ENGLISH

SD-29
INSTRUCTION MANUAL / PARTS LIST

This Instruction Manual only describes the setup and operation methods for the stitch skipping/double catching detection device (SD-29) for the LZ-2290C Series of sewing machine.
Refer to the documents (Instruction Manual and Safety Precautions) for the LZ-2290C Series of sewing machine for descriptions about parts other than the stitch skipping/double caching detection device (SD-29).

CONTENTS

- The work required to set up the sewing machine is described in "2. Installing the under cover" p.3 to "13. Setting the functions on the operation panel" p.24.
- The work required before putting the sewing machine into sewing process should be carried out referring to "14. Flow of work by maintenance personnel" p.28 to 30.
- Operators in charge of sewing should refer to "15. Operating and bobbin-changing procedures" p.32 to 34.

Preface

[SD-29]

SD-29 is the device that displays errors on the operation panel to notify the occurrence of below-stated malfunctions including stitching failure.

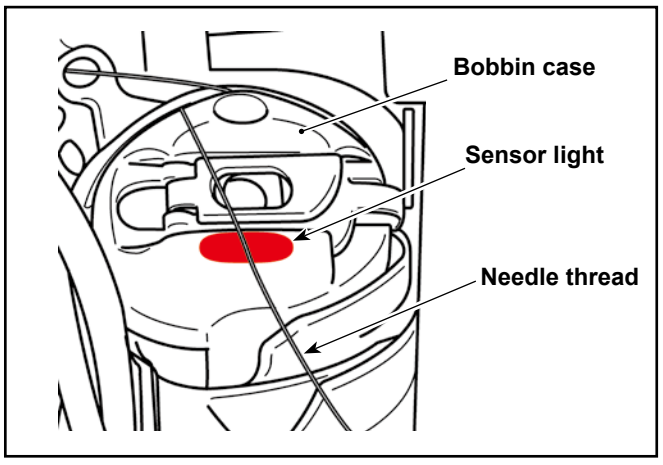
Stitching failure "stitch skipping" has occurred. Stitching failure "needle thread breakage" has occurred.	→	M640 Stitch skipping is detected
Stitching failure "double catching" has occurred.	→	M641 Double catching is detected
Sewing machine runs with neither bobbin nor bobbin case. Sewing machine runs while the operation plate (sensor) of the SD-29 is not put in its normal position.	→	M642 Light quantity of the stitch skipping detection sensor has decreased

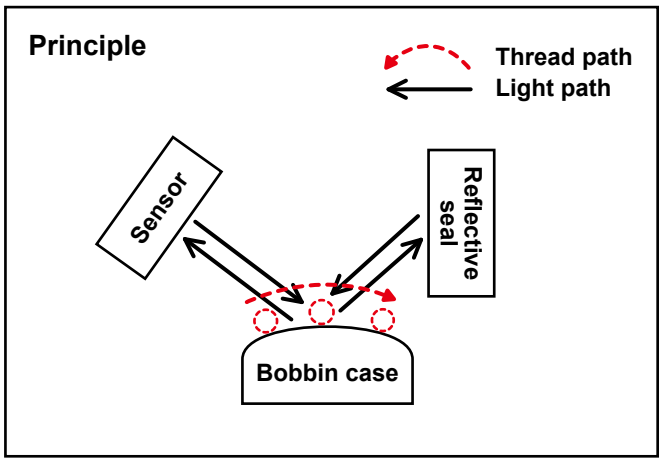
Reference

The timing to display errors (to stop the sewing machine immediately, to stop the sewing machine at the time of thread trimming, etc.) and the number of times of occurrence of an error until the error is detected (when thread skipping occurs twice, etc.) can be changed by changing the relevant settings on the operation panel.

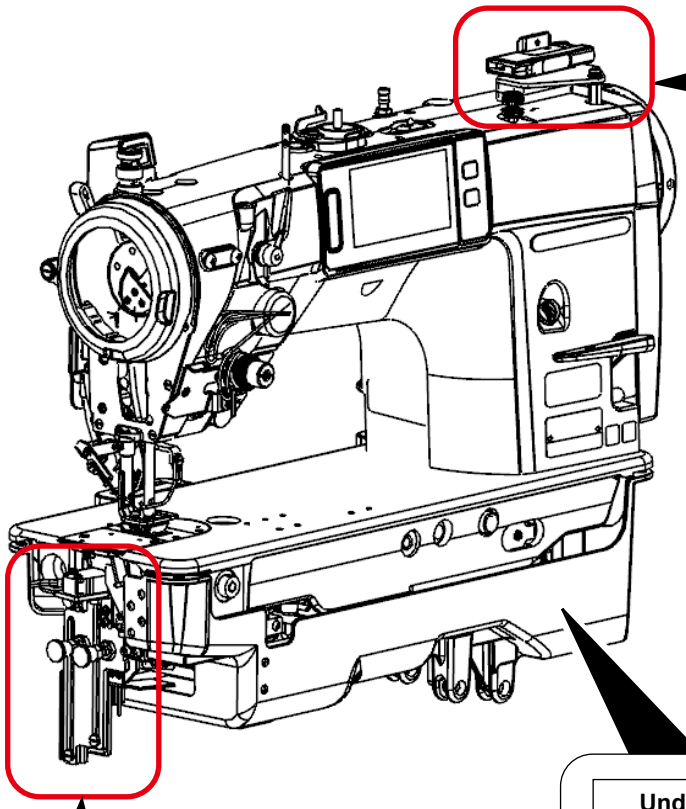
[Principle of the SD-29]

Normally, the needle thread crosses this side of the bobbin case once per single rotation of the main shaft (one stitch).
In the case of stitching failure, on the contrary, the needle thread does not cross this side of the bobbin case as described above. In the case of a stitch skipping, the needle thread does not cross this side of the bobbin case at all, or in the case of a double catching, the needle thread crosses there twice.
This device monitors the needle thread that crosses this side of the bobbin case by irradiating the sensor light on the bobbin case and returning the refracted/reflected light back to the sensor.



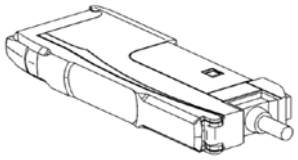


1. Parts supplied with the device (Parts of the SD-29 device)

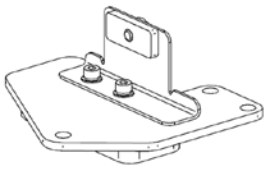


Sensor amplifier components

Sensor amplifier asm. (1 piece)

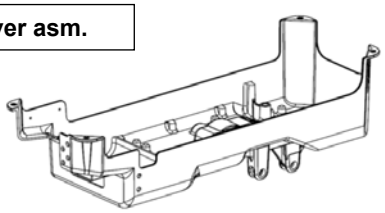


Sensor amplifier mounting base asm. (1 piece)



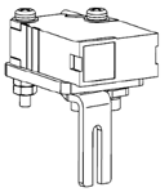
Support rod (2 pieces), Washer (4 pieces), setscrew (2 pieces), Ground wire (1 piece)

Under cover asm.

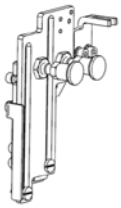


Sensor head components

❶ Sensor head asm. (1 piece)



❷ Operation plate asm. (1 piece)



❸ Reflective plate asm. (1 piece)

❶❸... M3 setscrews, washers (2 x 2 pieces each)
❷..... M4 setscrews (2 pieces)
❹..... 15/64 thread 40 setscrews, washers, spring washers (2 pieces each)

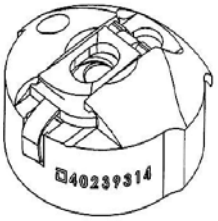
Miscellaneous

Plated bobbin case (1 piece) Parts No. 40234314
Cable clip band, small (5 pieces)
Cable clip band, large (1 piece)
Cord clamp (1 piece)
Cord clamp setscrew (1 piece)
Reflective seal (1 piece) * Spare part

If the current reflective seal is so contaminated with oil and cloth chips as to cause a device error, remove it and stick the spare reflective seal.

[Bobbin case]

It is recommended to use a plated bobbin case (part number: 40239314) as a rust preventive measure in order to maintain performance of the SD-29 for a long of time.
If it is hard to see the laser light when adjusting the sensor position as described in **"8. Adjusting the sensor position" p.13**, replace the plated bobbin case with the existing (separately available) non-plated bobbin case (part number: 40125507) and adjust the sensor position. Once you have adjusted the sensor position correctly, remove the non-plated bobbin case and re-attach the plated bobbin case for use.

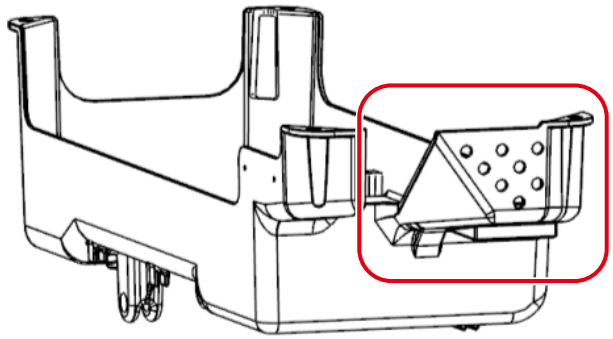


* **For the plated bobbin case (part number: 40239314), its part number is inscribed on its side face as shown in the figure given on the right.**

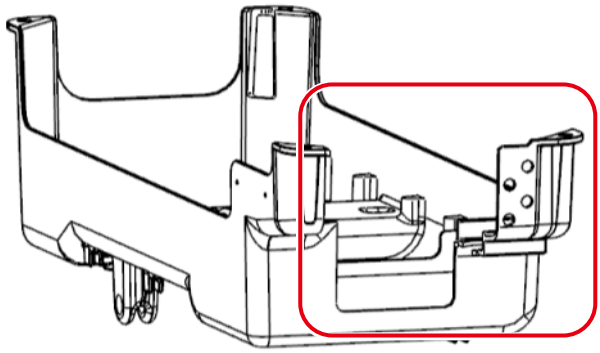
2. Installing the under cover

The under cover for the stitch skipping/double catching detection device differs from that for the standard sewing machine in shape of the front section as shown in the figure given below.
When using the stitch skipping/double catching detection device with your sewing machine, the under cover for the standard sewing machine should not be used.

Under cover for the standard sewing machine



Under cover dedicated for the stitch skipping/double catching detection device



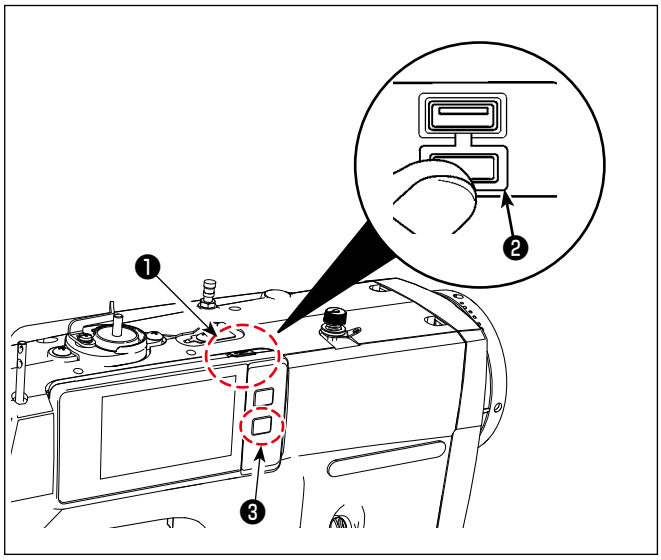
* **Since the maximum rotation speed of the sewing machine is 4000 sti/min for SD-29 (U220 skipping/double hook detection function 1: when enabled), the undercover attached to SD-29 (undercover for skipping/double hook detection device) Is not equipped with a hook cooling fan. (Maximum sewing speed of the standard sewing machine: 5000 sti/min).**
When the SD-29 is not used (in the case "U220 Stitch skipping and double catching detecting function" is set to "2: Disable") or when there is a risk that the hook becomes hot due to the environmental temperature, the optional part (separately available), hook cooling set (part number: 40250042) should be used.

Refer to "2-1" to "2-19" in the Instruction Manual for the LZ-2290C Series of sewing machine for the installation method of the under cover and for the setup method of the main body of sewing machine and electrical components (excluding the stitch skipping/double catching detection device).

3. Writing the software for electrical components and the software for the operation panel (for a limited time)

In the case of using the stitch skipping/double catching detection device, the electrical components and the operation panel respectively use the dedicated software. (These pieces of software are different from those for the standard sewing machine.)
The software for the standard sewing machine will be interchangeable with the dedicated software after changing its design. At the present, however, it is necessary for you to re-write the software for the electrical components until JUKI completes the change in design.

- **Re-writing procedure**

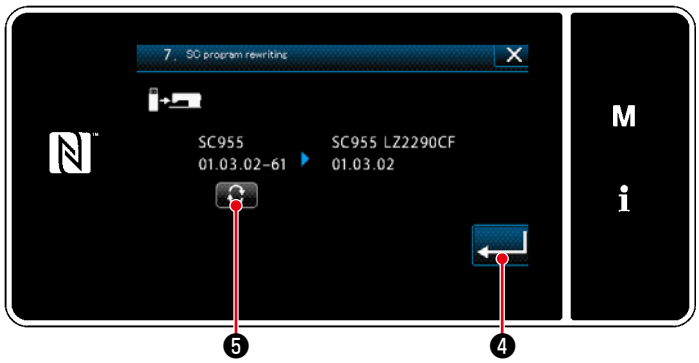


① Insert the USB memory.
The USB connector is provided on top ❶ of the operation panel.
To use a USB thumb drive, remove connector cover ❷ and insert the USB thumb drive into the USB connector.

* **In the case a USB thumb drive is not used, the USB connector should be protected with connector cover ❷ without exceptions. If dust or the like enters the USB connector, a failure can be caused.**

② Turning ON the power to the sewing machine.
Turn ON the power switch located on the table while keeping i ❸ held pressed.

* **Keep i ❸ held pressed until the data communication screen appears on the operation panel.**

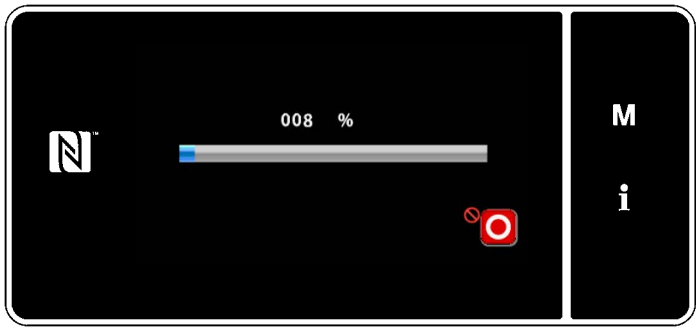


③ Writing the SC software

1. Press ▼ .
2. Press "7. Re-write SC software".
3. Check the version of the software.

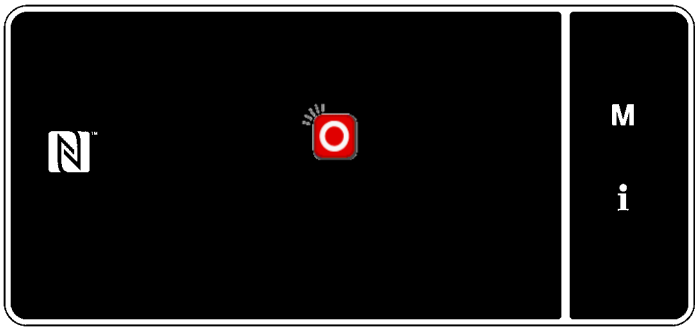
Caution
The version of the software that is required to be re-written is "01.03.02-65".

4) Press ↵ ❹ .



④ Updating the software.

Caution
Do not turn the power OFF even when "100%" is displayed on the operation panel screen.



⑤ Turning OFF the power to the sewing machine.

*** Turn OFF the power switch located on the table after the screen as shown in the figure on the left appears on the operation panel.**

Re-turn ON the power to the sewing machine after the green lamp located on the upper part of the operation panel goes out.

⑥ Re-writing the software for the operation panel.

The operation panel software re-writing procedure is same with ① to ⑤ as described above excluding ③ -2. and ③ -3.

In the case of re-writing the PANEL software, steps of procedure ③ -2 and ③ -3 are as described below.

③ -2. Press "6. Re-write PANEL software".

③ -3. Check the version of the software.

The version of the software that is required to be re-written is "01.03.01-65".

[In the case of the LZ-2290C-F]

After the completion of the aforementioned steps of procedure, also re-write the SUB software.

The SUB software re-writing procedure is same with ① to ⑤ as described above excluding ③ -2 and ③ -3.

In the case of re-writing the SUB software, steps of procedure ③ -2 and ③ -3 are as described below.

③ -2. Press "8. Re-write SUB software".

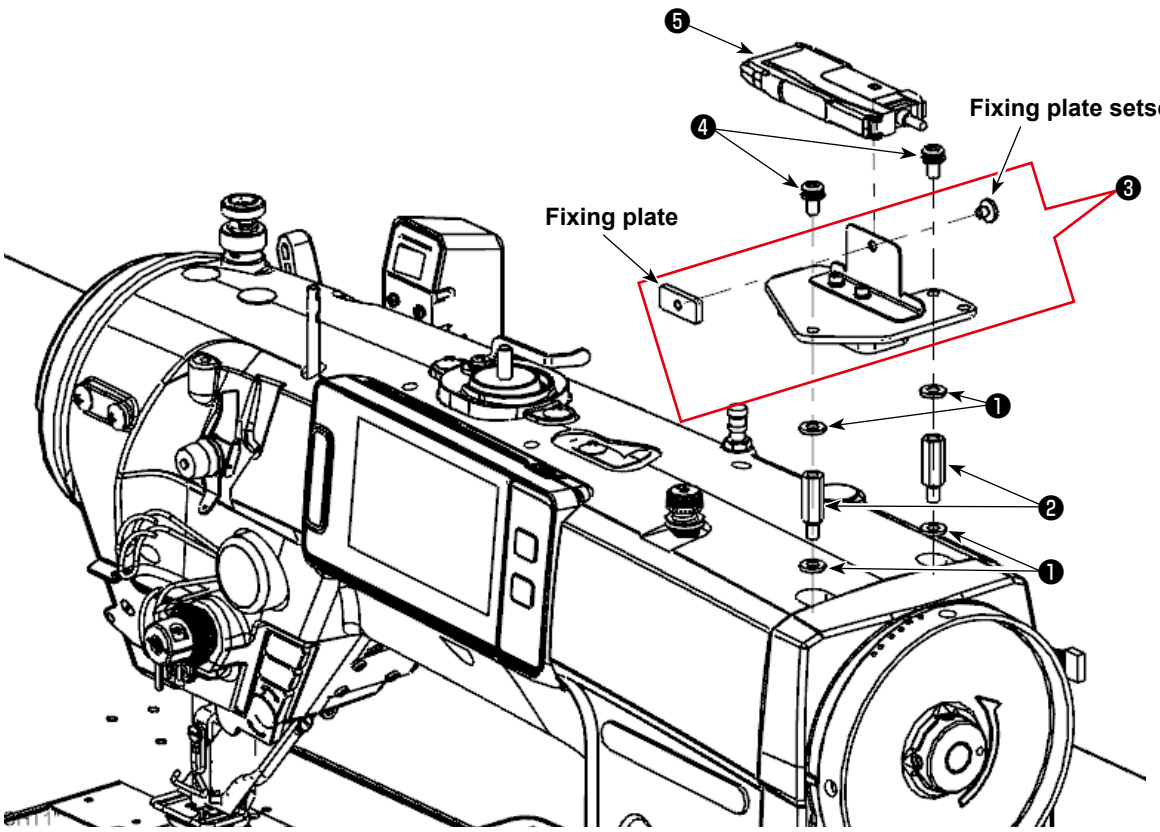
③ -3. Check the version of the software.

The version of the software that is required to be re-written is "01.01.07".

4. Assembling the sensor amplifier components

WARNING

1. **Be sure to turn OFF the power to the sewing machine for the sake of safety before assembling the sensor amplifier components.**
2. **Be sure to firmly tighten the screws to prevent them from loosening by vibration when the sewing machine is in operation.**

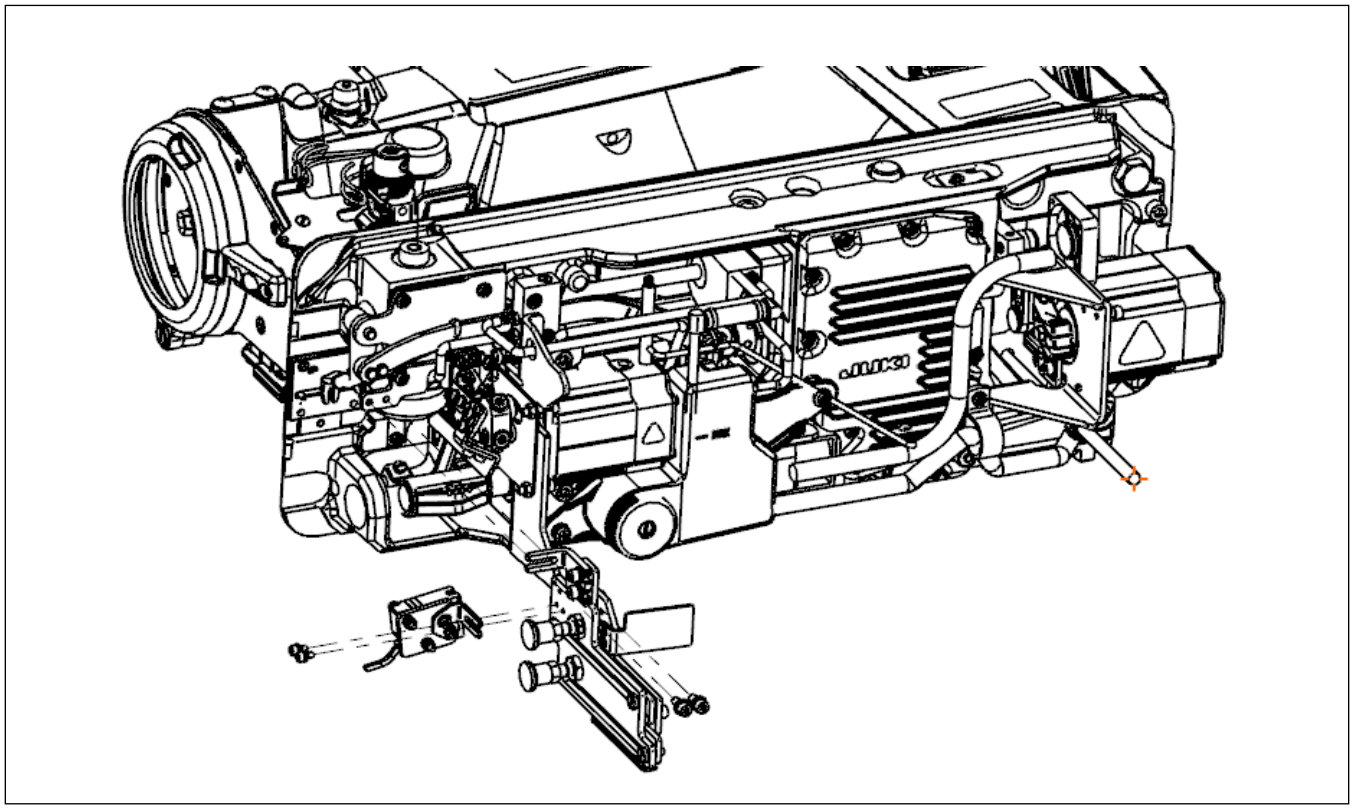


① Attach washers ❶ (four pieces) and support rods ❷ (two pieces) to the main body of sewing machine.
② Put sensor amplifier mounting base asm. ❸ on ① and secure with setscrews ❹ (two pieces).
③ Detach the fixing plate and the fixing plate setscrews from sensor amplifier mounting base asm. ❸ (one piece). Then, fit sensor amplifier asm. ❺ in the sensor amplifier mounting plate.
④ Secure sensor amplifier asm. ❺ to sensor amplifier mounting base asm. ❸ (one piece) with the fixing plate and the fixing plate setscrews.

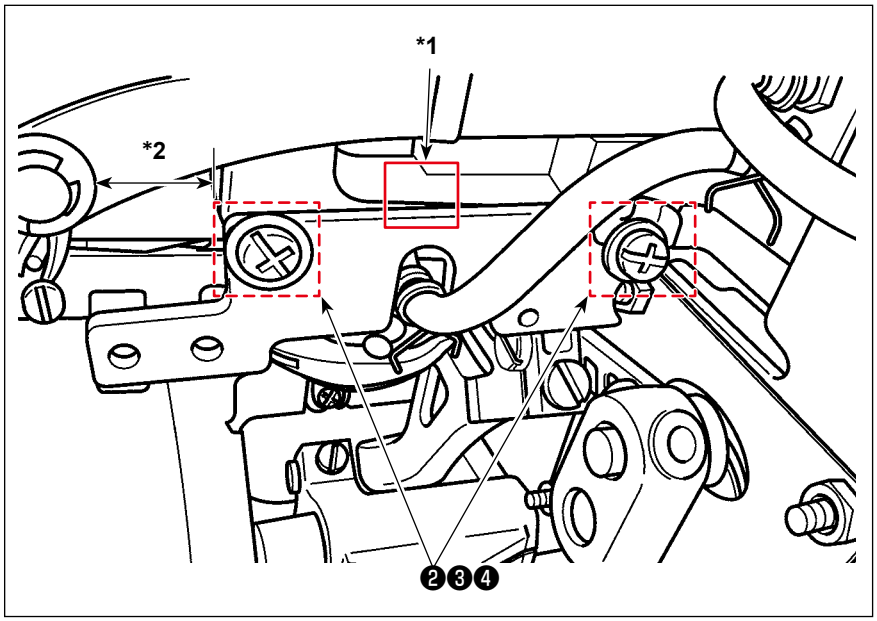
5. Assembling the sensor head components

WARNING

1. **Be sure to turn OFF the power to the sewing machine for the sake of safety before assembling the sensor amplifier components.**
2. **Be sure to firmly tighten the screws to prevent them from loosening by vibration when the sewing machine is in operation.**



① Tilt the main body of sewing machine.

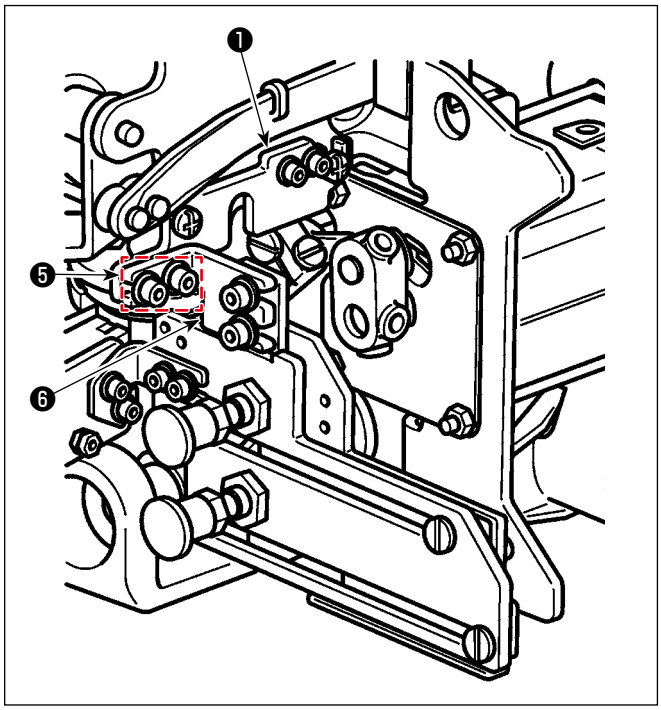


② **Installing the base plate.**

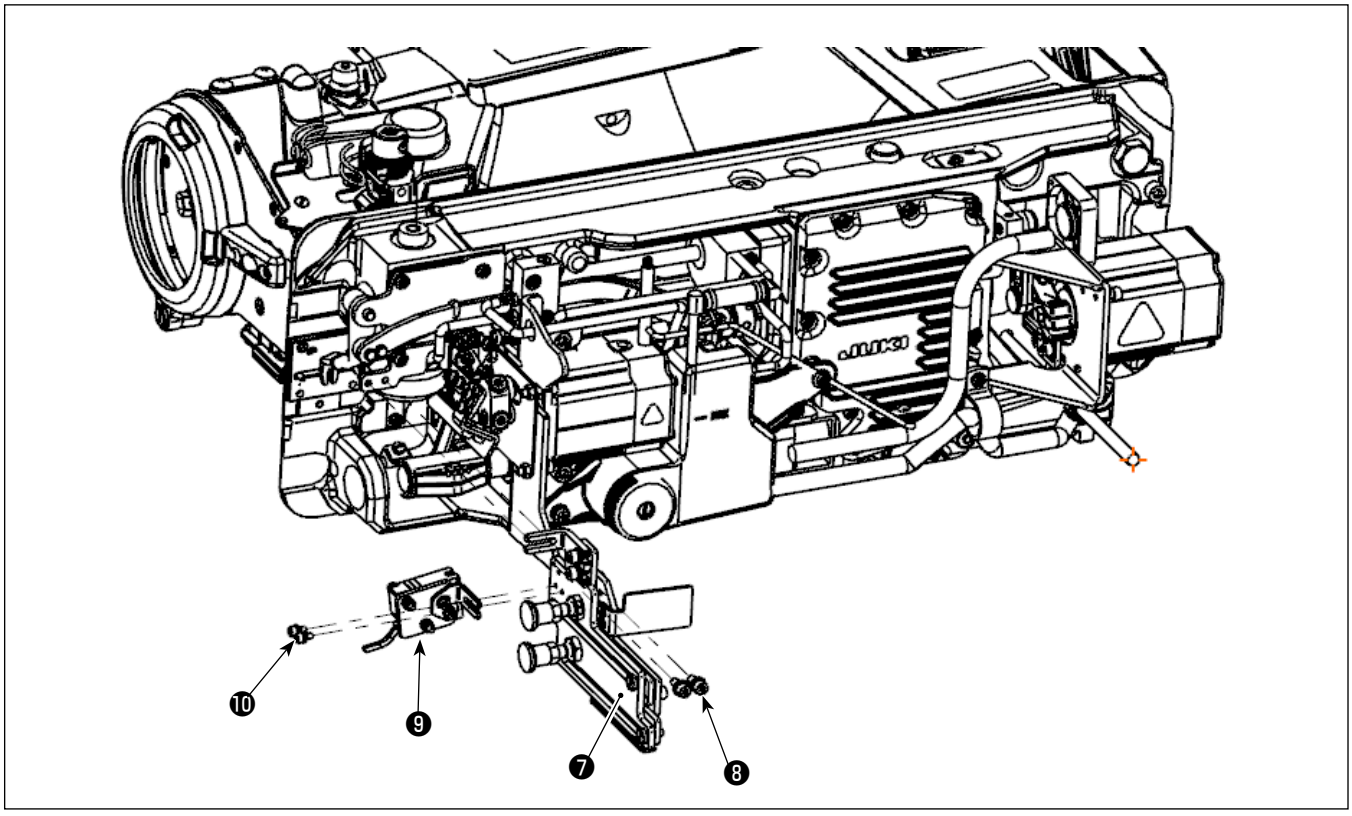
1) Install base plate ❶ to the sewing machine with setscrews ❷, washers ❸ and spring washers ❹ of the base plate.

***1. It is recommended to lower the left side of the base plate (tilt the base plate to the left) by approximately 1 mm.**

***2. Pushing the thread trimming link by hand, check whether it interferes with base plate ❶.**



2) Install position adjustment plate C ❻ to base plate ❶ with setscrews ❺ of the position adjustment plate C.



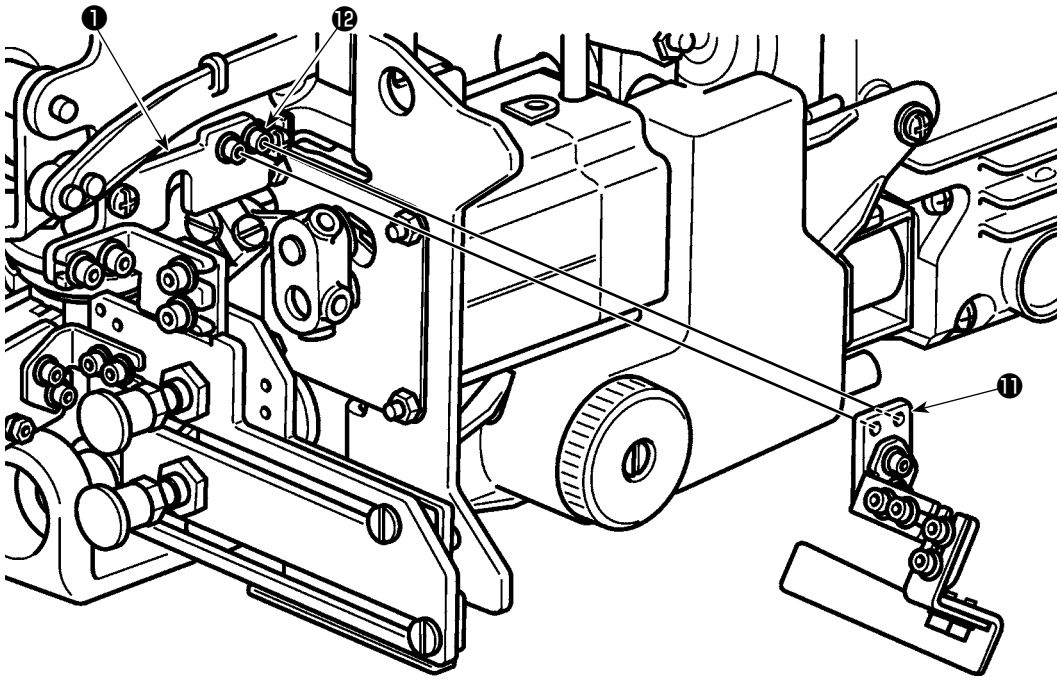
③ **Assembling the sensor head components**

Attach operation plate asm. ❼ with setscrews ❾ (two pieces).

Attach sensor head asm. ❾ with setscrews ❿ (two pieces).

It is recommended to roughly determine the mounting position of operation plate asm. ❼ in advance using the jig that will also be used in"8. Adjusting the sensor position" p.13.

④ **Installing the reflective plate asm.**



1) Install reflective plate asm. ⓫ to base plate ❶ with setscrews ⓬ of the reflective plate asm.

*** Install the reflective plate asm. to the base plate in such a way that it does not come in contact with the hook and the feed bar.**

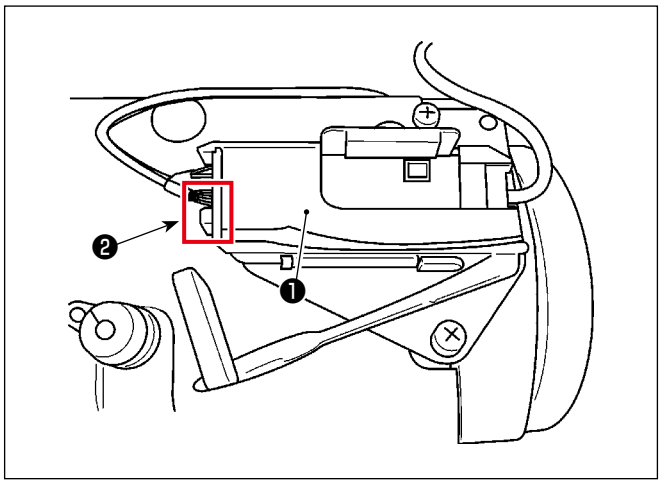
⑤ After you have installed reflective plate asm., raise the main body of the sewing machine.

Carefully prevent operation plate asm. ❼ from interfering with the under cover when raising the main body of sewing machine.

6. Connecting the cords (1) - On the sensor amplifier side -

WARNING

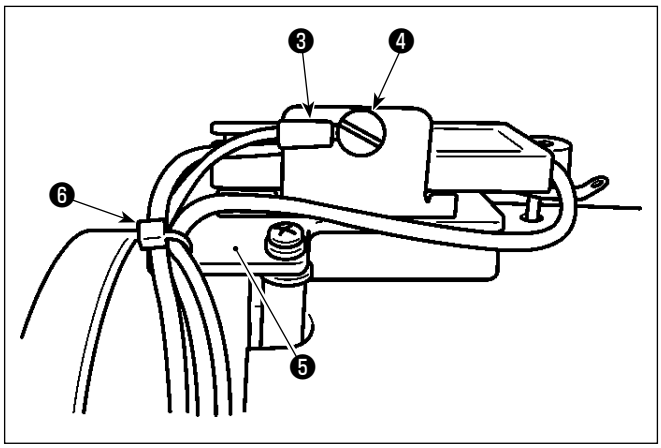
1. **Be sure to turn OFF the power to the sewing machine for the sake of safety before assembling the sensor amplifier components.**
2. **Be sure to firmly tighten the screws to prevent them from loosening by vibration when the sewing machine is in operation.**



① Open the cover of sensor amplifier ❶ . Connect the connector of sensor head ❷ .

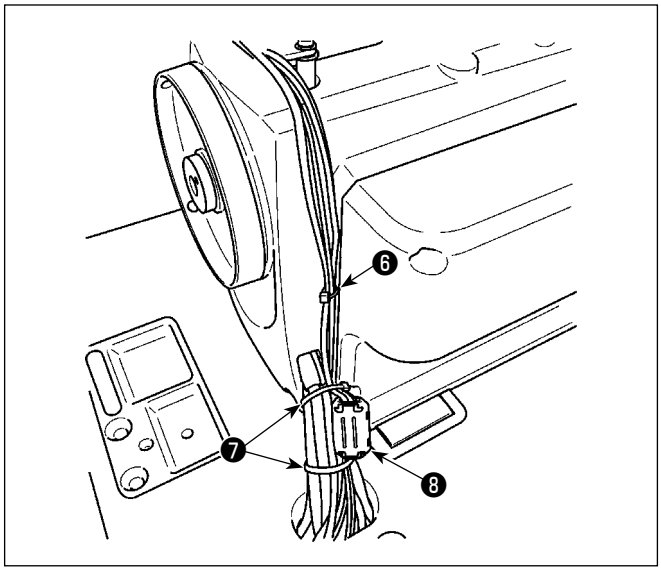
② Close the cover of sensor amplifier ❶ .

Take care not to allow the cords to be caught under the cover.



③ Attach ground wire ❸ using amplifier fixing plate setscrews ❹ .

④ Pass cable clip band, small ❻ through the hole in sensor amplifier mounting base ❺ and secure the sensor amplifier cords and sensor ground wire ❸ (totally three pieces) with cable clip band, small ❻ .



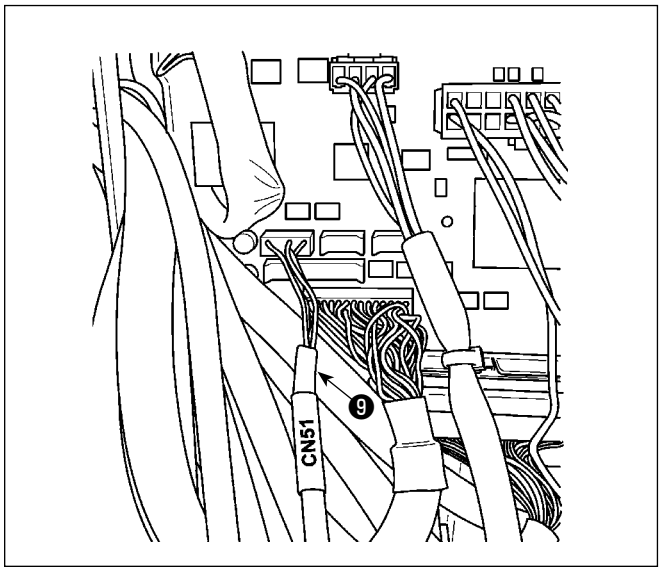
⑤ Secure the cords described in the aforementioned step ④ with cable clip band, small ❻ approximately 25 cm away from the previously secured position.

⑥ Bind the cord coming from the pulley cover and the cords described in the aforementioned step ⑤ together with cable clip bands, large ❼ .

[Only for the BB type models (EU type models)]

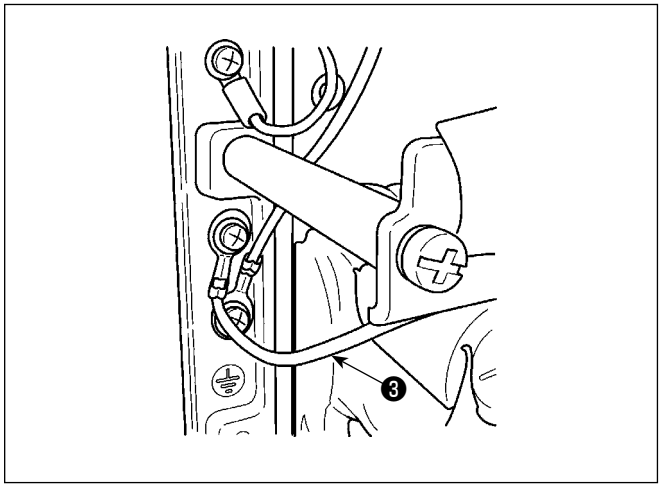
Clamp the three cords described in the aforementioned step ⑥ with core ❽ (large) (diameter: φ23 mm).

Secure the cords clamped with core ❽ (large) with cable clip bands, large ❼ to prevent the core from moving out of position.



⑦ Remove the screws (four pieces) from the electrical control box to open the cover.

⑧ Connect the connector of sensor junction cord ❾ to the connector of the cords described in the aforementioned step ⑤ . Connect the remaining connector to the CN51 on the CTL PCB mounted inside the electrical control box.



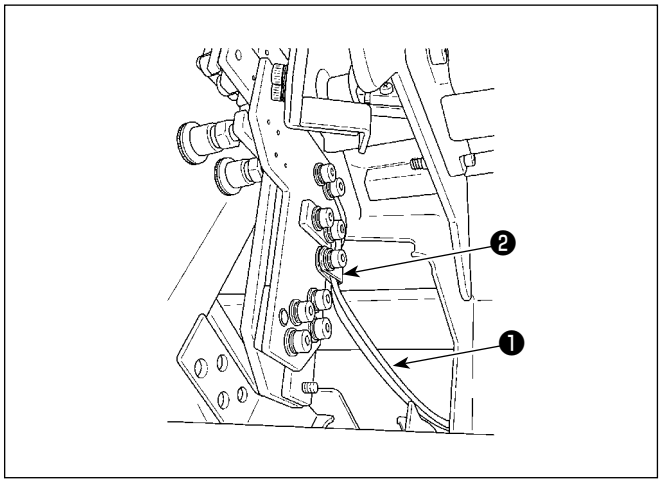
⑨ Secure ground wire ❸ described in the aforementioned step ④ to the frame of electrical control box.

⑩ Attach the cover to the electrical control box with the screws (four pieces) you have removed in the aforementioned step ⑦ .

7. Connecting the cords (2) - Sensor head side -

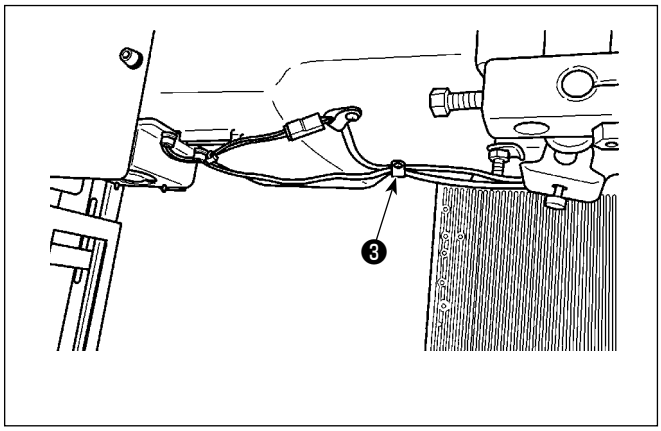
WARNING

1. Be sure to turn OFF the power to the sewing machine for the sake of safety before assembling the sensor amplifier components.
2. Be sure to firmly tighten the screws to prevent them from loosening by vibration when the sewing machine is in operation.



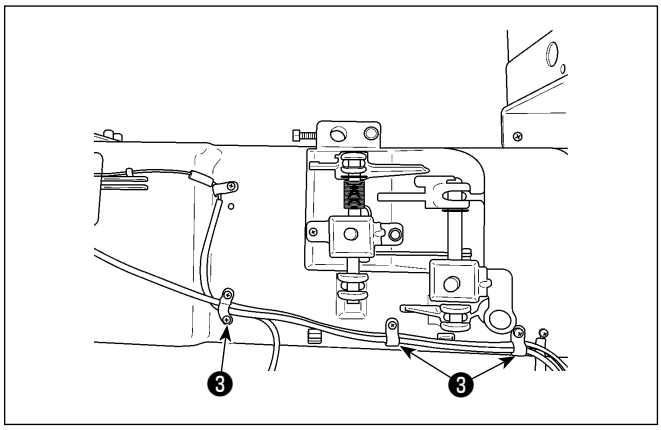
① Secure cord ❶ of the sensor head asm. with clamp ❷ of the operation plate asm.

When securing the cord, carefully prevent the cord from being excessively tensed or excessively loosened to interfere with other parts.



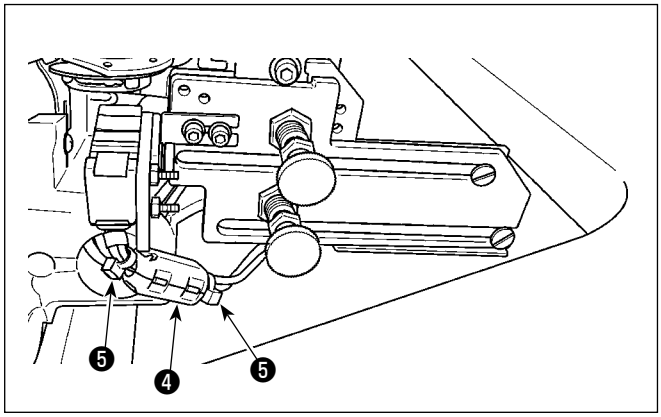
② Secure cord described in the aforementioned step ① with clamp ❸ of the under cover with slackened by approximately 10 mm.

If the cord is not sufficiently slackened, the sensor head may break when raising the machine head, or the operation plate may not be lowered smoothly when changing the bobbin.
On the contrary, if the cord is excessively slackened, the cord may be caught under the machine head when tiling it.
It is recommended to secure the cord while slackening it to such an extent that it will not be caught under the machine head.

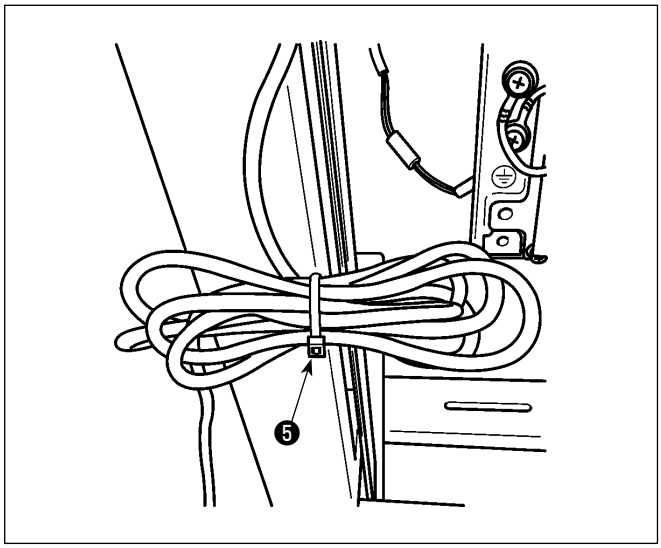


③ Secure the cord described in the aforementioned step ② with clamps ❸ (two pieces) of the under cover.

Take care not to excessively tense the cord.



[Only for the BB type models (EU type models)]
Clamp the cords of the sensor head asm. with core ❹ (small) (diameter: φ12 mm).
Secure the cords at both ends of core ❹ (small) with cable clip bands, small ❺ (two pieces) to prevent core ❹ (small) from moving out of position.



④ Bind the slackened portions of the cords with cable clip band, small ❺ .

Take care not to excessively tense the cord.

⑤ Turn ON the power to the sewing machine. Check that the sensor head and the sensor amplifier are energized (emit light).
⑥ Turning OFF the power to the sewing machine.

8. Adjusting the sensor position

WARNING

1. **Be sure to turn OFF the power to the sewing machine for the sake of safety before assembling the sensor amplifier components.**
2. **Be sure to firmly tighten the screws to prevent them from loosening by vibration when the sewing machine is in operation.**
3. **Jig is separately available. The gauge set (part number: 40250040) for the SD-29 should be purchased separately.**
4. **Be sure to turn OFF the DPC function. (Refer to "11. DPC function" p.20.)**

WARNING

1. **Take care not to allow the direct laser light or the mirrored-surface reflected laser light to enter your eyes.**
2. **The laser light irradiated from the laser has a high optical power density and therefore can cause blindness when it enters the eye.**

WARNING

Do not disassemble the sensor.
If the sensor is disassembled, the laser light will leak to cause impaired eyesight.

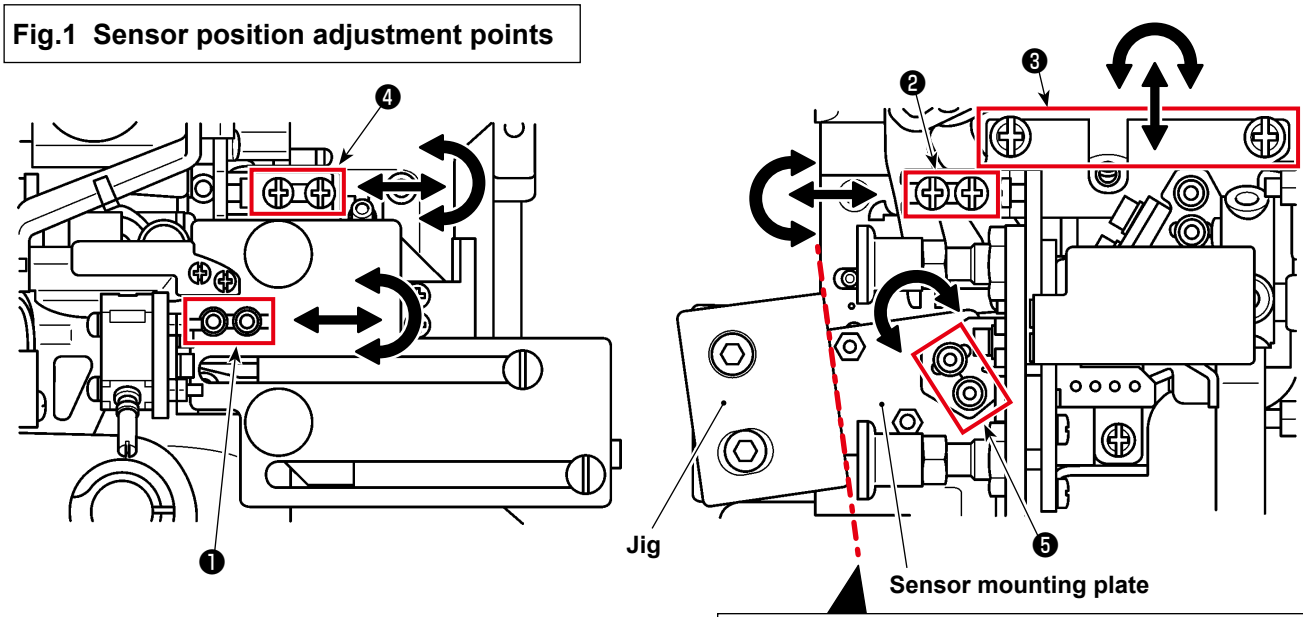
① Tilt the main body of sewing machine.

② Place the jig on the top surface of the bed. Adjust the position (temporary positioning) and angle of the sensor with screws ❶ to ❷ as shown in Fig. 1.

③ Turn ON the power to the sewing machine. Press the ready key (needle bar stop position button ) on the operation panel of the sewing machine.

Caution **The sensor head emits light. Take care not to allow the light to directly enter your eyes.**

Fig.1 Sensor position adjustment points



Only as a guide, assemble the jig and the sensor mounting plate so that they are positioned to have an equal clearance of 1 mm over the length (in parallel with each other).

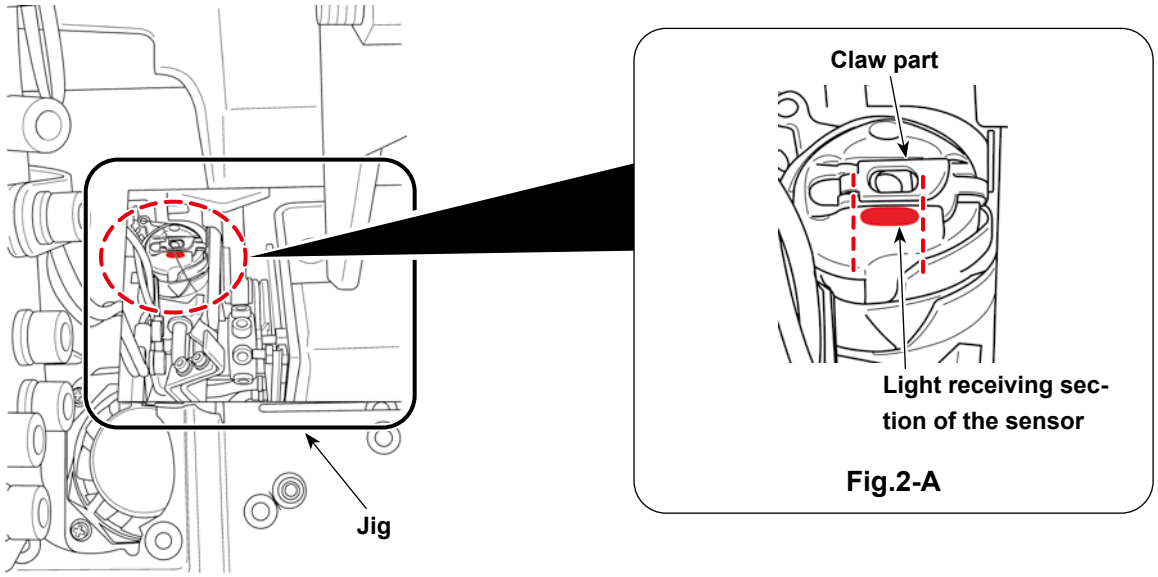
④ Place the jig on the under cover. Observe the light receiving section of the sensor (on the surface of the bobbin case) from the mirror of the jig.

* **If it is hard to see the laser light when using the accessary plated bobbin case, change it with the existing (separately available) non-plated bobbin case [part number: 40125507] to carry out adjustment.**

⑤ Adjust the position of the sensor (final positioning) with screws ❶, ❷ and ❹ as shown in Fig. 1 (excluding screws ❸ and ❺ in Fig. 1) so that the light receiving section of the sensor (on the surface of the bobbin case) is irradiated as shown in Fig. 2.

Adjust the sensor position so that it will not interfere with the under cover when raising the main body of sewing machine (adjust the sensor to such a position as to prevent interference with the under cover using screws ❶ and ❷). Do not raise the main body of sewing machine with the jig placed on the under cover.

Fig.2 Sensor light irradiation position



The irradiation position is a flat surface located on the lower section of the claw part at the center of bobbin case as shown in Fig. 2-A.

Adjust the sensor position as described below.

- Light inclination should be in parallel with the claw part
- Vertical position of the light should be within 1 mm from the bottom of the claw part
- Lateral position and length of the light should fall within the slit in the claw part

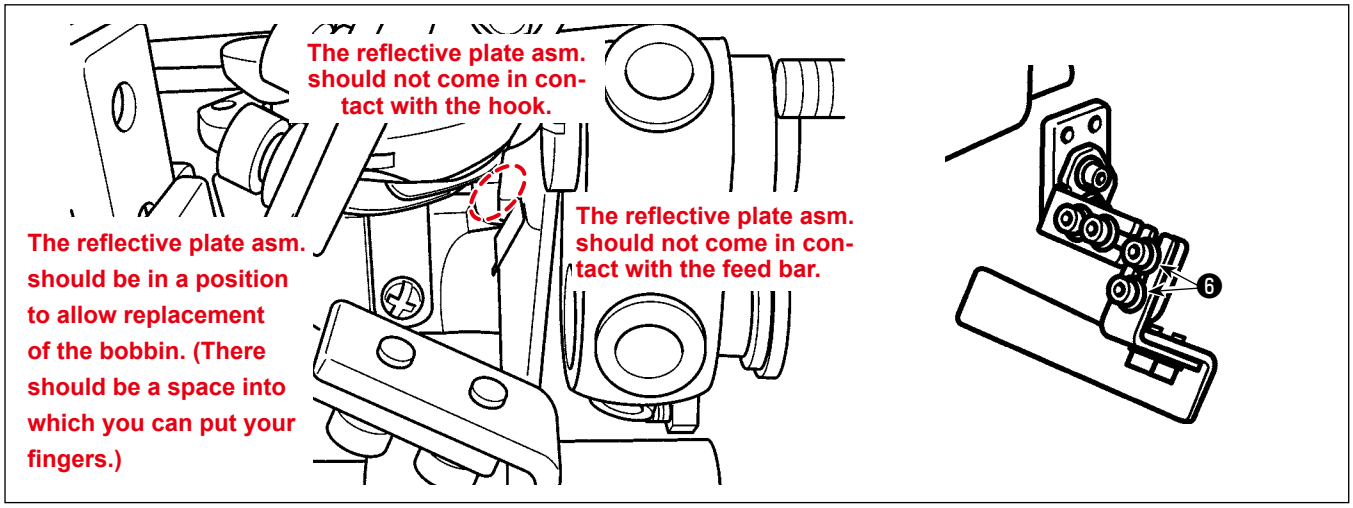
* **Inclination of light = Screw ❶ or screw ❹ in Fig. 1**

* **Length of light = Screw ❷ or screw ❺ in Fig. 1**

* **Position of light, lateral = Screw ❸ or screw ❷ in Fig. 1**

* **Position of light, vertical = Screw ❶ or screw ❹ in Fig. 1**

Adjusting the reflective plate asm.

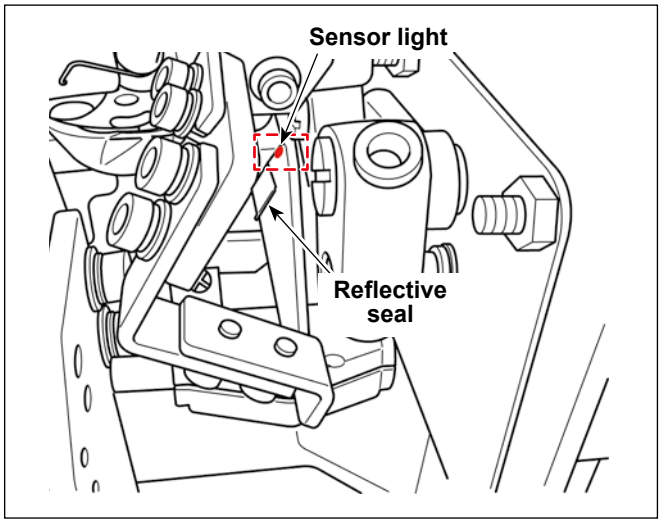


1) Adjust the reflective plate asm. with screws ❻ so that the sensor light hits the reflective tape of the reflective plate.
2) Rotating the main shaft one revolution by hand, check whether it interferes with the reflective plate.

Caution

If you want to check whether the bobbin can be changed, remove the jig from the under cover and lift the bracket to raise the sewing machine.

*** Adjust the position of the reflective plate asm. with the screws of the reflective plate asm.**

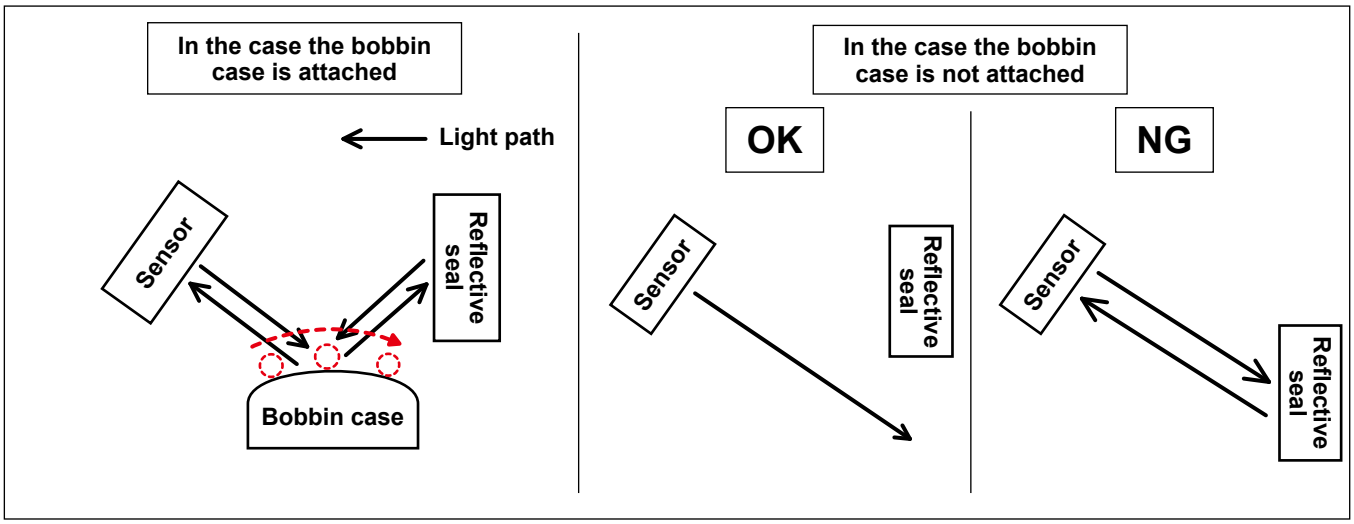


Check to make sure that the sensor light does not hit the reflective tape of the reflective plate when the bobbin case is not attached.

Caution

Since the position of the reflective seal can cause a reduction in the amount of sensor light received, adjust screws ❻ to position the reflective seal as described below. (See the figures given below.)

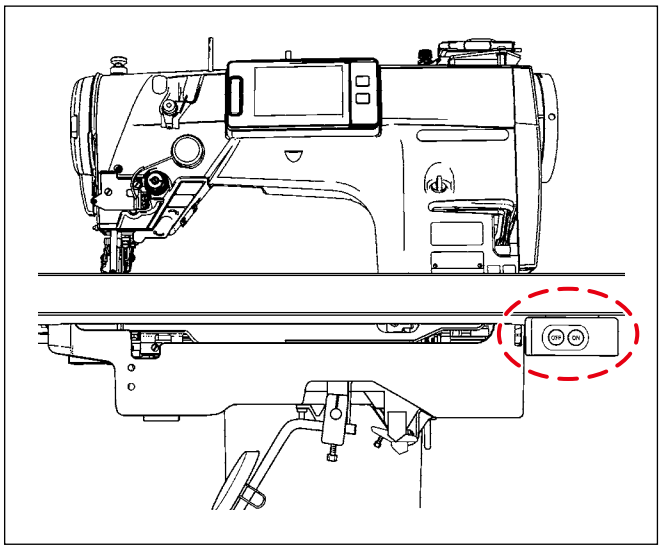
- **The bobbin case is attached →Adjust the position of the reflective seal so that the sensor light hits it.**
- **The bobbin case is not attached →Adjust the position of the reflective seal so that the sensor light does not hit it.**



9. Turning the sensor

WARNING

1. **Be sure to turn OFF the power to the sewing machine for the sake of safety before assembling the sensor amplifier components.**
2. **Be sure to firmly tighten the screws to prevent them from loosening by vibration when the sewing machine is in operation.**
3. **Jig is separately available. The gauge set (part number: 40250040) for the SD-29 should be purchased separately.**
4. **Be sure to turn OFF the DPC function. (Refer to "11. DPC function" p.20.)**



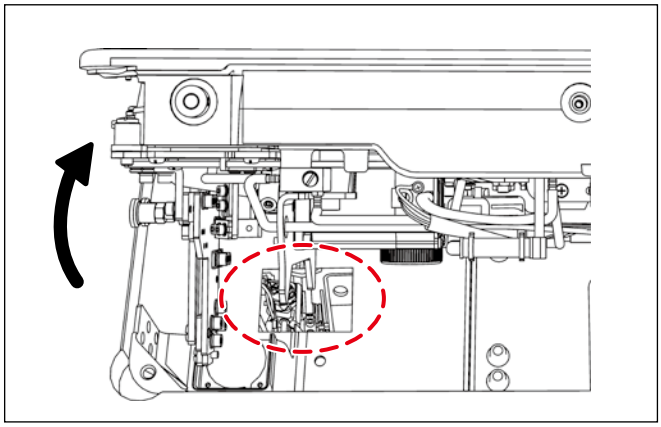
Caution

1. **Do not raise the main body of sewing machine with the jig placed on the under cover.**
2. **In the case you have already carried out the procedure described in "8. Adjusting the sensor position" p.13, you should start this procedure for tuning the sensor from ② . (① is not necessary.)**

① Raise the main body of sewing machine and turn ON the power to the sewing machine. Press the ready key (needle bar stop position button ) on the operation panel of the sewing machine.

② Thread the sewing machine head.

* **Refer to the Instruction Manual for the LZ-2290C Series of sewing machine for how to thread the sewing machine head.**



③ Check to make sure that the operation plate of the sensor head asm. is not lowered. Then, tilt the main body of sewing machine.

Caution

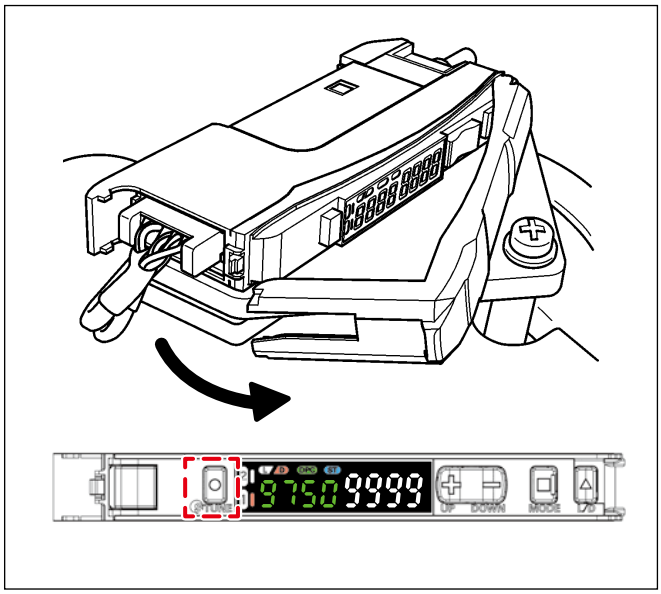
1. **If the main body of sewing machine is tilted while the operation plate of the sensor head asm. is lowered, the sensor head asm. will interfere with the under cover to cause false detection (deviation of sensor position).**
2. **If the sensor head asm. interferes with the under cover, check the sensor position. If the sensor has moved out of position, re-adjust the sensor position correctly. (Refer to "8. Adjusting the sensor position" p.13.)**

④ Place the jig on the under cover.

* **Put the jig at a position to allow you to observe the bobbin case from the mirror of the jig.**

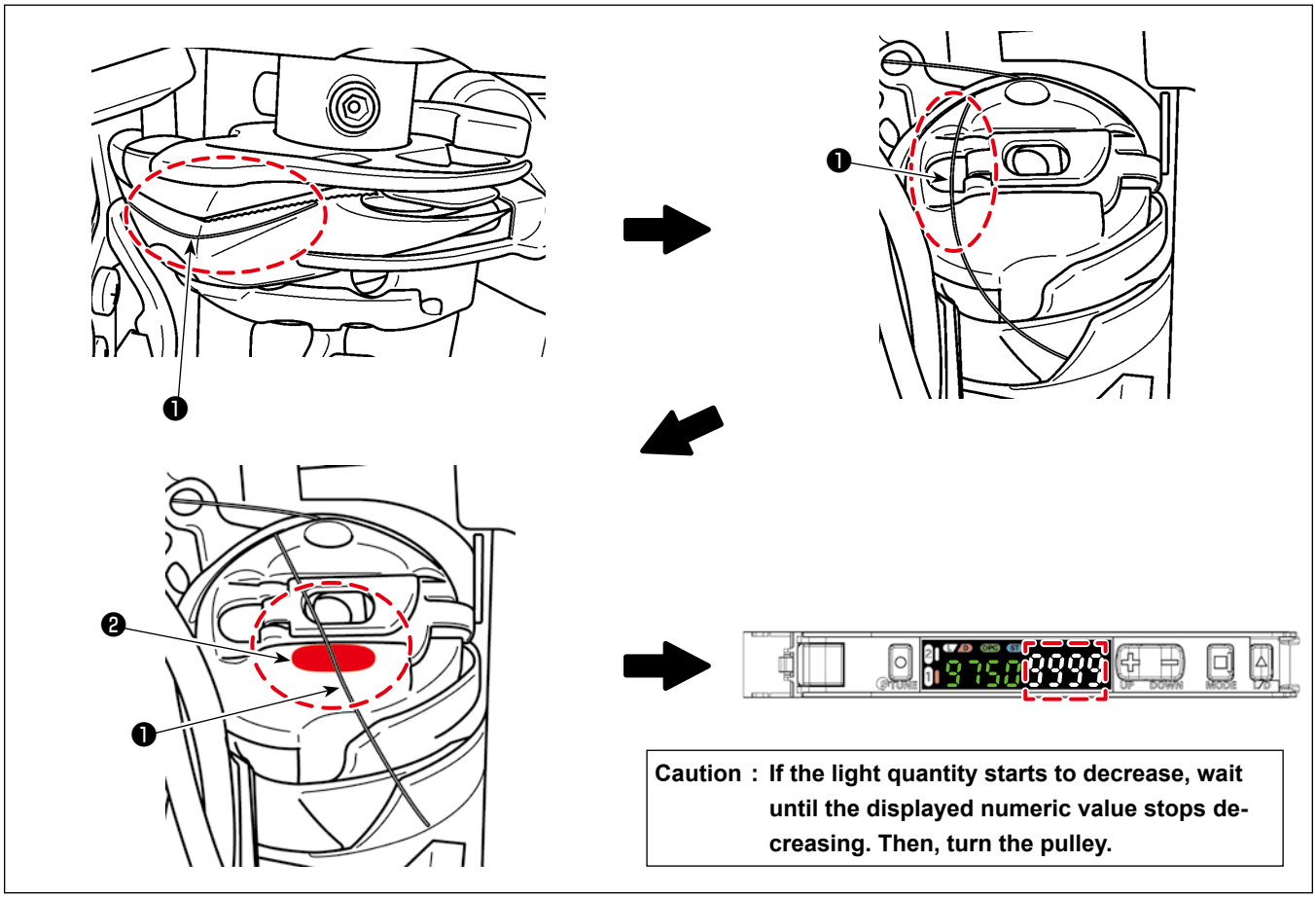
⑤ Set the bobbin thread.

* **Refer to the Instruction Manual for the LZ-2290C Series of sewing machine for how to set the bobbin thread.**



⑥ Open the cover of the sensor amplifier. Press the "TUNE" button located on the left side of the amplifier once.

* **When you press the "TUNE" button, "1Pnt 9999" is displayed on the amplifier. When you release the "TUNE" button, "2Pnt 9999" is displayed on the amplifier.**



⑦ Observing the bobbin case from the mirror of the jig, slowly turn the pulley counterclockwise by hand and stop turning it before the needle thread ❶ is brought to the irradiation position. Then, further turn the pulley slowly counterclockwise by hand until the needle thread ❶ is brought approximately to the center of the width of sensor light ❷ .

* **It is recommended to observe the light value of the amplifier simultaneously with the movement of the needle thread ❶ and stop turning the pulley by hand at around the position where the light value of the amplifier reaches the minimum value (4000 or less).**

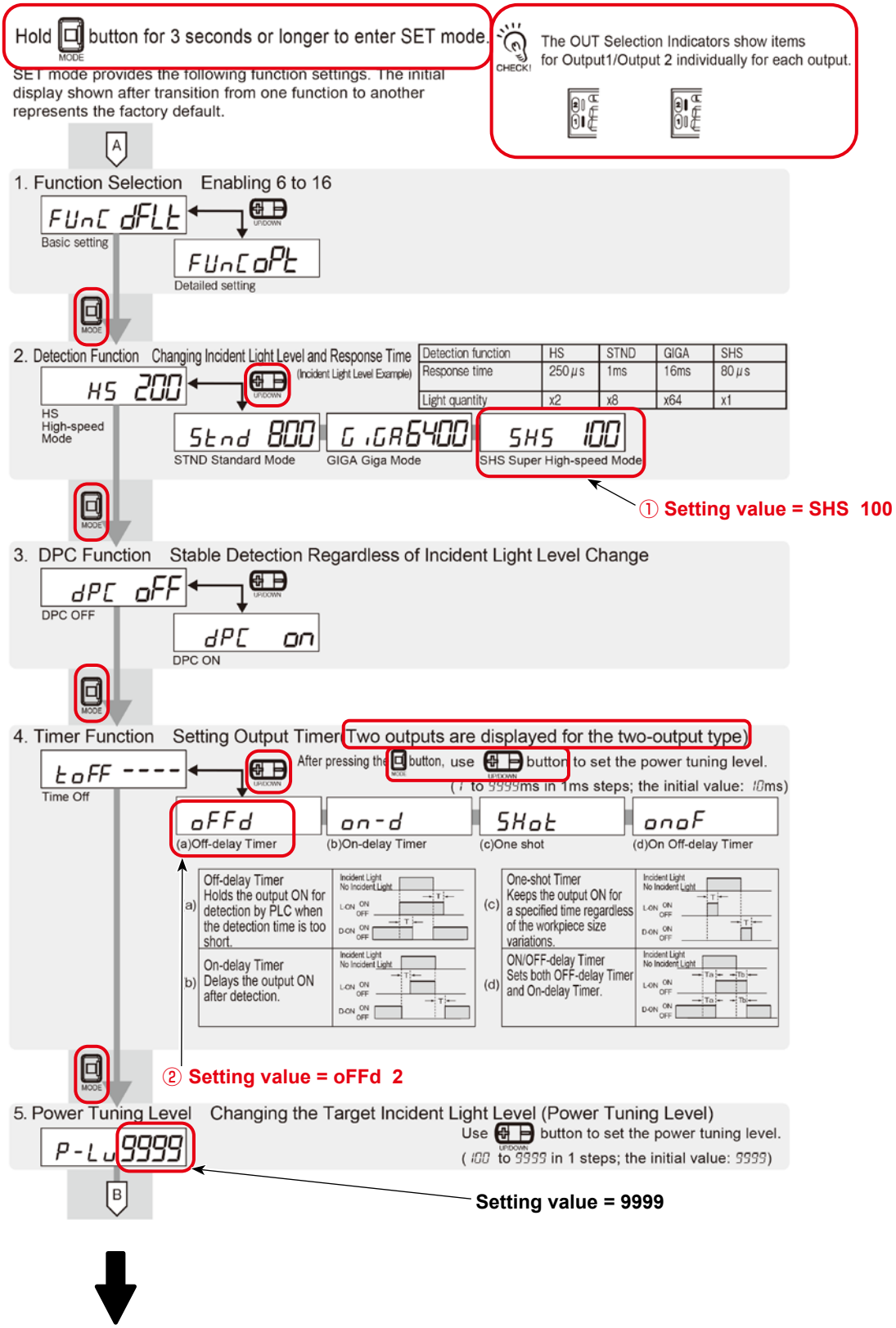
⑧ Press the "TUNE" button located on the left side of the amplifier of the sensor amplifier once.

* **Display "2Pnt 9999" blinks on the amplifier and is changed to "2Pnt ****". ("****" will be a value between 6 and 7.)**

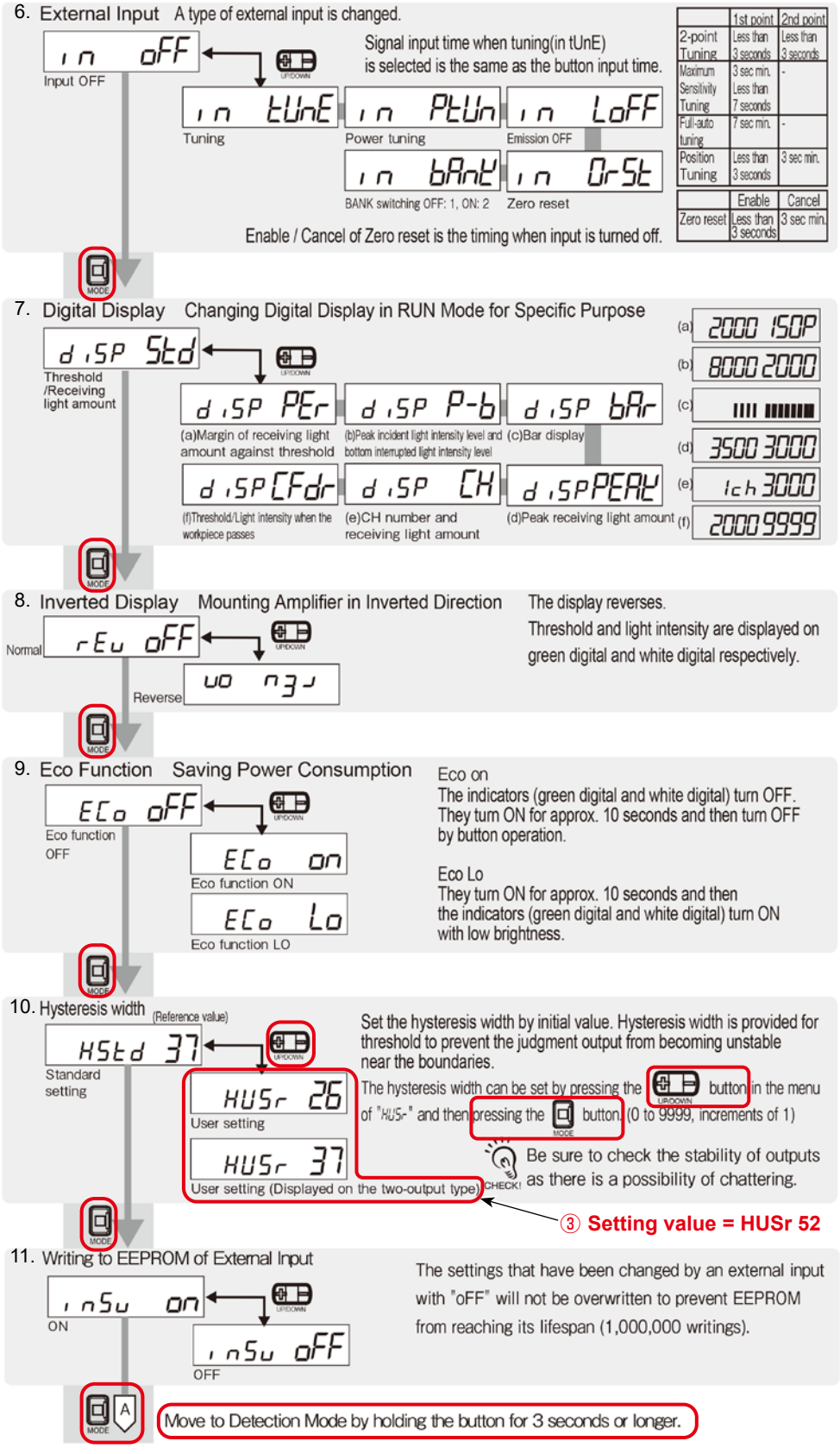
⑨ Slowly turn the pulley counterclockwise by hand while observing the bobbin case from the jig mirror and stop turning it when the needle thread ❶ is brought to a position where it not exposed to the sensor light ❷ .

10. Setting the amplifier

Set ①② and ③ as described below.

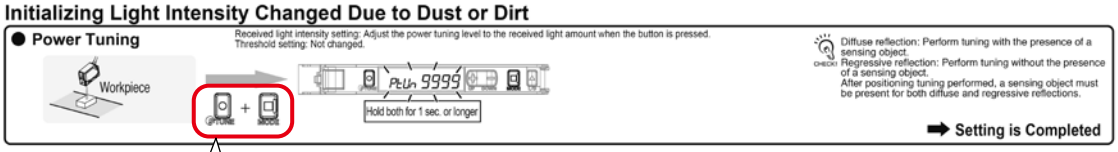


[Refer to the next page]



● Power tuning

Initializing Light Intensity Changed Due to Dust or Dirt



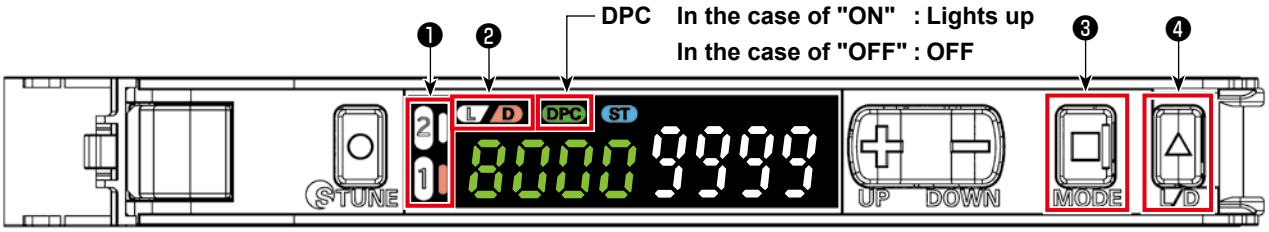
Reference

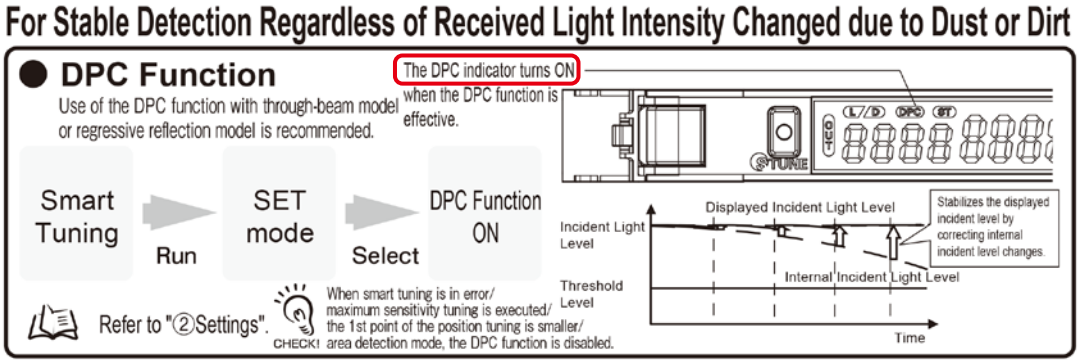
* **If the value cannot be returned to 9000 or more by means of the DPC function when the bobbin case surface is free from stains and the bracket lifting is correctly set, it will be necessary to carry out the power tuning.**

11. DPC function

The DPC function is a correction function to help the user to use the SD-29 satisfactorily.
(The DPC function works to allow the SD-29 to carry out detection with stability even when the quantity of light received by the sensor varies due to cloth chips or oil gathering on the sensor head, bobbin case surface and/or reflective plate.)

WARNING
Be sur to turn OFF the DPC function before you carry out "8. Adjusting the sensor position" p.13 or "9. Turning the sensor" p.16.





The SD-29 amplifier has two output channels. (It is possible to set two channels.) The right side of channel number ❶ lights up when it is selected.

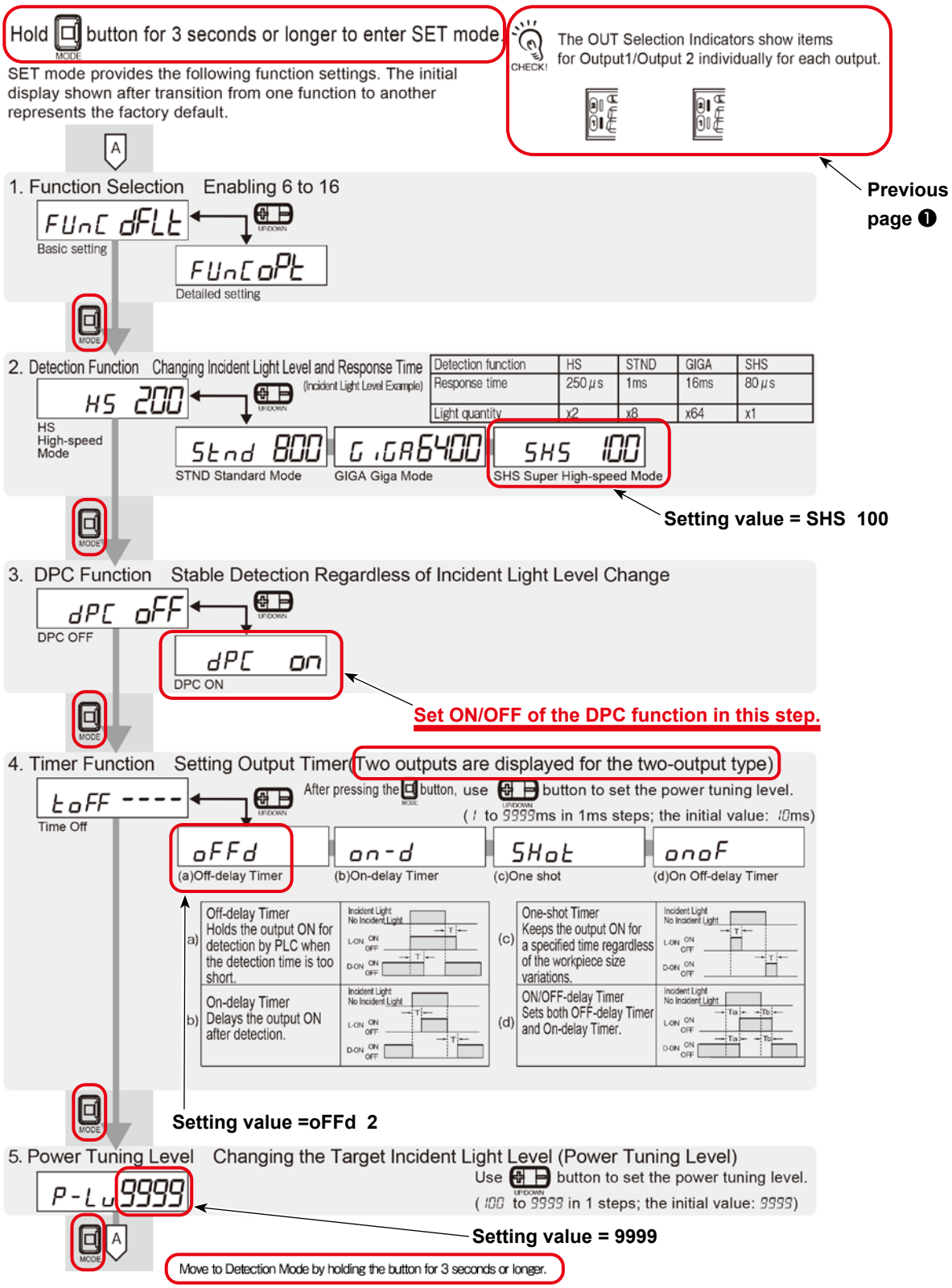
① When there is no thread at this side of the bobbin case, channel number ❶ goes out and D ❷ lights up.
② When there is the thread at this side of the bobbin case (when the thread receives the sensor light and the quantity of light received is lower than the threshold), channel number ❶ lights up and D ❷ goes out.
③ If you want to change over the channel, press "MODE" ❸ . When the on/off state of the L/D is reversed, press "L/D" ❹ to change over the channel.

Be aware that the sensor may fail to carry out detection normally if the on/off state of the L and D is reversed.

Refer to the next page for how to set the DPC function.

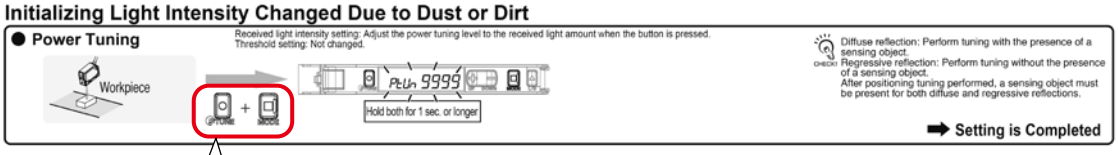
- **Standard condition at the start of sewing (no thread is present on this side of the bobbin case)**

[How to set the DPC function]



● **Power tuning**

Initializing Light Intensity Changed Due to Dust or Dirt

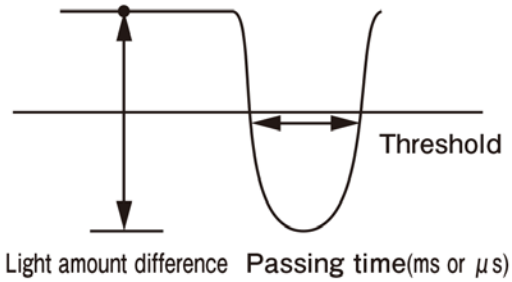


Reference

* **If the value cannot be returned to 9000 or more by means of the DPC function when the bobbin case surface is free from stains and the bracket lifting is correctly set, it will be necessary to carry out the power tuning.**

12. Solution viewer function

The solution viewer is a check function to help the user to use the SD-29 satisfactorily.
When the sewing machine actually performs sewing with the condition (thread, material, sewing pattern and the number of revolutions) applied to the sewing process, the solution viewer measures the detection-ON transit time and difference in the quantity of light received (difference in light quantity between ON and OFF states of the detection).



12-1. Specification values and handling method

Transit time, **specification value =**

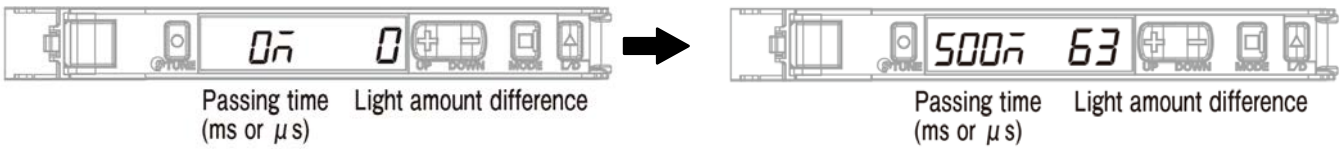
120 μs or more (milliseconds are all acceptable). If the transit time is smaller than 120 μs, the threshold should be increased.

*** The threshold can be changed with the "+" and "-" while the solution viewer mode is placed in ON.**

Difference in the quantity of light received, **specification value =**

5500 or more. If it is smaller than 5500, carry out the procedure described in **"9. Turning the sensor" p.16** again.

If the difference in the quantity of light received is still smaller than 5500 even after you have carried out tuning of the sensor, carry out the procedure described in **"8. Adjusting the sensor position" p.13** again.



The specification of the difference in the quantity of light received may differ with the thread to be used. (The specification value "5500 or more" has been obtained by the test with FUJIX Ltd. for Resilon #60 thread.)

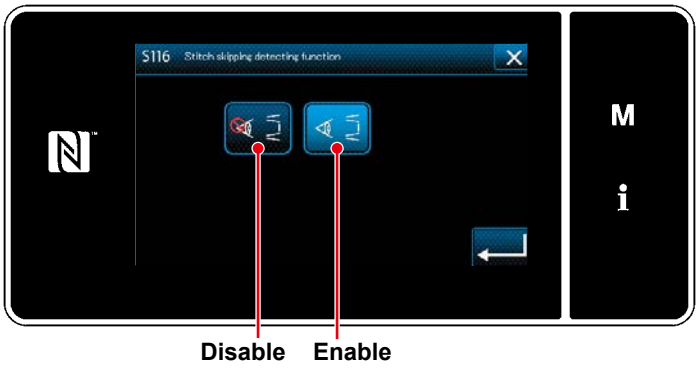
12-2. Procedure for checking the solution viewer

1. Place the thread and material you want to use in the sewing process on the sewing machine.
2. Raise the main body of the sewing machine and turn ON the power to the sewing machine. Then, press the ready key (needle bar stop position button ) .
3. Set the sewing pattern and the number of revolutions to those you wan to use in the sewing process.
4. Turn ON the solution viewer.
5. Carry out sewing.
6. Check the value of the solution viewer.
   * **If the value does not fall within the specification value range, carry out setting or adjustment of the solution viewer again. Then, carry out the steps of procedure from the aforementioned step 5. (Refer to "12-1. Specification values and handling method" p.22.)**
7. Turn OFF the solution viewer.

12-3. How to turn ON and OFF the solution viewer

1. Keep the "MODE" and "L/D" held pressed simultaneously for three seconds or more.
   * **The solution viewer is turned OFF by keeping the "MODE" and "L/D" held pressed simultaneously for three seconds or more again.**
   * **When the solution viewer is in the ON state, "SoLU on" is displayed. When it is in the OFF state, "SoLU oFF" is displayed.**

13. Setting the functions on the operation panel



If you want to use the SD-29's detecting function, set "S116 Stitch skipping and double catching detecting function" to "Enable".
When you have changed the setting of "U220 Stitch skipping and double catching detecting function" from the default value "1: Enable" to "0: Disable", set "S116 Stitch skipping and double catching detecting function" to "1: Enable" and turn OFF the power to the sewing machine.

13-1. Messages on the operation panel

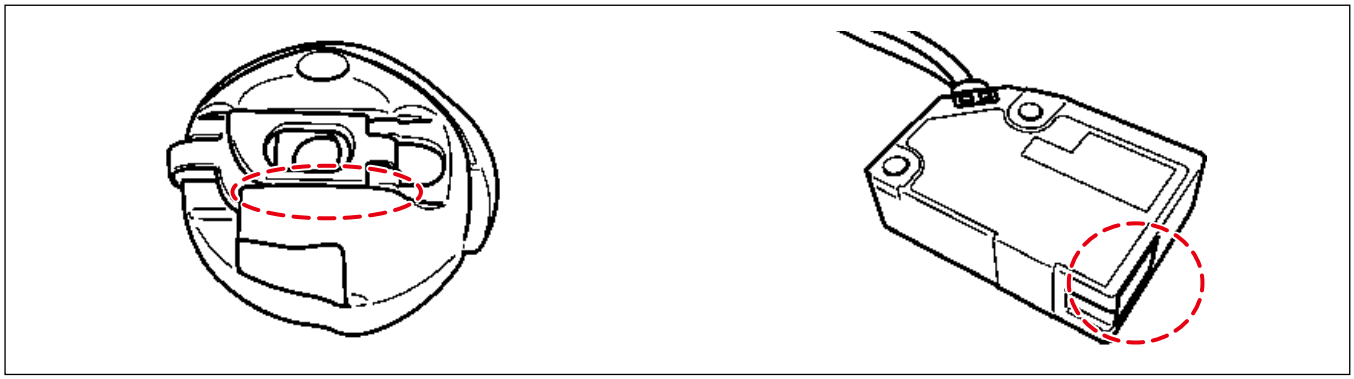
When you use this device (SD-29) with your sewing machine, the notification message will be displayed on the built-in operation panel of the main body of sewing machine if the following phenomena occurs.

1. **The notification message is displayed when enable/disable of "U220 Stitch skipping and double catching detecting function" is set to "1: Enable".**
2. **Timing and the number of times of displaying the notification message are determined by the conditions set as described in "13-2. Set values of memory switches" p.25.**
3. **If both the M640 and M641 errors described in the table below have occurred, the notification message for the error which has been detected first will be displayed.**

Phenomenon	Message displayed on the operation panel	Display condition
Stitching failure "stitch skipping". Stitching failure "needle thread breakage".	M640 Stitch skipping is detected.	In the case stitch skipping is detected in repetition by the number of stitches set with the U221 or more
Stitching failure "double catching".	M641 Double catching is detected.	
The operation plate remains in its lower position Bobbin case is not loaded in the hook Quantity of the sensor light has decreased (Note 2.)	M642 Light quantity of the stitch skipping detection sensor has decreased.	

Note 1. If the notification message is not normally displayed on the operation panel, firstly check the set value as described in "13-2. Set values of memory switches" p.25 In the case the set value is correct, check the solution viewer as described in "12. Solution viewer function" p.22.

Note 2. This phenomenon occurs in the case the sensor light quantity displayed on the amplifier is not "9999" (in the case "11. DPC function" p.20 fails to work).
In this case, the bobbin case and/or the sensor head may be stained. Wipe stains such as oil and thread wastes gathering on their surfaces with a piece of clean waste cloth.



13-2. Set values of memory switches

Set the number of times of occurrence of stitching failure to be counted and the operation of the sewing machine to be performed until the error is notified.

Level 1

Phenomenon	Switch/display	Description	Initial value	Setting range
U220	Stitch skipping and double catching detecting function	Stitch skipping and double catching detecting function (*1.) 0 : Disable 1 : Enable	1	0 to 1
U221	Number of stitches to detect stitch skipping	Number of stitches that continuously skip until detection of stitch skipping is determined. 0 : No detection 1 : One stitch skipping is detected when one stitch skips. 2 : One stitch skipping is detected when two stitches have skipped continuously.	1	0 to 5
U222	Number of stitches to detect double catching	Number of stitches for which double catching occurs continuously until detection of double catching is determined. (*2.) 0 : No detection 1 : One double catching is detected when double catching has occurred once. 2 : One double catching is detected when double catching has occurred twice continuously.	1	0 to 5
U223	Number of stitches at the start of sewing for which detection of stitch skipping and double catching is disabled	The number of stitches to be sewn from the start of sewing until the detection is enabled.	3	0 to 10
U224	Operation of detecting stitch skipping and double catching	Timing and the sewing machine operation to output the stitch skipping/double catching detection message (*3.) 0 : Sewing machine immediately stops upon detection The sewing machine stops immediately when the number of times of detection set with the U225 and U226 is reached. Re-start of the sewing machine is prohibited until the message screen is closed. 1 : The message is displayed at the time of thread trimming. The message is displayed at the time of thread trimming after the number of times of detection set with the U225 and U226 is reached. In this case, the sewing machine can run up to thread trimming. 2 : The message is displayed at the time of first detection (the sewing machine stops immediately) The sewing machine stops immediately when the number of times of detection set with the U225 and U226 is reached. 3 : The message is displayed at the time of first detection (the sewing machine stops at the time of thread trimming) The sewing machine is able to run up to thread trimming after the number of times of detection set with the U225 and U226 is reached.	2	0 to 3

***1. The power is turned OFF after you have changed the set value.**
In the case of "1: Enable", the maximum sewing speed will be changed to 3,500 sti/min when it is set to 3,500 sti/min or more. (The maximum sewing speed (U096) remains at 4,000.)
If you change the set value to "1: Enable", "S116 Enable/disable of stitch skipping and double catching detecting function" can be selected on the pattern-by-pattern data list. If you also set the S116 to "Enable", the stitch skipping and double catching detecting function will be enabled.

***2. In the case "U222 Number of stitches to detect double catching" is enabled (i.e., "1" or "2" is selected), it is recommended to use the sewing machine with its maximum sewing speed set to 3,500 sti/min. (If the sewing speed is excessively high, false detection of double catching may be likely to occur.)**
If false detection of double catching occurs frequently, the threshold of the sensor should be re-set.

***3. In the case of "2: The message is displayed at the time of first detection (the sewing machine stops immediately)" and "3: The message is displayed at the time of first detection (the sewing machine stops at the time of thread trimming)", the previous number of times of detection will be cleared by trimming the thread or by closing the screen.**

Phe-nome-non	Switch/display	Description	Initial value	Setting range
U225	Number of times of detecting stitch skipping until the stitch skipping message is displayed and the machine is immediately stopped	The number of times of detecting stitch skipping until the stitch skipping message is displayed and the sewing machine is immediately stopped. (*4.) 0 or 1 : The message is displayed when stitch skipping is detected once 2 : The message is displayed when stitch skipping is detected twice.	2	0 to 999
U226	Number of times of detecting double catching until the double catching message is displayed and the machine is immediately stopped	The number of times of detecting double catching until the double catching message is displayed and the sewing machine is immediately stopped.(*5.) 0 or 1 : The message is displayed when double catching is detected once. 2 : The message is displayed when double catching is detected twice.	2	0 to 999

***4. In the case "U224 Stitch skipping/double catching detecting operation" is set to "1: The message is displayed at the time of thread trimming", the message will be displayed at the time of thread trimming.**
In the case "U221 Number of stitches to detect stitch skipping" is set to "2: One stitch skipping is detected when two stitches have skipped continuously" or a larger value, counting of the number of stitches will be started after the set number of skipped stitches has continued. (In the case the U221 is set to "2" and U225 is set to "2", the message will be displayed when two continuous times of stitch skipping have occurred twice.)

***5. In the case "U224 Operation of detecting stitch skipping and double catching" is set to "1: The message is displayed at the time of thread trimming", the message will be displayed at the time of thread trimming.**
In the case "U222 Number of stitches to detect double catching" is set to "2: One double catching is detected when double catching has occurred twice continuously" or a larger value, counting of the number of stitches will be started after the set number of stitches of double catching has continued. (In the case the U222 is set to "2" and U226 is set to "2", the message will be displayed when two continuous times of double catching have occurred twice.)

Level 2 (Keep M held pressed by two seconds on the sewing screen)

Phe-nome-non	Switch/display	Description	Initial value	Setting range
K227	Light quantity reduction error disabled	Enable/disable of the light quantity reduction error 0 : "M642 Light quantity reduction error" is detected 1 : "M642 Light quantity reduction error" is disabled	0	0 to 1
K230	Buzzer ring time at the time of detecting stitch skipping	Duration of ringing the buzzer when stitch skipping is detected (*1.) 0 : Standard warning tone 1- : (x 10 msec). The buzzer sounds for one second when this is set to 100.	100	0 to 250
K232	Signal lamp output	Enable/disable of the signal lamp (optional) (*2.) 0 : Disable 1 : Enable	0	0 to 1

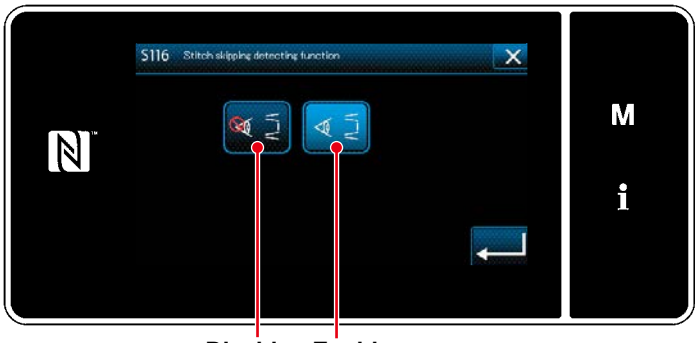
***1. The set value of the K230 is common to the buzzer on the operation panel and the signal lamp (optional).**

***2. If you want to use the signal lamp (optional), set the K232 to "1: Enable".**
If it is set to "0: Disable", neither the signal lamp (tricolor light) will light up nor the buzzer will sound.

13-3. Sewing pattern data

In the case "U220 Stitch skipping detection function" is set to "1: Enable", "S116 Stitch skipping and double catching detecting function" will be added to the sewing pattern data as described below.
Initial setting of "S116 Stitch skipping and double catching detecting function" is "Disable". If you use the SD-29's detecting function, set the S116 to "Enable".

Enable/disable of the stitch skipping detection can be set on a pattern-by-pattern basis.
In addition, the change in the setting you have made to "S116 Stitch skipping and double catching detecting function" will be reflected without turning the power OFF.



Disable Enable

In the case "U220 Stitch skipping and double catching detecting function ("Set values of the memory switches" on the previous page) is set to "Disable", be aware that the detecting function of the SD-29 detection device will be disabled even if "S116 Stitch skipping and double catching detecting function" is set to "ON".

- **Minimum setting required to enable the detecting function**
  Set the memory switch "U220 Stitch skipping and double catching detecting function" to "1".
  Set the U221 and U222 to 1 or a larger value.
  Set the sewing pattern data "S116" to "Enable".

14. Flow of work by maintenance personnel

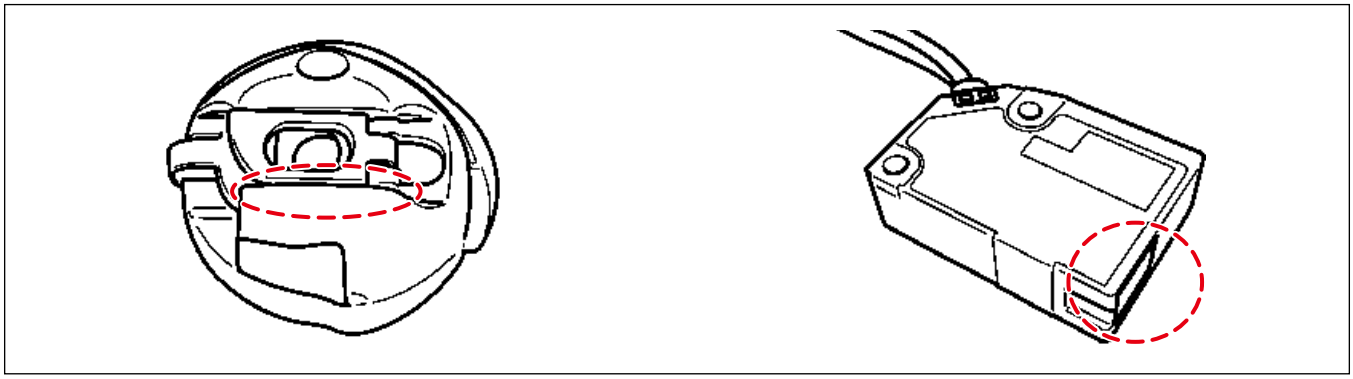
WARNING

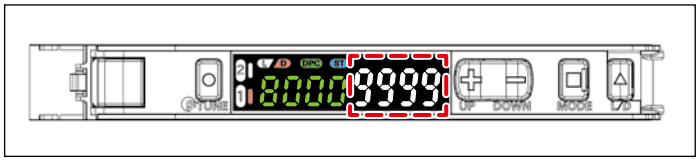
1. **Do not tilt or raise the main body of sewing machine with the operation plate held down. Doing so can cause the sensor to move out of position.**
2. **If the operation plate interferes with the under cover, the sensor sensitivity should be checked as described in "9. Turning the sensor" p.16. If you find a problem with the sensor sensitivity, carry out the procedures described in "8. Adjusting the sensor position" p.13 and "9. Turning the sensor" p.16.**

14-1. Replacing the thread, material and gauge

1. Replace the thread or material, or the gauge (needle, feed dog and throat plate) with a new one.
2. Unlock the index plunger. Lower the operation plate. Wipe the surfaces of the sensor head and bobbin case and the reflective seal with a piece of clean waste cloth if they are stained (cloth chips, thread waste, oil coming from the hook or your fingers, etc.) .
   * Refer to **"15. Operating and bobbin-changing procedures" p.32** for how to unlock and lock the index plunger and to lower and lift the operation plate.

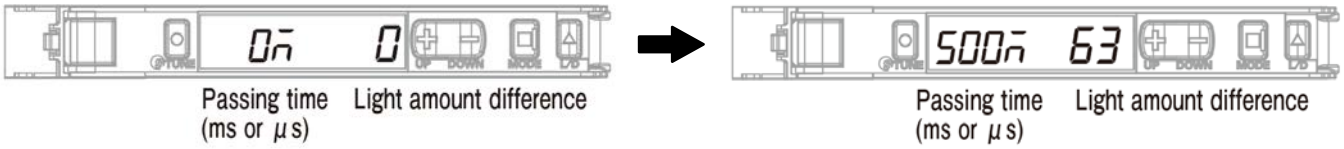
If cloth chips, thread waste, oil coming from the hook or your fingers, etc. frequently adhere to the surfaces of the sensor head and bobbin case and the reflective seal, the optional part (separately available), air blower set (part number 40250043) should be used with your sewing machine.





3. Lift the operation plate and lock the index plunger. Check that the light quantity displayed on the amplifier is "9999".
   * **Wait until the DPC function has finished.**
   * **If the light quantity of the amplifier is "9000" or more, carry out the power tuning to correct the light quantity to "9999".**

4. Carry out sewing under the solution viewer mode with the condition you want to use in the sewing process. Check the detection time and the difference in light quantity.



Transit time, **specification value =**

120 μs or more (milliseconds are all acceptable). If the transit time is smaller than 120 μs, the threshold should be increased.

*** The threshold can be changed with the "+" and "-" while the solution viewer mode is placed in ON.**

Difference in the quantity of light received, **specification value =**

5500 or more. If it is smaller than 5500, carry out the procedure described in **"9. Turning the sensor" p.16** again.

If the difference in the quantity of light received is still smaller than 5500 even after you have carried out tuning of the sensor, carry out the procedure described in **"8. Adjusting the sensor position" p.13** again.

[How to turn ON and OFF the solution viewer]

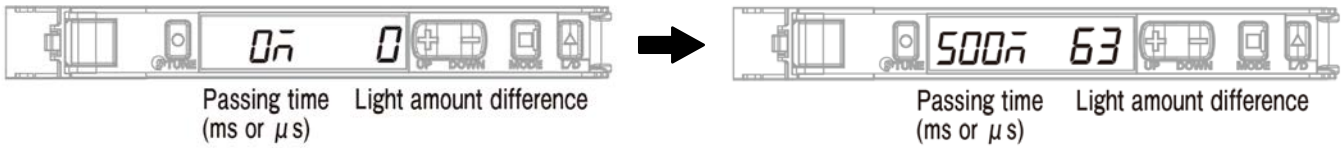
1. Keep the "MODE" and "L/D" held pressed simultaneously for three seconds or more.
   *** The solution viewer is turned OFF by keeping the "MODE" and "L/D" held pressed simultaneously for three seconds or more again.**
   *** When the solution viewer is in the ON state, "SoLU on" is displayed. When it is in the OFF state, "SoLU oFF" is displayed.**

14-2. Procedure for replacing the hook and for adjusting the hook timing

WARNING

1. **Do not tilt or raise the main body of sewing machine with the operation plate held down. Doing so can cause the sensor to move out of position.**
2. **If the operation plate interferes with the under cover, the sensor sensitivity should be checked as described in "9. Turning the sensor" p.16. If you find a problem with the sensor sensitivity, carry out the procedures described in "8. Adjusting the sensor position" p.13 and "9. Turning the sensor" p.16.**

1. Turn OFF the DPC function.
   * **Refer to "[How to set the DPC function]" p.21 for the operating procedure.**
2. Turn OFF the power to the sewing machine.
3. Unlock the index plunger, lower the operation plate and remove the bobbin case. Wipe the sensor head with a piece of clean waste cloth if it is stained (cloth chips, thread waste, oil coming from the hook or your fingers, etc.).
   * **Refer to "15. Operating and bobbin-changing procedures" p.32 for how to lock and unlock the index plunger and to lower and lift the operation plate.**
4. Lift the operation plate. Lock the index plunger.
5. Tilt the sewing machine. Replace the hook with a new one and adjust the hook timing.
6. Turn ON the power to the sewing machine.
7. Carry out two-point tuning using the thread you want to use in the sewing process.
   * **Refer to "9. Turning the sensor" p.16 for the two-point tuning.**
8. Carry out sewing under the solution viewer mode with the condition you want to use in the sewing process. Check the detection time and the difference in light quantity.



Transit time, **specification value =**

120 µs or more (milliseconds are all acceptable). If the transit time is smaller than 120 µs, the threshold should be increased.

*** The threshold can be changed with the "+" and "-" while the solution viewer mode is placed in ON.**

Difference in the quantity of light received, **specification value =**

5500 or more. If it is smaller than 5500, carry out the procedure described in **"9. Turning the sensor" p.16** again.

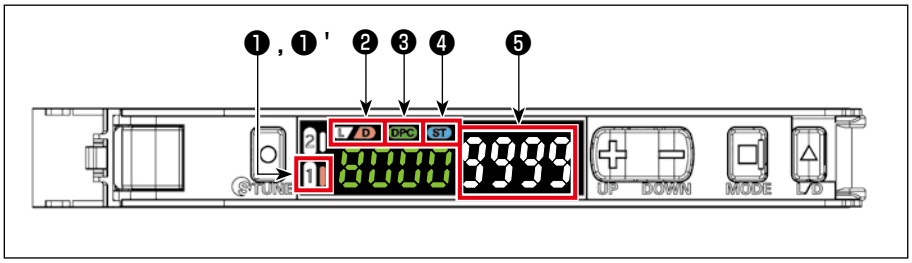
If the difference in the quantity of light received is still smaller than 5500 even after you have carried out tuning of the sensor, carry out the procedure described in **"8. Adjusting the sensor position" p.13** again.

[How to turn ON and OFF the solution viewer]

1. Keep the "MODE" and "L/D" held pressed simultaneously for three seconds or more.
   * **The solution viewer is turned OFF by keeping the "MODE" and "L/D" held pressed simultaneously for three seconds or more again.**
   * **When the solution viewer is in the ON state, "SoLU on" is displayed. When it is in the OFF state, "SoLU oFF" is displayed.**

9. Turn ON the DPC function.

   * **Refer to "11. DPC function" p.20 for the operating procedure.**
   * **As long as the display on the amplifier is as shown below at the beginning of sewing (no thread is present on this side of the bobbin case), there is no problem.**
     (The figure given below indicates the state that channel 1 is used.)

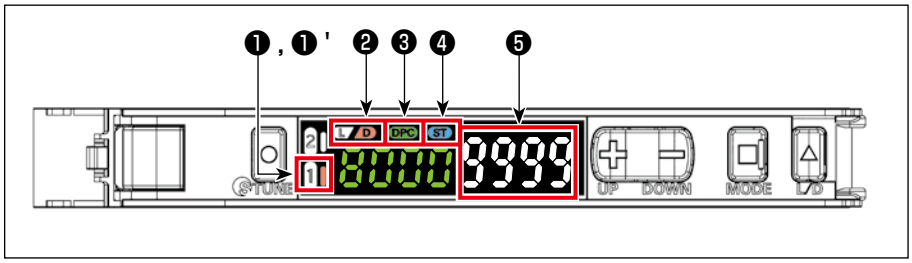


❶ "1" OFF
❶ ' "1" Right side lights up
❷ "D" Lights up
❸ "DPC" Lights up
❹ "ST" Lights up
❺ "9999"

* **❺ If the display on the amplifier is about "9000", the DPC function will work to automatically correct the value to "9999".**

15. Operating and bobbin-changing procedures

* **As long as the display on the amplifier is as shown below at the beginning of sewing (no thread is present on this side of the bobbin case), there is no problem.**
(The figure given below indicates the state that channel 1 is used.)



❶ "1" OFF
❶ ' "1" Right side lights up
❷ "D" Lights up
❸ "DPC" Lights up
❹ "ST" Lights up
❺ "9999"

* **❺ If the display on the amplifier is about "9000", the DPC function will work to automatically correct the value to "9999".**

15-1. Sewing method

1. Carry out sewing normally by turning ON the starting pedal.
   * **If an abnormal detection by the sensor occurs during sewing, error ① , ② or ③ will be informed with the "sound" and "display on the operation panel".**

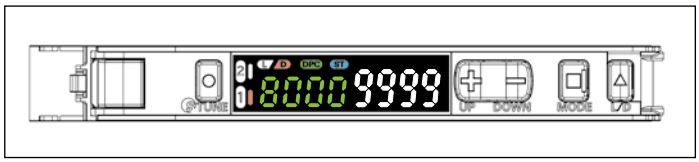
① "M640 stitch skipping is detected"
* **Stitch skipping or thread breakage may have occurred.**

② "M641 double catching is detected"
* **Double catching or thread breakage may have occurred.**
* **Bobbin may run idle or thread waste, etc. may have adhered to the sensor light path.**

③ "M642 Light quantity of the stitch skipping detection sensor has decreased"
* **The characters (white characters) displayed on the right side of the amplifier is located lower than the cha**racters (green characters) displayed on the left.

[Cause]

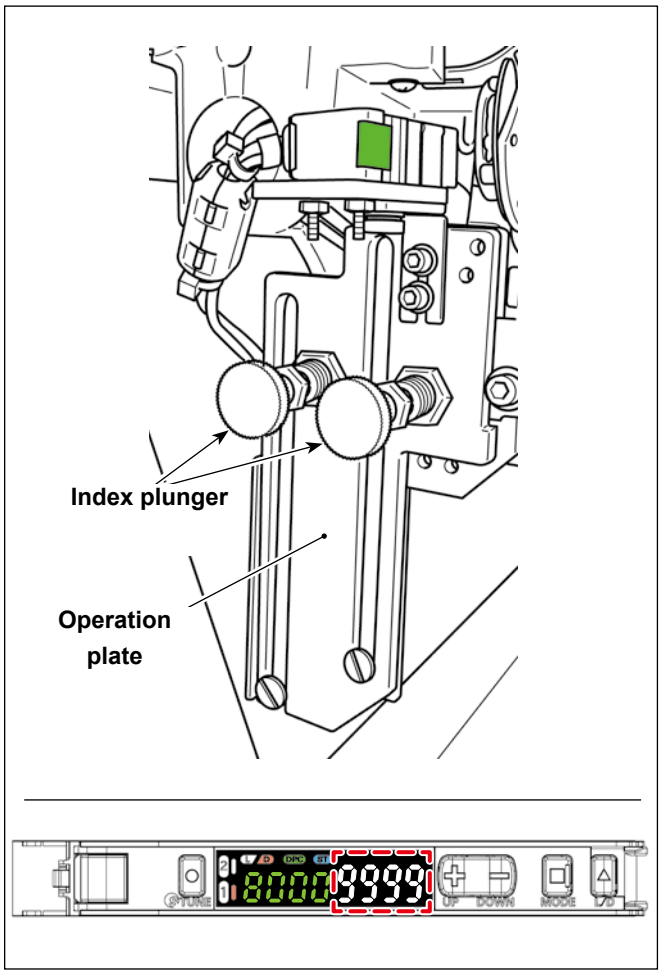
1. **The operation plate remains in its lower position.**
2. **The bobbin case and the sensor head are stained.**
3. **The operation plate (index plunger) has moved out of the correct setting position.**
4. **The sensor has moved out of position. (Contact the maintenance personnel)**



15-2. Method for changing the bobbin

WARNING

1. **Do not tilt or raise the main body of sewing machine with the operation plate held down. Doing so can cause the sensor to move out of position.**
2. **If the operation plate interferes with the under cover, the sensor sensitivity should be checked as described in "9. Turning the sensor" p.16. If you find a problem with the sensor sensitivity, carry out the procedures described in "8. Adjusting the sensor position" p.13 and "9. Turning the sensor" p.16.**

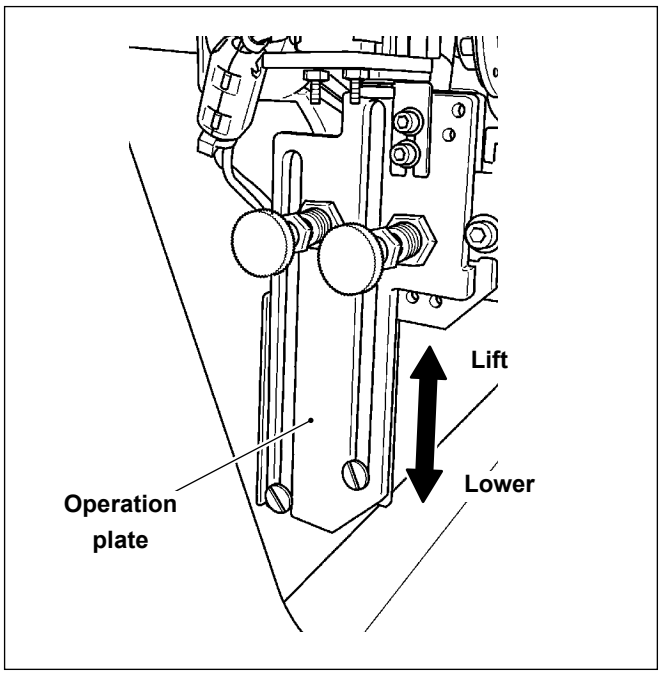


1. Unlock the index plunger (at two locations)
2. Lower the operation plate.
3. Change the bobbin. (Wipe the bobbin case clean.)
4. Lift the operation plate.
5. Lock the index plunger (at two locations)

*** Be sure to move the operating plate upward and downward slowly since the operating plate can cause a failure.**

5. Securely lock the index plunger. The index plunger is locked securely as long as "9999" is displayed on the amplifier. If the display on the amplifier is about "9000", the DPC function will work to automatically correct the value to "9999".

[Operating procedure (operator): Method for lowering/lifting the operating plate]



Method for lowering the operating plate

Holding the lower side of the operating plate, slowly move the operating plate downward until its lowest point is reached.

Method for lifting the operating plate

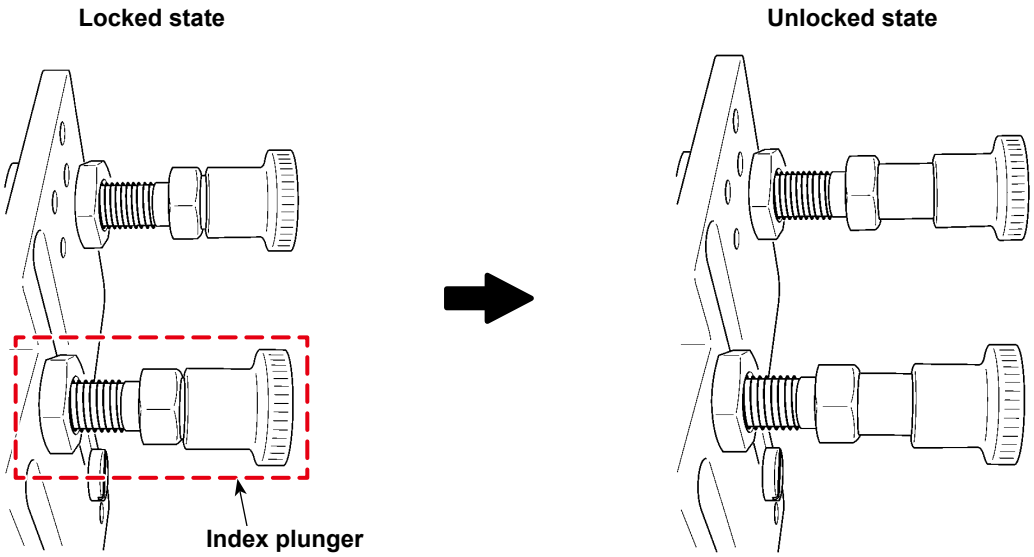
Move the operating plate in the opposite direction from when you lower it.
Slowly move the operating plate upward until its highest point is reached.

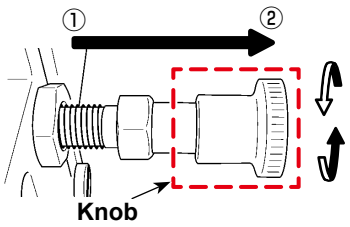
The operating plate should be moved upward/downward slowly.
In addition, do not tilt the sewing machine with the operating plate lowered. If you tilt the sewing machine while the operating plate is lowered, the parts such as the operating plate and the sensor can fail.

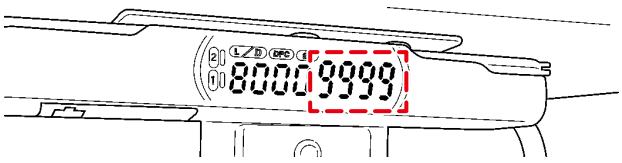
15-3. Method for unlocking and locking the index plunger (at two locations)

WARNING

1. **Do not tilt or raise the main body of sewing machine with the operation plate held down. Doing so can cause the sensor to move out of position.**
2. **If the operation plate interferes with the under cover, the sensor sensitivity should be checked as described in "9. Turning the sensor" p.16. If you find a problem with the sensor sensitivity, carry out the procedures described in "8. Adjusting the sensor position" p.13 and "9. Turning the sensor" p.16.**







[Unlocking method]

① Pull the knob in the direction of the arrow.

② Turn the knob counterclockwise by 90 degrees.

[Locking method]

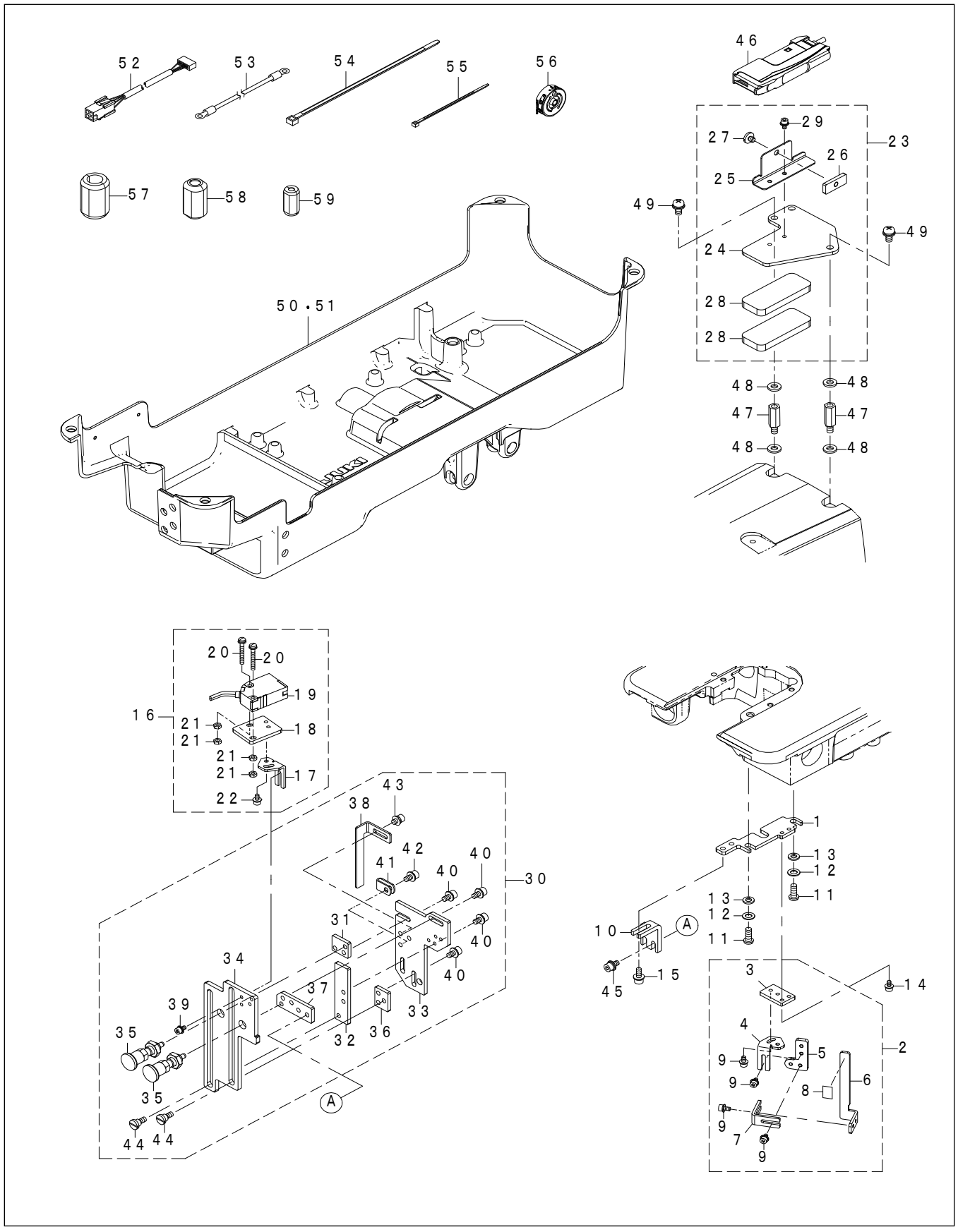
Turn the knob in the direction opposite to the direction you have turned the knob in step ① (Unlocking method).

The knob will automatically turn, by spring pressure, in the direction opposite to that in step ① . In some cases, however, the knob will not be fully returned to its home position. It is therefore necessary to push the top of the knob into position by hand.

When the display on the amplifier is "9999", the index plunger is correctly locked.

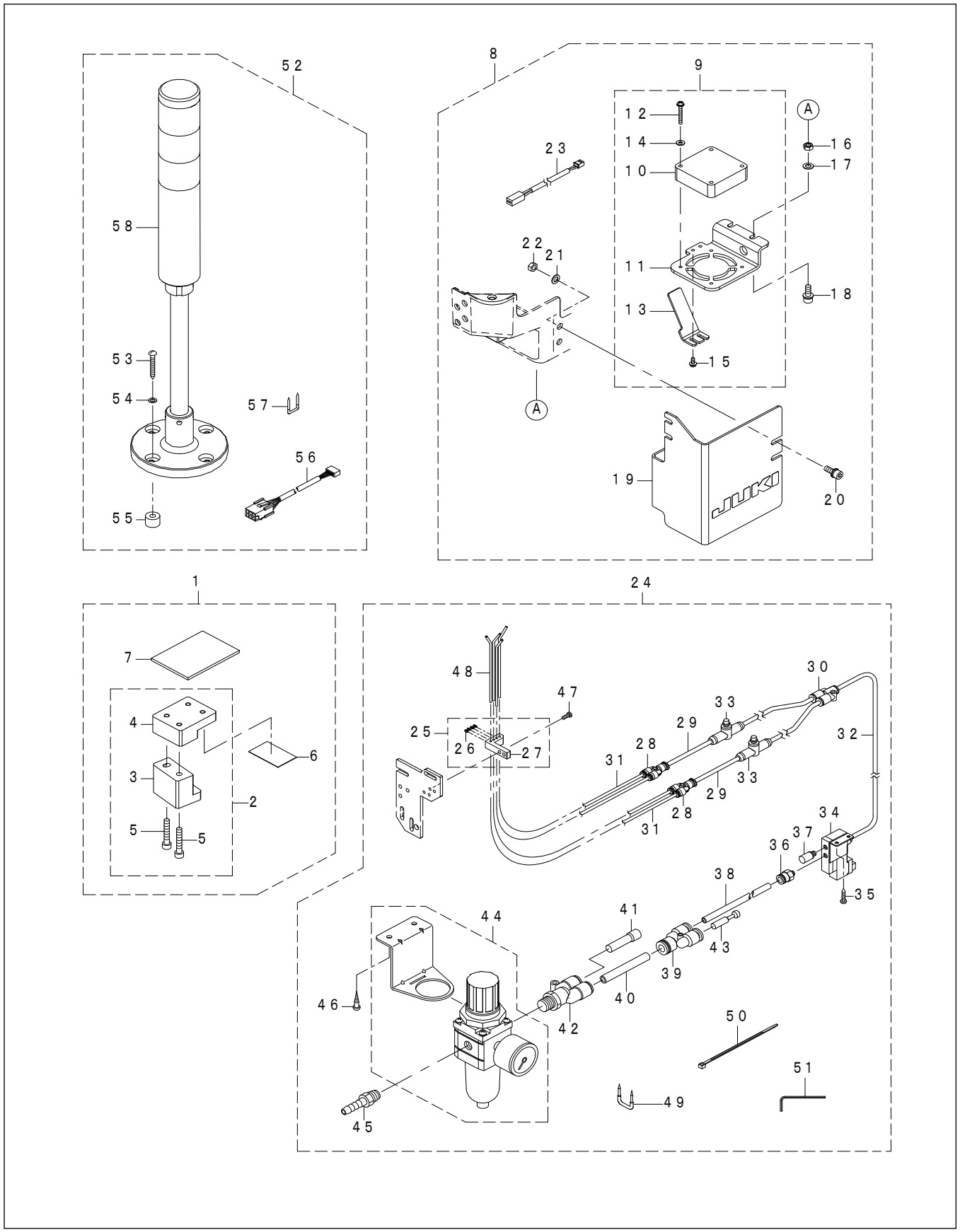
16. Parts list

[SD-29 equipment components]



REF.NO	NOTE	PART NO	D E S C R I P T I O N	品　名	Qty
1		402-24381	BASE_PLATE	ベース板	1
2		402-39338	REFLECTOR_ASM	反射板組	1
3		402-39329	BASE_PLATE_B	ベース板Ｂ	(1)
4		402-24382	ANGLE_ADJUSTMENT_PLATE	角度調整板	(1)
5		402-24383	POSITION_ADJUSTMENT_PLATE_A	位置調整板Ａ	(1)
6		402-24384	REFLECTIVE_SEAL_PASTING_PLATE	反射シール貼付板	(1)
7		402-24387	POSITION_ADJUSTMENT_PLATE_B	位置調整板Ｂ	(2)
8		402-24373	REFLECTOR	反射板	(0.5)
9		SL-6030692-TN	SCREW M3 L=6	座金付き六角穴ボルト　Ｍ３　Ｌ＝６	(8)
10		402-24378	POSITION_ADJUSTMENT_PLATE_C	位置調整板Ｃ	1
11		SS-4121615-SP	SCREW 3/16-28 L=16	ＳＣＲＥＷ　３／１６－２８　Ｌ＝１６	2
12		WP-0550800-SP	WASHER 5.5X10X0.8	ヒラザガネ　５．５Ｘ１０Ｘ０．８	2
13		WS-0510002-KP	SPRING WASHER 5.1X9.2X1.3	ハツキザガネ　５．１Ｘ９．２Ｘ１．３	2
14		SL-6030692-TN	SCREW M3 L=6	座金付き六角穴ボルト　Ｍ３　Ｌ＝６	2
15		SL-6041092-TN	SCREW M4 L=10	座金付き六角穴ボルト　Ｍ４　Ｌ＝１０	2
16		402-39335	SENSOR_HEAD_ASM	センサーヘッド組	1
17		402-24382	ANGLE_ADJUSTMENT_PLATE	角度調整板	(1)
18		402-24391	SENSOR_MOUNTING_PLATE	センサー取付板	(1)
19		HD-0035400-00	SENSOR	センサ	(1)
20		SL-4032591-SC	SCREW M3 L=25	座金付きなべ小ねじ　Ｍ３　Ｌ＝２５	(2)
21		NM-6030001-SC	NUT M3X0.5 TYPE1	六角　ナット　Ｍ３Ｘ０．５　１種	(4)
22		SL-6030692-TN	SCREW M3 L=6	座金付き六角穴ボルト　Ｍ３　Ｌ＝６	(2)
23		402-39336	AMP_MOUNTING_PLATE_ASM	アンプ取付板組	1
24		402-24396	AMP_MOUNTING_PLATE_A	アンプ取付板Ａ	(1)
25		402-24397	AMP_MOUNTING_PLATE_B	アンプ取付板Ｂ	(1)
26		225-56906	FIXED PLATE	コテイイタ	(1)
27		SS-7110570-SP	SCREW 11/64-40 L=4.8	マルヒラネジ　１１／６４－４０　Ｌ＝４．８	(1)
28		400-08978	RUBBER D	ボウシンゴムＤ	(2)
29		SL-6030592-TN	SCREW M3 L=5	座金付き六角穴ボルト　Ｍ３　Ｌ＝５	(2)
30		402-39337	SENSOR_BRACKET_ASM	センサーブラケット組	1
31		402-24385	FIXED_PLATE_RIGHT	固定板右	(1)
32		402-24386	FIXED_PLATE_LEFT	固定板左	(1)
33		402-24388	FIXED_BASE_PLATE	固定ベース板	(1)
34		402-24389	OPERATING_BASE_PLATE	稼動ベース板	(1)
35		402-24390	INDEX_PLUNGER	インデックスプランジャ	(2)
36		402-24377	FIXED_PLATE	固定板	(1)
37		402-24400	FIXED_PLATE	固定板	(1)
38		402-39328	GUIDE_PLATE	稼動ベース板支え	(1)
39		SL-6030692-TN	SCREW M3 L=6	座金付き六角穴ボルト　Ｍ３　Ｌ＝６	(2)
40		SL-6040892-TN	SCREW M4 L=8	座金付き六角穴ボルト　Ｍ４　Ｌ＝８	(8)
41		HX-0015000-00	CABLE CLAMP	ケーブルクリップ	(1)
42		SL-6040892-TN	SCREW M4 L=8	座金付き六角穴ボルト　Ｍ４　Ｌ＝８	(1)
43		SL-6040692-TN	SCREW M4 L=6	座金付き六角穴ボルト　Ｍ４　Ｌ＝６	(2)
44		SD-0600406-TP	SHOULDER SCREW D=6 H=4	段ねじ　Ｄ＝６　Ｈ＝４	2
45		SL-6040892-TN	SCREW M4 L=8	座金付き六角穴ボルト　Ｍ４　Ｌ＝８	2
46		402-40052	SENSOR AMP ASSY	センサアンプ組	1
47		400-12961	TENSION_PLATE_SCREW	チョウリョクイタネジ	2
48		115-29914	WASHER	ヨウドウカンササエジクザガネ	4
49		SL-4051091-SC	SCREW M5 L=10	座金付きなべ小ねじ　Ｍ５　Ｌ＝１０	2
50	#01	402-39332	OIL_RESERVOIR_ASM/X73257	アンダーカバー組／Ｘ７３２５７	1
51	#02	402-39333	OIL_RESERVOIR_ASM/X73257-BB	アンダーカバー組／Ｘ７３２５７－ＢＢ	1
52		402-40053	SENSOR RELAY CABLE A ASSY	センサ中継ケーブルＡ組	1
53		402-40056	SENSOR EARTH CORD ASM	センサーアースコード組	1
54		HX-0006500-0B	CABLE BAND	ソクセンバンド	2
55		EA-9500B01-00	CABLE BAND	ソクセンバンド	7
56		402-39314	BOBBIN CASE ASM.	ボビンケース（組）	1
57	#03	HN-0021100-00	CORES	コア	2
58	#03	HN-0028400-00	CORES	コア	1
59	#03	HN-0047200-00	CORES	コア	1
		NOTE(注記)	#01....FOR LZ-2290CS #02....FOR LZ-2290CF #03....TYPE BB	ＬＺ－２２９０ＣＳ用 ＬＺ－２２９０ＣＦ用 ＢＢ仕様	

17. Optional parts

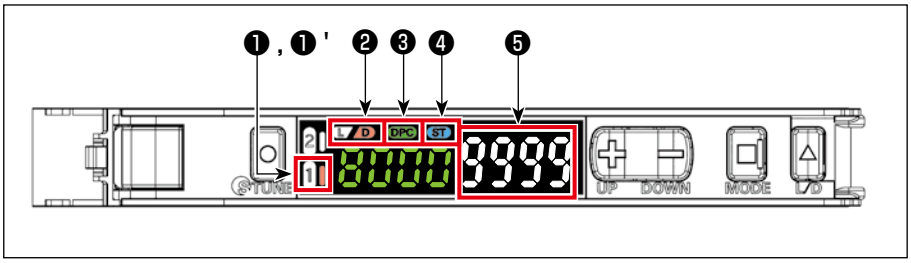


REF.NO	NOTE	PART NO	D E S C R I P T I O N	品　名	Qty
1		402-50040	SD-29_GAUGE_SET	ＳＤ－２９ゲージセット	1
2		402-50041	SD-29_GAUGE_ASM	ＳＤ－２９_ゲージ組	(1)
3		402-27675	SD-29_GAUGE	ＳＤ－２９_ゲージ	(1)
4		402-27676	SD-29_GAUGE_BASE	ＳＤ－２９_ゲージ土台	(1)
5		SM-6053002-TP	SCREW M5X0.8 L=30	ロッカクアナ　ボルト　Ｍ５Ｘ０．８　Ｌ＝３０	(2)
6		402-39325	MAGNET	マグネット	(1)
7		402-39326	MIRROR	ミラー	(1)
8		402-50042	SD-29_HOOK_COOLS_SET	ＳＤ－２９_釜冷却セット	1
9		402-50045	SD-29_FAN__ASM	ＳＤ－２９_ＦＡＮ組	(1)
10		400-19398	HEAD FAN MOTOR B ASSY	トウブ　ファンモータ　Ｂ　クミ	(1)
11		402-24374	FAN_MOUNTING_PLATE	ＦＡＮ取付板	(1)
12		SL-4032591-SC	SCREW M3 L=25	座金付きなべ小ねじ　Ｍ３　Ｌ＝２５	(4)
13		402-24376	COVER_B	カバーＢ	(1)
14		WP-0371016-SD	WASHER 3.7X8X1	ヒラザガネ　３．７Ｘ８Ｘ１	(4)
15		SL-4030891-SC	SCREW M3 L=8	座金付きなべ小ねじ　Ｍ３　Ｌ＝８	(2)
16		NM-6050001-SC	NUT M5X0.8 TYPE1	六角　ナット　Ｍ５Ｘ０．８　１種	(2)
17		WP-0550800-SP	WASHER 5.5X10X0.8	ヒラザガネ　５．５Ｘ１０Ｘ０．８	(2)
18		SL-6051492-TN	SCREW M5 L=14	座金付き六角穴ボルト　Ｍ５　Ｌ＝１４	(2)
19		402-50046	COVER_A	カバーＡ	(1)
20		SL-6051492-TN	SCREW M5 L=14	座金付き六角穴ボルト　Ｍ５　Ｌ＝１４	(2)
21		WP-0550800-SP	WASHER 5.5X10X0.8	ヒラザガネ　５．５Ｘ１０Ｘ０．８	(2)
22		NM-6050001-SC	NUT M5X0.8 TYPE1	六角　ナット　Ｍ５Ｘ０．８　１種	(2)
23		402-40055	FAN RELAY CABLE A ASSY	ＦＡＮ中継ケーブルＡ組	(1)
24		402-50043	SD-29_AIR_BLOW_SET	ＳＤ－２９_エアブローセット	1
25		402-50047	PIPE_BASE_ASM	パイプベース組	(1)
26		SM-8020302-TP	SCREW M2X0.4 L=3	トメネジ　Ｍ２Ｘ０．４　Ｌ＝３	(4)
27		402-24379	PIPE_BASE	パイプベース	(1)
28		402-13323	UNION_Y	継ぎ手	(2)
29		BT-0400251-EB	URETHANE TUBE BLACK 4X2.5	ポリウレタンチューブ黒　４Ｘ２．５	(0.2)
30		PJ-3080400-06	UNION	ユニオンワイ	(1)
31		BT-0320201-EB	URETHANE TUBE BLACK 3.18X2	ポリウレタン　チューブ　黒　３．１８Ｘ２	(0.4)
32		BT-0400251-EB	URETHANE TUBE BLACK 4X2.5	ポリウレタンチューブ黒　４Ｘ２．５	(2)
33		PC-0124060-00	SPEED CONTROLLER	スピードコントローラ	(2)
34		PV-1305390-00	3-PORT ELECTROMAGNETIC VALVE	３ポートデンジベン	(1)
35		SK-3311600-SE	WOOD SCREW D=3.1 L=16	丸木ねじ　Ｄ＝３．１　Ｌ＝１６	(2)
36		PJ-3010605-03	HALF UNION	ハーフ　ユニオン	(1)
37		PX-0505010-00	SILENCER	ショウオンキ	(1)
38		BT-0600401-EB	URETHANE TUBE BLACK 6X4	ポリウレタンチューブ黒　６Ｘ４	(2)
39		PJ-3080800-01	DIFFERENT DIAMETER UNION Y	イケイ　ユニオン　ワイ	(1)
40		BT-0800501-EB	URETHANE TUBE BLACK 8X5	ポリウレタンチューブ黒　８Ｘ５	(0.06)
41		PX-9500090-00	PLUG	プラグ	(1)
42		PJ-3080652-03	BRANCH	ブランチ	(1)
43		PX-9500100-00	PLUG	プラグ	(1)
44		400-03560	REGULATOR ASM.	レギュレーター（クミ）	(1)
45		PJ-0325260-01	PIPE JOINT (HOSE NIPPLE)	カンツギテ（ホースニップル）	(1)
46		SK-3412001-SE	WOOD SCREW D=4.1 L=20	丸木ねじ　Ｄ＝４．１　Ｌ＝２０	(2)
47		SM-4030855-SN	SCREW M3 L=8.0	ナベネジ　Ｍ３　Ｌ＝８	(2)
48		402-24380	PIPE	パイプ	(4)
49		MAO-11532000	CORD STAPLE	コード　ステップル	(2)
50		EA-9500B01-00	CABLE BAND	ソクセンバンド	(2)
51		402-50048	HEXAGONAL WRENCH_0.89	六角棒スパナ_0.89	(1)
52		402-50044	SD-29_SIGNAL_TOWER_SET	ＳＤ－２９_シグナルタワーセット	1
53		SK-3413201-SE	WOOD SCREW D=4.1 L=32	丸木ねじ　Ｄ＝４．１　Ｌ＝３２	(4)
54		WP-0450000-SD	WASHER 4.5X8X0.5	ヒラザガネ　４．５Ｘ８Ｘ０．５	(4)
55		400-33444	FRONT_BASE_SPACER	トウブコテイドダイマエスペーサ	(4)
56		402-40054	SIGNAL TOWER RELAY CABLE ASSY	シグナルタワー中継ケーブル組	(1)
57		MAO-11532000	CORD STAPLE	コード　ステップル	(2)
58		401-29009	SIGNAL TOWER CABLE ASM	シグナルタワーケーブルクミ	(1)

18. Troubleshooting

Check that the display on the amplifier is as shown below at the beginning of sewing (there is no thread on this side of the bobbin case).

(The figure given below indicates the state that channel 1 is used.)



❶ "1" OFF
❶ ' "1" Right side lights up
❷ "D" Lights up
❸ "DPC" Lights up
❹ "ST" Lights up
❺ "9999"

* **❺ If the display on the amplifier is about "9000", the DPC function will work to automatically correct the value to "9999".**

Q1 …… Stitching failure is sometimes missed (Error is not notified even when a stitching failure such as double catching, stitch skipping and/or thread breakage has occurred)

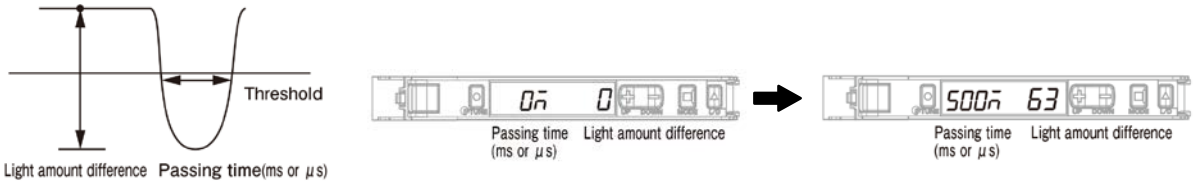
A. Check the following two items ① and ② in the written order.

① **Do you find any problem with respect to the error operation setting you have made on the operation panel?**
→Refer to "13. Setting the functions on the operation panel" p.24.

② **Carry out measurement with the solution viewer. Do you find any problem with respect to the transit time and/or the difference in the quantity of light received?**
→Refer to "12. Solution viewer function" p.22.

Transit time, **specification value =**
120 µs or more (milliseconds are all acceptable). If the transit time is smaller than 120 µs, the threshold should be increased.
*** The threshold can be changed with the "+" and "-" while the solution viewer mode is placed in ON.**

Difference in the quantity of light received, **specification value =**
5500 or more. If it is smaller than 5500, carry out the procedure described in **"9. Turning the sensor" p.16** again.
If the difference in the quantity of light received is still smaller than 5500 even after you have carried out tuning of the sensor, carry out the procedure described in **"8. Adjusting the sensor position" p.13** again.



The aforementioned specification values are the result of the test using FUJIX Ltd. for Resilon #60 thread.
It is necessary to increase the specification value (to increase the transit time or to increase the difference in the quantity of light received) in accordance with the thread you use.
If you decrease the threshold, the detection sensitivity of the sensor will be increased, thereby decreasing the frequency of missing the stitching failure. In this case, however, frequency of false detection will increase.

Q2 …… False detection occurs. (Error is notified though any stitching failure such as double catching, stich skipping or thread breakage has not occurred.)

A. Check the following two items ① and ② in the written order.

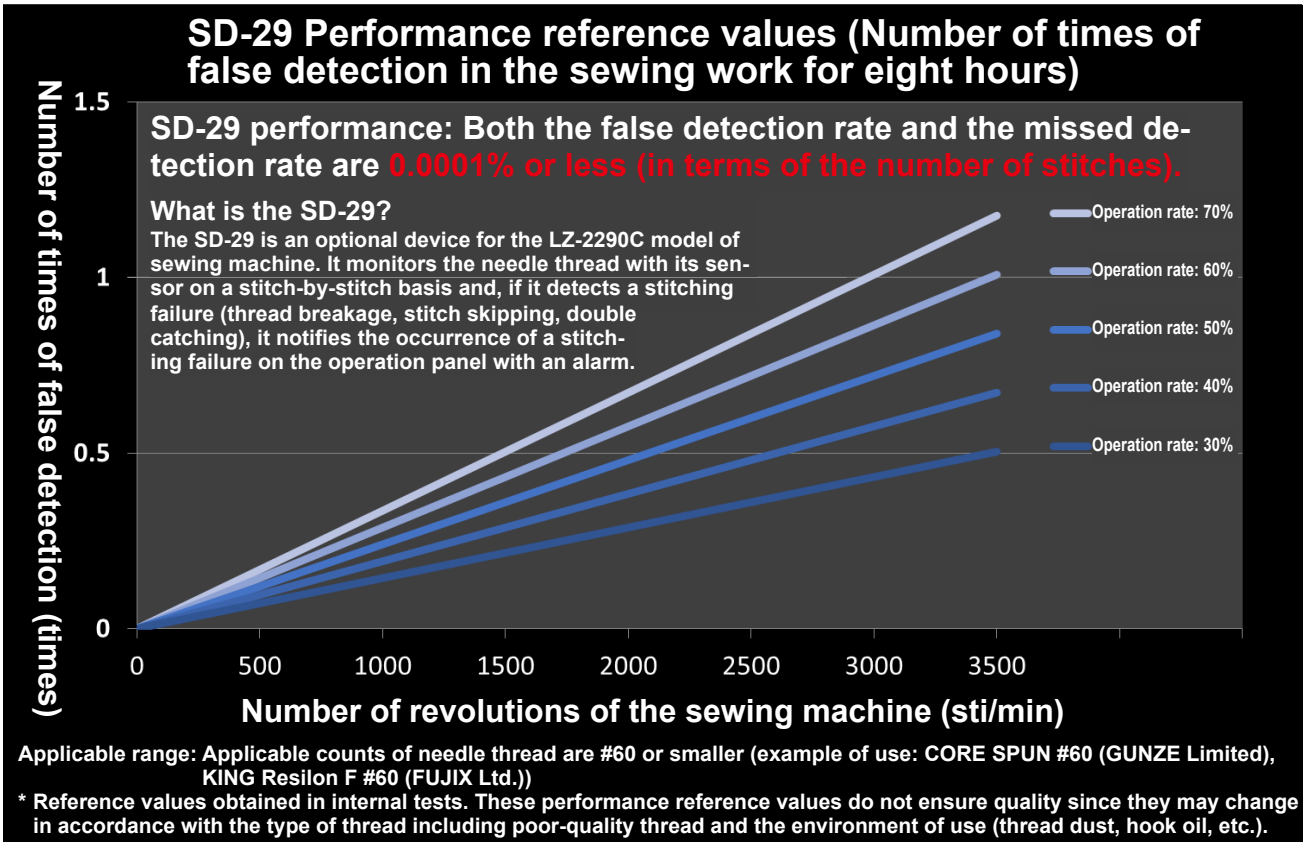
① **Carry out measurement with the solution viewer. Do you find any problem with respect to the measurement result of the transit time and/or the difference in the quantity of light received?**

→Refer to"Q1-A ② ".

→Contrary to "Q1-A ② ", however, increasing the threshold will decrease the detection sensitivity of the sensor and decrease the frequency of false detection. It should be remembered that in this case the stitching failure may be missed more.

② **How many malfunctions occur a day?**

→In the case the number of malfunctions that occurs in a day is close to the value shown in the performance graph given below, the sewing machine/device is operating normally.



Applicable range: Applicable counts of needle thread are #60 or smaller (example of use: CORE SPUN #60 (GUNZE Limited), KING Resilon F #60 (FUJIX Ltd.))

*** Reference values obtained in internal tests. These performance reference values do not ensure quality since they may change in accordance with the type of thread including poor-quality thread and the environment of use (thread dust, hook oil, etc.).**

Since this device gives priority to prevention of missing of a stitching failure, it detects an error when the sewing machine falls into the state that is close to a stitching failure.

- **When you decrease the threshold, the detection sensitivity of the sensor will be increased, thereby reducing the frequency of missing the stitching failure. In this case, however, frequency of false detection may increase.**
- **When you increase the threshold, the detection sensitivity of the sensor will be decreased, thereby reducing the frequency of false detection. In this case, however, frequency of missing the stitching failure may increase.**

If the number of malfunctions that occurs in a day is larger than the value shown in the performance graph given below, carry out measurement with the solution viewer. The performance will be improved by increasing the transit time or increasing the difference in the quantity of light received, as compared with the current values, in accordance with the measurement result.

Refer to "12. Solution viewer function" p.22.

Q3 …… The quantity of light fails to reach "9999".

A. Check the following two items ① , ② , ③ and ④ in the written order.

① **Check whether or not any of the below-stated phenomena 1 to 4 has occurred.**

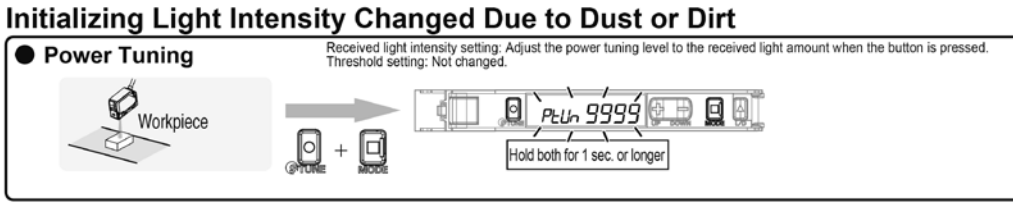
1. **The state where "the operation plate remains in its lower position" or "bobbin case is not placed in the hook"**
   → Put a bobbin case in the hook and lift the operation plate.
2. **The bobbin case, the sensor head and the reflective seal are stained.**
   → Remove the stains from the bobbin case and the sensor head with a piece of clean waste cloth or the like.
3. **The operation plate (index plunger) has moved out of its correct set position.**
   → Re-install the operation plate to its correct set position.
4. **The sensor has moved out of its correct position.**
   → Refer to "12. Solution viewer function" p.22.

② **Check whether or not the DPC function is turned ON during sewing.**

Be sure to turn OFF the DPC function before adjusting the sensor position.

③ **Carry out the power tuning. Carry out measurement with the solution viewer.**

- **Method for carrying out the power tuning**

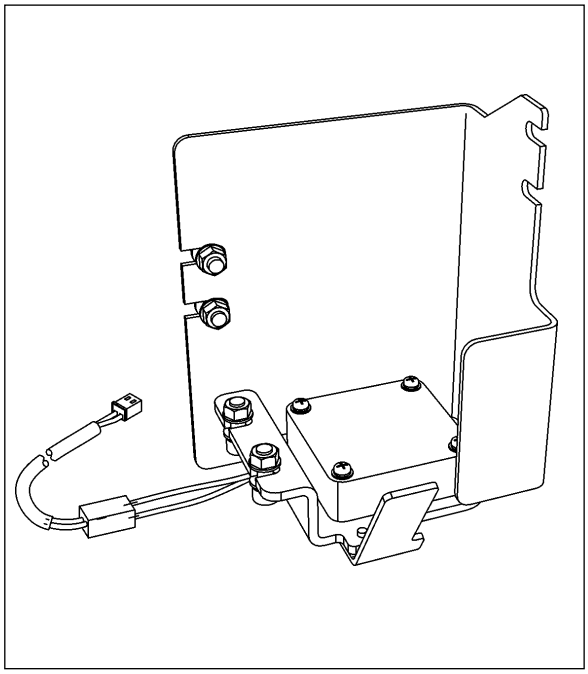


- **Refer to "12. Solution viewer function" p.22 for the solution viewer.**

④ **If the specification value is not obtained in the procedure as described in ③ , the sensor may have moved out of its correct position.**
→ Refer to "8. Adjusting the sensor position" p.13.
→ Refer to "9. Turning the sensor" p.16.

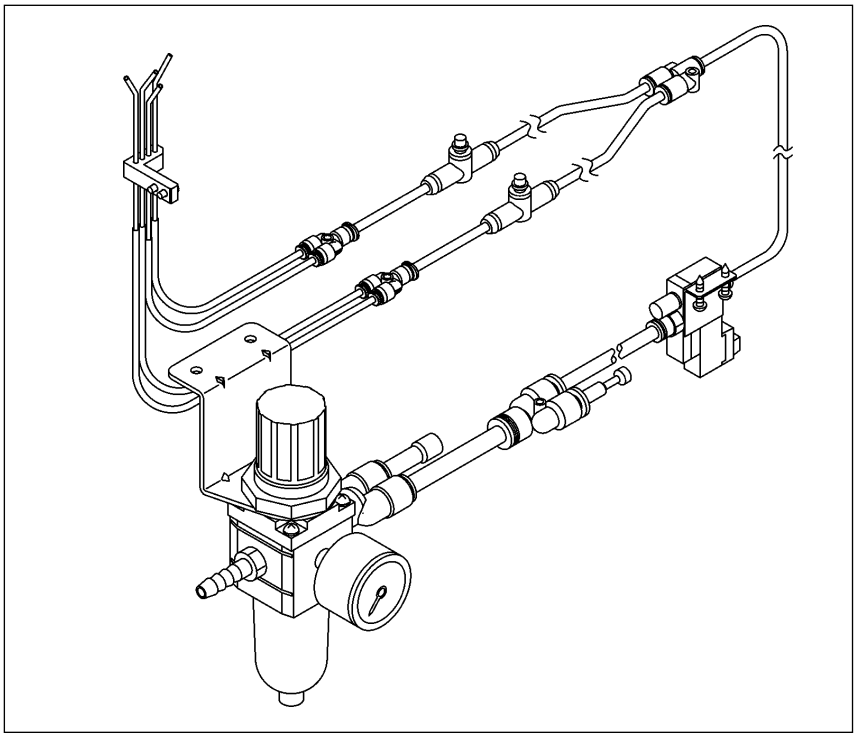
Q4 …… I am worried about the hook that becomes hot.

A. When you use this device, it is recommended to minimize the hook oil amount in order to maintain and improve performance of the device.
If you worry about the hook heating, use the optional part (separately available), "hook cooling device (part number: 40250042) as shown in the figure given below.



Q5 …… I am worried about stains such as cloth chips, thread waste, oil, etc. (In the case the sensor head, bobbin case and/or the reflective seal are frequently stained with them)

A. When you use this device, it will not be able to detect a stitching failure correctly if there are obstacles such as cloth chips on the sensor light path.
If you are worried about stains such as cloth chips or if you need to clean the device frequently, use the optional part (separately available), "air blower set (part number: 40240043) as shown in the figure given below.



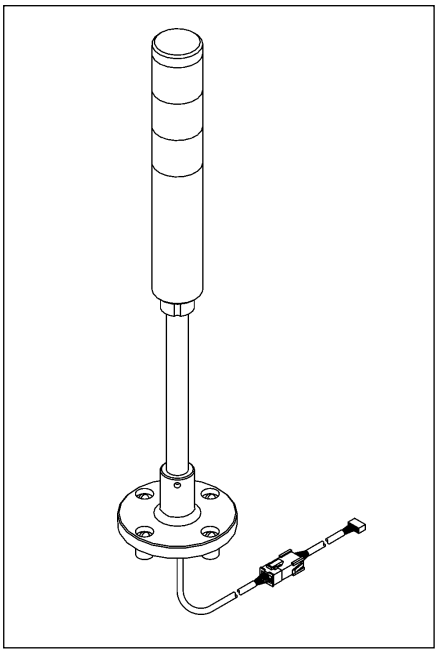
Q6 …… It is difficult to identify the error.

A. It is possible to increase the duration of error notification sound (up to 2.5 seconds) with the memory switch.

→ Refer to "13. Setting the functions on the operation panel" p.24.

If you still find it difficult to identify the error even after carrying out the above, use the optional part (separately available), "signal tower set (part number: 40250044).

*** When you use the optional signal tower set, the volume of the buzzer sound can be increased and the error can be identified with color as described below. (It is also possible to generate a warning before the sewing machine stops.)**



・Signal lamp (optional)

During the sewing machine rotation	Normal	Double catching	Stitch skipping
	Green	Yellow	Red
In the normal condition	ON	OFF	OFF
Detection of a stitch skipping (before confirmed)	ON	OFF	ON
Detection of a stitch skipping (confirmed)	OFF	OFF	ON
Detection of a double catching (before confirmed)	ON	ON	OFF
Detection of a double catching (confirmed)	OFF	ON	OFF

While the sewing machine is at rest	Normal	Double catching	Stitch skipping
	Green	Yellow	Red
Sensor OFF	Same as the time when the sewing machine is rotating		
When ON state of the sensor is detected	ON	OFF	ON
Light quantity reduction error	OFF	OFF	ON

[Example of use]

In the case the times of occurrence of stitch skipping that can be accepted as normal is twice