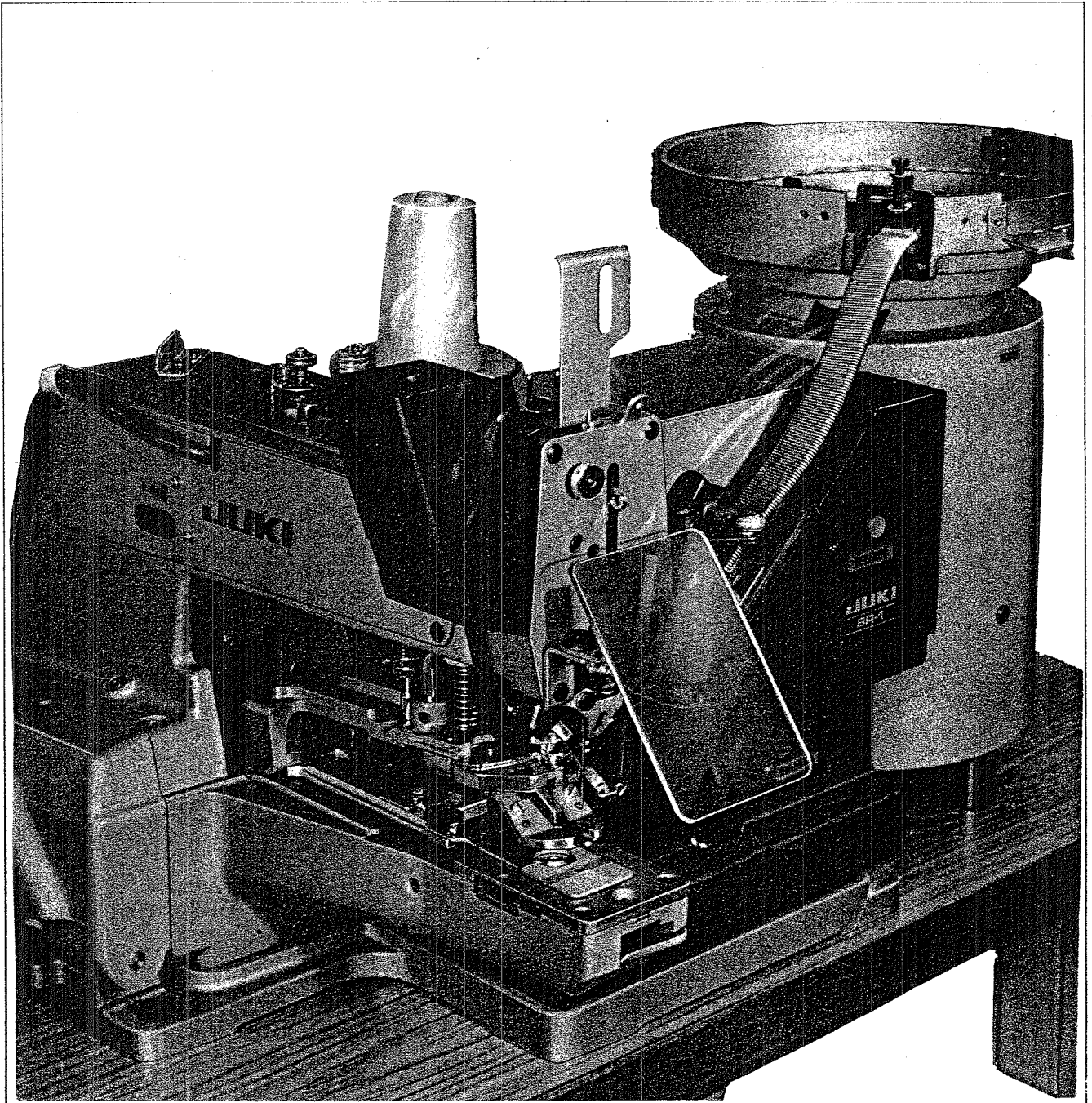


JUKI
MB-373/BR-1

AUTOMATIC BUTTON FEEDER
Single Thread Chainstitch Button Sewing Machine
with Automatic Thread Trimmer
ENGINEER'S MANUAL



TOKYO JUKI INDUSTRIAL CO.,LTD.
FOREIGN TRADE BUSINESS DIV.

PREFACE

This engineer's manual is written for the technical personnel who are responsible for the service and maintenance of the sewing machines. This manual presents detailed explanation of the adjusting procedures, etc. which are not covered by the INSTRUCTION BOOK intended for the maintenance personnel and operators at a garment factory.

It is advisable to use this engineer's manual in combination with the pertinent INSTRUCTION BOOK and PARTS BOOK when servicing the sewing machines of these models.

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1. GENERAL

This is an automatic button feeder which is designed to automatically supply the MB-373 single-thread chainstitch button sewing machine with buttons, thereby contributing to efficient button sewing.

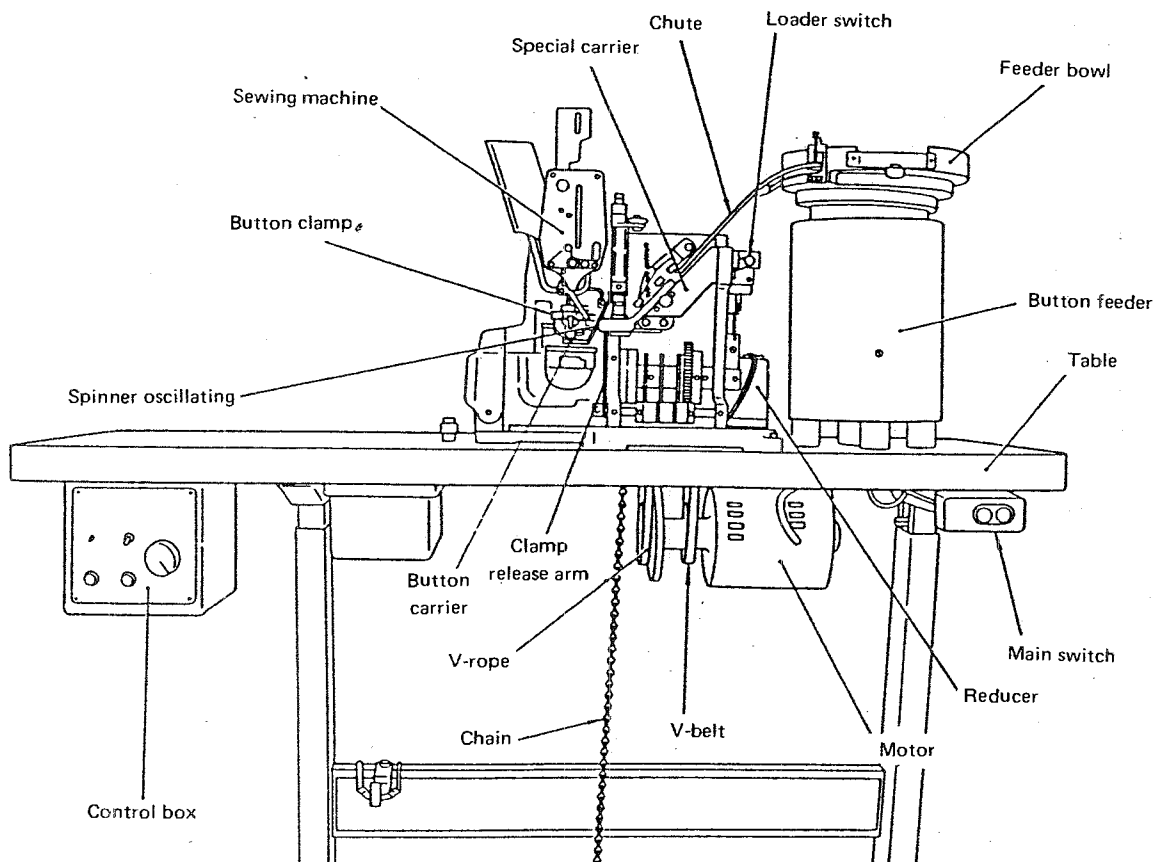
2. FEATURES

- (1) To assure ease of operation and safety, it is designed to set buttons from behind the button clamp jaw levers
- (2) Changes in button size require only simple fine readjustment and replacement of the button carrier and chute coil.
- (3) Button sewing without cross-over stitch can be done simply by changing the switch and lever setting.
- (4) The sewing machine and the button feeder are fixed on the same base, therefore, no fine readjustment is required even after a long period of operation.

3. SPECIFICATIONS

1. Machine head	MB-373-Z045 (Exclusive)
2. Max. sewing speed	1300 spm
3. Needle	TQ x 7, #16 (standard)
4. Number of stitches	16 (standard), 8, 32.
5. Button	Round button (2 holes, 4 holes) Diameter: $\phi 10 - \phi 20$ Thickness: t 1.8 (5/64") - t 3.5 mm (9/64")
6. Button feeding & sorting	Vibration method
7. Button setting	Buttons are set from behind button clamp jaw lever
8. No cross-over stitch function	Provided. Selector-switch double starter system
9. Control method	CPU box
10. Power consumption	270W
11. Power source	Shingle-phase 3-phase

4. NAMES OF COMPONENTS



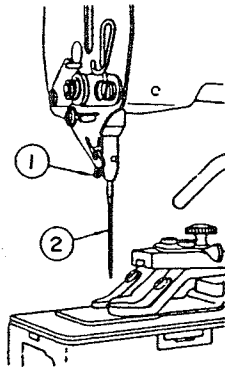
When this machine is unpacked, be sure that the following components are supplied. Also, when button size is changed, adjust these components.

- ① Button clamp
- ② Clamp release arm
- ③ Spinner oscillating arm
- ④ Special carrier chute
- ⑤ Button carrier
- ⑥ Feeder bowl

(1) Sewing machine

Important:

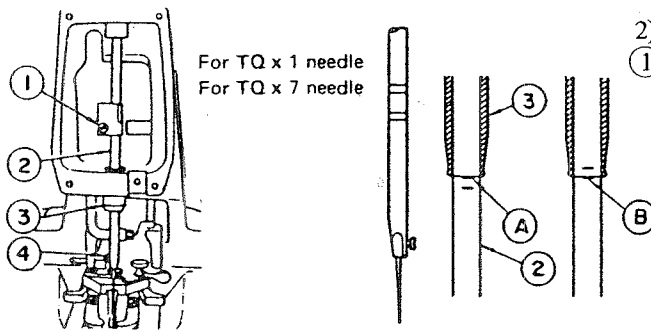
Be sure to turn the power switch OFF before starting any adjustment.



1) Attaching the needle

The standard needle is of TQ x 7 #16.

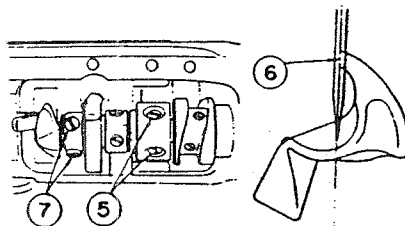
1. Loosen setscrew ①, and hold needle ② with its long groove facing toward you.
2. Insert needle ② into the hole in the needle bar until it will go no further.
3. Fix the needle by tightening setscrew ①.



2) Needle-to-looper relation

① Height of the needle bar

1. Lower needle bar ② to its lowest position and loosen setscrew ①.
 2. Use the upper two marker lines engraved on the needle bar for a TQ x 1 needle and the lower two marker lines for a TQ x 7 needle. In either case, align upper marker line A of the two marker line with the bottom end of lower bushing ③ of the needle bar. Tighten setscrew ①.
- (At this time, setscrew ④ should be just to the left of the needle bar.)

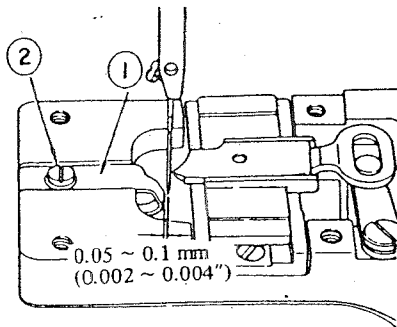


② Position of the needle and looper

1. Loosen setscrews ⑤ and turn the drive pulley until lower marker line B of the two marker lines engraved on needle bar ② aligns with the bottom end of lower bushing ③.
2. With the above conditions maintained, adjust to make blade point ⑥ of the looper meet the center of the needle. Tighten setscrew ④.

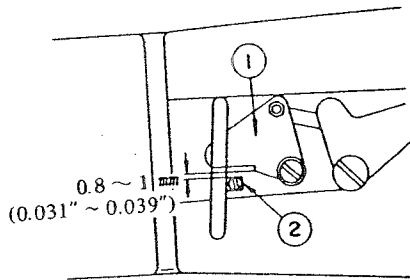
③ Clearance between the needle and the looper

Loosen setscrews ⑦ and adjust the clearance between the needle and the looper to 0.05 ~ 0.1 mm (0.002" ~ 0.004").



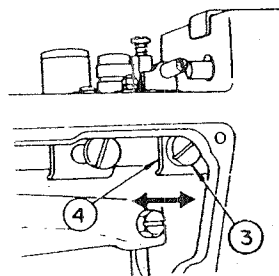
3) Positioning the needle guide

Loosen screw ② and move needle guide ① to the right or left so the needle is 0.05 to 0.1 mm (0.002" ~ 0.004") from the needle guide with the needle bar in its lowest position.



4) Adjusting the nipper

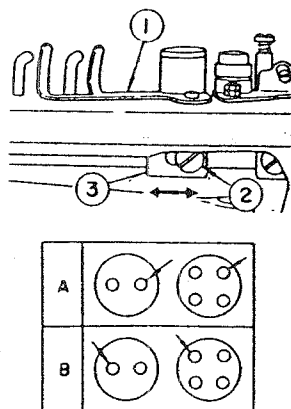
Loosen setscrew ③ and move nipper block ④ to the right or left so a clearance of 0.8 to 1 mm (0.031" ~ 0.039") is provided between nipper ① and nipper block ② while the sewing machine is in operation.

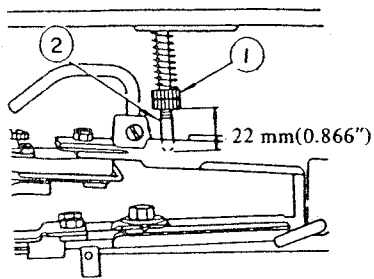


5) Adjusting the thread pull-off lever

To adjust thread pull-off lever ①, loosen setscrew ② using a screwdriver through the hole in the machine arm side cover (left), and move nipper bar lock ③ to the right or left for adjustment.

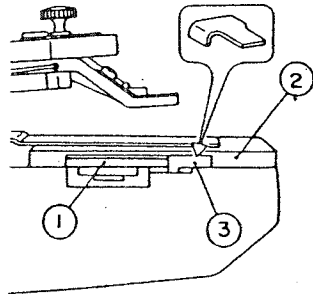
After a button is sewn, if the end of the thread comes out of the holes shown by arrows of A, move nipper bar block ③ to the left so the end of the thread does not come out. If the end of the thread comes out of the holes shown by arrows of B, move the nipper bar block to the right.





6) Adjusting the work clamping pressure

To adjust to the standard work clamping pressure, turn two nuts ① up or down so the bottom end of the lower nut is 22 mm (0.866") above the bottom end of pressure adjusting bar ②.

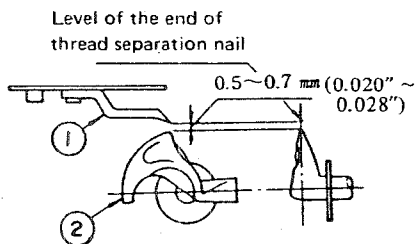
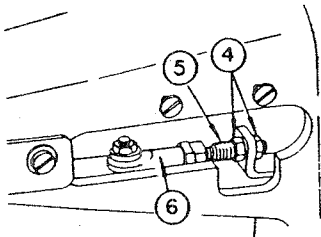


7) Positioning the moving knife

When the machine stops in the state of "stop-motion" and its button clamp assembly rests in the highest position, there must be a 13 mm (0.512") interspace (standard) between thread trimming connecting link (front) ① and the end of the slit in throat plate ②.

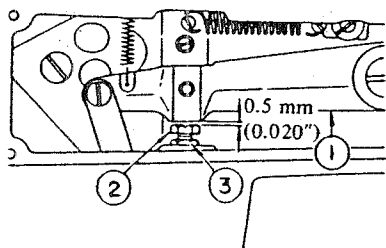
Loosen two nuts ④ and move connecting screw ⑤ in the axial direction to obtain the 13mm (0.512") clearance using gauge which is supplied in the accessory box.

When tightening nuts ④, be sure that joint ⑥ stays in the horizontal position.



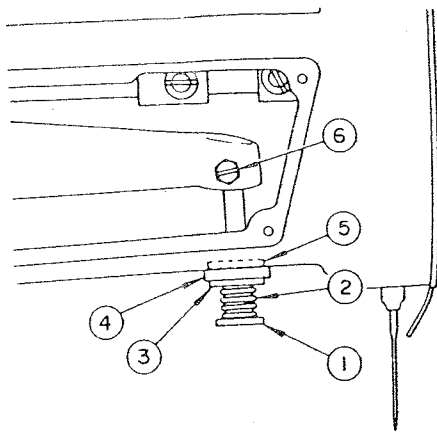
8) Height of the moving knife thread separation nail

The end of thread separation nail ① should be 0.5 to 0.7 mm (0.020" ~ 0.028") above the blade point of looper ②. If the height of nail ① is not correct, slightly bend the nail to achieve the proper height.



9) Clearance between the button clamp lifting lever and the adjusting screw

Adjusting the clearance between button clamp lifting lever ① and adjusting screw ② to 0.5 mm (0.020") and tighten nut ③.



10) How to set the spring guide shaft

Install stop-motion cushion spring ②, stop-motion cushion washer ③, stop-motion cushion ④, and stop-motion cushion washer ⑤ onto spring guide shaft ① in the order in which they are listed.

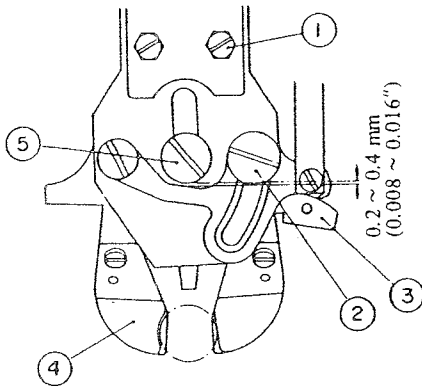
After confirming that the stop-motion mechanism has been engaged, lower the spring guide shaft by 0.5 mm (0.020") so the stop-motion cushion spring is fully compressed, then tighten screw ⑥.

(2) Button feeder components

1) Adjustment of the button clamp jaw levers

① Adjusting the needle entry point

Loosen setscrews ① and adjust so the needle enters the center of a hole in the button.



② Adjusting the button clamp

Loosen setscrew ② and depress button clamp stop lever ③ to open button clamp jaw lever ④. Properly position the button and provide a clearance of 0.2 to 0.4 mm (0.008" ~ 0.016") between button clamp stop lever ③ and connecting screw ⑤.

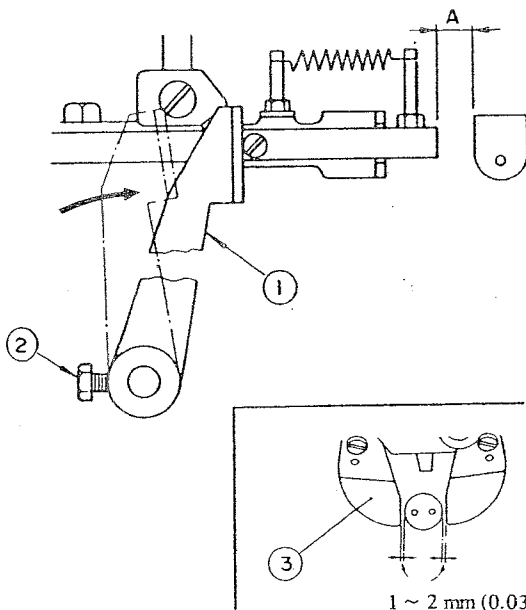
Then, tighten setscrew ②.

* If there is no clearance between the button clamp stop lever and the connecting screw :

- The button clamp jaw lever will not hold a button.
- The button will be held loosely between the button clamp jaw levers, leading to needle breakage or poor stitching.

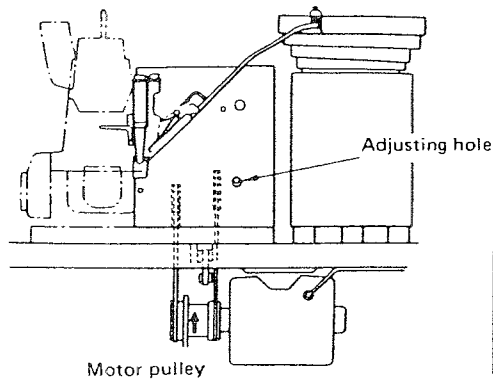
* If the above clearance is too wide:

- The button clamp jaw levers will not open wide enough to hold the button, causing chipped buttons, broken set-pins or poor button setting.



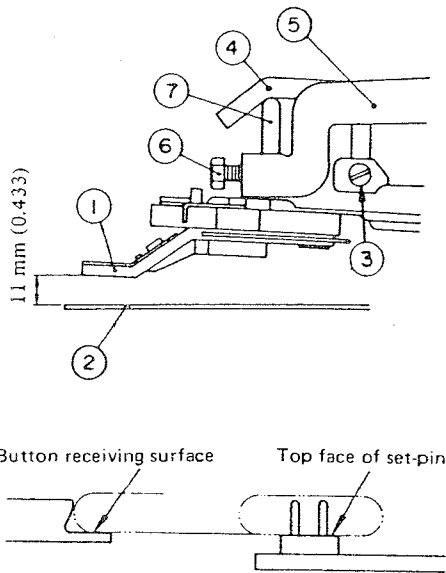
③ Adjusting the opening of the button clamp jaw levers

Clamp release arm ① is actuated when button clamp jaw lever ③ goes up upon completion of button sewing. Loosen screw ② and adjust to provide a clearance of 1 to 2 mm (0.039" ~ 0.079") between the button clamp jaw levers and the button when the button clamp jaw levers fully open. After adjustment, manually operate the loader to check the button clamp jaw levers for proper opening width. If the button clamp jaw levers open too wide, interspace A becomes too small, with possible contact of the button clamp jaw levers with the adjacent components.



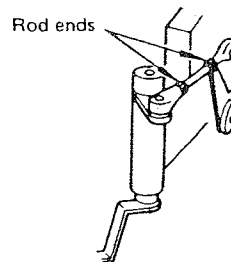
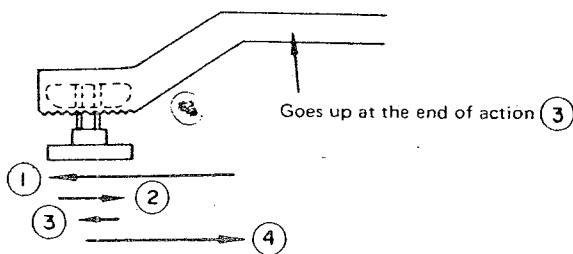
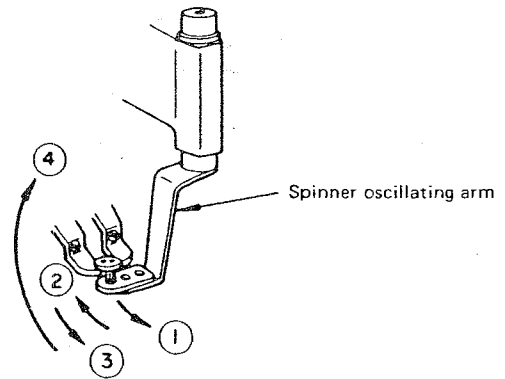
To make fine adjustment of the clamp and the loader, push the clamp shaft through the adjusting hole to remove the loader belt. Turn the loader pulley by hand for adjustment.

Important :
Be sure to complete the manual operation before turning ON the power.



- ④ Height of the button clamp jaw levers
The standard distance between the soles of button clamp jaw levers ① and the surface of feed plate ② is 11 mm (0.433") when the sewing machine is in the stop-motion state.
Loosen screw ③ move hook ④ up or down to properly adjust the height of the hook and retighten screw ③ .
Loosen bolt ⑥ and move hook ⑦ up or down to properly adjust the height of the hook, then retighten bolt ⑥ .
Be sure to make the button receiving surface flush with the top face of the set-pin.
The 11 mm (0.433") standard distance stated above may need to be changed for some shapes of buttons. Always make sure that the button is properly held between the right and left button clamp jaw levers.

- 2) Positioning the set-pin in relation to the needle entry point
After checking for correct needle entry point in relation to the holes in a button (see paragraph 1)- ① "Adjusting the needle entry point", operate the loader by hand.
The spinner oscillating arm moves in the order of ① ⇒ ② ⇒ ③ ⇒ ④ as illustrated.
When the button clamp starts to go up upon completion of action ③ , place a button between the button clamp jaw levers, turn the pulley in the reverse direction, and adjust by turning the rod ends so the set-pins are located at the centers of the holes in the button.



3) Adjustment of the special carrier assembly

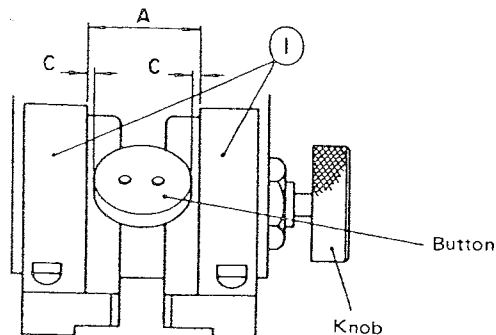
① Adjusting the distance between the sliding ways

Adjust the distance between sliding ways ① according to the buttons to be sewn so the buttons smoothly slide down.

Dimension A can be adjusted from 10 mm to 20 mm (0.394" ~ 0.787").

Adjust clearance C between the button and the sliding ways to 0.3 ~ 0.5 mm (0.012" ~ 0.02").

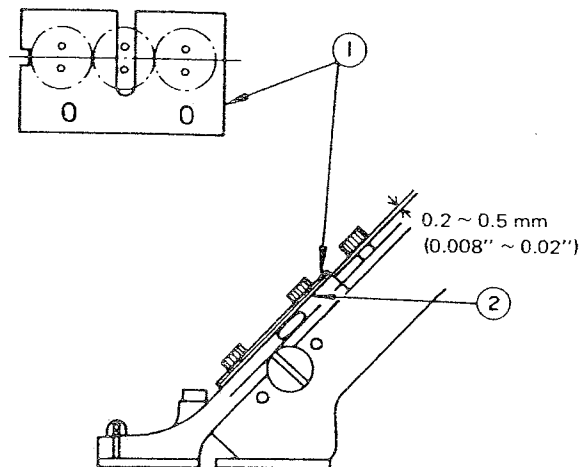
- If "C" is not wide enough, buttons will jam.
- If "C" is too wide, buttons will often fail to fit onto the set-pins.



② Positioning the guide plate

Adjust the position of guide plate ① so its slit is located at the center of the second button of the three buttons as illustrated. Also, adjust the clearance between guide plate ① and the buttons to 0.2 ~ 0.5 mm (0.008" ~ 0.02") using spacers ②.

- The guide plate comes in three types :
 $\phi 10$ to $\phi 13$, $\phi 13$ to $\phi 16$, and $\phi 16$ to $\phi 20$
- The spacer comes in three thickness :
 0.2 mm (0.005"), 0.5 mm (0.02"), and 1 mm (0.039")
 Make a proper combination of the spacers according to the thickness of the buttons so the buttons slide down smoothly.



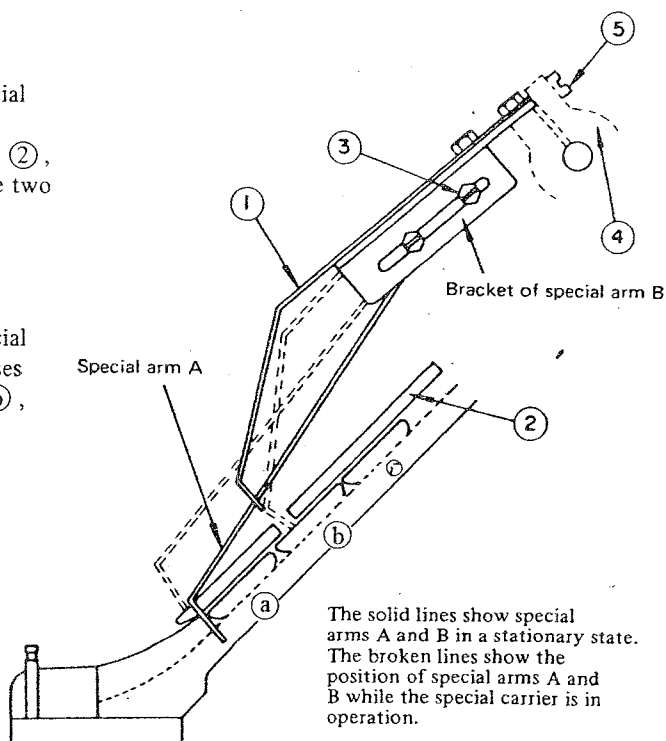
③ Adjusting special arms A and B

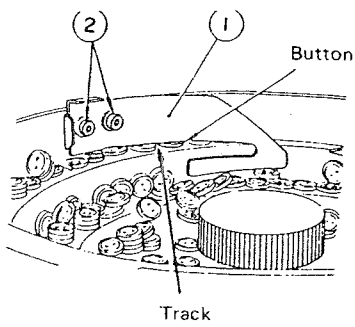
Loosen screws ③ and adjust the position of special arm B ① so it enters the slit in guide plate ②.

If special arm B ① is in contact with guide plate ②, the arm cannot hold button ⑥. This will cause two or three buttons to be fed at the same time with consequent button jamming.

Timing of the special arms

Special arm A should release button ⑥ after special arm B catches button ⑥. If special arm A releases button ⑥ before special arm B catches button ⑥, loosen screw ⑤ of driving arm ④ and make correction, (Manual operation)

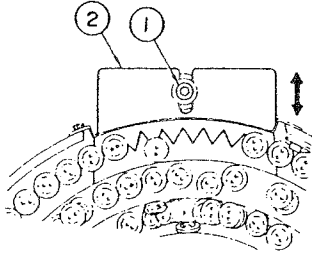




4) Adjusting the attachments in the feeder bowl

① Guide plate

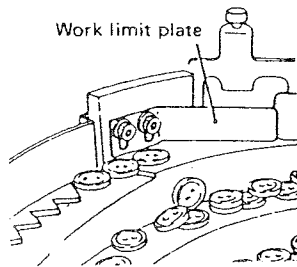
Loosen screws ② and move guide plate ① up or down to adjust the clearance between the top faces of the buttons and the guide plate to approx. 0.7 mm (0.028"). After adjustment, retighten screws ②.



② Selector plate

Buttons with their wrong side up are sorted from those with their right side up when they pass through the serrated part of the selector plate.

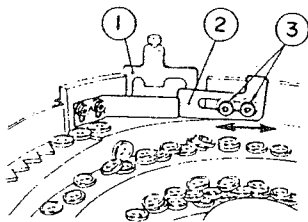
Loosen bolt ①, move selector plate ② up or down as indicated by the arrow and fix it in a proper position so only buttons with their right side up are fed into the chute.



③ Work limit plate

The work limit plate functions to put a button back into the bowl if the button rides on top of another at the entrance of the spring chute after it passes through the selector plate.

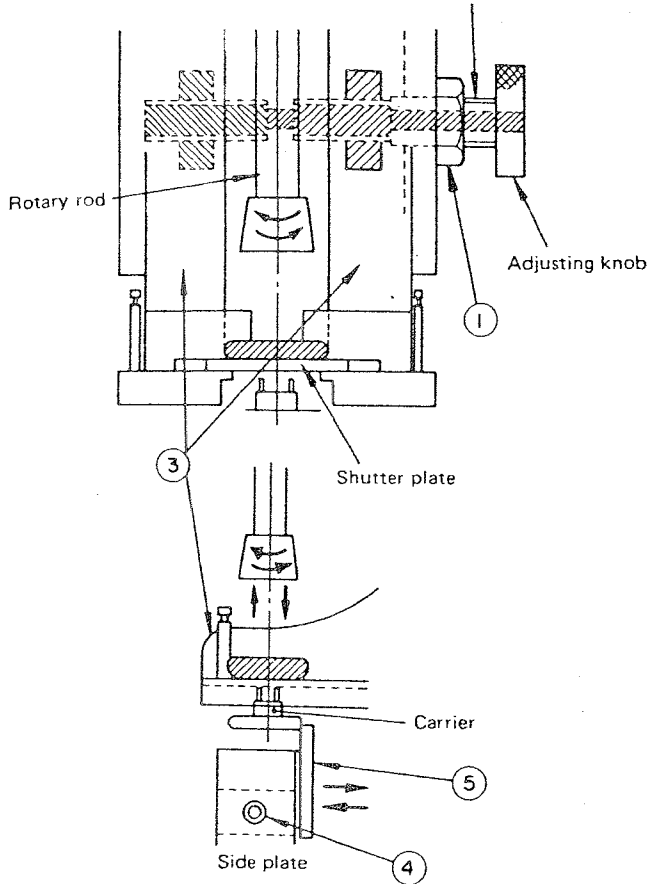
Adjust the work limit plate in the same way as the guide plate.



④ Stopper

Small buttons sometimes drop out through the clearances at spring chute bracket ①.

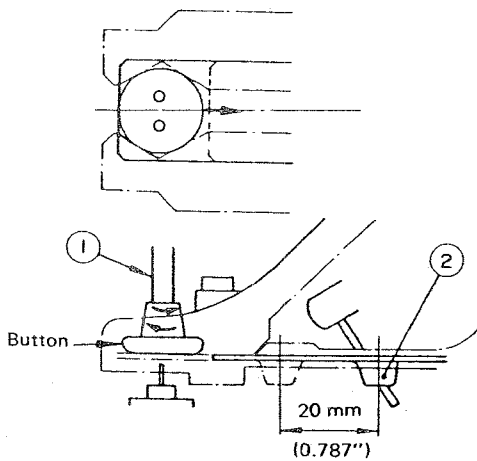
In order to prevent this, loosen screws ③ and move stopper ② to the right or left as indicated by the arrow to adjust the clearances at the spring chute bracket.



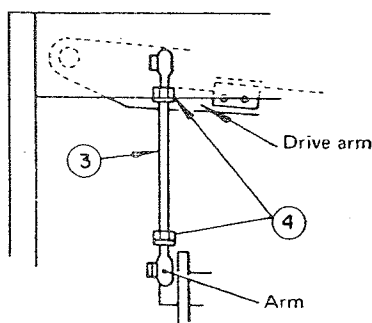
A button must always be placed right above the set-pin.

- ① Lateral positioning of the sliding ways
Loosen nut ① and turn adjusting knob ② for adjustment so the button is located just above the set-pin.
When adjusting knob ② is turned clockwise, both right and left sliding ways move to the left.
When the adjusting knob is turned counter-clockwise, both right and left sliding ways move to the right.

- ② Longitudinal positioning of the slide plates
Loosen screw ④ of the side plate of the holder and move stopper ⑤ to the right or left as indicated by the arrows to properly adjust the longitudinal position of the slide plates.



- 6) Positioning the shutter plate
As soon as rotary rod ① comes down and give the button a half turn, shutter plate ② opens to drop the button onto the set-pin.
The standard opening of shutter plate ② is 20 mm (0.787").
If the opening of shutter plate ② is smaller than the diameter of the button, the button will not be properly placed onto the set-pin.
If the opening of the shutter plate exceeds 20 mm (0.787"), the shutter plate may not work properly.
To adjust the position of the shutter plate, remove the cover, loosen nuts ④ on both end of connecting rod ③, and turn the connecting rod to obtain the proper position of the shutter plate.



(Viewed from the rear)

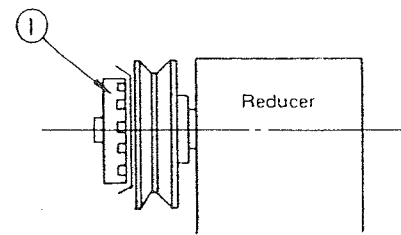
7) Safety device

If the loader should be subjected to any abnormal load due to some cause, the safety device is put into operation to make the reducer pulley idle.

However, if the reducer pulley is allowed to idle for a long time, the friction disc will seize. Therefore, immediately turn OFF the power and perform troubleshooting if the safety device is actuated.

If the loader does not run smoothly although no apparent problem is found, it is due to insufficient torque.

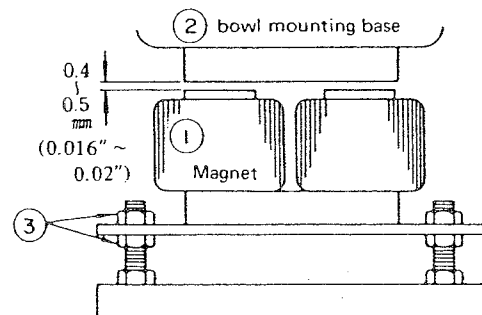
In this case, remove the stopper of adjusting nut ① and tighten the adjusting nut with a 60 kg/cm² torque (standard).



8) Clearance between the feeder bowl mounting base and the magnets

Turn adjusting nuts ③ to adjust the clearance between the top of the iron cores of feeder magnets ① and the bottom surface of bowl mounting base ② to 0.4 ~ 0.5 mm (0.016" ~ 0.02").

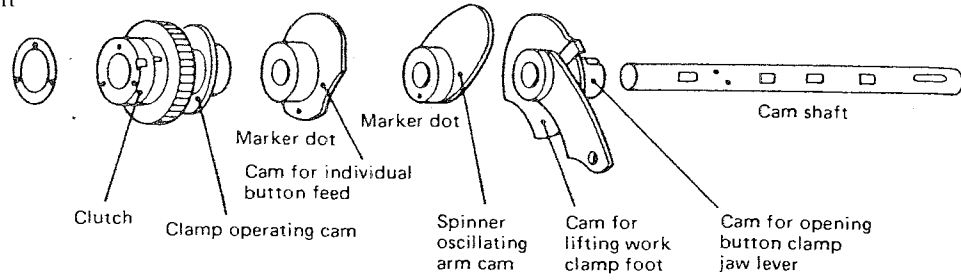
If the above clearance is not correct, abnormal sound or vibration may develop.



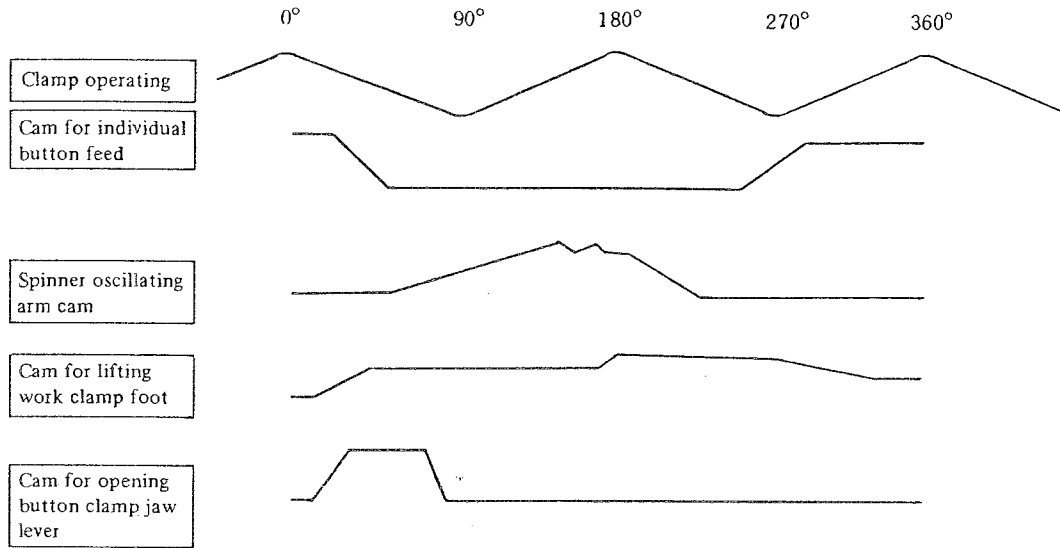
The stroke and motional timing of each component of the loader are controlled by single-shaft, single-rotary cams.

Accordingly, incorrect motional timing of the clutch and cams of the loader will prevent normal button feed and may cause damage to the mechanism.

Viewed from rear right



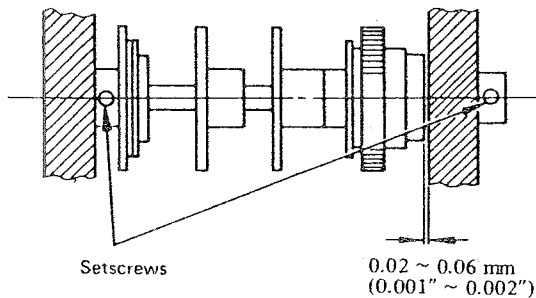
① Drive cam chart



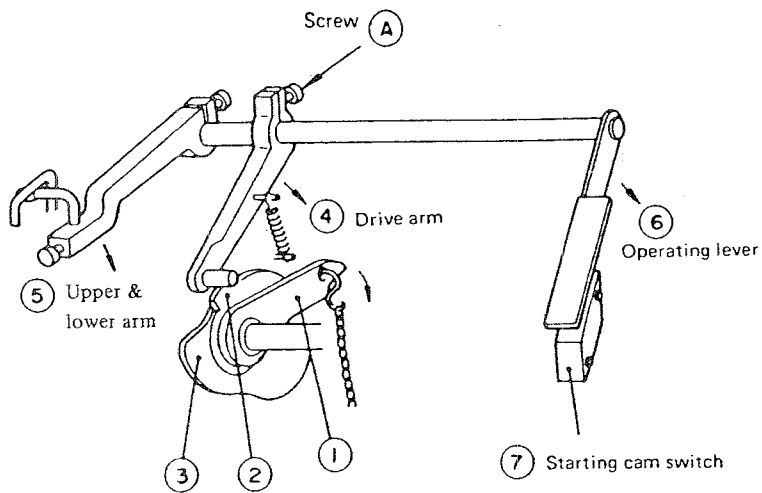
② Axial clearance

The axial clearance should be 0.02 to 0.06 mm (0.001" ~ 0.002")

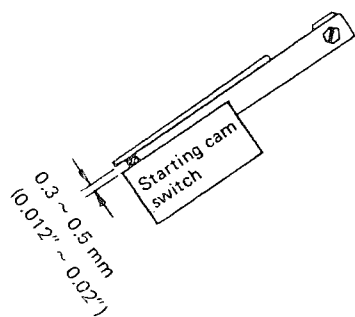
Excessive clearance will cause abnormal wear on the contacting surfaces of each cam. Insufficient clearance may cause the clutch to be disengaged incompletely, producing clatter.



10) Upper & lower arm and starting cam switch

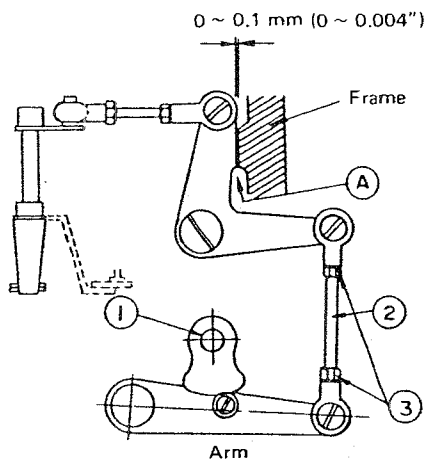


When the starter switch of the sewing machine is depressed in the manual operation mode, drive cam ① turns in the direction of the arrow. Drive cam ② turns along with drive cam ① and drive arm ④ moves down to the lowest point of drive cam ③.



- ① Positioning the starting cam switch
Loosen screw (A) and pull down the chain of the starting cylinder.
With drive arm (4) pushed against drive cam (3), adjust the clearance between operating lever (6) and starting cam switch (7) to 0.3 ~ 0.5 mm (0.012" ~ 0.02"). then retighten screw (A).
- ② Positioning the upper & lower arm
Position upper & lower arm (5) in accordance with the preceding paragraph, 9-(2)-1)- (4) "Height of the button clamp jaw levers".

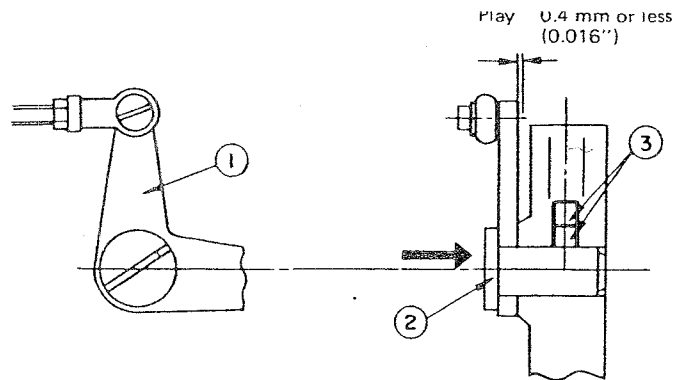
11) Spinner oscillating arm assembly



The spinner oscillating arm functions to pick up the button on the set-pin and set it between the button clamp jaw levers.

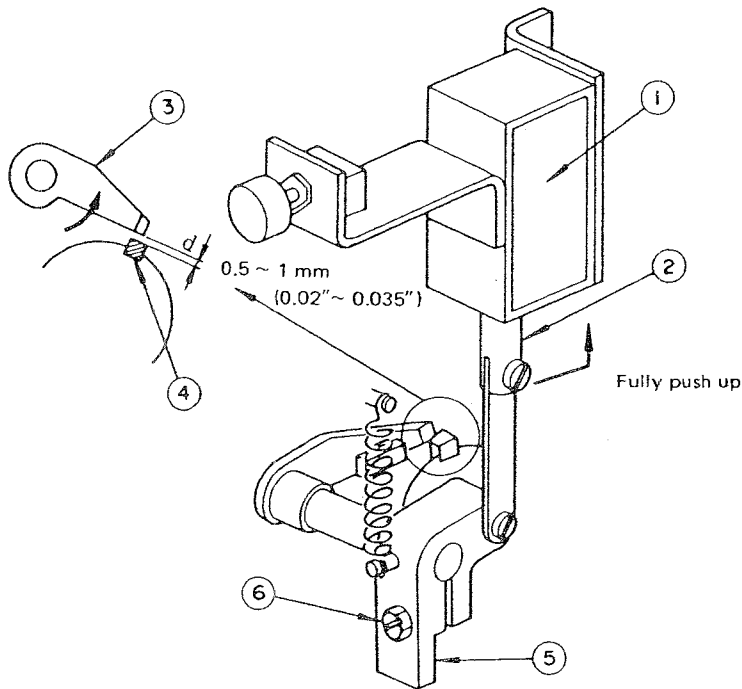
- ① Adjusting the spinner oscillating arm
When spinner oscillating arm drive cam (1) is in its highest position, loosen nuts (3) on both ends of connecting rod (2) and adjust clearance A to 0 ~ 0.1 mm (0 ~ 0.004").

If the clearance is not correct, abnormal sound, overload, or faulty button setting will result.



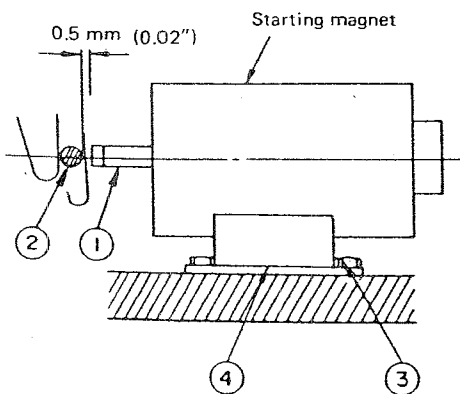
- ② Removing the play from the transfer arm lever
 Transfer arm lever ① is installed with pin ②.
 Remove the cover and loosen setscrew ③ (double-screw). Push pin ② in the direction of the arrow and retighten setscrew ③.
 If transfer arm lever ① has play, unstable button setting will result.

12) Adjusting the clutch operating mechanism



- Loosen setscrew ⑥ to release shaft holder ⑤ and adjust so a 0.5 to 1 mm (0.02" to 0.035") clearance is provided between clutch operating lever ③ and clutch key ④ as illustrated when plunger ② of loader magnet ① is fully pushed up by hand.
 If clearance "d" is too small, the clutch key will not work.
 If the clearance is too wide, the magnet will not work and the loader will not start.

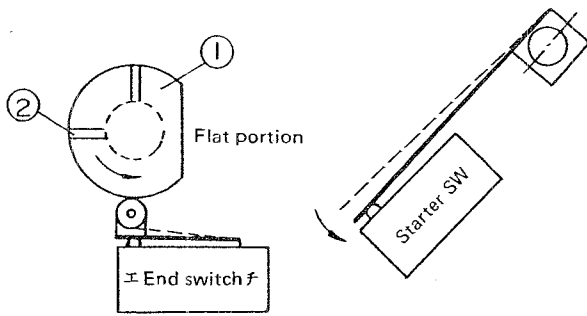
13) Positioning the starting magnet



Loosen bolts ③ and move magnet mounting base ④, to adjust the clearance between plunger ① and pin ②, to 0.5 mm (0.02").

- * If the clearance is too wide ;
The sewing machine will not start.
- * If the clearance is too small (i.e., the plunger is always in a depressed state) ;
The sewing machine will keep on running when it should stop.

14) Time for starter switch and end switch



Move the loader manually while pedaling. (See "Manual operation of the loader")

Loosen screw ② and adjust thrust switch cam ① so that the switch is turned on with the end switch depressed completely.

As a rule of thumb, the flat of the thrust switch is perpendicular to the end switch when the thrust switch is in its standby position.

Note:

The end switch must be actuated prior to the start switch.

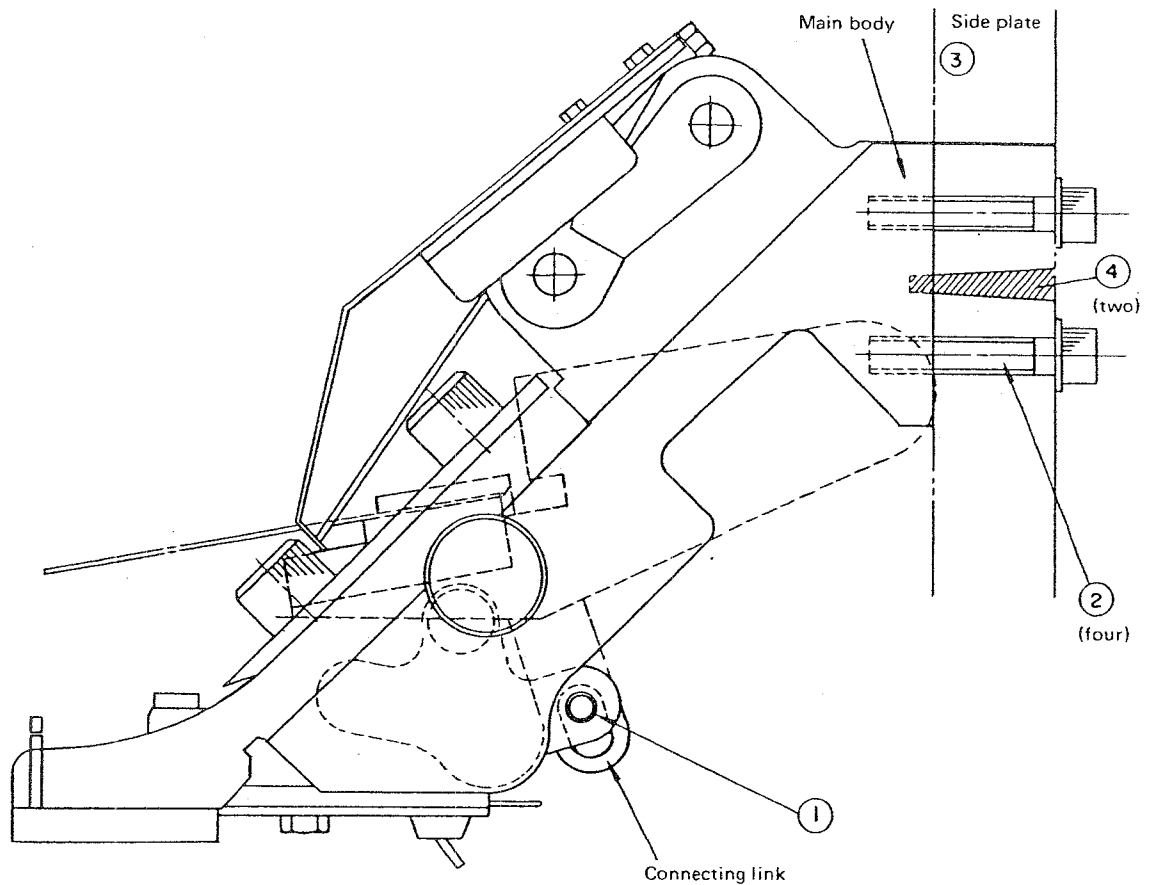
The machine does not start if both switches are actuated simultaneously.

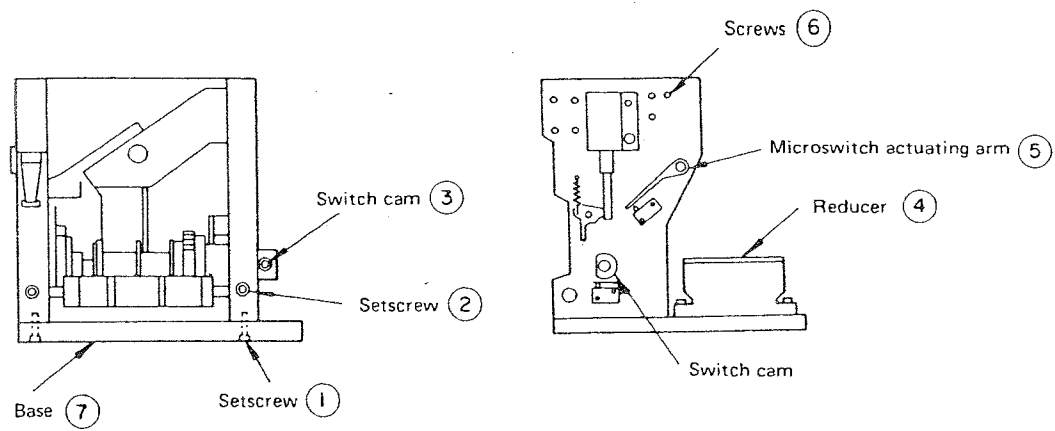
15) Disassembly and reassembly

① How to remove the special carrier

The whole special carrier mechanism can be removed as a block.

1. Remove hinge screw ① from the rear of the loader.
2. Remove four setscrews ② from the main body.
3. The chute is fixed to side plate ③ with two dowels ④ to allow easy removal and installation.
To remove the chute, insert a screwdriver into the tapped hole in side plate ③ and lightly tap the screwdriver.





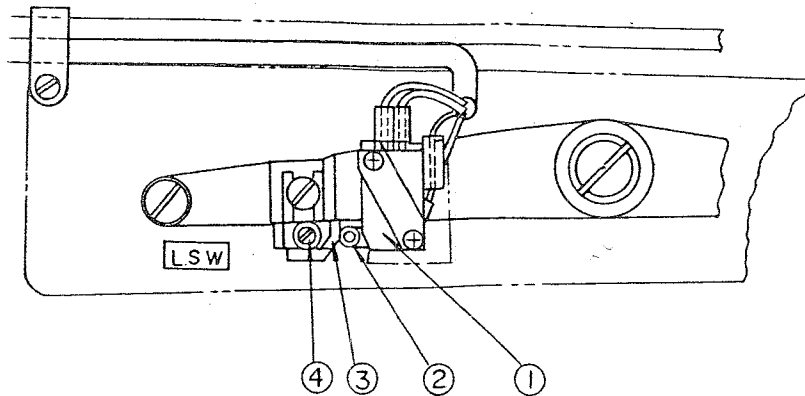
- a. Remove the special carrier. (Refer to the preceding paragraph 16)- (1).)
 - b. Remove the four setscrews of reducer (4) and remove reducer (4) from base (7).
 - c. Remove four base setscrews (1) and tap a corner of base (7) using a wood hammer to remove the base from the main body.
 - d. Remove switch cam (3).
 - e. Remove microswitch actuating arm (5).
 - f. Remove screw (6).
 - g. Loosen screw (2).
- Now, the side plate (right) can be removed.

Caution :

Use great care when removing the shaft because the shaft has needle bearings and lubricating bushings. Remove every connecting rod before removing the cam shaft cam drive assembly.

16) Positioning the L.S.W (Stop-motion switch)

Loosen screw ④ and move L.S.W detector plate ③ to the right or left so L.S.W ① moves 0.4 mm (0.016") when actuator ② is depressed in the stop-motion state (L.S.W should be ON).



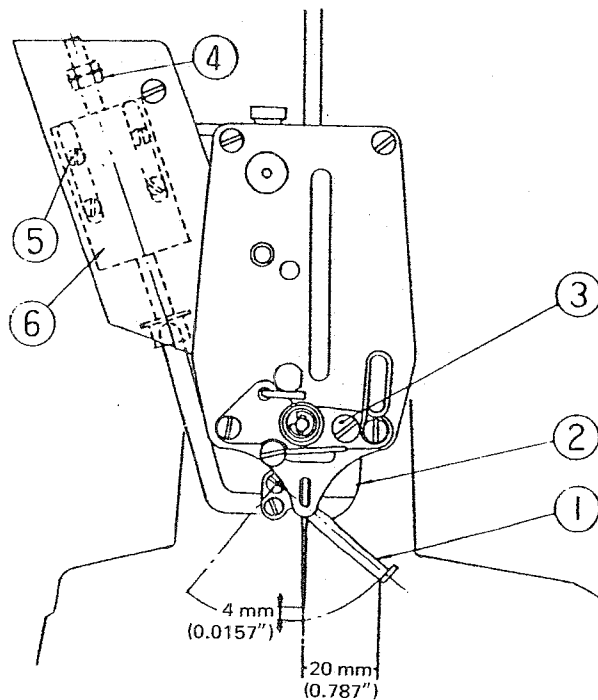
17) Positioning the wiper

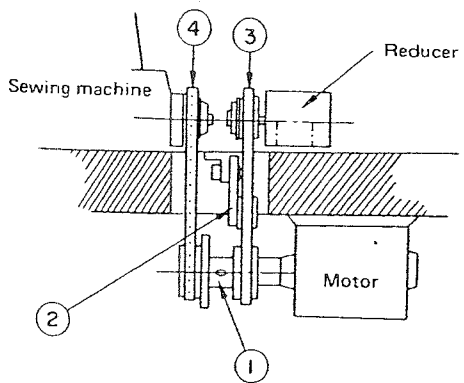
Loosen screw ③ of wiper installing base ② and adjust the position of wiper ① so the end of the wiper is 4 mm (0.157") from the point of the needle when the wiper passes under the needle at the time of stop-motion. Loosen four screw ⑤ and adjust so the end of the wiper is 20 mm (0.787") from the needle. (The stroke of wiper magnet ⑥ should be 9 mm (0.354")).

Caution:

Although the stroke of the wiper magnet can be changed by turning nut ④, do not make the stroke larger than 9 mm (0.354") because the attraction of the magnet will be changed accordingly.

If the swing motion of the wiper is not enough to wiper the thread away, decrease the distance (20 mm (0.787")) between the end of the wiper and the needle.

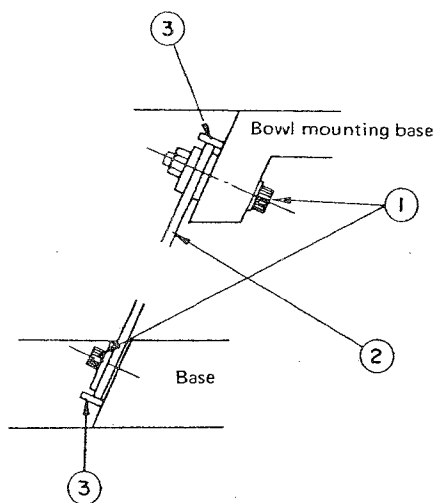




When a frequency change is necessary, replace motor pulley and feeder leaf spring.

- ① Replacing the motor pulley
Loosen the setscrew of tension pulley ② to release the tension of belt ③ .
Replace the pulley and attach the belt at a right angle to the shafts with care taken not to let the side face of the motor come in contact with pulley ① .
Tighten tension pulley ② until a belt tension with a maximum slack of approx. 5 mm (0.197") (under 1 kg pressure) is obtained.

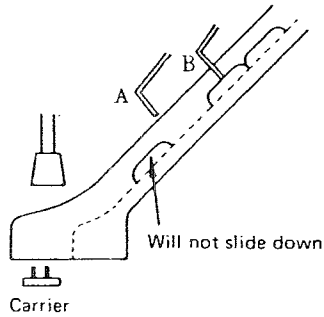
Frequency	Sewing speed	Feeder speed	V belt ③	V rope ④	Pulley Part No.
50 Hz	1300 spm	1000 rpm	M25	600 mm (23.622")	GBR0150400A
60 Hz	1300 spm	1000 rpm	M24	560 mm (22.047")	GBR0150400B



- ② Replacing the feeder leaf springs
Remove the feeder bowl and the feeder cover.
Remove bolts ① and replace four leaf springs ② one by one.

Type of leaf spring
Black leaf spring for 50 Hz
Red leaf spring for 60 Hz

Be sure that both ends of leaf springs ② are in contact with the stopper pins ③ .
After replacing the leaf springs, securely tighten the bolts, otherwise vibration will not be transferred to the feeder bowl.



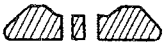

Some types of buttons, depending on the material or shape, produce static electricity due to friction between the buttons. Static-electrified buttons, whether they are made of metal or insulator, will cling to the special arms or the sliding ways and will not slide down onto the carrier. This trouble often occurs in a dry operating environment.

Remedy:

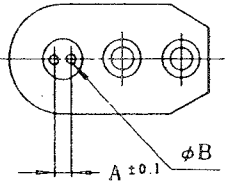
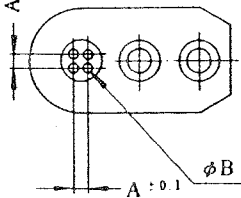
Put small amount of antistatic powder (robot powder) in the feeder bowl. Baby powder may be used in place of antistatic powder.

Note:

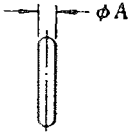
The powder absorbs humidity and solidifies and sticks on the slide if it is left for a long time. Wipe clean the portion shown by dotted line before starting operation.

- ① Material susceptible to static electricity Polyester
- ② Shape of button likely to stick to the slide  (Those having flat bottom)
- ③ Desirable shape  (Those having round bottom)

(1) Type of button carrier

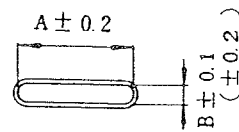
Shape	Name of part	Part No.	Dimension A	Dia. B
	Button carrier			
	Button carrier A (asm)	GBR01152AA0 (standard)	3.2 mm	φ 1.2
	Button carrier B	GBR01152BA0 (standard)	3.8	1.2
	Button carrier E	GBR01152EA0	2.0	1.0
	Button carrier F	GBR01152FA0	2.2	1.0
	Button carrier G	GBR01152GA0	2.4	1.0
	Button carrier H	GBR01152HA0	2.6	1.0
	Button carrier J	GBR01152JA0	2.8	1.0
	Button carrier K	GBR01152KA0	3.0	1.0
	Button carrier L	GBR01152LA0	2.4	1.2
	Button carrier M	GBR01152MA0	2.6	1.2
	Button carrier N	GBR01152NA0	2.8	1.2
	Button carrier P	GBR01152PA0	3.0	1.2
		Button carrier C (asm)	GBR01152CA0 (standard)	2.6 mm
Button carrier D		GBR01152DA0 (standard)	3.1	1.0
Button carrier Q		GBR01152QA0	2.0	1.0
Button carrier R		GBR01152RA0	2.2	1.0
Button carrier S		GBR01152SA0	2.4	1.0
Button carrier T		GBR01152TA0	2.4	1.2
Button carrier U		GBR01152UA0	2.6	1.2
Button carrier V		GBR01152VA0	2.8	1.2
Button carrier W		GBR01152WA0	3.0	1.2
Button carrier X		GBR01152XA0	4.0	1.2
Button carrier Y		GBR01152YA0	3.2	1.5

(2) Type of set-pin

Shape	Part No.	Dimension A
	GBR01155000	φ 1.2
	GBR01156000	1.0
	GBR01155H00	1.4
	GBR01155G00	1.5

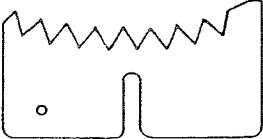

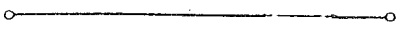

(3) Type of spring chute

* The size (A x B) is as shown at right.

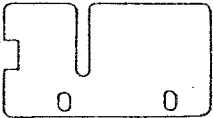





Name of part	Part No.	Marked No.	* Size (A x B)
Spring chute (asm) A	GBR01415AA0 (standard)	1	15 mm x 2.7 mm
Spring chute (asm) B	GBR01415BA0 (standard)	2	17 x 3.5
Spring chute (asm) C	GBR01415CA0	3	13 x 2.5
Spring chute (asm) D	GBR01415DA0	4	15 x 2.3
Spring chute (asm) E	GBR01415EA0	5	25 x 4.0
Spring chute (asm) F	GBR01415FA0	6	20 x 3.6
Spring chute (asm) G	GBR01415GA0	7	25 x 5.0
Spring chute (asm) H	GBR01415HA0	8	17 x 2.5
Spring chute (asm) J	GBR01415JA0	9	18 x 4.5
Spring chute (asm) K	GBR01415KA0	10	17 x 4.0
Spring chute (asm) L	GBR01415LA0	11	23 x 3.0
Spring chute (asm) M	GBR01415MA0	12	15 x 4.0
Spring chute (asm) N	GBR01415NA0	13	15 x 4.5
Spring chute (asm) P	GBR01415PA0	14	13 x 3.2
Spring chute (asm) Q	GBR01415QA0	15	20 x 4.0
Spring chute (asm) R	GBR01415RA0	16	22 x 5.7
Spring chute (asm) S	GBR01415SA0	17	13 x 2.0
Spring chute (asm) U	GBR01415UA0	19	25 x 3.6
Spring chute (asm) V	GBR01415VA0	20	13 x 1.4
Spring chute (asm) Y	GBR01415YA0	23	20 x 4.3

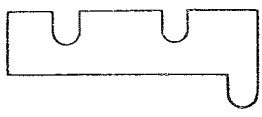

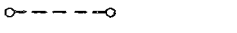
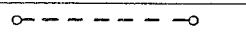
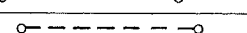

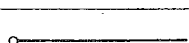
(4) Type of selector plate

	Button O.D. (mm)											
	9	10	11	12	13	14	15	16	17	18	19	20
												
												
												

(5) Type of guide plate

	Button O.D. (mm)											
	9	10	11	12	13	14	15	16	17	18	19	20
												
												
												

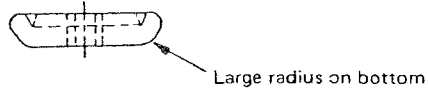
(6) Type of spacer

				Thickness of button (mm)				
				2.0	2.4	2.8	3.2	3.6
				1.8	2.2	2.6	3.0	3.4
Thin (0.2)	Medium (0.5)	Thick (1.0)	Combined thickness					
None			0 mm					
○			0.2					
	○		0.5					
○	○		0.7					
		○	1.0					
○		○	1.2					

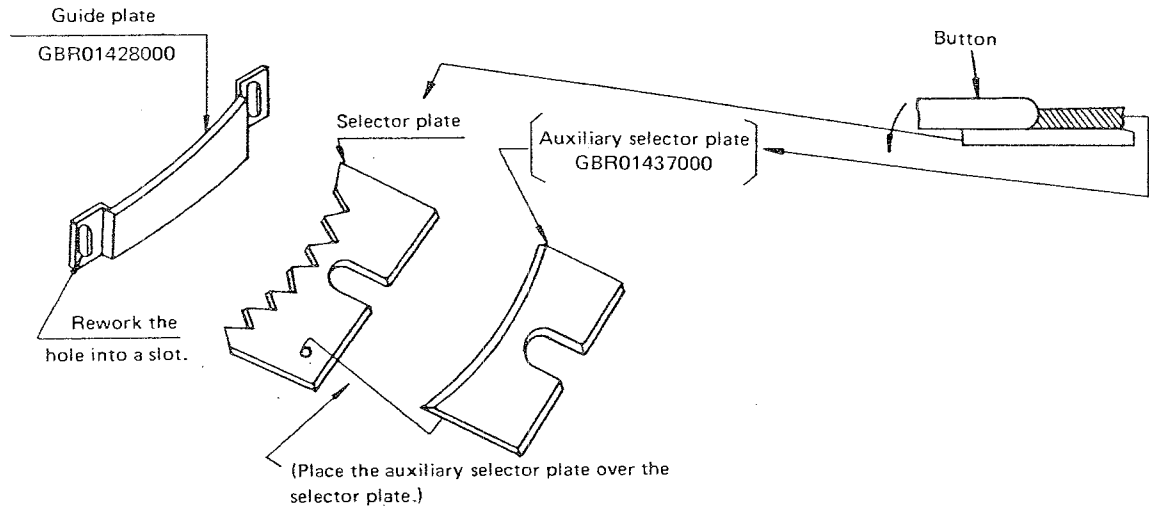
Note : ○ --- ○ represents a guide plate. ($\phi 10 \sim \phi 13$)

Use the auxiliary selector plate for buttons with flat faces as illustrated below, which are difficult to distinguish between the top and bottom faces.

(Button with flat face)



(How to use the auxiliary selector plate)



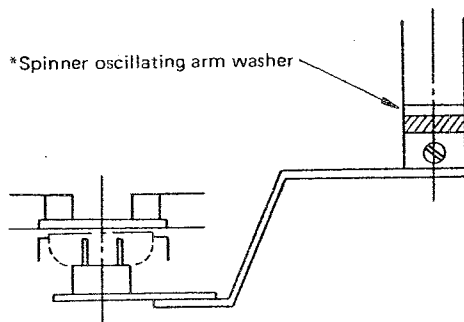
(8) Replacement parts for large buttons

When sewing large buttons ($\phi 16$ to $\phi 20$), use the following replacement parts designed for large buttons.

Replacement parts

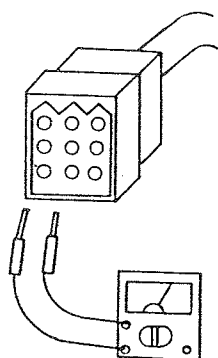
No.	Part No.	Name of part	Q'ty
1	GBR01320000 <i>PAGE 14-4</i>	Guide plate (large)	1
2	GBR013110AA <i>PAGE 17-10-1</i>	Shutter plate guide block (right) (asm) for large button	1
3	GBR0160400AA	Clamp release link for large button	1
4	GBR0134700A <i>PAGE 14-47</i>	Shutter plate for large button	1
* 5	B255728000B <i>PAGE 8-20</i>	Spinner oscillating arm washer	1

*Use this part for buttons having thickness of 3.6 mm (0.142") or more.



7. ELECTRICAL COMPONENTS

(1) Wiring system



9-pole connector (white)

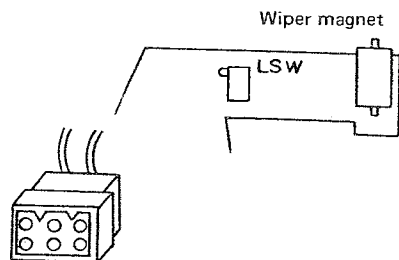
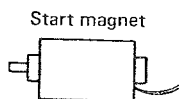
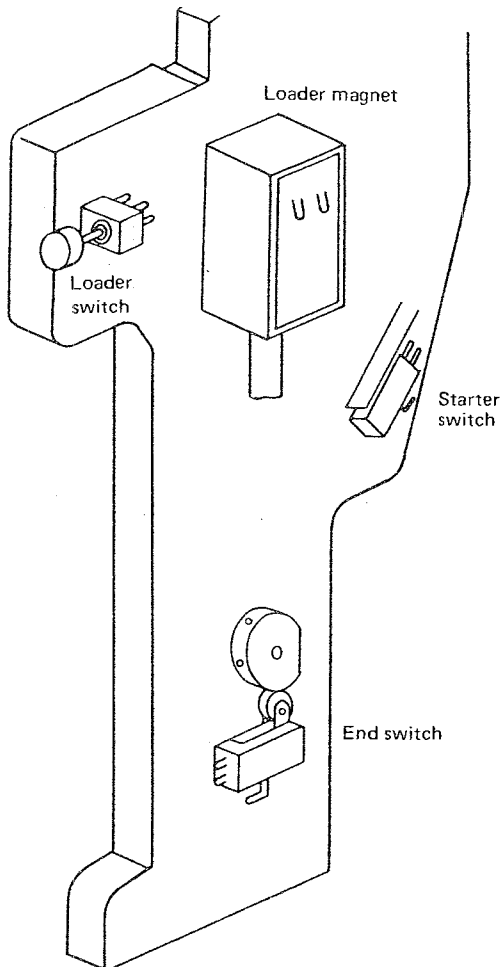
	Connector pin No.	Action	
		Press	Release
Feeder switch	① - ②	ON	OFF
	② - ③	OFF	ON
Starter switch	③ - ⑦	OFF	ON
	⑦ - ⑥	ON	OFF
End switch	⑧ - ⑨	ON	OFF
Loader magnet	④ - ⑤	20 - 25Ω	

2-pole connector (white)

Starting magnet		Approx. 6 ohm
-----------------	--	---------------

6-pole connector (white)

Wiper magnet	① - ②	Approx. 18 ohm	
L. SW	③ - ④	ON	OFF
	④ - ⑥	OFF	ON



(2) Adjusting the energizing time of the wiper magnet

Normally the wiper magnet energizing time is set to 70 msec. To adjust the wiper magnet energizing time, remove the control box cover and turn control knob VR1.

When control knob VR1 is turned clockwise, the energizing time is increased.

When control knob VR1 is turned counterclockwise, the energizing time is decreased.

(3) Line voltage change

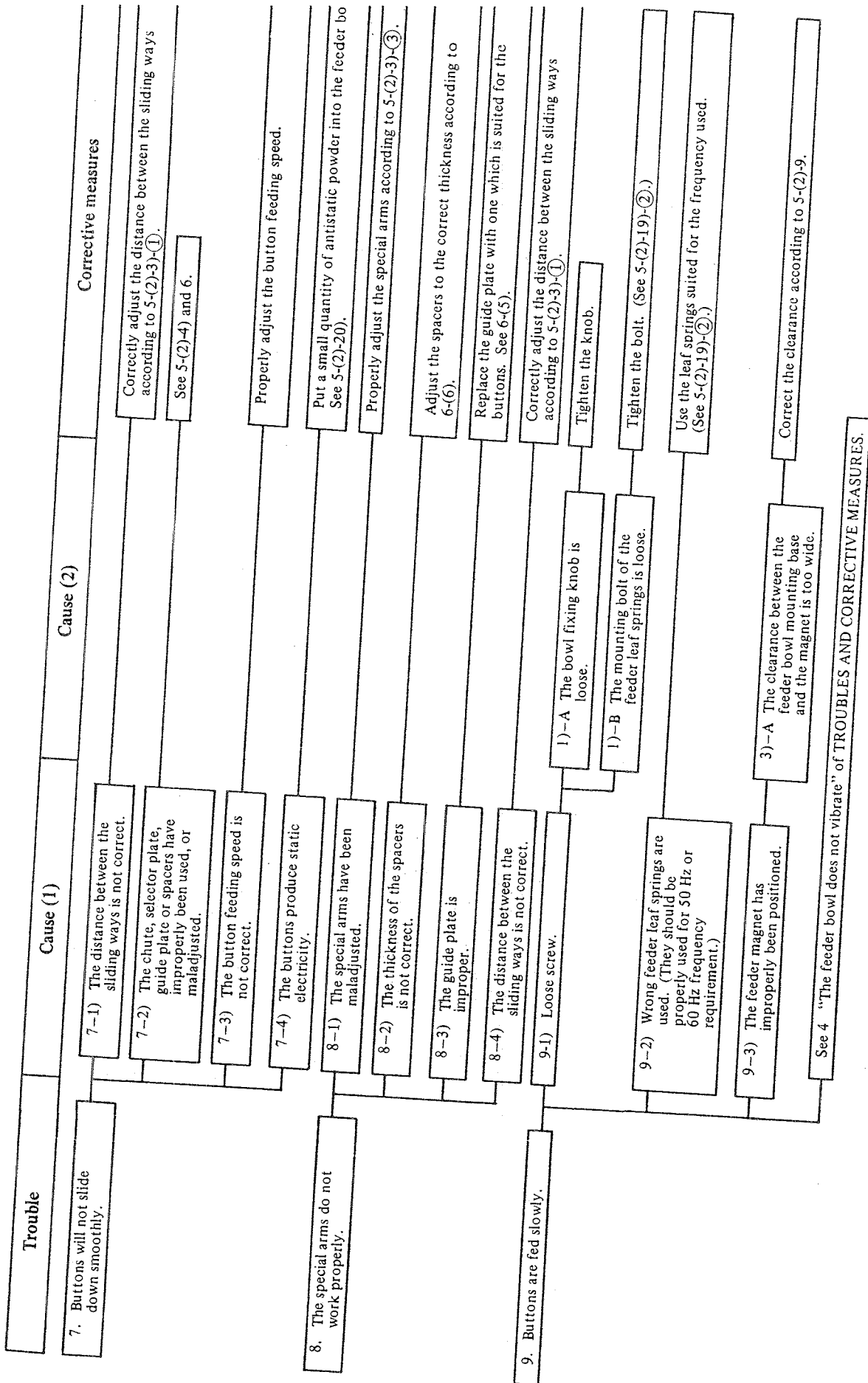
Line voltage change can be completed simply by changing the setting the transformer primary tap in the control box for the desired voltage.

Primary (100, 115, 200, 240 VAC)

8. TROUBLES AND CORRECTIVE MEASURES

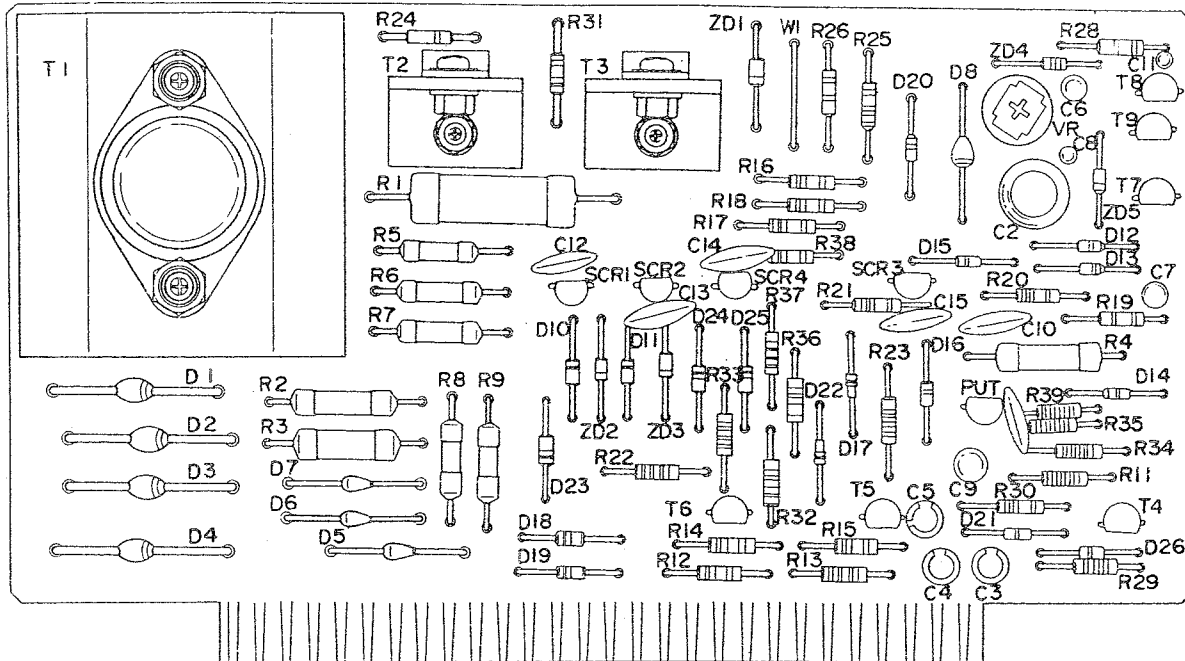
Trouble	Cause (1)	Cause (2)	Corrective measures
1. The sewing machine fails to start sewing.	1-1) Belt tension	1)-A The belt tension is not high enough.	Properly set the belt tension. See 5-(2)-19)-①.
	1-2) Stop-motion position	2)-A The machine falsely stops before it reaches the stop-motion point.	Turn the handwheel by hand until the stop-motion point is reached.
	1-3) L. SW (stop-motion switch)	3)-A The L. SW is not pressed at the time of a stop motion.	Correct the position of the L. SW. See 5-(2)-17).
		3)-B The L. SW is defective.	Replace the L. SW.
	1-4) Starter switch	4)-A The starter switch has been improperly positioned.	Correct the position of the starter switch. See 5-(2)-11)-①.
		4)-B The starter switch is defective.	Replace the starter switch.
	1-5) End switch	5)-A The end switch has been improperly positioned.	Correct the position of the end switch. See 5-(2)-15).
		5)-B The end switch is defective.	Replace the end switch.
	1-6) Drive arm	6)-A The drive arm has been maladjusted.	Properly adjust the drive arm. See 5-(2)-11).
1-7) Fuse	7)-A Fuse F1 (5A) is blown.	Replace the fuse F1.	
1-8) Starting magnet	8)-A The starting magnet has been improperly positioned.	Correct the position of the starting magnet. See 5-(2)-14).	
		8)-B Poor contact or disconnection of the connector.	Repair or replace the connector.
	8)-C Disconnection of the starting magnet	Check for the continuity between pins 1 and 2 of the 2-pole connector. If the measurement does not show a 6 ohm resistance, replace the starting magnet.	
1-9) Control circuit board	9)-A The control circuit board is defective.	Replace the control circuit board.	

Trouble	Cause (1)	Cause (2)	Corrective measures
2. The sewing machine fails to stop when it should.	2-1) Starting magnet	1)-A The starting magnet has been improperly positioned. 1)-B The starting magnet is not turned OFF when it should. (Transistor T1 is defective.)	Correct the position of the starting magnet. See 5-(2)-1(4).
	2-2) L. SW (stop-motion switch)	2)-A The L. SW chatters.	Replace transistor T1 or the control circuit board.
	2-3) Starter switch	3)-A The starter switch has been positioned improperly.	Correct the position of the L. SW. See 5-(2)-1(7).
3. A button is not released after it is sewn.	3-1) The button clamp jaw levers do not open properly.	1)-A No clearance is provided between the button and the button clamp jaw levers when the button clamp jaw levers open fully.	Correctly adjust the clamp release arm according to 5-(2)-1-(3).
4. The feeder bowl does not vibrate.	4-1) Voltage is not being applied to the feeder magnet.	1)-A Fuse F2 (1A) has blown.	Replace fuse F2.
		1)-B Connector 6P (blue) has poor contact or disconnection.	Correct the poor contact or replace the connector in case of disconnection.
		1)-C The feeder magnet is defective.	Check for continuity between 4 and 5 of connector 6P. If the resistance between them is not 30Ω, replace the feeder magnet.
	4-2) The feeder knob (VR2) or diode D ₉ is defective.		Check for continuity between pins 4 and 5 of the blue 6-pole connector on the plug. If the measurement does not indicate a 30 ohm resistance, replace the feeder magnet. Check for the continuity between pins 4 and 5 of the blue 6-pole connector on the box (normal resistance: 200 ohm). The resistance should be 30 to 200 ohm when measured with the positive and negative terminals of the tester reversed. If variable resistor VR2 fails to give a resistance which lies in the range of 30 to 200 ohm, replace variable resistor VR2 or diode D ₉ .
5. Buttons with bottoms up are falsely fed.	5-1) The selector plate has been maladjusted.		Properly adjust the selector plate according to 5-(2)-4)-2.
6. Buttons are not smoothly fed.	6-1) There are obstacles like wastes or projections on the button path.		Remove the obstacle.
	6-2) The chute, selector plate, guide plate, or spacers have improperly been used or maladjusted.		See 5-(2)-4) and 6.

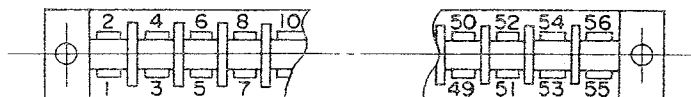


See 4 "The feeder bowl does not vibrate" of TROUBLES AND CORRECTIVE MEASURES.

Trouble	Cause (1)	Cause (2)	Corrective measures
10. Buttons are not supplied to the button clamp jaw levers.	10-1) The button clamp mechanism has been maladjusted.	1)-A The button clamp has been maladjusted.	Properly adjust the button clamp according to 5-(2)-1)-(2).
		1)-B The opening of the button clamp jaw levers has been maladjusted.	Properly adjust the clamp release arm according to 5-(2)-1)-(3).
		1)-C The height of the button clamp jaw levers is not correct.	Properly adjust the height of the button clamp jaw lever to 5-(2)-1)-(4).
		1)-D The spinner oscillating arm does not work properly.	See 5-(2)-2).
11. A button is not set on the button set-pin (carrier).	11-1) The special arms have been maladjusted.		Properly adjust the special arms according to 5-(2)-2)-(3).
	11-2) The sliding ways have been maladjusted.		Properly adjust the sliding ways according to 5-(2)-5).
	11-3) The shutter plate opening have been maladjusted.		Properly adjust the shutter plate according to 5-(2)-6).
12. The loader cannot be operated by hand.	12-1) The clutch key fails to work.	1)-A The clearance at the clutch key is too small.	Correct the clearance. See 5-(2)-13).
	12-2) The torque limiter (safety device) has been actuated.		See 5-(2)-8).
13. The loader fails to operate when the loader switch is pressed.	13-1) The loader magnet fails to work.	1)-A The clearance at the clutch key is too large.	Correct the clearance at the clutch key. See 5-(2)-13).
		1)-B The loader magnet is defective.	Check for continuity between pins 4 and 5 of the 9-pole connector. If the measurement does not indicate a resistance of 20 to 25 ohm, replace the loader magnet.
	13-2) The end switch has been improperly positioned.		Correct the position of the end switch. See 5-(2)-15).
	13-3) The end switch is defective.		Check for continuity between pins 8 and 9 of the 9-pole connector, and if any abnormal conditions are found, replace the end switch.
14. The sewing machine operates, but the loader fails to operate.	14-1) The L. SW has been improperly positioned.		Correct the position of the L. SW. See 5-(2)-17).
	14-2) The wiper magnet is defective.		Check for continuity between pins 1 and 2 of the white 6-pole connector. If the measurement result does not indicate a 18 ohm resistance, replace the wiper magnet.
	14-3) The control circuit board is defective		Replace the control circuit board.



(1) Circuit board connector terminal



(2) Wiring of circuit board connector terminal and connector terminals

Circuit board connector terminal	16	2	32	42	28	18	4	24	8
9-pole connector terminal	1	2	3	4	5	6	7	8	9

Circuit board connector terminal	44	30	10	34		6
6-pole connector terminal	1	2	3	4	5	6

Circuit board connector terminal	36	38	46
2-pole connector terminal	1	2	

10. SEQUENCE CHART

