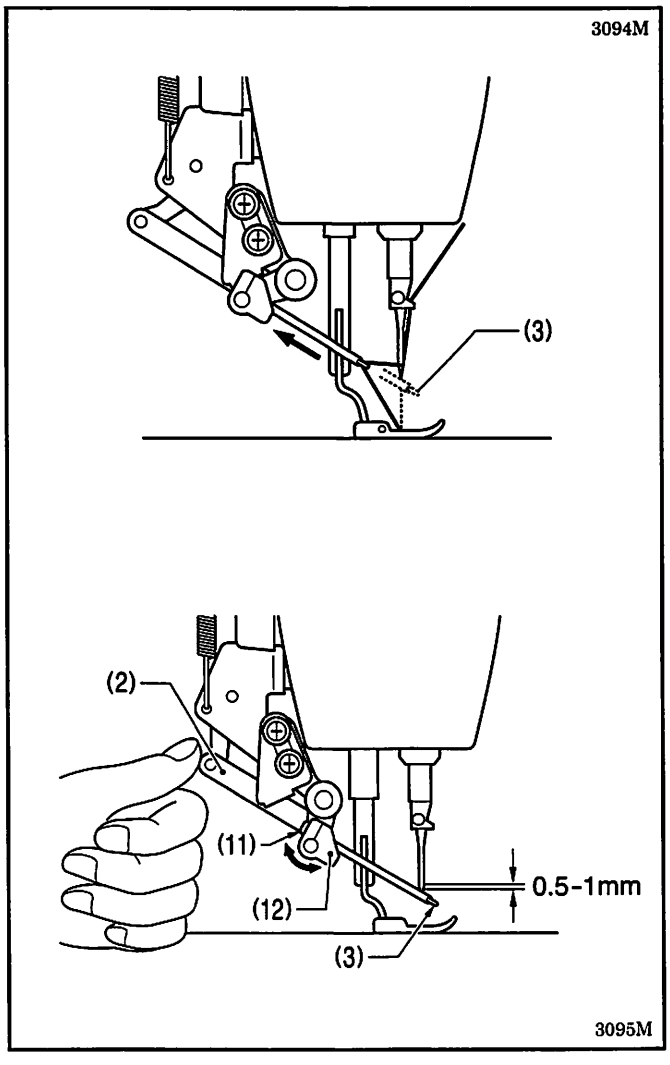
Note:

If the distance is too large

- The thread wiper (3) may touch the needle clamp (10).

If the distance is too small

- The thread wiper (3) may touch the presser bar (7).



< Vertical position adjustment >

13. The path for the tip of the thread wiper(3) is shown in the illustration.
14. Loosen the screw (11) and turn the thread wiper guard (12) to adjust so that the gap between the tip of the needle and the thread wiper (3) is 0.5–1 mm when the solenoid link (2) is pushed by hand as shown in the illustration.
15. Securely tighten the screw (11).

Note:

The stopping position for the tip of the needle will vary slightly after thread trimming.
Carry out thread trimming several times, and adjust so that the clearance is 0.5–1 mm at the lowest position that occurs at these times.

If the distance is too large

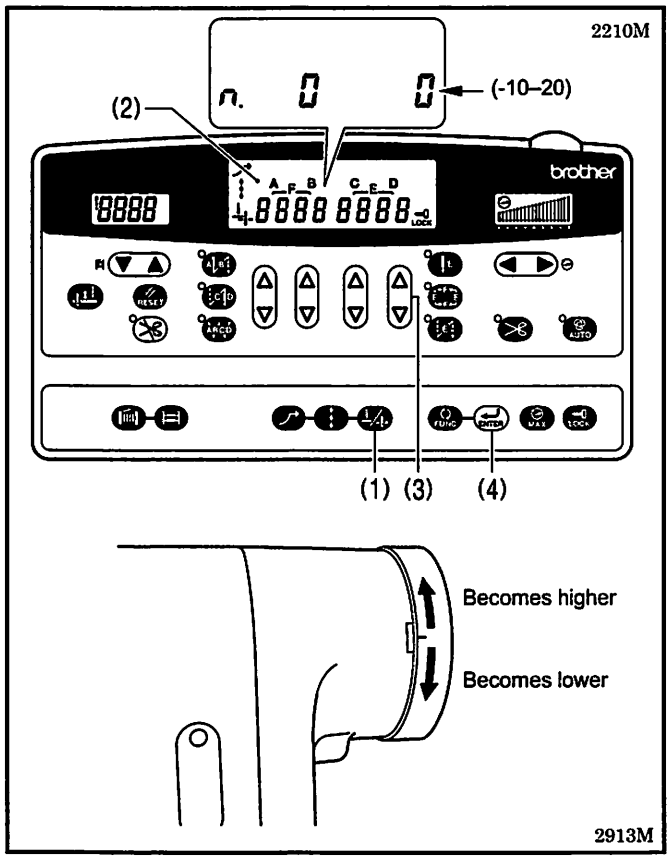
- Thread wiping errors will occur.

If the distance is too small

- The thread wiper (3) will touch the needle.

* After adjusting, carry out a test sewing and check that thread wiping is carried out correctly.

4-2 6. Adjusting the needle up stop position



The needle up stop position will vary slightly depending on the size of the sewing load. Adjust if the difference is too great.

1. While pressing the needle up/down key (1), turn on the power switch.
2. "n.0 xx" will appear in the main display (2).
   ("xx" is the setting value for the needle up stop position, and "0" is the default setting.)
3. Press the rightmost △ or ▽ key (3) to change the setting value for the needle up stop position.
   - If you press the △ key, the setting value will increase up to 20 and the needle up stop position will become lower.
   - If you press the ▽ key, the setting value will decrease down to -10 and the needle up stop position will become higher.
4. Press the ENTER key (4) for two seconds or more.
   A long buzzer will sound and the main display (2) will change to stitch number display mode. (This completes the needle up stop position setting.)

* A setting value of "10" corresponds to an angle of rotation of approximately 10° for the upper shaft.

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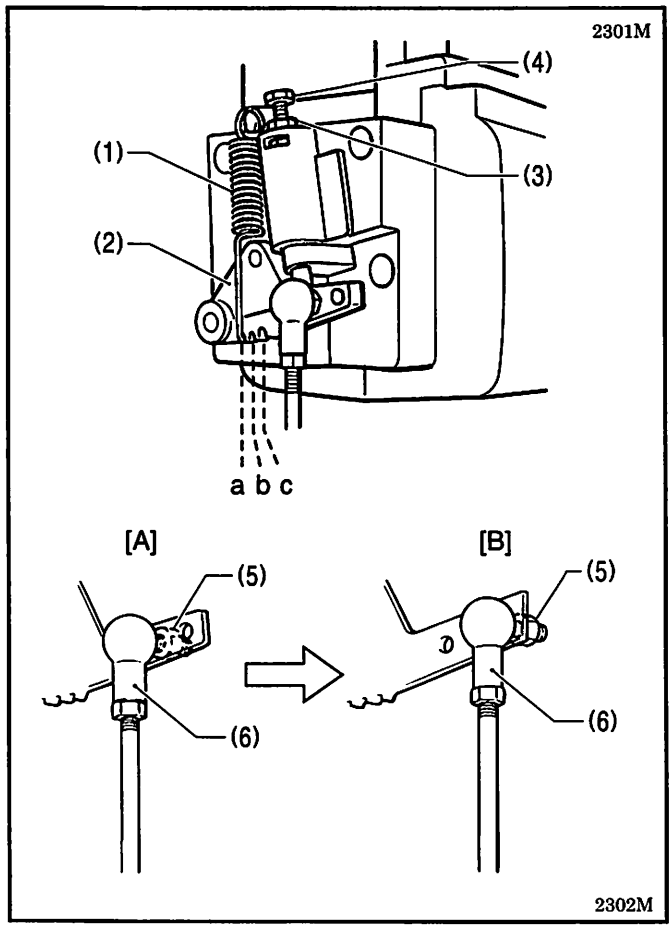
4-2 7. Adjusting the treadle



< 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 heaviest, and the setting becomes progressively lighter at b and c.

< 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 >

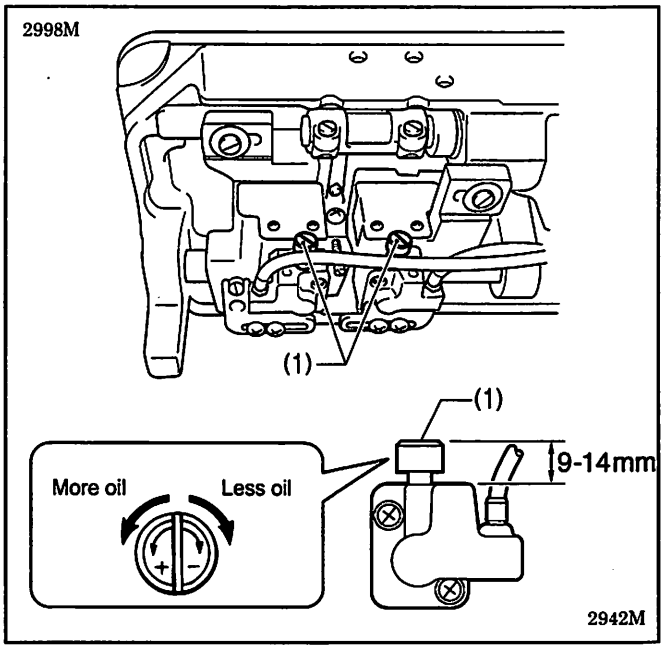
Remove the nut (5), and then move the connecting rod joint (6) from the position in figure A to the position in figure B. The treadle stroke will then be increased by approximately 27%.
At this time, the treadle forward and backward depression sensitivity will change, so readjust if necessary.

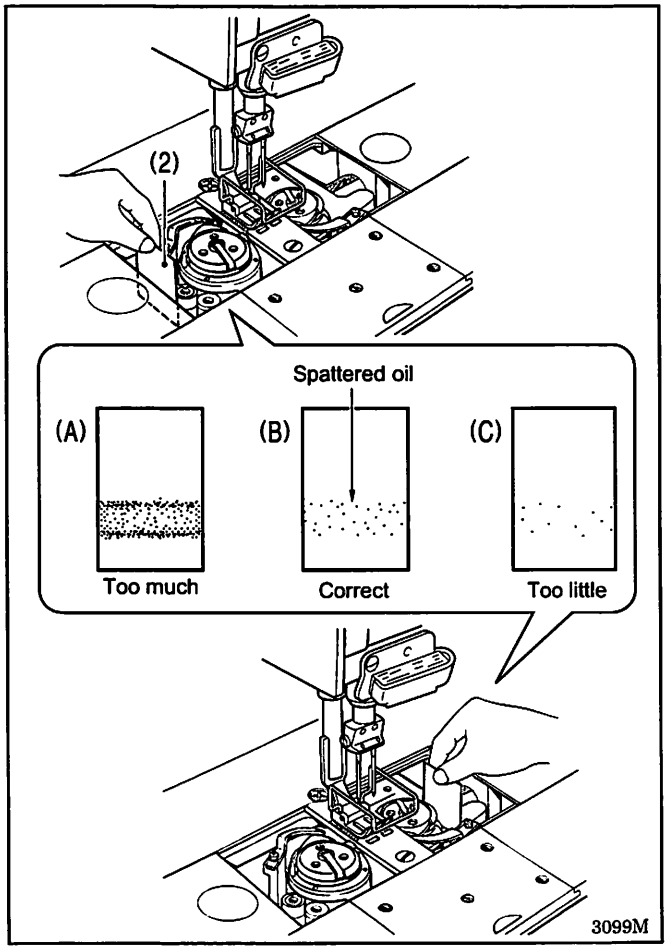
4-2 8. Adjusting the rotary hook lubrication amount

⚠ 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, otherwise injury may result.

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





< Guide to lubrication adjustment >

1. Tilt back the machine head.
2. Turn the oil adjusting screw (1) to adjust the height to within 9–14 mm.

< Checking the lubrication amount >

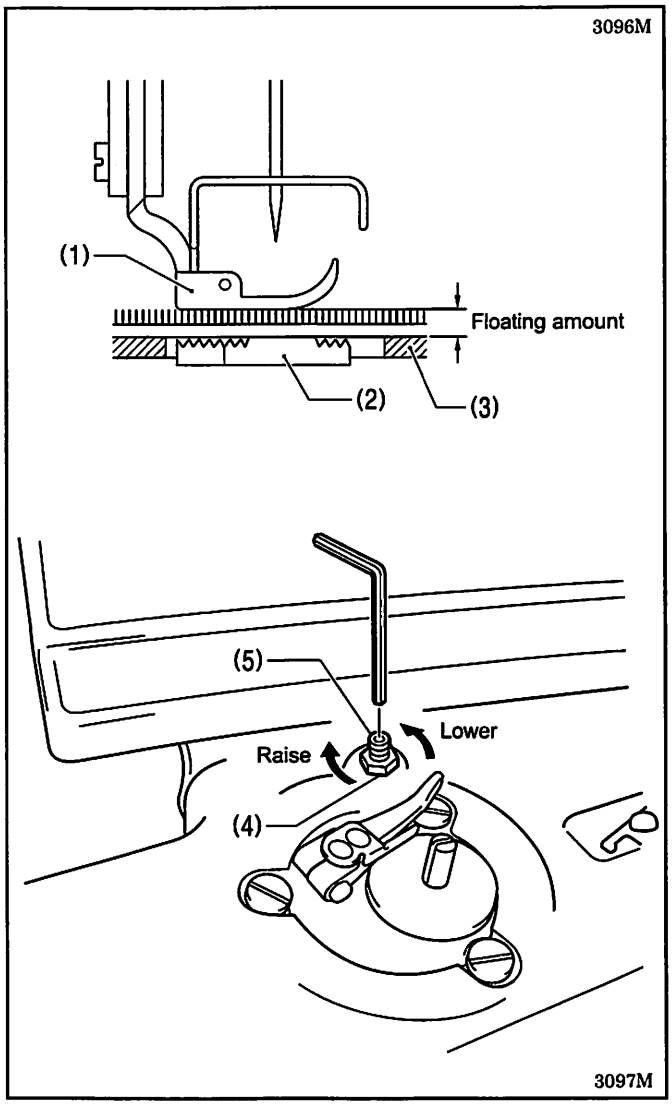
1. Turn off the power switch.
2. Remove the thread from all points from the thread take-up to the needle.
3. Remove the needle and the bobbin.
4. Use the lifting lever to lift the presser foot.
5. Turn on the power switch.
6. Run the machine at the normal sewing speed for approximately 1 minute without sewing any material (following the same start/stop pattern as when actually sewing).
7. Place the lubrication amount check sheet (2) to the left of the rotary hook (the right side is the right side of the rotary hook), and hold it in place while running the sewing machine at the normal sewing speed for approximately 8 seconds. (Any type of paper can be used as the lubrication amount check sheet (2).)
8. Check the amount of oil which has spattered onto the sheet.

* If the sewing machine speed is fast, the amount of lubrication will tend to be greater. If running the sewing machine at 3,000 rpm or less, the amount (C) in the right side of the illustration will be correct.

< Adjusting the lubrication amount >

1. Tilt back the machine head.
2. Turn the adjusting screw (1) to adjust the lubrication amount.
   - If the rotary hook adjusting screw (1) is turned counterclockwise, the lubrication amount becomes greater.
   - If the rotary hook adjusting screw (1) is turned clockwise, the lubrication amount becomes smaller.
3. Check the lubrication amount again according to the procedure given in "Checking the lubrication amount" above.
   * Turn the adjusting screw (1) and check the lubrication amount repeatedly until the lubrication amount is correct.
4. Check the lubrication amount again after the sewing machine has been used for approximately two hours.

4-2 9. 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.
- In addition, this can be useful for increasing ease of working when sewing curves.

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.

< Guide to adjustment when sewing curves >

When the material is placed under the presser foot (1) and the feed dog (2) is moved to its lowest position and the material is moved, there should ideally be some resistance in the material.

If the floating amount is too small

- Ease of working (handling) will be poorer when sewing curves.

If the floating amount is too large

- The stitch lengths and seam lines will be unstable.

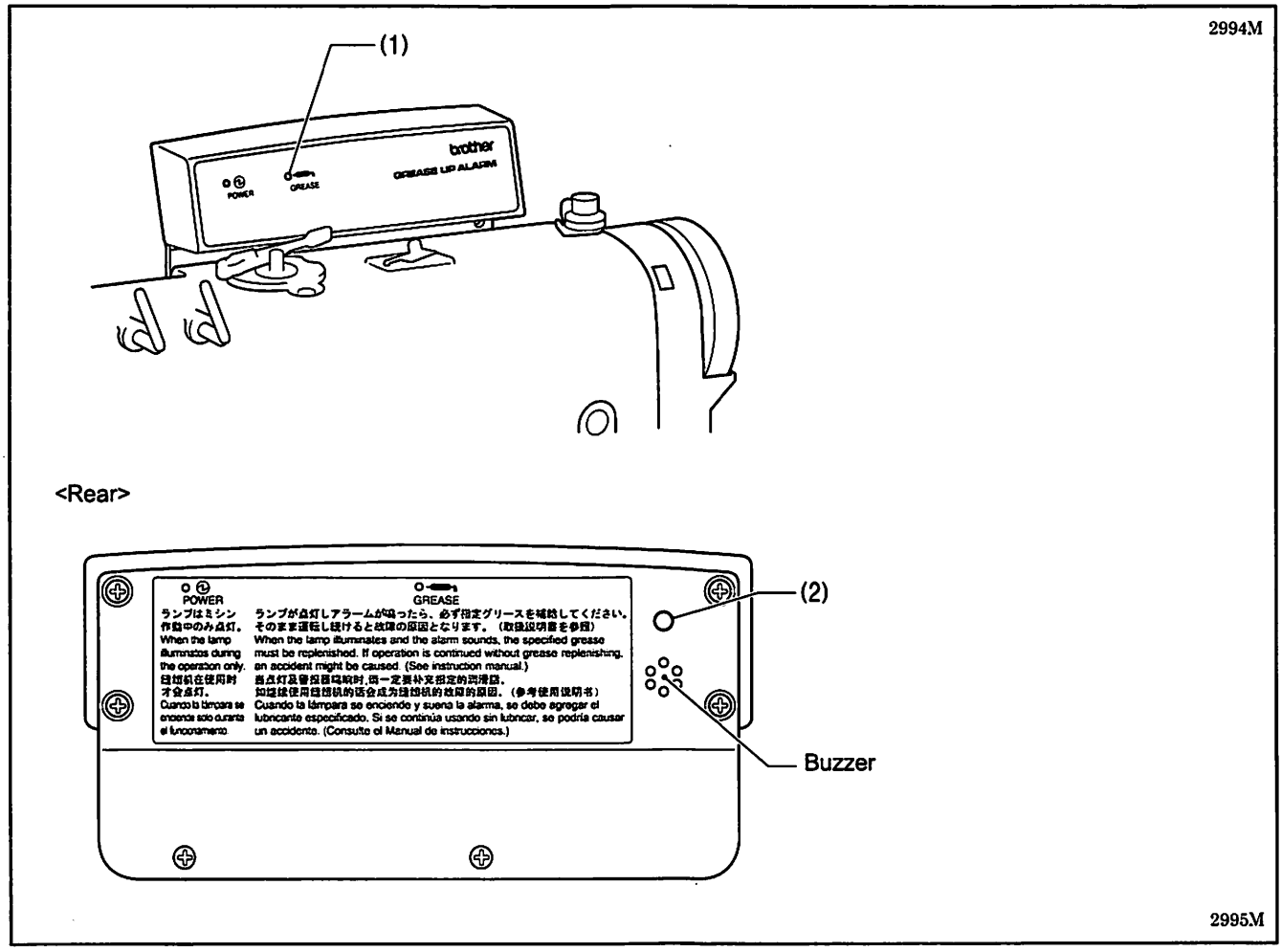
5. APPLYING GREASE

⚠ CAUTION

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

5-1. When the GREASE indicator illuminates (T-8420A, 8720A: Semi dry type)

If the GREASE indicator (1) illuminates and the buzzer sounds each time the treadle is depressed, it means that it is time to apply grease to the sewing machine. Apply grease while referring to the following page.



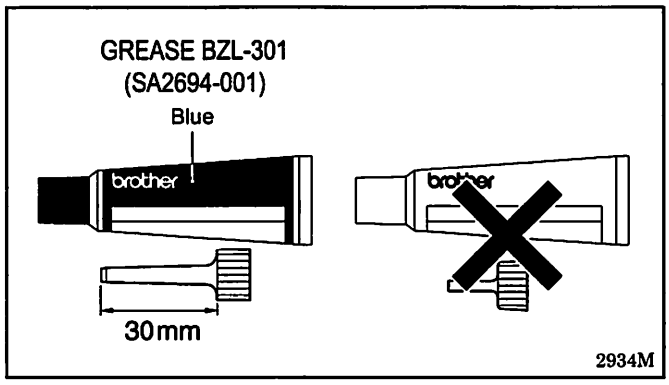
<To continue sewing temporarily without applying grease>

1. Press the RESET switch (2) for approximately one second.
   (The buzzer will stop sounding but the GREASE indicator (1) will remain illuminated even when the treadle is depressed.)
   * Use an object with a sharp point to firmly push in the RESET switch (2) as far as it will go.
2. Sewing can continue in this condition, but if the cumulative sewing machine operating time reaches a further 10 hours, the buzzer will start sounding again. If this happens, apply grease and then reset the alarm display by referring to the procedure on the following page.

* **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.**

5. APPLYING GREASE

<Applying grease>

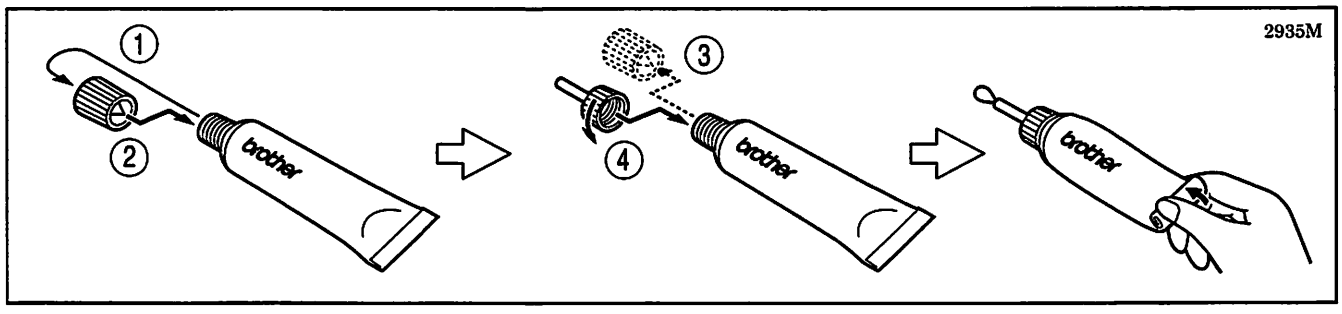


NOTE:

- Use only the grease <BZL-301 (SA2694-001) in the **blue tube>** specified by Brother.
- Do not use the BZL-300 (SA2355-001) grease in the **white tube** with this sewing machine.
- Do not use the BZL-301 (SA2694-001) grease in the blue tube for any models except for those which are indicated with "Use only the grease <BZL-301 (SA2694-001)> specified by Brother".

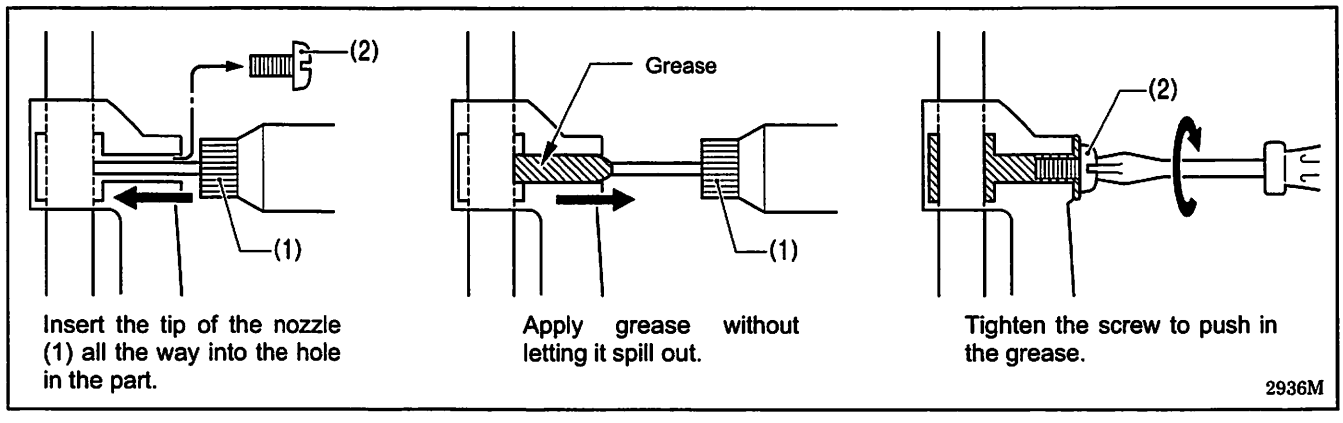
Purchase the grease unit (SA2693-001) to use for applying grease.

1. Using the tube

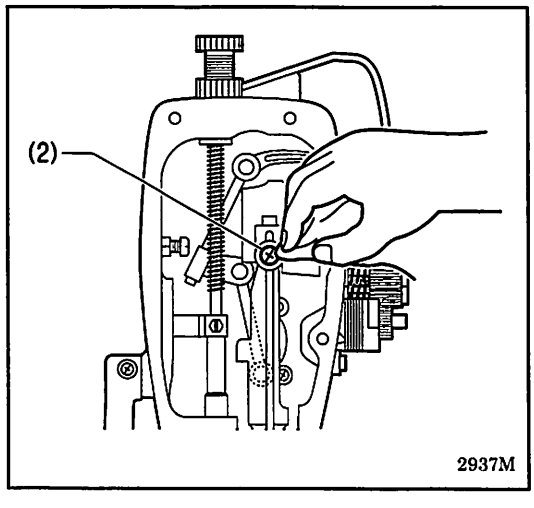


2. Applying grease

Follow the procedure below to apply grease to the places indicated by arrows on the next page.



1. Turn the power switch to "OFF".
2. Remove the screw (2). (Refer to the next page for greasing locations.)
3. Apply grease to each of the holes until the grease overflows slightly.
4. Tighten the screw (2) to push in the grease.



5. Use a cloth to wipe away any excess grease from around the screw (2).
6. Apply grease to all locations shown on the next page in the same way.
7. Carry out the reset procedure given on the next page.

Note:

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

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

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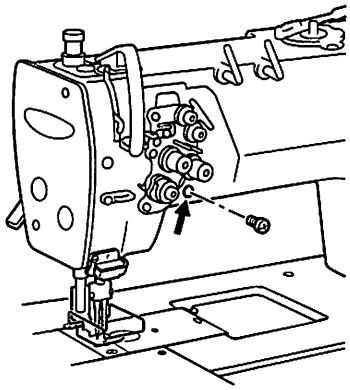
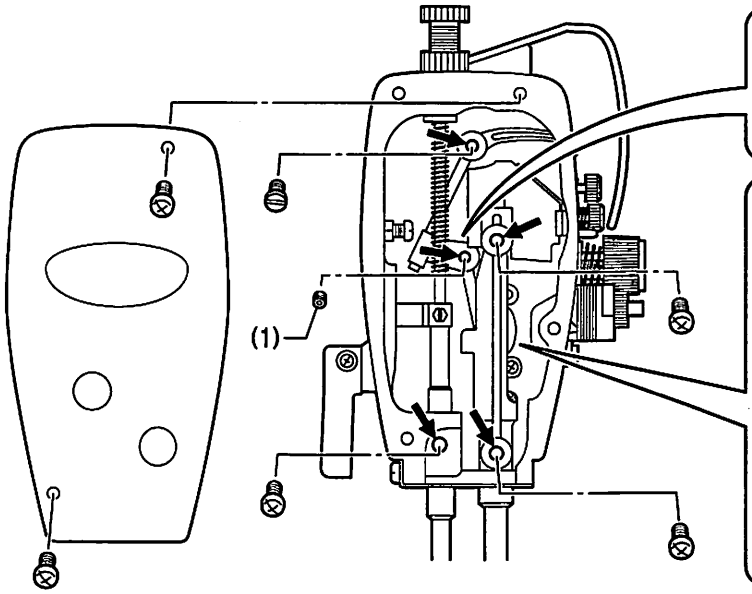
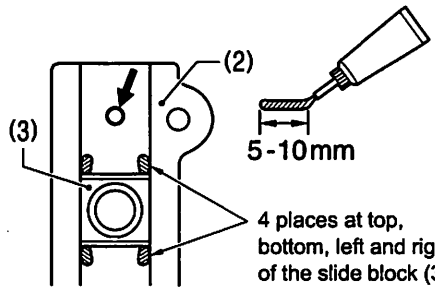




Turn the machine pulley until the screw (1) can be seen.

Use the tip of a screwdriver or similar to apply 5-10 mm beads of grease to the slide block slider (2).



*** Pour oil into the oil cover at the same time.**

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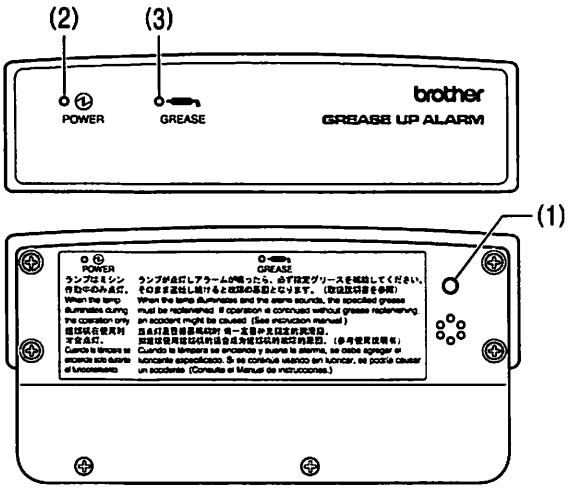
<Resetting the cumulative operating time>



2997M

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

1. Press the RESET switch (1) for about 5 seconds until a short beep (about 0.5 seconds) sounds. (Release the switch once the buzzer sounds.)
   * Use an object with a sharp point to firmly push in the RESET switch (1) as far as it will go.
2. Press the RESET switch (1) once more for approximately 5 seconds.
   A long beep (about 2 seconds) will sound, and the reset procedure will be carried out.

<Checking method after resetting>

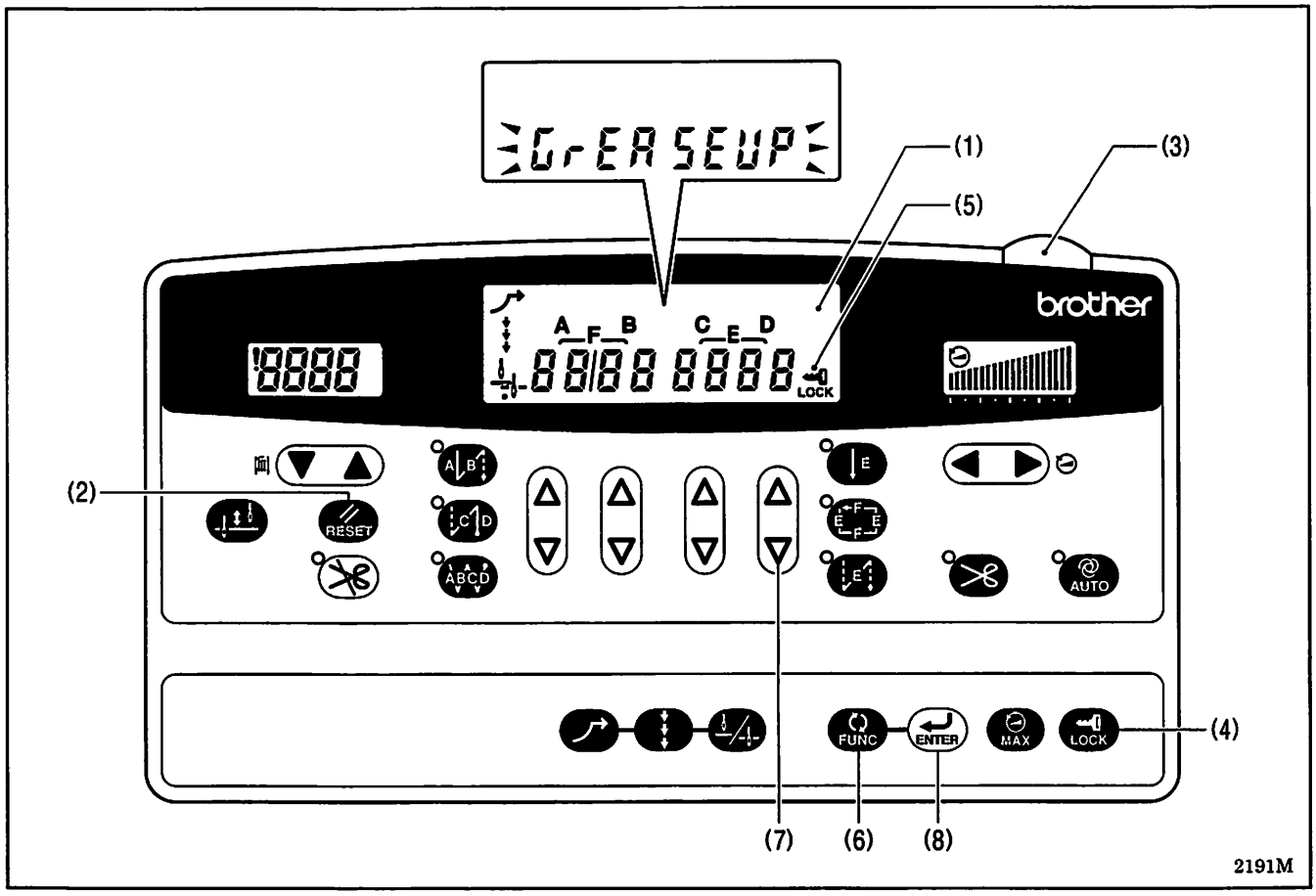
If only the POWER indicator (2) illuminates when the sewing machine is next used, the reset procedure has been carried out successfully.

Note:

- If the reset procedure has not been carried out successfully, repeat steps 1 and 2 above.
- If the GREASE indicator (3) does not illuminate and the buzzer does not sound when the RESET switch (1) is pressed, operate the sewing machine for more than 30 seconds, and then carry out the reset procedure again.
- The RESET switch (1) should never be pressed except when carrying out the reset procedure after grease application.

5-2. When "GREASEUP" appears (T-8421A, 8422A, 8722A: Semi dry specifications)

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.



<To continue sewing temporarily without applying grease>

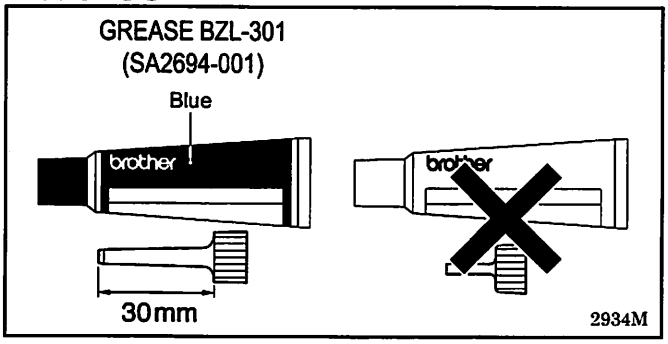
1. Press the RESET key (2).
2. The main display (1) will change to stitch number display mode, and sewing will be possible when the treadle is depressed. (The power indicator (3) will flash.)

NOTE

- If you do not apply grease when the "GREASEUP" notification appears, the notification will continue to appear and the power indicator (3) will flash each time the power is turned on until you reset the notification by carrying out the procedure on the following page.
- 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.**

<Applying grease>

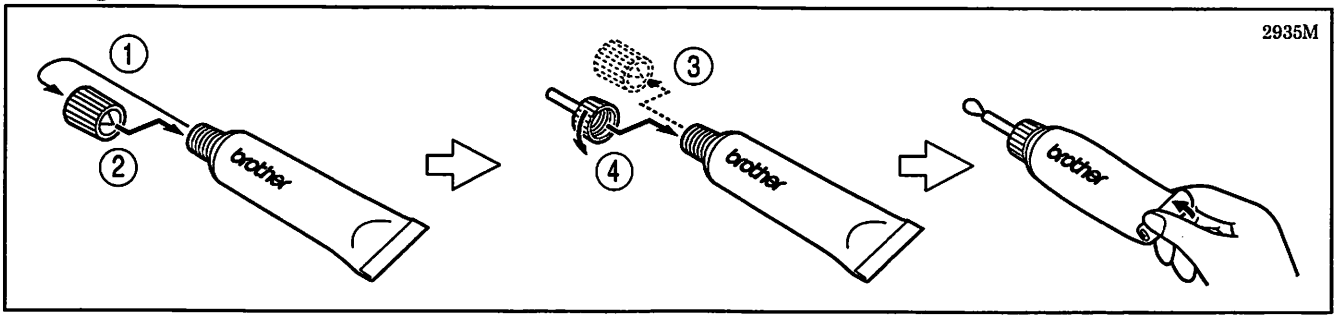


NOTE:

- Use only the grease <BZL-301 (SA2694-001) in the **blue tube>** specified by Brother.
- Do not use the BZL-300 (SA2355-001) grease in the **white tube** with this sewing machine.
- Do not use the BZL-301 (SA2694-001) grease in the blue tube for any models except for those which are indicated with "Use only the grease <BZL-301 (SA2694-001)> specified by Brother".

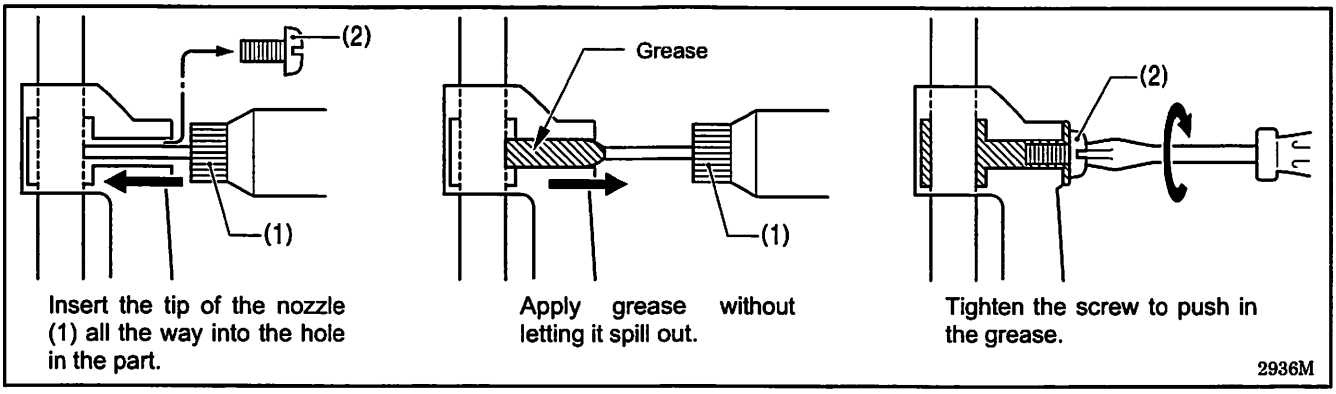
Purchase the grease unit (SA2693-001) to use for applying grease.

1. Using the tube

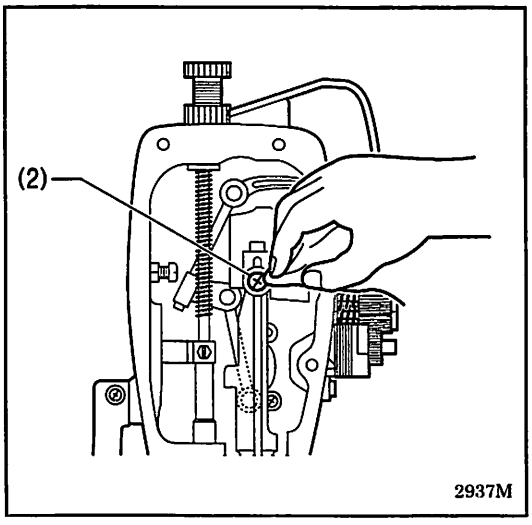


2. Applying grease

Follow the procedure below to apply grease to the places indicated by arrows on the next page.



1. Turn the power switch to "OFF".
2. Remove the screw (2). (Refer to the next page for greasing locations.)
3. Apply grease to each of the holes until the grease overflows slightly.
4. Tighten the screw (2) to push in the grease.



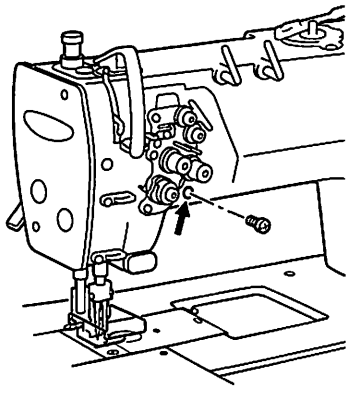
5. Use a cloth to wipe away any excess grease from around the screw (2).
6. Apply grease to all locations shown on the next page in the same way.
7. Carry out the reset procedure given on the next page.

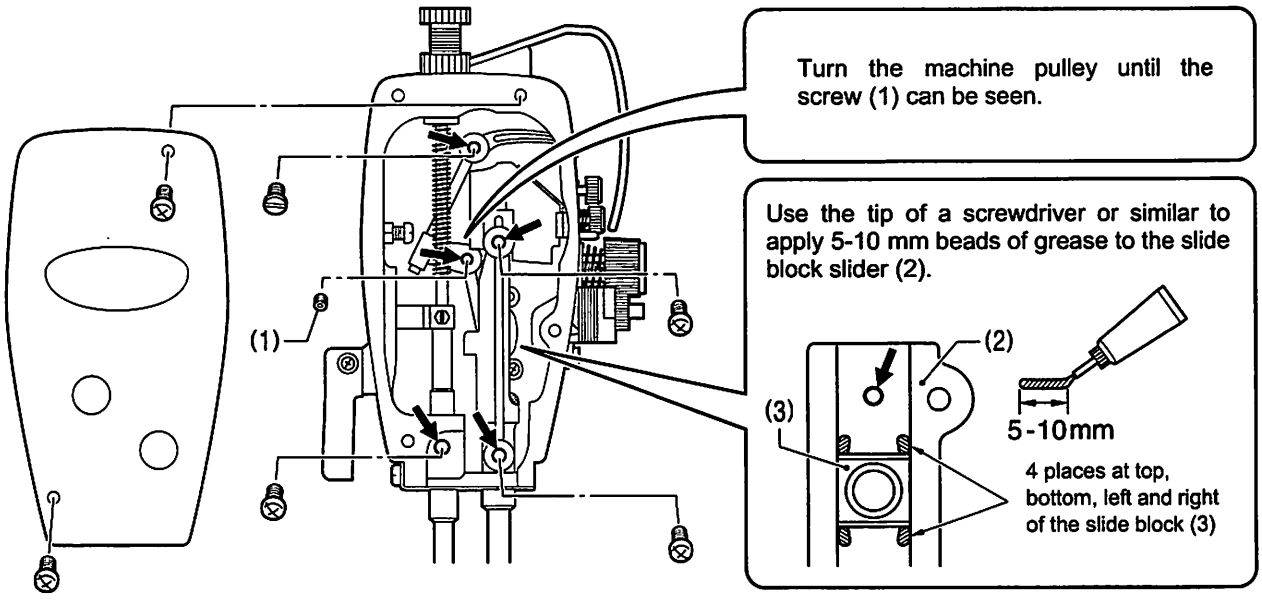
NOTE:

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

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

2938M

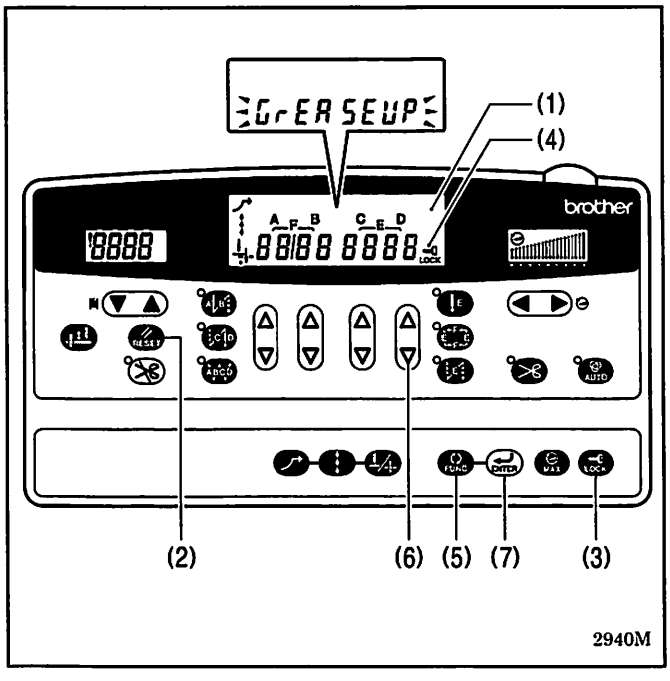




*** Pour oil into the oil cover at the same time.**

2939M

<Resetting the cumulative operating time>



2940M

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 change to stitch number display mode.
3. Press and hold the LOCK key (3) for 2 seconds or more. The lock icon (4) will switch off and the lock will be released.
4. Press the FUNC (Function) key (5). "n.134 xxx" will appear in green in the main display (1). (xxx represents the time between grease applications.)
5. Press the rightmost ▽ key (6). The "xxx" will change to "0".
6. Press and hold the ENTER key (7) for two seconds or more. The buzzer will make a long beep, and then the main display (1) will change to stitch number display mode. (This completes the reset procedure.)

2139M

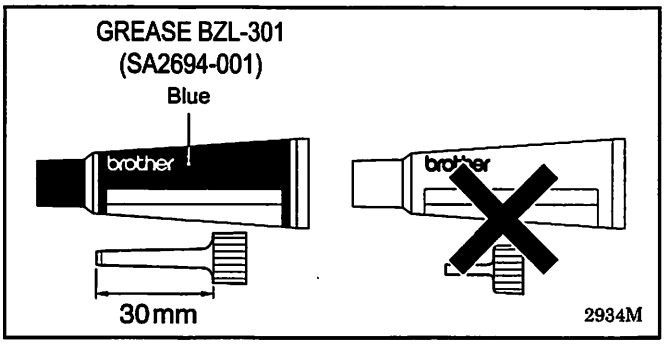
6. GREASE APPLICATION AND LUBRICATION WHEN DISASSEMBLING AND REPLACING PARTS

⚠ CAUTION

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

When disassembling parts and reassembling parts during replacement, apply or fill with grease or lubricate the following places marked with ○.

<Greasing>



NOTE:

- Use only the grease <BZL-301 (SA2694-001) in the **blue tube**> specified by Brother.
- Do not use the BZL-300 (SA2355-001) grease in the **white tube** with this sewing machine.
- Do not use the BZL-301 (SA2694-001) grease in the blue tube for any models except for those which are indicated with "Use only the grease <BZL-301 (SA2694-001)> specified by Brother".

Purchase the grease unit (SA2693-001) to use for applying grease.

- Filling means filling places such as grease sumps of meshing parts or gaps between bearing.
- Numbers in the table marked with * indicate places were grease is applied when the operation panel gives a greasing-up warning.

Dry ... Option specifications

No.	Applying or filling locations	Specifications			Apply	Fill
		(Dry)	Semi dry	Minimum lubrication		
Upper shaft mechanism						
1*	Meshing part of thread take-up lever and thread take-up support shaft	○	○		○	○
2*	Meshing part of thread take-up lever and thread take-up slide block, thread take-up slide block and needle bar connecting rod, and needle bar connecting rod and needle bar crank shaft	○	○		○	○
Needle bar rocking mechanism						
3*	Meshing part of needle bar and needle bar base (upper)	○	○		○	○
4*	Meshing part of needle bar and needle bar base (lower)	○	○		○	○
5*	Meshing part of needle bar connecting rod slide block and slide block slider	○	○		○	
6	Meshing part of needle bar clamp and needle bar connecting rod slide block	○	○		○	
7	Meshing part of needle bar clamp and needle bar connecting rod	○	○		○	
8*	Meshing part of needle bar rocker shaft and bush L	○	○		○	○
9	Meshing part of needle bar rocker shaft and needle bearing			○		○
10	Both sides of needle bearing case			○	○	
11	Both sides of needle bar rocker shaft thrust washer			○	○	
12	Meshing part of outside of needle bearing case and arm hole			○	○	

6. GREASE APPLICATION AND LUBRICATION WHEN DIASASSEMBLING AND REPLACING PARTS

No.	Applying or filling locations	Specifications			Apply	Fill
		(Dry)	Semi dry	Minimum lubrication		
13	Meshing part of needle bar rocker shaft and bush R	○	○	○	○	○
14	Both sides of bush R	○	○	○	○	
15	Meshing part of needle bar rocker link and needle bar rocker link shaft	○	○	○	○	○
16	Meshing part of needle bar rocker link and zigzag link bush	○	○	○	○	○
17	Both sides of needle bar rocker link	○	○	○	○	
Presser foot mechanism						
18*	Meshing part of needle bar and presser bar bush	○	○		○	○
19	Meshing part of needle bar and presser bar bush			○	○	
20	Meshing part of presser bar guide bracket and arm	○	○	○	○	
21	Meshing part of presser bar lifting crank and arm	○	○	○	○	
22	Meshing part of tension release plate assembly, presser bar lifting lever and presser bar lifting lever shaft	○	○	○	○	
23	Sloping surface of tension release plate	○	○	○	○	
24	Meshing part of knee lifter connecting rod and shoulder screw (2 places)	○	○	○	○	
25	Meshing part of knee lifter lever and shoulder screw (2 places)	○	○	○	○	
Feed mechanism						
26	Meshing part of reverse lever shaft	○	○	○	○	
27	Meshing part of level feed eccentric wheel and needle bearing	○	○	○	○	○
28	Meshing part of connecting rod and eccentric wheel shaft and shoulder screw	○	○	○	○	
29	Meshing part of feed regulating stud and arm	○	○	○	○	
30	Sliding parts of feed regulator and stopper	○	○	○	○	
Feed shaft mechanism						
31*	Meshing part of feed bar and feed bar shaft	○			○	○
32	Meshing part of feed bar shaft and feed rocker base arm, and both sides of thrust washer	○			○	
33*	Meshing part of feed bar slide block and feed bar fork, and feed bar slide block and feed lifting eccentric wheel	○			○	○
Rotary hook mechanism						
34*	Meshing part of opener link shaft and opener link	○			○	○
Threading mechanism						
35	Meshing part of tension release bar and arm hole	○	○	○	○	

- For sewing machines with thread trimmer, refer to the following page.
- For sewing machines without thread trimmer, after installing the parts, apply grease to the locations specified on pages 46 and 49.

Thread trimming sewing machines only (T-8422A, 8722A)

No.	Application locations	Apply
Quick reverse mechanism		
1	Meshing part of solenoid lever shaft and solenoid lever assembly	○
2	Sliding parts of solenoid lever assembly and pin	○
Rotary hook mechanism		
3	Meshing parts of movable knife lever L and R and rotary hook base	○
4	Sliding parts of movable knife lever and rotary hook base	○
5	Sliding parts of set screw collar and rotary hook base	○
Thread trimmer mechanism		
6	Meshing part of thread trimmer connecting rod L and R and shoulder screw	○
7	Rounded contact parts of round joints L and R	○
8	Meshing part of driving rod plate and main lever assembly	○
9	Meshing parts of driving rod and bed	○
10	Meshing parts of main lever shaft and main lever	○
11	Meshing parts of main lever assembly roller and thread trimmer cam (around whole of thread trimmer can groove)	○
12	Left side of thread trimmer cam (around whole of tension release cam)	○
13	Meshing parts of solenoid lever shaft and solenoid lever	○
14	Meshing parts of solenoid lever and shoulder screw	○
15	Meshing parts of solenoid lever and plunger pin	○
16	Meshing parts of tension release lever assembly and shoulder screw	○

<Lubrication> ... Thread trimming sewing machines only (T-8422A, 8722A)

Use only the lubricating oil (Nisseki Mitsubishi Sewing Lube 10N; VG10) specified by Brother.
* If this type of lubricating oil is difficult to obtain, the recommended oil to use is <Exxon Mobil Essotex SM10; VG10>.

No.	Lubrication locations	Lubricate
Thread trimmer mechanism		
1	Sliding parts of tension release lever assembly roller and shaft	○
2	Sliding parts of main lever roller and shaft	○
Tension release mechanism		
3	Between inner and outer tension release wires	○

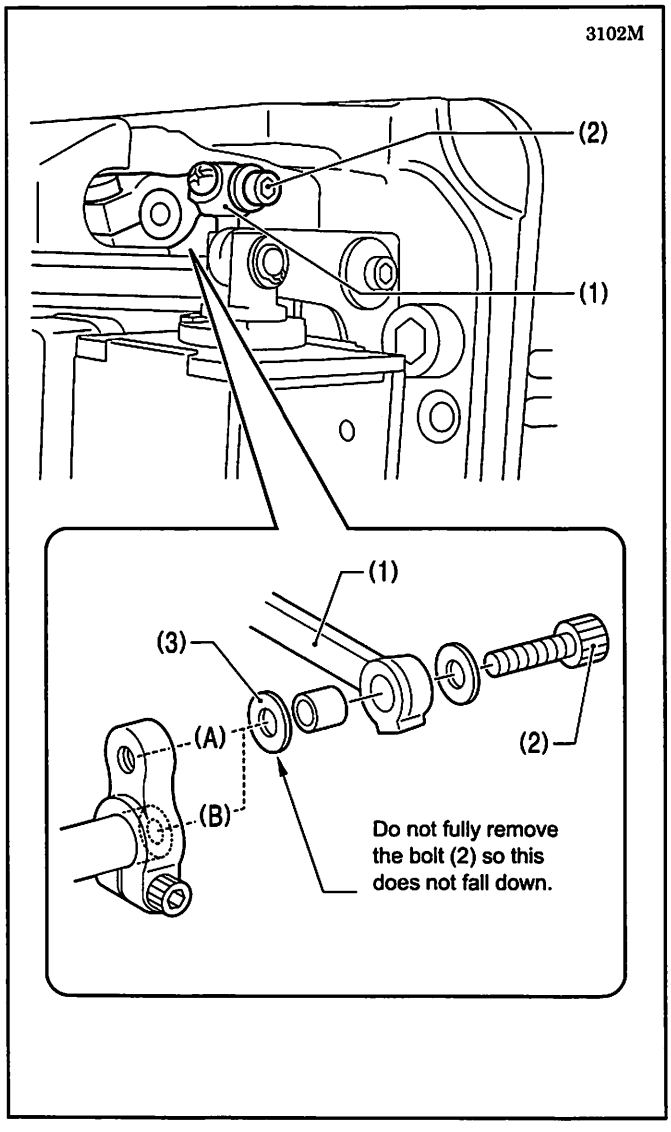
After installing the parts, apply grease to the locations specified on pages 46 and 49.

7. SWITCHING FROM NEEDLE FEED TO LOWER FEED

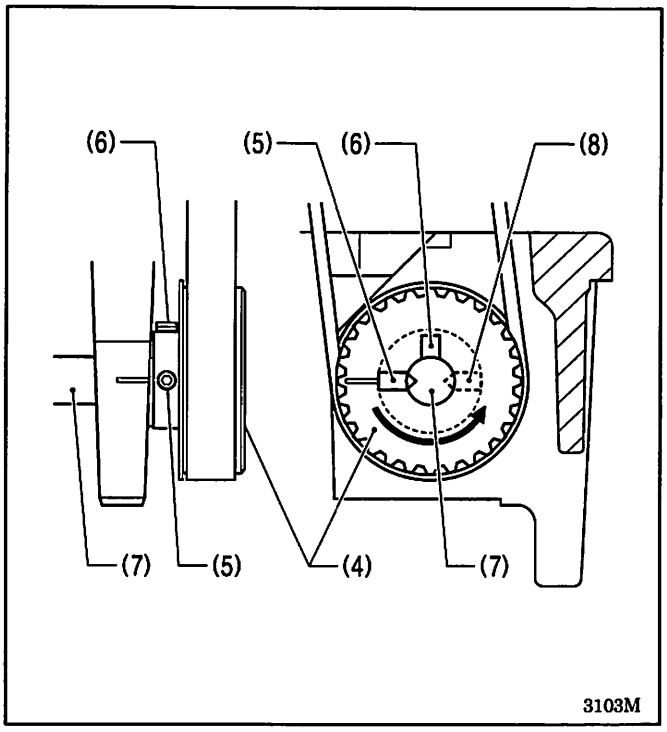
⚠ CAUTION

Switching between upper feed and lower feed should only be carried out by a properly qualified technician.

Turn off the power supply and disconnect the power cord before carrying out this procedure. Otherwise the machine will operate if the treadle is pressed by mistake, which could result injury.
When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.



1. Remove the needle feed gauge parts (feed dog, needle plate and presser foot).
2. Change the position of the bolt (2) of the needle bar rocker link (1) from (A) to (B).
   (Be careful not to pull out the bolt (2) too far, otherwise the washer (3) may fall down.)
3. Remove the screw (5) (sharpened tip) at the front of timing pulley D (4) in the turning direction. Also loosen the screw (6) on the far side.



4. Turn timing pulley D (4) forward 180 degrees with respect to the lower shaft (7), and then insert the removed screw (5) into the hole (8) that does not have a screw inserted. (The screw (6) at the far side will be in the far screw hole (8).)
5. Tighten the screw (5) (sharpened tip) so that it fits into the screw stop groove in the lower shaft (7).
6. Tighten the screw (6) that was loosened in step 3 above.
7. Install the lower feed gauge parts (feed dog, needle plate and presser foot) and carry out the respective adjustments.

   * If the needle does not go into the needle hole for the lower feed needle plate, adjust the position of the needle. (Refer to "4-7. Needle drop forward/back position".)

8. Carry out the adjustments in "4-8. Needle and rotary hook timing".
9. For the T-8421A, 8422A and 8722A, set function No. 34 on the operation panel to "0".
   (Refer to "8-4. Function settings".)

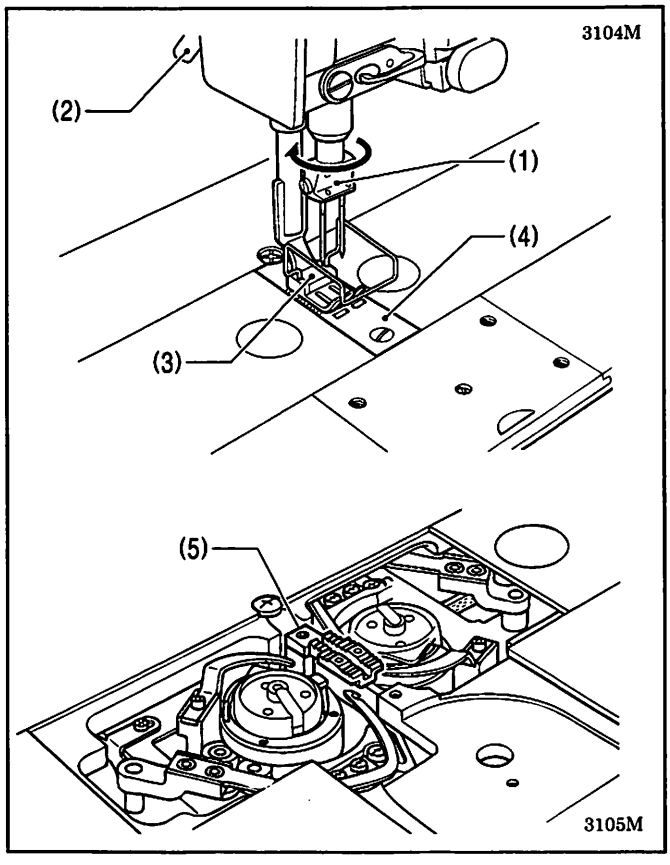
8. REPLACING GAUGE PARTS (CHANGING THE NEEDLE WIDTH)

⚠ CAUTION

Replacement of gauge parts should only be carried out by a qualified technician.

Turn off the power supply and disconnect the power cord before carrying out this procedure. Otherwise the machine will operate if the treadle is pressed by mistake, which could result injury.
When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

Gauge parts should only be replaced with parts specified by Brother.

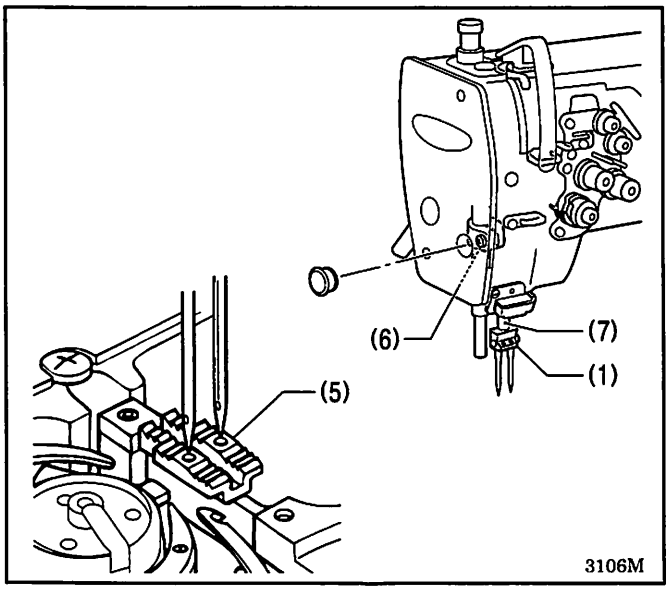


<Removal>

1. Remove the needle and the slide plate.
2. Remove the needle clamp (1) by turning it in the direction of the arrow.
3. Raise the presser foot (3) using the lifting lever (2).
4. Remove the presser foot (3).
5. Remove the needle plate (4) and the feed dog (5).
6. Tilt back the machine head.

< Moving the rotary hook base >

- **If moving the stitch width more than approx. 1 mm to one side**
  Carry out steps 2 to 6 in "4-11. Rotary hook base position".
- **If moving the stitch width approx. 1 mm to one side**
  Carry out steps 3 to 6 in "4-11. Rotary hook base position".



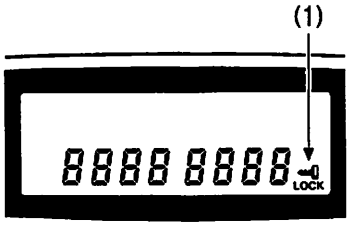
<Installation>

1. Install the needle clamp (1). Tighten to approximately 3 N, and be careful not to overtighten.)
2. Install the needle.
3. Install the feed dog (5).
   (Refer to "4-15. Installing the feed dog".)
4. Turn the machine pulley and check that the needle drops into the middle of the needle hole in the feed dog (5).
   (Loosen the screw (6) and turn the needle bar (7) to adjust.)

5. Readjust the needle and rotary hook timing.
   (Refer to "4-8. Needle and rotary hook timing".)
6. Move the rotary hook base to adjust the clearance between the needle and the rotary hook tip.
   - **If moving the stitch width more than approx. 1 mm to one side**
     Carry out steps 7 to 11 in "4-11. Rotary hook base position".
   - **If moving the stitch width approx. 1 mm to one side**
     Carry out steps 8 to 11 in "4-11. Rotary hook base position".
7. Return the machine head to its original position.
8. Instal the needle plate (4) and the presser foot (3).
9. If it is a thread trimming sewing machine, adjust the thread wiper.
   (Refer to "4-25. Thread wiper".)

9. FUNCTION SETTINGS (T-8421A, 8422A, 8722A)

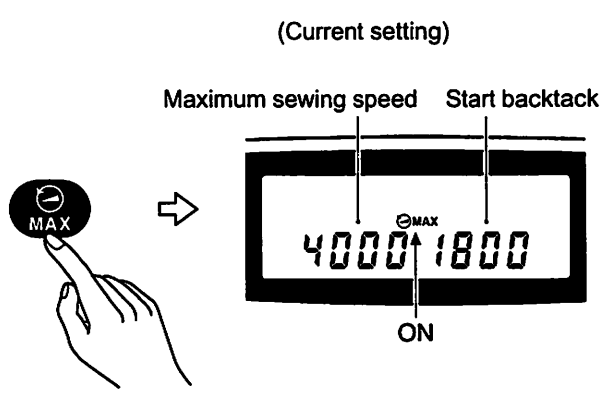
9-1. Maximum sewing speed and start backtack sewing speed setting methods



2232M

If the LOCK key icon (1) is on, release the lock before carrying out the following operations.

1

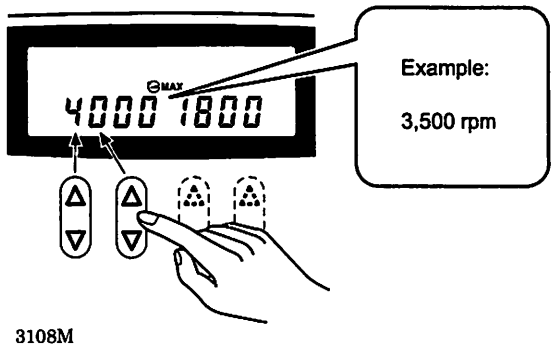


3107M

- The main display will change from an orange display to a green display.

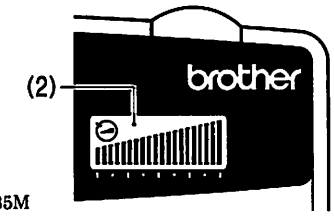
2

Maximum sewing speed setting



3108M

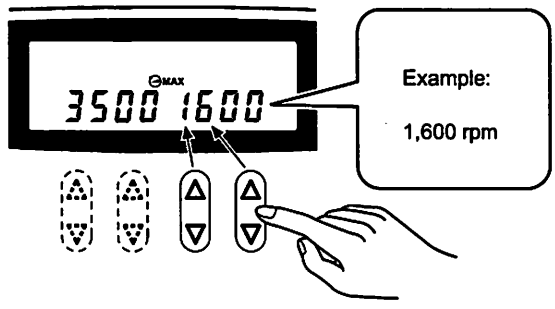
- The maximum sewing speed can be set to a speed from 220 rpm to the maximum sewing speed that has been set for the head detector unit.
- If all numbers in the sewing speed control display (2) are illuminated, sewing will be carried out at the maximum speed that is set here when the treadle is fully depressed.



2235M

3

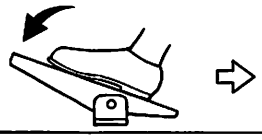
Start backtack sewing speed setting



3109M

- The start backtack sewing speed can be set to a speed from 220 rpm to 1,800 rpm.
(The factory default setting is 1,000 rpm.)

4



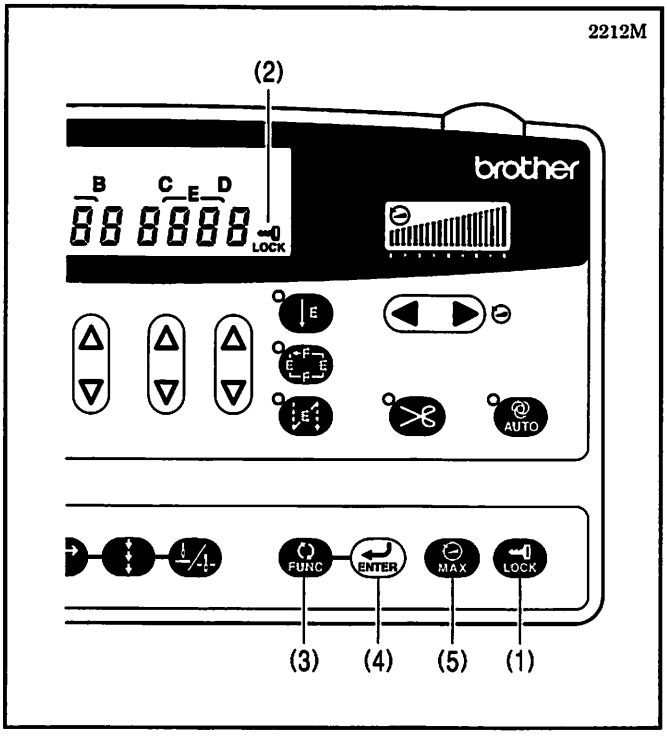
2159M

- When sewing starts, the sewing speed display disappears and returns to the orange display.

NOTE:

When the main display is green, normal key operations such as the start backtack key and the fixed stitch key cannot be used. Press the MAX key once more to clear the sewing speed display and return to the orange display. Normal key operations can then be carried out.

9-2. Using the LOCK key



When the power switch is turned on, the LOCK key (1) turns on. (The icon (2) is illuminated.)
In this state, the following three key operations are disabled so that setting values cannot be changed accidentally.

- FUNC key (3)
- ENTER key (4)
- MAX key (5)

<Releasing the lock>

Press down the LOCK key (1) for 2 seconds or more.
The icon (2) will switch off and the lock will be released.

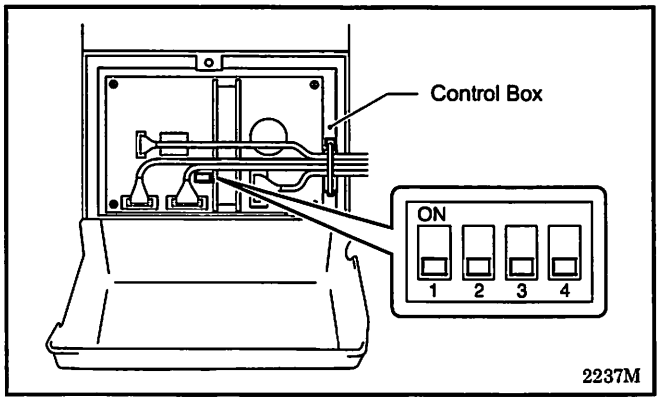
<Setting the lock>

When the icon (2) is switched off, press down the LOCK key (1) for 2 seconds or more.
The icon (2) will illuminate and the above three key operations will become disabled.

9-3. Setting the DIP switches

⚠ DANGER

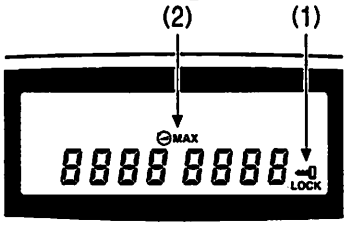
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.



1	Presser foot position when the treadle is returned to the neutral position after thread trimming	ON	Presser foot is lowered. (Export specification)
		OFF	Presser foot is kept raised. (Japanese specification only) (See NOTE 1.)
2	Presser foot lowering when the treadle is depressed to step 1. (See NOTE 2)	ON	Enabled
		OFF	Disabled
3			Spare
4			Always set to off. (See NOTE 3.)

(NOTE 1) Once the knee lifter switch is used to lower the presser foot, the treadle can not be used to raise the presser foot while the machine is stopped; at this time, only the knee lifter is able to raise and lower the presser foot.
(NOTE 2) The treadle unit should also be adjusted when using this function. (Refer to page 83.)
(NOTE 3) When set to ON, treadle operation is disabled, so it should always be left at OFF.
If set to ON, the messages "d. P 58 4" (green) and "Err 10 !" (orange) will flash alternately in the display.

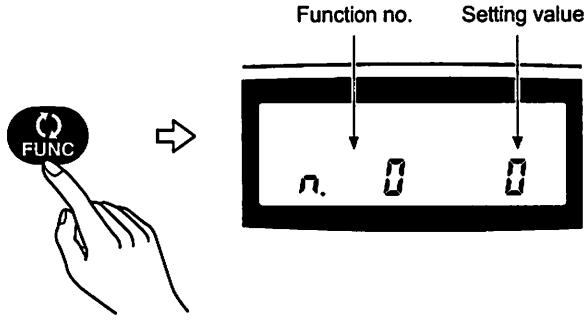
9-4. Setting functions



2238M

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

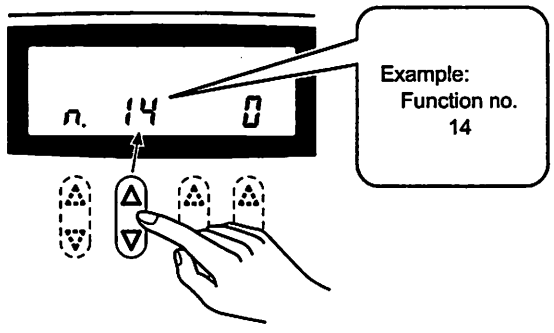
1



2239M

- The main display will change to green and function setting mode will be enabled.

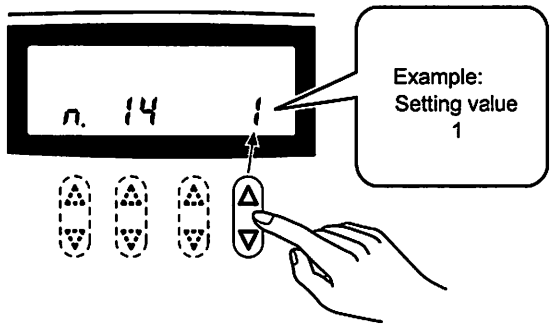
2 Selecting the function number



2240M

- Refer to the "Function List" to select the number for the function that you would like to change the setting for.

3 Changing the setting value



2241M

- Refer to the "Function List" to change the setting to a value within the setting range.

4

(Press for 2 seconds or more)

2242M

- The buzzer will sound for approximately 1 second, and then the setting will be accepted.
- The main display will return to the stitch number display (orange).

NOTE:

- If you depress the treadle before pressing the ENTER key, the main display will return to orange and the setting value will not be changed.
- If you change the function number after changing the setting value but before pressing the ENTER key, the setting value will not be changed.
  You need to press the ENTER key for each function number for the setting to be accepted.

9-5. Function List

Function No. 0–13

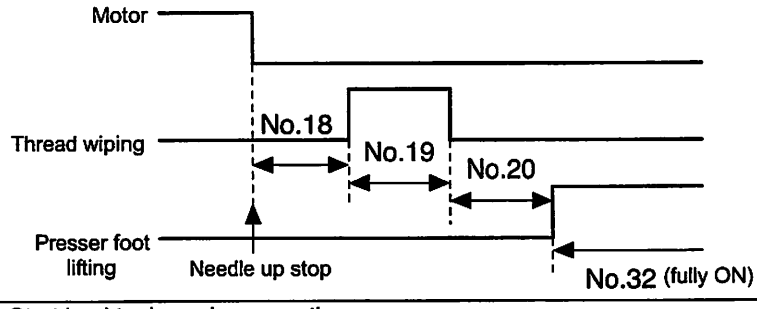
No.	Initial value	Setting range	Setting details
0	0 (degrees)	-10–20 (degrees)	Needle up stop position setting -10 ◄— 0 —► 20 Becomes higher / Becomes lower 2243M
1	0 (degrees)	-10–10 (degrees)	Needle down stop position setting -10 ◄— 0 —► 10 Becomes lower / Becomes higher 2244M
2	0	0–1	Depressing forward when depressed backward (thread trimming) 0: Disabled (depressing forward is enabled after returning to neutral position) 1: Enabled
3	1	0–1	Power supply voltage drop check (reset detection) function 0: Not used 1: Used; "Err 6" is displayed when a voltage drop occurs
4	0	0–1	Buzzer (electronic sound) for panel operation 0: Used 1: Not used
5	0	–	(Do not change this setting.)
6	0	0–1	Needle penetration up operation 0: Used 1: Not used
7	0	0–1	Backtack sewing speed 0: Limited by sewing speed control key 1: Not limited by sewing speed control key
9	0	0–1	End backtack sewing speed 0: Separate setting from start backtack sewing speed is possible 1: Setting for start backtack sewing is used
11 (NOTE 1)	0	0–4	Option actuator operation setting 0: Half stitch correction sewing 1: Single stitch correction sewing 2: Single reverse stitch correction sewing (reverse feed) 3: Thread trimming 4: Single end backtack cycle cancel 5: Presser foot lifter rises (alternate*) 6: Presser foot lifter rises (momentary*)
12	0	0–1	Presser foot status when treadle is returned to neutral after thread trimming 0: Presser foot drops (See NOTE 2) 1: Presser foot does not drop
13	0	0–1	Presser foot status after treadle stops at neutral 0: Presser foot does not lift 1: Presser foot lifts

(NOTE 1) If function No. 69 is set to "3", operation is enabled.

(NOTE 2) Presser foot will not drop if DIP switch 1 is set to OFF.

*... (Alternate): The presser foot rises or drops each time the option actuator is pressed.
(Momentary): The presser foot rises only while the option actuator is being pressed.

Function No. 14–27

No.	Initial value	Setting range	Setting details
14	0	0–1	Actuator function 0: Reverse stitch switch during operation, correction sewing switch when stopped 1: Thread trimming switch
15	0	0–1	Slow stop control when treadle is returned to neutral 0: Slow stop control without step operation 1: Above control is not used
16	3 (minutes)	0–30 (minutes)	Overtime function 0: Not used 1–30: Machine stops after continuous operation for set time, and "Err 8" is displayed.
17	0	0–2	Correction sewing function (See NOTE 3) 0: Half stitch correction sewing/Single stitch correction sewing 1: No correction sewing/Single stitch correction sewing 2: Reverse stitch (reverse feed) correction sewing/Single stitch correction sewing
18	20 (ms)	10–200 (ms)	Thread wiping and presser foot lift operation timing after thread trimming 2245M 
19	50 (ms)	10–200 (ms)	
20	50 (ms)	10–200 (ms)	
21	0	0–1	Start backtack sewing operation 0: Stitch number A, B (N stop) 1: Stitch number A, B, A, B (N stop double)
22	0	0–1	End backtack sewing operation 0: Stitch number C, D 1: Stitch number C, D, C, D (N stop double)
23 (NOTE 4)	0 (stitches)	0–99 (stitches)	Stitch number G
24 (NOTE 5)	0 (stitches)	0–99 (stitches)	Stitch number H
25 (NOTE 6)	0 (stitches)	0–99 (stitches)	Stitch number I
26	0	0–1	Speed for moving to end backtack 0: Decelerates to low speed, then end backtacking starts 1: Decelerates to end backtacking speed, then end backtacking starts (Cycle time can be shortened.)
27	0	0–1	Continuous backtacking operation 0: Stitch number A, B, C, D 1: Stitch number A, B x D times

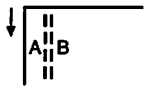
(NOTE 3) The setting to the left of the " / " symbol is when the correction stitch icon is off, and the setting to the right is when the correction stitch icon is on.
Turn the power off and back on again when this setting is changed. The setting will be enabled after the power turns back on.

(NOTE 4) Stitch number setting is enabled when Function No. 118 is set from "1" to "3".

(NOTE 5) Stitch number setting is enabled when Function No. 118 is set to "2" or "3".

(NOTE 6) Stitch number setting is enabled when Function No. 118 is set to "3".

Function No. 28–39

No.	Initial value	Setting range	Setting details
28	0	0–1	Feed direction when stopping immediately after start backtacking 0: Quick reverse solenoid turns off and stops in normal feed direction  1: After stopping, quick reverse solenoid turns OFF (See NOTE 7)  2246M
29	0	0–3	Actuator function when sewing machine is stopped 0: None 1: Presser foot lifter rises (alternate*) 2: Presser foot lifter rises (momentary*) 3: Quick reverse device operates
30	150 (ms)	0–500 (ms)	Delay time until motor starts operating when using automatic presser lifter and the presser foot is raised when sewing starts
31	0	0–1	Stopping during start backtacking and speed during start backtacking 0: When treadle is returned to neutral, start backtacking finishes and then operation stops, and the speed is the start backtacking (constant) speed 1: When treadle is returned to neutral, stopping is possible while start backtacking is in progress, and the start backtacking speed corresponds to the treadle depression amount (low speed up to start backtacking speed)
32	300 (ms)	10–990 (ms)	Presser foot lifter solenoid fully ON time
33	0	0–1	Operation during pleat sewing setting 0: Reverse sewing operation when actuator switch is ON 1: Fixed stitch sewing operation when actuator switch is ON (fixed stitch sewing recall function)
34	1	0–1	Changing twin needle lock stitcher feed specifications 0: Lower feed 1: Needle feed
35	0	0–1	Presser foot soft down mode 0: Automatic mode (See NOTE 8) 1: Manual mode (See NOTE 9)
36	180 (seconds) (3 minutes)	0–240 (seconds)	Presser foot lift time 0: No timer function (does not drop) 1–240: Presser foot drops after set time
37	0	0–1	Automatic presser foot lifter type 0: Solenoid type (See NOTE 10) 1: Pneumatic type (See NOTE 11)
38 (NOTE 12)	40 (ms)	20–120 (ms)	Delay time for presser foot lifter solenoid to turn on after presser foot drop command
39 (NOTE 13)	12	10–12	Voltage detection constant for presser foot lifter solenoid to turn on after presser foot drop command

(NOTE 7) Operates when treadle is lightly pressed when Function No. 31 is set to "0".

(NOTE 8) Adjustment of Function No. 39 is necessary.

(NOTE 9) Adjustment of Function No. 38 is necessary.

(NOTE 10) Duty during chopping can be changed using Function No. 115.

(NOTE 11) Duty during chopping can be changed using Function No. 116.

(NOTE 12) Only enabled when Function No. 35 is set to "1".

(NOTE 13) Only enabled when Function No. 35 is set to "0". If set to "10", response is fastest and operating noise is greatest.

*... (Alternate): The presser foot rises or drops each time the option actuator is pressed.
(Momentary): The presser foot rises only while the option actuator is being pressed.

Function No. 40–54

No.	Initial value	Setting range	Setting details
40	0	0–1	Operation after knee switch is used to raise and lower presser foot (See NOTE 14) 0: Presser foot cannot be raised and lowered by depressing the treadle backward 1: Above operation is possible
41	0	0–1	Presser foot lifting when treadle is depressed backward to 1st step after returning to neutral 0: Possible 1: Not possible
42	0	0–1	Operation when treadle is depressed backward 0: Thread trimming operation 1: Thread trimming operation disabled (presser foot is raised when treadle is depressed backward)
43	0	0–1	Depressed backward operation after treadle is returned to neutral and needle stops in the up position 0: Single stitch is sewn and then the thread is trimmed (lock stitchers) 1: Thread wiping operation when needle is stopped in up position (chain stitchers)
44	0	0–1	Operation when Standing operation variable speed pedal is on 0: Sewing speed corresponds to treadle depression amount 1: Sewing speed corresponds to sewing speed control key setting (constant speed)
45	80 (ms)	0–500 (ms)	Delay time from standing pedal turning on until motor starts operating
46	0	0–1	Operation during standing operation when AUTO function is on 0: Sewing pauses when presser foot lifter pedal is on (operation pause) 1: Above function is not used
47	0	0–1	Operation during standing operation when AUTO function is on 0: Operation stops when high speed pedal turns back on, and restarts when off 1: Above function is not used
48	0	0–1	Thread trimming pedal function after thread trimming during standing operation 0: Presser foot can be raised and lowered 1: Above operation not used (only possible using presser foot lifter pedal)
47	0	0–1	Operation during standing operation when AUTO function is on 0: Operation stops when high speed pedal turns back on, and restarts when off 1: Above function is not used
48	0	0–1	Thread trimming pedal function after thread trimming during standing operation 0: Presser foot can be raised and lowered 1: Above operation not used (only possible using presser foot lifter pedal)
49	0	0–1	Alternate standing operation pedal and treadle operation (See NOTE 15) 0: Treadle operation is disabled after standing operation pedal is used 1: Treadle operation can also be used after standing operation pedal is used (alternate operation is possible)
51*	0	0–1	Correction stitch sewing using actuator switch after thread trimming 0: Not possible (switch operation disabled) 1: Possible
52	2 (needles)	1–99 (needles)	Number of slow start stitches
53*	10 (needles)	0–100 (needles)	Count units for stitch counter display 0: No counting operation 1–100: Display counts down by number of stitches set
54*	1	0–2	Operation when stitch counter warning occurs ("!" icon is illuminated) 0: Starting using treadle is enabled as normal 1: Starting using treadle is disabled (thread trimming by depressing treadle backward is possible) 2: Starting using treadle is completely disabled once treadle is returned to neutral and operation stops

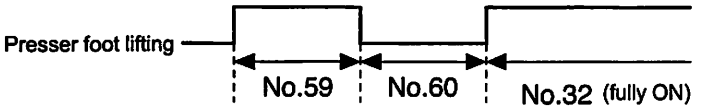
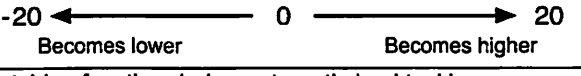
(NOTE 14) Setting is only enabled when DIP switch 1 is set to OFF.

(NOTE 15) Presser foot lifter pedal operation is not included. In the case of simultaneous operation, the standing operation pedal takes priority.

*... Settings indicated with " * " are enabled when the power is turned off and then back on.

**... (Alternate): The puller rises or drops each time the presser foot switch is pressed.
(Momentary): The puller rises only while the presser foot switch is being pressed.

Function No. 47–68

No.	Initial value	Setting range	Setting details
55 (NOTE 16)	0	0–1	Operation after treadle is depressed backward or knee switch is operated when presser foot is raised 0: When treadle is returned to neutral, presser foot is raised 1: When treadle is returned to neutral, presser foot is lowered
56	0	0–1	Function for preventing needle bar operation when treadle is accidentally depressed forward when it is returned to neutral after being depressed backward 0: Used 1: Not used
57 (NOTE 17)	0	0–1	Operation when treadle is depressed forward to 1st step when presser foot is raised 0: Presser foot is lowered 1: Presser foot is not lowered
58	0	0–1	Presser foot soft up function 0: Not used 1: Used (Function No. 59 and No. 60 must be set.)
59	0 (ms)	0–150 (ms)	Presser foot soft up timer setting (When Function No. 58 is set to "1")  2247M
60	0 (ms)	0–99 (ms)	
61	0	0–1	Highest needle position stop operation 0: Not used 1: Used
62 (NOTE 18)	0	0–1	Thread wiping operation during highest needle position stop operation 0: Thread wiping occurs after needle stops in highest position 1: Thread wiping occurs after thread trimming, and then needle bar is raised
63	0	0–1	Thread trimming timer operation 0: Not used (Thread trimming is off when needle bar is stopped at the up position) 1: Used (Time is set using Function No. 73)
64	2 (T-8422A -[][]3) 0 (Other)	0~2	Thread trimming gain adjustment 0 : 1 1 : 1/2 2 : 1/4 [Do not change this setting.]
65 (NOTE 18)	150 (ms)	10–500 (ms)	Delay time until reverse operation starts during highest needle position stop operation
66 (NOTE 18)	0	0–1	Presser foot lift timing during highest needle position stop operation 0: Presser foot is raised after needle bar is raised 1: Presser foot is raised before needle bar lift operation starts (See NOTE 19)
67 (NOTE 18)	0 (degrees)	-20–20 (degrees)	Highest needle position stop position setting  2248M
68 (NOTE 20)	0	0–1	Seam matching function during automatic backtacking 0: Operation does not stop when switching cloth feed direction 1: Operation momentarily stops when switching cloth feed direction

(NOTE 16) Setting is only enabled when DIP switch 1 is set to ON.

(NOTE 17) Setting is only enabled when DIP switch 2 is set to ON.

(NOTE 18) Setting is enabled when Function No. 61 is set to "1".

(NOTE 19) Operation is disabled when Function No. 62 is set to "1". Presser foot is raised after needle bar is raised.

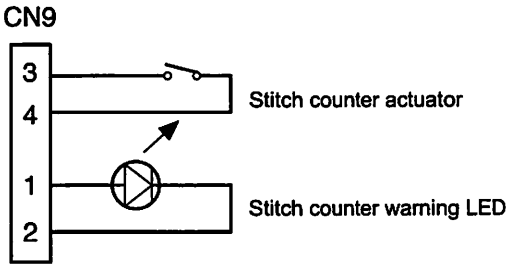
(NOTE 20) Used when you would like to match the seam accurately during automatic backtacking. Use Function No. 78 to set the stop position and Function No. 79 to change the time before restarting.

Function No. 69

No.	Initial value	Setting range	Setting details
69	0	0–3	Actuator (option) function 0: No function 1: Stitch counter actuator 2: Sewing speed actuator 3: Option actuator

<When set as a stitch counter actuator>

Connect to connector CN9 on the control circuit board.

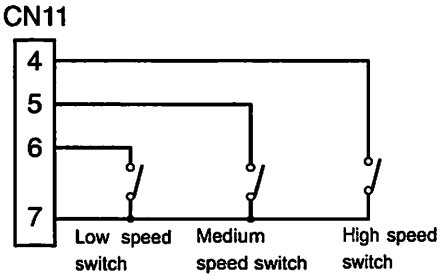


2249M

- The stitch counter warning LED illuminates when the stitch counter display reaches "-5". (This is the same function as the "!" icon in the operation panel icon display.)
- When the stitch counter actuator is pressed, treadle operation is possible. (This is the same operation as the RESET key on the operation panel.)

<When set as a sewing speed actuator>

Connect the switches to connector CN11 on the control circuit board.

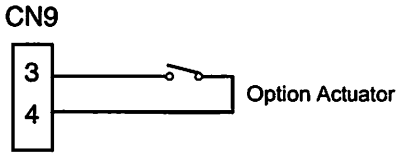


2250M

- When the low speed switch is pressed, the sewing speed becomes 1,000 rpm. The speed can be changed by setting Function No. 122.
- When the medium speed switch is pressed, the sewing speed becomes 3,000 rpm. The speed can be changed by setting Function No. 121.
- When the high speed switch is pressed, the sewing speed returns to the maximum sewing speed that has been set using the MAX key.

<When set as an option actuator>

Connect to connector CN9 on the control circuit board.



2251M

- Set the operation using Function No. 11.

Function No. 70–72

No.	Initial value	Setting range	Setting details
70 (NOTE 21)	6	0–6	Option output setting 0: Puller 1: Needle cooler (synchronized output during operation) 2: Air saving 3: Condense 4: Chain stitch thread trimming (thread wiping) 5: Pneumatic wiper 6: No output
71 (NOTE 22)	0 (needles)	0–99 (needles)	Number of stitches from sewing start until puller is lowered 0: Synchronized with presser foot lifter operation 1–99: Puller is lowered after the set number of stitches is sewn
72 (NOTE 22)	10 (seconds)	5–30 (seconds)	Time until puller is lowered

(NOTE 21) The factory default setting is for no output, so the output must be set. Output is from pins 2–4 of connector CN15 on the control circuit board.

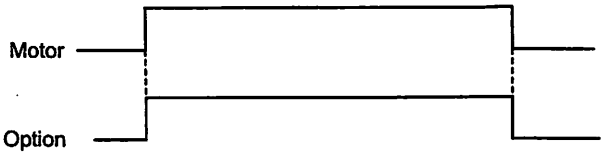
(NOTE 22) Setting is enabled when Function No. 70 is set to "0".

<When set to puller>

- When the sewing machine is stopped, the puller is lowered after 10 seconds in synchronization with the automatic presser foot lifter.
- During sewing, the puller is only raised when the reverse mechanism operates.
- The time of 10 seconds can be changed by setting Function No. 72.
- Function No. 71 can be used to set the number of stitches until the puller is lowered after sewing starts. If the puller is raised (in synchronization with the automatic presser foot lifter) while the sewing machine is stopped after thread trimming, this operation occurs.

<When set to needle cooler (synchronized output during operation)>

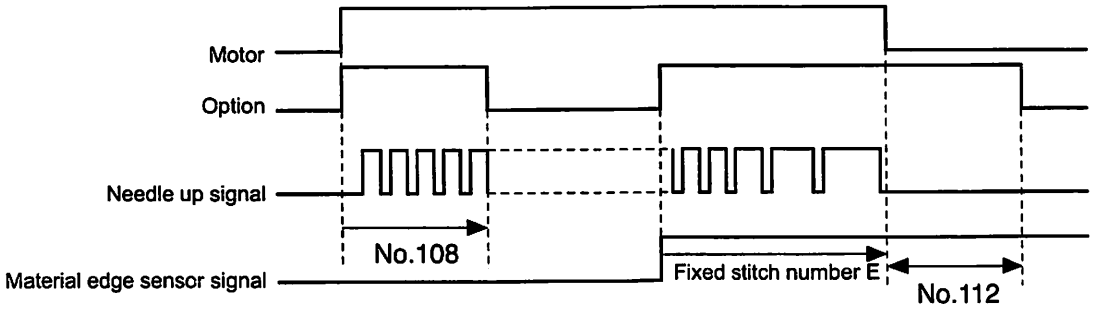
- Output is synchronized with motor operation.



2252M

<When set to air saving>

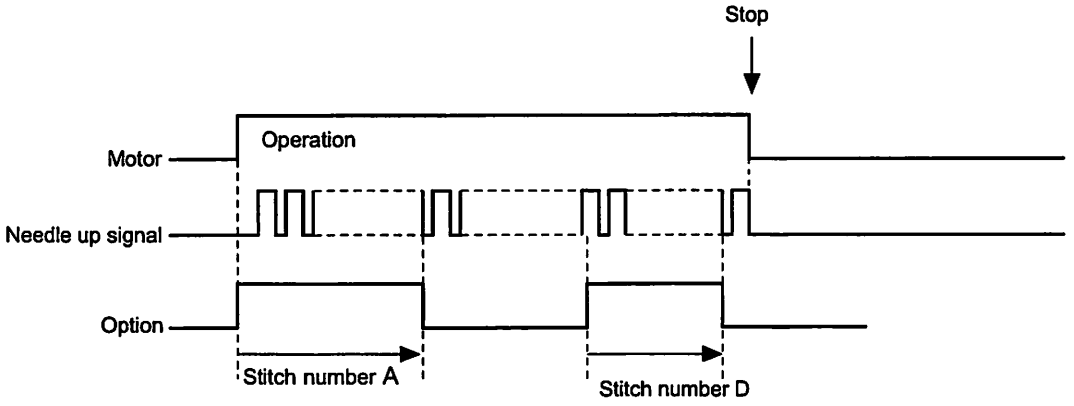
- Output only occurs at the sewing start and the sewing end. A material edge sensor (S2) is required for output at the sewing end.
- Function No. 108 is used to set the number of stitches at the sewing start. Output only occurs while the number of stitches set are being sewed after sewing starts.
- The number of stitches at the sewing end is set by fixed stitch number E at the operation panel. Output occurs when the edge of the material is detected.
- The delay time after thread trimming until output turns off is set using Function No. 112. If the needle stops in the down position after the edge of the material is detected, output turns off when the needle stops.



2253M

<When set to condense>

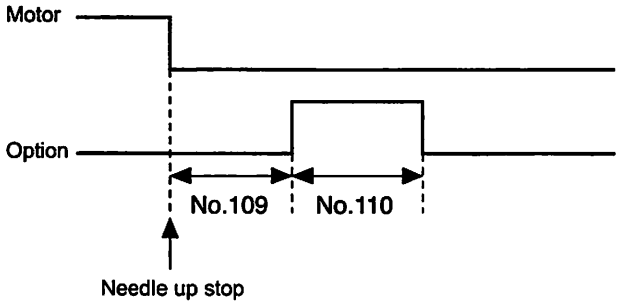
- Start backtacking or end backtacking must be set.
- For the sewing start, set stitch number B to "0". Output will occur while stitches for stitch number A are being sewn.
- For the sewing end, set stitch number C to "0". Output will occur while stitches for stitch number D are being sewn.



2254M

<When set to chain stitch thread trimming (thread wiping)>

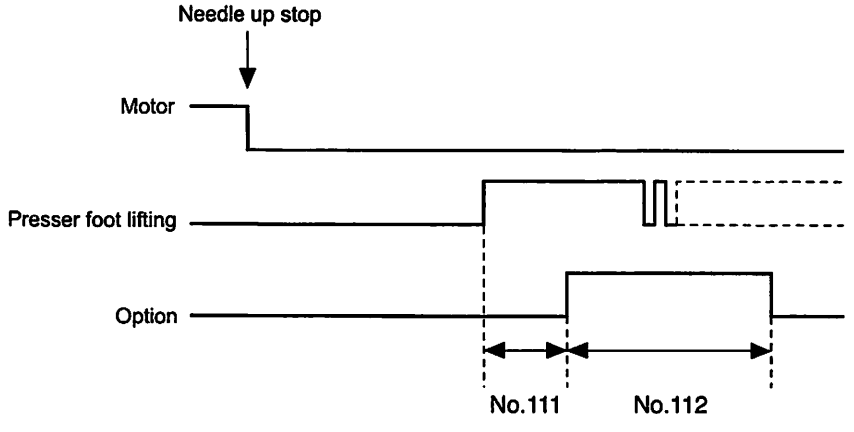
- After thread trimming, the thread wiper signal is output.
- Use Function No. 109 and No. 110 to set the timer operation.



2255M

<When set to pneumatic wiper>

- After thread trimming, output is synchronized with the automatic presser foot lifter.
- Use Function No. 111 and No. 112 to set the timer operation.
- When the presser foot is lowered, option output turns off.



2256M

Function No. 73–79

No.	Initial value	Setting range	Setting details
73 (NOTE 23)	90 (ms)	50–150 (ms)	Thread trimming on time
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 (NOTE 24)	15 degrees	-345–345 (degrees)	Quick reverse solenoid on timing during end backtacking
78 (NOTE 25)	180 (degrees)	0–350 (degrees)	Pause position when switching feed direction
79 (NOTE 26)	100 (ms)	10–500 (ms)	Pause time when switching feed direction

(NOTE 23) Setting is enabled when Function No. 63 is set to "1".

(NOTE 24) Setting is enabled when Function No. 22 or No. 26 is set to "1".

(NOTE 25) Setting is enabled when Function No. 68 is set to "1". The stopping position is the angle after the need up signal turns on.

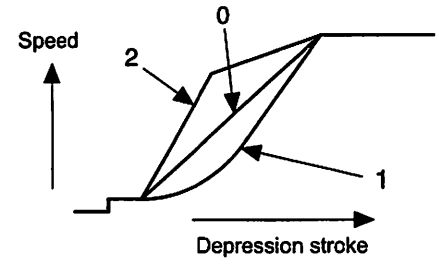
(NOTE 26) Setting is enabled when Function No. 68 is set to "1". The reverse feed mechanism switches at the stopping position.
When the stopping time has elapsed, the sewing machine restarts automatically.

<Settings for Function Nos. 74–77>

- If the values are set to values that are less than the initial value (- direction), the quick reverse solenoid on/off timing becomes faster. If the seam length immediately before switching occurs is short, change the setting to a value in the - direction.
- If the values are set to values that are greater than the initial value (+ direction), the quick reverse solenoid on/off timing becomes slower. If the seam length immediately after switching occurs is short, change the setting to a value in the + direction.

Function No.80–88

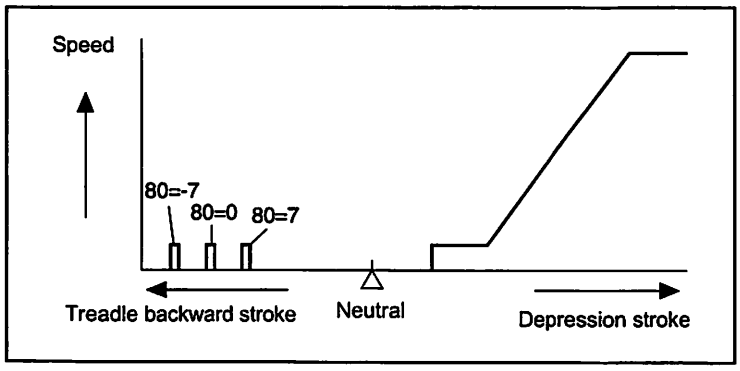
No.	Initial value	Setting range	Setting details
80*	0	-7–7	Treadle backward on (thread trimming) point
81*	0	-5–5	Treadle backward 1st step on (presser foot lifting) point
82*	0	-5–5	Treadle forward 1st step on (presser foot dropping) point
83*	0	-5–5	Treadle forward on (starting) point
84*	0	-5–5	Treadle variable speed range starting point
85*	0	-6–6	Treadle high speed range reaching point
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

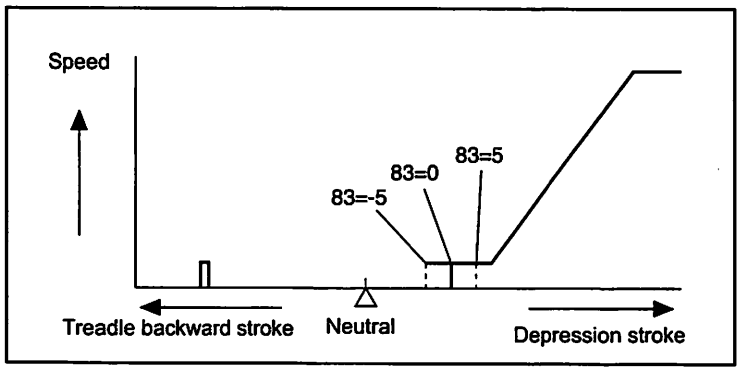
*... Settings indicated with " * " are enabled when the power is turned off and then back on.

With the treadle neutral position as the 0 point, the values in the forward direction are + (plus) values, and those in the backward direction are - (minus) values, so that the speeds accelerate or decelerate around the standard setting.
(Refer to page 84 for details.)



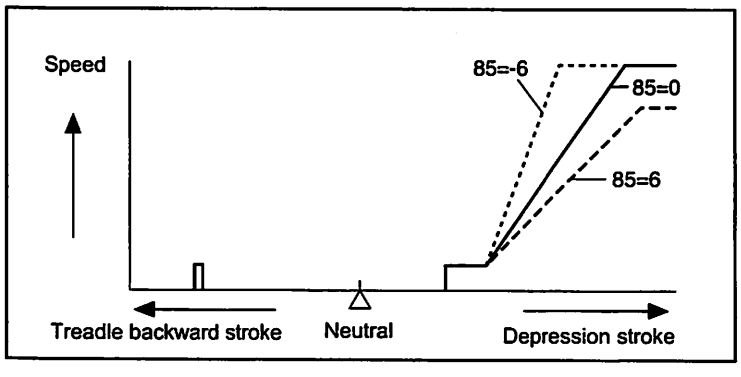
(ex. 1) Setting for Function No. 80

2258M



(ex. 2) Setting for Function No. 83

2259M



(ex. 3) Setting for Function No. 85

2260M

Function No. 90–107

No.	Initial value	Setting range	Setting details
90	220 (rpm) (T-8422A-[][]3) 220 (rpm) (Other)	150–300 (rpm)	Thread trimming speed (TRIM)
91	220 (rpm)	150–300 (rpm)	Low speed (INCH)
92	1400 (rpm)	500–2,500 (rpm)	Stop improvement speed (POS) [Do not change this setting.]
93	220 (rpm)	INCH–1,000 (rpm)	Slow speed (SLOW)
94	3,000 (rpm)	INCH–3,000 (rpm)	Start backtacking limit speed (SBL) (See NOTE 27)
96	1,800 (rpm)	INCH–3,000 (rpm)	End backtacking speed (EBT)
98	HIL (rpm)	INCH–HIL (rpm)	Automatic speed (AUTO)
99	(NOTE 28)	INCH–5,000 (rpm)	Maximum sewing speed limit speed (HIL) (See NOTE 29)
101	0	-	[Do not change this setting.]
102	0	-	[Do not change this setting.]
103	0	-	[Do not change this setting.]
104	50	-	[Do not change this setting.]
105	10	-	[Do not change this setting.]
106	7	-	[Do not change this setting.]
107	0	-	[Do not change this setting.]

(NOTE 27) This is the upper limit for the start backtacking speed setting. Refer to page 57 for details on start backtacking speed settings.

(NOTE 28) This setting is read from the head detector unit.

(NOTE 29) This is the upper limit for the maximum sewing speed setting. Refer to page 57 for details on maximum sewing speed settings.

Function No. 108–114

No.	Initial value	Setting range	Setting details
108 (NOTE 30)	0 (needles)	0–99 (needles)	Number of stitches for option output (C1)
109 (NOTE 31)	10 (ms)	0–990 (ms)	Delay time until option output turns on (C2)
110 (NOTE 31)	0 (ms)	0–990 (ms)	Option output on time (C3)
111 (NOTE 32)	0 (ms)	0–990 (ms)	Delay time until option output turns on (C4)
112 (NOTE 33)	2000 (ms)	0–9900 (ms)	Option output on time (C5)
113 (NOTE 34)	0 (needles)	0–99 (needles)	Number of stitches for option output (C6)
114 (NOTE 34)	0 (needles)	0–99 (needles)	Number of stitches for option output (C7)

(NOTE 30) Setting is enabled when Function No. 70 is set to "2".

(NOTE 31) Setting is enabled when Function No. 70 is set to "4".

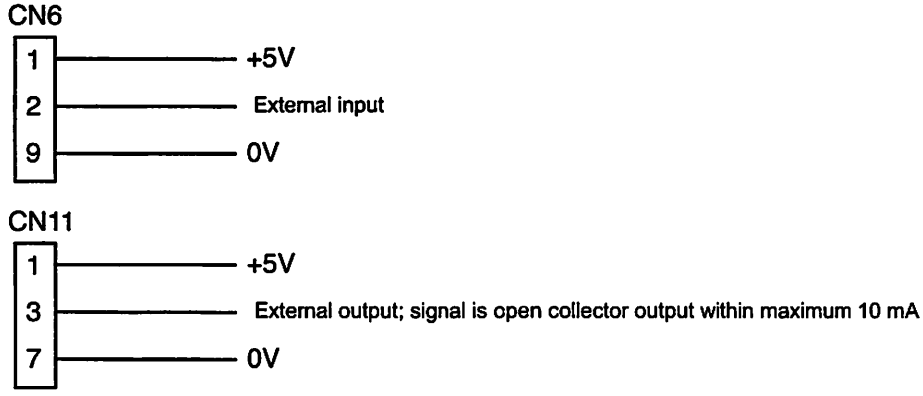
(NOTE 32) Setting is enabled when Function No. 70 is set to "5".

(NOTE 33) Setting is enabled when Function No. 70 is set to "2" or "5".

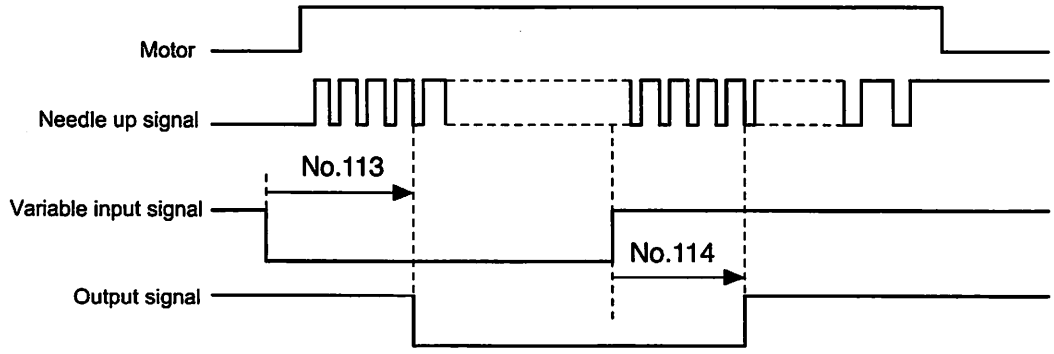
(NOTE 34) The stitch number control output signal can be set in accordance with the variable input signal.

<Stitch number control output signal>

The variable input signal should be connected to connector CN6. The output signal is sent to connector CN11.



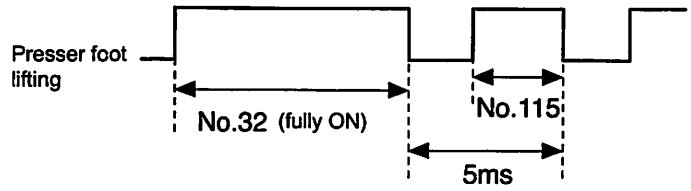
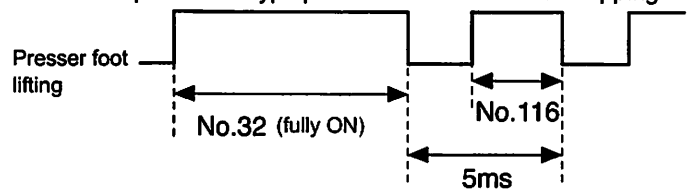
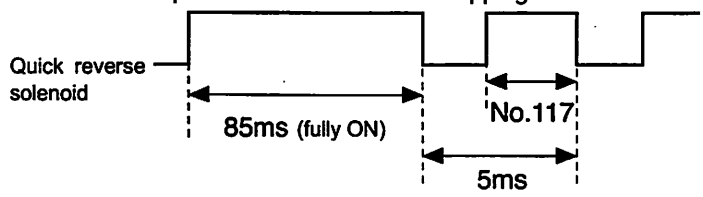
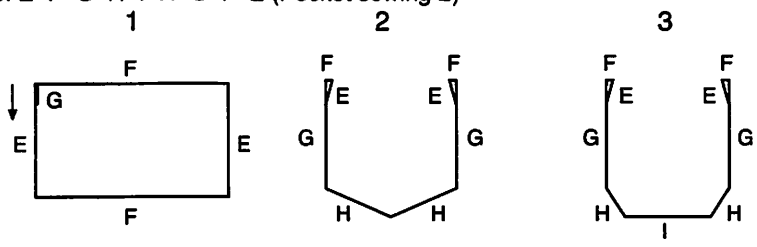
2262M



2263M

NOTE: If Function No. 112 and No. 113 are set to "0", output is synchronized with the variable input signal.

Function No. 115–118

No.	Initial value	Setting range	Setting details
115 (NOTE 35)	10 (1.0 ms)	1–49 0.1–4.9 (ms)	On time when solenoid-type presser lifter solenoid is chopping  2264M
116 (NOTE 36)	25 (2.5 ms)	1–49 (0.1–4.9 ms)	On time when pneumatic-type presser lifter solenoid is chopping  2265M
117	11 (1.1 ms)	1–49 (0.1–4.9 ms)	On time when quick reverse solenoid is chopping  2266M
118 (NOTE 37)	0	0–3	Sewing pattern setting when name label key is on 0: E–F–E–F (Name label attaching) 1: E–F–E–F–G 2: E–F–G–H–H–G–F–E (Pocket sewing 1) 3: E–F–G–H–I–H–G–F–E (Pocket sewing 2)  2267M

(NOTE 35) Setting is enabled when Function No. 37 is set to "0".

(NOTE 36) Setting is enabled when Function No. 37 is set to "1".

(NOTE 37) When set to "1", stitch number G is set for function No. 23.
When set to "2", stitch number G is set for function No. 23 and stitch number H is set for Function No. 24.
When set to "3", stitch number G is set for function No. 23, stitch number H is set for Function No. 24 and stitch number I is set for Function No. 25.

Function No. 119–131

No.	Initial value	Setting range	Setting details
119	3	-	[Do not change this setting.]
120	5	-	[Do not change this setting.]
121 (NOTE 38)	3000 (rpm)	200–5000 (rpm)	Speed when medium speed switch is on
122 (NOTE 38)	1000 (rpm)	200–5000 (rpm)	Speed when low speed switch is on
123	45 (degrees)	30–90 (degrees)	Servo lock release angle (Do not change this setting.)
124*	0	0–1	Material edge sensor logic selection 0: Detects material absent 1: Detects material present
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 operates (1–120 seconds)
127	10	-	[Do not change this setting.]
128	0	0–3	Flicker reduction function (when flickering occurs from fluorescent light) 0: None 1: Medium flicker reduction 2: Low flicker reduction 3: High flicker reduction 4: [Do not use this setting, otherwise the motor will overheat.]
129	0	-2–2	Motor acceleration gain [Do not change this setting.]
130	0	-2–2	Motor deceleration gain [Do not change this setting.]
131	14	-	[Do not change this setting.]

(NOTE 38) Setting is enabled when Function No. 69 is set to "2".

*... Settings indicated with " * " are enabled when the power is turned off and then back on.

Function No.132–136

The following function numbers show maintenance information.

No.	Description of displays
132	Cumulative power on time (Actual time = Displayed time x 10)
133	Cumulative operating time (Actual time = Displayed time xxxx x 10)
134	Cumulative greased-up operating time (time = display xxx x 1 hour)
135	ROM version (x.xxx)
136	Maximum sewing speed setting history (rpm)

9-6. Clearing saved data (Initialization)

<Types of data that are cleared>

When saved data is cleared, the following data are returned to factory default settings.

- All data that has been set using the operation panel (including function setting data)

<Initializing the data>

Initializing all data

1. While pressing the RESET key on the operation panel, turn on the power switch.
   The main display will change to orange and "iniT ALL" will be displayed.
2. Press the ENTER key.
   Initialization will be carried out and the "iniT ALL" display will change to green.
3. After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

Initializing only speed data

1. While pressing the MAX key on the operation panel, turn on the power switch.
   The main display will change to orange and "iniT rPM" will be displayed.
2. Press the ENTER key.
   The speed data will be initialized to the speed data from the head detector unit and the "iniT rPM" display will change to green.
3. After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

Initializing only the function setting data

1. While pressing the FUNC key on the operation panel, turn on the power switch.
   The main display will change to orange and "iniT FUnC" will be displayed.
2. Press the ENTER key.
   Initialization of the function setting data will be carried out and the "iniT FUnC" display will change to green.
3. After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

<Clearing data automatically>

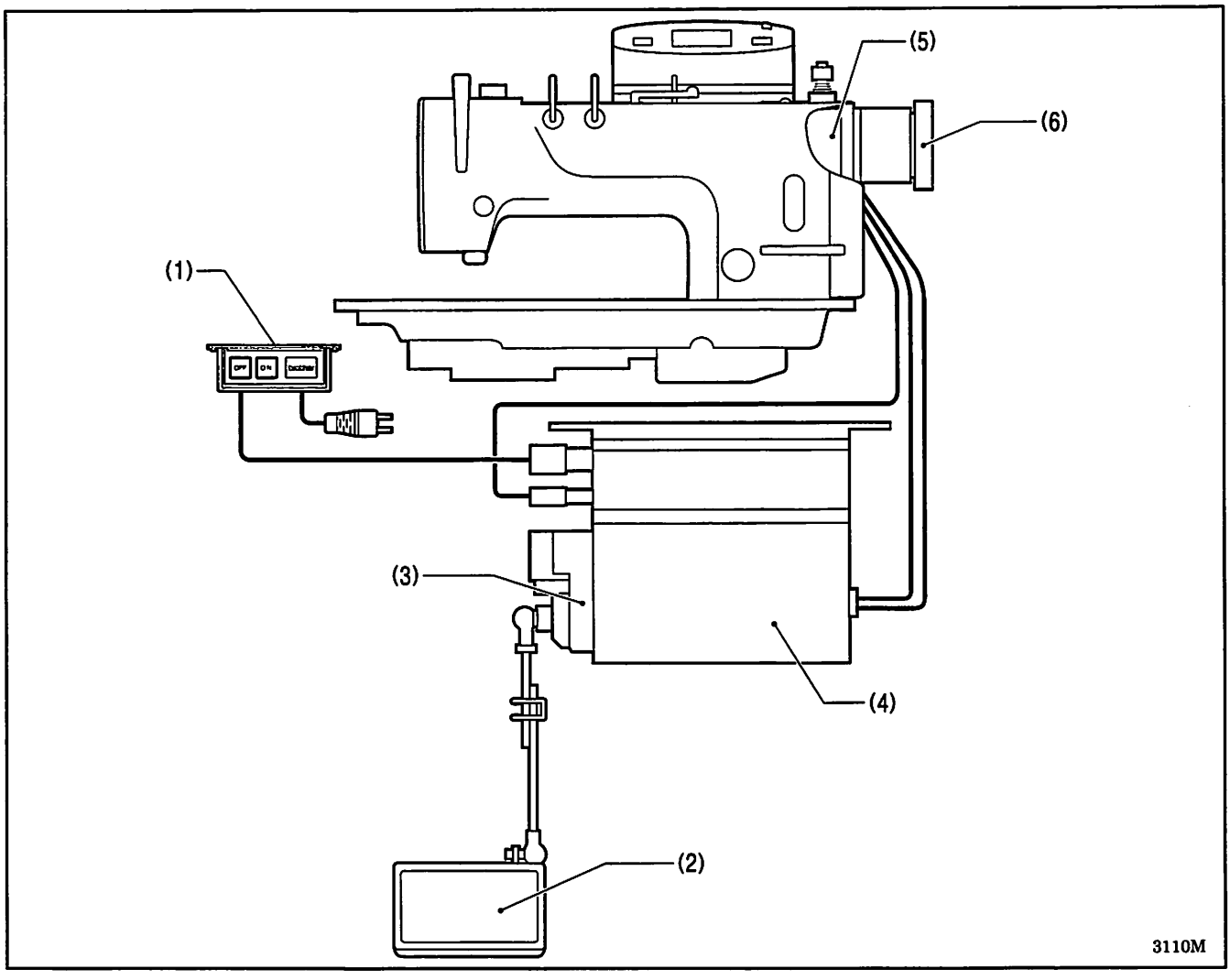
When the power is turned on for the first time, the treadle and the operation panel cannot be operated for a period of approximately 4 seconds.
After approximately 4 seconds, the main display will change to green and "init rPM" will be displayed. "iniT rPM" means that the sewing machine's speed settings have been initialized.
In addition, this display will also appear in the following cases approximately 4 seconds after the power has been turned on.

- When the control box has been replaced
- When a sewing machine with different speed specifications to the control box is connected

NOTE:

When the power switch is turned on, any of the sewing machine's sewing speeds that are different from the setting data in the head detector unit are reset automatically.
When initialization is complete, the main display will change to green and "init rPM" will be displayed.
After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

10. CONTROL SYSTEM (T-8421A, 8422A, 8722A)



Turn on the power switch (1).

A. When the treadle is depressed

1. When the treadle (2) is depressed, a voltage corresponding to the amount of treadle depression is transmitted by the treadle unit (3) to the control box (4).
2. The DD motor (5) that is directly linked to the sewing machine receives a voltage that corresponds to the treadle depression amount from the control box (4), causing the DD motor (5) to operate at the speed represented by the treadle depression amount, and this makes the sewing machine operate.

B. When the treadle is returned to the neutral position

1. When the treadle (2) is returned to the neutral position (when the operator's foot is removed from the treadle), a signal indicating that the treadle is at the neutral position is transmitted by the treadle unit (3) to the control box (4), and the electrical brake is then applied to slow the DD motor (5).
2. The encoder circuit board that is installed to the DD motor (5) sends a signal to the control box (4) so that the electrical brake is applied in order to stop the sewing machine at the stopping position (needle up or needle down) set by the pulley (6) that is attached to the DD motor (5).

C. When the treadle is depressed backward

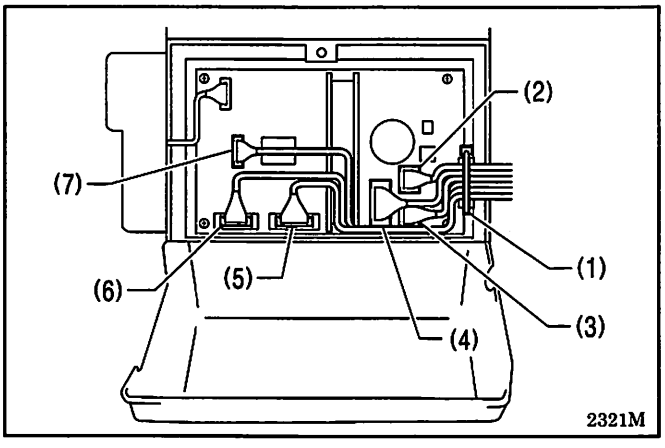
1. When the treadle (2) is depressed backward, a signal indicating thread trimmer operation is transmitted by the treadle unit (3) to the control box (4), and the DD motor (5) slows down to the thread trimming speed (inching speed). [For models with thread trimmer]
2. The encoder circuit board that is installed to the DD motor (5) sends a signal to the control box (4) so that the electrical brake is applied in order to stop the sewing machine at the needle up stopping position set by the pulley (6) that is attached to the DD motor (5).
   For models with thread trimmer, the thread trimming operation is carried out immediately before the sewing machine stops at the needle up stop position.

11. CONTROL BOX AND MOTOR (T-8421A, 8422A, 8722A)

11-1. Removing and installing the control box

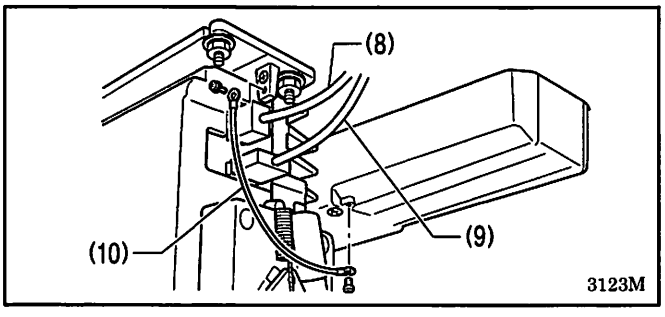
⚠ DANGER

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.

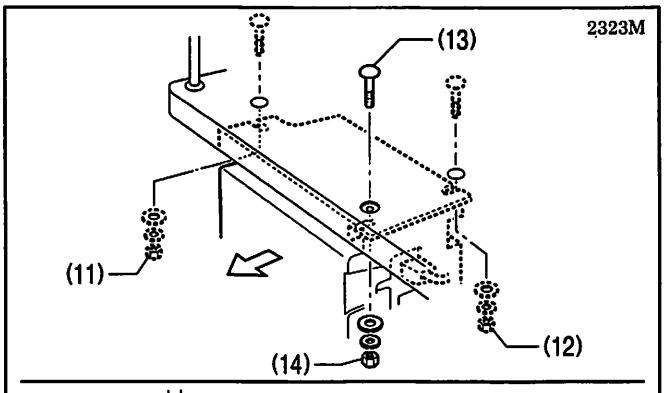


<Removal>

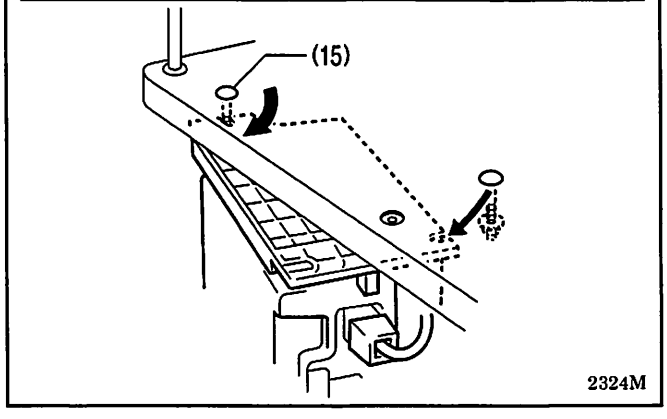
1. Remove the repeat cable tie (1), and then disconnect the connectors (2) to (7) from the sewing machine.
   * Be careful not to break the pawls of connectors (5), (6) and (7).



2. Disconnect the power supply connector (8) and the motor connector (9).
3. Disconnect the ground wire (10).



4. Loosen the nuts (11) and (12) (without removing them).
5. Remove the bolt (13) and nut (14).



6. Pivot the control box around the bolt (15) and pull it out to remove it from the table.

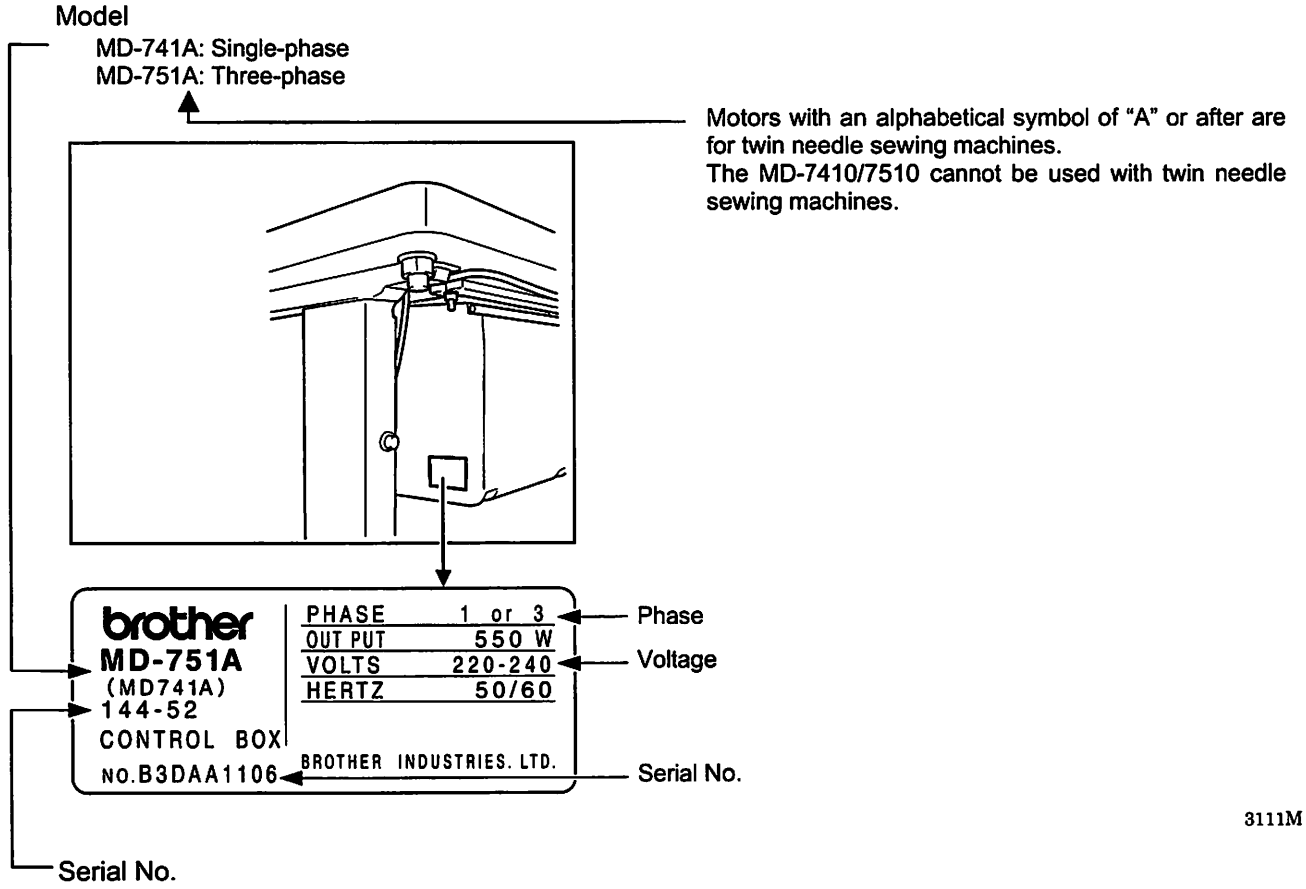
<Installation>

Install by following the removal procedure in reverse.

11-2. Control box and motor rating plate

<Control box>

- Check the phase, voltage and type for the control box.
- Some specifications are identical for both single- and three-phase. (appears on name plate)

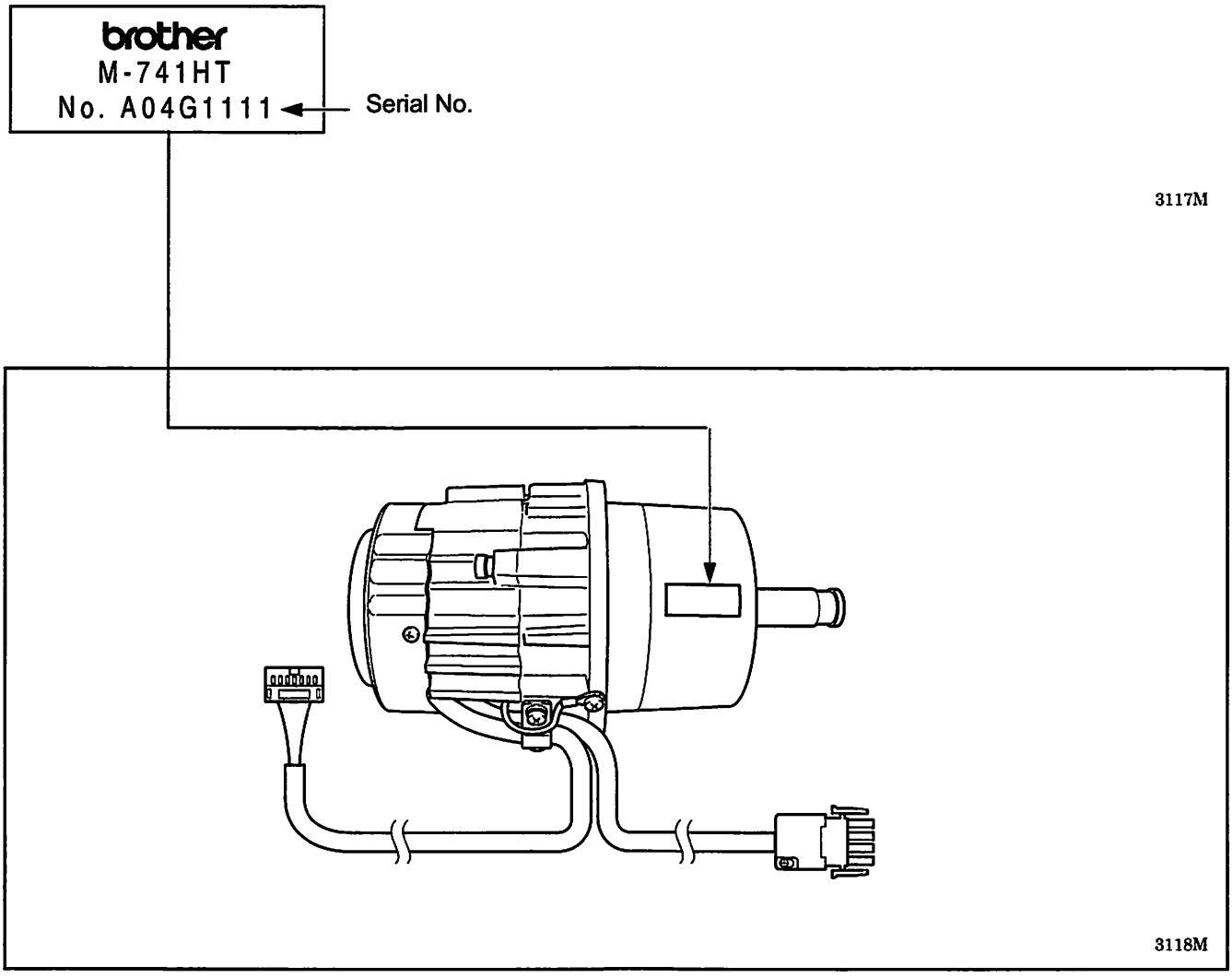


3111M

144-52

Destination	1	Japan
	2	Asia/Middle East
	3	USA/Mexico
	4	Canada
	5	Oceania (C-TICK)
	7	Turkey/ North Africa
	9	China
	L	Europe/Greece (CE)
Power supply voltage	1	100V
	2	110V
	3	200V
	5	220–240V
	8	380–415V
Treadle unit	4	1 forward 1 backward step type
	6	2 forward 2 backward step type
Operation panel	4	External
Sewing machine	1	T-8421A, 8422A, 8722A

<Motor>

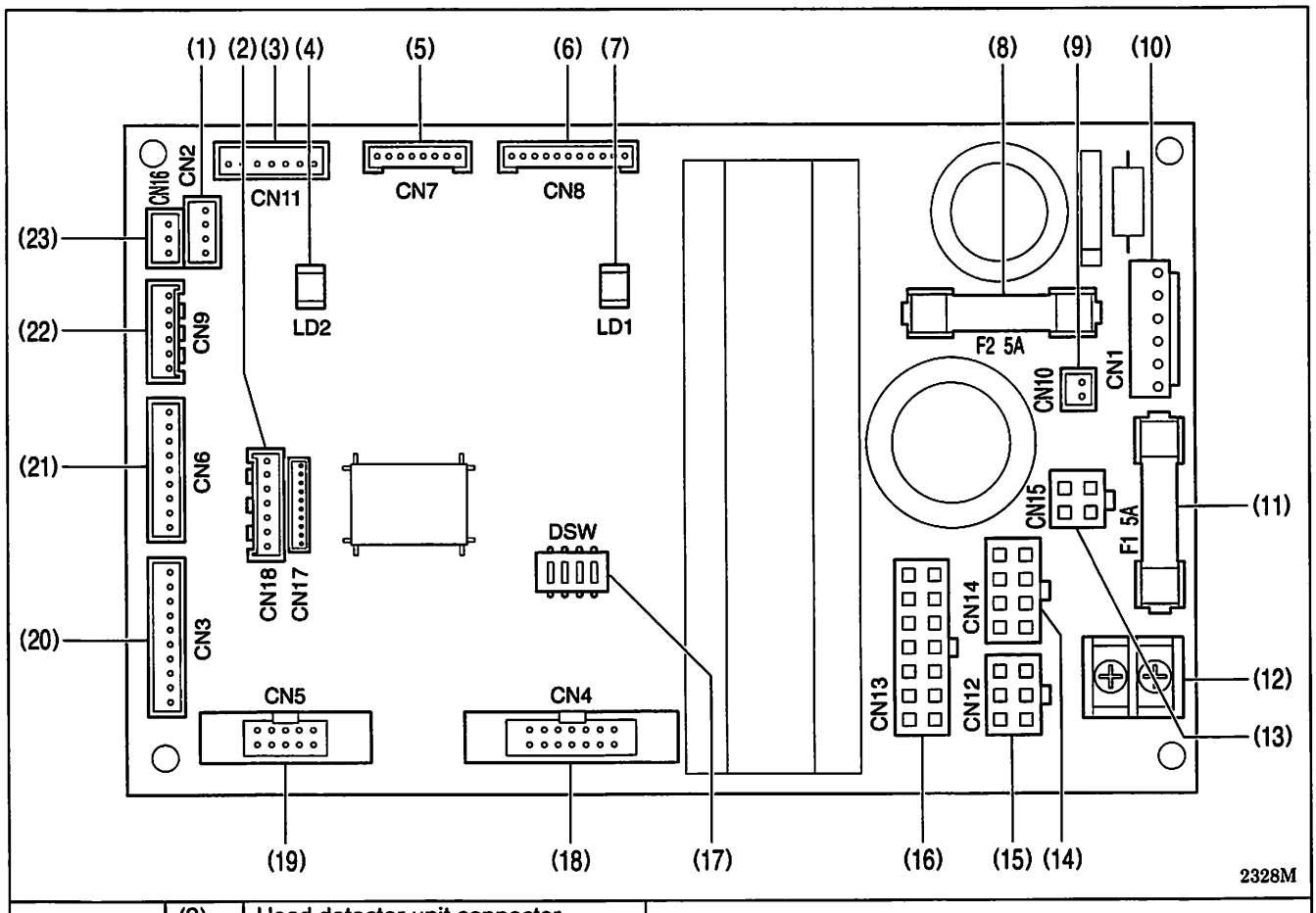


11-3. Control circuit board

⚠ 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.

<Name and function of each part>



Connectors	(2)	Head detector unit connector	Connect to sewing machine connectors.
	(14)	Option connector A	
	(15)	Solenoid-type presser lifter connector	
	(16)	Sewing machine connector	
	(18)	Synchronizer connector	
	(19)	Operation panel connector	
	(5)	Relay connector	Connect to power supply circuit board connectors.
	(6)	Coupler connector	
	(10)	Control power supply connector	Connect to transformer connectors.
	(1)	Treadle connector	Connect to treadle unit connector.
	(20)	Standing operation connector	Connect to plug (sold separately) for standing operation
	(13)	Puller connector	Connect to solenoid for puller or other device.
	(3)	Option connector 1	Connect to sewing speed actuator.
	(21)	Option connector 2	For input/output signals used by external devices
	(22)	Option connector 3	Connect to stitch counter actuator.
	(9)	Cooling fan power supply connector	Only used for three-phase high-voltage specifications.
	(23)	Thermistor connector	Connect to shorted connector when not using three-phase high-voltage specifications.

Fuses	(8)	Solenoid power supply fuse (5A)	For preventing overcurrent
	(11)	Illumination lamp power supply fuse (5A)	
Terminal board	(12)	Terminal board	For illumination lamp (6 V)
DIP switch	(17)	DSW	For function selection
LED indicators	(4)	Red LED	Indicates power supply circuit board problems.
	(7)	Green LED	Indicates that the power is on.

(21) Connector CN6

	Signal name		Remarks
1	+5V	DC +5V	
2	$\overline{\text{IN}}$	Variable signal input	For stitch counting
3	$\overline{\text{SPSP}}$	Speed command input	[Not used by the T-8421A, 8422A, 8722A]
4	$\overline{\text{STOP}}$	Operation prevention input	L level: Operation prevented
5	$\overline{\text{ND}}$	Needle down signal output (*)	L level: Needle down stop position
6	$\overline{\text{NU}}$	Needle up signal output (*)	L level: Needle up stop position
7	$\overline{\text{ENG}}$	Machine shaft sync signal (*)	45 pulses/stitch
8	$\overline{\text{STBY}}$	Operation signal output (*)	H level: Operation in progress
9	S0V	0V (GND)	
10	ENC-A	A phase signal output (*)	Encoder A phase (180 pulses/stitch)
11	ENC-B	B phase signal output (*)	Encoder B phase (180 pulses/stitch)

(*) Open collector output

(22) Connector CN9

	Signal name		Remarks
1	+5V	DC +5V	Stitch counter warning LED
2	UNTH_LED	Stitch counter LED signal output	
3	UNTH_SW	Stitch counter switch input signal	Stitch counter actuator
4	S0V	0V (GND)	
5	IN1	Variable input signal 1	
6	IN2	Variable input signal 2	

(3) Connector CN11

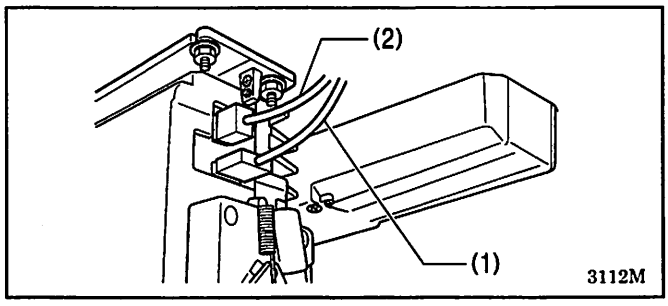
	Signal name		Remarks
1	+5V	DC +5V	
2	$\overline{\text{LED1}}$	Option signal output 1	
3	$\overline{\text{LED2}}$	Option signal output 2	
4	LEFT_UP_SW	Option signal input 1	Sewing speed actuator (high speed)
5	RIGHT_UP_SW	Option signal input 2	Sewing speed actuator (medium speed)
6	RESET_SW	Option signal input 3	Sewing speed actuator (low speed)
7	S0V	0V (GND)	

11-4. Checking the motor and power supply

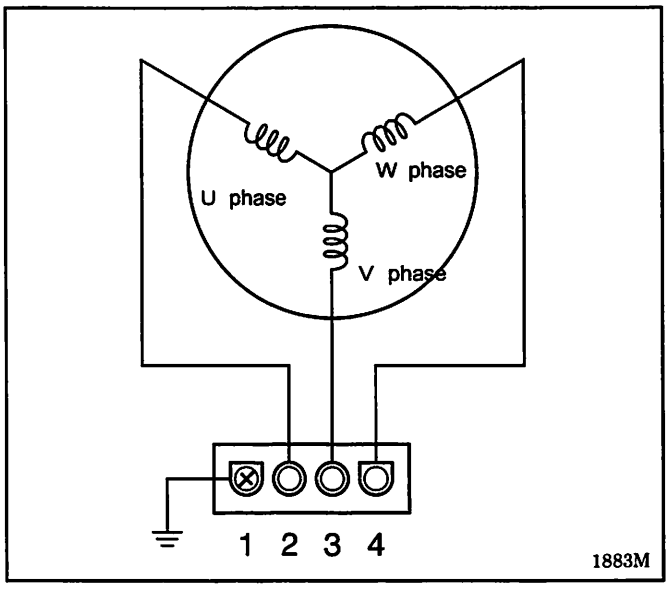
⚠ CAUTION

Turn off the power switch and disconnect the power cord from the wall outlet before carrying out these operations. The machine may operate if the treadle is depressed by mistake, which could result in injury.

If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



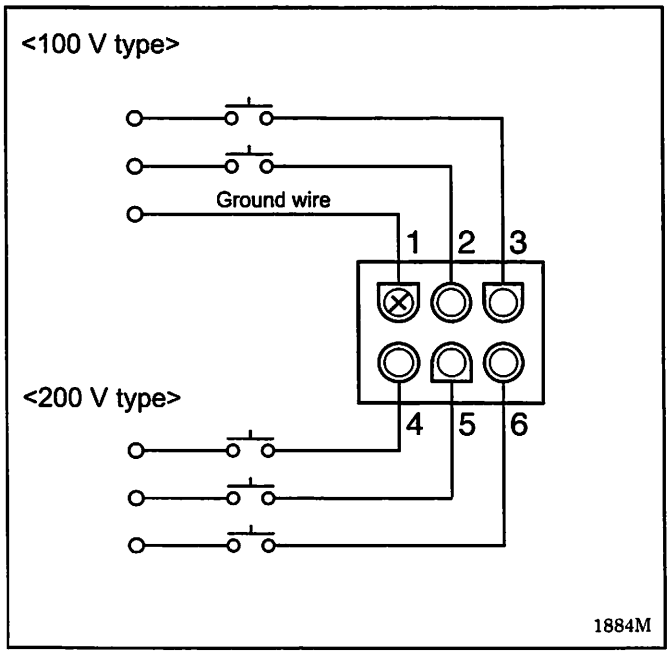
<Motor>



1. Disconnect the motor connector 4P (1) from the control box.
2. Measure the resistance of the motor connector (1) using an ohmmeter in the x 1 range.
   If the value is as shown in the table below, the connector is normal.

Between 2–3	Approx. 1.6Ω
Between 3–4	
Between 4–2	

<Power switch>



1. Disconnect the power supply connector 6P (2) from the control box.
2. Turn on the power switch.
3. Measure the voltage at the power supply connector (2) using the AC voltage range of a multimeter, and check that the voltage is within the allowable range for the specified voltage rating.

100 V type (100–120 V)

Measure the AC voltage between terminals 2–3.

200 V type (200–240 V)

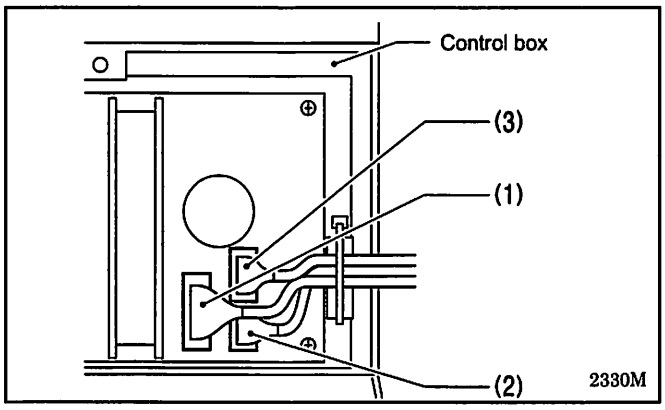
[A] For three-phase
Measure the AC voltage between terminals 4–5, 5–6 and 6–4.

[B] For single-phase
Measure the AC voltage between terminals 4–6.

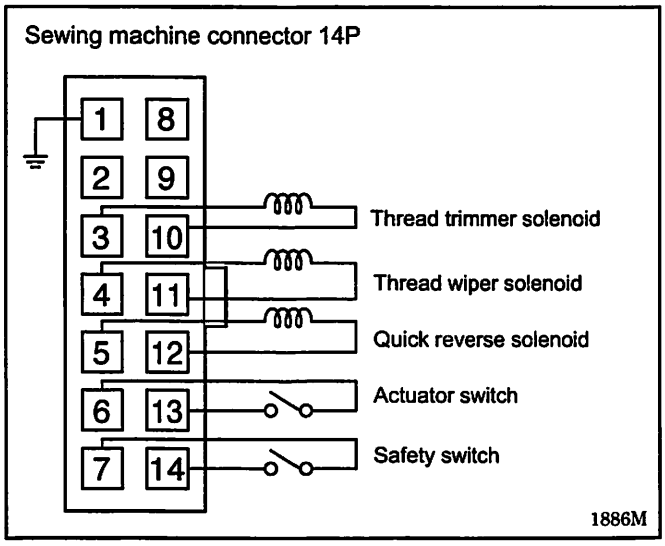
11-5. Checking the solenoids

⚠ 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.



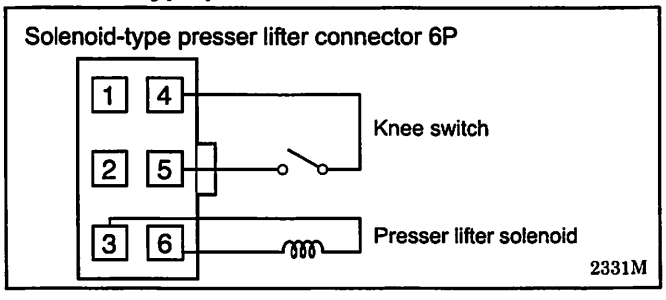
<Machine head>



1. Disconnect the sewing machine connector 14P (1) from the control circuit board.
2. Measure the resistance of the sewing machine connector (1) using an ohmmeter in the x 1 range.
   If the values are as shown in the table below, the connector is normal.

Between 3–10	Thread trimming solenoid: Approx. 7.6Ω
Between 4–11	Thread wiper solenoid: Approx. 5.7Ω
Between 5–12	Quick reverse solenoid: Approx. 4.8Ω
Between 6–13	When actuator is pressed: 0Ω
	When actuator is released: ∞Ω
Between 7–14	When machine head is upright (switch ON): 0Ω
	When machine head is tilted back (switch OFF): ∞Ω

<Solenoid-type presser lifter connector>



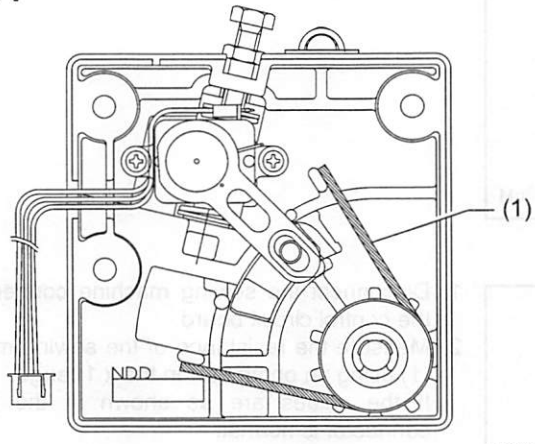
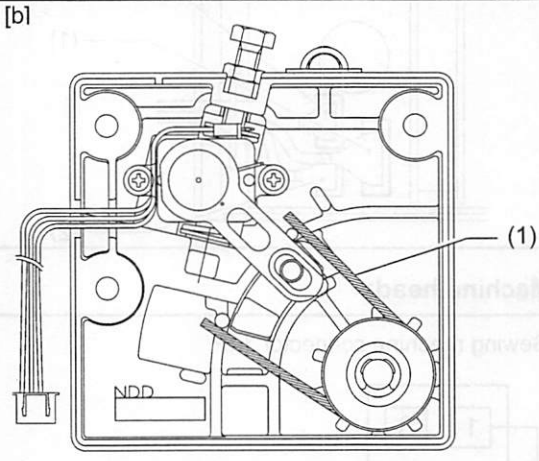
1. Disconnect the solenoid-type presser lifter connector 6P (2) from the control circuit board.
2. Measure the resistance of the solenoid-type presser lifter connector (2) using an ohmmeter in the x 1 range.
   If the values are as shown in the table below, the connector is normal.

Between 3–6	Presser lifter solenoid: Approx. 9.6Ω
Between 4–5	When knee switch is pressed: 0Ω
	When knee switch is released: ∞Ω

12. TREADLE UNIT ASSEMBLY (T-8421A, 8422A, 8722A)

12-1. Types

- The two types of treadle unit that are available are the type that controls the automatic presser foot lifter and the type that does not.
- You can switch between the two types by (A) changing the hooking position of the spring (1) inside the treadle unit; (B) setting DIP switch 2; and (C) setting the treadle stroke.

Types	Treadle unit G	Treadle unit H
Operation	Does not control automatic presser lifter	Controls automatic presser lifter
<A> Difference in spring position	[a]  1839M	[b]  1840M
<B> DIP switch setting	DIP switch 2: OFF <When depressing the treadle forward> The presser foot lifter control signal is not output when the treadle is being depressed.	DIP switch 2: ON <When depressing the treadle forward> The automatic presser foot lifter signal is output at the position before the treadle depression force suddenly changes.
<C> Signal setting	Carry out the setting in "Setting method for standard depression strokes" on page 85. Set the neutral position, maximum forward position and maximum backward position.	Carry out the setting in "Setting method for standard depression strokes" on page 85. Set the neutral position, maximum forward position and maximum backward position. The first modulation position for the treadle depression force is set automatically.
<D> Depression force	<When depressed forward and depressed backward> The depression force hardly changes at all from the start of depression until full depression.	<When depressed forward and depressed backward> The depression force suddenly changes at a point between the start of depression and full depression.
<E> Depression signal	< When depressed forward > The sewing machine starts. < When depressed backward > The sewing machine starts. (NOTE 1)	<When depressed forward and depressed backward> An automatic presser lifter signal is output at the point before the depression force suddenly changes, and the sewing machine starts at the point after the depression force suddenly changes.

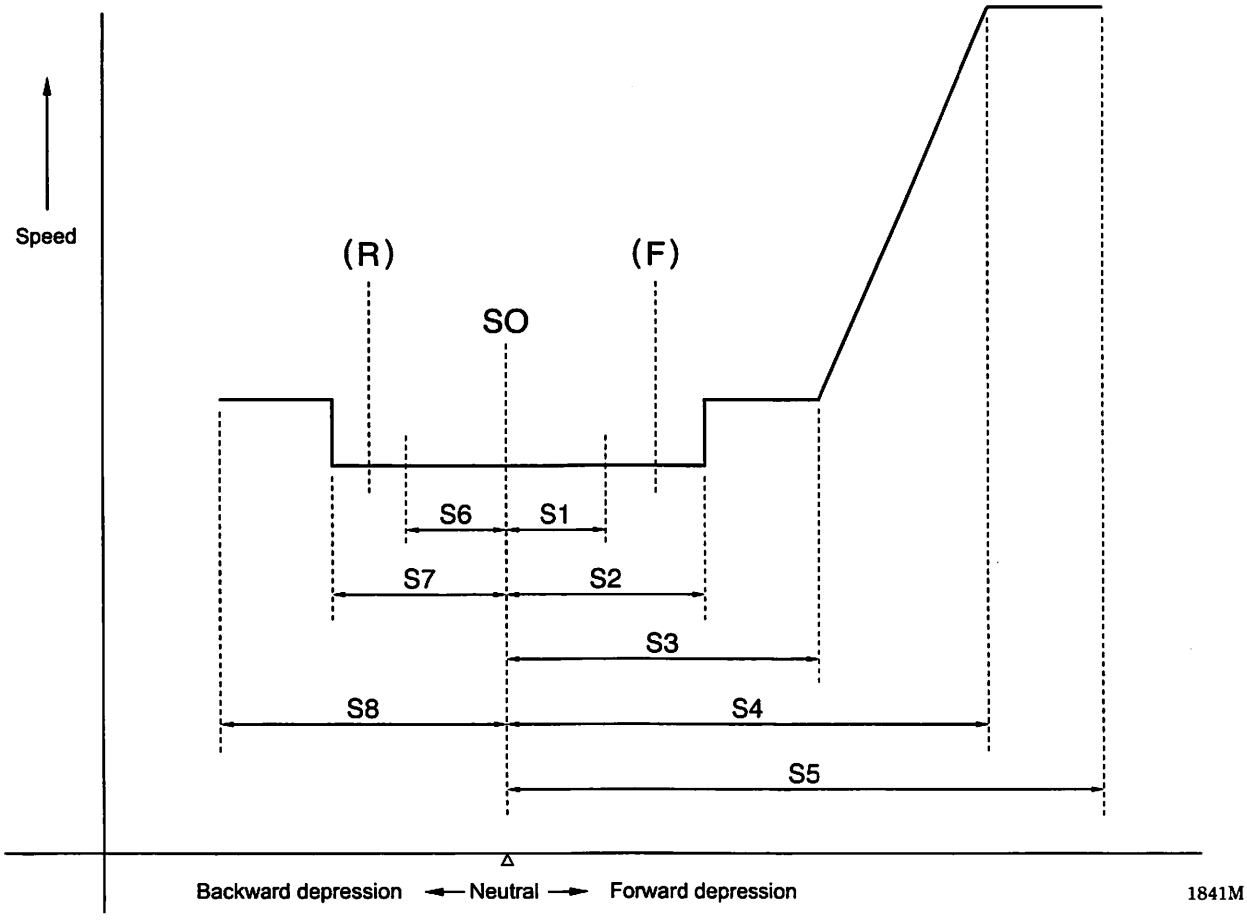
(NOTE 1) The presser foot lifter control signal is output while the treadle is depressed backward. However, if DIP switch 1 is set to OFF, the presser foot lifter control signal is not output when the treadle is depressed backward after the knee switch has been used to raise the presser foot.
Furthermore, if Function No. 41 is set to "1", the presser foot lifter control signal is not output when the treadle is depressed backward.

12-2. Standard setting values

Function No.	Symbol (diagram below)	Specification	Treadle unit G		Treadle unit H	
		Operation	Does not control automatic presser lifter		Controls automatic presser lifter	
		Spring position setting	No forward/back 1st step modulation (Figure [a] on previous page)		Forward/back 1st step modulation (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 lifter operating point	-	-	2 (NOTE 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 reaching point	S5-1	-	S5-1	-
-	S5	Maximum forward depression point	14.5	12	14.5	32
81	S6	Back automatic presser lifter operating point	-	-	2 (NOTE 2)	14
80	S7	Thread trimmer operating point	5	22	5	35
-	S8	Maximum back depression point	8	28	8	43

(NOTE 1) Setting is enabled when DIP switch 1 is set to ON and Function No. 13 is set to "1".
(NOTE 2) Setting is enabled when Function No. 12 is set to "0".

- When the connecting rod installation position is on the inside, the measurement value is the amount of movement of the treadle from the neutral position to the forward position and to the backward position.
- For treadle unit -H, the point of change (F) in the forward depression force is between S1 and S2, and the point of change (R) in the backward depression force is between S6 and S7.



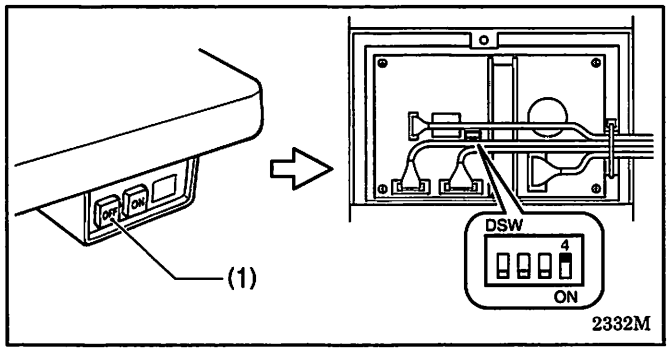
12-3. Setting method for standard depression strokes

⚠ CAUTION

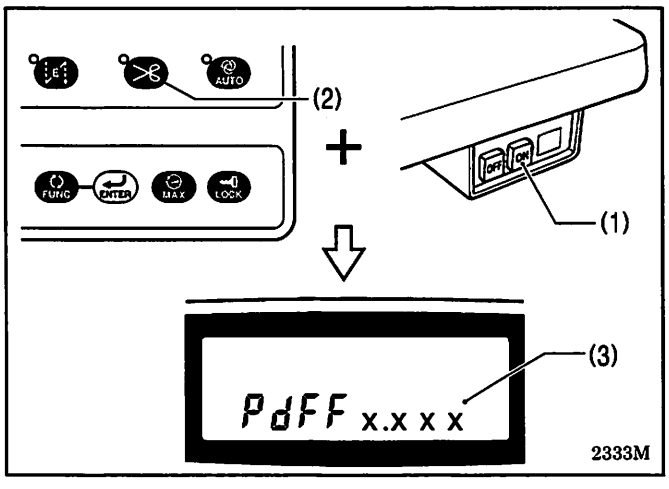
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

When the specifications of the treadle unit are changed or if the treadle unit or control circuit board are replaced, it will be necessary to make new settings according to the procedure described below.
Use the following procedure to set the operating positions for the depression stroke.

1) Signal setting entry

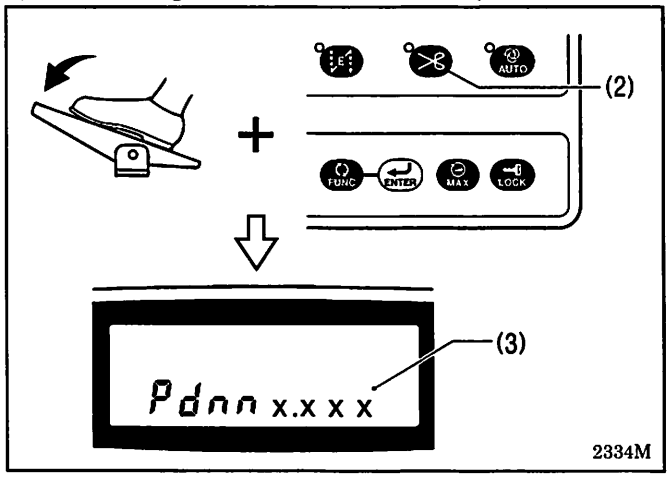


1. Turn off the power switch (1).
2. Set DIP switch No.4 to ON.



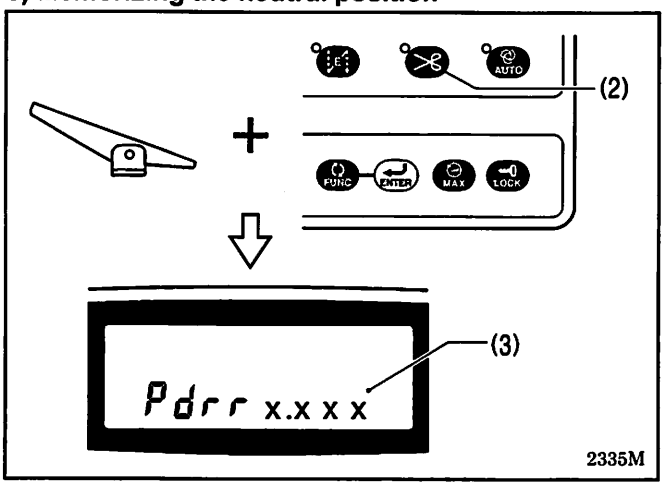
3. While pressing the thread trimming key (2), turn on the power switch (1).
"PdFF x.xxx" will appear in the main display (3).
(x.xxx indicates the depression voltage.)

2) Memorizing the maximum forward position



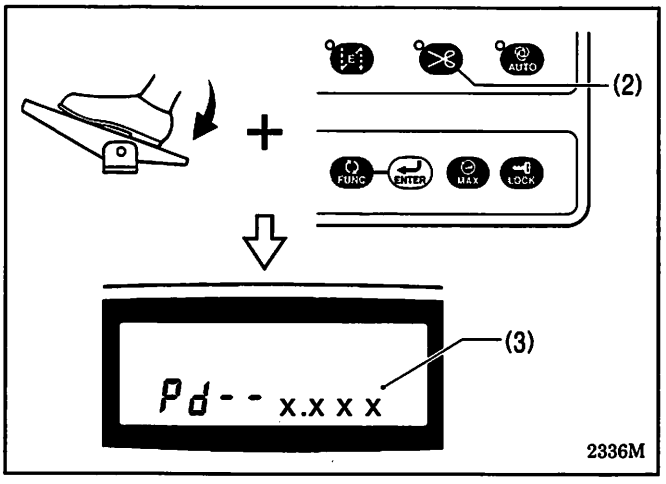
With the treadle depressed forward to the maximum forward position, press the thread trimming key (2).
"Pdnn x.xxx" will appear in the main display (3).

3) Memorizing the neutral position



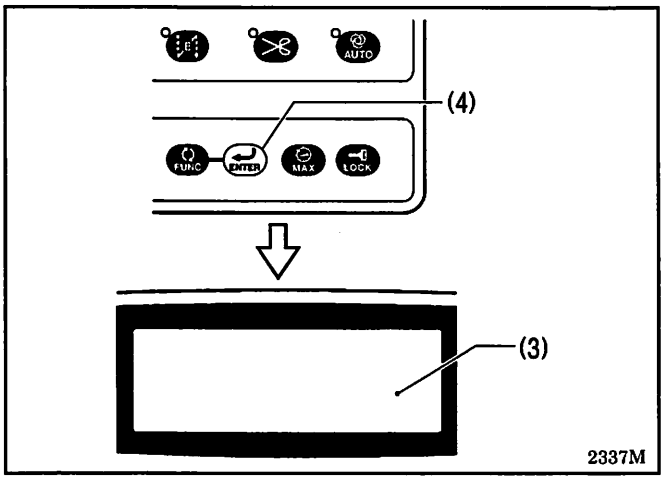
With your foot released from the treadle, press the thread trimming key (2).
"Pdrr x.xxx" will appear in the main display (3).

4) Memorizing the maximum backward position



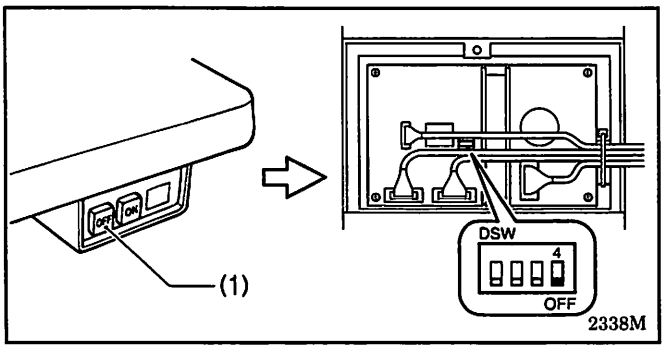
With the treadle depressed backward to the maximum backward position, press the thread trimming key (2).
"Pd-- x.xxx" will appear in the main display (3).

5) Completion of setting



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 memorized.



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

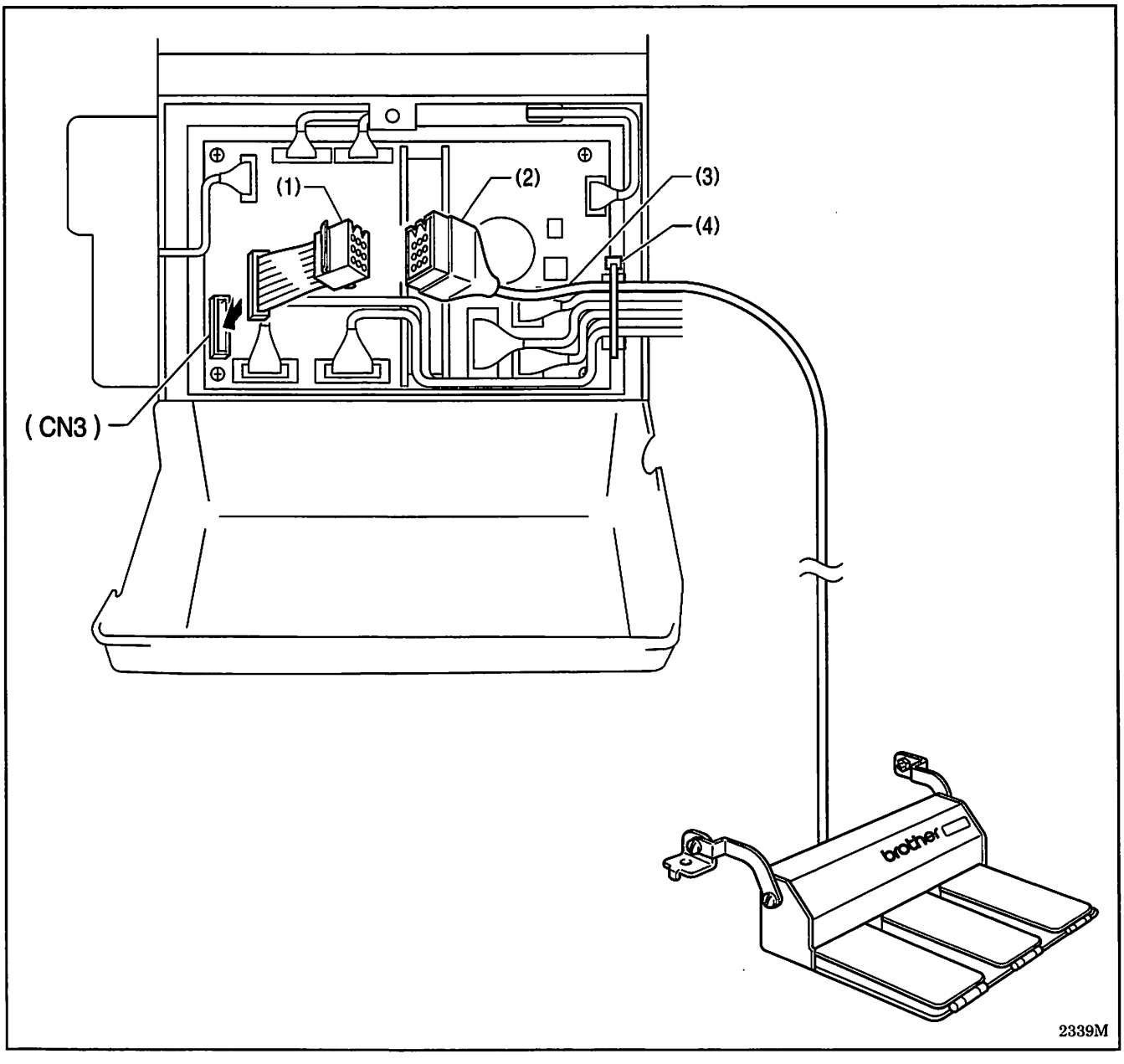
13. STANDING OPERATION PEDAL (T-8421A, 8422A, 8722A)

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

13-1. Installing the foot plug

⚠ DANGER

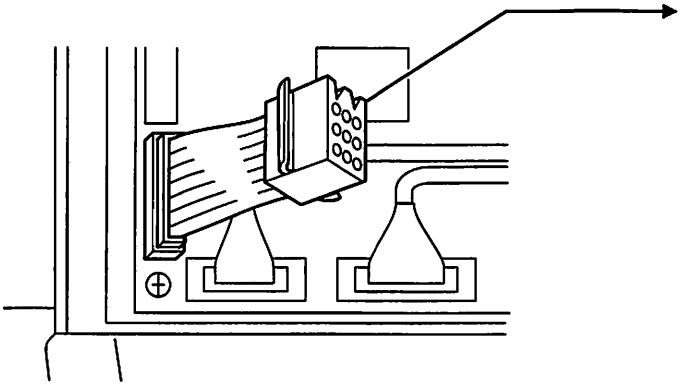
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.



1. Connect the foot plug (1) to connector CN3 on the control circuit board.
2. Connect the standing pedal connector (2) to the foot plug (1).
3. Secure the standing pedal cord (3) with a repeat cable tie (4).

13-2. Connectors

<At foot plug>



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

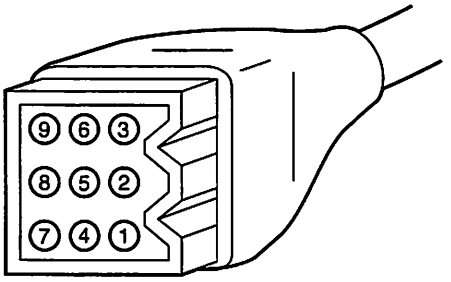
2340M

<At pedal>

NOTE:

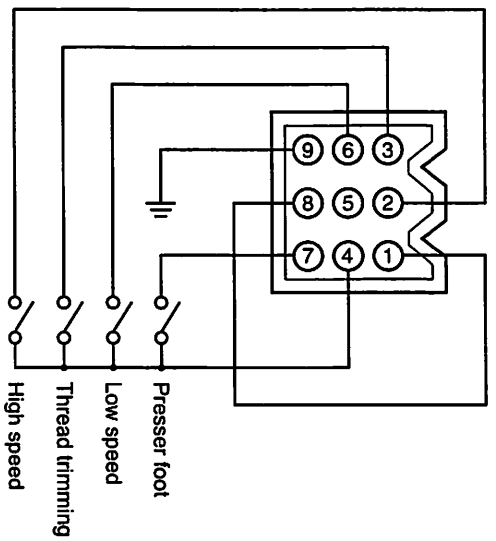
Connector types

Manufacturer	Connector No.	Connector terminal
MOLEX	1292 P	1380 TL

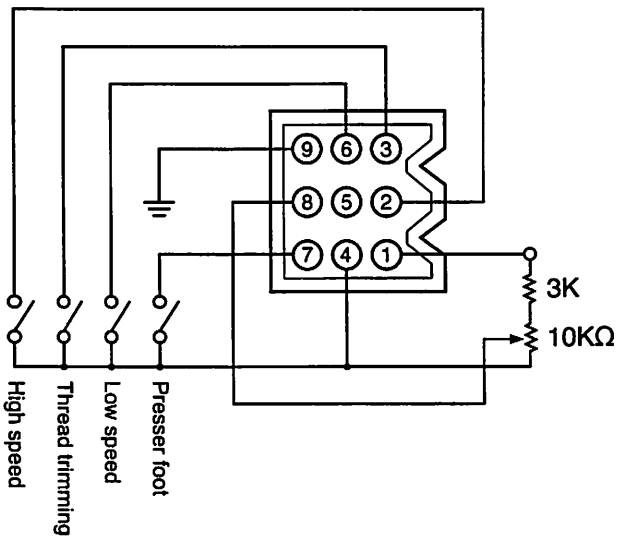


1867M

<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

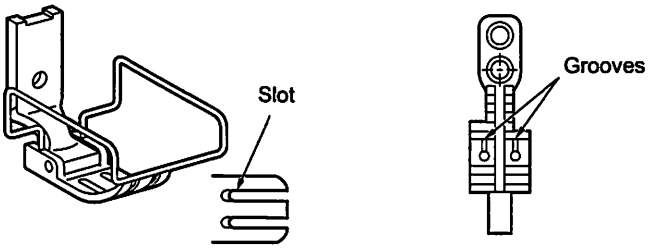
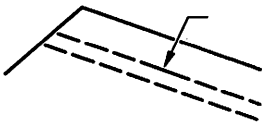
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

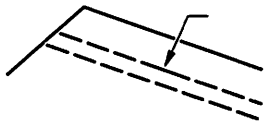
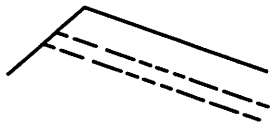
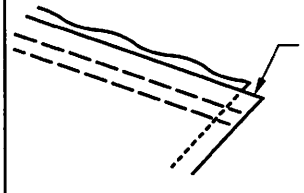
⚠ CAUTION

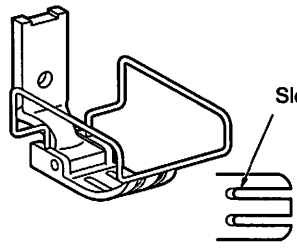
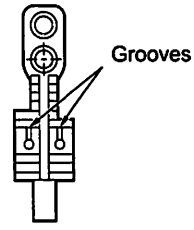
Turn off the power switch and disconnect the power cord before carrying out troubleshooting.
The machine may operate if the treadle is depressed by mistake, which could result in injury.
When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

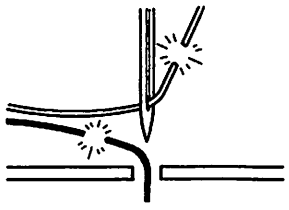
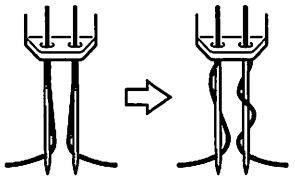
14-1. Sewing

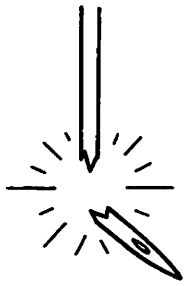
	Problem	Possible cause	Page
1	Poor thread tightening · Upper thread is not tight.  · Lower thread is not tight.  · Loops appear in seam.  0574M 0573M 0977M	• Has the thread been threaded incorrectly? If the thread is threaded incorrectly, thread it correctly. • Is the upper thread tension or lower thread tension too weak? Adjust the upper thread tension or lower thread tension. • Is the thread take-up spring operating range too small? Lower the position of the stopper. • Is the thread path not smooth enough? Use a file with a fine grain or sandpaper to polish smooth the thread path. • Is the bobbin not turning smoothly? Pull out the lower thread to check that there is no slackness in the thread tension, or replace the bobbin or bobbin case. • Is the thread take-up amount too large? Adjust the thread take-up amount. • Is the clearance between the rotary hook and the opener too large? Adjust the clearance between the rotary hook and the opener. • Is the feed dog too high? Adjust the feed dog height. • Is the clearance between the rotary hook and the needle plate too small? Adjust the clearance between the rotary hook and the needle plate.	Instruction manual Instruction manual 11 13 27 29 26

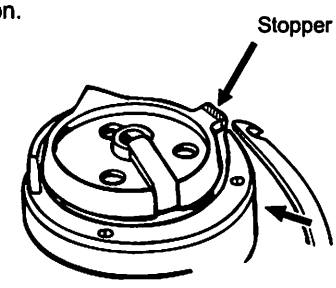
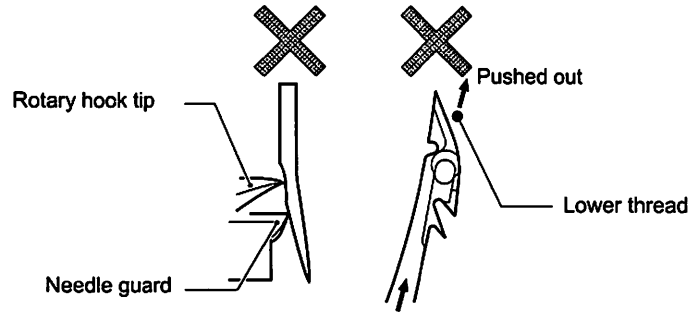
	Problem	Possible cause	Page
		<8422A, 8722A> • Is the thread being hooked onto the tip of the movable knife? Adjust the forward-back position of the movable knife.	36
		If using a sewing machine with medium-weight material specifications, poor thread tightening may occur depending on the type of material being sewn. In such cases, replace the presser foot with one that has slots on the underside, or replace the feed dog with a grooved feed dog. (Refer to the parts book for details such as part codes.)  2944M	
2	Skipped stitches occur while sewing  2945M	• Is the needle tip bent? Is the needle tip blunt? If the needle tip is bent or broken, replace the needle.	
		• Is the needle properly installed? If it is incorrect, install the needle correctly.	Instruction manual
		• Is the machine properly threaded? If it is incorrect, thread the thread correctly.	Instruction manual
		• Is the presser foot pressure too weak? Adjust the presser foot pressure.	Instruction manual
		• Is the needle too thin? Is this causing needle deflection? Replace the needle with a needle that is one rank thicker.	Instruction manual
		• Is the needle too thick for the thread? Try using a needle with a count that is one lower than the current needle.	Instruction manual
		• Is the presser foot too high? Adjust the height of the presser foot. If using the presser foot minute lifting function, stop using the function or reduce the floating height.	27 43
		• Is the thread take-up spring too weak? Adjust the tension of the thread take-up spring.	12
		• Is the thread take-up amount too large? Adjust the thread take-up amount.	13
		• Is the rotary hook tip out of shape? Correct the shape of the rotary hook tip, or replace the rotary hook.	26
		• Is the clearance between the needle and the rotary hook tip correct? Adjust the position of the rotary hook base.	24
		• Are the needle height and needle bar lift amount correct? Adjust the needle and rotary hook timing.	20
		• Is the clearance between the needle and the needle guard of the rotary hook correct? Adjust the position of the rotary hook base.	24

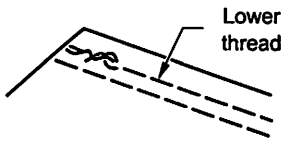
	Problem	Possible cause	Page
	Skipped stitches occur while sewing  2945M	• Is the sewing speed too fast? **<T-8420A, 8720A>** Check whether the correct motor pulley (with the correct outer diameter) that matches the maximum sewing speed and frequency of your particular model and sewing specifications is being used. If it is not correct, replace the motor pulley. * Depending on the type of material or thread, skipped stitches may still occur if the maximum sewing speed is within the standard speed range. In such cases, reduce the operating speed by selecting a motor pulley that is one size smaller. **<T-8421A, 8422A, 8722A>** Check whether the maximum sewing speed is correct for the swing machine model and specifications. If they are not correct, reduce the sewing speed while referring to "Maximum sewing speed setting method". * Depending on the type of material or thread, skipped stitches may still occur if the maximum sewing speed is within the standard speed range. In such cases, use the sewing speed control keys to reduce the sewing speed.	Instruction manual 57 Instruction manual
3	Uneven seam  2948M	• Is the presser foot pressure too weak? Adjust the presser foot pressure. • Is the presser foot too high? Adjust the height of the presser foot. If using the presser foot minute lifting function, stop using the function or reduce the floating height. • Is the feed dog too low? Adjust the feed dog height. • Is the bobbin scratched? If the bobbin is damaged, smooth it with an oiled grindstone or replace it. **<T-8420A, 8720A>** • Is the V-belt tension too low? Adjust so that there is 10-14 mm of deflection in the V-belt when it is pushed with a finger.	Instruction manual 27 43 29 Instruction manual
4	Material slippage (For lower feed)  2950M	• Is the presser foot pressure too strong? Adjust the presser foot pressure.	Instruction manual

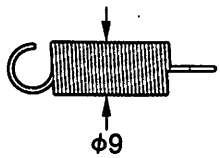
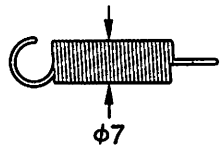
	Problem	Possible cause	Page
5	Large degree of puckering (excess tension)  2949M	• Is the needle too wide? Replace with a needle that is as narrow as possible.	Instruction manual
		• Is the upper thread tension too strong? Make the upper thread tension as weak as possible.	Instruction manual
		• Is the lower thread tension too strong? Make the lower thread tension as weak as possible.	Instruction manual
		• Are the thread take-up spring tensions too strong? Make the thread take-up spring tension as weak as possible.	12
		• Is the thread take-up spring operating range too large? Move the stopper to as high a position as possible.	11
		• Is the presser foot pressure too strong? Adjust the presser foot pressure.	Instruction manual
		• Is the thread take-up amount too small? Adjust the thread take-up amount.	13
		• Is the needle hole in the feed dog too large? Replace with a feed dog with a smaller hole. **NOTES:** The needle hole in the feed dog should be as small as possible without causing the needle to break. (Refer to the parts book for details such as part codes.)	
		• Is the sewing speed too fast? **<T-8420A, 8720A>** Check whether the correct motor pulley (with the correct outer diameter) that matches the maximum sewing speed and frequency of your particular model and sewing specifications is being used. If it is not correct, replace the motor pulley. * Depending on the type of material or thread, puckering may still occur if the maximum sewing speed is within the standard speed range. In such cases, reduce the operating speed by selecting a motor pulley that is one size smaller.	Instruction manual
		<T-8421A, 8422A, 8722A> Check whether the maximum sewing speed is correct for the swing machine model and specifications. If they are not correct, reduce the sewing speed while referring to "Maximum sewing speed setting method". * Depending on the type of material or thread, puckering may still occur if the maximum sewing speed is within the standard speed range. In such cases, use the sewing speed control keys to reduce the sewing speed.	57 Instruction manual
		<8422A, 8722A> • If using a sewing machine with heavy-weight material specifications, is a presser foot with slots on the underside or grooved feed dog being used? Use a presser foot without slots. Use a feed dog without grooves. (Refer to the parts book for details such as part codes.)   2944M	

	Problem	Possible cause	Page
6	Upper and lower threads are breaking.  0471M	• Is the needle bent or is the needle tip broken? Replace the needle if it is bent or broken.	
		• Is the needle properly installed? If it is incorrect, install the needle correctly.	Instruction manual
		• Is the machine properly threaded? If it is incorrect, thread the thread correctly.	Instruction manual
		• Is oil being supplied to the rotary hook? If the level of lubricating oil does not reach the bottom reference line in the oil gauge window, fill the oil tank with lubricating oil.	Instruction manual
		• Is the upper or lower thread tension too weak or too strong? Adjust the upper thread or lower thread tension.	Instruction manual
		• Is the rotary hook blocked with dust or thread scraps? Clean the rotary hook.	Instruction manual
		• Is the tension of the thread take-up spring correct? Adjust the tension of the thread take-up spring.	12
		• Is the upper thread may be loose because the thread take-up spring operating range is too small? Adjust the position of the stopper.	11
		• Is the rotary hook, feed dog or other part damaged? If they are damaged, smooth them with an oiled grindstone or replace the damaged parts.	
		• Is the thread path damaged? If the thread path is damaged, smooth it with sandpaper or replace the damaged part.	
		• Is the thread take-up amount correct? Adjust the thread take-up amount.	13
		• Is the presser foot installed correctly? Install the presser foot so that it faces the correct way.	
		• Is the needle hole of the feed dog damaged? Grind the needle hole of the feed dog.	
		• Is the rotary hook stopper groove in the needle plate damaged? Grind the rotary hook stopper groove or replace the needle plate.	
		• Is the clearance between the rotary hook and the opener correct? Adjust the clearance between the rotary hook and the opener.	27
		• Is the clearance between the needle and the rotary hook tip correct? Adjust the position of the rotary hook base.	24
		• Is the clearance between the rotary hook on the needle plate correct? Adjust the clearance between the rotary hook and the needle plate.	26
		• Are the needle height and needle bar lift amount correct? Adjust the needle and rotary hook timing.	20
		• Does the twist come back into the thread? Furthermore, are the stitches concealed? If using polyester thread, the following steps can reduce the problem. 1) Reduce the upper thread tension and reduce the thread take-up spring tension as much as possible. 2) Wind the thread around the needle.  3113M	12

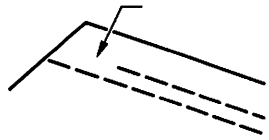
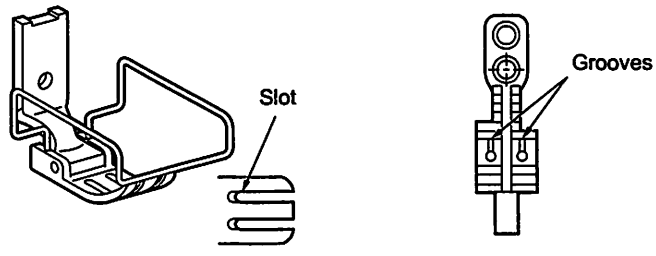
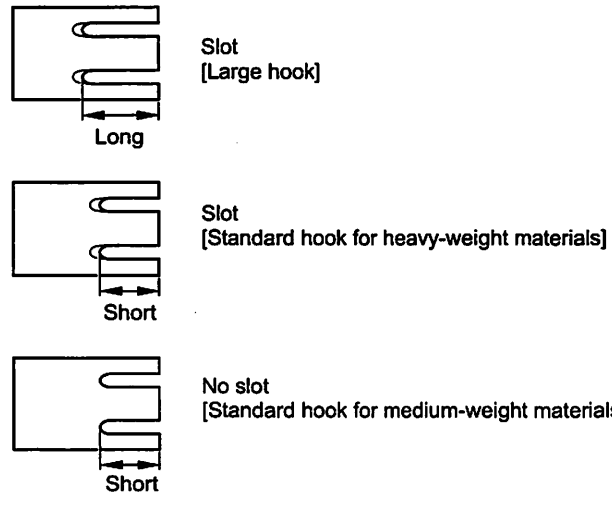
	Problem	Possible cause	Page
		• If sewing thick materials using synthetic threads, is the sewing speed too high and is the thread breaking from heat? **<T-8420A, 8720A>** Check whether the correct motor pulley (with the correct outer diameter) that matches the maximum sewing speed and frequency of your particular model and sewing specifications is being used. If it is not correct, replace the motor pulley. * Depending on the type of material or thread, thread breakages may still occur if the maximum sewing speed is within the standard speed range. In such cases, reduce the operating speed by selecting a motor pulley that is one size smaller. **<T-8421A, 8422A, 8722A>** Check whether the maximum sewing speed is correct for the swing machine model and specifications. If they are not correct, reduce the sewing speed while referring to "Maximum sewing speed setting method". * Depending on the type of material or thread, thread breakages may still occur if the maximum sewing speed is within the standard speed range. In such cases, use the sewing speed control keys to reduce the sewing speed.	Instruction manual 57 Instruction manual
7	Broken needles  0469M	• Is the material being pushed or pulled with excessive force during sewing? • Is the needle bent, is the needle tip broken, or is the needle hole blocked? Replace the needle. • Does the needle drop into the center of the needle hole in the feed dog? Check the needle drop position. If the needle does not drop into the center of the needle hole in the feed dog, reinstall the feed dog. If the needle bar has rotated, rotate the needle bar to the correct position. • Are joints being sewn using a fine needle? Replace with a needle that is one rank thicker. Caution • 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. • Furthermore, we recommend we recommend that through steps be taken to account for such needles to comply with product liability regulations.	Instruction manual 28
8	**<T-8422A, 8722A>** Upper thread trimming errors	• Is the movable knife damaged or bent? Replace the movable knife. • Is the thread trimming timing correct? Adjust the thread trimming timing. • Is the clearance between the movable knife and the stopper too large? Adjust the clearance between the movable knife and the stopper. • Is the clearance between the rotary hook and the opener correct? Adjust the clearance between the rotary hook and the opener. • Is the clearance between the needle and the rotary hook tip correct? Adjust the position of the rotary hook base. • Is the clearance between the rotary hook and the needle plate correct? Adjust the clearance between the rotary hook and the needle plate. • Are the needle height and needle bar lift amount correct? Adjust the needle and rotary hook timing. • Is the movable knife installed correctly? Adjust the forward-back position of the movable knife. • Is the thread take-up spring operating range too small? Lower the position of the stopper.	34 32 35 27 24 26 20 36 11

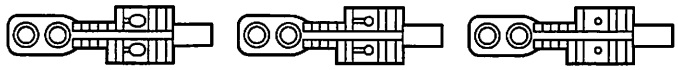
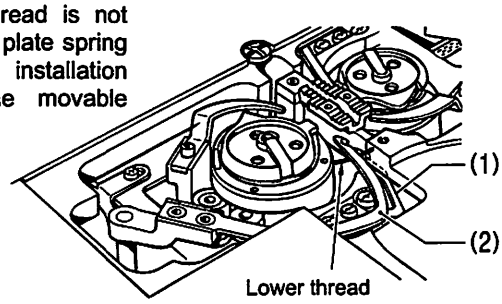
	Problem	Possible cause	Page
9	**<T-8422A, 8722A>** Lower thread trimming errors	• Is the movable knife damaged or bent? Replace the movable knife.	34
		• Is the tip of the movable knife too low? Replace the movable knife.	34
		• Is the rotary hook too high? Adjust the height of the rotary hook.	26
		• Is the clearance between the movable knife and the stopper correct? Adjust the clearance between the movable knife and the stopper.	35
		• Is the needle hole in the feed dog too large? Replace with a feed dog with a smaller hole.	
		• Is the feed dog too high? Adjust the feed dog height.	29
		• Has the rotary hook tip been ground too much? Replace the rotary hook.	26
		NOTE: If the rotary hook tip is repaired by grinding until the diameter of the rotary hook tip is smaller by 0.2 - 0.3 mm, the movable knife will move out of position and problems such as those described in the following item may occur. If this happens, adjust the stopper to move the movable knife back into position.	
		 3114M	
		• Is the clearance between the needle and the rotary hook tip correct? Adjust the position of the rotary hook base.	24
		NOTE: If the needle to rotary hook tip gap is adjusted while the needle guard is applied, the needle may bend and cannot be properly adjusted. Adjustment in this condition will result in an improper movable knife position, causing the lower thread to be pushed out, and trimming errors to occur.	
		 3115M	

	Problem	Possible cause	Page
10	**<T-8422A, 8722A>** Lower thread is tangled at the sewing start. Spinning of bobbin during thread trimming  2951M	• 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. • Is there too much thread wound onto the bobbin? The bobbin winding amount should not be more that 80%.  2124M • Is the bobbin turning smoothly? If the bobbin is not turning smoothly, replace the bobbin. • Is the rotary hook thread path damaged? Grind or replace the rotary hook. • Is a bobbin other that the light-alloy bobbins specified by Brother being used? Use only bobbins which are specified by Brother. • Is the anti-spin spring attached? Attach the anti-spin spring. • Is the pressure of the anti-spin spring too weak? Replace the anti-spin spring. • Are the following settings or parts incorrect? (In particular, if using threads such as polyester threads that can easily cause racing of the rotary hook) Use the following settings and parts that match the sewing machine model and specifications.	Instruction manual Instruction manual Instruction manual Instruction manual Instruction manual Instruction manual

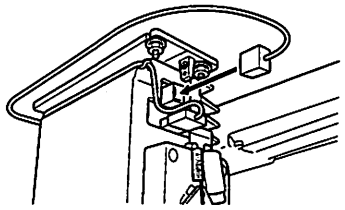
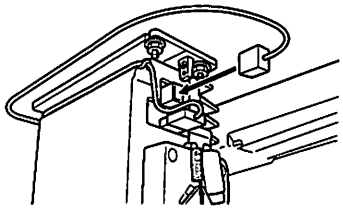
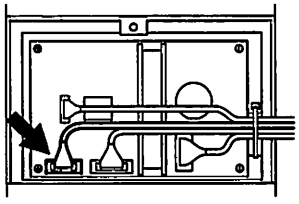
	T-8422-□□3 (For light-weight and medium-weight materials)	Other	
Thread trimming speed Function No. 90	200	220	70
Thread trimming gain adjustment Function No. 64	2	0	64
Extension spring	Weak spring  SA4458-001 Spring color (white)	Strong spring  SA2826-001 Spring color (black)	

3119M 3120M

	Problem	Possible cause	Page
11	**<T-8422A, 8722A>** Skipped stitches at sewing start Thread unravelling at sewing start  2946M	• Is the thread take-up spring tension too strong? Reduce the tension of the thread take-up spring. • Is the thread take-up spring operating range too large? Raise the position of the stopper. • Is the needle too wide? Try using a needle with a count that is one lower than the current needle. • Is the feed dog too low? Adjust the feed dog height. • Is the lower thread tension too strong? Reduce the lower thread tension. **NOTE:** Skipped stitches and thread pulling out at the sewing start can occur when the amount of thread wound on the bobbin is small and a fine thread is being used. For large-capacity rotary hooks in particular, the lower thread tension will be stronger so wind some other thread onto the bobbin first. • If sewing light or medium-weight materials, is a presser foot with slots on the underside or grooved feed dog being used? Use a presser foot without slots. Use a feed dog without grooves. (Refer to the parts book for details such as part codes.)  2944M **NOTE:** If the stitch is held early by the presser foot, skipped stitch and unravelling will occur less frequently.  If the stitch length is small under certain conditions when using a large-capacity rotary hook, use a standard rotary hook. 3121M	12 11 Instruction manual 29 Instruction manual

Problem	Possible cause	Page
	• Is the needle hole in the feed dog too large? Replace with a feed dog with a smaller hole. **NOTES:** The needle hole in the feed dog should be as small as possible without causing the needle to break. (Refer to the parts book for details such as part codes.)  [For extra heavy-weight materials] [For heavy-weight materials] [For medium-weight materials] 3122M	
	• Are the trailing lengths of the upper threads too short after thread trimming? Reduce the tension of the pretension.	Instruction manual
	• Are the threads not being trimmed cleanly? Sharpen the fixed knives, or replace the fixed and movable knives if necessary.	34
	• Is the sewing speed too fast at the sewing start? Or, is the presser foot floating at the sewing start? Use the slow start feature.	Instruction manual
	• Is the needle up stop position too high? Adjust the needle up stop position.	41
	• Is the lower thread pressed by the plate spring (1) after thread trimming? If the lower thread is not pressed by the plate spring (1), adjust the installation position of the movable knife (2).  2947M	35

	Problem	Possible cause	Page
12	**<T-8422A, 8722A>** After thread trimming, the upper thread trailing length from the needle is too short. The upper thread pulls out of the needle.	• Does the thread come out smoothly from the cotton stand? Check that the thread is not wound around anything and that it feeds out smoothly. • Is the tension of the pretension too strong? Reduce the tension of the pretension. • Is the thread take-up spring operating range too large? Raise the position of the stopper. • Is the hook of the movable knife badly worn? Replace the movable knife. • Do the tension discs operate during thread trimming? Tension Adjust the tension release wire. • Is the thread trimming timing correct? Adjust the thread trimming timing. • Is the movable knife installed correctly? Adjust the forward-back position of the movable knife. • Is the clearance between the rotary hook and the opener correct? Adjust the clearance between the rotary hook and the opener. • Is the clearance between the rotary hook and the needle plate correct? Adjust the clearance between the rotary hook and the needle plate. • Is the rotary hook stopper groove in the needle plate damaged? Grind the rotary hook stopper groove or replace the needle plate. • Are the threads not being trimmed cleanly? Sharpen the fixed knives, or replace the fixed and movable knives if necessary.	Instruction manual 11 34 38 32 36 27 26 34
13	**<T-8422A, 8722A>** Thread wiper does not hold the thread.	• Is the thread wiper installed in the correct position? Adjust the position of the thread wiper. • Are the trailing lengths of the upper threads too long after thread trimming? Adjust the pretension. Adjust the thread trimming timing. Adjust the forward-back position of the movable knife. • Is the plate spring tension too strong? Adjust the installation position of the plate spring. • Are the threads not being trimmed cleanly? Sharpen the fixed knives, or replace the fixed and movable knives if necessary.	39 Instruction manual 32 36 37 34
14	**<T-8422A, 8722A>** The thread wiper strikes the needle because of irregularity in the needle up stop position.	• Is the needle up stop position too low? Adjust the needle up stop position. • Is the thread wiper installed in the correct position? Adjust the position of the thread wiper.	41 39
15	Machine stops during sewing.	• 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.) **<T-8421A, 8422A, 8722A>** • Is the fixed stitch key turned on? Press the fixed stitch key so that the indicator turns off.	81 Instruction manual

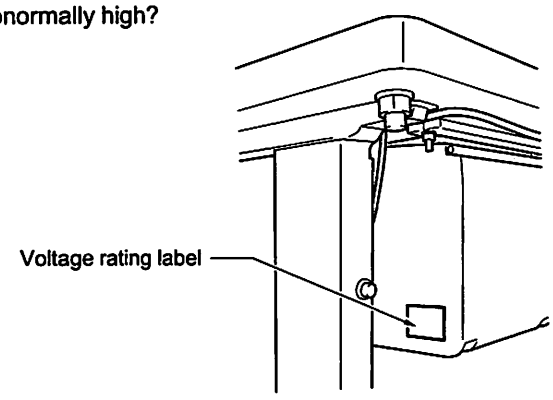
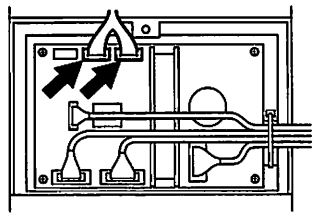
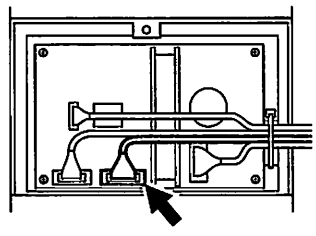
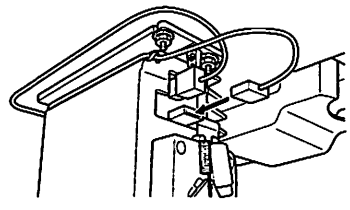
	Problem	Possible cause	Page
16	**<T-8420A, 8720A>** The GREASE indicator on the alarm display illuminates and the buzzer sounds when the treadle is depressed.	• This is a notification that it is time to apply grease. Apply grease to the sewing machine.	44
17	**<T-8421A, 8422A, 8722A>** "GREASEUP" flashes on the operation panel when the power is turned on.	• This display is to notify you that it is time to apply grease. Apply grease.	47
18	**<T-8421A, 8422A, 8722A>** Machine does not operate when power is turned on and treadle is pressed.	• Is the power supply connector disconnected from the control box? Insert the connector securely.  2952M	81
19	**<T-8421A, 8422A, 8722A>** Machine stops during sewing.	• Is the fixed stitch key turned on? Press the fixed stitch key so that the indicator turns off. • 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.)	Instruction manual 81
20	**<T-8421A, 8422A, 8722A>** Nothing appears on the operation panel display.	• Is the power supply connector disconnected from the control box? Insert the connector securely. 2952M  • Is the operation panel connector inside the control box disconnected? Insert the connector securely.  2197M	81 79

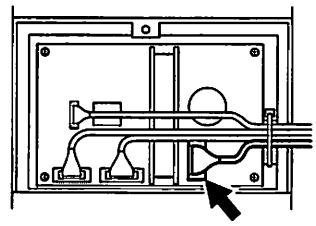
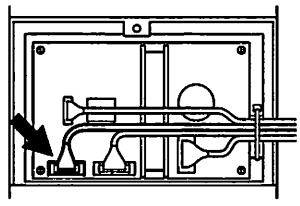
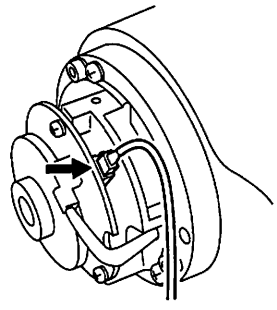
14-2. Error code displays (T-8421A, 8422A, 8722A)

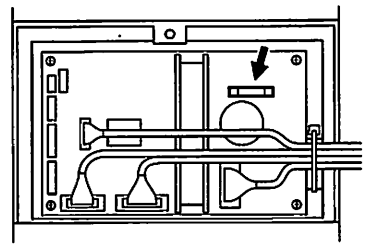
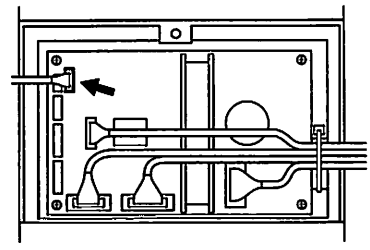
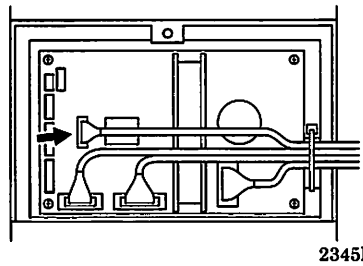
If an error code appears on the operation panel display

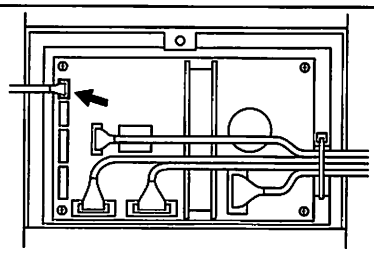
1. Make a note of the error code and then turn off the power.
2. After the operation panel display has turned off, eliminate the cause of the error and then turn the power back on.

2198M

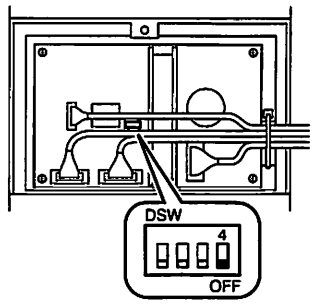
Error code	Possible cause	Page
Err 1 (Overvoltage)	• Is the power supply voltage abnormally high? Check the voltage.  2199M • Problem with control box. Replace the control box.	77
Err 2 (Overcurrent)	• Is connector CN7 or CN8 inside the control box disconnected? Insert the connector securely.  2200M	79
Err 3 (Encoder error)	• Is connector CN4 inside the control box disconnected? Insert the connector securely.  2201M	79
Err 4 (Motor lock)	• Is the motor connector disconnected from the control box? Insert the connector securely.  2202M • Has the machine locked up? Turn off the power and then turn the machine pulley by hand and check that it turns easily.	76

Error code	Possible cause	Page
Err 5 (Safety switch operated)	• Is connector CN13 inside the control box disconnected? Insert the connector securely.  2203M • Is the machine head tilted back? Return the machine head to its normal position. Check the operation of the safety switch.	79 10
Err 6 (Voltage drop)	• Is the power supply voltage too low? Check the power supply voltage. • Was the power turned on while the treadle was still depressed? Return the treadle to the neutral position, and then turn on the power switch.	81
Err 7 (Panel communicaiton error)	This is displayed when there is a problem in communication with the operation panel CPU. • Is connector CN5 inside the control box disconnected? Insert the connector securely.  2197M • Problem with operation panel or control box. Replace the operation panel or control box.	79 76
Err 8 (Over time)	• This appears on the display when the sewing machine has been operating continuously for 3 minutes or more. Turn the power switch off and then back on again, and then operate the sewing machine normally.	
Err 9 (Motor overheating)	• This is displayed when the motor is abnormally overheated and temperature protection has been activated. After the temperature cools down, turn the power switch back on and continue normal operation. • Problem with motor. Replace the motor.	
Err 10 (Solenoid overcurrent)	• This is displayed when abnormal current is flowing in a solenoid (thread trimming, thread wiping, quick reverse or presser foot lifter). Check the resistances of each solenoid. • Problem with control circuit board. Replace the control box.	82 76
Err 11 (Motor overheating sensor problem)	• Is connector CN5 inside the motor disconnected? Securely insert the connector.  3116M	

Error code	Possible cause	Page
Err 12 (Solenoid power supply problem)	• Is the solenoid fuse F2 (5 A) blown? Replace the fuse.  2343M • Problem with control circuit board. Replace the control box.	80 76
Err 13 (Treadle unit error)	• Is connector CN2 inside the control box disconnected? Insert the connector securely.  • Is there a broken wire in the treadle connector cord? Replace the treadle unit. 2344M	79
Err 14 (Head detector unit data error)	• Problem with head detector unit Check that connector CN18 inside the control box is securely connected. Replace the head detector unit.  2345M	79
Err 15 (Abnormal motor operation error)	• Problem with motor. Replace the motor. • Problem with motor driver. Replace the control box.	76
Err 16 (Thread trimming overtime error)	• This is displayed when the sewing machine motor locks during thread trimming. Remove any thread that is tangled. Check that there are no problems with the thread trimming mechanism.	
Err 18 (EEPROM access error)	• This is displayed when data could not be written correctly into the memory element of the control circuit board. Replace the control box.	76
Err 19 (Control box overheating)	• This is displayed when the control box is abnormally warm. (3-phase specifications only) Check that there is no problem with the cooling fan. If there is a problem, replace the cooling fan.	

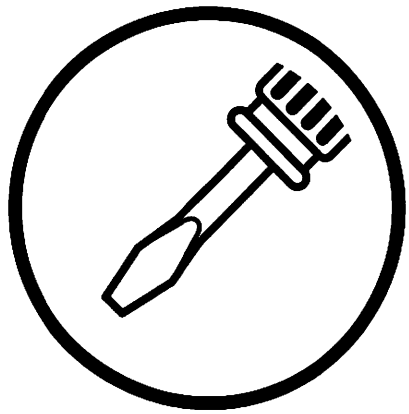
Error code	Possible cause	Page
Err 20 (Treadle setting error)	• Has the setting for standard depression strokes been set correctly? Repeat the setting for standard depression strokes. • Treadle unit malfunction. Replace the treadle unit.	85
Err 21 (Thermistor error)	• Is connector CN16 inside the control box disconnected? Insert the connector securely.  2347M	79

The error codes (orange) and error details (green) are displayed alternately.

Error code	Possible cause	Page
Err 100 (GrEASEUP)	• This appears on the display when the sewing machine has continued to be used for a certain period after the "GREASEUP" notification appears without the grease being applied (without the reset procedure being carried out). Apply grease and then carry out the reset procedure.	47
Err 101 (diP SW 4)	• Is DIP switch No.4 inside the control box set to ON? Set DIP switch No.4 to OFF.  2205M	80

If an error code that is not listed above appears, contact the place of purchase.

brother



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