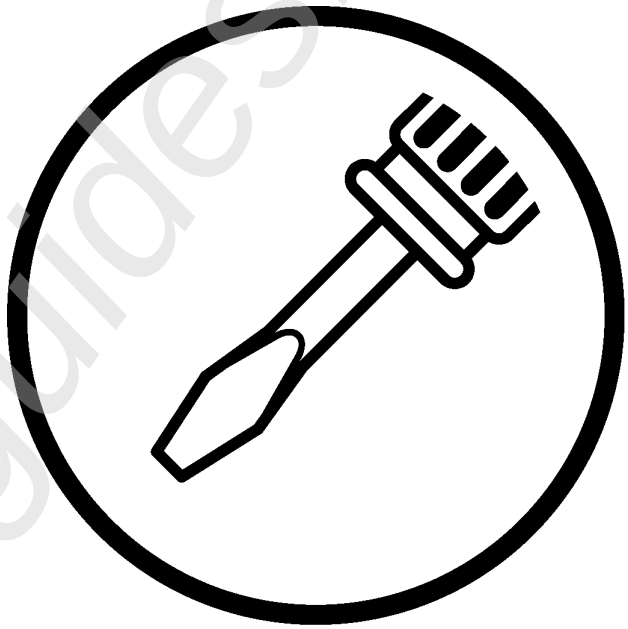
SERVICE MANUAL

SL-710A
DB2-DD7100A
DB2-DD7100

Please read this manual before making any adjustments.

SINGLE NEEDLE DIRECT DRIVE STRAIGHT LOCK STITCHER
WITH THREAD TRIMMER



brother®

This service manual is intended for SL-710A, DB2-DD7100A, DB2-DD7100 ; be sure to read the SL-710A, DB2-DD7100A, DB2-DD7100 instruction manual before this manual.
Carefully read the “SAFETY INSTRUCTIONS” below and the whole of this manual to understand this product before you start maintenance.
As a result of research and improvements regarding this product, some details of this manual may not be the same as those for the product you purchased.
If you have any questions regarding this product, please contact a Brother dealer.

SAFETY INSTRUCTIONS

1. Safety indications and their meanings

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

Indications

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 10 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 more than 36 kg. The installation should be carried out by two or more people.

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

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

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

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

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

Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.
Furthermore, do not drink the oil under any circumstances, as they can cause vomiting and diarrhea.
Keep the oil out of the reach of children.

Use a lamp which is rated at 6 V AC and 20 W or less. If a lamp with a higher rating than this is used, it could cause the lamp wires and the transformer to overheat and burn out, which could result in fire.

⚠ CAUTION

Sewing

This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.

The sewing machine should not be used for any applications other than sewing.

Be sure to wear protective goggles when using the machine.
If goggles are not worn, there is the danger that if a needle breaks, parts of the broken needle may enter your eyes and injury may result.

Turn off the power switch at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
- When threading the needle
- When replacing the bobbin and needle
- When not using the machine and when leaving the machine unattended

If 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 operation, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest Brother dealer or a qualified technician.

If the machine develops a problem, contact your nearest Brother dealer or a qualified technician.

Cleaning

Turn off the power switch before carrying out cleaning, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.

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, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.
Furthermore, do not drink the oil 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 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.

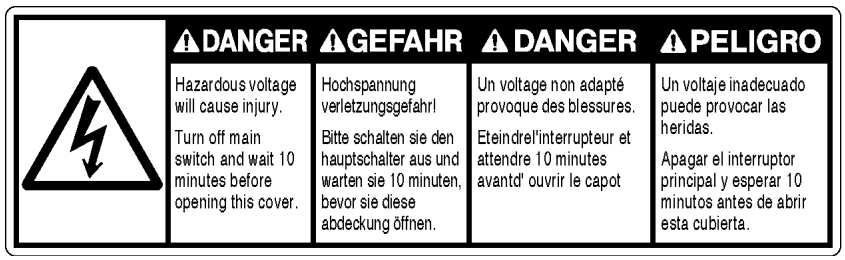
If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

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.

1



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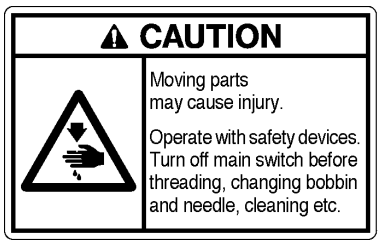
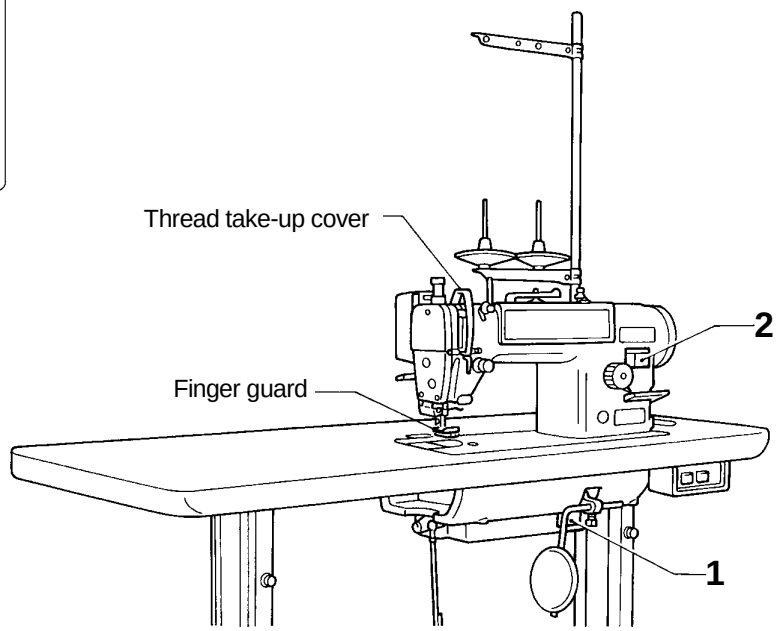


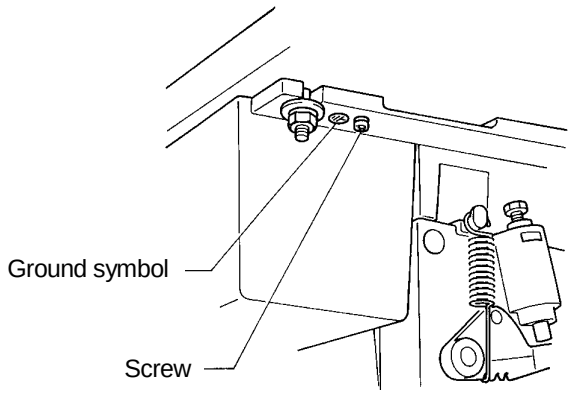
Safety devices
- Finger guard
- Thread take-up cover, etc.



0766M

4. About the ground symbol

There is a ground symbol which is shown on the control box in the position shown in the illustration.
If other equipment needs to be grounded, connect the ground wire to the screw which is next to this ground symbol.
If the ground connection is not secure, you run a high risk of receiving a serious shock, and problems with correct operation may also occur.



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INDEX

1. SPECIFICATIONS

■ **Machine head**

Models

DD7100- □□■ A
DD7100- □□■
SL-710A- □□■

	30	31	40	41	90	91
Thread trimmer	Solenoid					
Thread wiper			Solenoid			
Quick reverse	Solenoid					
Automatic presser lifter					Solenoid	
Bobbin thread detector		○		○		○

		1	3	5
Use		For light-weight and difficult-to-sew	For medium-weight materials	For heavy-weight materials
Sewing speed		220 - 4,000 rpm	220 - 5,000 rpm *	220 - 3,500 rpm
Start backtacking and continuous backtacking speed		220 - 1,800 rpm		
End backtacking speed		1,800 rpm		
Maximum stitch length		4.2 mm		5 mm
Needle bar stroke		29 mm	31 mm	35 mm
Thread take-up stroke		57.4 mm		61 mm
Feed dog		4 row	3 row	3 row (Long stitch)
Feed dog height		0.8 mm		1.2 mm
Presser foot height	Presser bar lifter	6 mm		
	Knee lifter	13 mm		
	Automatic presser lifter	10 mm		
Presser foot pressure		10 - 40N	40 - 79 N	57 - 98 N
Bed size		476 X 178 mm		
Arm pocket size		266.5 X 134.5 mm		
Needle (DB X 1)		NS # 9	# 11	# 22
Rotary hook		For light-weight materials	For medium-weight materials	For heavy-weight materials
Motor		AC servo motor (three-phase/single-phase, 4-pole, 400 W)		
Control circuit		Microprocessor		
Weight		36 kg (41 kg for sub-class-900)		

*… When using the rotary hook RP(Lubrication-free rotary hook),set the sewing speed to 4,000 rpm or less.

■ **Operation panel**

Operation panel	Part code
B-40	J80627-001
B-100	J80629-001

2. OPTIONAL PARTS

Part name			Part code
Presser foot lifting solenoid set A	With knee switch	DD7100A, 710A	S80008-001
		DD7100	183959-001
Presser foot lifting solenoid set B	Without knee switch	DD7100A, 710A	S80009-001
		DD7100	183960-001
Lower thread detector set		DD7100A, 710A	S80007-001
		DD7100	183955-001
Thread wiper set			183956-001
Tension gauge set			183922-101
Sensor II			J80755-001

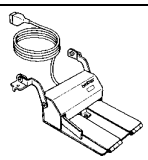
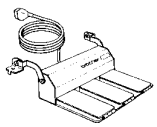
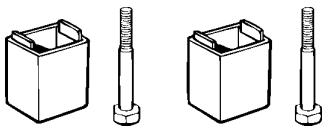
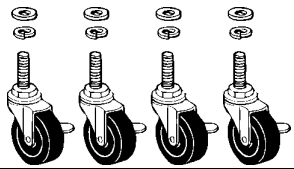
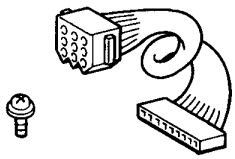
Part name		Part code
Set for new synthetic fabric *	For -□□3 models	183910-101

If changing -□□1 models to new synthetic fabric specifications, or if using the machine with standard specifications but with the rotary hook replaced by the rotary hook RP (lubrication-free rotary hook), please use the following parts.

S44338-901 (Rotary hook box assembly)*
S35786-001 (Cap screw)

* …When using the rotary hook RP (lubrication-free rotary hook), set the sewing speed to 4,000 rpm or less.

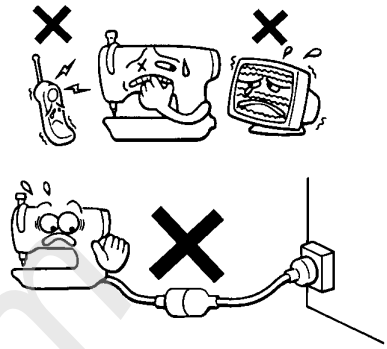
■ Table parts

Part name		Part code
 0772M	Standing operation 2 pedal #6 (Two pedals +kick pedal)	J80081-040
 0773M	Standing operation 3 pedal #40 (Three pedals)	J80380-040
	Standing operation 3 pedal two-speed (Three pedals)	J80630-001
 0527M	Spacer set	183504-009
 0528M	Caster set	183501-001
 1144M	Foot plug set, NDD (for control box)	J02953-001

3. NOTES ON HANDLING

About the machine set-up location

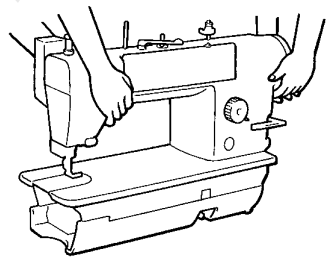
- Do not set up this sewing machine near other equipment such as televisions, radios or cordless telephones, otherwise such equipment may be affected by electronic interference from the sewing machine.
- The sewing machine should be plugged directly into an AC wall outlet. Operation problems may result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



0774M

Carrying the machine

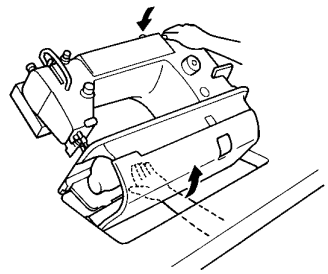
- The machine should be carried by the arm by two people as shown in the illustration.
  * Do not hold the machine by the machine pulley.



0775M

Tilting back the machine head

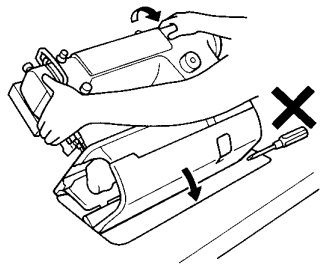
- While pulling the bottom rear of the bed toward you with your left hand, push the top right of the arm body with your rigth hand to tilt back the machine head.
  * Be careful not to get your left hand caught between the bottom of the bed and the table.



0776M

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.

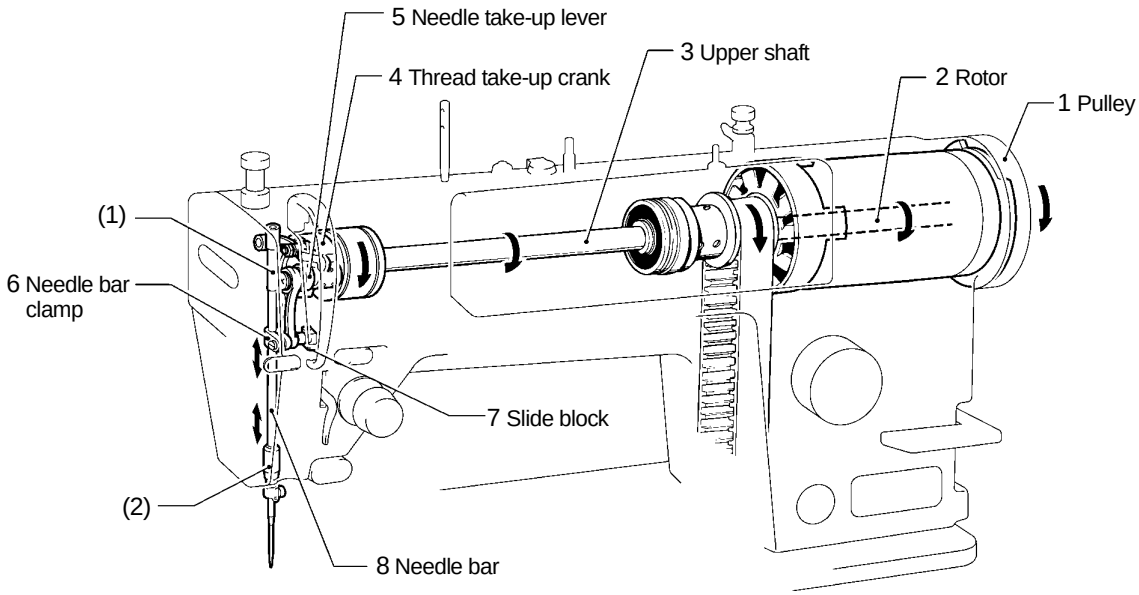


0777M

4. MECHANICAL DESCRIPTIONS

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

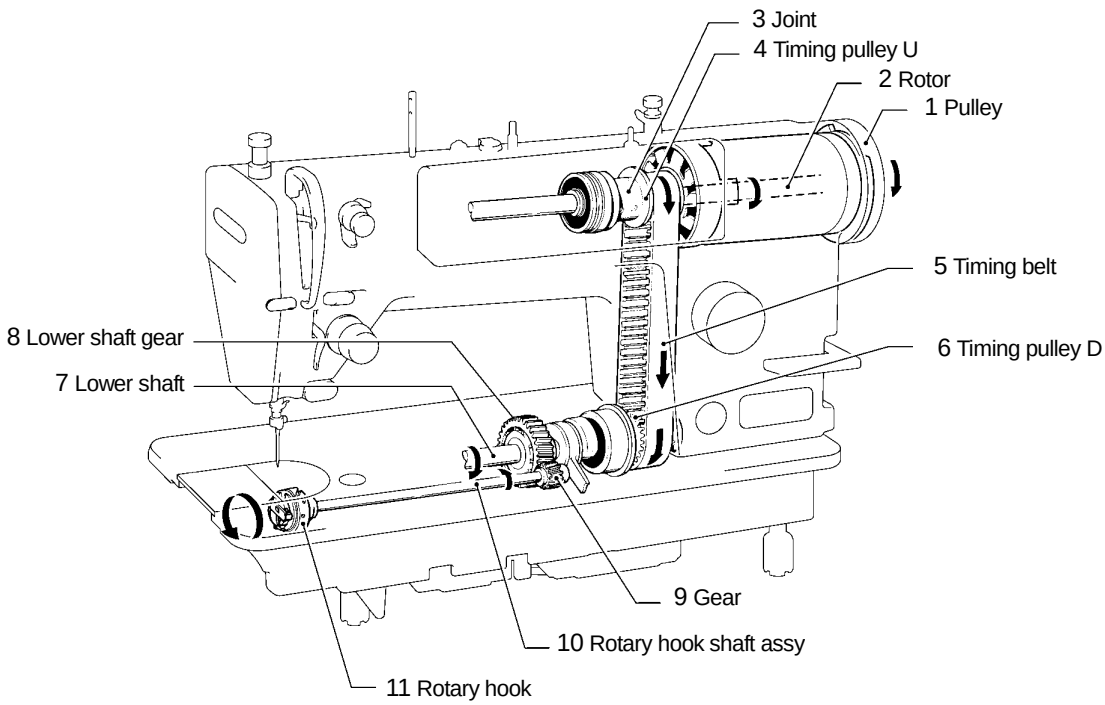
4-1. Upper shaft and needle bar mechanism



The needle bar is guided by the needle bar bush U (1) and needle bar bush D (2).

1626M

4-2. Lower shaft and rotary hook mechanism

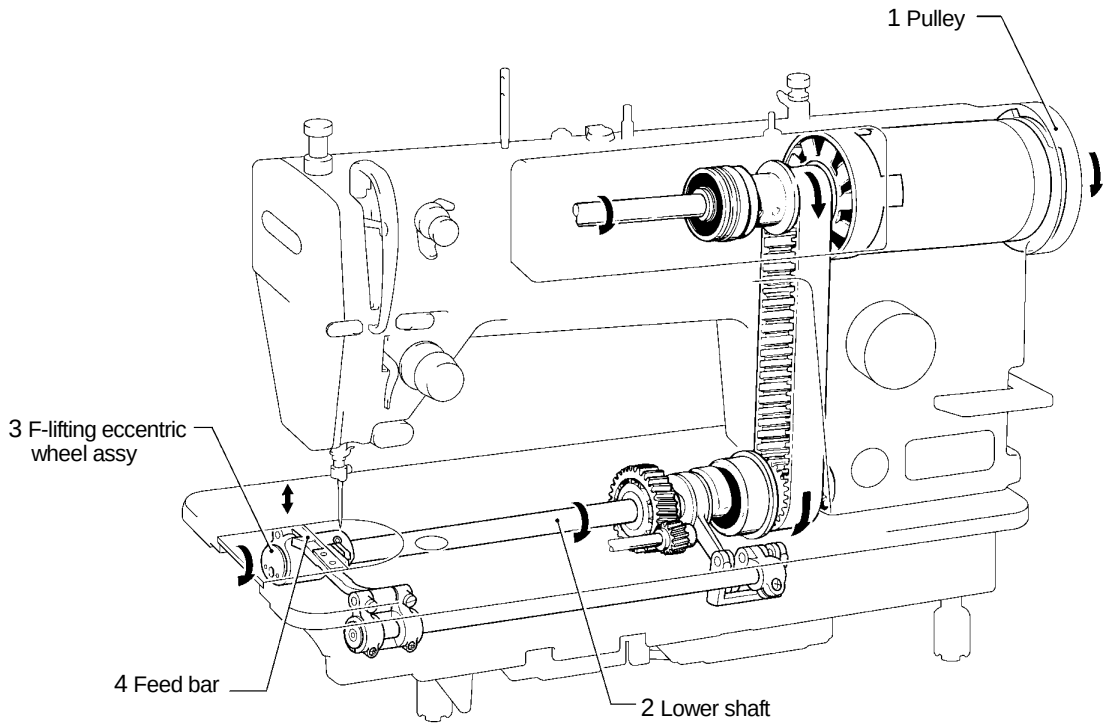


1627M

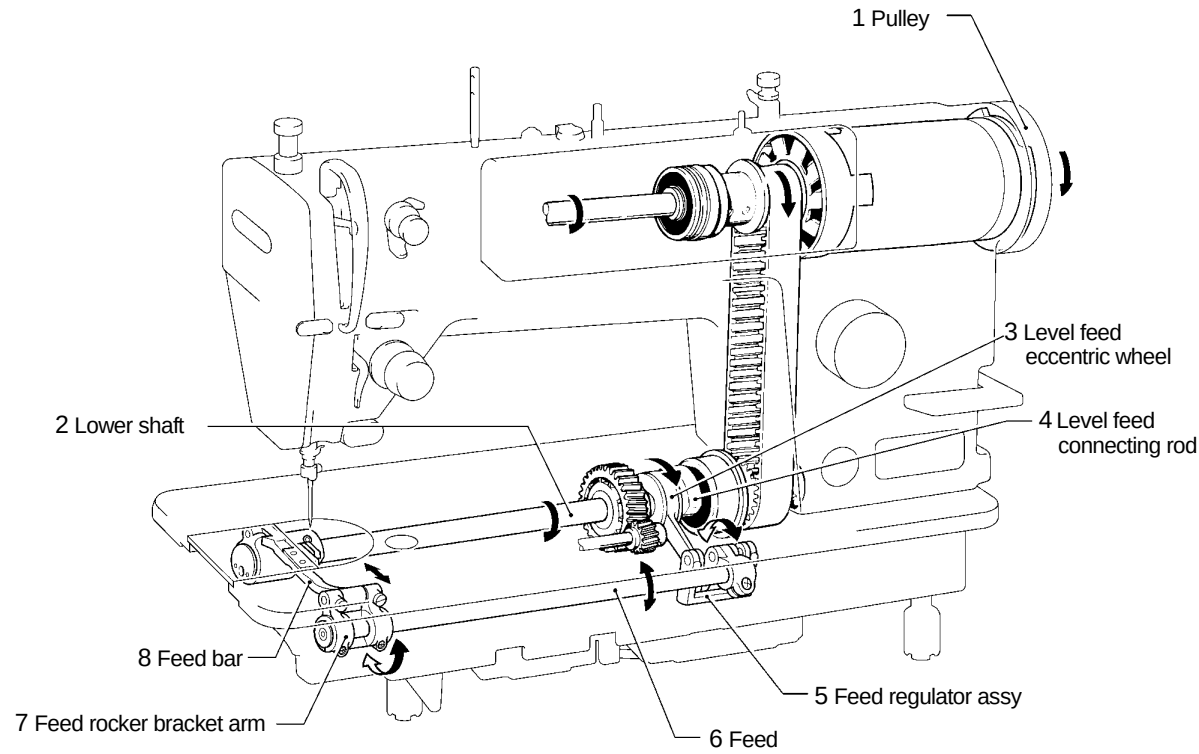
4-3. Feed mechanism

1628M

Vertical movement of feed bar

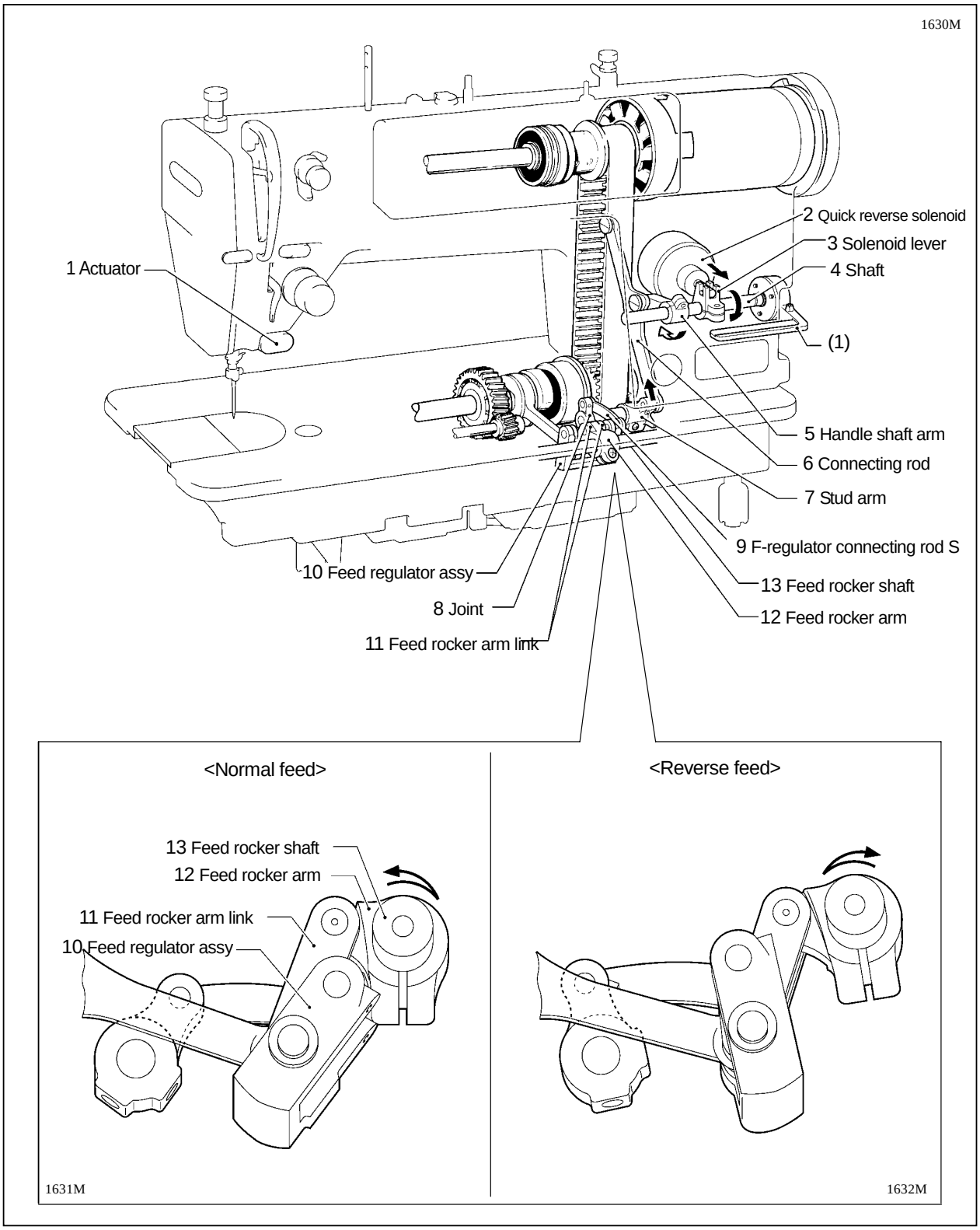


Horizontal movement of feed bar



1629M

4-4. Quick reverse mechanism



1. When the actuator is pressed lightly, the movement is transmitted to the various parts as shown in the illustration, so that the angle of the feed regulator assembly is reversed.
2. When the angle of the feed regulator assembly is reversed, the feed rocker arm link and feed rocker arm change from normal feed to reverse feed.

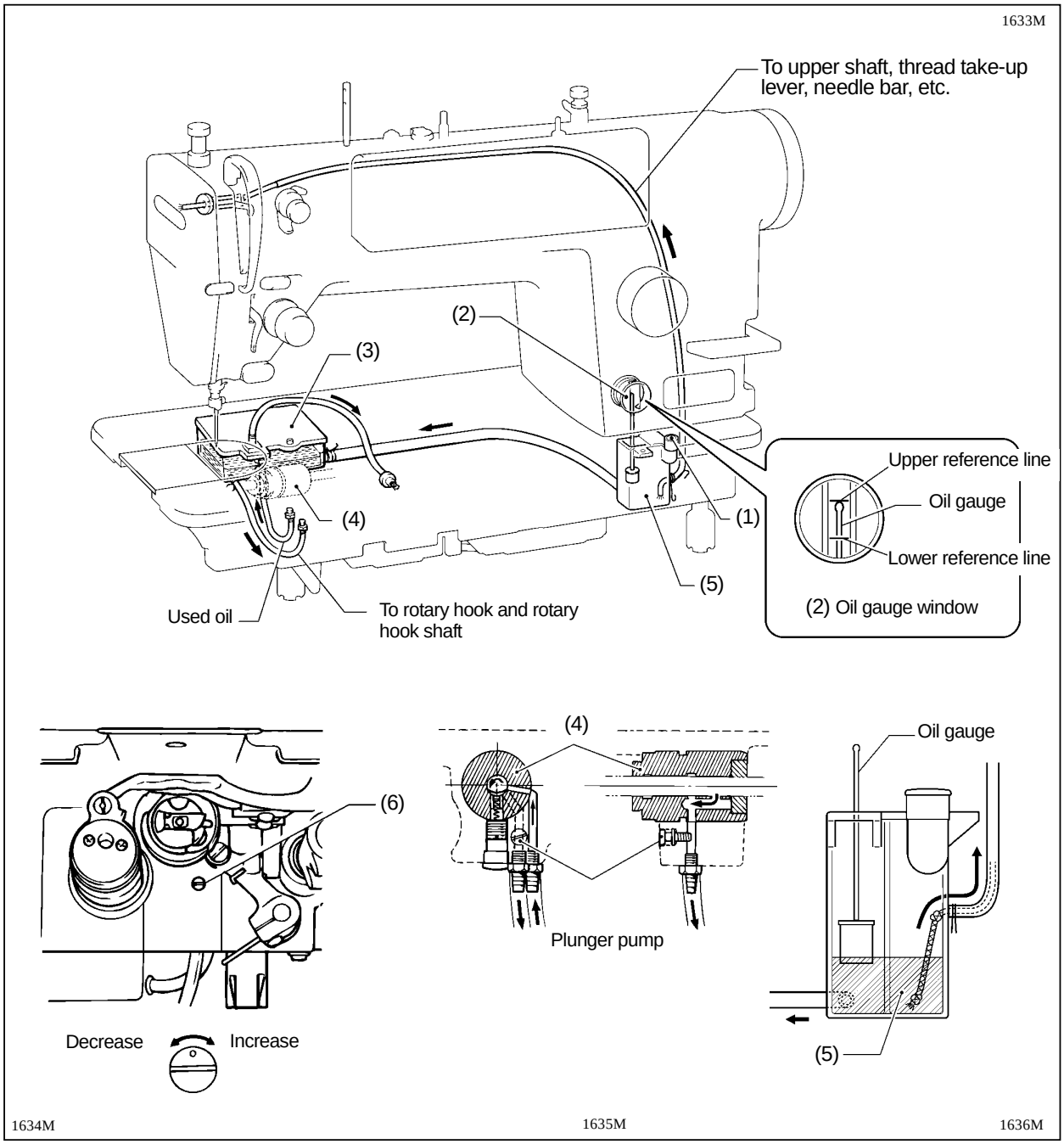
* Operation occurs in the same way as described above even when the reverse stitching lever (1) is lowered.

4-5. Lubrication mechanism (Thread take-up lever and rotary hook)

The lubrication mechanism for this sewing machine is a dry head method, with the oil supplied from a tank.
The oil level can be checked through the oil gauge window, without needing to tilt back the machine head or operate the sewing machine.

■ DD7100A, 710A

When adding the lubricating oil for the first time after unpacking the sewing machine, pour 130 ml of lubricating oil in through oil filler hole (1). The oil gauge in the oil gauge window (2) will rise as far as the upper reference line. (Refer to page 59 for details on the lubrication method.)

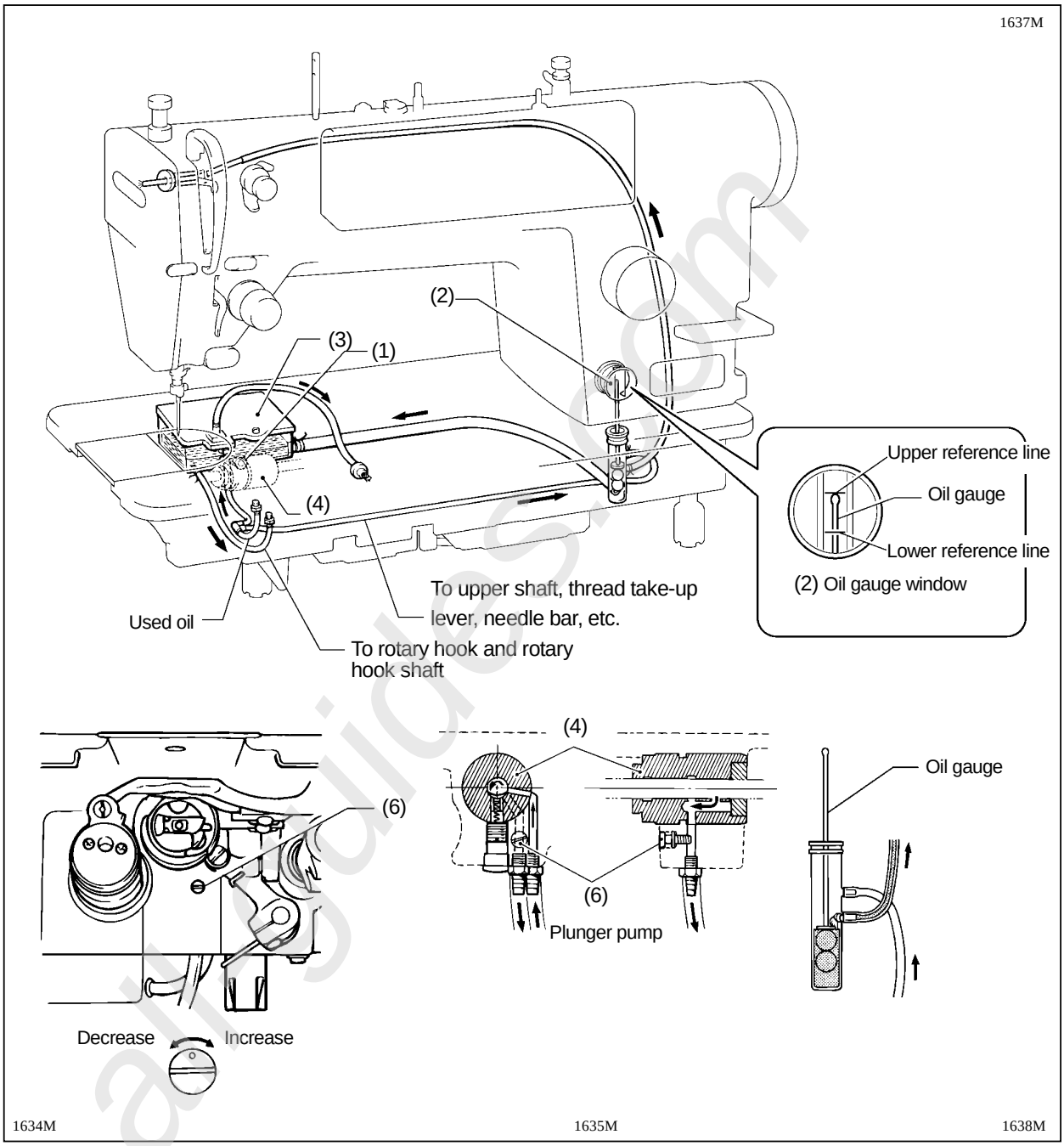


1. The lubricating oil that is poured into the oil filler hole (1) is stored in the oil tank (3).
2. The lubricating oil in the oil tank (3) is drawn up by the plunger pump (4).
3. The lubricating oil in the sub tank (5) is transferred to parts such as the thread take-up lever and needle bar by wicks.

* The rotary hook lubrication amount can be adjusted using the adjusting screw (6). (Refer to page 73.)

■ DD7100

When adding the lubricating oil for the first time after unpacking the sewing machine, pour 120 ml of lubricating oil in through oil filler hole (1). The oil gauge in the oil gauge window (2) will rise as far as the upper reference line. (Refer to page 59 for details on the lubrication method.)



1. The lubricating oil that is poured into the oil filler hole (1) is stored in the oil tank (3).
2. The lubricating oil in the oil tank (3) is drawn up by the plunger pump (4).
3. The lubricating oil that is drawn up by the plunger pump (4) is transferred to parts such as the thread take-up lever and needle bar by oil tubes and wicks.

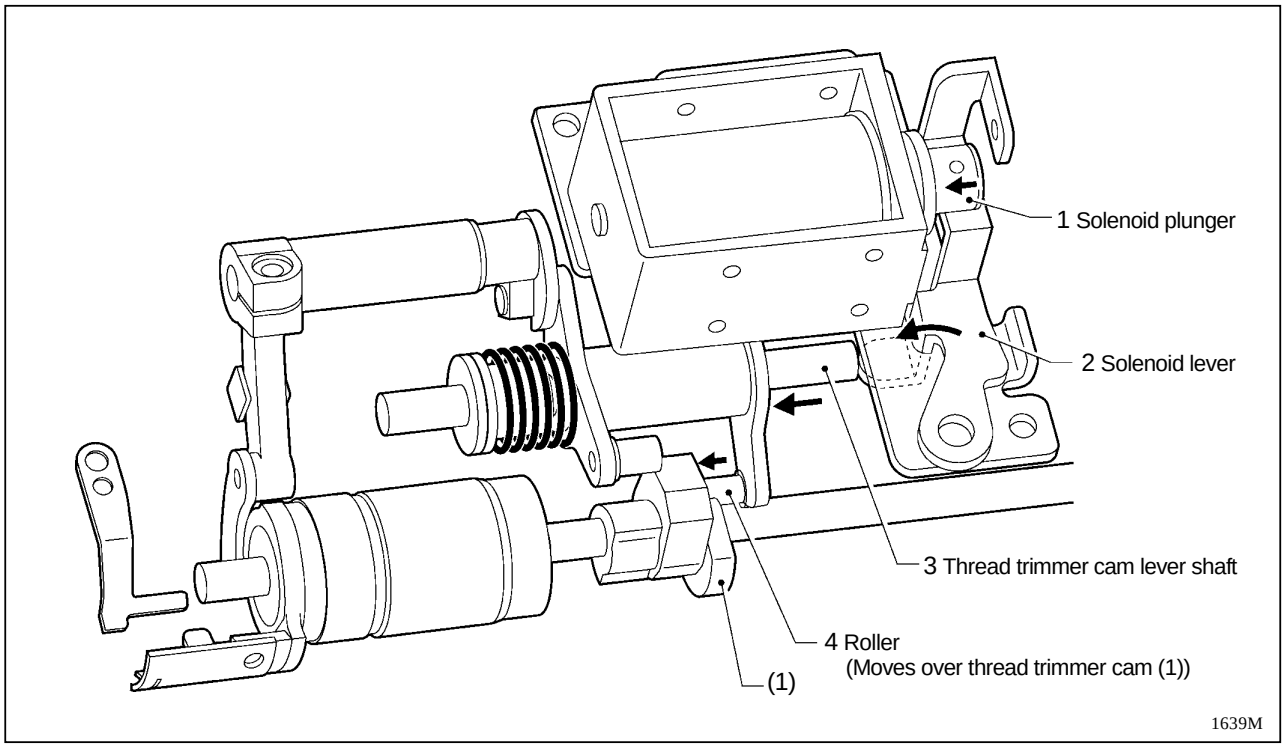
* The rotary hook lubrication amount can be adjusted using the adjusting screw (6). (Refer to page 73.)

4-6. Thread trimmer mechanism

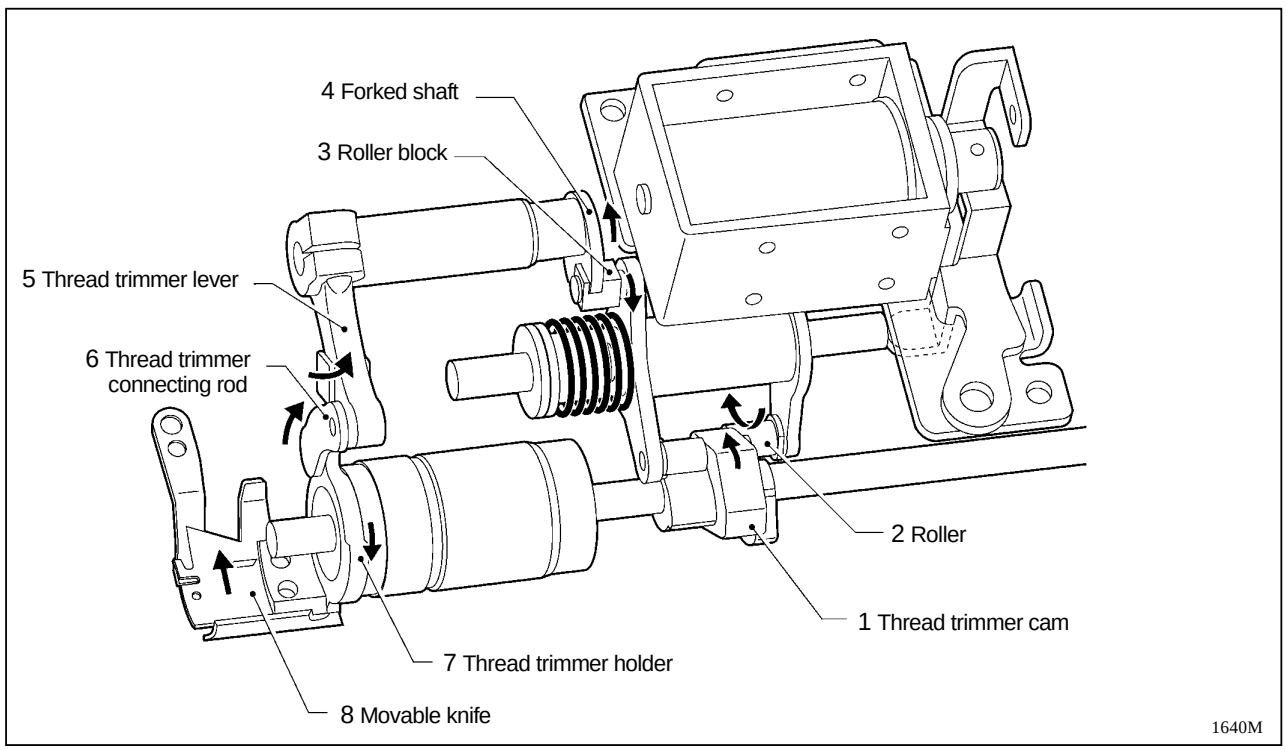
4-6-1. Thread trimmer operation

The figure below shows the thread trimmer without the high-speed rotary hook.

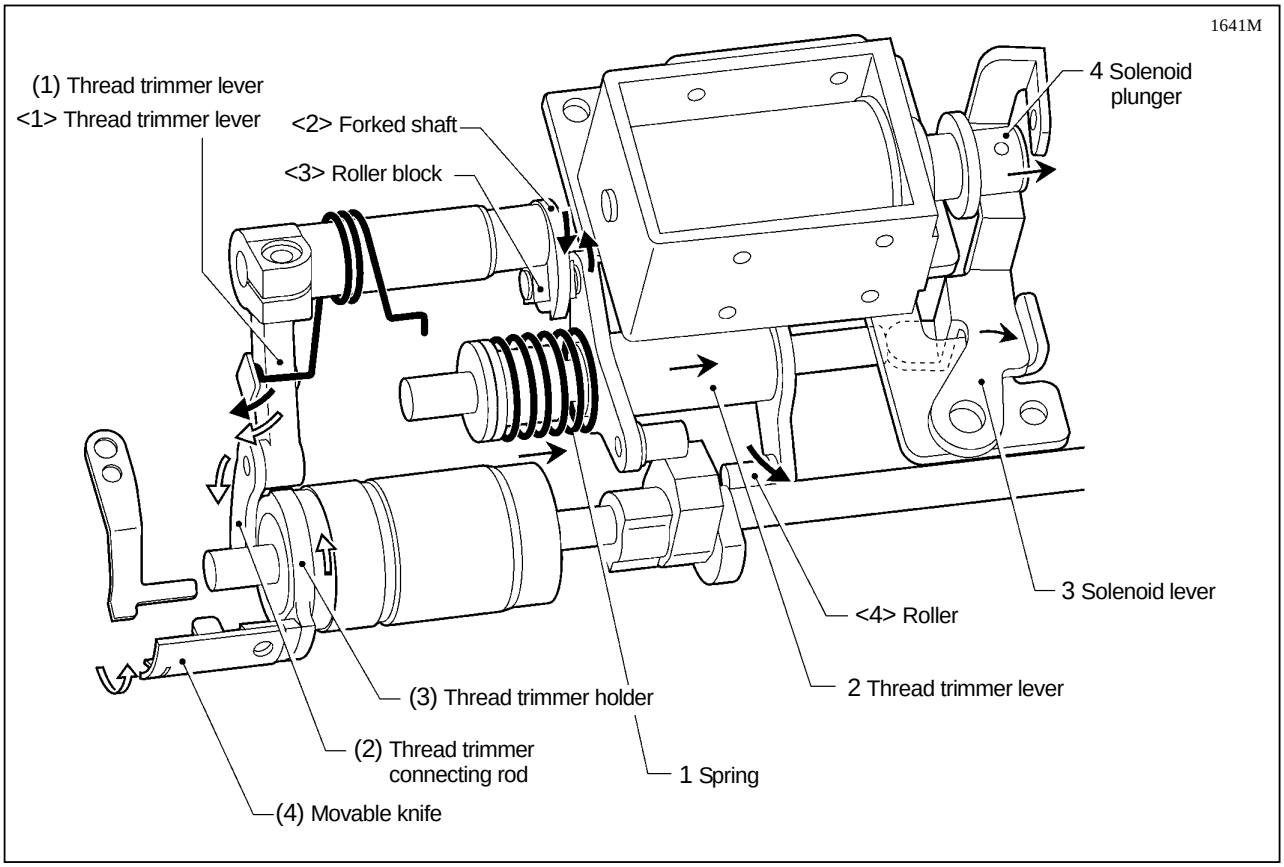
1) When the thread trimmer signal is received



2) Thread trimmer holder action

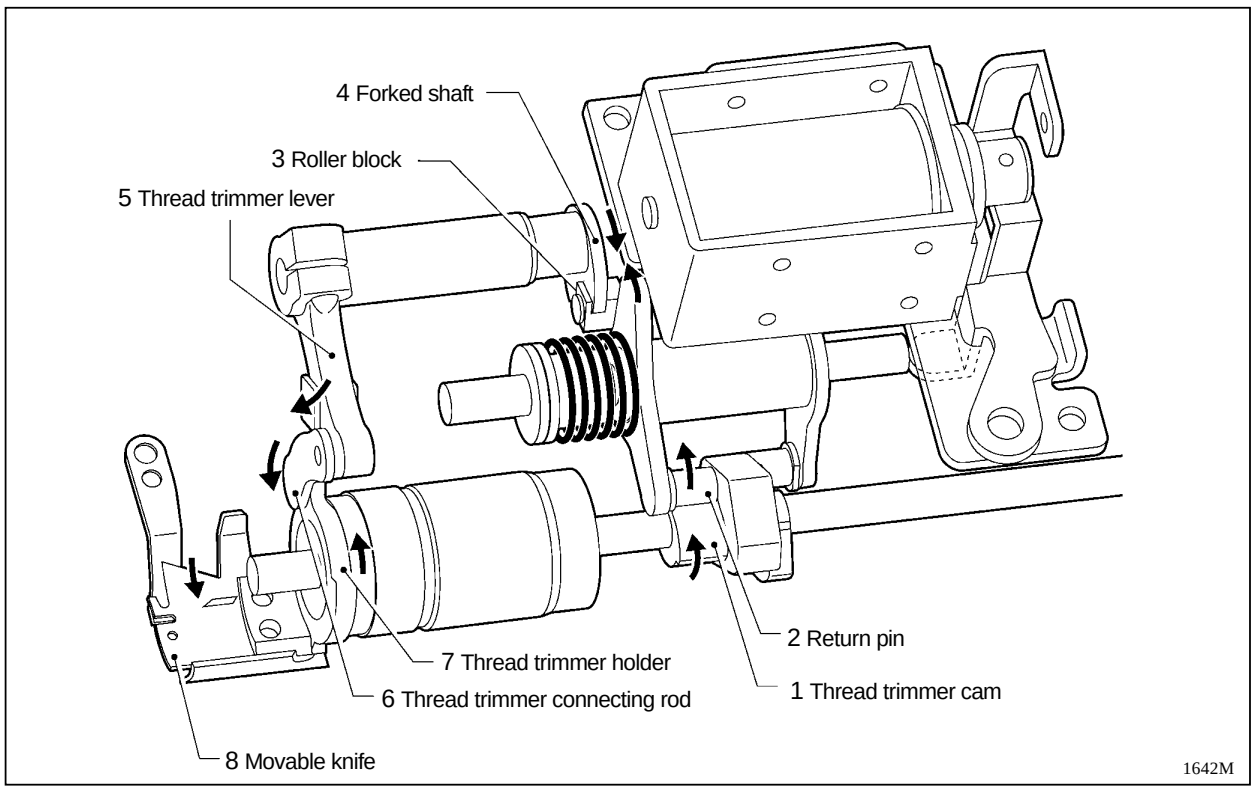


3) Thread trimming complete stop

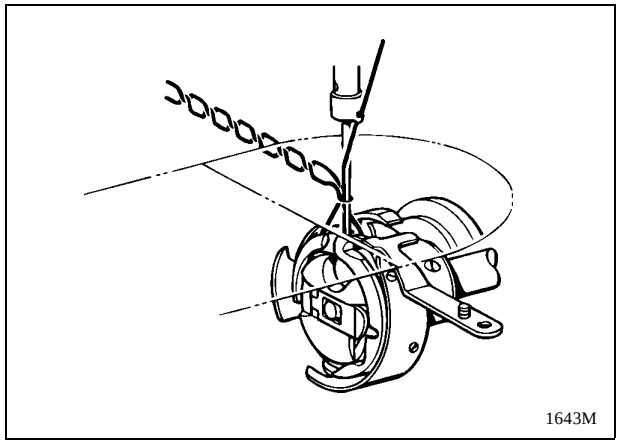


4) Thread trimmer safety device

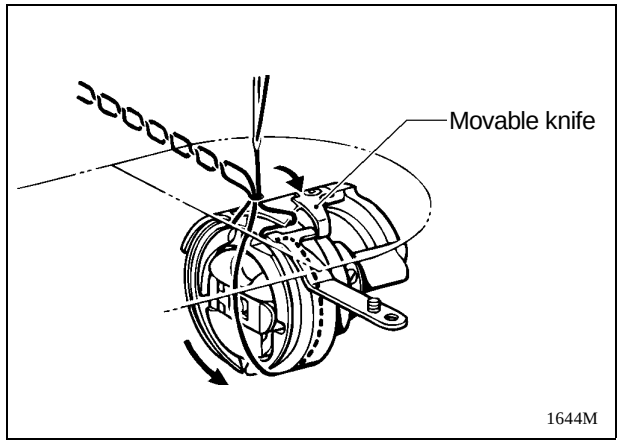
When the movable knife does not return to its original position, the mechanism operates as shown in the illustration below to move the movable knife to a position where it will not touch the needle.



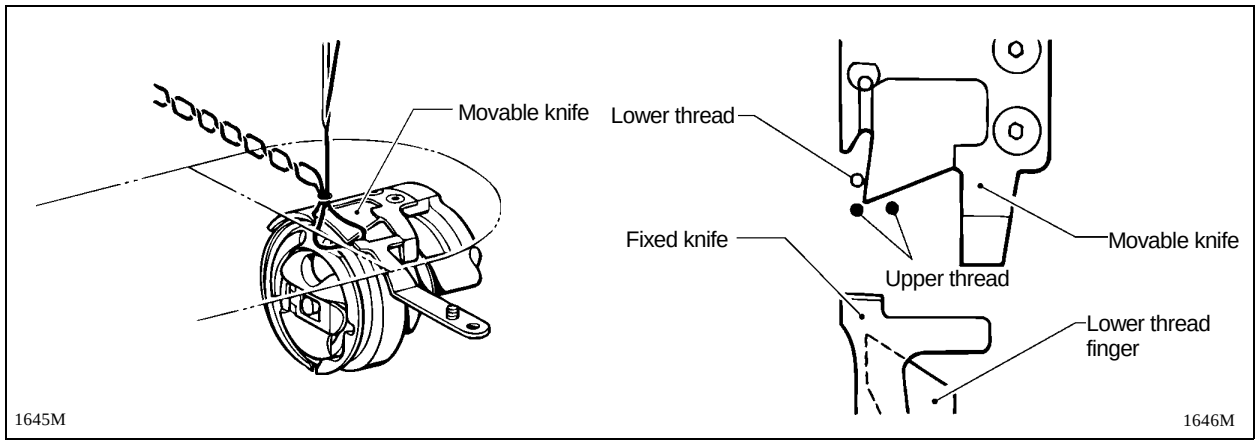
4-6-2. Upper and lower thread trimming



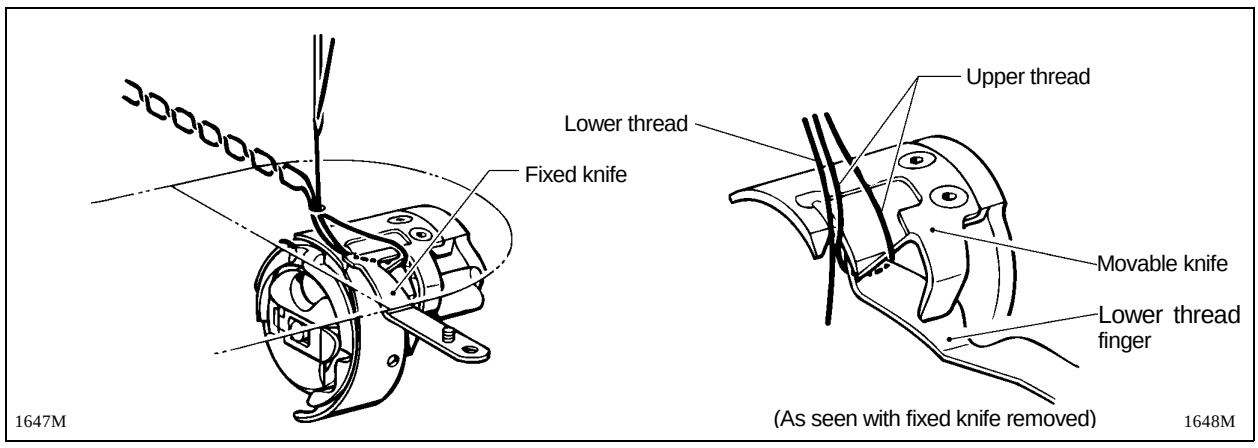
1. When the needle rises 1.8mm (2.2mm with heavy-weight materials) above the down position the rotary hook point catches the loop formed by the needle.



2.The thread trimmer signal is then relayed, and the thread trimmer cam drives the movable knife. The rotary hook catches the upper thread and passes it through the inner rotary hook.

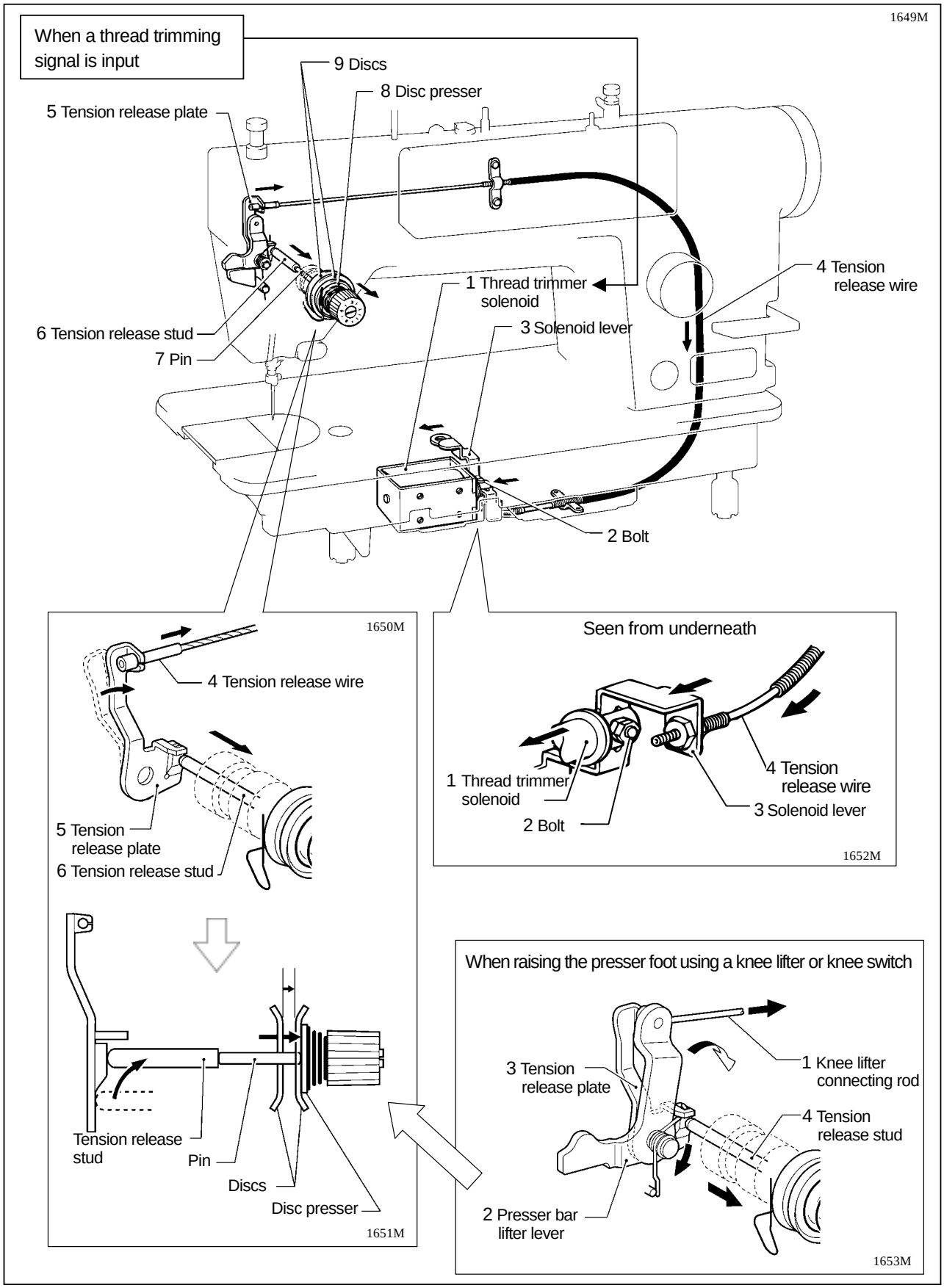


3. The tip of the movable knife passes through the middle of the triangular loop formed underneath the needle plate by the rotary hook to separate the upper and lower threads. At this time, the thread take-up lever moves up slightly from its lowest position. (The angular movement of the upper shaft is approximately 330°.)
   * If the timing of this operation is advanced, it will affect the separation of the upper and lower threads by the movable knife, and it may result in thread trimming errors.

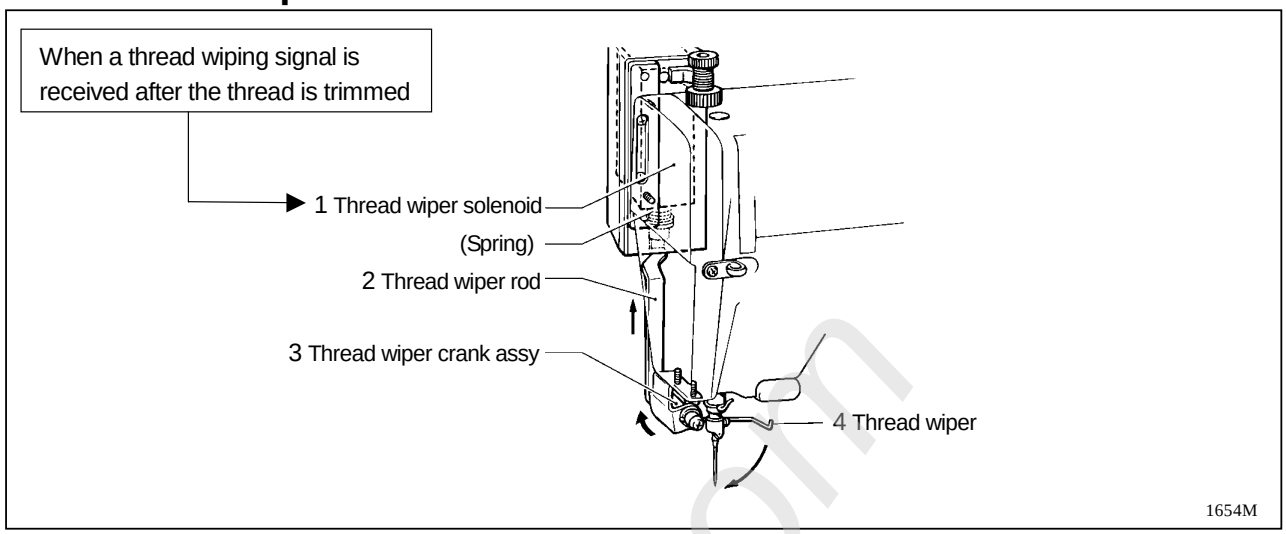


4. The upper and lower threads caught by the movable knife in 3 above are gradually spread by the knife and lower thread finger and cut by the fixed knife tip. The thread take-up lever has now approached the top of its stroke. When the knife is spreading the thread, the tension release relieves the upper thread tension to prevent excessive tension and to enable the upper thread to be smoothly extended. The length of thread spread by the movable knife determines the length of thread remaining from the needle tip and bobbin when thread trimming is complete, and effects stitch formation at the beginning of the next sewing procedure.

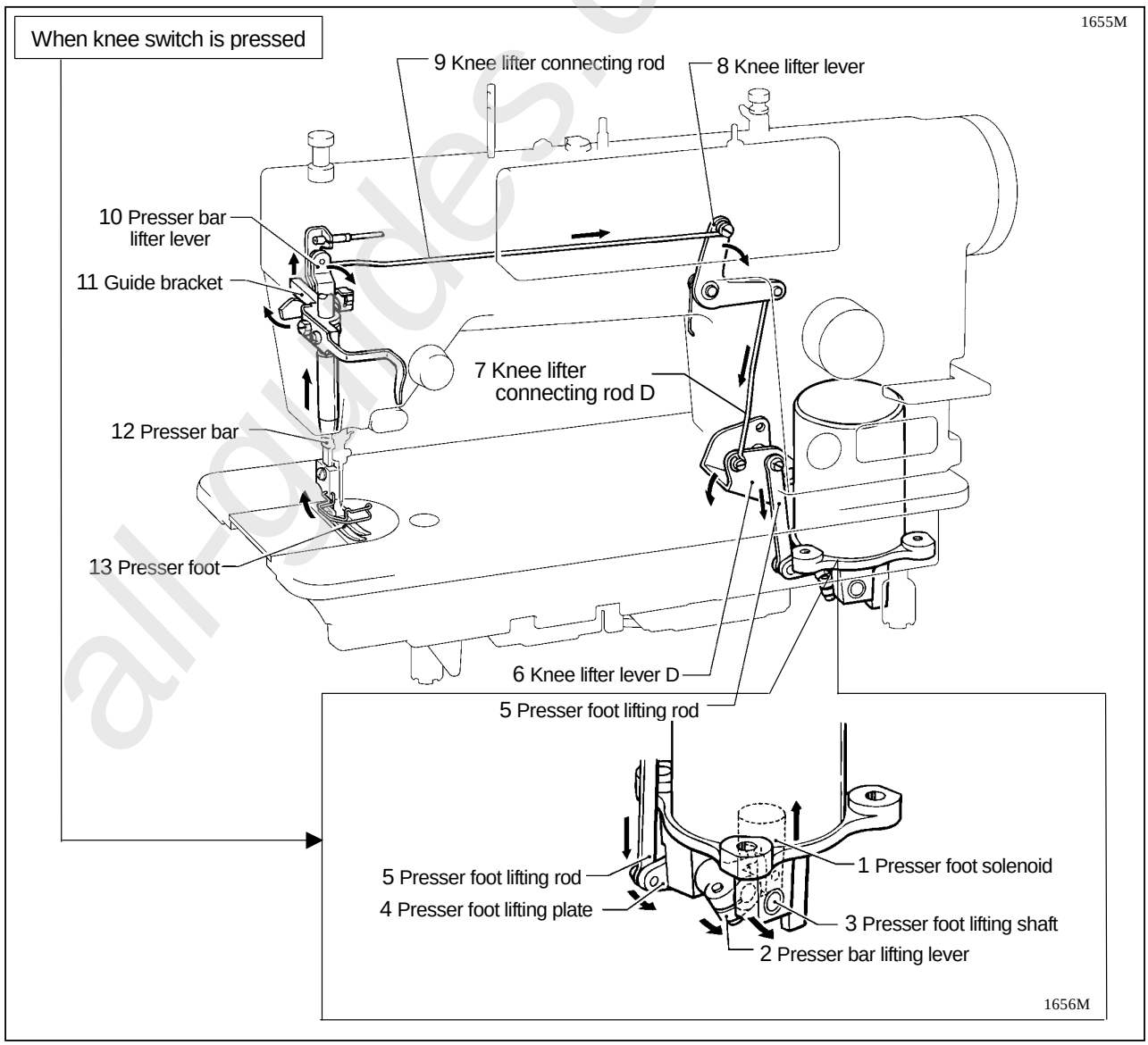
4-7. Tension release mechanism



4-8. Thread wiper mechanism



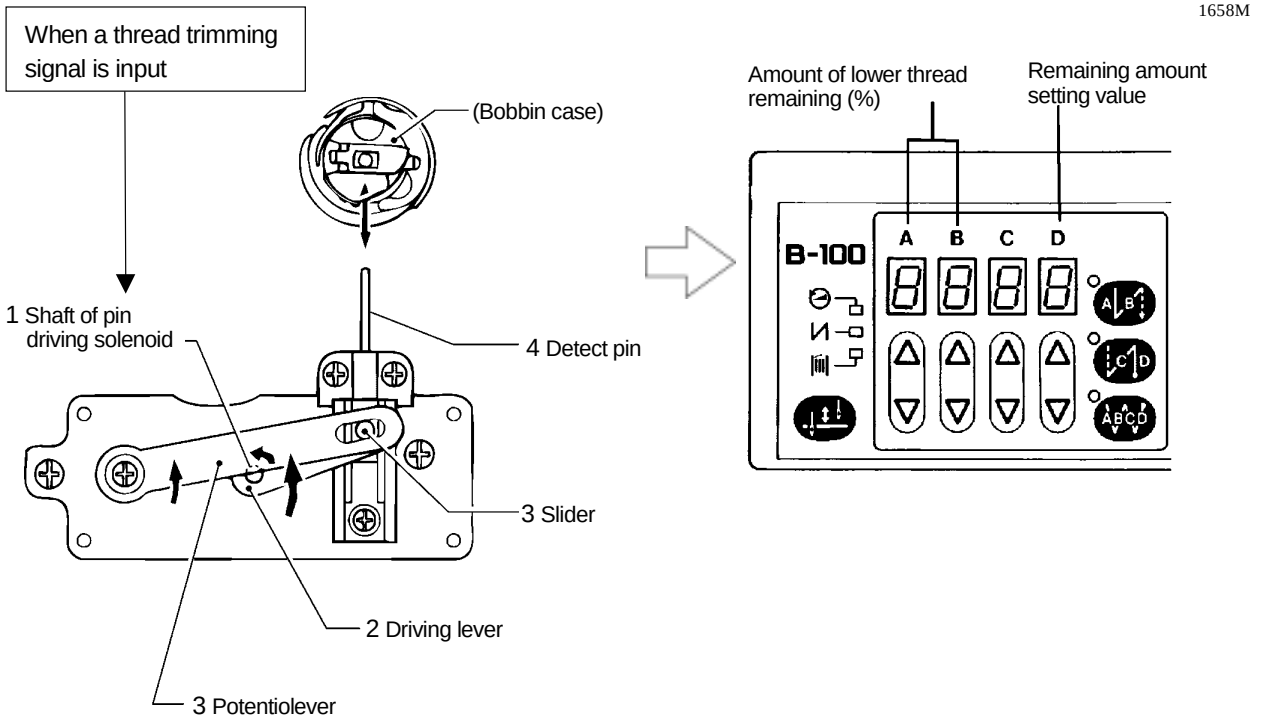
4-9. Presser foot lifter mechanism (-9[][], Option) (built into machine head)



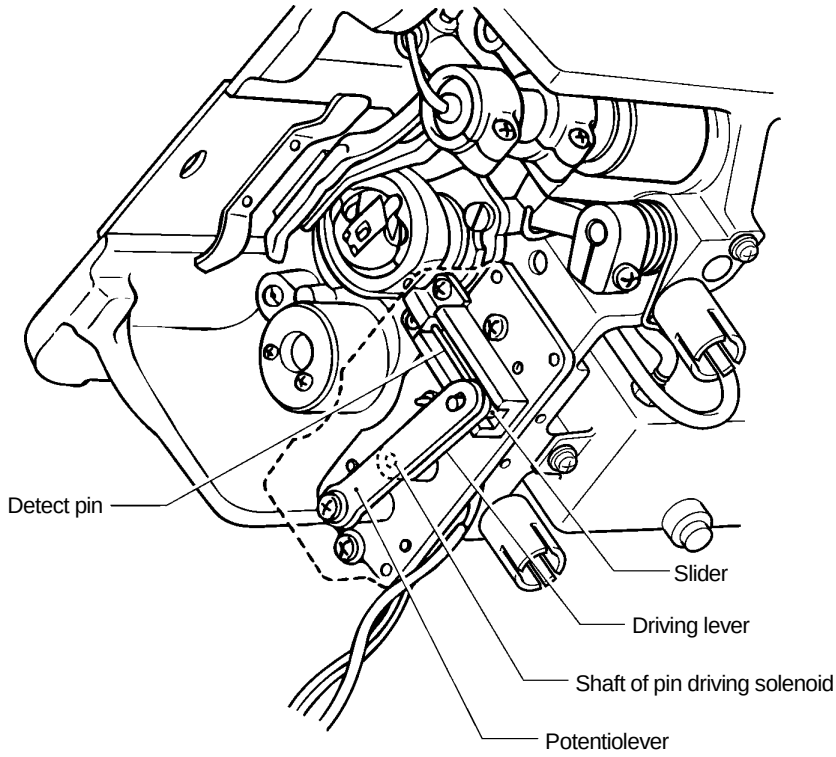
4-10. Lower thread detector mechanism

- The lower thread detector mechanism has been designed for materials which do not allow thread jointing or re-sewing to be carried out when the lower thread runs out.
- The lower thread is detected after the thread is trimmed, and the amount of lower thread remaining is displayed on the operation panel.

1658M



1657M



1659M

5. DISASSEMBLY

⚠ DANGER

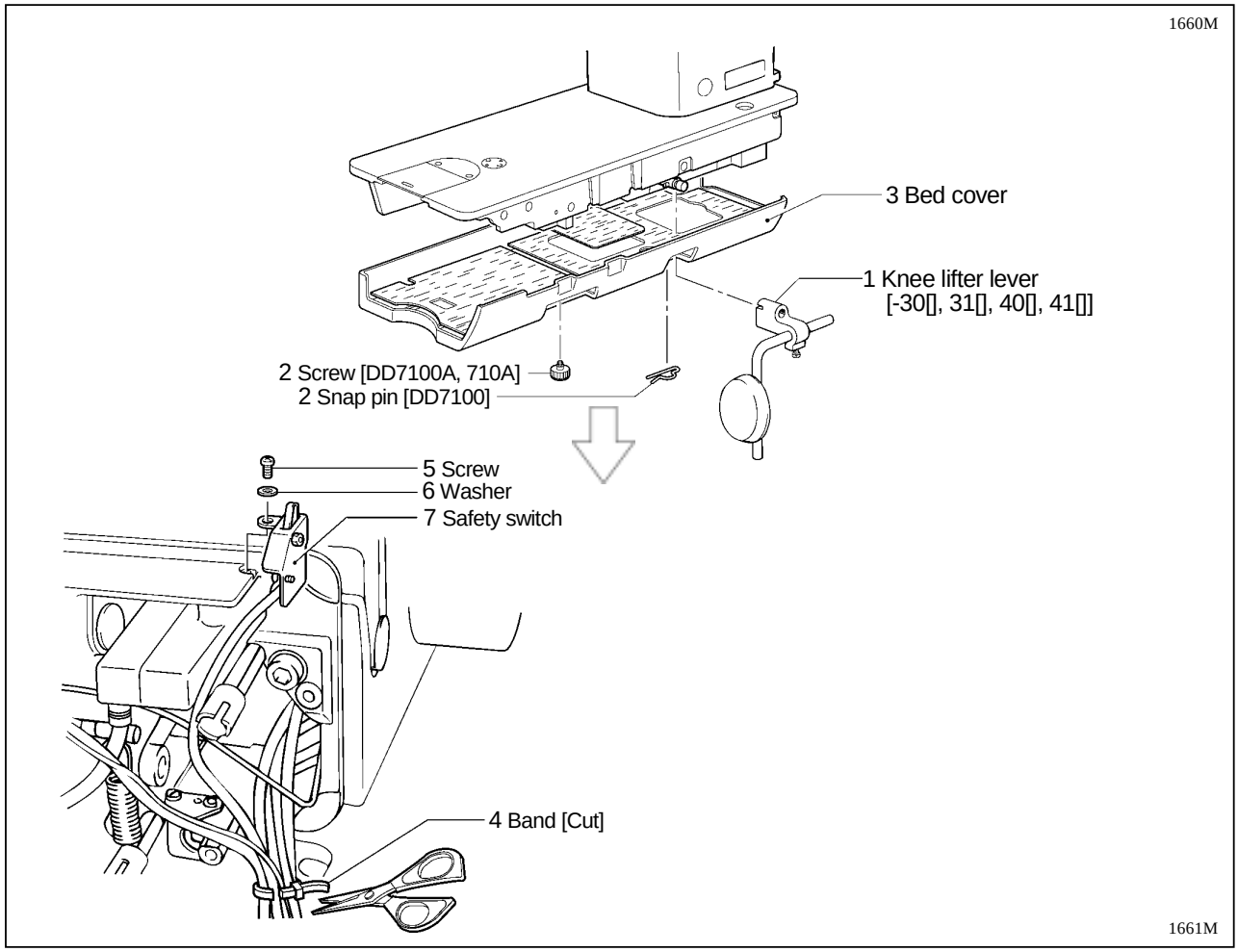
Wait at least 10 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

⚠ CAUTION

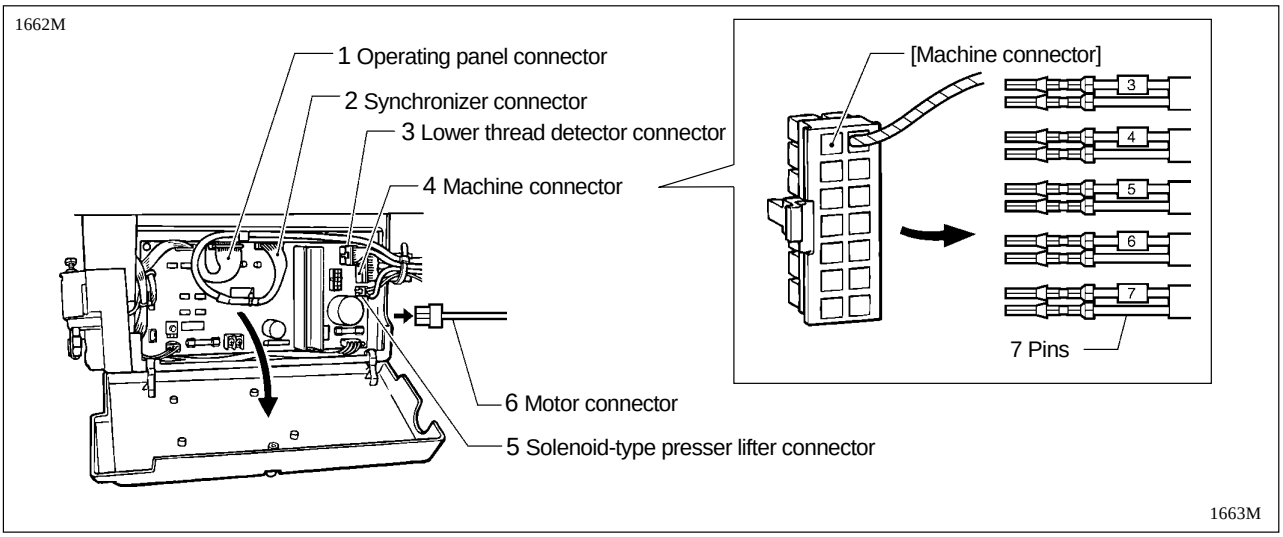
- Disassembly and assembly of the sewing machine should only be carried out by a qualified technician.
- Turn off the power switch and disconnect the power cord from the wall outlet before disassembly, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
- 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 slit, and your hand may get caught.
- Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.
  Furthermore, do not drink the oil under any circumstances, as they can cause vomiting and diarrhea.
  Keep the oil out of the reach of children.
- Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

Disassemble each part in order of the numbers.

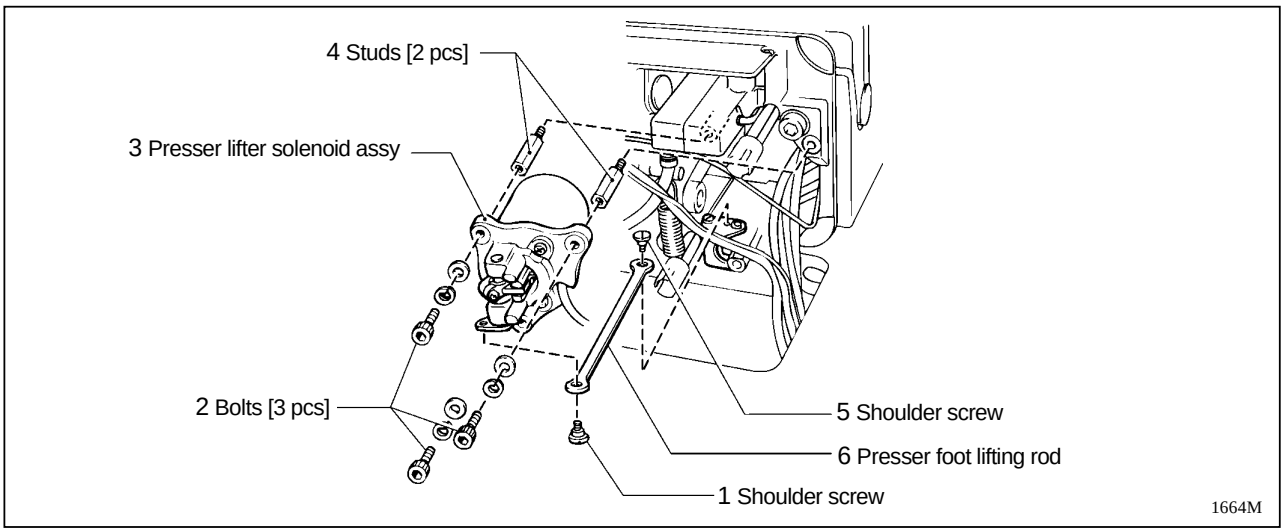
5-1. Bed cover and safety switch



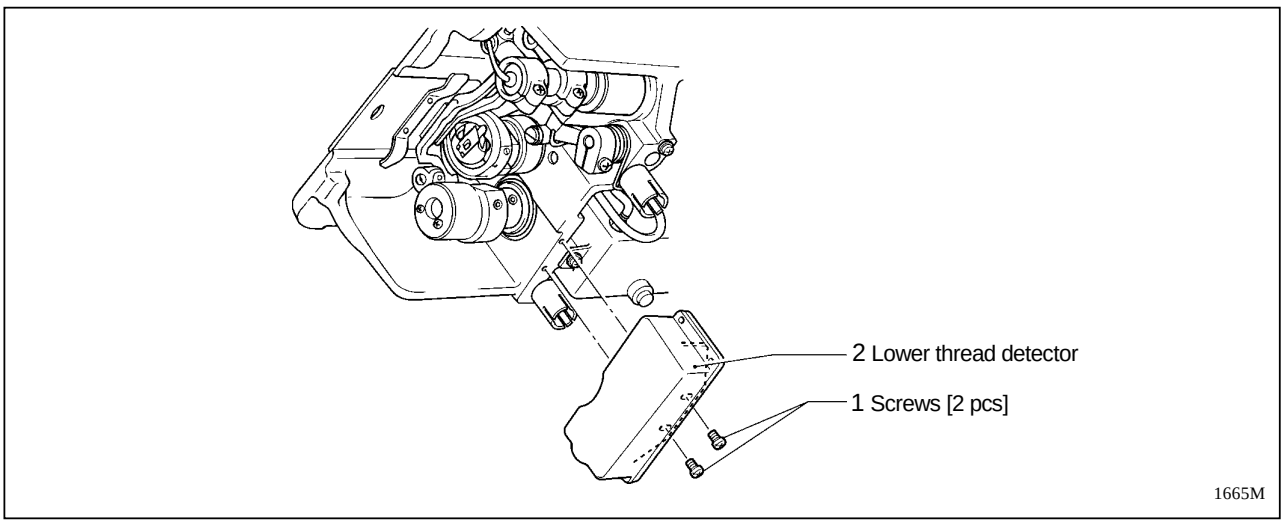
5-2. Connectors



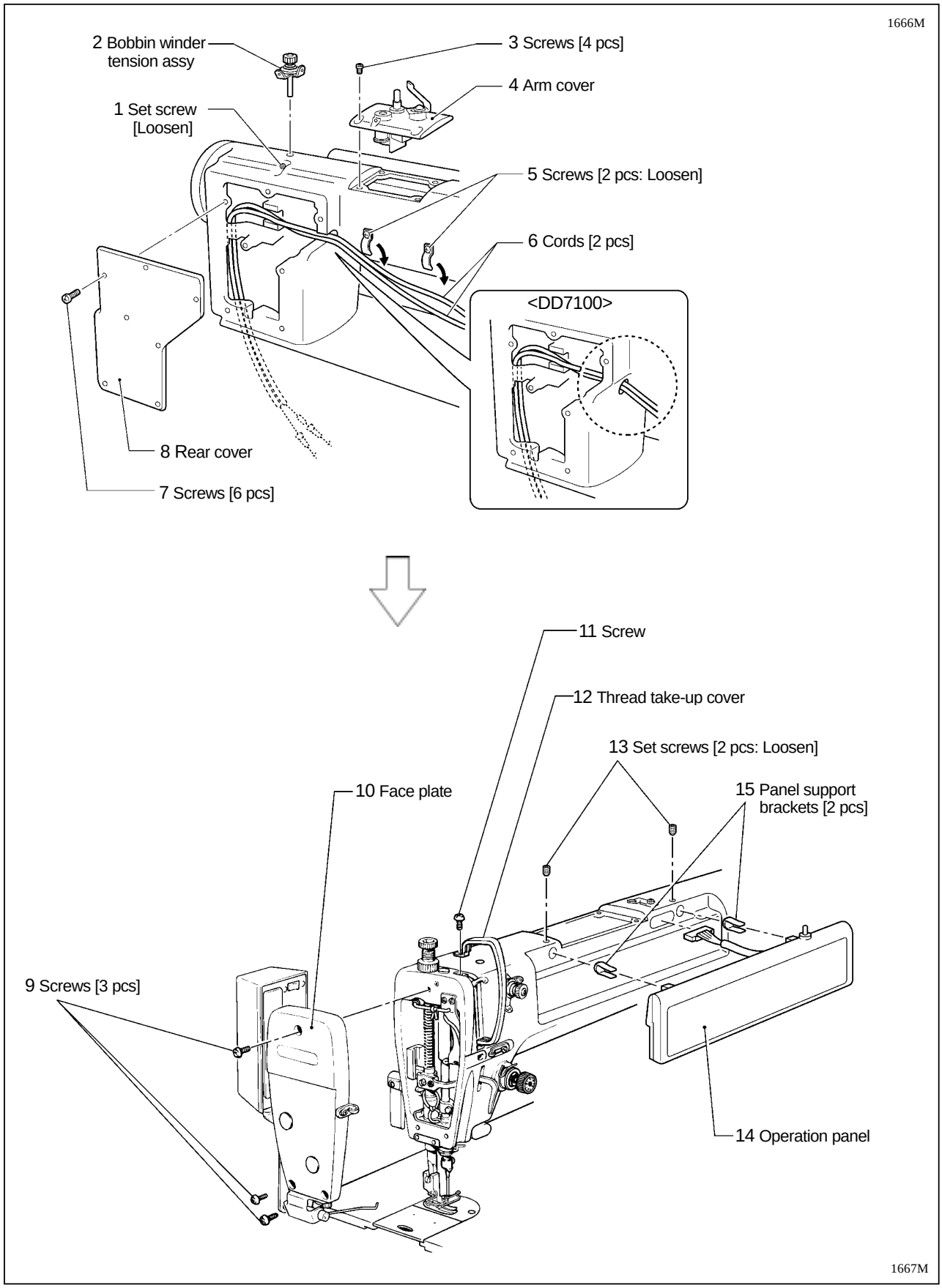
5-3. Solenoid-type presser lifter (-9[][], Option)



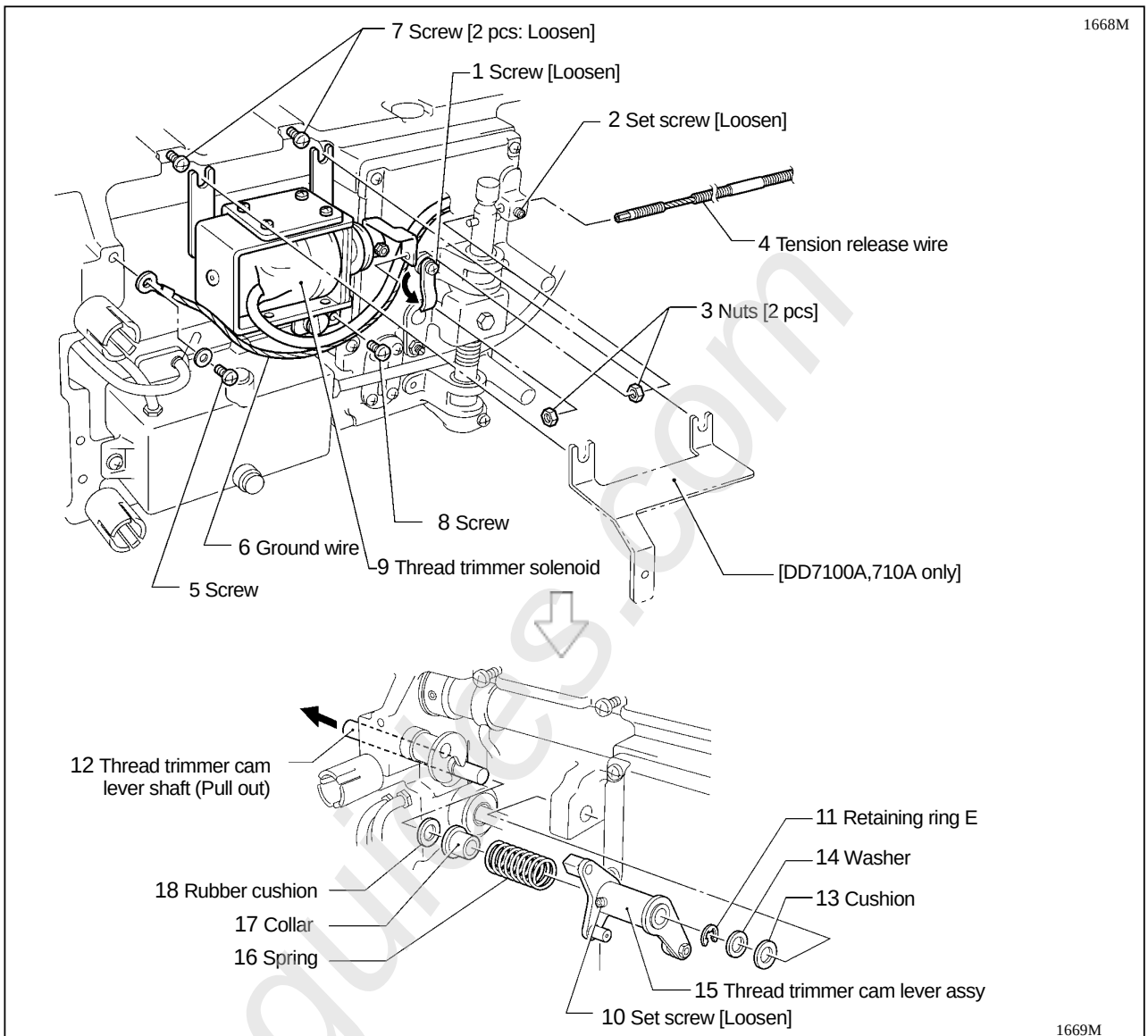
5-4. Lower thread detector (-31[], -41[], -91[], Option)

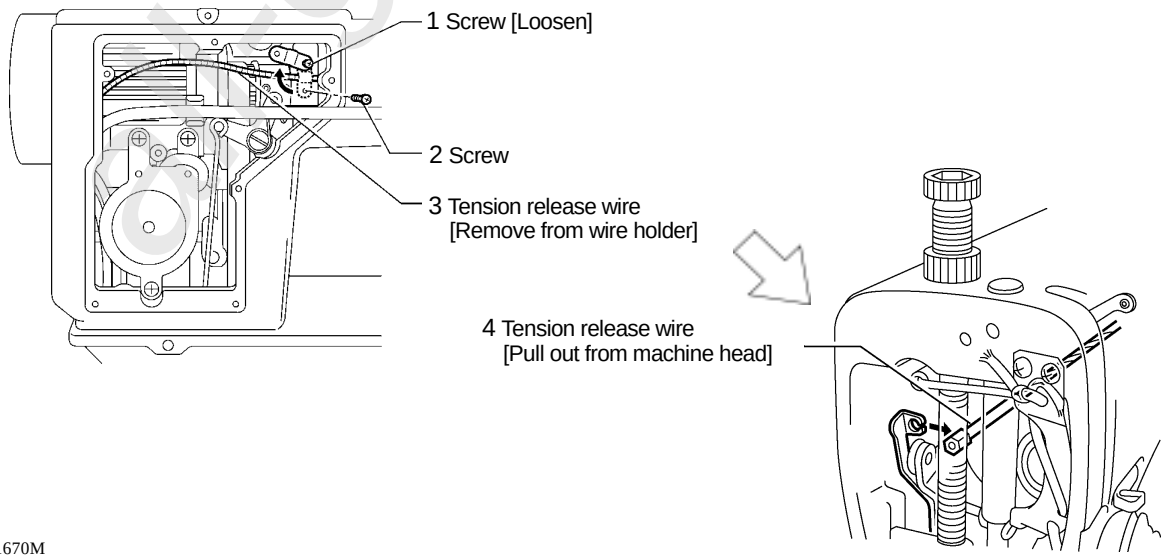


5-5. Covers and operation panel

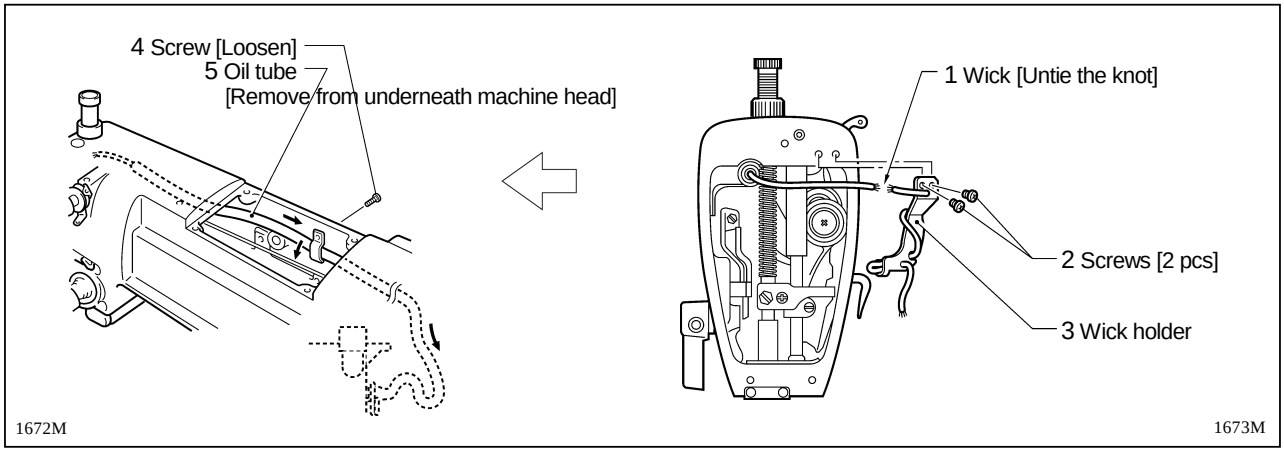


5-6. Tension release wire, ground wire and thread trimmer solenoid

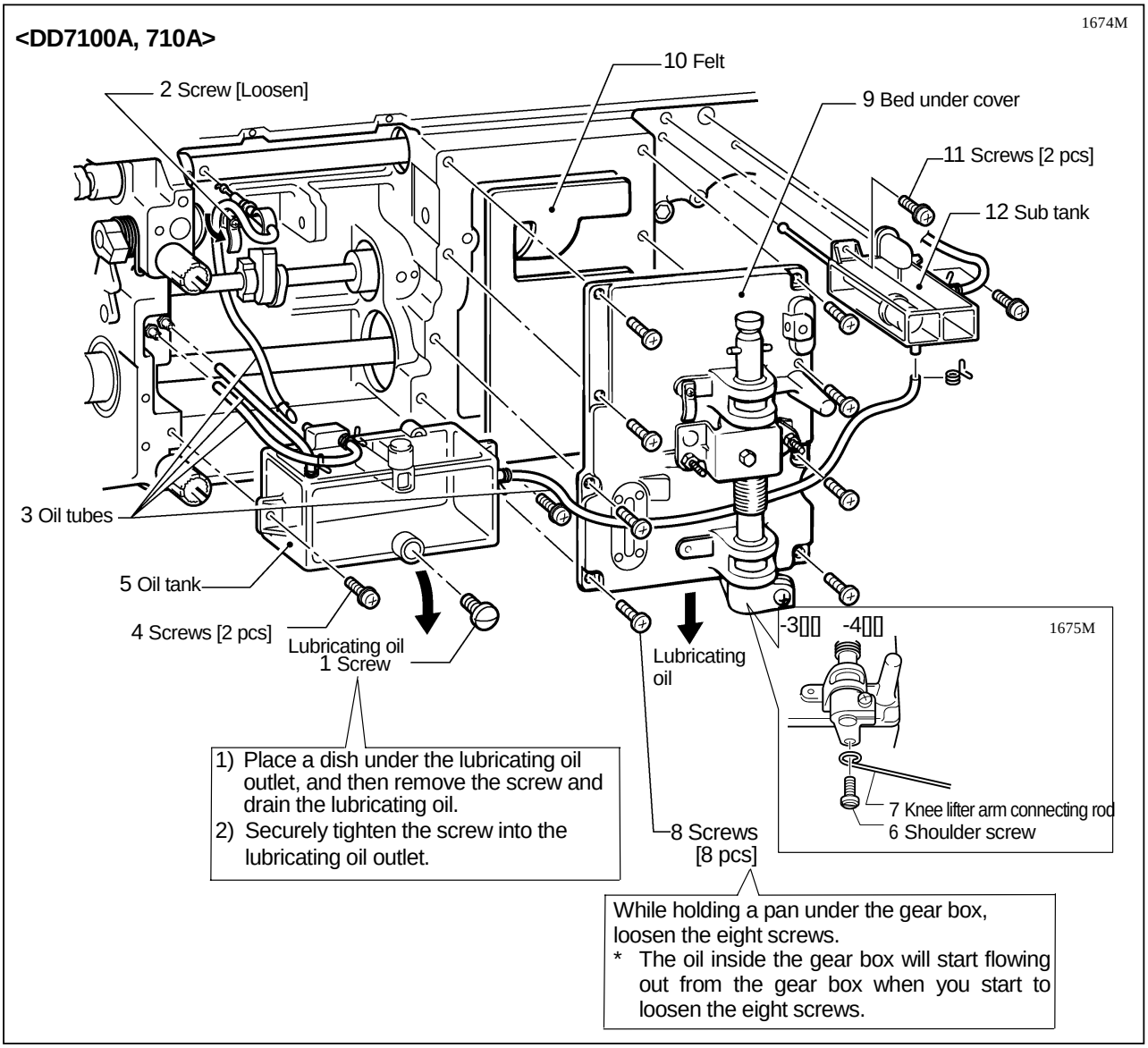


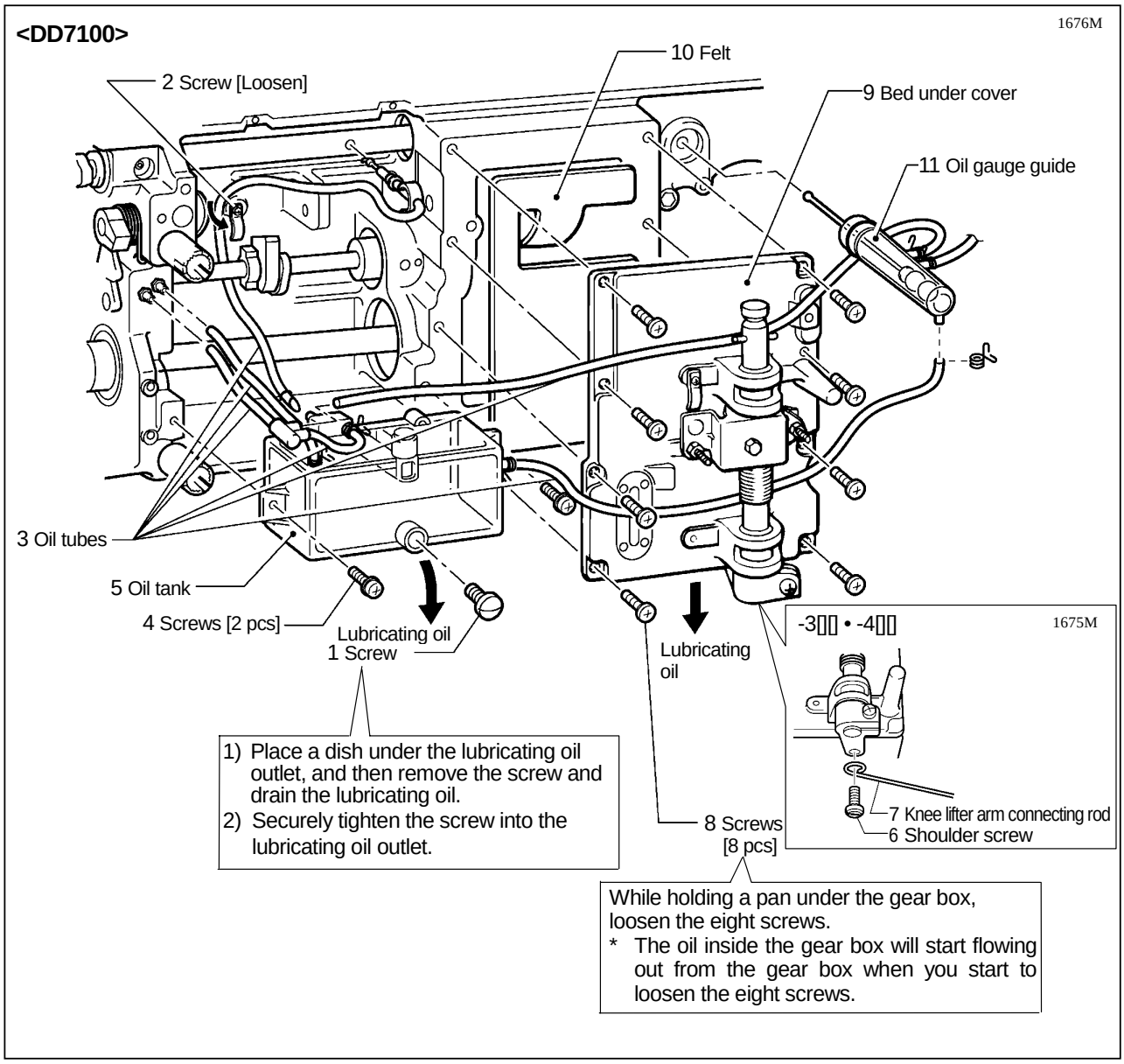


5-7. Wick holder and oil tube (Thread take-up lever)

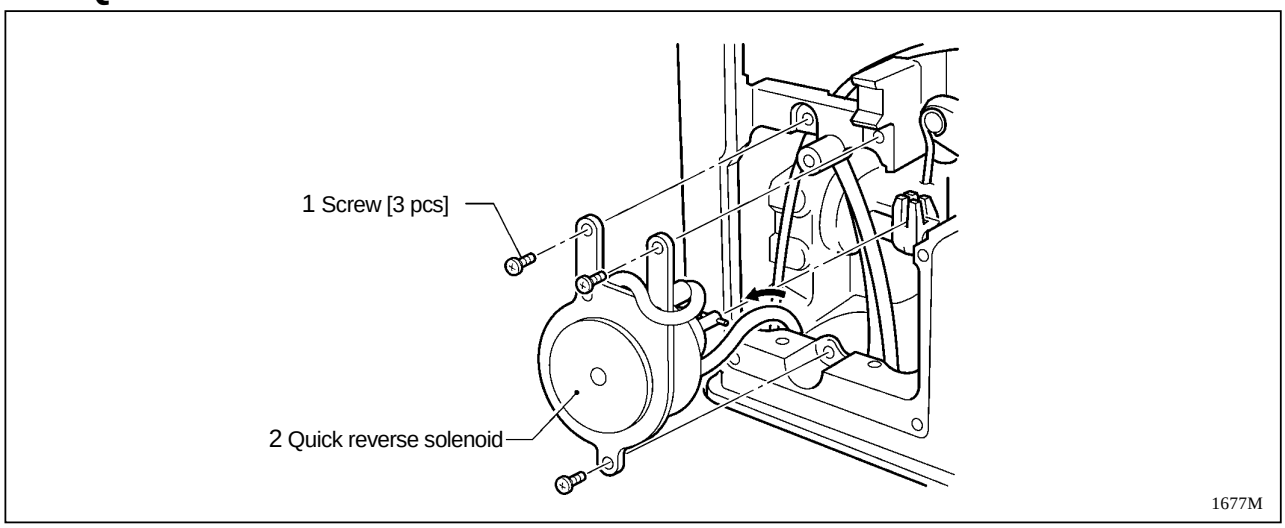


5-8. Oil tank, Bed under cover and sub tank

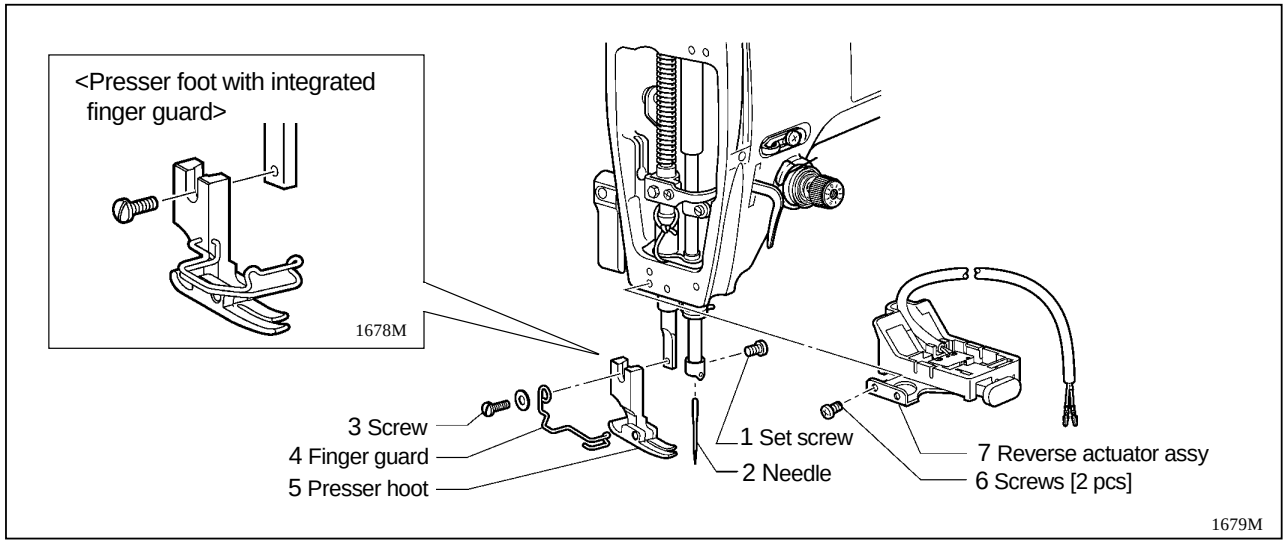




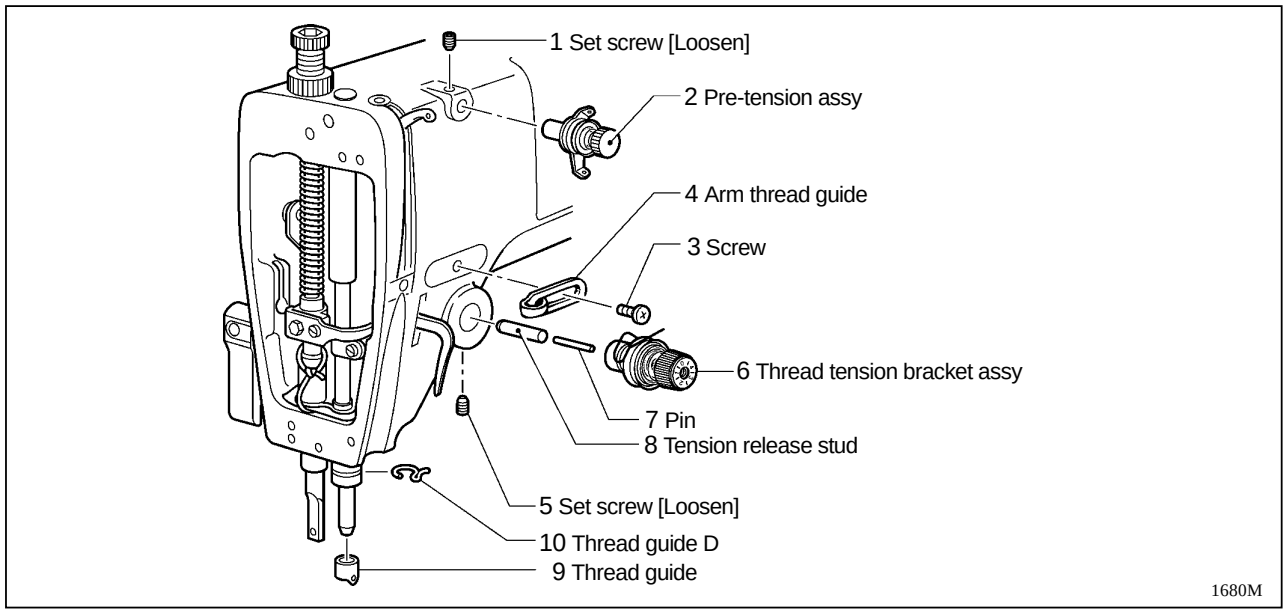
5-9. Quick reverse solenoid



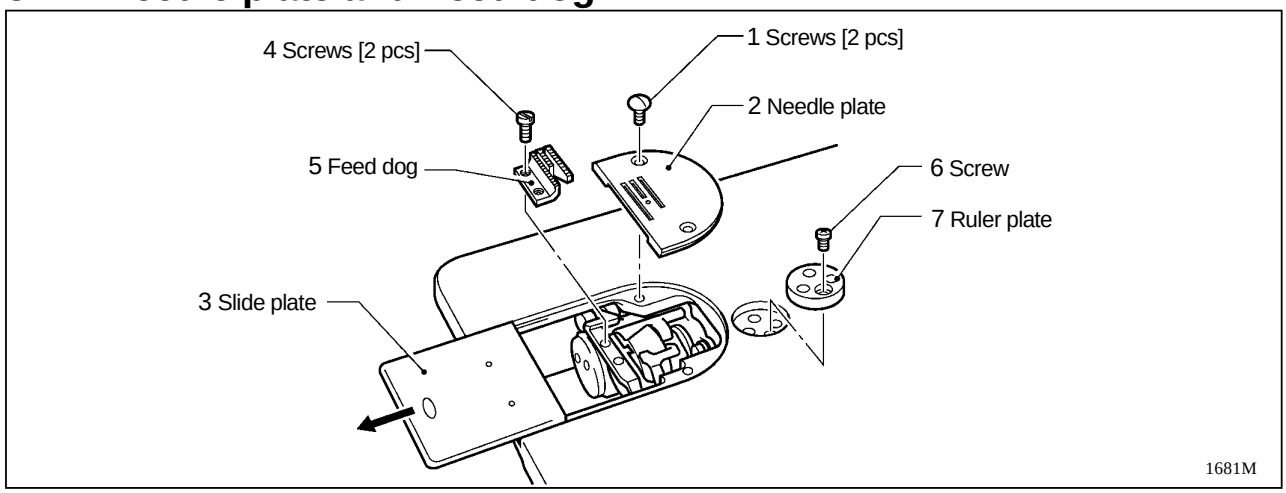
5-10. Needle, presser hoot and reverse actuator assy



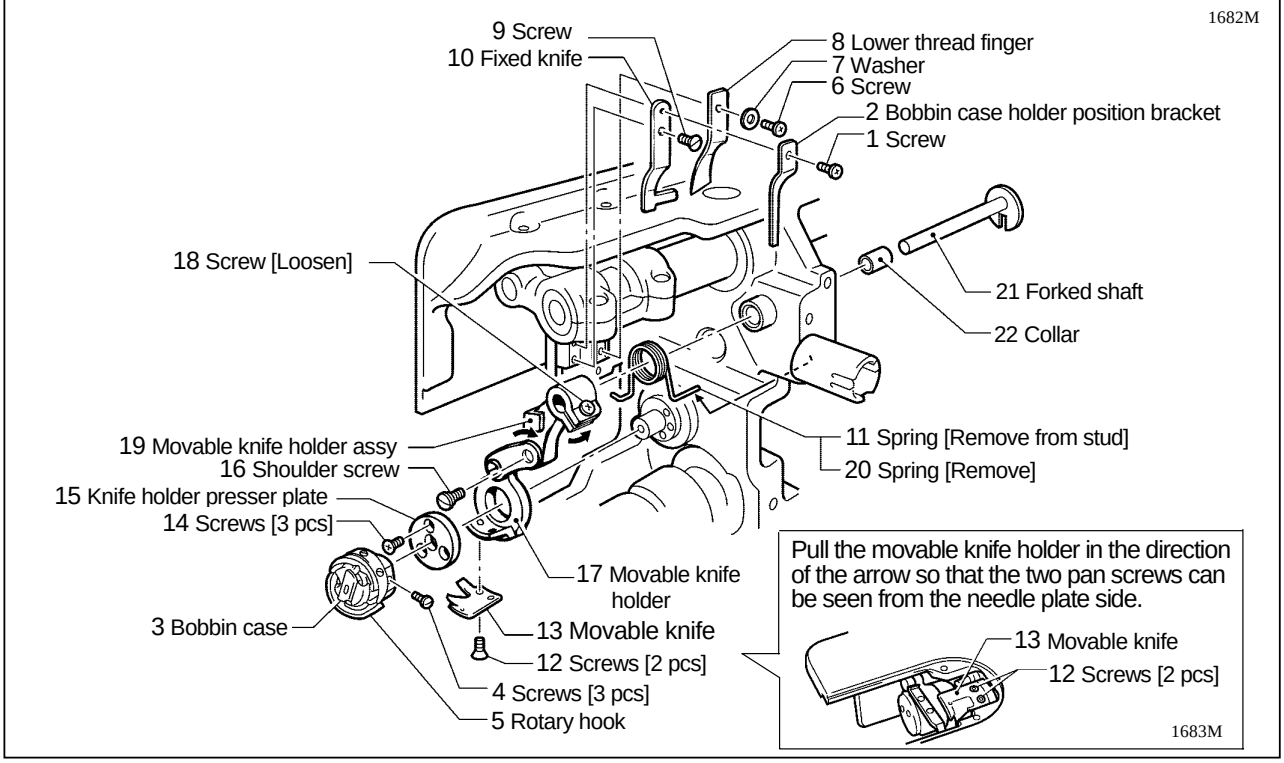
5-11. Thread tension mechanism



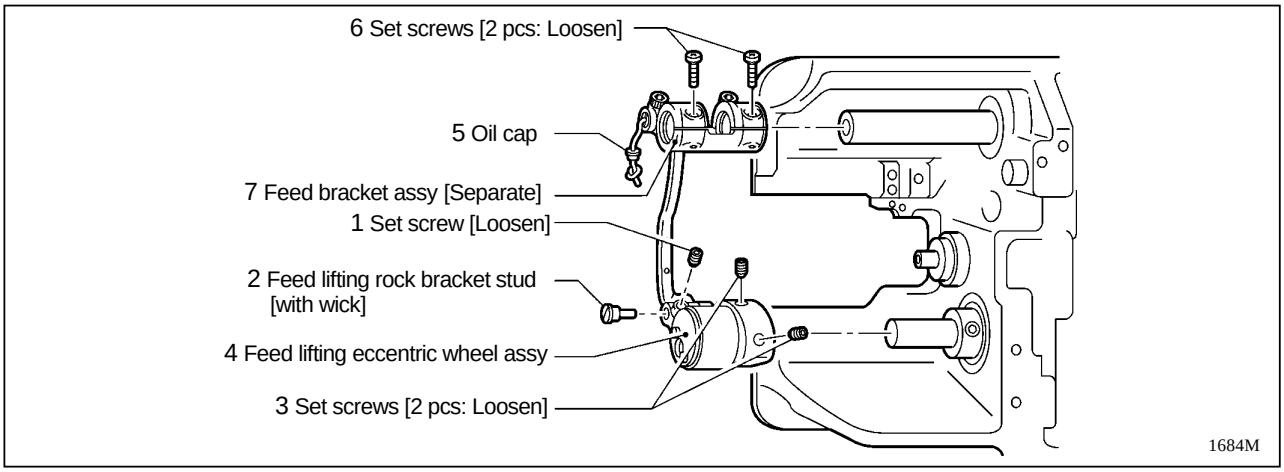
5-12. Needle plate and Feed dog



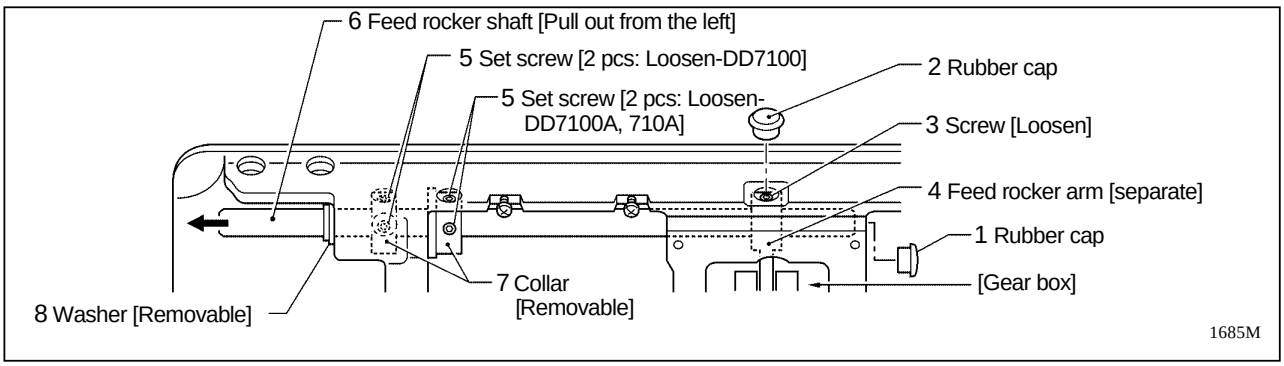
5-13. Bobbin case, rotary hook and thread trimming mechanism



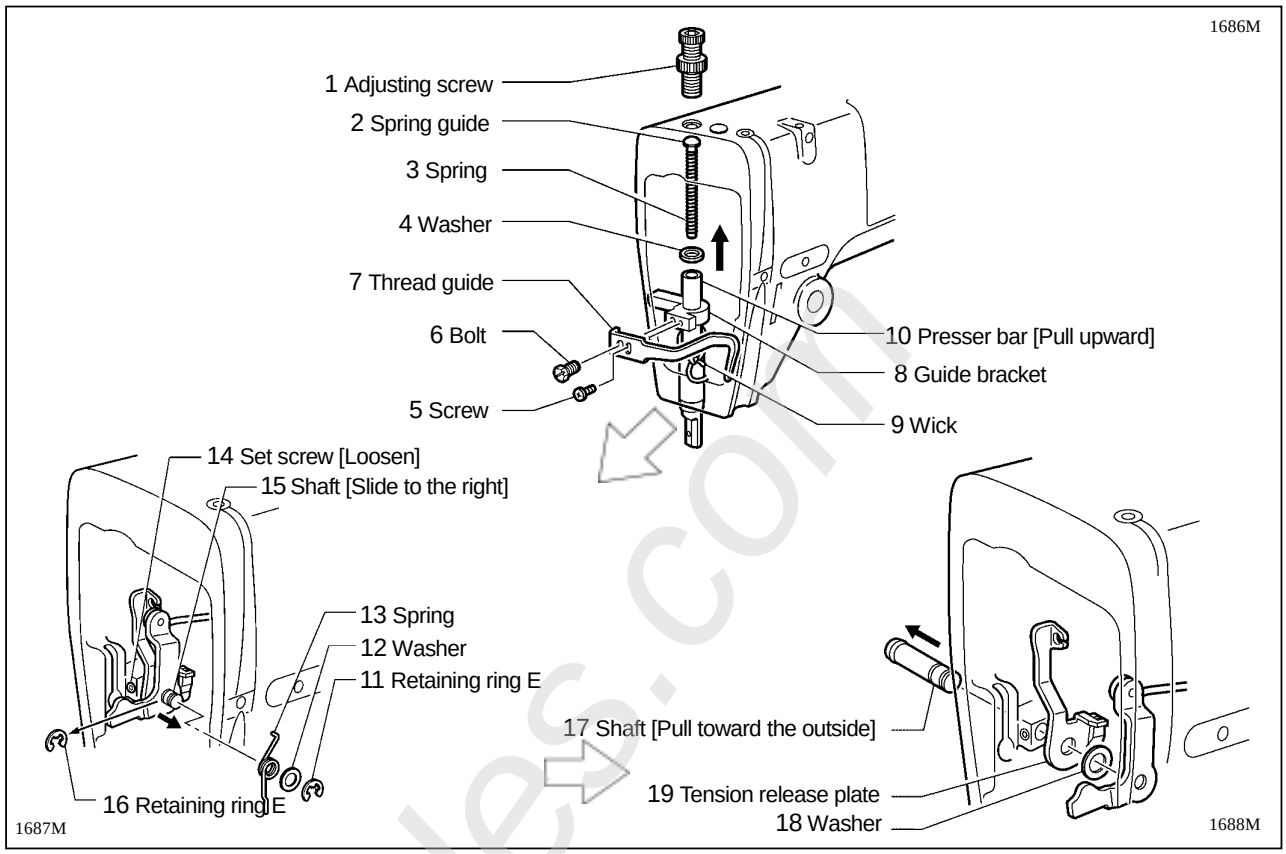
5-14. Feed bar mechanism



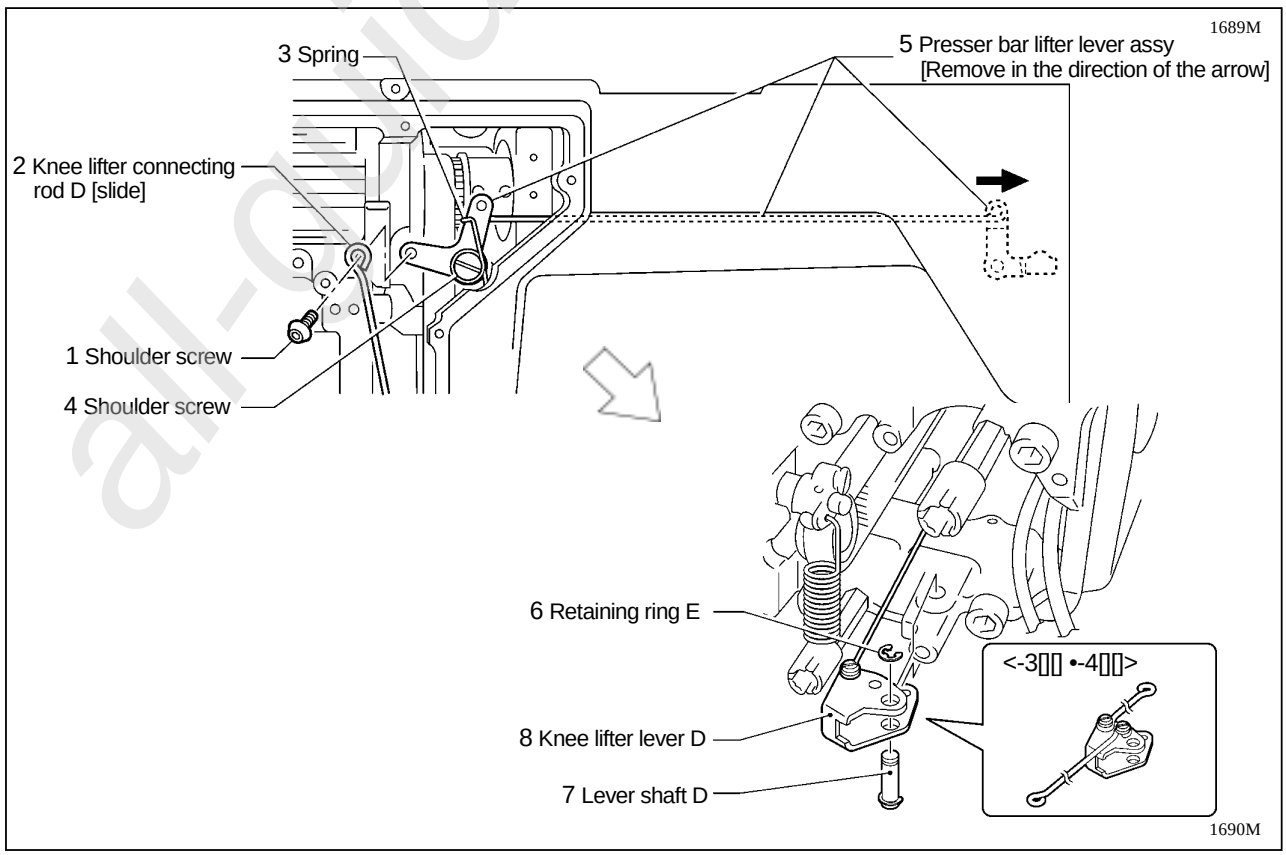
5-15. Feed rocker shaft



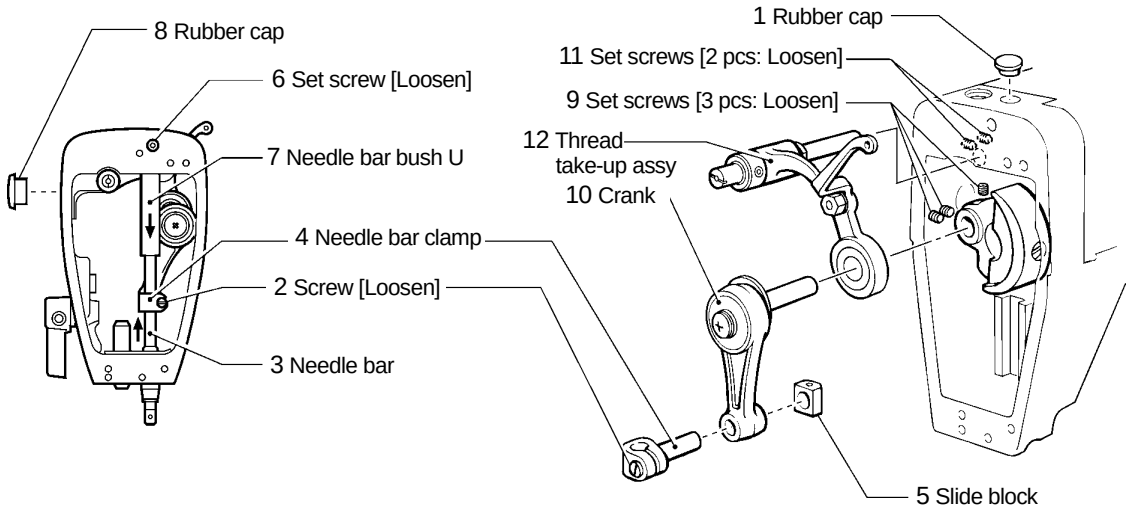
5-16. Presser foot mechanism



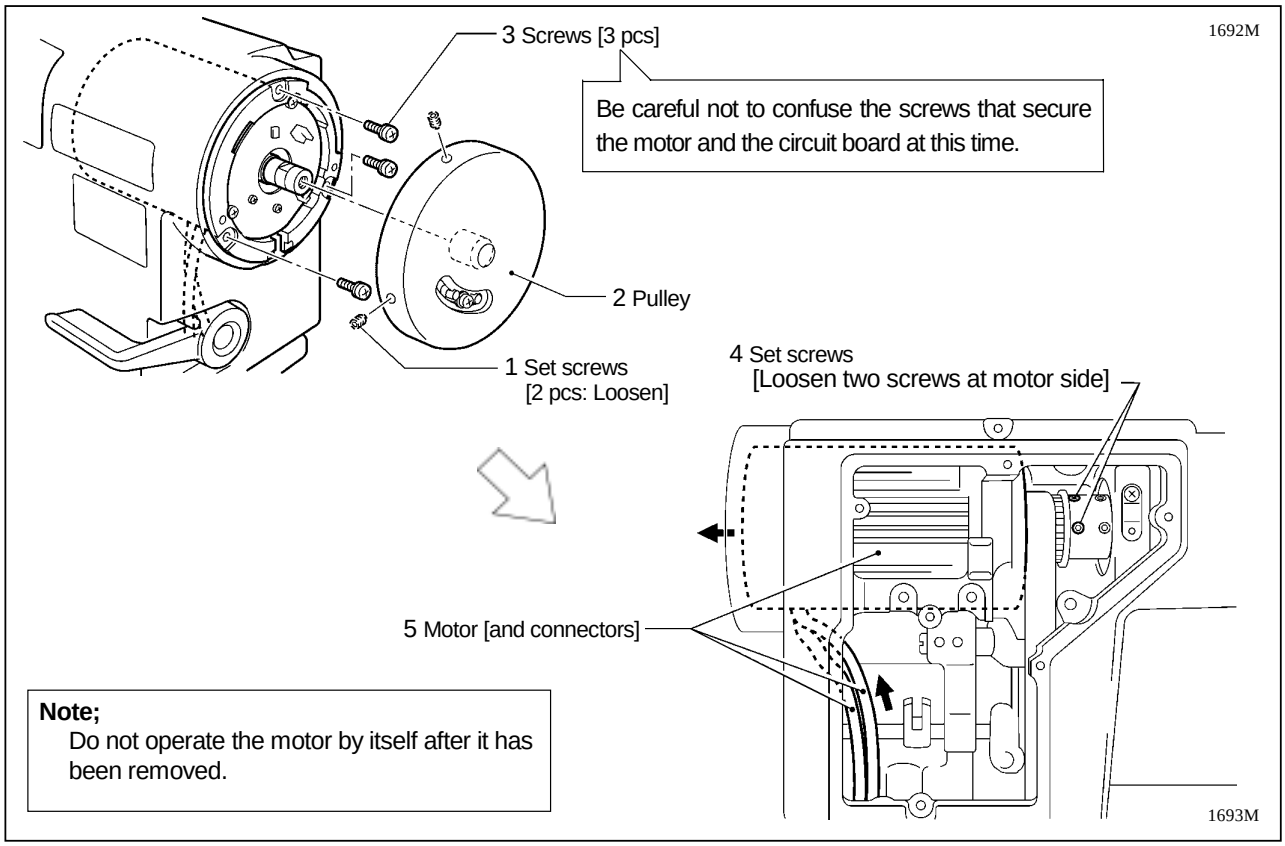
5-17. Knee lifter lever mechanism

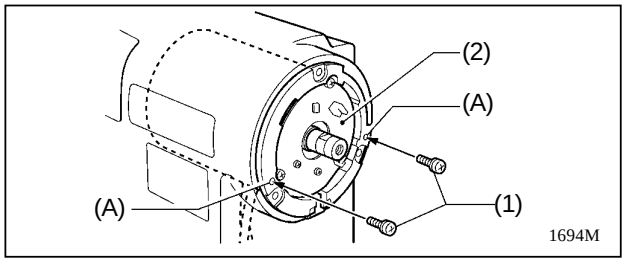


5-18. Needle bar and thread take-up mechanism



5-19. Pulley and motor

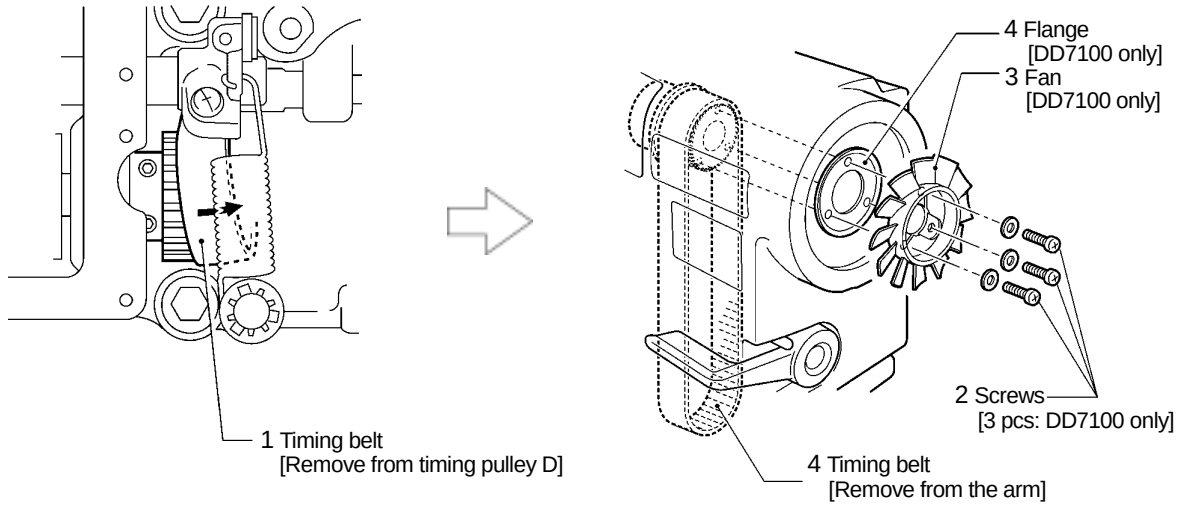




■ If the motor will not come out

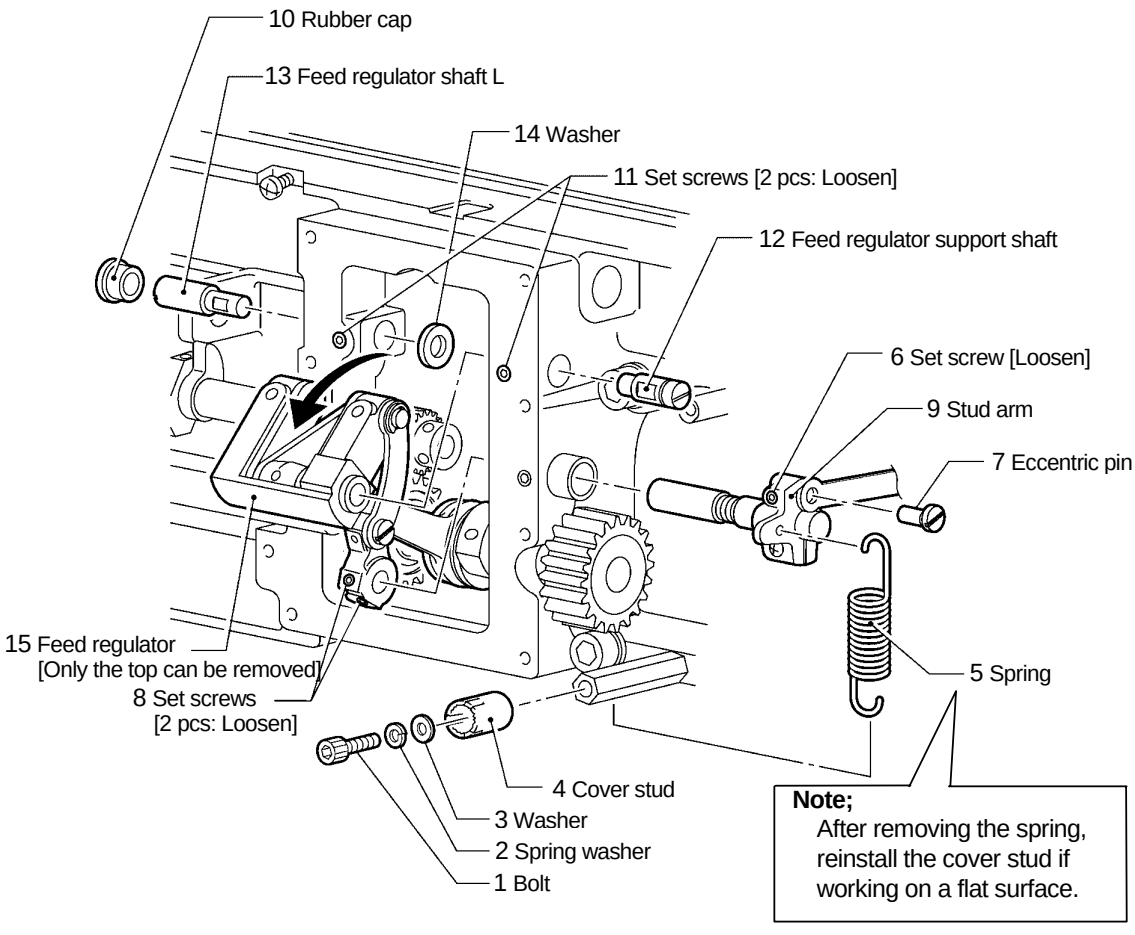
1. Insert the two screws (1) that were removed from the end of the motor into the screw holes (A), and tighten them. This will support the motor and make it easier to remove.
   Note; Tighten the screws (1) alternately left and right a little at a time.
2. After removing the motor (2), remove the screws (1).

5-20. Timing belt

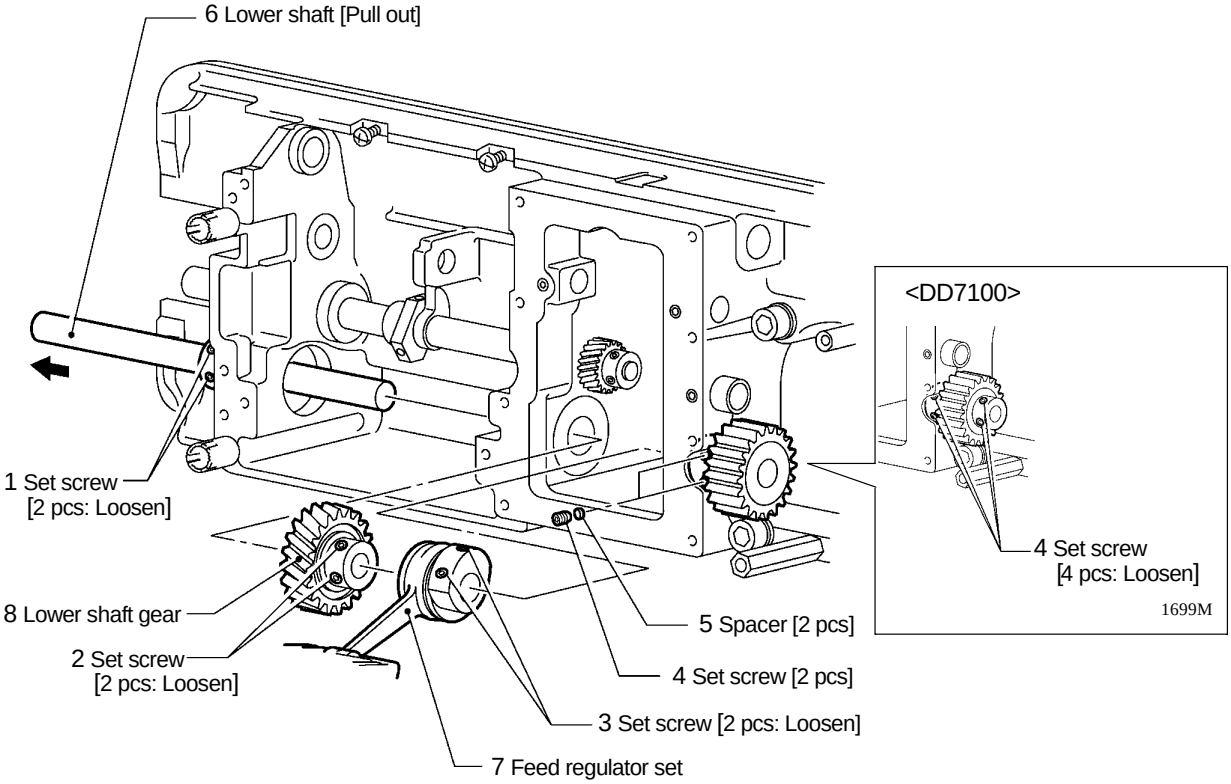


Note;
For the DD7100A and 710A, the fan and flange do not need to be removed.

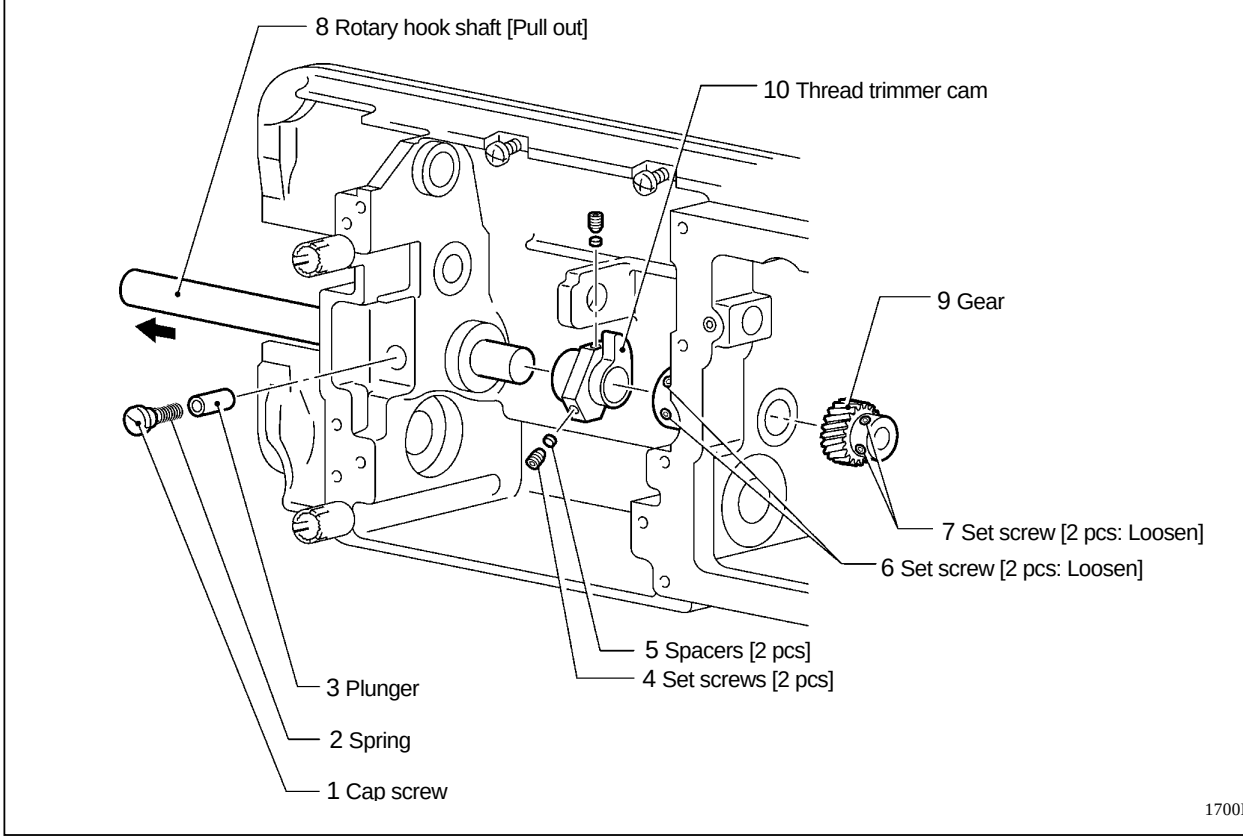
5-21. Spring and feed regulator



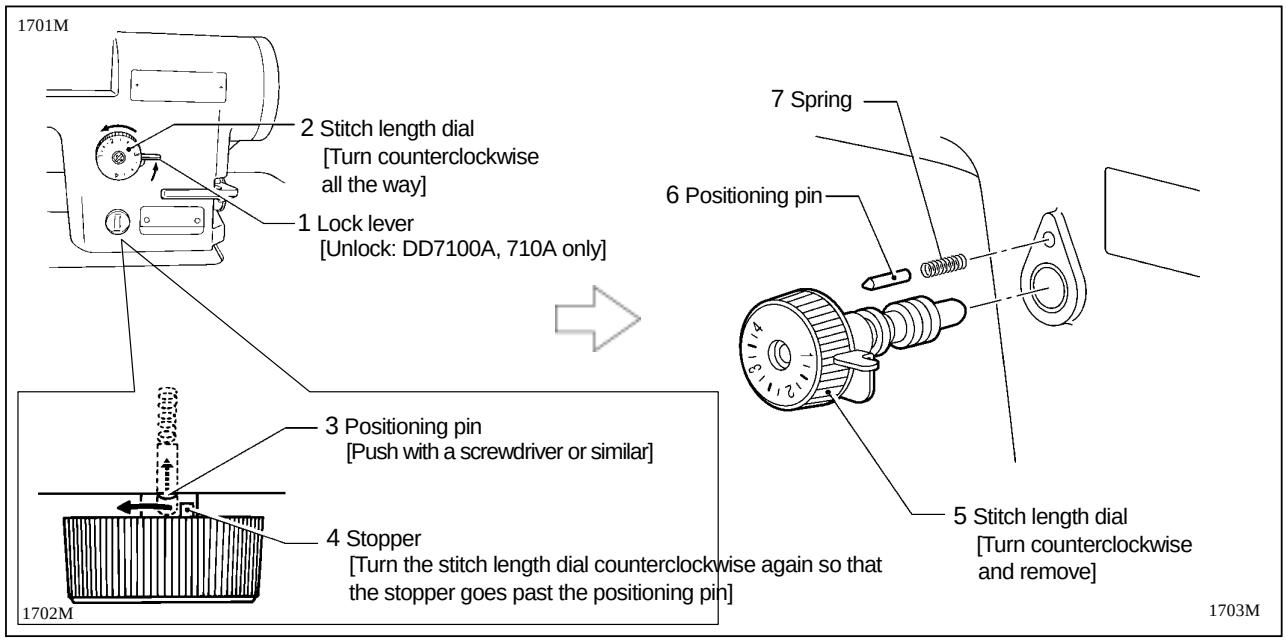
5-22. Lower shaft, lower shaft gear and feed regulator set



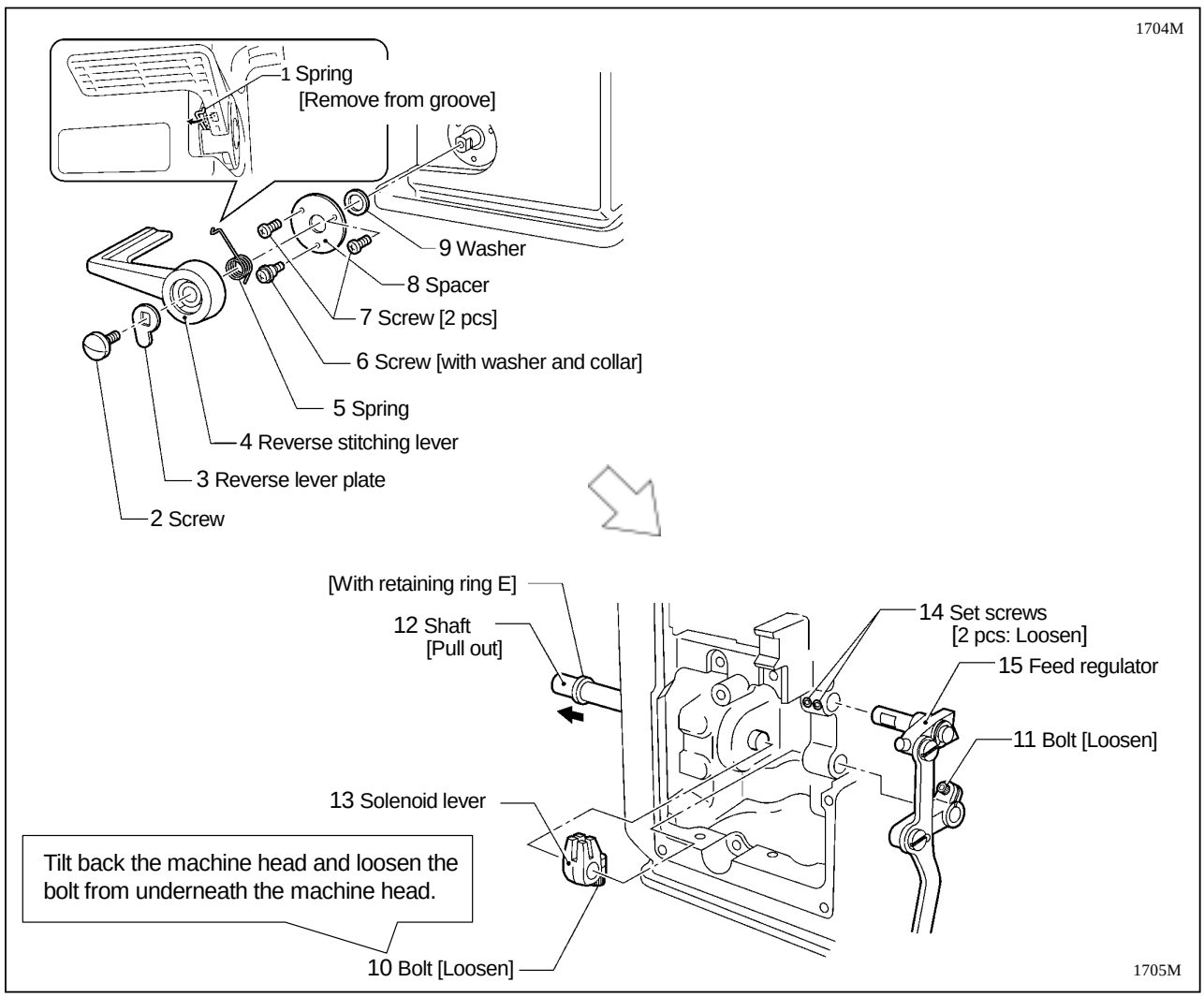
5-23. Plunger, rotary hook shaft, gear and thread trimmer cam



5-24. Stitch length dial



5-25. Reverse stitching lever and feed regulator



6. ASSEMBLY

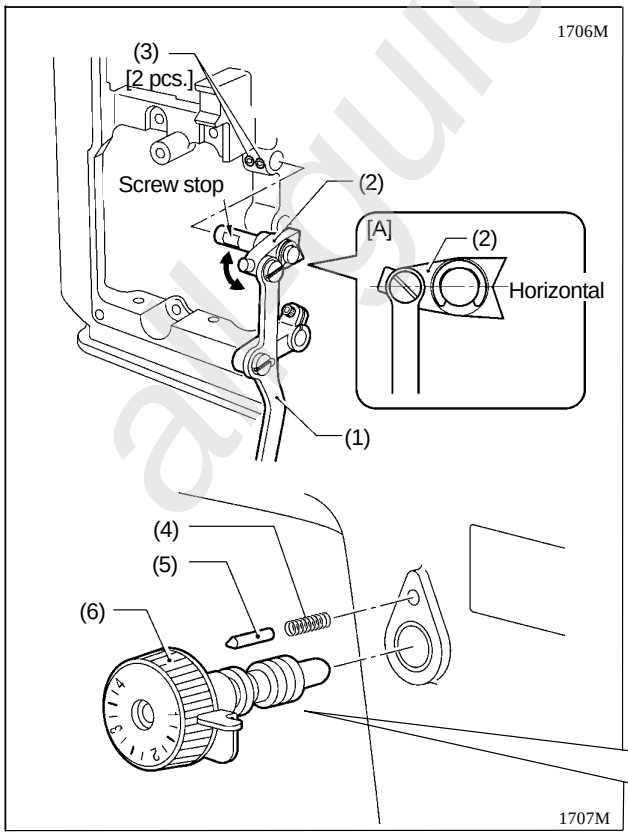
⚠ DANGER

Wait at least 10 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

⚠ CAUTION

- Disassembly and assembly of the sewing machine should only be carried out by a qualified technician.
- Turn off the power switch and disconnect the power cord from the wall outlet before assembly, otherwise 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.
- 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 slit, and your hand may get caught.
- Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.
  Furthermore, do not drink the oil under any circumstances, as they can cause vomiting and diarrhea.
- Keep the oil out of the reach of children.
  Use only the proper replacement parts as specified by Brother.
- If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.
- Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

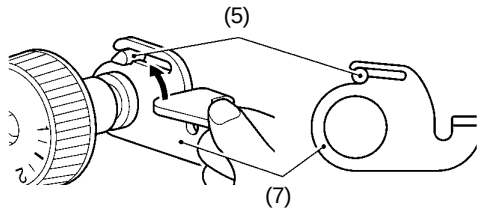
6-1. Stitch length dial, reverse stitching lever and feed regulator mechanism

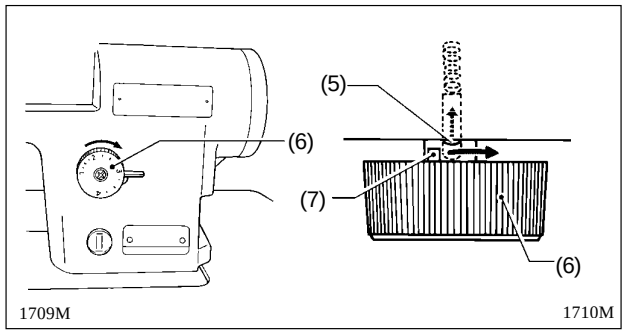


1. Insert the feed regulator assembly (1) into the mounting hole in the arm so that the screw stop is facing to the front.
2. Check that the feed regulator (2) moves smoothly with no play in the direction of the arrow, and then tighten the two set screws (3).
3. Set the feed regulator (2) so that it is horizontal as shown in figure [A], insert the spring (4) and the positioning pin (5) into the mounting hole, and then screw in the stitch length dial (6).

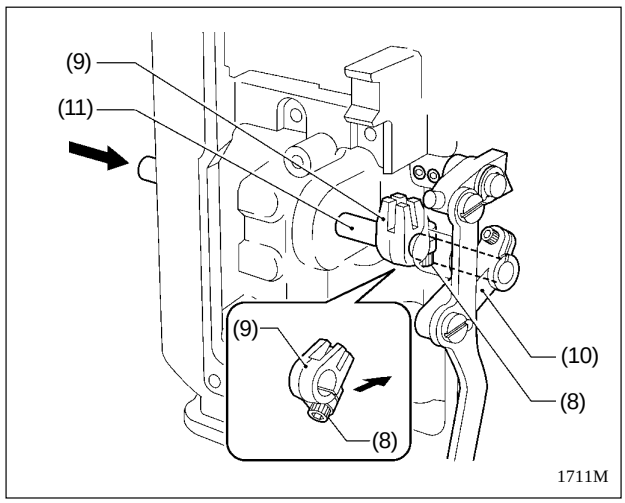
< For DD7100A, 710A >

The positioning pin (5) should be in the groove of the lock lever (7) when screwing in the stitch length dial (6).

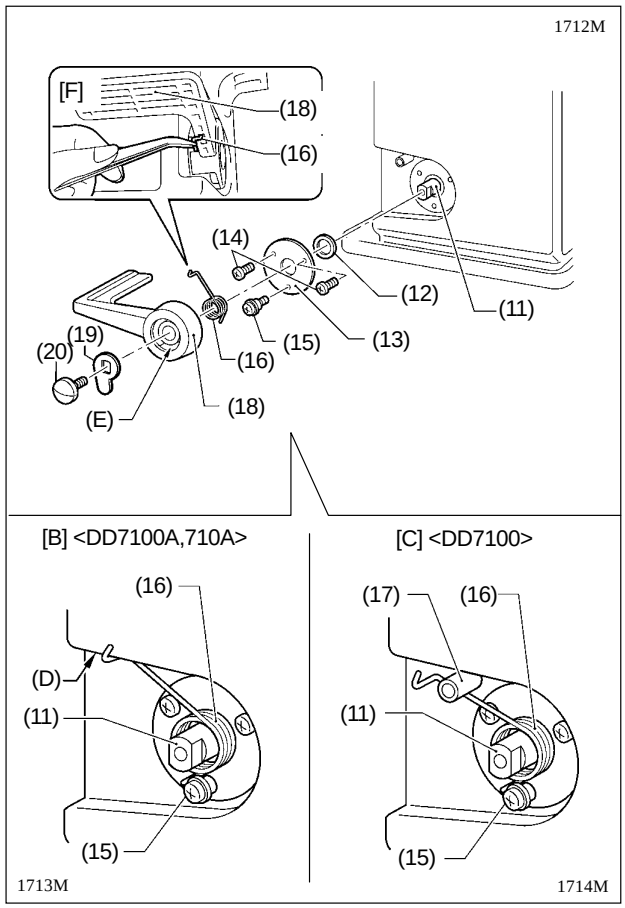




4. Turn the stitch length dial (6) clockwise all the way.
5. Push the positioning pin (5) with a screwdriver or similar, and then turn the stitch length dial (6) clockwise again so that the stopper (7) passes to the right of the positioning pin (5).

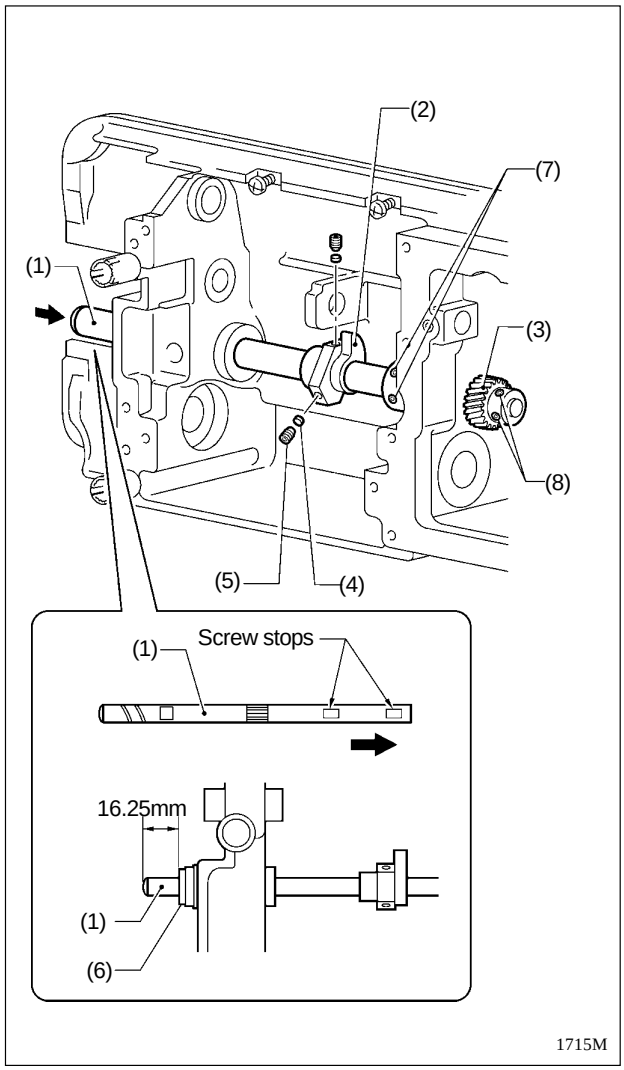


6. Set the bolt (8) so that it is facing away from you as shown in the illustration, and then pass the shaft (11) through the solenoid lever (9) and the handle shaft arm (10).



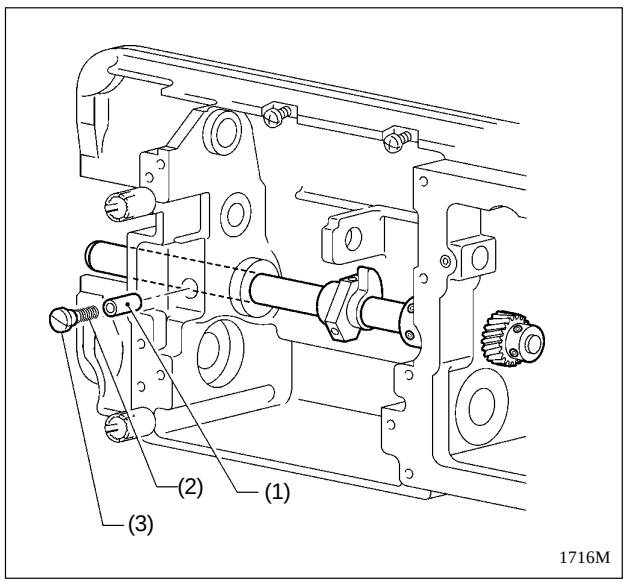
7. Place the washer (12) and spacer (13) onto the shaft (11), and then tighten the two screws (14) and the screw (with washer and collar) (15).
8. Pass the shaft (11) through the spring (16).
   <DD7100A, 710A>
   Hook the end of the spring onto the inside of the screw (15) and under surface (D) as shown in figure (B).
   <DD7100>
   Hook the end of the spring onto the inside of the screw (15) and under the stopper (17) as shown in figure (C).
9. Insert the reverse stitching lever (18).
10. Set the reverse lever plate (19) so that it is facing as shown in the illustration, and while inserting it into the groove in the reverse stitching lever (18), place it onto the shaft (11).
11. Tighten the screw (20).
12. Tilt back the machine head.
13. Use tweezers or similar to hook the longer end of the spring (16) into the second groove behind the reverse stitching lever (18) from underneath as shown in figure [F].

6-2. Rotary hook shaft, thread trimmer cam and gear



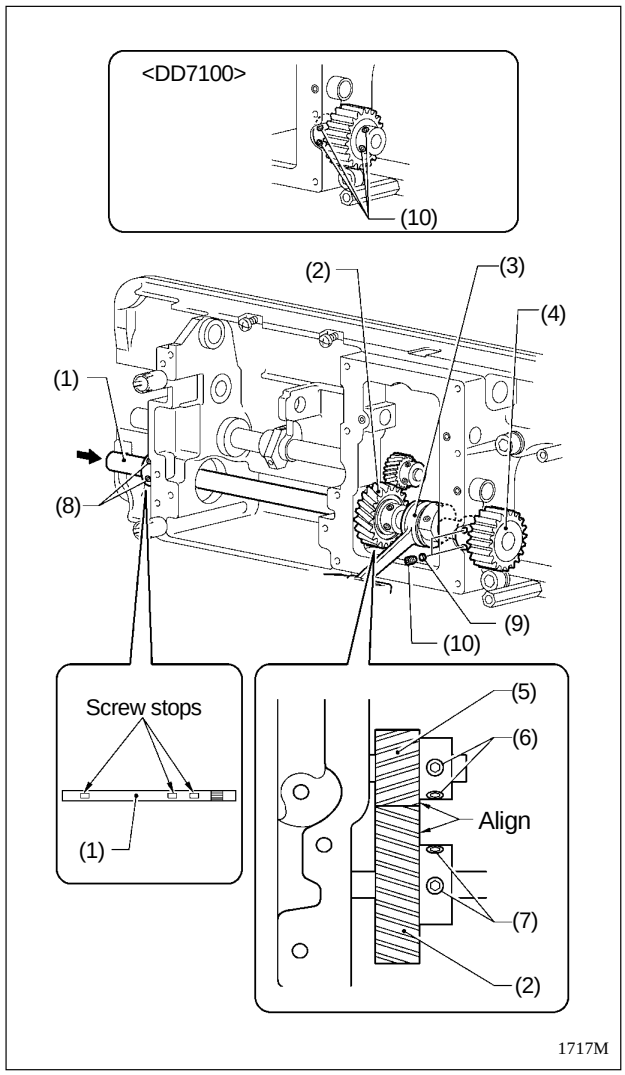
1. Insert the rotary hook shaft (1) into the arm so that the screw stops are at the right, and then place the thread trimmer cam (2) onto the rotary hook shaft (1) so that it faces as shown in the illustration.
2. Push the rotary hook shaft (1) all the way to the right, and then install the gear (3).
3. Insert the spacers (4) into the holes in the thread trimmer cam (2), and then tighten the set screws (5) (two places).
4. Push the rotary hook shaft (1) 16.25 mm to the left of the edge of the bush (6), and then tighten the two set screws (7) and the two set screws (8).
   * Align the screw stops of the rotary hook shaft (1) with the set screw above the set screws (7) and (8).
   * Check that the rotary hook shaft (1) turns smoothly with no play in the axial (left-right) direction.

6-3. Plunger

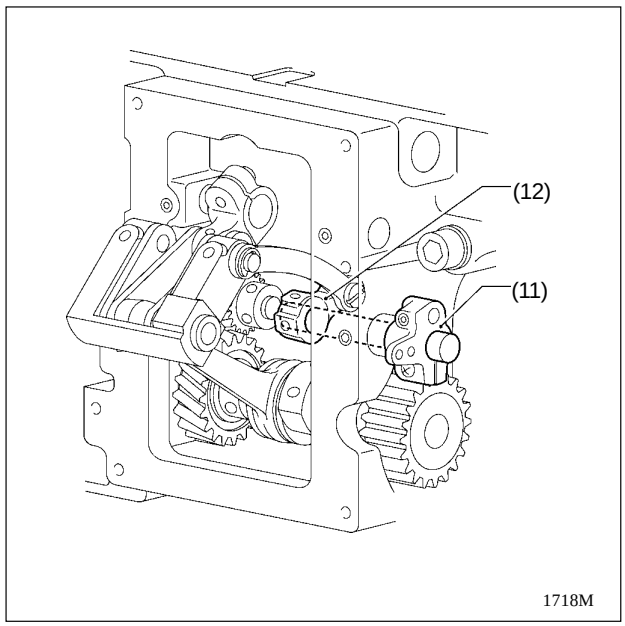


1. Insert the plunger (1) into the mounting hole as far as it will go.
2. Tighten the cap screw (3) that is attached to the spring (2).

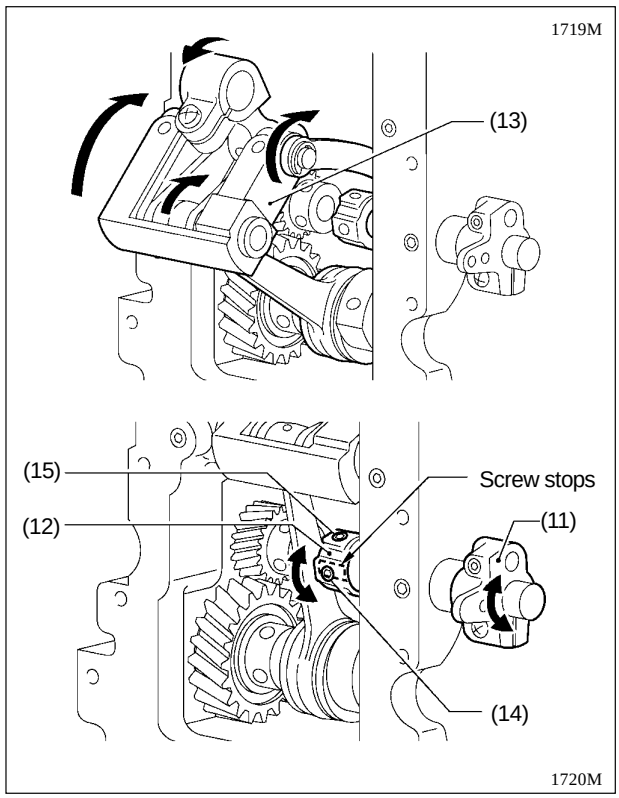
6-4. Lower shaft, lower shaft gear and feed regulator set



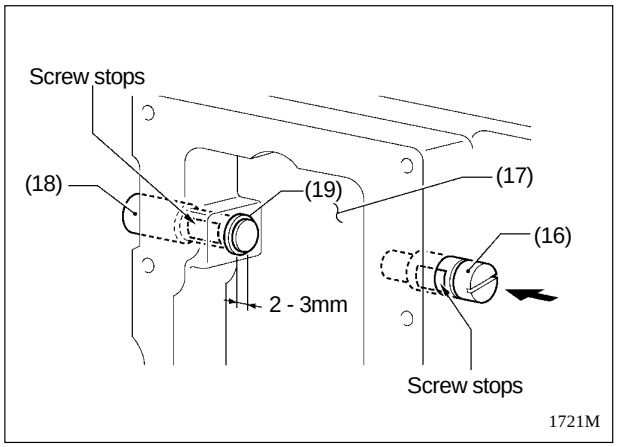
1. Hold the lower shaft (1) so that it faces as shown in the illustration, insert it into the arm, and pass it trough the lower shaft gear (2) and the level feed eccentric wheel (3) of the feed regulator assembly inside the gear box.
2. Insert the lower shaft (1) into timing pulley D (4) until it is almost to the edge of timing pulley D (4).
3. Set so that the set screw (6) above the gear (5) and the set screw (7) below the lower shaft gear (2) are facing forward, and then align the blade of the gear (5) with the blade of the lower shaft gear (2). In this condition, align the screw stops on the lower shaft (1), and then tighten the lower set screws (7).
4. Tighten the upper set screws (7).
5. Tighten the two set screws (8).
   (At this time, align the screw stops of the lower shaft (1) with the lower set screws (8).)
6. For the DD7100A and 710A, insert the two spacers (9) into the screw holes in timing pulley D (4).
7. While pushing the lower shaft (1) in the direction of timing pulley D (4), tighten the two set screws (10) [four set screws (10) for the DD7100].
   * Check that the lower shaft (1) turns smoothly with no play in the axial (left-right) direction.



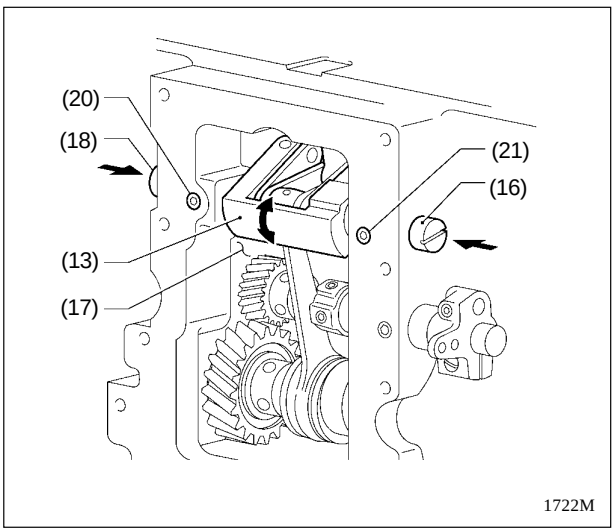
8. Insert the stud arm (11) into the arm, and then place it straight into the joint (12).



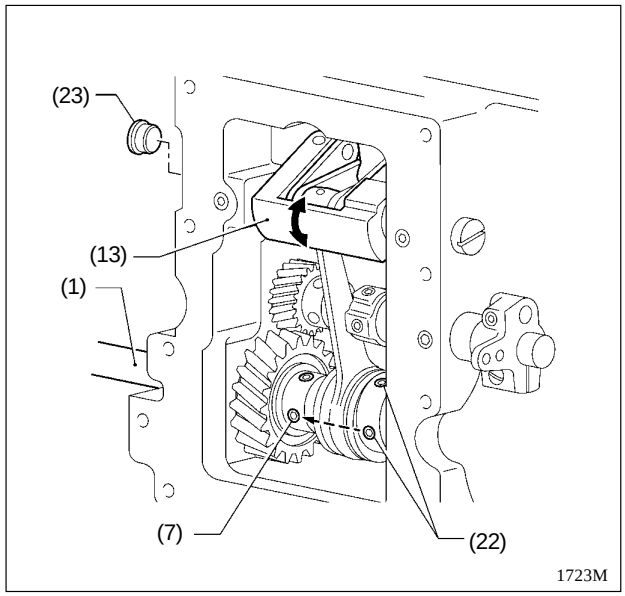
9. Push back the feed regulator (13) as shown in the illustration, set so that the lower set screw (14) is facing toward the front, align it with the screw stop of the stud arm (11) and then tighten the set screw (14).
   * Tighten the set screw (14) so that the stud arm (11) and joint (12) turn smoothly with no play.
10. Tighten the upper set screw (15).



11. Insert the feed regulator support shaft (16) into the gear box (17) as far as the inside edge and so that the screw stop is facing toward the front.
12. Insert feed regulator shaft L (18) into the gear box (17) so that it protrudes about 2--3 mm from the inside edge and so that the screw stop is facing toward the front, and then install the washer (19).

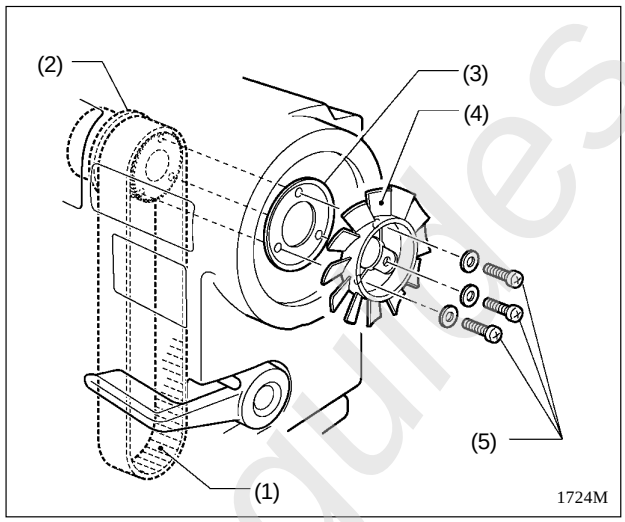


13. Push back the feed regulator (13) so that it goes into the gear box (17), and then insert feed regulator shaft L (18) and the feed regulator support shaft (16) into the holes in the feed regulator (13).
14. Push feed regulator shaft L (18) further in until the feed regulator (13) moves easily, and then tighten the set screws (20) and (21).

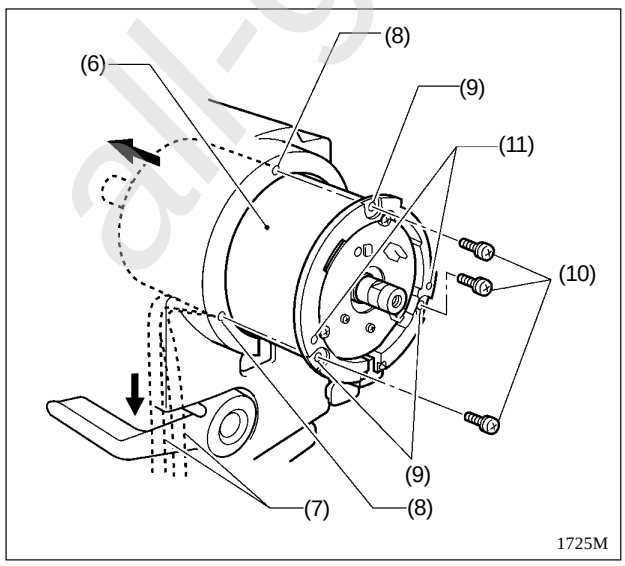


15. Align the lower set screw (22) and the set screw (7), then align the lower set screw (22) with the screw stop of the lower shaft (1) and tighten the set screw (22). At this time, make sure that the movement of the feed regulator (13) does not become stiffer.
16. Tighten the upper set screw (22).
17. Insert the rubber cap (23) into the left side of the gear box.

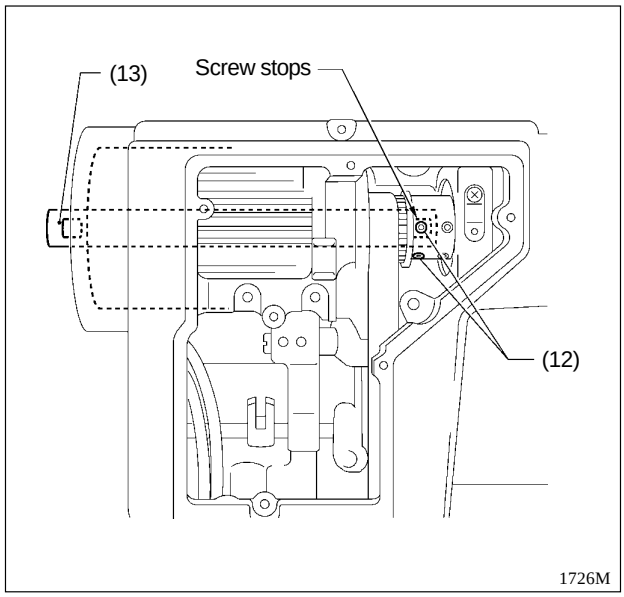
6-5. Timing belt, motor and pulley



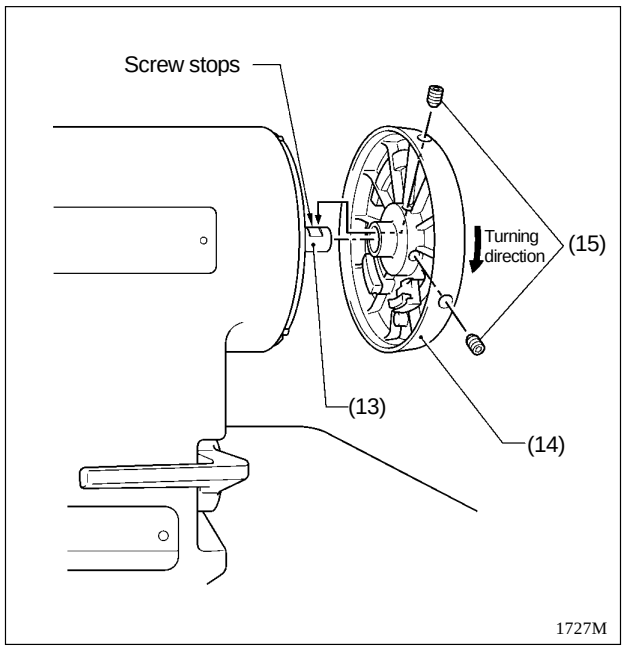
1. Insert the timing belt (1) through the motor mounting hole, and place it onto timing pulley U (2).
2. Install the flange (3) and the fan (4) to timing pulley U (2) with the three screws (5).
   <For DD7100A, 710A>
   This step is not required.



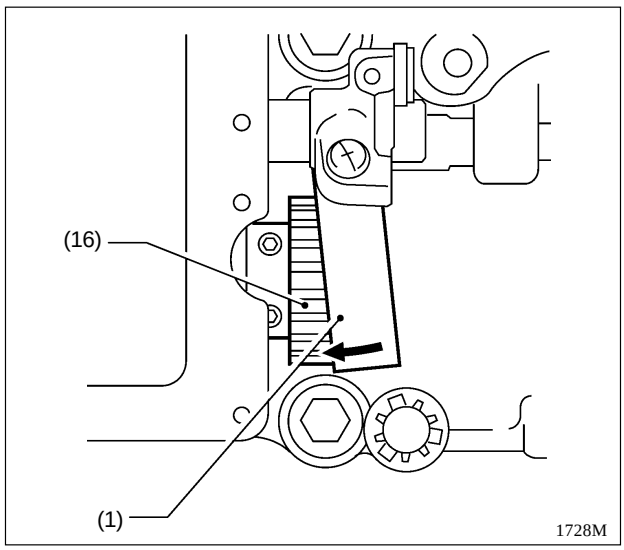
3. First pass the connector (7) of the motor (6) into the arm, and then insert the motor (6) into the arm as far as it will go.
4. Align the screw holes (8) in the arm with the screw holes (9) in the motor, and then secure the motor by tightening the three screws (10).
   * Be careful not to confuse screw holes (9) and (11).



5. Tighten the two motor-side screws (12) of the joint.
   * At this time, align the screw stop of the rotor (13) with the upper set screw (12).

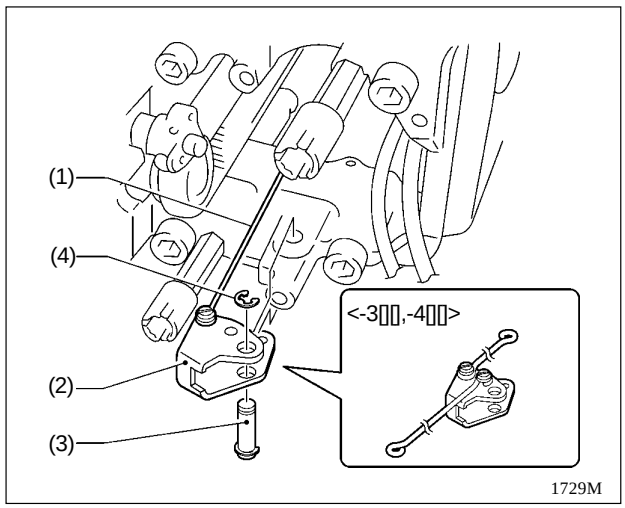


6. Set the rotor (13) so that the screw stop is facing upward, and then install the pulley (14).
7. Secure the pulley (14) to the rotor (13) with the two set screws (15)
   * At this time, the screw stop of the rotor (13) should be aligned with the set screw (15) that is at the rear relative to the turning direction of the pulley (14).

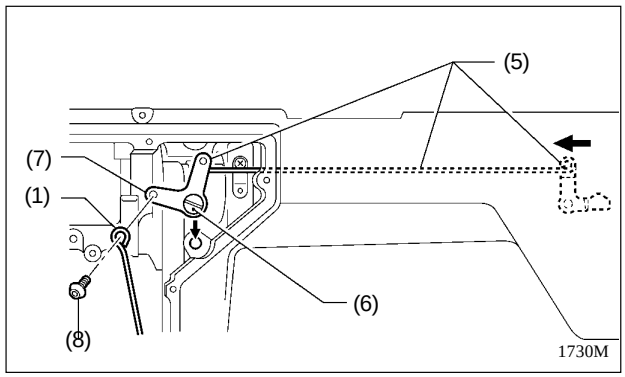


8. Tilt back the machine head.
9. Check that the timing belt (1) is correctly attached to timing pulley U (2) (refer to 1. on page 34), and then set the timing belt (1) onto timing pulley D (16).
   * While pushing the timing belt (1) in the direction of the arrow, turn the pulley (14) to set the timing belt (1) onto timing pulley D (16).

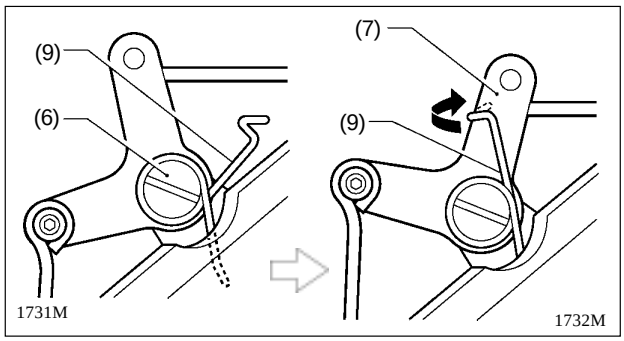
6-6. Knee lifter lever mechanism



1. Move the knee lifter connecting rod D (1) as far to the left as possible, and then insert knee lifter lever D (2) into the arm bed.
2. Insert lever shaft D (3) into knee lifter lever D (2) from underneath, and then attach retaining ring E (4).

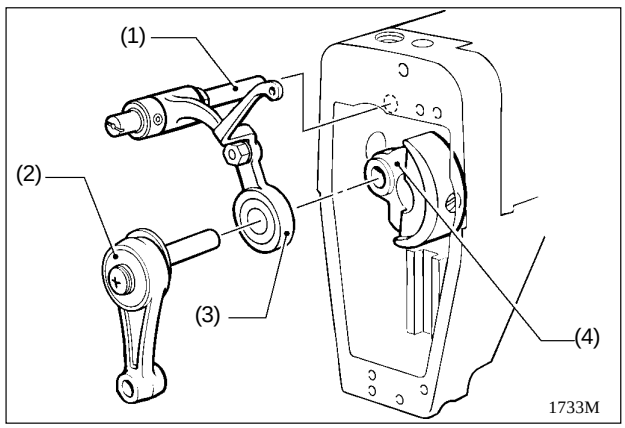


3. Insert presser bar lifter lever assembly (5) from the side of the machine head, and then install the knee lifter lever (7) to the arm bed with the shoulder screw (6) as shown in the illustration.
4. Install knee lifter connecting rod D (1) to the knee lifter lever (7) with the shoulder screw (8).

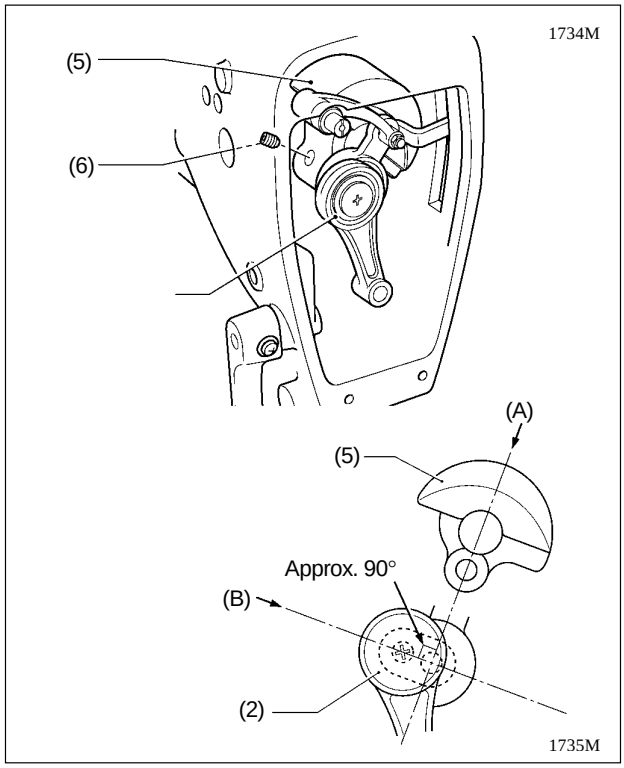


5. Install the spring (9) to the shoulder screw (6) so that it faces as shown in the illustration.
6. Hook the bent end of the spring (9) onto the knee lifter lever (7).

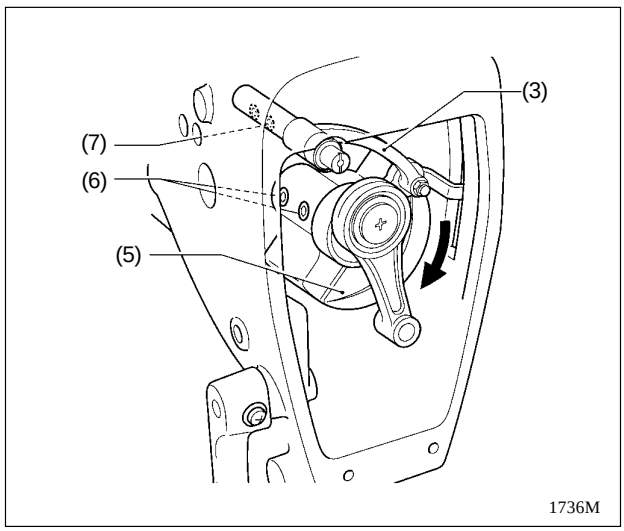
6-7. Needle bar and thread take-up mechanism



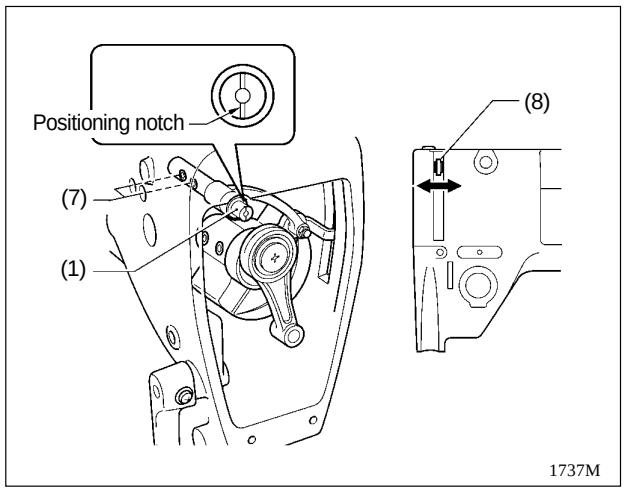
1. Insert the thread take-up support shaft (1) into the machine head as shown in the illustration.
2. Insert the crank (2) into the thread take-up assembly (3), and then insert it into the upper shaft assembly (4) as far as it will go.



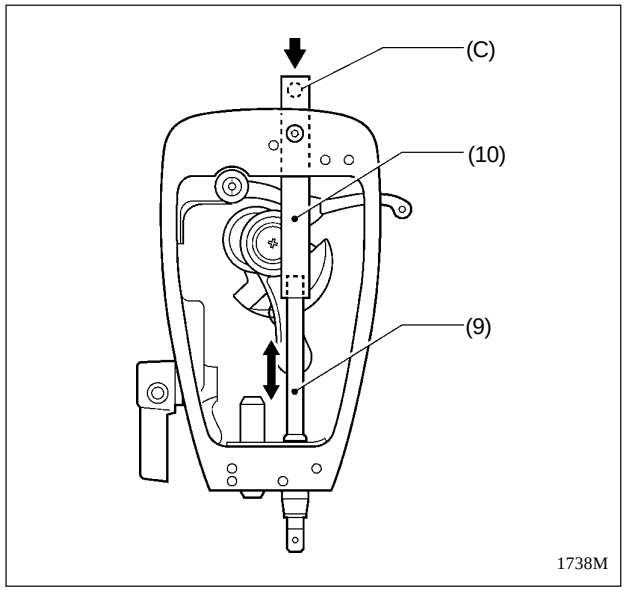
3. Set the thread take-up crank (5) so that line (A) is at a right angle to line (B) on the crank (2), and then while pushing the crank (2), tighten the set screw (6).
   (At this time, align the screw stop of the crank (2) with the set screw (6) when tightening it.)



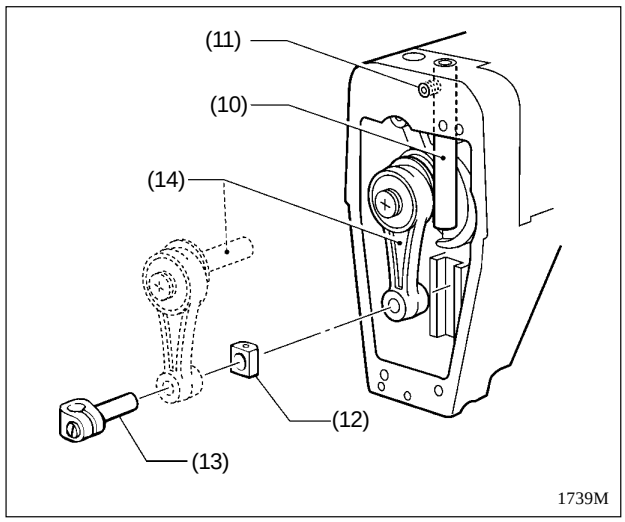
4. Turn the pulley to rotate the thread take-up crank (5), and then tighten the two set screws (6).
5. Turn the pulley back and forth two or three times by about 90°. (The upper shaft will turn and the thread take-up assembly (3) will move into position.)
   After doing this, provisionally tighten the set screw (7) on the face plate.



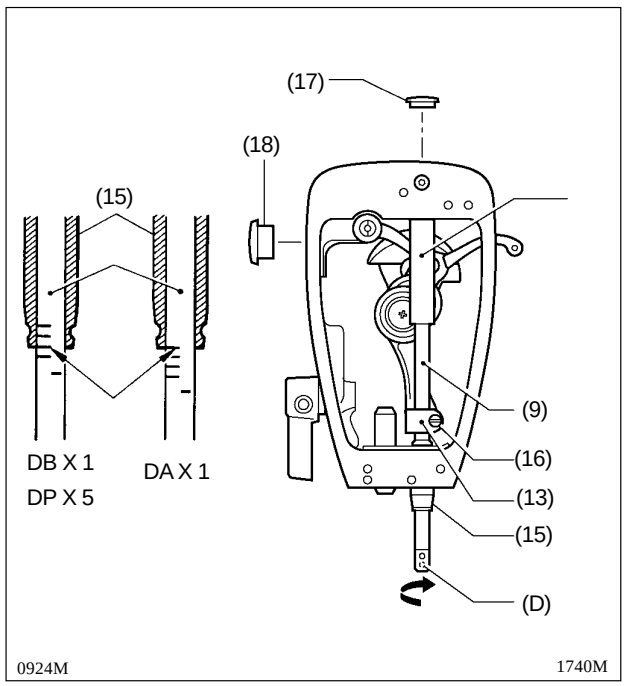
6. Gently move the thread take-up lever (8) to the left and right and check that there is a small amount of sideways play in the thread take-up lever (8).
7. Set the thread take-up support shaft (1) so that the positioning notch is vertical, and then tighten the two set screws (7).



8. Insert the needle bar (9) into the arm from above.
9. Tap needle bar bush U (10) into the arm so that the hole (C) is facing toward the pulley.
   * Tap in needle bar bush U (10) while checking that the needle bar (9) can move up and down smoothly.
     (This is to check that needle bar bush U (10) is being tapped in straight downward.)
   * Tap in needle bar bush U (10) until its top is about flush with the top of the arm.
10. Pull the needle bar (9) out from the bottom of the arm.

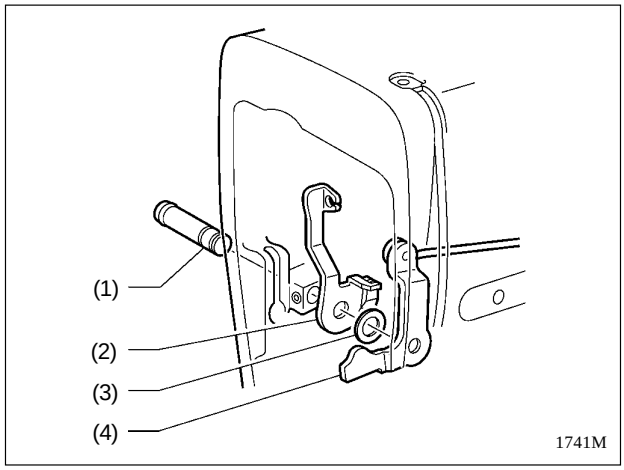


11. Tighten the set screw (11) to secure needle bar bush U (10).
12. Insert the slide block (12) into the groove in the arm so that the bevelled side is facing inward.
13. Insert the needle bar clamp (13) into the crank rod (14) and the slide block (12).

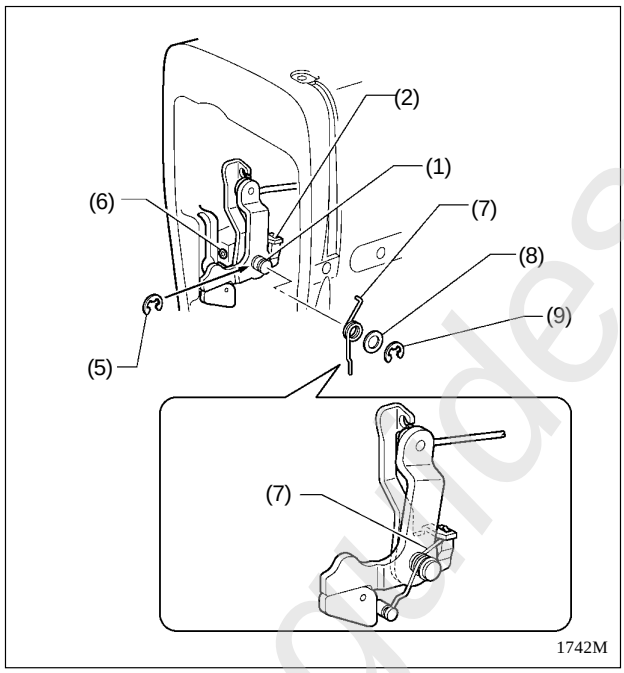


14. Insert the needle bar (9) into the arm from above.
15. Set the needle bar (9) so that the screw hole (D) is facing toward the pulley.
16. Turn the pulley to set the needle bar (9) to its lowest position, and then align the reference line (E) on the needle bar (9) with the bottom edge of needle bar bush D (15) in accordance with the type of needle to be used.
17. Tighten the screw (16) of the needle bar clamp (13).
18. Insert the rubber caps (17) and (18).

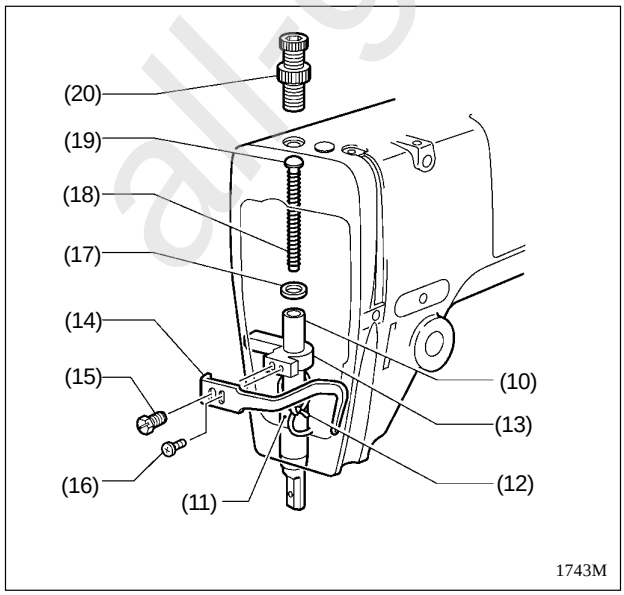
6-8. Presser foot mechanism



1. Insert the shaft (1) into the arm.
2. Place the tension release plate (2) and the washer (3) onto the shaft (1).
3. Place the presser bar lifter lever (4) onto the shaft (1).

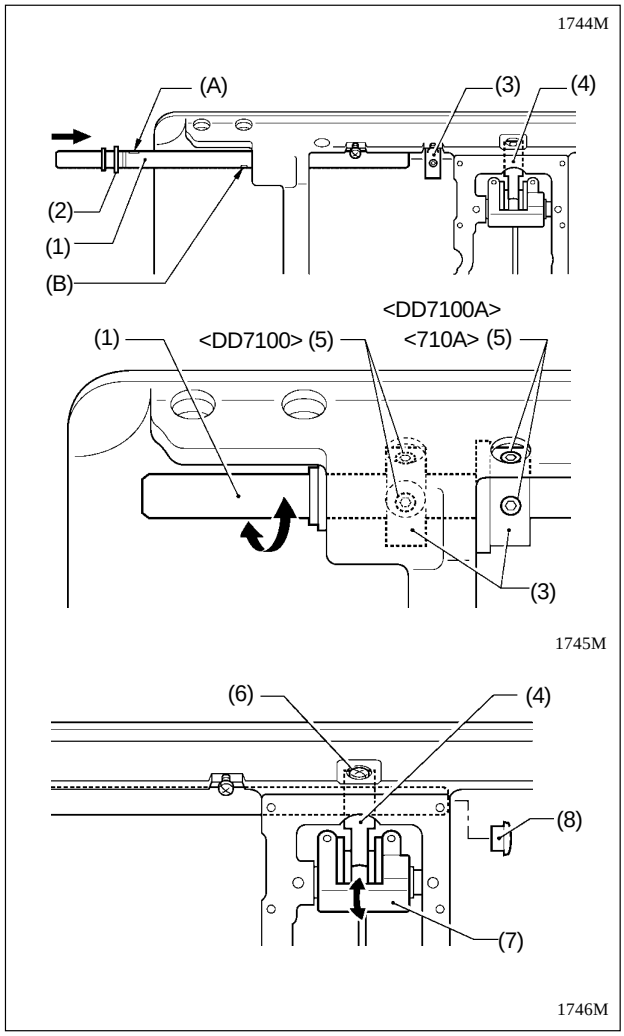


4. Push the shaft (1) to the right, and then install retaining ring E (5) to the left-side groove.
5. Move the shaft (1) to the left, and then tighten the set screw (6) on the arm.
6. Place the spring (7) onto the shaft (1), and then attach it to the tension release plate (2) and to the pin of the arm.
7. Place the washer (8) onto the shaft (1), and then install retaining ring E (5) to the right-side groove.



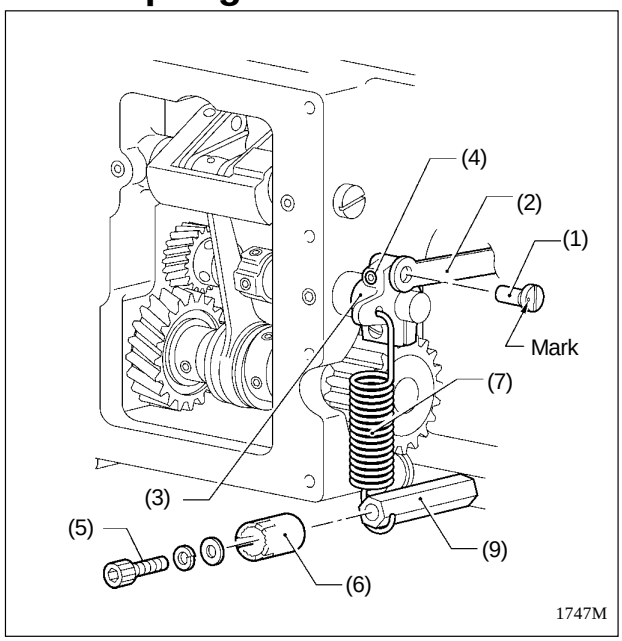
8. Insert the presser bar (10) through the top of the arm, and insert it into the bush (11).
9. Attach the wick (12) to the presser bar (10).
10. Install the guide bracket (13) to the arm and to the presser bar (10).
11. Install the thread guide (14) to the guide bracket (13), and provisionally tighten it with the bolt (15) and the screw (16).
12. Place the washer (17) on top of the presser bar (10), and then insert the spring (18) and the spring guide (19) through the top of the arm.
13. Install the adjusting screw (20) to the top of the arm.

6-9. Feed rocker shaft



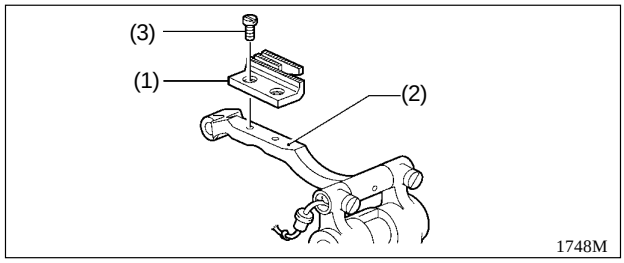
1. Place the washer (2) onto the feed rocker shaft (1), and then insert the feed rocker shaft (1) into the arm.
   * Insert the feed rocker shaft (1) so that the screw stop (A) of the feed rocker shaft (1) is facing upward and the oil tube hole (B) is facing downward.
2. When the feed rocker shaft (1) is in the position shown in the illustration, place the collar (3) onto it, and then push the feed rocker shaft (1) in further.
   * Tap a wedge or similar into the feed rocker arm (4) so that the feed rocker shaft (1) can pass through.
3. Align the screw stop (A) on the feed rocker shaft (1) with the rear set screw (5) relative to the pulley turning direction, and then secure the collar (3) by tightening the two set screws (5).
   * Check that the feed rocker shaft (1) moves smoothly with no play.
4. Remove the wedge, and then tighten the screw (6) of the feed rocker arm (4).
   * Check that the feed regulator (7) moves easily.
5. Insert the rubber cap (8) into the hole in the right side of the gear box.

6-10. Spring

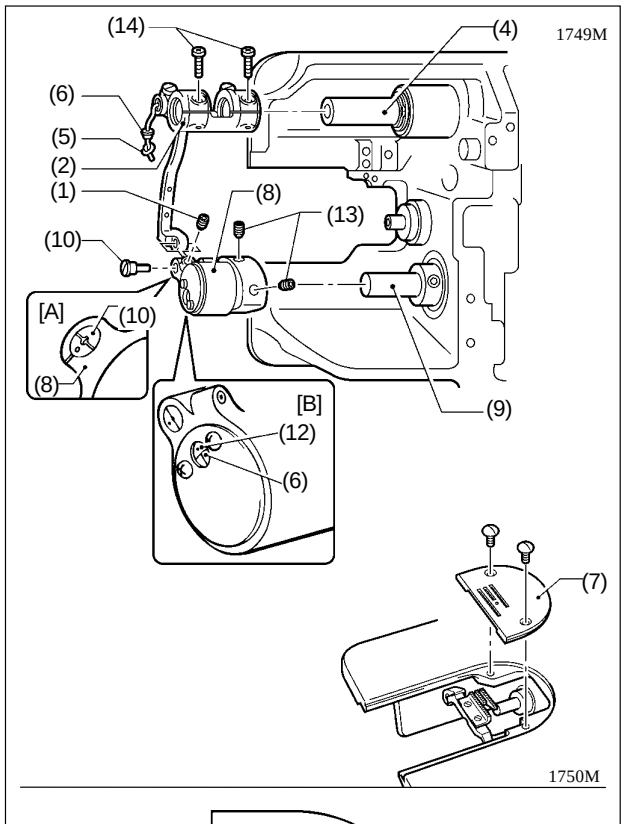


1. Insert the eccentric pin (1) into the connecting rod (2) and the stud arm (3) so that the mark is facing in the opposite direction to the motor (toward the bottom).
2. Tighten the set screw (4).
3. Loosen the bolt (5), and then remove the cover stud (6).
4. Install the spring (7) to the stud arm (3) and stud (9) so that it faces as shown in the illustration.
5. Install the cover stud (6) with the bolt (5).

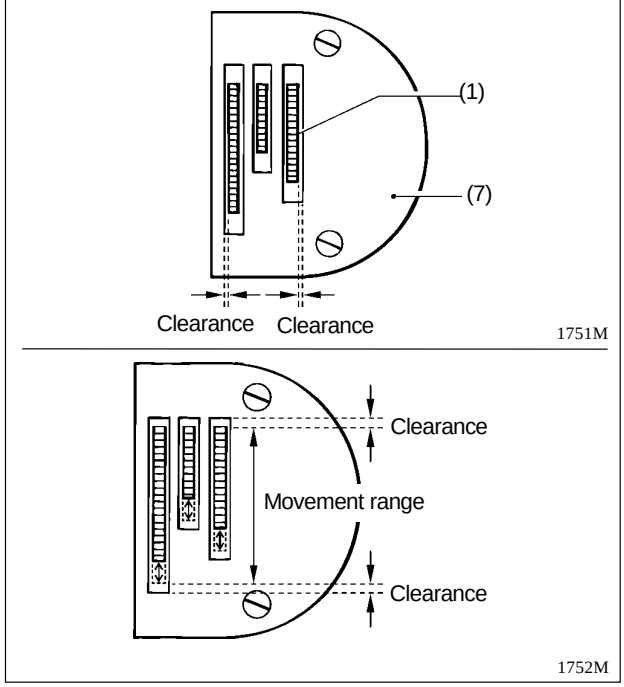
6-11. Feed bar mechanism



1. Install the feed dog (1) to the feed bracket assembly (2) with the two screws (3).



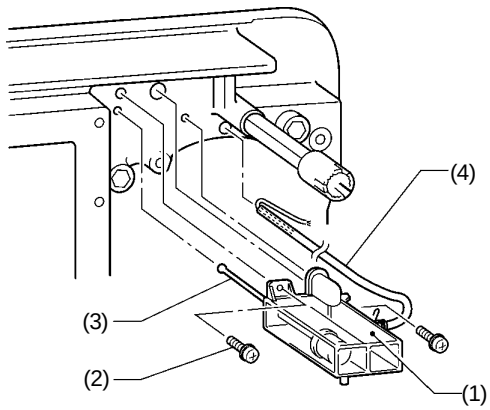
2. Place the feed bracket assembly (2) onto the feed rocker shaft (4).
3. Insert the wick (5) into the hole in the feed rocker shaft (4), and then insert the oil cap (6).
4. Provisionally install the needle plate (7) in order to position the feed bracket assembly (2).



5. Move the feed bracket assembly (2) to the left and right until the left and right clearances between the feed dog (1) and the needle plate (7) are the same.
   [Feed dog left/right adjustment]
6. Place the feed lifting eccentric wheel assembly (8) onto the lower shaft (9).
7. Place the end of the feed bracket assembly (2) into the fork in the feed lifting eccentric wheel assembly (8), and then insert the feed lifting rock bracket stud (10).
8. Align the O mark of the feed lifting rock bracket stud (10) with the reference line on the feed lifting eccentric wheel assembly (8), and then tighten the set screw (11). (Figure (A))
9. Align the O mark of the feed lifting eccentric wheel (12) with the reference line on the lower shaft (9), and then tighten the two set screws (13). (Figure (B))
10. Adjust the forward/back position of the feed dog (1).
    1) Turn the stitch length dial to the maximum setting.
    2) Turn the pulley to rotate the feed bracket assembly (2) in order to adjust so that the clearance between the movement range of the feed dog (1) and the needle plate (7) is equal at the front and the back.
    3) Tighten the two screws (14).

6-12. Sub tank, wick holder and wick

<DD7100A, 710A>

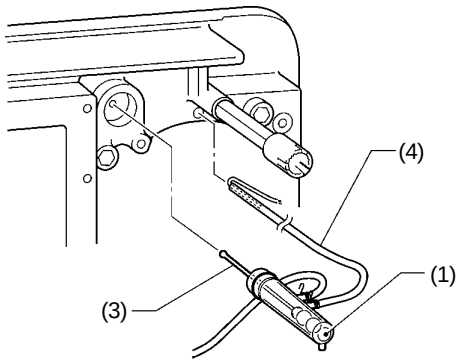


1753M

<DD7100A, 710A>

1. Install the sub tank (1) to the arm bed with the two screws with washer (2).
   * Be careful not to bend the oil gauge (3) at this time.
2. Insert all of the oil tubes (4) containing the wicks through the hole in the arm bed.
   (Continue to step 3.)

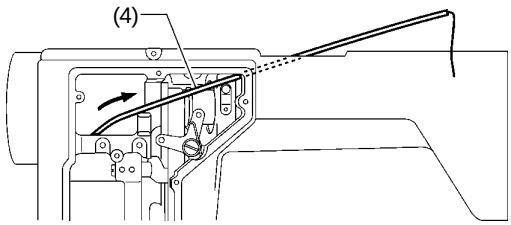
<DD7100>



1754M

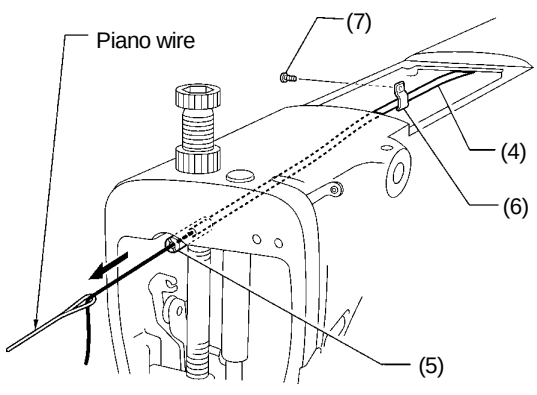
<DD7100>

1. Insert the oil gauge guide (1) into the mounting hole in the arm bed so that it faces as shown in the illustration.
   * Be careful not to bend the oil gauge (3) at this time.
2. Insert all of the oil tubes (4) containing the wicks through the hole in the arm bed.



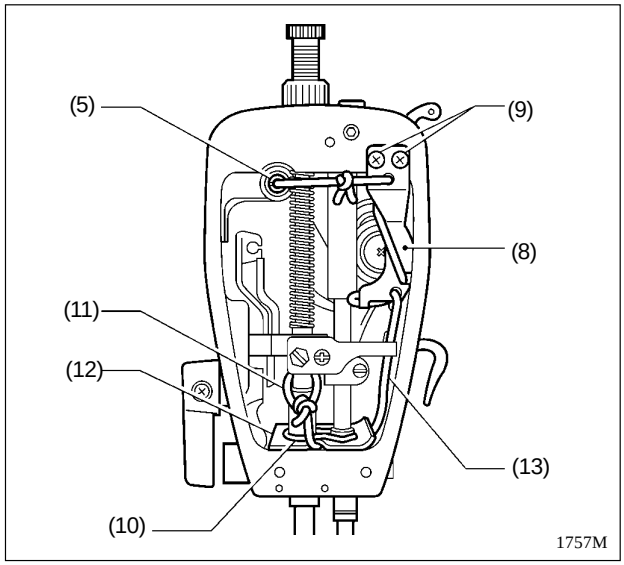
1755M

3. Route the oil tube (4) as shown in the illustration.



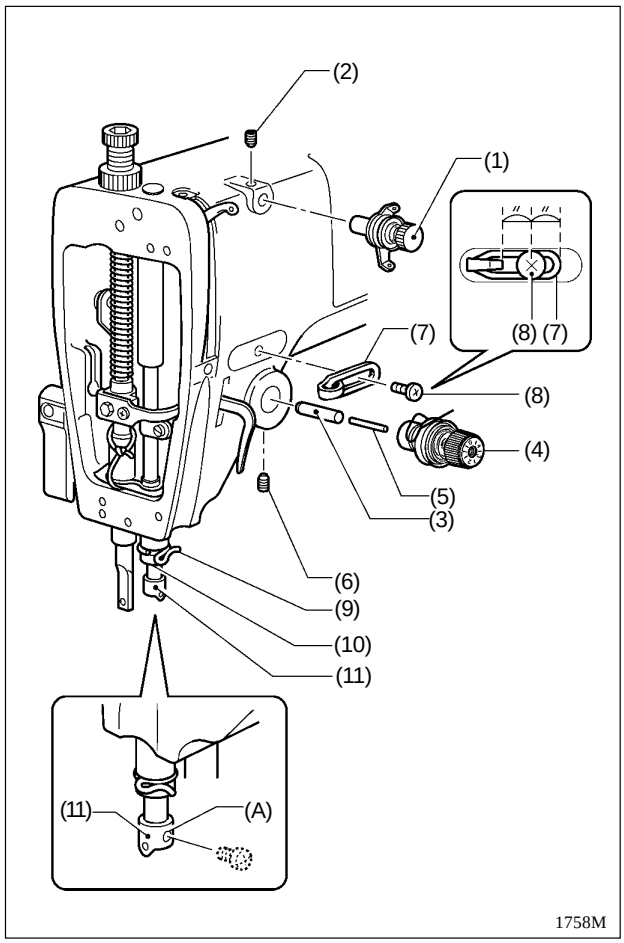
1756M

4. Use piano wire or similar to pass the wick in the oil tube (4) through the thread take-up support shaft (5)
5. Use your finger to check that the end of the oil tube (4) is inserted into the hole in the thread take-up support shaft (5).
6. Secure the oil tube (4) with the cord holder (6), and tighten the screw (7) from outside the arm.



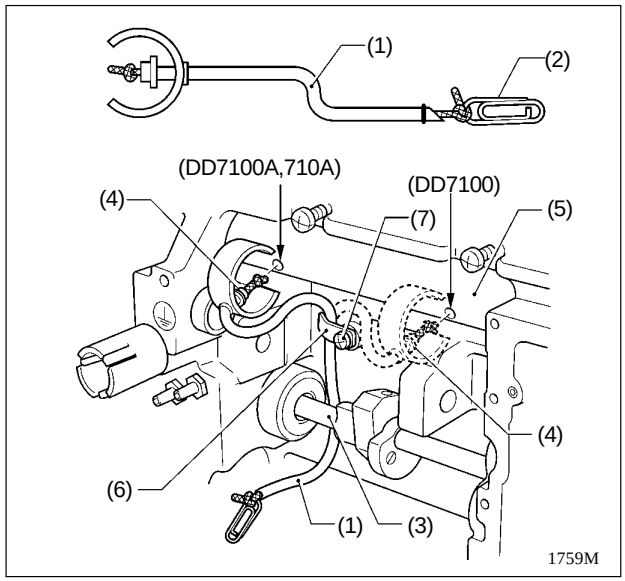
7. Install the wick holder (8) to the arm with the two screws (9).
8. Tie together the wick that is coming out from the wick holder (8) and the wick that is coming out from the thread take-up support shaft (5).
9. Lift the felt support (10) up slightly.
10. Pull the wick (11) and insert the end under the felt (12).
11. Run the wick (13) along the inside of the arm and insert the end under the felt (12).
12. Clamp the felt (12) with the felt support (10).

6-13. Thread tension mechanism



1. Insert the pre-tension assembly (1) into the arm so that it faces as shown in the illustration, and then tighten the set screw (2).
2. Insert the tension release stud (3) into the mounting hole.
3. Insert the pin (5) into the thread tension bracket assembly (4), then insert it into the mounting hole and tighten the set screw (6).
4. Install the arm thread guide (7) with the screw (8).
   * Tighten the screw (8) so that it comes to about the center of the arm thread guide (7).
5. Install thread guide D (9) to the groove in needle bar bush D (10) so that the part that catches the thread faces toward the front.
6. Install the thread guide (11) to the needle bar, and then align the needle set screw hole (A) with the needle bar hole.

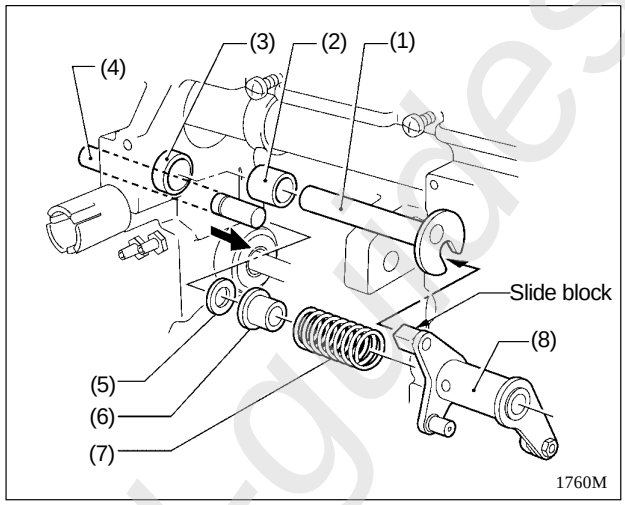
6-14. Oil (Feed rocker shaft)



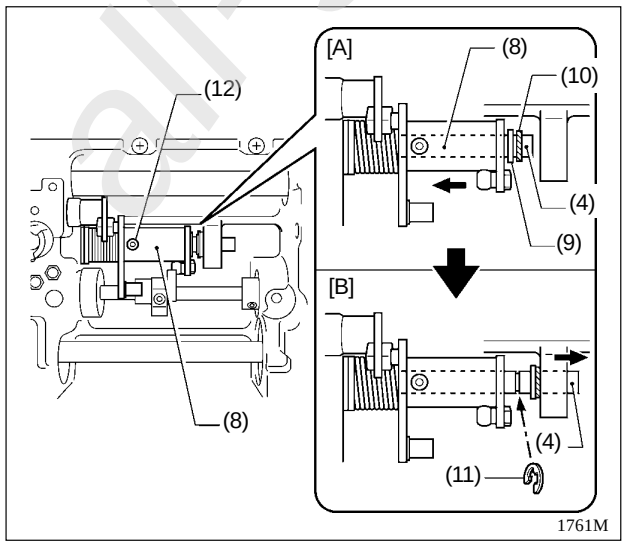
1. Secure the end of the wick in the oil tube (1) using a clip (2) or similar as shown in the illustration. (This is to prevent the wick from being pulled into the oil tube.)
2. Pass the oil tube (1) behind the rotary hook shaft (3), and insert oil cap (4) into the mounting hole in the feed rocker shaft (5).
3. Secure the oil tube (1) with the cord holder (6) and tighten the screw (7).

6-15. Thread trimming mechanism

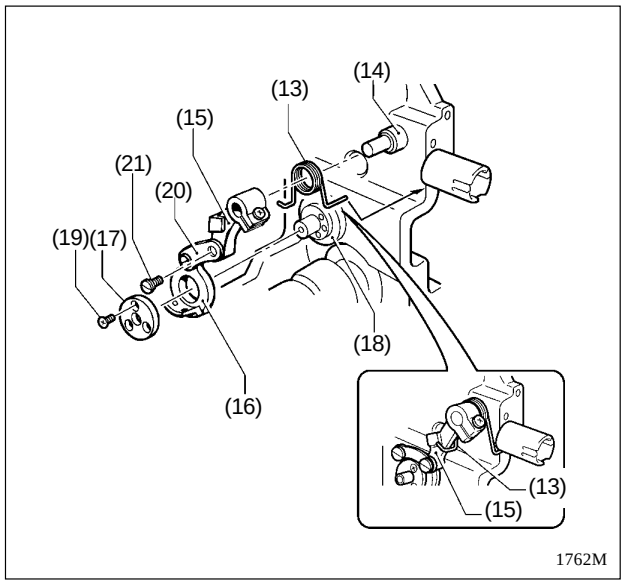
6-15-1. Installing the thread trimmer cam lever



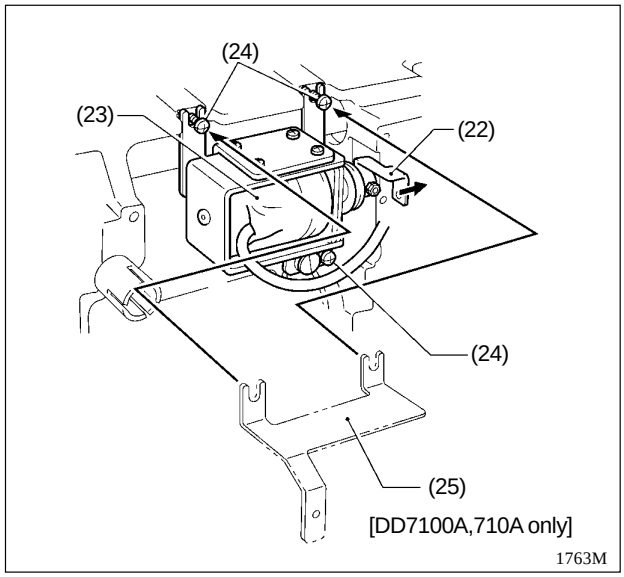
1. Place the collar (2) onto the forked shaft (1), and then insert it into the bush (3).
2. Insert the thread trimmer cam lever shaft (4) into the bed so that the groove is at the right.
3. Install the rubber cushion (5), collar (6) and spring (7) to the thread trimmer cam lever shaft (4).
4. With the slide block of the thread trimmer cam lever (8) set into the forked shaft (1), insert the thread trimmer cam lever shaft (4) into the thread trimmer cam lever (8).



5. Push the thread trimmer cam lever (8) to the left, and then place the washer (9) and cushion (10) onto the thread trimmer cam lever shaft (4). (Figure (A))
6. Push the thread trimmer cam lever shaft (4) to the right so that the groove can be seen, and then install retaining ring E (11). (Figure (B))
7. Push the thread trimmer cam lever (8) back to the right, and then tighten the set screw (12).



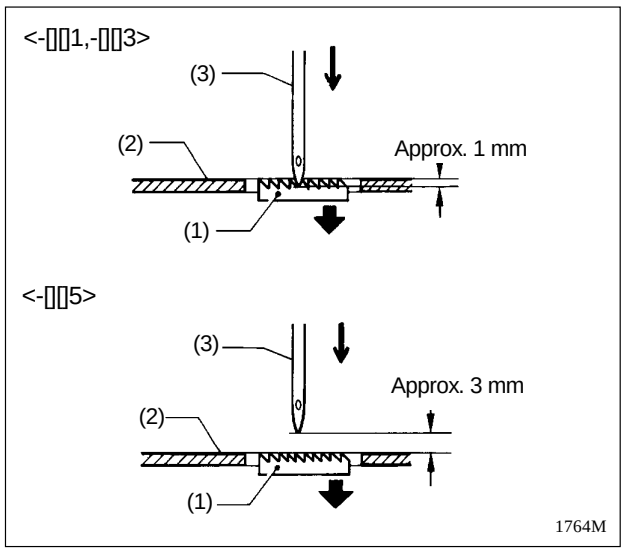
8. Place the spring (13) onto the bush (14) so that it faces as shown in the illustration.
9. Place the thread trimmer lever (15) onto the bush (14).
   * It will be easier to do this if you insert a screwdriver or similar into the gap.
10. Hook the spring (13) onto the thread trimmer lever (15) as shown in the illustration.
11. Place the movable knife holder (16) and the knife holder presser plate (17) onto the pump bush (18), and then tighten the three pan screws (19).
12. Connect the thread trimmer lever (15) and the thread trimmer connecting rod (20) by tightening the shoulder screw (21).



13. With the solenoid lever (22) pushed all the way to the right, install the thread trimmer solenoid (23) with the three screws (24).
    <For DD7100A, 710A>
    At this time, install the stopper bracket (25) with two of the screws (24) also.

* Push the solenoid lever (22) to the left and check that the solenoid lever (22) can move sideways by 5 - 6 mm.

6-15-2. Adjusting the needle and feed mechanism timing



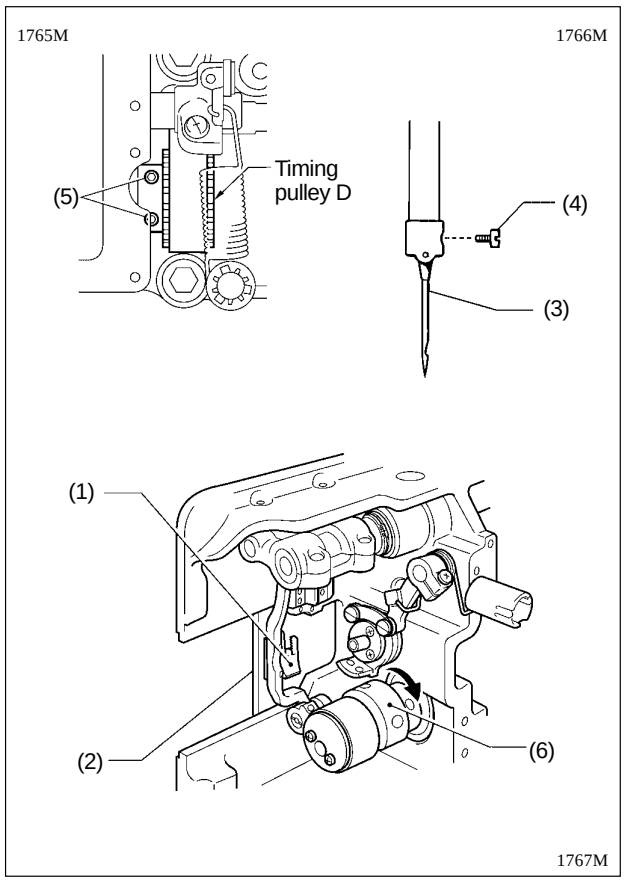
Adjust so that the needle (3) is positioned as described below (depending on the sub-class) when the feed dog (1) drops from its highest position until it is level with the top of the needle plate (2).

For sub-classes -[][]1 and -[][]3

The needle (3) should move down from its highest position until the tip of the needle (3) is approximately 1 mm below the top of the needle plate (2).

For sub-class -[][]5

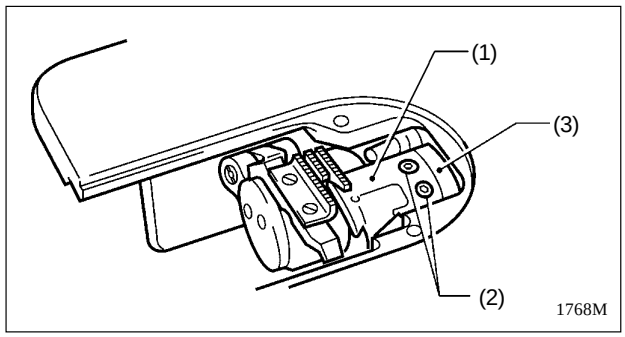
The needle (3) should move down from its highest position until the tip of the needle (3) is approximately 3 mm above the top of the needle plate (2).



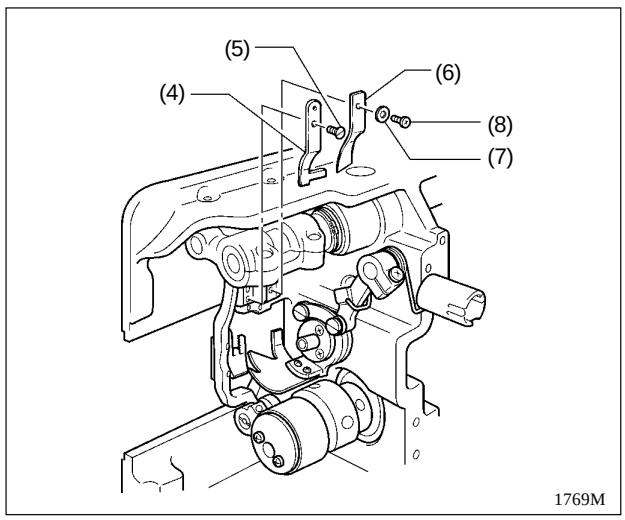
1. Install the needle (3) to the needle bar with the screw (4).
2. Tilt back the machine head.
3. Loosen the two set screws (5) [four set screws for the DD7100].

4. Turn the feed lifting eccentric wheel (6) toward you so that the feed dog (1) moves down from its highest position until it is level with the top of the needle plate (2).
5. With the feed dog (1) secured in place, turn the pulley toward you to adjust the position of the needle (3) in accordance with the sub-class when the needle is moving down from its highest position.
6. Tighten the two set screws (5) [four set screws for the DD7100].

6-15-3. Installing the movable knife and fixed knife

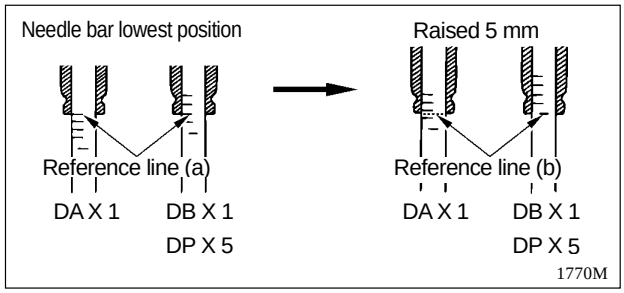


1. Remove the needle plate and the needle.
2. Install the movable knife (1) to the movable knife holder (3) with the two pan screws (2).



3. Tilt back the machine head.
4. Install the fixed knife (4) to the bed with the pan screw (5).
5. Install the lower thread finger (6) to the bed with the washer (7) and screw (8).

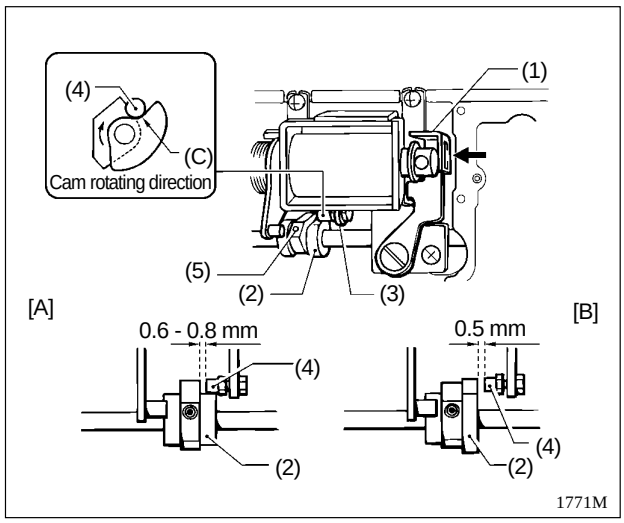
6-15-4. Adjusting the thread trimming timing



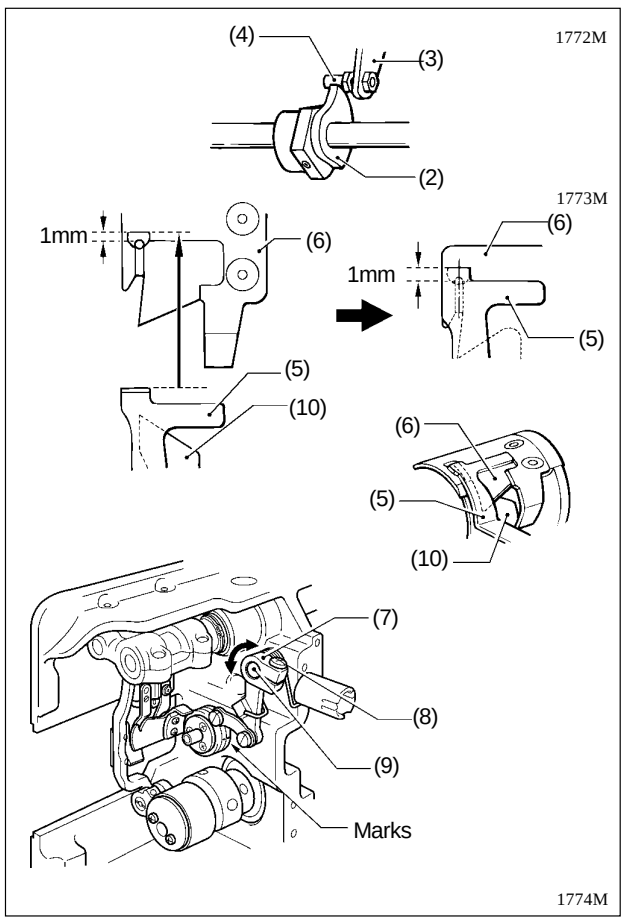
Remove the fed dog.

■ **Thread trimmer cam position adjustment**

1. Turn the pulley to raise the needle bar 5 mm from its lowest position (reference line (a) position) so that reference line (b) is aligned with the bottom of the needle bar bush.



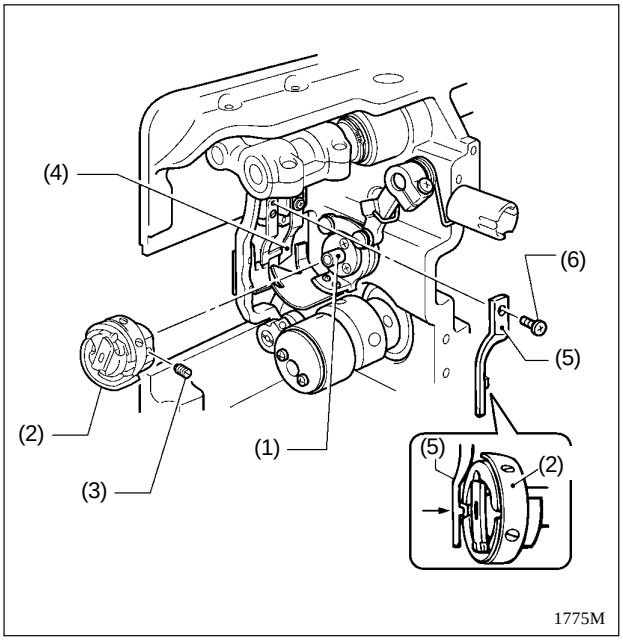
2. From the above position, push the thread trimmer solenoid (1) with a finger in the direction of the arrow. At this time, adjust the position of the thread trimmer cam (2) so that the roller shaft (4) of the thread trimmer cam lever assembly (3) touches the hollow (c) in the thread trimmer cam (2), and so that the clearance between the surface of the thread trimmer cam (2) and the roller shaft (4) is 0.6--0.8 mm. Then tighten the set screw (5). (Figure (A))
3. Check that the clearance between the surface of the thread trimmer cam (2) and the roller shaft (4) is 0.5 mm when the roller shaft (4) returns to the right. (Figure (B))
   * Tighten the set screw (5) at a torque of approximately 4 N.m.



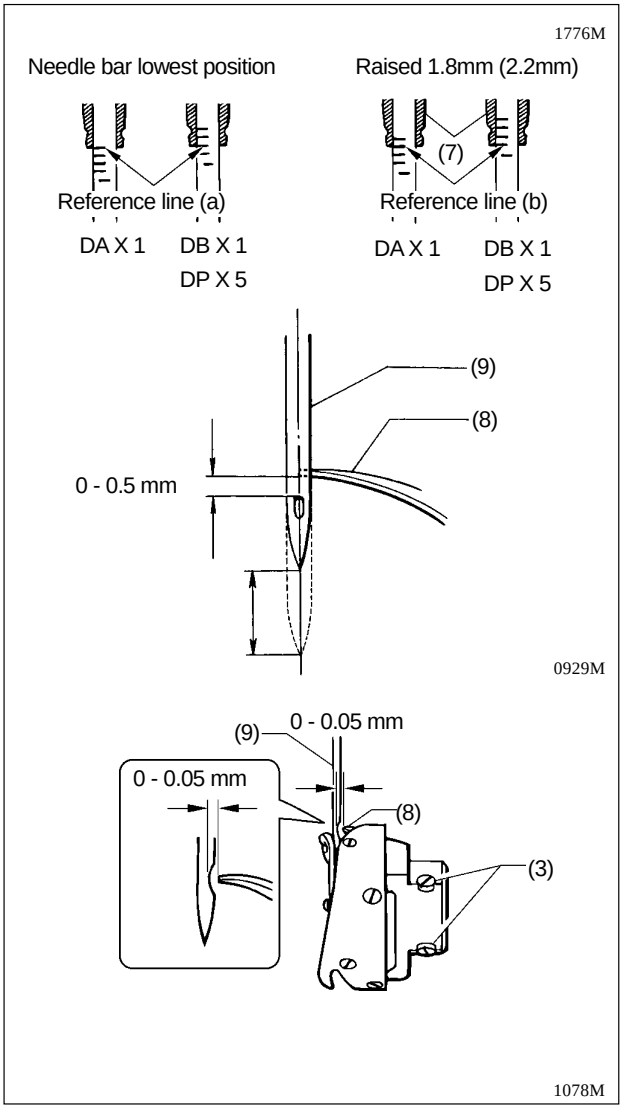
■ **Movable knife and fixed knife position adjustment**

1. Turn the pulley and push the thread trimmer solenoid (1) with a finger.
2. While doing this, turn the pulley again until the roller shaft (4) of the thread trimmer cam lever assembly (3) is sitting on top of the thread trimmer cam (2). In this position, move the thread trimmer lever (7) to adjust so that the amount of overlap between the tip of the fixed knife (5) and the edge of the movable knife (6) is 1 mm. Then tighten the screw (8).
   * At this time, adjust so that the meshing amount is 1 mm, using the alignment of the marks on the thread trimmer holder and the bush as a guide.
   * Tighten the screw (8) so that there is no play in the forked shaft (9).
   * The lower thread finger (10) must be below the movable knife (6).

6-16. Rotary hook and bobbin case holder position bracket

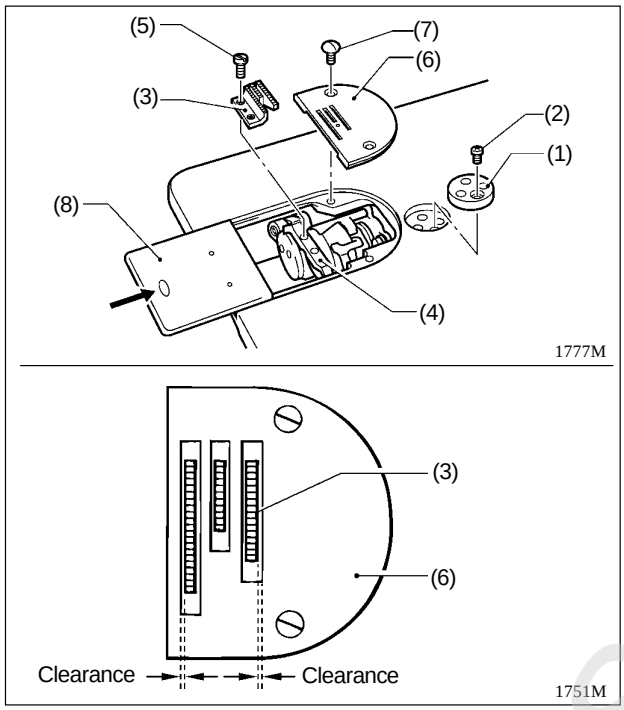


1. Remove the feed dog.
2. Tilt back the machine head.
3. Place the high-speed rotary hook (2) onto the rotary hook shaft (1), and provisionally secure it with the three set screws (3).
   * When installing the high-speed rotary hook (2), check that it does not touch the lower thread finger (4).
4. Install the bobbin case holder position bracket (5) with the screw (6).
   At this time, align the notch in the high-speed rotary hook (2) with the projection of the bobbin case holder position bracket (5).
   * Check that there is just enough clearance between the bobbin case holder position bracket (5) and the high-speed rotary hook (2) for the thread being used to pass comfortably in between.



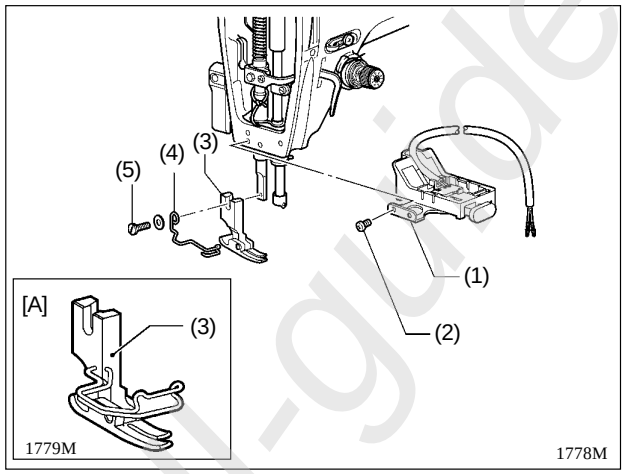
5. Adjust the needle and high-speed rotary hook (2) timing.
   1) Install the needle.
   2) Turn the pulley raise the needle bar 1.8 mm (or 2.2 mm for sub-class -[][]5) from its lowest position (reference line (a) position) so that reference line (b) is aligned with the bottom of the needle bar bush (7).
   3) Loosen the three set screws (3), and then adjust the position of the high-speed rotary hook (2) at the condition described in step 2) above.
      - Align the rotary hook tip (8) with the center of the needle (9).
        (At this time, the clearance between the top edge of the needle hole and the rotary hook tip (8) should be 0 - 0.5 mm.)
      - Adjust the clearance between the rotary hook tip (8) and the needle (9) to 0 - 0.5 mm.
   4) Tighten the three set screws (3).

6-17. Ruler plate and needle plate

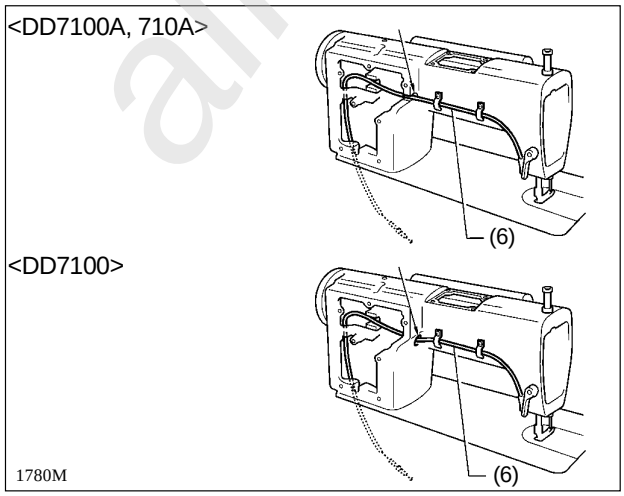


1. Remove the needle for safety while working.
2. Install the ruler plate (1) to the bed with the screw (2).
3. Install the feed dog (3) to the feed bar (4) with the two screws (5).
4. Install the needle plate (6) to the bed with the two pan screws (7).
5. Install the feed dog (3) so that the clearances between the left and right sides of the feed dog (3) and the needle plate (6) are the same.
6. Tilt back the machine head and install the slide plate (8).

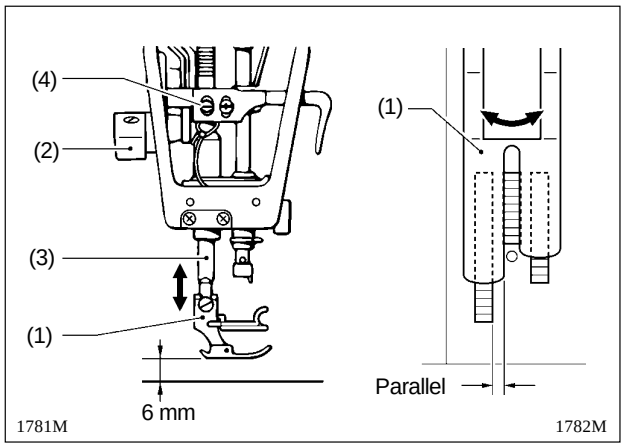
6-18. Reverse actuator assembly and presser hoot



1. Install the reverse actuator (1) to the arm with the two screws (2).
2. Install the presser foot (3) and finger guard (4) to the presser bar with the screw (5).



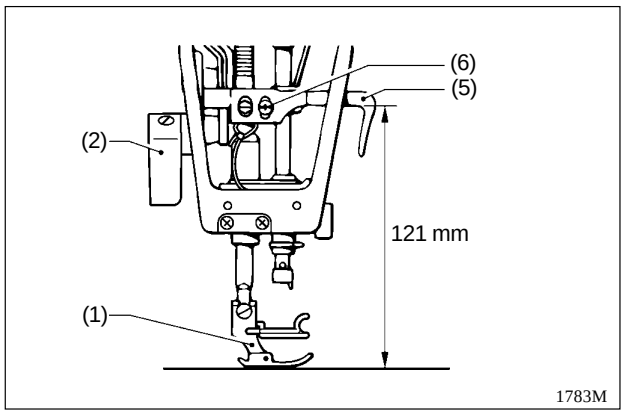
3. Pass the cord (6) of the reverse actuator (1) under the arm as shown in the illustration.



6-18-1. Adjusting the presser foot height

The standard height for the presser foot (1) is 6 mm when the presser foot (1) is raised by the presser bar lifter (2).

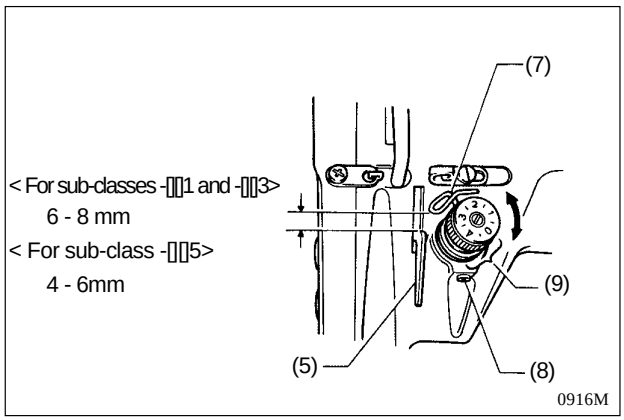
1. Raise the presser foot (1) using the presser bar lifter (2).
2. Move the presser bar (3) up and down until the presser foot (1) is 6 mm above the top of the needle plate.
   In addition, adjust so that the groove of the presser foot (1) is parallel to the groove of the needle plate.
3. Tighten the bolt (4).



6-18-2. Adjusting the thread guide height

The standard height for the thread guide (5) is 121 mm above the top of the bed when the presser foot (1) is lowered.

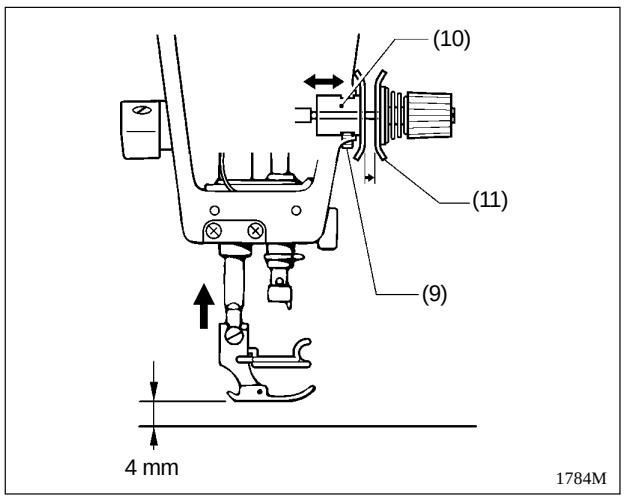
1. Lower the presser foot (1).
2. Loosen the screw (6).
3. Adjust the position of the thread guide (5) so that it is 121 mm above the top of the bed, and then tighten the screw (6).



6-18-3. Adjusting the tension spring vertical position

The standard position for the tension spring (7) is 6 - 8 mm (4 - 6 mm for sub-class -[][]5) above the top of the thread guide (5) when the presser foot is lowered.

1. Lower the presser foot.
2. Loosen the set screw (8).
3. Turn the thread tension bracket (9) to adjust the position of the tension spring (7).
4. Tighten the set screw (8).
   * Check the forward/back position of the thread tension bracket (9) when tightening the set screw (8).

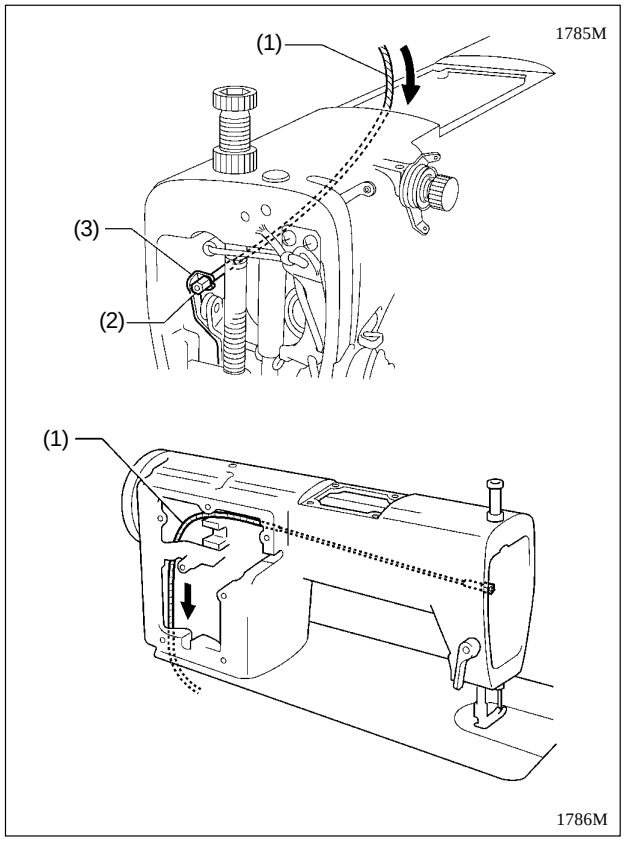


6-18-4. Adjusting the thread tension bracket forward/back position

The correct forward/back position of the thread tension bracket (9) is when the tension discs (10) start to open when the presser foot is 4 mm above the needle plate.

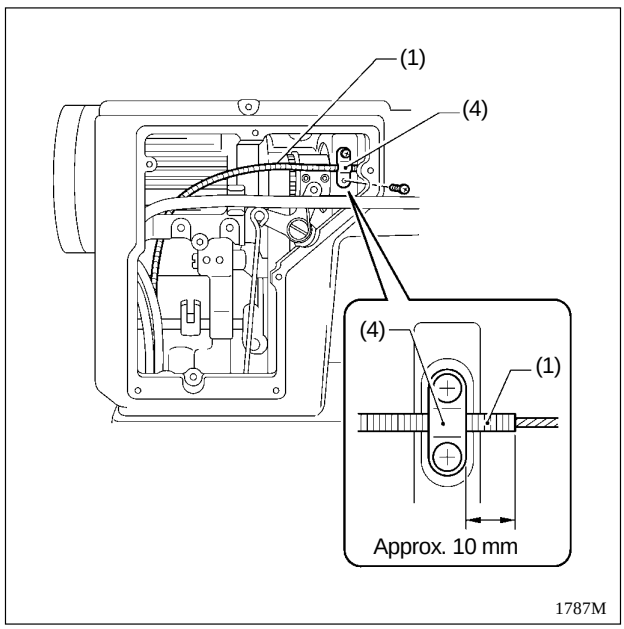
1. Loosen the set screw (8).
2. Move the thread tension bracket (9) forward and back to adjust so that the tension discs (10) start to open when the presser foot rises to 4 mm above the needle plate.
3. Tighten the set screw (8).
   * Check the vertical position of the tension spring (7) when tightening the set screw (8).

6-19. Tension release wire



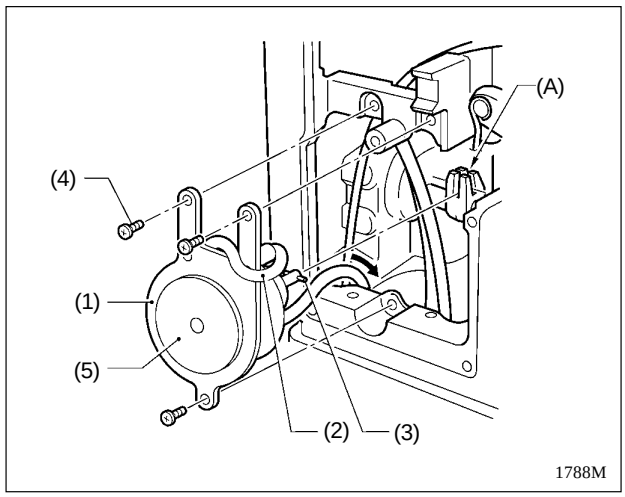
1. Insert the terminal (2) end of the tension release wire (1) through the top of the arm, and attach it to the tension release plate (3).

2. Pass the other end of the tension release wire (1) through the arm as shown in the illustration.

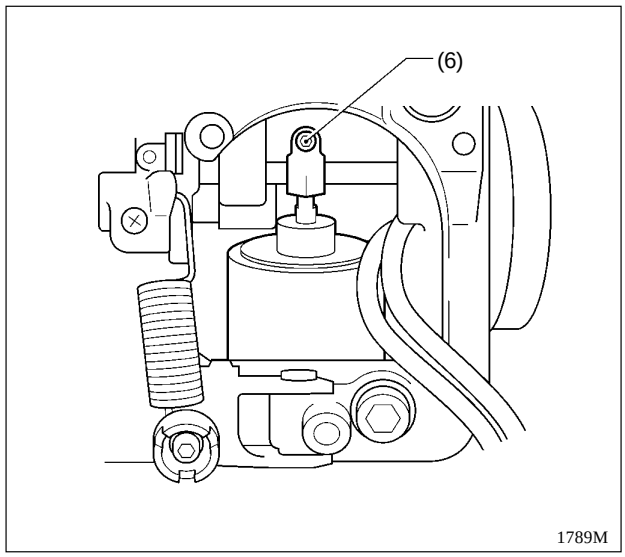


3. Secure the tension release wire (1) with the wire holder (4) as shown in the illustration.

6-20. Quick reverse solenoid

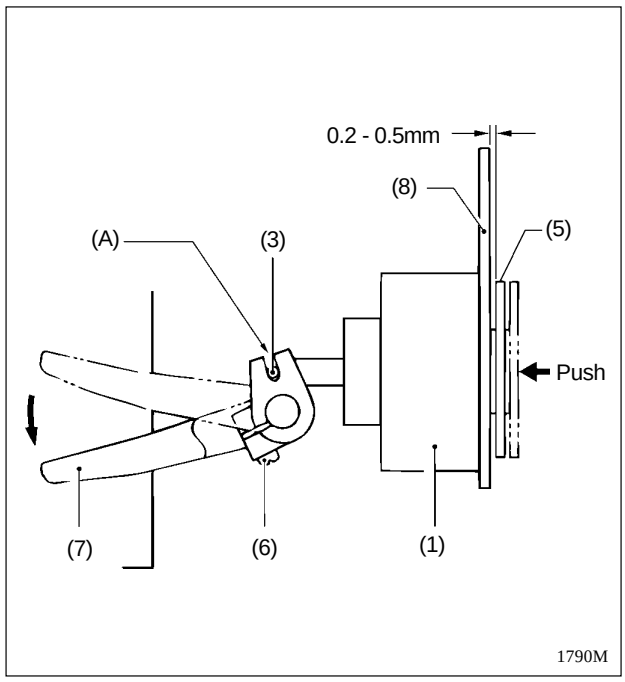


1. Pass the cord (2) of the quick reverse solenoid (1) under the bed.
2. Install the quick reverse solenoid (1) to the arm with the three screws (4) so that the plunger pin (3) fits into the groove (A) in the solenoid lever.
   * Pull the plunger (5) by hand and check that the plunger pin (3) fits into the groove (A) in the solenoid lever.



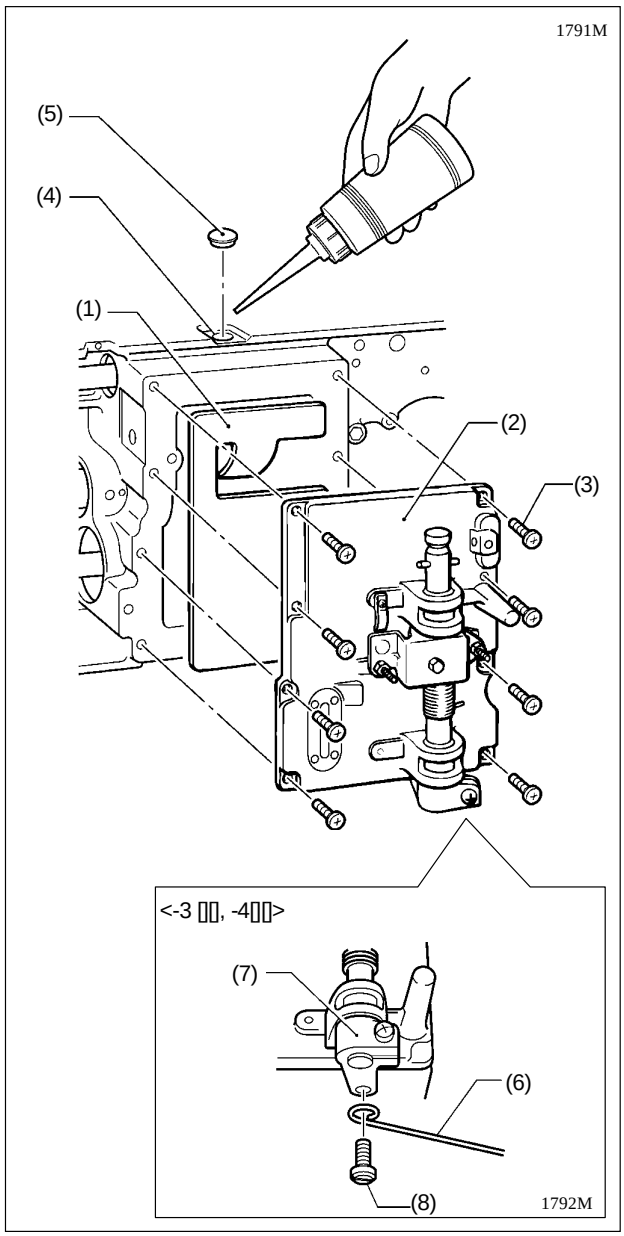
■ **Quick reverse solenoid adjustment**

1. Turn the stitch length dial to the maximum setting.
2. Tilt back the machine head.
3. Check that the position of the solenoid lever screw (6) can be verified when the machine head is restored to its normal position.



4. Return the machine head to its normal position, and loosen the screw (6).
5. Check that the plunger pin (3) is in the groove (A) in the solenoid lever.
6. With the reverse stitching lever (7) lowered all the way, push the plunger (5) until the clearance between the setting plate (8) of the quick reverse solenoid (1) and the plunger (5) is 0.2 - 0.5 mm.
7. Tighten the screw (6).
   * If the above clearance of 0.2 - 0.5 mm is large, the operation of the quick reverse solenoid (1) will become slower.
     In addition, if the clearance is small, the impact noise from the quick reverse solenoid (1) will become more apparent.

6-21. Bed under cover (Gear box)



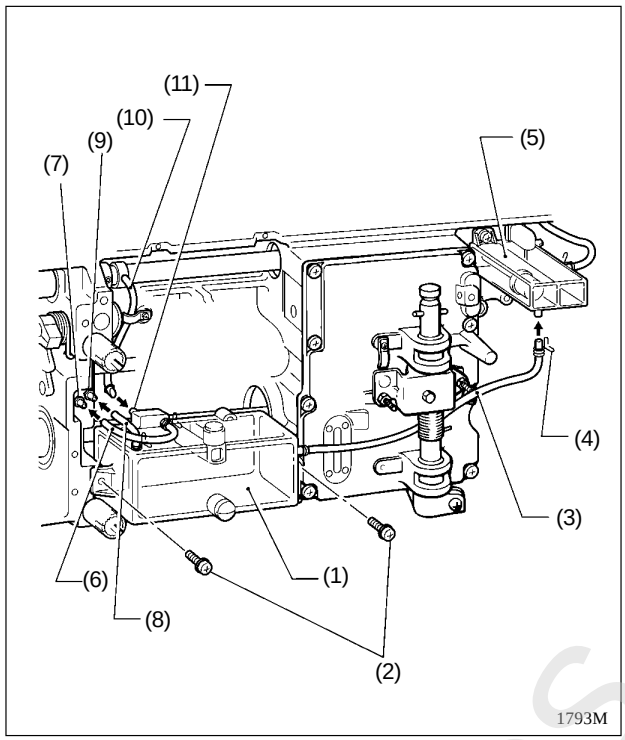
1. Tilt back the machine head.
2. Insert the felt (1) into the gear box as shown in the illustration.
3. Install the bed under cover (2) to the bed with the eight screws (3).
   * Be careful not to clamp the felt (1) at this time.
4. Pour 70 ml of lubricating oil in through the oil filler hole (4), and insert the rubber cap (5). (When the felt has absorbed the lubricating oil, the oil level will be reduced by about 50 ml.)
   * Use only the lubricating oil (Nisseki Mitsubishi Sewing Lube 10N; VG10) specified by Brother.
   * Do not add more than the specified volume of lubricating oil.
     If you add too much lubricating oil, it may result in oil leaks.
5. For sub-classes -3□□ and -4□□, connect the knee lifter connecting rod (6) and the knee lifter arm (7) by tightening the shoulder screw (8).

■ Checking the amount of oil

Check the amount of oil inside the gear box according to the method below which matches the model being used.

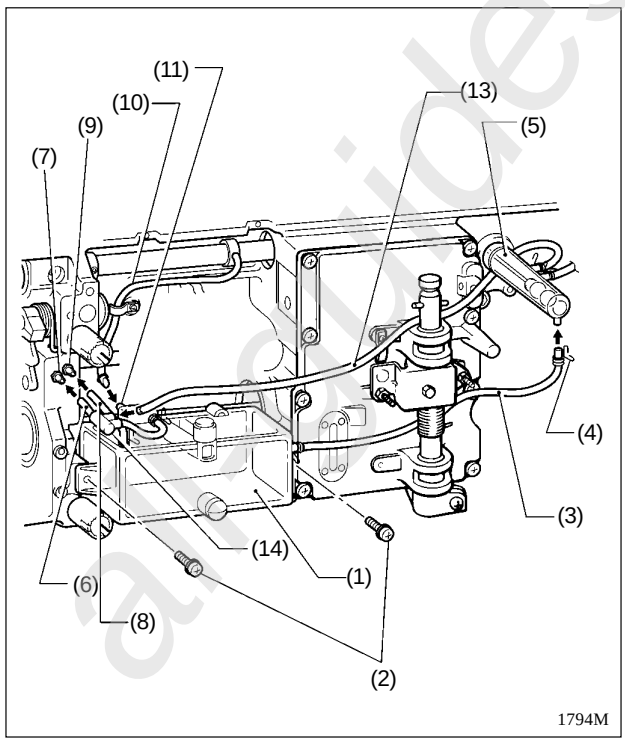
<DD7100A, 710A>
Refer to "Cleaning" in the Instruction Manual.
<DD7100>
Refer to SE Information No. 2001-019.

6-22. Oil tank



<DD7100A, 710A>

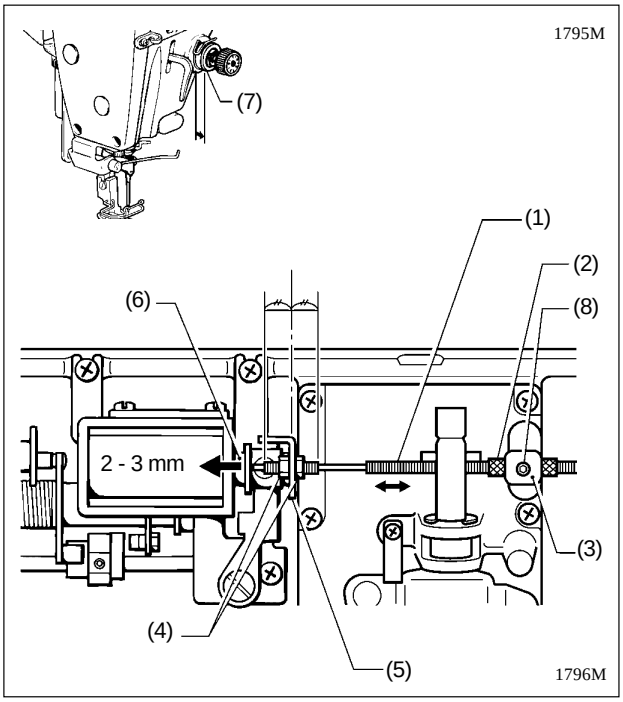
1. Install the oil tank (1) to the bed with the two screws (2).
2. Place the tube clip (4) onto the oil tube (3).
3. Insert the oil tube (3) into the sub tank (5), and clamp it with the tube clip (4).
4. Insert the oil tube [L=110] (6) into the oil feeding pipe (7), and insert oil tube MS (8) into the oil feeding pipe (9).
5. Insert the oil tube (10) from the horizontal feed shaft into the hole (11) at the rear of the oil tank (1).



<DD7100>

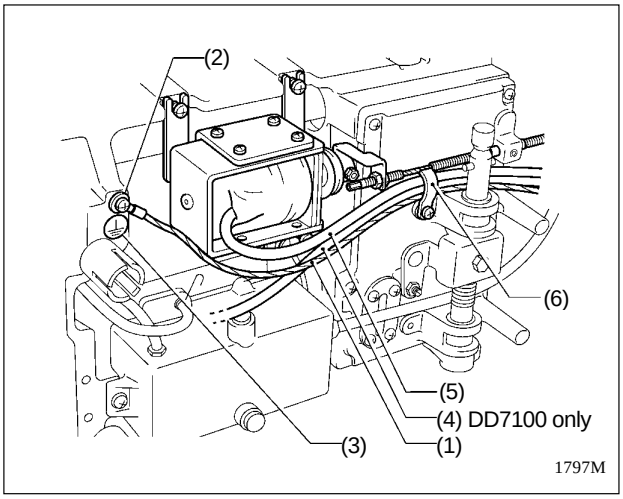
1. Install the oil tank (1) to the bed with the two screws (2).
2. Place the tube clip (4) onto the oil tube (3).
3. Insert the oil tube (3) into the oil gauge guide (5), and clamp it with the tube clip (4).
4. Insert oil tube S (6) into the oil feeding pipe (7), and insert oil tube M (8) into the oil feeding pipe (9).
5. Insert the oil tube (10) from the horizontal feed shaft into the hole (11) at the rear of the oil tank (1).
6. Insert the oil tube (13) from the oil gauge guide (5) into the terminal (14).

6-23. Tension release wire



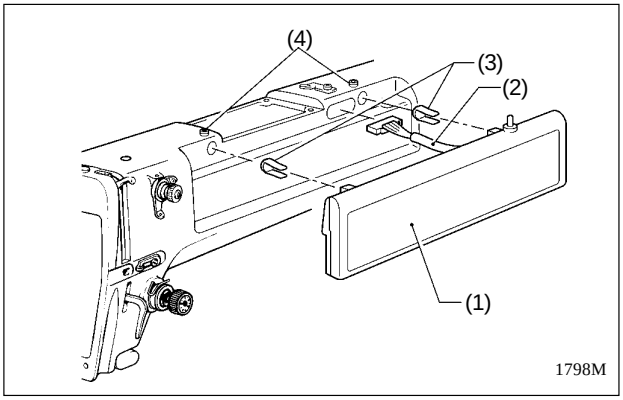
1. With the holder (2) installed to the tension release wire (1), pass the tension release wire (1) around the wire holder (3) and install it to the solenoid lever (5) with the two nuts (4).
   * Tighten the two nuts (4) when the solenoid lever (5) is at the center of the threaded part at the end of the tension release wire (1).
2. Move the outside of the tension release wire (1) to the position where the tension discs (7) start to open when the solenoid plunger (6) is pressed by 2 - 3 mm, and then tighten the set screw (8) to secure it in that position.
   * At this time, the holder (2) should be under the set screw (8).

6-24. Ground wire

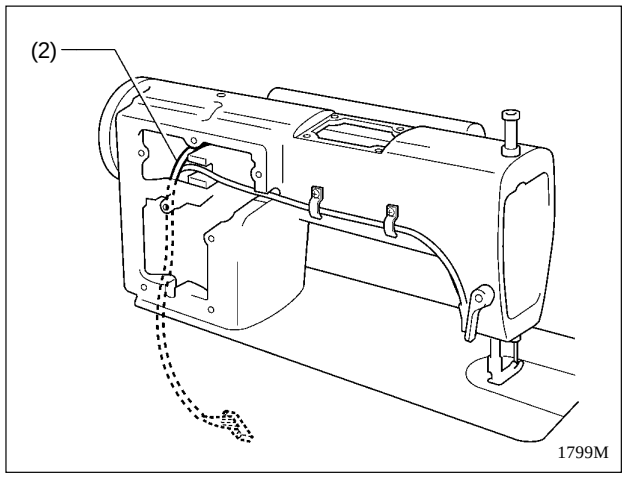


1. Secure the ground wire (1) to the bed with the screw (2).
   (The ground symbol (3) indicates the location.)
2. Group the ground wire (1), oil tube (4) [DD7100 only] and thread trimmer solenoid cord (5) together in that order, and secure them together with the cord holder (6).

6-25. Operation panel

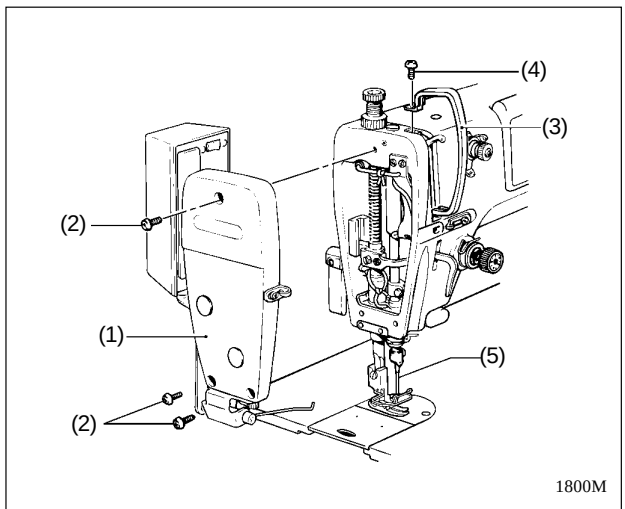


1. Pass the cord (2) of the operation panel (1) through the hole in the arm.
2. Insert the two panel support brackets (3) into the mounting holes.
3. Install the operation panel (1) to the arm, and then secure it by tightening the two set screws (4).



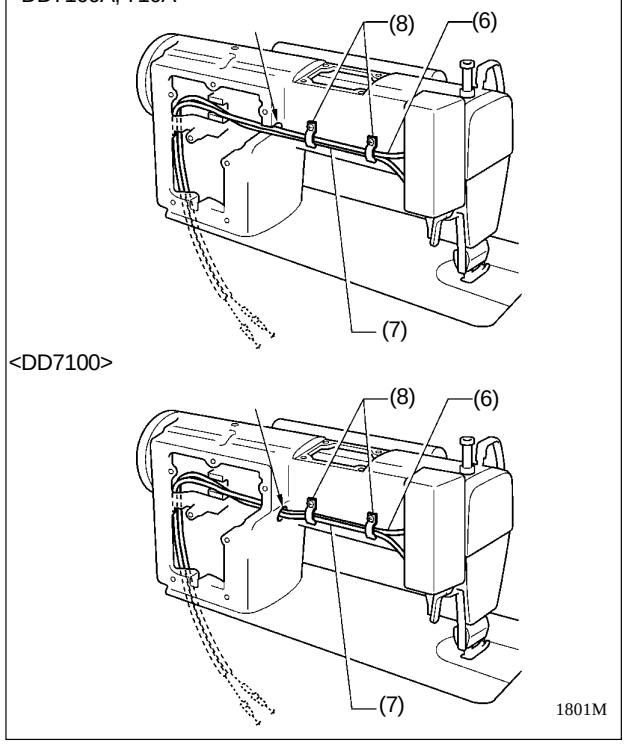
4. Pass the cord (2) of the operation panel (1) under the arm as shown in the illustration.

6-26. Face plate and thread take-up cover



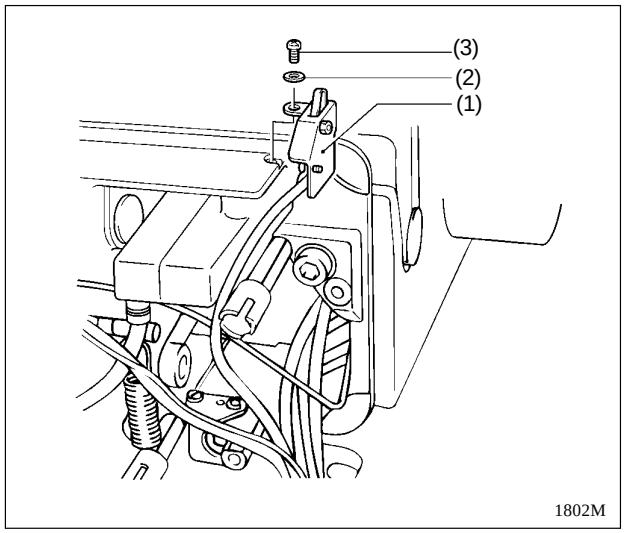
1. Install the face plate (1) to the arm with the three screws (2).
2. Install the thread take-up cover (3) to the arm with the screw (4).
3. Install the needle (5).

<DD7100A, 710A>



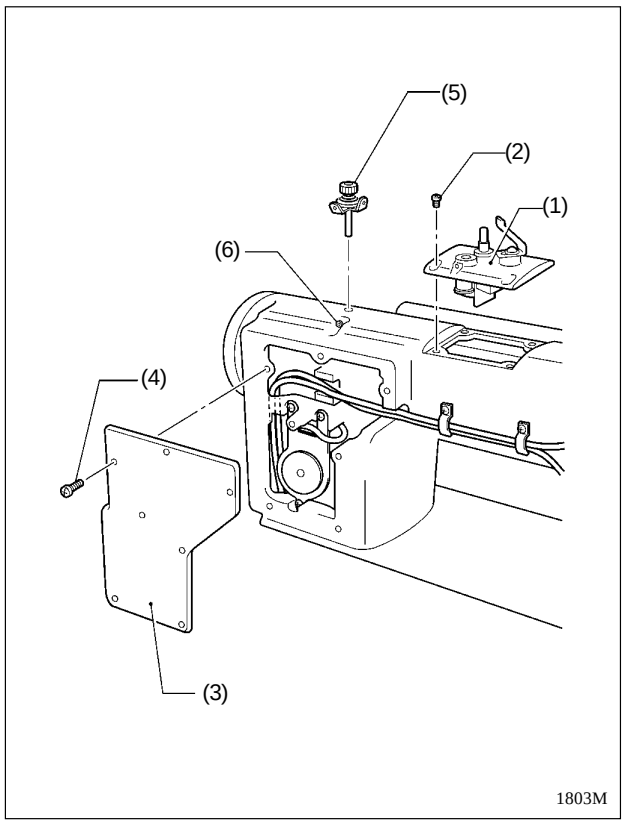
4. Pass the thread wiper cord (6) under the arm as shown in the illustration.
5. Secure the thread wiper cord (6) together with the reverse actuator cord (7) using the cord holder (8).

6-27. Safety switch



1. Tilt back the machine head.
2. Install the safety switch (1) to the bed with the washer (2) and screw (3).

6-28. Arm cover, rear cover and bobbin winder tension assembly

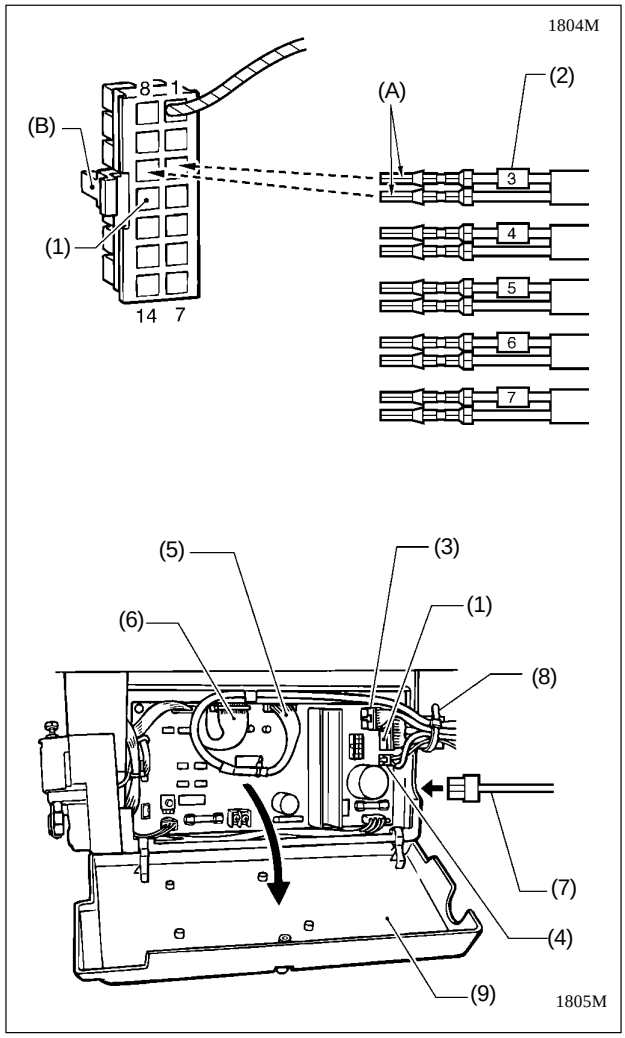


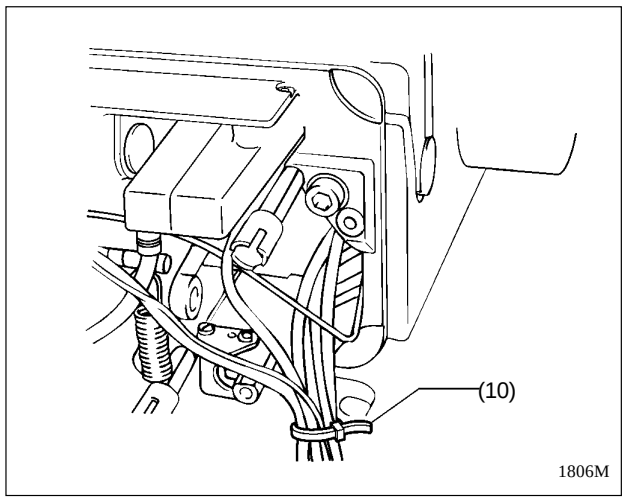
1. Install the arm cover (1) to the arm with the four screws (2).
2. Install the rear cover (3) to the arm with the seven screws (4).
3. Insert the bobbin wider tension (5) into the mounting hole so that it faces as shown in the illustration, and then secure it with the set screw (6).

6-29. Other devices

Refer to the Instruction Manual for details on installing other devices.

6-30. Connectors





1. Insert the pins for the solenoid cords and the safety switch cord into the sewing machine 14P connector (1).
   - Match the numbers on the sewing machine 14P connector (1) with the numbers (tube marks) (2) on each pin.
   - Insert the split ends (A) of each pin so that they face toward the locking mechanism (B) for the sewing machine 14P connector (1).

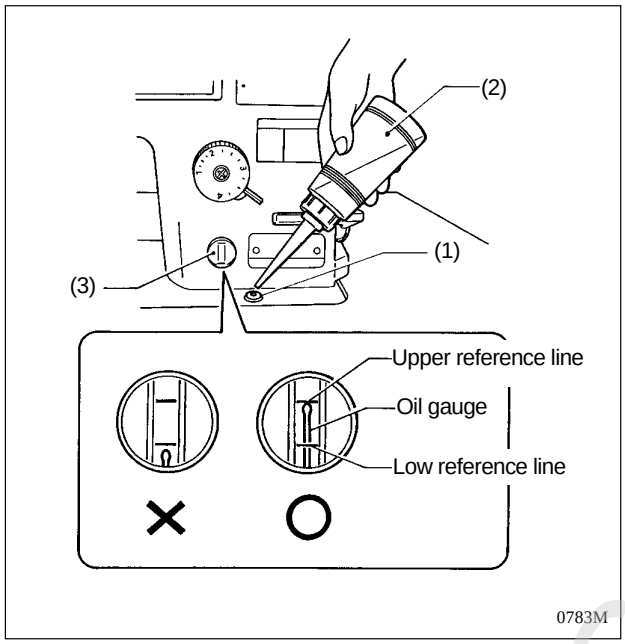
14P	Code	14P	Code
1	(Ground wire)	8	-
2	-	9	-
3	Thread trimmer solenoid	10	Thread trimmer solenoid
4	Thread wiper	11	Thread wiper
5	Quick reverse solenoid	12	Quick reverse solenoid
6	Reverse actuator	13	Reverse actuator
7	Safety switch	14	Safety switch

2. Insert the sewing machine 14P connector (1), the lower thread detector mechanism 8P connector (3), the solenoid-type presser lifter connector (4), the synchronizer connector (5) and the operation panel connector (6) into the control box circuit board.
3. Insert the motor connector (7) into the side of the control box.
4. Bind the cords together with a cable tie (8).
5. Tilt back the machine head.
6. Close the control box cover (9).
   * Be careful not to clamp the cords inside the control box.

7. Bind the cords with a cable tie (10).

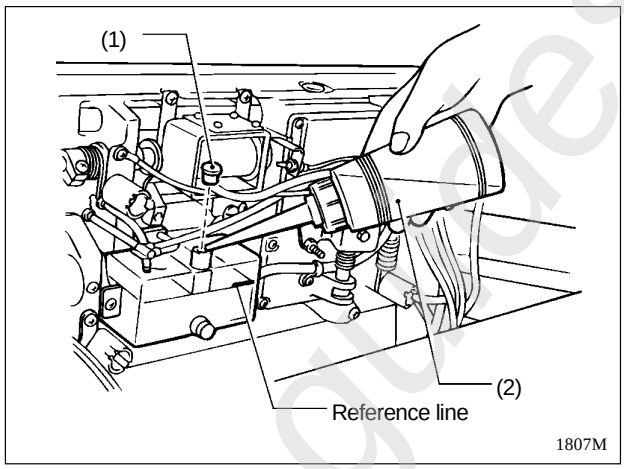
6-31. Lubrication

Use only the lubricating oil (Nisseki Mitsubishi Sewing Lube 10N; VG10) specified by Brother.



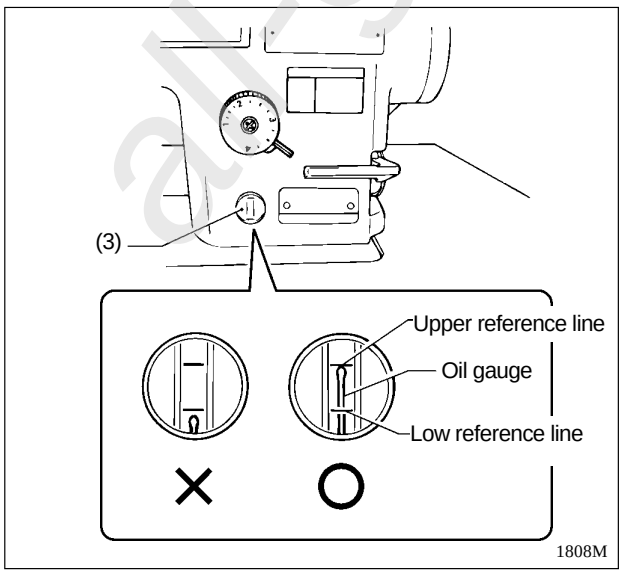
<DD7100A, 710A>

1. Pour 130 ml of lubricating oil from the accessory oil bottle (2) in through the oil filler hole (1).
   * Do not pour all of the lubricating oil in at once at this time. Pour the lubricating oil bit by bit while checking the oil gauge to make sure that the lubricating oil does not overflow from the oil filler hole (1)
2. Check that the oil gauge comes to the upper reference line in the oil gauge window (3).



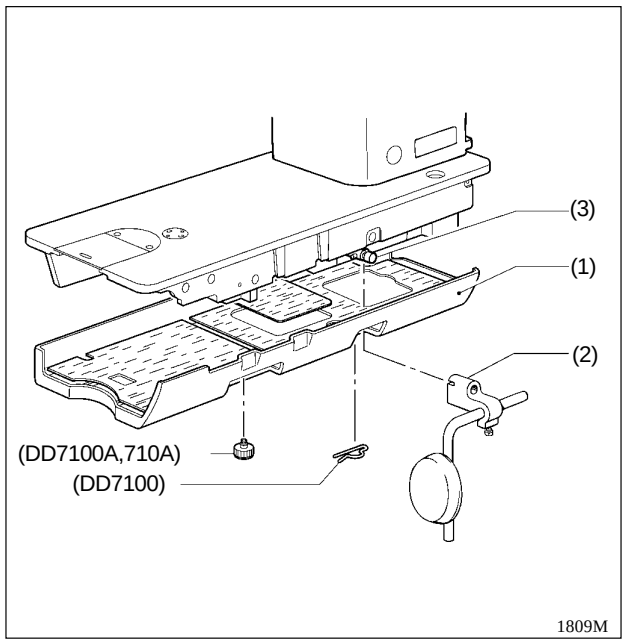
<DD7100>

1. Remove the oil tank cap (1), and pour in 120 ml of lubricating oil from the accessory oil bottle (2).
   (Use the reference line as a guide when pouring.)
2. Replace the oil tank cap (1).



3. Return the machine head to its original position.
4. Check that the oil gauge comes to the upper reference line in the oil gauge window (3).

6-32. Bed cover and knee lifter lever

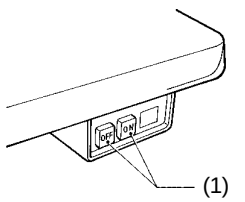


1. Install the bed cover (1) to the bed.
2. For sub-classes -30[], -31[], -40[] and -41[], push the knee lifter lever (2) onto the knee lifter shaft (3).

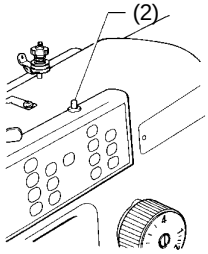
6-33. Test operation

⚠ CAUTION

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.



0789M



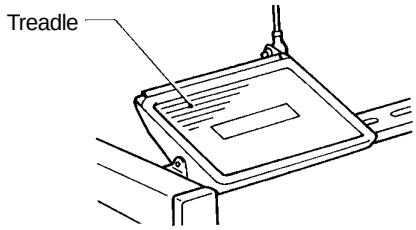
0790M

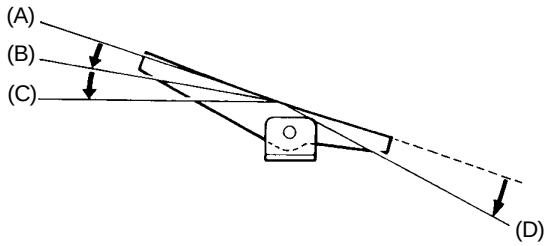
For machines with a lower thread detector, set the lower thread remainder limit before carrying out test operation.

■ **Turning on the power**

Press the ON power switch (1).
The power indicator (2) will illuminate.

0791M





0792M

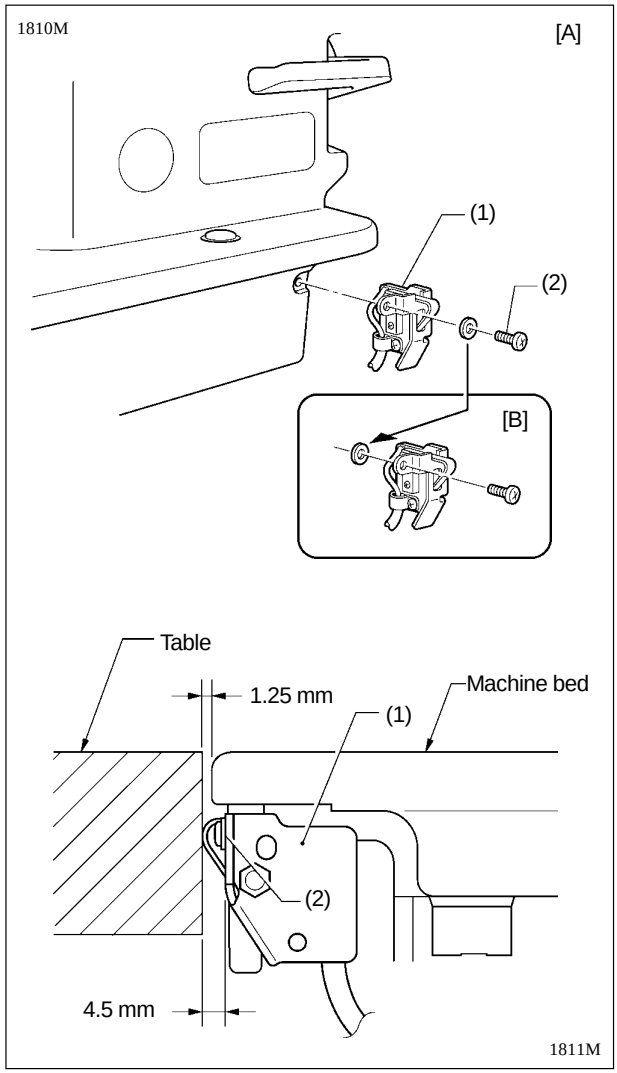
■ **Test operation**

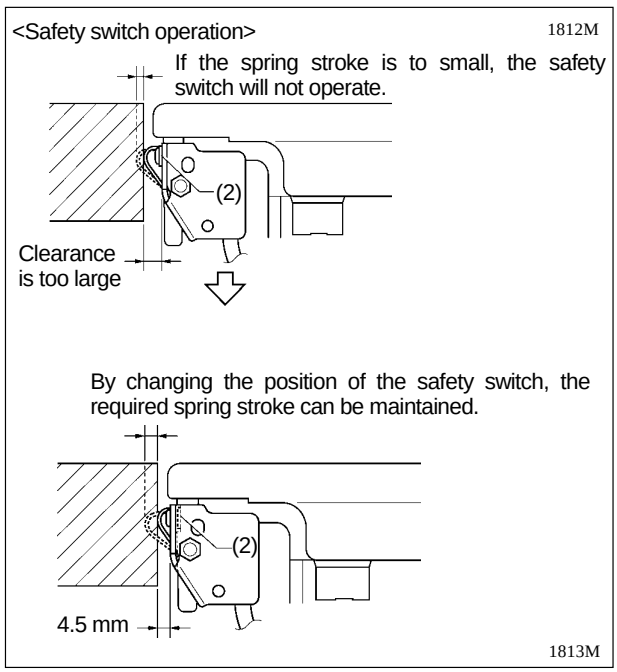
1. Check that the machine sews at low speed when the treadle is gently pressed to position (B).
   Then check that it sews at high speed when the treadle is gently pressed to position (C).
2. After pressing the treadle forward, check that the needle is lowered to the top of the needle plate when the treadle is returned to the neutral position (A) [when needle down stopping has been set].
3. If the treadle is pressed to position (D) [or if it is pressed to position (D) and then returned to the neutral position (A)], thread trimming is carried out and the needle then rises above the needle plate and stops.

■ **If the sewing machine does not operate when the treadle is pressed**

- If "of" is flashing on the operation panel, check the position of the safety switch. (Refer to the next page.)
  If this does not solve the problem, refer to the description of error code "of" (page 144).
- If there is no error display on the operation panel, refer to page 140.

6-34. Adjusting the safety switch position





The safety switch (1) is normally installed as shown in figure (A).
However, if the processing method used for the table leaves too much space between the machine head and the table hole, it may adversely affect the operation of the safety switch (1).

■ **Adjustment method**

The standard amount of clearance between the machine head and the table hole is 1.25 mm. (At this time, the clearance between the safety switch (1) and the table hole is 4.5 mm.)
If the clearance is too great, place a washer (2) on the machine head side as shown in figure (B) and re-install the safety switch (1).

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

7. ADJUSTMENTS

⚠ CAUTION

Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.

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

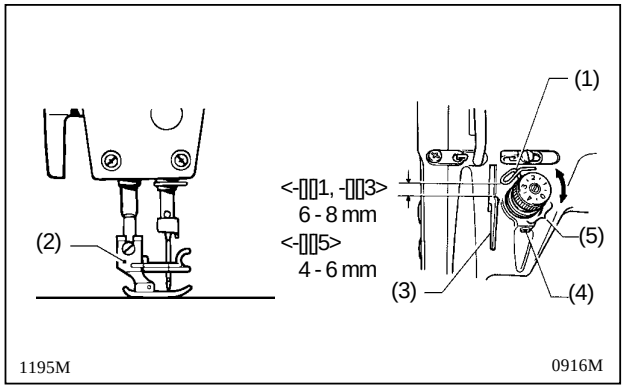
If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

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 macnine 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 de pressed by mistake, which could result in injury.
- 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.

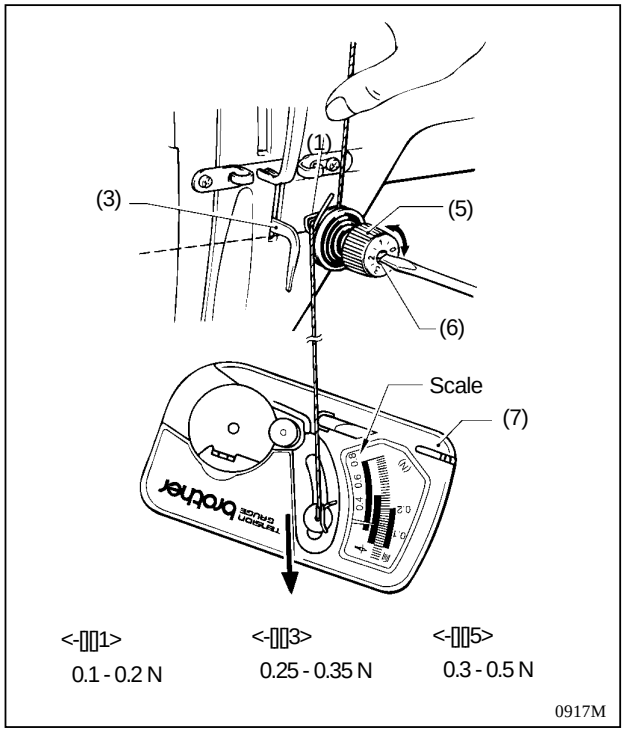
7-1. Adjusting the thread tension spring



■ **Thread tension spring position**

The standard position of the thread tension spring (1) is 6 - 8 mm [4 - 6 mm for -[][]5 models] above the surface of the thread guide (3) when the presser foot (2) is lowered.

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



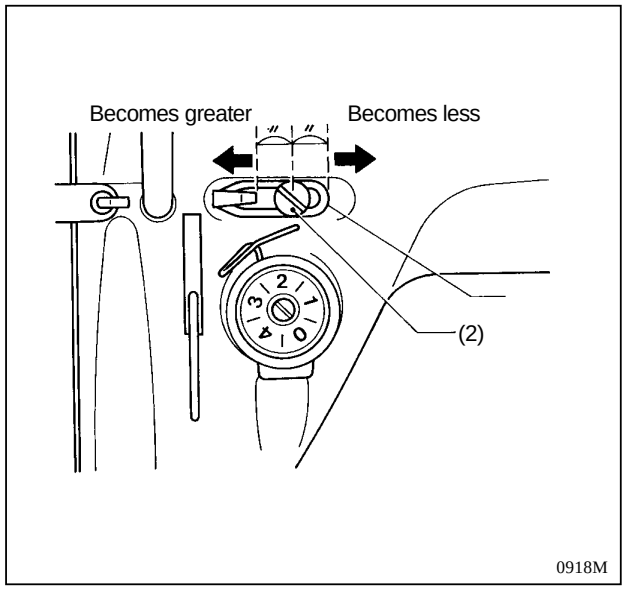
■ **Thread tension spring tension**

The standard tension of the thread tension spring (1) is 0.1- 0.2 N for - [][] 1 models, 0.25 - 0.35 N for - [][]3 models, and 0.3 - 0.5 N for -[][]5 models.

1. Push the needle thread with your finger until it is slightly higher than the thread tension bracket (5) and so that the upper thread is not pulled out.
2. Pull the upper thread down until the thread tension spring (1) is at the same height as the base of the thread guide (3), and then measure the tension of the thread tension spring(1).
3. Insert a screwdriver into the slot of the thread tension stud (6), and turn the screwdriver to adjust the tension of the thread tension spring (1).

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

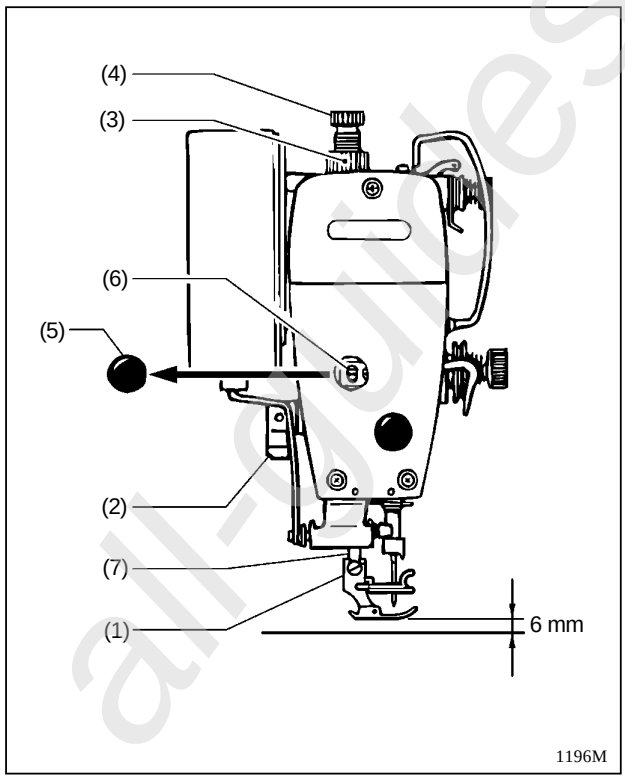
7-2. Adjusting arm thread guide R



The standard position of arm thread guide R (1) is the position where the screw (2) is in the center of the adjustable range for arm thread guide R. (1).

* To adjust the position, loosen the screw (2) and then move arm thread guide R (1).
- When sewing thick material, move arm thread guide R (1) to the left. (The thread take-up amount will become greater.)
- When sewing thin material, move arm thread guide R (1) to the right. (The thread take-up amount will become less.)

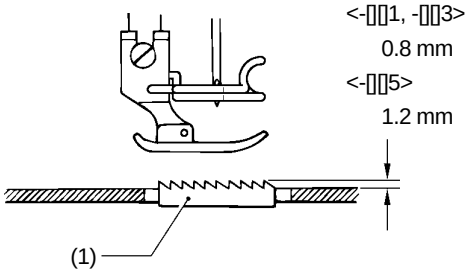
7-3. Adjusting the presser foot height



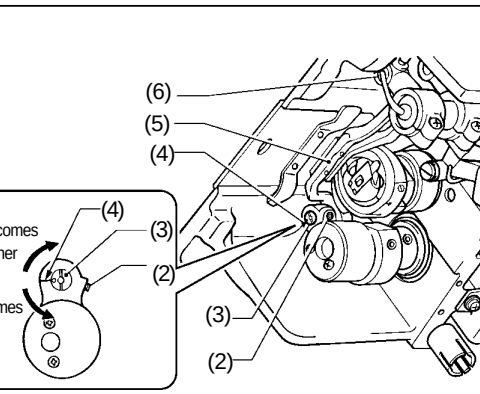
The standard height of the presser foot (1) is 6 mm when the presser foot (1) is raised by means of the presser bar lifter (2).

1. Loosen the nut (3) of the adjustment screw (4), and then turn the adjustment screw (4) so that there is no pressure applied to the presser foot.
2. Raise the presser bar lifter lever (2). The presser foot (1) will also rise.
3. Remove the oil cap (5).
4. Loosen the bolt (6) and then move the presser bar (7) up or down until the presser foot (1) is at the standard height of 6 mm.
5. Tighten the bolt (6).
6. Replace the oil cap (5).
7. Adjust the presser foot pressure using the adjustment screw (4), and then tighten the nut (3).

7-4. Adjusting of the feed dog height

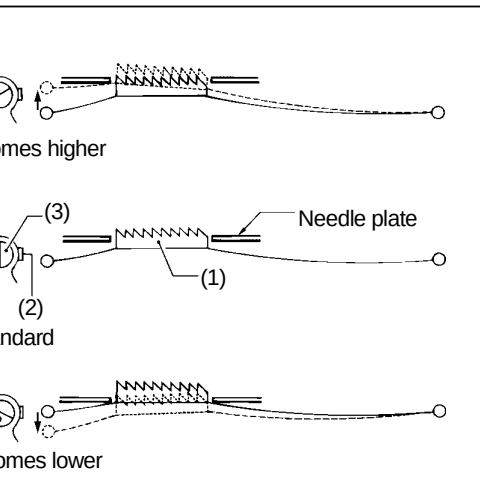


The standard height of the feed dog (1) when it is at its maximum height above the top of the needle plate is 0.8 mm for -[][]1/[][]3 models, and 1.2 mm for -[][]5 models.

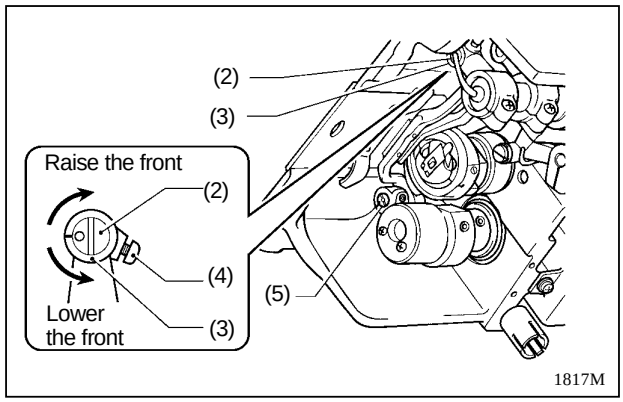


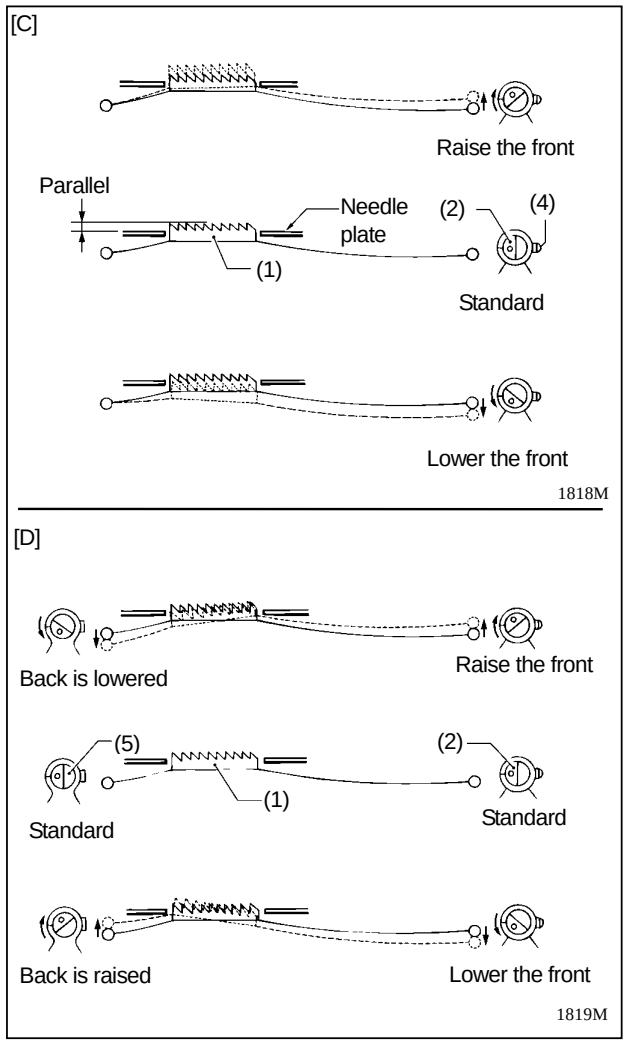
1. Turn the pulley until the feed dog (1) rises to the highest position.
2. Tilt back the machine head.
3. Loosen screw (2).
4. Turn the feed lifting rock bracket stud (3) within a range of 90° from the reference line (4) to adjust the vertical height of the feed bar (5). (Fig.[A])
5. Tighten the screw (2).

* If you are worried about the angle of the feed dog (1), turn the shaft (6) while carrying out the above adjustment. (Figure (B))
(Refer to "7-5. Adjusting the feed dog angle" on the next page for details of this operation.)



7-5. Adjusting the feed dog angle



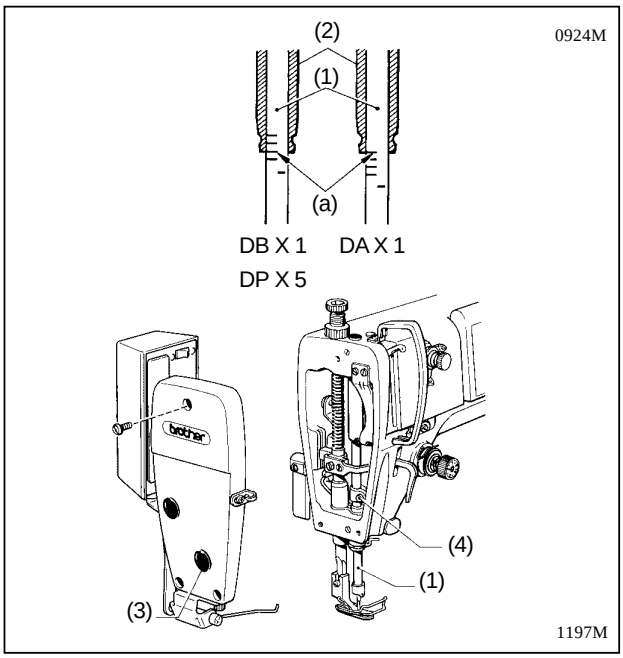


The standard angle for the feed dog (1) when it is at its highest position above the needle plate is when the "○" mark (or V groove) on the shaft (2) is aligned with the feed rocker bracket arm (3) and the feed dog (1) is parallel to the needle plate.

1. Turn the machine pulley to move the feed dog (1) to its highest position above the needle plate.
2. Tilt back the machine head.
3. Loosen the two set screws (4).
4. Turn the shaft (2) in the direction of the arrow within a range of 90° with respect to the standard position. (Fig. [C])
   * In order to prevent puckering, lower the front of the feed dog (1).
   * In order to prevent the material from slipping, raise the front of the feed dog (1).
5. Securely tighten the set screws (4).

* If you would like to tilt the feed dog (1) further, turn the feed lifting rock bracket stud (5) while carrying out the above adjustment. (Figure [D])
  (Refer to "7-4. Adjusting the feed dog height" on the previous page for details of this operation.)
* The height of the feed dog (1) will change after the angle has been adjusted, so it will be necessary to re-adjust the height of the feed dog (1).

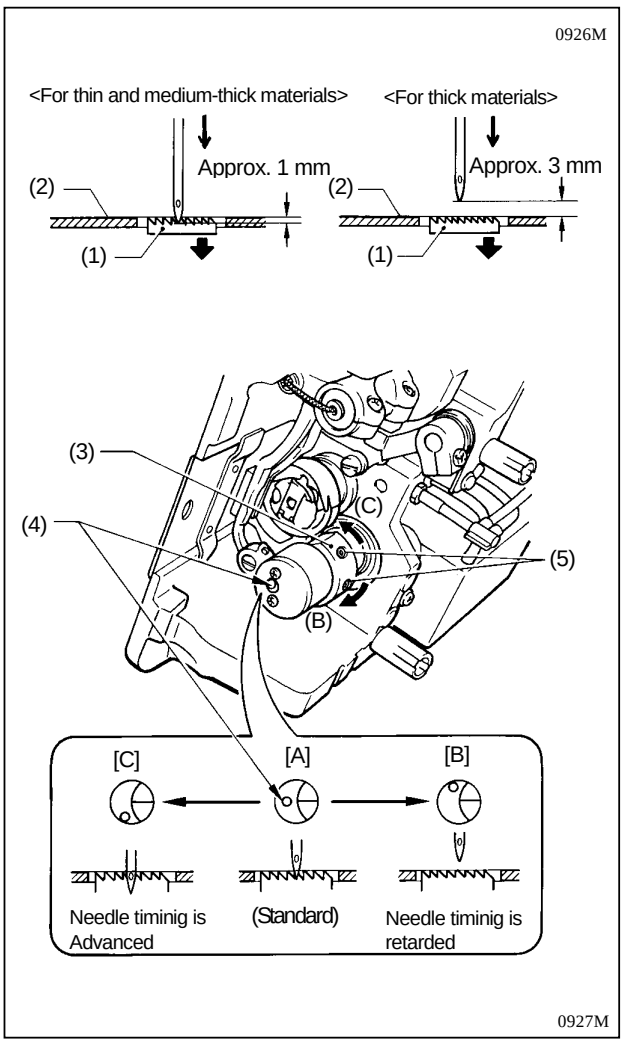
7-6. Adjusting the needle bar height



Reference line (a), which is the second line from the bottom of the needle bar (1)(fourth line from the bottom when using a DA X 1 needle) should be aligned with the lower edge of the needle bar bush D (2) as shown in the illustration when the needle bar (1) is at its lowest position.

1. Turn the machine pulley to set the needle bar (1) to its lowest position.
2. Remove the oil cap (3).
3. Loosen the screw (4) and then move the needle bar (1) up or down to adjust its position.
4. Securely tighten the screw (4).
5. Replace the oil cap (3).

7-7. Adjusting the needle and feed mechanism timing



The standard position for point of the needle is as described below when the feed dog (1) is lowered from its highest position until it is aligned with the top of the needle plate (2). (At this time, the "○" mark (4) on the vertical cam (3) should be aligned with the "-" mark on the lower shaft. Refer to [A] in the illustration.)

[For thin and medium-thick materials]

The top of the feed dog (1) and the top of the needle plate (2) should be aligned, and the point of the needle should be approximately 1 mm below the needle plate (2).

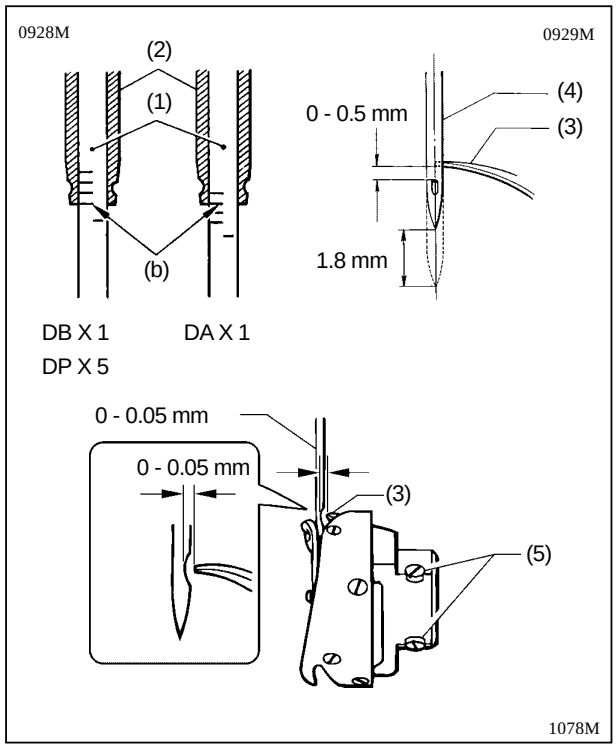
[For thick materials]

The top of the feed dog (1) and the top of the needle plate (2) should be aligned, and there should be a clearance of approximately 3 mm between the point of the needle and the needle plate (2).

1. Tilt back the machine head. (Refer to page 8.)
2. Loosen the two set screws (5), and then turn the vertical cam (3) sligtly to adjust the timing.
   - If setting the timing to the standard timing, turn the vertical cam (3) until the "○" mark (4) is aligned with the "-" mark on the lower shaft ([A] in the illustration).
   - To prevent material slippage from occurring, retard the needle timing. (Turn the vertical cam (3) in the direction of (B). Refer to [B] in the illustration.)
   - To improve thread tightening, advance the direction of (C). Refer to [C] in the illustration.)

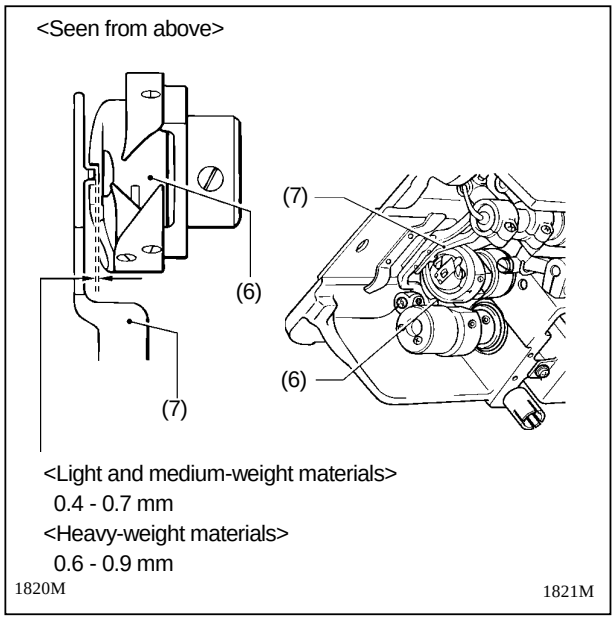
   Note: Do not turn the vertical cam (3) too far in the direction of (C), otherwise it could cause the needle to break.
3. After adjustment is completed, securely tighten the two screws (5).

7-8. Adjusting the needle and rotary hook timing



The tip of the rotary hook (3) should be aligned with the center of the needle (4) when the needle bar (1) moves up from its lowest position to the position where reference line (b), which is the line at the bottom of the needle bar (1) (third line from the bottom when using a DA X 1 needle), is aligned with the lower edge of the needle bar bush D (2) as shown in the illustration.

1. Turn the machine pulley to raise the needle bar (1) from its lowest position until reference line (b) is aligned with the lower edge of the needle bar bush D (2) as shown in the illustration.
   (The needle should rise by 1.8 mm [2.2 mm for -[][] 5 specifications] and the distance from the needle hole to the tip of the rotary hook should be 0 - 0.5 mm.)
2. Loosen the set screws (5), and then align the tip of the rotary hook (3) with the center of the needle (4).
   The distance between the tip of the rotary hook (3) and the needle (4) should be approximately 0 - 0.05 mm.
3. Securely tighten the set screws (5).

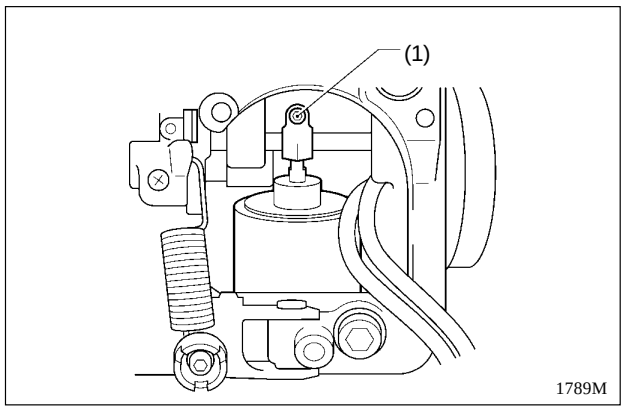


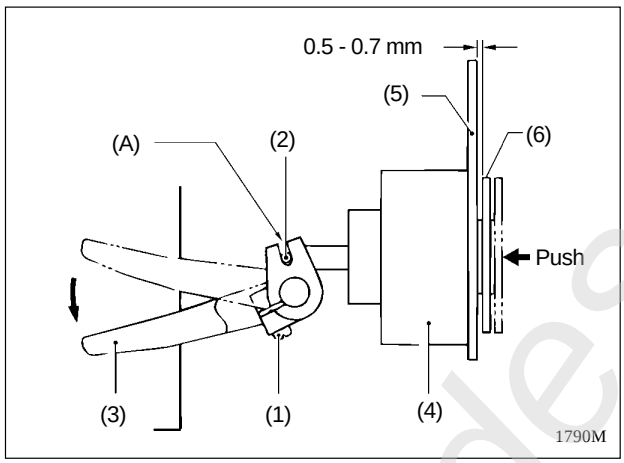
■ **Checking the clearance between the rotary hook and bobbin case holder position bracket**

Check that the clearance between the rotary hook (6) and the bobbin case holder position bracket (7) is enough to allow the thread being used to pass through smoothly.

The clearance should be 0.4 - 0.7 mm for light and medium-weight materials, and 0.6 - 0.9 for heavy-weight materials.

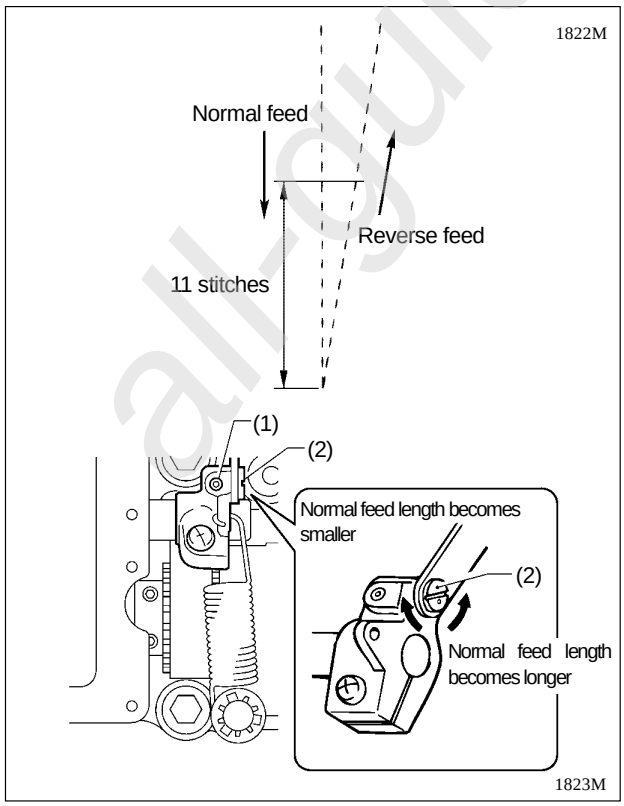
7-9. Quick reverse mechanism





1. Turn the stitch length dial to the maximum setting.
2. Remove the rear cover.
3. Tilt back the machine head.
4. Check that the position of the solenoid lever screw (1) can be verified when the machine head is restored to its normal position.
   * If the automatic presser lifter has been installed, remove it. (Refer to page 17.)
5. Return the machine head to its normal position, and loosen the screw (1).
6. Check that the plunger pin (2) is in the groove (A) in the solenoid lever.
7. With the reverse stitching lever (3) lowered all the way, push the plunger (6) until the clearance between the setting plate (5) of the quick reverse solenoid (4) and the plunger (6) is 0.5 - 0.7 mm.
8. Tighten the screw (1).
   * If the above clearance of 0.5 - 0.7 mm is large, the operation of the quick reverse solenoid (4) will become slower.
     In addition, if the clearance is small, the impact noise from the quick reverse solenoid (4) will become more apparent.

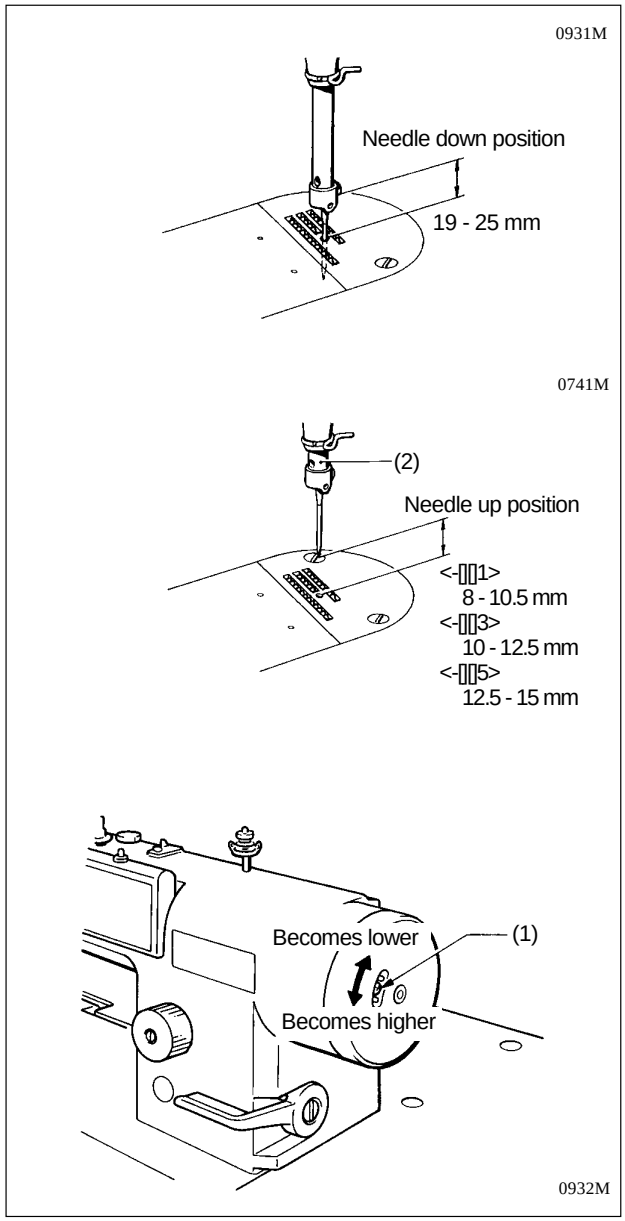
7-10. Matching stitch lengths for normal feed and reverse feed



The following operation matches the stitch lengths for normal feed and reverse feed.

1. Turn the stitch length dial to the "3" setting.
2. At a low sewing speed (220 rpm), sew using normal feed and using reverse feed (11 stitches in each direction)
3. If adjustment is required, carry out the following.
   1) Tilt back the machine head.
      * If the automatic presser lifter has been installed, remove it. (Refer to page 17.)
   2) Loosen the screw (1).
   3) Adjust by turning the eccentric pin (2) within a range of 90°. (If the eccentric pin (2) is turned more than 90°, the adjustment will be reversed.)
      - **If the stitch length is larger for normal feed than for reverse feed**
        Turn the eccentric pin (2) clockwise.
      - **If the stitch length is smaller for normal feed than for reverse feed**
        Turn the eccentric pin (2) counterclockwise.
   4) After adjusting, securely tighten the screw (1).

7-11. Synchronizer Adjustment



The synchronizer uses a single element to detect the needle up stop position. The needle down single is fixed.

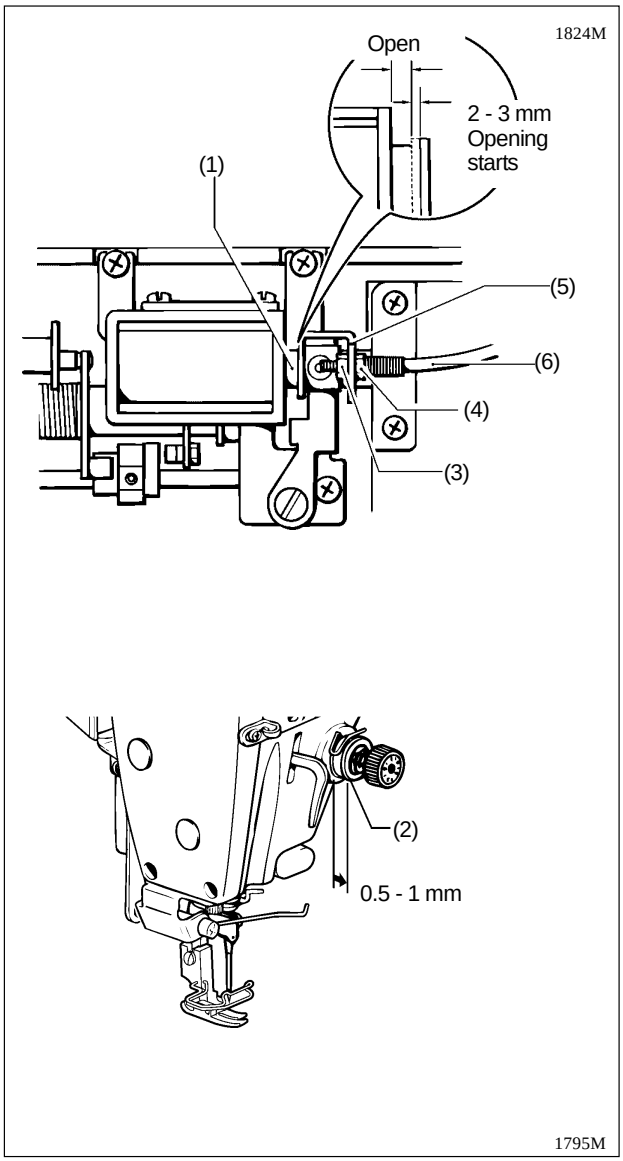
■ **Checking method**

1. Turn on the power switch.
2. Stop the machine with the needle in the needle down position.
   Check that the distance from the top of the needle plate to the bottom edge of the needle set screw is 19 - 25 mm at this time.
3. After the thread is trimmed, stop the machine with the needle in the needle up position.
4. Check that the distance from the top of the needle plate to the tip of the needle is within the value shown in the illustration in accordance with the machine model.

■ **Adjusting the needle up stop position.**

1. Turn off the power switch.
2. Loosen the screw (1).
3. Move the screw (1) in the direction of rotation of the machine pulley to raise the needle bar (2) to a higher stop position.
   Move the screw in the other direction to lower the needle bar stop position.
4. Securely tighten the screw (1).
   Note: Do not turn the pulley while the screw (1) is loosened, otherwise other parts may become damaged as a result of the looseness.

7-12. Adjusting the tension release wire



If the tension discs stay open or if the upper thread pulls out of the needle after thread trimming, carry out the following adjustments.

* Lower the presser foot when making these adjustment.

A. If the upper thread pulls out of the needle (The tension release wire does not operate enough during thread trimming)

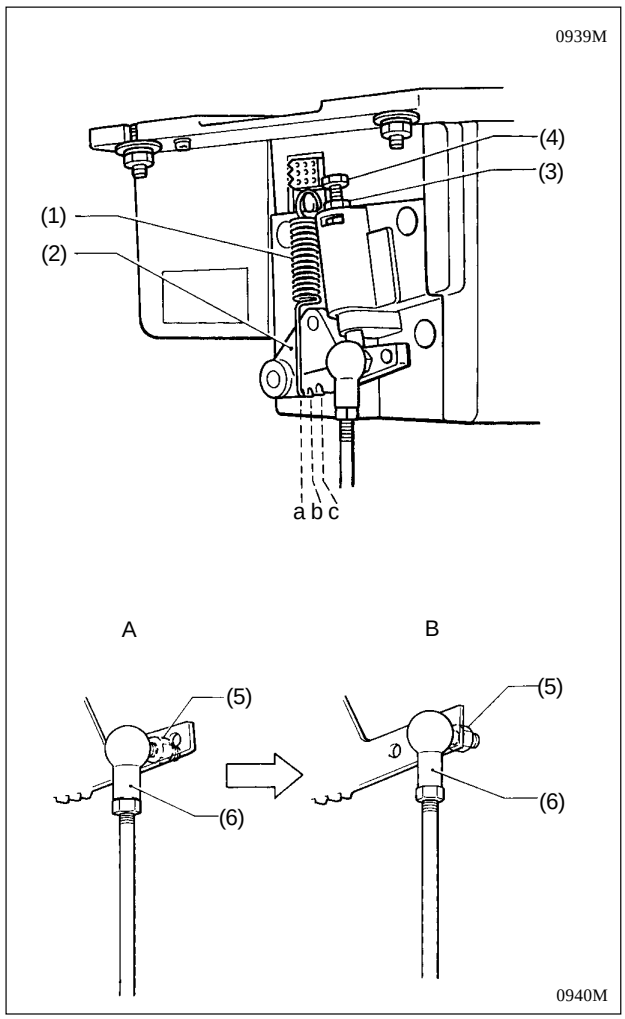
- When the solenoid plunger (1) is pushed by 2 - 3 mm, the tension discs (2) start opening, and when it is pushed all the way, the tension discs (2) should always be open.
- When the solenoid plunger (1) is released, the tension discs (2) close.

1. Loosen the nuts (3) and (4), and then push the solenoid plunger (1) by 2 - 3 mm.
2. Tighten the left-side nut (3) until the tension discs (2) start to open.
3. Check that the tension discs (2) open fully when the solenoid plunger (1) is pushed all the way, and that the tension discs (2) close when the solenoid plunger (1) is released.
4. Tighten the right-side nut (4).

B. If the tension discs stay open

1. Check that the solenoid lever (5) has returned fully.
2. Check that the tension release wire (6) is not stretched.
3. Adjust using nuts (3) and (4) as described above.
   * If adjustment is not possible, adjust the tension of the tension release wire (6). (Refer to 6-23 on page 55.)

7-13. Adjusting the treadle



■ **Adjusting the treadle pressure**

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).

* The treadle pressure will increase from position a to position c.

■ **Adjusting the treadle return pressure**

1. Loosen the nut (3) and turn the bolt (4).
   The treadle return pressure becomes heavier as the bolt (4) is tightened, and it becomes lighter as the bolt (4) is loosened.
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 %.

* This adjustment will also affect the treadle pressure and the treadle return pressure, so these setting should be readjusted if necessary.

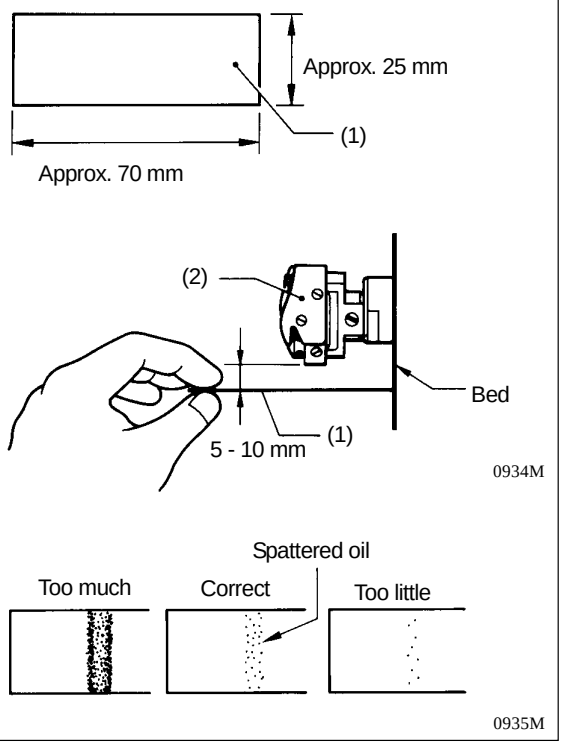
7-14. Adjusting the rotary hook lubrication amount

⚠ 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.

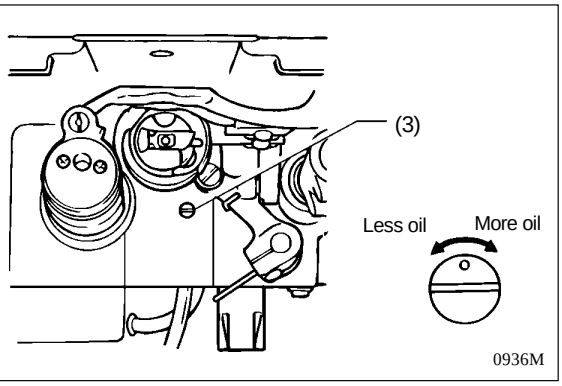
Use the following procedure to check the amount of oil being supplied to the rotary hook when replacing the rotary hook or when changing the sewing speed.

Note: If changing from the normal rotary hook to the rotary hook RP (lubrication - free rotary hook), a different procedure should be followed. Refer to page 74 for further details.



■ **Checking the lubrication amount**

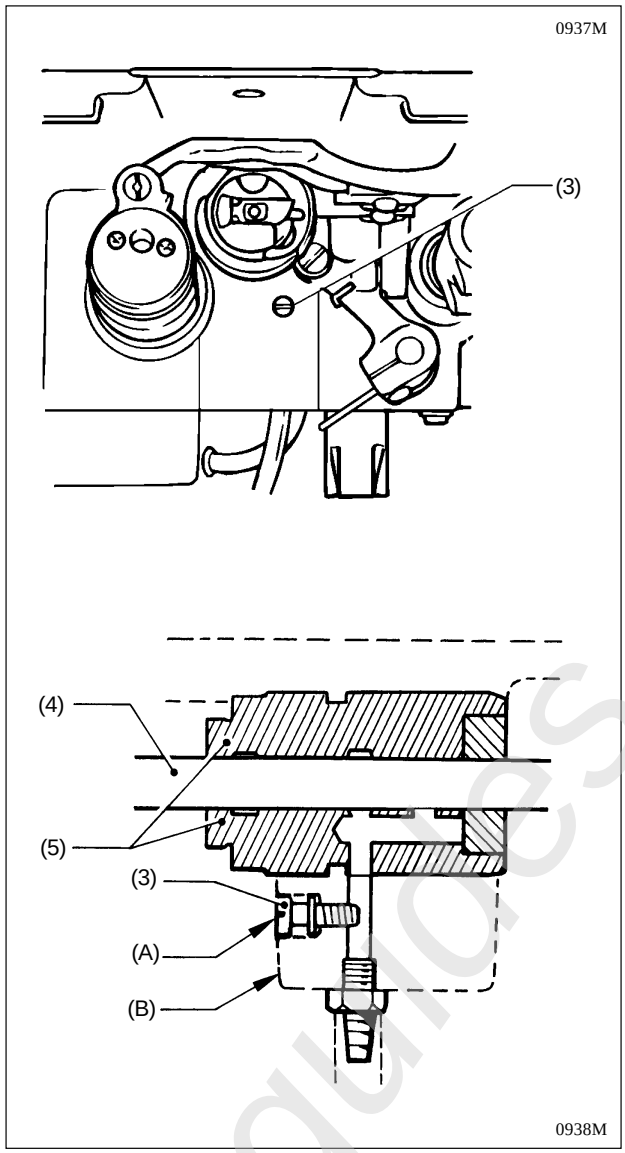
1. Run the machine at the normal sewing speed for approximately 1 minute without sewing any material (following the same start/stop pattern as when actually sewing).
2. Place the lubrication amount check sheet (1) underneath the rotary hook (2) and hold it there. Then run the sewing machine at the normal sewing speed for 8 seconds. (Any type of paper can be used as the lubrication amount check sheet (1).)
3. Check the amount of oil which has spattered onto the sheet.



■ **Adjusting the lubrication amount**

1. Tilt back the machine head.
2. Turn the lubrication adjustment screw (3) approximately 45° to adjust the lubrication amount.
   - If the rotary hook lubrication adjustment screw (3) is turned clockwise, the lubrication amount becomes greater.
   - If the rotary hook lubrication adjustment screw (3) is turned counterclockwise, the lubrication amount becomes smaller.
3. Check the lubrication amount again according to the procedure given in “Checking the lubrication amount” above.
   * Turn the lubrication adjustment screw (3) 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.

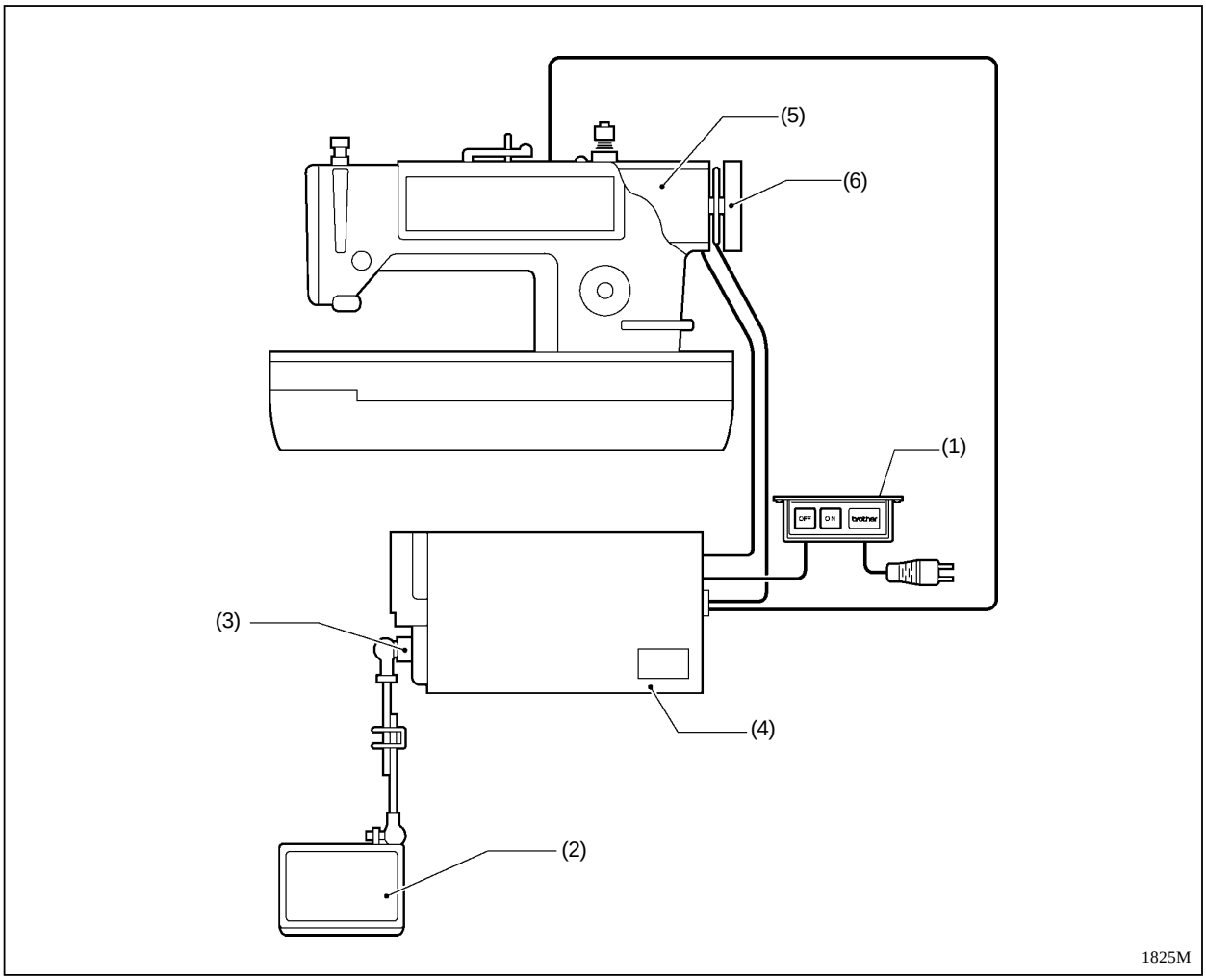
■ **When changing from the normal rotary hook to the rotary hook RP (lubrication-free rotary hook)**



1. While referring to the instruction manual, replace the rotary hook RP and the cap screw.
2. Tighten the lubrication adjustment screw (3) as far as it will go, and then turn it back the other way about three full turns.
   (At this time, the head (A) of the lubrication adjustment screw (3) should be almost flush with the edge (B) of the bed.)

Note: If the sewing machine is used while the lubrication adjustment screw (3) is in the fully-tightened position, it will cause oil to leak out through the gap between the rotary hook shaft (4) and the bracket (5).

8. CONTROL SYSTEM



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).

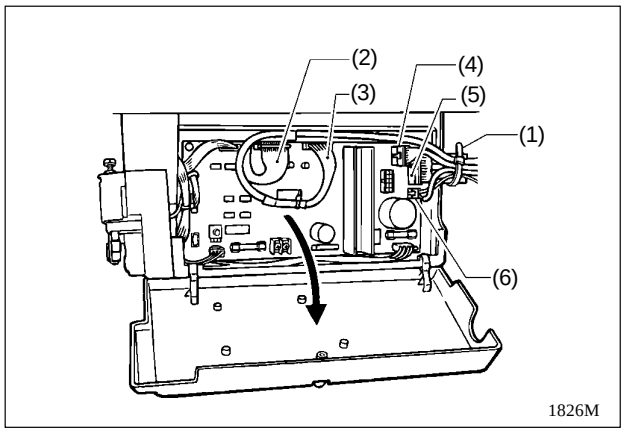
C. When the treadle is depressed backward

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).
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). The thread trimming operation is carried out immediately before the sewing machine stops at the needle up stop position.

9. REMOVING AND INSTALLING THE CONTROL BOX

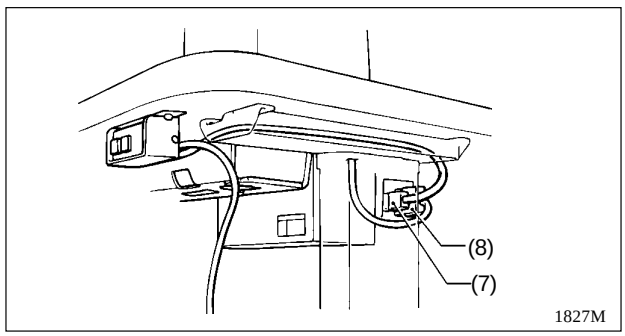
⚠ DANGER

Wait at least 10 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.

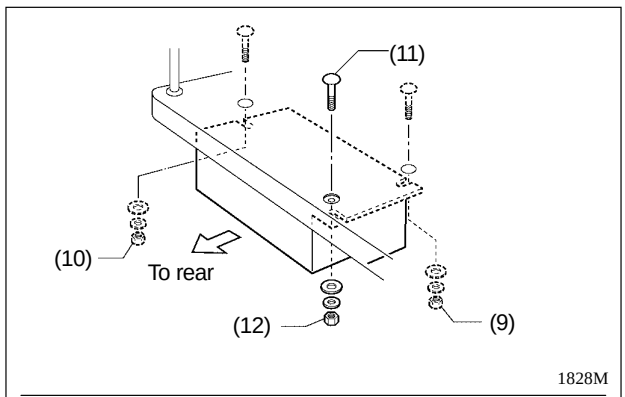


■ Removal

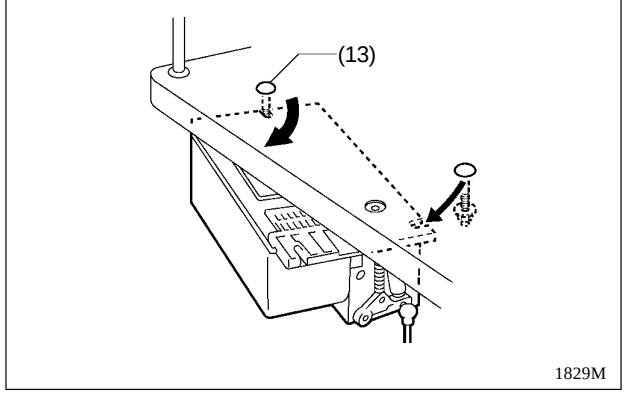
1. Remove the cable tie (1), and then disconnect the connectors (2) to (6) from the sewing machine.



2. Disconnect the power supply connector (7) and the motor connector (8).



3. Loosen the nuts (9) and (10) (without removing them).
4. Remove the bolt (11) and nut (12).



5. Pivot the control box around the bolt (13) and pull it out to remove it from the table.

■ Installation

Install by following the removal procedure in reverse.

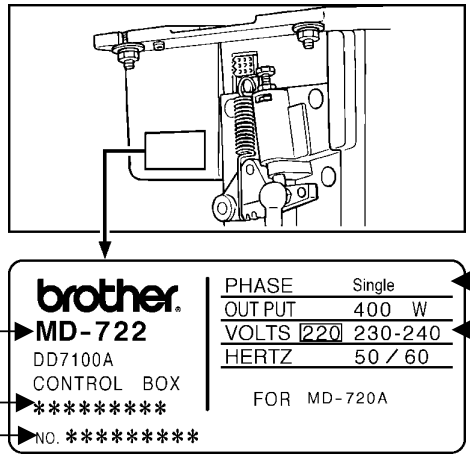
10. CONTROL BOX AND MOTOR RATING PLATE

■ Control box

- Check the phase, voltage and type for the control box.
- Some specifications are identical for both single- and three-phase.

Model

MD-721:DD7100/Single-phase MD-722: DD7100A/Single-phase MD-7220:SL-710A/Single-phase
MD-731:DD7100/Three-phase MD-732: DD7100A/Three-phase MD-7320:SL-710A/Three-phase



Phase

Voltage (number in brackets indicates factory default setting)

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Serial No.

NO. K01A11101

- Design revision symbol (A, B, C...)
- Year of manufacture (last two digits of year)
- Month of manufacture (A - M)

Type

DD7100A,DD7100
*[ ] [ ] * [ ]

SL-710A
* [ ]*- [ ]***- [ ]*

Compliance

E	4 or 5	CE compliant
N	Others	None

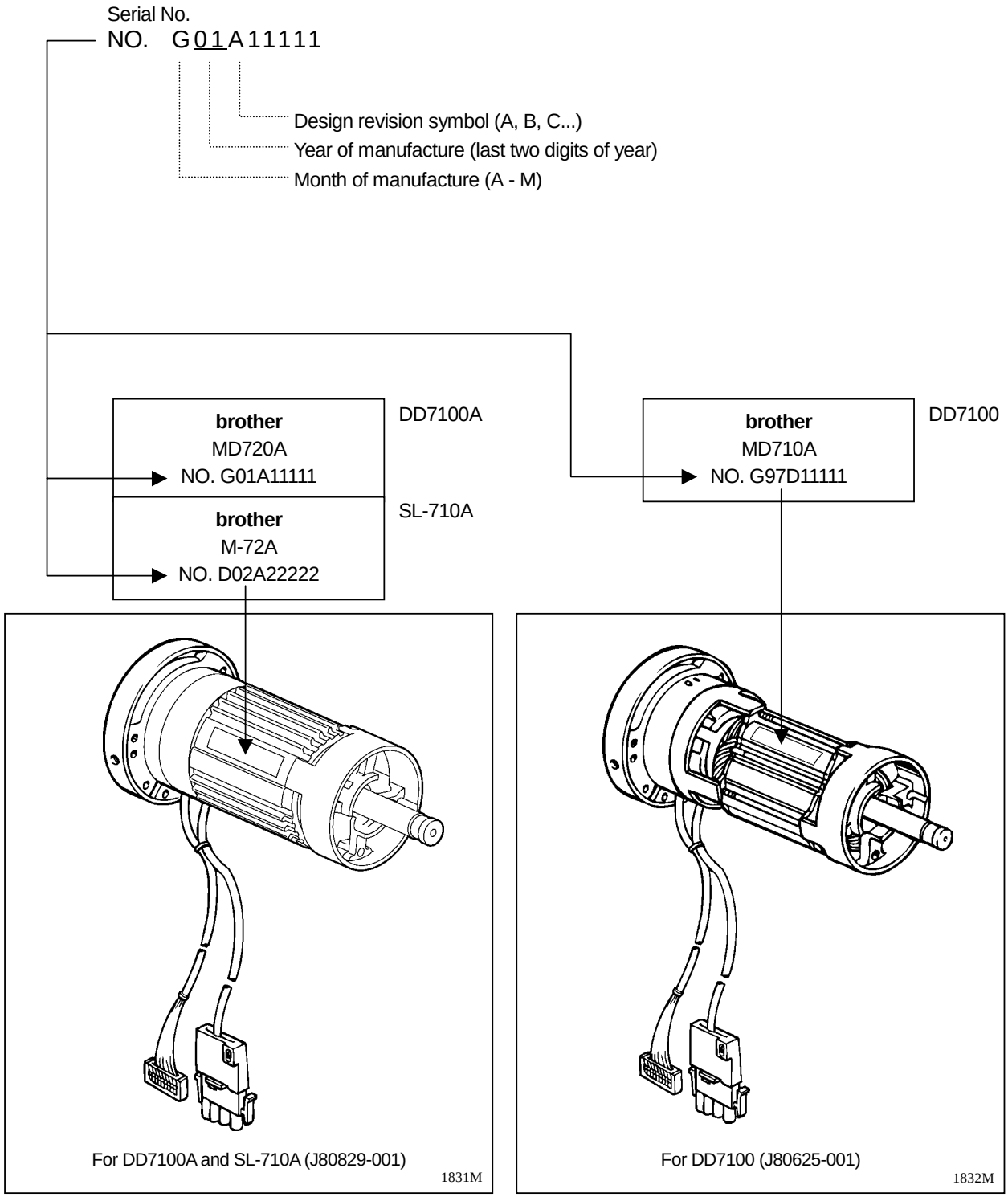
Speed (limit speed setting)

3	7	3,000 rpm
4	8	3,500 rpm
5	9	4,000 rpm
6	A	4,500 rpm
7	B	5,000 (4,700) rpm

Treadle unit

G	4	No modulation forward & back first step
H	6	Modulation of forward & back first step

■ Motor

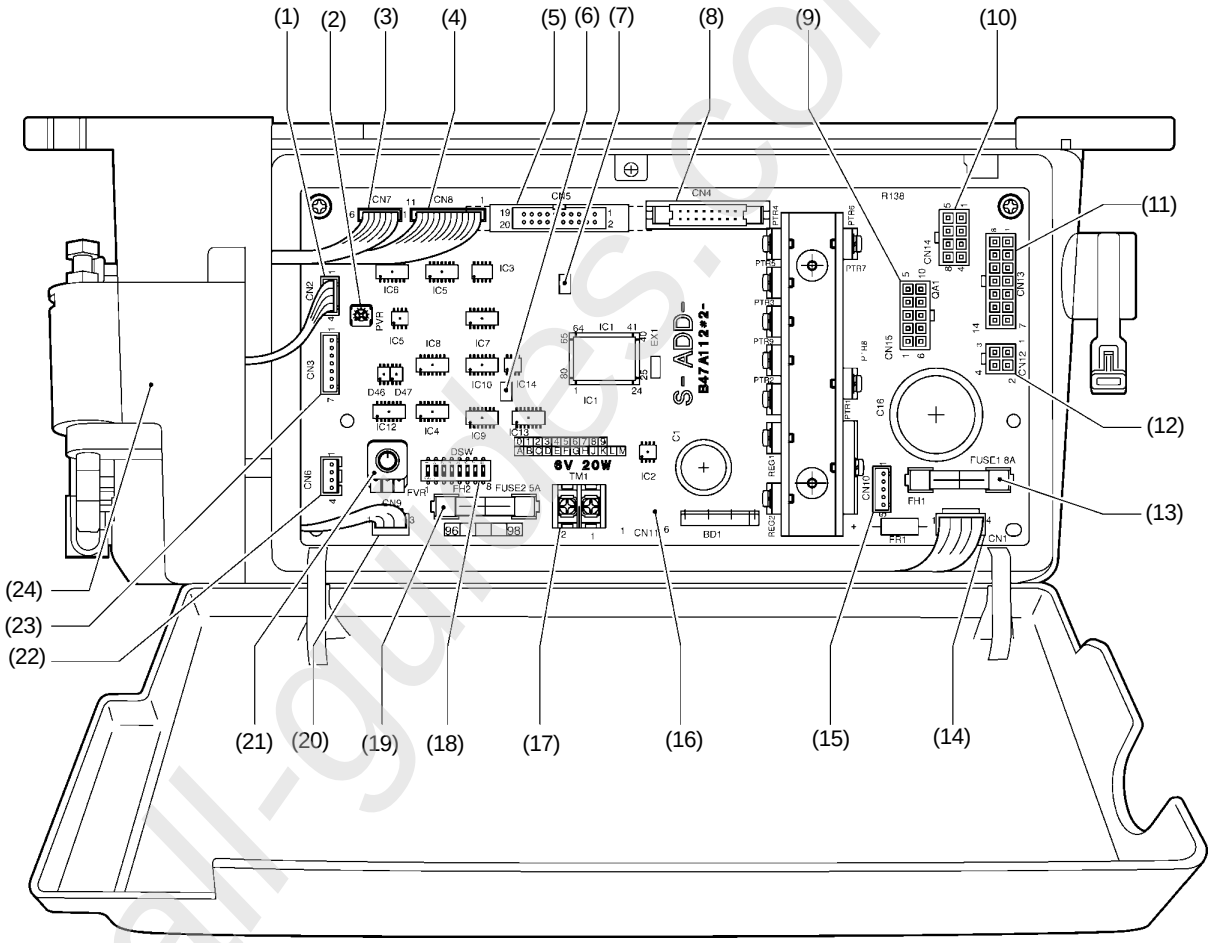


11. CONTROL CIRCUIT BOARD

⚠ DANGER

Wait at least 10 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



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	Name		Function
Connectors	(5)	Operation panel connector	Connect to sewing machine connectors.
	(8)	Synchronizer connector	
	(10)	Lower thread detector connector	
	(11)	Sewing machine connector	
	(12)	Solenoid-type presser lifter connector	
	(4)	Coupler connector	Connect to power supply circuit board connectors.
	(3)	Relay connector	
	(1)	Treadle connector	Connect to treadle unit connector.
	(23)	Standing operation connector	(Already connected for some specifications.)
	(14)	Control power supply connector	Connect to transformer connectors.
	(20)	Illumination lamp connector	
	(9)	Puller connector	For optional devices.
	(15)	Output power supply connector	
	(22)	Bobbin changer connector	
Fuses	(13)	Solenoid power supply fuse (8 A)	For preventing overcurrent
	(19)	Illumination lamp power supply fuse (5 A)	
Terminal board	(17)	Terminal board	For illumination lamp (6 V)
DIP switch	(18)	DSW	8-element DIP switch (*1)
Control dials	(2)	PVR	Coordinates the treadle unit (24) and control circuit board (16). (*2)
	(21)	FVR	Use to adjust the fluorescent tube and lamp if they are flickering when the sewing machine starts. (*3)
LED indicators	(6)	Red LED	Indicates power supply circuit board problems.
	(7)	Green LED	Indicates that the power is on.

*1: When using the automatic presser lifter, set DIP switch 2 to ON. If the sewing machine is used while DIP switch 2 is set to OFF, the sewing machine may start operating before the presser foot is lowered. (Refer to page 81.)

*2: This is adjusted at the time of shipment from the factory, and should generally not be touched. However, it should be adjusted when either the control circuit board (16) or treadle unit (24) is replaced. (Refer to page 92.)

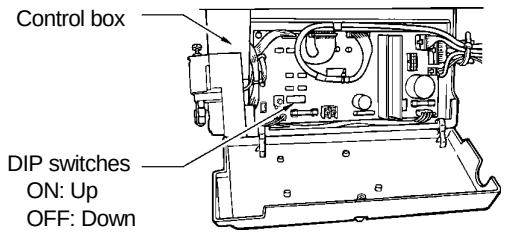
*3: This is set to the right-most position at the time of shipment from the factory. The flickering is reduced if turned to the left, but the sewing machine operation will become slower.
In addition, the maximum speed may become lower.

12. FUNCTION SETTING METHODS

12-1. DIP switch functions

⚠ DANGER

Wait at least 10 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.



0973M

1	Presser foot position when the foot pedal 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	Setting of a delay from the time the presser foot is turned OFF until the motor starts (See NOTE 2.)	ON	With delay
		OFF	Without delay
3	Needle up stop position due to reverse rotation	ON	The machine stops with the needle at its highest position due to reverse rotation.
		OFF	The machine stops with the needle at its highest position without reverse rotation.
4		ON	
		OFF	
5			Spare
6	Limited speed setting 1		Maximum sewing speed (during high-speed sewing) that can be through the operation panel (See NOTE 3.)
7	Limited speed setting 2		
8			Always set to off. (See NOTE 4.)

(NOTE 1) Once the knee lifter switch is used to lower the presser foot, the foot pedal 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.

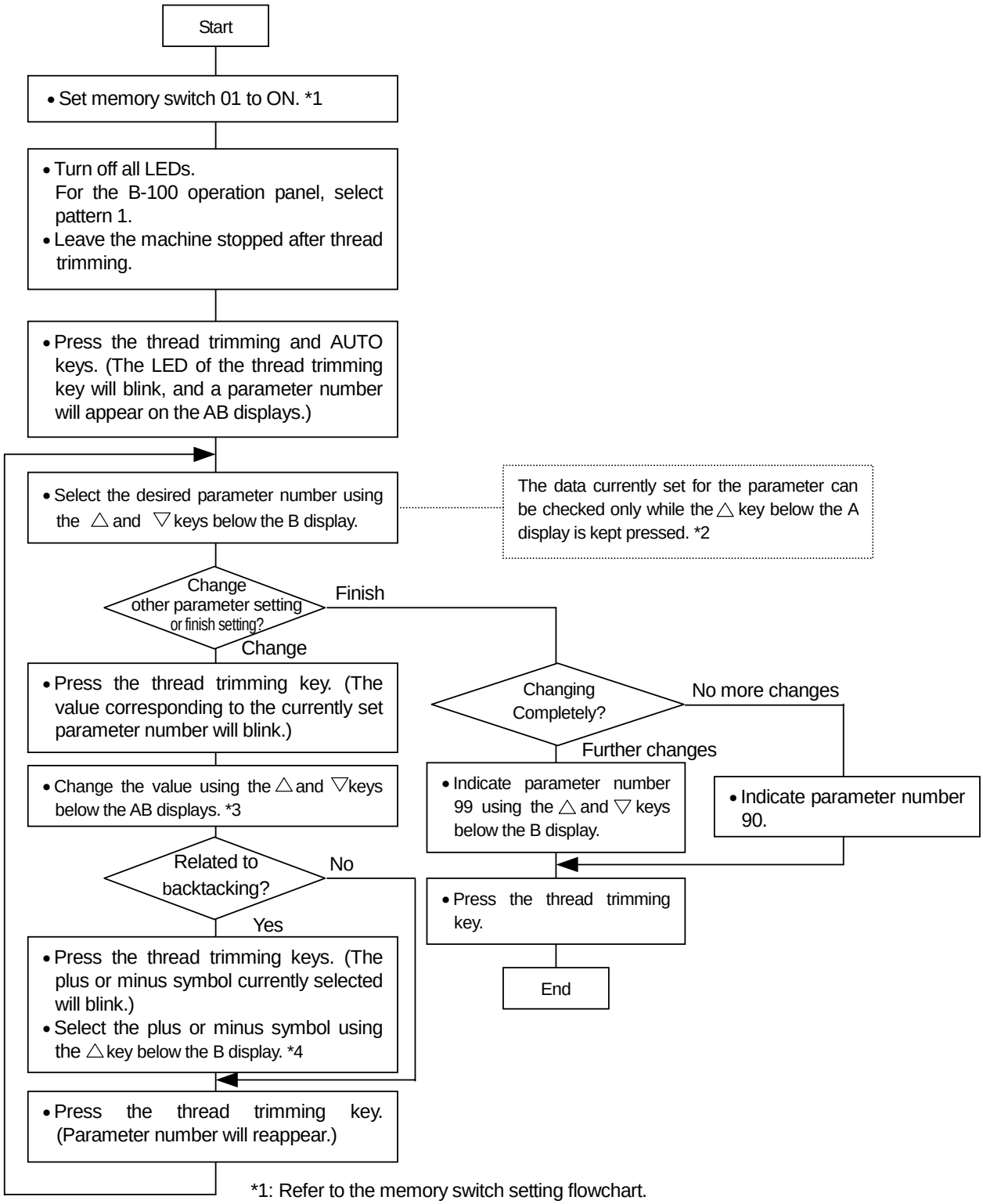
(NOTE 2) For -900 series specification macnines (machines with an automatic presser foot lifter), be sure to set DIP switch 2 to on.

(NOTE 3) Limited sewing speeds depend on settings for DIP switches 6 and 7 as shown in the following table. When the maximum sewing speed is specified as 5,000 rpm on the operation panel, it is actually limited to 4,700 rpm.
If the setting of memory switch 04 is changed to on, the set sewing speed is not limited to 4,700 rpm.

DIP switch 6	DIP switch7	Limited speed
OFF	OFF	3,500 rpm
ON	OFF	4,000 rpm
OFF	ON	4,500 rpm
ON	ON	5,000 rpm

(NOTE 4) If DIP switch 8 is set to on, all pedal operations are deactivated. Be sure to set it to off.

12-2. Parameter setting flowchart



*1: Refer to the memory switch setting flowchart.
*2: As to the data related to backtacking, press the △ key to indicate the timing angle (X15°) and ▽ key to indicate a plus or minus symbol.
*3: As to backtacking information, the timing angle (X15°) will appear.
*4: Select a plus < + > or minus symbol < − > for the value determined in *3.

12-3. Parameters

The parameter numbers appear on the panel.

Parameter No.10 - 33

Parameter No.	Default value	Data value setting range	Function
10	15 (150 ms)	00 - 25 [X10] (0 - 250 ms)	Time delay from the time the machine starts to operate with the automatic presser foot raised to the time the moter operates.
11	05 (50 ms)	03 - 10 [X10] (30 - 100 ms)	Time delay from the time the thread wiper turns OFF until the automatic presser foot turns ON
12 *1 (From design change B onward)	03	01 - 10	Time from when lower thread solenoid finally turns OFF to when motor can operate
13	30 (300 ms)	10 - 90 [X 10] (100 - 900 ms)	Time to keep the automatic presser foot lifter raised
14 (a)	36 (3 min)	00 - 60 [X 5] (5sec - 5 min)	The presser foot signal will be automatically off after the set time passes. When the data is set to 00, the presser foot signal is not automatically off.
15 (b)	00 (30ms)	00 - 60 [X 2.5] (0 - 150 ms)	Time from the presser foot lowering command to when the presser foot momentarily turns ON
16	12	10 - 12	Detection voltage constant from the presser foot lowering command to when the presser foot momentarily turns ON
17	10 (10s)	05 - 30 (5 - 30 s)	Continuous puller ON time
18	40 (40 stitches)	00 - 99 (0 - 99 stitches)	Number of stitches from sewing start to lowering of puller
20	02 (20ms)	01 - 07 [X10] (10 - 70ms)	Time delay from end of thread trimming to the time when thread wiper turns ON
21	05 (50ms)	04 - 10 [X10] (40 - 100ms)	Thread wiper ON time
22	50 (50ms)	40 - 70 [X1] (40 - 70ms)	Lower thread detect pin ON control time (all areas)
23	10 (10ms)	05 - 25 [X1] (5 - 25ms)	First ON time for lower thread detect pin
24	07 (7ms)	01 - 15 [X1] (1 - 15ms)	First OFF time for lower thread detect pin
26	03 (30ms)	00 - 05 [X10] (0 - 50ms)	Time delay from the time the thread wiper turns OFF to the time when the lower thread detect pin turns ON
27 (c)	05 (0.5s)	02 - 50 [X0.1] (0.2 - 5.0s)	Time delay from the time when the machine stops with the needle at its highest/lowest position to the lower thread detect pin ON (Lower thread detection function at the needle up/down stop with the foot pedal in neutral)
30	-04 (-60 °)	-23 to +23 (units of 15°) (- appears as "-", and + appears as "1".)	ON timing for quick reverse device during start backtacking and continuous backtacking
31	00 (0 °)	-23 to +23 (units of 15°) (- appears as "-", and + appears as "1".)	OFF timing for quick reverse device during start backtacking and continuous backtacking
32	+02 (30 °)	-23 to +23 (units of 15°) (- appears as "-", and + appears as "1".)	OFF timing for quick reverse device during end backtacking.
33 (d)	-04 (-60 °)	-23 to +23 (units of 15°) (- appears as "-", and + appears as "1".)	2nd ON timing for quick reverse device during double end backtacking

*1 ... Values are X10 ms.

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Notes

(a) The timer-off function for the presser foot is activated only when memory switch 36 is set to off.

(b) The indicated parameters are only enabled when memory switch 35 is set to ON.

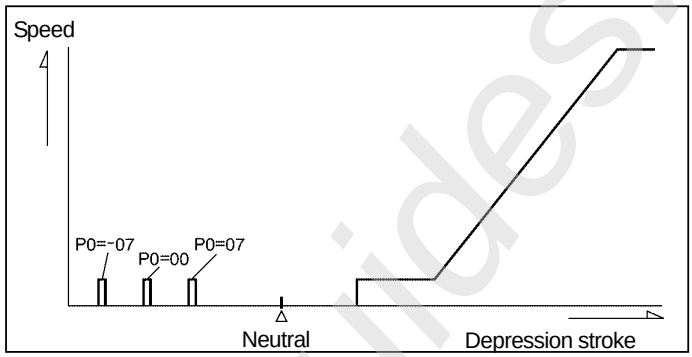
(c) The lower thread detection function for the needle up/down stop when the pedal is positioned at neutral is activated only when memory switch 51is set to on.

(d) The indicated parameters are the settings when memory switch 22 is set to ON.

Parameter No.P0 - S5

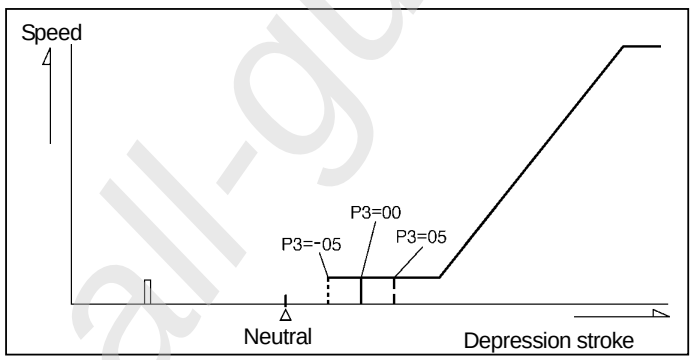
Parameter No.	Default value	Data value setting range	Function
P0	00 (0 mm)	-07 - 07 [X0.25] (-1.75 - 1.75 mm)	Thread trimmer operating point of depression stroke
P1	-01 (-0.25 mm)	-05 - 05 [X0.25] (-1.25 - 1.25 mm)	Back automatic presser lifter operating point of depression stroke
P2	01 (0 mm)	-05 - 05 [X0.25] (-1.25 - 1.25 mm)	Forward automatic presser lifter operating point of depression stroke
P3	00 (0 mm)	-05 - 05 [X0.25] (-1.25 - 1.25 mm)	Low speed start operating point of depression stroke
P4	00 (0 mm)	-05 - 05 [X0.25] (-1.25 - 1.25 mm)	Speed change starting point of depression stroke
P5	00 (0 mm)	-06 - 06 [X0.75] (-4.5 - 4.5 mm)	Maximum speed reaching point of depression stroke
S4	-01 (-0.25 mm)	-02 - 02 [X0.50] (-1.0 - 1.0 mm)	Speed change starting point of standing operation variable speed pedal
S5	00 (0 mm)	-02 - 02 [X0.50] (-1.0 - 1.0 mm)	Maximum speed reaching point of standing operation pedal

With the value being 0 at the treadle neutral position, the value is positive when the treadle is depressed forward, and negative when the treadle is depressed backward. The value is added to or deducted from the standard setting value. (Refer to page 91 for details.)



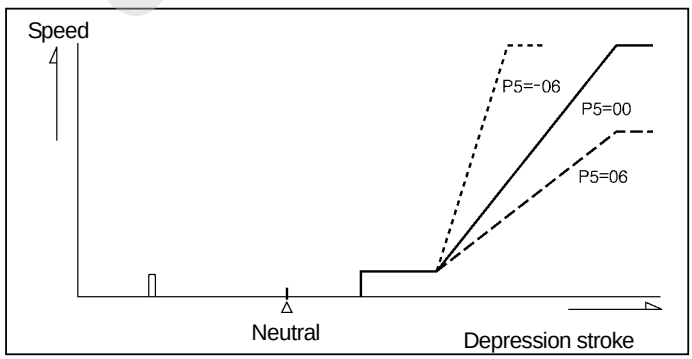
(Example 1: Changing setting for P0)

1835M



(Example 2: Changing setting for P3)

1836M

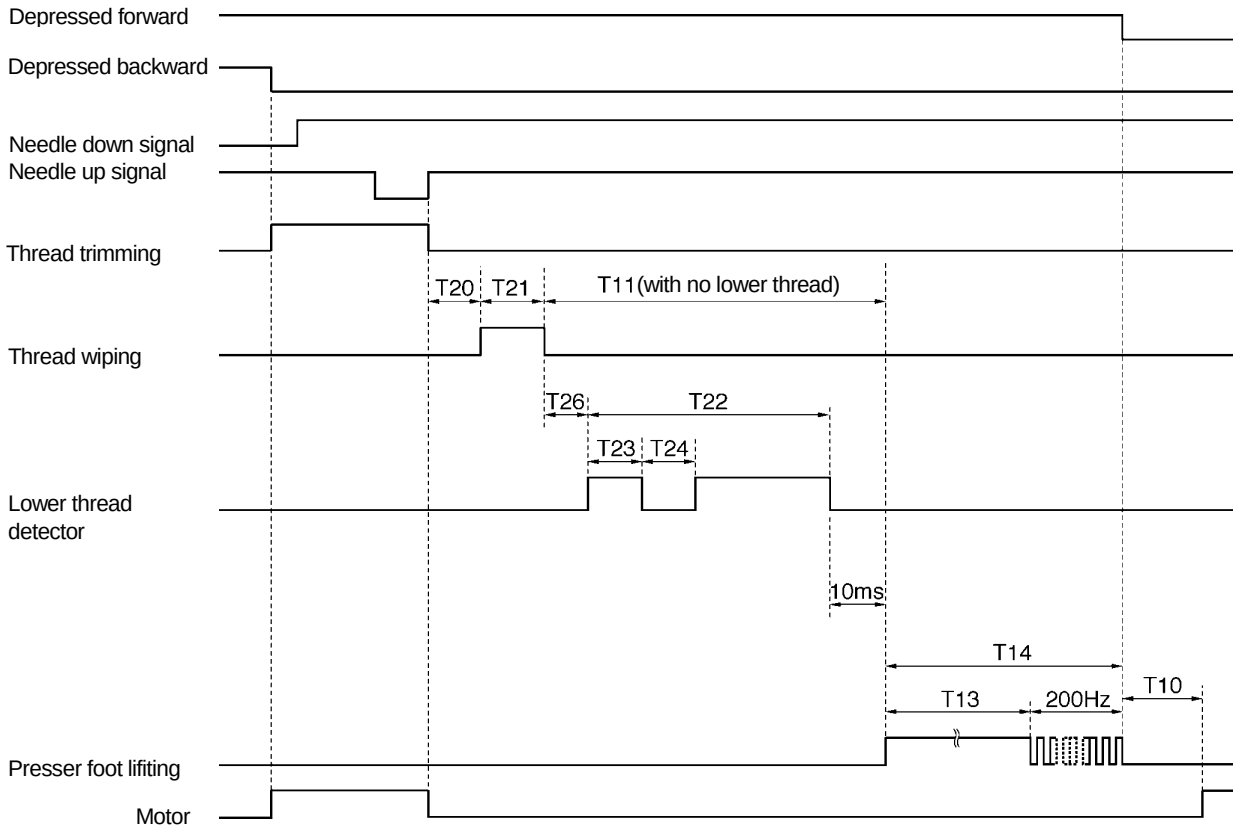


(Example 3: Changing setting for P5)

1837M

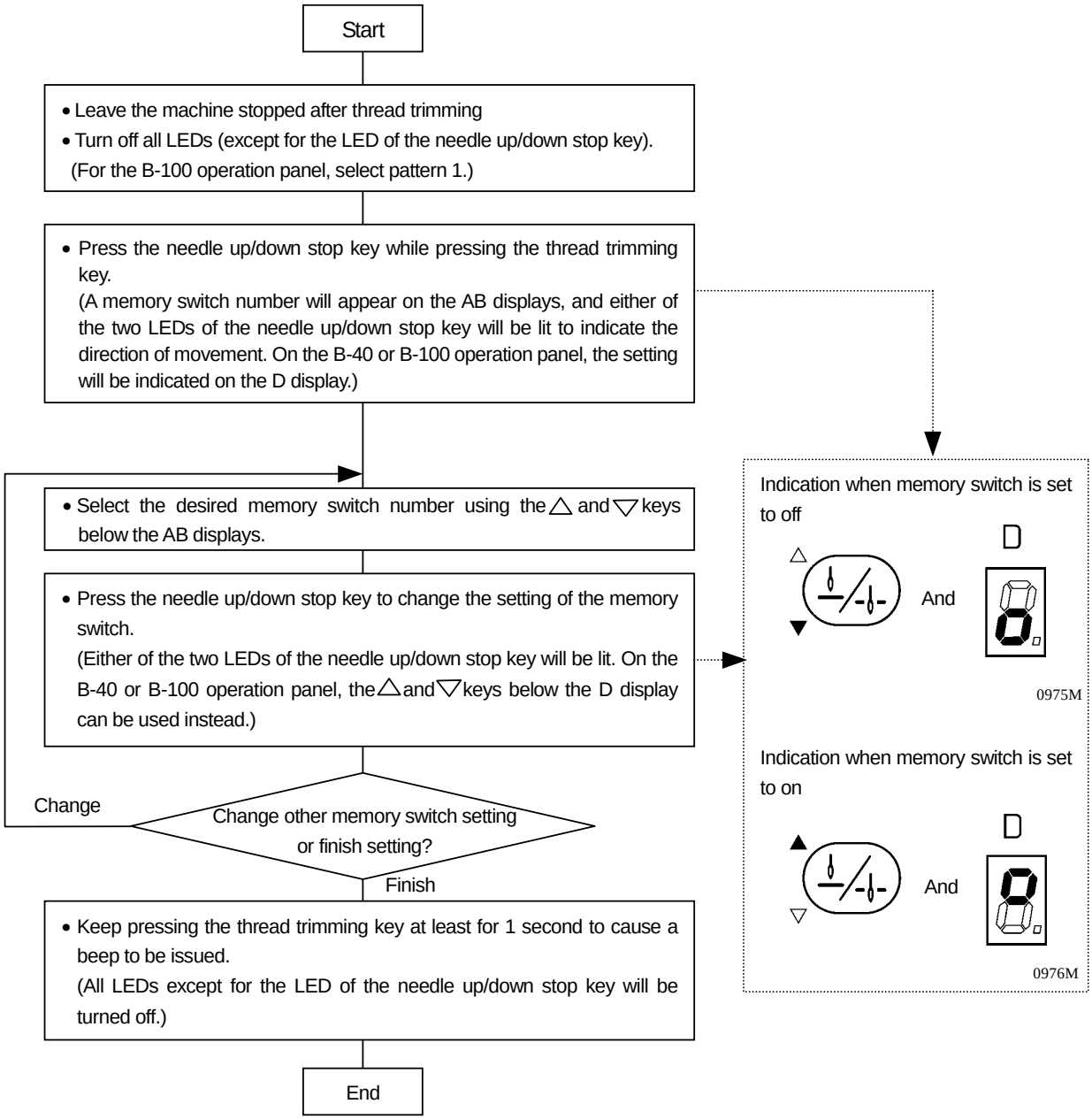
<Parameter time setting>

"T " in the diagram (where "**" is a two-digit number) corresponds to the various parameter numbers.**



1838M

12-4. Memory switch setting flowchart



(NOTE) If the power is turned off before the end operation, memory switch settings are not renewed.

12-5. Memory switches

Memory switches 01 - 08

01	Parameter setting	ON	Parameter setting can be changed.
		OFF	Parameter setting change is prohibited.
02	Interlocking along with forward step	ON	Forward step is possible during backward step (for thread trimming).
		OFF	Forward step is impossible during backward step (for thread trimming).
03	Power supply drop check	ON	Power supply drop check (reset detection) function is activated.
		OFF	Without the above-mentioned function
04	Limited sewing speed	ON	The same as settings of DIP switches 6 and 7. (See NOTE 1.)
		OFF	Maximum sewing speed is limited to 4,700rpm.
05	Needle penetration force	ON	Needle penetration force is strong.
		OFF	Needle penetration force is ordinary.
06	Overtime function	ON	Overtime function disabled
		OFF	Overtime function enabled (3 minutes)
07	Independent backtacking speed setting	ON	Backtacking speed is not limited by high speed setting
		OFF	Backtacking speed is limited by high speed setting
08	Slow start function (From design change C onward)	ON	Number of stitches and sewing speed can be set using the operation panel
		OFF	Low speed is fixed at 2 stitches

(NOTE 1) When the power is turned on again, sewing speed can be set up to 5,000 rpm.

Memory switches 11 - 18

11	Thread trimming and thread wiper output	ON	Without thread trimming and thread wiper
		OFF	With thread trimming and thread wiper
12	Presser foot position after thread trimming (See NOTE 2.)	ON	Presser foot is raised when the foot pedal is in neutral.
		OFF	Presser foot is lowered when the foot pedal is in neutral.
13	Presser foot position after the machine stops with the pedal in neutral	ON	Presser foot is at its highest position.
		OFF	Presser foot is at its lowest position.
14	Actuator switch	ON	It is used as the thread trimming switch.
		OFF	It is used as the reverse and correction switches.
15	Slowdown stop control	ON	Ordinary slowdown stop and control
		OFF	Slowdown and stop control with 1 stitch elimination
16	Lower thread remaining detection	ON	Unable to be used
		OFF	Able to be used.
17	Half-stitch correction	ON	A forward stitch or half stitch can be corrected. (See NOTE 3.)
		OFF	A forward stitch can be corrected. A half stitch cannot be corrected. (See NOTE 3.)
18	Reverse stitch correction	ON	A forward stitch or reverse stitch can be corrected. (See NOTE 3.)
		OFF	A forward stitch can be corrected. A reverse stitch cannot be corrected. (See NOTE 3.)

(NOTE 2) It is activated when DIP switch 1 is set to on.

(NOTE 3) A forward stitch can be corrected when the LED of the correction switch is lit. A half stitch or reverse stitch can be corrected when the LED of the correction switch is not lit.

Memory switches 21 - 28

21	Double start backtacking	ON	Start backtacking is performed in the order of lengths A, B, A, then B.
		OFF	Start backtacking is performed in the order of lengths A and B.
22	Double end backtacking	ON	End backtacking is performed in the order of lengths C, D, C, and D (B, A, B, and A on the B-20 operation panel).
		OFF	End backtacking is performed in the order of lengths C and D (B and A on the B-20 operation panel).
23	Number of stitches for start backtacking plus 10 stitches	ON	Extra 10 stitches are added to the number of stitches set for both lengths A and B.
		OFF	No extra stitches are added.
24	Number of stitches for end backtacking plus 10 stitches	ON	Extra 10 stitches are added to the number of stitches set for both lengths C and D (B and A on the B-20 operation panel).
		OFF	No extra stitches are added.
25	Feed direction when the start backtacking is completed	ON	The machine will stop with the reverse feed remaining on.
		OFF	The machine will stop after feed is returned to normal.
26	Start end backtacking	ON	End backtacking will start without speed slowing down.
		OFF	The machine will slow the sewing speed gradually to start low speed sewing, then shift to end backtacking.
27	Continuous backtacking setting	ON	Forward stitching for the number of stitches set in the A display, and backward stitching for the number of stitches set in the B display will be performed repeatedly for the number of times set in the D display. (The C display will be blank.)
		OFF	Continuous stitching will be performed for lengths A, B, C, and D as specified in the ABCD displays.
28	Number of stitches for continuous backtacking plus 10 stitches	ON	Extra 10 stitches are added to each lengths A, B, C, and D.
		OFF	No extra stitches are added.

Memory switches 31 - 38

31	Start backtacking suspension by foot pedal being placed in neutral or backtacking speed change during the start backtacking	ON	Sewing can be suspended by returning the foot pedal to neutral. During start backtacking, sewing speed depends on the foot pedal stroke.
		OFF	Sewing can not be suspended by returning the foot pedal to neutral. During start backtacking, sewing speed is fixed regardless of the foot pedal stroke.
32	The number of backtack stitches on the B-20 or B-40 operation panel	ON	The number of backtack stitches for fixed stitching, label attaching, or pleats presser sewing can be changed.
		OFF	The number of backtack stitches is fixed to 4 (for fixed stitching, label attaching, and pleats presser sewing) (See NOTE 4)
33	Pleats presser stitching direction	ON	Without reverse stitching (Fixed stitching will be called back.)
		OFF	With reverse stitching (Ordinary pleats presser stitching)
34	-	ON	-
		OFF	-
35	Presser foot soft drop function	ON	Manual soft drop function (NOTE 5)
		OFF	Automatic soft drop function (NOTE 6)
36	Presser foot timer-off function	ON	Timer-off function is not activated. (Presser foot will not be lowered by timer.)
		OFF	Timer-off function is activated. (See NOTE 7)
37	Automatic presser lifter output selection (From design change B onward)	ON	Pneumatic-type presser lifter-compatible (Duty 1:1)
		OFF	Solenoid-type presser lifter-compatible (Duty 1:6)
38		ON	
		OFF	

(NOTE 4) For the B-40 operation panel, the number of end backtack stitches can be changed for fixed stitching or pleats presser sewing.
(NOTE 5) Adjustment is required using parameter No. 15. If set to "00", response is fastest and operating noise increases.
(NOTE 6) Can be adjusted using parameter No. 16. If set to "10", response is fastest and operating noise increases.
(NOTE 7) Timer-off function is not activated when parameter No.14 is set to 00.

Memory switches 41 - 48

41	Mode after lower thread alarm	ON	Foot pedal can be used after lower thread alarm.
		OFF	After lower thread alarm, the foot pedal operation is deactivated until the cancel key is pressed.
42	Rotary hook used with the lower thread detector	ON	1.7-time rotary hook
		OFF	Standard rotary hook
43	(See NOTE 8.)	ON	-
		OFF	Be sure to set to off.
44	(See NOTE 8.)	ON	-
		OFF	Be sure to set to off
45	Delayed start of standing operation	ON	Without any delay.
		OFF	With a delay (for 80 ms).
46	Emergency stop by presser lifter pedal during standing operation	ON	Impossible to make an emergency stop using presser lifter pedal
		OFF	During automatic sewing, emergency stop can be performed using presser lifter pedal.
47	Emergency stop using variable speed pedal during standing operation	ON	Impossible to make an emergency stop using variable speed pedal.
		OFF	During automatic sewing, emergency stop can be performed using variable speed pedal.
48	Lifting the presser foot using thread trimming pedal during standing operation	ON	It is always deactivated after the presser lifter pedal is used.
		OFF	It is activated.

Memory switches 51 - 58

51	Lower thread detection after the machine is stopped by putting foot pedal in neutral (See NOTE 9).	ON	Lower thread is detected while the machine is stopped by putting foot pedal in neutral for the specified time.
		OFF	Lower thread is not detected after the machine is stopped by putting foot pedal in neutral.
52	Needle up/down stop key operation	ON	Needle up/down stop key operation is deactivated. (Needle stop position cannot be changed.)
		OFF	Needle up/down stop key operation is activated.
53		ON	
		OFF	
54	Actuator correction stitches after thread trimming ends (From design change B onward)	ON	Correction enabled
		OFF	Correction disabled
55		ON	
		OFF	
56		ON	
		OFF	
57		ON	
		OFF	
58		ON	
		OFF	

(NOTE 8) Do not change these settings.

(NOTE 9) The time for delay can be changed in parameter No.27. If the foot pedal is pushed forward within the time, lower thread will not detected. The default delay is 0.5 seconds.
This function is available for sewing process without thread trimming.

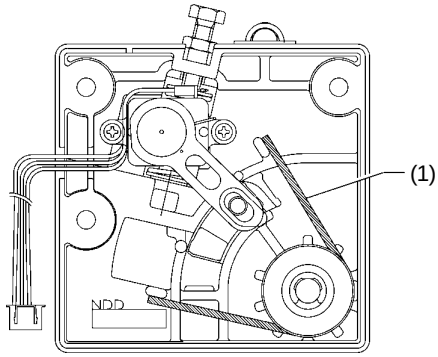
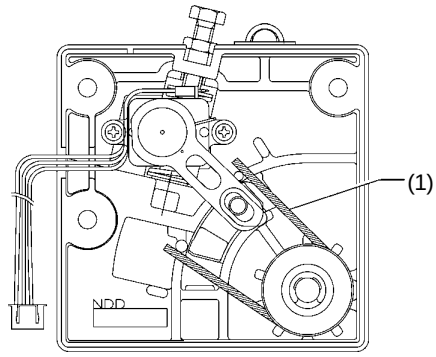
Memory switch 61

61	Puller output selection (lifting/lowering the puller)	ON	Synchronizer signal output
		OFF	Puller output

13. TREADLE UNIT ASSEMBLY

13-1. Types

- Two different types are available: a type that controls the automatic presser lifter, and a type does not control the automatic presser lifter.
- The two specifications are changed over by (A) changing the attachment position of the spring (1) inside the treadle unit, and (B) resetting the depression stroke signal.

Specification	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> Signal setting	Carry out the setting in "Setting method for standard depression strokes" on page 92. "F1" and "r1" are set at the neutral position.	Carry out the setting in "Setting method for standard depression strokes" on page 92. "F1" and "r1" are set at the first modulation point for the depression force.
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.
Depression signal	<When depressed forward and depressed backward> No automatic presser lifter signal is output.	<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.

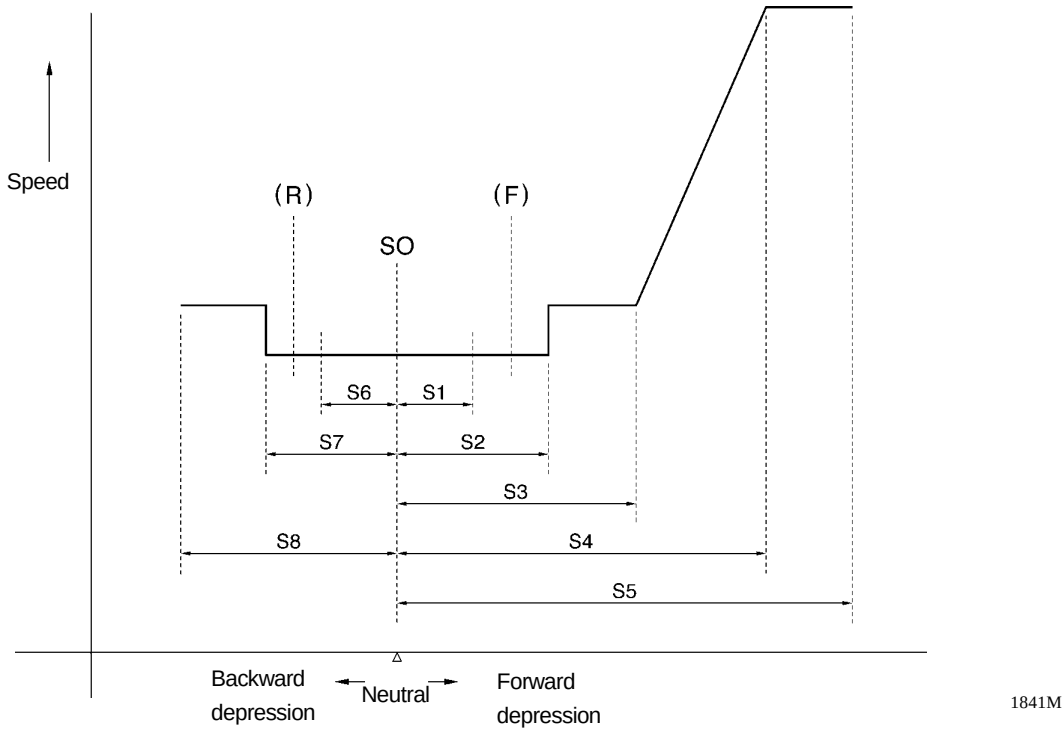
13-2. Standard setting values

Parameter 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	-
P2	S1	Forward automatic presser lifter operating point	-	-	2 (*1)	10
P3	S2	Low speed operation starting point	3	10	5	25
P4	S3	Speed change starting point	6	-	7	-
P5	S4	Maximum speed reaching point	S5-1	-	S5-1	-
-	S5	Maximum forward depression point	14.5	12	14.5	32
P1	S6	Back automatic presser lifter operating point	-	-	2 (*2)	14
P0	S7	Thread trimmer operating point	5	22	5	35
-	S8	Maximum back depression point	8	28	8	43

*1 : Enabled when DIP switch 1 is ON and memory switch 13 is ON.

*2 : Enabled when memory switch 13 is OFF.

- 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.



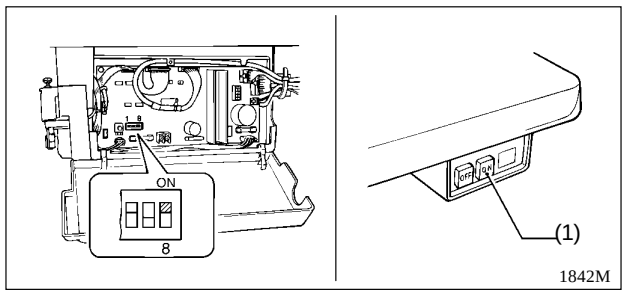
13-3. Setting method for standard depression strokes

⚠ CAUTION

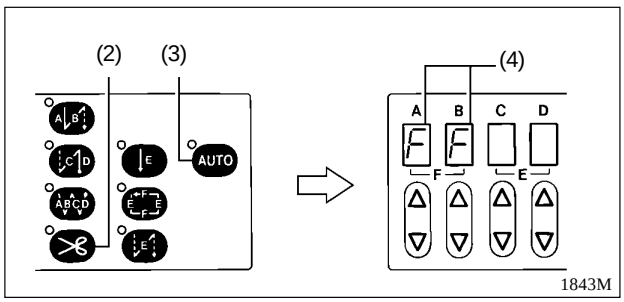
If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

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.

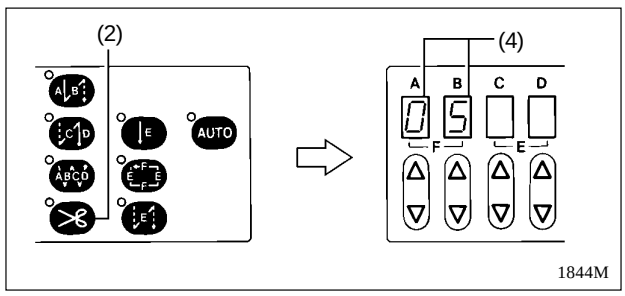
1) Signal setting entry



1. Set DIP switch No.8 to ON.
2. Turn on the power switch.

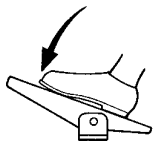


3. Press the thread trimming key (2) and the AUTO key (3) simultaneously.
   “FF” will appear in columns A and B (4) of the display window.

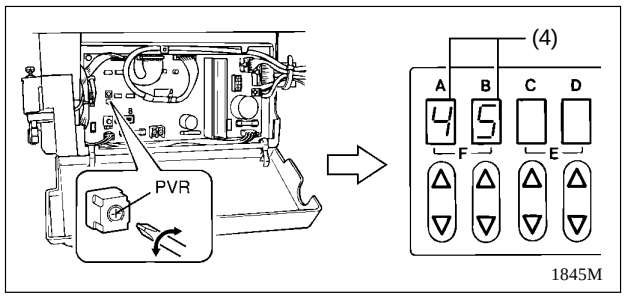


4. Press the thread trimming key (2).
   A value of “05” or higher will flash in columns A and B (4) of the display window.

2) Memorizing the maximum forward position

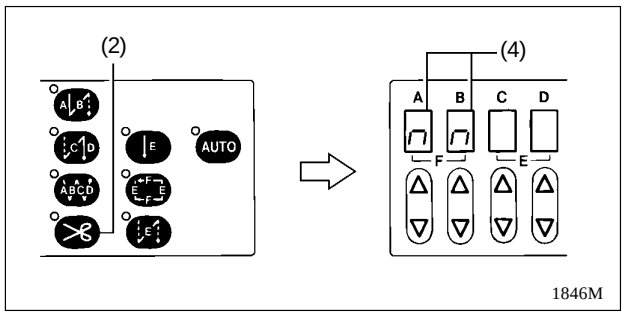

0844M

• Carry out the following procedure <u>while pressing</u> the treadle forward as far as it will go.



1845M

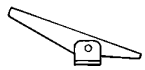
1. Turn the PVR so that “45” appears in columns A and B (4) of the display window.



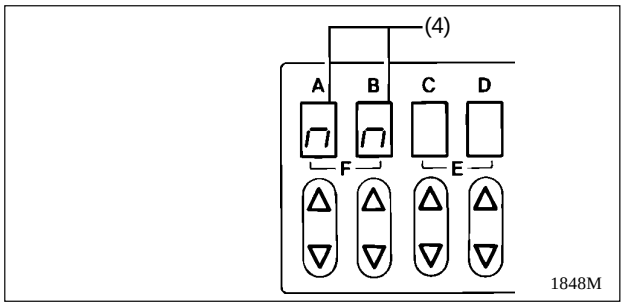
1846M

2. Press the thread trimming key (2).
“nn” will flash in columns A and B (4) of the display window.

3) Memorizing the neutral position

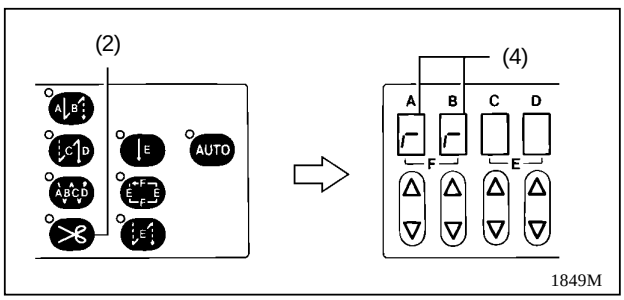

1847M

• Carry out the following procedure while removing your foot from the treadle.



1848M

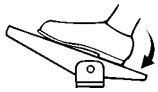
1. Check the “nn” is flashing in columns A and B (4) of the display window.



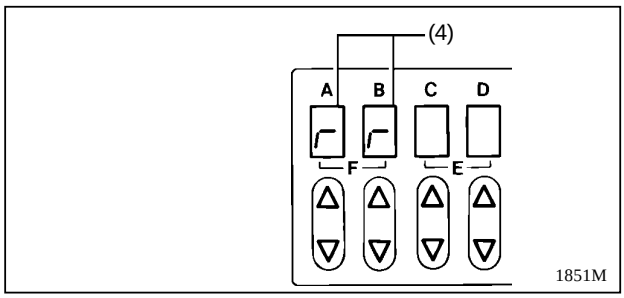
1849M

2. Press the thread trimming key (2).
“rr” will flash in columns A and B (4) of the display window.

4) Memorizing the maximum backward position

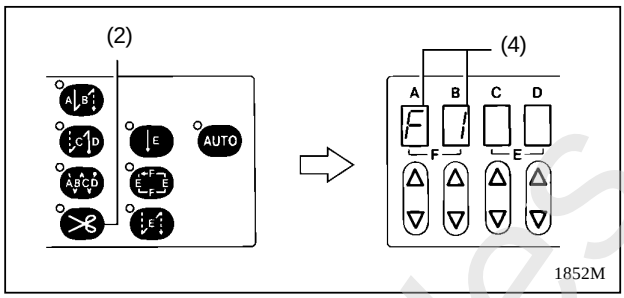

1850M

• Carry out the following procedure <u>while pressing</u> the treadle backward as far as it will go.



1851M

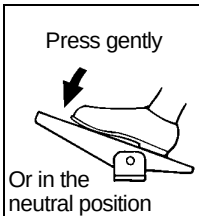
1. Check that “rr” is flashing in columns A and B (4) of the display window.



1852M

2. Press the thread trimming key (2).
“F1” will flash in columns A and B (4) of the display window.

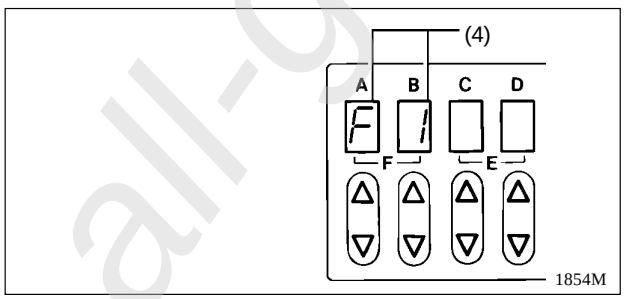
5) Memorizing the modulation position when pressing the treadle forward



1853M

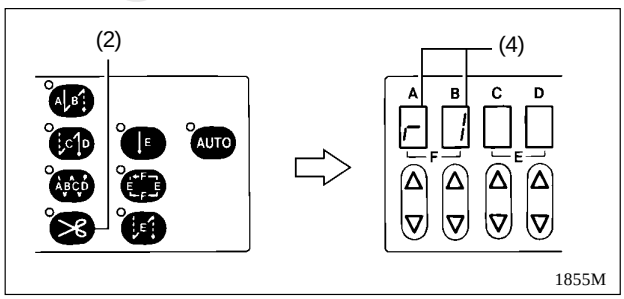
• Press the treadle forward until the depression force suddenly becomes heavier, and <u>hold the pedal in that position</u> while carrying out the following procedure. (For treadle unit H)

• If the depression force of the pedal does not change suddenly when it is pressed forward, carry out the following procedure with your foot removed from the pedal. (For treadle unit G)



1854M

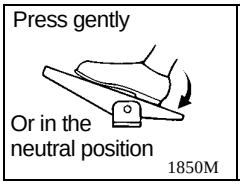
1. Check that “F1” is flashing in columns A and B (4) of the display window.



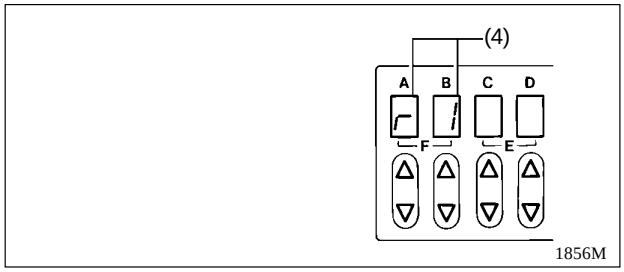
1855M

2. Press the thread trimming key (2).
“r1” will flash in columns A and B (4) of the display window.

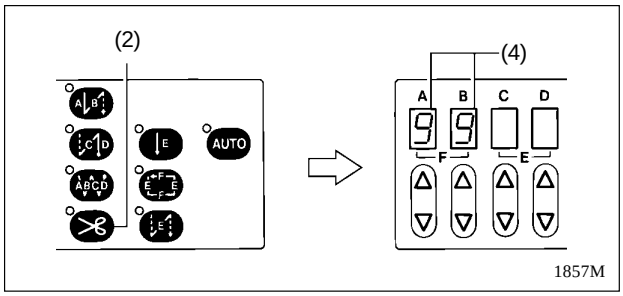
6) Memorizing the modulation position when pressing the treadle backward



- Press the treadle backward until the depression force suddenly becomes heavier, and hold the pedal in that position while carrying out the following procedure. (For treadle unit H)
- If the depression force of the pedal does not change suddenly when it is pressed backward, carry out the following procedure with your foot removed from the pedal. (For treadle unit G)

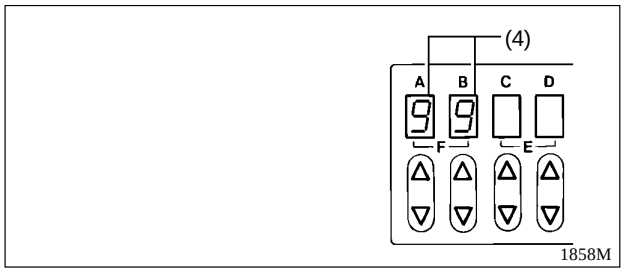


1. Check that “r1” is flashing in columns A and B (4) of the display window.

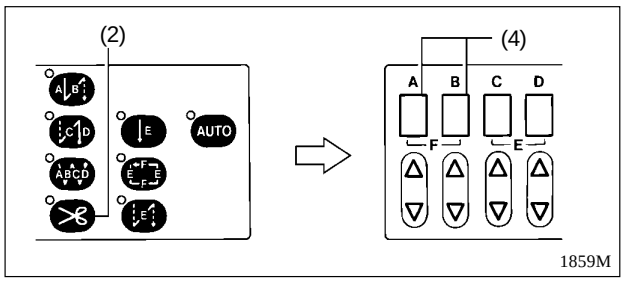


2. Press the thread trimming key (2).
   “99” will flash in columns A and B (4) of the display window.

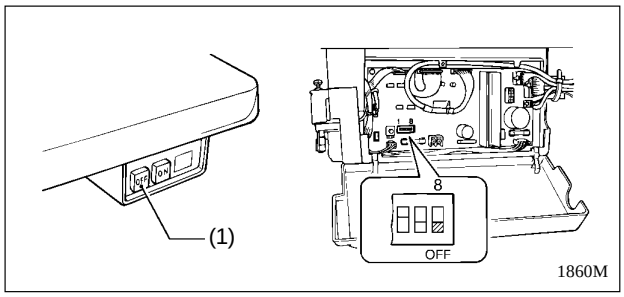
7) Completion of setting



1. Check that “99” is flashing in columns A and B (4) of the display window.



2. Press the thread trimming key (2).
   Columns A and B (4) of the display window will be cleared.

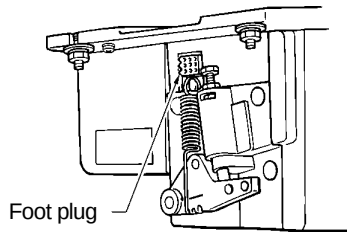


3. Turn off the power switch (1).
4. Set DIP switch No.8 to OFF.

14. STANDING OPERATION PEDAL

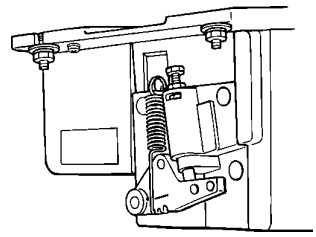
Some sub-classes are not equipped with a foot plug set.
In such cases, install the foot plug set (J02953-001) by the following procedure.

<With foot plug set>



1861M

<Without foot plug set>

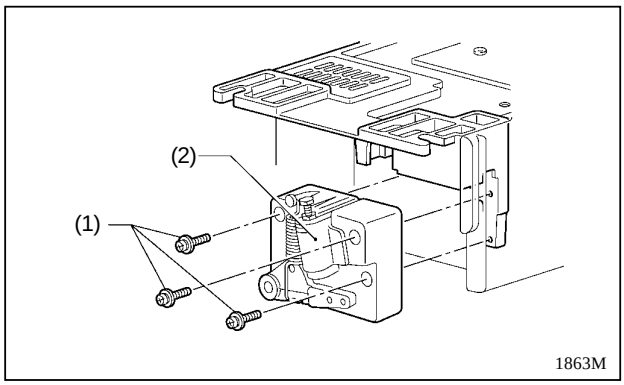


1862M

14-1. Installing the foot plug

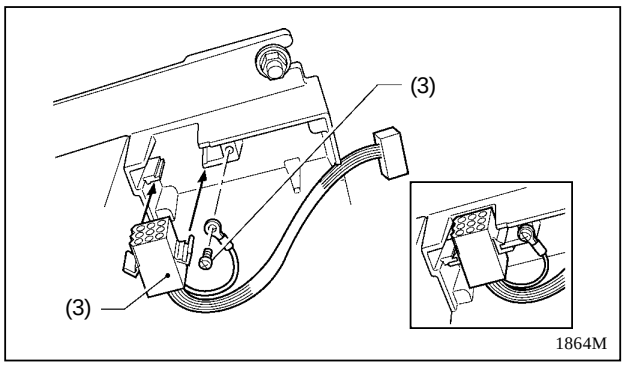
⚠ DANGER

Wait at least 10 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.



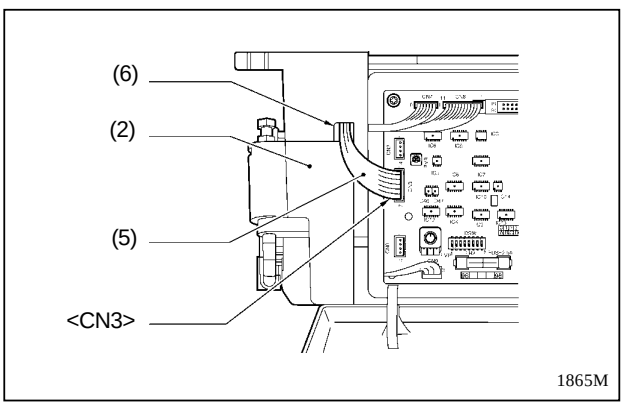
1863M

1. Remove the three screws (1), and then remove the treadle unit (2).



1864M

2. Install the foot plug (3).
3. Install the ground wire with the screw (4).

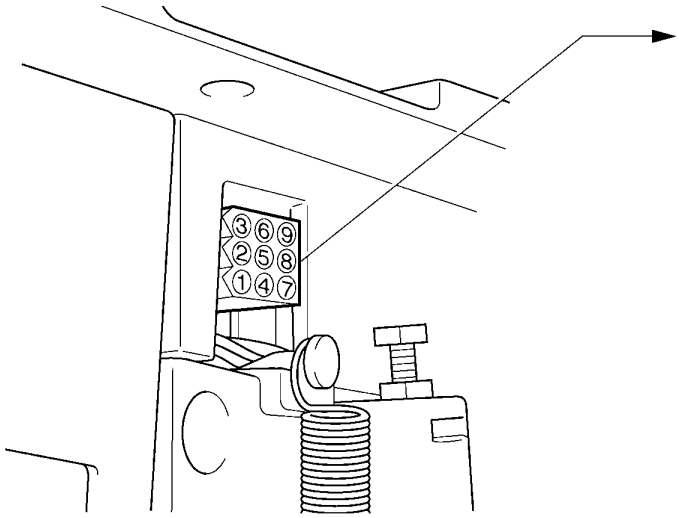


1865M

4. Insert the connector (5) of the foot plug (3) into the CN3 connector of the control circuit board.
5. With the connector (5) passed through the opening (6), install the treadle unit (2) with the three screws (1).

14-2. Connectors

■ At control box



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

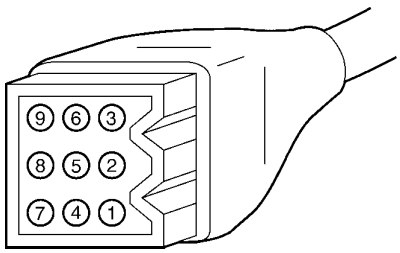
1866M

■ At pedal

<Note>

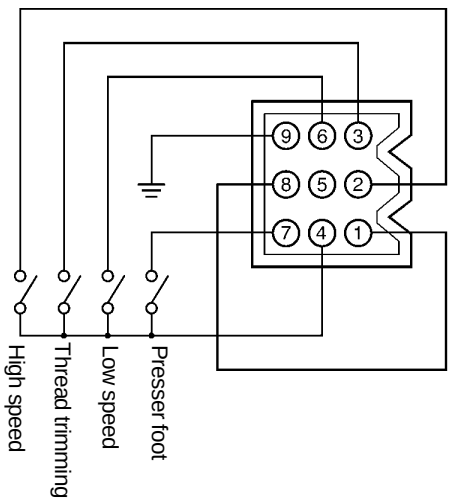
Connector types

Manufacturer	Connector No.	Connector terminal
MOLEX	1292 P	1380 TL

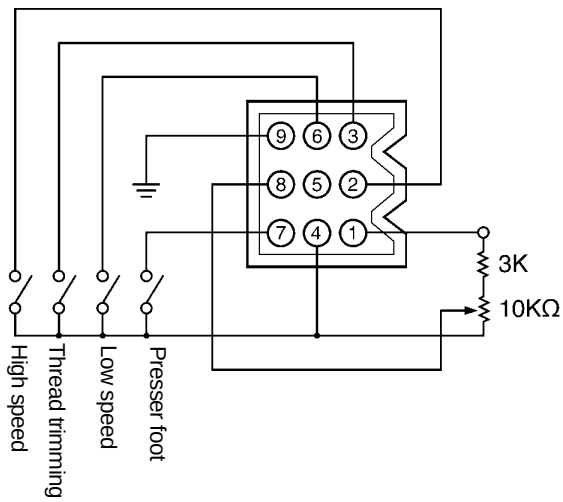


1867M

<A> Two-step pedal



<B> Variable speed pedal



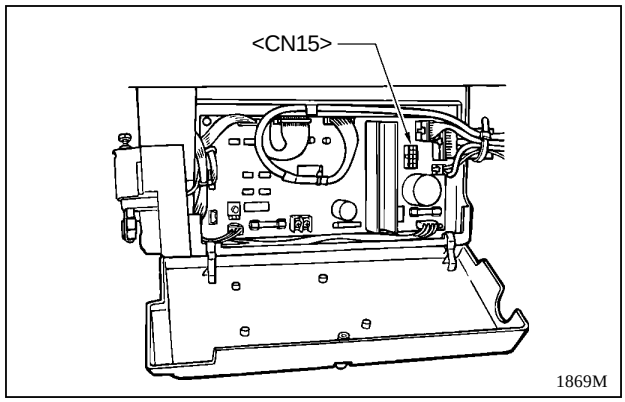
1868M

15. Puller (commercially available)

⚠ DANGER

Wait at least 10 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.

15-1. Timing

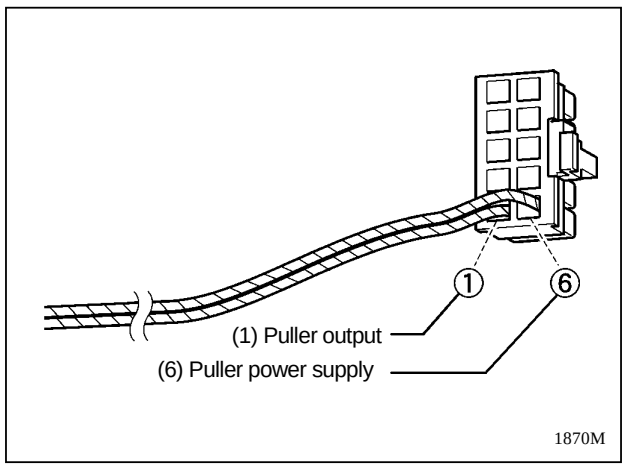


Obtain the puller output from the CN15 connector on the control circuit board.

- The puller is lowered after the 40th stitch from the sewing start.
- After the sewing machine stops, it is raised together with the automatic presser lifter, and then after 10 seconds it is lowered.

Note:
The 40th stitch and 10 seconds settings given above can be changed by changing the parameter settings.

15-2. Connector



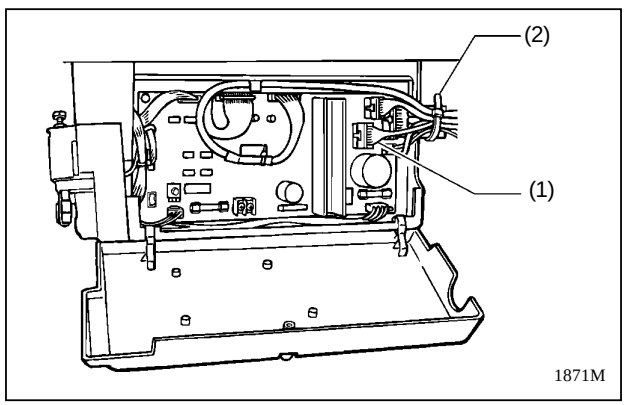
The following puller connector is provided.

Part name	Part code
Puller connector assembly	J03126-001

<Note>
If purchasing the connector as a single part from the manufacturer, specify the following number.

Manufacturer	MOLEX
Connector No.	5557-10R
Connector terminal	5556PBTL
Terminal puller	57031-6000

15-3. Binding the cord



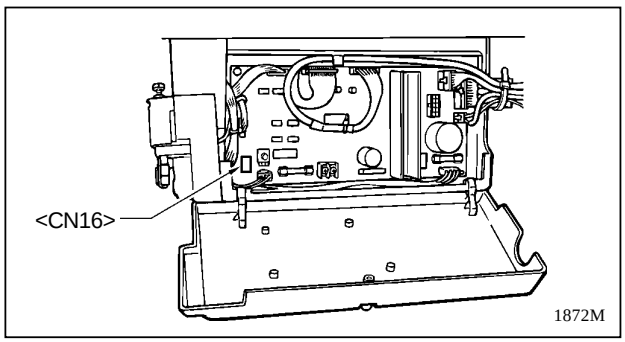
Secure the puller cord (1) using a cable tie (2).

16. AUTO BOBBIN CHANGER

⚠ DANGER

Wait at least 10 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.

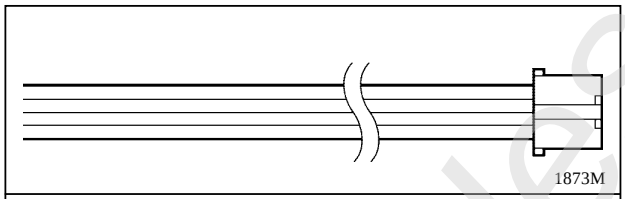
16-1. Timing

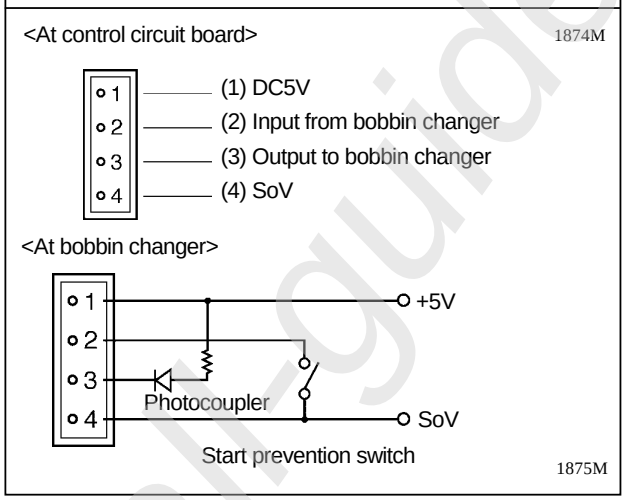


Obtain the bobbin changer signal from the CN6 connector on the control circuit board.

- When the lower thread amount is detected, a "L" signal is output from pin (3) of CN6 for 500 ms.
- The motor will not operate while a "L" signal is being output from pin (2) of CN6.

16-2. Connector





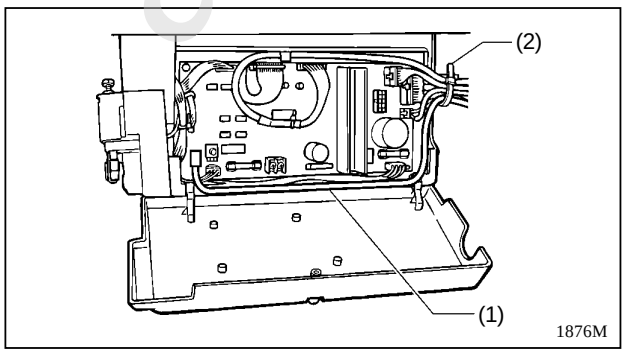
The following bobbin changer connector is provided.

Part name	Part code
Bobbin changer connector assembly	J03136-001

Note: If purchasing the connector as a single part from the manufacturer, specify the following number.

Manufacturer	MOLEX
Connector No.	51103-400
Connector terminal	50351-8100

16-3. Binding the cord



Pass the bobbin changer cord (1) under the control circuit board and secure it using a cable tie (2).

17. SPEED SETTING METHODS

17-1. Types of speed settings

Type of speed		Speed setting range	Initial setting	Minimum setting unit
Signal	Speed			
Lo	Low speed	150 - 300	220	10
t	Thread trimming speed	150 - Low speed	220	10
SL	Slow speed	Low speed - 1000	220	100
LI (*1)	Start backtacking limit speed	Low speed - 3000	1800	100
Sb (*2)	Start backtacking speed	Low speed - Start backtacking limit speed	1800	100
Eb	End backtacking speed	Low speed – 3000	1800	100
H (*2)	High speed	Low speed - Limit speed	Limit speed	100
Au	Automatic speed	Low speed - High speed	Limit speed	100
Po	Stop improvement speed	(Do not change.)	1500	100

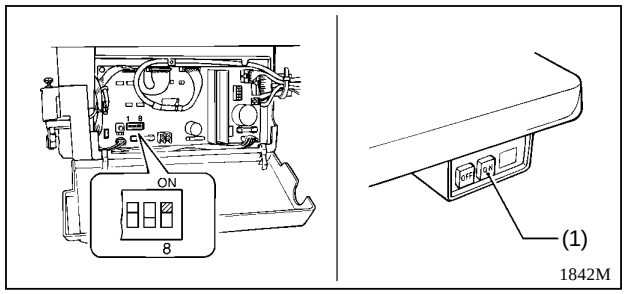
*1: The actual speed for LI is dependent on Sb.

*2: Sb (Start backtacking speed) and H (High speed) can also be set and changed using the operation panel.

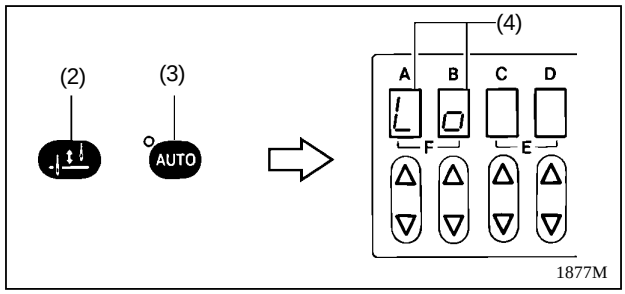
17-2. Setting method

⚠ DANGER

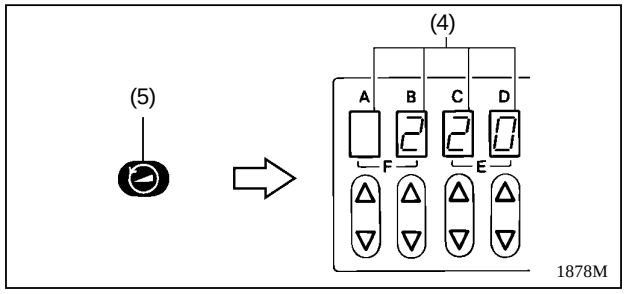
Wait at least 10 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.



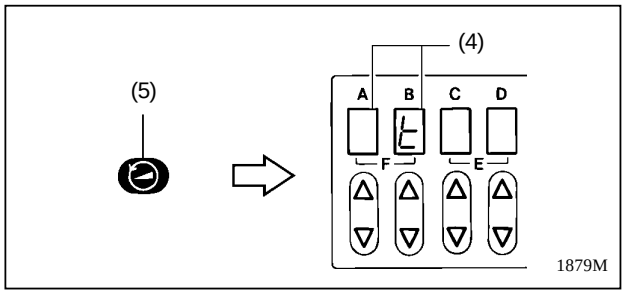
1. Set DIP switch 8 to ON.
2. Turn on the power switch (1).



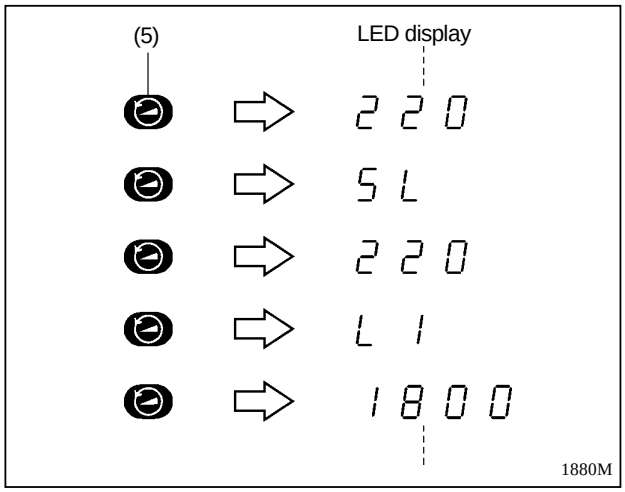
3. Press the half stitch key (2) and the AUTO key (3) simultaneously.
   The "Lo" (Low speed) symbol will appear in LED display AB (4).



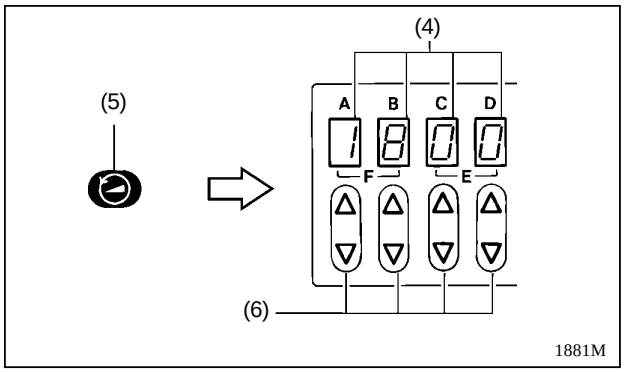
4. Press the sewing speed key (5).
5. The "Lo" (Low speed) setting speed will appear in LED display ABCD (4).



6. Press the sewing speed key (5).
7. The "t" (Thread trimming speed) symbol will appear in LED display AB (4).

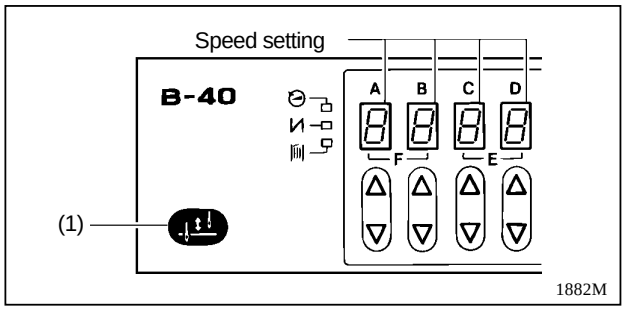


8. In this way, the symbol and the corresponding speed will appear in the order given in the "Types of speed settings" table on the previous page each time the sewing speed key (5) is pressed.



9. Press the sewing speed key (5) several times to display the speed setting corresponding to the symbol for the speed that you would like to set in LED display ABCD (4).
10. Press the △ and ▽ keys (6) to change the speed setting.
    * If you would like to operate the machine at this point to check the speed, proceed to "17-3. Checking the speed settings".
11. When the setting is complete, turn off the power switch (1).
12. Set DIP switch 8 to OFF.

17-3. Checking the speed settings



While the setting speed is being displayed as described in step 10 above, carry out the following operations.

1. Press the half stitch key (1).
   The sewing machine will operate at the set speed.
2. Press the half stitch key (1) once more to stop the sewing machine.
3. Return to step 10 above.

Note:

When checking the "H" (High speed) setting, carry out the following operations.

1. Press the half stitch key (1) to start the sewing machine at low speed.
2. Depress the treadle to the maximum.
   The sewing machine will operate at the high speed that has been set.
3. Return the treadle to the neutral position. The sewing machine will decelerate to low speed.
4. Press the half stitch key (1) once more to stop the sewing machine.
5. Return to step 10 above.

18. CLEARING THE MEMORY DATA

■ Types of data that are cleared

Clearing the memory data returns all of the following data items to the factory default settings.

- Panel settings
- Memory switch settings
- Parameter settings
- Speed settings
- Lower thread counter data

■ Forced clearing method

While holding down the half stitch key, turn on the power.

The memory data will be cleared, and the power indicator on the operation panel will illuminate and "CL" will appear in the LED display. After this both will start flashing. In addition, the buzzer will sound continuously.

(After this, carry out the "Confirming the clear" below.)

■ Automatic clearing

If the sewing machine's computer judges that the memory data is corrupted when the power is turned on, the memory data will be cleared automatically.

In this case, the power indicator on the operation panel will illuminate and "CL" will appear in the LED display. After this both will start flashing. In addition, the buzzer will sound continuously.

(If the sewing machine has done this, carry out the "Confirming the clear" below.)

■ Confirming the clear

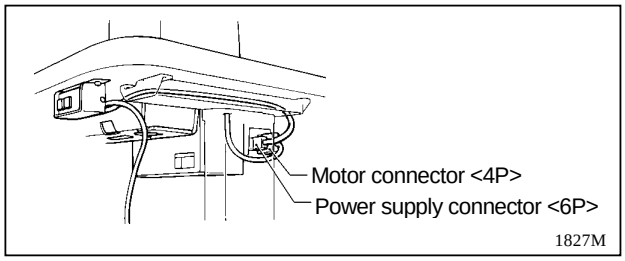
If "CL" is flashing in the LED display of the operation panel and the buzzer is sounding continuously, press the half stitch key. The buzzer will stop sounding and the sewing machine can then be used.

19. CHECKING THE MOTOR AND POWER SUPPLY

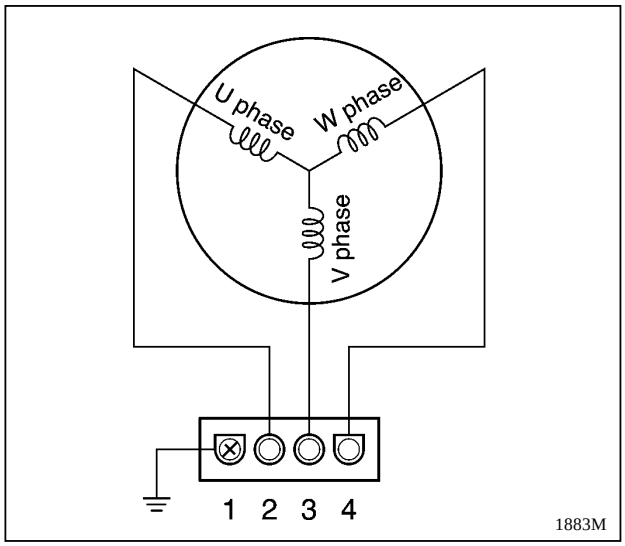
⚠ CAUTION

Turn off the power and disconnect the power plug from the wall outlet before carrying out these operations, otherwise the sewing machine may operate if the treadle is pressed by mistake, and injury may result.

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



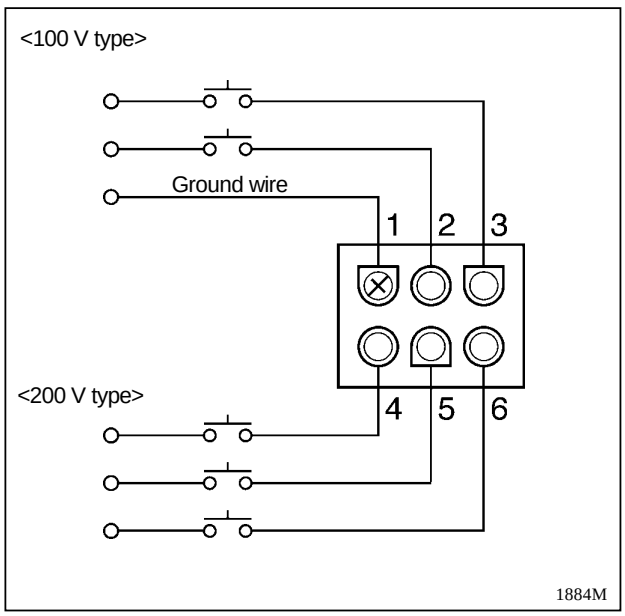
■ Motor



1. Disconnect the motor connector (4P) from the control box.
2. Measure the resistance of the motor connector using an ohmmeter in the x1 range.
   If the value is as shown in the table below, the connector is normal.

Between 2 - 3	Approx. 2 - 3 Ω
Between 3 - 4	
Between 4 - 2	

■ Power switch

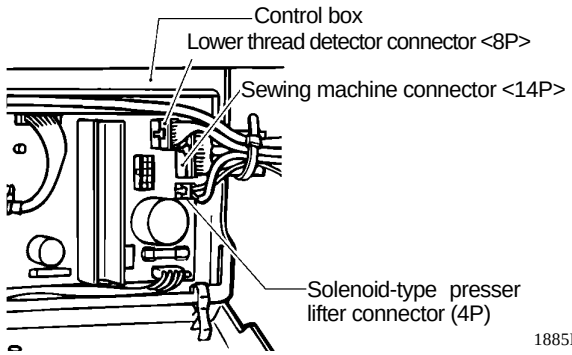


1. Disconnect the power supply connector (6P) from the control box.
2. Turn on the power switch.
3. Measure the voltage at the power supply connector using the AC voltage range of a multimeter, and check that the voltage is within the allowable range for the specified voltage rating.
   <100 V type (100 - 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.

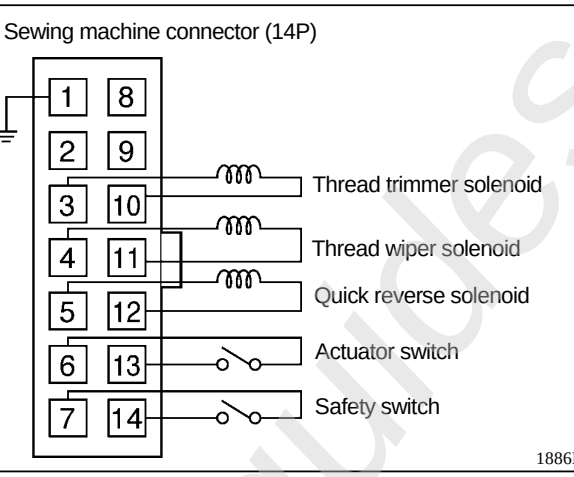
20. CHECKING THE SOLENOIDS

⚠ DANGER

Wait at least 10 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.



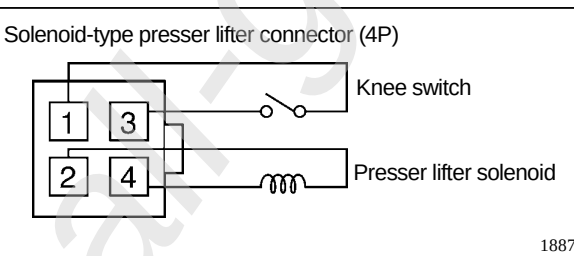
■ Machine head



1. Disconnect the sewing machine connector (14P) from the control box.
2. Measure the resistance of the sewing machine connector using an ohmmeter in the x1 range.
   If the values are as shown in the table below, the connector is normal.

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

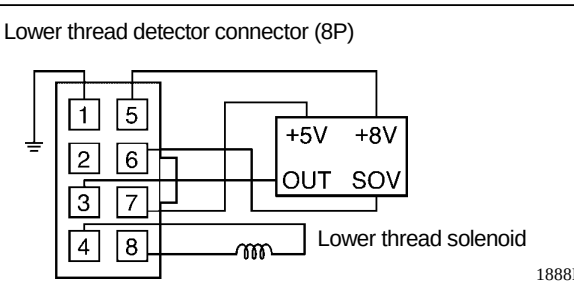
■ Solenoid-type presser lifter connector



1. Disconnect the solenoid-type presser lifter connector (4P) from the control box.
2. Measure the resistance of the solenoid-type presser lifter connector using an ohmmeter in the x1 range.
   If the values are as shown in the table below, the connector is normal.

Between 2 - 4	Presser lifter solenoid: Approx. 9 Ω
Between 1 - 3	When knee switch is pressed: Approx. 0 Ω
	When knee switch is released: ∞ Ω

■ Lower thread detector



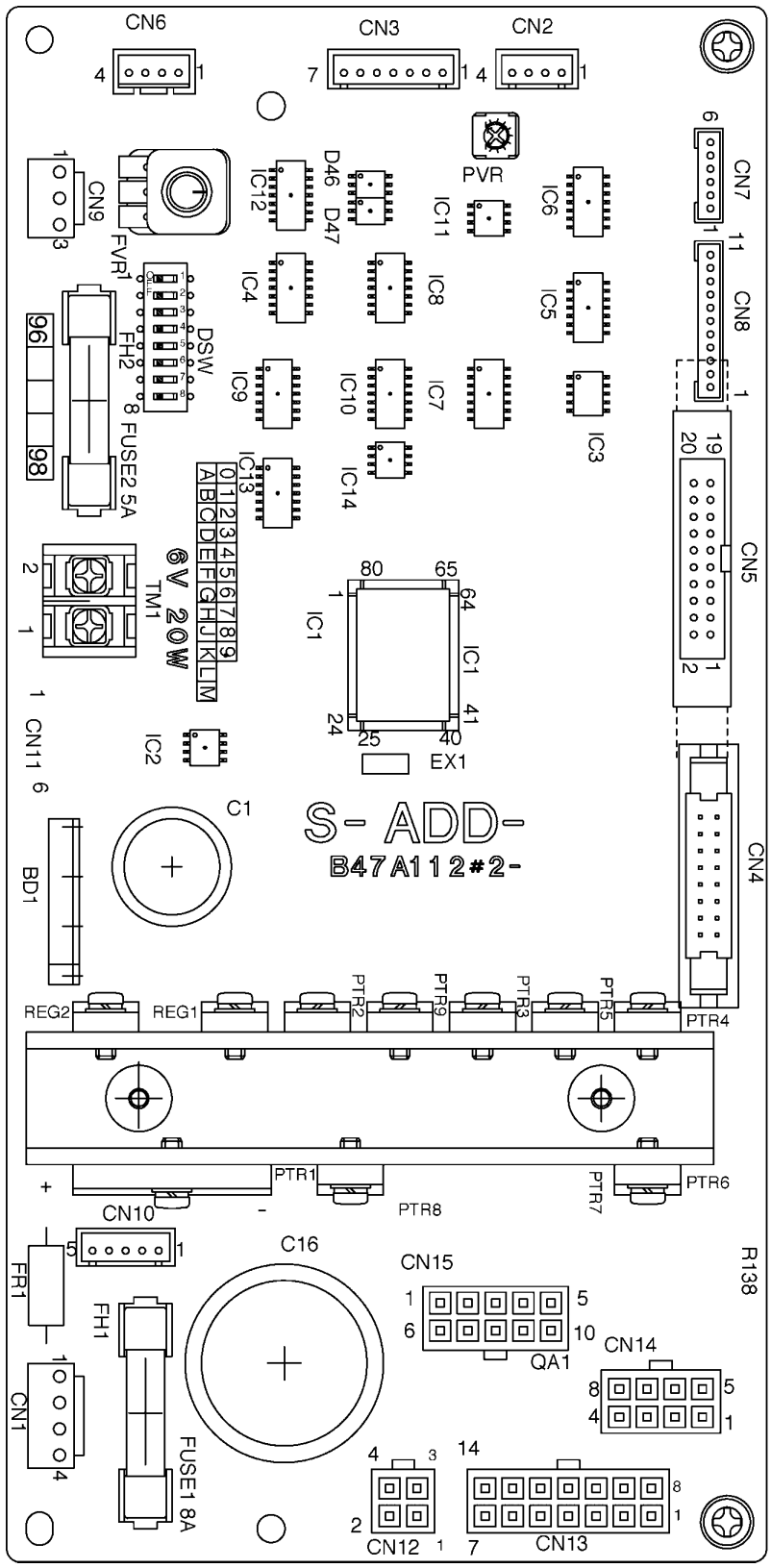
1. Disconnect the lower thread detector connector (8P) from the control box.
2. Measure the resistance of the lower thread detector connector using an ohmmeter in the x1 range.
   If the value is as shown in the table below, the connector is normal.

Between 4 - 8	Lower thread solenoid Approx. 12 Ω

1889M

21. WIRING DIAGRAMS

21-1. Control circuit board assembly (1/6)



Control circuit board assembly (2/6)

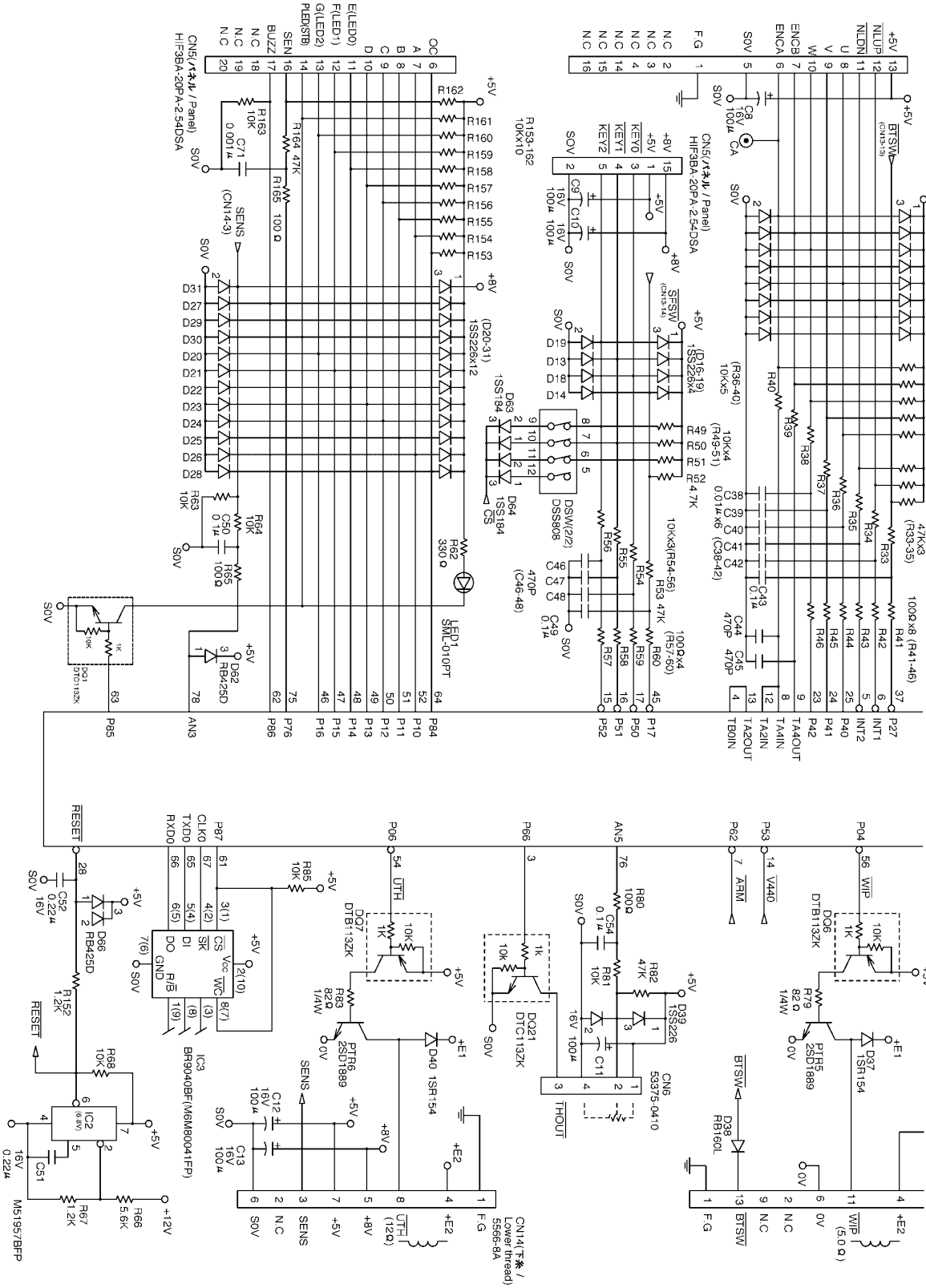
1934M

	DD7100		DD7100A, 710A				
	S-NDD		S-ADD-1		S-ADD-2		
	(J80713-001)		(J80821-001)				
SYMBOL	NAME	CODE	NAME	CODE	NAME	CODE	NOTE
IC1	MCU37702M6B-267	J03262001	MCU37702M6B-309	J03486001	MCU37702M6B-326	J03589001	CPU
IC2	RESET M51957BFP	J00810001	←	←	←	←	RESET IC
IC3	EEPM6M80041FP	J02674001	←	←	EEPROMBR9040F	J02620001	E^2ROM
IC4	COMSIC74HC257AF	093600257	←	←	←	←	CMOS
IC5, 6	BIPIC74LS38FP	091120038	←	←	←	←	TTL
IC7	CMOSIC74HC00F	093600000	←	←	←	←	CMOS
IC8	CMOSIC74HC32F	093600032	←	←	←	←	CMOS
IC9	CMOSICTC4538BF	092504538	←	←	←	←	CMOS
IC10	CMOSIC74HC74F	093600074	←	←	←	←	CMOS
IC11	BIPICBA10358F	X56244001	←	←	←	←	AMP
IC12	BIPICBA10339F	U36678000	←	←	←	←	COMP
IC13	CMOSIC74HC4075F	093604075	←	←	←	←	CMOS
IC14	CMOSICUPD5555G	J03031001	←	←	←	←	TIMER
EX1	CRYSTAL CST16MXWOC	X56246001	←	←	←	←	16MHz
BD1	SID3SBA10	U17798000	←	←	←	←	100V 4A
BD2	D-AR D5SB10	136346001	←	←	←	←	100V 5A
REG1	VLTREGAN7805F	233159001	←	←	←	←	5V 1A
REG2	VLTREGUPC2408HF	J02747001	←	←	←	←	8V 1A
PTR1	SITR2SB1020	J00328001	←	←	←	←	100V 7A
PTR2~6, 9	SITR2SD1889	J02765001	←	←	←	←	120V 6A
FR1	GR-B12KR22	J02754001	←	←	←	←	–
C1	C-C25B682	J02755001	←	←	←	←	25V6800 μ
C2~15	C-C16B101	J02756001	←	←	←	←	16V100 μ
C16	C-C63B472	J02236001	←	←	←	←	63V4700 μ
LED1	LED SML010PT	J02757001	←	←	←	←	Green
LED2	LED SML010LT	UL8039000	←	←	←	←	Red
DSW	DIP-SW DSS808	U33944001	←	←	←	←	8Circuit
FVR	DVR IRLB502L20	J02758001	←	←	DVR 1RLB502L20	J03857001	L=20
PVR	GVR IRLB202	J00873001	←	←	←	←	–
FUSE1	FUSE 8A	219225001	←	←	←	←	125V 8A
FUSE2	FUSE FGBO-5AH	J02759001	←	←	←	←	125V 5A
FH1, 2	FUSE HOLDER F-062	J01684001	←	←	←	←	–
TM1	TERMINAL ML-40SI	J02760001	←	←	←	←	250V 10A

21. WIRING DIAGRAMS

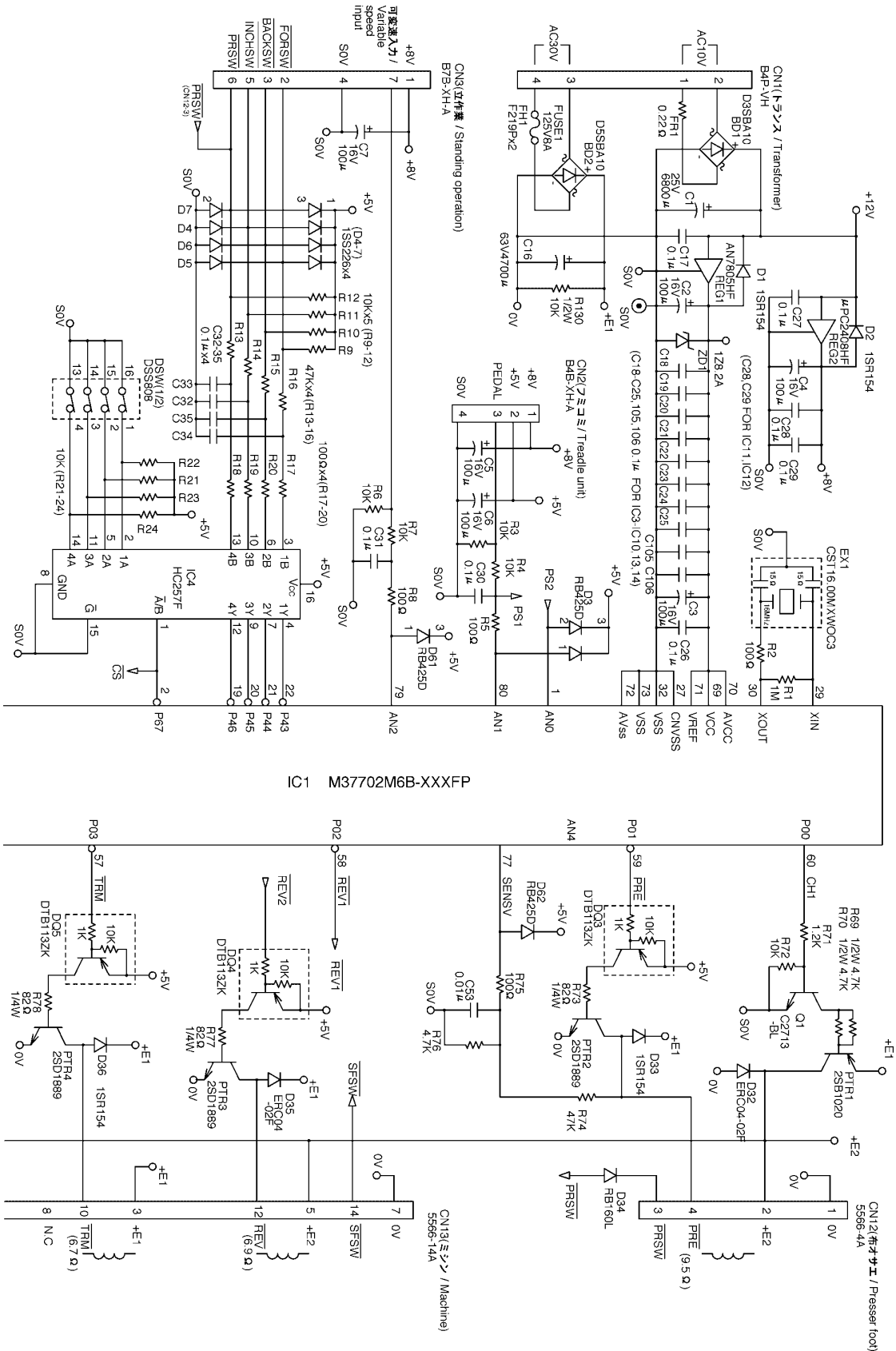
Control circuit board assembly (3/6)

1890M



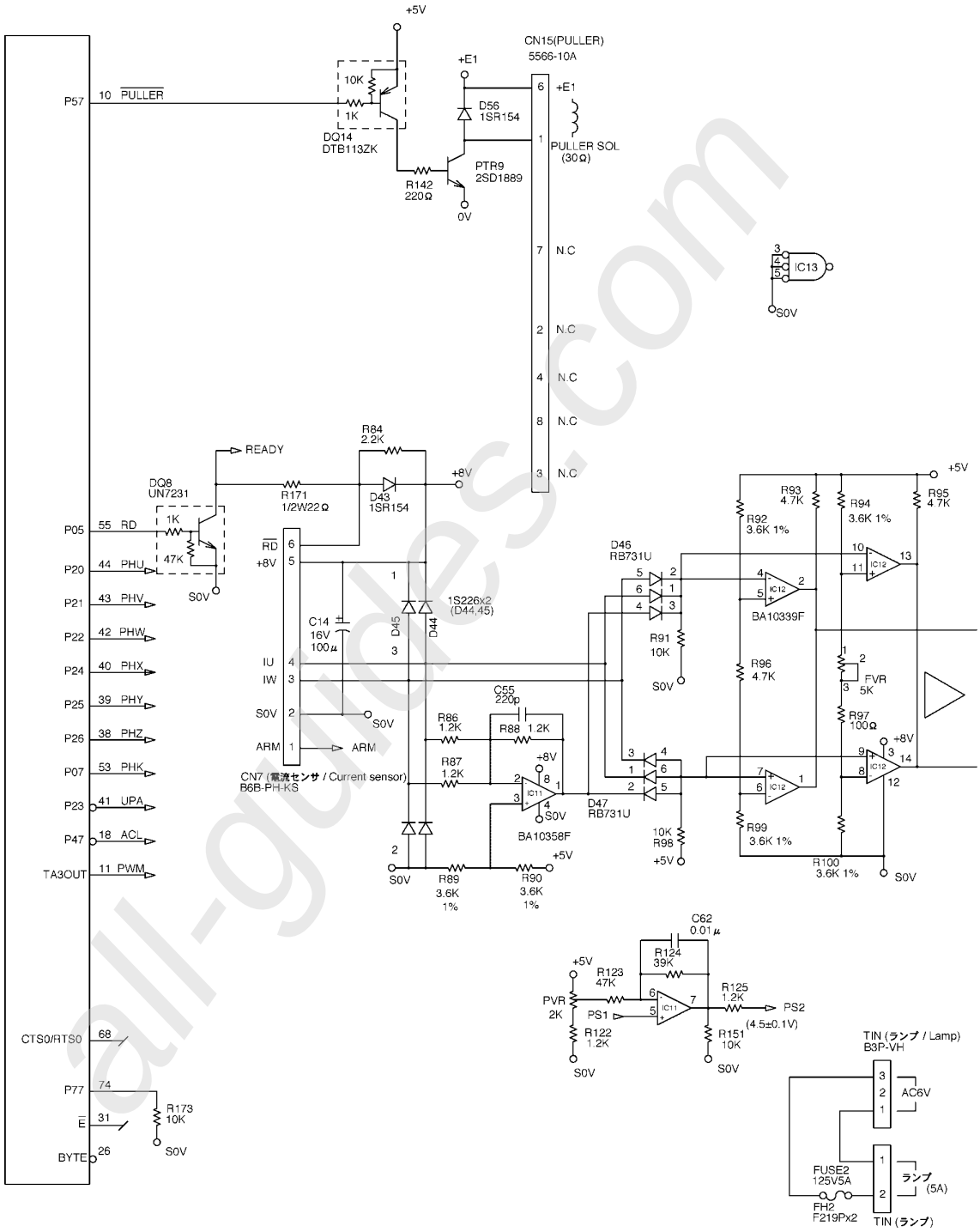
Control circuit board assembly (4/6)

1891M



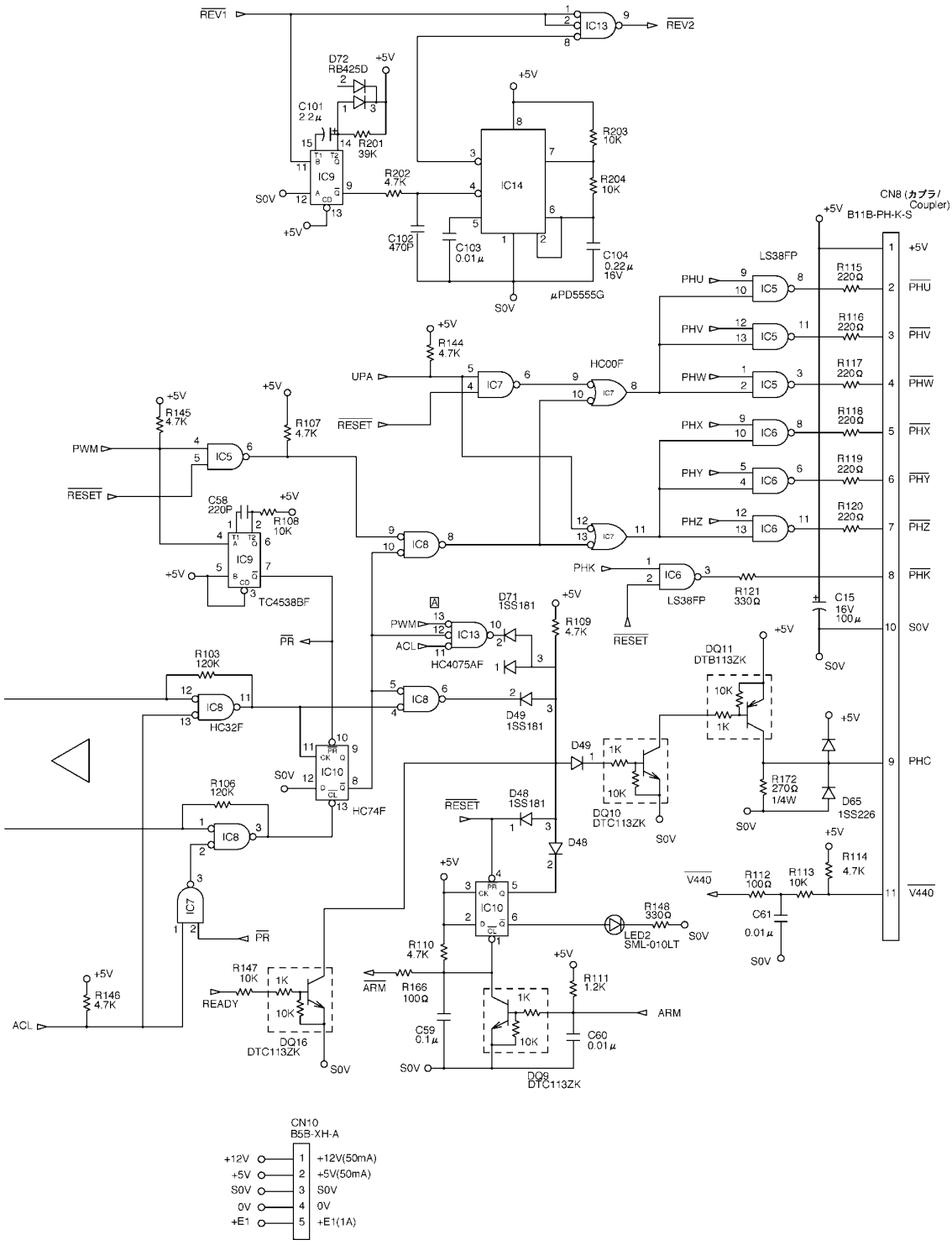
Control circuit board assembly (5/6)

1892M



1893M

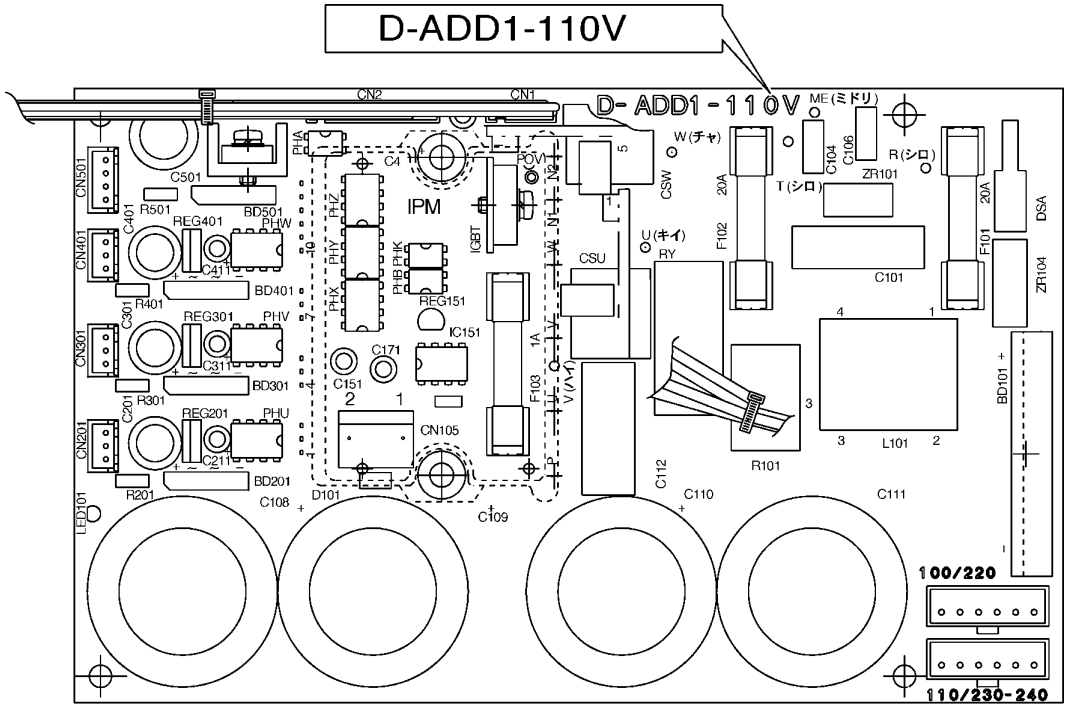
Control circuit board assembly (6/6)



1894M

21-2. Power supply circuit board assembly (DD7100A, 710A)

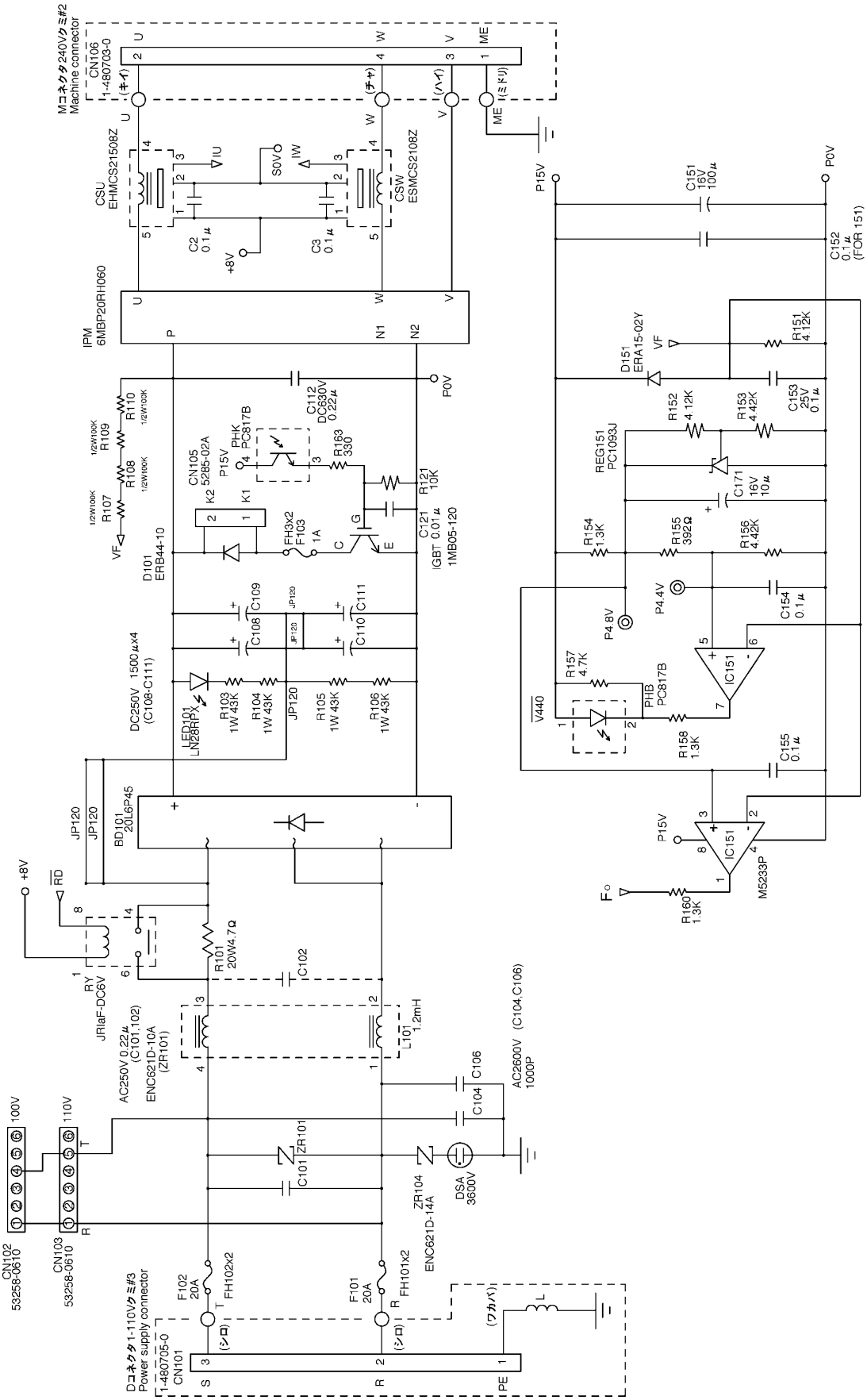
■ Power supply circuit board assembly (DD7100A, 710A) D-ADD1-110V (1/3)



D-ADD1-110V(J80822001)			
SYMBOL	NAME	CODE	NOTE
C101	C-C250B224	J02434001	AC250V0.22μF
C112	C-C630B224	J02444001	630V, 0.22μF
C104, 106	C-C260B102	J03464001	AC2600V
ZR101	S-ABSO ENC621D	232380001	558V-682V
ZR104	S-ABSO ENC621D-14	J02696001	558V-682V
DSA	S-ABSO DSA362MA	232384001	3600V
L101	COIL NF10KL122	J00791001	5A, 1.2mH
R101	RESISTOR R20W4R7	J03465001	20W, 4.7Ω
CSU, CSW	SENNSOR NDD	J02698001	8V, ±15A, ±1.5v
BD101	SID20L6P45	J02699001	800V, 20A
IPM	IPM 6MBP20RH060	J03466001	600V, 20A
IGBT	IGBT1MB05-120	J00775001	1200V, 5A
RY	RELAY JR1AF-DC6V	J00776001	250V, 16A
C108, 109, 110, 111	C-C250B152	J03479001	250V1500μF
IC151	BIPICM5233P	137906001	COMPARATOR
REG151	BIPICMPC1093J	U80613000	2.495 ±2%
REG201, 301, 401	VLTREGAN78N15	J02702001	15V300mA
REG501	V-REGUPC7815AHF	J00249001	15V1A
BD201, 301, 401, 501	SIBRSIVB20	226170000	200V, 1A
D101	SIDERB44-10	J02703001	1000V, 1A
D151	SIDERA15-02Y	J00787001	200V, 1A
PHA, PHB, PHK	PH-PC817B	T22304000	-
PHU, V, W, X, Y, Z	PH-TLP559HV	J02465001	-
R201, 301, 401, 501	HR-A16KR47	J02706001	1/6W, 0.47Ω
LED101	LEDLN28RPX(TA3)	J00817001	Red Color
F101, F102	FUSE 20A250V	J02585001	250V, 20A
F103	FUSE FGBO-1AH	J02713001	250V, 1A
FH101-103	F-HOLDER F-062	J01684001	-

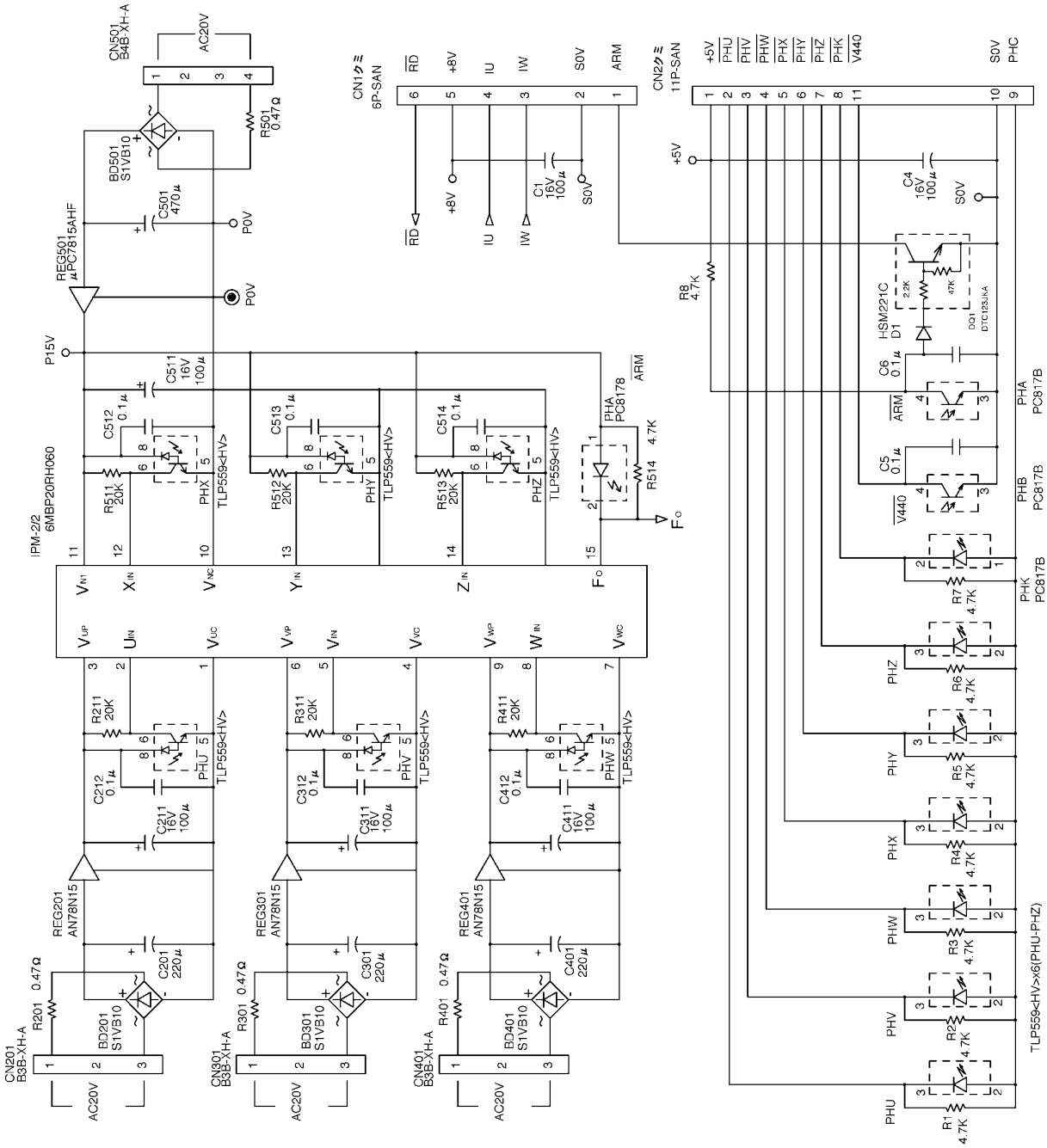
1895M

Power supply circuit board assembly (DD7100A, 710A) D-ADD1-110V (2/3)



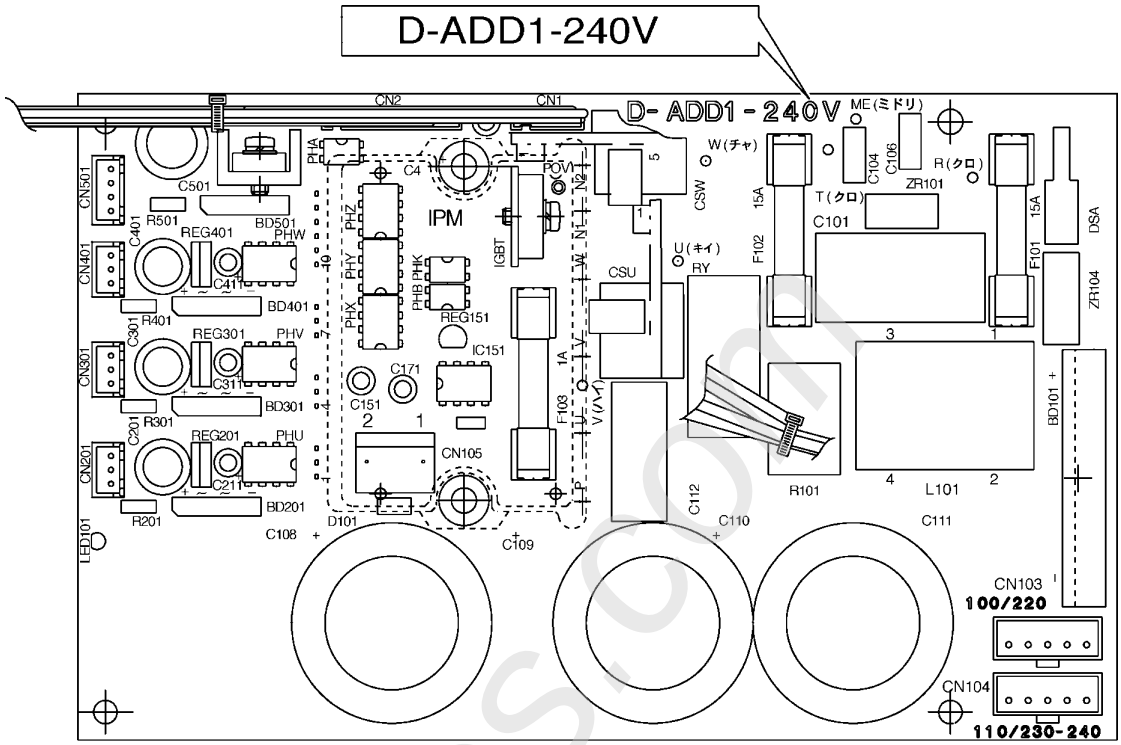
Power supply circuit board assembly (DD7100A, 710A) D-ADD1-110V (3/3)

1896M



1897M

■ Power supply circuit board assembly (DD7100A, 710A) D-ADD1-240V (1/3)

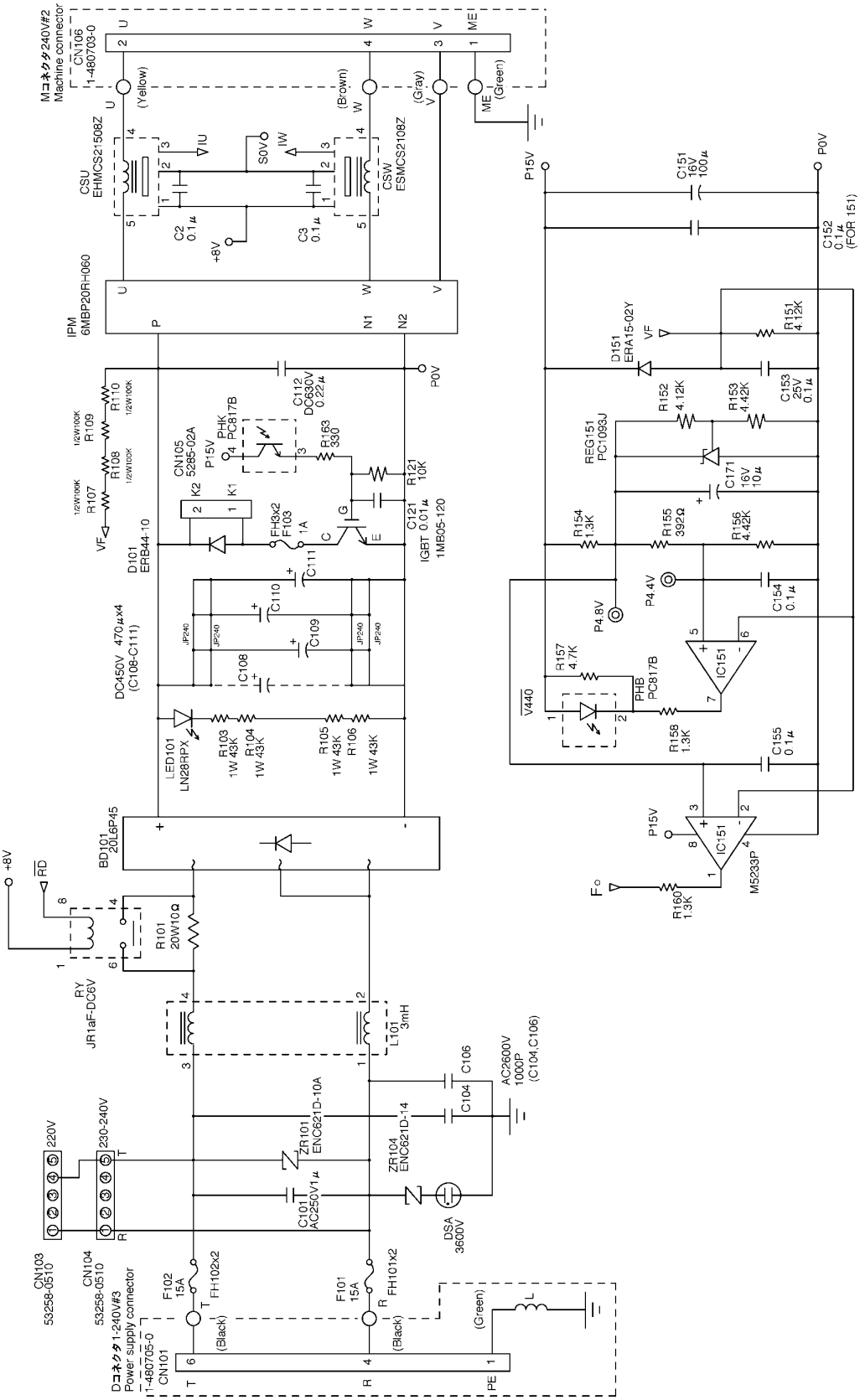


D-ADD1-240V(J80841001)			
SYMBOL	NAME	CODE	NOTE
C101	C-C250B105	J02595001	AC250V1μF
C112	C-C630B224	J02444001	630V, 0.22μF
C104, 106	C-C260B102	J03464001	AC2600V
ZR101	S-ABSO ENC621D	232380001	558V-682V
ZR104	S-ABSO ENC621D-14	J02696001	558V-682V
DSA	S-ABSO DSA362MA	232384001	3600V
L101	COIL FM05C302M	J03343001	5A, 3mH
R101	RESISTOR R20W10	J02717001	20W, 10Ω
CSU, CSW	SENNSOR NDD	J02698001	8V, ±15A, ±1.5v
BD101	SID20L6P45	J02699001	800V, 20A
IPM	IPM 6MBP20RH060	J03466001	600V, 20A
IGBT	IGBT1MB05-120	J00775001	1200V, 5A
RY	RELAY JR1AF-DC6V	J00776001	250V, 16A
C108, 109, 110	C-C450B471	J03480001	450V470μF
IC151	BIPICM5233P	137906001	COMPARATOR
REG151	BIPICMPC1093J	U80613000	2.495 ±2%
REG201, 301, 401	VLTREGAN78N15	J02702001	15V300mA
REG501	V-REGUPC7815AHF	J00249001	15V1A
BD201, 301, 401, 501	SIBRSIVB20	226170000	200V, 1A
D101	SIDERB44-10	J02703001	1000V, 1A
D151	SIDERA15-02Y	J00787001	200V, 1A
PHA, PHB, PHK	PH-PC817B	T22304000	-
PHU, V, W, X, Y, Z	PH-TLP559HV	J02465001	-
R201, 301, 401, 501	HR-A16KR47	J02706001	1/ 6W, 0.47Ω
LED101	LEDLN28RPX(TA3)	J00817001	Red Color
F101, F102	FUSE 15A250V	218469001	250V, 15A
F103	FUSE FGBO-1AH	J02713001	250V, 1A
FH101-103	F-HOLDER F-062	J01684001	-

21. WIRING DIAGRAMS

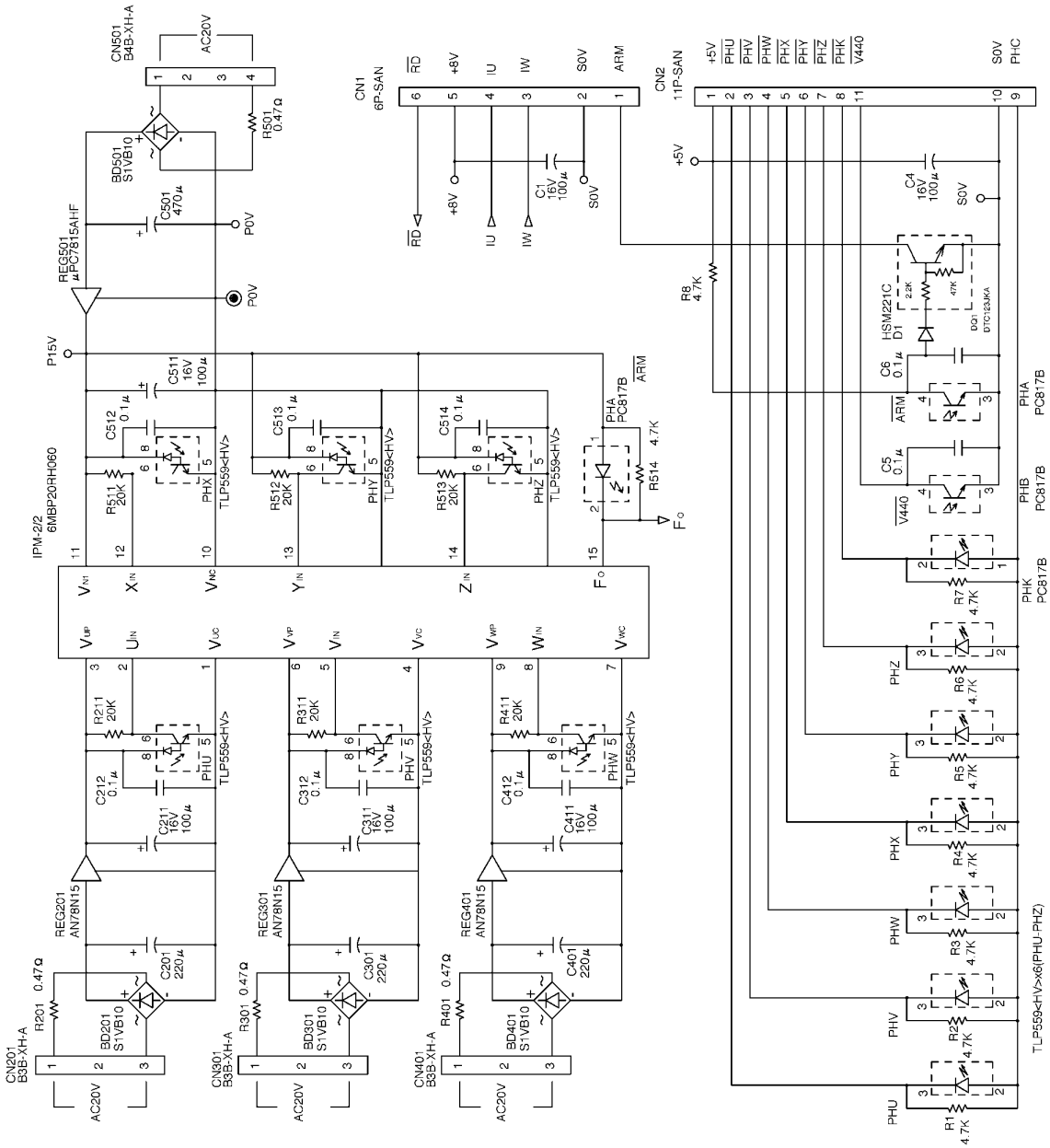
Power supply circuit board assembly (DD7100A, 710A) D-ADD1-240V (2/3)

1898M



1899M

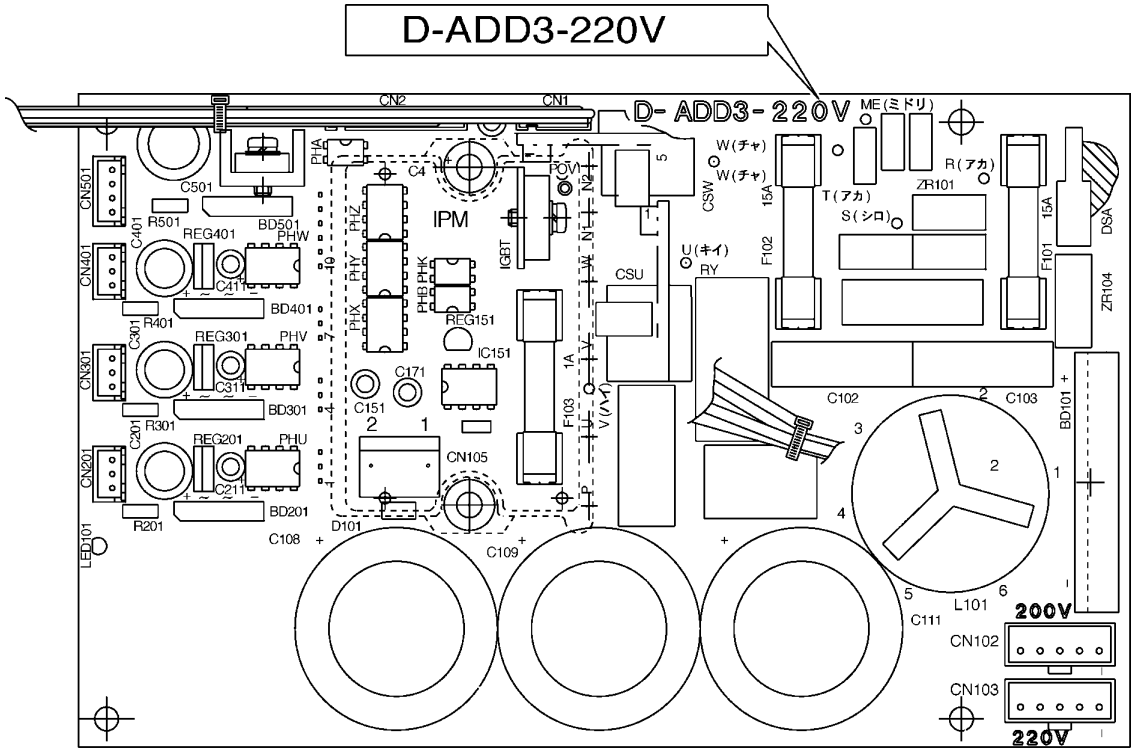
Power supply circuit board assembly (DD7100A, 710A) D-ADD1-240V (3/3)



21. WIRING DIAGRAMS

■ **Power supply circuit board assembly (DD7100A, 710A) D-ADD3-220V (1/3)**

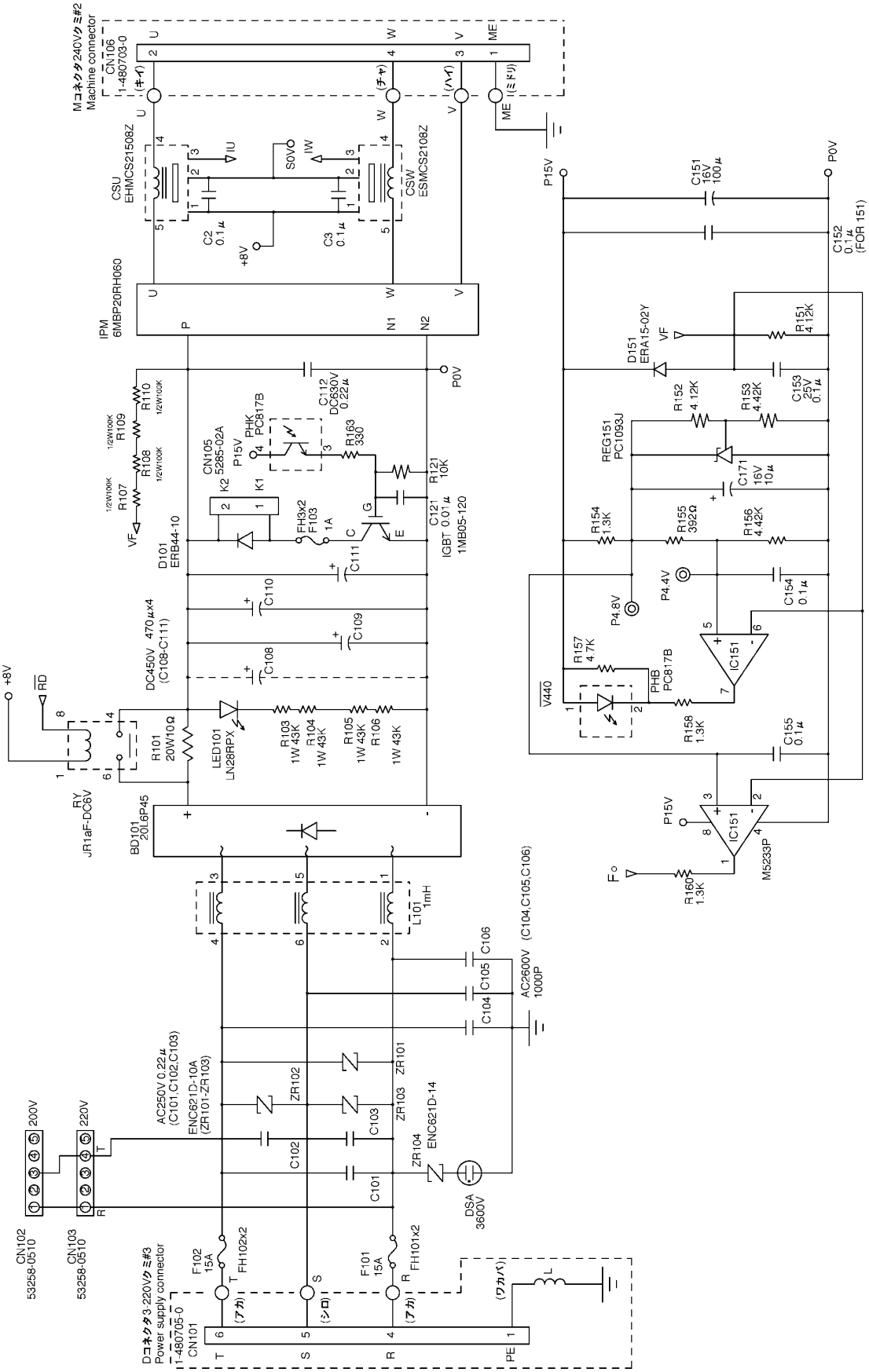
1900M



D-ADD3-220V(J80824001)			
SYMBOL	NAME	CODE	NOTE
C101, 102, 103	C-C250B224	J02343001	AC250V0.22μF
C112	C-C630B224	J02444001	630V, 0.22μF
C104, 105, 106	C-C260B102	J03464001	AC2600V
ZR101	S-ABSO ENC621D	232380001	558V-682V
ZR104	S-ABSO ENC621D-14	J02696001	558V-682V
DSA	S-ABSO DSA362MA	232384001	3600V
L101	COIL RF25L91	J03477001	5A, 1mH
R101	RESISTOR R20W10	J02717001	20W, 10Ω
CSU, CSW	SENNSOR NDD	J02698001	8V, ±15A, ±1.5v
BD101	SID20L6P45	J02699001	800V, 20A
IPM	IPM 6MBP20RH060	J03466001	600V, 20A
IGBT	IGBT1MB05-120	J00775001	1200V, 5A
RY	RELAY JR1AF-DC6V	J00776001	250V, 16A
C108, 109, 110	C-C450B471	J03480001	450V470μF
IC151	BIPICM5233P	137906001	COMPARTOR
REG151	BIPICMPC1093J	U80613000	2.495 ±2%
REG201, 301, 401	VLTREGAN78N15	J02702001	15V300mA
REG501	V-REGUPC7815AHF	J00249001	15V1A
BD201, 301, 401, 501	SIBRSIVB20	226170000	200V, 1A
D101	SIDERB44-10	J02703001	1000V, 1A
D151	SIDERA15-02Y	J00787001	200V, 1A
PHA, PHB, PHK	PH-PC817B	T22304000	-
PHU, V, W, X, Y, Z	PH-TLP559HV	J02465001	-
R201, 301, 401, 501	HR-A16KR47	J02706001	1/ 6W, 0.47Ω
LED101	LEDLN28RPX(TA3)	J00817001	Red Color
F101, F102	FUSE 15A250V	218469001	250V, 15A
F103	FUSE FGBO-1AH	J02713001	250V, 1A
FH101-103	F-HOLDER F-062	J01684001	-

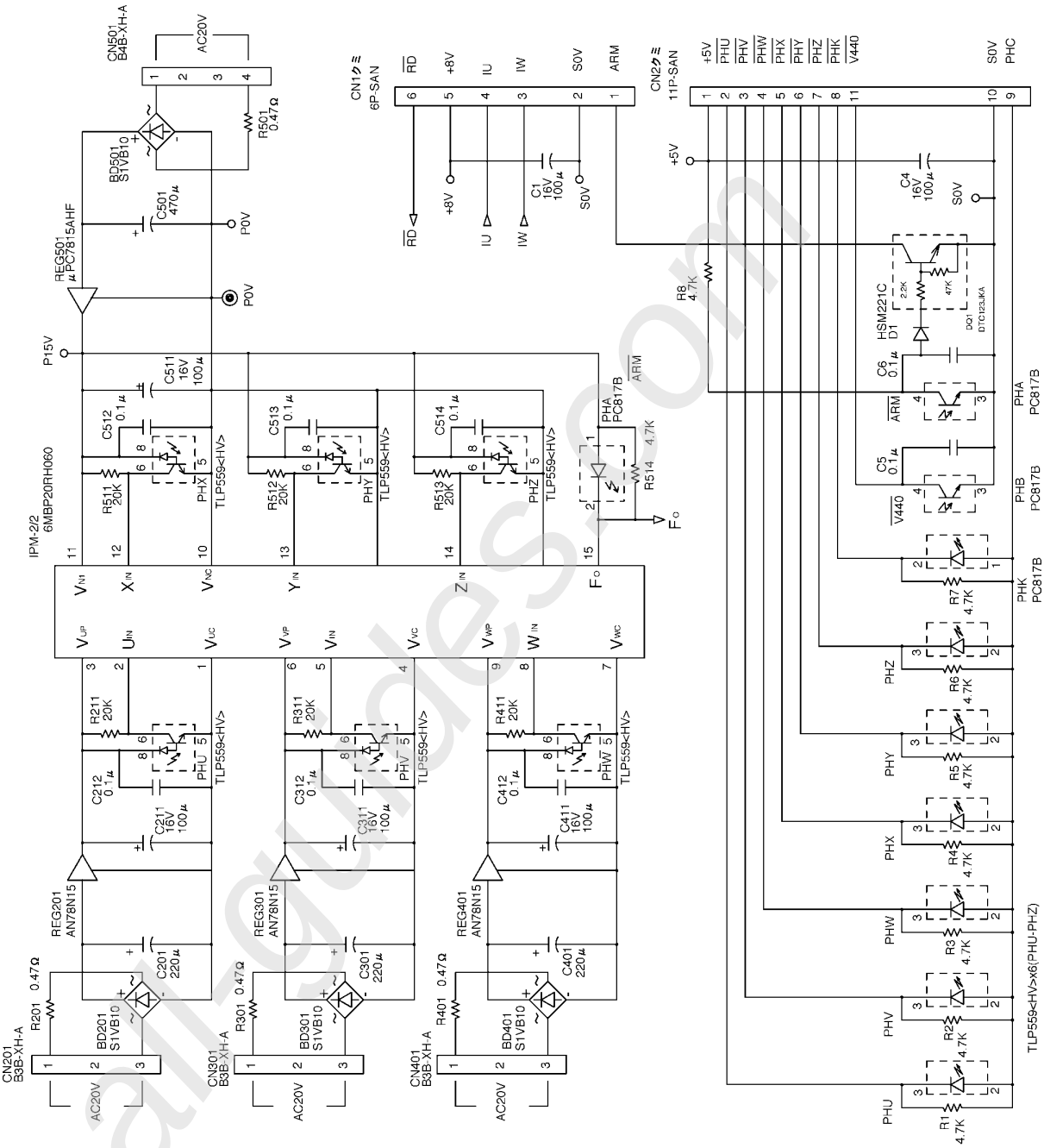
1901M

Power supply circuit board assembly (DD7100A, 710A) D-ADD3-220V (2/3)



Power supply circuit board assembly (DD7100A, 710A) D-ADD3-220V (3/3)

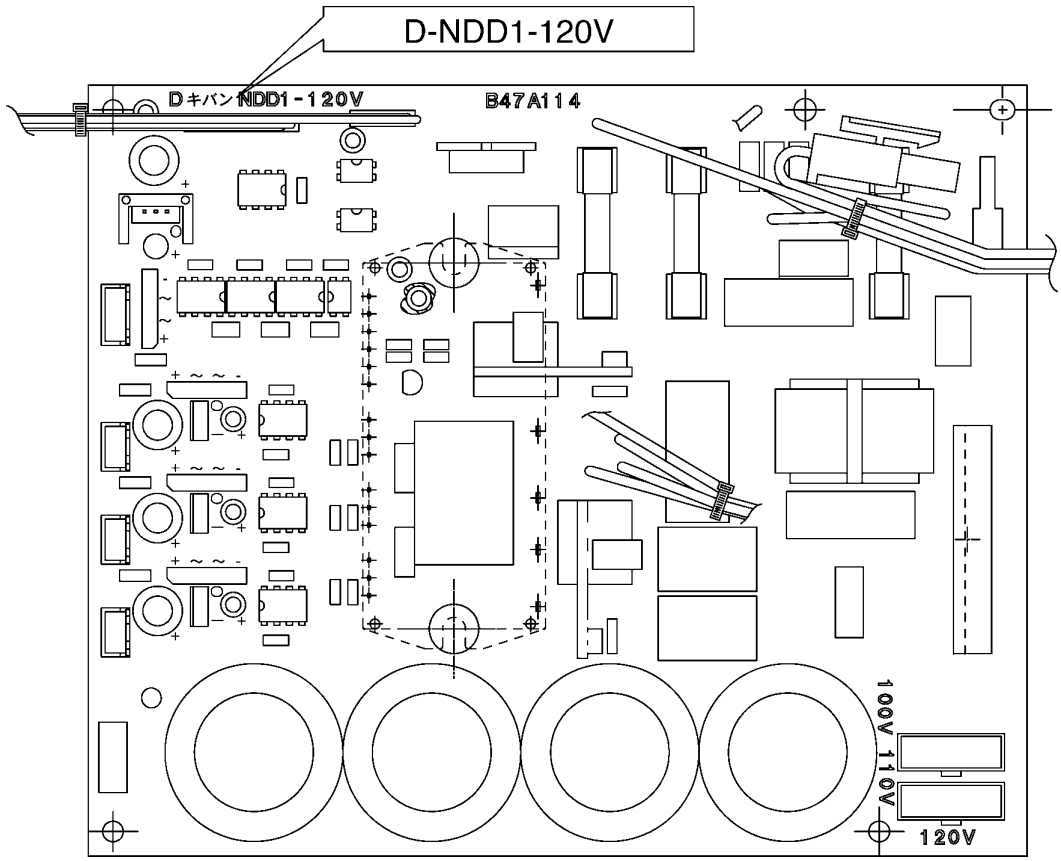
1902M



1903M

21-3. Power supply circuit board assembly (DD7100)

■ **Power supply circuit board assembly (DD7100) D-NDD1-120V (1/3)**

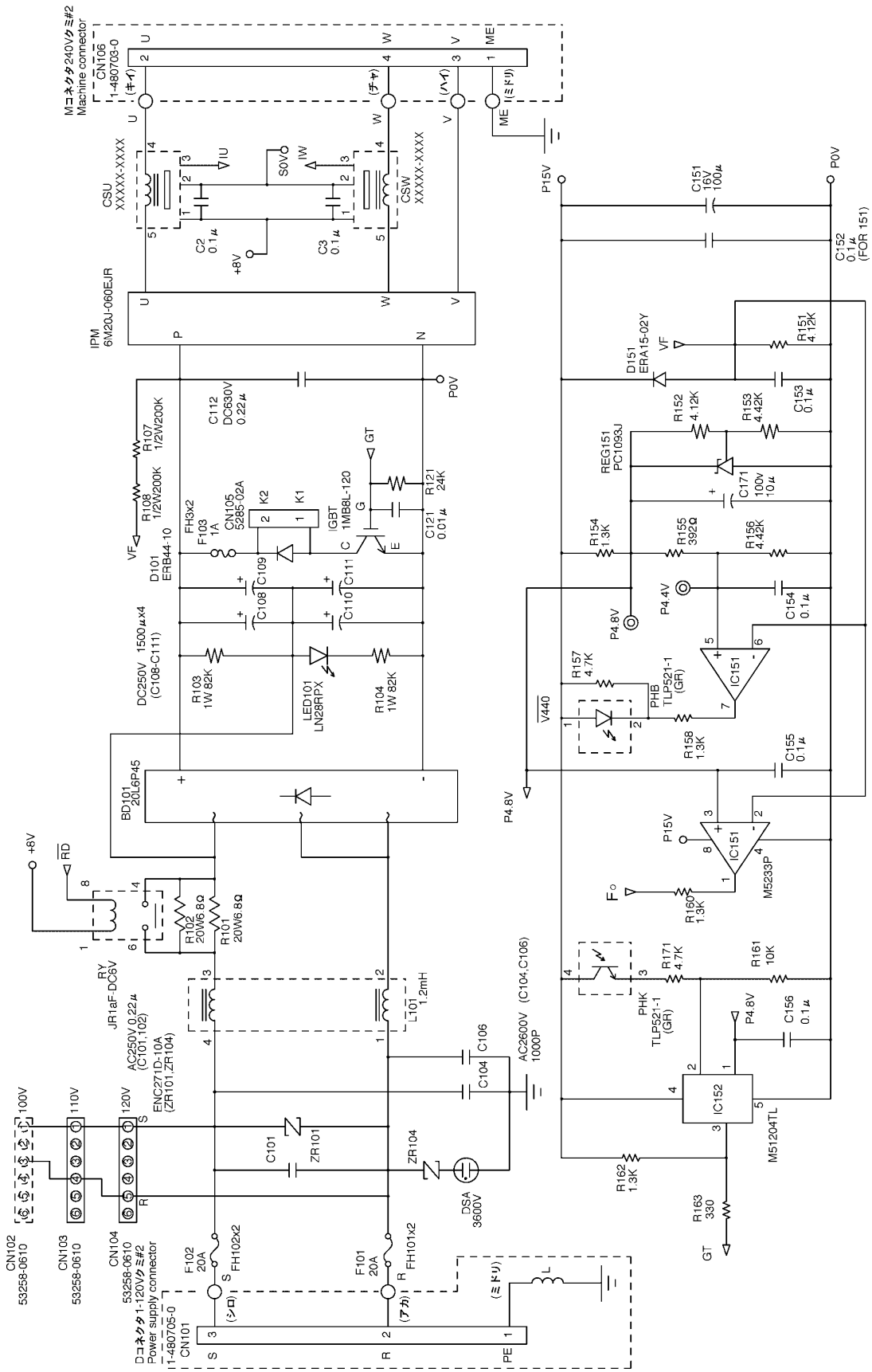


D-NDD1-120V(J80714001)			
SYMBOL	NAME	CODE	NOTE
C101	C-C250B224	X55094001	AC250 V0.22μF
C112	C-C630B224	J00904001	630V,0.22μF
R104,106	C-C2600B102	J02695001	AC2600V
ZR101	S-ABSO ENC621D	232380001	558V-682V
ZR104	S-ABSO ENC621D-14	J02696001	558V-682V
DSA	S-ABSO DSA362MA	232384001	3600V
L101	COIL NFI0KL122	J00791001	5A,1.2mH
R101,102	RESISTOR R20W6R8	J02697001	20W,6.8Ω
CSU,CSW	SENNSOR NDD	J02698001	8V,±15A,±1.5v
BD101	SID20L6P45	J02699001	800V,20A
IPM	IPM 6MB20J-060	J00863001	600V,20A
IGBT	IGBT1MB05-120	J00775001	1200V,5A
RY	RELAY JR1AF-DC6V	J00776001	250V,16A
C108,109,110,111	C-C250B152	J02700001	250V1500μF
IC151	BIPICM5233P	137906001	COMPARATOR
IC152	BIPICM51204TL	J02701001	COMPARATOR
REG151	BIPICMPC1093J	U80613000	2.495±2%
REG201,301,401	VLTREGAN78N15	J02702001	15V300mA
REG501	V-REGUPC7815AHF	J00249001	15V1A
BD201,301,401,501	SIBRSIVB20	226170000	200V,1A
D101	SIDERB44-10	J02703001	1000V,1A
D151	SIDERA15-02Y	J00787001	200V,1A
PHA,PHB,PHK	PH-TLP521-1G	T22708000	-
PHU,V,W,X,Y,Z	PH-TLP559HV	J02465001	-
R201,301,401	HR-A16AJ2R2	J02705001	1/6W,2.2Ω
R501	HR-A16AJR47	J02706001	1/6W,0.47Ω
LED101	LEDLN28RPX(TA3)	J00817001	Red Color
F101,F102	FUSE 20A250V	J02585001	250V,20A
F103	FUSE FGBO-1AH	J02713001	250V,1A
FH101-103	F-HOLDER F-062	J01684001	-

21. WIRING DIAGRAMS

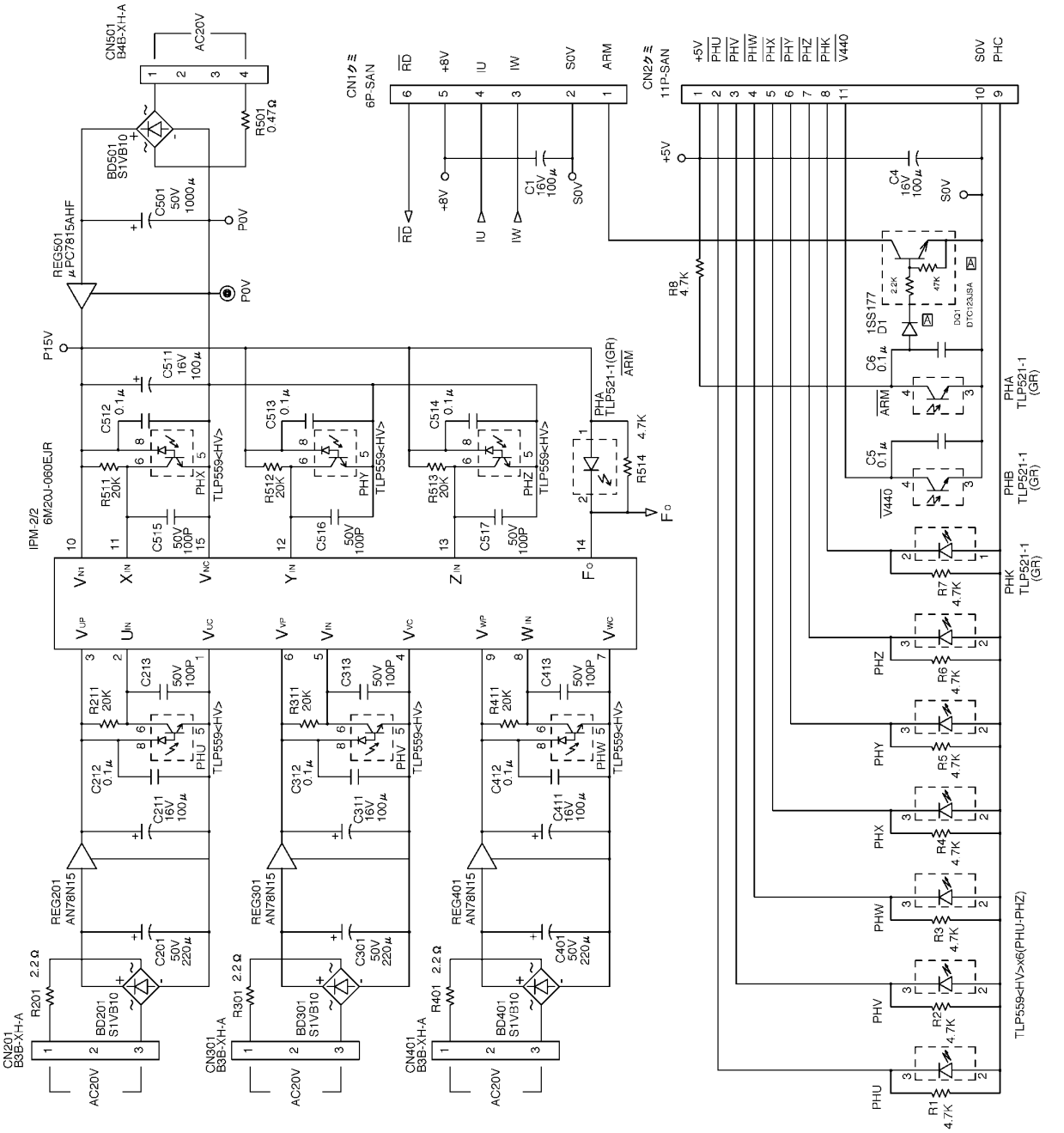
Power supply circuit board assembly (DD7100) D-NDD1-120V (2/3)

1904M



1905M

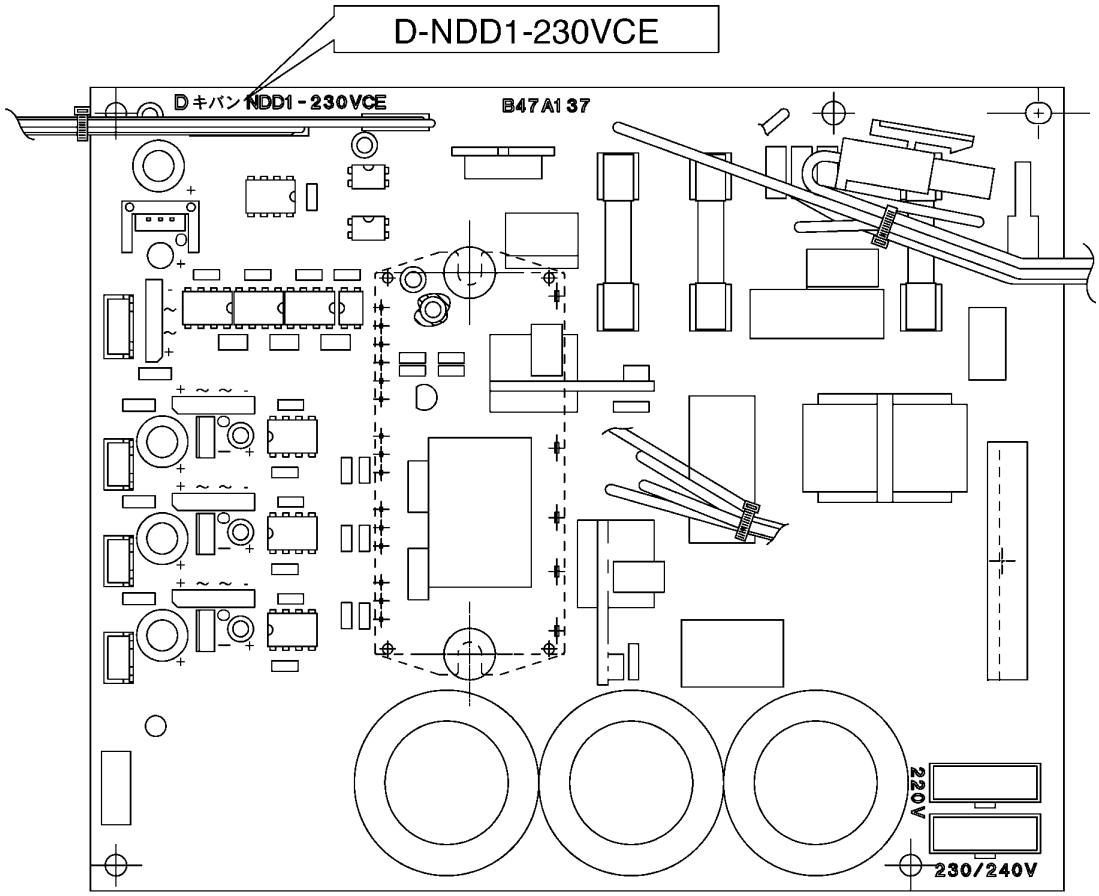
Power supply circuit board assembly (DD7100) D-NDD1-120V (3/3)



21. WIRING DIAGRAMS

1906M

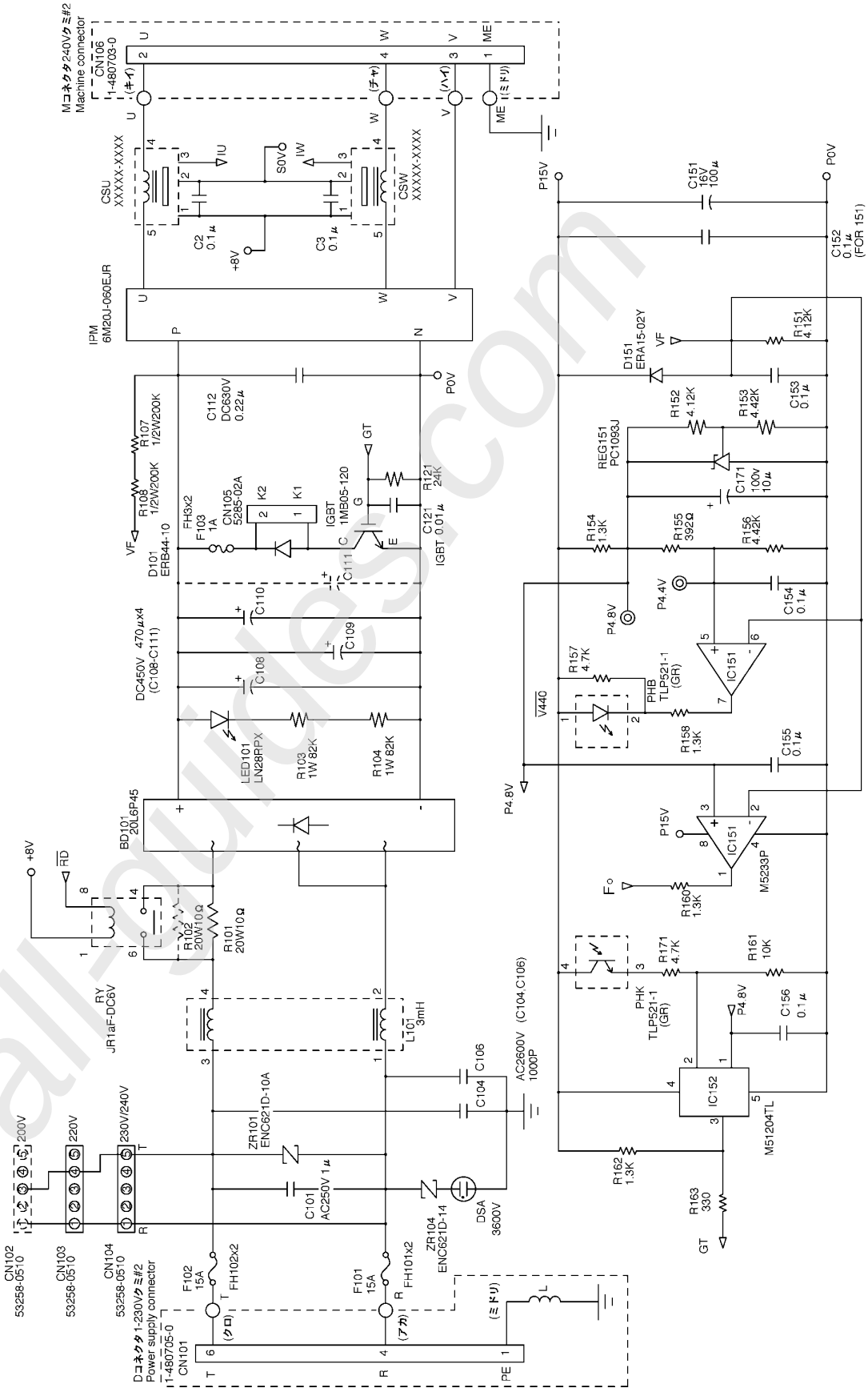
■ Power supply circuit board assembly (DD7100) D-NDD1-230V (1/3)



D-NDD1-230VCE(J80861001)			
SYMBOL	NAME	CODE	NOTE
C101	C-C250B105	J02595001	AC250V1μF
C112	C-C630B224	J00904001	630V,0.22μF
R104,106	C-C2600B102	J02695001	AC2600V
ZR101	S-ABSO ENC621D	232380001	558V-682V
ZR104	S-ABSO ENC621D-14	J02696001	558V-682V
DSA	S-ABSO DSA362MA	232384001	3600V
L101	COIL FM05C302M	J03343001	5A,3mH
R101	RESISTOR R20W10	J02717001	20W,10Ω
CSU,CSW	SENNSOR NDD	J02698001	8V,±15A,±1.5v
BD101	SID20L6P45	J02699001	800V,20A
IPM	IPM 6MB20J-060	J00863001	600V,20A
IGBT	IGBT1MB05-120	J00775001	1200V,5A
RY	RELAY JR1AF-DC6V	J00776001	250V,16A
C108,109,110	C-C450B471	J02718001	450V470μF
IC151	BIPICM5233P	137906001	COMPARATOR
IC152	BIPICM51204TL	J02701001	COMPARATOR
REG151	BIPICMPC1093J	U80613000	2.495±2%
REG201,301,401	VLTREGAN78N15	J02702001	15V300mA
REG501	V-REGUPC7815AHF	J00249001	15V1A
BD201,301,401,501	SIBRSIVB20	226170000	200V,1A
D101	SIDERB44-10	J02703001	1000V,1A
D151	SIDERA15-02Y	J00787001	200V,1A
PHA,PHB,PHK	PH-TLP521-1G	T22708000	-
PHU,V,W,X,Y,Z	PH-TLP559HV	J02465001	-
R201,301,401	HR-A16AJ2R2	J02705001	1/6W,2.2Ω
R501	HR-A16AJR47	J02706001	1/6W,0.47Ω
LED101	LEDLN28RPX(TA3)	J00817001	Red Color
F101,F102	FUSE 15A250V	218469001	250V,15A
F103	FUSE FGBO-1AH	J02713001	250V,1A
FH101-103	F-HOLDER F-062	J01684001	-

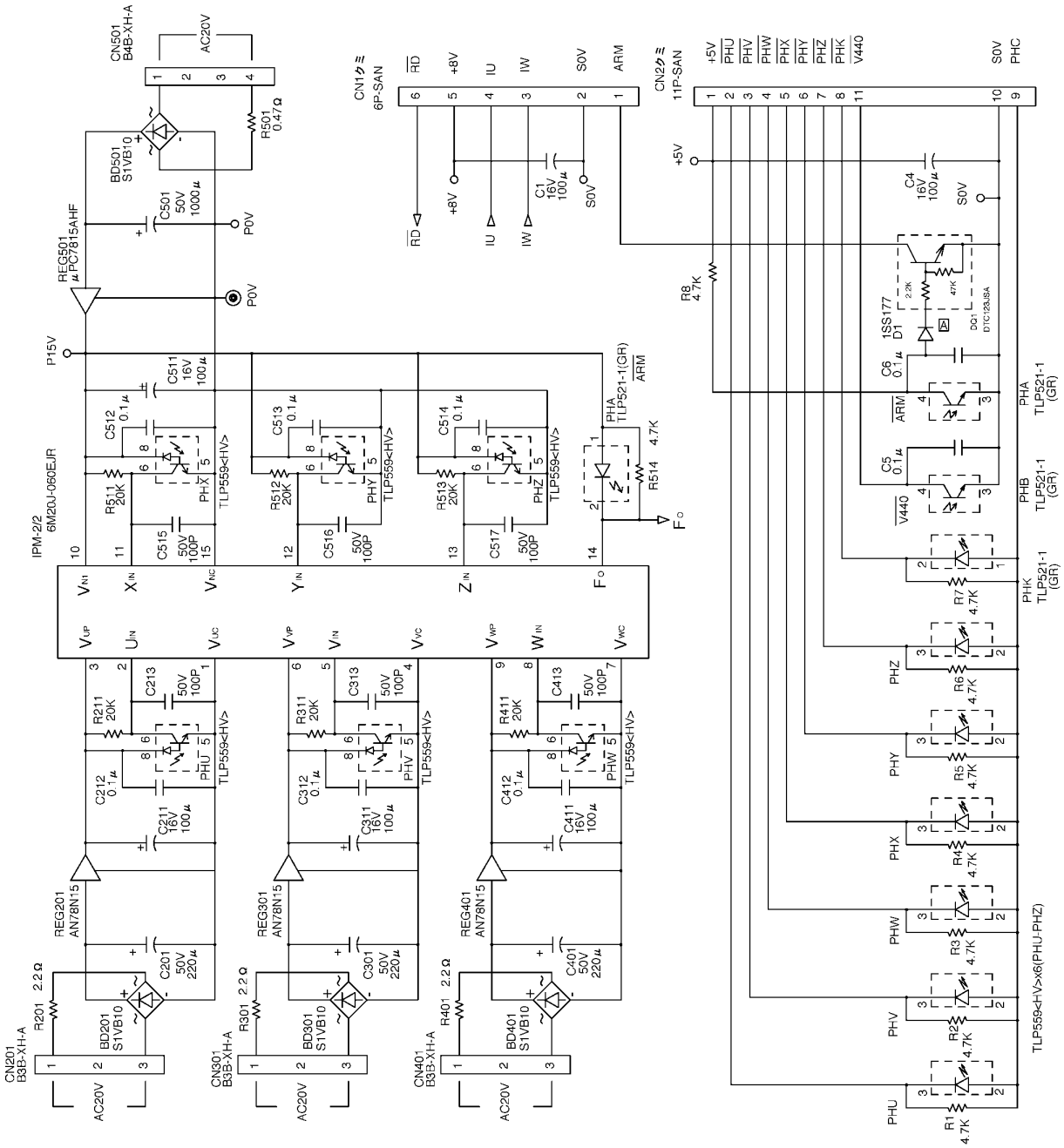
1907M

Power supply circuit board assembly (DD7100) D-NDD1-230V (2/3)



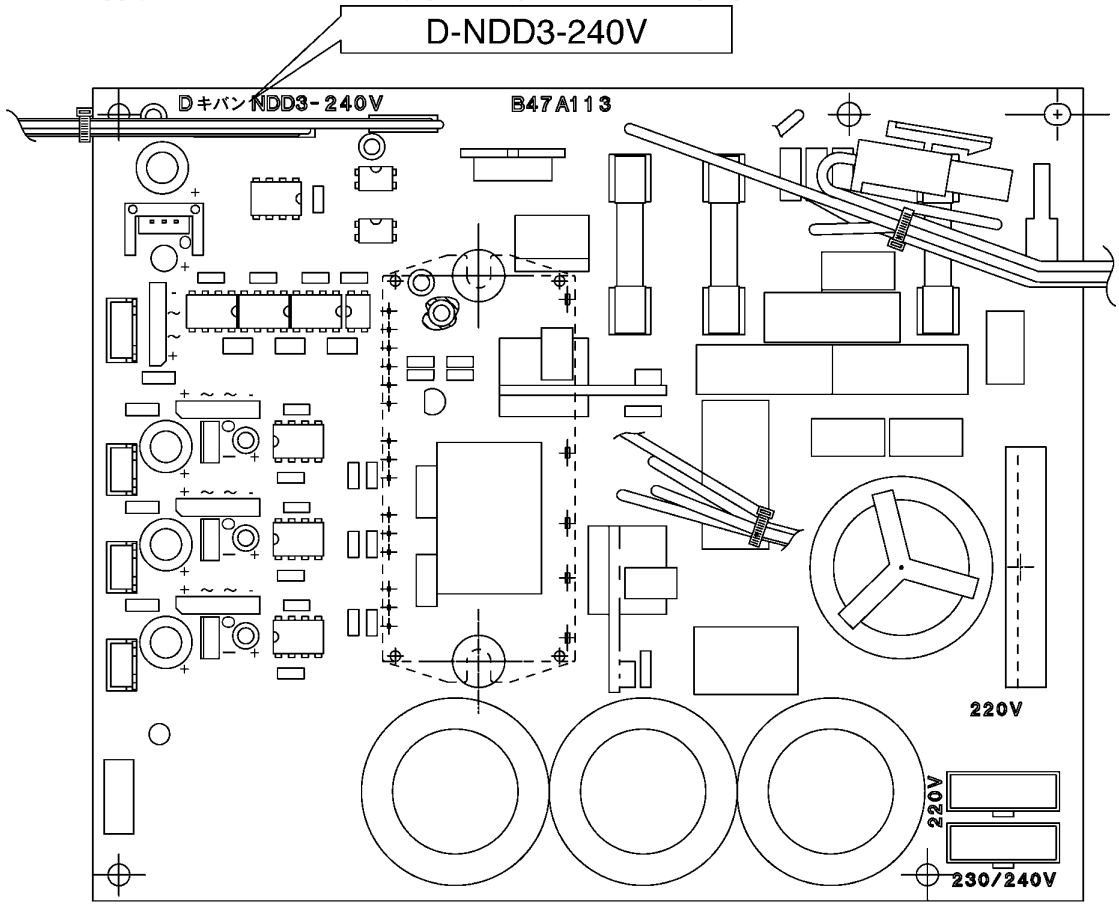
Power supply circuit board assembly (DD7100) D-NDD1-230V (3/3)

1908M



1909M

■ Power supply circuit board assembly (DD7100) D-NDD3-240V (1/3)

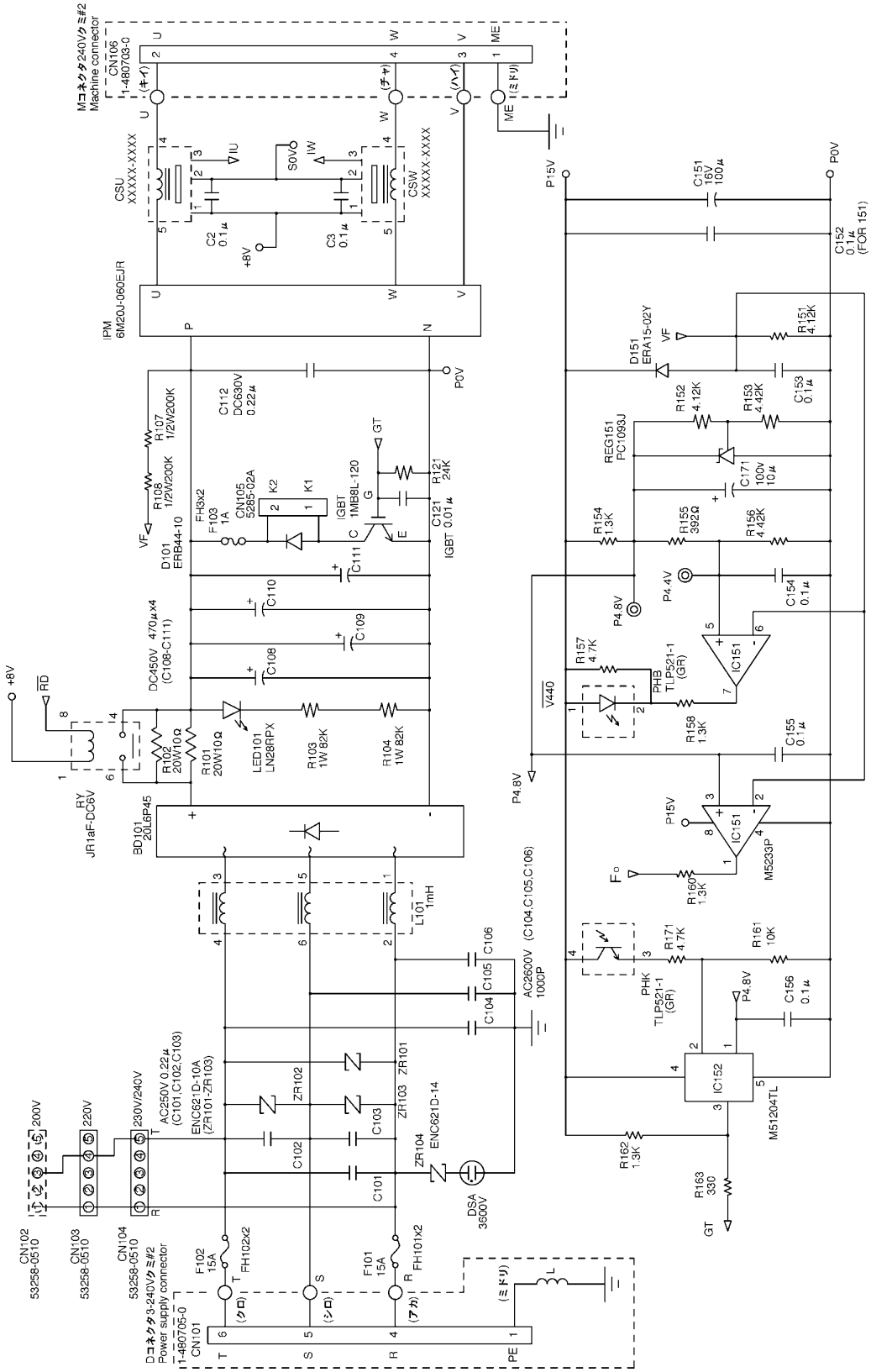


D-NDD3-240V(J80715001)			
SYMBOL	NAME	CODE	NOTE
C101,102,103	C-C250B224	X55094001	AC250V0.22μF
C112	C-C630B224	J00904001	630V,0.22μF
R104,105,106	C-C2600B102	J02695001	AC2600V
ZR101	S-ABSO ENC621D	232380001	558V-682V
ZR104	S-ABSO ENC621D-14	J02696001	558V-682V
DSA	S-ABSO DSA362MA	232384001	3600V
L101	COIL NF05TL102	J00770001	5A,1mH
R101	RESISTOR R20W10	J02717001	20W,10Ω
CSU,CSW	SENNSOR NDD	J02698001	8V,±15A,±1.5v
BD101	SID20L6P45	J02699001	800V,20A
IPM	IPM 6MB20J-060	J00863001	600V,20A
IGBT	IGBT1MB05-120	J00775001	1200V,5A
RY	RELAY JR1AF-DC6V	J00776001	250V,16A
C108,109,110	C-C450B471	J02718001	450V470μF
IC151	BIPICM5233P	137906001	COMPARATOR
IC152	BIPICM51204TL	J02701001	COMPARATOR
REG151	BIPICMPC1093J	U80613000	2.495±2%
REG201,301,401	VLTREGAN78N15	J02702001	15V300mA
REG501	V-REGUPC7815AHF	J00249001	15V1A
BD201,301,401,501	SIBRSIVB20	226170000	200V,1A
D101	SIDERB44-10	J02703001	1000V,1A
D151	SIDERA15-02Y	J00787001	200V,1A
PHA,PHB,PHK	PH-TLP521-1G	T22708000	-
PHU,V,W,X,Y,Z	PH-TLP559HV	J02465001	-
R201,301,401	HR-A16AJ2R2	J02705001	1/6W,2.2Ω
R501	HR-A16AJR47	J02706001	1/6W,0.47Ω
LED101	LEDLN28RPX(TA3)	J00817001	Red Color
F101,F102	FUSE 15A250V	218469001	250V,15A
F103	FUSE FGBO-1AH	J02713001	250V,1A
FH101-103	F-HOLDER F-062	J01684001	-

21. WIRING DIAGRAMS

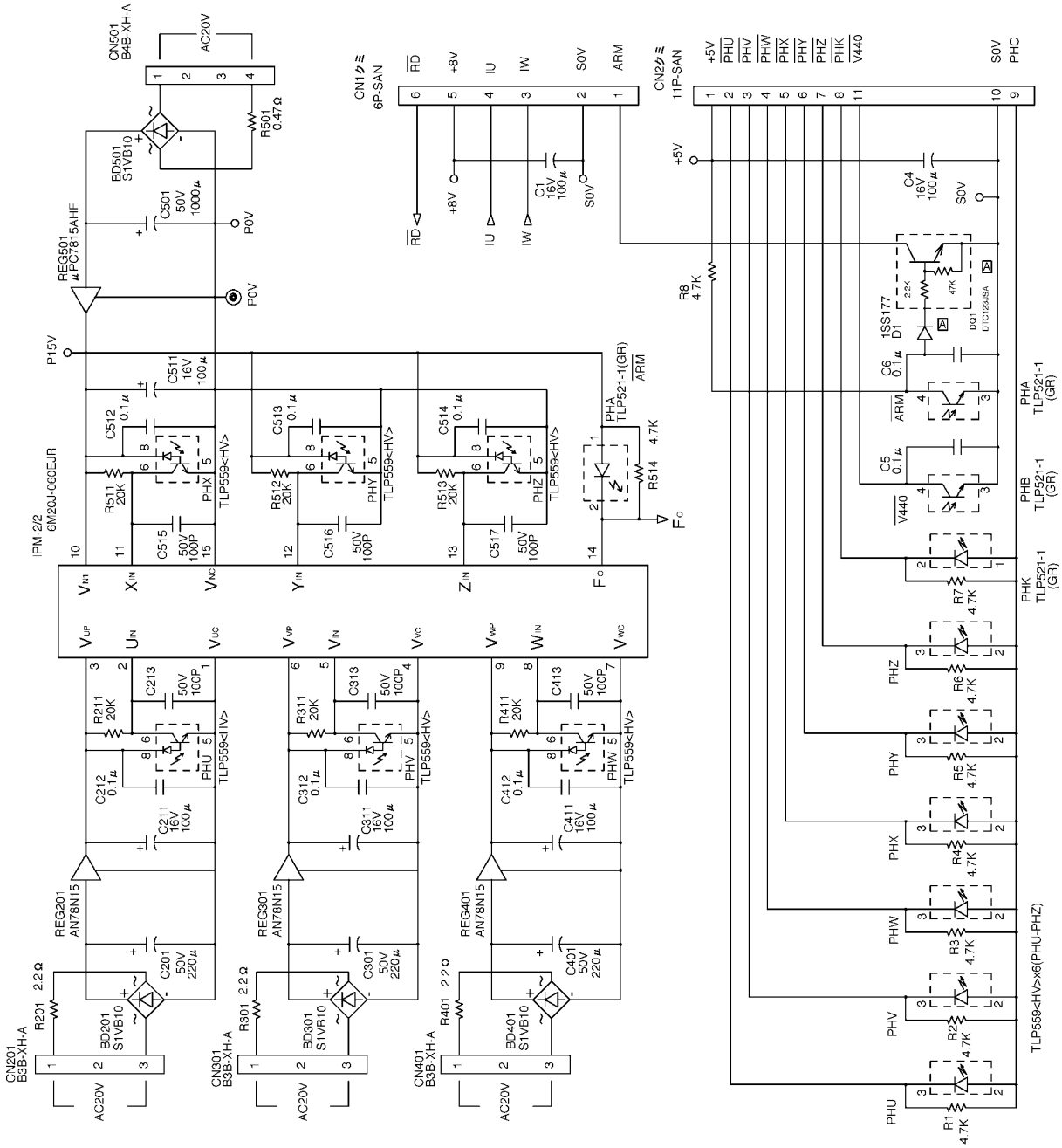
Power supply circuit board assembly (DD7100) D-NDD3-240V (2/3)

1910M



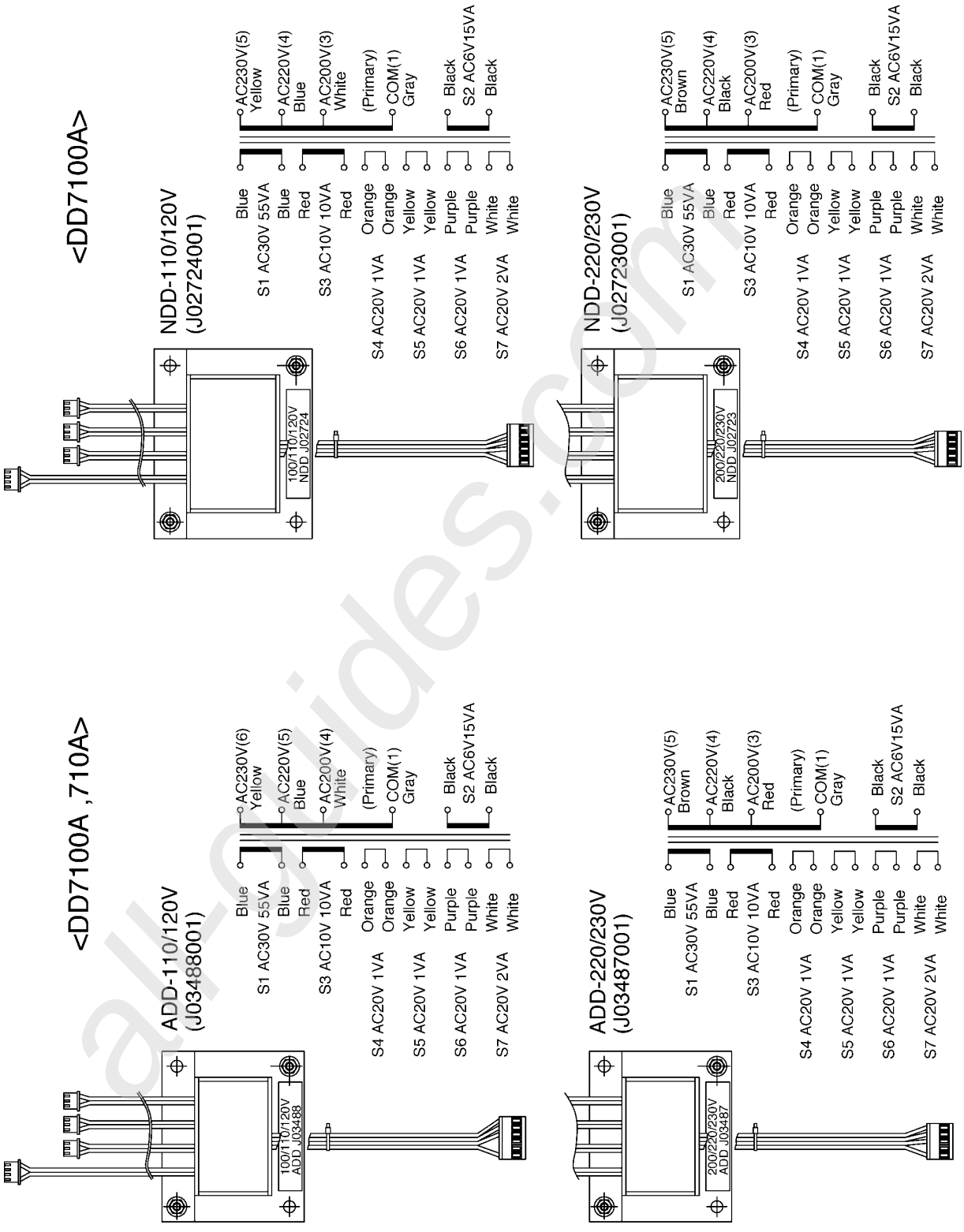
1911M

Power supply circuit board assembly (DD7100) D-NDD3-240V (3/3)



1912M

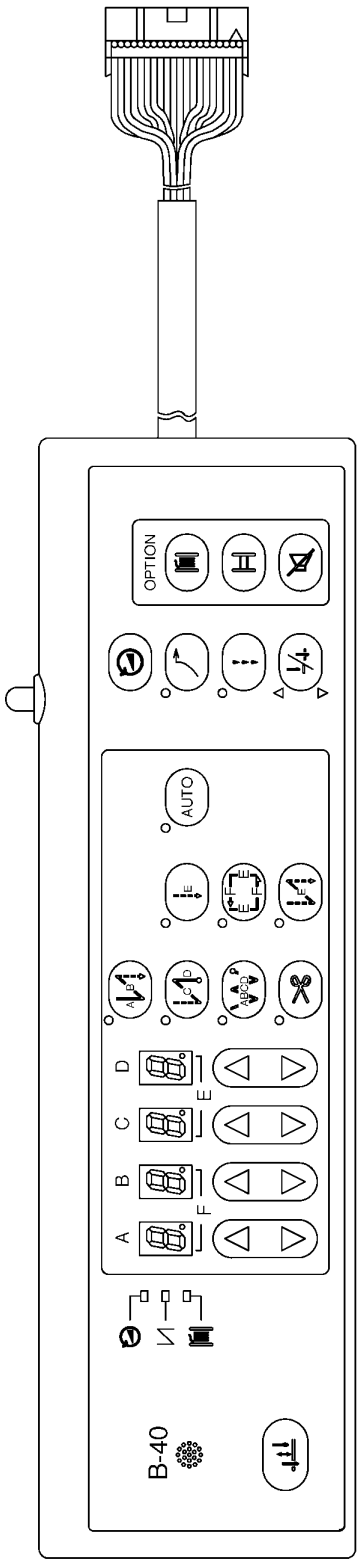
21-4. Transformer



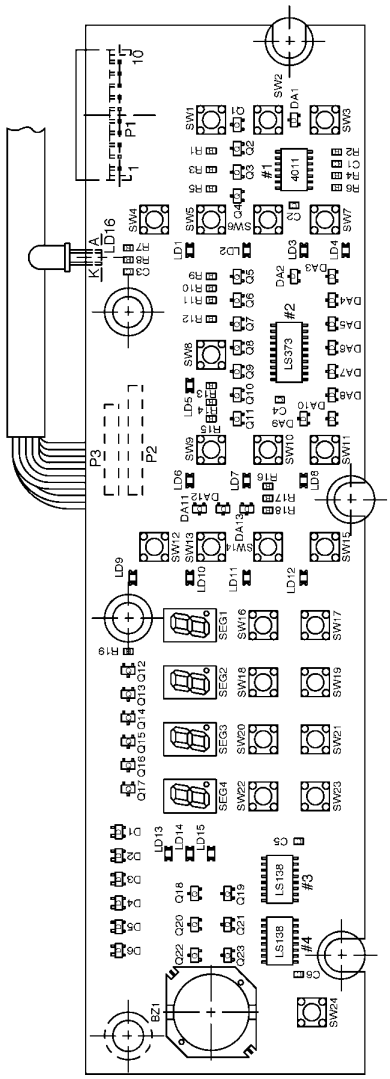
1913M

21-5. Operation panel B-40

■ Operation panel B-40 (1/3)

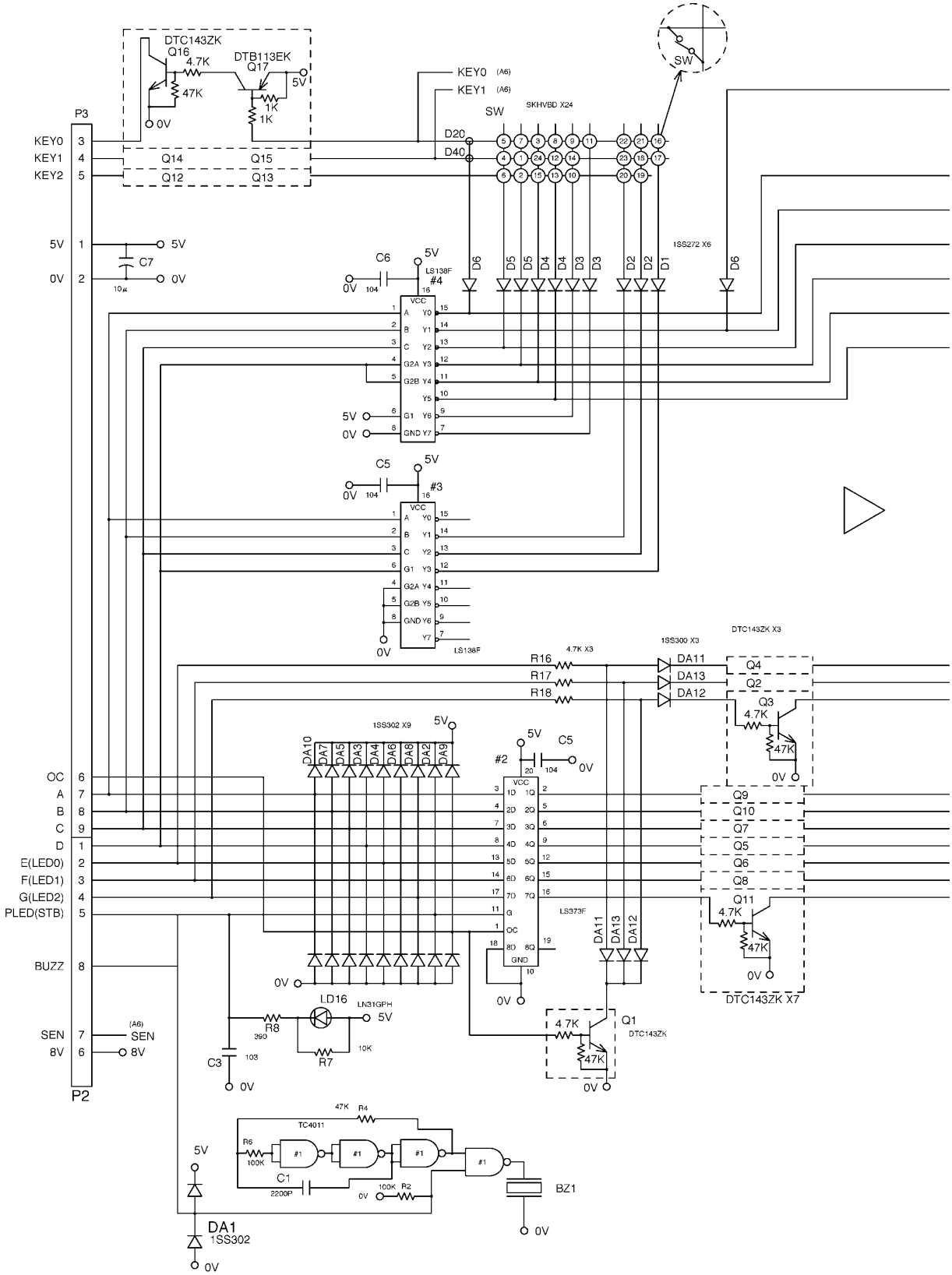


SYMBOL	CODE	NAME
#3,#4	091120138	BIPIC74LS138
#2	091120373	BIPIC74LS373F
#1	092554011	BIPICTC4011BF
Q13,15,17,18,19,20,21,22,23	J00625001	TRDTB113EK
Q1,2,3,4,5,6,7,8,9,10,11,12,14,16	U38326000	TRDTC143ZK
SEG1,2,3,4	J00621001	LEDLA-301VB L
LD1,2,3,4,5,6,7,8,9,10,11,12,13,14,15	UL8039000	SML-010LT
LD16	J00623001	LEDLN31GPH
P2,P3	J03503001	PANEL COAD B
P1	U73353000	CONNECTOR10-XH-A
BZ1	J00626001	EFBAL30D402
DA11,12,13	J02614001	SID1SS300
D1,2,3,4,5,6	U33547085	SID1SS272T
DA1,2,3,4,5,6,7,8,9,10	J02613001	SID1SS302
R1,3,5,8,9,10,11,12,13,14,15	094391120	GR-C110J391
R16,17,18	094472120	GR-C110J472
R7,19	094103120	GR-C110J103
R4	094473120	GR-C110J473
R2,6	094104120	GR-C110J104
C7	Y41002301	C-C16B100
C2,4,5,6	Y81042415	C-C50C104F-T
C3	Y81030015	C-C50C103B
C1	Y82220015	C-C50C222
SW1,2,3,4,5,6,7,8,9,10,11,12, 13,14,15,16,17,18,19,20,21,22,23,24	236387001	SW SKHVBD



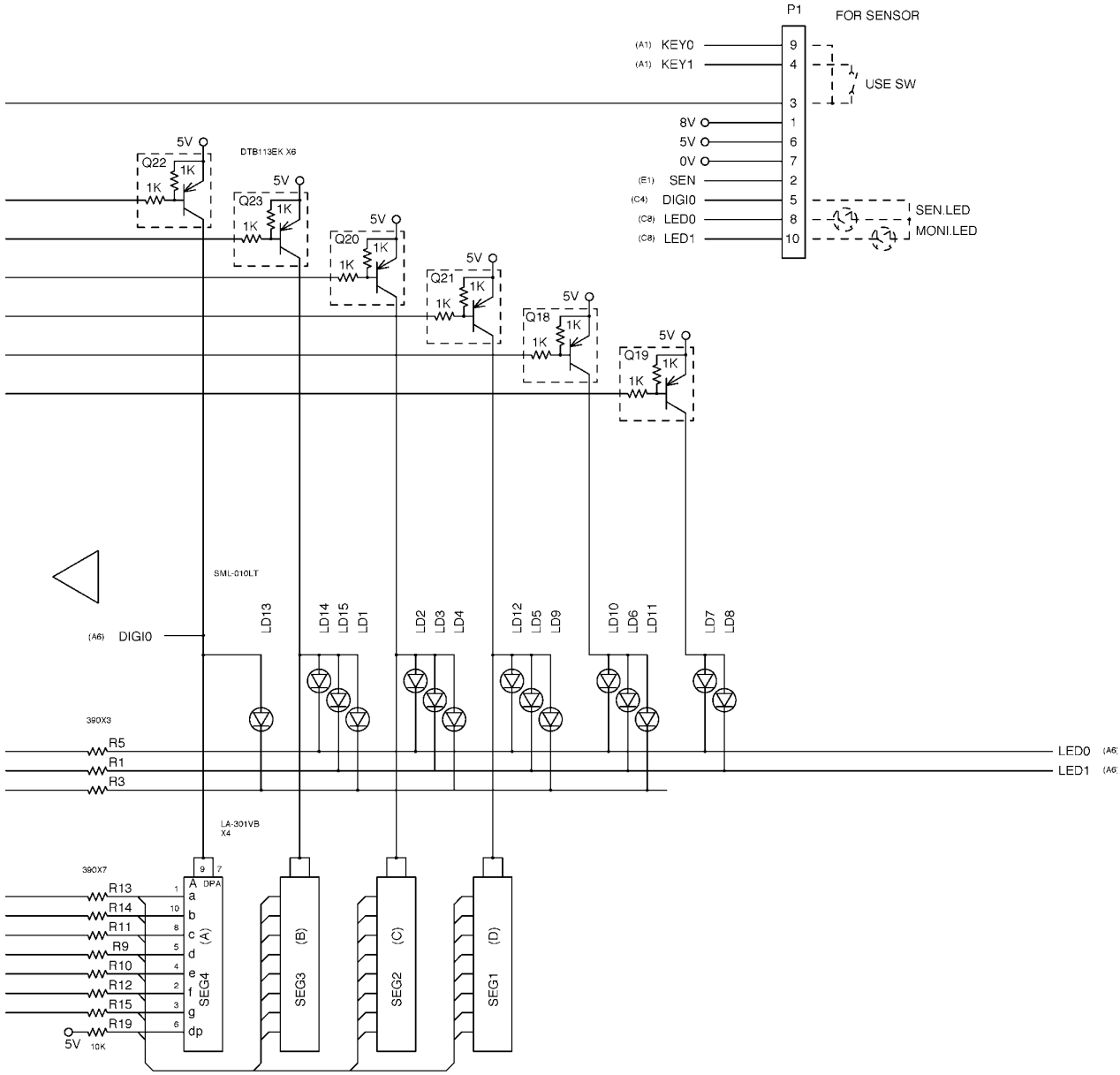
Operation panel B-40 (2/3)

1914M



1915M

Operation panel B-40 (3/3)



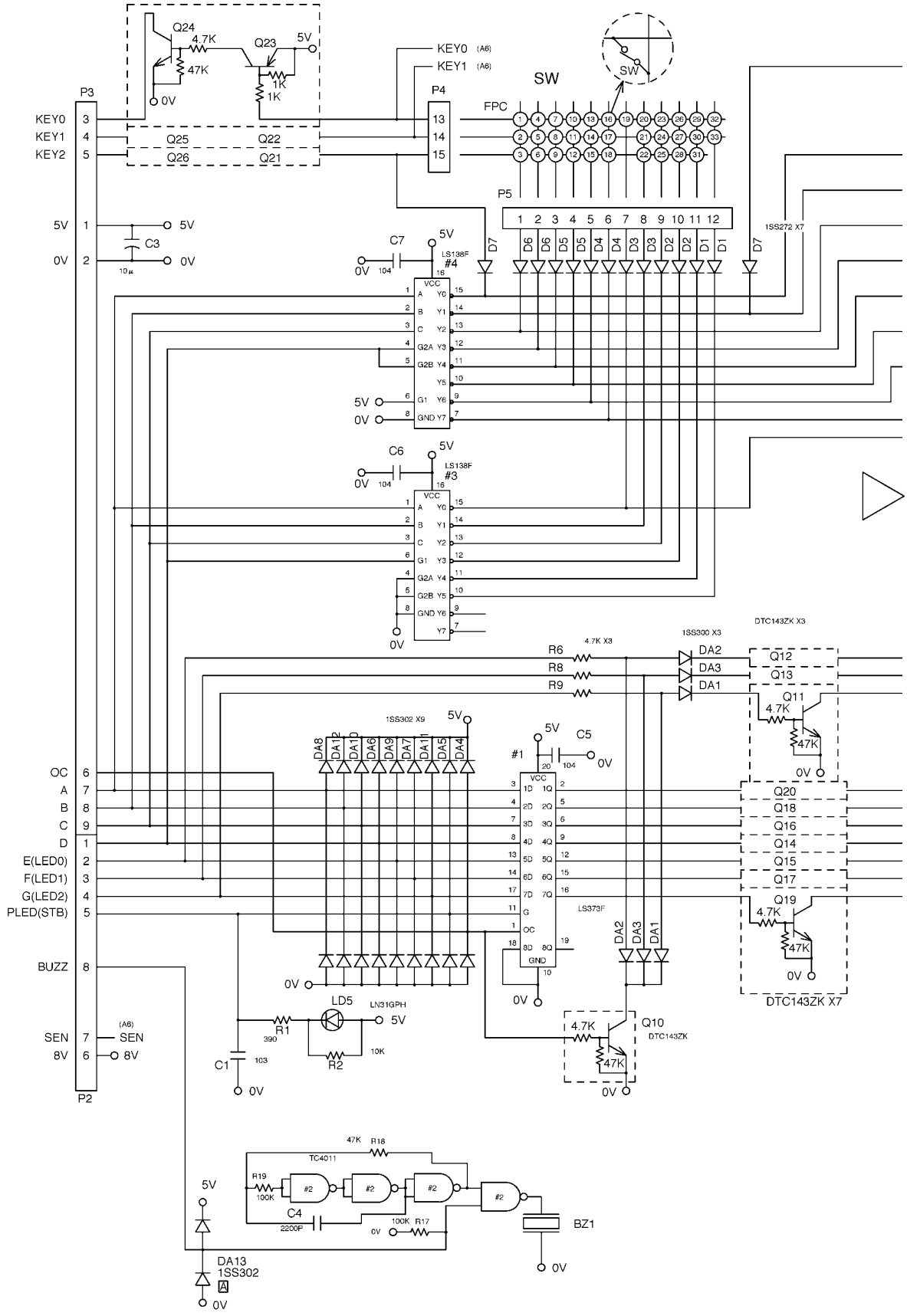
LD No.	名称	Name
LD13	縫イ速度	Sewing speed
14	止メ縫	Backtack
15	下糸残量	Lower thread
1	スロースタート	Slow start
2	補正	Correction
3	針上停止	Needle up stop
4	針下停止	Needle down stop
12	糸切	Thread trimming
5	自動	Automatic sewing
9	前止メ縫イ (AB)	Start backtack (AB)
10	後止メ縫イ (CD)	End backtack (CD)
6	定寸	Fixed stitch
11	連続止メ縫イ	Continuous backtack
7	ネーム	Name label stitch
8	プリーツ	Pleats presser stitch

SWNO.	名称	Name
SW1	下糸残量モード	Lower thread counter mode
2	下糸残量初期値記憶	Initial lower thread value recording
3	下糸残量警告音停止	Lower thread warning buzzer stop
4	縫イ速度	Sewing speed
5	スロースタート	Slow start
6	補正	Correction
7	針上下停止切替	Needle up/down stop select
8	自動	Automatic sewing
9	定寸	Fixed stitch sewing
10	ネーム	Name labels
11	プリーツ	Pleats presser
12	前止メ縫イ (AB)	Start backtack (AB)
13	後止メ縫イ (AB)	End backtack (CD)
14	連続止メ縫イ	Continuous backtack
15	糸切	Thread trimming
16	D +	D +
17	D -	D -
18	C +	C +
19	C -	C -
20	B +	B +
21	B -	B -
22	A +	A +
23	A -	A -
24	針上ゲ	Half stitch

1916M

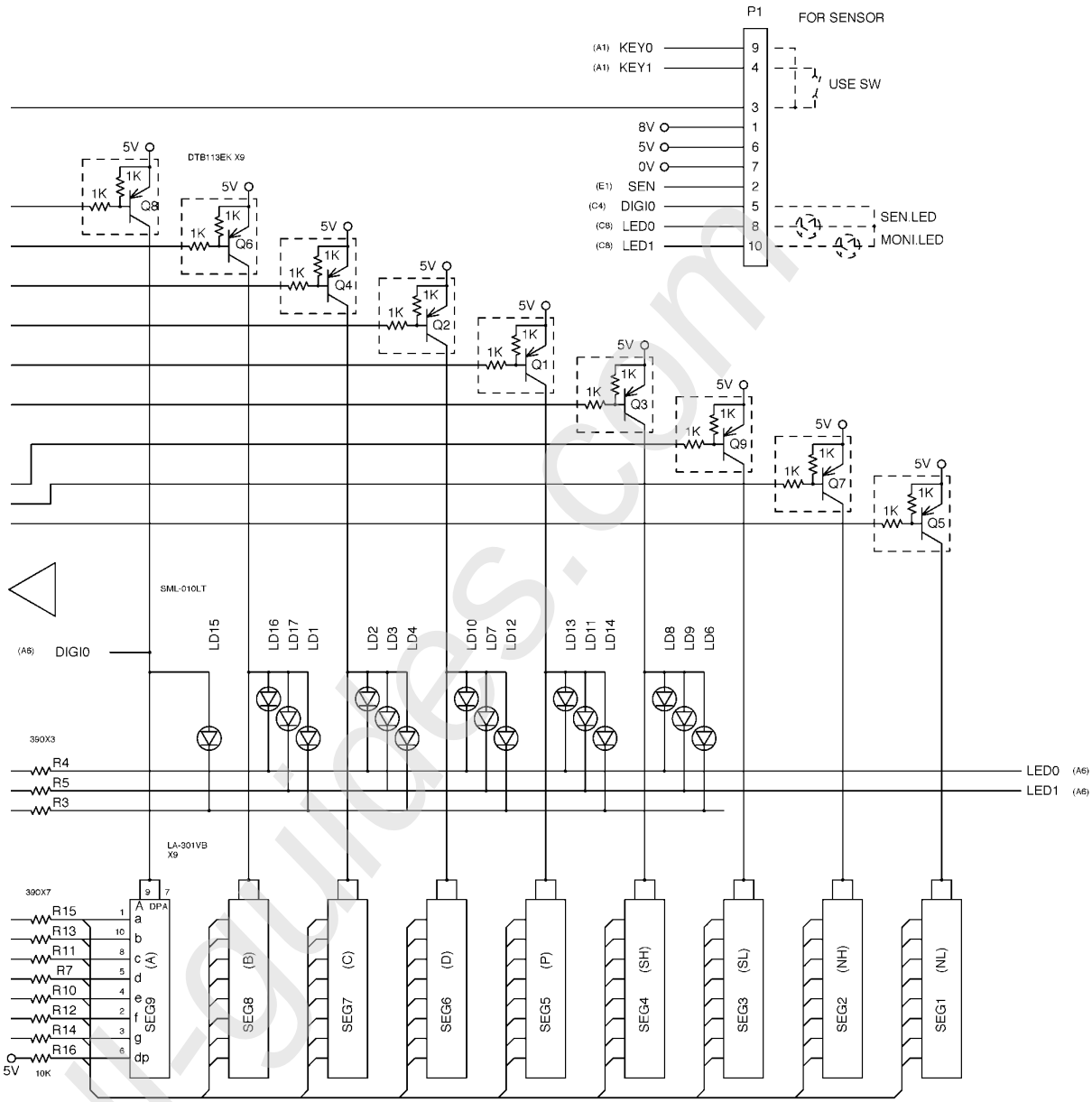
21-6. Operation panel B-100

■ Operation panel B-100 (1/3)



1917M

Operation panel B-100 (2/3)

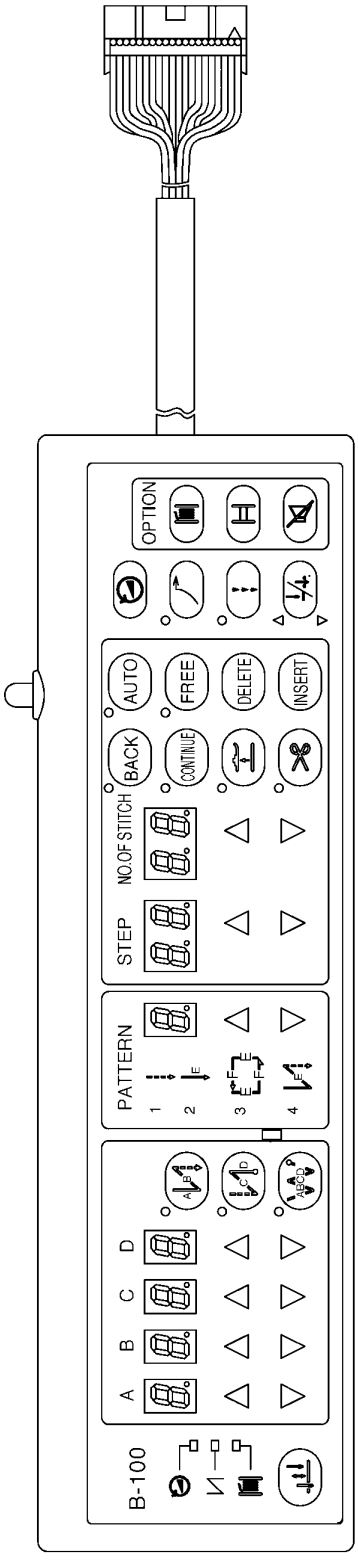


LD No.	名称	Name	SWNO.	名称	Name	SWNO.	名称	Name
LD15	縫イ速度	Sewing speed	SW1	スロースタート	Slow start	SW18	挿入	Step insertion
16	止メ縫	Backtack	2	縫イ速度	Sewing speed	19	削除	Step deletion
17	下糸残量	Lower thread	3	補正	Correction	20	A +	A +
1	スロースタート	Slow start	4	針上下停止切替	Needle up/down stop select	21	A -	A -
2	補正	Correction	5	下糸残量モード	Lower thread counter mode	22	B +	B +
3	針上停止	Needle up stop	6	下糸残量初期値記憶	Initial lower thread value recording	23	B -	B -
4	針下停止	Needle down stop	7	下糸残量警告音停止	Lower thread warning buzzer stop	24	C +	C +
10	糸切	Thread trimming	8	針上ゲ	Half stitch	25	C -	C -
7	自動	Automatic sewing	9	糸切	Thread trimming	26	D +	D +
12	前止メ縫イ (AB)	Start backtack (AB)	10	自動	Automatic sewing	27	D -	D -
13	後止メ縫イ (CD)	End backtack (CD)	11	前止メ縫イ (AB)	Start backtack (AB)	28	パターン +	Pattern +
11	逆転	Quick reverse	12	後止メ縫イ (CD)	End backtack (CD)	29	パターン -	Pattern -
14	連続止メ縫イ	Continuous backtack	13	逆転	Quick reverse	30	ステップ +	Step +
8	連続	Continuous stitch	14	連続止メ縫イ	Continuous backtack	31	ステップ -	Step -
9	押エ	Automatic presser lifter	15	連続	Continuous stitch	32	針数 +	Number of stitches +
6	フリー	Free	16	押エ	Automatic sewing	33	針数 -	Number of stitches -
			17	フリー	Free			

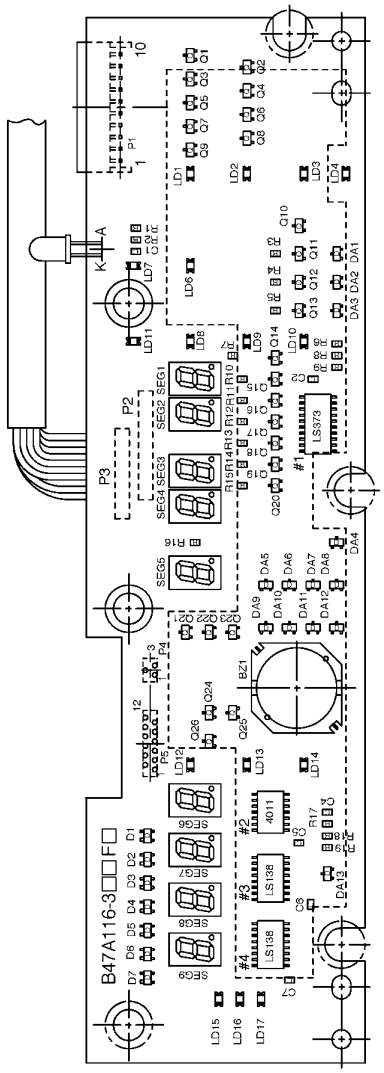
21. WIRING DIAGRAMS

Operation panel B-100 (3/3)

1918M



SYMBOL	CODE	NAME
#3,#4	091120138	BIPIC74LS138
#1	091120373	BIPIC74LS373F
#2	092554011	BIPICTC4011BF
Q1,2,3,4,5,6,7,8,9,21,22,23	J00625001	TRDTB113EK
Q10,11,12,13,14,15,16,17,18, 19,20,24,25,26	U38326000	TRDTC1432K
SEG1,2,3,4,5,6,7,8,9	J00621001	LEDLA-301VB L
LD1,2,3,4,6,7,8,9,10,11,12,13,14,15,16,17	UL8039000	SML-010LT
LD5	J00623001	LEDLN31GPH
DA1,2,3	J02614001	SIDSS300
D1,2,3,4,5,6,7	U33547085	SID1SS272T
DA4,5,6,7,8,9,10,11,12,13	J02613001	SID1SS302
BZ1	J00626001	EFBAL30D402
R1,3,4,5,7,10,11,12,13,14,15	094391120	GR-C110J391
R6,8,9	094472120	GR-C110J472
R2,16	094103120	GR-C110J103
R18	094473120	GR-C110J473
R17,19	094104120	GR-C110J104
C3	Y41002301	C-C16B100
C2,5,6,7	Y81042415	C-C50C104F-T
C1	Y81030015	C-C50C103B
C4	Y82220015	C-C50C222
P2,P3	J03503001	PANEL COAD B
P5	J00627001	CONNECTOR 12FM-1.0BT
P4	J00628001	CONNECTOR 03FM-1.0BT
P1	U73353000	CONNECTOR 10B-XH-A



22. TROUBLESHOOTING

- Please check the following points before calling for repairs or service.
- If the following suggestions do not solve the problem, turn off the machine power supply and contact your nearest Brother service center.

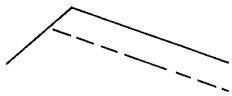
⚠ DANGER

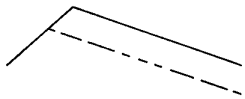
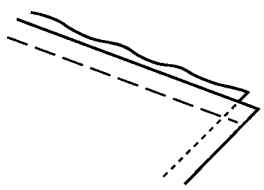
Wait at least 10 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

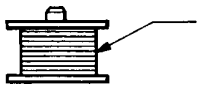
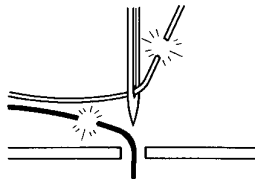
⚠ CAUTION

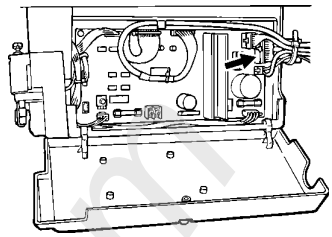
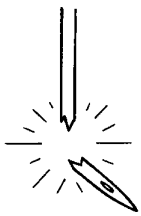
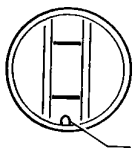
Turn off the power switch and disconnect the power cord before carrying out troubleshooting, otherwise the machine will operate if the treadle is pressed by mistake, which could result in injury.

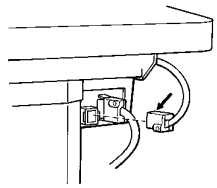
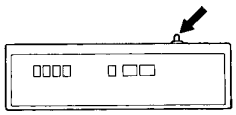
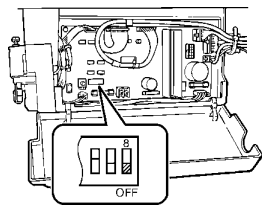
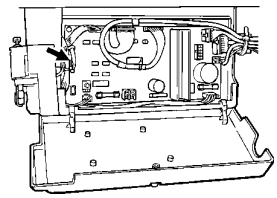
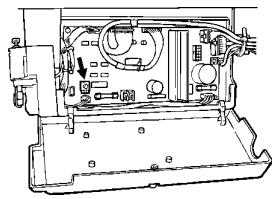
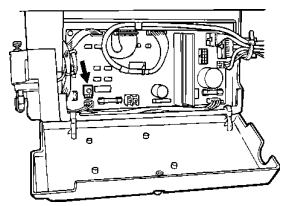
22-1. Sewing

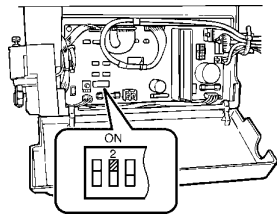
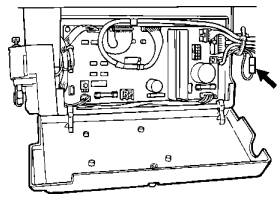
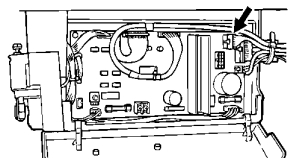
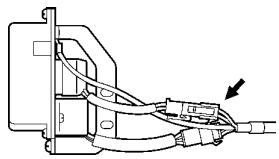
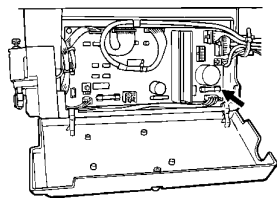
Problem	Possible cause	Page
1. Upper thread is not tight.  0573M	• Is the upper thread tension too weak, or is the lower thread tension too strong? Adjust the upper thread tension or lower thread tension. • Is the needle and feed mechanism timing correct? Advance the needle timing.	Instruction manual 67
2. Lower thread is not tight.  0574M	• Is the lower thread tension too weak, or is the upper thread tension too strong? Adjust the lower thread tension or upper thread tension.	Instruction manual
3. Loops appear in seam.  0977M	• 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.	- Instruction manual
4. Skipped stitches occur while sewing.  0470M	• 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. • Is the machine properly threaded? If it is incorrect, thread the thread correctly. • Is the presser foot pressure too weak? Adjust the presser foot pressure. • Is the needle too thin? Replace the needle with a needle that is one rank thicker. • Is the presser foot too high? Adjust the height of the presser foot. • Is the needle and rotary hook timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook. • Is the thread tension spring too weak? Adjust the tension of the thread tension spring. • Is the rotary hook tip broken? If it is broken, replace the rotary hook.	- Instruction manual Instruction manual Instruction manual - 64 67 68 63 48

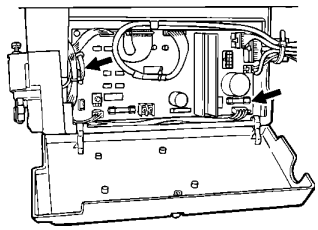
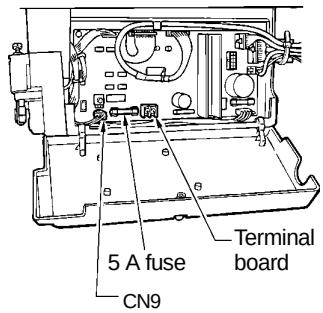
Problem	Possible cause	Page
5. Skipped stitches at sewing start Thread unravelling at sewing start  0749M	• Are the thread tension spring tensions too strong? Reduce the tension of the thread tension springs. • Is the thread tension spring operating range too large? Lower the position of the thread tension spring. • Are the trailing lengths of the upper threads too short after thread trimming? Adjust the pretension. • Are the threads not being trimmed cleanly? Sharpen the fixed knives, or replace the fixed and movable knives if necessary. • Is the needle too wide? Try using a needle with a count that is one lower than the current needle. • Is the length of thread trailing out from the bobbin case after thread trimming too short? If the bobbin is spinning loosely, replace the stopper spring in the bobbin case. • Is the sewing speed too fast at the sewing start? Use the slow start feature. • Is the needle up stop position too high? Adjust the synchronizer.	63 63 Instruction manual Instruction manual - - Instruction manual 70
6. Uneven seam  0473M	• Is the presser foot pressure too weak? Adjust the presser foot pressure. • 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.	Instruction manual 65 -
7. Large degree of puckering (excess tension)  0978M	• Is the upper thread tension too strong? Make the upper thread tension as weak as possible. • Is the lower thread tension too strong? Make the lower thread tension as weak as possible. • Are the thread tension spring tensions too strong? Make the thread tension spring tension as weak as possible. • Is the thread tension spring operating range too large? Lower the position of the thread tension spring to as low a position as possible. • Is the presser foot pressure too strong? Adjust the presser foot pressure. • Is the sewing speed too fast? Reduce the sewing speed slightly. • Is the angle of the feed dog incorrect? Tilt the front of the feed dog down slightly.	Instruction manual Instruction manual 63 63 Instruction manual Instruction manual 66
8. Seam position is incorrect.  0750M	• Is the presser foot pressure too strong? Adjust the presser foot pressure. • Is the angle of the feed dog incorrect? Tilt the front of the feed dog up slightly. • Is the needle and feed mechanism timing correct? Retard the needle timing.	Instruction manual 66 67

Problem	Possible cause	Page
9. Lower thread is tangled at the sewing start. Spinning of bobbin during thread trimming  0751M  0801M	• 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 than 80%. • Is the free spinning prevention spring attached? Attach the free spinning prevention spring. • Is the bobbin turning smoothly? If the bobbin is not turning smoothly, replace the bobbin. • Is a bobbin other than the light-alloy bobbins specified by Brother being used? Use only bobbins which are specified by Brother.	 Instruction manual Instruction manual - - -
10.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. • Is the needle properly threaded? If it is incorrect, thread the needle correctly. • Is the rotary hook sufficiently lubricated? If the oil gauge is down to the lower reference line in the oil sight glass, add more oil. • Is the upper or lower thread tension too weak or too strong? Adjust the upper thread or lower thread tension. • Is the upper thread may be loose because the thread tension spring operating range is too small? Adjust the position of the thread tension spring. • 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.	- Instruction manual Instruction manual 59 Instruction manual 63 48, 49 -
11. Incorrect thread trimming. (upper and lower threads are both not being trimmed).	• Is the fixed knife or movable knife damaged or worm? Replace the fixed knife or the movable knife. • Is the fixed knife and movable knife meshing amount correct? Adjust the fixed knife and movable knife meshing amount. • Is the movable knife operating correctly? Measure the resistance between terminals 3-4 of the sewing machine connector with an ohmmeter. If the measured value is not normal, replace the thread trimmer solenoid.	Instruction manual 47 104
12. Incorrect thread trimming. (upper thread or lower thread is not being trimmed).	• Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the fixed knife or movable knife blunt? Replace the fixed knife or the movable knife. • Is the fixed knife and movable knife meshing amount correct? Adjust the fixed knife and movable knife meshing amount.	Instruction manual Instruction manual 47

Problem	Possible cause	Page
13. Movable knife does not operate.	• Is the resistance between terminals 3 - 4 of the sewing machine connector normal? Measure the resistance between terminals 3 - 4 of the sewing machine connector with an ohmmeter. If the measured value is not normal, replace the thread trimmer solenoid. • Is the sewing machine connector disconnected from the control circuit board? Or, is the thread trimmer solenoid cord disconnected from the sewing machine connector? If the sewing machine connector is connected correctly, there may be a problem with the control circuit board. Contact the place of purchase.  0987M	104 58
14. Broken needle  0469M	• Is the material being pushed or pulled with excessive force during sewing? • Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the needle bent, is the needle tip broken, or is the needle hole blocked? Replace the needle. • Is the needle and rotary hook timing incorrect? Adjust the height of the needle bar. Adjust the clearance between the needle and the rotary hook. • Is the needle timing advanced too far with respect to the feed dog? Retard the needle timing. **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 that through steps be taken to account for such needles to comply with product liability regulations.	- Instruction manual - 67 68 67
15. The stitch lengths in the normal feed direction and reverse feed direction are not equal.	• Is the eccentric pin adjusted properly? Adjust the eccentric pin.	69
16. An impact noise is heard from the quick reverse solenoid.	• Is the quick reverse solenoid clearance correct? Adjust the position of the solenoid lever.	52
17. Oil gauge is not visible in oil sight glass.  0979M	• Is the oil tank empty? Fill the oil tank with oil. • Is the rotary hook lubrication adjusting screw too loose? Check the rotary hook lubrication amount, and adjust the rotary hook lubrication adjusting screw. • Is the oil gauge damaged? Replace the oil gauge.	59 73 42

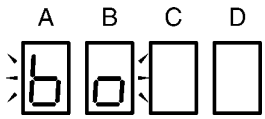
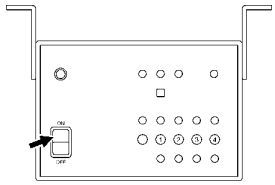
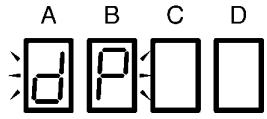
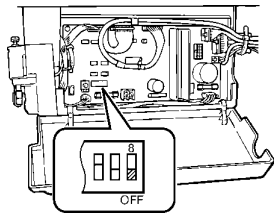
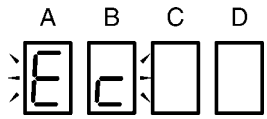
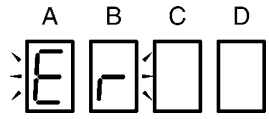
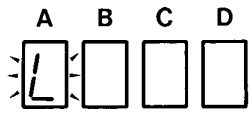
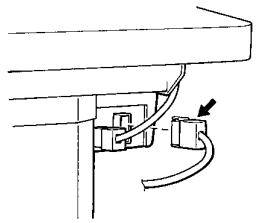
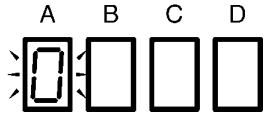
Problem	Possible cause	Page
18.Machine does not operate when power is turned on and treadle is pressed. 1) Operating panel power indicator does not illuminate.	• Is the power supply connector disconnected from the control box? Insert the connector securely.  1002M	Instruction manual
	• Is the power supply plug incorrectly wired or is the voltage incorrect? Check the power plug wiring and the power supply voltage. (Try inserting into a different wall socket.)	-
2) Only operating panel power indicator illuminates.  1001M	• Is DIP switch No.8 inside the control box set to ON? Set DIP switch No.8 to OFF.  1003M	81
3) Operation panel operates normally.	• Is the treadle unit connector inside the control box disconnected? Securely connect the connector.  0998M	96
	• Has the treadle unit or control circuit board been replaced? Adjust the depression stroke to the standard setting.	92
	• Is operation possible using the standing operation pedal? If operation is not possible, turn the power off and then back on again.	-
19. Machine does not operate at high speed.	• Is the sewing speed setting or backtack speed setting incorrect? Set the speed to a higher speed using the operating panel.	Instruction manual
	• Is the FVR inside the control box at the maximum setting? Turn the FVR clockwise to the maximum setting.  1920M	80
	• Treadle unit signal abnormality. Adjust the depression stroke to the standard setting.	92
20. Thread is trimmed when treadle is returned to the neutral position.	• Treadle unit signal abnormality. Adjust the depression stroke to the standard setting.	92
21. Startup is slow.	• Is the FVR inside the control box at the maximum setting? Turn the FVR clockwise to the maximum setting.  1920M	80

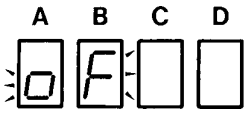
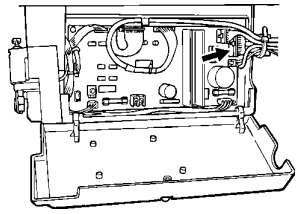
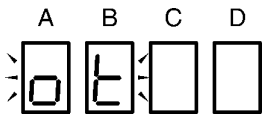
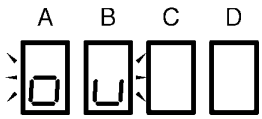
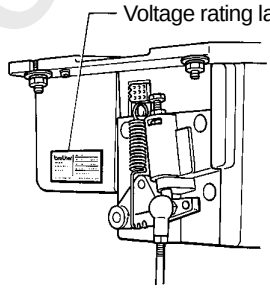
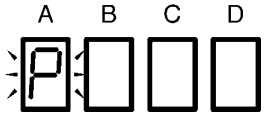
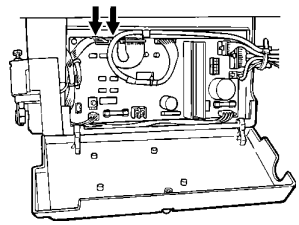
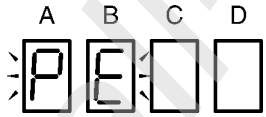
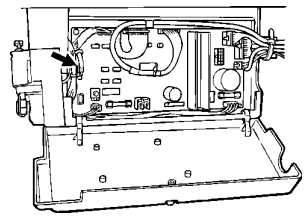
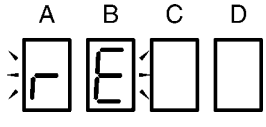
Problem	Possible cause	Page
22. Sewing machine starts operating before presser foot is lowered (solenoid-type presser lifter specifications).	• Is DIP switch 2 inside the control box set to OFF? Set DIP switch 2 to ON.  1921M	81
23. Presser foot does not lower (solenoid-type presser lifter specifications).	• Is the solenoid-type presser lifter 1P connector also connected? If not using the 1P connector, disconnect it.  1922M • Treadle unit signal abnormality. Adjust the depression stroke to the standard setting.	- 92
24. 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.)	103
25. Lower thread detector does not operate.	• Is the lower thread detector connector inside the control box disconnected? Insert the connector securely.  0993M • Is the lower thread detector relay cord inside the machine head disconnected? Securely connect the cord.  • Is memory switch No. 16 set to ON? Set memory switch No. 16 to OFF. 0994M	Instruction manual - 87
26. None of the solenoids operate.	• Is the 8 A fuse inside the control box blown? If the 8 A fuse is blown, check the resistances of all the solenoids, and replace any solenoid that has an abnormal resistance. After this, replace the 8 A fuse.  1923M	104

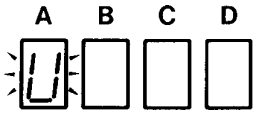
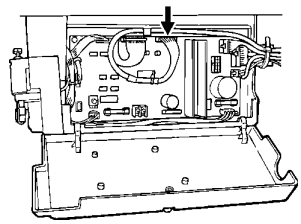
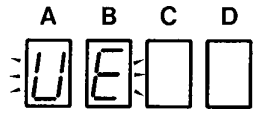
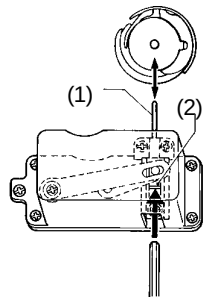
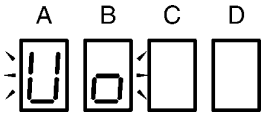
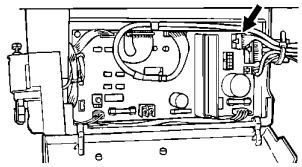
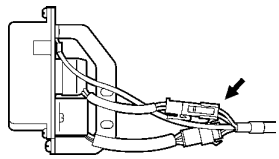
Problem	Possible cause	Page
27. The thread trimmer and thread wiper solenoids do not operate.	• Is memory switch No. 11 set to ON? Set memory switch No. 11 to OFF. • Are the solenoid resistances normal? If the resistances are not normal, replace the solenoids. • Is the 8 A fuse inside the control box blown? If the 8 A fuse is blown, check the resistances of all the solenoids, and replace any solenoid that has an abnormal resistance. After this, replace the 8 A fuse.  1919M	87 104 104
28. Motor does not operate smoothly, or motor makes an abnormal noise.	• Problem with speed sensor. Replace the motor.	34
29. Fluorescent lamp flickers.	• This can occur if the power supply capacity is not sufficient. Adjust the FVR inside the control box. The flicker is reduced when the FVR is turned to the left. (The sewing machine start-up also becomes slower when this is done.)	80
30. The illumination lamp does not turn on.	• Is the lamp blown? Replace the lamp (6 V). • Is the 5 A fuse inside the control box blown? Replace the 5 A fuse. • Is the lamp cord disconnected from the terminal board inside the control box? Securely connect the cord. • Is the CN9 connector inside the control box disconnected? Securely connect the connector.  1924M	- 80 80 80
31. Stitch number display on operation panel is flashing.	• Problem with control box. Replace the control box.	76
32. Some other operating problem is found.	• Clear the memory data. The settings will be returned to their factory defaults. • Adjust the depression stroke to the standard setting.	102 92

22-2. Error code displays

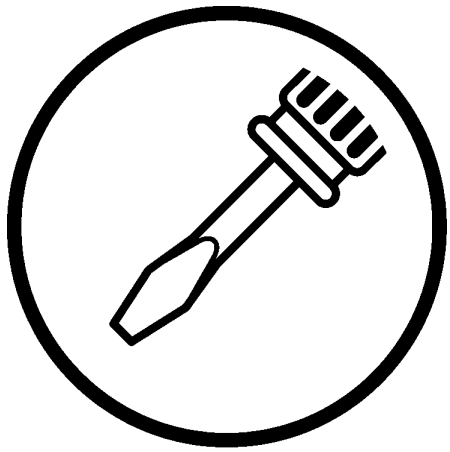
If an error code is flashing on the operation panel display

Error code	Possible cause	Page
bo  0995M	• Is the bobbin changer power switch turned on? Turn on the bobbin changer power switch.  0996M • Is a standby signal still being input from the bobbin changer? Check the bobbin changer.	- -
dp (DD7100A, 710A only)  1925M	• Is DIP switch 8 inside the control box set to ON? Set DIP switch 8 to OFF.  1003M	81
Ec  0999M	• Malfunction of speed sensor, or open circuit in cord. Replace the motor.	34
Er  1000M	• Has the setting for standard depression strokes been set correctly? Repeat the setting for standard depression strokes. • Treadle unit malfunction. Replace the treadle unit.	92 96
L  0988M	• Is the motor connector inside the control box disconnected? Insert the connector securely.  0989M • Has the machine locked up? Turn off the power and then turn the machine pulley by hand and check that it turns easily.	Instruction manual -
O  1926M	• Was a key other than the half stitch key on the operation panel still on when the power was turned on? Take your hand off the operation panel and turn the power switch on. • Problem with operation panel. Replace the operation panel.	- 55

Error code	Possible cause	Page
oF  0986M	• Is the machine connector inside the control box disconnected? Insert the connector securely. • Is the machine head tilted back? Return the machine head to its normal position. Check the operation of the safety switch.  0987M	Instruction manual 62, 104
ot  0991M	• 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.	-
ou  0980M	• Is the power supply voltage abnormally high? Check that the power supply voltage matches the control box voltage specifications.  0981M	77
P  1927M	• Is connector CN7 or CN8 inside the control box disconnected? Securely connect the connectors. • Problem with control box. Replace the control box.  1928M	80 76
PE  0997M	• Is the treadle unit connector inside the control box disconnected? Insert the connector securely. • Treadle unit malfunction. Replace the treadle unit.  0998M	96 96
rE  0990M	• 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.	103 -

Error code	Possible cause	Page
U  0982M	• Is the synchronizer connector inside the control box disconnected? Insert the connector securely.  1929M • Problem with synchronizer. Replace the motor.	80 34
UE  0984M	• Is detector pin (1) of the bobbin thread detector not retracted correctly? Retract the detector pin (1). Use an Allen key to move the slider (2), and check that the detector pin (1) moves correctly.  0985M • Problem with lower thread detector. Replace the lower thread detector.	Instruction manual Instruction manual
Uo  0992M	• Is the lower thread detector connector inside the control box disconnected? Insert the connector securely. 0993M  • Is there an open circuit in the lower thread detector connecting cord inside the machine head? Replace the lower thread detector or the connecting cord.  0994M	80 -

brother



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