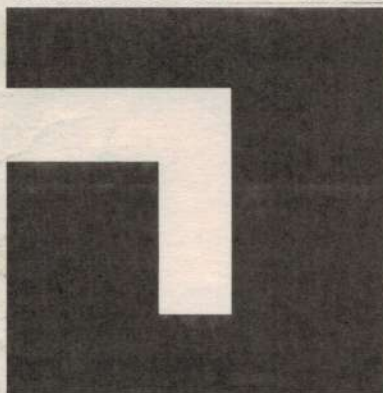


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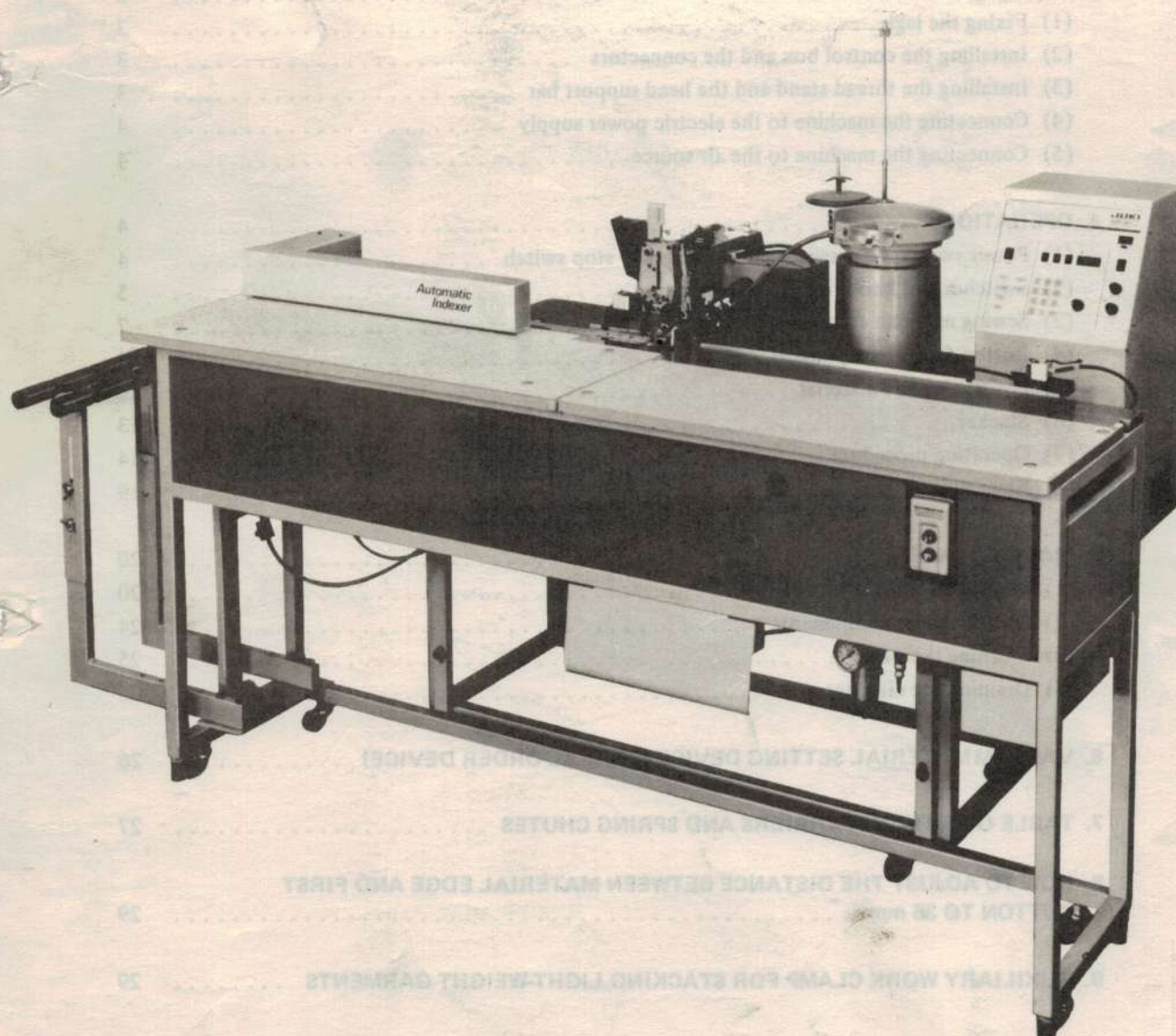
No. 01



MODEL **ACF-161-373**

BUTTON ATTACHING INDEXER

INSTRUCTION BOOK



TOKYO JUKI INDUSTRIAL CO., LTD.

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1. GENERAL DESCRIPTION

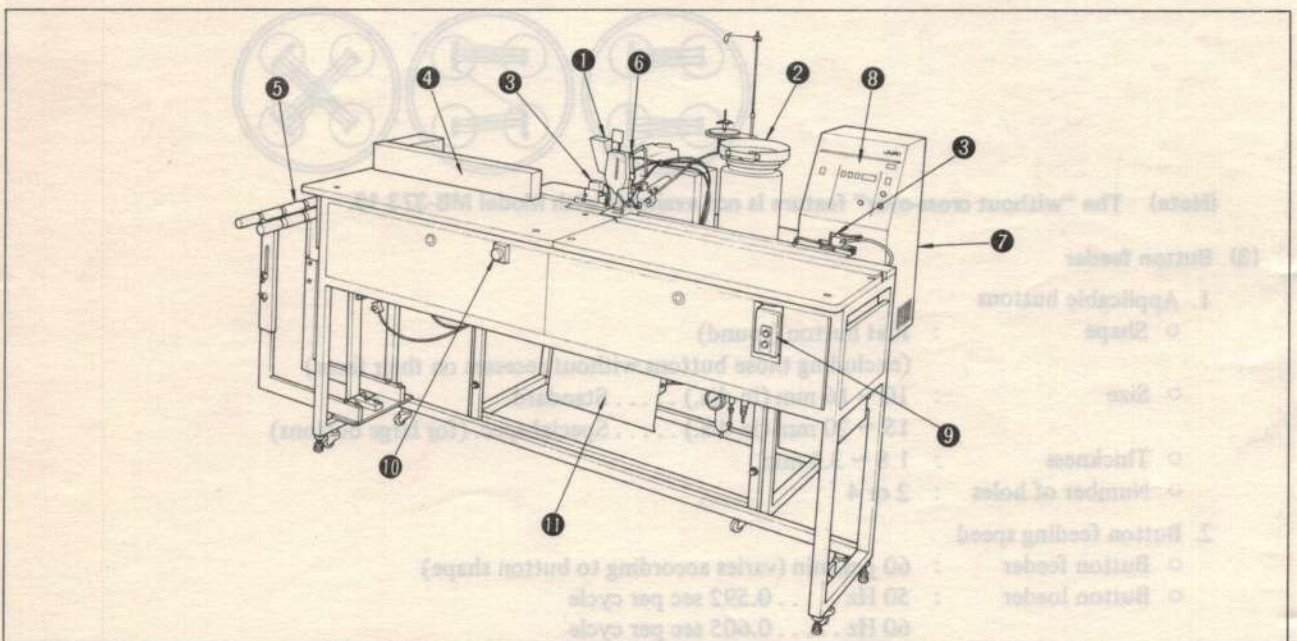
Mainly consisting of a sewing machine, button feeder, conveyor, and stacker, the ACF-161-373 indexer is designed to automatically carry out a series of operations starting with sewing buttons on the front center strips of men's shirts, etc. and ending with stacking of workpieces.

(1) Features

1. High material feeding speed and accurate feeding interval ensured.
2. Easy to set and change the number or feed amount of buttons. Further, three different feed patterns can be stored, permitting easy pattern change.
3. All the operations from button sewing to stacking are done automatically, enabling an operator to attend on two or three machines at a time.
4. Various indications of errors (erroneous setting, defective button sewing, etc.) will be given.
5. Unpressed front center strips can be also dealt with by the use of the vacuum material setting device (optional device).
6. Buttons can be sewn also to the front top-center strips of ladies' wear.

(2) Configuration

- | | |
|-------------------|--------------------|
| ① Sewing machine | ⑦ Control box |
| ② Button feeder | ⑧ Control panel |
| ③ Work clamp foot | ⑨ Power switch |
| ④ Conveyor | ⑩ Emergency switch |
| ⑤ Stacker | ⑪ Start switch |
| ⑥ Button sensor | |



(3) Cautions in operation

1. Before operation, be sure that the motor of the sewing machine runs in the correct direction. (The motor should run counter-clockwise as observed from the motor pulley.)
2. Do not put your hand near the needle when turning ON the power switch or starting the sewing machine.
3. Do not start the sewing machine with the belt cover or eye guard removed.
4. During operation, do not bring head or hands close to, or place anything near the V-belt, motor or stacker, otherwise personal injuries or dangerous conditions may result.
5. Be careful not to have your hand caught by the work clamp when setting materials.

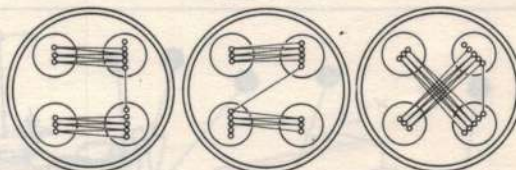
2. SPECIFICATIONS

(1) Main unit

- | | | |
|--|---|----------------------------------|
| 1. Feed interval | : 20 ~ 250 mm for automatic operation
20 ~ 255 mm for manual operation | } Can be set in every millimeter |
| 2. Overall feed amount | : Max. 650 mm | |
| 3. Number of buttons which can be sewn | : 2 to 9 pcs. | |
| 4. Distance from material front edge to first button | : Min. 40 mm (Min. 35 mm is possible by additional adjustment) | |
| 5. Distance from material side edge to button | : 12 to 25 mm | |
| 6. Size of material | : 100 ~ 400 mm wide x 350 ~ 900 mm long | |
| 7. Electric power supply | : 3-phase 200V | |
| 8. Power consumption | : 540W | |
| 9. Compressed air pressure | : 4 kg/cm ² | |
| 10. Air consumption | : 62 Nl/min. or less | |
| 11. Dimensions of machine | : Width — 1,797 mm (excluding stacker) , 2,140 mm (including stacker)
Depth — 998 mm
Height of table — 900 ~ 1,020 mm | |
| 12. Weight of machine | : 213 kg | |

(2) Button sewing machine

- | | |
|--------------------------|--|
| 1. Sewing speed | : Max. 1,300 s.p.m. |
| 2. Number of stitches | : 8 stitches and 16 stitches |
| 3. Feed length | : Crosswise — 2.5 ~ 6.5 mm,
Lengthwise — 0 ~ 6.5 mm |
| 4. Needle | : TQ x 7, TQ x 1 #16 (#18, #20) |
| 5. Lubricant | : JUKI New Defrix Oil No. 1 |
| 6. Needle entry diagrams | : MB-373, MB-373-10, MB-373-11 |



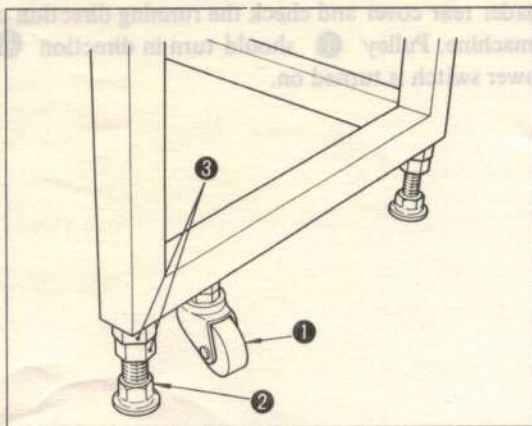
(Note) The "without cross-over" feature is not available with Model MB-373-10.

(3) Button feeder

- | | |
|-------------------------|---|
| 1. Applicable buttons | |
| ○ Shape | : Flat button (round)
(excluding those buttons without recesses on their faces) |
| ○ Size | : 10 ~ 16 mm (in dia.) Standard
15 ~ 20 mm (in dia.) Special spec. (for large buttons) |
| ○ Thickness | : 1.8 ~ 3.5 mm |
| ○ Number of holes | : 2 or 4 |
| 2. Button feeding speed | |
| ○ Button feeder | : 60 pcs/min (varies according to button shape) |
| ○ Button loader | : 50 Hz 0.592 sec per cycle
60 Hz 0.605 sec per cycle |

3. INSTALLATION

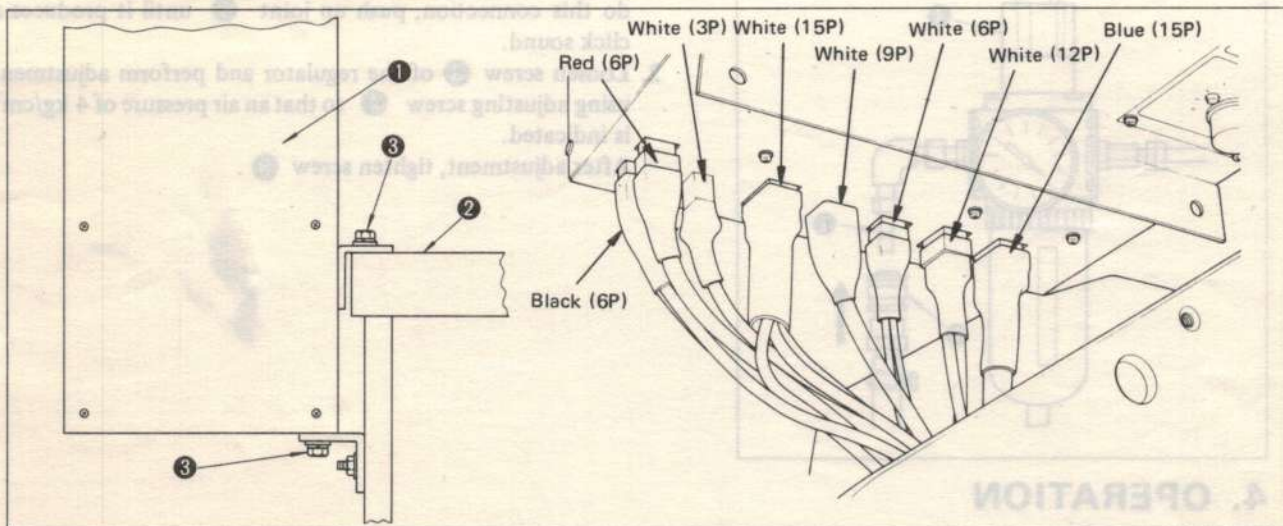
(1) Fixing the legs



The legs of the main unit are provided with casters ① for easy transfer. Fix the legs with eight adjustor bolts ②, and tighten lock nuts ③ after adjustment.

Adjust the height of the legs are required using adjustor bolts ② which are adjustable up to 120 mm.

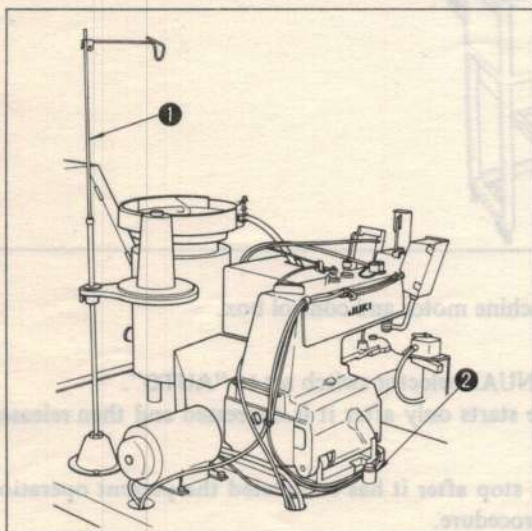
(2) Installing the control box and the connectors



1. Attach control box ① to the right side of machine table ② using four setscrews ③.
2. Connect each connector to the control box.

(Caution) Pay enough attention to the color of the 6-pole connector and 15-pole connector. Be sure to turn off the power switch before attaching or removing the connectors.

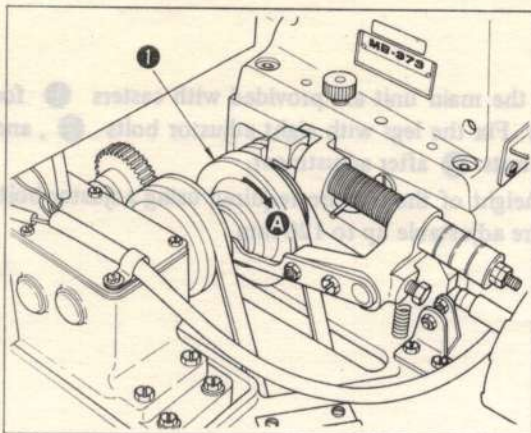
(3) Installing the thread stand and the head support bar



Position thread stand ① as illustrated and fix it with the screws supplied with the thread stand.

Also insert head support bar ② into the specified point.

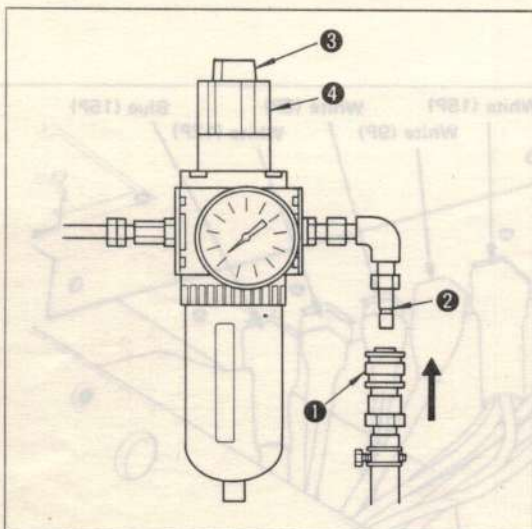
(4) Connecting the machine to the electric power supply



First confirm that the power switch is "OFF", then connect the power cord to the power supply.

Open the loader rear cover and check the running direction of the sewing machine. Pulley ① should turn in direction A when the power switch is turned on.

(5) Connecting the machine to the air source



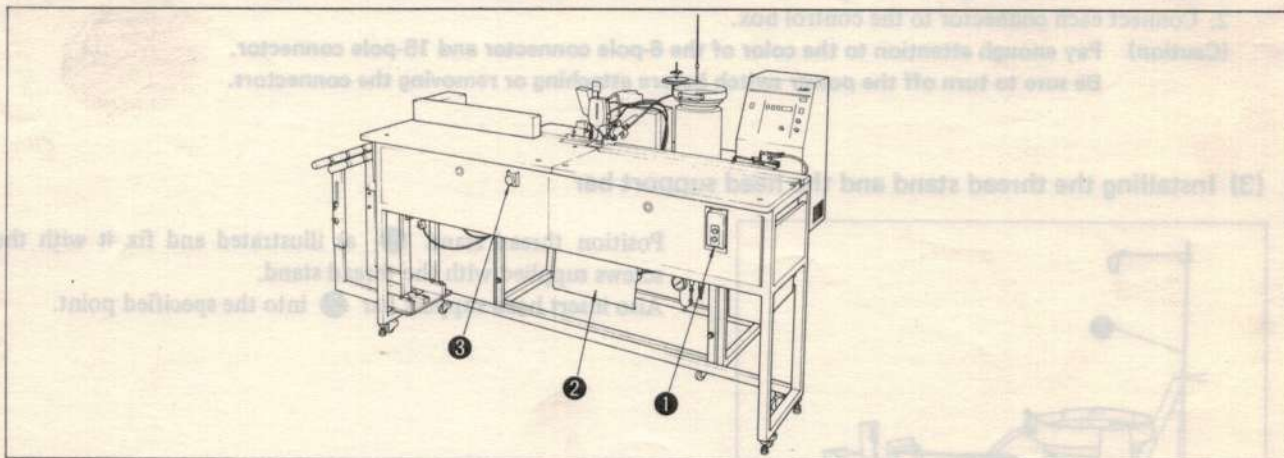
1. Connect quick-coupling joint ① to the hose of the air source and then connect it joint ② of the main unit. To do this connection, push up joint ① until it produces a click sound.

2. Loosen screw ③ of the regulator and perform adjustment using adjusting screw ④ so that an air pressure of 4 kg/cm² is indicated.

After adjustment, tighten screw ③.

4. OPERATION

(1) Power switch, start switch, and emergency stop switch



① Power switch

Switches ON/OFF the electric power supplied to the sewing machine motor and control box.

② Start switch

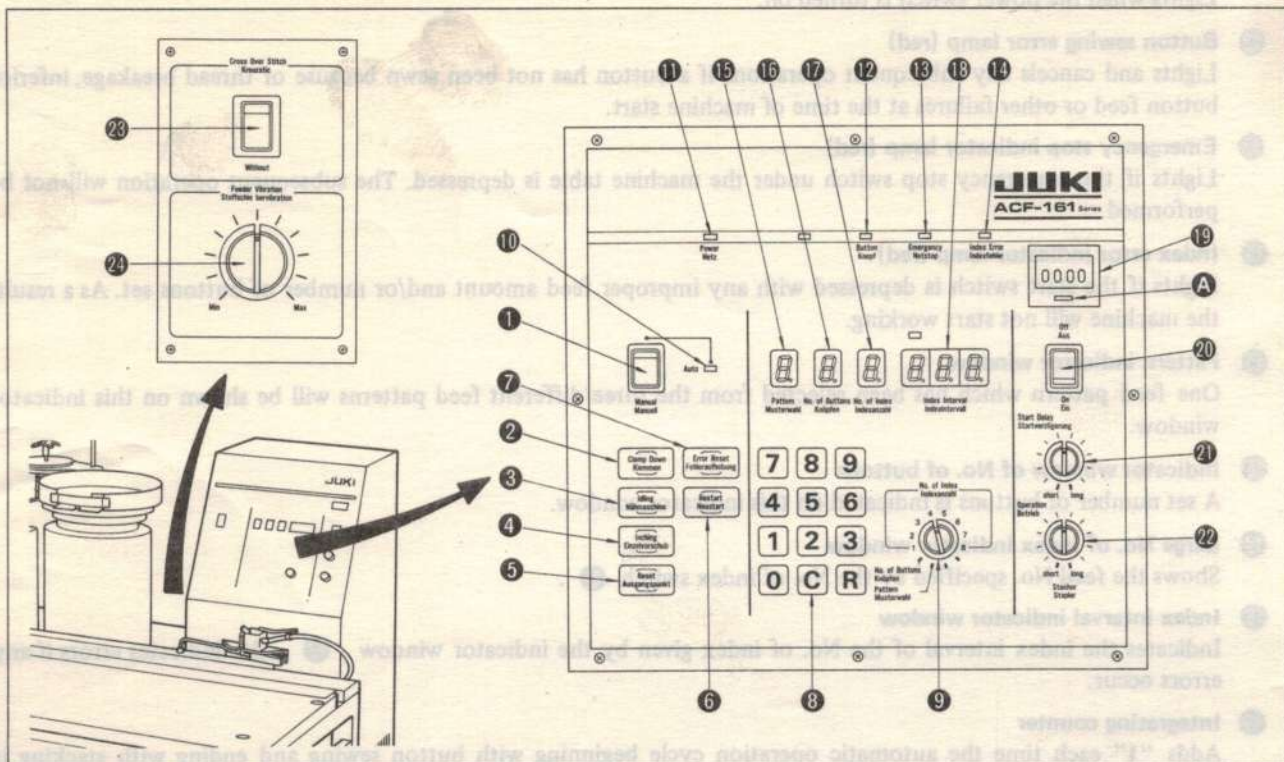
Operate this switch when starting the machine with AUTO/MANUAL selector switch set to "AUTO".

This switch is provided with safety design so that the machine starts only after it is depressed and then released.

③ Emergency stop switch

If this switch is depressed during operation, the machine will stop after it has completed the present operation. Refer to "(8) Error indication and resetting" for the resetting procedure.

(2) Switches and knobs on the control panel



1 AUTO/MANUAL selector switch

When the knee switch is depressed with this selector switch set to "AUTO", a series of operations from button sewing to stacking will be performed under predetermined conditions.

When this switch is set for "MANUAL", each of the following operations will be given independently through switches 2 to 5.

2 Clamp down switch

The work clamp foot goes up and down each time this switch is depressed.

3 Idling switch

The sewing machine alone will start when this switch is depressed.

4 Inching switch

When this switch is depressed, the machine will feed the material in the amount indicated index internal indicator window 18.

When this switch is kept depressed, the machine will feed the material continuously.

5 Reset switch

Used to return the work clamp foot which has been moved during the fixed dimension feed operation to its home position.

6 Restart switch

Depress this switch if any button sewing error occurs during the automatic operation, then the sewing machine will restart to proceed with the subsequent operation.

7 Error reset switch

This switch is depressed to initialize the machine after correcting errors. (Refer to "(8) Error indication and resetting.")

8 Keyboard switches

Pattern No., number of buttons and feed amount are inputted using these switches.

9 No. of index switch

Used to select keyboard inputs.

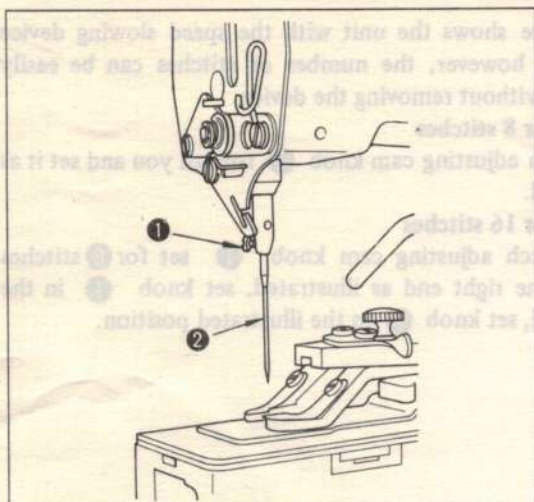
10 AUTO indicator lamp (green)

Lights when AUTO/MANUAL selector switch 1 is set to "AUTO".

- 11 **Power indicator lamp (green)**
Lights when the power switch is turned on.
- 12 **Button sewing error lamp (red)**
Lights and cancels any subsequent operations if a button has not been sewn because of thread breakage, inferior button feed or other failures at the time of machine start.
- 13 **Emergency stop indicator lamp (red)**
Lights if the emergency stop switch under the machine table is depressed. The subsequent operation will not be performed.
- 14 **Index error indicator lamp (red)**
Lights if the start switch is depressed with any improper feed amount and/or number of buttons set. As a result, the machine will not start working.
- 15 **Pattern indicator window**
One feed pattern which has been selected from the three different feed patterns will be shown on this indicator window.
- 16 **Indicator window of No. of buttons**
A set number of buttons is indicated on this indicator window.
- 17 **Large No. of index indicator window**
Shows the feed No. specified by the No. of index switch 9 .
- 18 **Index interval indicator window**
Indicates the index interval of the No. of index given by the indicator window 17 . Also indicates errors if any errors occur.
- 19 **Integrating counter**
Adds "1" each time the automatic operation cycle beginning with button sewing and ending with stacking is completed.
The counter is reset to "0000" when the resetting switch A is depressed.
The counter operates when stacker switch 20 is set to "ON" but does not operate if the stacker switch is set to "OFF". When the counter is required to operate without actuating the stacker, set the stacker switch to "ON" and move up the conveyor.
- 20 **Stacker switch**
When this switch is set to "ON", a series of stacking operations will be done to stack a finished front center strip after completing last button sewing in the automatic operation.
When this stacker switch is set to "OFF", the stacker will not be actuated.
- 21 **Stacker start delay adjusting knob**
Used to adjust the time between completion of button sewing and start of stacker operation when stacker switch 20 has been set to "ON".
- 22 **Stacker operation time adjusting knob**
Used to adjust the time between the start of operation and return of the stacker when stacker switch 20 has been set to "ON".
- 23 **Cross-over stitch selector switch**
Set as follows:
For sewing 4-hole buttons:
"WITH" + 16 sewing machine stitches With cross-over stitch
"WITHOUT" + 8 sewing machine stitches Without cross-over stitch
For the adjustment of the sewing machine, refer to "4) Changing the number of stitches".
- 24 **Feeder vibration adjusting knob**
As this adjusting knob is turned toward "MAX", the buttons in the bowl will go up faster and as it is turned toward "MIN", the buttones will go up slower.

(3) Sewing machine components

(Caution) Make sure to turn off the power switch before making adjustment of the sewing machine.

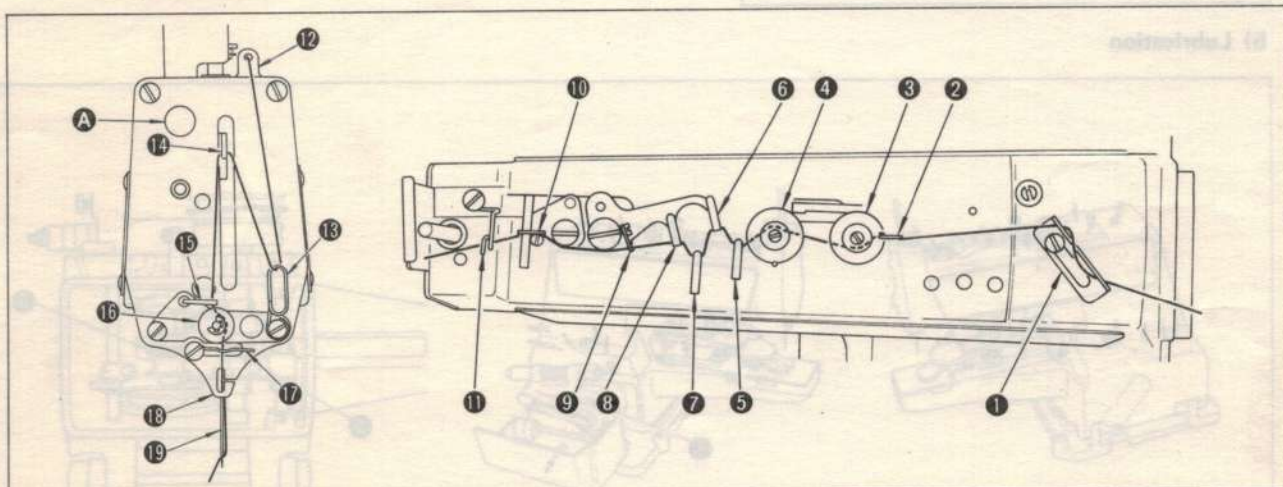


1) Attaching the needle

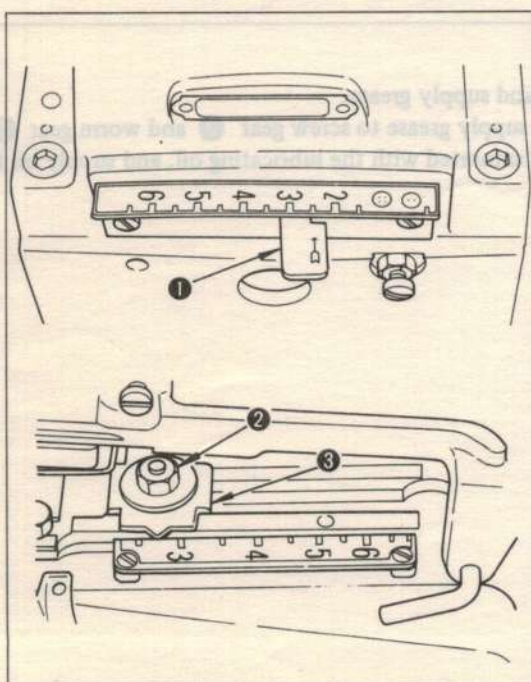
The standard needle is TQ x 7 #16.

1. Loosen setscrew ①, and hold needle ② with its long groove facing you.
2. Insert needle ② into the needle bar hole until it will go no further, then securely tighten setscrew ①.

2) Threading the machine head



Thread the machine head in the order illustrated, and pass the thread through the needle eyelet from the operator's side while pushing nut A so that the thread trails about 60 to 70 mm from the needle eyelet.



3) Setting for sewing 2-hole and 4-hole buttons

First determine the interval between the holes in the button. For a 4-hole button, set the lengthwise feed graduated plate and the crosswise feed graduated plate to the same value.

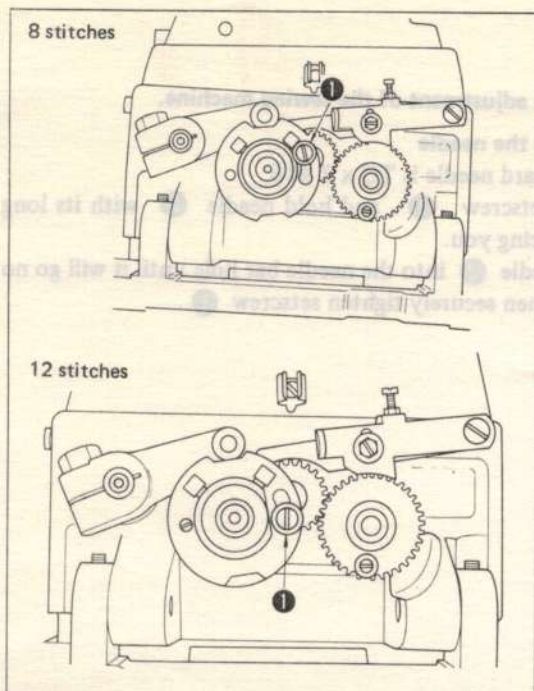
A. Longitudinal feed graduated plate

Set the graduated plate to "0" for 2-hole buttons or to a graduation corresponding to the measured value for 4-hole buttons while pushing down longitudinal feed regulator lever ①.

B. Lateral feed graduated plate

Loosen nut ②, and set pointer ③ to a graduation corresponding to the measured value. Then retighten nut ②.

(Caution) Confirm that the needle enters the center of each button hole before operating the sewing machine.



4) Changing the number of stitches

To change the number of stitches, open the left face cover and change the setting through stitch adjusting cam knob ①.

The figure shows the unit with the speed slowing device removed, however, the number of stitches can be easily changed without removing the device.

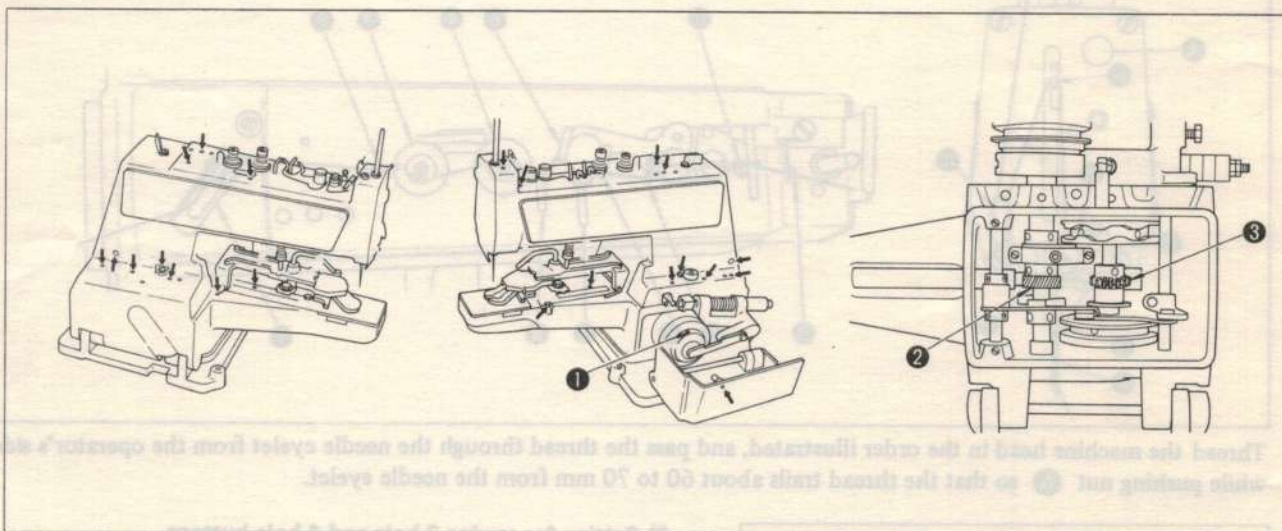
A. Setting for 8 stitches

Pull stitch adjusting cam knob ① toward you and set it as illustrated.

B. Setting for 16 stitches

When stitch adjusting cam knob ① set for 8 stitches reaches the right end as illustrated, set knob ① in the illustrated, set knob ① in the illustrated position.

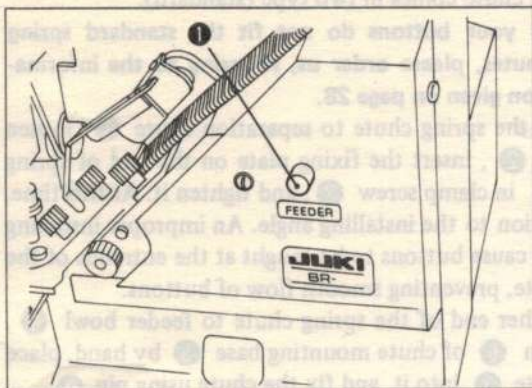
5) Lubrication



1. Apply Juki New Defrix Oil No. 1 to the parts shown by arrows.
2. Open the loader rear cover, remove screw ① of the drive pulley and supply grease.
3. Tilt the machine head (refer to 5-(1)-1), tilting the machine), and supply grease to screw gear ② and worm gear ③.
4. Check whether or not the oil felt on the machine sub-base is fully saturated with the lubricating oil, and supply oil if necessary.

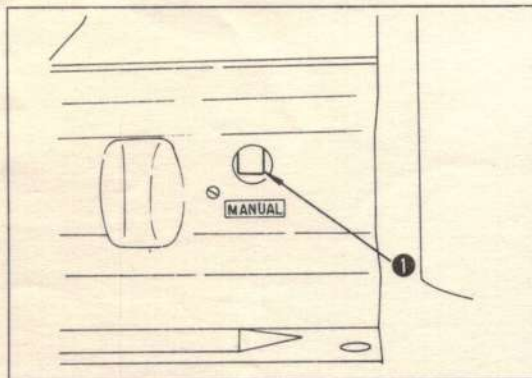
(4) Button feeder components

(Caution) Ensure to set AUTO/MANUAL selector switch on the control panel to "MANUAL" before performing adjustment of the button feeder components.



1) Loader pushbutton switch

Loader pushbutton switch ① on the front of the button feeder is used to advance the button feeder solely by one cycle. This operation is needed when a batch of buttons newly supplied or added to the button loader is not distributed evenly in the feeding system.

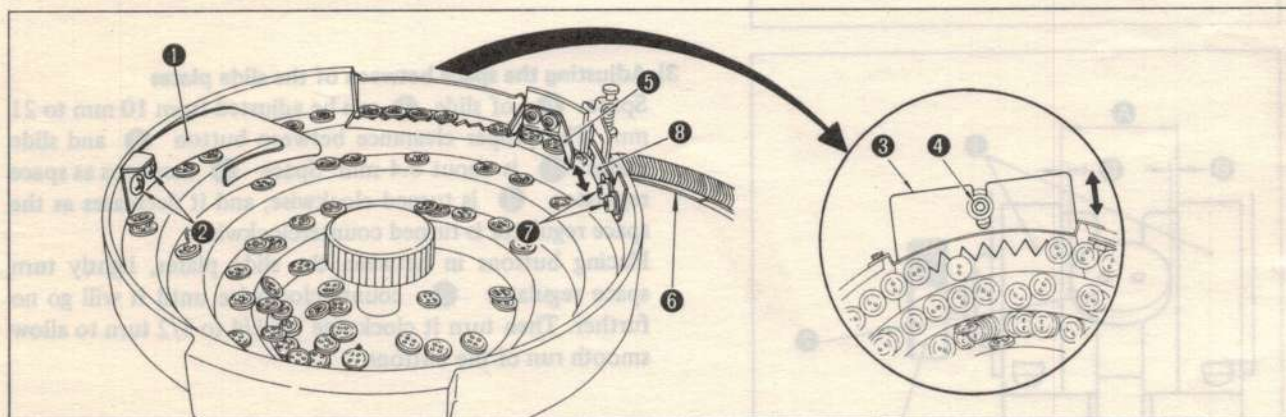


2) Manual operation

To manually operate the button feeder, depress manual lever ① seen through the manual access opening with your finger and turn by hand the needle driving pulley.

(Caution) Never turn the pulley in the reverse direction.

3) Adjusting the attachments in the feeder bowl



A. Guide plate

Adjust the clearance between the bowl track surface and guide plate ① to allow only one button to pass through between them, then fix the plate using setscrew ②. The appropriate clearance between the button top face and the guide plate is approx. 0.7 mm.

B. Separation plate

Buttons with their wrong side up are sorted from those with their side up when they pass through the serrated part of separation plate ③. Loosen lock bolt ④, move the separation plate in the direction of the arrow, and fix it in proper position so that buttons with their wrong side up are shaken down in the middle of the separation plate.

(Note) A change in the button feed speed may require repositioning of the separation plate.

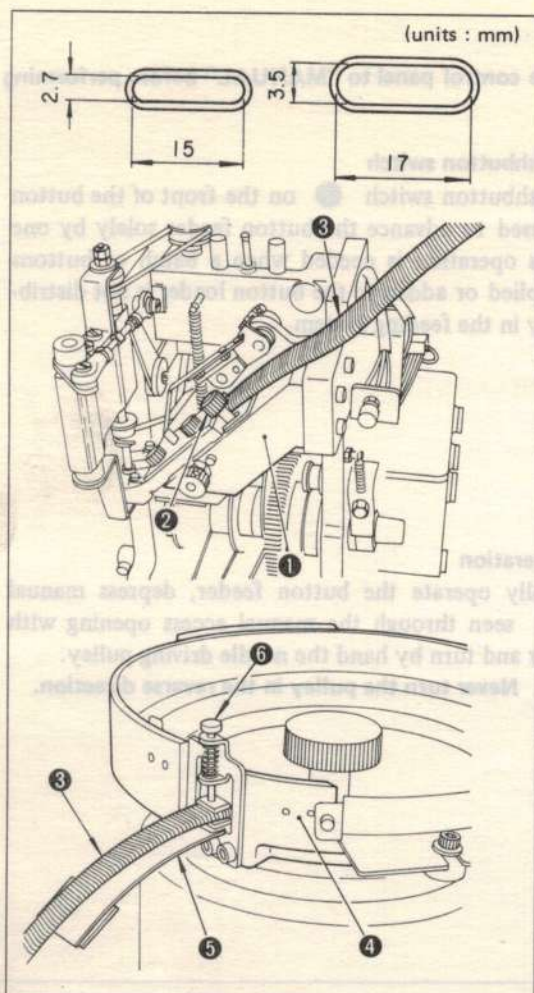
C. Overflow prevention plate

Overflow prevention plate ⑤ functions to return a button into the bowl if the button rides on top of another at the spring chute entrance after it passes through separation plate ③. The overflow plate is to be adjusted in the same way as in guide plate ①.

D. Bridge plate

Small buttons sometimes drop out through the clearances at spring chute mounting base ⑥. In such a case, loosen two setscrews ⑦ and move bridge plate ⑧ forward or backward to position it properly in order to prevent buttons from dropping out.

(Note) If static electricity generated comes to prevent smooth dropping of buttons, put a small amount of antistatic powder into the feeder bowl.



2) Selecting and installing the spring chute

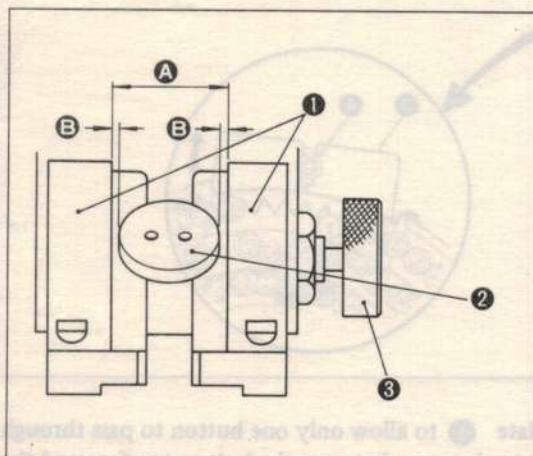
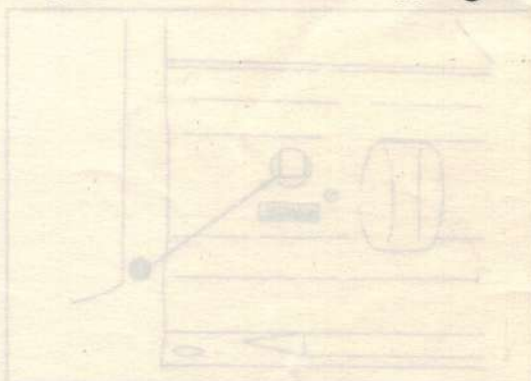
The spring chute must be replaced according to the size of buttons.

The spring chute comes in two type (standard).

(Note) If your buttons do not fit the standard spring chutes, please order us, referring to the information given on page 28.

To attach the spring chute to separation chute ①, loosen setscrew ②, insert the fixing plate on the end of spring chute ③ in clamp screw ②, and tighten it. At this time, pay attention to the installing angle. An improper installing angle may cause buttons to be caught at the entrance of the spring chute, preventing smooth flow of buttons.

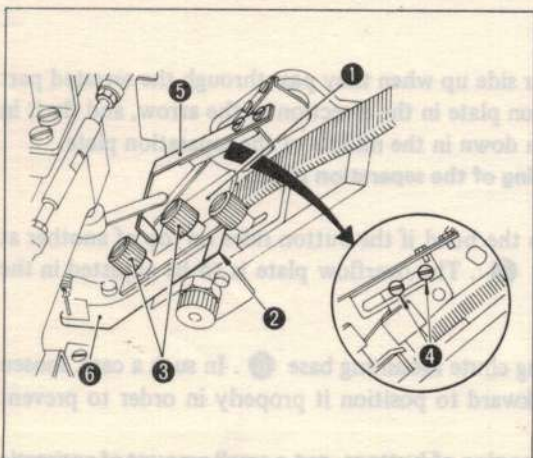
Fix the other end of the spring chute to feeder bowl ④, pull up pin ⑥ of chute mounting base ⑤ by hand, place spring chute ③ into it, and fix the chute using pin ⑥.



3) Adjusting the space between of the slide plates

Space A of slide ① can be adjusted from 10 mm to 21 mm. The proper clearance between button ② and slide plates ① is about 0.4 mm. Space A increases as space regulator ③ is turned clockwise, and it decreases as the space regulator is turned counterclockwise.

Placing buttons in between the slide plates, lightly turn space regulator ③ counterclockwise until it will go no further. Then turn it clockwise by 1/4 to 1/2 turn to allow smooth run of the buttons.

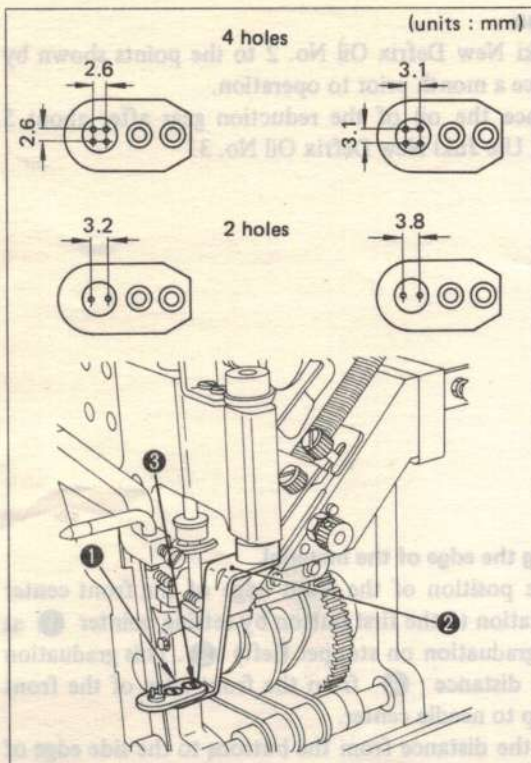


4) Replacing the guide plate and readjusting the spacer

Change guide plate ① and readjust the spacer when the size of button is changed.

Two different guide plates ① are furnished, one type covering $\phi 10 \sim \phi 13$ and the other covering $\phi 13 \sim \phi 16$. Guide plate ① is removed by removing two screws ③. To install the guide plate, loosen setscrew ④, and align special arm (B) to the center of the groove on guide plate ①.

As for spacers ②, one 0.2 mm-thick spacer, one 0.5 mm-thick spacer and one 1 mm-thick spacer are supplied with the unit. To install spacers ②, loosen screw ③, make a proper combination of spacers ② to permit smooth run of buttons, and insert it between slide ⑥ and guide plate ①, then tighten screw ③ to fix it.

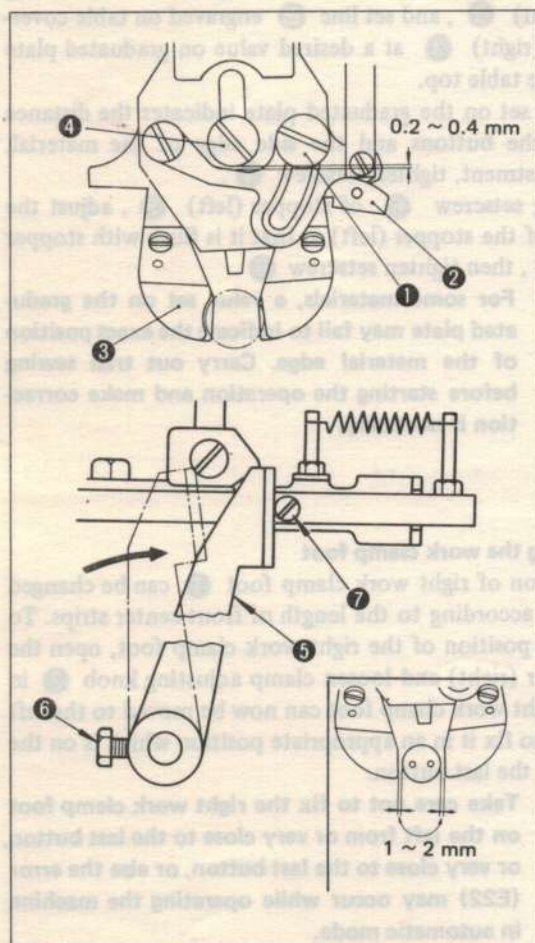


5) Replacing the button carrier

Four different button carriers are furnished. Use a proper button carrier according to the number of button holes and the distance between the holes. Check that the button fits smoothly onto the setting pin.

(Note) If your buttons do not fit the standard button carrier, please order us, referring to the information given on page 27.

Button carrier ① is fixed to spinner oscillating arm ② with two counter-sunk-head screw ③. To replace the button carrier, push the manual lever and turn the needle driving pulley until spinner oscillating arm ② turns 90°.



6) Adjusting the button clamp jaw lever

A. Adjusting the button clamp

Loosening setscrew ①, depress button clamp stop lever ②, and button clamp jaw lever ③ will open. Set the button in the proper position and make adjustment to provide a 0.2 to 0.4 mm clearance between button clamp stop lever ② and connecting screw ④. Then tighten setscrew ①.

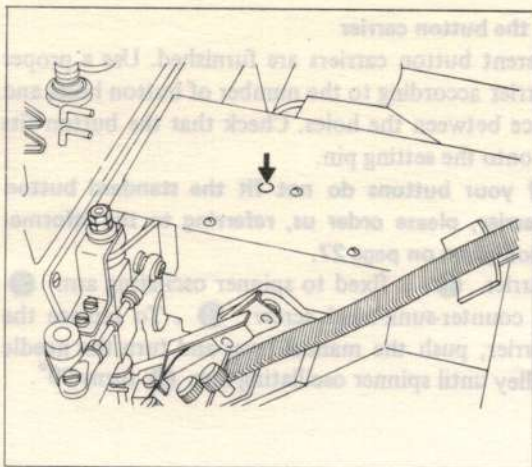
If the above clearance is too large, buttons may not be set properly.

On the contrary, if the clearance is insufficient, defective stitches or needle breakage.

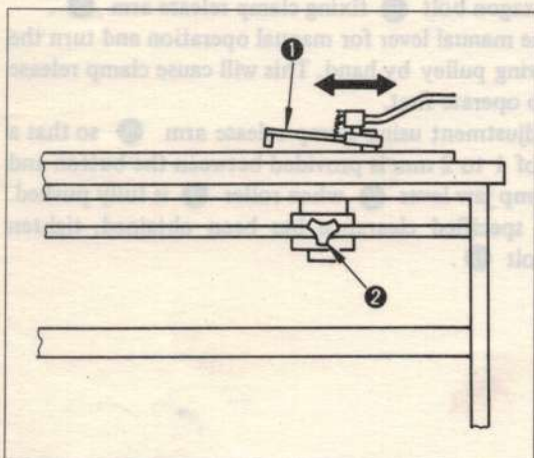
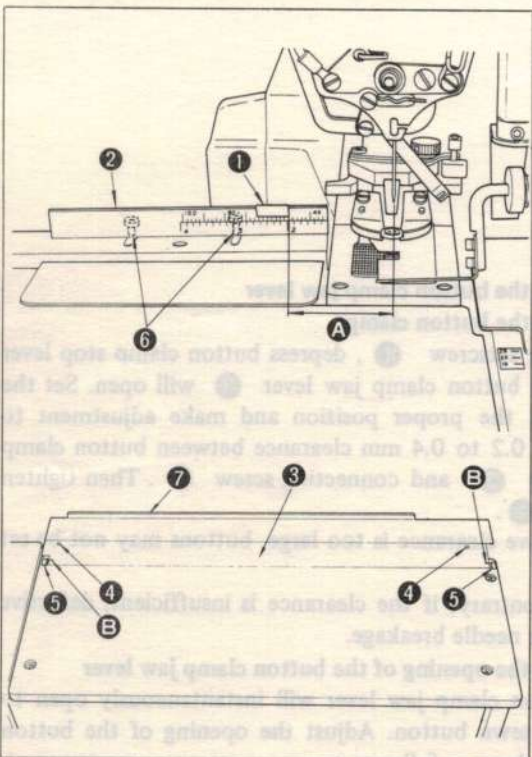
B. Adjusting the opening of the button clamp jaw lever

The button clamp jaw lever will instantaneously open to release a sewn button. Adjust the opening of the button clamp jaw lever as follows:

1. Loosen hexagon bolt ⑥ fixing clamp release arm ⑤.
2. Depress the manual lever for manual operation and turn the needle driving pulley by hand. This will cause clamp release arm ⑤ to operate first.
3. Perform adjustment using clamp release arm ⑤ so that a clearance of 1 to 2 mm is provided between the button and button clamp jaw lever ③ when roller ⑦ is fully pushed. When the specified clearance has been obtained, tighten hexagon bolt ⑥.



(5) Positioning the material



7) Lubrication

Apply Juki New Defrix Oil No. 2 to the points shown by arrows once a month prior to operation.

Also replace the oil of the reduction gear after about 5 year's use. Use Juki New Defrix Oil No. 3.

1) Positioning the edge of the material

Adjust the position of the front edge of the front center strip in relation to the first button by setting pointer ① at a desired graduation on stopper (left) ②. This graduation shows the distance A from the front edge of the front center strip to needle center.

To adjust the distance from the buttons to the side edge of the material, loosen two setscrews ④ on table covering plate (right) ③, and set line B engraved on table covering plate (right) ③ at a desired value on graduated plate ⑤ on the table top.

The value set on the graduated plate indicates the distance between the buttons and the side edge of the material. After adjustment, tighten setscrew ④.

Loosening setscrew ⑥ of stopper (left) ②, adjust the position of the stopper (left) so that it is flush with stopper (right) ⑦, then tighten setscrew ⑥.

(Caution) For some materials, a value set on the graduated plate may fail to indicate the exact position of the material edge. Carry out trial sewing before starting the operation and make correction if necessary.

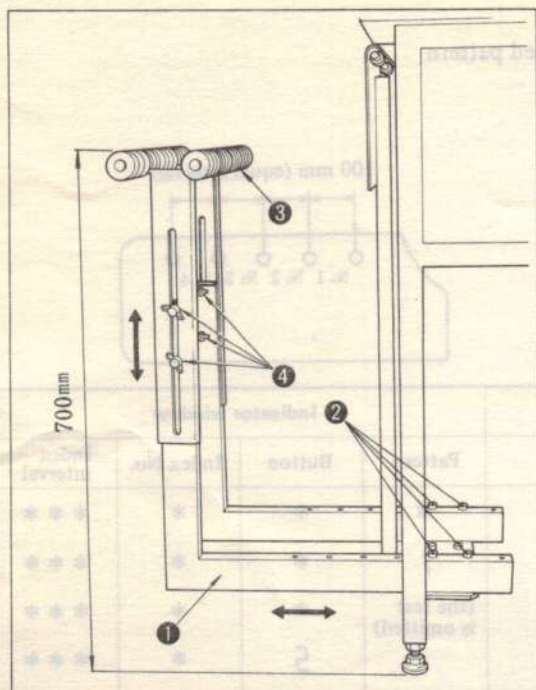
2) Positioning the work clamp foot

The position of right work clamp foot ① can be changed as desired according to the length of front center strips. To adjust the position of the right work clamp foot, open the front cover (right) and loosen clamp adjusting knob ② in it. The right work clamp foot can now be moved to the left and right so fix it in an appropriate position which is on the right from the last button.

(Caution) Take care not to fix the right work clamp foot on the left from or very close to the last button, or very close to the last button, or else the error (E22) may occur while operating the machine in automatic mode.

Fix the right work clamp foot at 40 mm or more left from the last button.

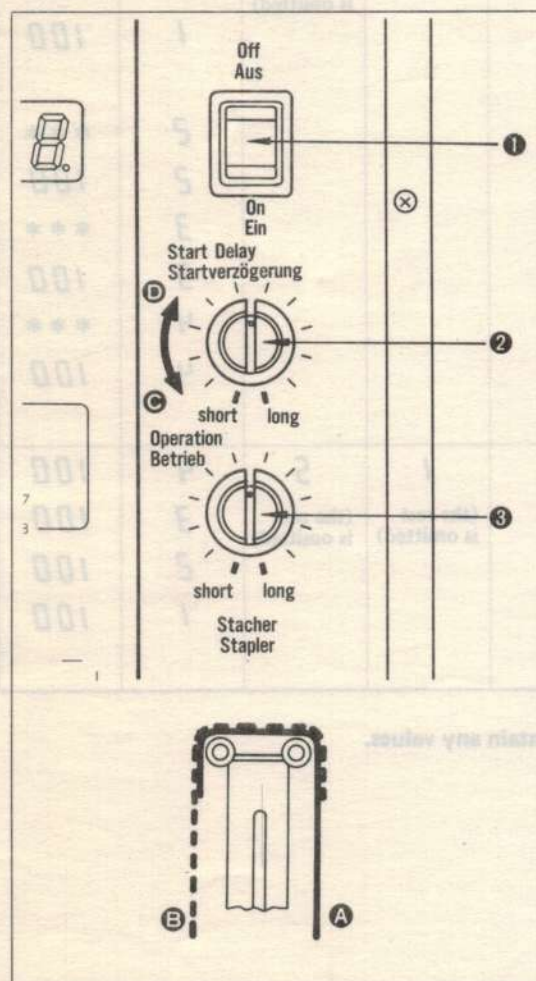
(6) Stacker



1) Positioning the stacker

For standard men's wear front center strips, fix stacker strut ① as illustrated using four bolts ②, and also fix hanger ③ at 700 mm above the ground using thumbscrew ④.

(Caution) Make sure to do trial sewing before operation to check the stacker for proper positioning.



2) Operation timing of the stacker

To adjust the action timing of the stacker for standard men's wear front center strips, set stacker switch ① to "ON", and set stacker start delay adjusting knob ② and stacker operation time adjusting knob ③ as illustrated.

Now, make the stacker actually stack workpieces to check for proper timing of the stacker action. If a front center strip is stacked as shown by A (solid line), turn stacker delay adjusting knob ② in direction C. If the front center strip is stacked as shown by B (broken line), turn the stacker start delay adjusting knob in direction D.

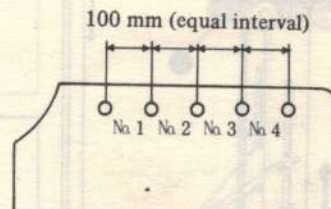
The operation time and blowing time of the stacker will increase as stacker operation time adjusting knob ③ is turned clockwise and vice versa. Properly adjust it according to the type of material.

(7) Operating procedure

1) Setting the feed pattern

Turn on the power switch and make the machine ready for feed pattern setting.

Example of setting No. 1 Number of buttons : 5
Index interval : 100 mm
Setting for pattern No. 1



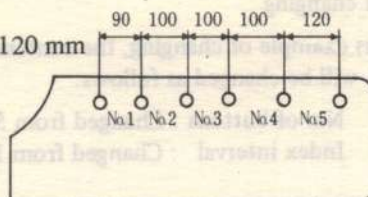
Procedure	Procedure		Indicator window			
	No. of index switch	Key board	Pattern	Button	Index No.	Index interval
Selecting the pattern No.	Set to "Pattern"		*	*	*	***
		Depress "1"	/	*	*	***
Setting the No. of buttons	Set to "No. of Buttons"		(the rest is omitted)	*	*	***
		Depress "5"		5	*	***
Setting the index interval	Set to "Feed No. 1"			(the rest is omitted)	/	***
		Depress "1" "0" "0"			1	100
	Set to "Feed No. 2"				2	***
		Depress "R"			2	100
	Set to "Feed No. 3"				3	***
		Depress "R"			3	100
	Set to "Feed No. 4"				4	***
		Depress "R"			4	100
Checking the settings	Set to "Feed No. 4"		/	5	4	100
	Set to "Feed No. 3"		(the rest is omitted)	(the rest is omitted)	3	100
	Set to "Feed No. 2"				2	100
	Set to "Feed No. 1"				1	100

(Note) The asterisked positions in the indicator window contain any values.

Example of setting No. 2 No. of buttons : 6

Index interval : 90, 100, 100, 100, 120 mm

Setting for pattern No. 2



Procedure	Procedure		Indicator window			
	No. of index switch	Key board	Pattern	Button	Index No.	Index interval
Selecting the pattern No.	Set to "pattern"		*	*	*	***
		Depress "2"	2	*	*	***
Setting the No. of buttons	Set to "No. of Buttons"		(the rest is omitted)	*	*	***
		Depress "6"		6	*	***
Setting the index interval	Set to "Feed No. 1"			(the rest is omitted)	1	***
		Depress "0" "9" "0"			1	090
	Set to "Feed No. 2"				2	***
		Depress "1" "0" "0"			2	100
	Set to "Feed No. 3"				3	***
		Depress "R"			3	100
	Set to "Feed No. 4"				4	***
		Depress "R"			4	100
Checking the settings	Set to "Feed No. 5"		2	6	5	120
	Set to "Feed No. 4"		(the rest is omitted)	(the rest is omitted)	4	100
	Set to "Feed No. 3"				3	100
	Set to "Feed No. 2"				2	100
	Set to "Feed No. 1"				1	090

(Note) The asterisked positions in the indicator window contain any values.

Example of changing

In this example of changing, the contents of Pattern No. 1 set in the previous example of setting No. 1 will be changed as follows:

No. of buttons : Changed from 5 pcs. to 7 pcs.

Index interval : Changed from 100 mm to 90 mm (equal interval)

Procedure	Procedure		Indicator window			
	No. of index switch	Key board	Pattern	Button	Index No.	Index interval
Calling the pattern	Set to "Pattern"		*	*	*	***
		Depress "1"	1	5	1	100
Changing the number of buttons	Set to "No. of Buttons"		(the rest is omitted)	5	1	100
		Depress "7"		7	1	100
Changing the index interval	Set to "Feed No. 1"			(the rest is omitted)	1	100
		Depress "C"			1	000
		Depress "9" "0"			1	090
		or				
		Depress "0" "9" "0"			1	090
	Set to "Feed No. 2"				2	100
		Depress "R"			2	090
	(Repeat in successive fashion)					
	Set to "Feed No. 6"				6	100
		Depress "R"			6	090
Checking	Set to "Feed No. 6"		1	7	6	090
	Set to "Feed No. 5"		(the rest is omitted)	(the rest is omitted)	5	090
	Set to "Feed No. 4"				4	090
	Set to "Feed No. 3"				3	090
	Set to "Feed No. 2"				2	090
	Set to "Feed No. 1"				1	090

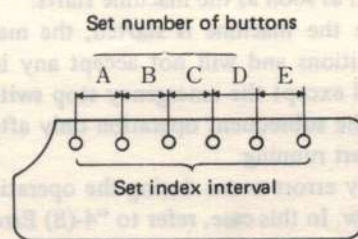
(Note) The asterisked positions in the indicator window contain any values.

2) Cautions

1. Any of the following pattern settings will be an error:

Setting of AUTO/ MANUAL selector switch	An index pattern setting error will occur if;	When a setting error has occurred;
AUTO	<ol style="list-style-type: none"> 1. any of the set index interval is not within the range of 20 to 250 mm. 2. the total of the set index interval exceeds 650 mm. 3. the set number of button is "1". 	The setting error lamp lights when the start switch is depressed and the machine will not start.
MANUAL	Set index interval is not within the range of 20 to 255 mm.	The material will not be fed even if the inching switch is depressed. (The lamp will not light.)

2. When "R" on the keyboard is depressed for setting the index interval, the index-interval set in the immediately preceding index interval No. will be entered. Therefore, the key "R" can not be used for index interval No. 1.
3. If an index interval exceeding one required for the number of buttons is set, it will be ignored when operating the machine in automatic mode.
4. The switches and knobs on the control panel can not be set unless the work clamp foot is in its home position.
5. Set number of buttons and index interval will be maintained even if the power switch is turned off as long as a backup battery works.
6. When setting a index interval of two figures, add "0" to the beginning except when depressing "C".



* The index interval E is ignored.

3) How to make the test operation

Carry out the test operation in accordance with the following procedures:

(It is assumed that the pattern setting and material positioning have been completed, and the sewing machine is ready to sew.)

1. Before turning on the power switch;
 - Check that the air pressure is 4 kg/cm^2 .
 - Check that the work clamp foot of the sewing machine is up. (If the work clamp foot is down, lift it by hand.)
2. Turn on the power switch, and call the set pattern. (Check the number of buttons and the index interval.)
3. When sewing 4-holed buttons to material, make selection for with or without cross-over stitches. (Confirm the number of stitches.)
4. Set the stacker switch to "ON".
5. Depress the reset pushbutton switch of the integrating counter if necessary.
6. Set AUTO/MANUAL selector switch to "AUTO".
7. Holding the both edges of a front center strip, place the side edges of the material against the right and left stoppers while setting the front edge to the pointer.
8. After setting the material, depress the start switch. The machine will not start unless the start switch is depressed and released.

The material should be set in a position where your hand is not caught under the work clamp foot which comes down as soon as the machine starts.
9. Once the machine is started, the machine performs a series of automatic operations under the predetermined conditions and will not accept any interruption of changes given through the switches or knobs on the control panel except the emergency stop switch. You can change the settings of the switches and depress the start switch for the subsequent operation only after the machine has completed the final button sewing, causing the conveyor to start running.
10. If any errors occur during the operation, they will be indicated on the control panel, and machine shutdown will follow. In this case, refer to "4-(8) Error indication and resetting".

(8) Error indication and resetting

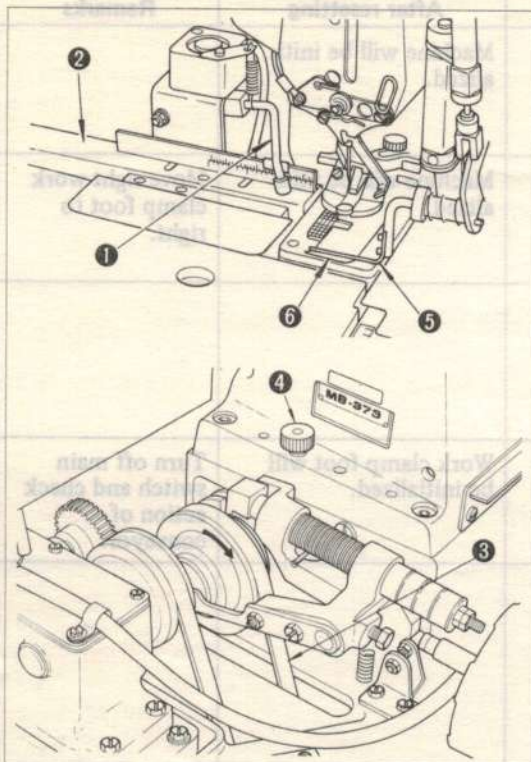
If the emergency stop switch is depressed or an operation trouble has occurred, it will be shown on the error indicator (index internal indicator window) or by the error lamps (emergency stop) lamp, setting error lamp and button sewing error lamp). The machine will not restart until it is reset.

Error indication	Description of error	How to reset	After resetting	Remarks
Indication "E10" is given and emergency stop lamp lights.	Emergency stop switch is depressed.	Depress error reset switch.	Machine will be initialized.	
Indication "E22" is given.	Right work clamp foot has been positioned improperly.	Depress error switch.	Machine will be initialized.	Move right work clamp foot to right.
Indication "E51" is given.	Stop-motion switch is not depressed at the time of stop motion.	Turn off power switch, and make readjustment according to "10) Adjusting the stop-motion switch".		
Indication "E31" is given.	Pulse motor has stepped out.	Depress error reset switch.	Work clamp foot will be initialized.	Turn off main switch and check action of conveyor.
Setting error lamp lights.	Erroneous index interval setting One index is 19 mm or less, or 251 mm or more. Or total index interval amount is 651 mm or more.	Set proper index interval. (Setting error lamp will go out after starting machine.)		
Button sewing error lamp lights.	A button has not been sewn because of thread breakage, stitch skipping or faulty button supply. Or the button sensor switch has been improperly positioned.	Depress restart switch.	Sewing machine will restart from the interrupted position to proceed with subsequent operation.	Two buttons are sometimes fed piled up immediately after the machine has failed to feed a button. Therefore be sure to check this before depressing the restart switch.
		Depress error rest switch.	Machine will be initialized.	
		Setting AUTO/MANUAL selector switch to "MANUAL", depress inching switch, and then set AUTO/MANUAL selector switch to "AUTO" before depressing restart switch.	Machine will skip point of defectively sewn button and begin with the following button sewing.	
Indication "E52" is given.	BR reset switch is on.	Depress error reset switch.	Machine will be initialized.	

5. MAINTENANCE

(1) Sewing machine components

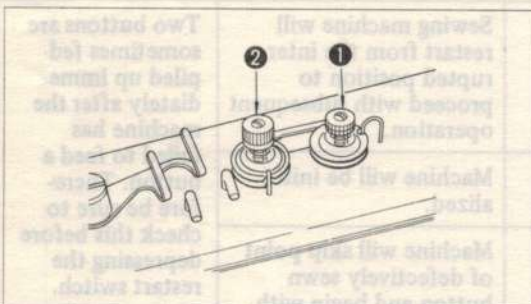
(Caution) Be sure to turn off the power switch before making adjustment of the sewing machine components.



1) Tilting the machine head

Tilt the machine head in accordance with the following procedure:

1. Turning off the power switch, move work clamp foot ① to the left and draw out stopper guide (left) ② upward.
2. Opening the loader rear cover, remove V belt ③ of the sewing machine and loosen mounting screw ④.
3. Pull button sensor arm ⑤ toward you, and slowly tilt the machine head with care taken not to allow it to come in contact with button stopper ⑥.

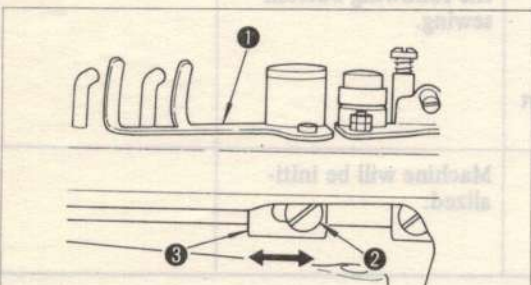


2) Adjusting the thread tension

Adjust nut ① to provide a minimum tension for sewing buttons.

Adjust nut ② to produce properly tightened stitches on the reverse of a button. The tension of nut ② should be higher than that of nut ①, and should vary according to the thread, material, thickness of button, etc.

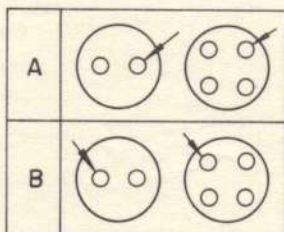
The tension of either nut increases as it is turned clockwise and vice versa.



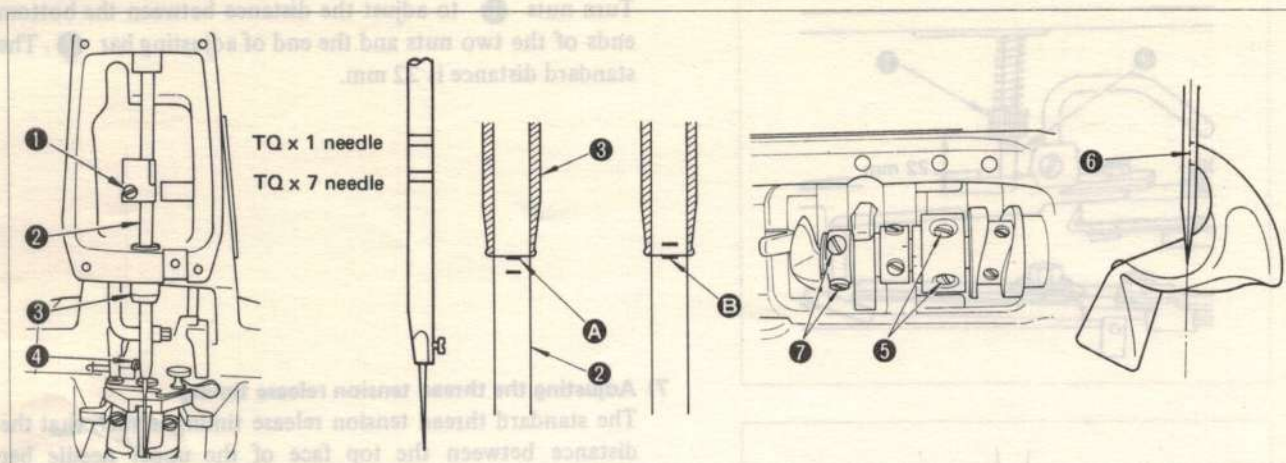
3) Adjusting the thread adjusting lever

To adjust thread adjusting lever ①, loosen setscrew ② through the hole in the left face plate using a screwdriver, and move nipper bar block ③ to the right or left.

If the end of thread comes out of hole A indicated by arrow after completion of button sewing, move block ③ to the left. If the end of thread comes out of hole B indicated by arrow after completion of button sewing, move the block to the right to prevent it from coming out of the hole.



4) Needle-to-looper relation



(Adjust the needle and looper as follows:)

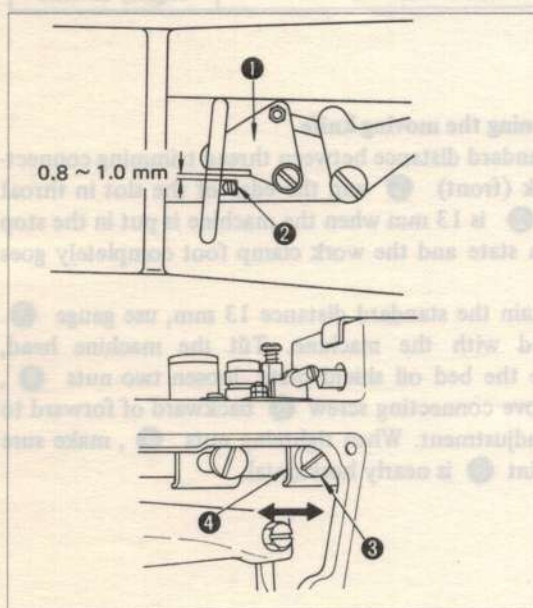
1. Turning off the power switch, turn the needle driving pulley in the forward direction to bring down the needle bar to the lowest point of its stroke, and loosen setscrew ①.

(Adjust the height of the needle bar as follows:)

2. For a TQ x 1 needle, use the upper two marker lines and use the lower two lines for a TQ x 7 needle. For either needle, align upper marker line A with the bottom end of needle bar lower bushing ③, then tighten setscrew ①. At this time, make sure that screw ④ faces exactly to the left.

(Position the looper as follows:)

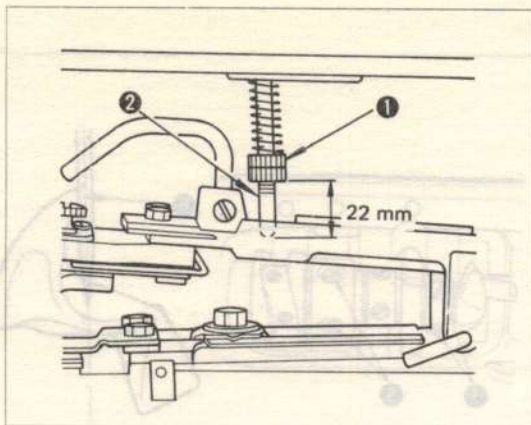
3. Loosen setscrew ⑤ and turn needle driving pulley to make lower marker line B of the two marker lines engraved on needle bar ② align with the bottom end of needle bar lower bushing ③.
4. With the above condition maintained, align looper blade point ⑥ with the center of the needle, and then tighten setscrew ⑤.
5. Loosen setscrew ⑦ and make adjustment to provide a 0.05 ~ 0.1 mm clearance between the looper and the needle. Then tighten setscrew ⑦.



5) Adjusting the nipper

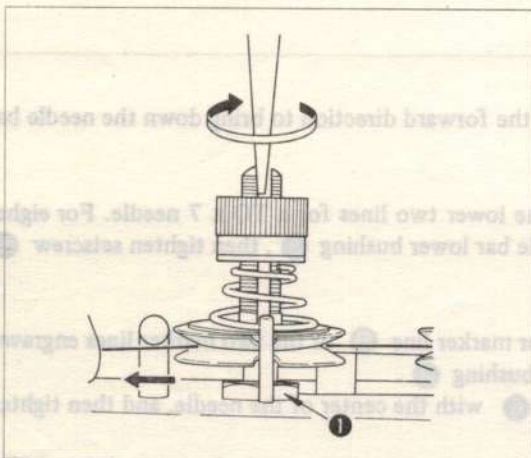
Perform adjustment to provide a 0.8 ~ 1.0 mm clearance between nipper block ② and nippers ① so that nipper ① will not hold thread during operation.

To make the adjustment, loosen setscrew ③ and move nipper bar block ④ to the right or left.



6) Adjusting the pressure of the work clamp foot

Turn nuts ① to adjust the distance between the bottom ends of the two nuts and the end of adjusting bar ②. The standard distance is 22 mm.



7) Adjusting the thread tension release timing

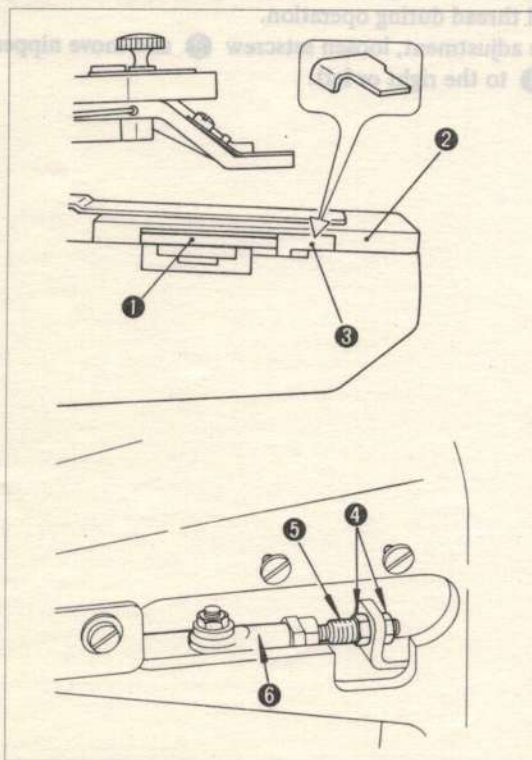
The standard thread tension release timing is such that the distance between the top face of the upper needle bar bushing and the top end of the needle bar is 55 to 58 mm at the moment the tension discs No. 2 are released, letting the thread go quickly when the drive pulley is turned while pulling the thread in the direction of arrow.

If the trouble listed below frequently occur, make correction as follows:

Loosening nut ①, insert a screwdriver into the tension disc pin No. 2 and turn it in the direction of arrow to advance the thread tension releasing timing and in the opposite direction to delay the timing.

Trouble	Thread tension release timing
1. Stitches on the wrong side of material are loose.	Slightly delay
2. Thread breaks at an intermediate point.	Slightly delay
3. Thread often breaks.	Slightly advance

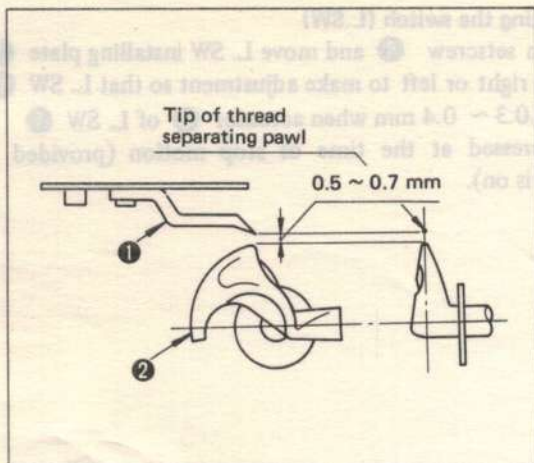
8) Thread trimmer



A. Positioning the moving knife

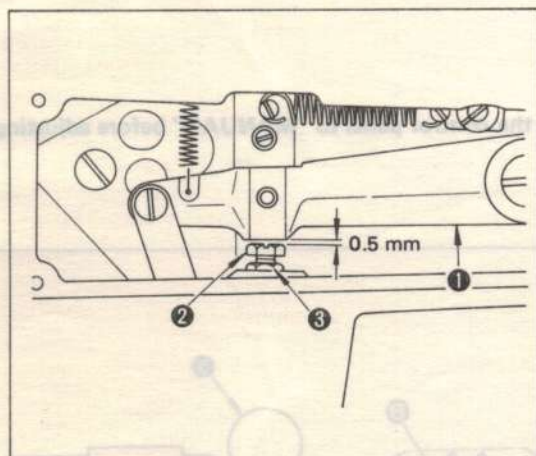
The standard distance between thread trimming connecting link (front) ① and the edge of the slot in throat plate ② is 13 mm when the machine is put in the stop motion state and the work clamp foot completely goes up.

To obtain the standard distance 13 mm, use gauge ③ supplied with the machine. Tilt the machine head, remove the bed oil shield plate, loosen two nuts ④, and move connecting screw ⑤ backward or forward to make adjustment. When tightening nuts ④, make sure that joint ⑥ is nearly horizontal.



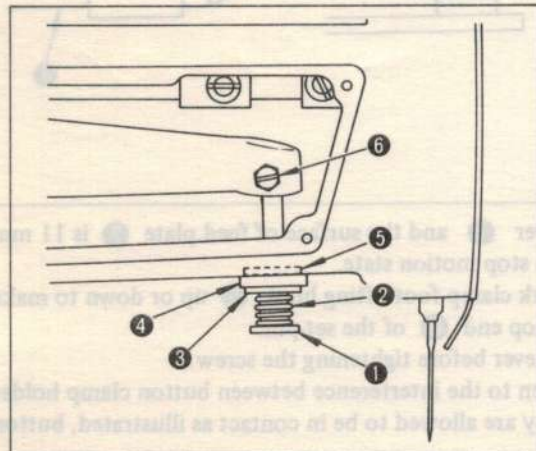
B. Adjusting the height of the thread separating pawl

The clearance between pawl ① and looper ② should be 0.5 to 0.7 mm. If the height of the pawl is disturbed, correct it by bending pawl ①.



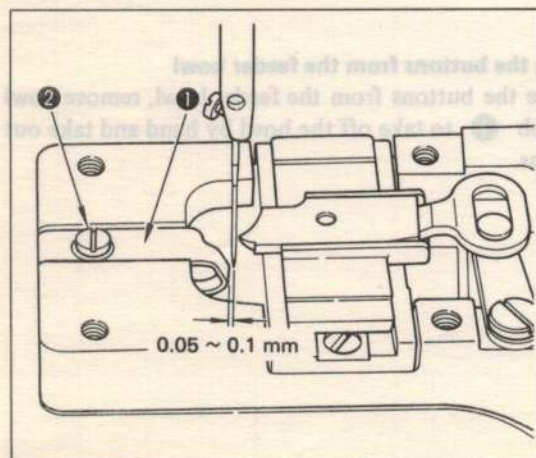
C. Adjusting the clearance between the button clamp lifting lever and the adjusting screw

Adjust the clearance between the end of lever ① and adjusting screw ② to 0.5 mm and tighten nut ③.



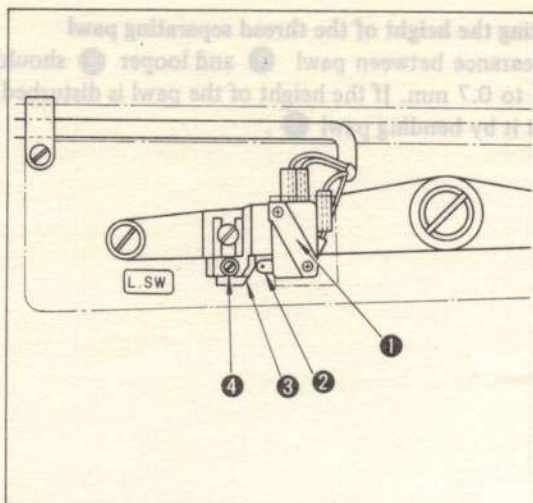
D. Installing the spring guide shaft

Assemble spring guide shaft ①, cushion spring ②, washer ③, cushion ④, and washer ⑤ in the order in which they are listed. Confirm that the stop motion has been completely engaged, and then bring them down 0.5 mm lower than the level at which the cushion spring is fully compressed. Then tighten screw ⑥.



9) Positioning the needle guide

Loosen screw ② and move needle guide ① forward or backward to make adjustment so that a clearance of 0.05 to 0.1 mm is provided between the needle and needle guide ① when the needle bar reaches the lowest point of its stroke.



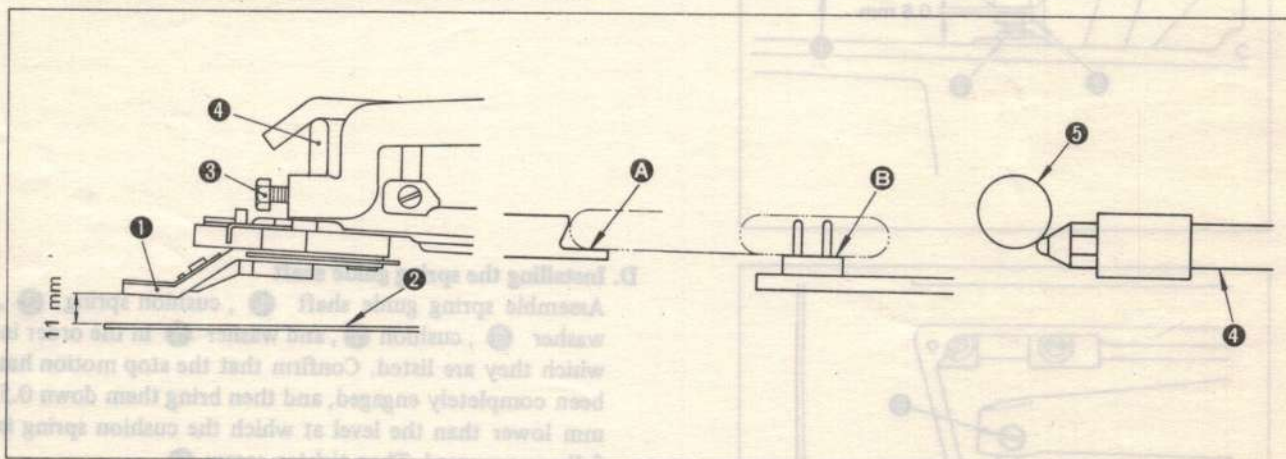
10) Adjusting the switch (L.SW)

Loosen setscrew ④ and move L. SW installing plate ③ to the right or left to make adjustment so that L. SW ① moves 0.3 ~ 0.4 mm when actuator ② of L. SW ① is depressed at the time of stop motion (provided L. SW is on).

(2) Button feeder components

(Caution) Be sure to set AUTO/MANUAL selector switch on the control panel to "MANUAL" before adjusting the button feeder components.

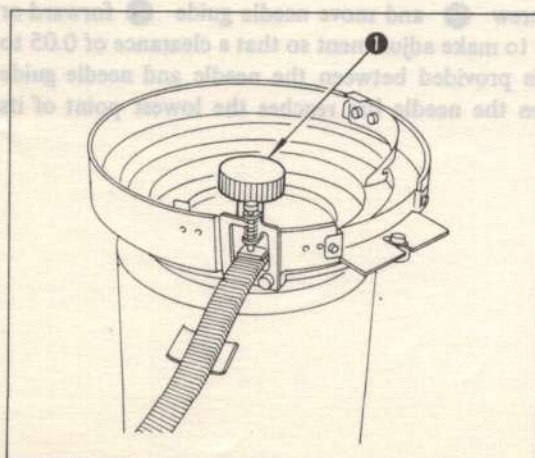
1) Adjusting the height of the button clamp holder



The standard distance between the sole of button clamp jaw lever ① and the surface of feed plate ② is 11 mm when the button feeder is running idle with the sewing machine is stop motion state.

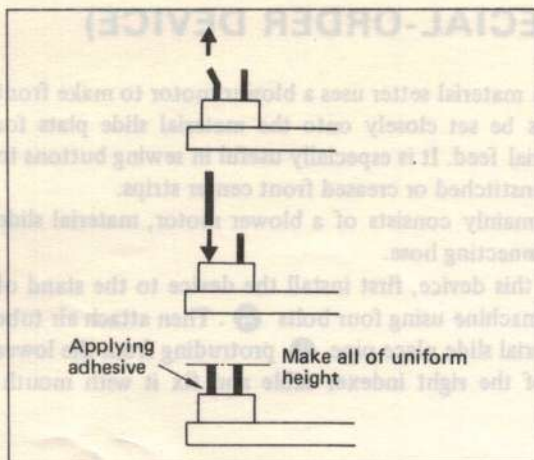
1. To adjust the upper & lower arm, loosen screw ③ and move work clamp foot lifting hook ⑤ up or down to make button resting face A of the button clamp jaw lever level with top end B of the set-pin.
2. Check that a button is positively rested on the button clamp jaw lever before tightening the screw.

Remount the machine head in the normal position with care taken to the interference between button clamp holder lifting hook ⑥ and work clamp foot lifting hook ⑤. If they are allowed to be in contact as illustrated, button clamp jaw lever ① will not be lifted.



2) Removing the buttons from the feeder bowl

To remove the buttons from the feeder bowl, remove bowl fixing knob ① to take off the bowl by hand and take out the buttons.



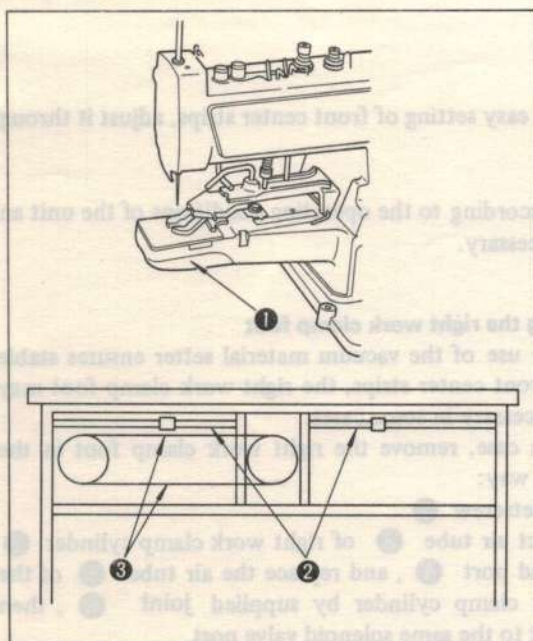
3) Replacing the set-pin

If a set-pin in the button carrier is broken or bent, replace it by a set-pin A ($\phi 1.2$ for 2-holed button) or set-pin B ($\phi 1.0$ for 4-holed button) in the following way:

1. Pull out a broken or bent set-pin using a pair of pliers. If the pin is too tight to come out, tap it out from the rear using the stem of a broken sewing needle or the like.
2. Insert a suitable set-pin into the hole and tap it straight into the button carrier.

If the set-pin is loose due to expansion of the hole, make it tight by applying some adhesive (ALON-ALPHA, CEMEDINE 3000 or LOCK-TITE). When applying the adhesive, remove oil and dust thoroughly from the set-pin and the hole using thinner or benzine and allow them to dry for more than 5 minutes. Then drive in the set-pin and apply the adhesive agent.

(3) Cleaning the parts

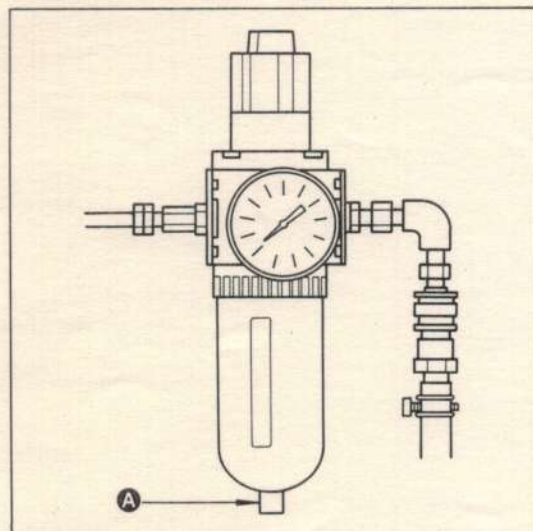


Accumulating of dust or fibrous wastes on the parts shown at left will adversely affect the stitching performance and operation. Remember to always clean these parts after work.

1. Open looper cover ① of the sewing machine and remove the fibrous wastes or dust from the looper using a rag.
2. Wipe conveyor support shaft ② using a rag wetted with oil.

(Caution) Be careful not to allow any oil to drop onto left timing belt ③.

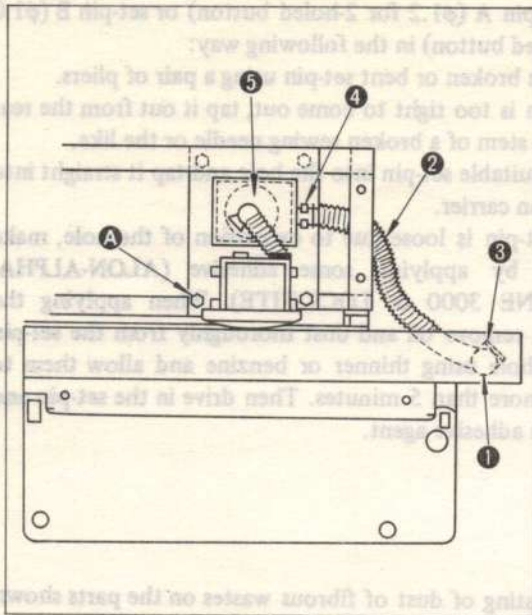
(4) Draining the air filter



Drain the air filter once a week.

The air filter can be drained by pushing sideways black part ① on the bottom of the air filter.

6. VACUUM MATERIAL SETTER (SPECIAL-ORDER DEVICE)

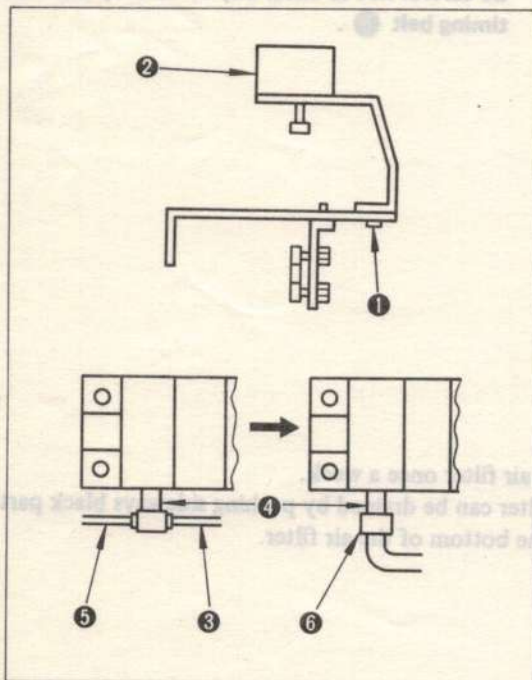


1) Adjusting the suction force

If the suction force of the vacuum tube is too strong to permit easy setting of front center strips, adjust it through adjusting ring ④.

2) Replacing the air filter

Check air filter ⑤ for dust once every three to six months according to the operating conditions of the unit and the environmental conditions. Clean or replace the air filter as necessary.



3) Removing the right work clamp foot

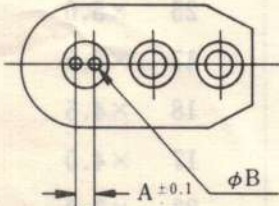
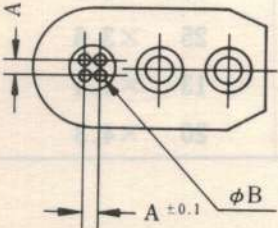
Since the use of the vacuum material setter ensures stable feed of front center strips, the right work clamp foot may not be necessary in some cases.

In such a case, remove the right work clamp foot in the following way:

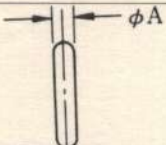
1. Remove setscrew ①.
2. Disconnect air tube ③ of right work clamp cylinder ② at solenoid port ④, and replace the air tube ⑤ of the left work clamp cylinder by supplied joint ⑥, then connect it to the same solenoid valve port.

7. TABLE OF BUTTON CARRIERS AND SPRING CHUTES

1) Type of button carrier

Shape	Name of part	Part No.	Dimension A	Dia. B
<p>For 2-holed button</p> 	Button carrier A	GBR01152AA0 (Standard)	3.2mm	φ 1.2
	Button carrier B	GBR01152BA0 (Standard)	3.8	φ 1.2
	Button carrier E	GBR01152EA0	2.0	φ 1.0
	Button carrier F	GBR01152FA0	2.2	φ 1.0
	Button carrier G	GBR01152GA0	2.4	φ 1.0
	Button carrier H	GBR01152HA0	2.6	φ 1.0
	Button carrier J	GBR01152JA0	2.8	φ 1.0
	Button carrier K	GBR01152KA0	3.0	φ 1.0
	Button carrier L	GBR01152LA0	2.4	φ 1.2
	Button carrier M	GBR01152MA0	2.6	φ 1.2
	Button carrier N	GBR01152NA0	2.8	φ 1.2
	Button carrier P	GBR01152PA0	3.0	φ 1.2
<p>For 4-holed button</p> 	Button carrier C	GBR01152CA0 (Standard)	2.6mm	φ 1.0
	Button carrier D	GBR01152DA0 (Standard)	3.1	φ 1.0
	Button carrier Q	GBR01152QA0	2.0	φ 1.0
	Button carrier R	GBR01152RA0	2.2	φ 1.0
	Button carrier S	GBR01152SA0	2.4	φ 1.0
	Button carrier T	GBR01152TA0	2.4	φ 1.5
	Button carrier U	GBR01152UA0	2.6	φ 1.5
	Button carrier V	GBR01152VA0	2.8	φ 1.5
	Button carrier W	GBR01152WA0	3.0	φ 1.5
	Button carrier X	GBR01152XA0	4.0	φ 1.2
	Button carrier Y	GBR01152YA0	3.2	φ 1.5

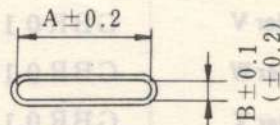
2) Type of set-pin

Shape	Name of part	Dimension A
	GBR01155000	φ 1.2
	GBR01156000	φ 1.0
	GBR01155G00	φ 1.5

3) Type of spring chute

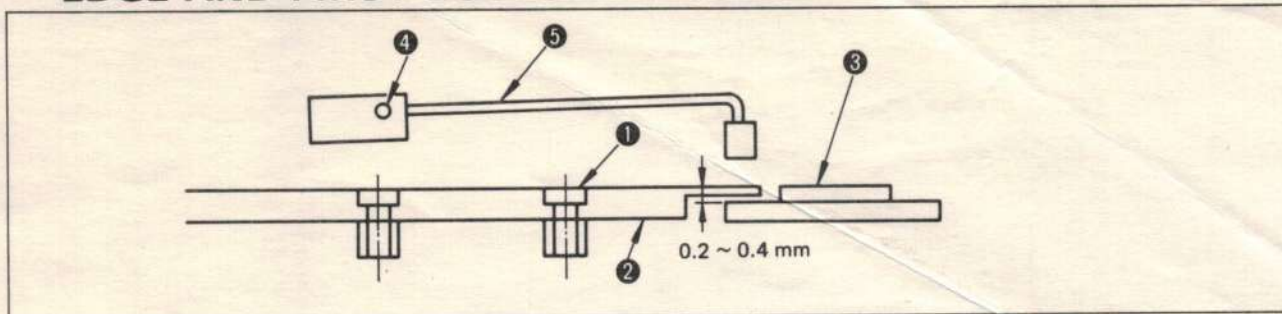
Name of part	Part No.	Engraved No.	Size (A x B)
Spring chute A	GBR01415AA0 (Standard)	1	15 mm × 2.7 mm
Spring chute B	GBR01415BA0 (Standard)	2	17 × 3.5
Spring chute C	GBR01415CA0	3	13 × 2.5
Spring chute D	GBR01415DA0	4	15 × 2.3
Spring chute E	GBR01415EA0	5	25 × 4.0
Spring chute F	GBR01415FA0	6	20 × 3.6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

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



Dimension A	Name of part	Shape
4.1.3	GBR01152000	
4.1.9	GBR01156000	
4.1.5	GBR01155000	

8. HOW TO ADJUST THE DISTANCE BETWEEN MATERIAL EDGE AND FIRST BUTTON TO 35mm

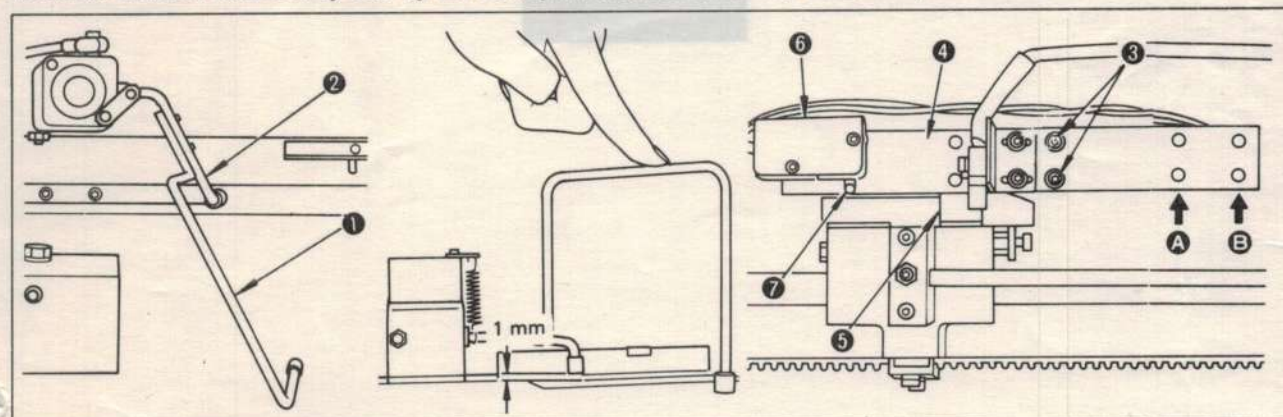


The standard minimum distance between the material edge and the first button is 45 mm. This minimum distance can be set to 40 mm by making the following adjustment.

1. Loosen setscrew ① and change the positions of the right and left plates ② each other as illustrated above. Normally, a 0.2 to 0.4 mm clearance is provided between plates ② and feed plate ③ with the work clamp in its original position. (This clearance is strictly factory-adjusted before shipment. If, however, no proper clearance is found between them, place a washer (WP045000SD) under plates ② to properly adjust the clearance.)
2. Loosen setscrew ④ and adjust to make the right end of work clamp arm ⑤ align with the right ends of plates ②.

9. AUXILIARY WORK CLAMP FOR STACKING LIGHT-WEIGHT GARMENTS

It is advisable to use the auxiliary work clamp supplied with the machine when stacking light-weight or soft garments which are difficult to smoothly feed by the conveyor. Install the auxiliary work clamp as follows:



1. Attach auxiliary work clamp ① to left work clamp ②.
2. Push work clamp ③ down by hand to adjust it so the end of the work clamp is 1 mm above the surface of the machine table when auxiliary work clamp ① is in contact with the machine table.
3. Manually lower the work clamp and be sure that the garment is securely clamped by the ends of both work clamps.
4. Garments can be effectively fed by clamping their edges with left work clamp ②. When clamping ladies' garments, it is necessary to move the home position of the left work clamp to the left.

(How to move the left work clamp)

Open the front cover and remove screws ③ from the decelerator switch mounting plate. Align the left work clamp with the garment edge and attach decelerator switch mounting plate ④ in either A or B position. At this time, fix mounting plate ④ so actuator ⑦ of the decelerator switch can be pushed down approx. 0.5 mm by hand when decelerator switch cam ⑤ has passed decelerator switch ⑥.

(Note) When the decelerator switch mounting plate is fixed in position A, the overall feed amount will be 590 mm. The overall feed amount will be 550 mm when the mounting plate is fixed in position B.

The exclusive material slide plate (Part No. G5065161AA0) is available to successively stack light-weight garments which are liable to fall into the aperture of the clamp plate, preventing themselves from being stacked.

It is a pleasure to use the excellent work done by the company in the field of research and development.

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