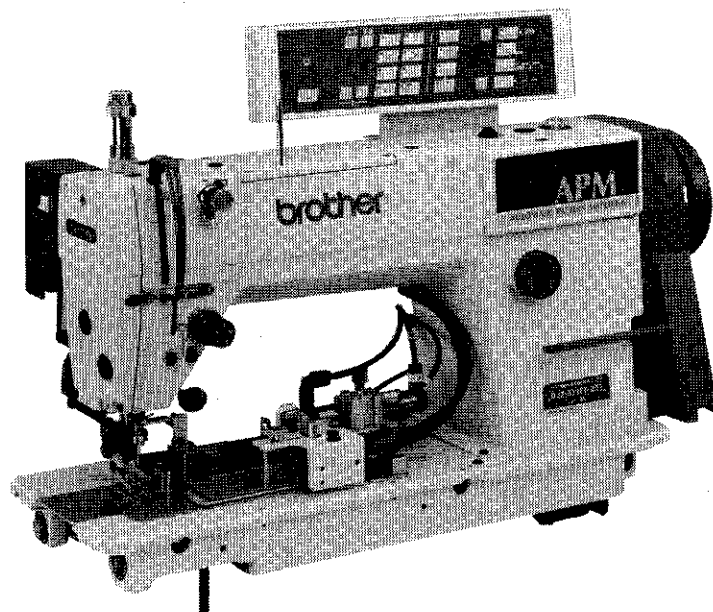


**SERVICE MANUAL
FOR
DB2-B7700**

APM

**LOCK STITCH, AUTOMATIC PATTERN
MATCHING SEWING MACHINE**



Also read the service manual for the DB2-8774
 Refer to this service manual DB2-7700 for those parts which are common to both models.

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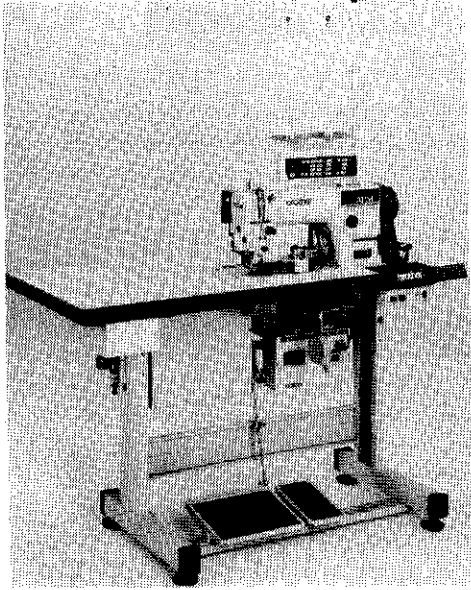
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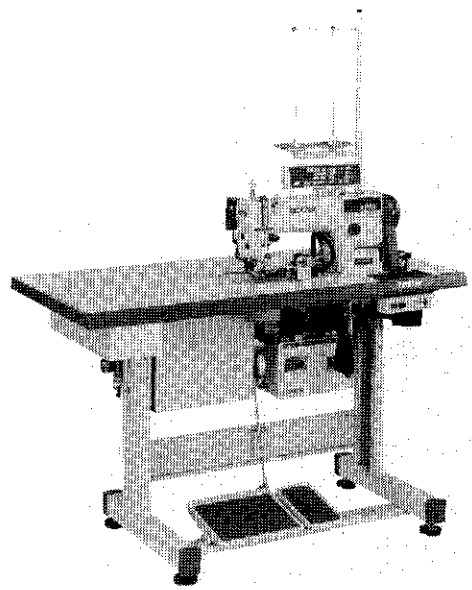
SPECIFICATIONS

1 Specifications code

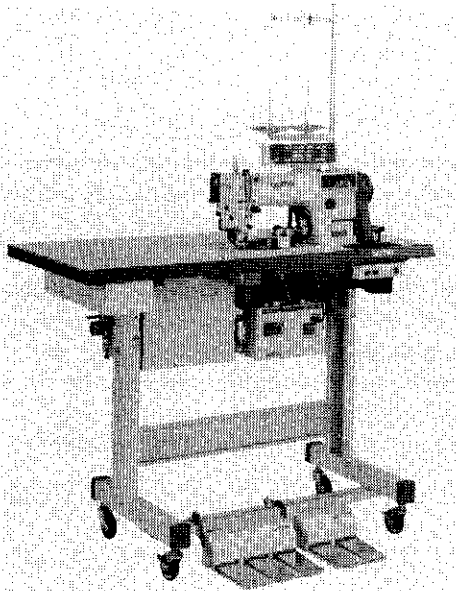
[Knee lifter]



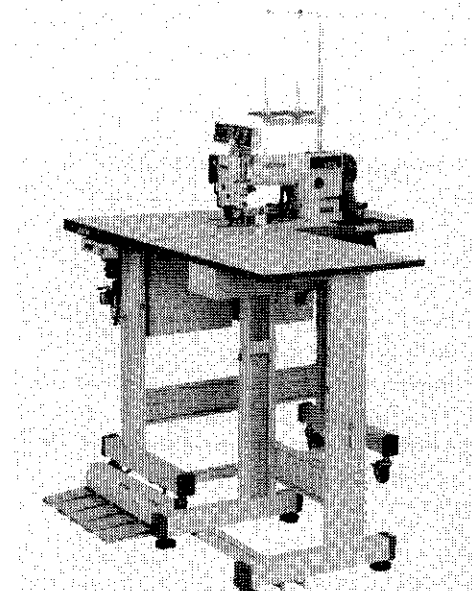
[Presser foot lifter]



[Stand - up operation]



[Edge seamer type]



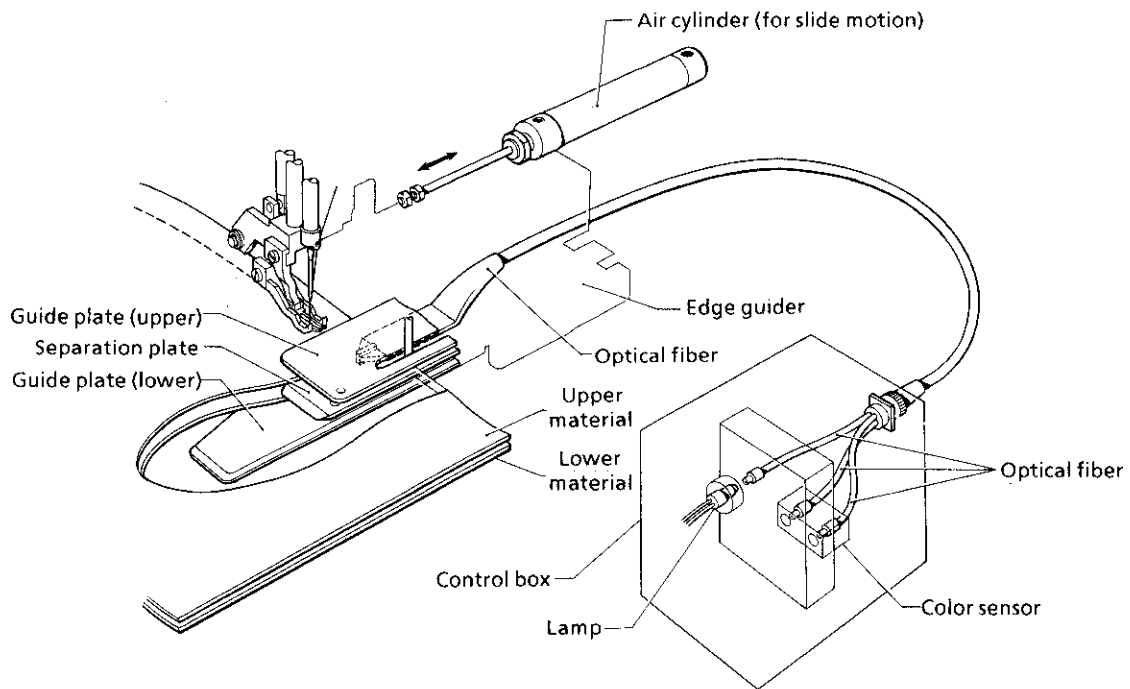
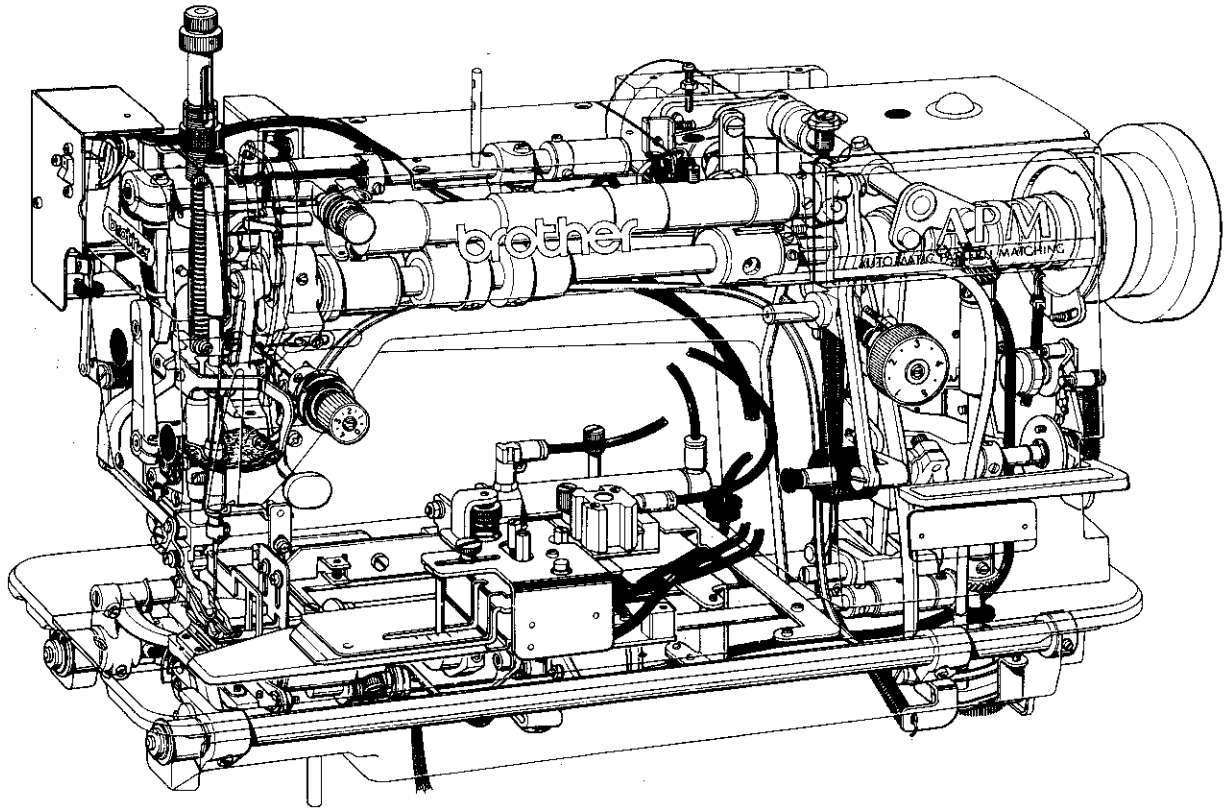
2 Specifications



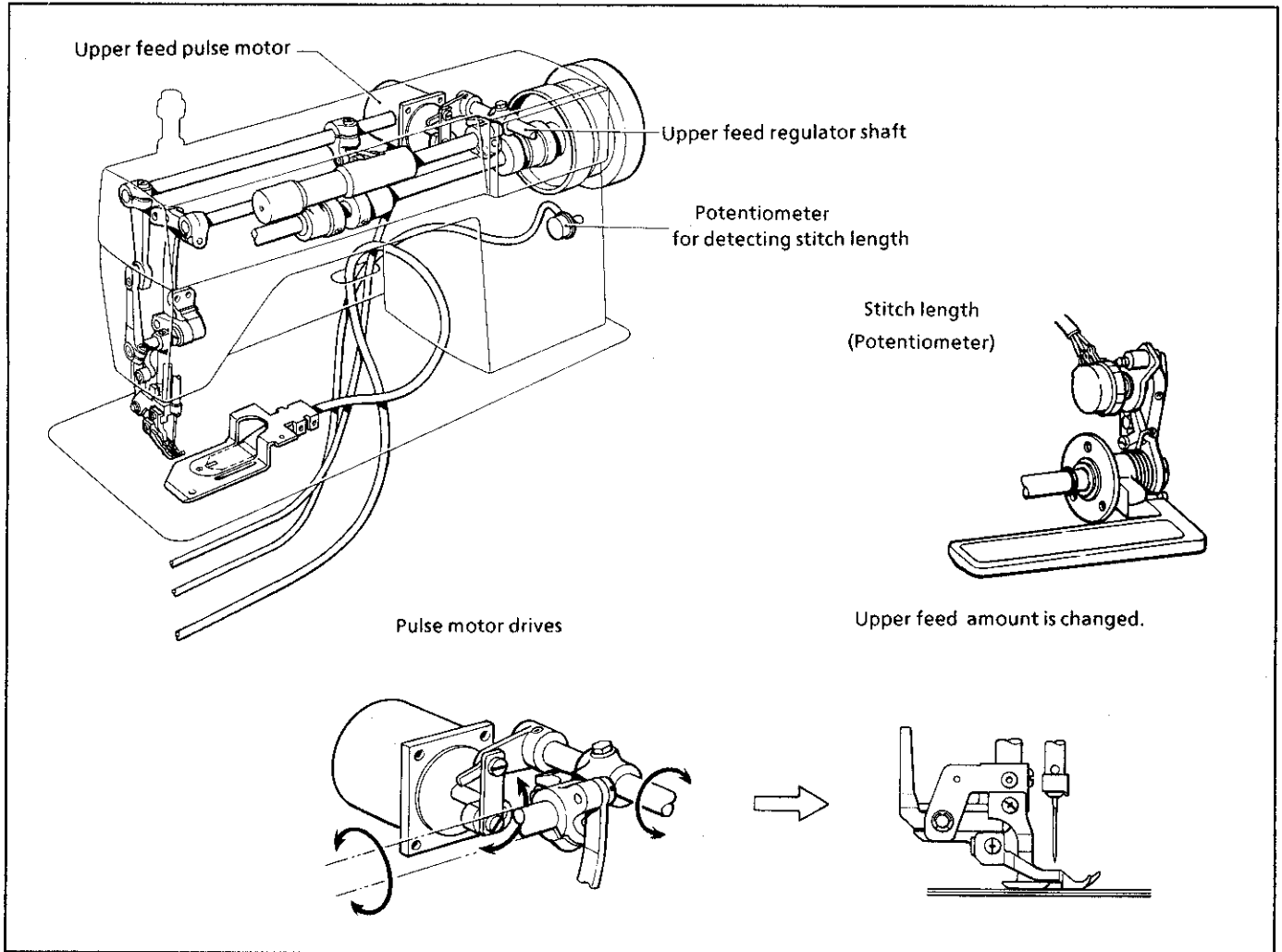
Specification	DB2-B7700-□06
Maximum sewing speed	4,500 SPM (During pattern matching 4,000 SPM)
Stitch length	5mm (During pattern matching 1.5 – 3 mm)
Reverse stitching length	3 mm
Maximum upper feed amount	8 mm
Feed dog height	0.8 mm
Presser foot pressure	6 kg (Standard setting)
Upper feed dog pressure	1.5 kg (Standard setting)
Needle	DB x 1 #11
Gauge	Type P
Edge guider	Point type
Curve performance	R 250 mm or more
Margin to seam	8 – 25 mm
Upper feed amount setting	Pulse motor
Gathering amount setting	Pulse motor
Light source	Lens lamp
Pattern detector	Optical fiber light guide built into separation plate
Receptacle	R.G.B color sensor
Temperature range	0° – 40°C
Power supply voltage	200V ± 10 %

MECHANICAL DESCRIPTION

1 Perspective



2 Automatic pattern matching



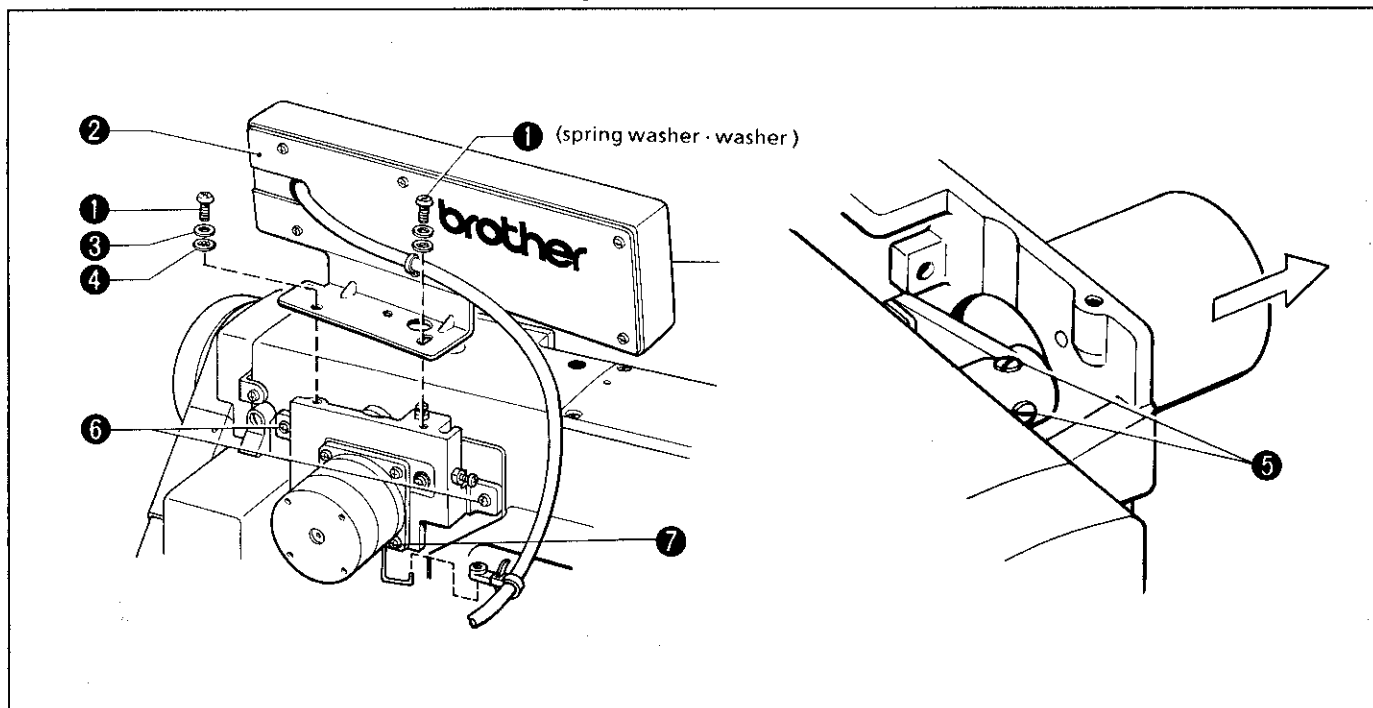
- 1) During sewing, the optical fiber prism in the separation plate in the edge guider detects the pattern of the upper and lower material.
- 2) The pattern data detected by the optical fiber prism is sent to the control box and processed.
- 3) The control box calculates the mismatch of the material then sends a signal to the pulse motor in the machine head.
- 4) The pulse motor corrects the upper feed amount of the upper feed dog so that the pattern matches.

DISASSEMBLY

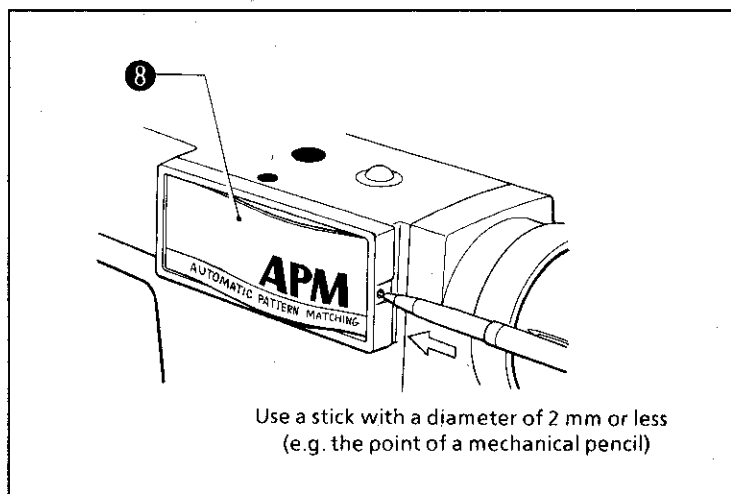
Refer to the service manual for DB2-B773 and B774 concerning the needle bar mechanism, the rotary hook mechanism and the feed mechanism of the machine head.

When adjusting the internal parts of the machine head, remove the pulse motor bracket assembly in one piece.

1 Pulse motor bracket assembly



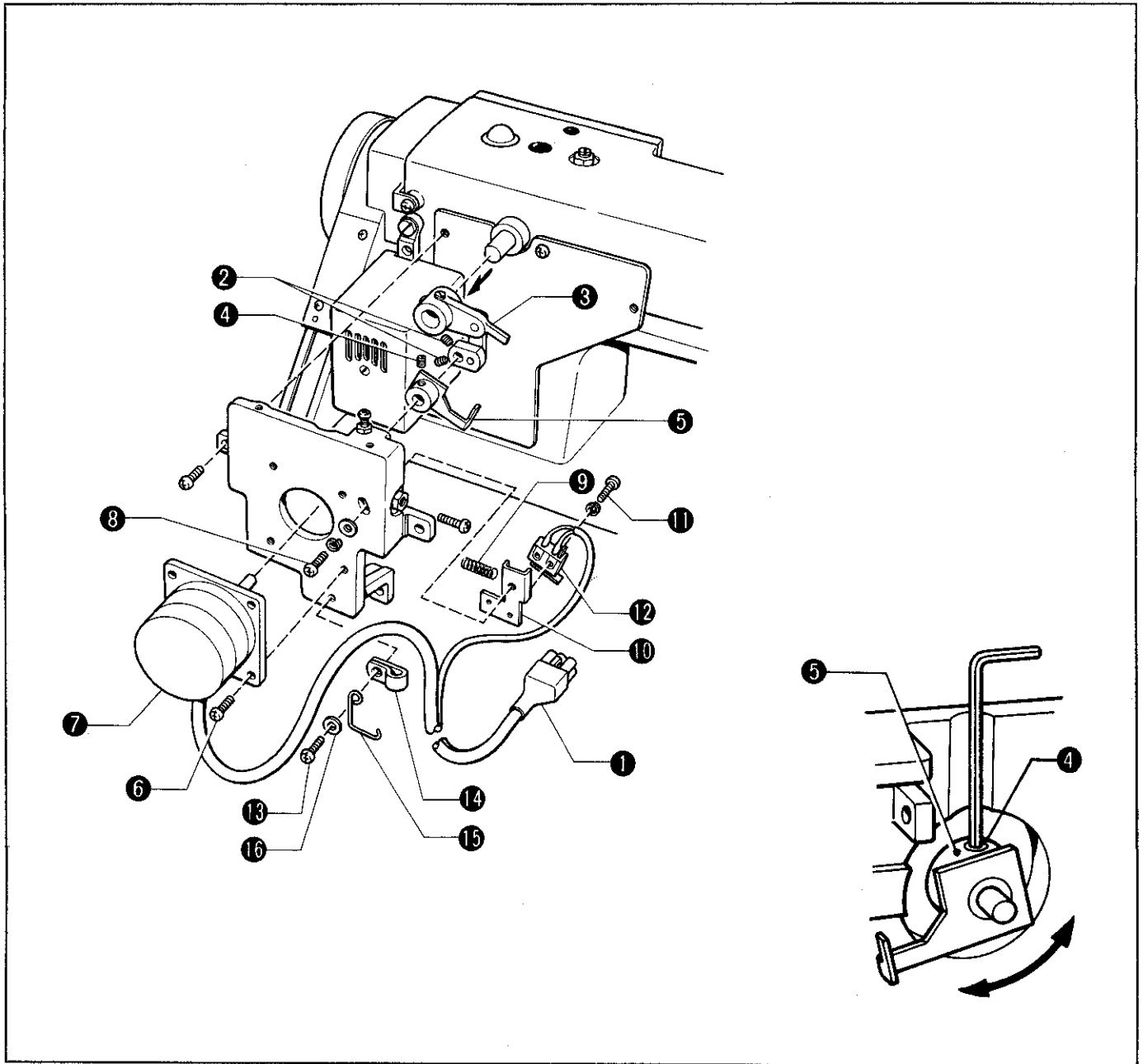
- 1) Remove the screw ①, the control box ②, the spring washer ③ and the washer ④.
- 2) Loosen the two set screws ⑤.
- 3) Remove the two screws ⑥, the stud screw ⑦, then take off the pulse motor bracket assembly and the link assembly.



- 4) Push the pin with the point of a mechanical pencil, then remove the panel (APM) ⑧.

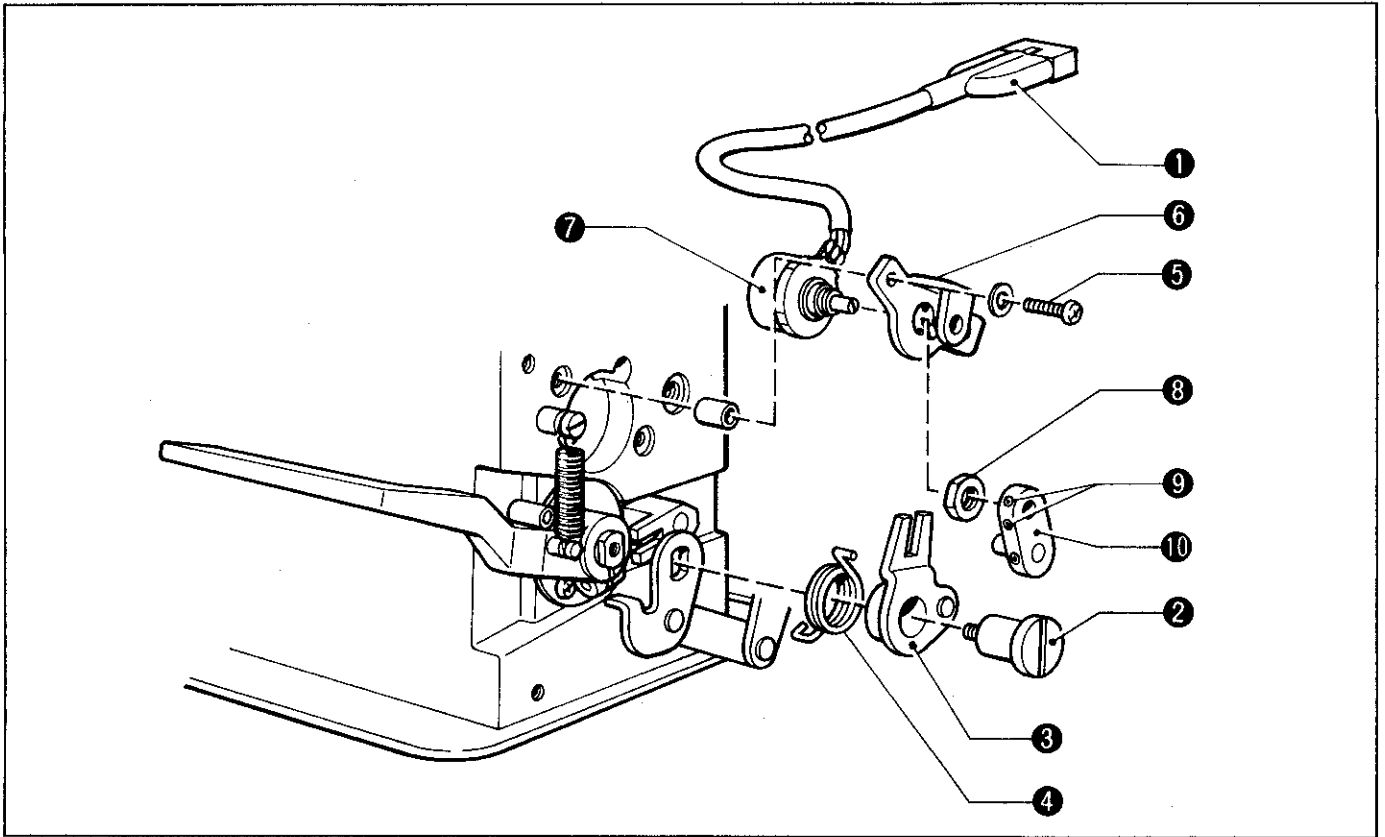
NOTE: When removing the pulse motor bracket assembly in one piece as above (when the side cover is open to permit adjustment of the internal parts of the machine head), adjusting the pulse motor should not be necessary.

2 Upper feed motor



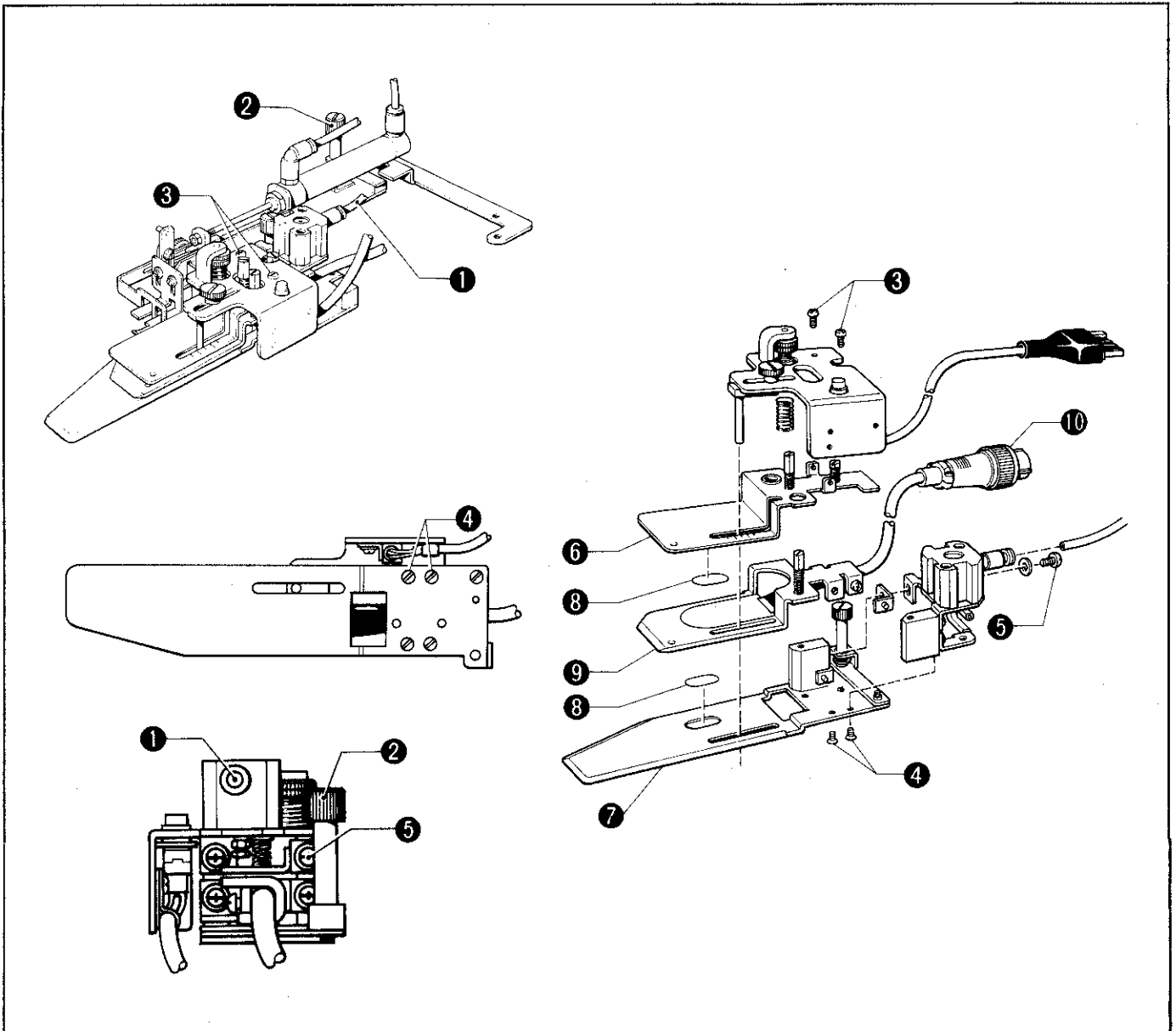
- 1) Remove the connector ①.
 - 2) Loosen the two set screws ② and remove the link assembly ③.
 - 3) Turn the shaft of the upper feed motor until the set screw ④ can be removed. Loosen the set screw ④ and remove the home position lever ⑤.
 - 4) Remove the four screws ⑥ and the upper feed motor ⑦ on the pulse motor bracket.
 - 5) Remove the screw ⑧, the switch spring ⑨ and the switch bracket ⑩.
 - 6) Remove the screw ⑪ and the upper feed motor home position switch ⑫.
 - 7) Remove the screw ⑬, the cord holder ⑭, the cord hook ⑮ and the washer ⑯.
- NOTE: Replace the upper feed motor ⑦ and the upper feed motor home position switch ⑫ together.

3 Potentiometer



- 1) Remove the connector ①.
- 2) Remove the stud screw ②, the potentiometer lever plate assembly ⑥ and the potentiometer lever spring ④.
- 3) Remove the two screws ⑤, the potentiometer fixing plate ③ and the potentiometer ⑦.
- 4) Remove the nut ⑧ and loosen the two set screws ⑨. Remove the potentiometer ⑦ and the potentiometer lever ⑩.

4 Edge guider



- 1) Remove the air tube ①.
- 2) Remove the guide plate fixing screw ② and the edge guider assembly.
- 3) Remove the two screws ③.
- 4) Remove the two screws ④.
- 5) Remove the screw ⑤.
- 6) Disassemble the edge guider assembly as shown in the figure above.
- 7) Put the reflector tapes ③ on the guide plate (upper) ⑥ and (lower) ⑦.
- 8) When replacing the separation plate ⑧, remove the connector ⑩.

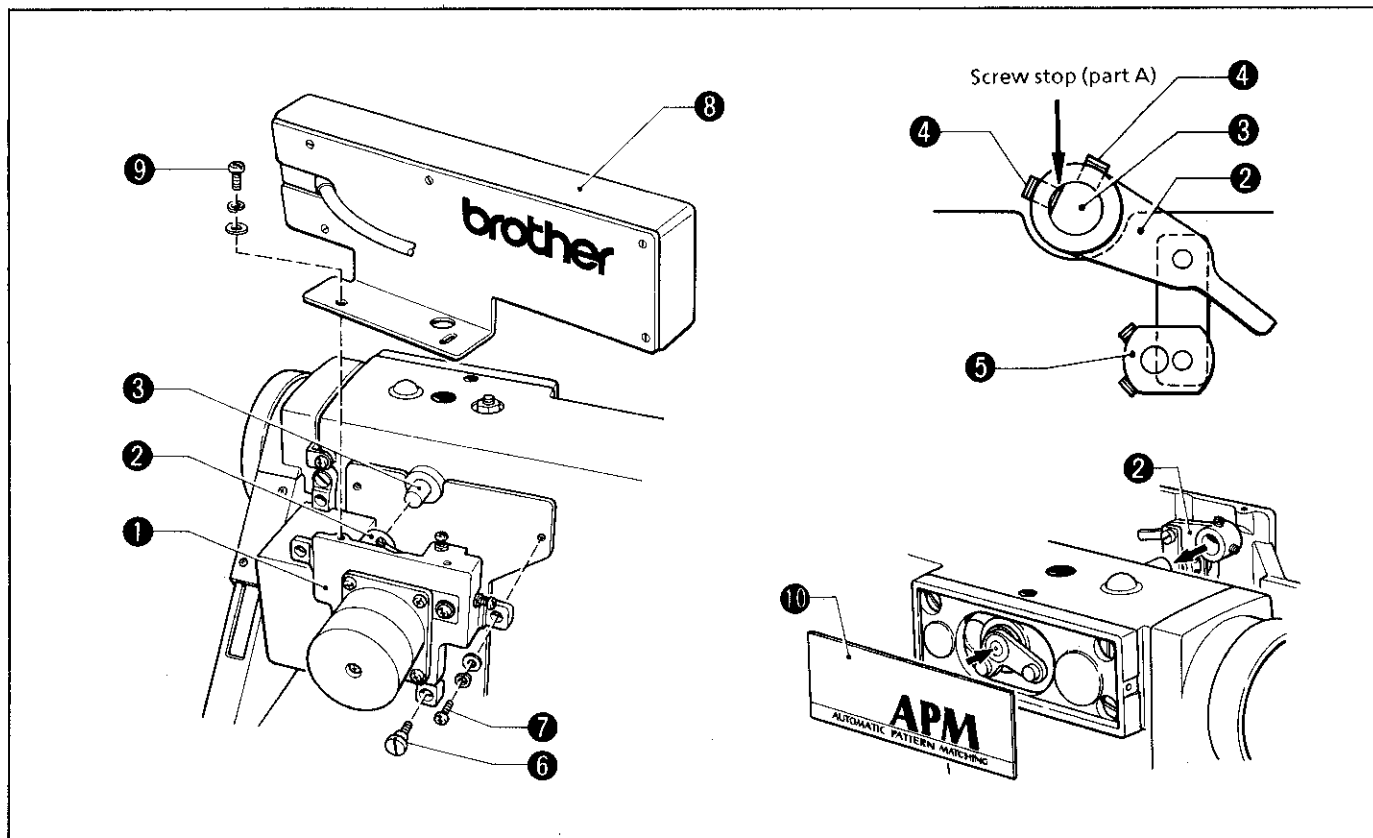
After replacing the separation plate ⑧, adjust the sensor sensibility.

NOTE: After having removed a screw or a set screw other than the above-mentioned screws, adjust the edge guider space.

(Refer to page 17 "Adjusting the edge guider space" and page 18 "Adjusting the edge guider opening".)

ASSEMBLY

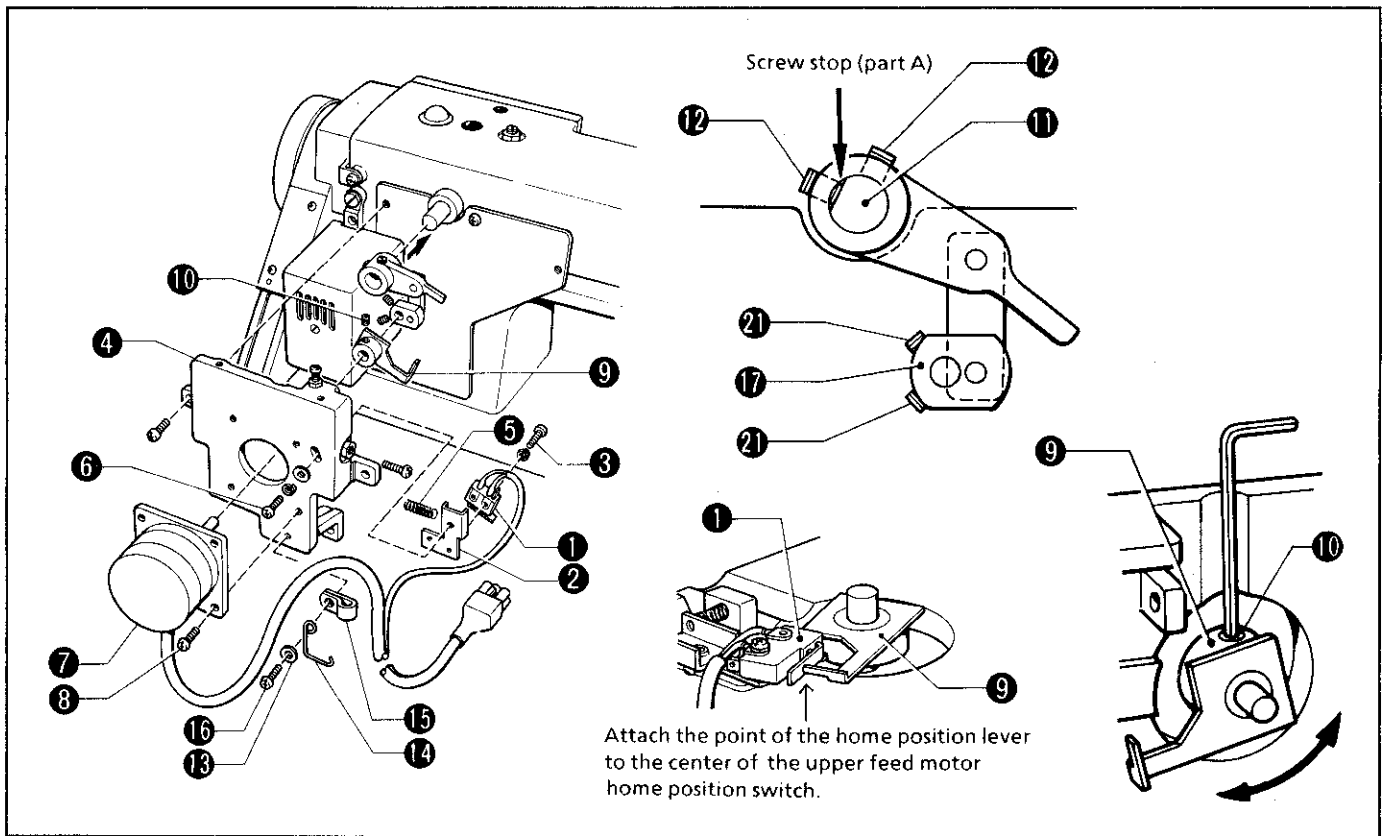
1 Pulse motor bracket



Adjusting the pulse motor should not be necessary when removing and attaching the pulse motor bracket assembly in one piece.

- 1) Attach the pulse motor bracket assembly ① and the link assembly.
Place the upper feed lever ② of the link assembly on the upper feed regulator shaft ③, then adjust the upper feed regulator shaft ③ so that there is no looseness.
- 2) Secure the upper feed lever ② with the set screw ④.
Tighten the upper feed lever ② to the screw stop (part A) of the upper feed regulator shaft ③ with the set screw ④.
- 3) Set the pulse motor lever ⑤ of the link assembly shown in the figure above. Secure the pulse motor bracket assembly ① with the stud screw ⑥ and the screw ⑦ in that order.
- 4) Secure the control box ⑧ with the screw ⑨, spring washer and washer.
- 5) Secure the panel (APM) ⑩.

2 Upper feed motor



- 1) Secure the upper feed motor home position switch ① to the switch bracket ② with the screw ③.
- 2) Place the switch spring ⑤ between the switch bracket ② and the pulse motor bracket ④.
- 3) Temporarily tighten the switch bracket ② with the screw ⑥ from the elliptical hole of pulse motor bracket ④.
- 4) Secure the upper feed motor ⑦ with the screw ⑧.
- 5) Place the home position lever ⑨ on the shaft of the upper feed motor ⑦. Temporarily tighten the set screw ⑩ so that the point of the home position lever ⑨ is in the center of the upper feed motor home position switch ①.
- 6) Insert the link assembly into the upper feed regulator shaft ⑪. Secure the upper feed regulator shaft ⑪ with the screw ⑫ so that there is no looseness.
Tighten the screw ⑫ with special attention to the screw stop (part A) of the upper feed regulator shaft ⑪.
- 7) Pass the washer ⑬, the cord hook ⑭ and the cord holder ⑮ in that order through the screw ⑯. Then secure them to the pulse motor bracket ④.

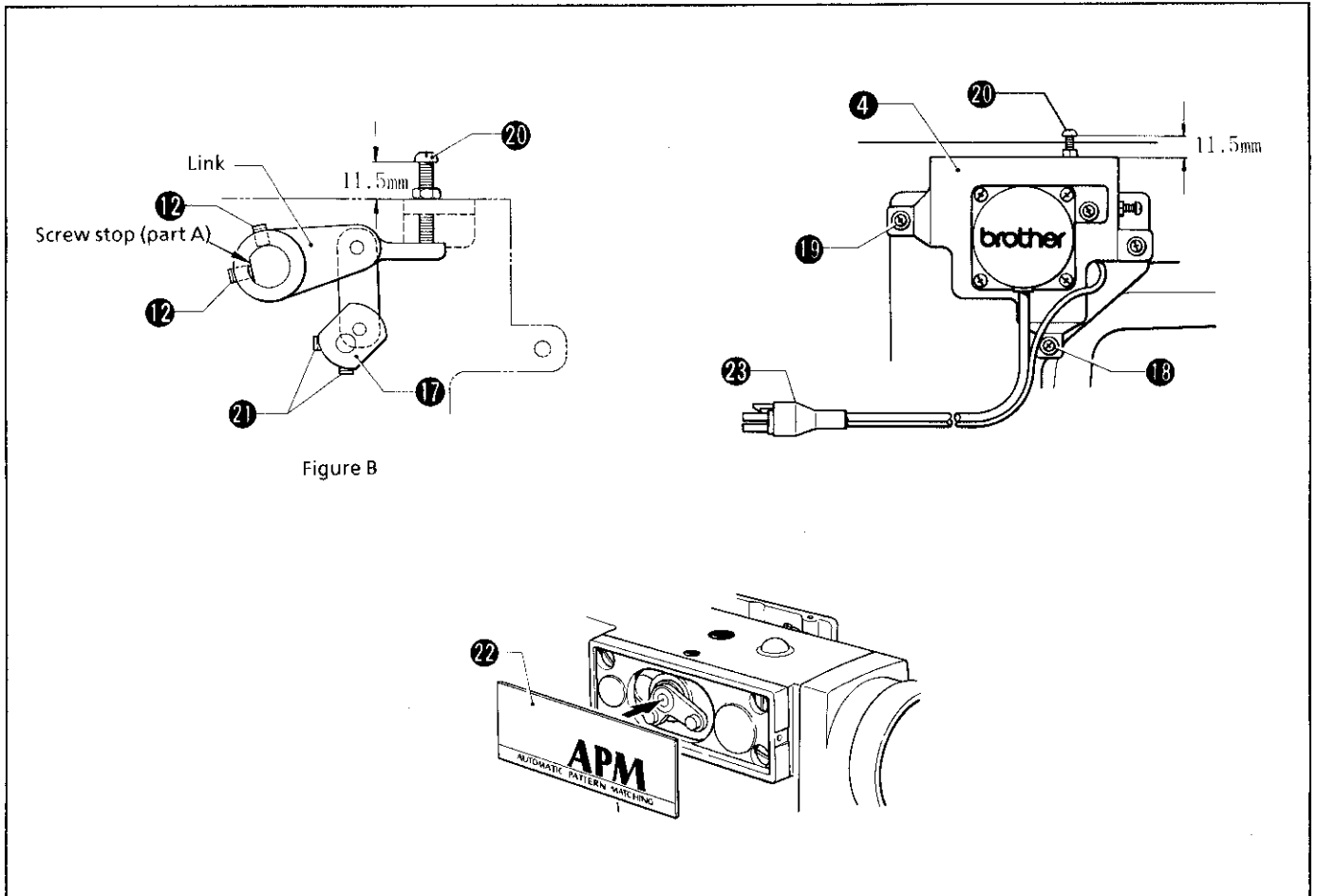
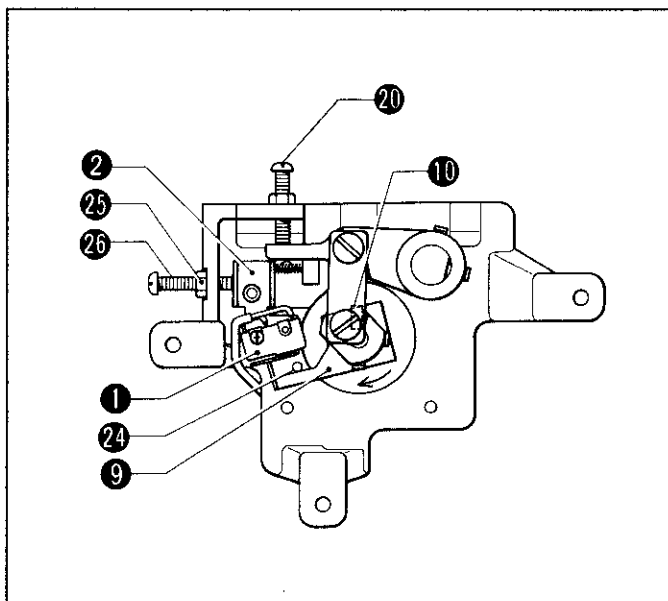


Figure B

- 8) Set the pulse motor lever 17 in the position shown in figure B. Insert the shaft of the upper feed motor into the pulse motor lever 17.
- 9) Secure the pulse motor bracket 4 with the stud screw 18 and the screw 19 in that order.
When replacing the pulse motor bracket 4, adjust the gap between the screw 20 bottom and the pulse motor bracket 4 top to 11.5 mm (standard size).
- 10) Secure the pulse motor lever 17 with the set screw 4.
Check the link assembly so that it moves easily by hand.
- 11) Secure the panel (APM) 22.
- 12) Secure the connector 23.

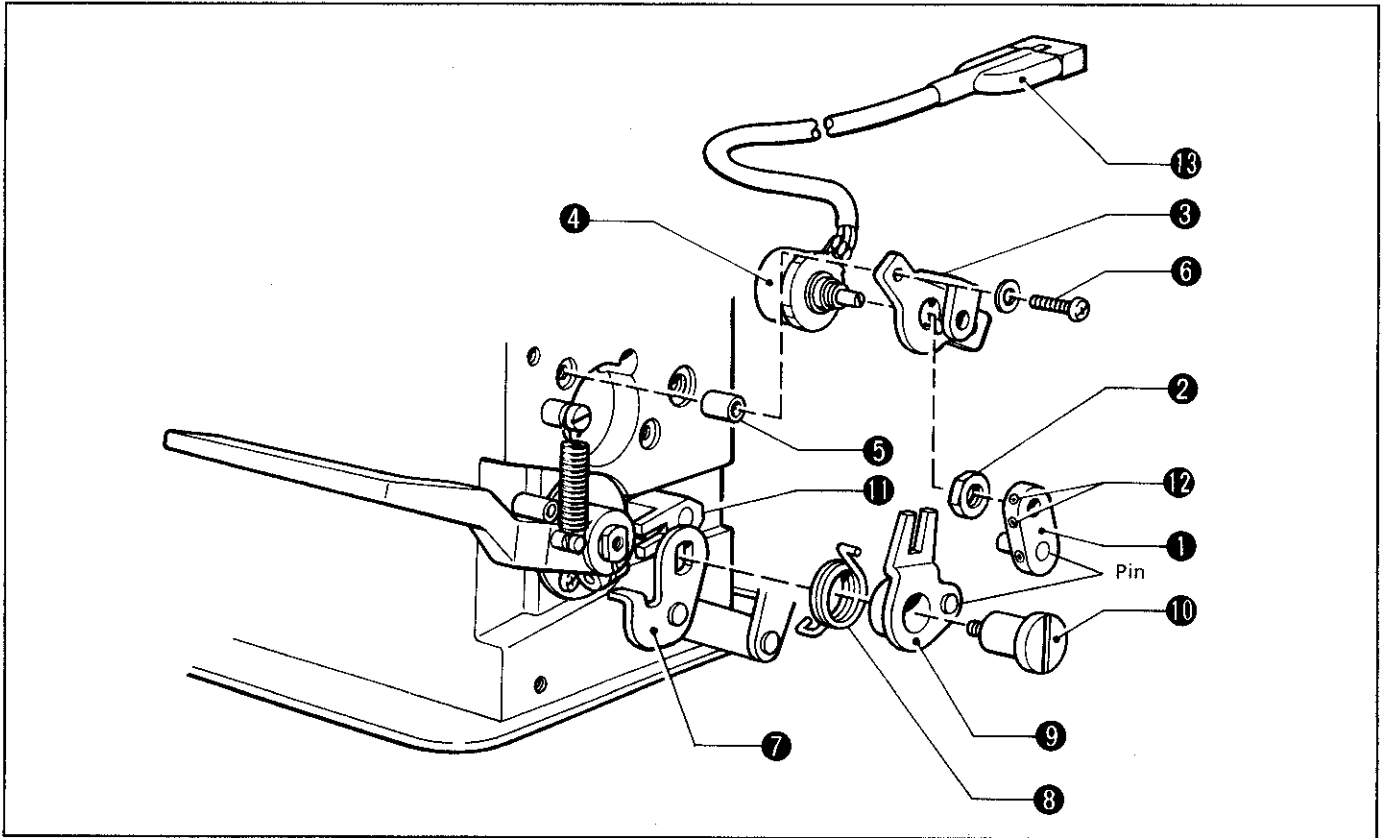


Adjusting the home position lever and the upper feed motor home position switch

- 1) As in Figure B, press the point of the link assembly against the screw 20, touch the home position lever 1 to the pin 24 and secure it with the set screw 4.
- 2) Loosen the nut 25. Taking the switch bracket 2 in and out by the adjust screw 23, adjust the upper feed motor home position switch 1 so that it turns ON.
- 3) After adjusting, tighten the screw 3 and the nut 25.

NOTE: After attaching, adjust the upper feed pulse motor home position. Refer to page 14.

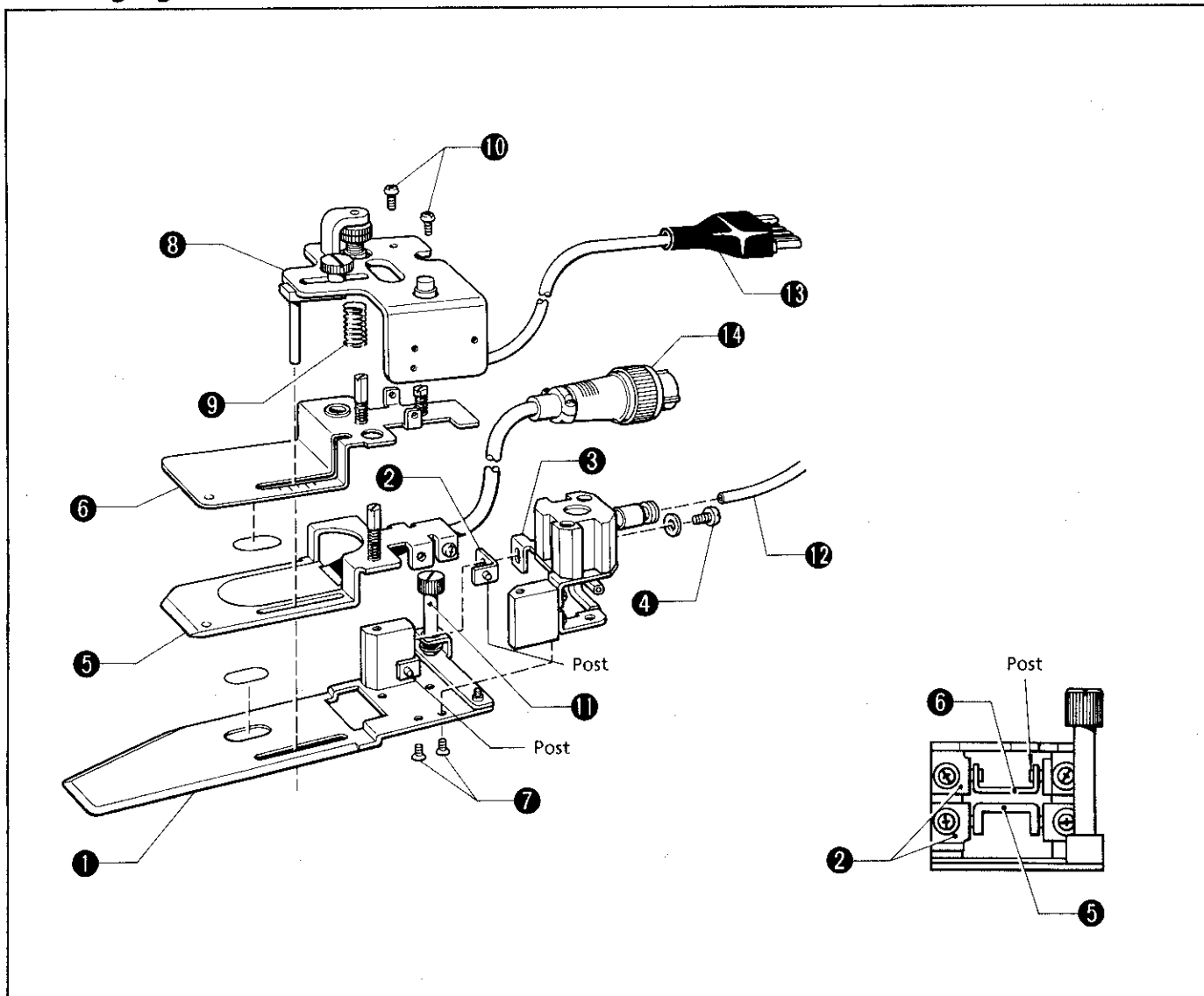
3 Potentiometer



- 1) Place the potentiometer lever ① and the nut ② on the potentiometer fixing plate ③. Insert the shaft of the potentiometer ④ into the potentiometer lever ① and the nut ②, then secure the potentiometer ④ with the nut ②.
- 2) Secure the potentiometer fixing plate ③ and the potentiometer fixing collar ⑤ with the screw ⑥.
- 3) Secure the reverse link lever assembly ⑦, potentiometer lever spring ⑧ and the potentiometer lever plate assembly ⑨ with the stud screw ⑩.
Place the pin in the potentiometer lever plate assembly ⑨ on the potentiometer feed forked lever ⑪.
Place the forked part in the potentiometer lever plate assembly ⑨ on the potentiometer pin attached to the potentiometer lever ①.
- 4) After adjusting the potentiometer, tighten the set screw ⑫.
- 5) Secure the connector ⑬.

NOTE: Refer to page 15 to adjust the potentiometer.

4 Edge guider

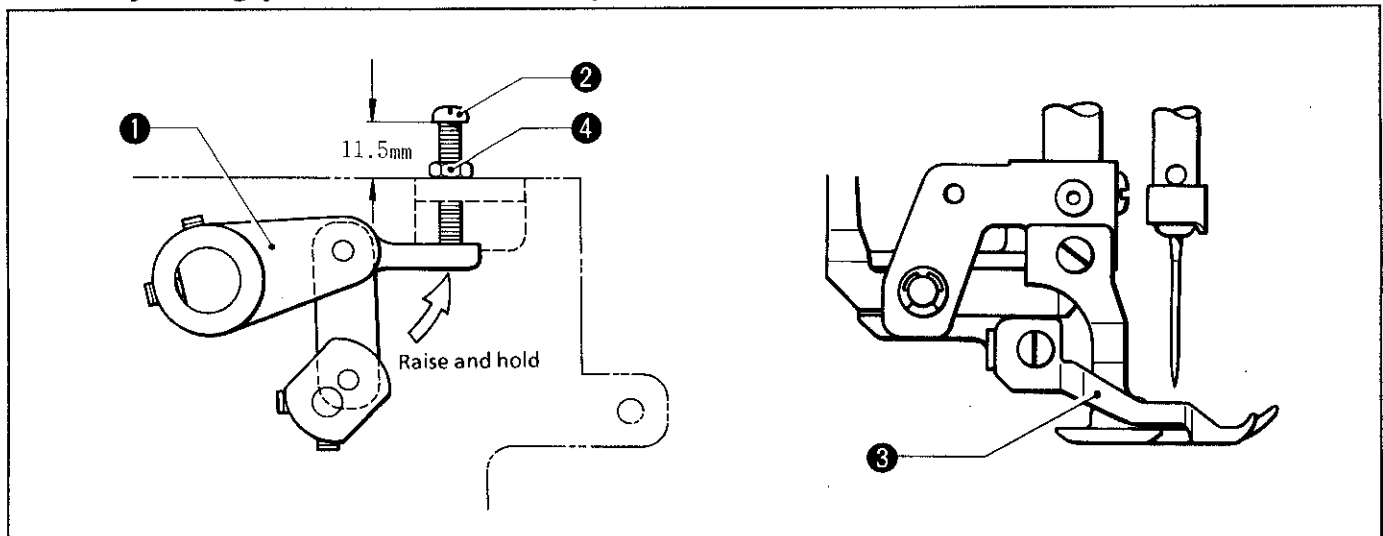


- 1) Temporarily tighten the guide plate (lower) ①, the indicating plate ② and the opening and closing cylinder bracket ③ with the screw ④.
- 2) Put the holes of separation plate ⑥ and guide plate (upper) ⑤ onto the posts of each indicating plate ②.
- 3) Tighten the screw ④.
- 4) Put the point spring ⑨ into the guide cover ⑧ and tighten the screw ⑩.
- 5) Check that the guide plate (upper) ⑤ and the separation plate ⑥ open and close easily.
- 6) Secure the edge guider assembly with the guide plate fixing screw ⑪.
- 7) Secure the air tube ⑫.
- 8) Secure the connector ⑬ for the guider switch assembly and the connector ⑭ of the separation plate ⑥.

NOTE: After having removed a screw or a set screw other than the above-mentioned screws, refer to page 17 "Adjusting edge guider space".

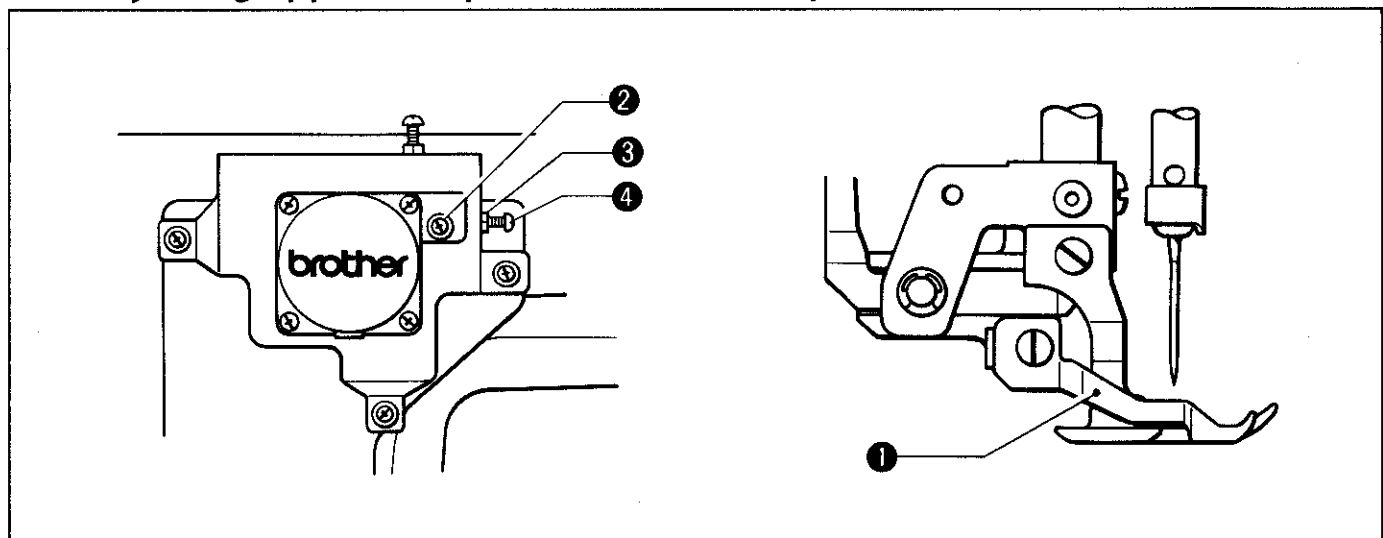
STANDARD ADJUSTMENT

1 Adjusting pulse motor home position



- 1) Raise the upper feed lever ① and hold it lightly to the screw ②. Turn the pulley manually and check that the upper feed dog ③ does not move. (The horizontal feed -- feed from when the upper feed dog contacts lower feed dog to when they separate -- should be 0-0.4 mm.)
- 2) If the upper feed ③ moves, turn the screw ② to adjust it.
When the upper feed amount is zero, tighten the nut ④.

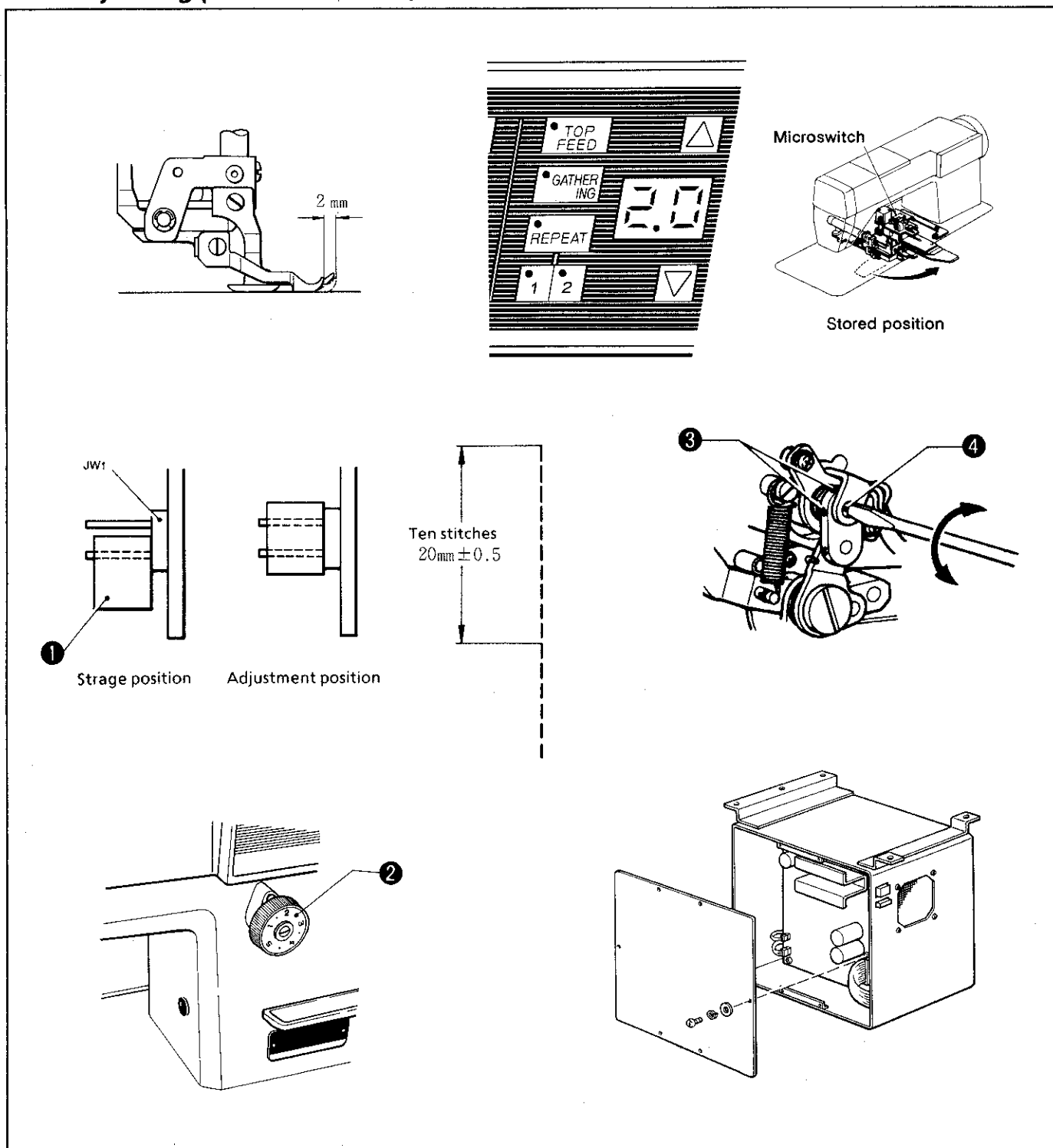
2 Adjusting upper feed pulse motor switch position



- 1) Turn the power on.
- 2) Set the upper feed amount to zero on the operation panel.
- 3) Turn the machine pulley manually, and check that the upper feed lever ① does not move. If it moves 0.4mm or more, repeat the adjustment explained below until the upper feed lever does not move.
- 4) If the upper feed amount is not zero, loosen the screw ② and nut ③, then turn the screw ④ clockwise. If the upper feed phase does not synchronize with the lower feed phase, turn the screw ④ counter clockwise.
- 5) Turn off the power then turn it back on.
- 6) Repeat 3), 4). When the upper feed dog ① does not move, secure the screw ② with the nut ③.

NOTE: If the pulse motor makes step-out noise when the power of turned on, it can not be adjusted any more. To continue adjusting, readjust the pulse motor home position referring to 1 on this page.

③ Adjusting potentiometer (lower feed amount detector)

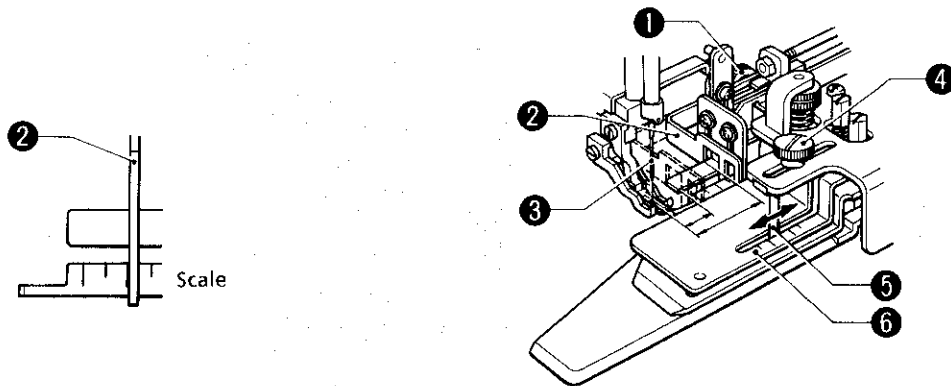


Switch off the pattern matching function (P. MATCHING LED does not light).

Remove and store the edge guider.

- 1) Set the upper feed amount to 2 mm (see the scale).
- 2) Detach the control box cover and put the short plug ❶ to the adjustment position.
- 3) The lower feed amount is displayed on the operation panel.
- 4) Sew the papers in inching speed. Adjust the feed regulator dial ❷ so that the ten stitches are 20 mm ± 0.5 .
- 5) Loosen the two set screws ❸. Turn the potentiometer shaft ❹ to set the lower feed amount on the operation panel to 2.0.
- 6) After adjustment, tighten the set screw ❸ and check that the displayed number does not change.
- 7) Return the short plug ❶ to the storage position. Attach the cover.

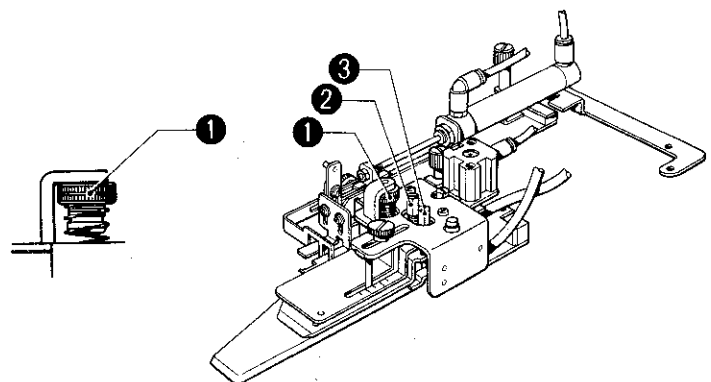
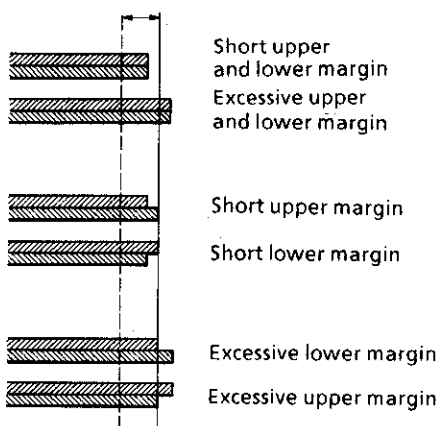
4 Adjusting margin to seam



- 1) The margin to seam can be adjusted from 8 to 25 mm.
- 2) Loosen the screw ① and move the fixing guide bar ② right and left. At this time, set the margin to the scale marked from the needle ③ to the fixing guide bar ②. Tighten the screw ①.
- 3) Loosen the screw ④ and move the guide bar ⑤ right and left. At this time, set the margin according to the scale marked on the guide plate (upper) ⑥. Tighten the screw ①.
- 4) Do a test sewing. Check the margin then tighten the screws ① and ④.

5 Adjusting the point pressure

Set margin to seam

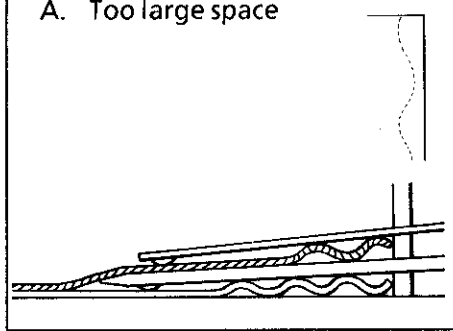
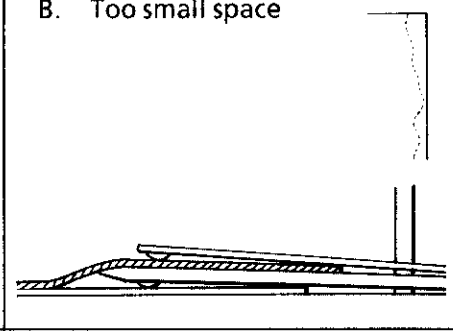
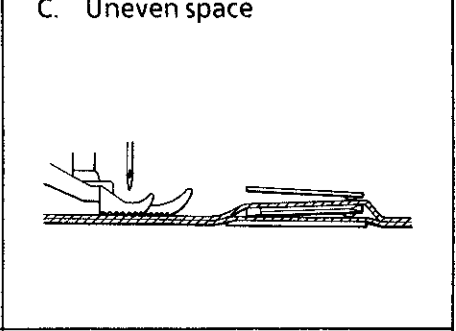


Do a test sewing. If the actual margin is different from the set margin, adjust as follows:

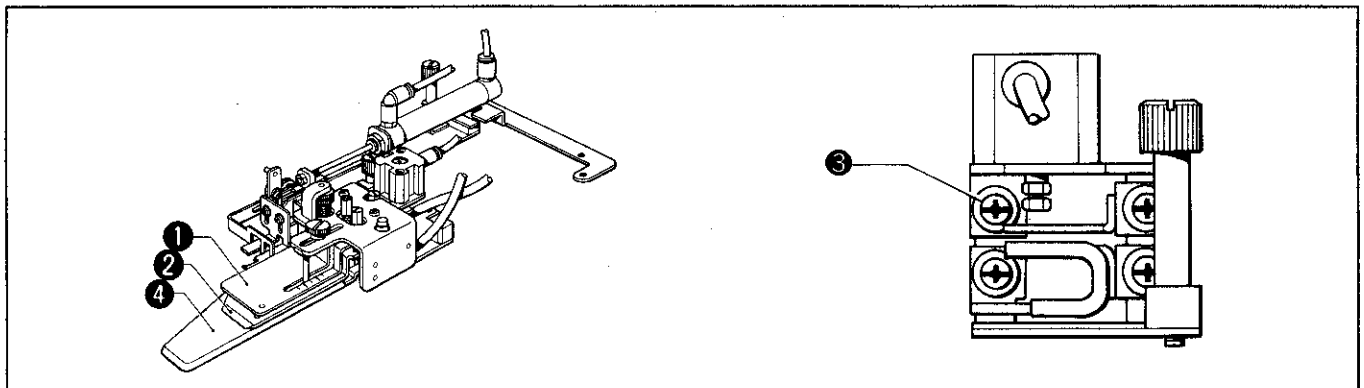
- 1) When both upper and lower margins are wider or narrower than the set margin:
When the margins are too narrow.
Turn the pressure adjust screw ① clockwise to adjust it.
When the margins are too wide.
Turn the height adjusting screw ② (upper) and ③ (lower) clockwise gradually to adjust it.
- 2) When one margin is narrower than the set margin:
Turn the pressure adjusting screw ① clockwise to readjust the narrower margin so that it is set margin.
- 3) When one margin is wider than the set margin:
When the upper margin is wider than the set margin.
Turn the height adjusting screw ② clockwise gradually to adjust it.
When the lower margin is wider than the set margin.
Turn the height adjusting screw ③ clockwise gradually to adjust it.

⑥ Adjusting the edge guider space

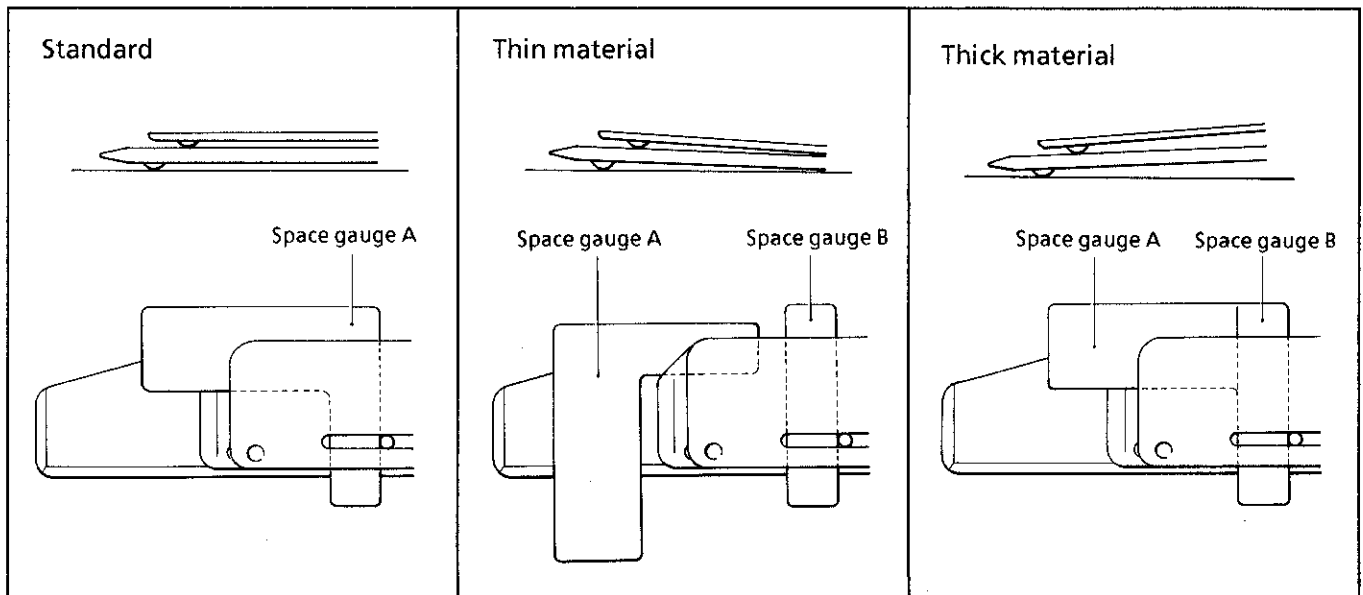
Improper edge guider space may cause the troubles listed below.

<p>A. Too large space</p> 	<p>B. Too small space</p> 	<p>C. Uneven space</p> 
<p>The margin becomes larger than the set margin, also the seam meanders.</p>	<p>The margin becomes smaller than the set margin or seam goes out of margin.</p>	<p>Troubles like A and B will occur.</p>

How to use space gauge



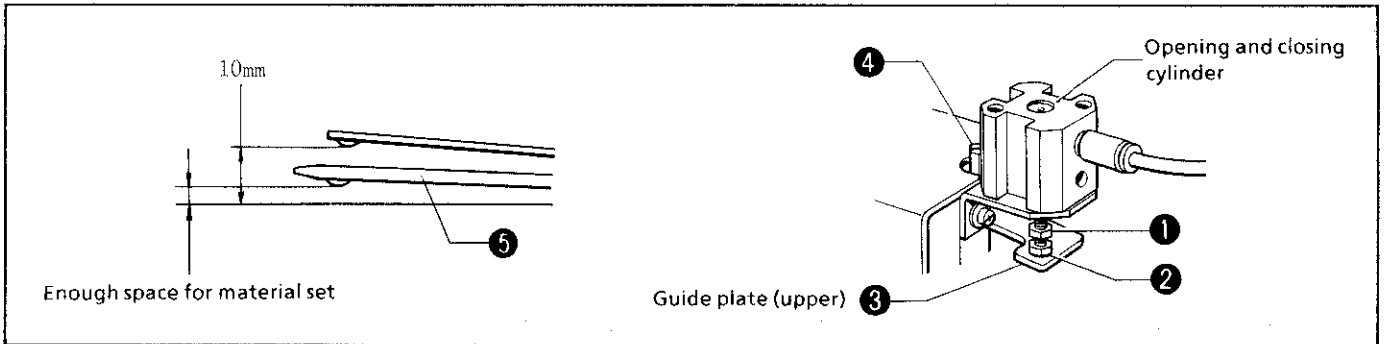
- 1) Loosen the guide plate fixing screw ③ supporting the guide plate (upper) ① and separation plate ②.
- 2) Put the space gauge between the guide plate ① and separation plate ②, and between the separation plate ② and guide plate (lower) ④ as shown in the figure below.



- 3) Press the guide plate ① and secure it with the screw ③.

7 Adjusting edge guider opening

When the edge guider is open, these dimensions are standard.



Adjustment

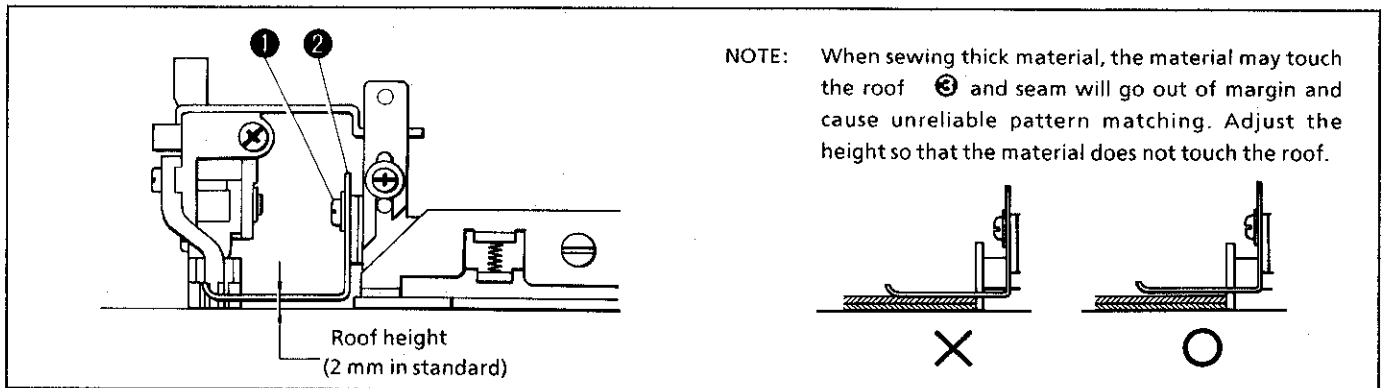
Loosen the nut ①. Turn the screw ② to adjust the opening of the guide plate (upper) ③ to 10 mm. Turn the make and break screw ④ to adjust the opening of the separation plate ⑤ so that the lower material goes smoothly below the separation plate.

8 Adjusting roof opening

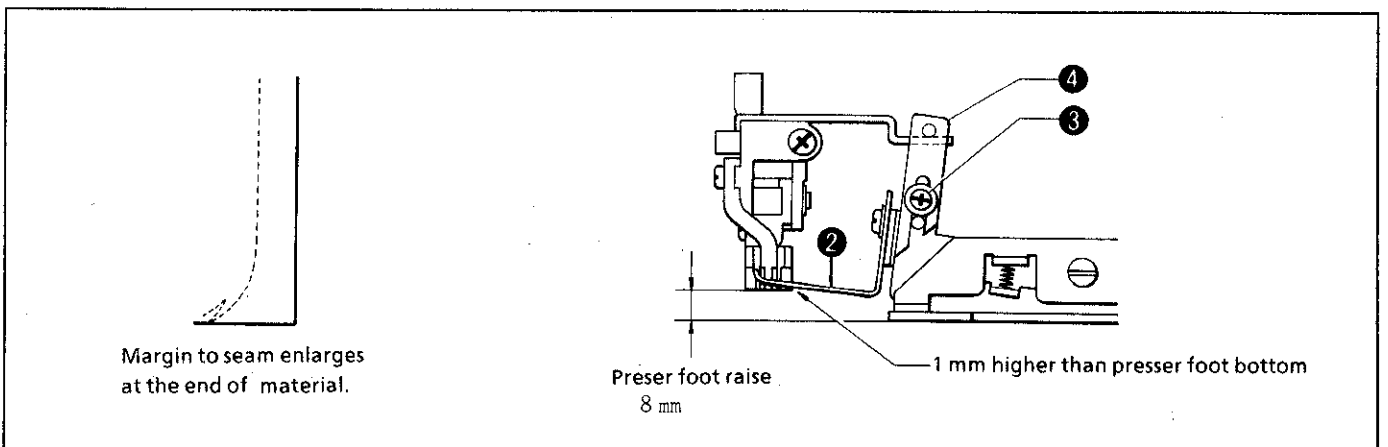
The roof is interlocked with the presser foot. They open and close together. When the material is set under the presser, they open so as not to interfere with the material. Also they keep the trailing material edge from floating.

Therefore, if they are too high when they open, soft material may be sewn as in the figure below.

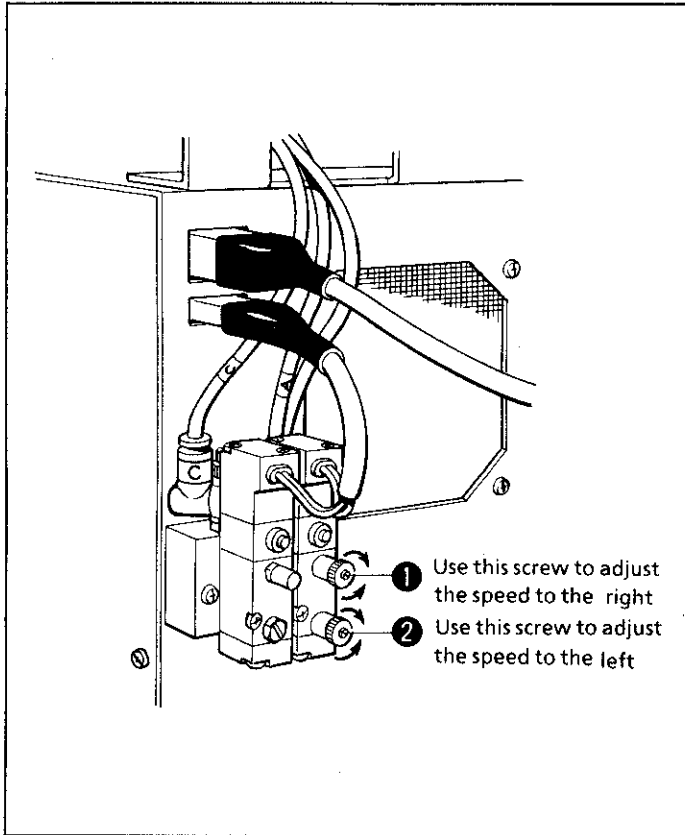
- 1) Loosen the screw ①. Adjust the roof ② height to approx. 2 mm when the presser foot is lowered.
NOTE: Attach it so that it does not hinder material movement, and so the margin to seam does not become too wide.



- 2) Loosen the screw ③. Raise the presser foot (10mm when -400, 8mm when -900) adjust the roof opening and closing lever ④ up and down and attach so that the roof ② is 1 mm higher than presser foot bottom.

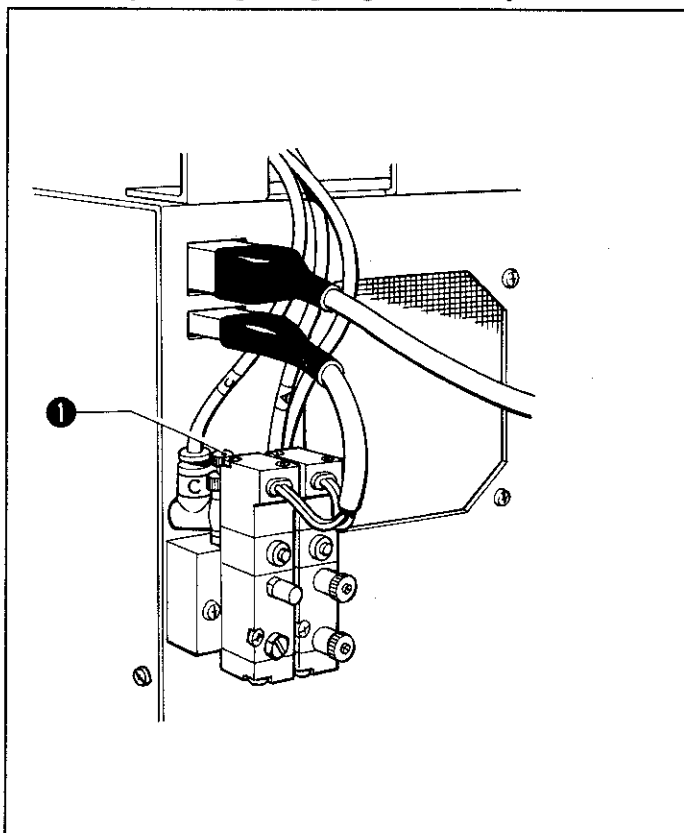


9 Adjusting edge guider right and left movement speed



Turning the adjusting screws ① and ② clockwise will increase the speed and counterclockwise will decrease it.

10 Adjusting edge guider open and close speed

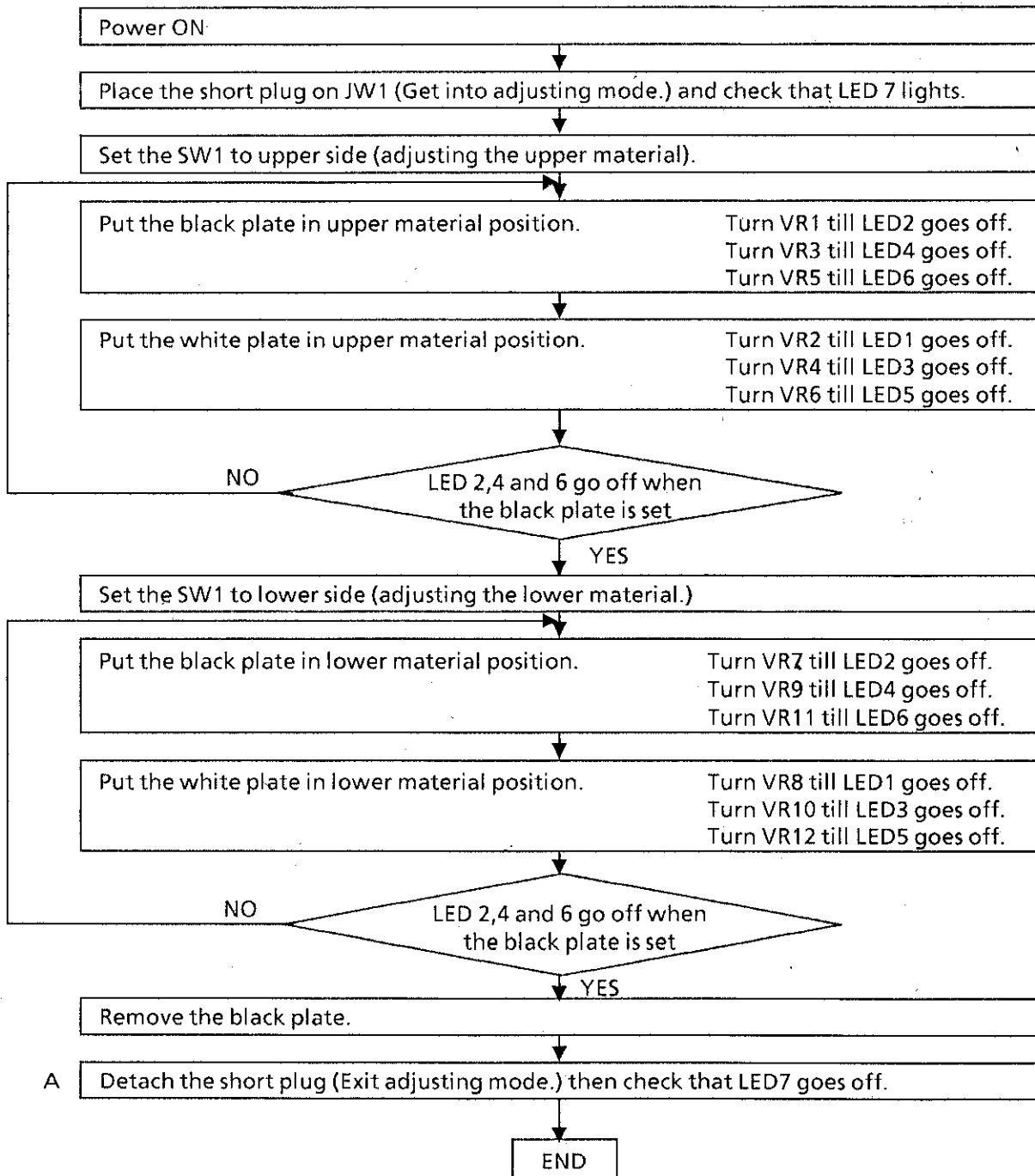


Turning the adjusting screw ① clockwise will decrease the speed and counterclockwise will increase it.

11 Adjusting sensor sensibility

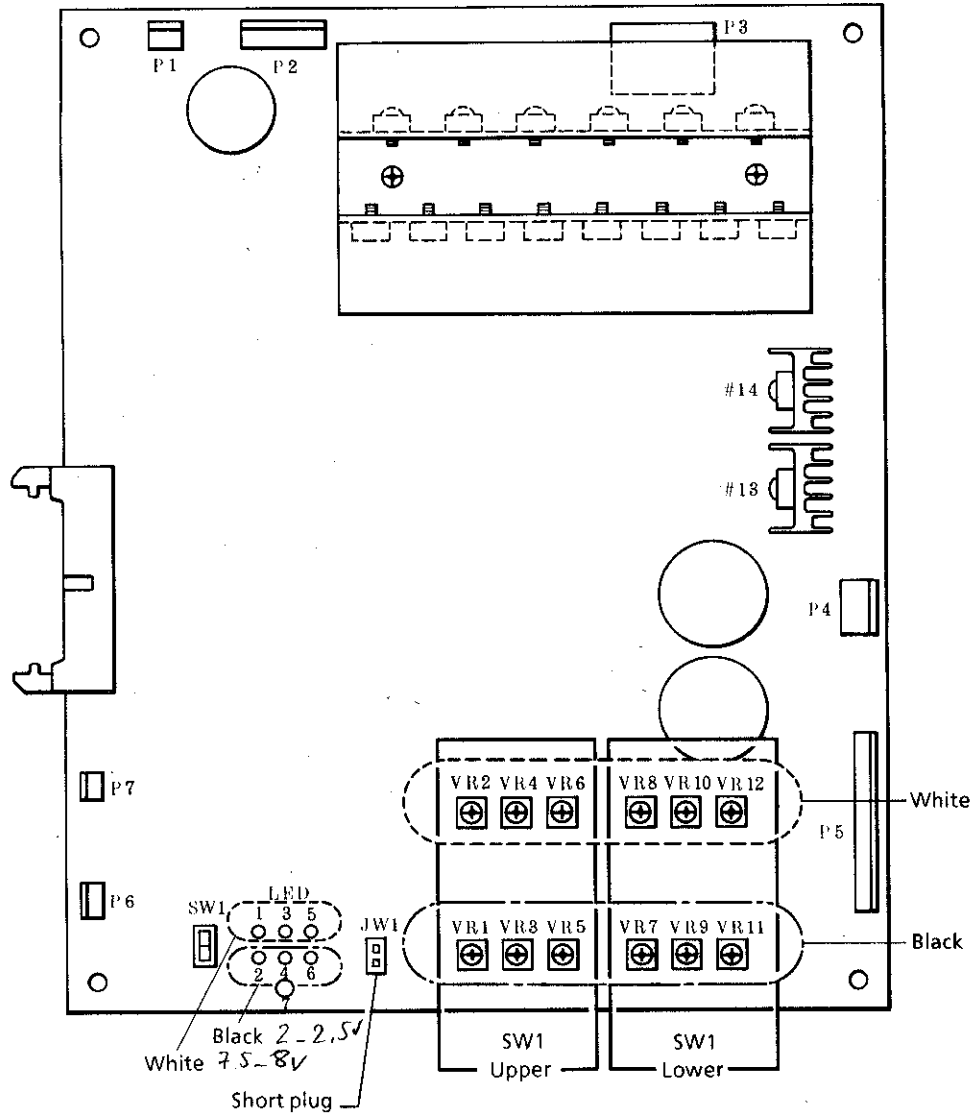
DB2-B7700's RGB sensor needs 12 VR adjustment.
Adjust them 2 minutes or more after the power is on.
Remove the power unit cover.

Adjusting flow chart

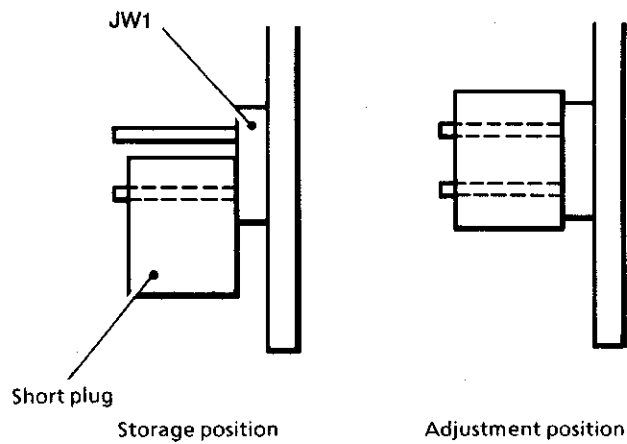


In procedure A, detaching short plug while the plate (white and black) in the position will light the LED7. When the plate (white and black) is removed, LED7 goes off.
Use Brother authorized white and black plates.

Analog circuit board diagram



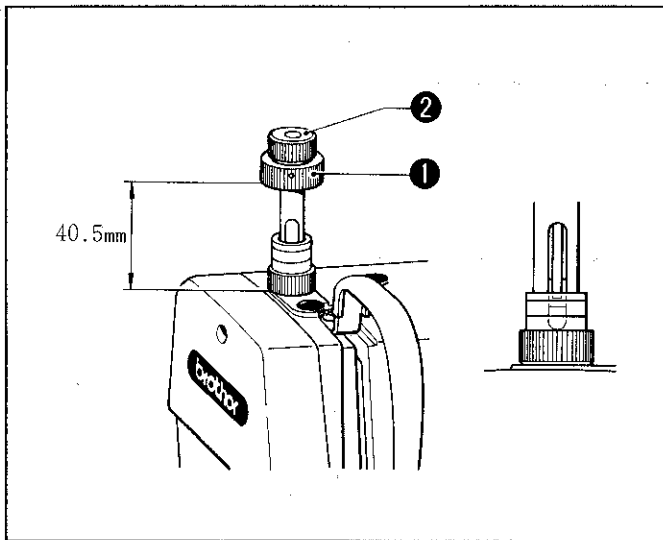
Place the short plug on JW1 shown in the figure and store it.



Setting pattern matching

1 Checking sewing machine

1. Checking presser foot pressure and upper feed dog pressure



Adjust the pressure to 6 kg using the adjust screw ①. If the material stretches or the feed dog leaves a mark, decrease the pressure. If the material does not feed, increase the pressure.

Confirm that the upper feed dog pressure is approximately 1.5 kg.

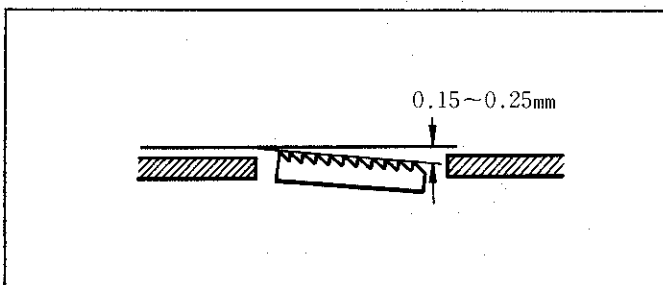
Set the upper feed amount so that the shift amount is 0 mm when white broadcloth material is sewn for 600 mm with a stitch length of 2 mm at 4000 spm.

Set the displayed upper feed amount to + 1.0 mm.

Sew again and adjust the gather amount to 30 - 50 mm using the upper feed adjustment screw ②.

NOTE: If the upper feed dog does not catch the material, increase the pressure using the upper feed adjustment screw ②. If the pressure is too great, decrease it. Adjust to suit the material.

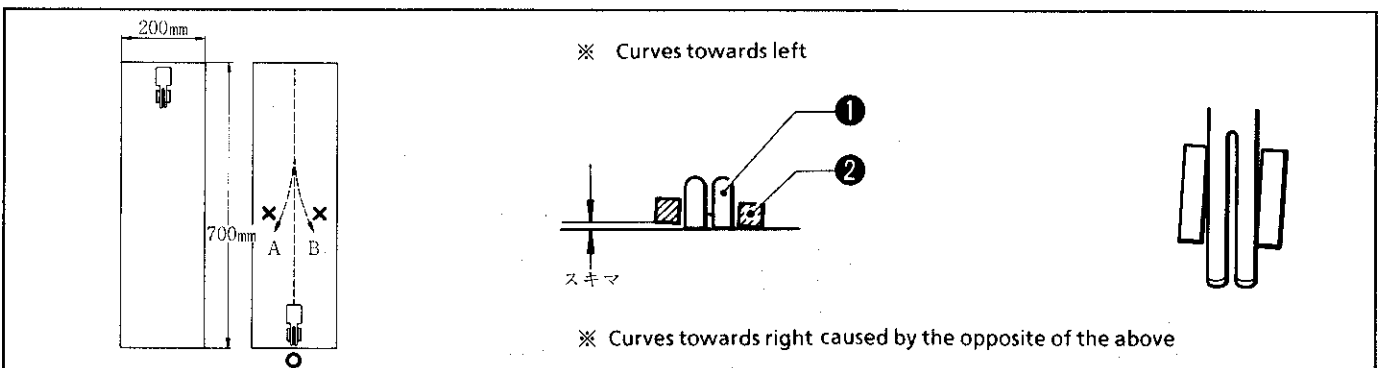
2. Checking lower feed dog inclination



Check that the lower feed dog inclines 0.15 - 0.25 mm toward the front.

3. Checking sewing straightness

If the upper feed dog inclination is improper, the seam will be curved resulting in poor pattern matching and gathering.

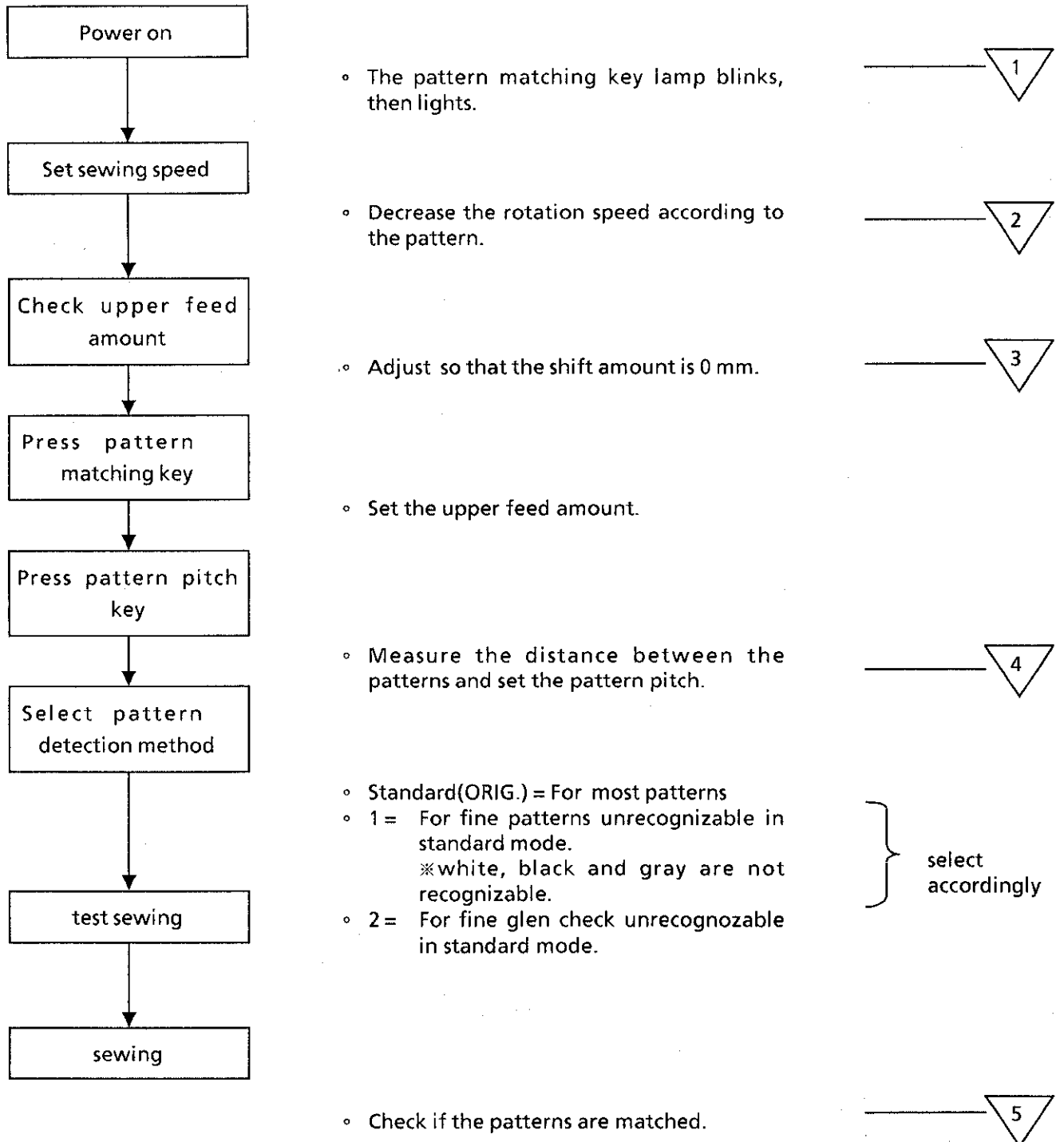


- 1) Prepare two pieces of thin material (preferably georgette) cut into 200 × 700 mm and put one piece on top of the other.
- 2) Set the lower feed amount to 2 mm, the upper feed amount to 6 mm, and the rotation speed to 4000 mm spm.
- 3) Place the two pieces of the material so the center comes under the presser foot ①, then start sewing without manually guiding the material. Check that the seam is straight and is nearly in the center of the material.
- 4) If the seam is curved, adjust the upper feed dog inclination according to the direction of the curve.

2 Procedures

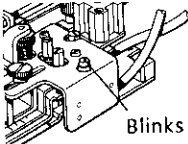
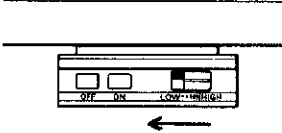
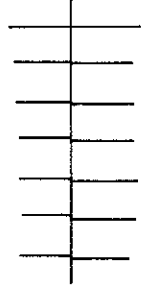

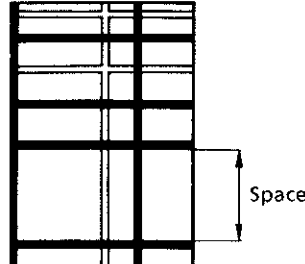

Checking the material

- Is the material suitable for pattern matching?(Refer to the Instruction Manual.)
- Is the variation in the pattern within 3 - 5 %?



NOTE: If the patterns do not match, refer to the next page.

3 If patterns do not match

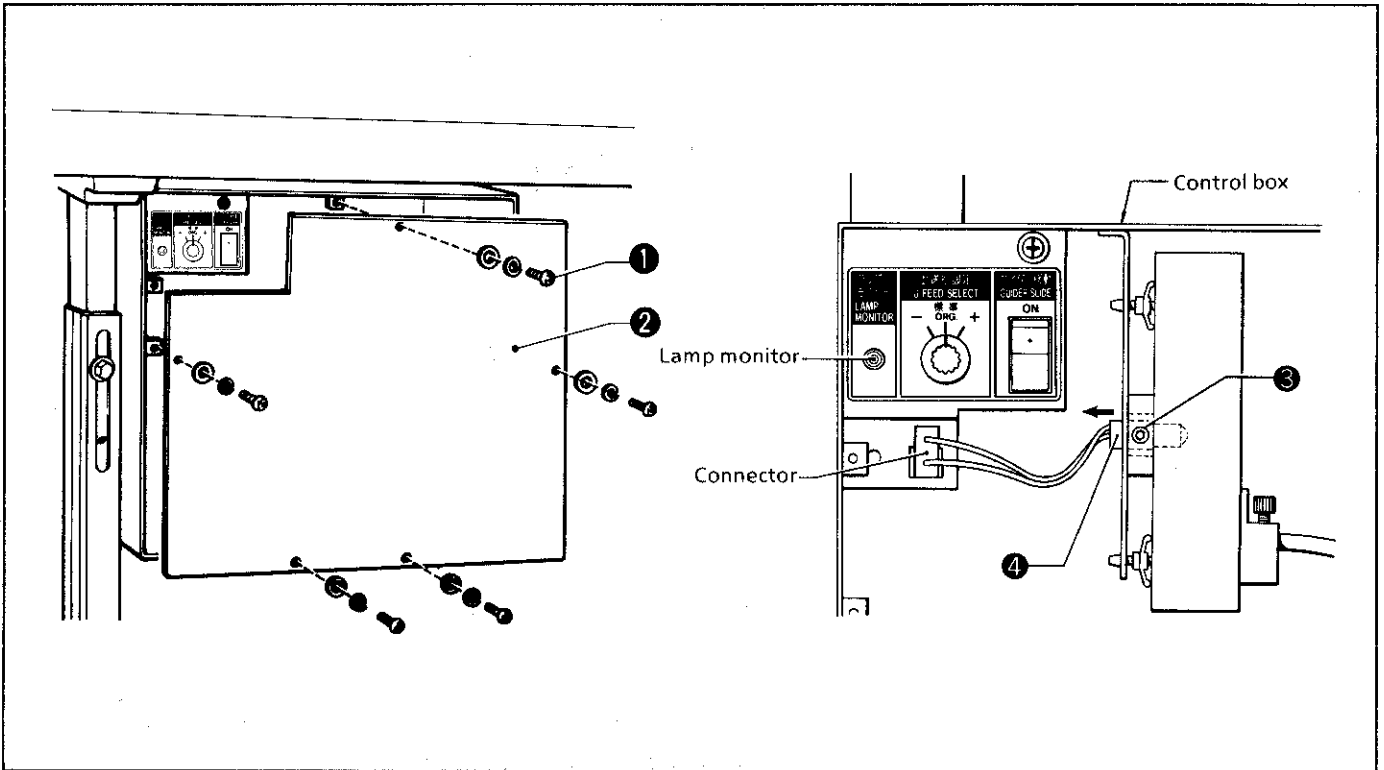
No.	Cause	Check point	Solution	Page
<p>1</p>	<ul style="list-style-type: none"> Power switch is turned on. Pattern matching key is not blinking. Guider switch is blinking. 	<ul style="list-style-type: none"> Adjust the sensor sensitivity. Replace lamp. 	<ul style="list-style-type: none"> Refer to "Adjusting sensor sensitivity". Refer to "Replacing lamp". 	<p>20</p> <p>26</p>
<p>2</p>	<ul style="list-style-type: none"> Feed amount may change according to material. 	<ul style="list-style-type: none"> Decrease machine rotation speed. 	<ul style="list-style-type: none"> Decrease the rotation speed with speed adjustment volume. 	
<p>3</p>	<ul style="list-style-type: none"> Improperly positioned upper or lower cloth 	<ul style="list-style-type: none"> Check upper feed amount again. Set upper feed amount. 		
<p>4</p>	<ul style="list-style-type: none"> Improper pattern pitch 	<ul style="list-style-type: none"> Check pattern pitch again. 		<p>I/M</p>

I/M = Refer to the Instruction Manual

Replacing parts

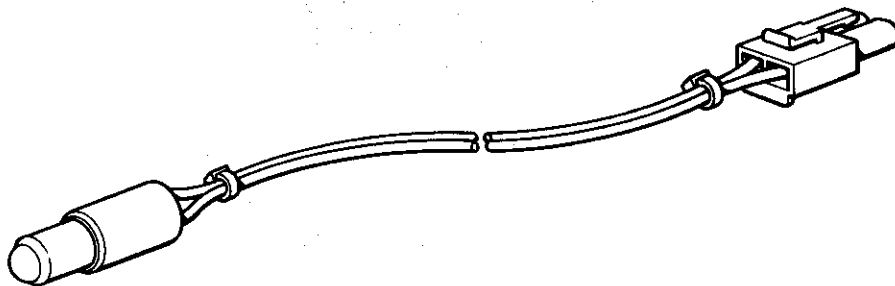
1 Replacing lamp

The lamp monitor lights if the lamp goes off or wears down.
When the lamp becomes dim, the voltage will increase automatically.
The life of the lamp is approximately two years.

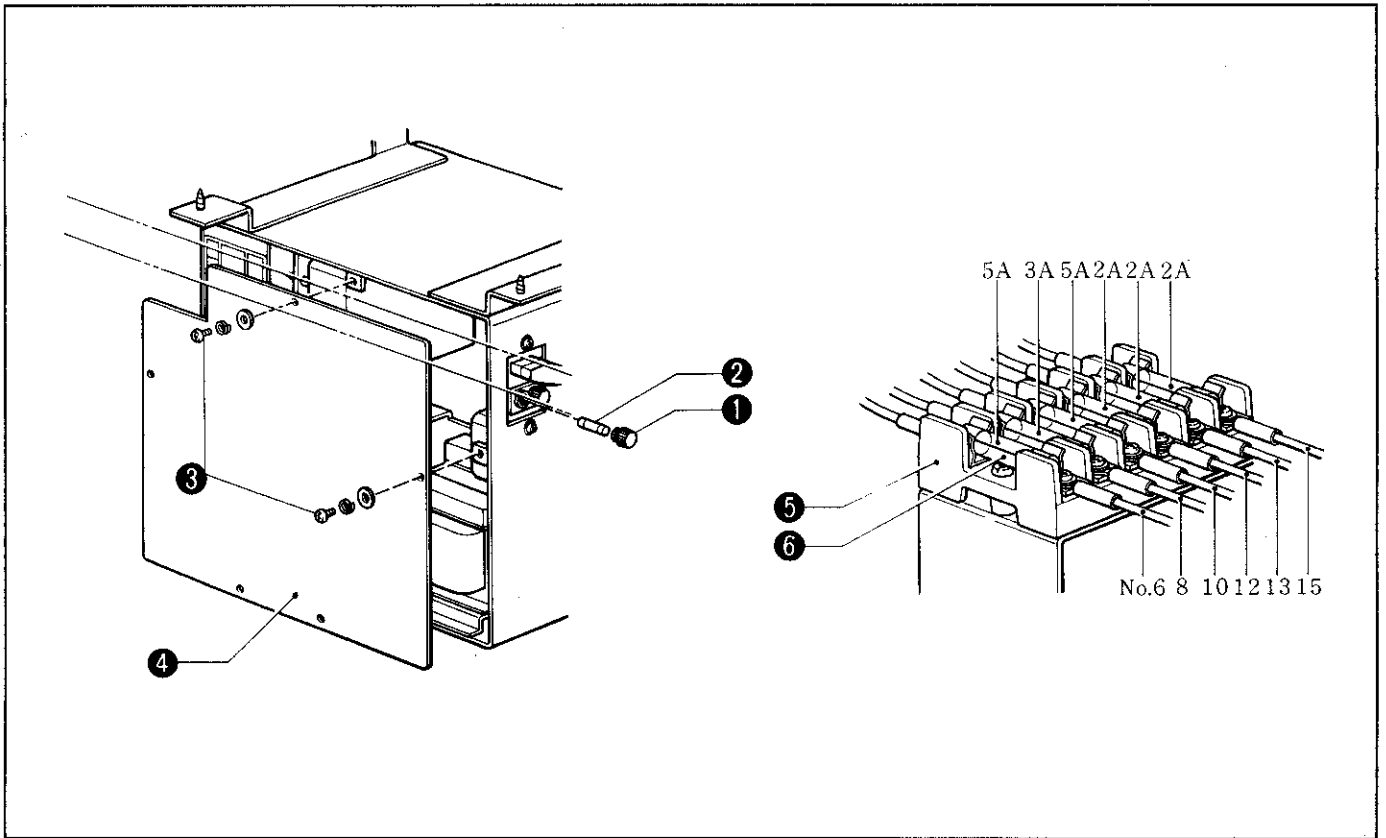


- 1) Remove screw ① of the control box and the front cover ②.
 - 2) Loosen screw ③, then remove the lamp ④ and the connector.
 - 3) After replacing the lamp, reverse the above procedure for reassembling.
- NOTE1: Push the lamp all the way to the back.
NOTE2: Use an approximately 10kg-cm torque to tighten screw ③.

Part name	Lamp assembly
Part code	S13897-000



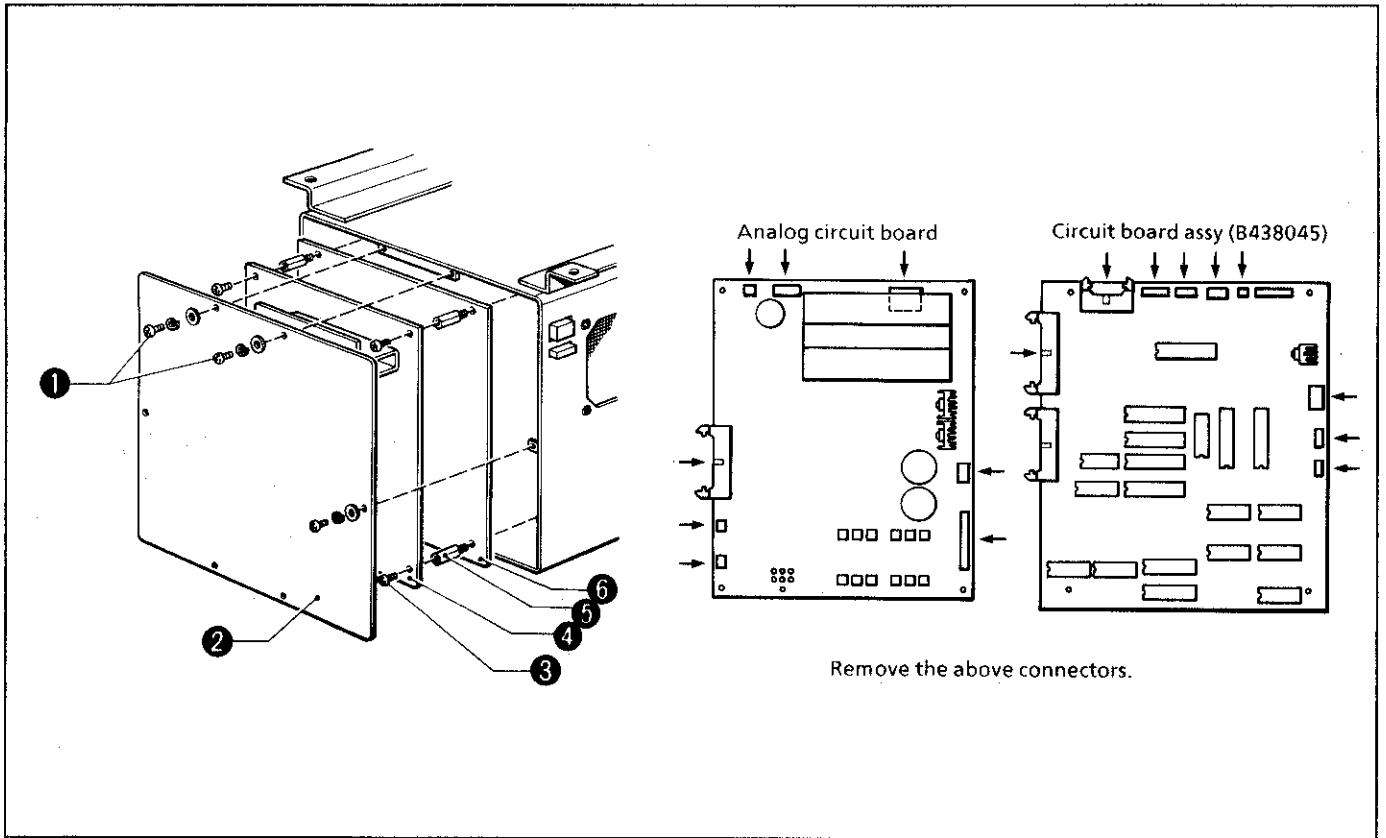
2 Replacing fuse



- 1) Remove the cap of the fuse holder ① and replace the fuse ②.
NOTE: Use 3A fuses for both right and left sides.
- 2) Remove five screws ③ and remove the cover ④ of the control box.
- 3) Replace the fuse ⑤ in the fuse holder ⑤.
NOTE: From front, fuses are placed in the order of 5A·3A·5A·2A·2A·2A.

NOTE: When reassembling, reverse the above procedure.

3 Replacing circuit board



1. Replacing analog circuit board

- 1) Remove six screws ❶ and remove the front cover ❷.
- 2) Remove the eight connectors, four screws ❸, and the analog circuit board ❹.

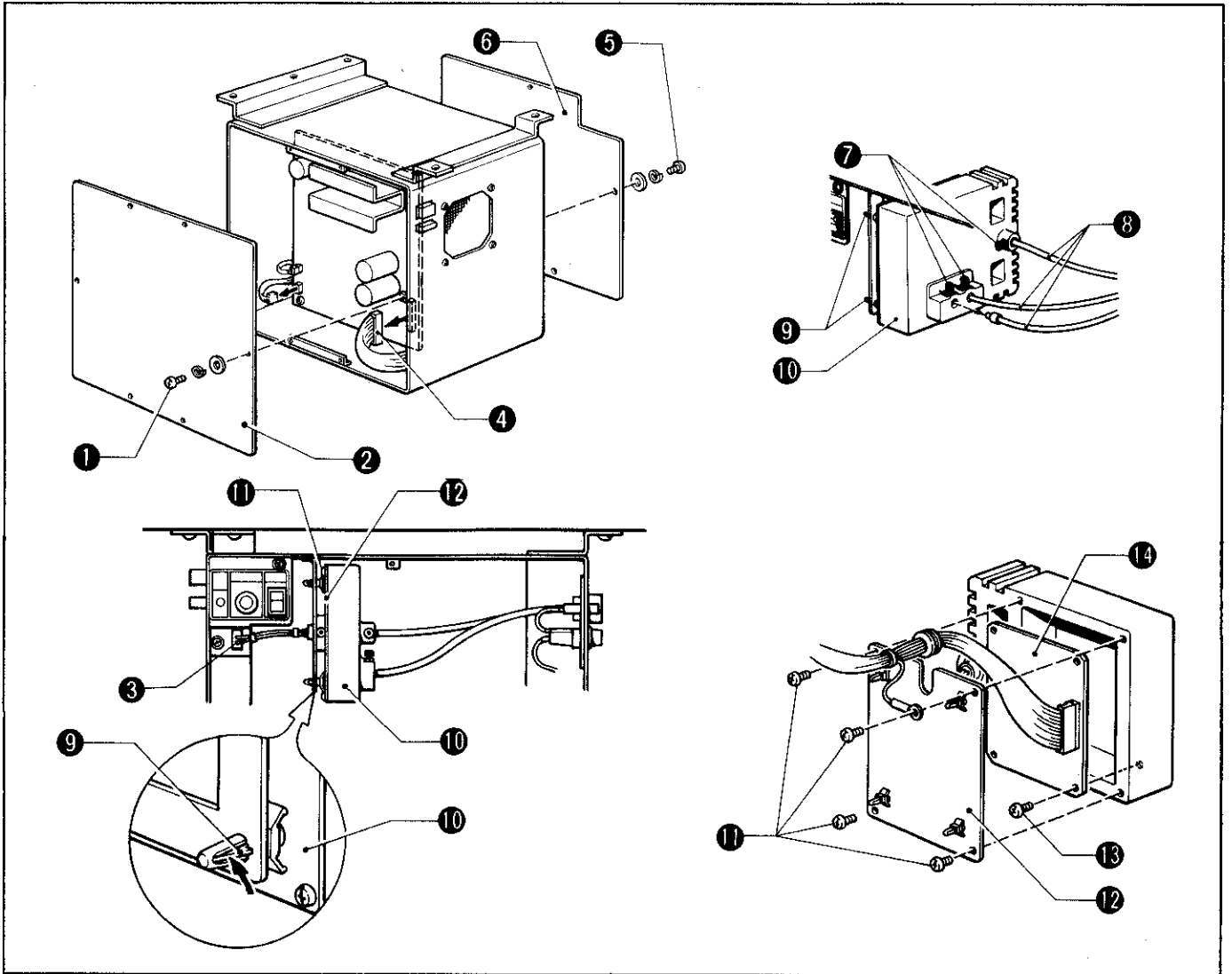
2. Replacing circuit board assembly (B438045)

- 1) Remove the analog circuit board ❹.
- 2) Remove the nine connectors, four studs ❺, and the circuit board assembly (B438045) ❻.

NOTE1: After replacing the analog circuit board ❹, refer to p.20 and adjust the sensor sensitivity.

NOTE2: When reassembling, reverse the above procedure.

3. Replacing sensor circuit board



- 1) Remove six screws ❶ and the front cover ❷.
- 2) Remove the connectors ❸ and ❹.
- 3) Remove five screws ❺ and the cap ❻ of the control box.
- 4) Loosen bolt ❼ and remove the three optical fiber cables ❸ of the receptacle assembly. (Do not apply unnecessary force to the cables.)
- 5) Push the four claws ❾ and remove the reflector box assembly ❿.
- 6) Remove four screws ⓫ and the cap ⓬.
- NOTE: When reassembling, do not forget the ground wire.
- 7) Remove four screws ⓭ and the sensor circuit board ⓮.

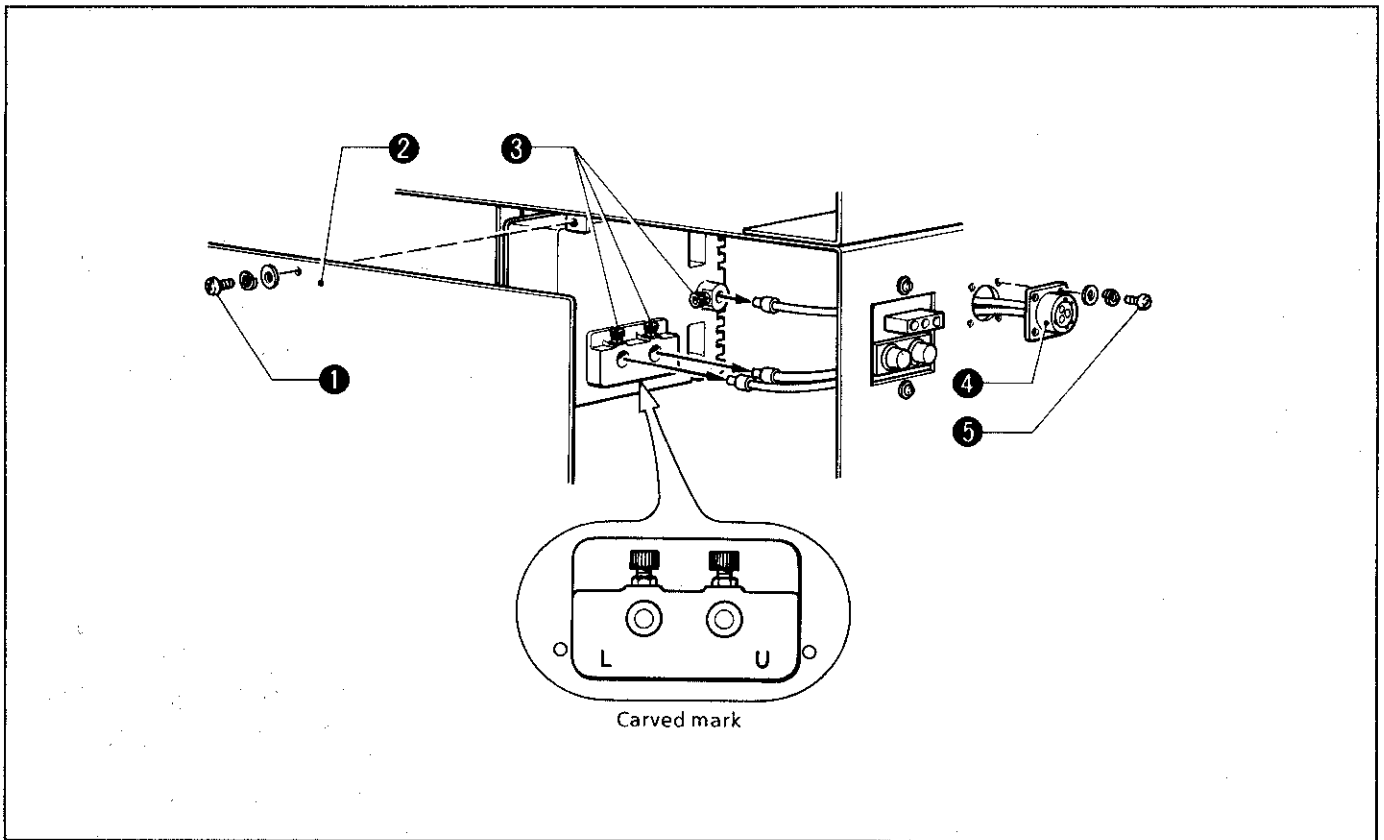
NOTE1: Be careful not to scratch the end of the optical fiber cables ❸ of the receptacle assembly.

NOTE2: When reassembling, reverse the above procedure.

NOTE3: Use an approximately 10kg · cm torque to tighten bolt ❼.

NOTE4: After replacing the sensor circuit board ⓮, refer to p.20 and adjust the sensor sensitivity.

4 Replacing receptacles



- 1) Remove five screws ❶ and the cover ❷ of the control box.
- 2) Loosen bolt ❸ and remove the three optical fiber cables of the receptacle assembly ❹. (Do not apply unnecessary force to the cables.)
- 3) Remove four screws ❺ and the receptacle assembly ❹.

NOTE1: Be careful not to scratch the end of the optical fiber cables of the receptacle assembly ❹.

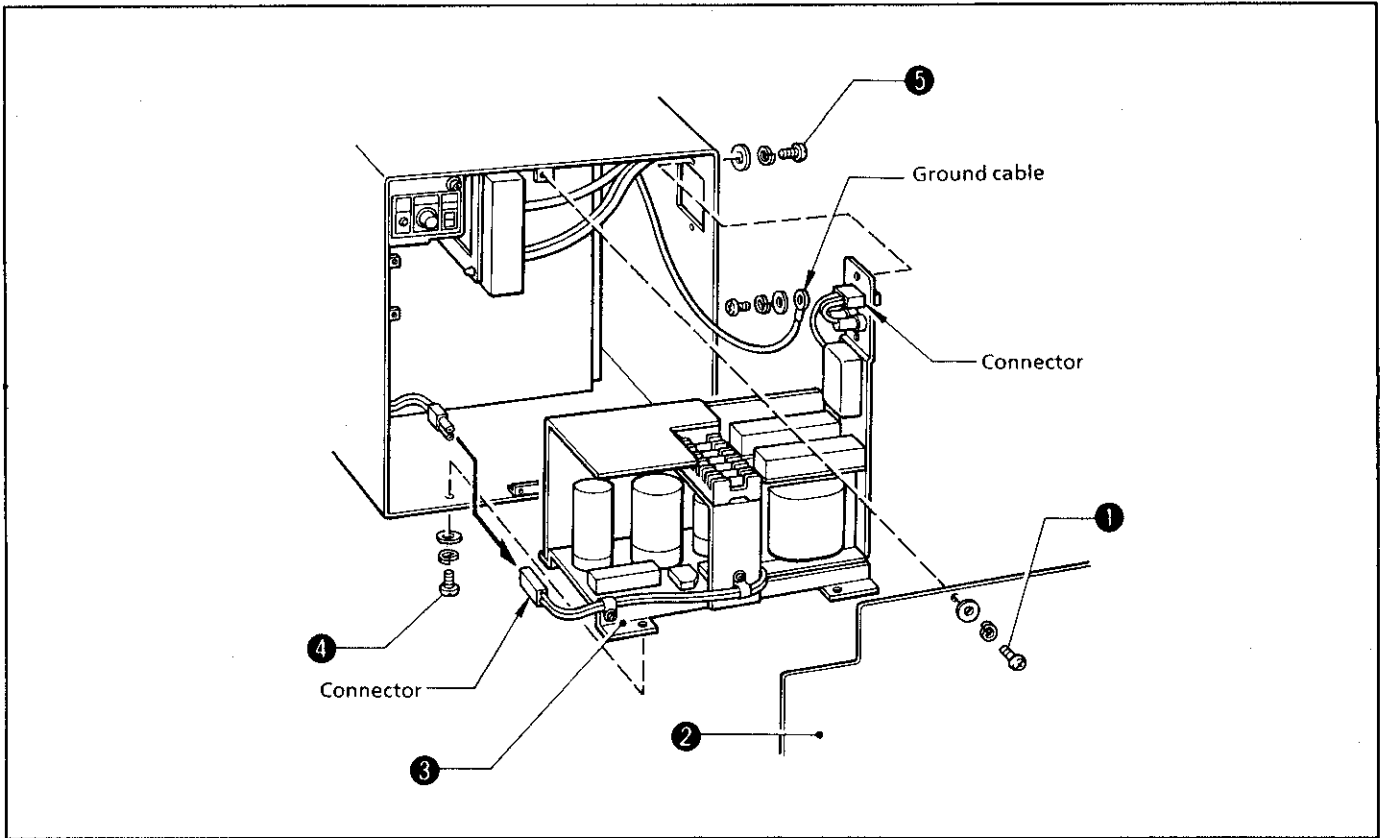
NOTE2: When reassembling, reverse the above procedure.

NOTE3: Use an approximately 10kg · cm torque to tighten bolt ❸.

NOTE4: When assembling the receptacle assembly ❹, match the two wire marks with the carved marks. Then, push the assembly all the way to the back. (The projection fiber cable is unmarked.)

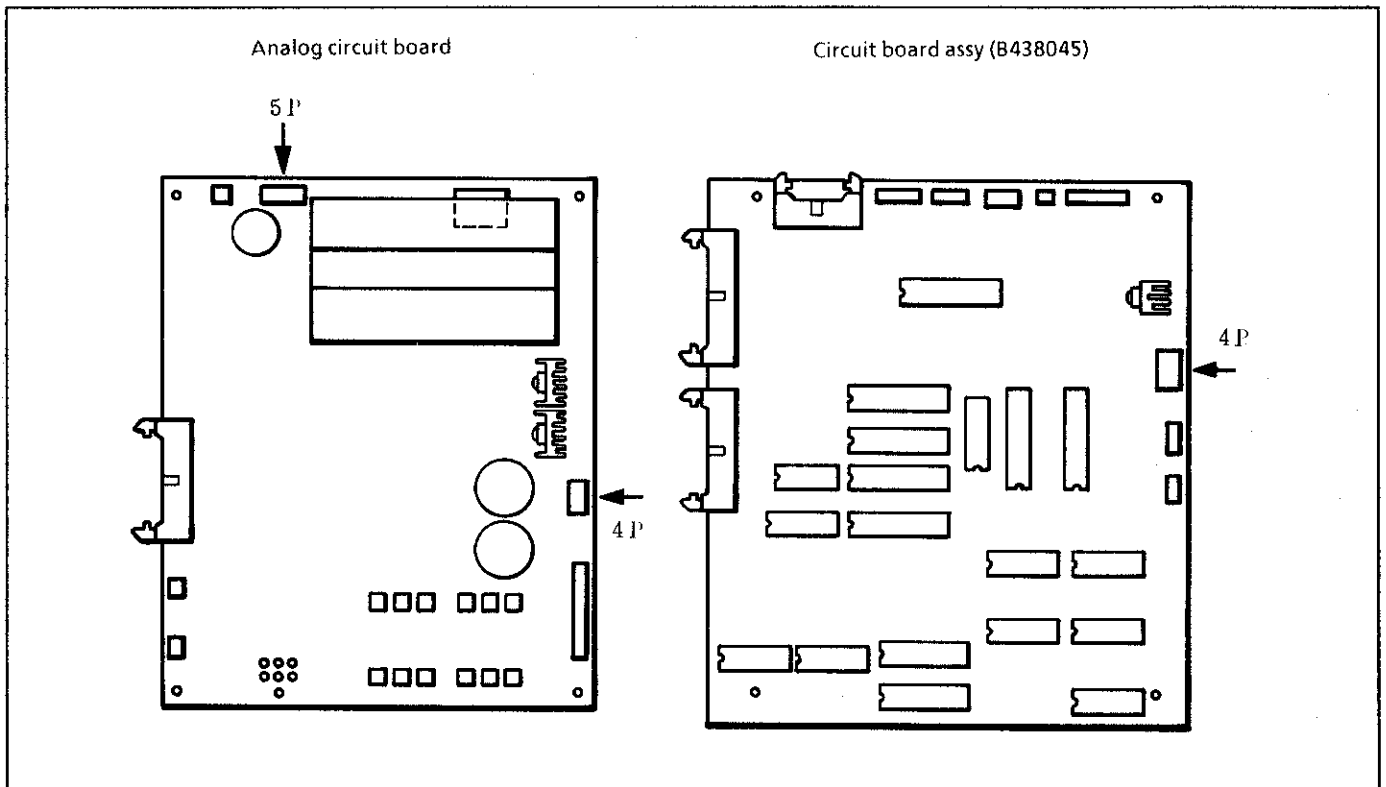
NOTE5: After replacing the receptacle assembly ❹, refer to p.20 and adjust the sensor sensitivity.

5 Replacing power supply unit



- 1) Remove five screws ① and the cap ②.
- 2) Remove the two connectors attached to the power supply unit assembly ③ and the ground cable.
- 3) Remove the connectors of the circuit board. (The analog circuit board side 5P connector-4P connector ·circuit board assembly(B438045) 4P connector)
- 4) Remove the four screws ④ on the bottom and the two screws ⑤ on the sides. Then, remove the power supply unit assembly ③.

NOTE: When reassembling, reverse the above procedure.



1 Instructions for motors of pattern matching sewing machine

1. The MD-813 Mark II motor cannot be used for this machine. Use a motor suitable for pattern matching.
2. Only the DIP switch B-3 should be ON.
 - 1) If the DIP switch B-3 is OFF, the number of the back tack stitches will be A,B for the back tack start and B,A for the back tack end.
 - 2) Do not turn the DIP switches A-1 and B-1 on. It will hinder normal operation.
 - 3) Other DIP switches have the same functions as the ones in MD-813 Mark II. Refer to the MD-813 Mark II instruction.

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