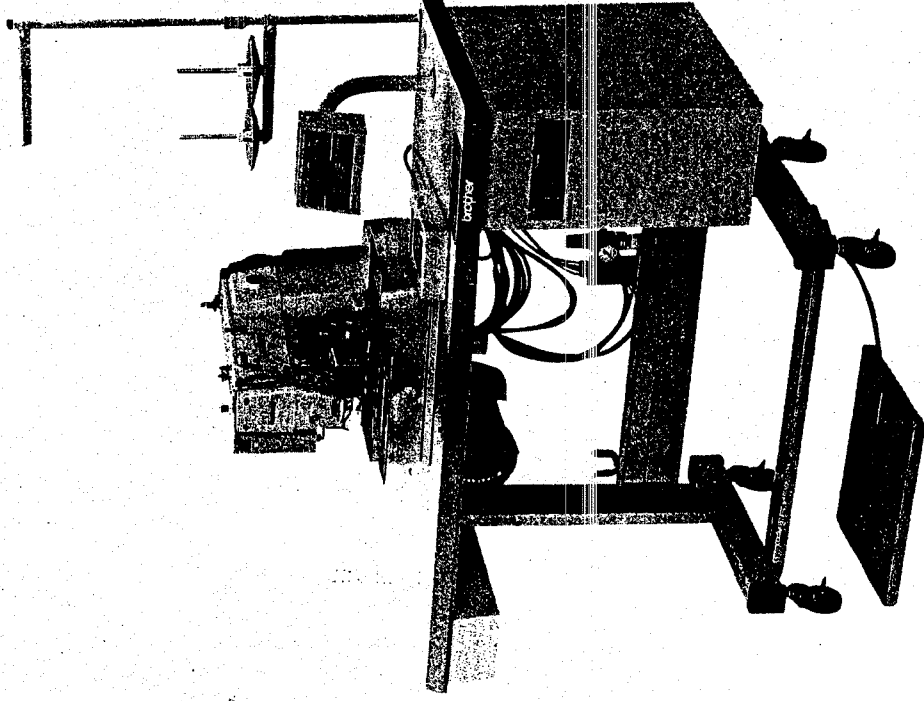


brother.

**PROGRAMMABLE ELECTRONIC PATTERN SEWER
WITH CYLINDER BED**

BAS-311A

INSTRUCTION MANUAL



CONTENTS

MAIN PART NAMES	1
SPECIFICATIONS	1
INSTALLATION	2
1 Positioning	2
2 Installation of spool stand	2
2 Card connections	2
4 Tilting the sewing machine head	2
5 V-belt tension	3
LUBRICATION AND OIL DRAINING	3
1 Adding oil	3
2 Oil draining	3
CORRECT OPERATION	4
1 Needle installation	4
2 Upper thread threading	4
3 Bobbin thread winding	4
4 Bobbin case installation and threading	6
5 Thread tension	6
OPERATING PROCEDURE	7
1 Operation panel part names and functions	7
2 Using the floppy disk	8
3 Using production counter	8
4 Using 8,000 stitch sewing mode	9
5 Using single split mode	9
6 Using the program R/W switch	10
7 Using the STEP BACK switch	11
8 Adjusting the sewing SPEED control	11
9 Using the TEST switch	12
10 Using the emergency stop switch	12
11 Shifting a stitch pattern	13
12 Using bobbin thread counter	13
SEWING	14

STANDARD ADJUSTMENTS

1 Needle bar height adjustment	15
2 Needle bar lift stroke adjustment	15
3 Needle to shuttle hook point gap adjustment	15
4 Shuttle driver needle contact adjustment	16
5 Shuttle hook thread guide adjustment	16
6 Two-step work clamp adjustment	16
7 Movable knife adjustment	17
8 Presser foot adjustment	18
9 Changing the presser foot lift	18
10 Wiper adjustment	19
11 Needle and feed timing adjustment	19
12 2-step work clamp operation adjustment	20
13 Changing the thread breakage detection stitch margin setting	22
14 Changing the feed speed	22
15 Changing the speed at the start and end of sewing	23
16 Using the memory switch	24

MEMORY SWITCH SETTINGS

24

OPERATION FLOW CHART

25

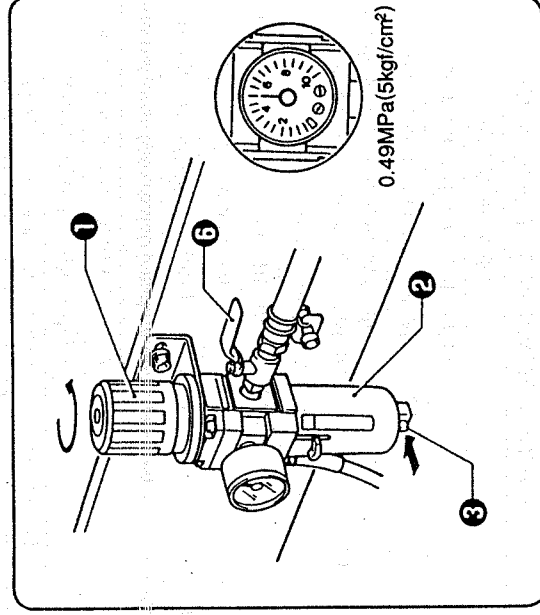
DIP SWITCH SETTINGS

26

ERROR NO. LIST

27

Air pressure adjustment

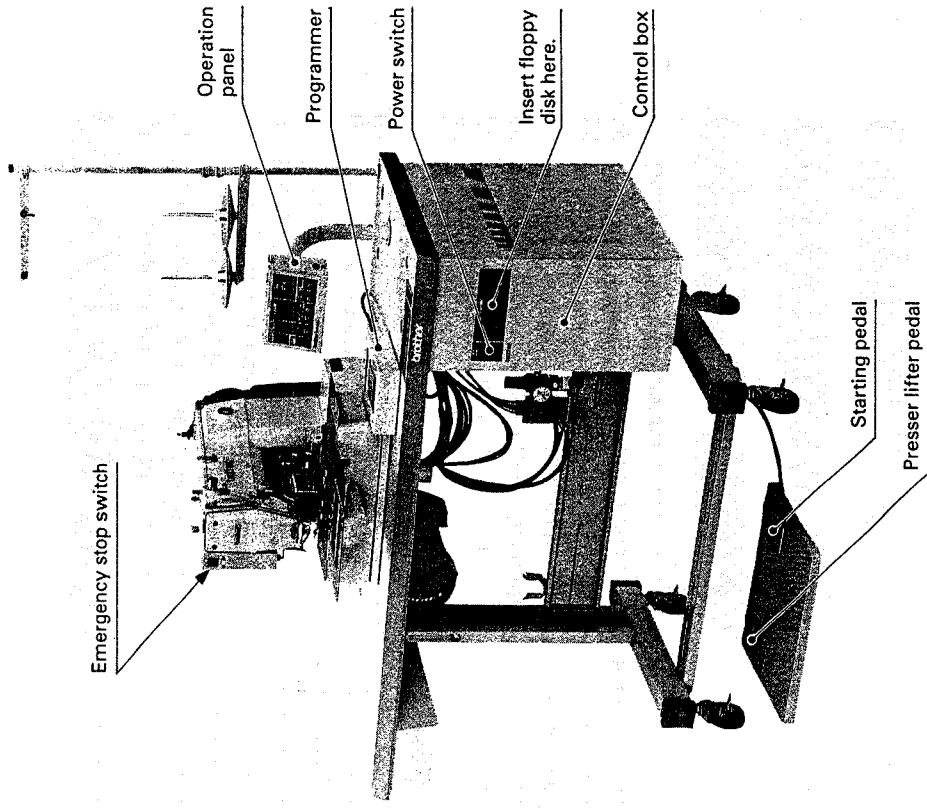
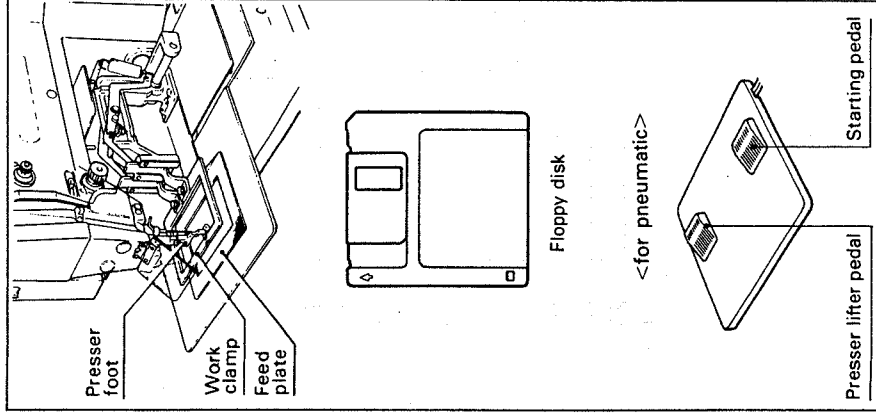


(1) The air pressure should be 0.49MPa (5kgf/cm²) during use. If adjustment is necessary, lift up the cap ① and turn it.

(2) If water collects in the bottle ② push up the drain cock ③ to drain the water.

NOTE: Open the air cock ③ slowly.

MAIN PART NAMES

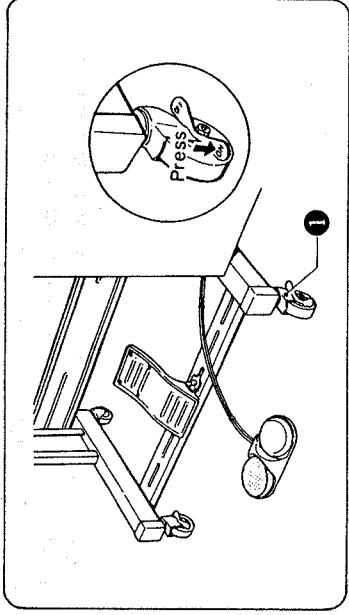


SPECIFICATIONS

Stitch type	Single needle, lock stitch		
Sewing machine	Lock stitch, pattern tacking sewing machine (with large shuttle hook)		
Stitch length and max. sewing speed	0.1~3.0 mm	3.1~4.4 mm	4.5~6.3 mm
	1,000~2,000 spm	750~1,500 spm	400~1,200 spm
Feed format	Intermittent feed, pulse motor drive		
Max. pattern size	100 mm wide (X axis) and 60 mm deep (Y axis)		
Number of stitches	Max. 4,000 (one pattern) Max. 8,000 (reading two patterns)		
Work clamp lift stroke	18 mm (for solenoid), 20 mm (for pneumatic)		
2-step presser foot	Solenoid or pneumatic		
Intermittent feed	0, 4, 7 mm selectable (factory set to 4 mm; 10 mm optionally available)		
Test function	Operation test function provided for use with low speed drive		
Safety devices	Automatic stop function for activation in the event of misoperation realized with intermediate stop function and safety circuits.		
Machine dimensions	1,200W × 590D × 1140H mm (Sitting) ~ 1,350H mm (Standing)		
Power table	T-shaped for use sitting or standing		
Memory medium	3.5-2DD floppy disk		
Power source	1-phase 110V, 200V, 220V, 240V 3-phase 220V, 380V, 415V		
Motor	Three phase induction motor 400W		

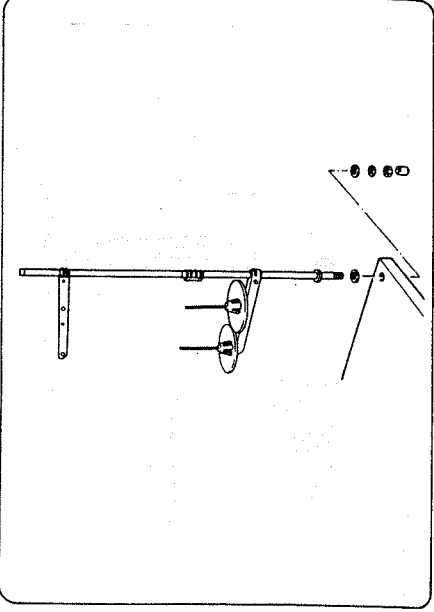
INSTALLATION

1 Positioning



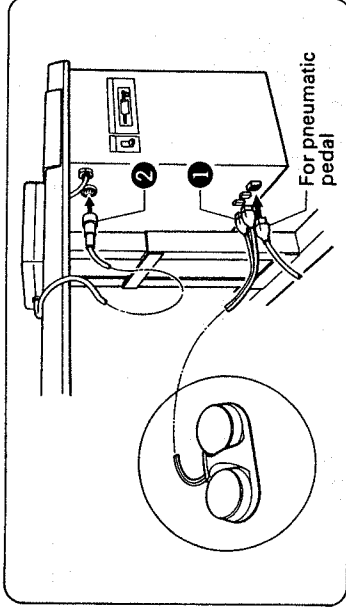
Determine the position for the sewing machine, and then lock the casters **1** so that the sewing machine will not move.

2 Installation of spool stand



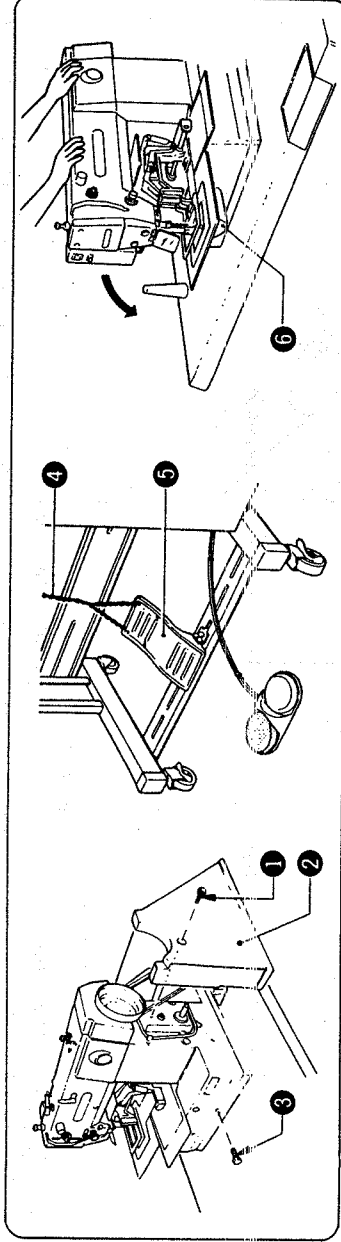
Install the spool stand to the table.

3 Cord connections



Connect the cords for the pedal **1**, and the programmer **2** to their respective terminals.

4 Tilting the sewing machine head



(1) Remove bolt **1** at the back of the work table, and remove belt cover D **2**.

(2) Remove head lock bolt **3**.

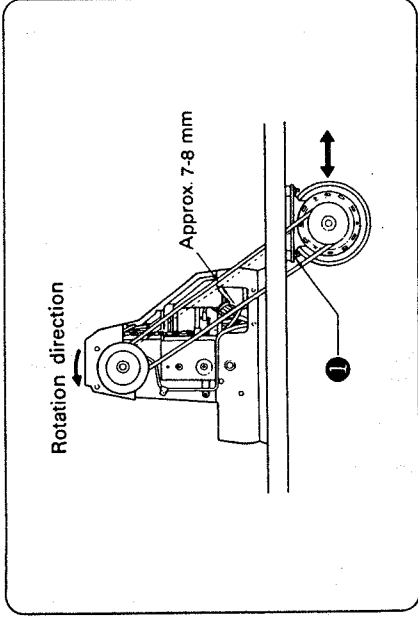
※ The bolt **3** is for transport only. After installation, keep the bolt **3** in the safe place.

※ Disconnect chain hook S **4**

hooked on pedal **5**.

(3) Stand at the left side of the table, and gently tilt the machine towards you. When returning the machine to the original position, be careful of the shuttle hook cover **6** and the cord.

3 V-belt tension

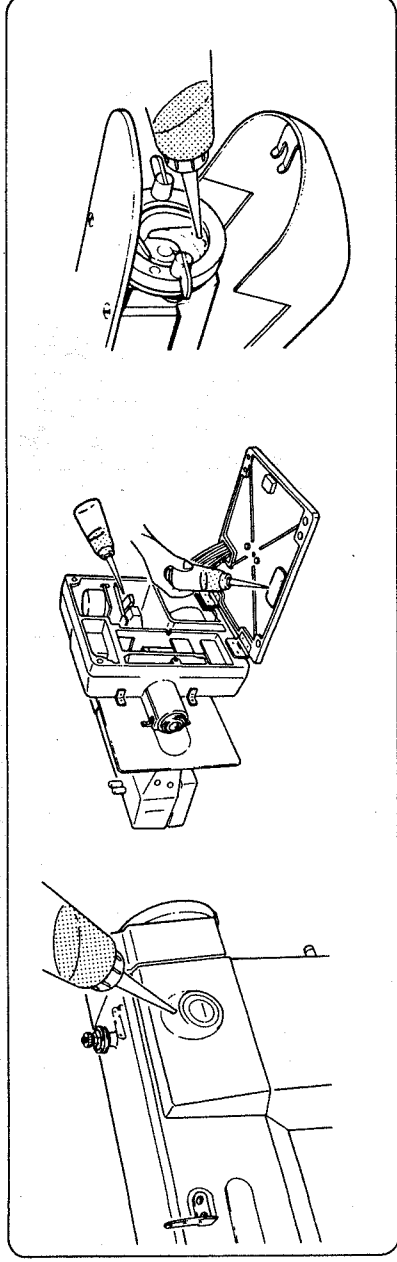


There should be approximately 7-8 mm of give when the V-belt is pressed at the center. To adjust, loosen the four nuts 1, and shift the motor right or left.

LUBRICATION AND OIL DRAINING

1 Adding oil

- ★ Be sure to use Brother-specified machine oil (Nisseki Sewing Lub. 10).

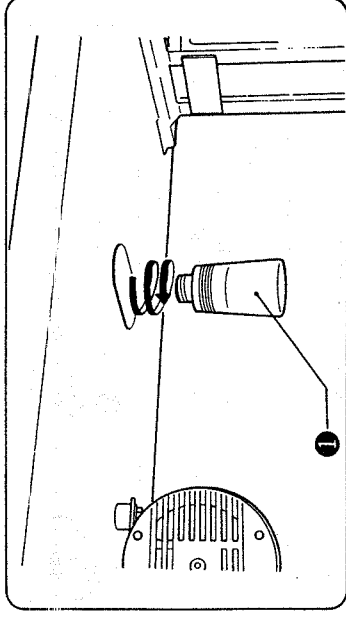
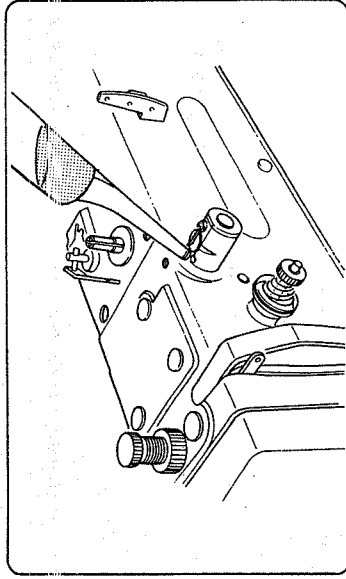


- (1) Fill the oil tank with sewing machine oil.

- (2) Soak the shuttle hook lubrication left with oil. Also add several drops of oil to the gear felt.

- (3) Add a drop of oil to the shuttle hook race.

2 Oil draining

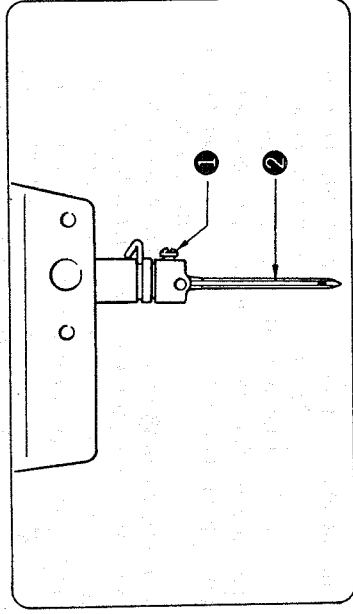


- (4) Fill the cooling tank with silicon oil.

- ★ Remove and empty the oil drain 1 wherever it is full.

CORRECT OPERATION

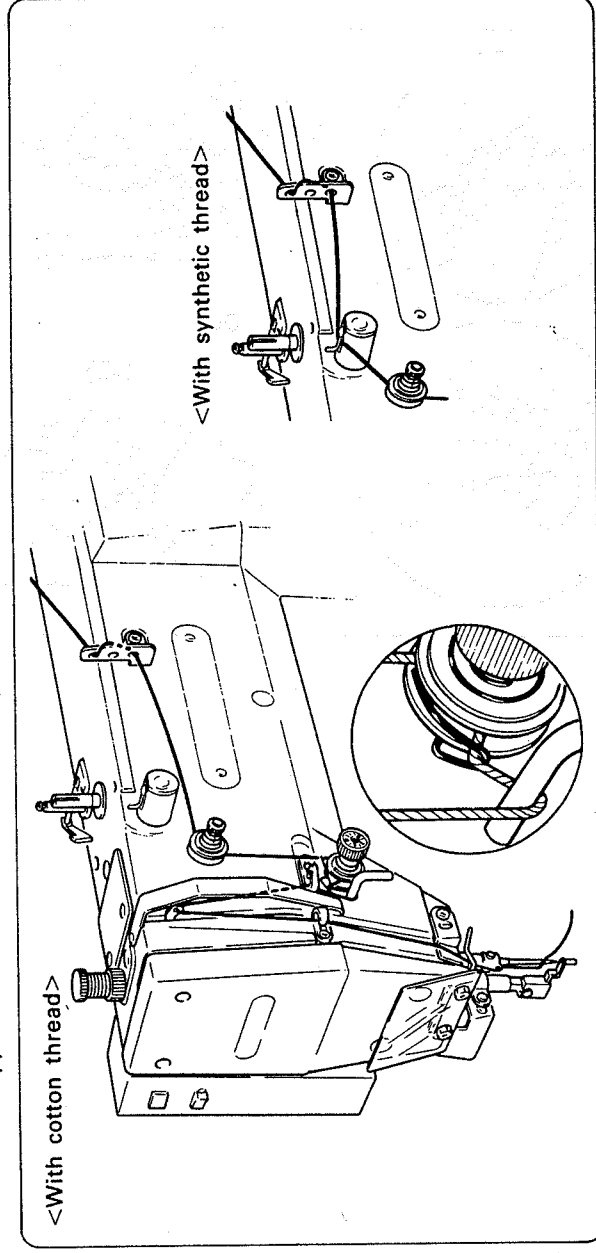
1 Needle installation



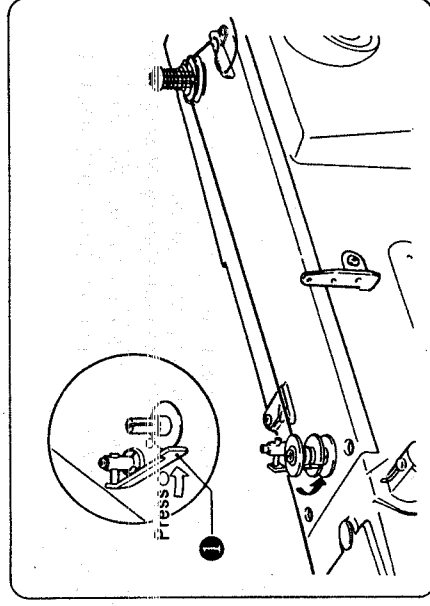
- ★ Loosen set screw **1**. Fully insert the needle **2** with the groove facing the front, and then retighten set screw **1**.

2 Upper thread threading

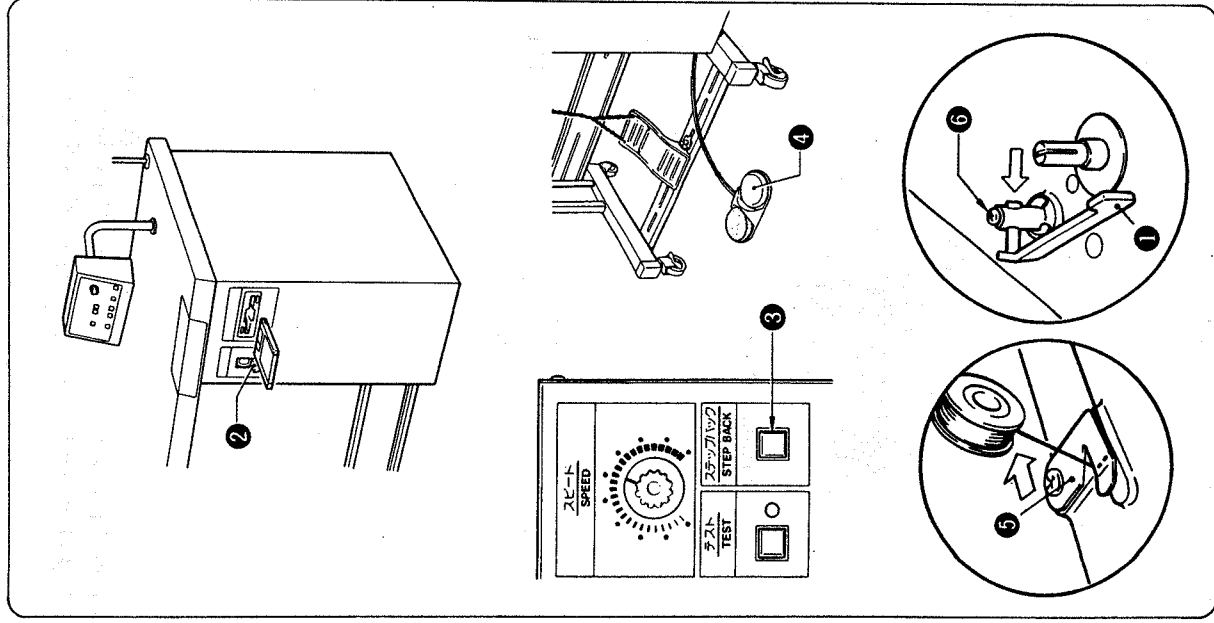
- ★ Thread the upper thread as shown in the diagrams below.



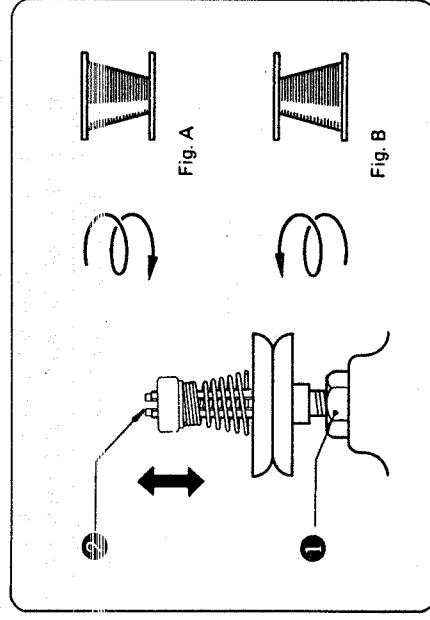
3 Bobbin thread winding



- (1) Slide the bobbin all the way onto the spindle.
- (2) Thread the thread as shown in the figure at left, wind the thread around the bobbin several times in the direction of the arrow, and then press the bobbin holder.

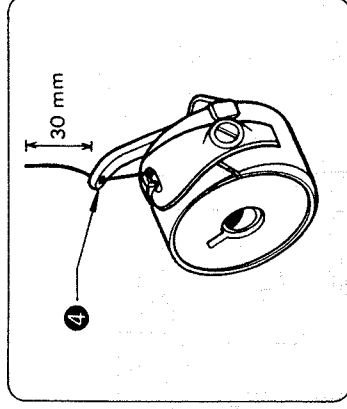
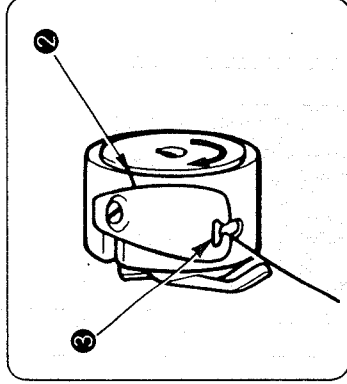
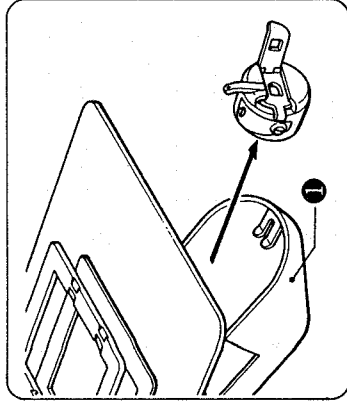


- Turn the power switch **2** on. (The power indicator on the operation panel will light.)
- Press and hold the step-back switch **3** on the operation panel, and depress the starting pedal **4** to start the sewing machine. Keep the start switch depressed until the bobbin is fully wound. (Release the step-back switch **3** when the sewing machine starts.)
- The bobbin holder **1** will automatically return when the bobbin is filled to capacity (approximately 80 ~ 90% of the bobbin diameter.)
- Release the starting pedal **4**.
- Remove the bobbin, and pull the bobbin in the direction of the arrow to cut the thread on the thread cutter **5**.
- To wind more thread onto the bobbin, loosen set screw **6** to move the bobbin holder **1** out.



If the bobbin thread is wound unevenly onto the bobbin, loosen nut **1**, and turn thread tension stud **2** to adjust so that the thread is wound evenly.
 ※ If the bobbin is wound as in Fig. A, turn the stud clockwise; if Fig. B, turn the stud counterclockwise.

4 Bobbin case installation and threading



(1) Pull the shuttle race cover **1** forward and then open the cover.

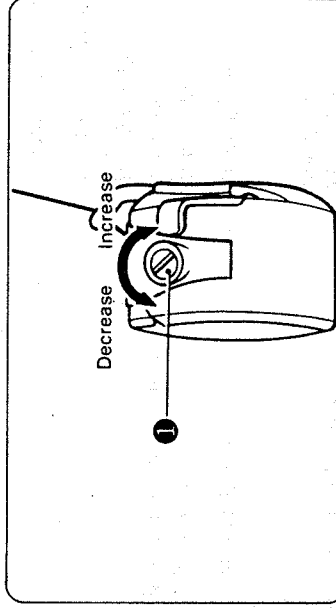
(2) Lift the bobbin case latch and remove the bobbin case.

(3) Insert the bobbin into the bobbin case, pass the thread through the cut line **2**, and pull it out through the thread hole **3**. Make sure the bobbin turns in the direction of the arrow when the thread is pulled.

(4) Pass the end of the thread through the thread hole **4** in the horn, and pull approximately 30 mm of thread out.

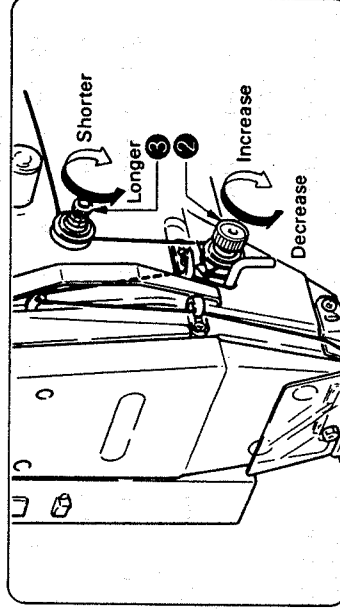
5 Thread tension

1. Bobbin thread tension



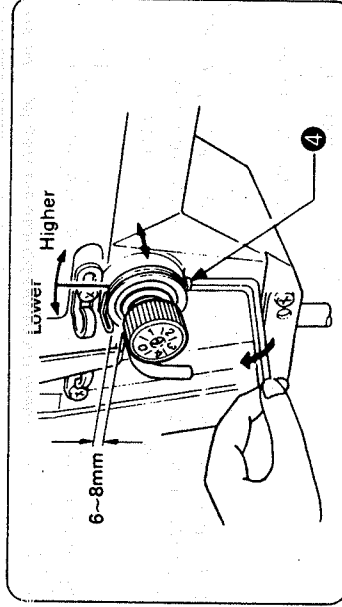
★ The bobbin thread tension should be adjusted so that the bobbin will not descend of its own weight when suspended by the bobbin thread. Turn adjustment screw **1** to adjust.

2. Upper thread tension



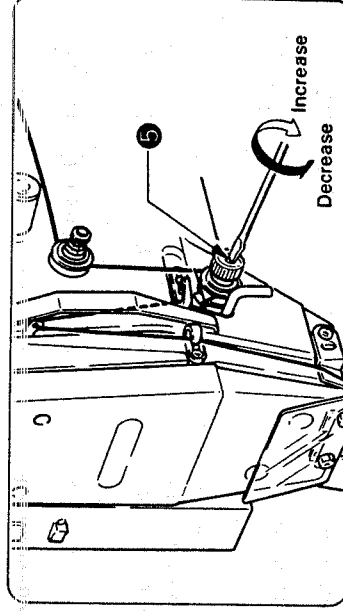
Turn the thread tension control nut **2** to adjust the upper thread tension to the material being sewn. Adjust thread tension control nut **3** so that the thread remainder is between 35 to 40 mm.

3. Thread take-up spring height



Loosen screw **4** and turn the entire thread take-up unit to adjust so that the height of the thread take-up spring is 6 ~ 8 mm.

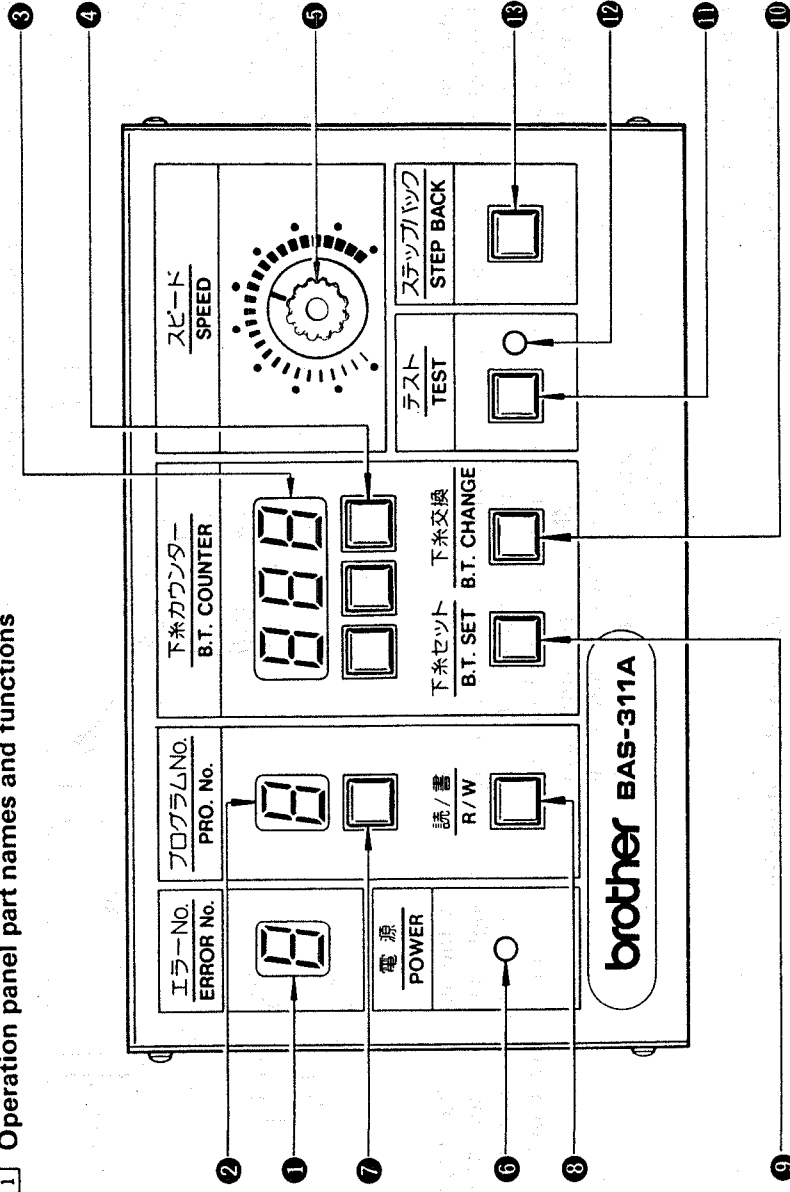
4. Thread take-up spring tension



Adjust the thread take-up spring tension by turning the tension stud **5** with a screwdriver.

OPERATING PROCEDURE

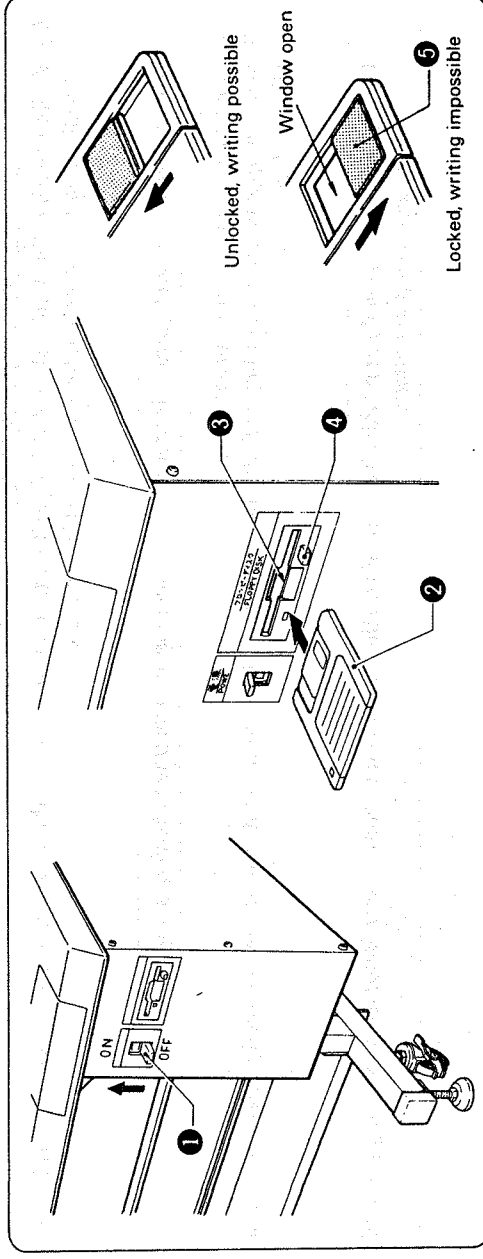
1 Operation panel part names and functions



- 1 ERROR No. display Used to display error numbers 1 ~ 9 and A.
- 2 PROGRAM No. display Displays the program number 0 ~ 9.
- 3 Bobbin Thread COUNTER Shows the number (000~999) of pieces sewn. (Decrementing type; the number decrements one each time a single stitch pattern is completed, indicating the remaining bobbin thread.)
- 4 Bobbin Thread COUNTER Used to set the number of work pieces in the bobbin thread counter. switches
- 5 SPEED control Used to change the sewing speed. (The sewing speed can be adjusted in ten steps according to the stitch length.)
- 6 POWER indicator Lights when the power is turned on.
- 7 Program select switch Used to select the program number when reading a program from or writing a program to disk.
- 8 Program Read/Write switch Used to read a program from floppy disk, or to write a newly programmed stitch pattern to floppy disk. Up to ten patterns (0 ~ 9) can be stored on each disk.
- 9 Bobbin Thread SET switch Used to store the number of work pieces displayed in the bobbin thread counter to floppy disk.
- 10 Bobbin Thread CHANGE switch ... Used to continue sewing after replacing the bobbin thread. (An alarm will sound when the counter reads <000>. Sewing is not possible when the counter reads <000>.) (Refer to page 13 "Using the bobbin thread counter").
- 11 TEST switch Used to confirm a programmed stitch pattern.
- 12 TEST indicator Lights when the TEST switch is pressed.
- 13 STEP BACK switch Used when winding a fresh bobbin, or when correcting a stitch pattern due to a broken needle thread.

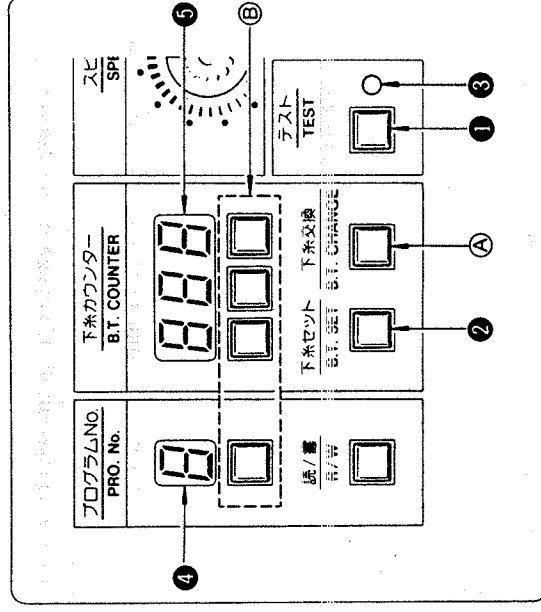
2 Using the floppy disk

- ★ Programs for up to ten programs each containing up to a maximum 4,000 stitches can be stored on each floppy disk.



- 1 Turn the power switch **1** on.
- 2 Hold the disk **2** with the label up and the metal shutter to the front, and insert the disk into the drive **3**. It will click into place.
- 3 To eject the disk, press the eject button **4**.
- ※ Slide the write protector **5** on the back of the disk up (the window opens) to lock the disk and prevent accidental erasure of the disk contents.
- ※ Inserting the disk into the drive upside down or backwards may damage the drive and will prevent reading or writing of data.
- ※ Be sure to store your disks away from any magnets or magnetic sources, including radios, televisions, telephones, and other devices. Magnetism can erase or damage disk contents. Also, be careful to prevent exposure of the disk to oil or dust.

3 Using production counter



Both PRO. NO. and B.T. COUNTER displays are available for the four-digit PRODUCTION counter.

- 1 While pressing the TEST switch **1**, press the B.T. SET switch **2**. The test lamp **3** will light to display the production count on both PRO. NO. and B.T. COUNTER displays.
 - 1 Press the B.T. CHANGE switch **A**. The PRODUCTION counter will display 0000.
 - 2 Using the keys **B**, the PRODUCTION counter can be set from 0000 to 9999.
- 2 Press the TEST switch **4**. The test lamp **5** will go out and all displays will return to their former display.

NOTE: The production counter will be displayed only after step (1). Sewing can not be done while displaying the PRODUCTION counter.

4 Using 8,000 stitch sewing mode

- ★ By successively reading the two stitch patterns in 8,000 stitch sewing mode, it is possible to sew up to 8,000 stitches.
- (1) Set the DIP SW ⑥ No.2 to ON. This will enter 8,000 stitch sewing mode.
(Refer to page 26, "DIP SWITCH SETTINGS".)
- (2) While pressing the EMERGENCY STOP switch, turn on the power, then release the EMERGENCY STOP switch. The stitch pattern stored in the machine will be erased.

NOTE: When the stitch pattern is stored in the machine, consecutive reading is impossible.

- (3) Input two stitch patterns successively.
- (4) When stepping on the starting switch, the second stitch pattern input will be sewn directly after the first input stitch pattern.

NOTE: The machine will jump stitch from the final stitch of the first stitch pattern input to the starting point of the second stitch pattern.

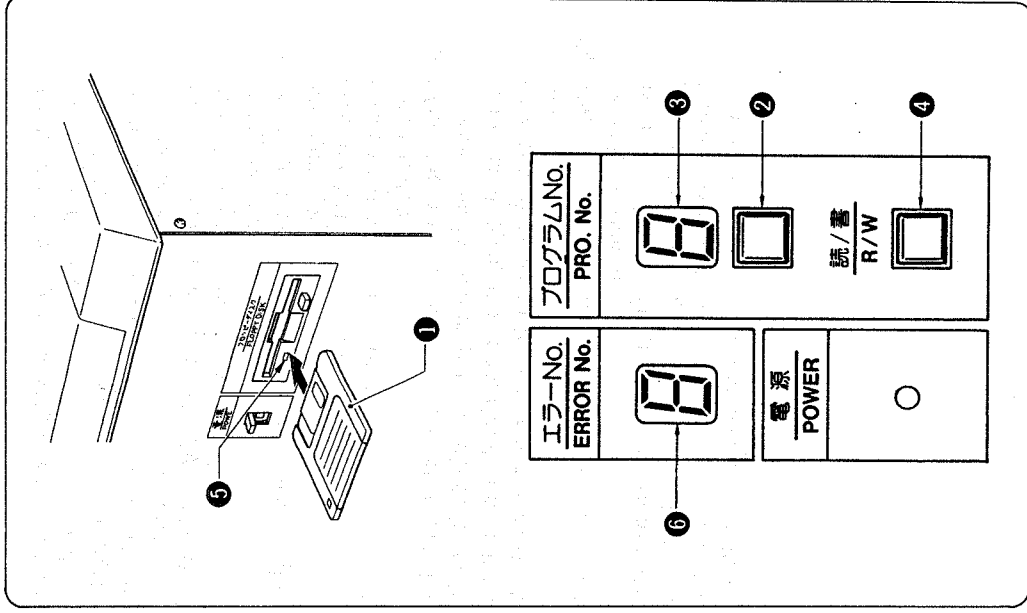
5 Using single split mode

- ★ By using single split mode, it is possible to change up to 9 patterns immediately.

NOTE: As to split sewing, refer to the instruction manual of the "electronic programmable pattern tacker programmer" (a separate volume).

- (1) Set the DIP SW ⑥ No.1 to ON. This will enter single split mode.
(Refer to page 26, "DIP SWITCH SETTINGS".)
- (2) Turn on the power, input the pattern programmed with split sewing.
"1" will be displayed on the PRO. NO. display. When pressing the program select switch, the program numbers will be displayed in order.
(Ex) When the three patterns are programmed with split sewing, the display switches 1, 2, 3, 1, 2 ... in that order.
- (3) When stepping on the starting switch, only the pattern displayed on the PRO. NO. display can be sewn.
- ※ When reading new stitch patterns into the machine from the floppy disk, press the program select switch while pressing the step back switch.
(The PRO. NO. display switches from 1, 2 ... to 9, 0.)
Pressing the RW switch and the displayed stitch pattern will be newly read into the machine.

6 Using the program R/W (Read/Write) switch



* Programmed stitch patterns stored on floppy disk can be read into memory, and newly programmed patterns can be written to disk for permanent storage and later recall.

(1) Insert the floppy disk **1** containing or which is to contain the programmed stitch pattern.

(2 — 1) To READ a pattern to memory

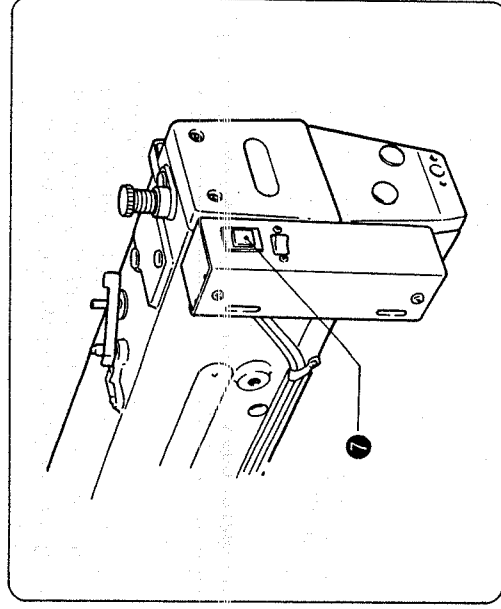
Press the PRO. NO. **2** on the operation panel to display the number of the programmed stitch pattern in the PRO. NO. display **3**. After selecting the desired program number, press the R/W switch **4**. The drive indicator **5** will light, and a "P" will be displayed on the PRO. NO. display while the data is being read.

When the alarm sounds and the indicator **5** goes out and the "P" on the PRO. NO. display changes to the number of the stitch pattern, reading is completed. At this time, the number on the PRO. NO. display **6** will blink. Blinking will stop after the home position is detected.

(2 — 2) To WRITE a pattern to disk

Press the PRO. NO. **2** on the operation panel to select the desired program number. After programming the pattern with the stitch programmer, press the R/W switch **4**. The drive indicator **5** will light, and a "P" will be displayed on the PRO. NO. display while the data is being read.

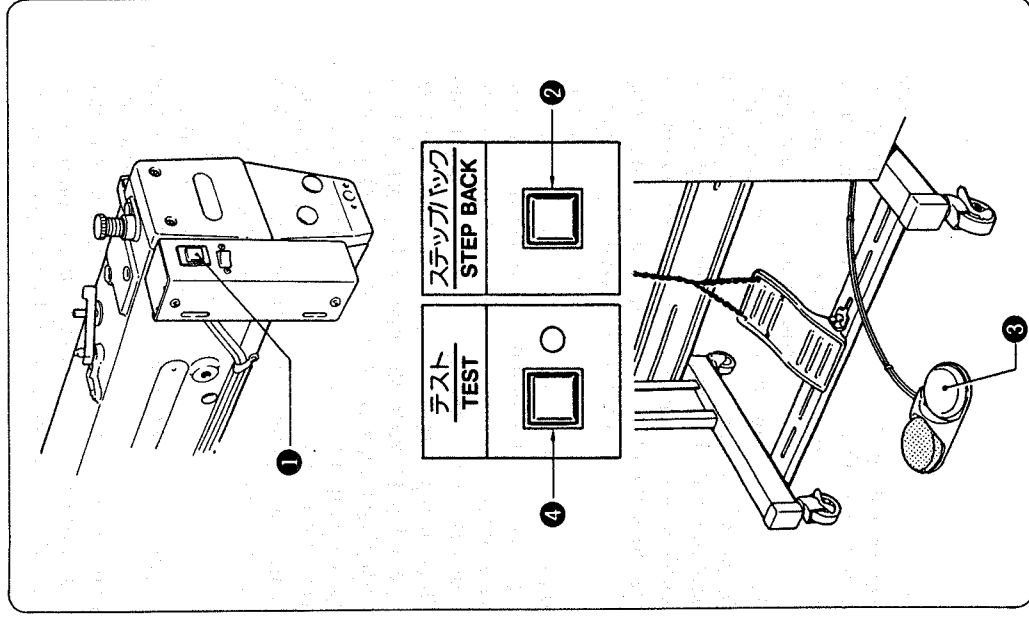
Pattern writing onto disk will start when the alarm sounds and the indicator **5** goes out and the PRO. NO. display returns to its former display, writing is completed.



※ If an error message is displayed

If an error message code (1 ~ 9, A) is displayed in the ERROR No. display **6**, and alarm will sound. Press the emergency stop switch **7** on the front of the machine to stop sewing machine operation, and then refer to and follow the error code list on page 27.

7 Using the STEP BACK switch

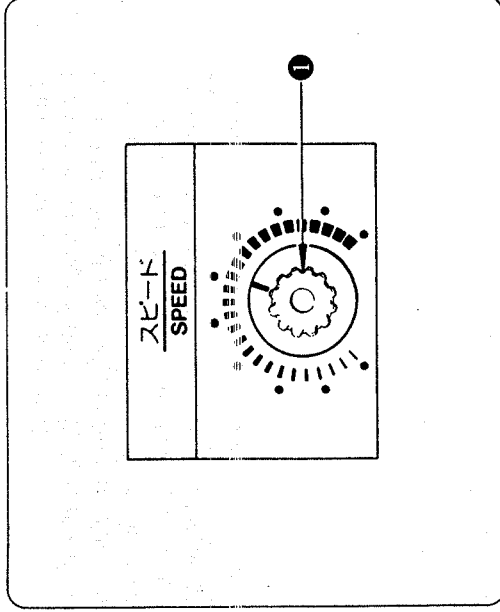


★ This switch is used to move the machine one stitch at a time in the reverse sewing direction to enable reweaving in the event the thread breaks or the bobbin thread runs out in mid-pattern. Use this switch to return to the point where the thread broke or run out. This is especially useful with large patterns.

- (1) Press the emergency stop switch ❶ while the machine is running. All operations will stop and the emergency stop lamp will illuminate.
- (2) Press the emergency stop switch ❶ once again. The emergency stop lamp will go out.
- (3) Press the STEP BACK switch ❷. The work clamp will reverse one stitch at a time as long as the step back switch is depressed.
- (4) When the presser foot has returned to the desired position, release the step back switch. If the work clamp is stopped too soon, simply press the step back switch again to resume reverse work clamp movement.
- (5) The machine will start sewing when the starting pedal ❸ is pressed.

※ Turn the TEST switch ❹ on and press the starting pedal ❸ to move the presser foot one stitch at a time forward. The work clamp will advance in 100 stitch units if the STEP BACK switch is pressed at this time.

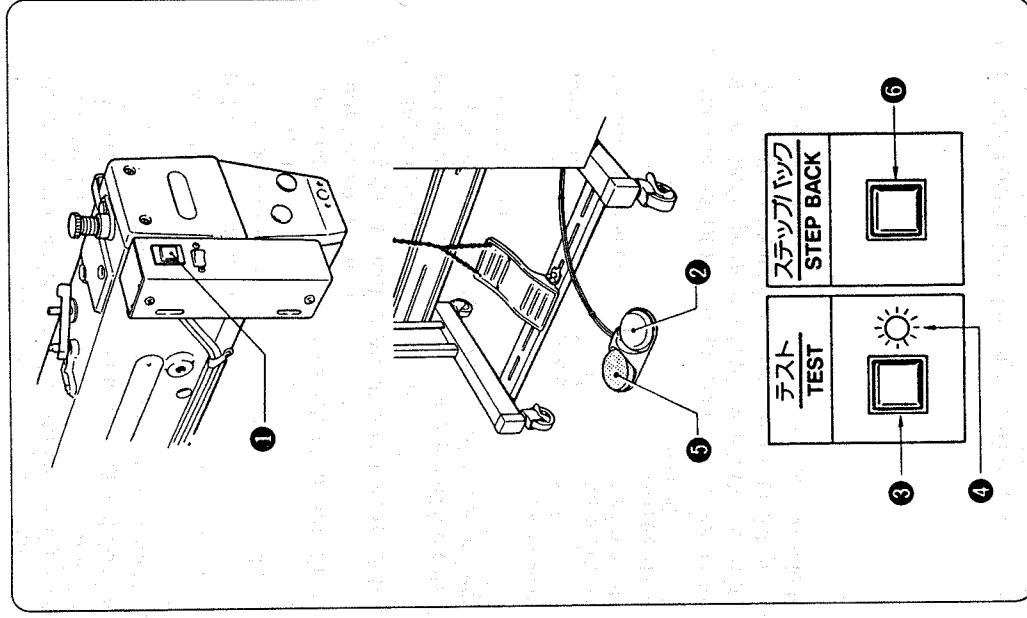
8 Adjusting the sewing SPEED control



- (1) The actual sewing speed can be adjusted in ten steps through the sewing speed ranger for each stitch length. Turn SPEED control ❶ to adjust.
- (2) Refer to the table below for allowable sewing speeds.

Stitch length (mm)	Sewing speed (spm)
0.1~3.0	1,000~2,000
3.1~4.4	750~1,500
4.5~6.3	400~1,200
6.4~12.7	400~600

9 Using the TEST switch



★ Use the TEST switch to begin sewing again from any desired point when the thread breaks or the bobbin thread runs out.

- (1) Press the emergency stop switch ① while the sewing machine is running. (All operations will stop, and an alarm will sound.)
- (2) Press the emergency stop switch ① again. (The thread cutter will operate and the alarm will stop.)
- (3) Press the starting pedal ②.
- (4) The work clamp will move automatically to the sewing start position.
- (5) Press the TEST switch ③. The test indicator ④ will light.

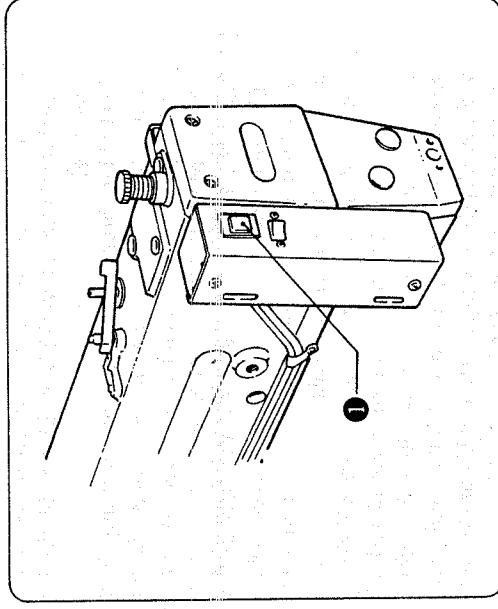
(6) Press the starting pedal ②. (The needle will remain stationary as the work clamp advances through the pattern at low speed one stitch at a time. Press the presser lifter pedal ⑤ to fast forward. If the work clamp was stopped too late, press the STEP BACK switch ⑥ to advance the work clamp one stitch at a time.)

(7) When the work clamp reaches the desired position, press the TEST switch ③. The work clamp will stop, and the test indicator ④ will go out. If the work clamp was stopped too early, press the TEST switch ③ again to proceed.

(8) Sewing will start when the starting pedal ② is pressed.

※ The work clamp can be forwarded in 100 stitch units by pressing the STEP BACK switch ⑥ when the TEST switch ③ is on. (Press the presser lifter pedal ⑤ to fast forward.)

10 Using the emergency stop switch



★ Press the emergency stop switch to immediately stop the sewing machine during actual sewing or when in the test mode.

(1) If the emergency stop switch ① is pressed while sewing.

All operations will stop, and an alarm will sound. Correct the problem, and press the emergency stop switch ① again. The thread cutter will operate, the emergency stop function will be cancelled, and the alarm will stop.

※ There will be no response when either foot switch ① is pressed when the emergency stop switch ① is on (the alarm is sounding).

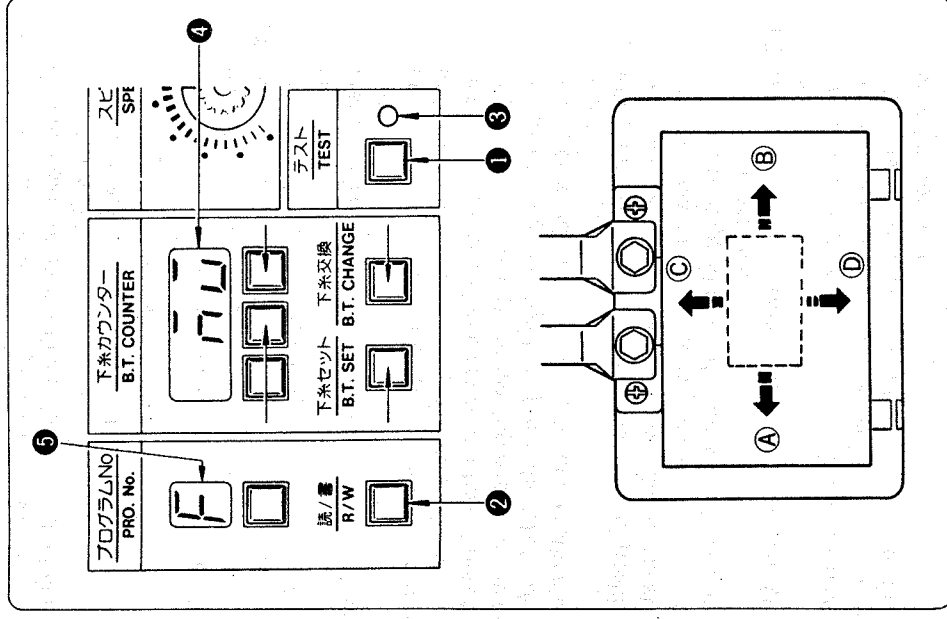
(2) If the emergency stop switch ① is pressed during the test mode.

All operations will stop, and an alarm will sound. The emergency stop function will be cancelled when the emergency stop switch ① is pressed.

(3) If a problem occurs

If an abnormal load is applied or a problem occurs during sewing, the emergency stop function is automatically activated, all operations stop, and the alarm sounds. Press the emergency stop switch ① to cancel the emergency stop mode.

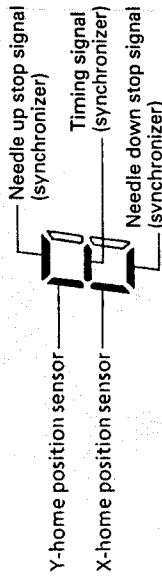
11 Shifting a stitch pattern



- ★ The relative position of a previously programmed stitch pattern can be shifted up/down and right/left.
- (1) Press and hold the TEST switch ① and press the R/W switch ②. The test indicator ③ will light, and $\overline{710}>$ will appear in the bobbin thread counter ④.

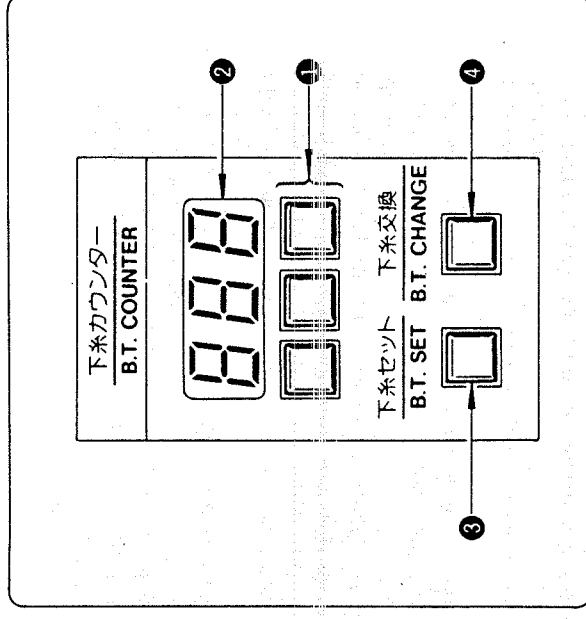
- ① Press bobbin thread counter switch ④ to shift the pattern 1 pulse (0.1 mm) left.
- ② Press bobbin thread counter switch ⑤ to shift the pattern 1 pulse (0.1 mm) right.
- ③ Press bobbin thread SET switch ③ to shift the pattern 1 pulse (0.1 mm) up.
- ④ Press bobbin thread CHANGE switch ② to shift the pattern 1 pulse (0.1 mm) down.

※ At this time, the PRO. NO. display ⑤ will indicate the synchronizer and the home position sensor which are operating.



- (2) After fine adjustment of the pattern position is completed above, press the TEST switch ①. The test indicator ③ and bobbin thread counter ④ will go out, and the stitch pattern shift mode will be cancelled.

12 Using the bobbin thread counter



- ★ Set the bobbin thread counter to display the number of pieces of the selected pattern which can be sewn with the amount of thread on the bobbin to avoid running out of bobbin thread in the middle of a pattern.

- (1) Press the bobbin thread counter switches ① to display the number of work pieces in the bobbin thread counter ②.

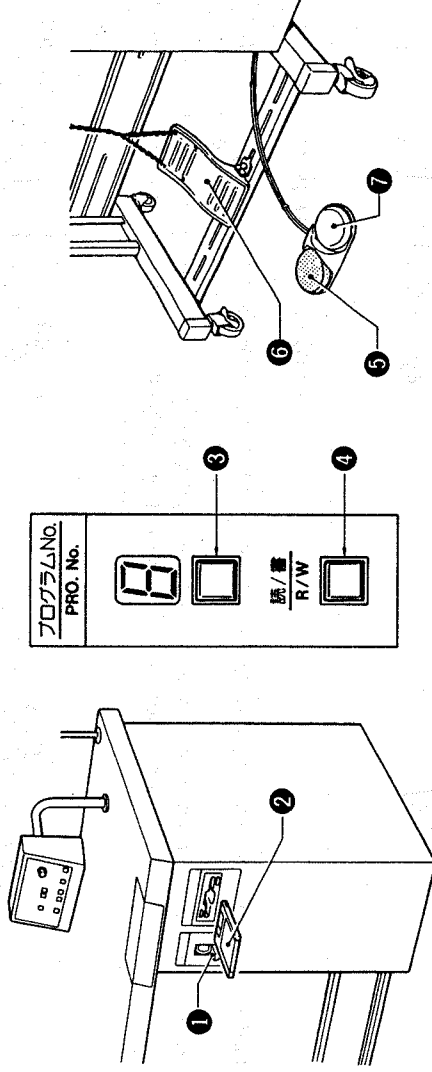
※ The bobbin thread counter can be set to any number from $\overline{001}>$ to $\overline{999}>$. If the counter is set to $\overline{000}>$, sewing continues irrespective of the amount of bobbin thread remaining.

- (2) Insert the floppy disk and press the bobbin thread SET switch ③. An alarm will beep twice. This will record the number of work pieces shown in the bobbin thread counter ② to the disk.

- (3) The number shown in the counter ② will decrease one each time the stitch pattern is completed. When the number of patterns shown in the counter is sewn, the counter ② will read $\overline{000}>$, and an alarm will sound. (The sewing machine will not start even if the start switch is pressed.)

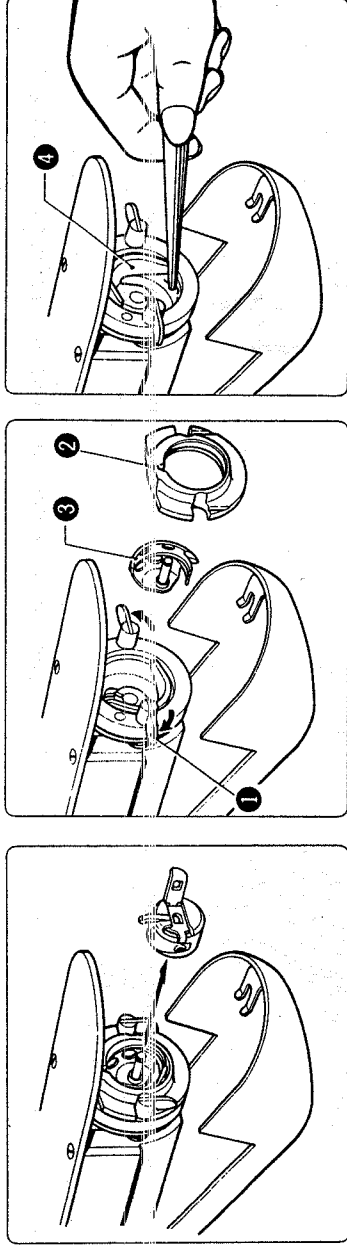
- (4) Press the bobbin thread change switch ④ and replace the bobbin. The alarm will stop, and the number of work pieces set in step (2) will be displayed again in the bobbin thread counter ②.

- (1) Turn the power switch **1** on. The power indicator on the operation panel will light.
- (2) Insert the floppy disk **2**.
- (3) Press the PRO. No. selection switch **3** to select the desired program number.
- (4) Press R/W switch **4**.
(The floppy disk drive indicator will light and the program no. display will show a P while the data is being read. When reading is completed, an alarm will sound and the indicator will go out, then the program no. display will blink the program number.)
- (5) Step on the presser lifter switch **7** to raise the presser foot.
- (6) Insert the work piece under the work clamp, and press the presser lifter pedal **7** to lower the clamp.



- ※ When working with small pieces which are hard to position, or when precise sewing is required, press the manual work clamp lifter pedal **6** for precise positioning of the work piece, and then press presser lifter pedal **5**. (This is convenient when sewing while sitting.)
- (7) Press the starting pedal **7**. (The work clamp will return to the origin, and will then advance to the sewing start position and blinking will stop. This is only required the first time a program is sewing.)
 - (8) Press the starting pedal **7** again to start sewing.
 - (9) After sewing is completed, the thread cutter will automatically operate, then the work clamp will rise. When the power is turned on after once being turned off, the same pattern of sewing can be continued since the machine still stores the sewing data from the last time.

★ Shuttle hook lubrication

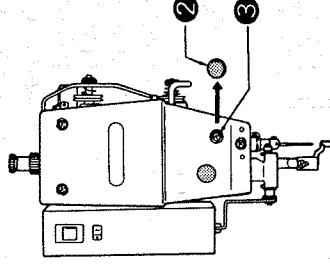
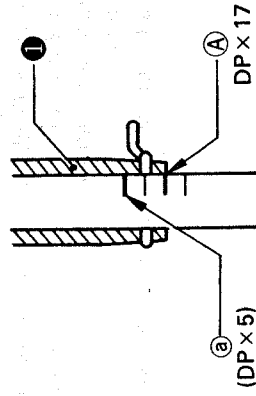


- (1) Pull the shuttle hook cover forward to open, and then remove the bobbin case.
- (2) Slide the tab **1** in the direction of the arrow, and remove the shuttle race body **2** and shuttle hook **3**.
- (3) Clean any dust and thread pieces from the driver **4**, the shuttle hook thread guides and race.
After cleaning is completed, add a drop of oil to the race.

STANDARD ADJUSTMENTS

★ Turn the machine pulley by hand when making any adjustments

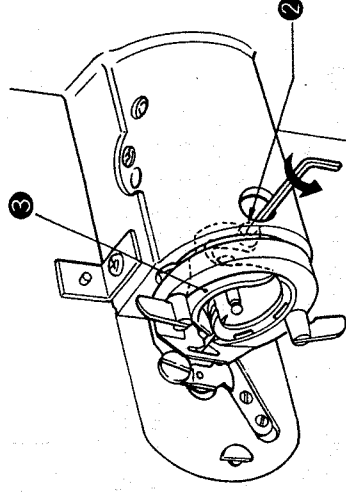
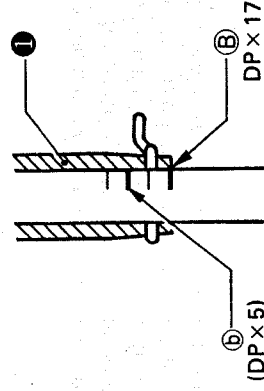
1 Needle bar height adjustment



Turn the pulley to completely lower the needle bar. Remove cap 2, loosen set screw 3, and vertically adjust the needle bar so that reference line A, the second from bottom reference line on the needle bar, is aligned with the bottom of the needle bar bushing 1.

※ Align the top reference line a, with the bottom of the needle bar bushing when using needle DP x 5.

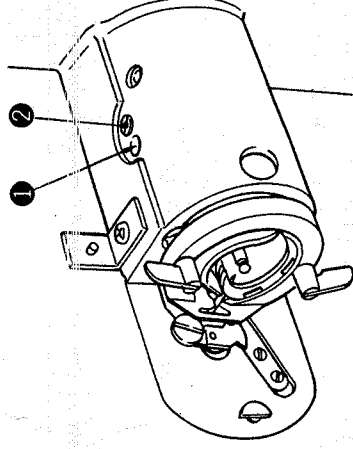
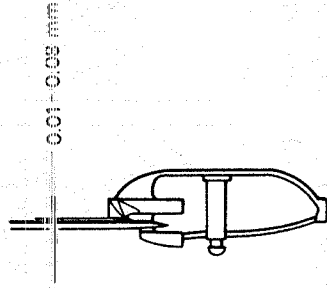
2 Needle bar lift stroke adjustment



Turn the pulley to raise the needle bar from the lowest needle position and align the bottom reference line B, with the bottom of the needle bar bushing 1. Now, loosen Allen screw 2 and turn the shuttle driver 3 so that the shuttle hook point is aligned with the needle center.

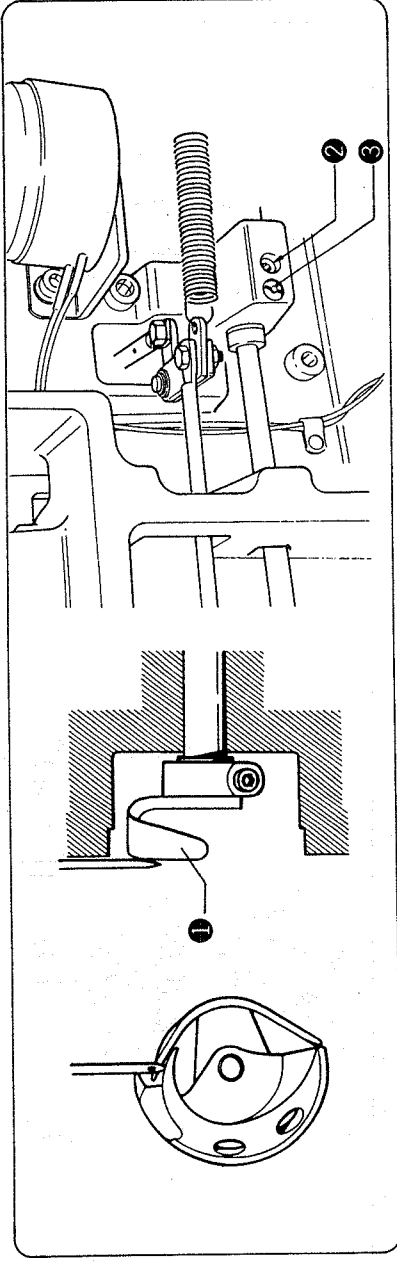
※ Align the second from top reference line b, with the bottom of the needle bar bushing when using needle DP x 5.

3 Needle to shuttle hook point gap adjustment



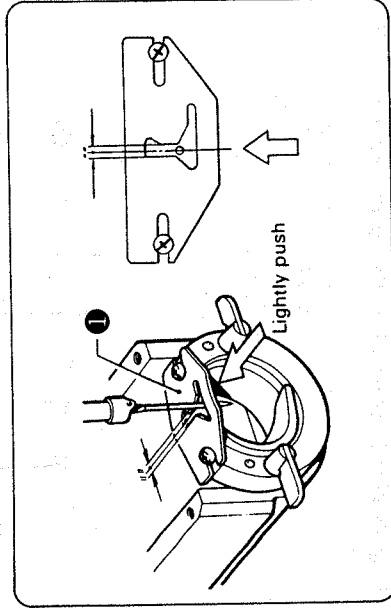
Turn the pulley and align the shuttle hook point with the needle center. Loosen set screw 1 and turn the eccentric connecting link stud 2 to adjust the needle to shuttle hook point gap to 0.01~0.08 mm.

4 Shuttle driver needle contact adjustment



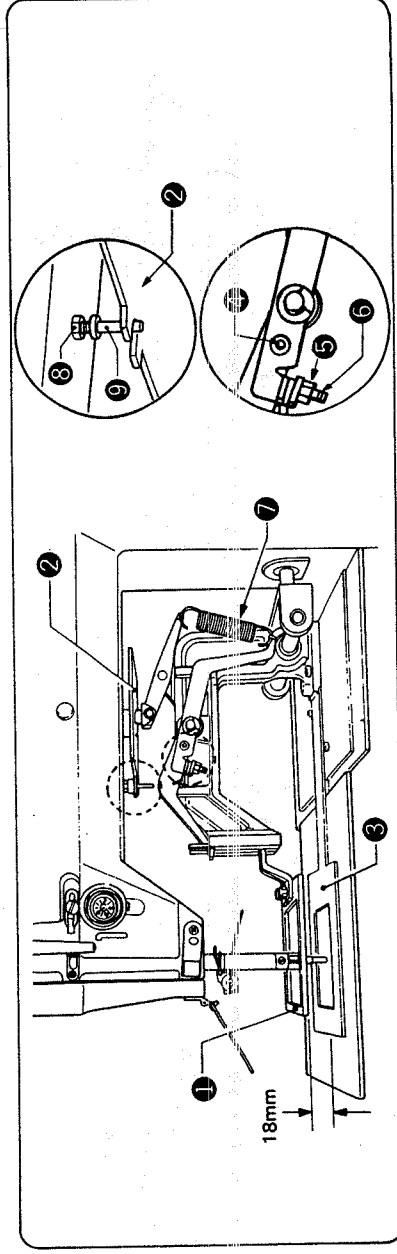
Turn the pulley and align the shuttle hook point with the needle center. Loosen set screw **2** and turn the eccentric connecting link stud **3** so that the shuttle driver meets the needle **1**. Note that excessive needle to driver contact will result in skipped stitches. Also, if the needle does not sufficiently contact the shuttle driver, the shuttle hook point will interrupt the needle, resulting in abnormal abraision.

5 Shuttle hook thread guide adjustment



Adjust so that the needle groove of the shuttle hook thread guide **1** is at the center of the needle, slide the thread guide lightly in, and then retighten the screws.

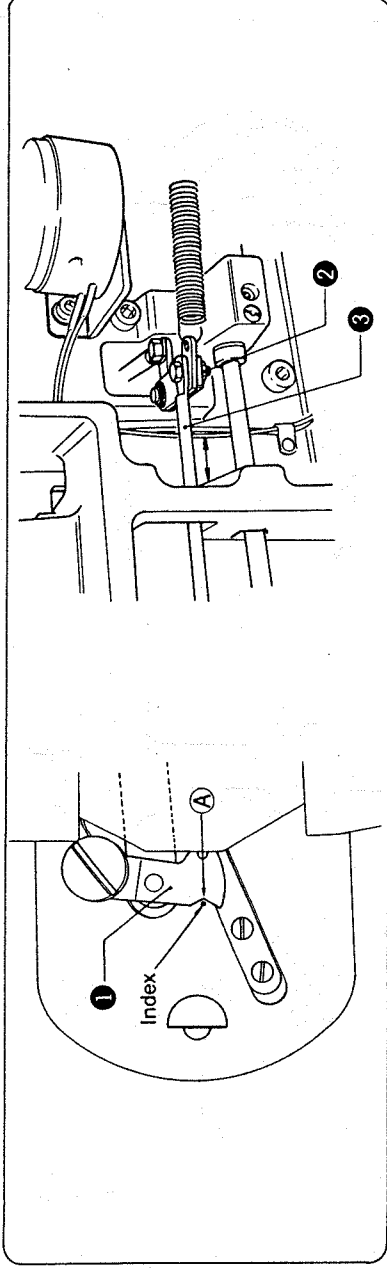
6 Two-step work clamp adjustment (independent presser foot solenoid type)



Maximum work clamp **1** lift is 18 mm from the needle plate top to the work clamp **1** when the machine is stopped.

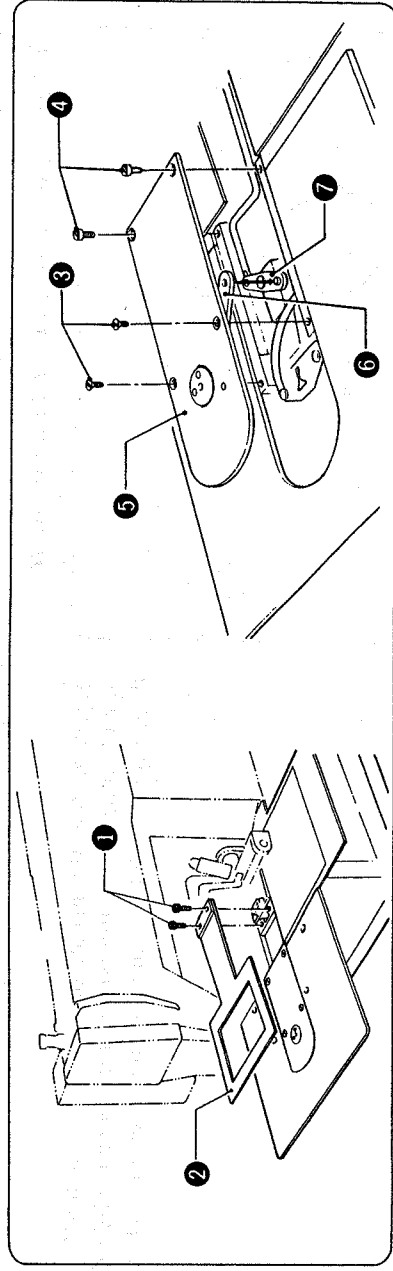
- (1) Lower the presser plate **2**. Loosen screw **4** and nut **5** to adjust the gap between the work clamp **1** and feed plate **3** to 0 mm, and then tighten screw **6**. Spring **7** will be minimally tensioned at this time. Now tighten screw **4** and nut **5**.
- (2) Lift presser plate **2** again, and loosen nut **8**. Adjust guide stud **9** so that the height from the needle plate top to the work clamp **1** is 18 mm.

7 Movable knife adjustment

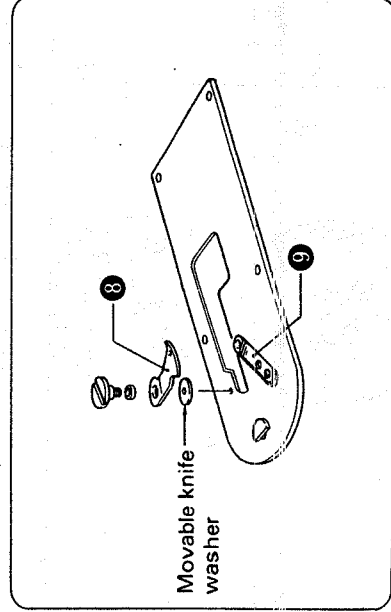


Loosen nut **2** and move connecting rod **3** right or left so that the V-notch **A** of the movable knife **1** is even with the index on the needle plate when the machine is stopped.

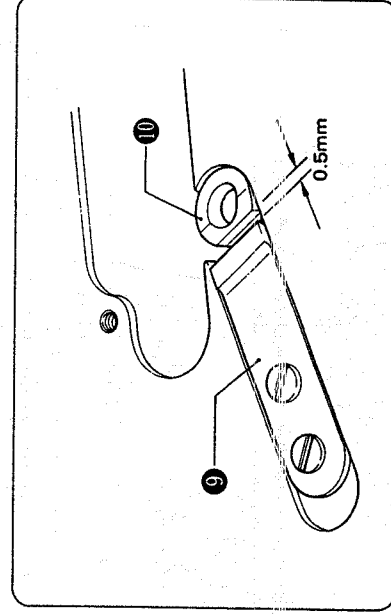
《Replacing the movable and fixed knives》



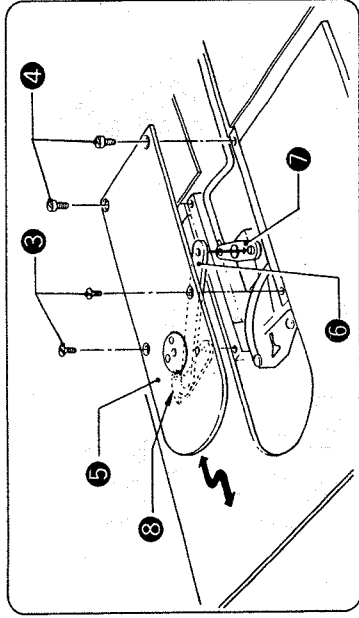
(1) Remove screws **1**, and remove feed plate **2**. Remove screws **3** and **4**, and remove needle plate **5**. Now disconnect the thread cutter connecting rod **6** from stud **7**.



(2) Remove the movable knife, and replace it with a new movable knife. Now check the cutting edge of the movable knife **8** and the fixed knife **9**. If necessary, use the provided movable knife washer to adjust the knives so that they cut properly.

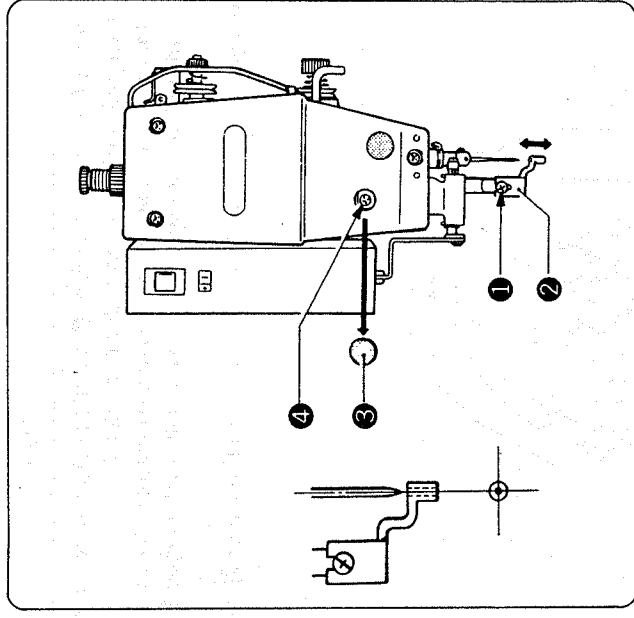


(3) Install the fixed knife **9** 0.5 mm away from needle hole plate **10**.



- (4) Fit the thread cutter connecting rod **6** on connecting lever pin **7**, and install needle plate **5**.
- ※ When fitting the connecting rod **6** on the connecting lever pin **7** and before tightening screws **3** and **4**, move the needle plate back and forth a little bit to confirm that the movable knife **8** is pulled by the connecting rod **6**.

8 Presser foot adjustment

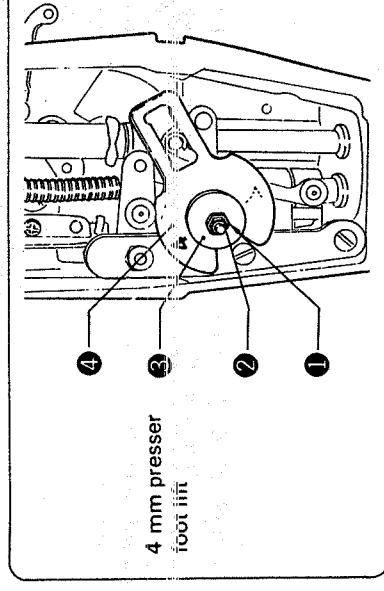


- ★ Turn the pulley by hand to lower the presser foot to the down position, and then proceed with the steps below.

- (1) Loosen screw **1**, set the bottom of the presser foot **2** lightly against the work piece, and then tighten screw **1**.
- ※ If the presser foot is lowered too far, the work piece will shift when sewing. Also, if the presser foot is too high, skipped stitches may occur.
- (2) Turn the pulley by hand, and make sure 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, remove cap **3**, loosen screw **4**, and turn the presser foot (presser bar) to adjust.

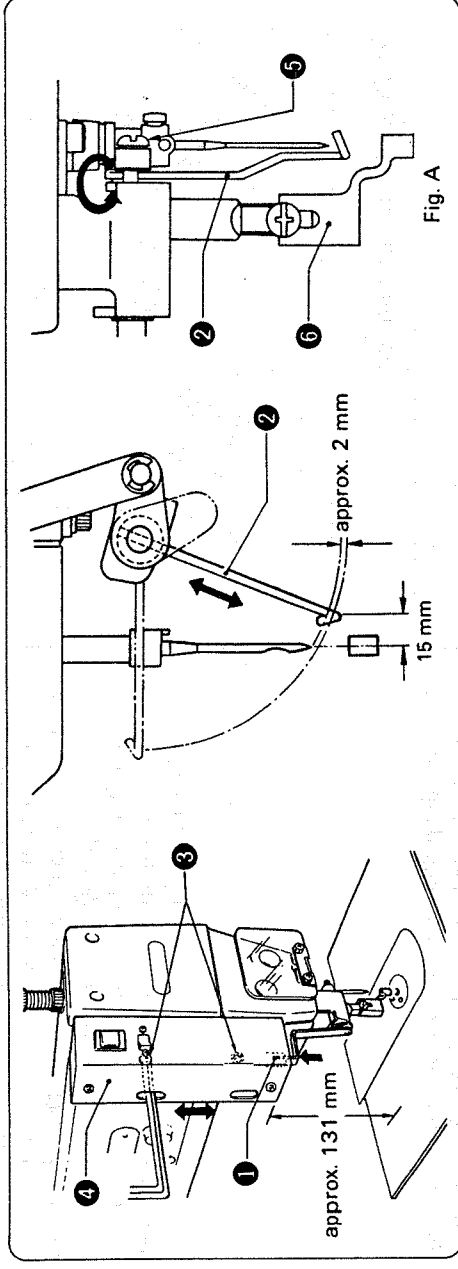
9 Changing the presser foot lift

- ★ Maximum standard presser foot lift is 4 mm. Presser foot lift on this machine can be set to either 4 mm or 7 mm.



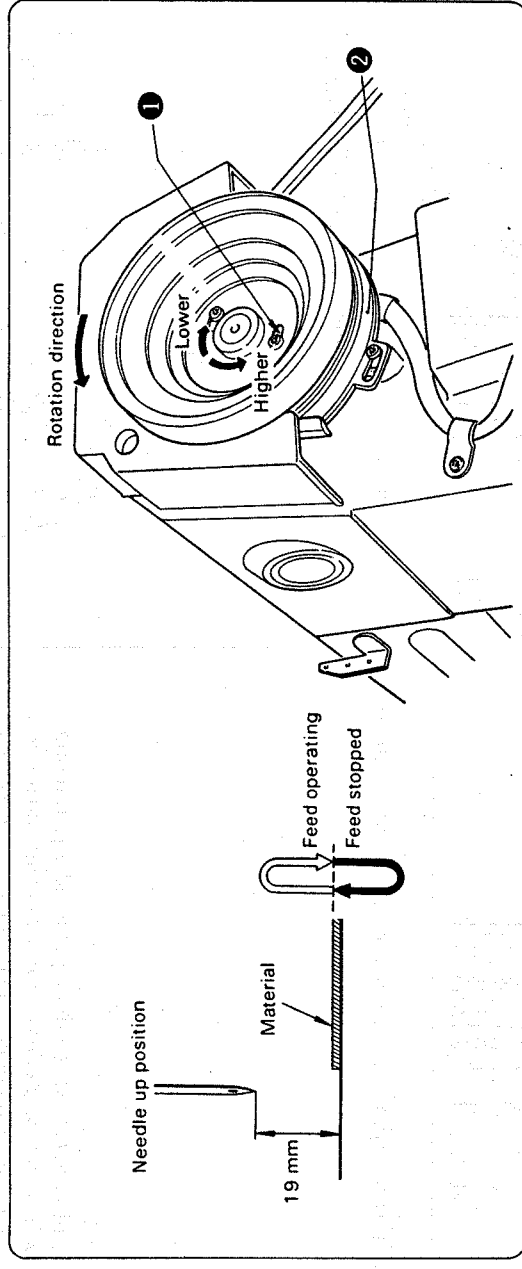
- (1) To change the lift of the presser foot, remove nut (small) **1**, nut (large) **2**, and washer **3**, and then turn the intermittent presser foot cam **4** over.
(There are two indexes, 4 and 7, on the cam. The number of the index indicates the lift in millimeters.)
- (2) If vertical movement of the presser foot is not required, remove the cam **4**.

10 Wiper adjustment



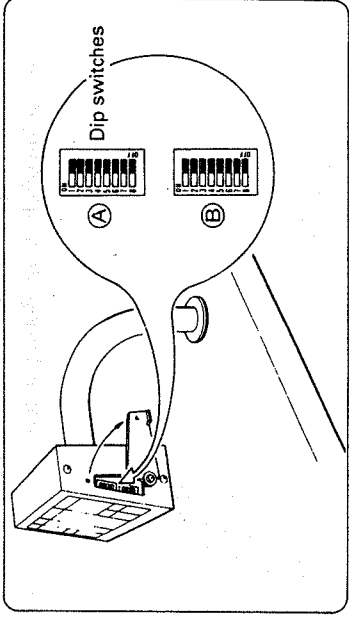
- (1) When the thread wiper solenoid plunger ① is driven to the full stroke, the wiper ② should be 15 mm in front of the needle center. Loosen screws ③ and shift the entire solenoid bracket ④ up or down to adjust.
- ※ The standard height from the solenoid bracket ④ bottom to the needle plate top is approximately 131 mm.
- (2) When the wiper ② is operated and aligned with the center of the needle bar, the distance from the wiper ② to needle tip should be approximately 2 mm. Loosen screw ⑤ and move the wiper ② in or out to adjust. As shown in Fig. A, make sure the wiper ② does not strike the presser foot ⑥ or needle.

11 Needle and feed timing adjustment



- (1) Adjust reflector ① so that the needle tip is 19 mm above the needle plate when the needle is in the up position. Turn clockwise to lower, counterclockwise to raise the stop position.
- ※ Adjust the needle and feed timing with synchronizer ② so the feed mechanism begins to operate after the needle has been removed from the material, and so that the feed mechanism stops before the needle enters the material.

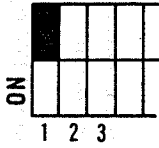
12 2-step work clamp operation adjustment



Turn the power off, then open the side cover of the operation panel.

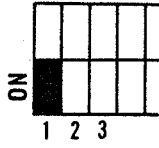
(1) Presser foot motion can be adjusted by changing the settings of DIP switches A 1, 2, 3, 4, 5 and 7.

«DIP switch A-1»



When OFF;

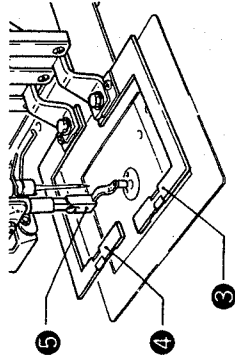
The presser foot will rise automatically when sewing is completed.



When ON;

The presser foot will rise when the presser lifter pedal is pressed after sewing is completed.

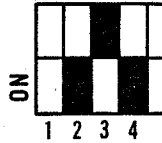
«DIP switch A-2, 3, 4»



First switch
Second switch

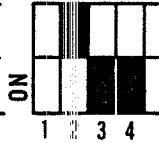
For pneumatic type, after sewing work clamp right ①, work clamp left ②, and the presser foot ③ will all rise simultaneously. The work clamp (right and left) and the presser foot will appear as below when they descend. (The presser lifter pedal is a two position switch.)

※ For solenoid type, DIPSW A-2,3 and 4 should be all set to OFF.



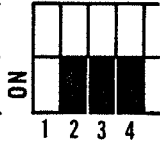
2:ON 3:OFF 4:ON

First switch ON: Work clamp right ① descends.
Second switch ON: Work clamp left ② and presser foot ③ descend.



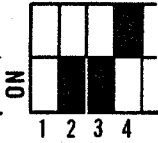
2:OFF 3:ON 4:ON

First switch ON: Work clamp left ② descends.
Second switch ON: Work clamp right ① and presser foot ③ descend.



2:ON 3:ON 4:ON

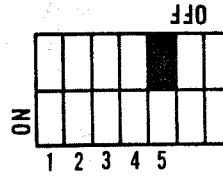
First switch ON: Work clamp right ① and work clamp left ② descend.
Second switch ON: Presser foot ③ descends.



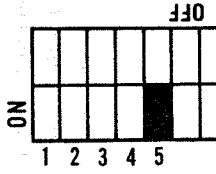
2:ON 3:ON 4:OFF

First switch ON: Work clamp right ① and left ② descend.
Second switch ON: No movement
Start switch ON: Presser foot ③ descends.

«DIP switch Ⓐ-5»



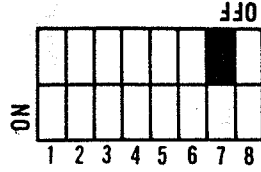
Work clamp rises automatically during split mode operation.



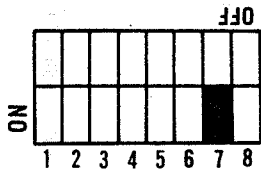
Work clamp rises when the presser lifter pedal is pressed during split mode operation.

The setting of DIP switch Ⓐ <5> determines the operation of the work clamp during split mode operation.

«DIP switch Ⓐ-7»



Normal



Single pedal operation

DIP switch Ⓐ <7> is used to select single pedal operation.

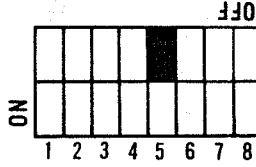
When the start switch is pressed, the work clamp automatically drops, and sewing starts when the switch is released.

13 Changing the thread breakage detection stitch margin setting

«DIP switch ⑤-5»

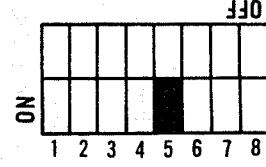
The thread breakage detection stitch margin setting can be set to either 8 or 14 stitches by changing the setting of DIP switch ⑤- <5>.

< Normal: 8 stitches >



DIP switch ⑤- <5> is normally set to OFF.

(In this position, the thread breakage detection stitch margin is 8 stitches.)



< 14 stitches >

When this switch is set to ON, the stitch margin will be 14 stitches.

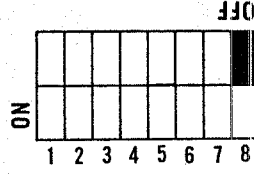
NOTE: If the thread breakage detector misoperates, set the thread breakage detection stitch margin to 14 stitches.

NOTE: If the thread is broken during sewing, the thread breakage detector senses thread breakage, stopping the machine upon the third stitch regardless of the setting of DIP switch ⑤- <5>.

14 Changing the feed speed

«DIP switch ⑥-8»

< Normal speed >

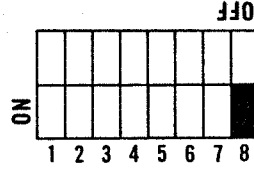


The feed speed can be changed by changing the setting of DIP switch ⑥- <8>.

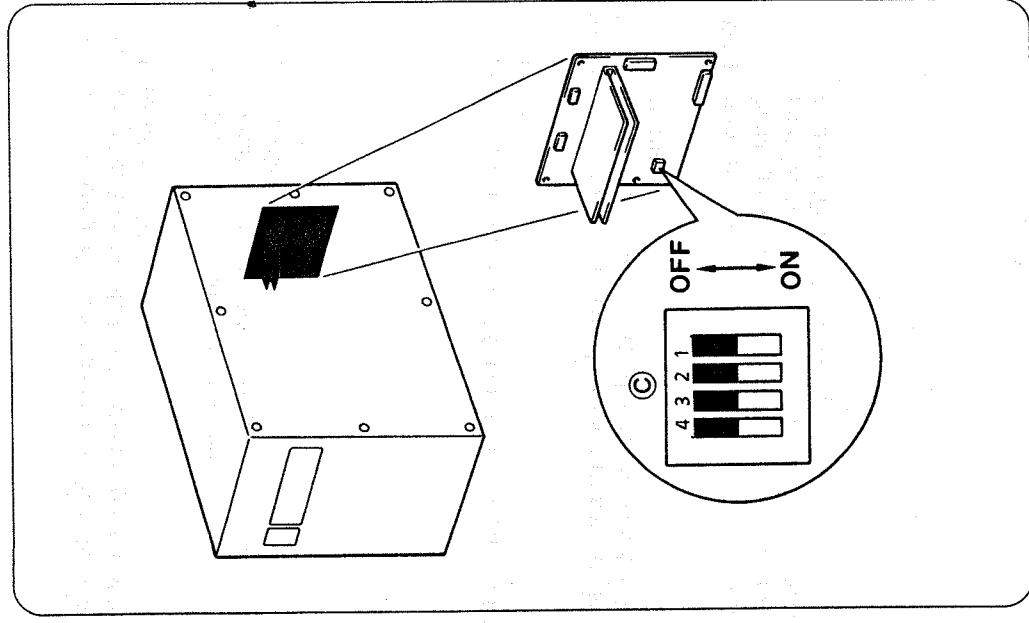
DIP switch ⑥- <8> is normally set to OFF.
(Feed speed: approx. 15 cm/sec.)

When this switch is set to ON, the machine can feed the material at high speed.
(Feed speed: approx. 25 cm/sec.)

※ If the material slips, set the switch to OFF.



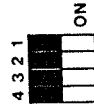
15 Changing the speed at the start and end of sewing



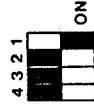
Be sure to turn off the power before opening the control box.

(1) The sewing starting and ending speeds can be changed according to the setting of DIP switch ©-1 <1> and <2>.

«DIP switch ©-1»

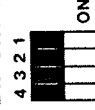


When OFF: It will be approx. 600 spm for the first stitch.



When ON: It will be approx. 260 spm for the first two stitches.

«DIP switch ©-2»



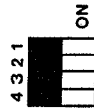
When OFF: It will be approx. 400 spm for the last two stitches.



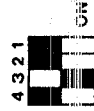
When ON: It will be approx. 260 spm for the last two stitches.

(2) By changing the setting of DIP switch ©-3 on the motor circuit board, the machine can be stopped with the needle at its highest position since the upper shaft is rotated in the reverse direction after the thread is trimmed.

«DIP switch ©-3»



When OFF: The machine will stop with the needle at its normal position.

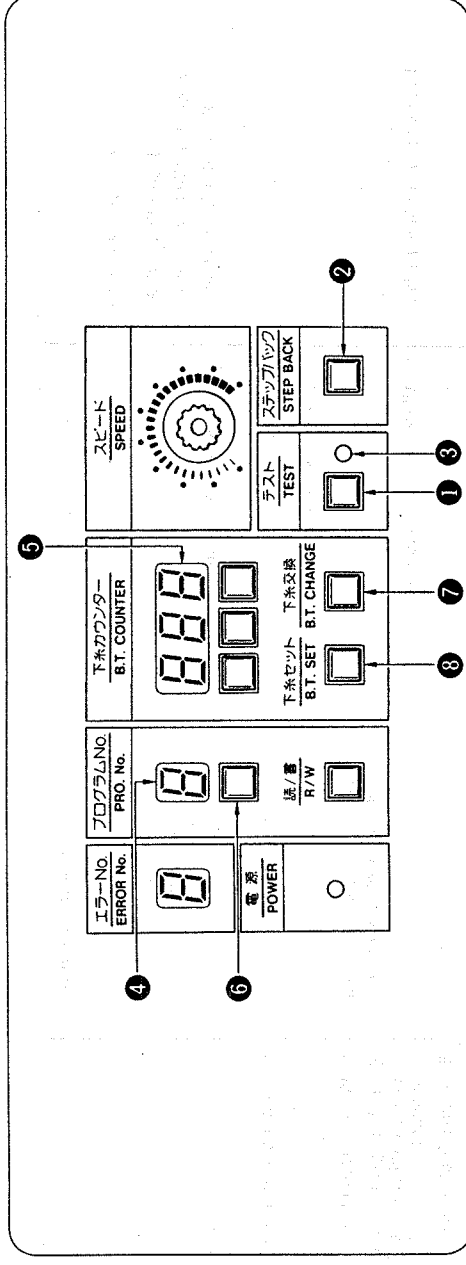


When ON: The machine will stop with the needle at its highest position.

NOTE: All of DIP switch © is factory preset to OFF.

16 Using the memory switch

The memory switch settings can be used to customize the work clamp's operation. (Refer to the following table of the memory switch settings.)



- (1) While pressing the TEST switch ①, press the STEP BACK switch ②. The TEST lamp ③ will light, the memory switch No.0 will appear on the PRO. No. display ④, and "on" or "off" will appear on the B.T. COUNTER display ⑤ according to the memory switch number.
- ① "on" or "off" will appear on the B.T. COUNTER display ⑤ alternately when the STEP BACK switch ② is pressed.
- ② When the PRO. No. switch ⑥ is pressed, the memory switch number on the PRO. No. display ④ will change in the order of 0, 1, 2, ..., 9, A, b, ..., F, 0, 1, and simultaneously the memory switch function corresponding to its memory switch number will appear on the B.T. COUNTER display.
- ③ All of the memory switch will be set to "off" when the B.T. CHANGE switch ⑦ is pressed.
- ④ Insert a floppy disk, and press the B.T. SET switch ⑧. The current memory switch setting will be stored on the floppy disk.

NOTE: When memorizing the current memory switch setting on the floppy disk, this setting will appear automatically when the program including your setting is read from the floppy disk drive.

- (2) Press the TEST switch ②.

The TEST lamp ③ will go out, and the indication on each display will be returned to its original state.

NOTE: All of the memory switch is factory preset to OFF.

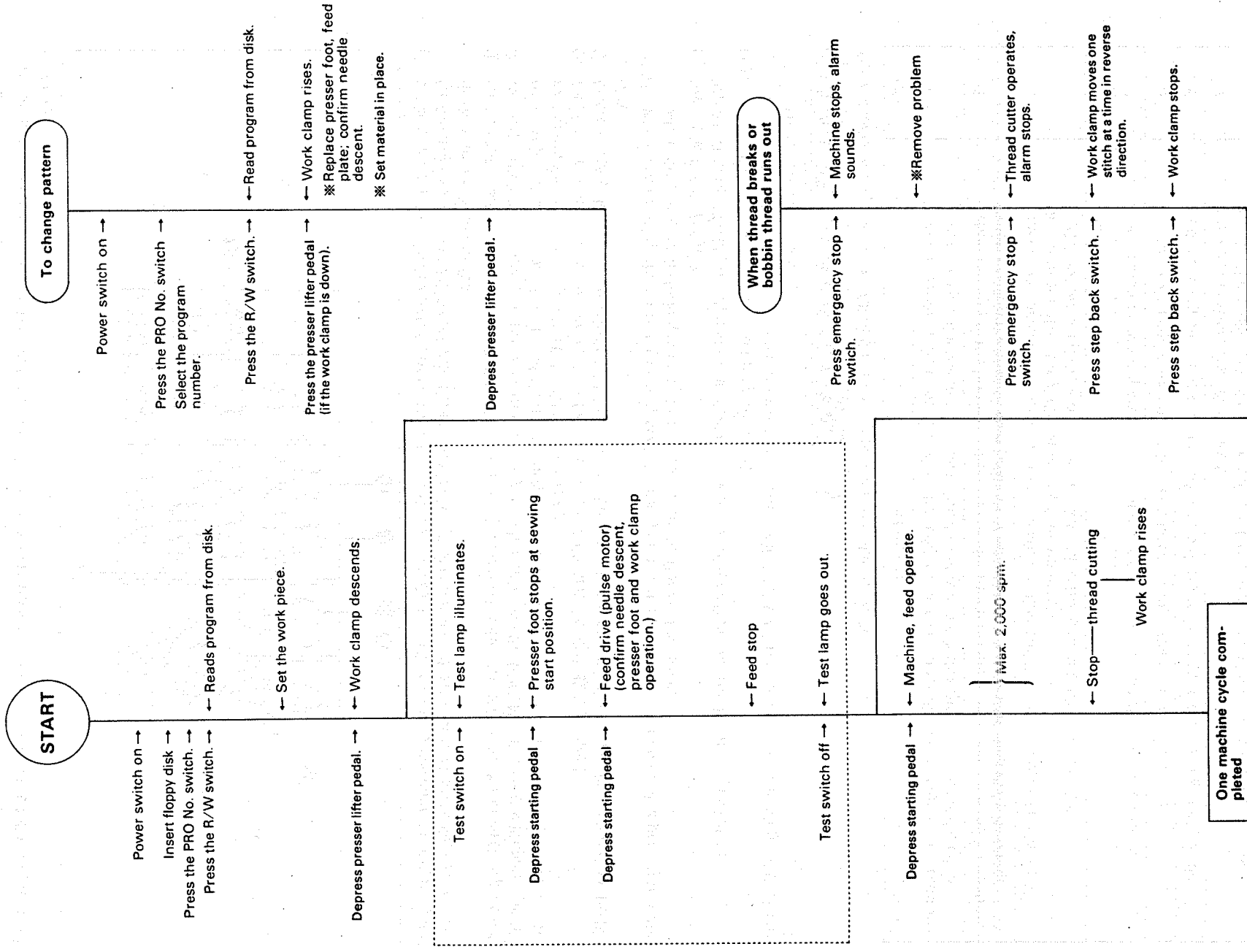
Also, when the power is turned on while pressing the EMERGENCY STOP switch, all the settings of the memory switch are set to OFF.

MEMORY SWITCH SETTINGS

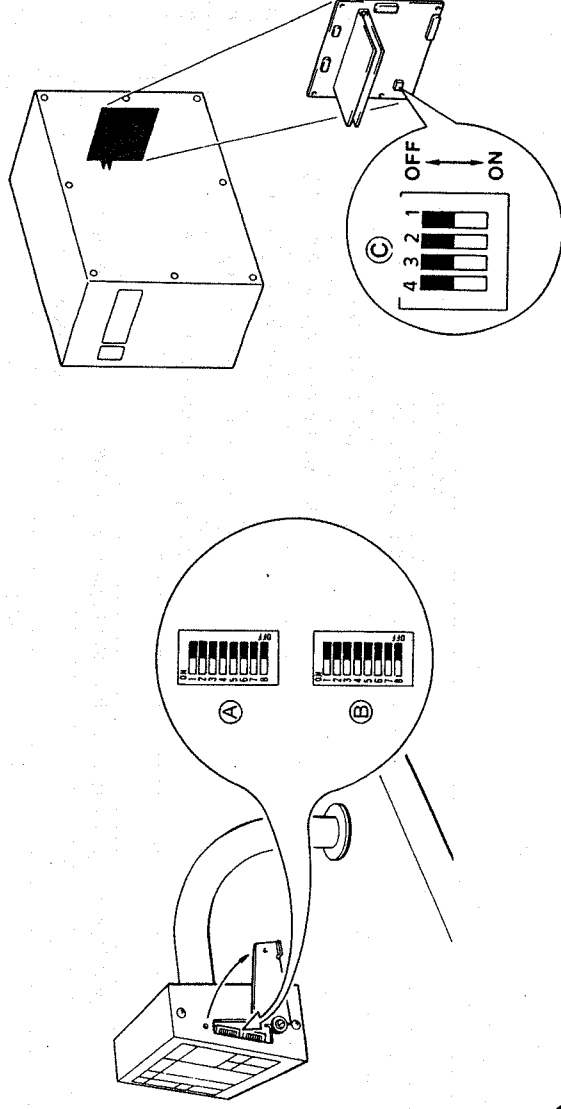
The following are special uses. All of the memory switch is usually set to OFF.

NO.	When ON
0	When moving to the home position, the feeder moves in the X direction, then the Y direction. When moving the sewing start position, it moves in the Y direction, then the X direction.
1	When moving to the home position, the feeder moves in the Y direction, then the X direction. When moving the sewing start position, it moves in the X direction, then the Y direction.
2	The home position is changed to the forward position and the feeder moves first in the Y direction and then the X direction, and then reversely. NOTE: When using the work clamp for attaching buttons, set this switch to ON.
3	OFF
4	Upon emergency stoppage, the machine stops with the needle at its highest position.
5	At the sewing end position, the feeder passes through the first home position.
6	At the sewing end position, the work clamp rises, and moves to the sewing start position.
7	The presser foot remains lowered. NOTE: The cycle time will be shortened when the program includes many feed points.
8	Presser crank flips over after 1/4 of a pattern is sewn, and flips back after 3/4 is sewn.
9 ~ F	OFF

OPERATION FLOW CHART



DIP SWITCH SETTINGS



(A)

NO.	When ON
1	Work clamp does not rise when sewing completed
2	Right → left two-step work clamp
3	Left → right two-step work clamp
4	When the switches 2, 3 and 4 are on, left and right work clamps will descend at one time, and presser foot will descend with two positions.
5	Work clamp does not rise during split mode operation.
6	Presser crank of inner clamping device turns to the other side (Inner clamping device is optional.)
7	Single pedal operation possible using the starting pedal
8	Activates thread breakage detector (Thread breakage detector is optional)

(B)

NO.	When ON
1	Single split mode possible
2	8000-stitch sewing mode possible
3	Thread trimming does not function when emergency stop switch is pressed.
4	Needle cooler can be used. (Needle cooler device is optional.)
5	Thread breakage detection stitch margin setting can be set to either 8 or 14 stitches.
6	OFF
7	OFF
8	High feed speed

(C)

NO.	When ON
1	The first two stitches are sewn at low speed (approx. 260 spm).
2	The last two stitches are sewn at low speed (approx. 260 spm).
3	The upper shaft turns in the reverse direction after thread breakage, and the machine stops with the needle at its highest position.
4	OFF

ERROR NO. LIST

NO.	Cause
1	Emergency stop switch pressed
2	Trouble with the motor or synchronizer/Motor stopped when voltage dropped
3	Over-area
4	Floppy disk not inserted, or cable not properly connected
5	Floppy disk is locked (write protected).
6	No program registered
7	Error occurred in program mode.
8	Thread breakage detected
9	Protection network activated because of abnormal voltage
A	No usable pattern data on disk