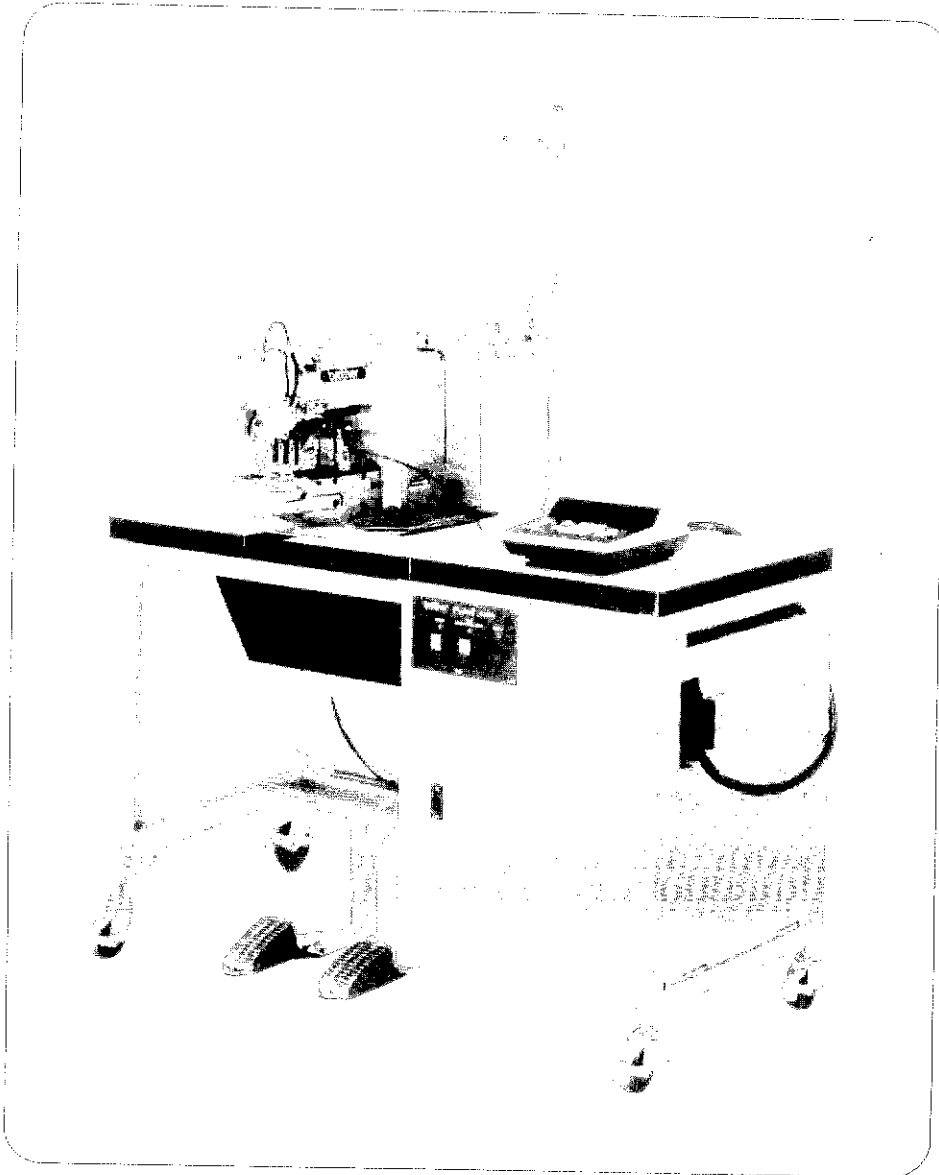


brother®

SERVICE MANUAL FOR BAS-330



BROTHER INDUSTRIES, LTD.

NAGOYA, JAPAN

CONTENTS

MOTOR PULLEY AND SPEED	1
STANDARD TENSION	1
MECHANISM	2
1 Needle Bar, Thread Take-up Lever, Lower Shaft, Shuttle mechanisms	2
2 Clutch mechanism	3
3 Power Work Clamp Lifter and Thread Wiper mechanisms	4
4 Feed mechanism	5
5 Thread Trimmer mechanism	6
6 Thread Tension and Tension Release mechanisms	7
7 Stepping Foot mechanism	8
ADJUSTMENTS (I)	9
1 To turn the machine by hand	9
2 Needle Bar Height adjustment	9
3 Shuttle Hook Timing adjustment	9
4 Driver and Needle Contact adjustment	10
5 Needle and Shuttle Hook clearance adjustment	10
6 Lower Shaft Gear backlash adjustment	10
7 Shuttle Race Thread Guide installation adjustment	11
8 Checking and adjustment of original starting point	11
9 Needle and feed timing adjustment	12
10 Roller Holder Lever position adjustment	13
11 Worm Wheel backlash adjustment	13
12 Gear backlash adjustment	13
13 Stopper adjustment	14
14 Clutch Lever position adjustment	14
15 Ball Presser Plate position adjustment	14
16 Clutch Cam timing adjustment	16
17 Start Lever position adjustment	16
18 Start Safe Lever adjustment	17
19 Start Stopper position adjustment	17
20 Brake adjustment	17
21 Clutch Lever Spring pressure adjustment	17
22 Brake Spring pressure adjustment	18
23 Power Drive Lever position adjustment	18
24 Air pressure adjustment	19
25 Presser foot adjustment	19
26 Movable Knife position adjustment	20
27 Movable Knife timing adjustment	20
28 Thread Take-up Lever stroke adjustment	21
29 Main Tension Disc adjustment	21
30 Sub-tension adjustment	22
31 Thread Wiper adjustment	22
HOW TO MAKE THE PRESSER	23
1 How to make the bar tacking presser	23
2 How to make the cassettes	25
LIST OF REPLACEMENT PARTS	27
TROUBLESHOOTING FLOW CHART	28
ADJUSTMENTS (II)	34
1 Cover removal	34
2 Fuse replacement	35
3 Circuit Board replacement	35
4 Dip Switch	36
5 Solenoid Valve adjustment	37
ELECTRIC-CIRCUIT	38
TROUBLESHOOTING FLOW CHART	39
1 Troubleshooting flow chart for machine control device	40
2 Troubleshooting flow chart for programming device	44
ACTION COUNTERMEASURE	45

MOTOR PULLEY AND SPEED

This high-speed sewing machine can sew at a maximum 2,000 spm.
When changing the rotation speed, refer to the following table and select a revolution speed to match the product being sewn.

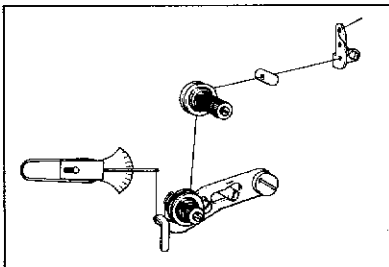
Frequency	Sewing speed (r.p.m.)	Motor pulley (Diameter)	High speed V-belt (Inches)	Low speed V-belt (Inches)
50 Hz	1,800	153109001 (107.8)	082105190 (51)	082104890 (48)
	1,500	153426001 (90)	082105090 (50)	
	1,000	154306001 (60.8)	082104990 (49)	
60 Hz	1,800	153108001 (91)	082105090 (50)	
	1,500	153425001 (75.5)	082104990 (49)	
	1,000	154305001 (51.3)	082104890 (48)	

STANDARD TENSION

Use	For ordinary clothes	For heavy materials (Standard)
Upper thread tension (g)	80 ~ 120	180 ~ 220
Lower thread tension (g)	15 ~ 25	15 ~ 25
Thread take-up spring height (mm)	6 ~ 8	8 ~ 10
Thread take-up spring tension (g)	15 ~ 35	150 ~ 200
Thread take-up lever stroke (mm)	2 ~ 4	5

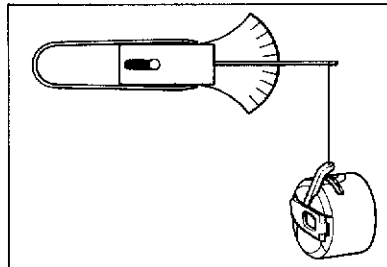
● Tension measurement

Upper thread tension



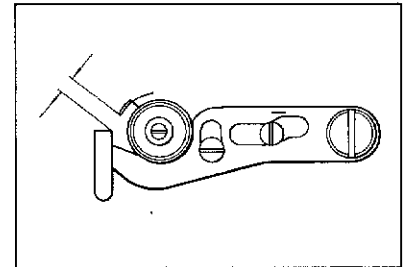
Start machine, and measure as shown above.

Lower thread tension



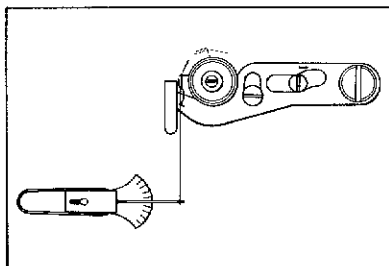
Measure as shown above.

Thread take-up spring height



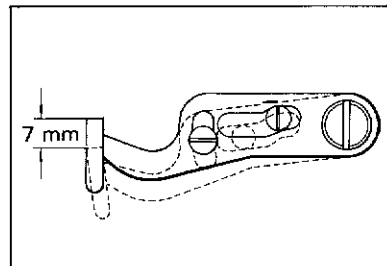
Start the machine and measure distance.

Thread take-up spring tension



Measure it when thread take-up spring is lower to thread take-up lever.

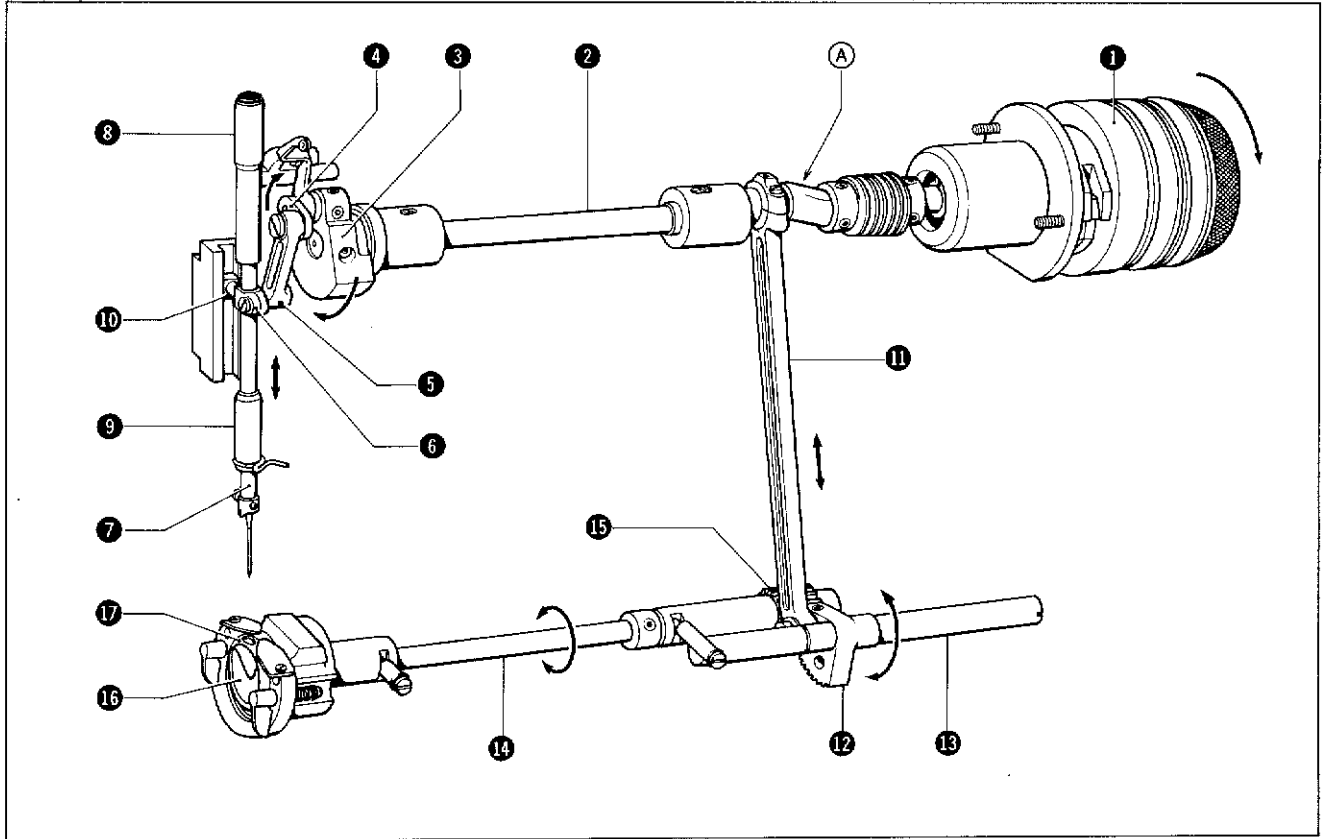
Thread take-up lever stroke



Measure distance from lever position when machine is started to its stop position.

MECHANISM

1 NEEDLE BAR, THREAD TAKE-UP LEVER, LOWER SHAFT, SHUTTLE MECHANISMS



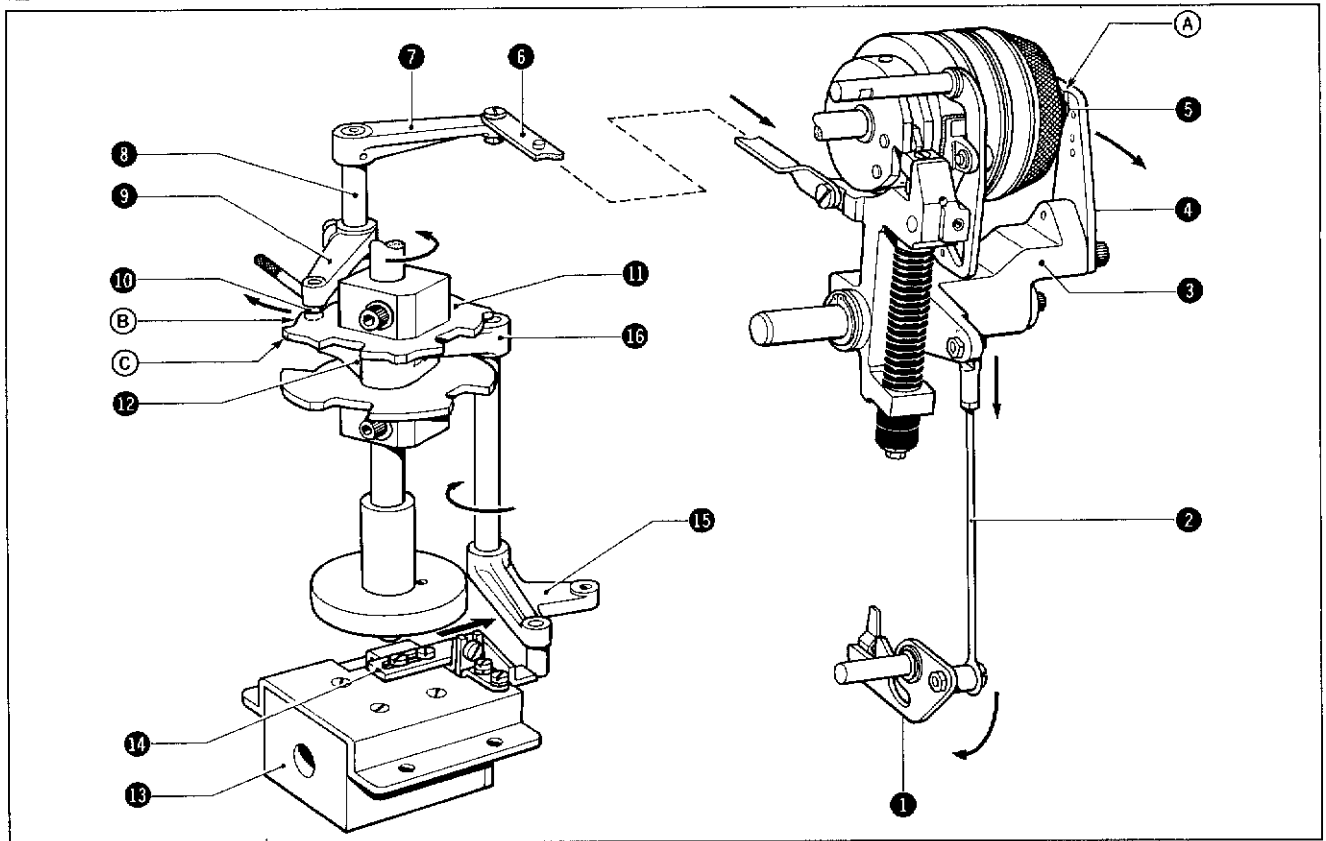
(1) Needle Bar and Thread Take-up Lever mechanism

1. When pulley 1 turns in the arrow direction, its rotating motion is conveyed to counter weight 3 which is connected to upper shaft 2.
2. Needle bar crank 4 is attached to counter weight 3 so that needle bar clamp 6 is moved up and down via needle bar crank rod 5.
3. Needle bar 7 which is gripped by needle bar clamp 6 is guided by needle bar bushing U 8, needle bar bushing D 9 and needle bar guide slide block 10 to smoothly run up and down.

(2) Lower Shaft and Shuttle mechanism

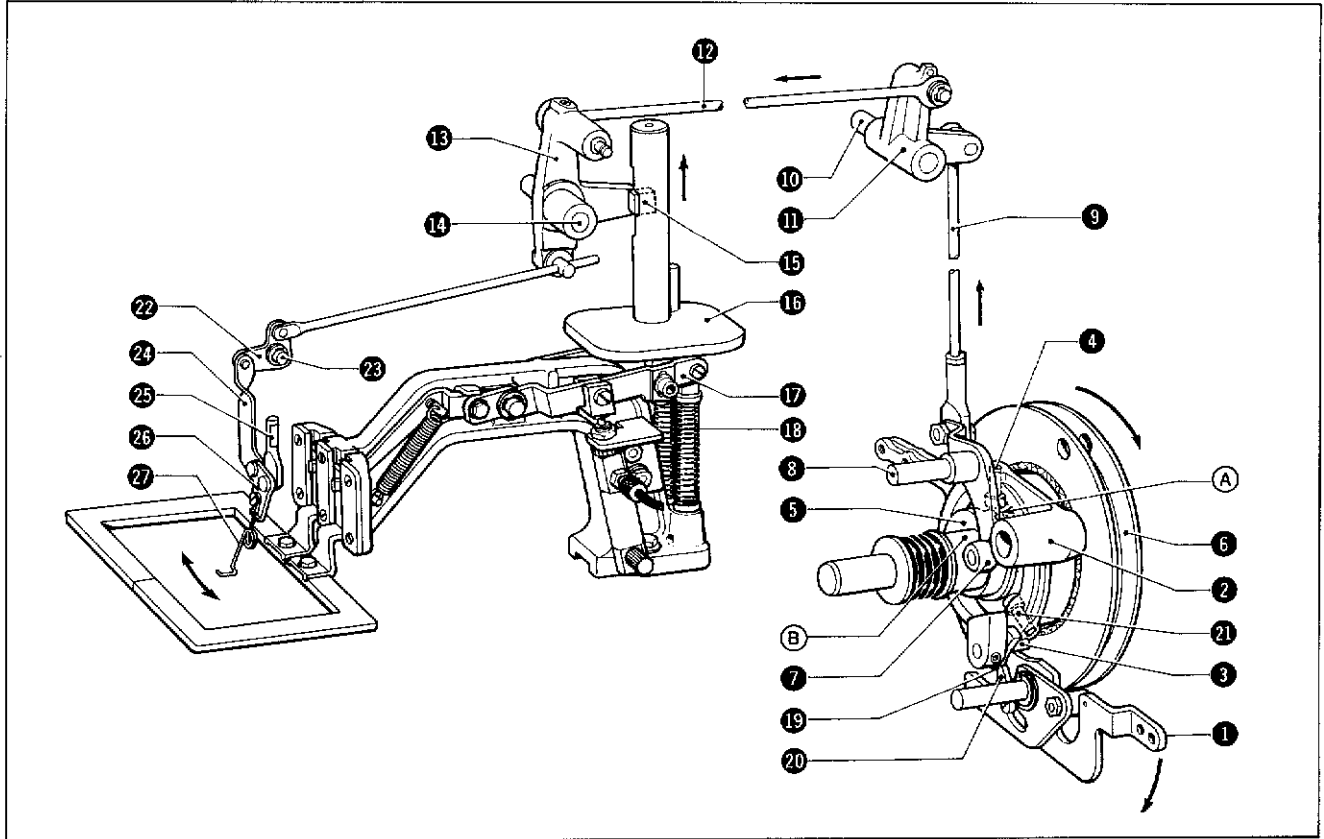
4. When pulley 1 turns in the arrow direction, crank rod 11 moves up and down via the crank part A of the upper shaft.
5. The lower end of crank rod 11 is connected to rock gear 12 and rocks about rock gear shaft 13.
6. Rock gear 12 engages lower shaft gear 15 which is fixed to lower shaft 14 and turns lower shaft 14 one half of a turn. Similarly, its motion is conveyed to driver 16 attached to the tip of lower shaft 14 to drive shuttle 17 one half of a turn.

2 CLUTCH MECHANISM



1. When the start lever **1** moves in the direction of the arrow, the low speed part **A** of the ball presser plate **4**, which is connected to the clutch lever **3**, is aligned with the steel ball **5** and transmits power to the upper shaft by means of the start connecting rod **2**.
2. One end of the clutch connecting rod **6** is coupled to the clutch lever **3**, the other end being connected to the clutch actuating lever **7**. The clutch cam lever **9** moves on the clutch actuating lever shaft **B**, and the end roller **10** rides up onto the low speed section **B** of the clutch cam **11**, the machine starts to rotate with low speed for 2 stitches.
3. When the roller **10** rides up onto the high speed section **C** of the clutch cam **11**, the roller holder **12** moves under the roller **10** and high-speed sewing continues until the fourth stitch before the final stitch.
4. When the stop solenoid **13** turns on, the clutch lever plate **14** is pushed out in the direction of the arrow, turns the control cam lever **15** and transmits movement to the control lever **16**.
5. When the roller **10** is nearly aligned with the high speed section **C** of the clutch cam, the stop solenoid **13** becomes off, and the roller **10** is released from the roller holder **12**, dropping to the high speed section **C** of the clutch cam **11**. Continuing, the roller **10** moves to the low speed section **B** sews four low speed stitches and rolls into the concave part of the clutch cam **11** causing the machine to stop.

3 POWER WORK CLAMP LIFTER AND THREAD WIPER MECHANISMS



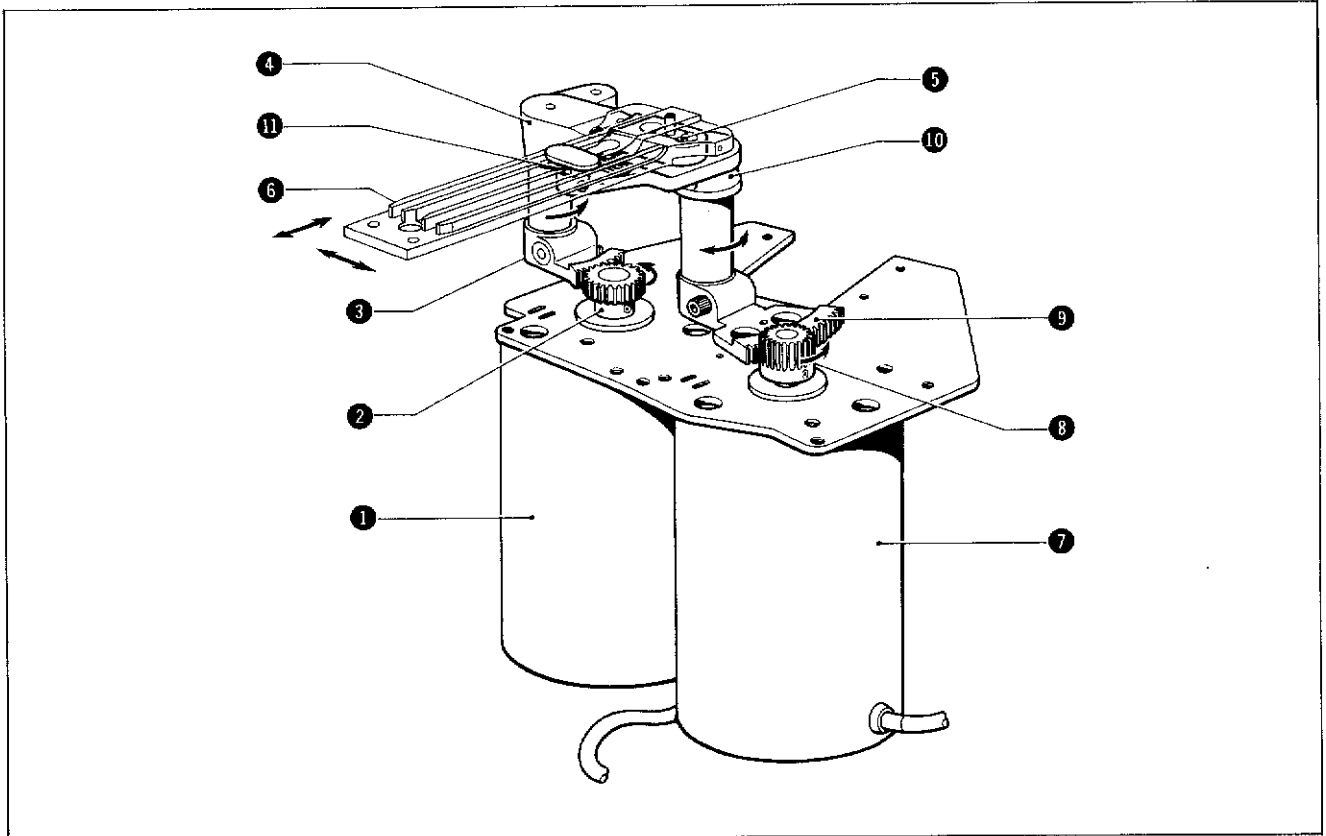
(I) Power Work Clamp Lifter mechanism

1. When the power actuating lever **1** moves in the direction of the arrow, the roller **3** connected to the bottom end of the clutch actuating lever **2**, is pushed upwards, the clutch actuating lever roller **4** is separated from the cam **A** of the power cam, the power cam **5** connects to the power pulley **6**, and the power cam **5** rotates 1/2 revolution.
2. The work clamp lifter lever roller **7** connects to the work clamp lifter cam **B** and transmits motion to the connecting rod **9** by rotating on the actuating lever shaft **8**.
3. The connecting rod **9** is coupled to the connecting lever **10**, and transmits movement to lifter rod A **12** by rotating on the connecting lever shaft **11**.
4. Rod A **12** is coupled to the work clamp lifter lever **13**, and raises the work clamp lifter plate **16** by means of moving the slide block **15** which is fitted to the work clamp lifter lever **13** that pivots on the work clamp lifter lever shat **14**.
5. Presser arm lever B **17**, which is pushed down by the work clamp lifter plate **16**, is pushed up by the presser spring **18**.
6. When the work clamp lifter roller shaft **19** is separated from the start lever claw **2** at the final stitch, the clutch actuating lever roller **21** separates from the cam **A**; the power cam **5** connects to the power pulley **6**, the power cam rotates 1/2 revolution, and the work clamp lifter plate **16** pushes presser arm lever B **17** down.

(II) Thread Wiper mechanism

The thread wiper rod assembly **22** is connected to the bottom end of the work clamp lifter lever **13**. The assembly pivots on the thread wiper shaft **23** and transmits motion to the thread wiper link **24**, thereby operating the thread wiper **27** which is connected to the thread wiper arm **26** and pivoting on the thread wiper arm support **25**.

4 FEED MECHANISM



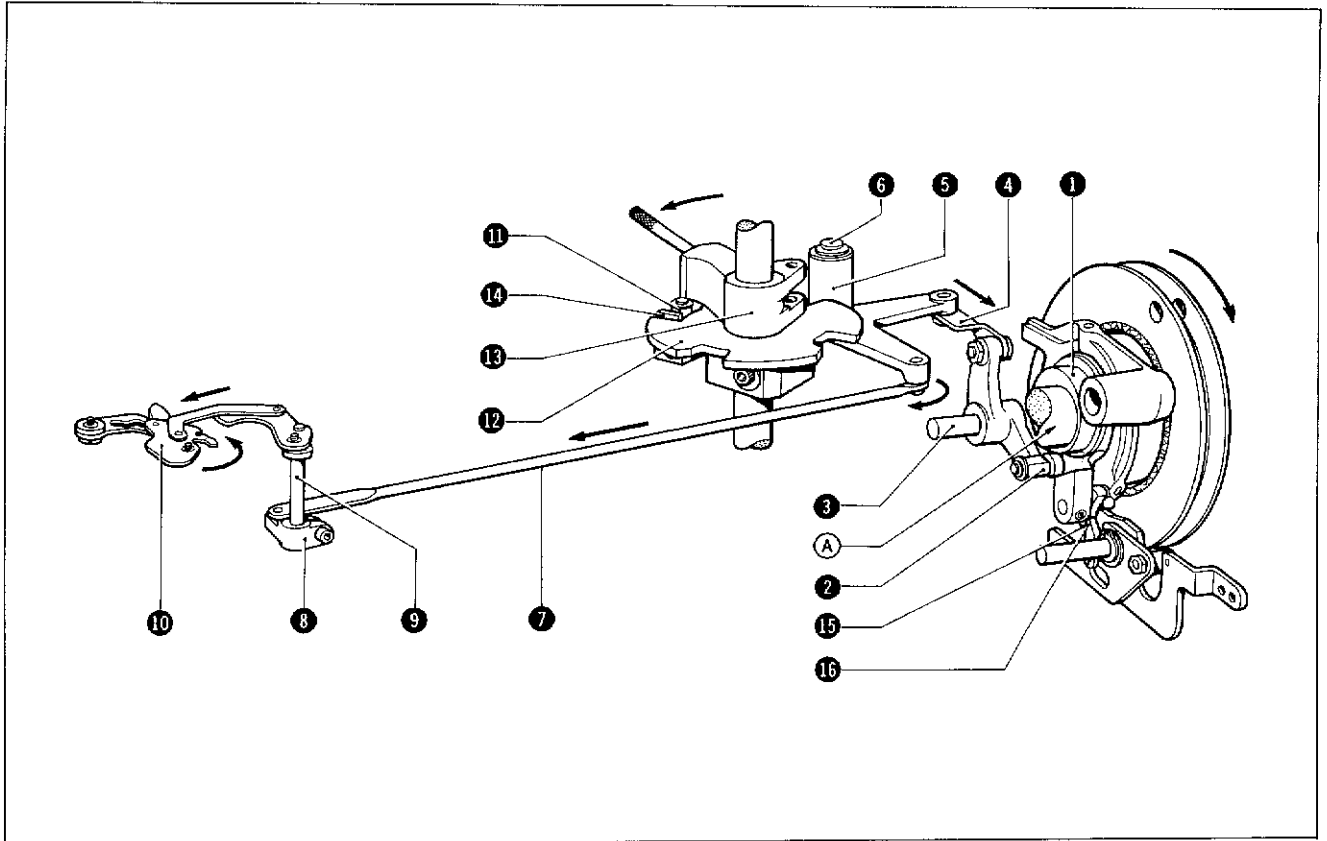
(I) Vertical Feed (Y-direction) mechanism

1. When the pulse motor ① rotates, movement is transmitted to the vertical driving gear ③ that meshes with the gear ② connected to the pulse motor shaft.
2. The vertical driving gear ③ is connected to the bottom end of the tack width lever ④, and directly transmits the gears' rocking motion to the tack width lever ④.
3. The tack width block assembly ⑤ fits in the guide hole of the tack width lever ④ and moves the feed guide ⑥ forward and back.

(II) Horizontal Feed (X-direction) mechanism

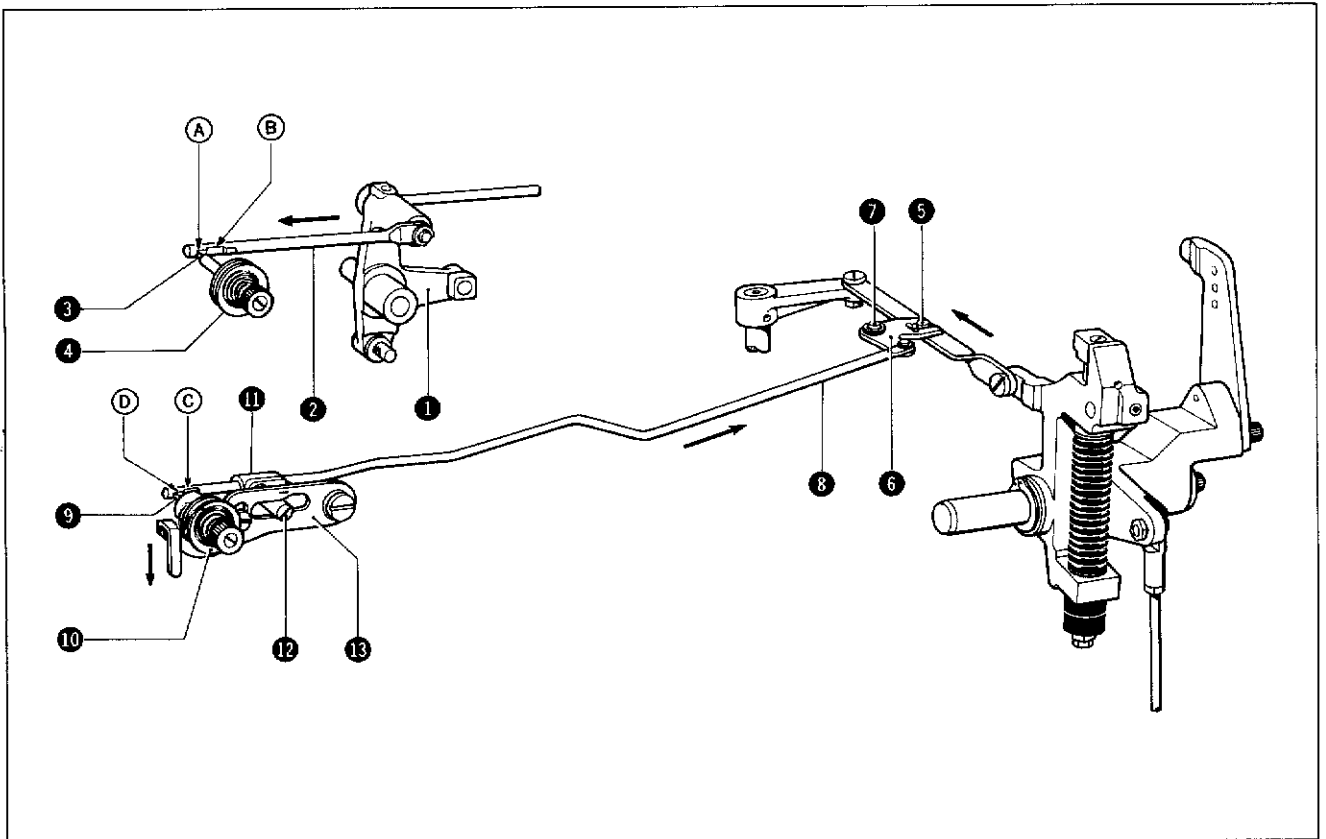
1. When the pulse motor ⑦ rotates, movement is transmitted to the horizontal driving gear ⑨ that meshes with the horizontal drive gear ⑧ connected to the pulse motor shaft.
2. The horizontal driving gear ⑨ is connected to the bottom end of the tack length lever ⑩ and directly transmits the gear's rocking motion to the tack length lever ⑩.
3. The slide block ⑪ connected to the top end of the tack length lever ⑩ fits in the guide hole in the feed guide ⑥ and moves the feed guide ⑥ left and right.
4. Depending on the combination of movements of steps ③ and ⑥ above, various sewing patterns can be formed.

5 THREAD TRIMMER MECHANISM



1. When power cam ① rotates one half of turn in the arrow direction, roller ② in contact with the cam part (A) of power cam ① is pushed down so that the motion is conveyed via thread trimming link ④ to cam lever ⑤ through driving shaft ③ as fulcrum.
2. Cam lever ⑤ conveys the motion to connecting rod ⑦ via cam lever shaft ⑥ as fulcrum to forcibly return movable knife ⑩ via thread trimming arm B ⑨, which is connected to thread trimming arm A ⑧, to a specific position.
3. When roller ⑪ rides on the periphery of knife cam ⑫, roller holder ⑬ gets under roller ⑪ to holder roller ⑪ there till 4 stitches before the final stitch.
4. When cam lever claw ⑭ drops from the periphery of knife cam ⑫ one half into its recess, movable knife ⑩ scoops an upper thread loop up and stop before the needle hole; and when work clamp lifter roller shaft ⑮ disengages from start lever claw ⑯, power cam ① rotates one half of a turn and movable knife ⑩ cuts the thread.

6 THREAD TENSION AND TENSION RELEASE MECHANISMS



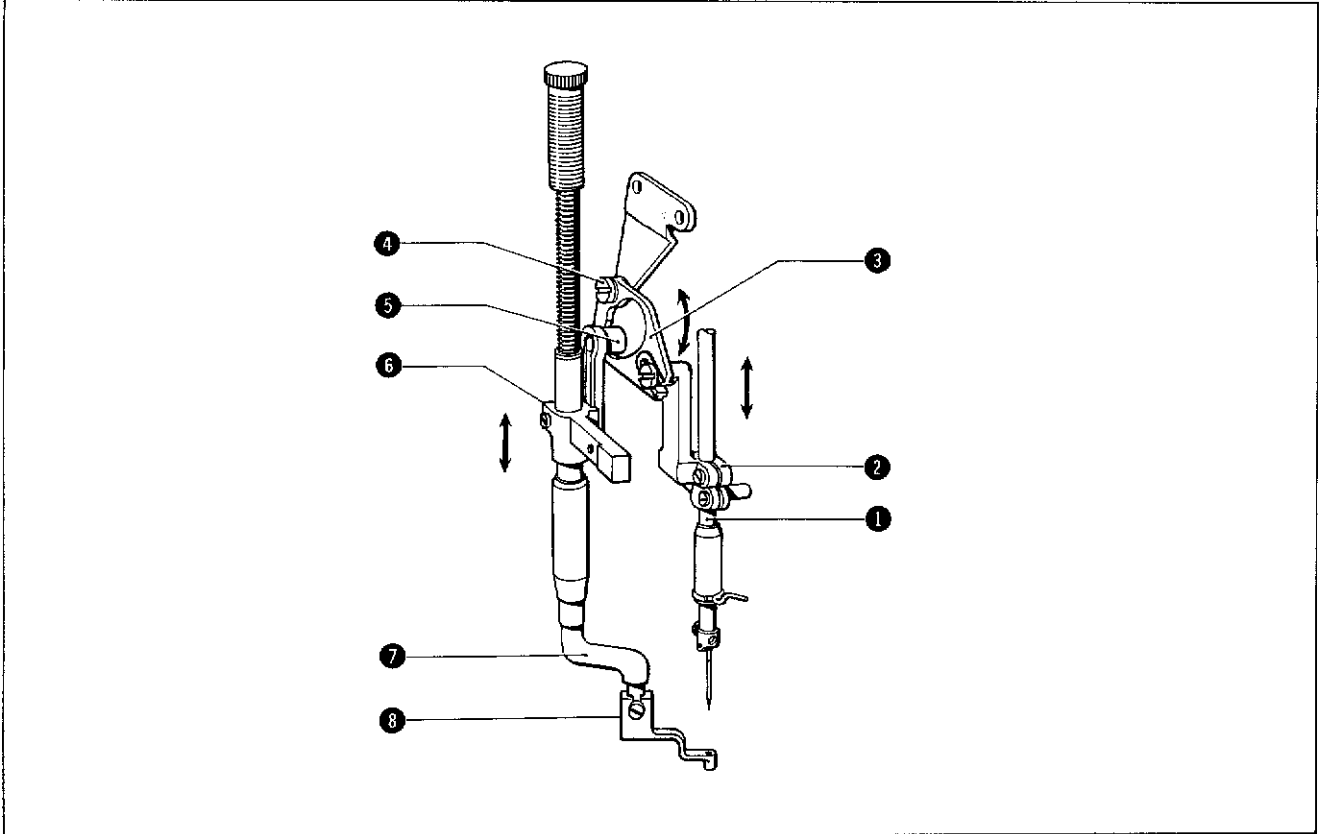
(I) Thread Tension mechanism

The thread tension mechanism is interlocked with the power work clamp lifter mechanism. Tension release bar ② is connected to the upper end of work clamp lifter lever ①. When the machine is started tension release pin ③ is located at the cam part ①; and immediately before the movable knife cuts the thread, tension release pin ③ falls into the cam part ② to momentarily tighten tension discs ④ to prevent the upper thread from running on while thread cutting.

(II) Tension Release mechanism

1. The tension release mechanism is interlocked with the clutch mechanism. When the clutch is engaged 90° before the stop cam reaches the stop position upon sewing the final stitch, tension release lever ⑥ which is engaged with roller ⑤ conveys the motion to tension release bar ⑧ via tension release lever shaft ⑦ as fulcrum.
2. When the machine is started, tension release pin ⑨ is at the cam part ③; and when the stop cam reaches 90° before the stop position, tension release pin ⑨ rides on the cam part ④ to release tension discs ⑩ and simultaneously conveys the motion to thread take-up lever ⑬ via guide stud ⑫ which is fixed to guide bearing ⑪, thereby feeding the necessary length of thread for starting the next sewing.

7 STEPPING FOOT MECHANISM

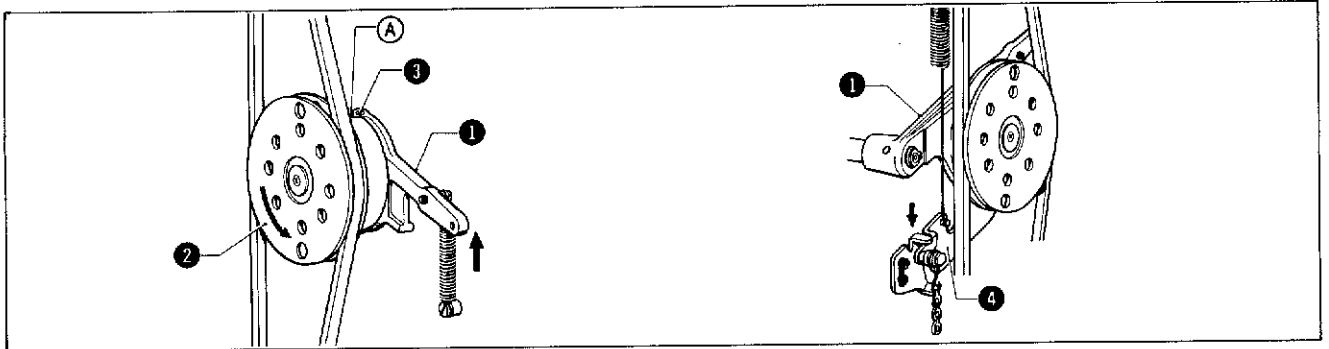


1. When the needle bar ① moves up and down, movement is transmitted to stepping foot cam S ③ through the movement of the stepping foot needle bar clamp ② that is connected to the needle bar ①.
2. The stepping foot cam S ③ pivots on the step screw ④ creating a rocking motion.
3. The stepping foot roller ⑤ connects to the cam section of the stepping foot cam S, moving the stepping foot presser bar clamp ⑥ up and down.
4. The stepping foot presser bar clamp ⑥ is connected to the presser bar ⑦ and moves the presser foot ⑧ up and down one stitch at a time in synchronization with the needle bar ①.

ADJUSTMENT (I)

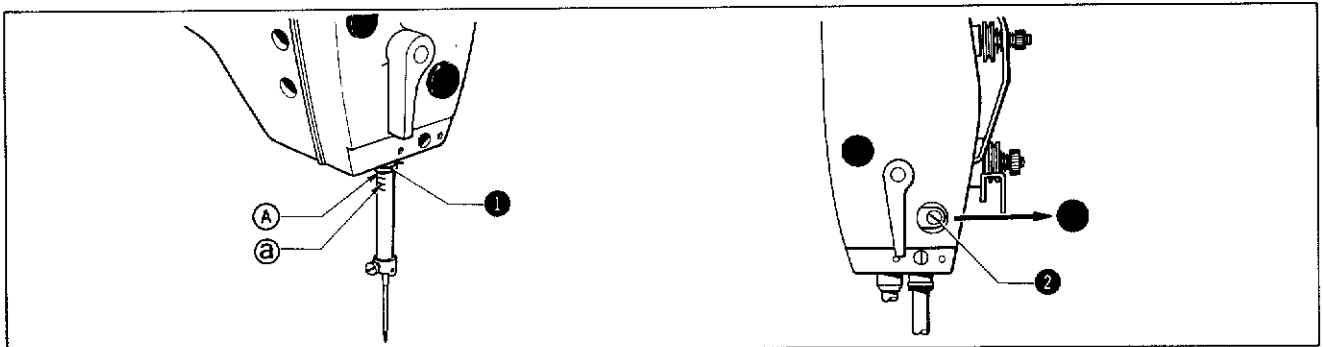
1 TO TURN THE MACHINE BY HAND

* By following the order below, the machine can be manually operated. First set the machine to the manual operation position and then perform each of these adjustments.



- (1) With the machine stopped and the drive lever ① raised, if the power pulley ② is turned in the direction of the arrow, the work clamp lifter plate rises, and the groove (A) of the power cam will align with the center of the roller ③.
- (2) Holding the drive lever ① as is, if the power start lever ④ is fully lowered, the clutch will engage.
- (3) Release the drive lever ① and after turning the pulley 2 ~ 3 revolutions, release the power start lever ④.

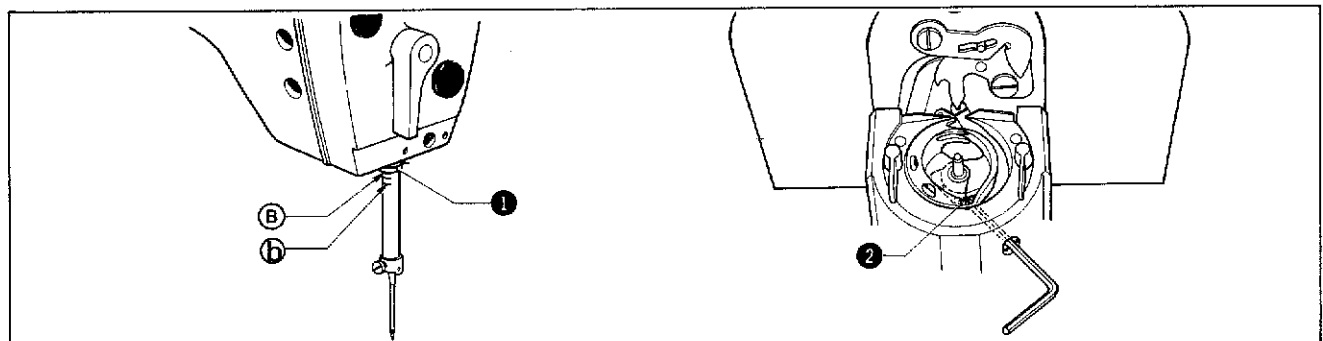
2 NEEDLE BAR HEIGHT ADJUSTMENT



Turn the pulley to lower the needle bar to its lowest position. Then loosen screw ② and move the needle bar up or down so that the uppermost reference line (A) of the needle bar is flush with the lower end of the needle bar bushing ①.

* If using a DP × 17 needle, adjust the needle bar so that the reference line second from the bottom (a) is flush with the base of the bushing.

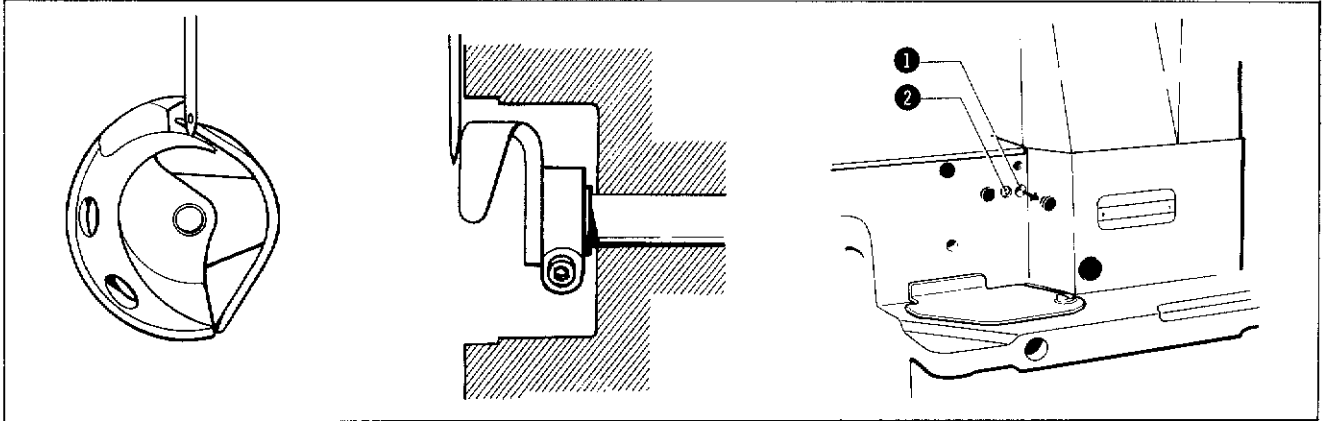
3 SHUTTLE HOOK TIMING ADJUSTMENT



Turn the pulley to move the needle bar up from its lowest position and set the reference line (B), second from the top of the needle bar, flush with the lower end of the needle bar bushing ①. Then, with the needle bar in this position, loosen bolt ② and move the driver so that the top of the shuttle hook is in line with the center of the needle.

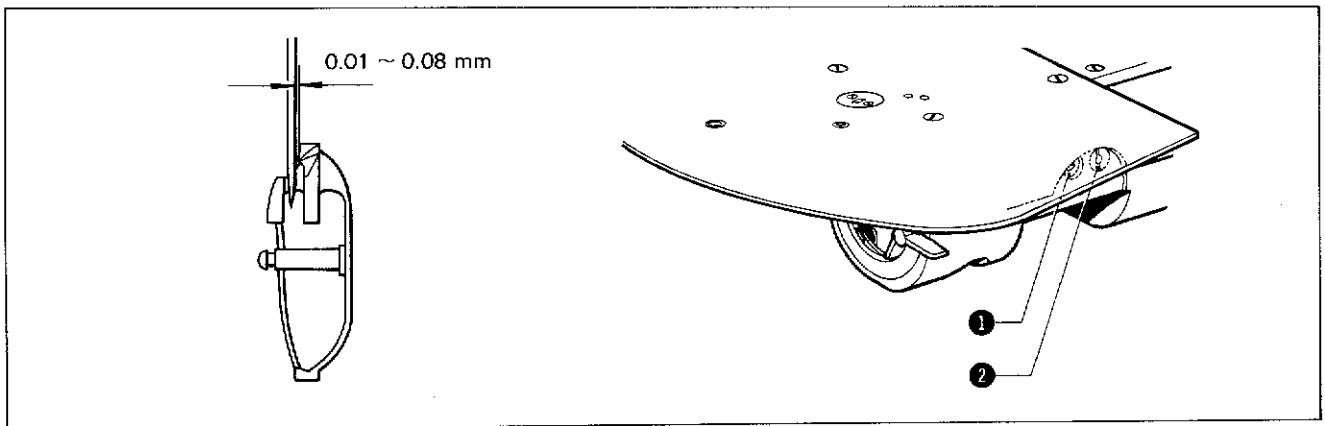
* If using a DP × 17 needle, adjust the needle bar so that the lowest reference line (b) is flush with the base of the needle bar bushing.

4 DRIVER AND NEEDLE CONTACT ADJUSTMENT



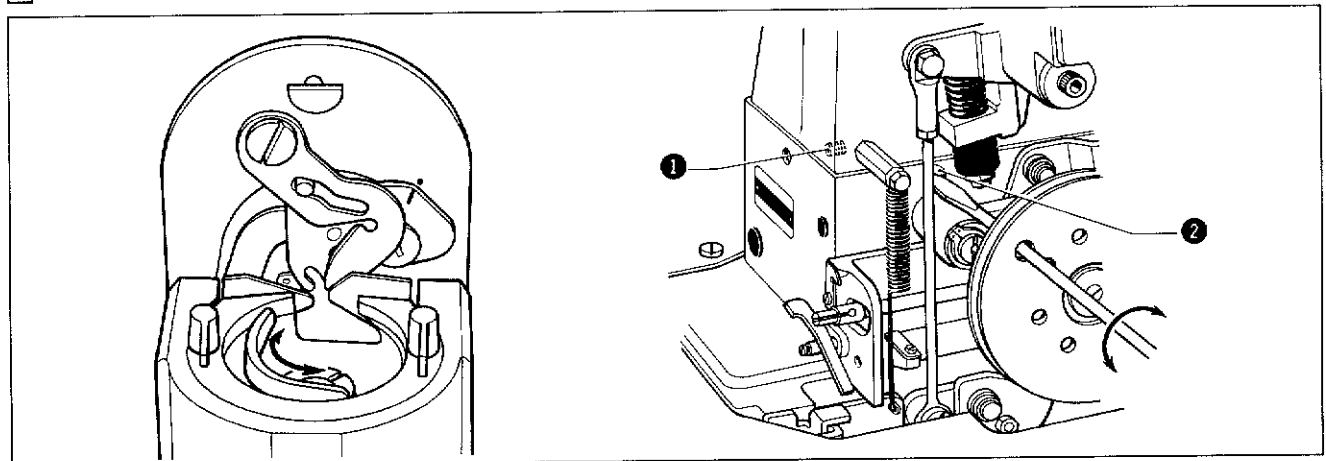
Turn the pulley to bring the top of the shuttle hook into line with the center of the needle. Loosen screw ① and turn the eccentric shaft ② so that the needle comes into contact with the driver. If the needle is received deeper than necessary it may cause skipped stitches. Again, if the needle does not contact the driver, the top of the shuttle hook may be subjected to great wear and tear. Take care when making this adjustment.

5 NEEDLE AND SHUTTLE HOOK CLEARANCE ADJUSTMENT



Turn the pulley to bring the top of the shuttle hook into line with the center of the needle. Then loosen screw ① and turn the eccentric shaft ② so that the clearance between the needle and the top of the shuttle hook is 0.01 to 0.08 mm.

6 LOWER SHAFT GEAR BACKLASH ADJUSTMENT



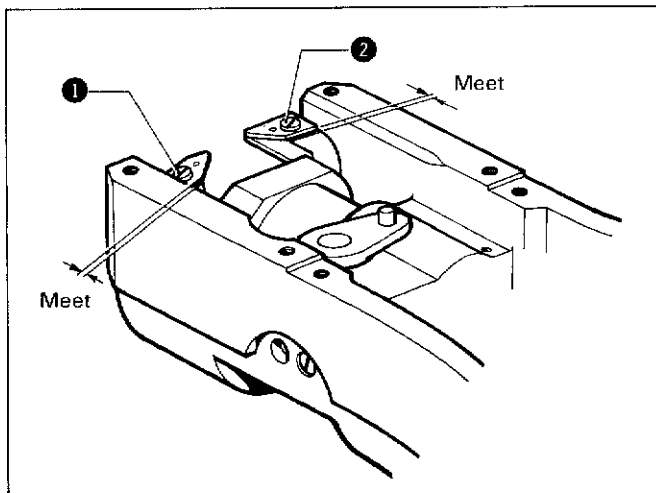
Loosen screw ① and turn rock gear shaft ② so that there appears to be a play of 0.04 to 0.07 mm at the top of the driver when it is moved in the rotating direction by hand.

7 SHUTTLE RACE THREAD GUIDE INSTALLATION ADJUSTMENT

Adjust or repair as follows. Damage to the edge of the shuttle race thread guide, or improper installation may result in the thread breaking or binding instead of running smoothly.

- (1) When the shuttle race thread guide is rough: First, remove the rough area with sand paper and then finish with a round file.
- (2) When the shuttle race thread guide is improperly installed: Loosen the two screws ①, ②, and reinstall so that the end surface of the shuttle race thread guide is aligned with the end surface of the shuttle race.

* After adjustment, apply a screw lock to the screw heads so that the screws do not loosen.

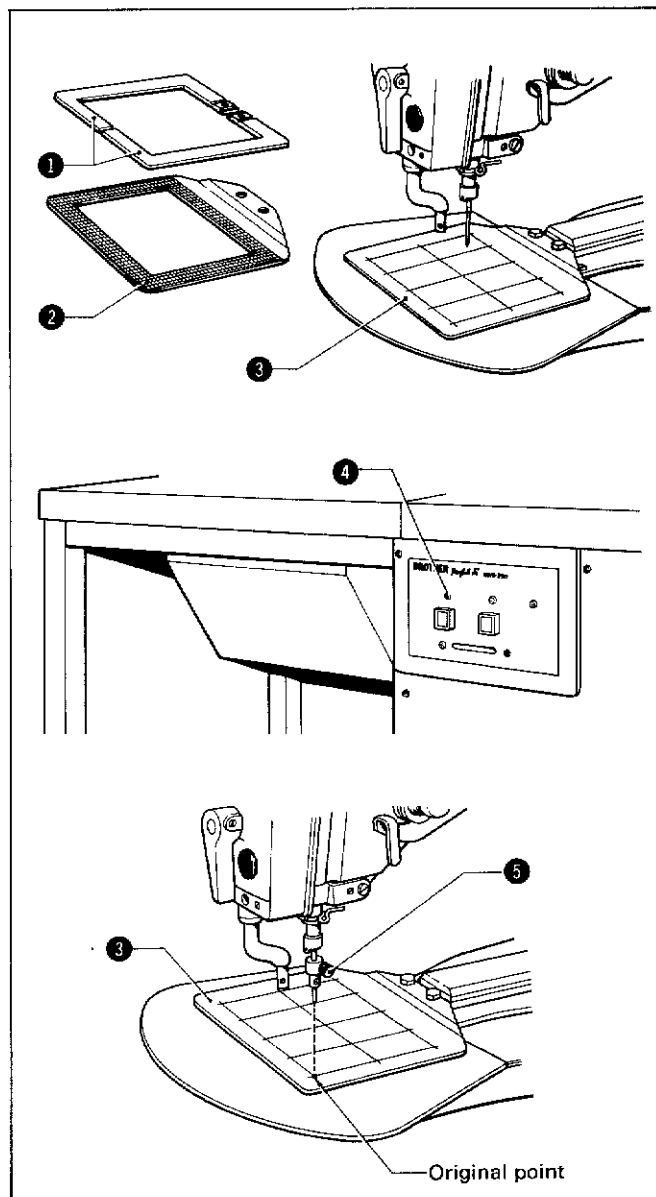


8 CHECKING AND ADJUSTMENT OF ORIGINAL POINT

1. Checking the Original Point

- (1) Remove the work clamp presser ① and feed plate ② and install the program standard plate ③.
- (2) Move the program standard plate ③ to approximately the center of the needle plate by hand.
- (3) Turn the power switch on.
- (4) After depressing the work clamp presser bar lifter switch and lowering the presser foot, depress the start switch.
- (5) Feed will move to the original starting point and the emergency stop lamp ④ will illuminate.
- (6) Remove the machine needle, install the accessory program needle ⑤, and check whether the tip of the program needle is aligned with the original starting point of the program standard plate ③.

* Because the feed moves to the original starting point if the [F]-Key is pressed when in the program mode, position checks can also be made on machines having a program function. When adjustments are necessary after making the above checks, go through the steps in "Starting Position Adjustment" on the next page.

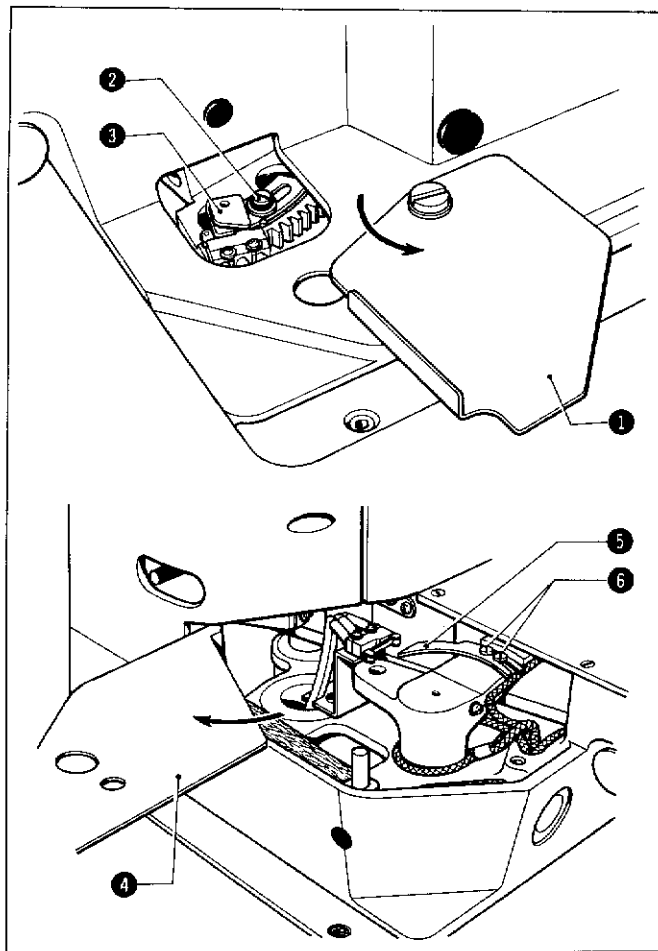


2. Starting Position Adjustment (X-direction start adjustment)

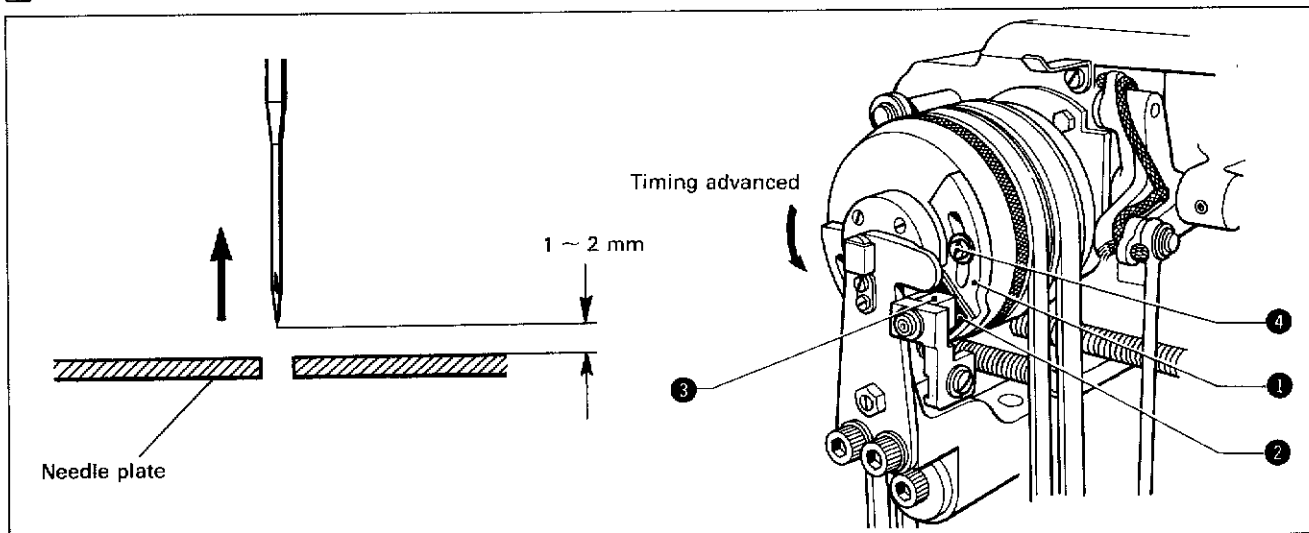
- (1) Open bed cover R ①, loosen the set screw ②, and adjust by moving the X-position dog ③.
- (2) After adjusting, check the starting position.

(Y-direction start adjustment)

- (1) Open bed cover L ④, loosen the two set screws ⑥, and adjust by moving the Y-position dog ⑤.
- (2) After adjusting, check the starting position.

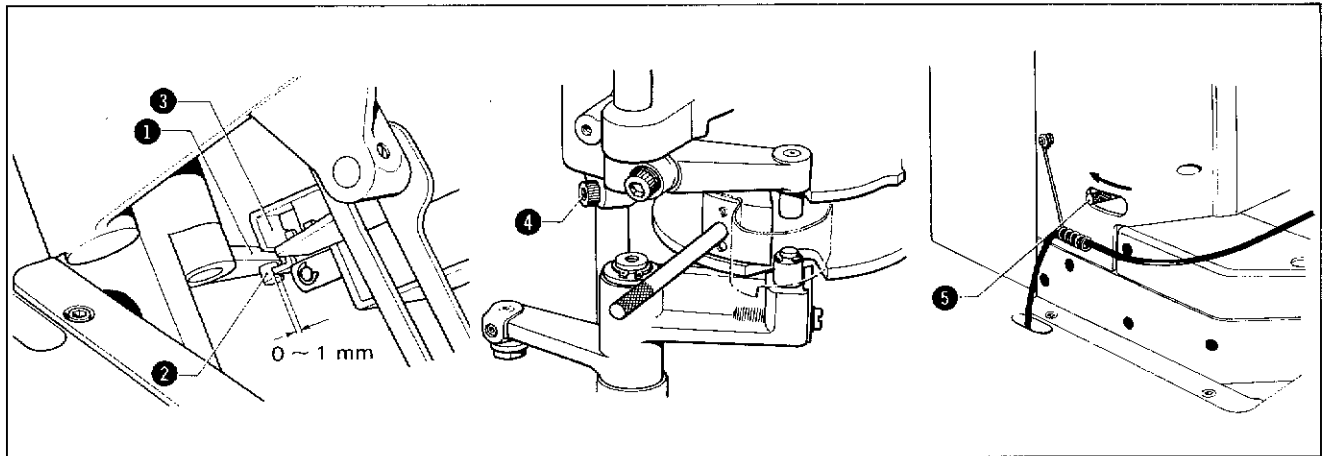


9 NEEDLE AND FEED TIMING ADJUSTMENT



Needle and feed timing adjustment is as follows. Turn the pulley by hand raising the needle bar from its lowest position. When the distance from the top of the needle plate to the tip of the needle is between 1 ~ 2 mm, loosen the set screw ④ and move the magnet holder ①. Adjust so that the center of the magnet ② installed in the magnet holder ① is aligned with the center of the synchronizer ③.

10 ROLLER HOLDER LEVER POSITION ADJUSTMENT



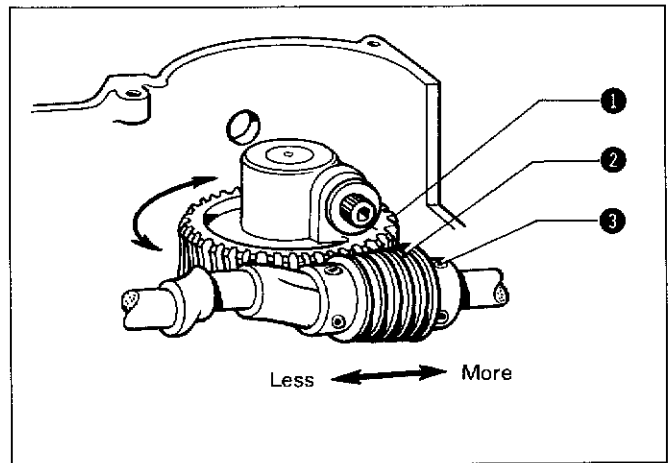
Loosen the bolt ④ in the hole of the control lever and move the roller holder cam lever ①, adjusting so that the space between the clutch lever plate ③ and roller ② on the end of the roller holder cam lever ① is between 0 ~ 1 mm when the machine begins operating.

11 WORM WHEEL BACKLASH ADJUSTMENT

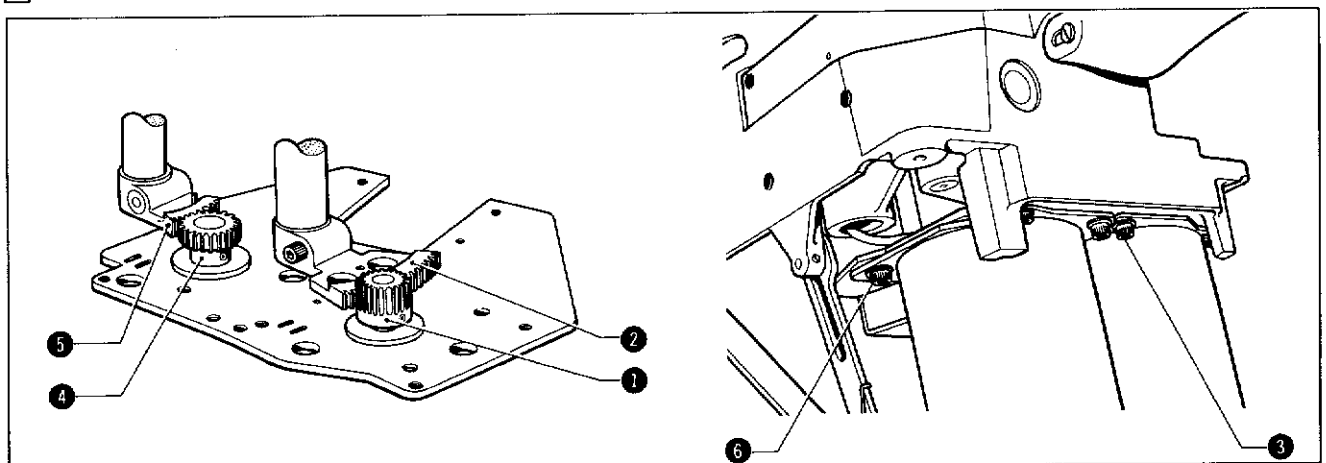
With the machine at the stop position, loosen six screws ③ for worm ②, and move worm ② so that worm wheel ① has a play of 0.02 to 0.05 mm when the clutch cam, or the knife cam is gently moved by hand. Play increases if worm ② is moved in the forward direction of the machine, or decreases if the worm is moved backward.

After this adjustment, check the timing of the needle and feed; the position and timing of the movable knife; and the clutch cam timing.

* After this adjustment, turn the machine by one cycle and make sure that the worm wheel turns smoothly.



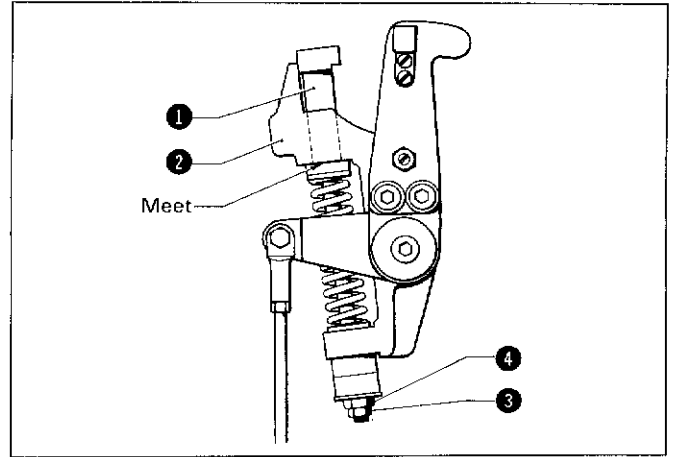
12 GEAR BACKLASH ADJUSTMENT



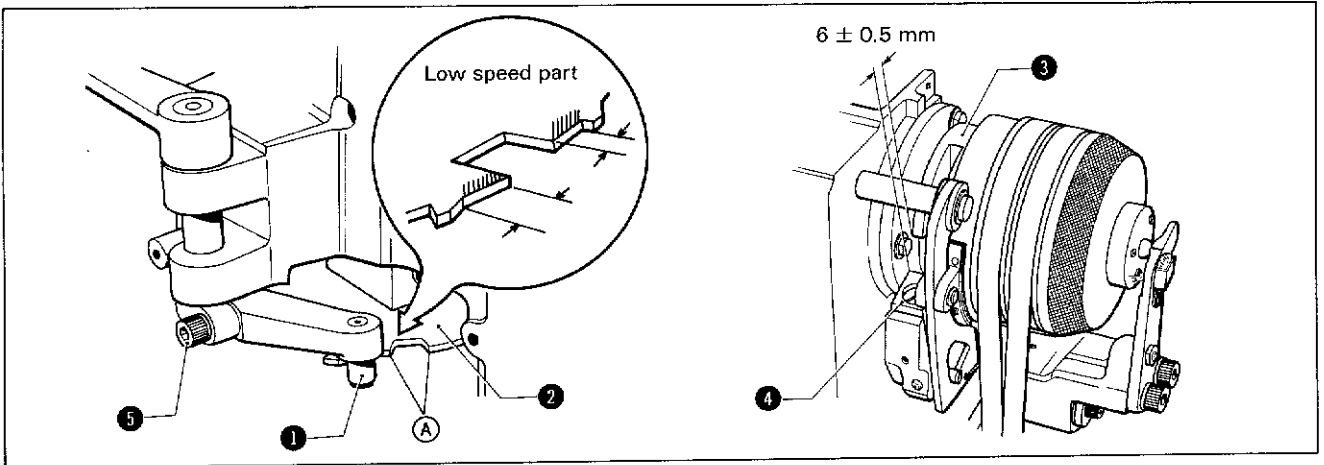
- (1) Remove the clamp to the center of the needle plate at the stop position and loosen the bolt ③ four pieces, adjusting so that the backlash between gear ① and driving gear ② is 0.02 ~ 0.05 mm when the switch is on and the clamp arm is moved slightly by hand.
- (2) Loosen the bolt ⑥ four pieces, adjusting so that the backlash between gear ④ and driving gear ⑤ is 0.02 ~ 0.05 mm when the clamp is moved forward and backward.

13 STOPPER ADJUSTMENT

With the machine at the stop position, loosen nut ③ and adjust nut ④ so that the bottom of stopper ① meets the end of clutch lever ②.



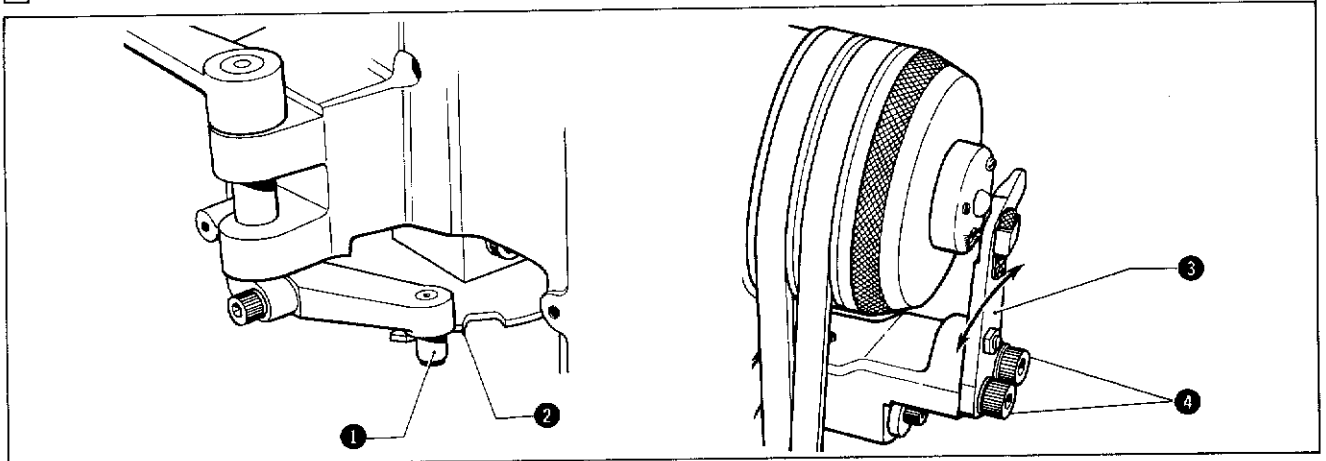
14 CLUTCH LEVER POSITION ADJUSTMENT



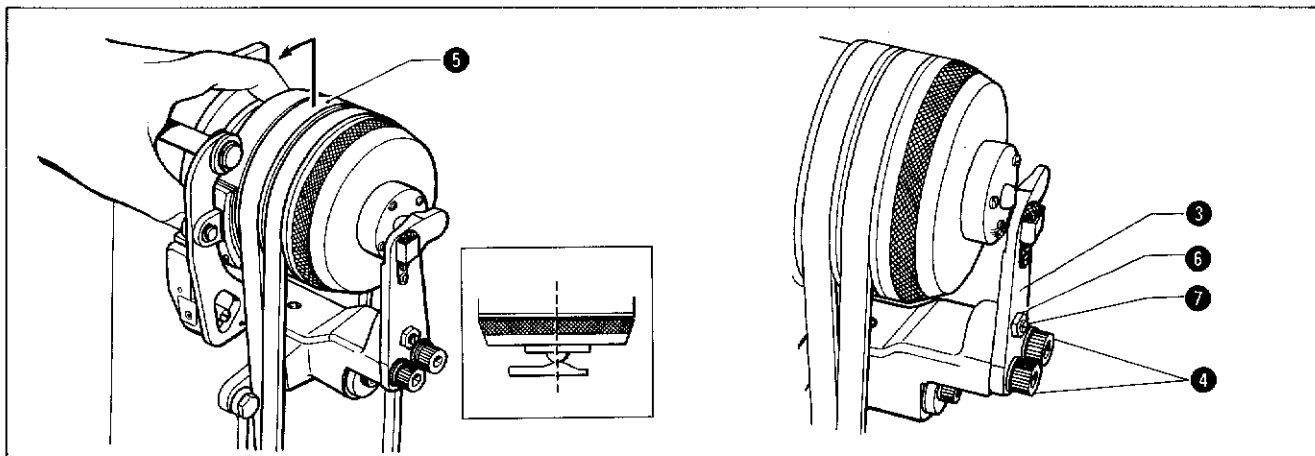
With clutch cam lever roller ① on the low speed part (A) of clutch cam ②, loosen bolt ⑤ and adjust the clearance between stop cam ③ and stopper ④ to 6 ± 0.5 mm.

* In this case, it is suggested that the clutch lever spring be removed for easy adjustment.

15 BALL PRESSER PLATE POSITION ADJUSTMENT

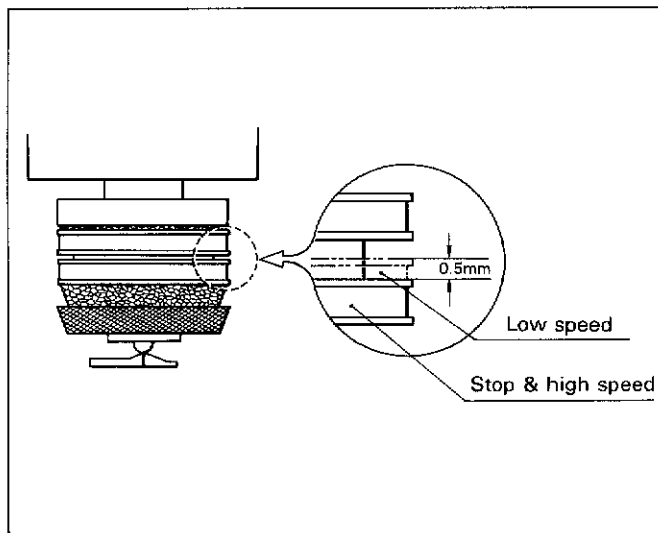


(1) With clutch cam lever roller ① on the low speed part of clutch cam ②, loosen two bolts ④ and move ball presser plate ③ to the right or left so that the mark of ball presser plate ③ meets the center of the steel ball.



- (2) Bring the mark of ball presser plate ⑤ to meet the center of the steel ball, loosen two bolts ④ and nut ⑥ to such an extent that low speed pulley ⑤ hardly slips when the stop cam is locked and low speed pulley ⑤ turned by hand, and adjust by turning adjusting screw ⑦. After this adjustment, run the machine at high speed, and make sure that the high speed pulley will not slip.

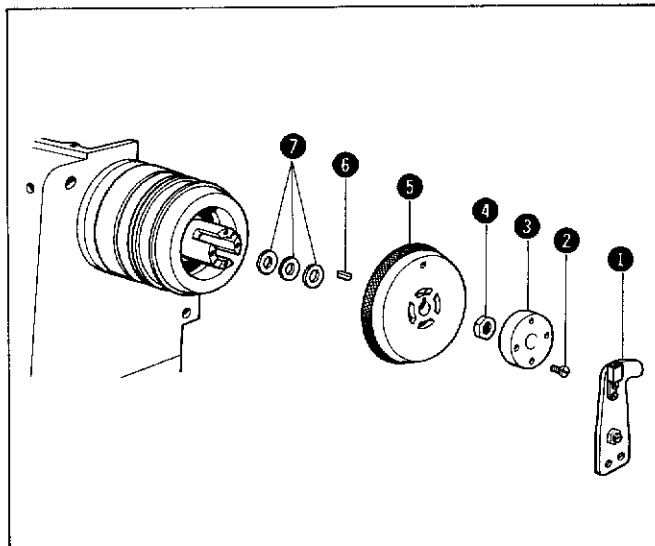
* Because the above adjustment is made by touch and individual differences may appear in the contact torque on the pulley, in low speed operation, visually check that the gap between the low speed pulley and high speed pulley becomes as much as 0.5 mm smaller in low speed than when stopped or in high speed.



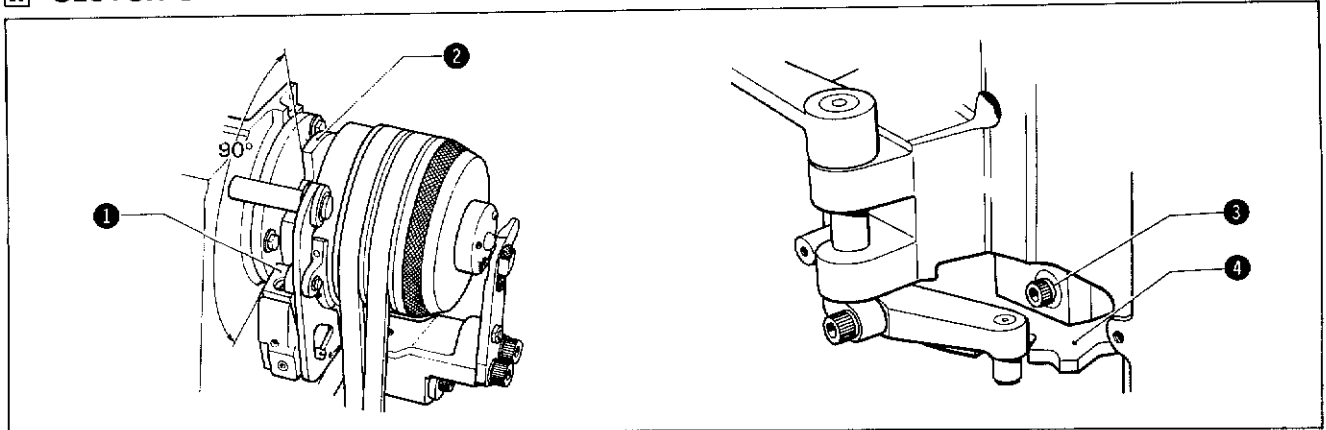
❏ **Slipping doesn't stop after the above adjustments have been made.**

When slipping does not stop even though the above adjustments have been made, as may happen with machines that have been used for many years, disassemble the pulley in the following order and remove one washer.

1. After removing the ball presser plate ①, loosen the four set screws ②, and remove the ball holder ③.
2. Remove the nut ④ (left-handed) and remove the clutch plate ⑤ and ⑥.
3. Remove one washer ⑦.
4. Reassemble in reverse order to disassembly, and then readjust the ball presser plate position.



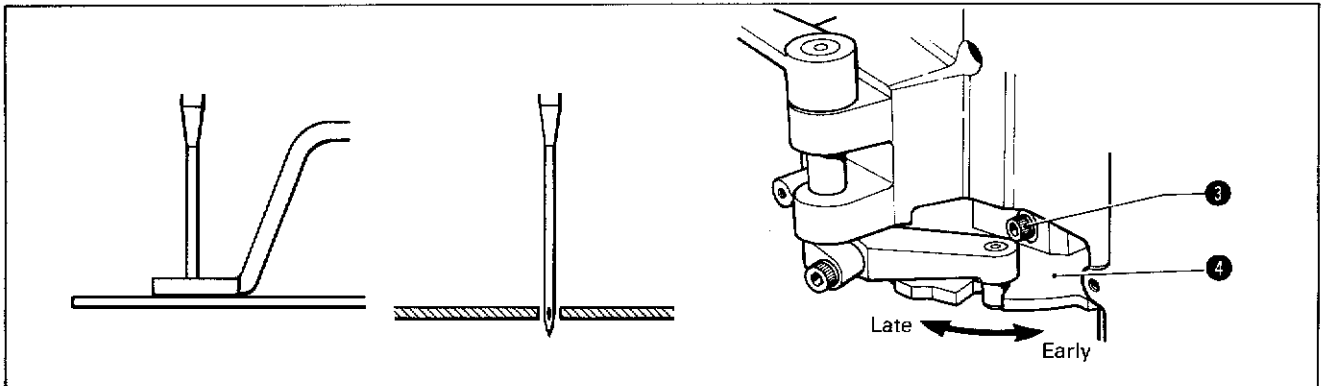
16 CLUTCH CAM TIMING ADJUSTMENT



Loosen bolt ③ and turn clutch cam ④ so that stopper ① contacts stop cam ② 90° before the machine stop position.

*The timing advances as the clutch cam is turned in the rotating direction.

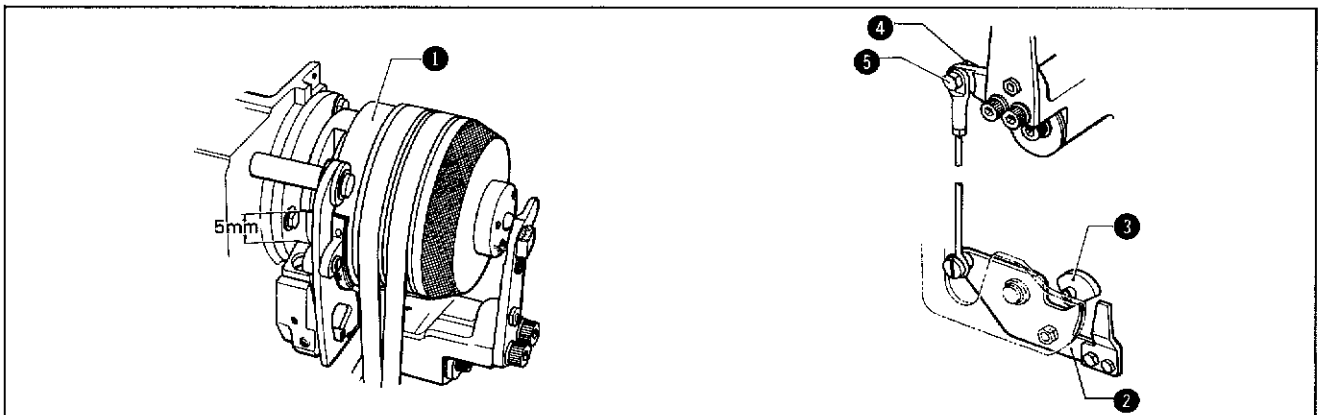
◆ Improper starting when sewing extremely thick products



When sewing thick products and the resistance of needle and material causes the machine to stop with the needle stuck in the materials, adjust the clutch cam timing by following these steps.

- (1) If from the start of sewing the pulley is turned by hand, there is a spot (third stitch) at which the pulley will slip. Stop the machine, loosen the bolt ③, and slightly delay the timing of the clutch cam ④ (adjust the stopper so it contacts the stopper cam at approximately 60°), so that the needle tip enters the needle hole plate when the pulley slips.
- (2) When the stop cam reaches a position approximately 60° before the machine stop position, adjust the brake so that the brake shoe contacts the stop cam. (Refer to p.17, "Brake Adjustment.")

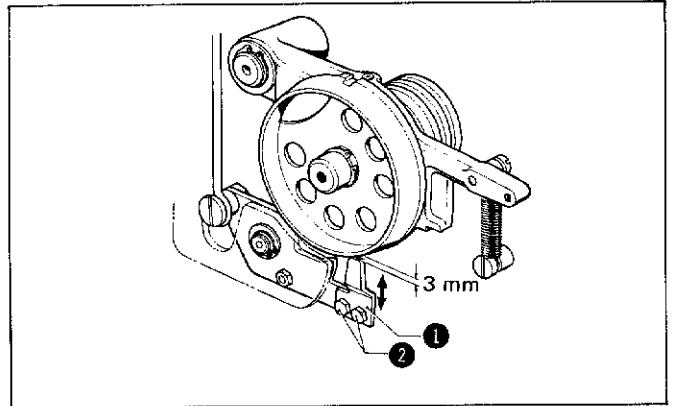
17 START LEVER POSITION ADJUSTMENT



Loosen nut ④ and turn eccentric screw ⑤ so that roller shaft ③ disengages from start lever ② when stop cam ① reaches 5 mm before the machine stop position.

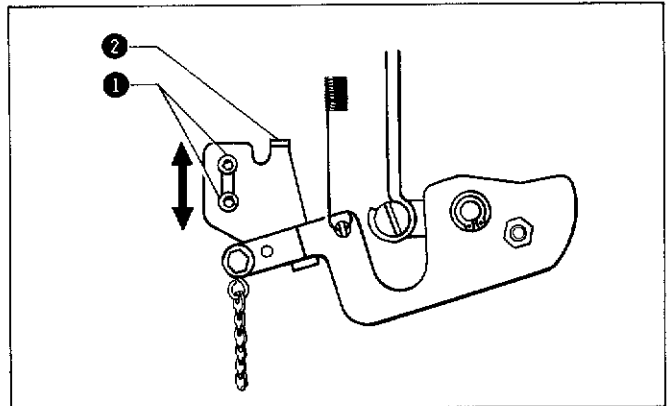
18 START SAFE LEVER ADJUSTMENT

Loosen two bolts ② and move start safe lever ① up or down so that the clearance between it and periphery of the power cam is 3 mm at the machine stop position.



19 START STOPPER POSITION ADJUSTMENT

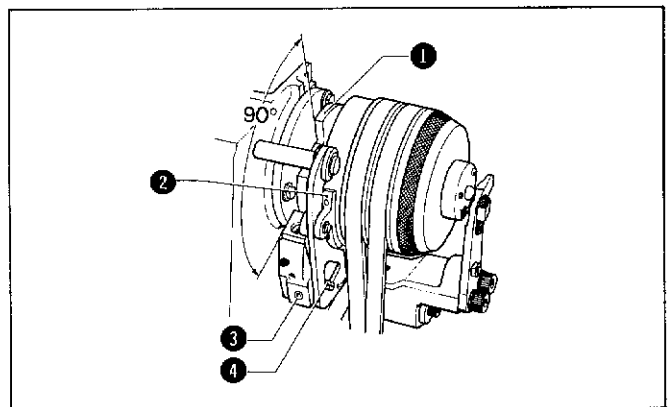
Loosen two bolts ① and move stopper ② up or down so that, when the treadle is depressed two steps, the mark of the ball presser plate meets the center of the steel ball.



20 BRAKE ADJUSTMENT

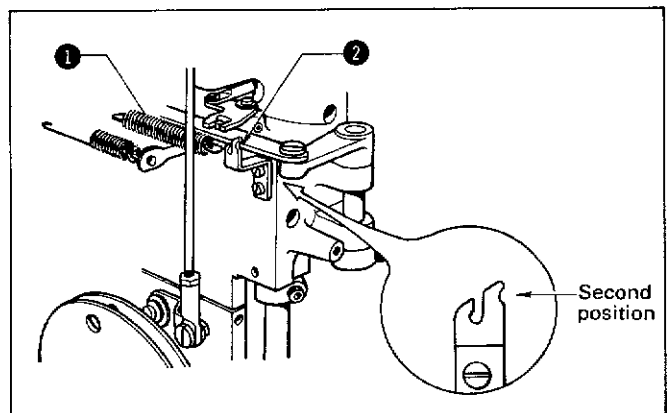
Loosen screw ③ and turn brake actuating pin ④ so that, when stop cam ① reaches 90° before the machine stop position, brake shoe ② contacts stop cam ①.

* When sewing extremely thick products, adjust so that the brake shoe contacts the stop cam with the stop cam set approximately 60° before the machine stop position.



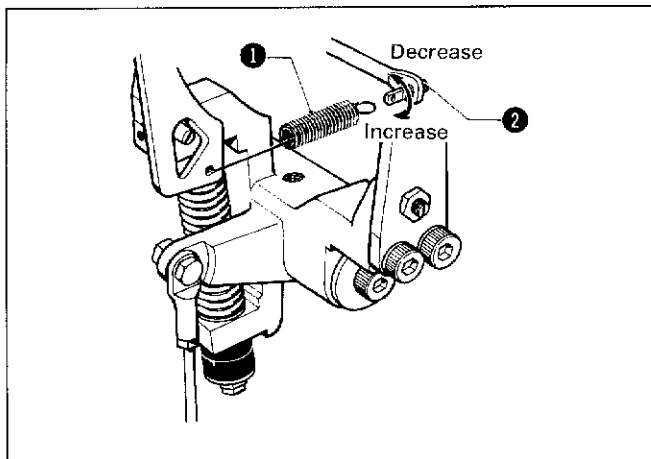
21 CLUTCH LEVER SPRING PRESSURE ADJUSTMENT

If the clutch lever operates so hard that the clutch will not positively fall upon sewing the last stitch, reconnect clutch lever spring ① to the second position of the clutch lever spring hook ②.



22 BRAKE SPRING PRESSURE ADJUSTMENT

If a very heavy material is sewn with the machine of the standard specifications, the stop cam might not turn all the way to the stop position upon sewing the last stitch due to increased friction resistance between the needle and the material. In such a case, unhook brake spring ①, and turn spring hook ② counterclockwise to reduce the brake spring pressure.

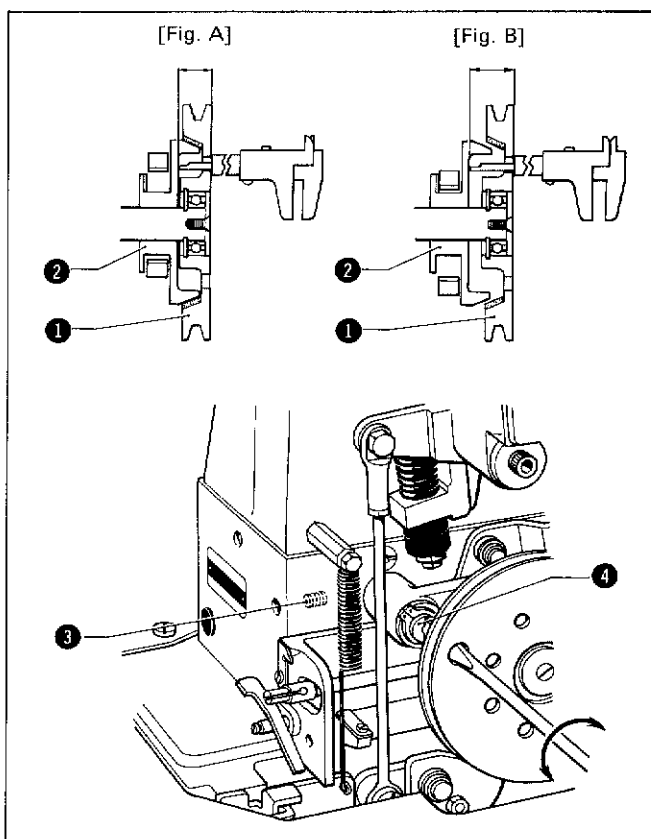


23 POWER DRIVE LEVER POSITION ADJUSTMENT

(1) With the machine in the stop position (the presser foot is raised), loosen the hole set screw ③ and turn the power drive lever shaft ④, adjusting so that the difference of the clearances between the power pulley ① and power cam ② [Fig. A], and between the power cam ② and power pulley ① when the drive lever is engaged, is between 0.4 ~ 0.5 mm.

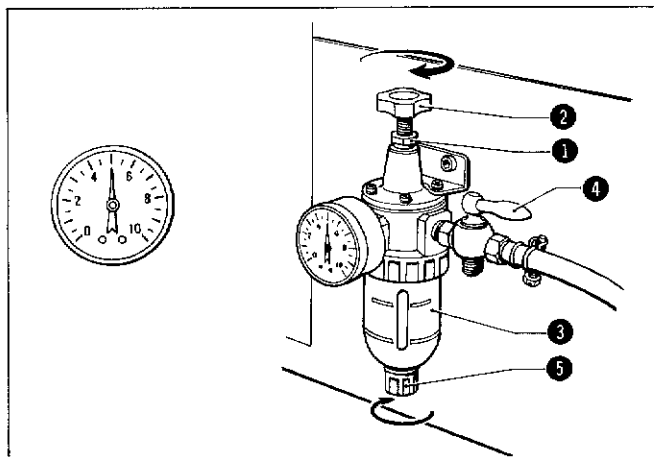
* To measure the distance between the power pulley and power cam, insert slide calipers from the hole in the power pulley, and measure. The value of Fig. A minus the value of Fig. B = 0.4 ~ 0.5 mm.

(2) With the presser foot in both the raised and lowered positions, confirm that the power cam does not rotate with the power pulley when the power pulley is pushed lightly in the reverse direction of its normal rotation.



24 AIR PRESSURE ADJUSTMENT

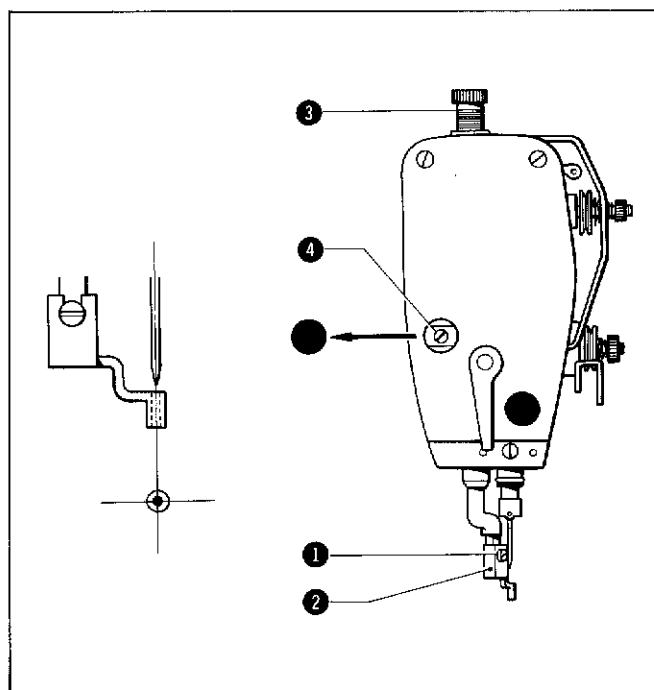
- (1) Use 5 kg/cm² air pressure. When adjustment is necessary, loosen the nut ① and turn the handle ② to adjust.
- (2) If water collects in the bottle ③, close the cock ④; next, open the drain cock ⑤ and drain the water.



25 PRESSER FOOT ADJUSTMENT

Presser foot adjustments should be made in the following order after lowering the presser foot to its lowest point.

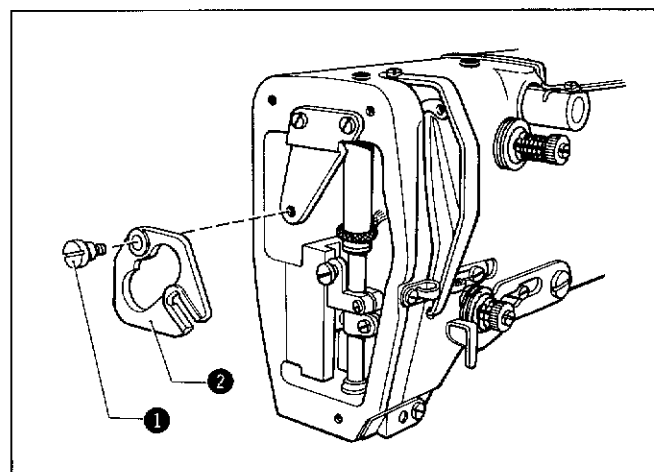
- (1) Loosen the set screw ①, and with the bottom surface of the presser foot ② lightly touching the surface of the product being sewn, retighten the set screw ①.
 - * Carefully adjust presser foot height because if the presser foot is lowered too far, material will slip or bunch up during sewing. Furthermore, if it is too high, it may cause the stitching to skip.
- (2) Turn the pulley by hand and confirm that the needle enters the center of the needle hole in the presser foot ②. If the needle is not aligned with the center of the needle hole, after sufficiently loosening the pressure adjustment screw ④, adjust by moving the presser foot. After adjusting, tighten the adjustment screw ③ and the set screw ④.



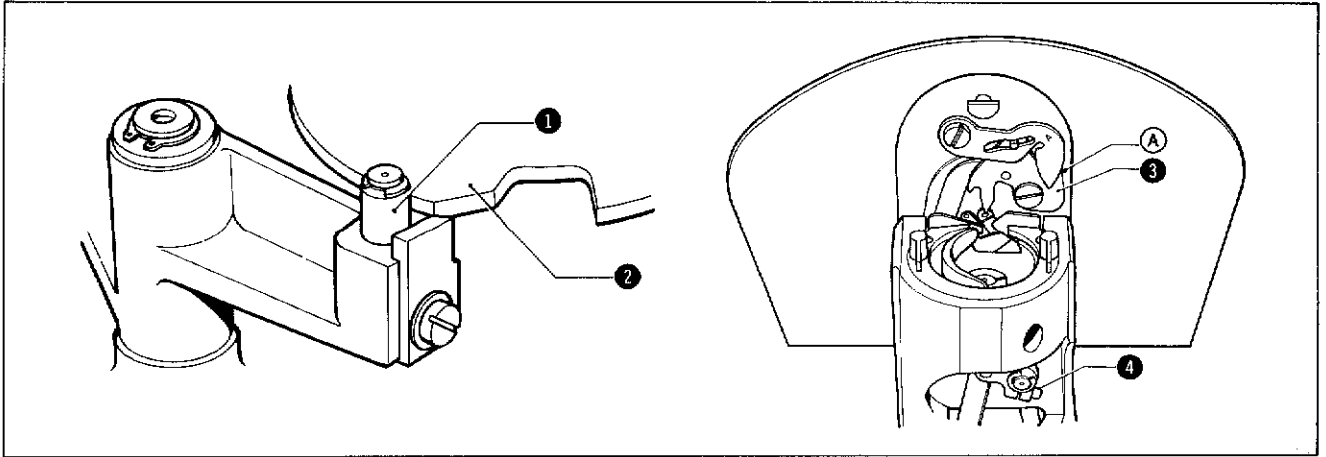
★ WHEN NOT USING THE STEPING FOOT

When the stepping foot is not needed, the device can be removed by following these steps.

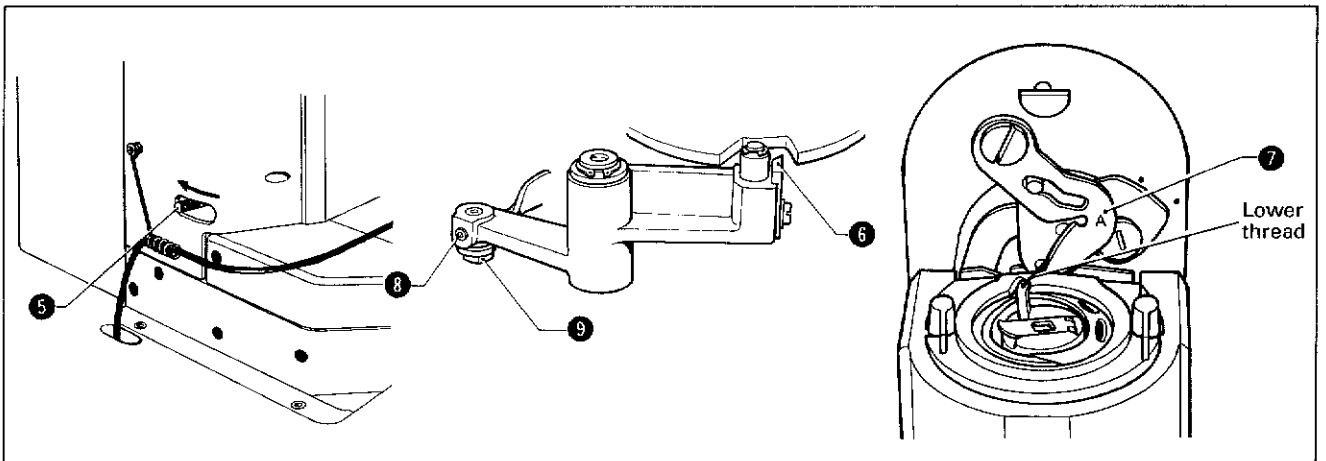
- (1) Remove the face plate.
- (2) Remove the step screw ① and remove the stepping foot cam S ②.



26 MOVABLE KNIFE POSITION ADJUSTMENT

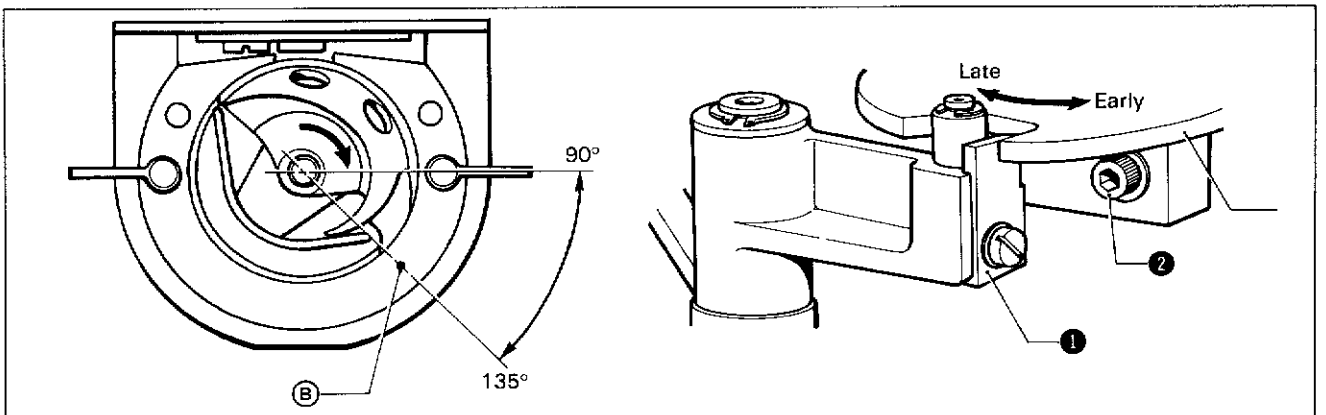


- (1) With knife cam lever roller **1** on the periphery of the knife cam **2**, loosen screw **4** and move movable knife **3** so that its mark meets the mark **A** of the needle plate.



- (2) Push the emergency stop lever **5** in the direction of the arrow, turn the pulley and set the machine to the stop position.
- (3) If the power pulley is turned slightly in its direction of normal rotation, the knife cam lever claw **6** will drop one step. At this time, loosen the set screw **8** and turn the stud **9**, adjusting so that the lower thread retainer **7** contacts the lower thread.

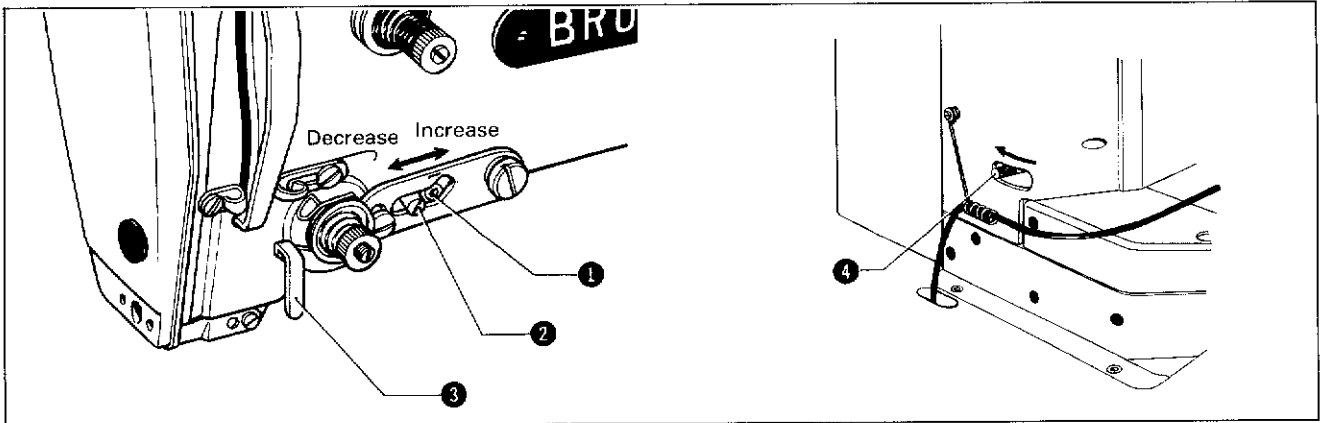
27 MOVABLE KNIFE TIMING ADJUSTMENT



Loosen bolt **2** and turn knife cam to adjust the movable knife timing so that knife cam lever claw **1** drops into a recess of the knife cam when the shuttle hook point is between 90° and 135° (until it meets the mark **B** of the shuttle race ring) upon sewing the final stitch.

*The timing advances as the knife cam is turned in the rotating direction.

28 THREAD TAKE-UP LEVER STROKE ADJUSTMENT



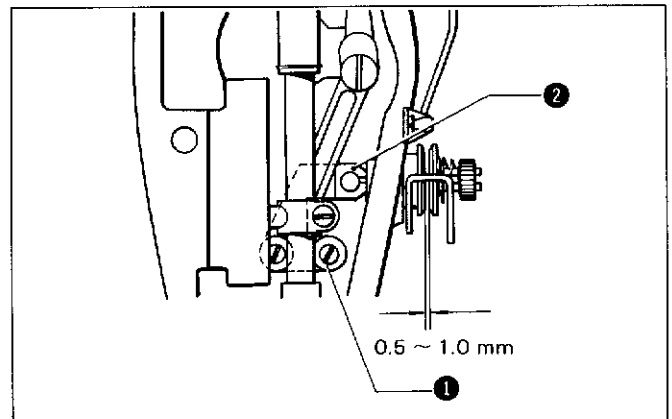
The thread take-up lever stroke can be adjusted up to a maximum 7 mm to prevent thread from not being supplied at the beginning of the next stitch. Follow these steps, adjusting to match the product being sewn.

- (1) Turn the pulley and set the machine to the start position.
- (2) Loosen the set screw ①. If the thread take-up guide shaft ② is moved to the right, the stroke of the thread take-up lever ③ increases; if moved to the left, the stroke decreases. However, if the thread take-up guide shaft is moved more than is necessary, thread tightening will be poor. Therefore, adjust so that the center of the thread take-up guide shaft ② is within the take-up range.
- (3) After adjusting, push the emergency stop lever ④ in the direction of the arrow, turn the pulley and return the machine to the stop position.

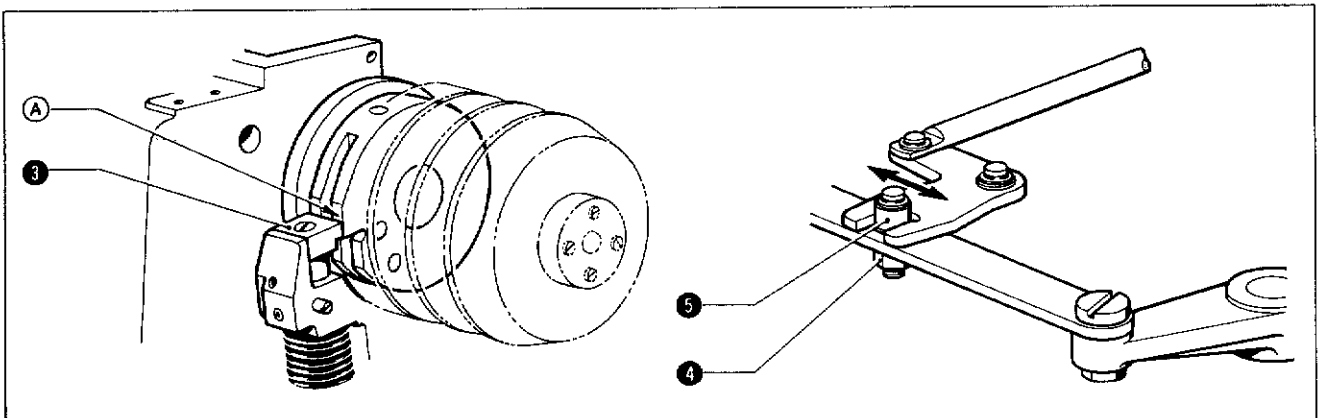
29 MAIN TENSION DISC ADJUSTMENT

1. Main Tension Disc Clearance Adjustment

With the machine at the stop position, loosen two screws ① and move tension release bar ② to the right or left so that the main tension discs have a clearance of 0.5 to 1 mm.

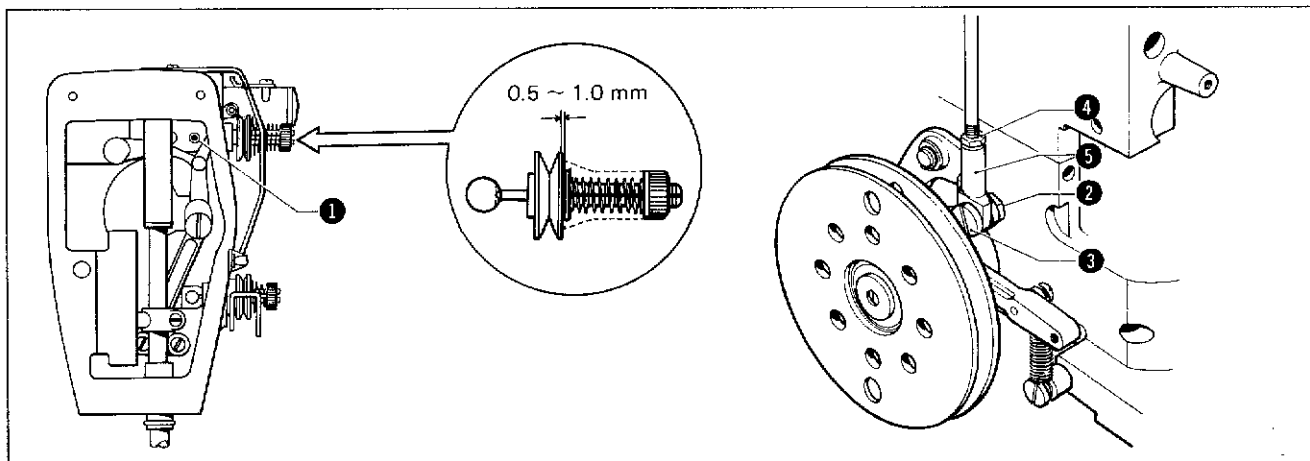


2. Main Tension Timing Adjustment



In the machine stop position with the main tension disc loose and the clutch stopper ③ riding on the outer circumference ① of the stop cam, loosen the nut ④ and move the roller ⑤, adjusting so that the tension disc tightens.

30 SUB-TENSION ADJUSTMENT



(1) Sub-Tension Disc Clearance Adjustment

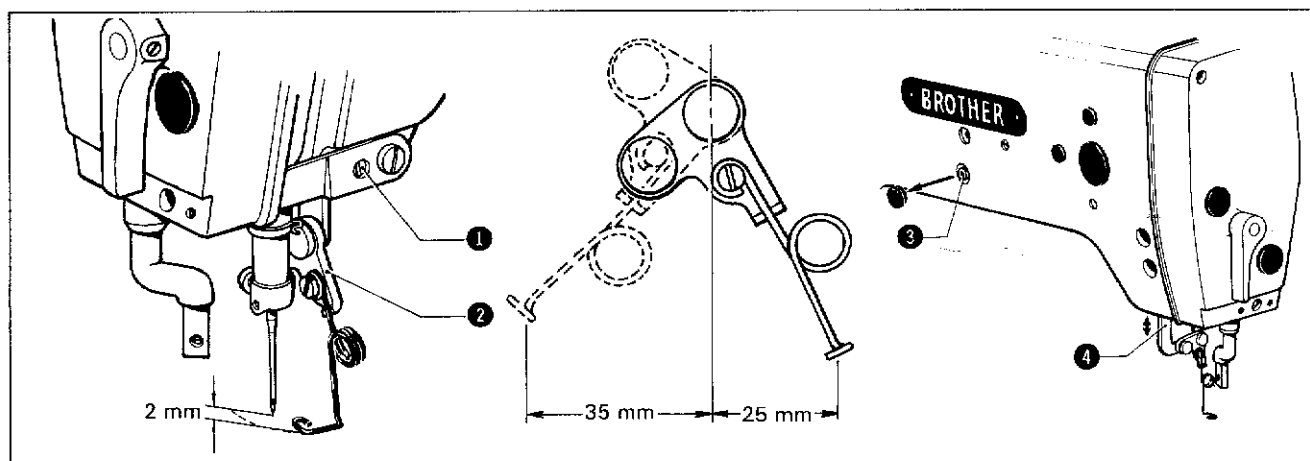
With the machine at the stop position, loosen screw ① and move the sub-tension assembly so that the sub-tension discs will have a clearance of 0.5 to 1.0 mm.

(2) Sub-Tension Timing Adjustment

Loosen nut ②, remove screw ③, loosen nut ④, and turn work clamp lifter adjusting joint ⑤ so that the sub-tension discs will tighten immediately before the movable knife cuts the thread.

* The sub-tension discs tighten sooner as the work clamp lifter adjusting joint is turned in.

31 THREAD WIPER ADJUSTMENT



(1) Thread Wiper Height Adjustment

Loosen screw ①, and move thread wiper arm supporter ② up or down so that the clearance between the wiper and the tip of the needle will be 2 mm when the wiper passes under the needle.

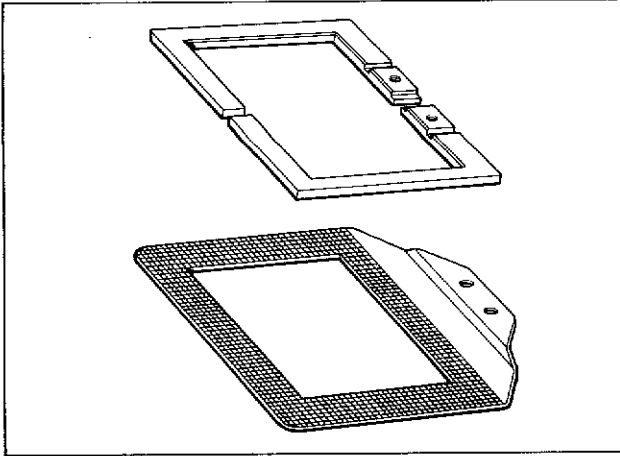
(2) Thread Wiper Stroke Adjustment

Loosen screw ③, and move thread wiper link ④ up or down so that the wiper will be 25 mm from the center of the needle bar before it wiper the thread, or 35 mm from the same after it has wiped the thread.

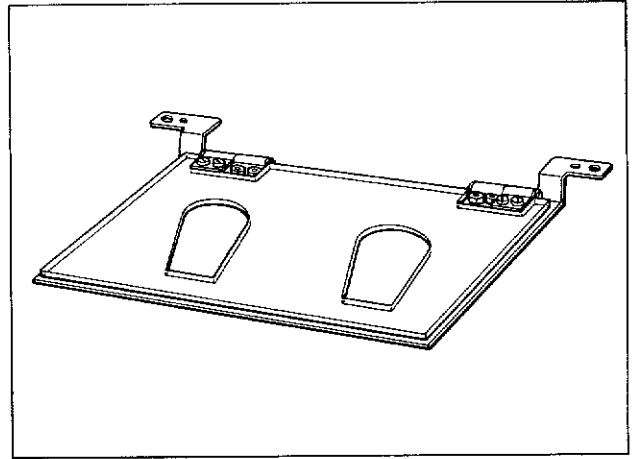
HOW TO MAKE THE PRESSER

There are two presser methods: Bar tacking and Cassette.

[Bar tacking method]



[Cassette method]



I HOW TO MAKE THE BAR TACKING PRESSER

1. How to Make the Presser

A standard presser conforms to the dimension shown in the figure at the right.

The sewing range is the 100 (50 + 50) × 60 area marked by slanted lines in the figure at the right.

- (1) Cut a presser blank to the dimensions in the figure.
- (2) Decide where to place the product to be sewn, and then remove the presser to match the dimensions to be sewn in.

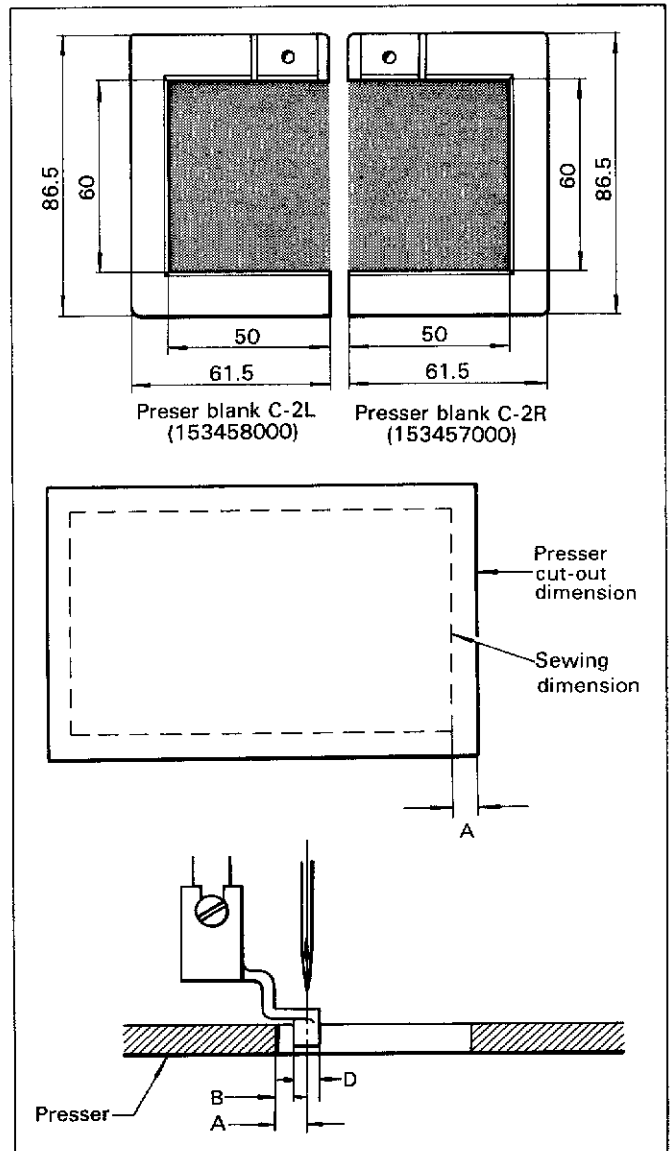
* The outer dimensions of the presser should be "A" larger than the dimensions of the product to be sewn, where:

$$A = D/2 + B, \text{ in which}$$

A = presser's cut-out dimension;

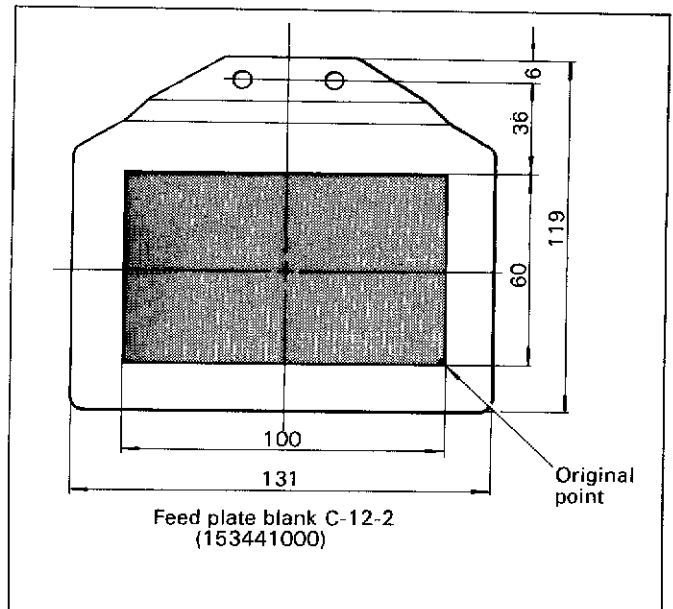
D/2 = 1/2 the width of the presser foot;

B = the gap between presser foot and presser.



2. How to Make the Feed Plate

- ★ The standard feed plate conforms to the dimensions in the figure at right.
Sewing range is the same as the presser, the 100 × 60 slanted line area.
- (1) A feed plate cut to match the presser dimensions.

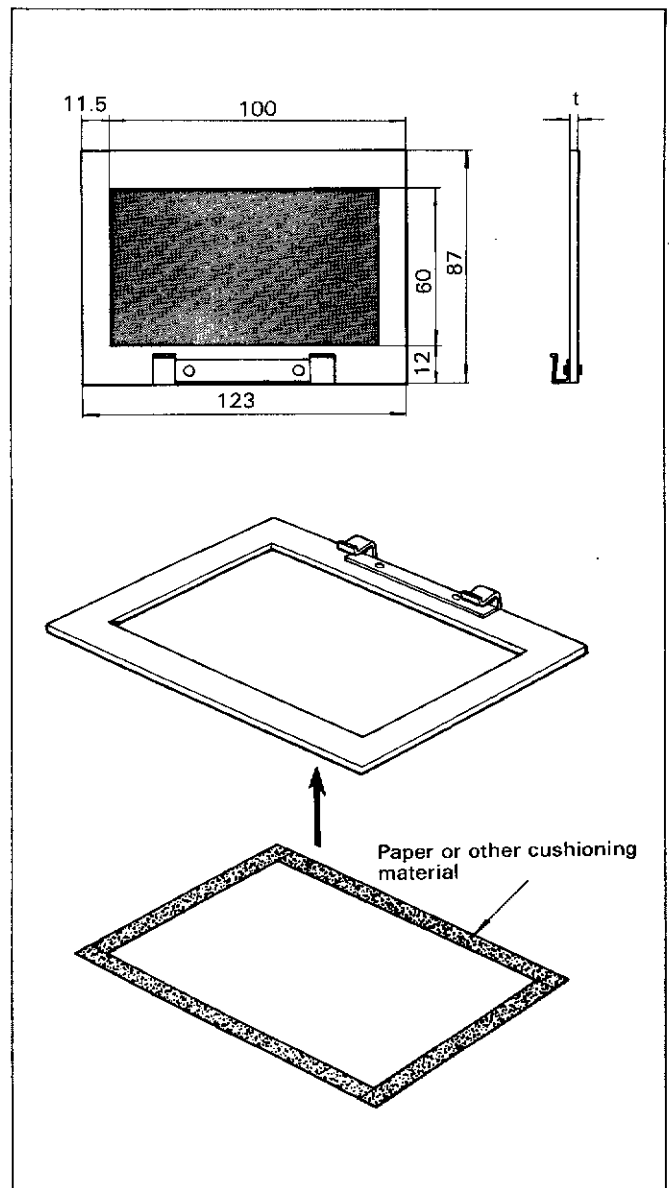


3. How to Make a Resin Bar Tacking Presser

- ★ Three different types of resin bar tacking pressers are available as shown in the below table. Select the presser to match the thickness of materials being sewn.

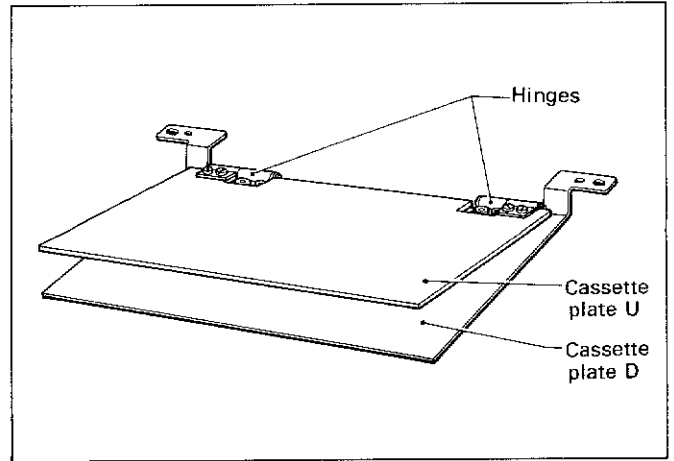
Parts Name	Parts No.	Thickness (mm)
OT Presser Plate A Assembly	157248001	0.5
OT Presser Plate B Assembly	157250001	1.0
OT Presser Plate C Assembly	157251001	2.0

- ★ Resin bar tacking stoppers conform to the dimensions shown in the figure at right.
- (1) Cut the resin plate to match the outer dimensions of the product to be sewn.
- (2) To firmly hold the material, attach a paper cushion, etc., to the circumference of the cut-out portion.
- (3) Cut the feed plate after referring to "2. How to make the feed plate."

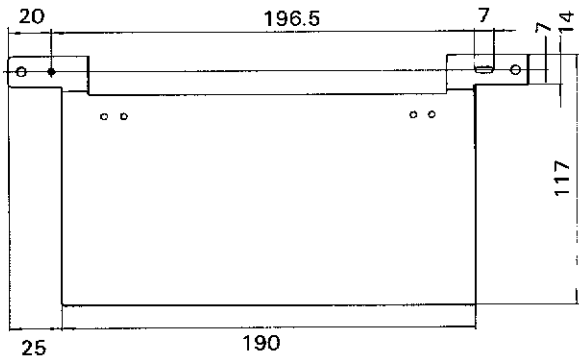


2 HOW TO MAKE THE CASSETTES

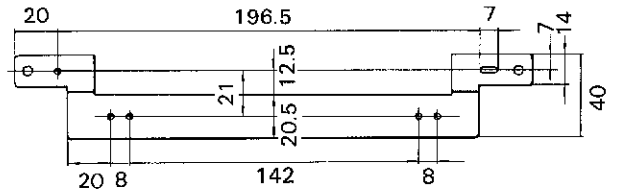
★ Cassettes are composed of cassette plate U, cassette plate and hinges as shown in the figure at right.



★ The following types are available for use as cassette plate D.

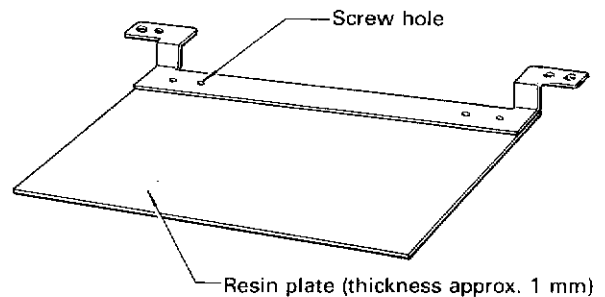


Cassette plate DA
(157714001)



Cassette plate DB
(157715001)

* Attach the resin plate to the bottom of cassette DB and use as cassette plate DA. Furthermore, when installing the hinge to cassette plate DB, attach the resin plate after passing screw M3 through the 4.6 mm diameter countersink.



★ Cassettes conform to the dimensions shown in the diagram at right.

Sewing range is the 100×60 shaded area.

(1) Decide where to place the product to be sewn, and cut out to the dimensions matching the sewing dimensions.

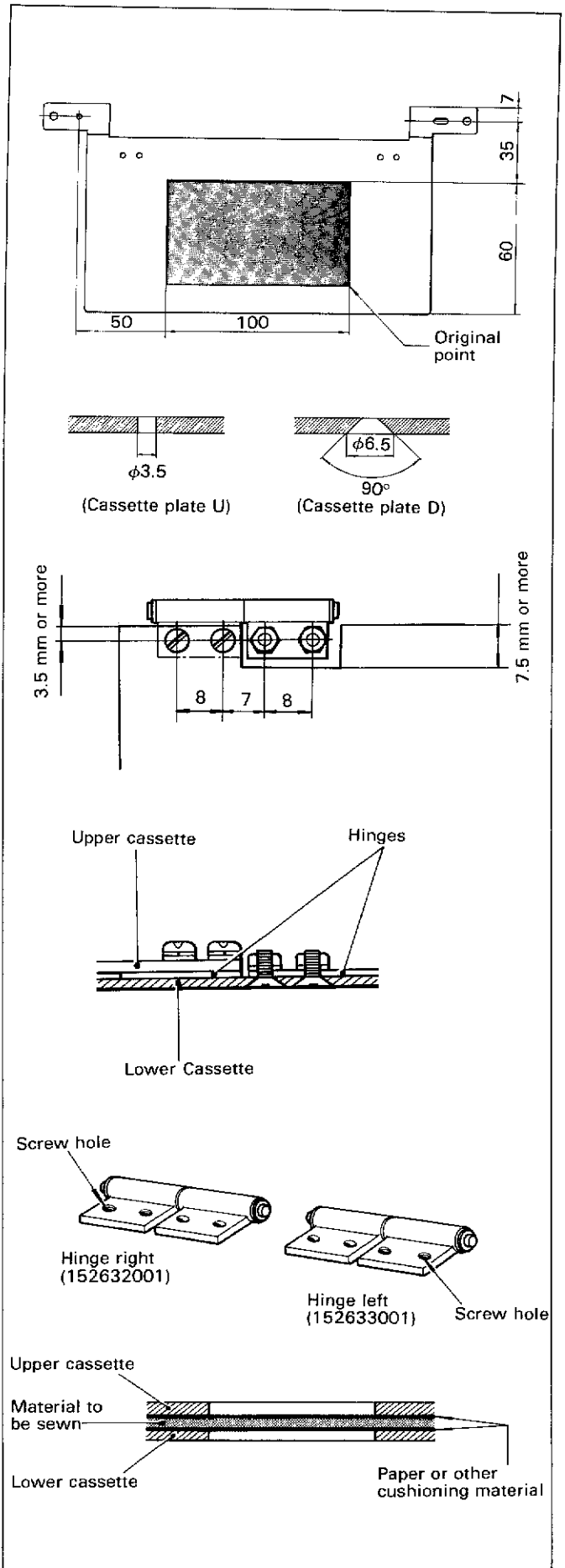
(2) Cut both cassette plate U and cassette plate D. Refer to "How to Make a Bar Tacking Presser and Feed Plate."

* When interchanging and using cassettes, cut both cassettes out identically.







(3) Open a 3.5 mm diameter hole in cassette plate U, and a countersink hole in cassette D.

(4) Install the hinge as shown in the picture.

(5) To firmly hold the sewing material, attach a paper cushion, etc., to the circumference of the cut-out portion.



LIST OF REPLACEMENT PARTS

Name of parts	Uses	For ordinary clothes		For heavy materials	
Needle 		Needle DP × 5 #9	107415-0-09	Needle DP × 17 #14	145646-0-14
		Needle DP × 5 #11	107415-0-11	Needle DP × 17 #16	145646-0-16
		Needle DP × 5 #14	107415-0-14	Needle DP × 17 #18	145646-0-18
		Needle DP × 5 #16	107415-0-16	Needle DP × 17 #19	145646-0-19
		Needle DP × 5 #18	107415-0-18	Needle DP × 17 #21	145646-0-21
		Needle DP × 5 #19	107415-0-19	Needle DP × 17 #24	145646-0-24
		Needle DP × 5 #21	107415-0-21	Needle DP × 17 #25	145646-0-25
Needle hole plate 		Needle hole plate A	156149-0-01	Needle hole plate C	156151-0-01
		Needle hole plate B	156150-0-01	Needle hole plate D	156152-0-01
		Needle hole plate F	156154-0-01	Needle hole plate E	156153-0-01
				Needle hole plate G	156155-0-01
Shuttle hook 		Shuttle hook A	152685-0-1	Shuttle hook B	152687-0-01
Shuttle race ring 		Shuttle race ring A	152682-0-1	Shuttle race ring B	152686-0-01
Thread take-up spring 		Thread take-up spring	145519-0-01	Thread take-up spring B	144588-0-01
Main tension spring 		Main tension spring	104525-0-01	Main tension spring	107606-0-01

Note: It is necessary to select needles and needle hole plates to match the thread being used and material being sewn.

TROUBLESHOOTING FLOW CHART

Trouble	Cause	Check	Remedy	Page
Clutch does not engage, and machine operates continuously.	Clutch lever does not turn up enough.	Clearance between stop cam and stopper	Adjust clutch lever position.	14
	Ball presser plate is in wrong position in longitudinal directions in low speed operation.	Ball presser plate	Adjust ball presser plate position.	14
	Ball presser plate is in wrong position in sidewise directions in low speed operation.	Ball presser plate	Adjust ball presser plate position.	14
	Clutch lever spring pressure is not enough.	Clutch lever spring pressure	Adjust clutch lever spring pressure, or replace spring.	18
	Ball presser plate is out of oil.	Ball presser plate oil	Supply oil to ball presser plate wick, or apply grease to it.	/
	Excessive roller holder movement.	Is the emergency stop lever hitting the side cover?	Adjust roller holder cam lever position.	13
Machine stops in low speed operation.	Ball presser plate is in wrong position in longitudinal directions in low speed operation.	Ball presser plate	Adjust ball presser plate position.	14
	Ball presser plate is in wrong position in sidewise directions in low speed operation.	Ball presser plate	Adjust ball presser plate position.	14
	Clutch lever does not turn up enough.	Clearance between stop cam and stopper	Adjust clutch lever position.	14
	Low-speed belt tension is not enough.	Low-speed belt tension	Adjust low-speed belt to yield about 10 mm.	/
Clutch plate gets hot.	High-speed pulley is slipping in high speed operation.	High-speed pulley torque	Adjust ball presser plate position, or remove pulley washer.	14
Stop cam gets hot.	Low-speed pulley is slipping in low speed operation.	<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Ball presser plate position in longitudinal directions</div> <div style="border: 1px solid black; padding: 2px;">Ball presser plate position in sidewise directions</div>	Adjust ball presser plate position.	14
	Clutch lever does not turn up enough.	Clearance between stop cam and stopper	Adjust clutch lever position.	14

Trouble	Cause	Check	Remedy	Page
No high-speed operation	High-speed belt tension is not enough.	High-speed belt tension.	Adjust high-speed belt to yield about 10 mm.	/
	High-speed pulley is slipping in high-speed operation.	High-speed pulley torque.	Adjust ball presser plate position, or remove pulley washer.	14
Work clamp does not rise.	Machine does not run to stop position.	Clutch cam timing.	Adjust clutch cam timing.	16
		Brake shoe contact timing.	Adjust brake.	17
	Work clamp lifter roller shaft does not disengage from start lever.	Start lever position.	Adjust start lever position.	16
	Power drive lever does not operate properly.	Power cam operation.	Replace power drive lever spring.	/
	Power cam operation is faulty.	Power cam operation.	Adjust power drive lever.	18
Oil power drive lever roller.			/	
Work clamp does not lower.	Power cam operation is faulty.	Low-speed belt tension.	Adjust power drive lever.	18
	Low-speed belt tension is not enough.	Low-speed belt tension.	Adjust low-speed belt to yield about 10 mm.	/
Power pulley gets hot.	Power pulley torque is too small for power cam to turn to reference needle position.	Power pulley operation.	Adjust power actuating lever.	18
	Power pulley torque is so great that power cam is forced back.			
Faulty start.	Start stopper position is wrong.	Ball presser plate position.	Adjust start stopper position.	17

Trouble	Cause	Check	Remedy	Page
Excessive shock at stop	Deceleration is not enough at low speed.	Clutch cam timing	Adjust clutch cam timing.	16
		Brake spring pressure	Adjust brake spring pressure.	18
		Brake shoe clearance	Adjust brake.	17
		Ball presser plate	Adjust ball presser plate position.	14
Thread wiper does not operate properly.	Thread wiper interferes with needle.	Clearance between thread wiper and needle point	Adjust thread wiper height.	22
	Thread wiper position is wrong.	Thread wiper position	Adjust thread wiper stroke.	22
Lower thread is wound unevenly.	Lower thread tension bracket position is wrong.	Lower thread tension bracket position	Adjust lower thread tension bracket position.	/
Lower thread is not wound enough.	Bobbin presser position is wrong.	Thread volume	Adjust bobbin presser position.	/
Thread slips out.	Main tension release timing is wrong.	Clutch cam timing	Adjust clutch cam timing.	16
	Needle thread length is uneven.	Roller shaft disengaging timing	Adjust start lever position.	16
	Thread take-up lever stroke is incorrect.	Thread take-up lever stroke	Adjust thread take-up lever stroke.	21
Lower thread breaks.	Lower thread tension is too great.	Lower thread tension	Adjust lower thread tension.	1
	Needle hole plate or bobbin case edge has flaws.	Flaws	Polish or replace defective parts.	/
Lower thread snaps.	Thread retainer position is wrong.	Thread retainer position	Adjust movable knife position.	20
	Thread retainer has flaws.	Flaws	Polish thread path, or replace thread retainer.	/

Trouble	Cause	Check	Remedy	Page
Upper thread breaks.	Upper thread tension is too great.	Upper thread tension	Adjust upper thread tension.	1
	Needle is installed in wrong way.	Needle direction	Install needle so its long groove faces front.	/
	Thread is too thick for needle.	Thread and needle	Select thread suitable to needle.	/
	Thread take-up spring tension and height are incorrect.	Thread take-up spring tension and height	Adjust thread take-up spring tension and height.	1
	Shuttle hook, needle hole plate or needle has flaws or burrs.	Flaws, burrs	Polish or replace defective parts.	/
	Heat	Thread end	Use liquid cooler.	/
Skip stitch.	Clearance between needle and shuttle hook point is too great.	Needle and shuttle hook clearance	Adjust needle and shuttle hook clearance.	10
	Needle and shuttle timing is wrong.	Needle timing	Adjust needle timing.	9
	Driver receives needle more than necessary.	Clearance between driver and needle	Adjust driver and needle contact.	10
	Needle is bent.	Needle bend	Replace needle.	/
	Needle is installed wrong way.	Needle direction	Install needle so its long groove faces front.	/
	Presser foot is raised too high.	The clearance between the cloth and the bottom of the presser foot is too large or not.	Adjust presser foot height.	19
	Improper presser type.	Material firmly pressed where the needle meets material?	Change presser type.	23
	Presser foot pressure is weak.	Presser foot vibrates vertically while sewing.	Tighten the presser foot spring.	/
Seams break.	Are presser foot needle hole and needle center not aligned?		Adjust so the needle is aligned with the presser foot center.	/
	Is the presser foot needle hole damaged?		Remove the damaged part with sand paper.	/

Trouble	Cause	Check	Remedy	Page
Upper thread is not cut.	Fixed knife is blunt.	Fixed knife edge	Sharpen fixed knife or replace it.	
	Thread trimming lever spring pressure is too small for movable knife to run all way.	Thread trimming lever spring pressure	Replace thread trimming lever spring with a new one.	
	Movable knife does not scoop up upper thread.	Shuttle thread guide position	Adjust shuttle thread guide position.	11
		Needle bar stroke	Adjust needle bar stroke.	9
	Movable knife does not scoop upper thread due to final stitch skipping.	Final stitch skipping	Refer to instructions for stitch skipping, and take steps to prevent it.	31
	Movable knife position is wrong.	Movable knife position	Adjust movable knife position.	20
	Sub-tension tightening timing is wrong.	Sub-tension tightening timing	Adjust sub-tension.	21
Sub-tension tension is too small.	Sub-tension tension	Turn tension nut to adjust sub-tension.		
Thread gets caught.	Thread take-up spring tension and height are incorrect.	Thread take-up spring tension and height	Adjust thread take-up spring tension and height.	21
	Shuttle thread guide does not properly guide thread.	Shuttle thread guide position.	Adjust shuttle thread guide position.	11
Thread tension poor.	Upper thread tension is too small.	Upper thread tension	Adjust upper thread tension.	1
	Lower thread tension is too small.	Lower thread tension	Adjust lower thread tension.	1
	Thread take-up spring tension and height are incorrect.	Thread take-up spring tension and height	Adjust thread take-up spring tension and height.	21
	Presser foot is too low.	Excessive presser foot pressure.	Adjust presser foot height.	19
	Needle movement.	Feed timing OK?	Adjust the needle and feed timing.	21

Trouble	Cause	Check	Remedy	Page
Needle breaks.	Needle hits shuttle hook.	Needle and shuttle hook clearance	Adjust needle and shuttle hook clearance.	10
		Needle timing	Adjust needle timing.	9
	Needle is bent.	Needle bend	Replace needle.	/
	Needle runs off course.	Needle and feed timing	Adjust needle and feed timing.	12
	Improper feed timing.	Feed plate moving when needle is in the material?	Adjust needle and feed timing.	12
Pattern slips	Needle hitting presser foot or presser.	Marks where the needle hits presser or presser foot?	Adjust presser and presser foot position so needle does not strike them.	/
	Play in the feed gear.	With power on will the feed move by hand?	Adjust feed gear timing.	13
	Material slips	Material properly pressed?	Adjust presser.	/
		Feed timing OK?	Adjust needle and feed timing.	12
		Presser foot too low?	Adjust presser foot height.	19
Starting point slips	Check the starting point.	Adjust starting position.	11	

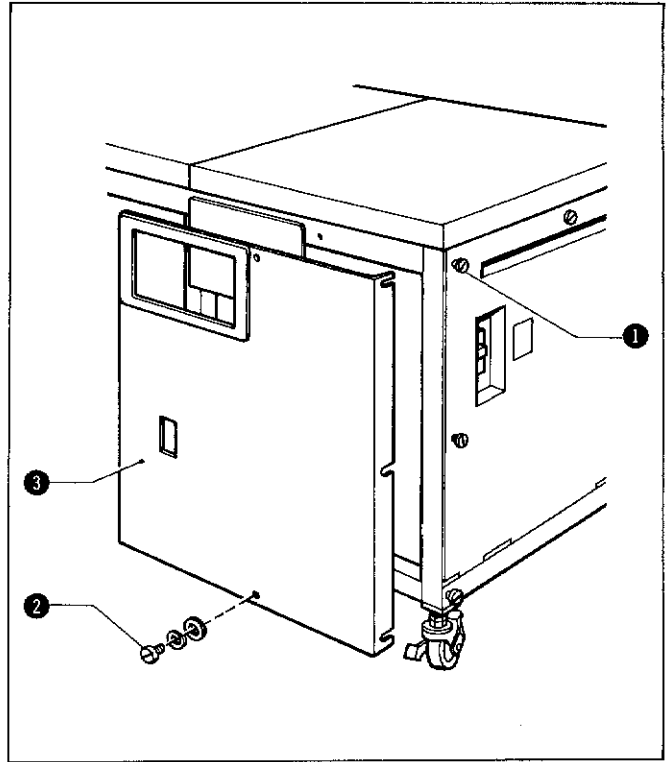
ADJUSTMENT (II)

I COVER REMOVAL

* Always to the following after turning the power switch off.

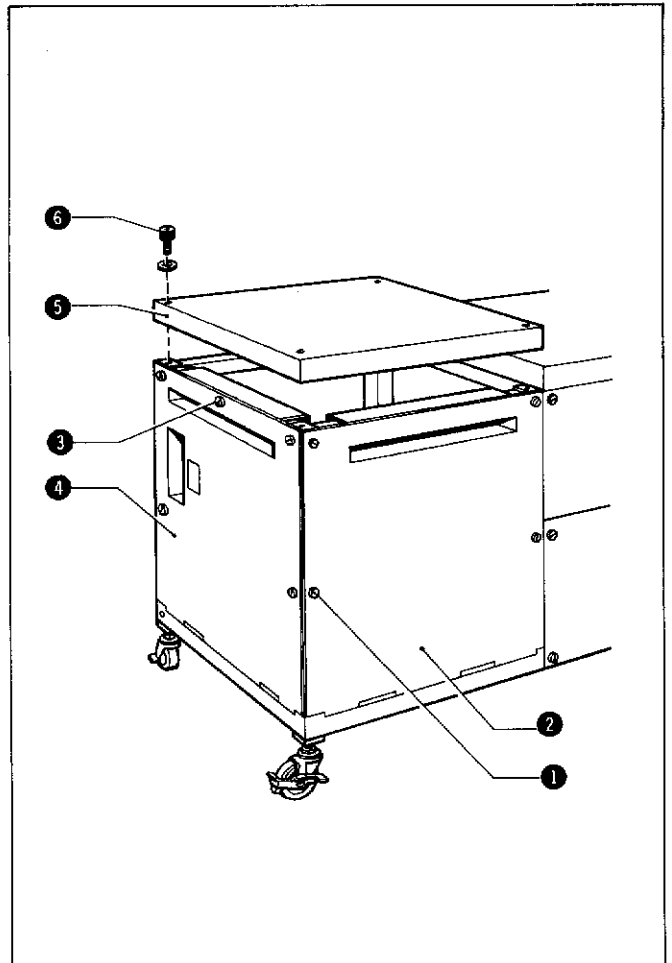
1. Front Cover Removal

- (1) Loosen the six screws ①.
- (2) Remove the two screws ② in the front, and remove the front cover ③.



2. Side and Front Cover Opening

- (1) Remove the five screws ①, and carefully open rear cover R ②.
 - (2) Remove the five screws ③, and carefully open side cover R ④.
- When removing table SR ⑤, remove the bolts ⑥ in the four corners and remove the table.



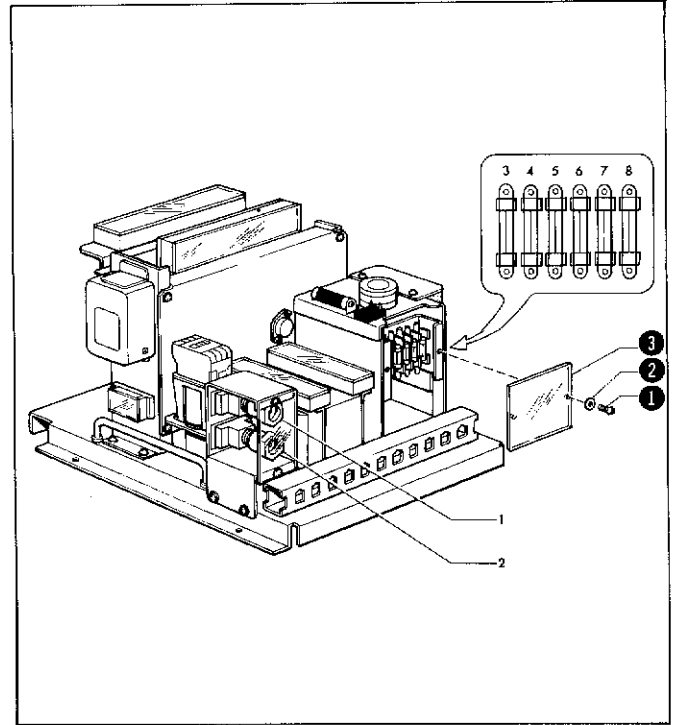
2 FUSE REPLACEMENT

* Always to the following after turning the power switch off.

1. Power Supply Unit

- (1) Open side cover R on the right side of the main body.
- (2) Remove the screw ① and remove the washer ② and cover ③.
- (3) Refer to the table below and replace with an identical fuse.

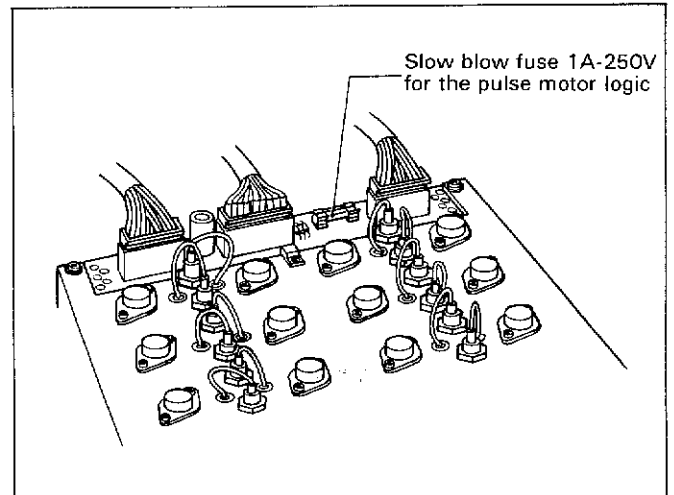
No.	Kind of fuse	Remarks
1	Fuse 10A-600V	For pulse motor
2	Fuse 10A-600V	For pulse motor
3	Fuse 1A-125V	For fan motor
4	Fuse 5A-125V	For solenoid valve
5	Fuse 5A-125V	For pulse motor (high voltage)
6	Fuse 5A-125V	+5V
7	Fuse 1A-125V	+12V
8	Fuse 1A-125V	-5V



2. Pulse Motor Circuit Board

Replace the fuse (slow blow fuse 1A-125V) located on the pulse motor circuit board.

No.	Kind of fuse	Remarks
9	Fuse 1A-125V	For pulse motor

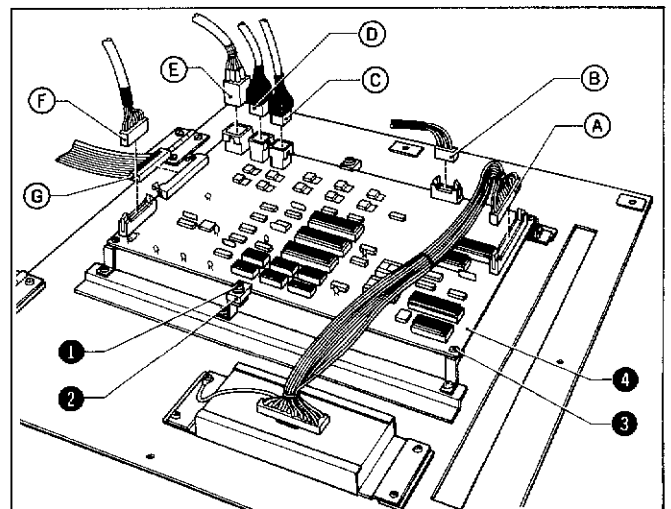


3 CIRCUIT BOARD REPLACEMENT

* Always to the following after turning the power switch off.

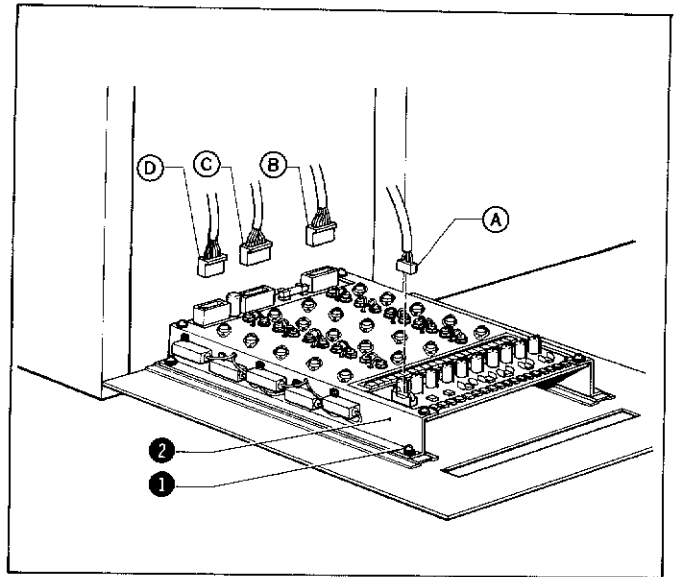
1. Replacement of Printed Circuit Board

- (1) Open side cover R.
- (2) Disconnect connectors (A), (B), (C), (D), (E), (F) and flat cable (G).
- (3) Loosen the screw ①, and move the circuit board mounting plate ② to the outside.
- (4) Remove the four set screws ③, remove the control circuit board ④ and replace with a new unit.



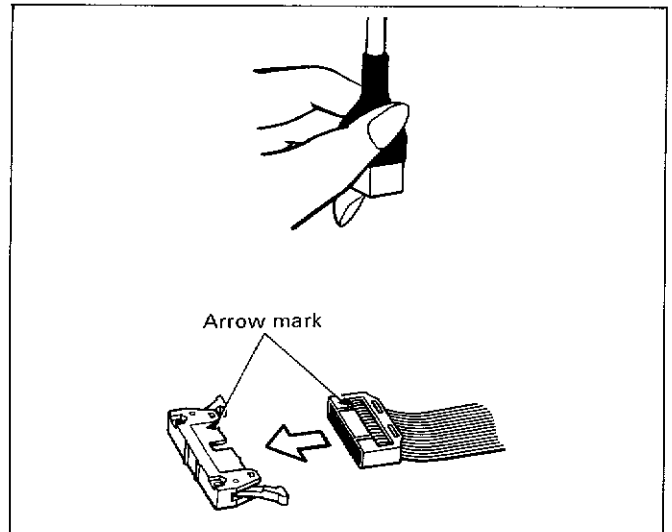
2. Pulse Motor Circuit Board

- (1) Open rear cover R.
- (2) Disconnect connectors (A), (B), (C), (D).
- (3) Remove the four set screws ① and replace the pulse motor circuit board ② with a new unit.



[Warning]

- (1) For installation and removal of connectors, do not hold the lead wires. Hold the connector and connect/disconnect carefully.
- (2) After replacing a circuit board, do not forget to reconnect the connectors.
- (3) To connect the flat cable, match the arrows and connect.

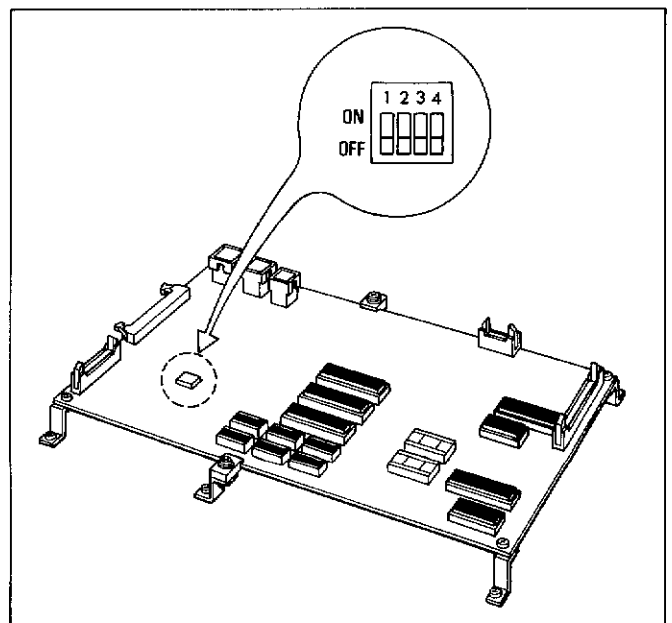


4 DIP SWITCH

Because switching the control circuit board dip switch can change the presser from a two-step to a single-step type, consider the operability of machine and work to be done when setting the switch.

No.	Switch	ON	OFF
1			
2		Two-step type	Single-step type
3			
4		Air type	

* No. 4 should normally be left on.



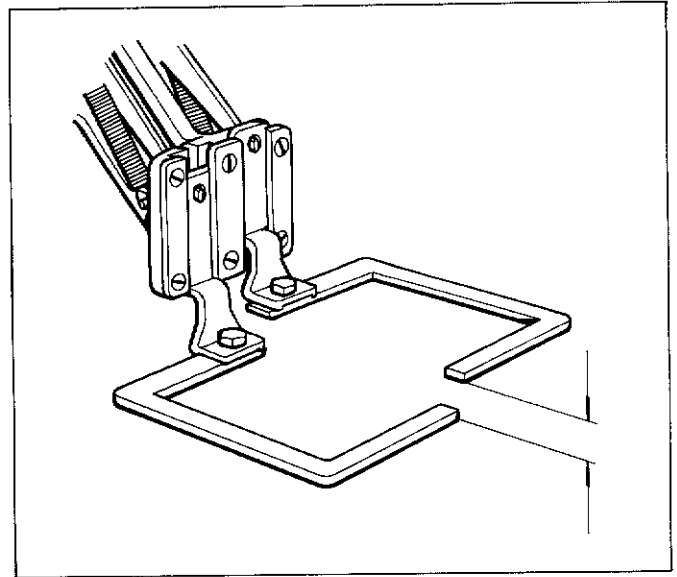
1. Using a Two-Step Presser

Holding down the body of a garment for attachment of names, labels, and accessories, position of attachment can be decided while sewing the garment.

- (1) Open side cover R.
- (2) Turn dip switch No. 2 on.
This sets the presser to a two-step type.

(Presser Movements)

- (1) When the work clamp lifter switch is depressed one step, the left side presser lowers. (When released, the presser returns to its original position.)
- (2) If the work clamp lifter switch is depressed further, the right side presser also lowers. (To lift the presser, depress the switch again. The right and left side pressers will rise simultaneously.)



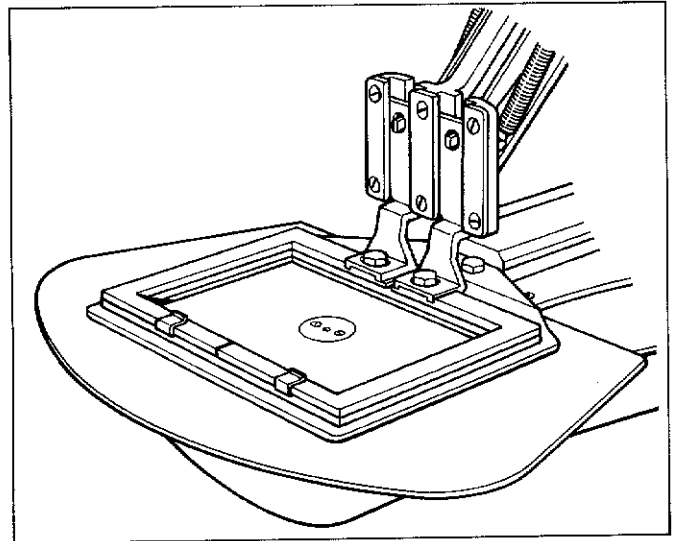
2. Using a Single-Step Presser

Used in work with resin bar tacking presser feet or cassette presser.

- (1) Open side cover R.
- (2) Turn dip switch No. 2 off. This sets the presser to a single-step type.

(Presser Movements)

When the work clamp lifter switch is depressed, both right and left pressers lower simultaneously. (To lift the presses, depress the switch once more.)



5 SOLENOID VALVE ADJUSTMENT

1. Start Switch

If the knob ① is turned in the direction of the arrow, air pressure drops.

2. Presser Right:

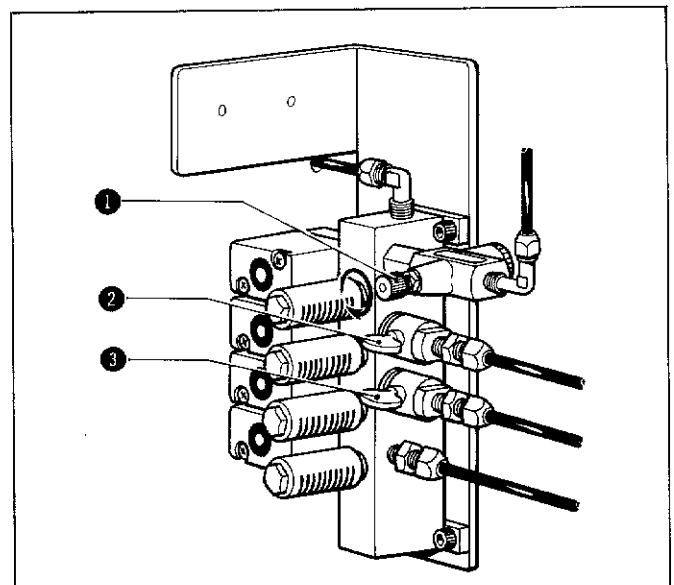
If the upper cock ② is turned, air pressure drops.

(If turned 90° from the position shown in the illustration, air will stop.)

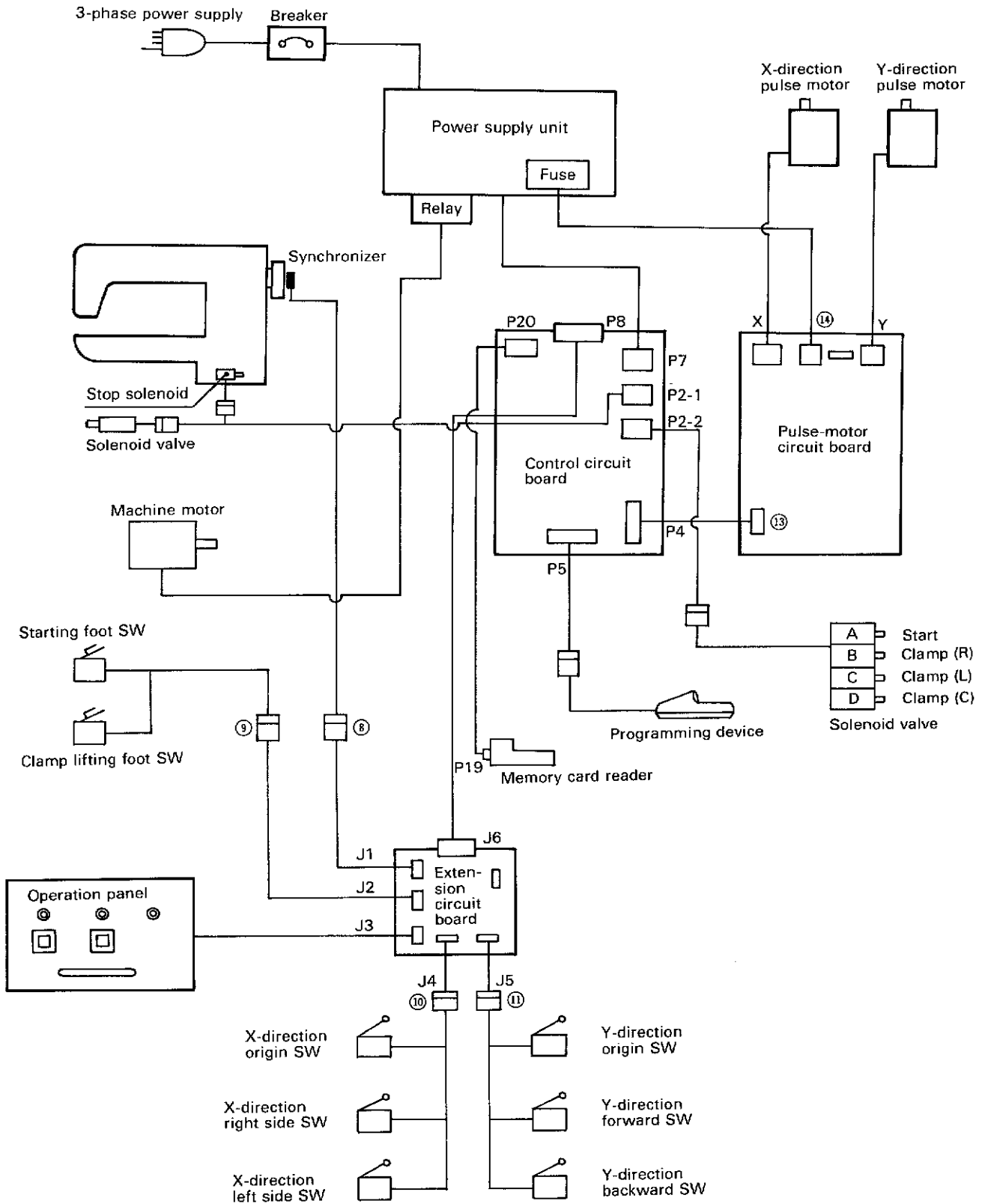
3. Presser Left:

If the lower cock ③ is turned, air pressure drops.

(If turned 90° from the position shown in the illustration, air will stop.)

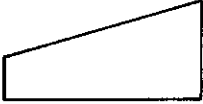

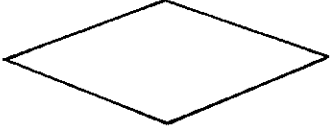






ELECTRIC-CIRCUIT

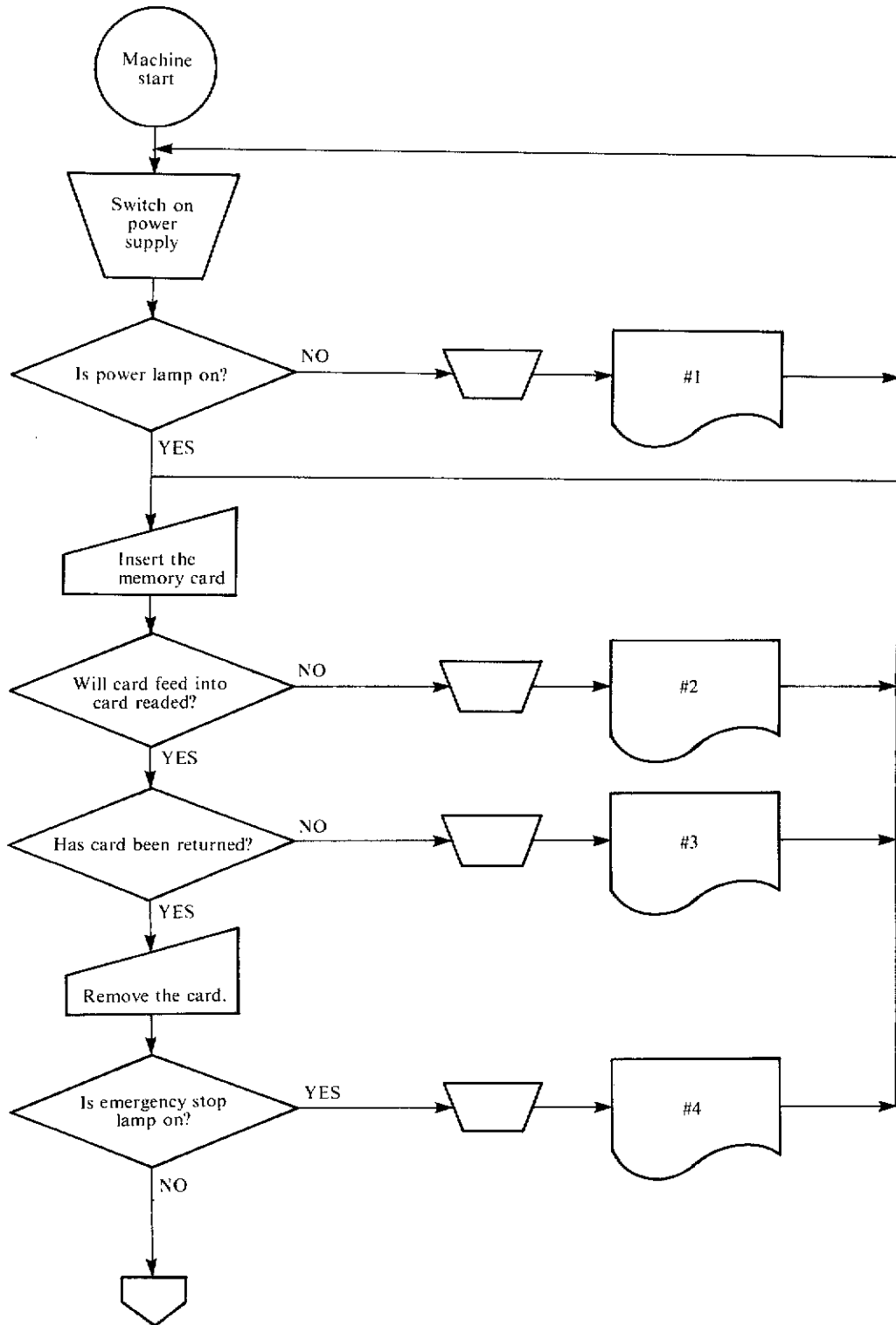


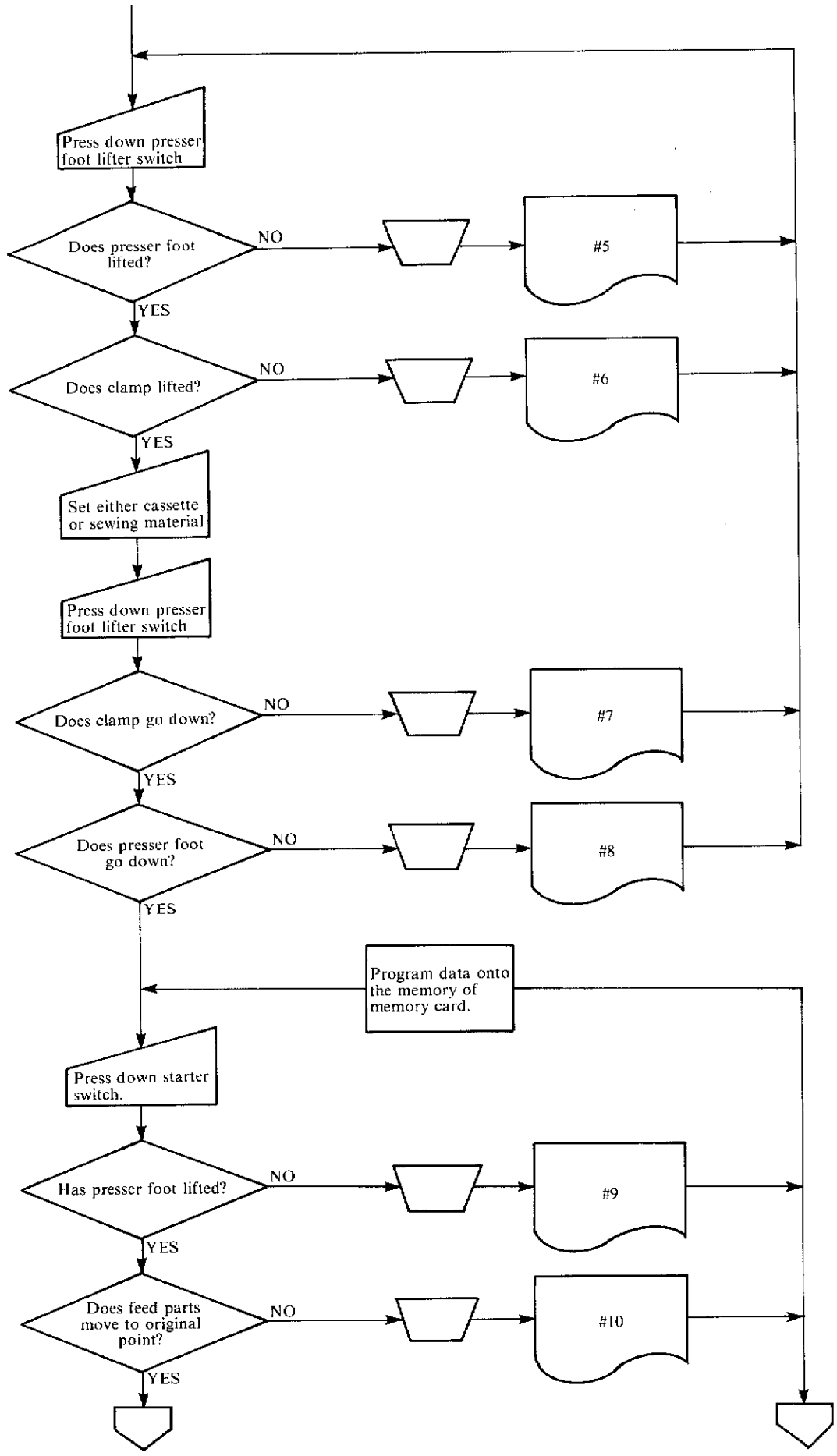
TROUBLESHOOTING FLOW CHART

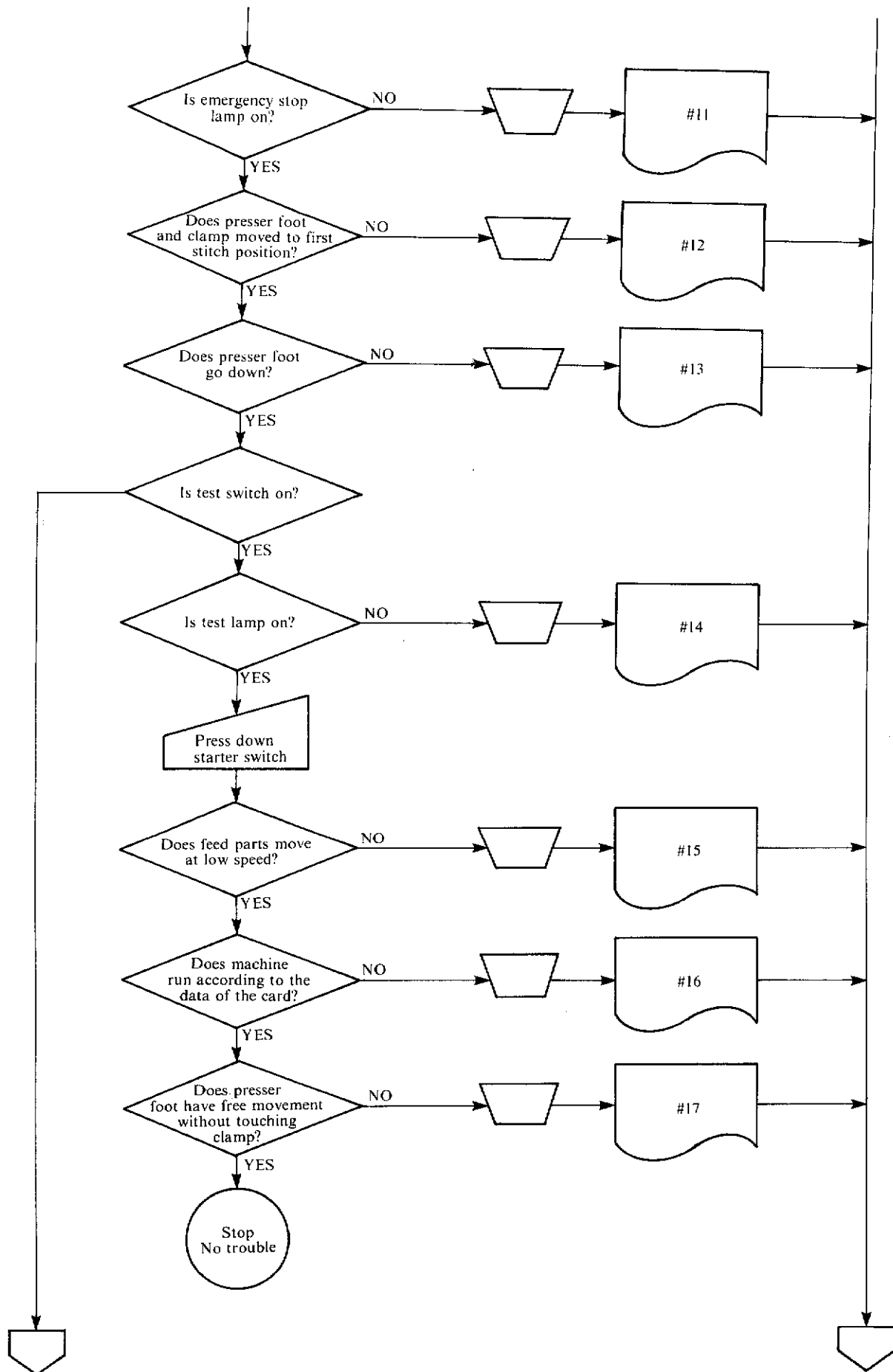
[EXPLANATION ON MARKINGS]

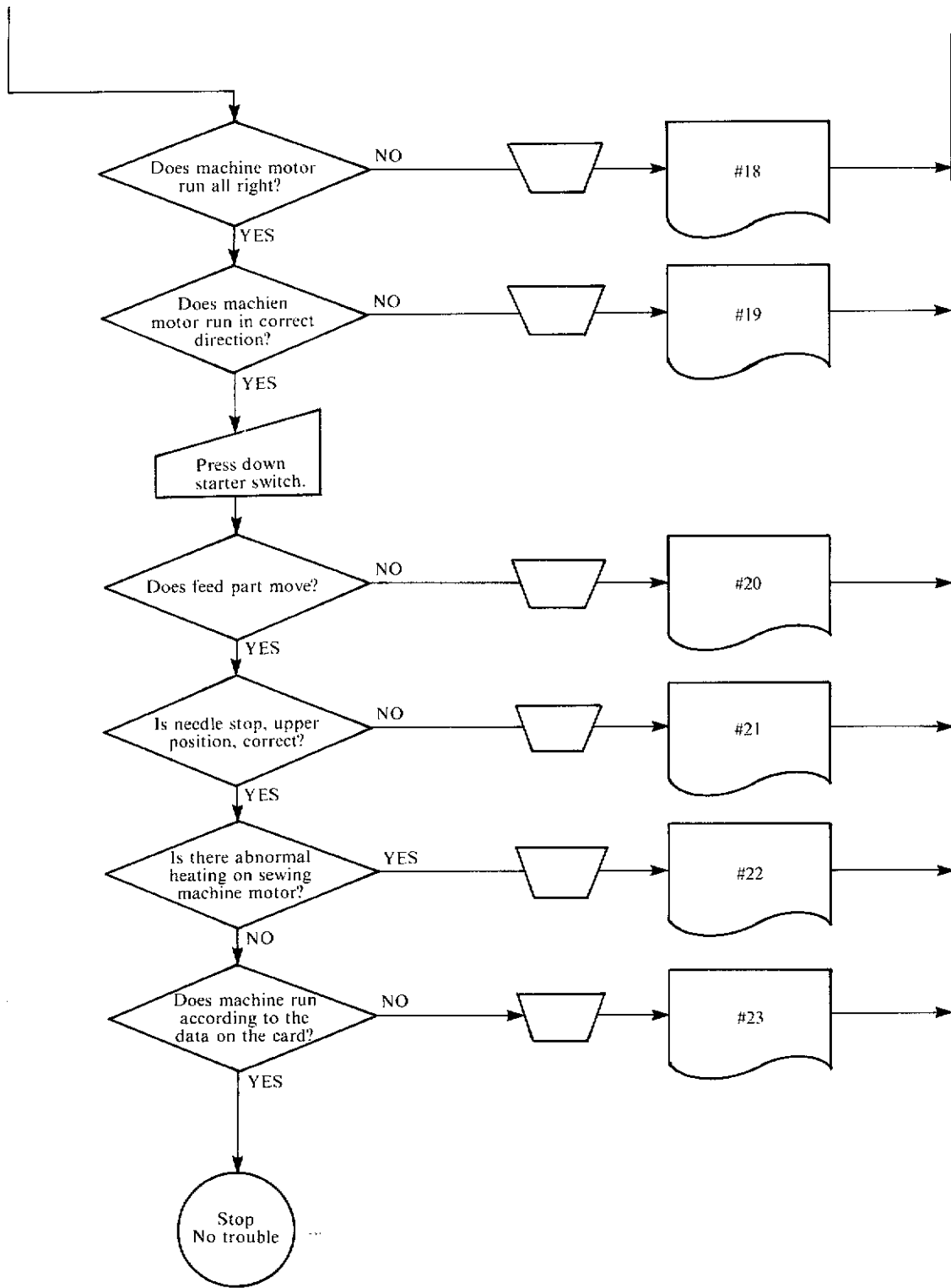
1.  means "manual operation"
2.  means "switch operation"
3.  means "decision"
4.  means "refer to Item Number"
5.  means "set-up of conditions or situation"
6.  means "continue to next page"
7.  means "switch-off of power supply"

1 TROUBLESHOOTING FLOW CHART FOR MACHINE CONTROL DEVICE

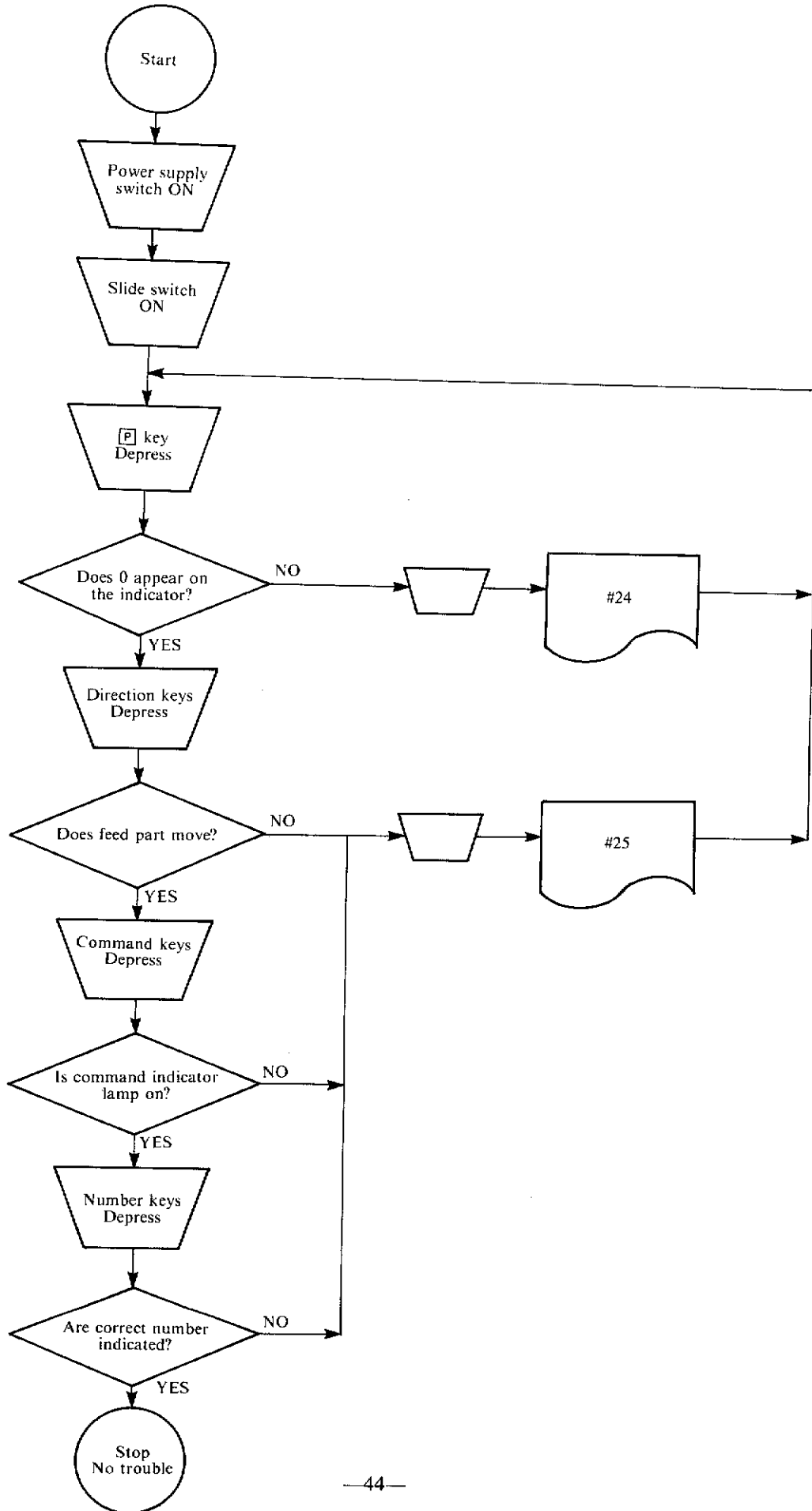








2 TROUBLESHOOTING FLOW CHART FOR PROGRAMMING DEVICE



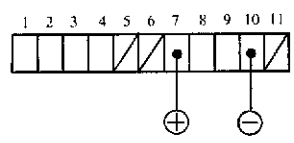
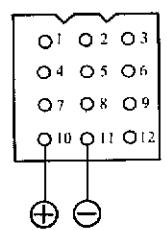
ACTION COUNTERMEASURE

WARNINGS WHEN CARRYING CUT TROUBLESHOOTING:

1. Make sure to remove or replace the plug after switching off the power supply.
2. Switch off the power supply when taking off the covers or tables from the machine.
3. When replacing fuse, always make sure to use exactly the same quality and capacity of fuse.
4. Turn the switch on, and check the voltage.
 Turn the switch off, and check the resistance.

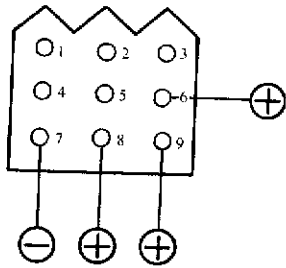
◀BEFORE MAKING ADJUSTMENTS▶

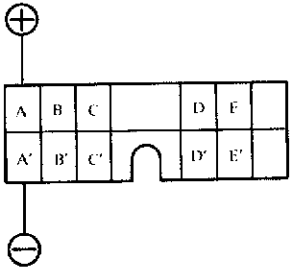
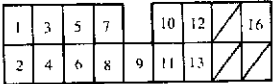
1. Check whether fuse is not blown.
2. Confirm whether all plugs are properly connected.
3. Find out with flow chart under what condition it's symptoms occurs.

No.	Cause	Check, Repair, Adjustment .	Replacement parts	Page
Electric power supply lamp does not light	1. No power supply	<input type="checkbox"/> Measure the voltage of 3 ph. power transformer.		
	2. Fault on power supply switch or cord	<input type="checkbox"/> Powr switch on. Test for continuity between power transformer output terminals and terminals of power supply.	Power switch Power supply cord	38
	3. Fuse failure	<input type="radio"/> Switch off. Remove fuse No. 6 and check for continuity.	Fuse No. 6 (5A)	38
	4. Fault on lamp (LED) or cord 	<input type="radio"/> Switch off. Remove plug J3 from connector board, set test meter to highest resistance range. Connect test leads as shown. If LED is O.K. Meter will show low resistnace. No. 7 ··· ⊕ No. 10 ··· ⊖	Switch panel assembly (LED)	38
	5. Fault on power supply equipment 	<input type="checkbox"/> Disconnect plug P7 of control circuit board and measure the voltage as drawing. If it is approx 5 VDC it is O.K. No. 10 ··· ⊕ No. 11 ··· ⊖	Power supply equipment	38

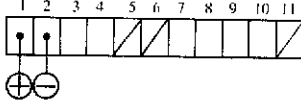
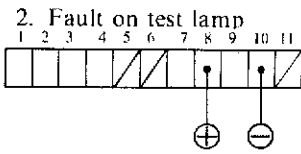
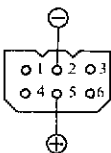
No.	Cause	Check, Repair, Adjustment	Replacement parts	Page
#2	1. Fuse failure	○ Switch off. Remove fuse No. 7, 8 and check for continuity.	Fuse No. 7, 8 (1A)	35
	2. Fault on cord for card reader	○ Switch off. Disconnect plug P20 of control circuit board and disconnect plug P19 of card reader. The check for continuity as follows. P20 A13—B1 P19 A11—B5 A1 —B10 A7 —A8	Reader harness assembly	38
	3. Fault on power supply equipment	□ Disconnect plug P7 of control circuit board and measure the DC Voltage as shown below. No. 1... ⊕ No. 10... ⊕ No. 11... ⊕ ↑ ↑ ↑ +12V +5V -5V ↓ ↓ ↓ No. 11... ⊖ No. 11... ⊖ No. 12... ⊖	Power supply equipment	38
	4. Fault on card reader	If above mentioned item 1 ~ 3 are good, card reader is fault.	Card reader	
#3	1. Fault on card reader	Replace the card reader.	Card reader	
	#4	1. Incorrect reading by card reader	Insert cleaning card to clean magnetic head.	
2. Fault on memory card		Try another card of known quality.	Memory card	
3. Fault on card reader cord		○ Switch off. Disconnect plug P20 of control circuit board and disconnect plug P19 of card reader. Then check for continuity as follows: P20 B5 — B14 P19 B4 — B13 B1 — B9 B3 — B8 B2 — B12 B7 — B4 B10 — B6 B9 — B7	Reader harness assembly	

No.	Cause	Check, Repair, Adjustment	Replacement parts	Page
	4. Fault on card reader	○ Switch off. Replace card reader.	Card reader	
	5. Fault on control circuit board	○ Switch off. Replace the control circuit board.	Control circuit board	
#5	1. Fuse failure	○ Switch off. Disconnect fuse No. 4 check for continuity.	Fuse No. 4 (5A)	35
	2. Presser foot cylinder load is too great.	Check wire and stepping foot mechanism.		
Presser foot does not lift when presser foot switch is operated.	3. Fault on presser foot micro switch.	○ Switch off. Disconnect plug J2 of the relay circuit board and check for continuity. No.1·····No.2 No.1·····No.4 common normally closed When switching on, the electricity is on.	Foot switch assembly	38
	4. Fault on solenoid valve	○ Switch off. Disconnect plug P2-1 of control circuit board and check for continuity and resistance of solenoid valve. 500 ohms approx No.3 ⊖ ··· ⊕ No. 6	Solenoid valve assembly	38
	5. Fault on power supply equipment	□ Disconnect plug P7 of control circuit board and measure voltage as diagram. No.9 ⊖ ··· ⊕ No. 12 50V approx	Power supply equipment	38
	6. Fault on control circuit board.	If all above tests do not reveal fault, replace control circuit board.	Control circuit board	

No.	Cause	Check, Repair, Adjustment	Replacement parts	Page
#6	1. Excessive load on clamp cylinder.	Check clamp mechanism.		
	2. Fault on clamp solenoid valve.	○ Switch off. Disconnect plug P2-2 of control circuit board and check for continuity and resistance of solenoid valve. 500 ohms approx No.7 - ... ⊕ No. 6 No.9 - ... ⊕ No. 8	Solenoid valve assembly	38
		Fault on control circuit board.	Control circuit board	
3. Fault on control board.	Fault on control circuit board.	Control circuit board		
#7	1. Excessive load on clamp cylinder	Check clamp mechanism.		
	2. Fault on control board	Fault on control circuit board.	Control circuit board	
#8	1. Excessive load on presser foot cylinder	Check wire and stepping foot mechanism.		
	2. Fault on control board	Fault on control circuit board.	Control circuit board	
#9	1. Fault on start switch	○ Switch off. Disconnect plug J2 of relay circuit board and check switch operation contacts. No.6 - No. 7 ⊕ No.6 - No. 8 ⊕ common normally closed	Foot switch assembly	38
	2.	Refer to #5.		

No.	Cause	Check, Repair, Adjustment	Replacement parts	Page
#10	1. Fuse failure	○ Switch off. Remove fuse numbers: 1, 2, 5, 9 and check for continuity.	Fuse No. 1 No. 2 No. 5 No. 9	38
	2. Fault on clock harness	○ Switch off. Disconnect plug P4 of control circuit board and plug ⑬ of pulse motor. check for continuity. P4 B1—B5 ⑬ B2—B3 B3—B4 B4—B2 B5—B1	Clock harness assembly.	38
	3. Fault on pulse motor connector 	○ Switch off. Disconnect plug X, Y of pulse circuit board and check resistance of pulse motor windings. A ⊕ ··· ⊖ A' B ⊕ ··· ⊖ B' C ⊕ ··· ⊖ C' D ⊕ ··· ⊖ D' E ⊕ ··· ⊖ E' All windings approx. 2 ohms.	Pulse motor assembly	38
	4. Fault on power supply 	□ Disconnect plug ⑭ and measure the voltage as diagram. Approx. value 1,2,4 ⊕ ··· ⊖ 6 15V (DC) 9,10,11,12,13 ⊕ ··· ⊖ 4,5,6,7,8 7V (DC) 16 ⊕ ··· ⊖ 6 120V (DC)	Power supply equipment	38
	5. Fault on circuit boards	Replace control circuit board and pulse motor circuit board	Control circuit board or pulse motor circuit board.	
#11	No. pattern data in memory	Insert memory card.		

Feed does not move back to original point.

No.	Cause	Check, Repair, Adjustment	Replacement parts	Page
#12	1. Dirty oil on the head of card reader.	Insert cleaning card several time.		
	2. Fault on memory card	Try another card of known memory card quality.	Memory card	
	3. Fault on card reader and control circuit board	Fault on card reader and control circuit board.	Card reader or control circuit board	
#13		Refer to #8.		
#14	1. Fault on test switch 	<input type="radio"/> Switch off. Disconnect plug J3 of relay circuit board and check switch operation. No. 1 + ... - No. 2	Switch panel assembly	38
	2. Fault on test lamp 	<input type="radio"/> Switch off. Disconnect plug J3 of relay circuit board. Set test meter to highest resistance range connect test lends as shown. If LED is OK, meter will show low resistance. No. 8 + ... - No. 10	Switch panel assembly (LED)	
	3. Fault on control circuit board	Fault on control circuit board.	Control circuit board	
#15		Refer to #10.		
#16		Refer to #12.		
#17	Presser foot and clamp are not compatible for this programme	Modify clamp. Use suitable presser foot. Modify programme.	Presser foot	
#18	1. Fault on cord	<input type="radio"/>	Machine motor	
	2. Fault on power supply equipment	<input type="checkbox"/>	Power supply equipment	
#19				
#20		Refer to #12.		
#21	1. Fault on stop solenoid 	<input type="radio"/> Switch off. Disconnect plug P2-1 of control circuit board and check for continuity. No.5 + ... - No. 2 20 ohms approx.	Solenoid assembly	38
	2. Roller holder is in wrong position	Adjust roller holder lever position.		13

No.	Cause	Check, Repair, Adjustment	Replacement parts	Page
#22	Excessive load on machine motor.	Adjust machine head.		
#23		Refer to #12.		
#24	1. Poor connection of programmes harness	Ensure connector is fitted correctly.		
	2. Poor connections of connector on programme circuit board	Same as above.		
	3. Poor connection of key	Same as above. switch circuit board		
	4. Poor connection of indicator circuit board	Same as above.		
#25		Refer to #1 (1, 2, 3).		



BROTHER INDUSTRIES, LTD.

HEAD OFFICE: No. 35, 9-CHOME,
HORITA-DORI, MIZUHO-KU, NAGOYA, JAPAN 467
CABLE: BROTHER NAGOYA,
TELEX: BROTHER J59908; J59970 & J59743