

Yamato[®]

Instruction Manual

SIDE SEAM SENSING DEVICE FOR BLINDSTITCH HEMMING

CH20

AZ-G, AZF-G


Before using this sewing equipment, please read the instruction manual and understand the contents well.

After reading the instruction manual, please keep it in a location where it is easy to access for operators.

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Attention

◇ This instruction manual is designed mainly for technicians, but it is advisable that also operators read the instructions with  mark to use the machine properly.

◇ The numbers in lower left corners of figures are figure numbers. We use them in texts as needed for your reference.

Attention

The description in this instruction manual is subject to change for improvements of the commodity without notice.

1. Outline

Features on CH20

① Off-stitch prevention

Off-stitch can be prevented because this is stepped part detection type. When the stepped part at joint seam passes the blind-hemming guide, the sensor detects the stepped part and the slide edge guide moves to the right to prevent off-stitch.

② Guide fix

Stable seam can be obtained and very beautiful sewing will result because the blind-hemming guide is fixed securely with the solenoid during sewing. Also when the stepped part of joint seam passes the blind-hemming guide and the sensor, the guide is fixed and the sensor detects the stepped part correctly.

③ Easy guide operation

The blind-hemming guide is raised by pressing the knee switch lightly and manual raising is unnecessary, and the beautiful sewing finish. When placing a fabric, the blind-hemming guide is free (no load), and placing of a fabric is easy.

④ Easy interchanging to plain sewing (with TC device only)

When CH device swings out frontward and the lever of TC device moves to plain sewing direction, the tension changes from blind hemming to plain sewing and easy plain sewing is possible.

⑤ Easy cleaning

Swing-out type of CH device can be easy to clean the device.

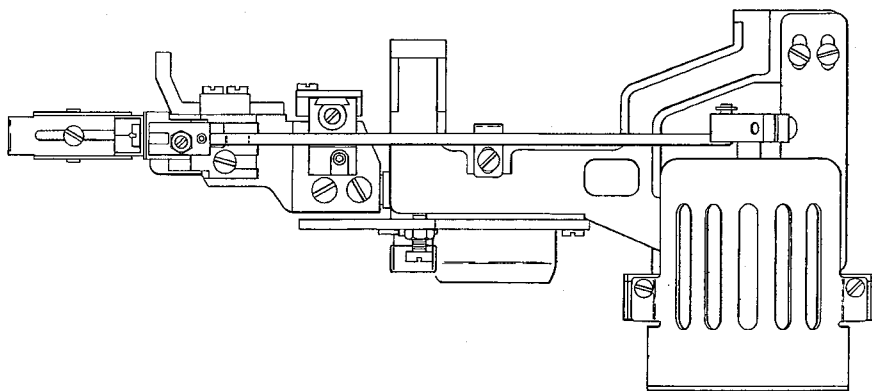


Fig. 1 CH device

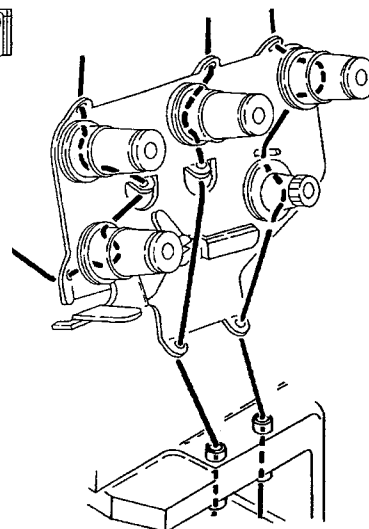


Fig. 2 TC device

2. Installation

2.1 Installation

WARNING

Before operating, ALWAYS turn the motor power switch OFF and check that the motor has already stopped.

Install the control box at the right or left end on the back surface of the machine table, and the knee switch on the right or left side easy to operate. Refer to Fig. 3 to connect those connectors with the same color and shape, and the power cord to the control box.

CAUTION

To prevent something moving from hitting and tearing the cord, attach the cord to some place like the table legs. Be careful not to damage the cord.

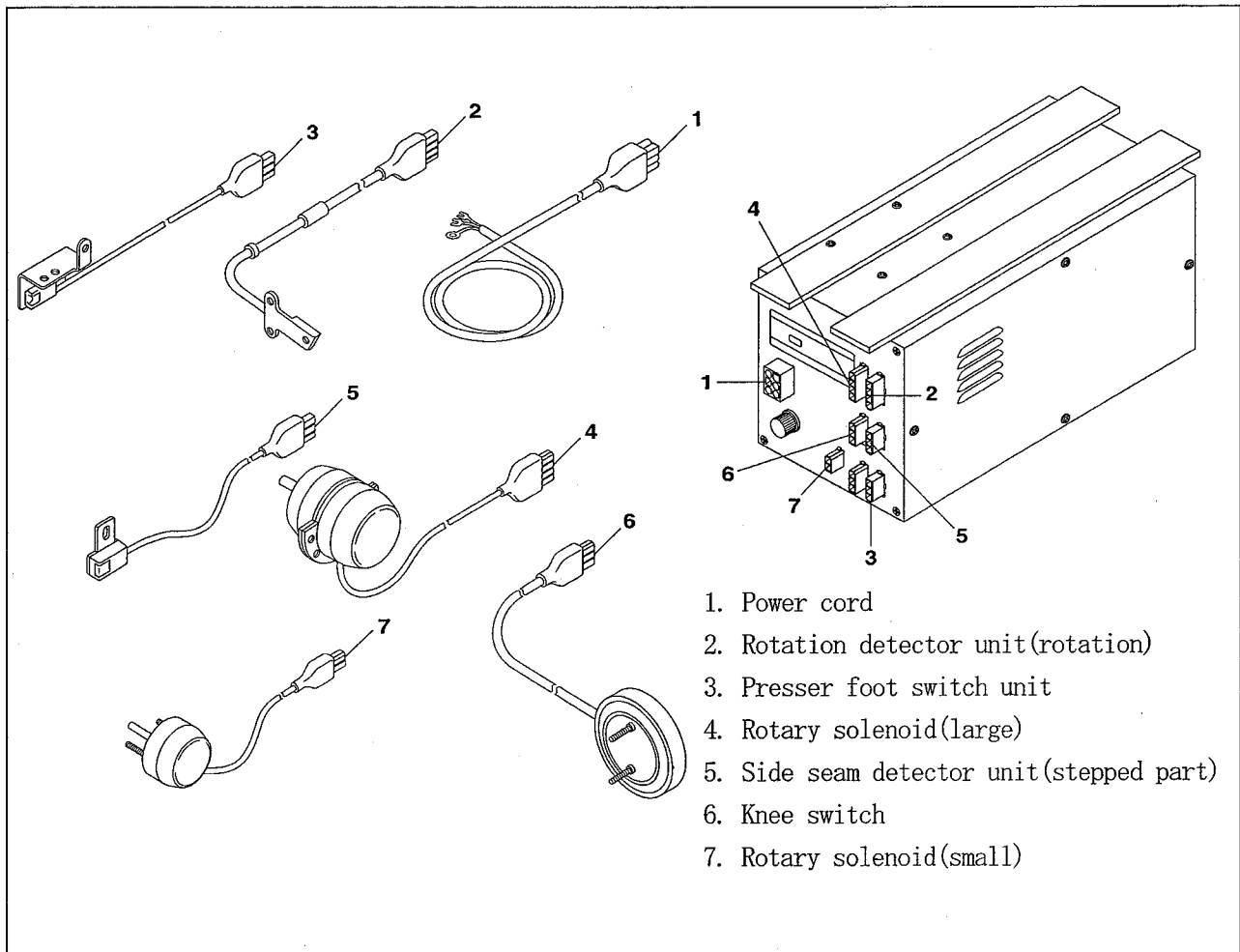


Fig. 3

⚠ WARNING

Unplug the motor power cord from the outlet when operating.

Turn OFF the power switch on the control box.

2.2 Connecting power cord

Use the power cord applicable to the voltage indicated.

If not different from standard, change the power cord and fuse.

Connect the red and black cords to the terminals on the motor's side of the power switch.

The green cord is a ground wire. Connect it to the same screw to which the ground wire of the motor's side is connected.

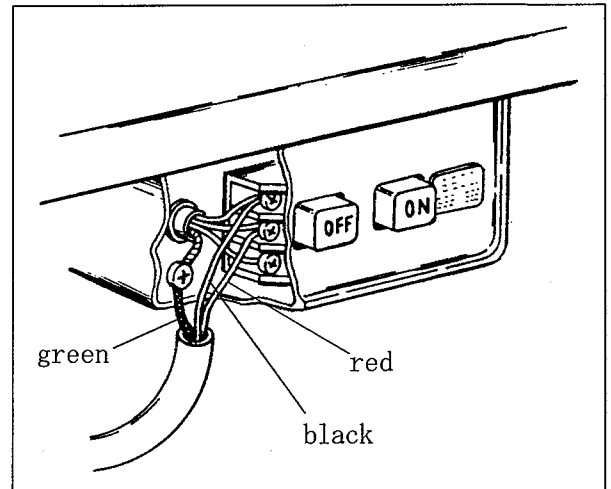


Fig. 4

2.3 Precautions

- ◇ Use always those fuses applicable to the capacity of the power voltage used, referring to Table 1.
- ◇ Even if fuses are the same size, their capacities can be different. Be sure to check printed capacities.

⚠ CAUTION

Using inapplicable power cord or fuse can damage the machine.

| Power supply voltage | Power cord part No. | Fuse capacity |
|----------------------|---------------------|---------------|
| 100 V | 11943 | 2 A |
| 200 V | 11944 | 1 A |
| 220 V | 11945 | 1 A |
| 380 V | 11946 | 0.5 A |

Table 1

3. Proper operation

3.1 Opening front cover

When adjusting the looper, open the front cover as follows.

- (1) Slide the presser foot to the left.
- (2) Pull the part① of CH device frontward to swing out at 180° .
- (3) Slide the front cover to the right and tilt it frontward.

3.2 Sewing procedure

- (1) Turn on the power switch of the motor.
- (2) Turn on the power switch of the control box.
- (3) Fold a fabric into two, insert it into the blind-hemming guide, and pull down the guide horizontally.

Raise the presser foot to set the fabric under it.

- (4) Lower the presser foot to start sewing.
 - Blind-hemming guide is fixed with the solenoid.
 - When the stepped part passes through the guide, the slide edge guide moves to the right to prevent off-stitches.
- (5) When coming the start point of sewing near the guide, push the knee switch to raise the blind-hemming guide.
- (6) Finish sewing.

3.3 Interchanging to plain sewing (with TC device only)

Interchange to plain sewing as follows.

- (1) Slide the presser foot to the left.
- (2) Pull the part① of CH device frontward to swing out at 180° . It is held with the solenoid holder fixing spring plate②. (Fig. 5)

- (3) Set the lever of TC device in the direction "T" . (Fig. 6)

Note: When not using CH device, turn "OFF" the power switch of the control box.

- (4) Reset the presser foot.

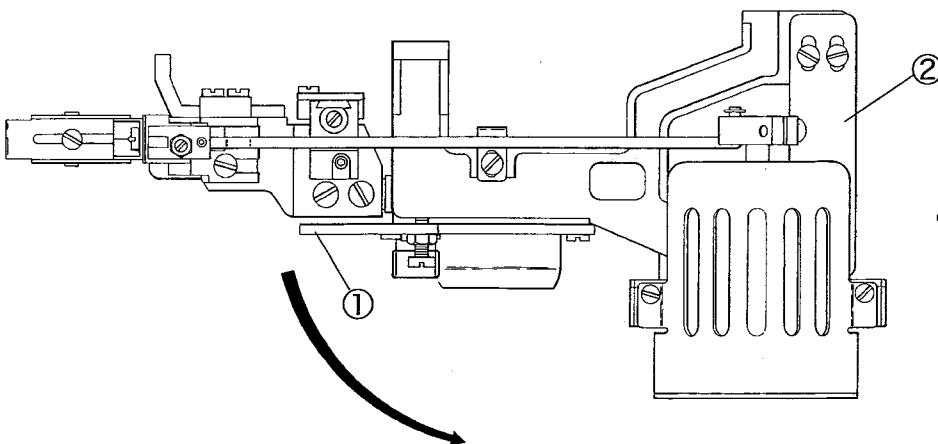


Fig. 5 CH device

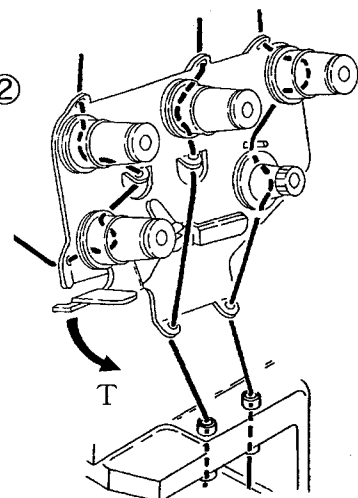


Fig. 6 TC device

3.4 Standard adjustment of hemming operation

- Adjust the differential feeding amount depending on a fabric.
- To set the blind-hemming edge guide as standard, align the left side of the slide edge guide with that of the needle.
 - Loosen the adjusting lever ① and turn the adjusting screw ② depending on the stitch depth.
 - To make the stitch deep, turn the adjusting screw ② to the right.
 - To make the stitch shallow, turn the adjusting screw ② to the left.

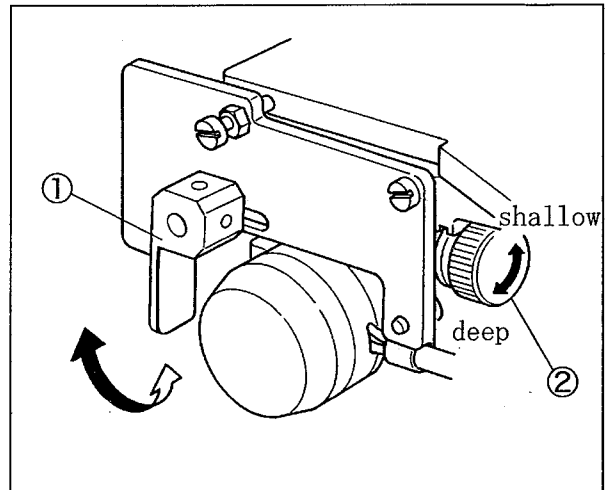


Fig. 7

- After setting the blind-hemming edge guide, fix the adjusting lever ①.
- Make the standard height of the blind-hemming edge ③ 2 mm above the top of the cloth plate. Loosen the screw ④ to adjust the height to feed a heavy weight fabric smoothly.
 - Loosen the screw ⑤ and move the hemming positioner ⑥ right or left to adjust the hemming width.

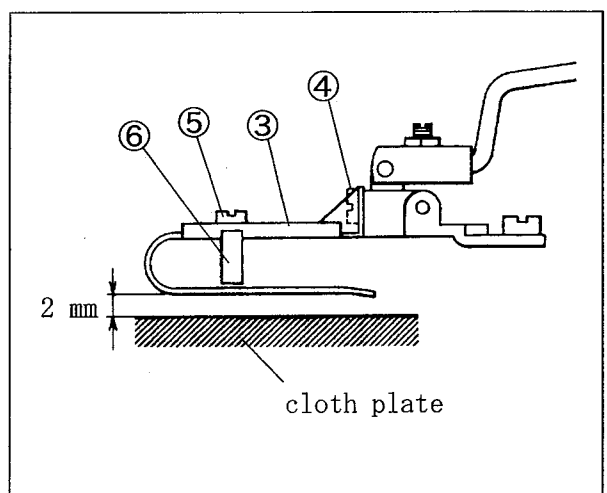


Fig. 8

- Set the sensitivity adjusting knob ⑦ to "5" - "6" for the sensor of the control box.
- Set the operation count(front) ⑧ for the slide edge guide to "2", the operation count(rear) ⑨ to "6".

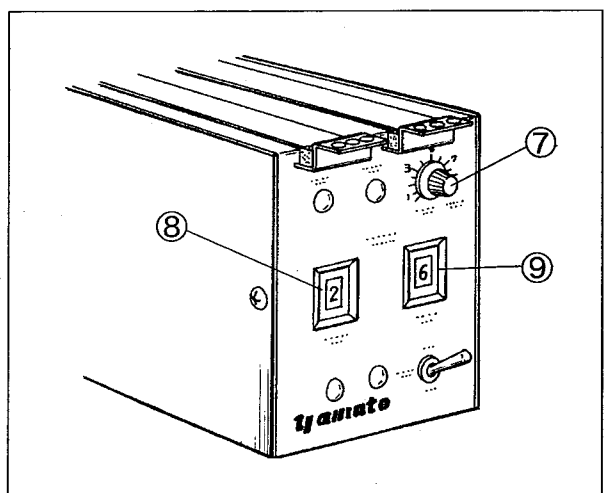


Fig. 9

3.4 Each name on control box

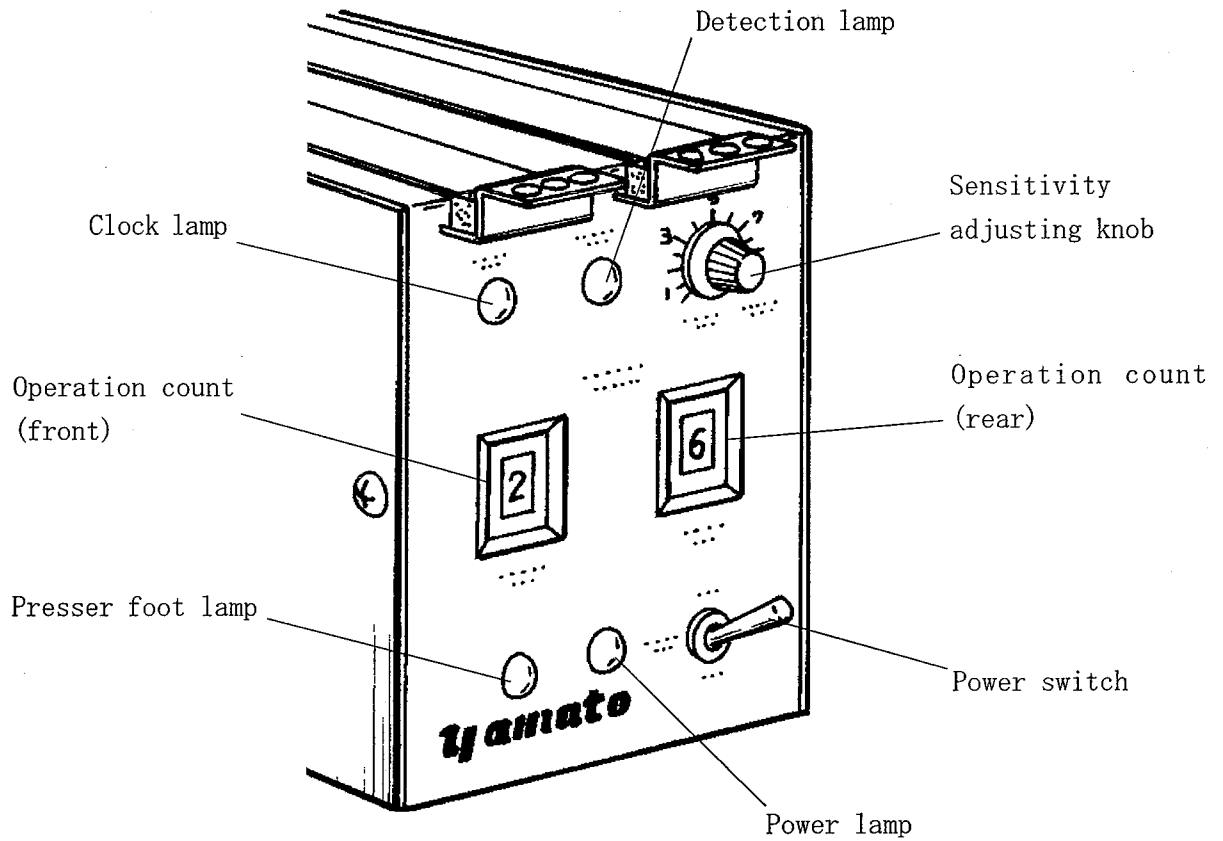


Fig. 10

- Power switch
 - Power lamp
 - Presser foot lamp
 - Operation count (front)
 - Operation count (rear)
 - Sensitivity adjusting knob
 - Detection lamp
 - Clock lamp
- It turns on when the power switch is on.
- It turns on when the presser foot switch is on.
- After detecting the stepped part, the count (front) sets the stitch number before the slide edge guide moves to the right, and the count (rear) sets it before the guide returns.
- It adjusts the sensitivity to detect the stepped part.
- It turns on when the sensor detects the stepped part.
- It turns on every time a machine runs one rotation.

4. Adjustments

4.1 Relation between fabric elasticity and differential feeding amount

Differential feeding amount should be adjusted depending on kind of fabric elasticity.

When hemming operation, especially on stepped parts, increasing amount than plain sewing will be sewn on stepped part better. Also beautiful finish can be obtained.

Refer to Table 2 to adjust the amount.

When differential feeding amount too much, the stitches become coarser. Press the push button to rotate the pulley and adjust the proper stitch length.

| Kind of fabric | Graduation for differential feed dog |
|---|--------------------------------------|
| Stretchable fabric (synthetic fiber, etc.) | 1.9 - 2.1 |
| Medium stretch fabric (general knitted fabric) | 1.6 - 1.8 |
| Stretchless fabric (general cotton cloth, etc.) | 1.0 - 1.2 |

Table 2

4.2 Blind-hemming guide and blind-hemming edge guide

WARNING

Before adjusting, ALWAYS turn the motor switch OFF and check that the motor has already stopped.

- Set the left end of the slide edge guide 1.5 mm inside that of the blind-hemming edge guide①. Loosen the nut③ and turn the adjusting screw④ to adjust it.
- Set the blind-hemming guide② 2.7 mm inside the left end of the blind-hemming edge guide①. Loosen the screw⑤ to adjust it.
- Make the standard clearance between the sensor⑥ and the right end of the blind-hemming guide② to 0.8 mm. Loosen the screw⑦ to adjust it. Adjust the clearance depending on the thickness of fabric or stepped size. Increase the clearance when sewing heavy weight fabric or large stepped parts.

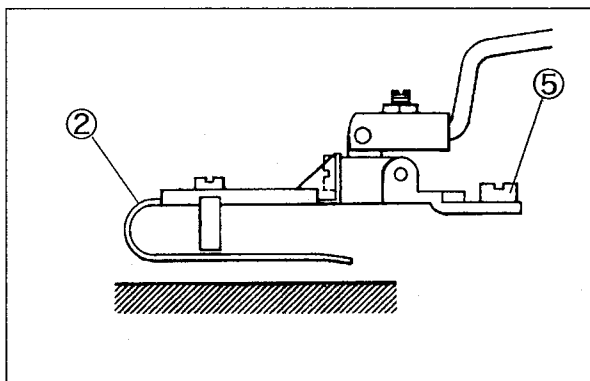


Fig. 13

- Make the standard height of the blind-hemming edge guide from the top of the stitch plate to the bottom of the guide to 0.1 mm. Too high position of it cannot detect the stepped part. Loosen the screws⑧⑨ and move CH device up or down to adjust it. After that, check the slide edge guide moves smoothly.

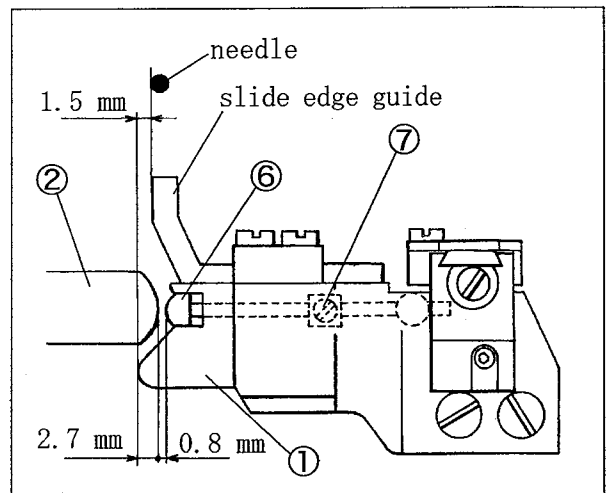


Fig. 11

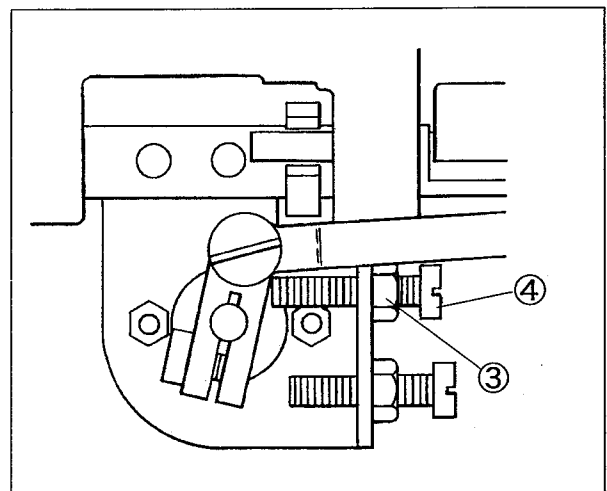


Fig. 12

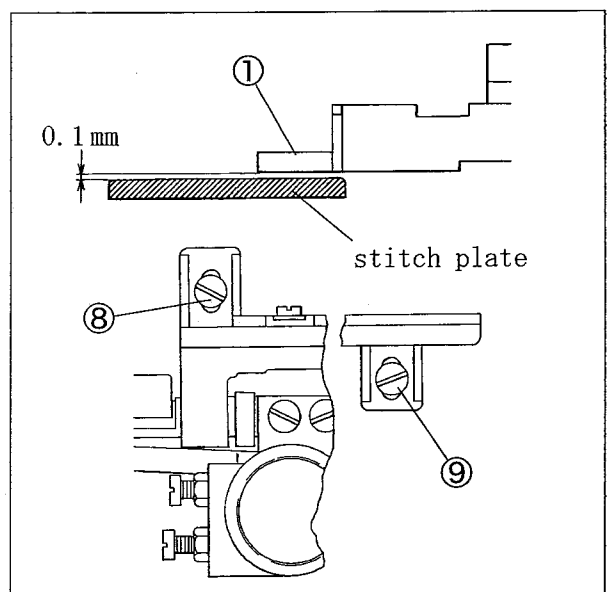


Fig. 14

4.3 Stepped part

4.3.1 Sensitivity on stepped part

Turn the sensitivity adjusting knob ① to adjust the sensitivity depending on thickness of fabric.

- When sewing heavy weight fabric, always the sensor detects and operate the slide edge guide, turn the knob to the left or to low number.
- When sewing light weight fabric, the sensor is difficult to detect the stepped part, turn the knob to the right or to high number.

If the above adjusting fails to detect, make the clearance between the blind-hemming guide and the sensor to 0.5 - 0.7 mm.

Note: Do not keep the detection lamp ② turning on.

4.3.2 Stitch depth on stepped part

Adjust the stitch depth on the stepped part by operating amount of the slide edge guide. Standard amount is 2 mm.

Loosen the nut ③ and turn the adjusting screw ④ to adjust it.

- To decrease the operating amount and make the stitch shallow, turn the adjusting screw ④ to the right.
- To increase the operating amount and make the stitch deep, turn the adjusting screw ④ to the left.

After adjusting, lock the adjusting screw ④ with the nut ③.

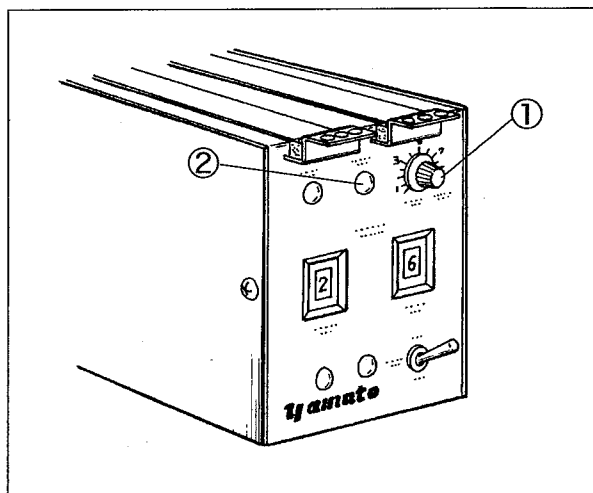


Fig. 15

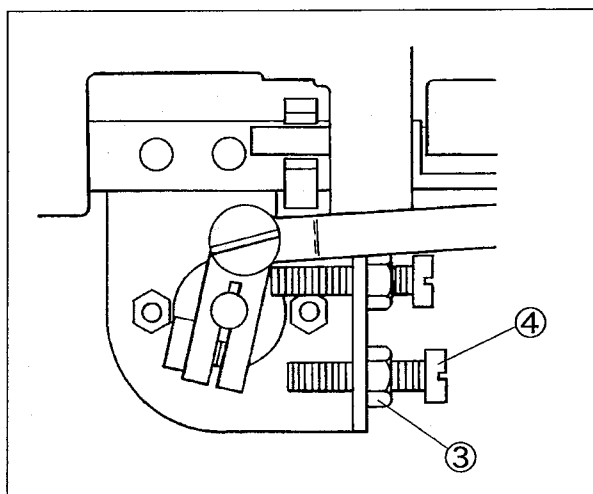


Fig. 16

4. Adjustments

4.3.3 Stitch number on stepped part of joint seam

The operation count (front) ① has been adjusted to "2" and operation count the (rear) ② to "6" at shipment.

When the sensor detects the stepped part, the slide edge guide moves to the right after two stitches. When the sensor finishes to detect the stepped part, it returns after six stitches.

Adjust the stitch number depending on the stitch length.

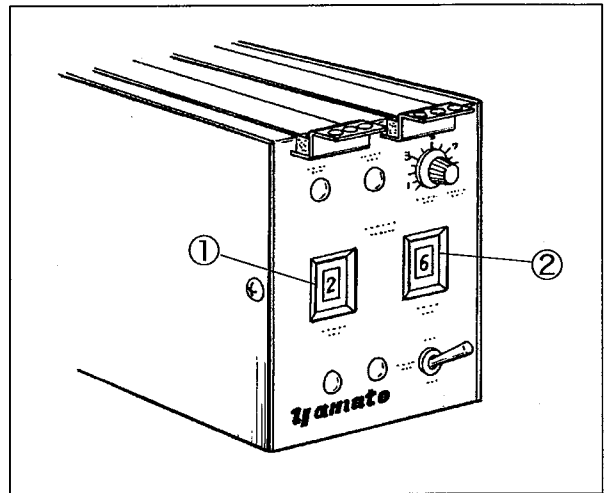


Fig. 17

- When much appeared stitches are many on a fabric before the stepped part, increase the number of the operation count (front) ①. If stitch depth is too shallow or off-stitch occurs, decrease the number.
- When much appeared stitches are many on a fabric after the stepped part, decrease the number of the operation count (rear) ②. If stitch depth is too shallow or off-stitch occurs, increase the number.

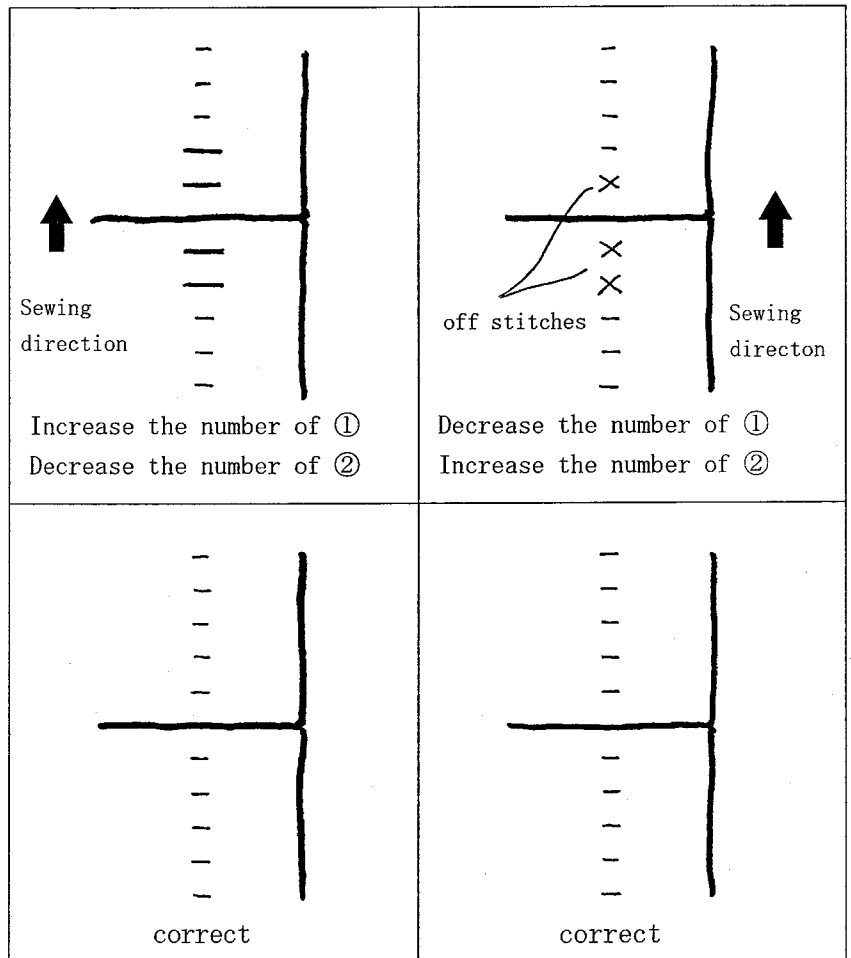


Fig. 18

4.4 Rotary solenoid (large) and blind-hemming guide

The blind-hemming guide can be put down until it is horizontally. Check it is tilted up enough when using.

Loosen the screw ① and keep the guide tilted up. Turn the shaft ② of the rotary solenoid (large) clockwise (seen from the shaft side) fully and fix it with the screw ①.

And fix the hemming guide interlocking lever ③.

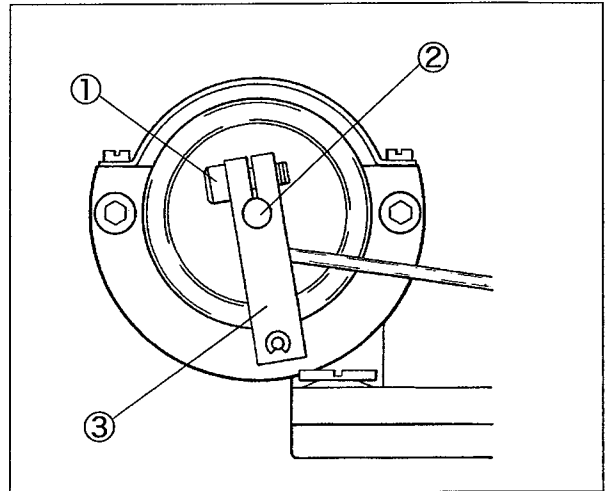


Fig. 19

4.5 Rotation detector unit

WARNING

Do not put your foot on the pedal not to run a machine.

Adjust the rotation detector unit so that the clock lamp ④ turns on when the needle tip is raised to the top of the stitch plate.

Loosen the screw when the needle tip is up to the top of the stitch plate.

Align the magnet ⑤ of the oil cooling fan magnet unit with the rotation detector unit ⑥.

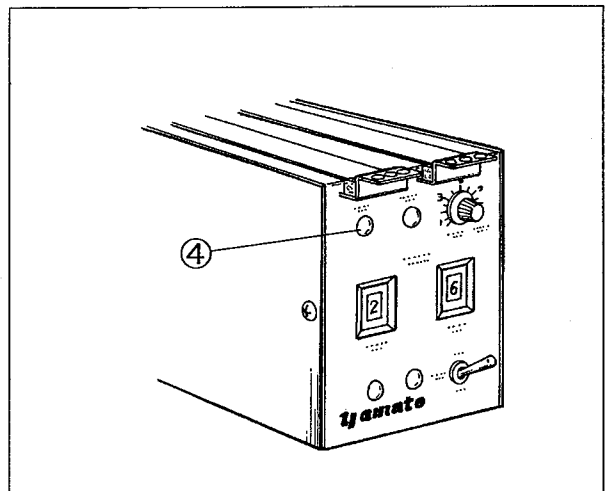


Fig. 20

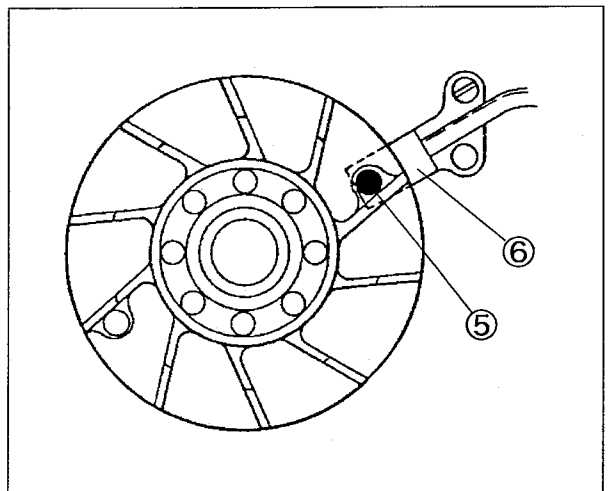


Fig. 21

4.6 Presser foot switch

Adjust the presser foot switch so that the presser foot lamp ① turns on when the presser foot is raised though it turns off usually.

Make the clearance between the rotation detector unit ② and the magnet ③ to 1.0 mm.

Loosen the screws ⑤ and adjust the position of the magnet basement to move the switch plate ④ smoothly.

Loosen the screw ⑥ and adjust the position of the switch plate ④ to move the presser foot lifter lever smoothly.

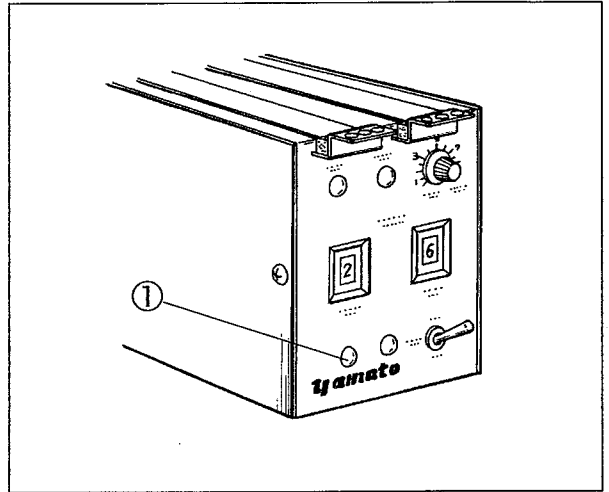


Fig. 22

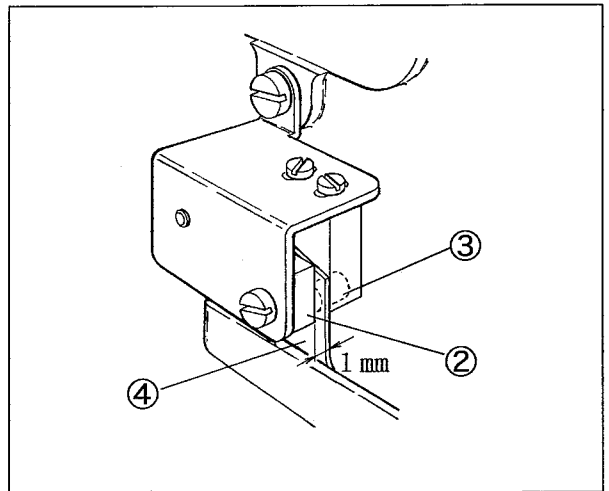


Fig. 23

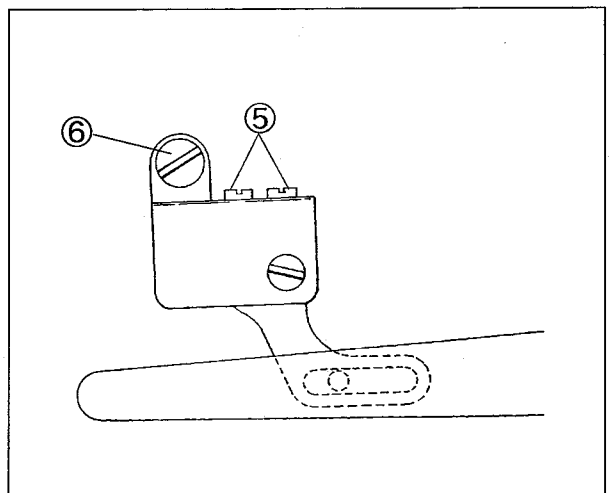


Fig. 24

4.7 Detection of stepped part (Side seam detector unit and magnet)

When the sensor is stayed, the detection lamp ① turns on at the graduation "10" of the sensitivity adjusting knob ② and turns off at "7". These are correct positions of the side seam detector unit and the magnet.

Turn the sensitivity adjusting knob ② to "1" - "3" and push the sensor fully. The detection lamp ① turns on.

Loosen the screw ③ and turn the adjusting screw ④ to adjust up-and-down position.

- To raise the side seam detector unit, turn it clockwise.
- To lower the side seam detector unit, turn it counterclockwise.

Loosen the screw ⑤ and turn the adjusting screw ⑥ to adjust right-and-left position.

- To move the side seam detector unit to the left, turn it clockwise.
- To move the side seam detector unit to the right, turn it counterclockwise.

Note: If the detection lamp turns on when the sensor is pushed fully on the graduation "0", adjust the variable resistor ⑦ in the control box as follows.

Set the sensitivity adjusting knob to "1" - "2".

Turn the variable resistor ⑦ to the right until the detection lamp turns off while pushing the sensor fully.

After that, adjust it mentioned above.

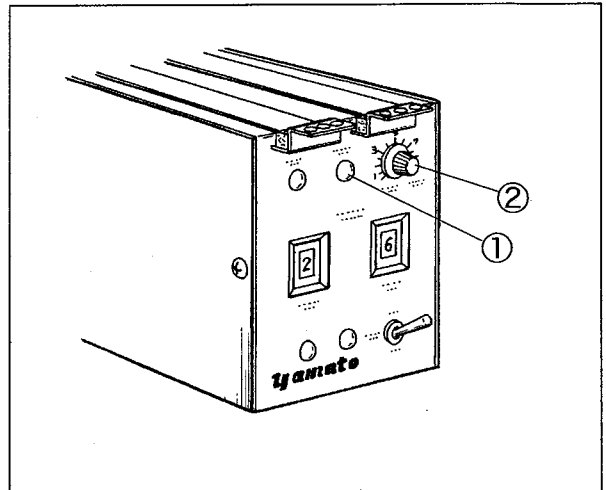


Fig. 25

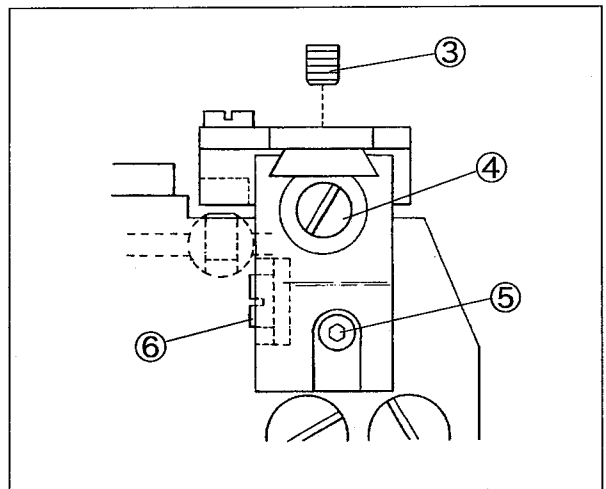


Fig. 26

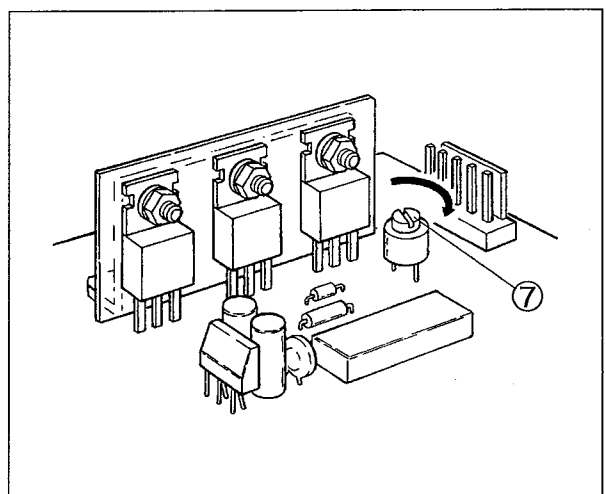


Fig. 27

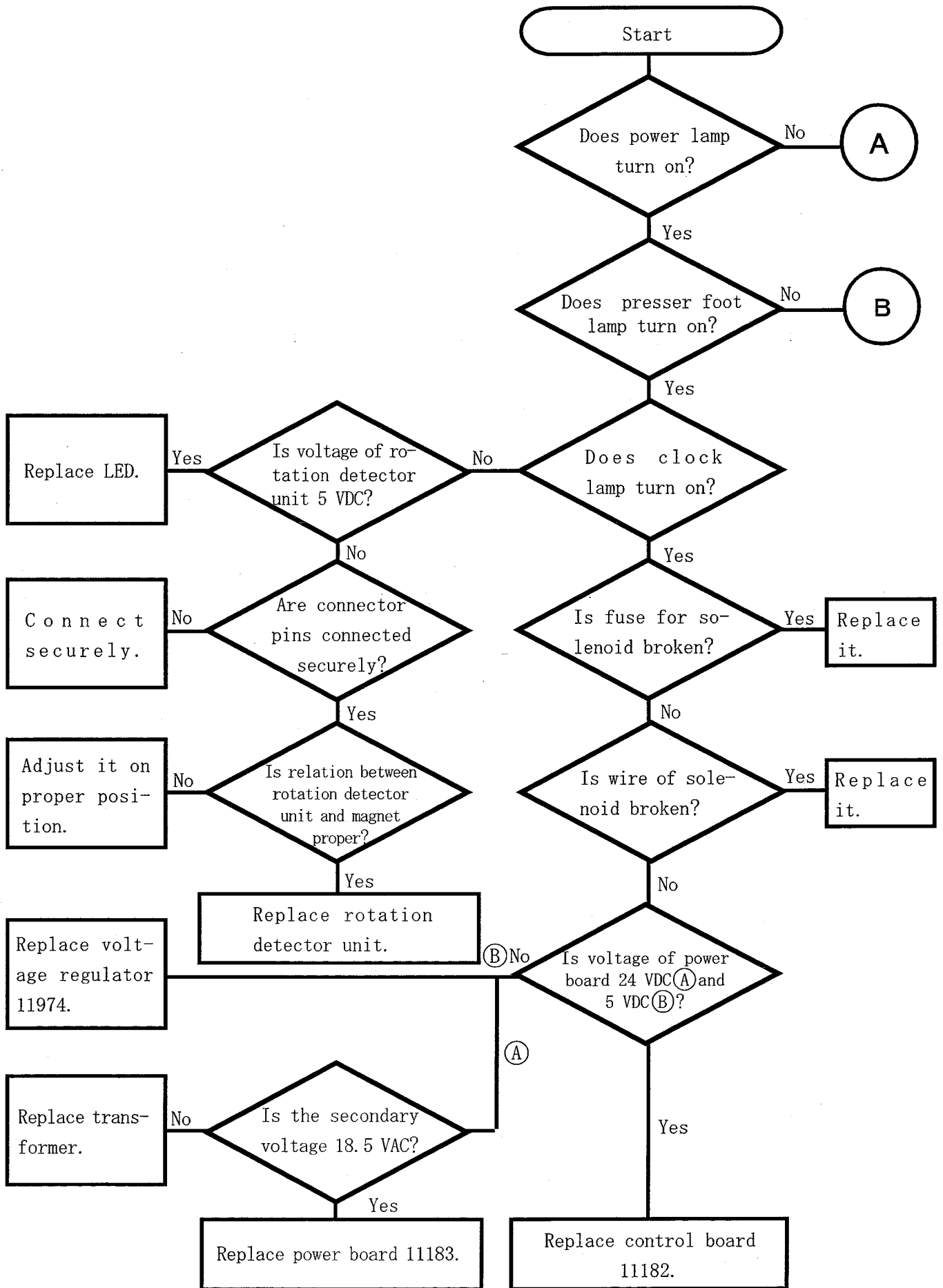
5. Troubleshooting

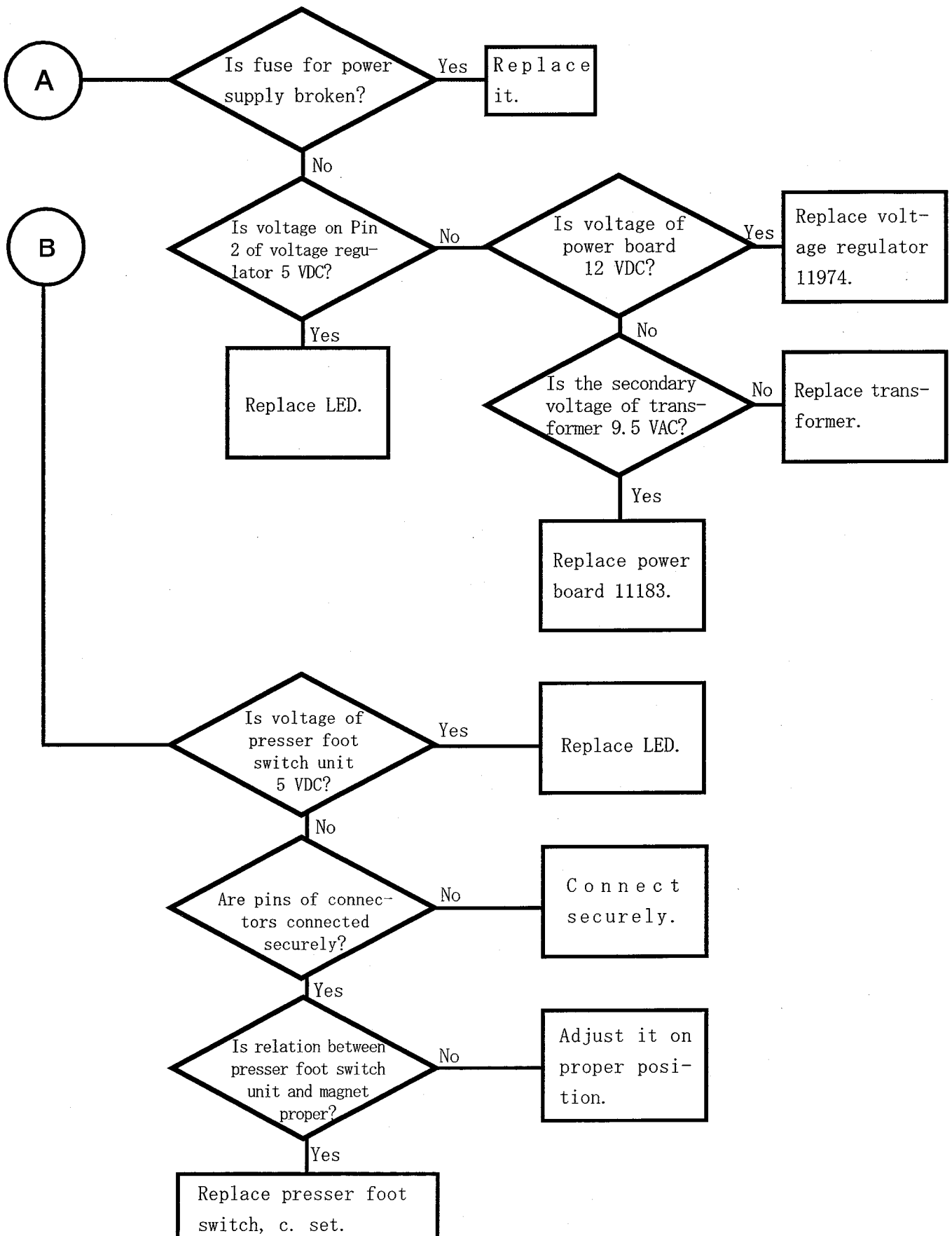
| No. | Malfunction | Cause | Countermeasures |
|-----|--|--|---|
| 1 | Power lamp does not turn on. | Refer to Attached chart 1. | |
| 2 | Clock lamp does not turn on. | Refer to Attached chart 1. | |
| 3 | Presser foot lamp does not turn on. | Refer to Attached chart 1. | |
| 4 | Slide edge guide moves during plain sewing. | ① Sensor detects too sensitively. | Refer to 4.3.1 to turn the knob to low number. |
| | | ② Clearance between guide tip and sensor is improperly. | Refer to 4.2 to adjust the clearance properly. |
| | | ③ Side seam detector unit and magnet are set on improper positions. If sensor is stayed and detection lamp turns off unless sensitivity adjusting knob indicates under "7", malfunction is easy to occur. | Refer to 4.7 to adjust position of side seam detector unit. |
| 5 | Detection lamp does not turn on at stepped part. | ① Sensor does not detect enough. | Refer to 4.3.1 to turn the knob to high number. |
| | | ② Sensor does not operate smoothly. | Remove dust around sensor. |
| | | ③ Clearance between the guide and sensor is too much. | Refer to 4.2 to adjust clearance properly. |
| | | ④ Side seam detector unit and magnet are set on improper | Refer to 4.7 to adjust the position of side seam detector unit. |
| | | ⑤ The guide is set on too high position. | Refer to 3.3 to adjust the height of the guide. |
| | | ⑥ The guide is not fixed securely. | Refer to Attached chart 3. |
| | | ⑦ Side seam detector unit itself is defective. | Replace it with new one with 2.7 - 3.3 VDC. |
| 6 | Though detection lamp turns on, slide edge guide does not operate. | The guide is set on low position. Refer to Attached chart 2. | Refer to Attached chart 2. |
| 7 | The guide cannot be fixed securely. | When a machine runs one rotation and clock lamp turns on, the guide should be fixed securely. If not fixed, refer to Attached chart 3. | |
| 8 | Blind-hemming guide lifter does not operate. | Refer to Attached chart 4. | |
| 9 | CH device does not operate. | Refer to Attached chart 1. | |
| 10 | Malfunction occurs. | The earth of power supply in factory is incompletely. | Pull the earth line of control box from machine motor switch, and machine can operate normally. Bury the earth line after connecting it to copper pipe to make securely. |

| No. | Malfunction | Cause | Countermeasures |
|-----|---|--|--|
| 11 | Stitches are sewn too deep on stepped part. | ① Movement of the edge is too much. | Refer to 4.3.2 to decrease the movement depending on the fabric. |
| | | ② The guide returns slowly. | Refer to 4.2 to adjust the clearance properly. |
| | | ③ The guide is set on too high position. | Refer to 3.3 to adjust the height of the guide. |
| | | ④ Slide edge guide and blind-hemming edge guide are set on improper positions. | Refer to 4.2. |
| 12 | Stitches are sewn too long deep on stepped part. | Operation counts are set on improperly depending on the stitch length. | Adjust the counts depending on the stitch length. ① Increase the number of the count (front). ② Decrease the number of the count (rear). Refer to 4.3.3. |
| 13 | Off-stitches are sewn on the rear of the stepped part | ① Movement of the edge is not enough. | Refer to 4.3.2 to increase the movement. |
| | | ② Stitch depth on flat seam is too shallow. | Refer to 3.3 to adjust it with adjusting screw. |
| | | ③ Operation count (rear) is set improperly. | Refer to 4.3.3 to increase the number of the count (rear). |
| | | ④ Stepped part stitch is fallen down forcedly in the direction difficult to fall down. | Adjust looper thread tension or change sewing direction. |
| | | ⑤ Fabric is pulled too much. | Do not pull a fabric too much. |
| | | ⑥ Fabric jam occurs on stepped part. | Decrease pressure of presser foot. Increase differential feeding amount. Set differential feed dog higher. Adjust position of presser foot half-stay to tilt presser foot (lower) forward down. |
| 14 | Off-stitch are sewn on the front of the stepped part | Number of the count (front) is too high. | Refer to 4.3.3 to decrease the number of the count (front). |
| 15 | The rear stitches on the stepped part is too deep. | Fabric is not set horizontally to the blind-hemming edge guide. | Hand the lower part of the fabric to feed horizontally. |

Attached chart 1

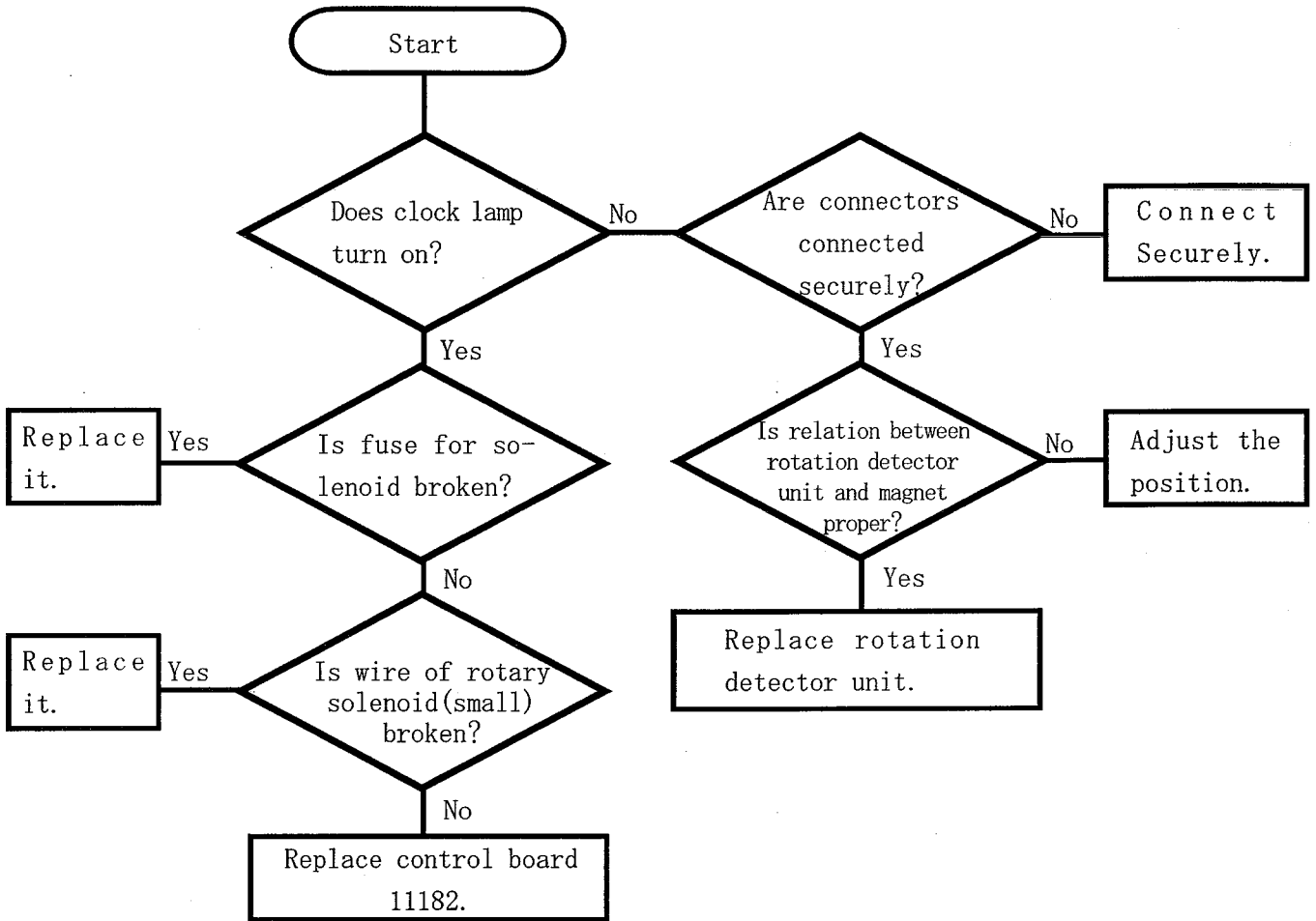
CH device itself does not operate.





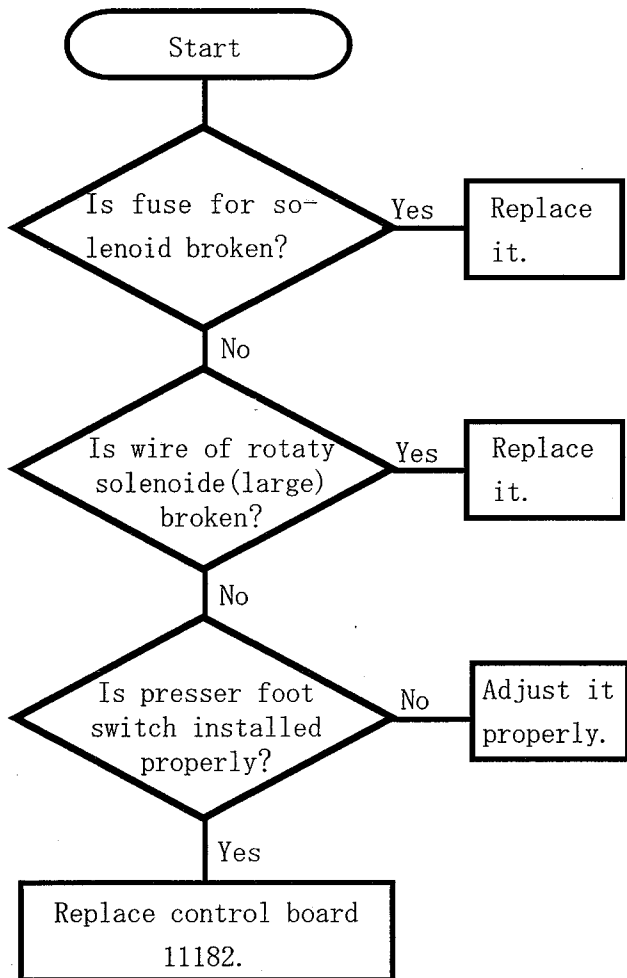
Attached chart 2

Though detection lamp turns on,
slide edge guide does not move.



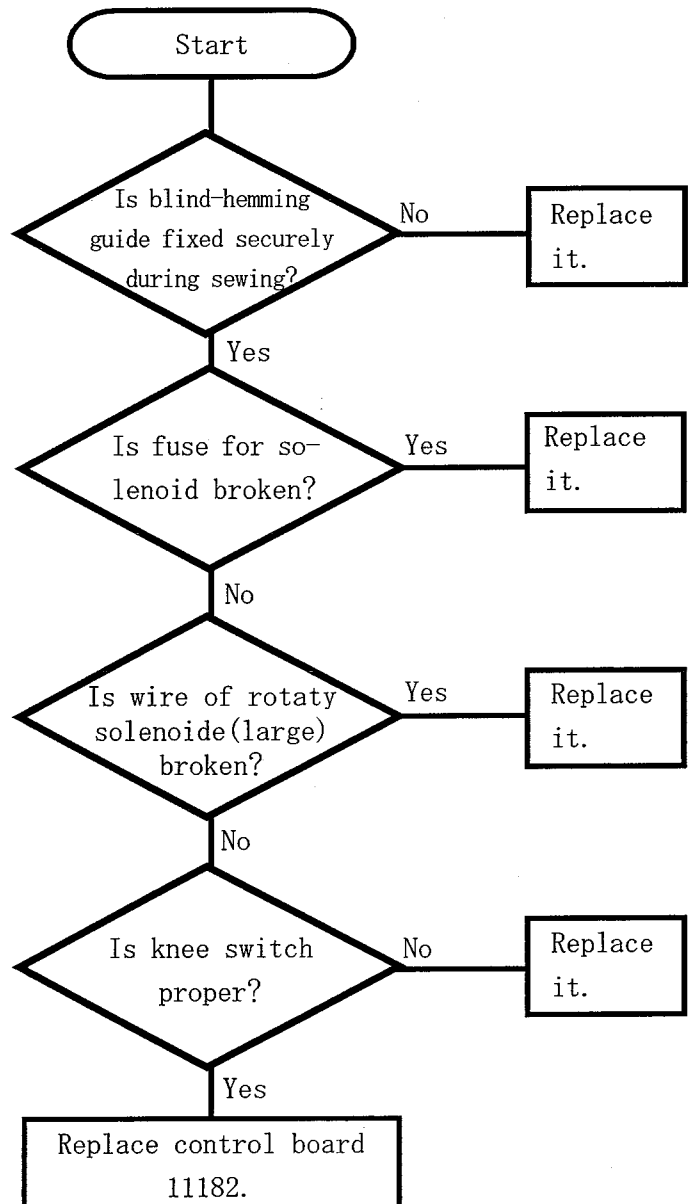
Attached chart 3

Blind-hemming guide cannot be fixed securely.



Attached chart 4

Blind-hemming guide lifter does not operate.





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