

ENGLISH

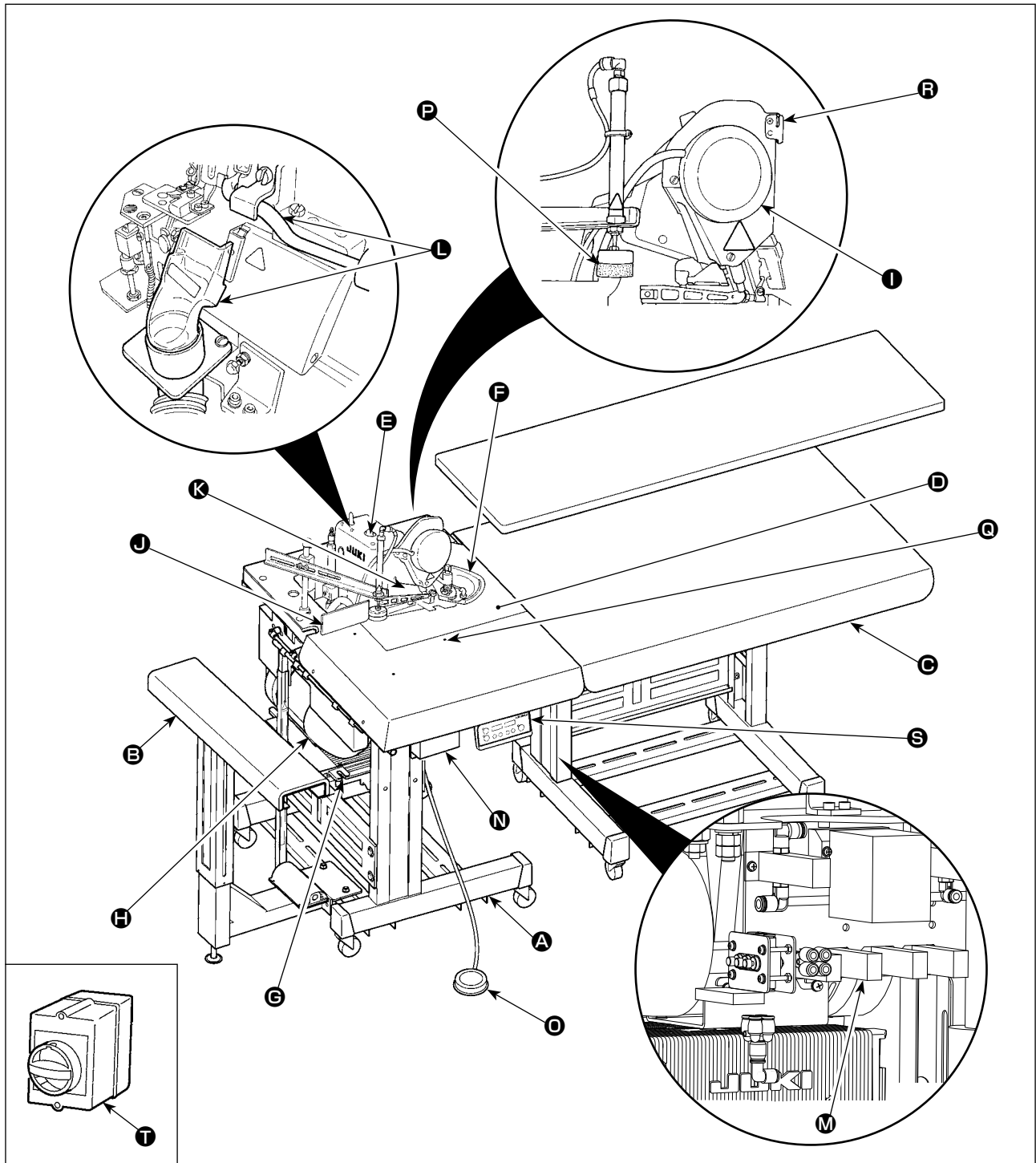
**ASN-690
INSTRUCTION MANUAL**

CONTENTS

1. CONFIGURATION OF THE MACHINE	1
2. SPECIFICATIONS.....	2
3. INSTALLATION.....	3
3-1. Removing packing materials	3
3-2. Securing the machine.....	3
3-3. Installing the dust collector	4
3-4. Installing the stacker	5
3-5. Installing the stacker cloth guide	6
3-6. Installing the cloth plate and the cloth guide unit	7
3-7. Installing the thread stand	8
3-8. Installing the regulator	8
3-9. Connecting the air coupler.....	9
3-10. Connecting the starting pedal for the machine.....	9
3-11. Joining the sub-table (only for the long table type).....	10
3-12. Connecting the power plug.....	12
3-13. Installing the cloth receiving board (KM-5) (optional).....	13
3-14. Installing the 3-pedal unit (PK-79) (optional).....	14
4. PREPARATION	15
4-1. Caution before operation	15
4-2. Lubrication.....	15
4-3. Threading the machine.....	16
4-4. Adjusting the pressure of the presser foot and removing the presser foot.....	17
4-5. Adjusting the stitch length.....	17
4-6. Differential feed mechanism	18
5. OPERATION	19
5-1. Sewing procedure	19
5-2. Explanation of the operation panel	22
5-3. Description of the pedals and the switches on the machine head	23
5-4. List of functions to be set	24
5-5. Details of selected functions	25
5-6. Other settings.....	28
5-7. Initialization of the setting data	28
6. ADJUSTMENT	29
6-1. Stacker support board adjustment.....	29
6-2. Adjusting the position of the thread trimmer presser	30
6-3. Adjusting the air blow.....	30
6-4. Adjusting the edge guide	31
6-5. Adjusting the cloth guide	32
6-6. Regulator adjustment	32
6-7. Adjusting the cloth chip suction force.....	33
6-8. Adjusting the sensors.....	34

7. MAINTENANCE	36
7-1. Adjusting the knife	36
7-2. Cleaning the machine head.....	36
7-3. Checking the cartridge filter and replacing it.....	37
7-4. Changing the machine oil	37
7-5. Changing needles	38
7-6. Drainage of filter regulator	38
7-7. Cautions for the compressed air supply (source of supply air) facility	39
7-8. Dust collector box.....	40
7-9. Cleaning the sensor.....	40
7-10. Consumable parts to be replaced	41
7-11. Replacing the fuse	42
7-12. Adjusting the belt tension	43
7-13. Destination of connection for input/output connectors.....	44
7-14. Error codes	45
7-15. Error code list.....	46

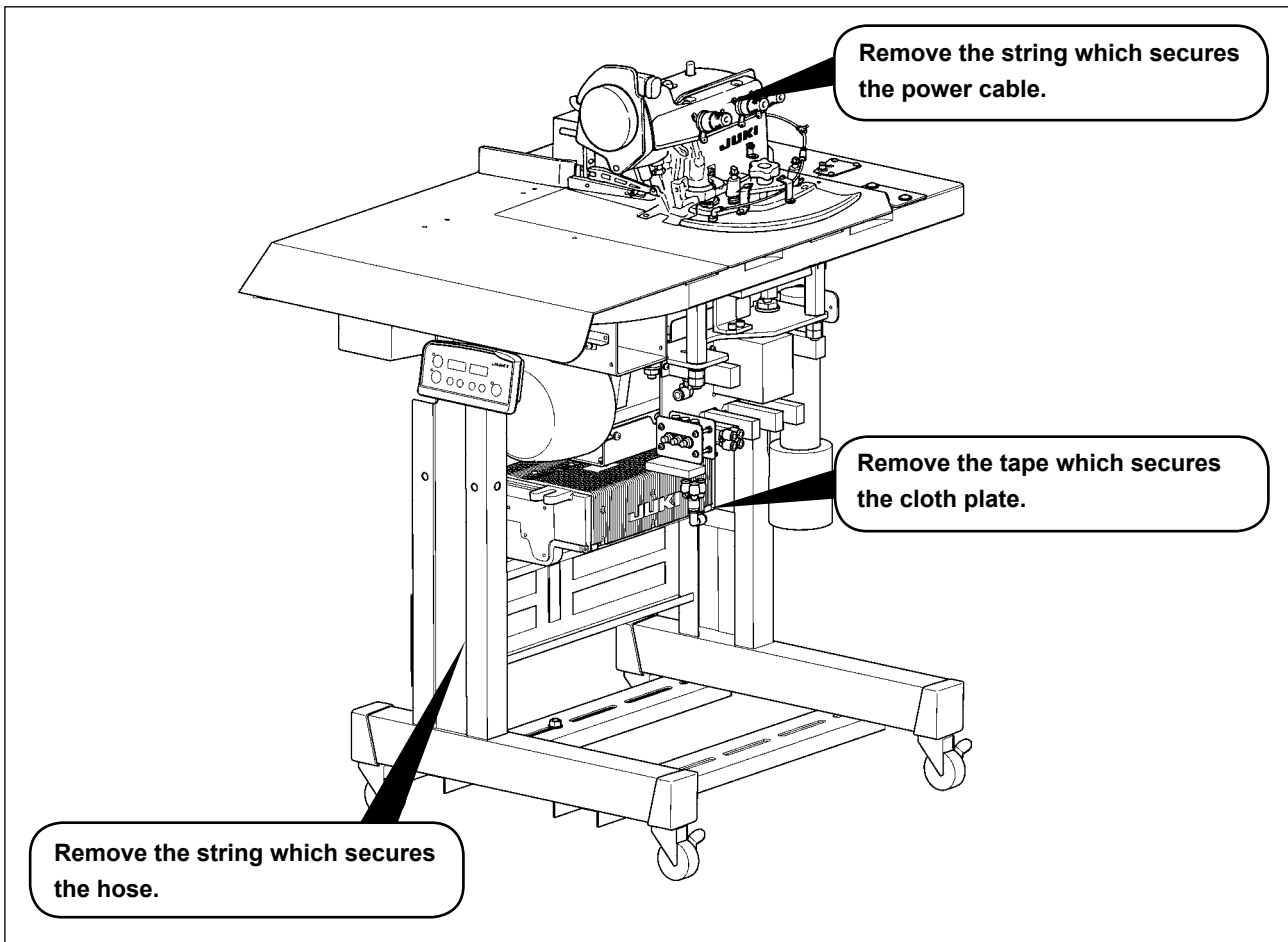
1. CONFIGURATION OF THE MACHINE



- | | |
|---|---|
| A Main body structural mechanism section
(table stand, machine support and sewing table covers) | K Side cutter |
| B Stacker unit | L Dust collector |
| C Sub-table | M Pneumatic controller |
| D Cloth plate | N Power switch |
| E Sewing machine head | O Starting pedal for the sewing machine |
| F Cloth guide | P Thread trimmer presser |
| G Control box | Q Cloth feeding air blow |
| H Sewing machine motor | R Pause switch |
| I Start switch for the stacker | S Operation panel CP-18 |
| J Stacker cloth guide | T Power switch (EU type)
(also used as the emergency stop switch) |

3. INSTALLATION

3-1. Removing packing materials

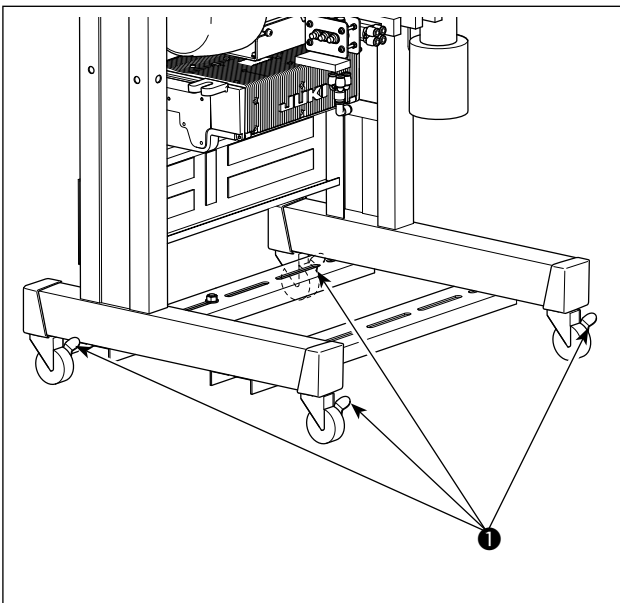


3-2. Securing the machine

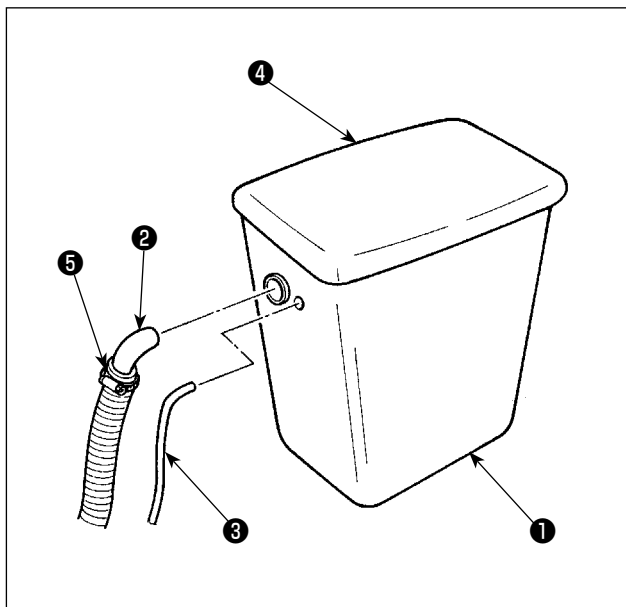


CAUTION :

To avoid possible personal injuries, be sure to move the machine to a level and stable place and lock casters ①.



3-3. Installing the dust collector



CAUTION :

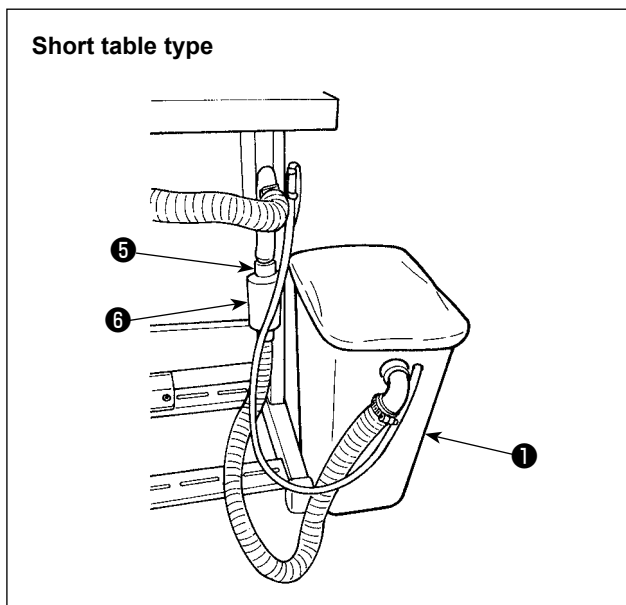
If the dust collector is not securely installed, blown-out dust or lint can get in eyes, resulting in personal injury.

- 1) Plug the filings blowing hose ② and the chain-off thread blowing hose ③ into the dust collection box ① .
- 2) Install filter ④ so that it completely covers the top of the box.



When dumping dust from the dust collection box, also clean up filter ④ .

Short table type



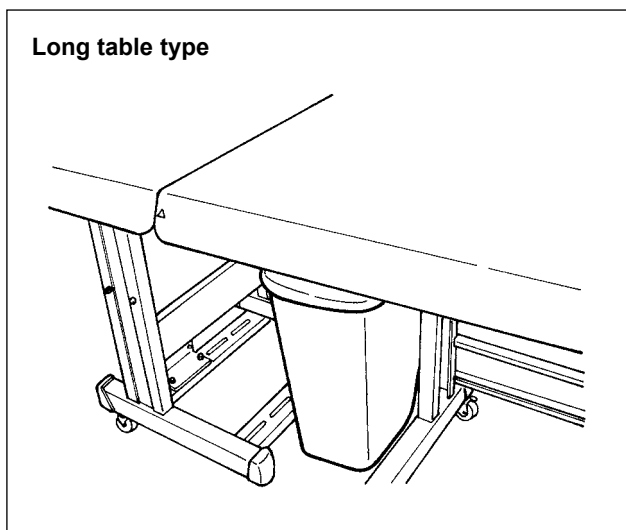
Install the dust collection box ① to the rear of the main unit, as shown in the figure.

(Configuration position differs depending upon specification.)



Confirm that the hose mounting bracket ⑤ is completely tightened (the same for other mounting hardware). Note that the noise muffler ⑥ is optional.

Long table type

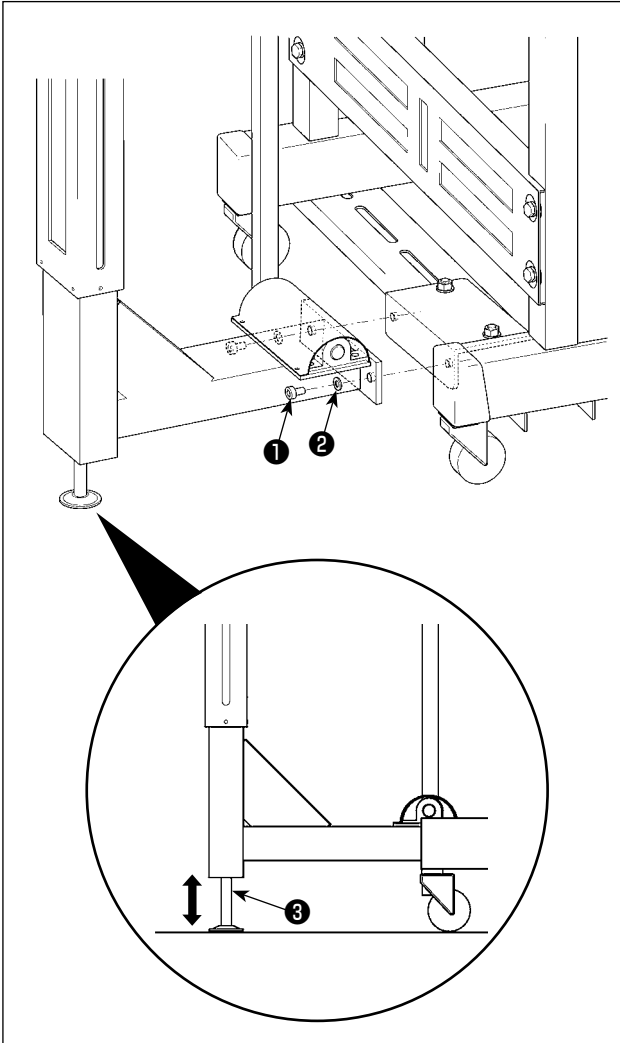


3-4. Installing the stacker

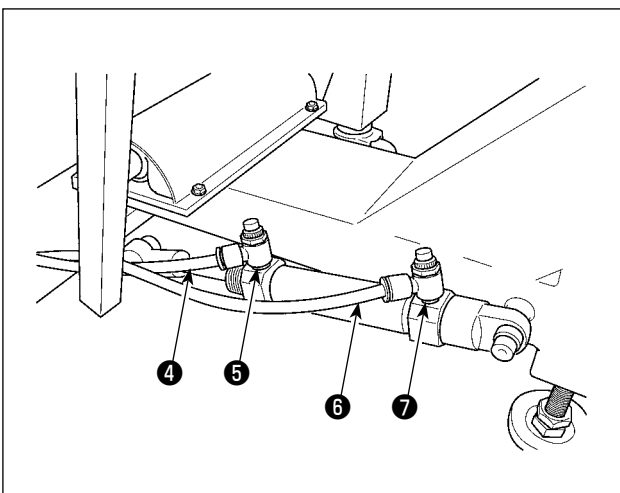


CAUTION :

Be sure to carry out installation of the stacker by two or more workers in order to protect against accidents caused by the stacker unit when it accidentally falls.

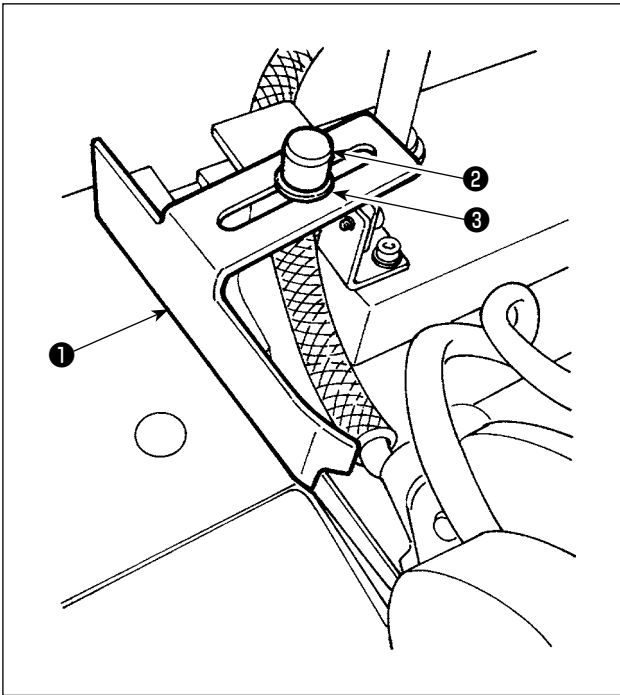


- 1) Install the stacker unit on the base with screws **1** and washers **2** (at two locations each).
- 2) Adjust adjusting bolt **3** to make the support rod of the stacker parallel to the installing plane.

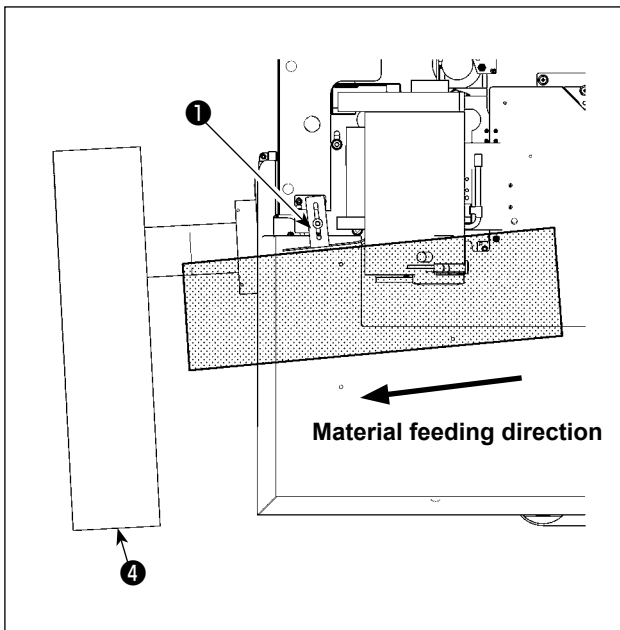


- 3) Connect air tube **4** to joint **5** and air tube **6** to joint **7** in numerical order.

3-5. Installing the stacker cloth guide

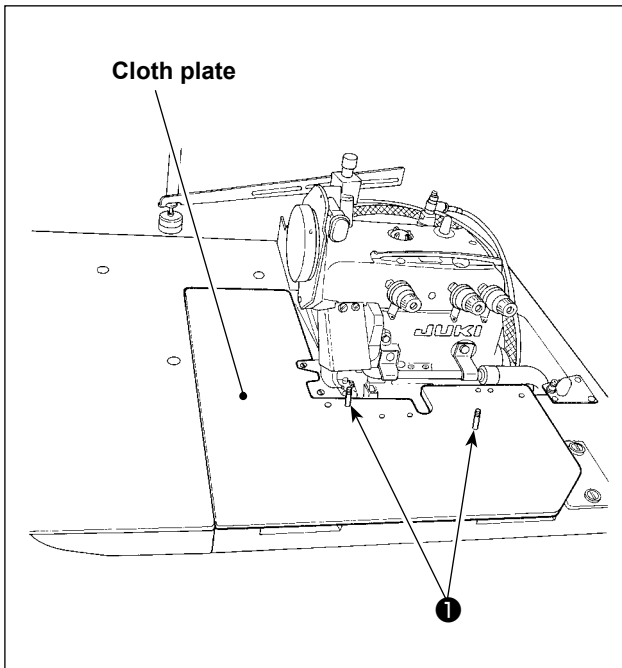


Installing stacker cloth guide **1** on the guide base with hand screw **2** and washer **3**.

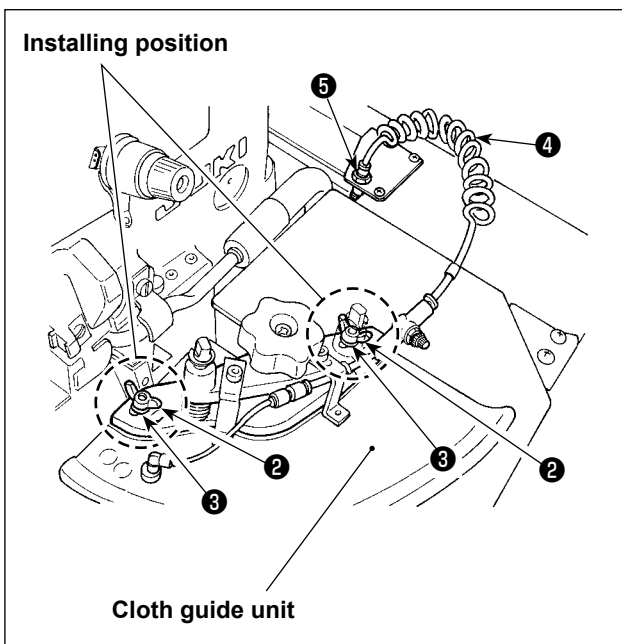


Adjust the orientation of the cloth guide according to the clamping position at the stacker unit **4**.

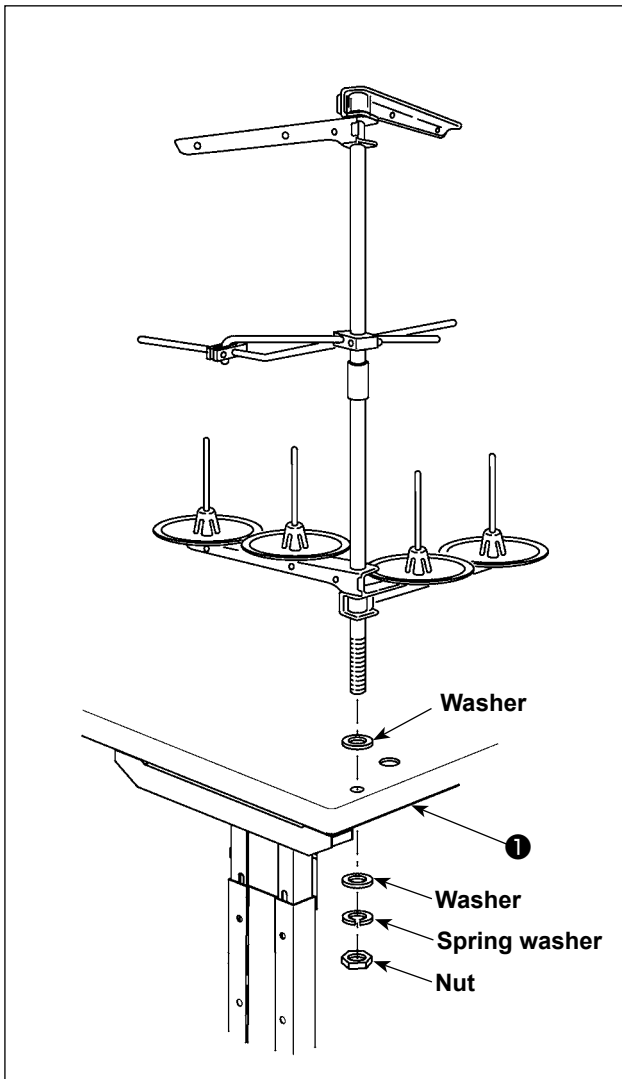
3-6. Installing the cloth plate and the cloth guide unit



- 1) Place the cloth plate on the sewing machine table.
- 2) Put the slots (at two locations) in the cloth guide unit as illustrated in the figure over two studs **1** (at two locations) of the cloth plate over. Fix the studs **1** with washer **3** and thumb screws **2**.
- 3) Connect air tube **4** to joint **5**.

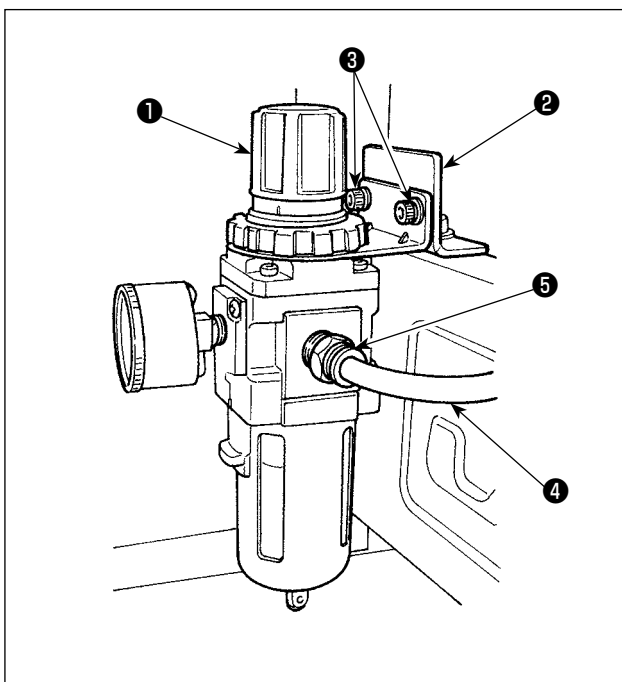


3-7. Installing the thread stand



Insert the thread stand into the hole in table **1** with a washer placed between them and fix with the nut and washers from under the table as illustrated in the figure at left.

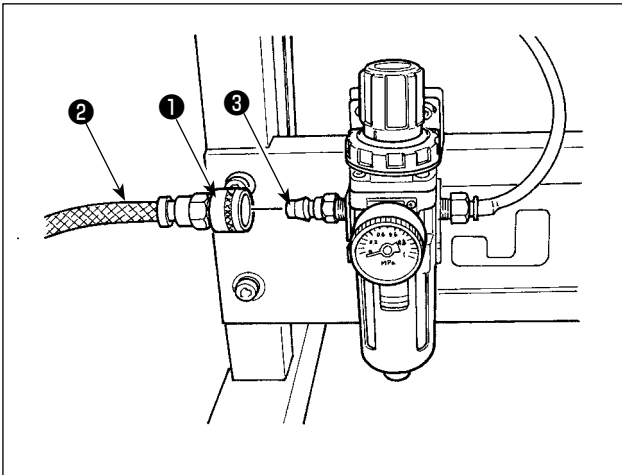
3-8. Installing the regulator



Fix regulator **1** on mounting plate **2** with screws **3** (at two locations).

Connect $\varnothing 8$ air tube **4** to joint **5**.

3-9. Connecting the air coupler

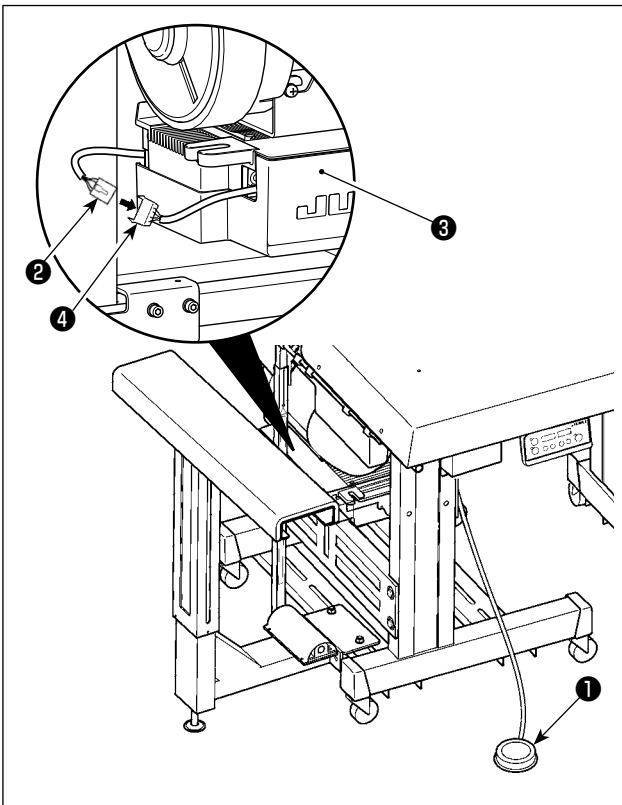


Connect the air coupler ① supplied with the unit as an accessory firstly to air hose ② , secondly to coupler ③ on the main body side.



Make sure that the pressure gauge of the regulator reads 0.5 MPa.

3-10. Connecting the starting pedal for the machine



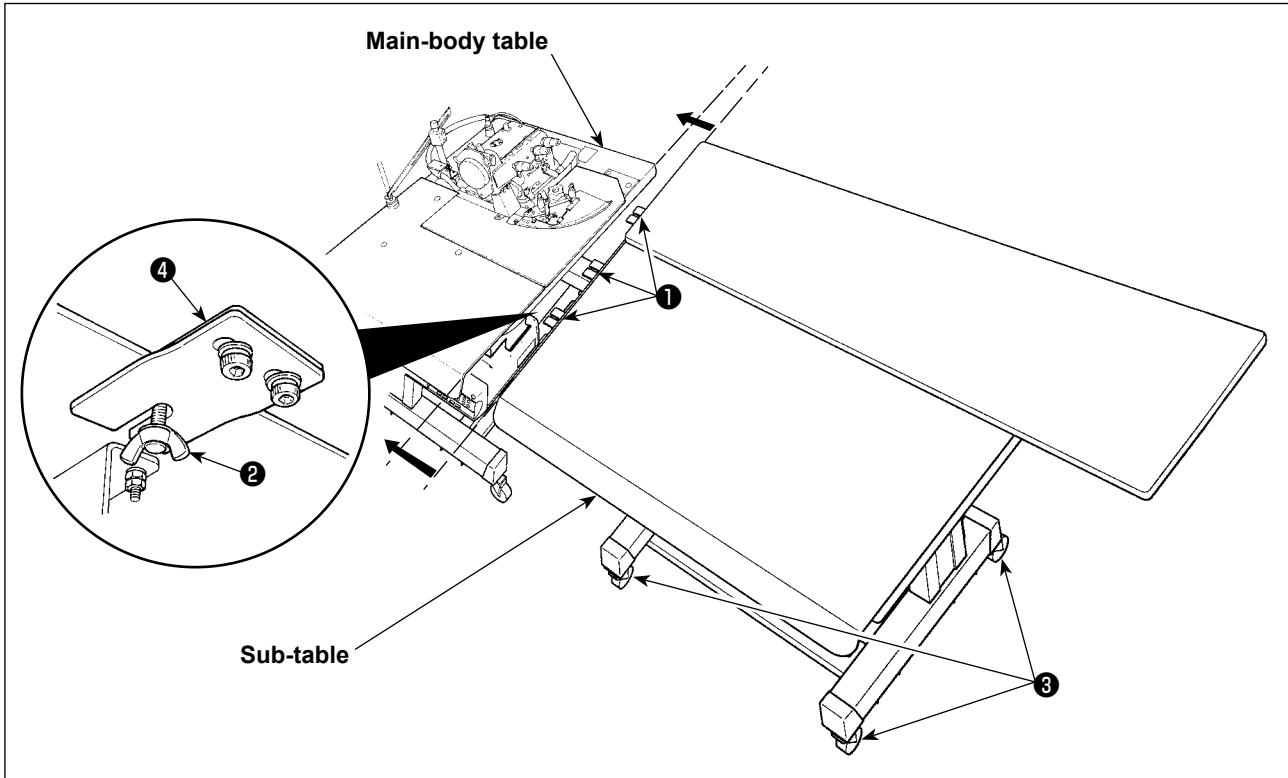
Connector ② of starting pedal ① to junction connector ④ coming from control box ③ .

3-11. Joining the sub-table (only for the long table type)



CAUTION :

Connect the sub-table to the main-body table taking care not to allow your fingers caught between them.



Butting the sub-table and the main-body table with no clearance provided between them, fix clips ❶ (at three locations) with thumbscrews ❷ . Lock casters ❸ (at four locations) to secure the sub-table.

A difference in height between the top face of the main-body table and that of the sub-table may be observed on some installation site.

If such a difference is observed, adjust so that the tables are same in height with spacers ❹ for adjusting the height of the clips. (Three spacers are supplied.)

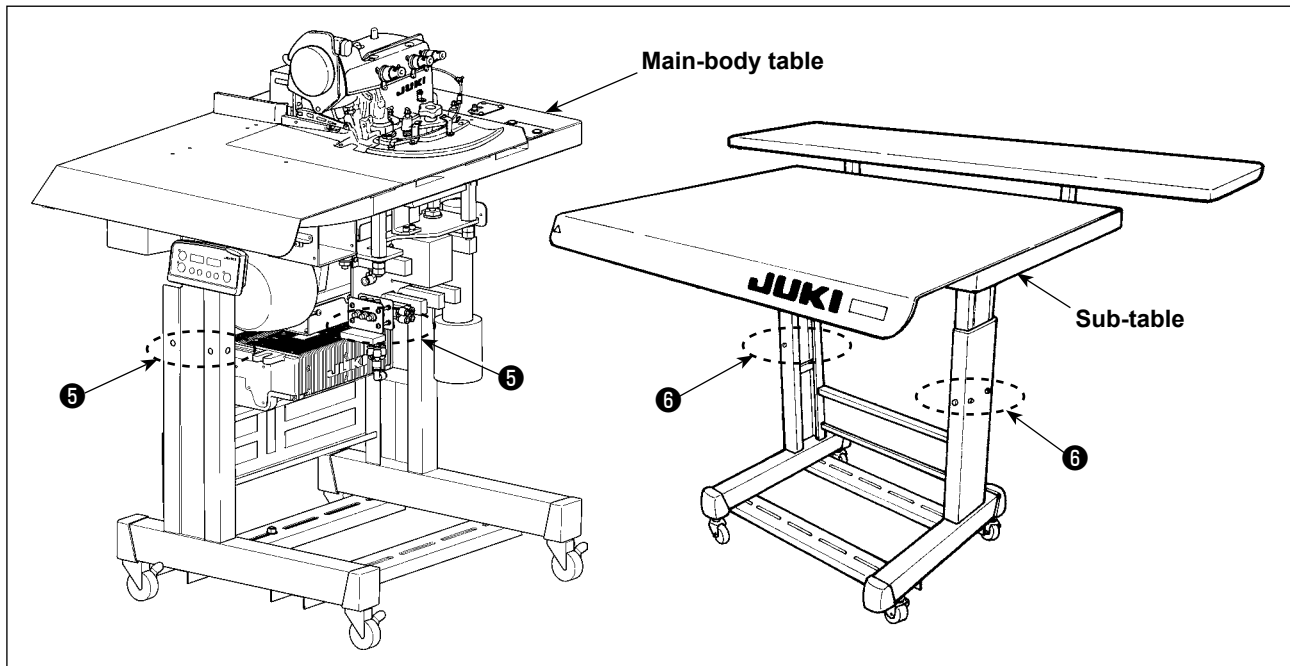
- If the sub-table is lower than the main-body table :
Add the supplied spacer(s) appropriately.
- If the sub-table is higher than the main-body table :
Remove spacer ❹ and change with a thinner one.



CAUTION :

To protect against possible personal injury or death, be sure to connect the tables while supporting the machine by four or more workers.

If the difference in height between the sub-table and the main-body table cannot be eliminated with spacer ④, adjust the height of the main-body table (or the height of the sub-table).



To adjust the height of the main-body table, loosen screws ⑤ that secure the casters (at six locations) to adjust the height of the main-body table to that of the sub-table and tighten the screws ⑤ .

To adjust the height of the sub-table, loosen screws ⑥ that secure the casters (at six locations) to adjust the height of the sub-table to that of the main-body table and tighten the screws ⑥ .

3-12. Connecting the power plug



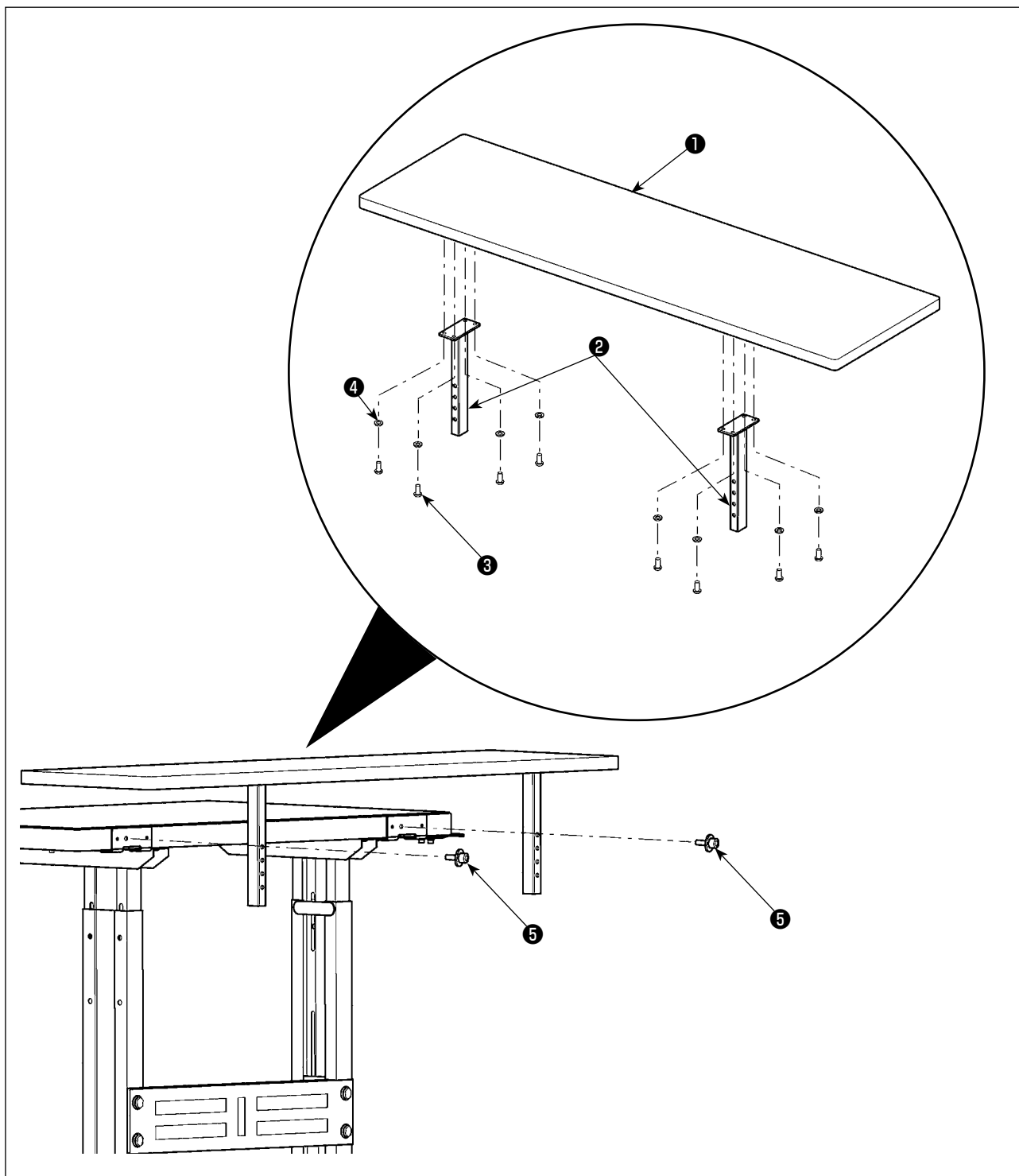
CAUTION :

To prevent possible accidents caused by leakage or dielectric strength, an appropriate power plug shall be installed by a person who has an expert knowledge of electricity. Be sure to connect the power plug to the receptacle that is well grounded.

Connection of the power plug to the power depends on the specifications of the product. Adjust the power plug to the power specifications to connect.

- ① **In case of the product of single-phase, 200 to 240V specifications (CE specifications) :**
Connect the sky-blue and brown wires of the power cord to the power terminal (AC200 to 240V) and the yellow/green wire to the ground (earth) terminal respectively.
- ② **In case of the product of single-phase, 200 to 240V specifications (other than CE specifications) :**
Connect the black and white wires of the power cord to the power terminal (AC 200 to 240V), and the yellow/green wire to the ground (earth) terminal respectively.
- ③ **In case of the product of 3-phase, 200 to 240V specifications :**
Connect the red, white and black wires of the power cord to the power terminal (AC200 to 240V) and the yellow/green wire to the ground (earth) terminal respectively.

3-13. Installing the cloth receiving board (KM-5) (optional)

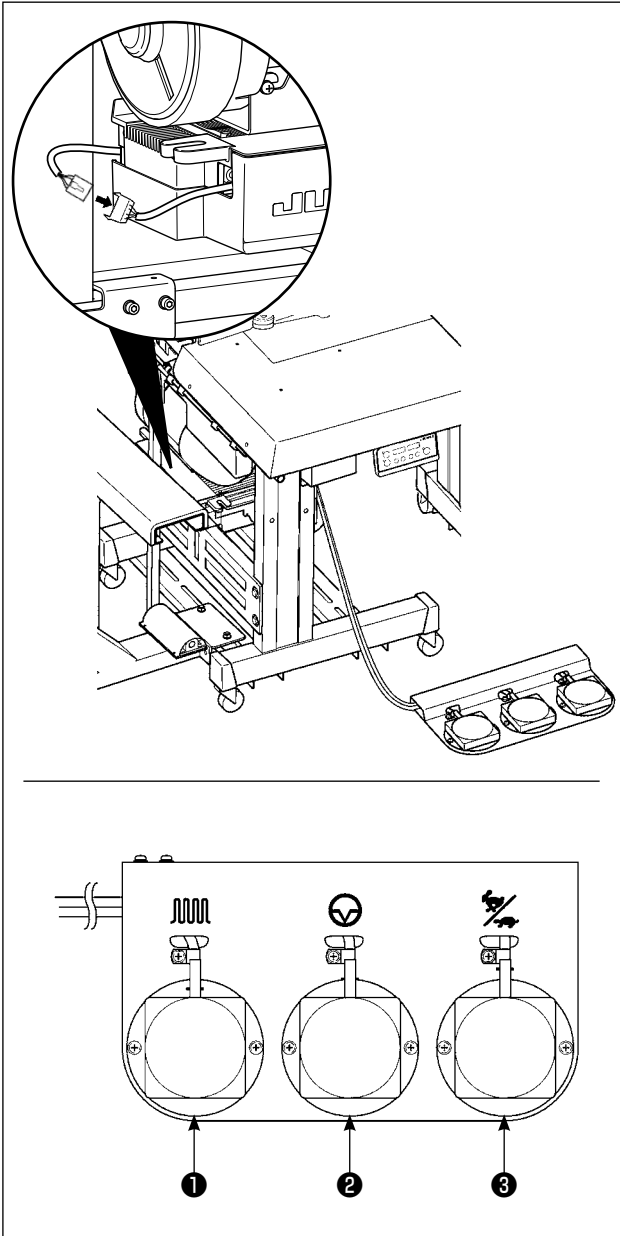


- 1) Fix support rods ② on cloth holding table ① with wood screws ③ and washers ④ (at four locations each).
- 2) Fix the cloth holding table mounted with the support rods on the sub-table with screws ⑤.



The cloth holding table can be adjusted to four different heights using the fixing holes in the support rod.

3-14. Installing the 3-pedal unit (PK-79) (optional)



Connect the connector of the pedal to the junction connector coming from the control box.

The figure shows differential feed switch ❶, pause switch ❷ and high-/low-speed changeover switch ❸ from left to right.

<p>❶ Differential feed switch</p>	<p>As long as this switch is held depressed, the differential feed function works.</p>
<p>❷ Pause switch</p>	<p>As long as this switch is held depressed, the pause function works. The machine returns to the normal operation (running) by releasing the switch.</p>
<p>❸ High-/low-speed changeover switch</p>	<p>Changeover from the high-speed to low-speed can be done only by a depress on this switch. The machine returns to the normal operation (running) by releasing the switch.</p>

4. PREPARATION

4-1. Caution before operation



CAUTION :

To avoid possible malfunctions and damage of the machine, check the following items.

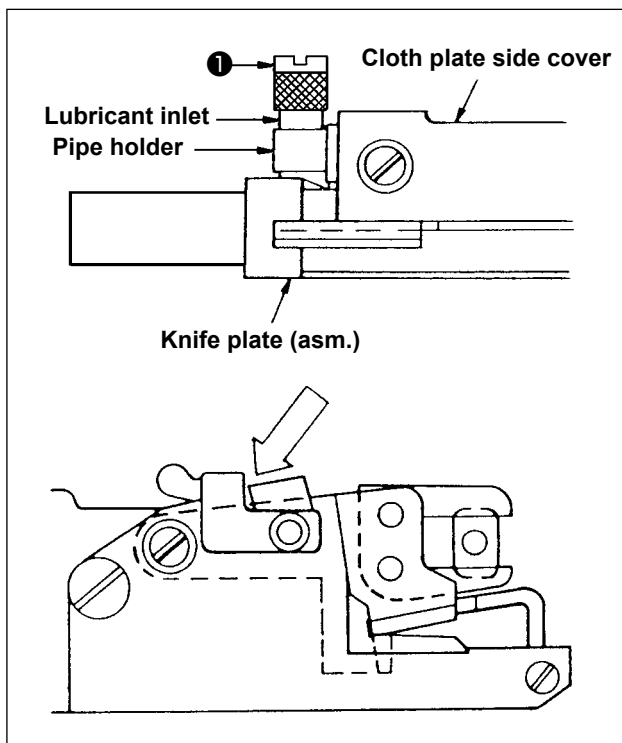
- Before you put the machine into operation for the first time, be sure to thoroughly clean it.
- Check to be sure that the voltage has been correctly set.
- Make sure that the power plug is connected properly.
- Never use the machine under a voltage that is different from the specification.

4-2. Lubrication



CAUTION :

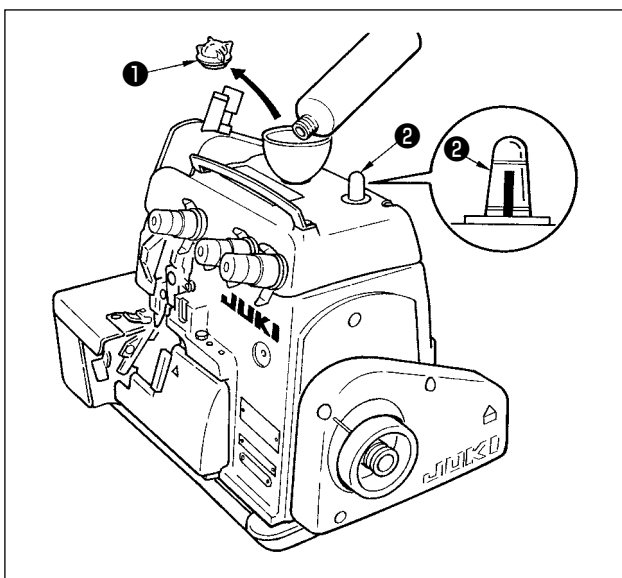
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



- Lubrication to chain-off thread trimming device
Remove screw ① from the top end of the oil hose at the rear section of the machine. The upper limit of the oil quantity is at the top of the pipe holder.
Oil consumption differs depending on the condition of use. The oil quantity should be checked on a daily basis.
As a guide, lubricate the chain-off thread trimmer at the following intervals :
 - Once a day for the continuous use
 - Normally once every three to four days



The chain-off thread trimmer has not been factory-oiled at the time of delivery. JUKI MACHINE OIL 18 should be used for lubrication.

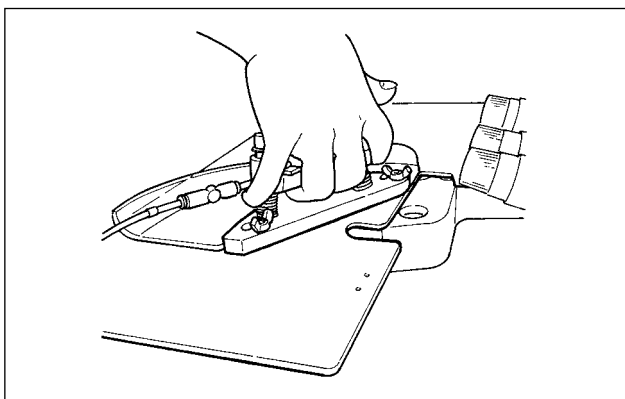


- 1) Remove oil cap ① .
- 2) Pour JUKI MACHINE OIL 18 into the oil reservoir.
- 3) Supply oil until the pointer bar almost reaches the upper red marker line when oil gauge ② is observed from the side.



If the oil amount pointer bar exceeds the red marker line, the oil quantity becomes excessive resulting in oil leakage. Be sure to stop adding the oil before the red marker line is reached.

4-3. Threading the machine

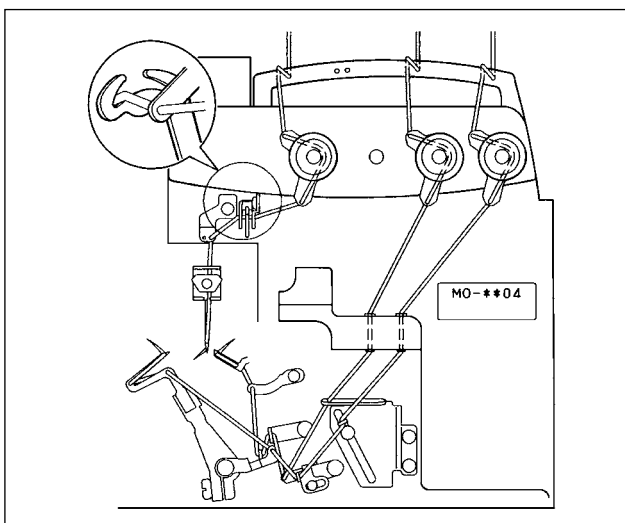


★ How to remove the cloth plate

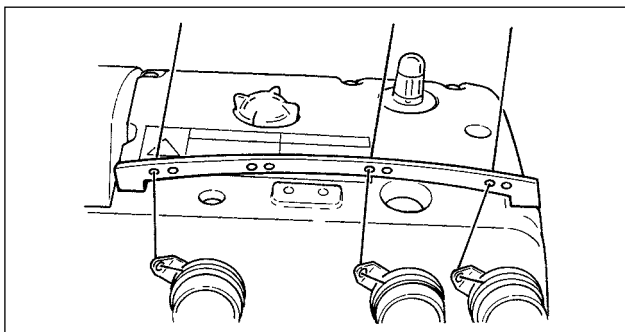
Remove the cloth plate by holding the cloth plate guide base.



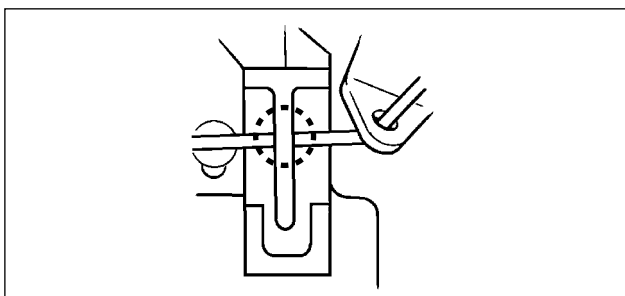
Do not touch the curve sensor (optional) mounted on the cloth plate.



To thread the machine head, remove the cloth plate in advance.

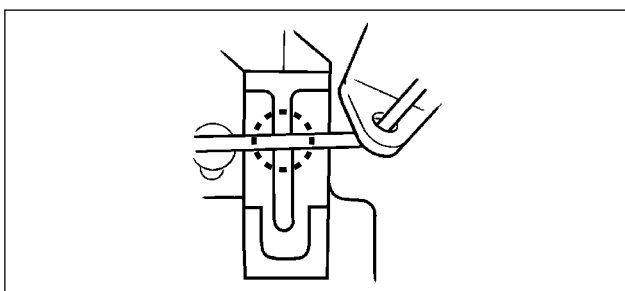


When using an untwisted thread such as wooly nylon thread or weak thread, do not wind it round the intermediate thread guide.



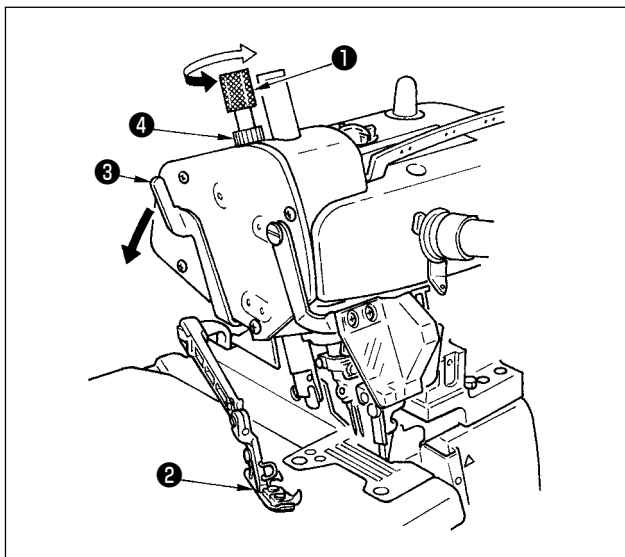
★ How to thread the needle thread silicon oil tank

When the needle cooler is used. Pass the thread under the center pawl.



When the needle cooler is not used. Pass the thread above the center pawl.

4-4. Adjusting the pressure of the presser foot and removing the presser foot



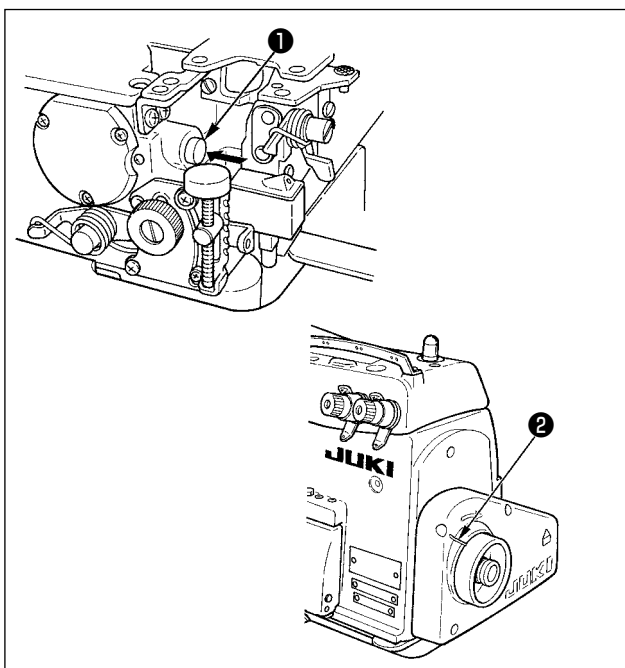
- 1) Adjust the pressure of the presser foot by loosening first nut ④ and turning presser foot adjust screw ① .
When the adjust screw is turned clockwise, the pressure will increase. When it is turned counterclockwise, the pressure will decrease.
After the adjustment, be sure to turn nut ④ without fail.
- 2) To open presser foot ② sideways, raise the needle to the highest position of its stroke and lower presser bar lifting lever ③ .

4-5. Adjusting the stitch length



CAUTION :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



To carry out adjustment, remove the cloth plate in advance.

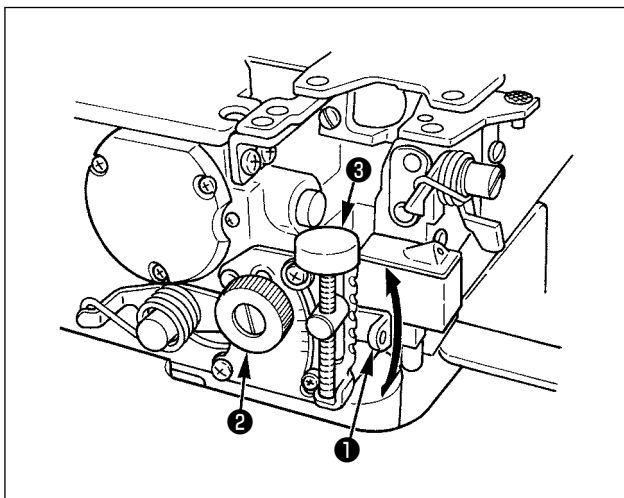
- 1) Slowly turn the handwheel as you keep depressing pushbutton ① , and you will find a point at which the pushbutton goes in farther.
- 2) With the above condition maintained, align the desired scale mark on the handwheel with mark ② on the belt cover.
- 3) Reset the pushbutton ① after setting the dial.

4-6. Differential feed mechanism



CAUTION :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



To carry out adjustment, remove the cloth plate in advance.

- 1) Loosen differential feed lock nut **2** . Move lever **1** up for stretching stitch or down for gathering stitch.
- 2) When you want to move the lever **1** only slightly, use differential feed minute-adjust screw **3** .
- 3) When the differential feed adjusting lever is set to graduation S, the machine will perform stretching with a differential feed ratio of 1 : 0.8. When the lever is set to graduation 0, the differential feed ratio between the main feed dog and the differential feed dog will be 1 : 1.
- 4) The maximum differential feed ratio for gathering is 1 : 2. The graduations beyond 0 are used as standard.
- 5) After the adjustment, securely tighten locknut **2** .

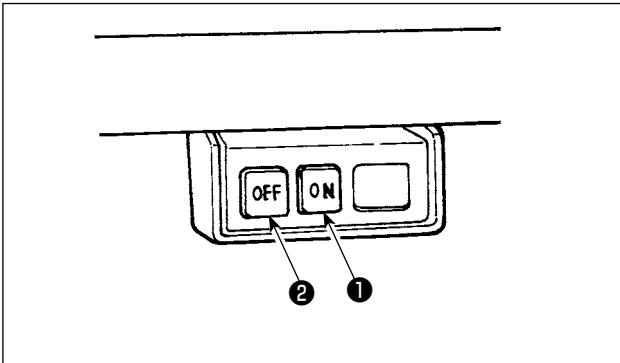
5. OPERATION

5-1. Sewing procedure

CAUTION :



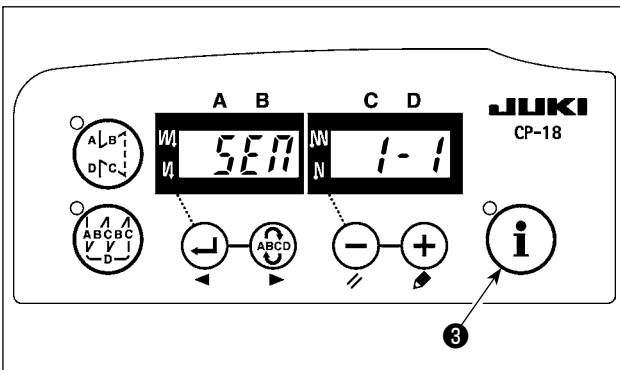
- Never start the machine with the eye protector cover raised in order to prevent injury accidents caused by the needle and the knife.
- The machine becomes hot when it is running continuously or after it has run, never touch the sewing machine.



- 1) Press ON button ❶ of the power switch to turn ON the power.



When the buzzer is kept beeping immediately after turning ON the power, press OFF button ❷ on the sewing machine to turn OFF the power since connection of the cord or power voltage may be wrong.



Indication given after turning the power on

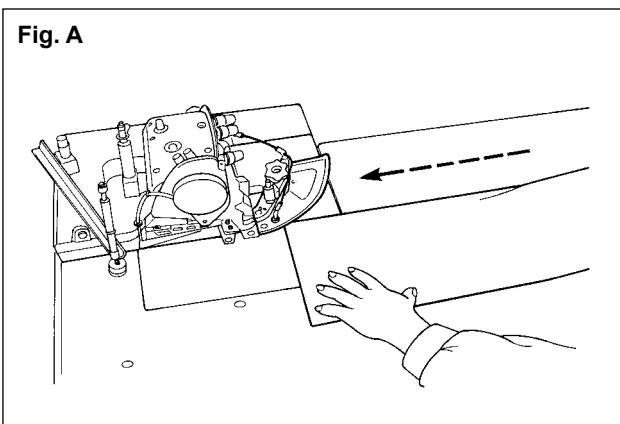
- 2) After the power to the machine is turned on, the indication shown below appears on the operation panel.

The setting item "SEM" flashes on and off.



The machine will not start as long as the lamp flashes on and off. If this indication does not appear on the operation panel, turn off the power to the machine. If the machine head is not selected correctly, the indication will not appear on the operation panel. Refer to the Engineer's Manual for details.

Fig. A

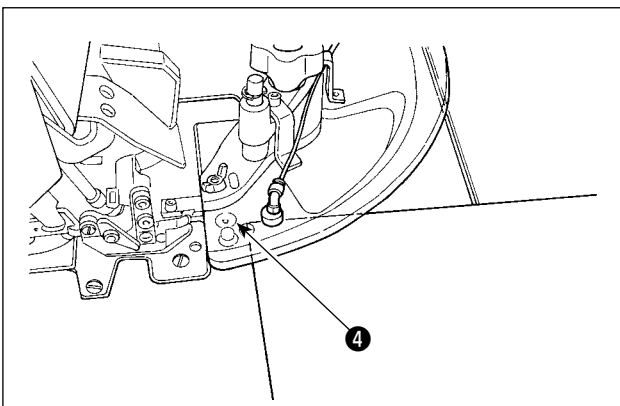


CAUTION :

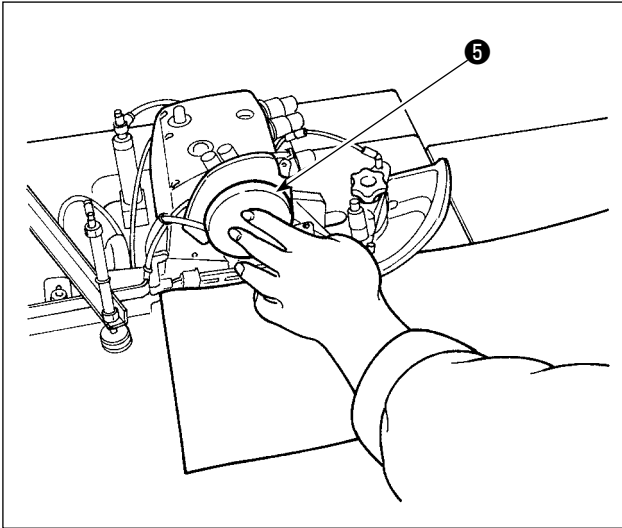


Never remove the cloth guide while the machine is ready for sewing in order to prevent accidents caused by abrupt start of the machine.

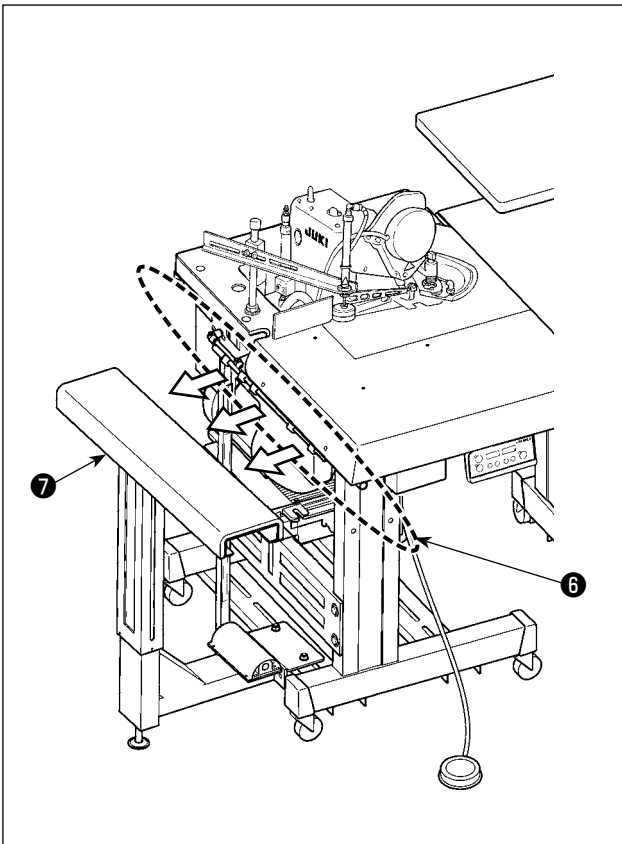
- 3) When ❸ is pressed while it is flashing on and off, the machine gets ready for sewing. Insert the material along the cloth guide from the direction of the arrow as shown in Fig. A.



When the material is inserted on start sensor ❹ located this side of the throat plate, the machine starts running to perform sewing.

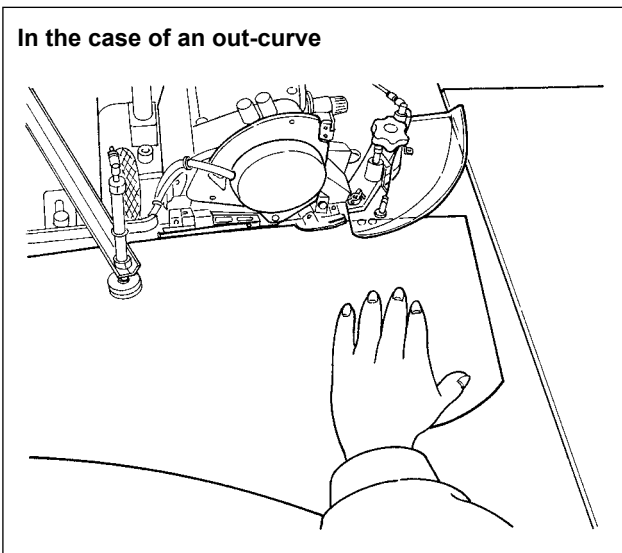


4) Once the material has come out of the sensor, the machine stops after several stitches. The stacker operates when the stacker selector switch or stacker starting switch ⑤ is depressed.

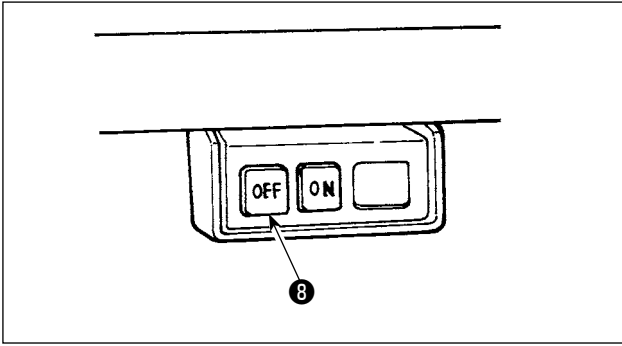


CAUTION :

- Do not place hands under the thread trimmer presser in order to protect against injury caused by trapping.
- Do not place your face near the stacker while it is in operation since air is blown out from the stacker blower outlet ⑥ .
- Do not place hands near receiving plate ⑦ of the stacker unit while the stacker is in operation.

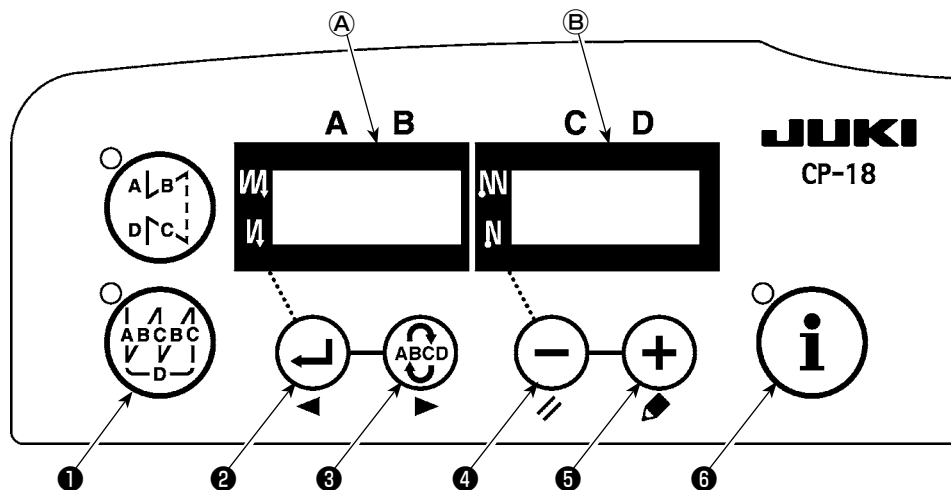



Caution When sewing an out-curve part of the material, support the material by hand since seams easily slip off the material edge.




- 5) When sewing is completed, make sure that the sewing machine has stopped. Then, press the OFF button ⑧ of the power switch to turn OFF the power.


5-2. Explanation of the operation panel



①  switch : Used for returning the setting to the initial value.

②  switch : Used for changing the contents of setting.

When this switch is pressed, changeable positions flash on and off.
By pressing the switch, flashing position shifts in the left direction.
Starting the machine is prohibited while the switch lamp is flashing on and off (setting mode).

③  switch : Used for changing the contents of setting.

By pressing the switch, flashing position shifts in the right direction.

④  switch : Used for changing the contents of the selected display (flashing section).

When this switch is pressed, the set value is decreased.

⑤  switch : Used for changing the contents of the selected display (flashing section).

When this switch is pressed, the set value is increased.

⑥  switch : Used for determining the contents of setting.

When this switch is pressed, flashing stops and the contents of setting are determined.
The machine enters the sewing mode under which it can start. When the material to be sewn is already placed on the machine under the Automatic mode, E333 will appear on the operation panel. In this case, the machine is unable to enter the sewing mode. If the curve sensor is set effective, the same phenomenon occurs when the material is already placed on the machine (E334). If E334 is displayed, check firstly the neighboring area of the sensor whether the material has been placed on the machine. (The same phenomenon occurs when dust settles on the sensor. Check the neighboring area of the sensor for dust.) The operation level can be changed by keeping this switch held pressed for three seconds while the switch light is flashing on and off.

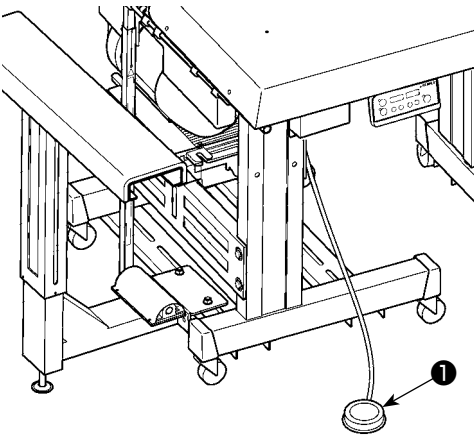
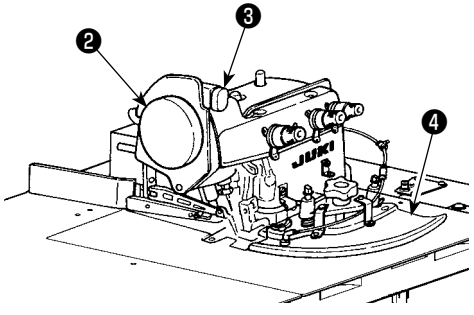
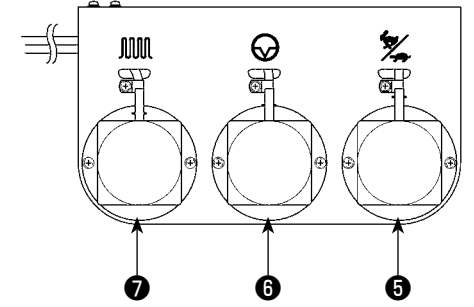


If the power to the machine is turned off before having taken the aforementioned procedure, the data changed will not be stored in memory.

Ⓐ **Set item indication :** Abbreviation of the name of the set item selected is displayed.

Ⓑ **Set contents indication :** Content of the set item selected is displayed.

5-3. Description of the pedals and the switches on the machine head


Switch location	Name and description of function
	<p>① Sewing machine starting pedal The machine starts at the chain-off thread setting speed (at the high speed if the manual start mode is selected) as long as this switch is held depressed.</p> <ul style="list-style-type: none"> • When the automatic start mode is selected : When the material is detected, the automatic starting is given priority. The chain-off thread (starting pedal) is inoperative under the automatic starting. • When the manual start mode is selected : The material detection is inoperative. The operation same with that taken when the material has come out of the sensor under the automatic mode is taken by releasing the switch.
	<p>② Stacker operation switch When the switch is pressed, the seam is changed to be last one regardless of the setting of the number of seams for activating the stacker. The stacker works regardless of the use/disuse setting of the stacker.</p> <p>③ Pause switch When the switch is pressed, E050 is displayed on the operation panel to stop the machine. After the machine has stopped, the machine is restored to the on state by pressing the panel switch.</p> <p>④ Cloth plate open/close switch When this switch works, E302 is displayed on the operation panel to stop the machine. To reset, turn the power off then on.</p>
	<p>⑤ Low-/high-speed changeover switch (optional) Changeover from the high-speed to low-speed can be done only by a depress on this switch. As long as the switch is held depressed, the low-speed operation is selected.</p> <p>⑥ Temporary stop switch (optional) As long as this switch is held depressed, the temporary stop function works. The machine returns to the normal operation (running) by releasing the switch.</p> <p>⑦ Differential feed switch (optional) As long as this switch is held depressed, the differential feed function works. The speed to be employed while the function is working will be the one for the curve sensor.</p>

5-4. List of functions to be set

Item indication	Contents indication (initial value)			Description	Setting range	Operation level	
1	S	E	M	1 - 1	The number of seams, current seam	1 to 9	1
2	C	n	T		No. of pcs. counter	0 to 9999	1
3	S	T	K		Use/disuse of the stacker	0 to 1	1
4	S	T	d		Number of delay stitches for the thread trimming presser	0 to 99 stitches	2
5	S	C	d		Number of delay stitches for the stacker presser	0 to 999 stitches	2
6	S	S	T	5	Number of delay stitches for operating the stacker and stopping the machine	0 to 999 stitches	1
7	S	b	d	5	Delay time of the stacker blow	0 to 9900 ms	2
8	S	b	L	7	Stacker blow time	0 to 9900 ms	1
9	S	T	F	2	Delay time of the thread trimmer presser	0 to 200ms	2
10	H	S	P	5	Speed of stitch for the high-speed mode	200 to 8000 sti/min*	1
11	L	S	P	3	Speed of stitch for the low-speed mode	200 to 8000 sti/min*	1
12	S	S	P	2	Speed of stitch for the curve sensor	200 to 8000 sti/min*	1
13	d	S	P	2	Speed of stitch for producing chain-off thread	200 to 8000 sti/min*	2
14	S	T	r	1	Start delay time	0 to 9900 ms	2
15	S	T	P	5	Number of delay stitches for stopping the machine	0 to 999 stitches	1
16	A	U	T		Setting of the start mode	0 to 1	2
17	C	U	b		Curve-mode setting	0 to 1	1
18	C	U	1		Curve-mode seam setting	0 to 1	1
19	C	S	H		Curve differential feed mode setting	0 to 1	1
20	C	S	1		Curve differential feed mode seam setting	0 to 1	1
21	C	S	S		Setting of the number of stitches for starting the curve mode	0 to 999 stitches	1
22	C	S	E	5	Setting of the number of stitches for ending the curve mode	0 to 999 stitches	1
23	d	U	S	2	Setting of the number of stitches for sucking chain-off thread at the beginning of sewing	0 to 999 stitches	2
24	C	U	r		Curl blow time	0 to 60 seconds	2
25	F	L	U		Presser-lifter lift waiting time	0 to 9900 ms	2
26	F	L	d		Presser-lifter lowering waiting time	0 to 9900 ms	2

* "sti/min" is an abbreviation for "stitches per minute."

★ Indication given when changing the operation level

L	E	v			1	Operation level 1 : Normal operation (When turning the power on)
L	E	v			2	Operation level 2 : Detailed operation The operation level can be changed by keeping the  switch held depressed for three seconds.



After the operation level has been changed, the indication which appears when turning on the power to the machine is shown on the operation panel.

★ Listing of digitally displays

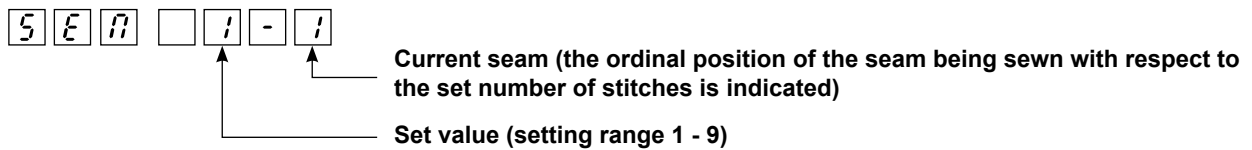
Numeral	0	1	2	3	4	5	6	7	8	9			
Digital display													
Character	A	B	C	D	E	F	G	H	I	J	K	L	M
Digital display													
Character	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Digital display													

5-5. Details of selected functions

① Setting of the number of seams (level 1)

The number of seams for activating the stacker is set.

The preset number of seams and the current seam are indicated.



② Setting of the No. of pcs. counter (level 1)

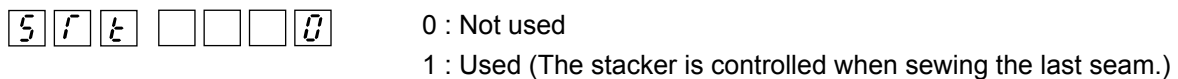
The number of pieces of products to be sewn is set.

The No. of pcs. counter increments by one every time the stacker operates.



③ Setting of use/disuse of the stacker (level 1)

Whether the stacker is used or not is selected.



④ Setting of the number of delay stitches for the thread trimmer presser (level 2)

The number of stitches to be sewn before the thread trimmer presser works after the material has come out of the sensor is set.



⑤ Setting of the number of delay stitches for the stacker presser (level 2)

The number of stitches to be sewn before the stacker presser works after the thread trimmer presser has worked is set.



⑥ Setting of the number of delay stitches for operating the stacker and stopping the machine (level 1)

The number of stitches to be sewn before the sewing machine stops after the material has come out of the sensor is set.



⑦ Setting the delay time for the stacker blow (level 2)

The time to be elapsed before the stacker blow works after the stacker presser has worked is set.



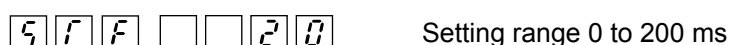
⑧ Setting the time for the stacker blow (level 1)

The length of time during which the stacker blow works after the delay time for the stacker blow has elapsed.



⑨ Setting the delay time for lifting the thread trimmer (level 2)

The time to elapsed before lifting the thread trimmer presser after the stacker blow has worked is set.



⑩ **Setting the speed of stitch for the high-speed mode (level 1)**

The speed of stitch for the high-speed mode is set.

Setting range 200 to 8000 sti/min *

⑪ **Setting the speed of stitch for the low-speed mode (level 1)**

The number of low-speed revolutions is set.

Setting range 200 to 8000 sti/min *

⑫ **Setting the speed of stitch for the curve sensor (level 1)**

The speed of stitch for the section where the curve sensor is effective (from the number of stitches at which the curve sensor starts to the one at which the sensor stops) is set.

Setting range 200 to 8000 sti/min *

⑬ **Setting the speed of stitch for producing chain-off thread (level 2)**

The speed of stitch to be employed when operating the chain-off thread (starting) pedal.

Setting range 200 to 8000 sti/min *

⑭ **Setting of the start delay time (level 2)**

The time to be elapsed before starting the machine after the material has been detected is set.

Setting range 0 to 9900 ms

⑮ **Setting of the number of delay stitches for stopping the machine (level 1)**

The number of stitches to be sewn before the machine stops after the normal-seam material (other than the stack mode) has come out of the sensor is set.

Setting range 0 to 999 stitches

⑯ **Setting of the start mode (level 2)**

The start mode of the machine is set.

Either the automatic mode by the start sensor or the manual mode by the starting pedal is selected.

0 : Manual mode (The start sensor is inoperative.)
1 : Automatic mode
(The starting pedal is used as the chain-off thread switch.)

⑰ **Curve mode setting (level 1)**

Whether the curve sensor is used or not is selected.

0 : Not used
1 : Used

⑱ **Curve mode seam setting (level 1)**

Whether the curve sensor is used or not is selected for the specified seam.

0 : Not used
1 : Used

⑲ **Curve differential feed mode setting (level 1)**

Whether the differential feed mechanism is activated or not by means of the curve sensor is selected.

0 : Not used
1 : Used

* "sti/min" is an abbreviation for "stitches per minute."

⑳ **Curve differential feed mode seam setting (level 1)**

Whether the differential feed mechanism is activated or not by means of the curve sensor is selected for the specified seam.

 0 : Not used
1 : Used

㉑ **The number of stitches for starting the curve mode (level 1)**

The number of stitches to be sewn before the curve mode or differential feed mode starts after the curve sensor has detected a curved part of the material is set.

 Setting range 0 to 999 stitches

㉒ **The number of stitches for ending the curve mode (level 1)**

The number of stitches to be sewn from the start to the end of the curve mode or differential feed mode is set.

 Setting range 0 to 999 stitches

㉓ **The number of stitches for sucking chain-off thread at the beginning of sewing (level 2)**

The number of stitches for sucking chain-off thread at the beginning of sewing is set.

 Setting range 0 to 999 stitches

㉔ **Curl blow output time (level 2)**

The time to be elapsed before turning off the curl blow after the machine has stopped is set.

 Setting range 0 to 60 seconds

㉕ **Presser-foot lift waiting time (level 2)**

The time to be elapsed before lifting the presser foot after the machine has stopped is set.
(The presser foot automatically goes up when the machine has stopped after stacking.)

 Setting range 0 to 9900 ms

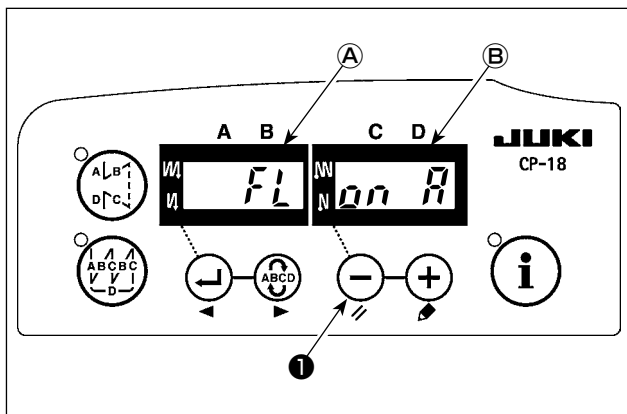
㉖ **Presser-foot lowering waiting time (level 2)**

The period of time to be elapsed from the startup of sewing machine to the lowering of the presser foot.

 Setting range 0 to 9900 ms

5-6. Other settings

(1) Setting of the auto lifter function (optional)



FL ON A

Air drive display (+24V)



CAUTION :

When the auto-lifter function is used, do not place your fingers under the presser foot.

When the optional auto-lifter device (AK) is attached, the auto-lifter function is brought into action.

- 1) Turn ON the power switch while pressing switch ① on the operation panel.
- 2) LED display is turned to ①, ② (FL ON) with “beep”, and the function of auto-lifter becomes effective.
- 3) Turn OFF the power switch, and turn ON the power switch again to return to the normal mode.
- 4) Repeat the operation 1) to 3), and LED display is turned to (FL OFF). Then, the function of auto-lifter does not work.

FL ON : Auto-lifter device becomes effective.

FL OFF : Auto-lifter function does not work.

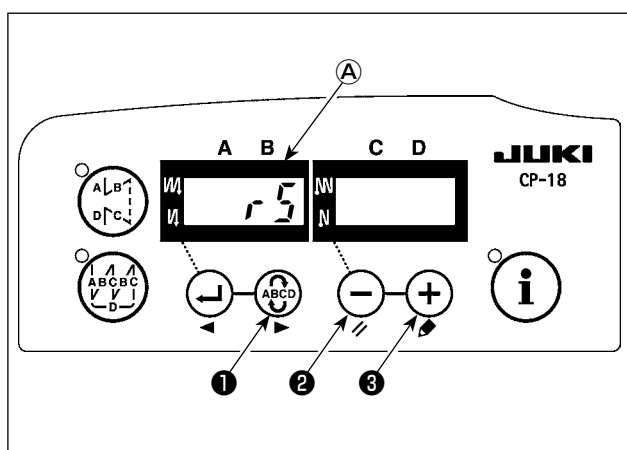


1. To perform re-turning ON of the power, be sure to perform after the time of one second or more has passed.

(If ON / OFF operation of the power is performed quickly, setting may be not changed over well.)

2. Auto-lifter is not actuated unless this function is properly selected.

5-7. Initialization of the setting data



All contents of function setting of the control box can be returned to the standard set values.

- 1) Pressing all switches ①, ② and ③, turn ON the power switch.
- 2) LED displays indication ① with the sound “peep”, and initialization starts.
- 3) The buzzer sounds after approximately one second (single sound three times, “peep”, “peep”, and “peep”), and the setting data returns to the standard setting value.



Do not turn OFF the power on the way of initializing operation. Program of the main unit may be broken.

- 4) Turn OFF the power switch, and turn ON the power switch again to return to the normal mode.

6. ADJUSTMENT

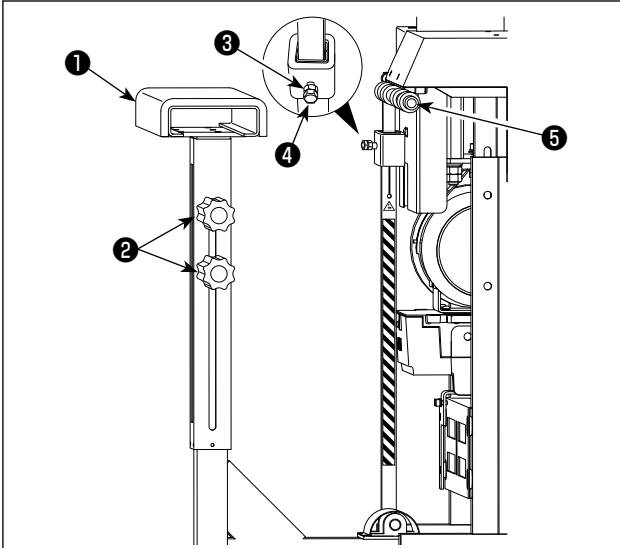
6-1. Stacker support board adjustment



CAUTION :

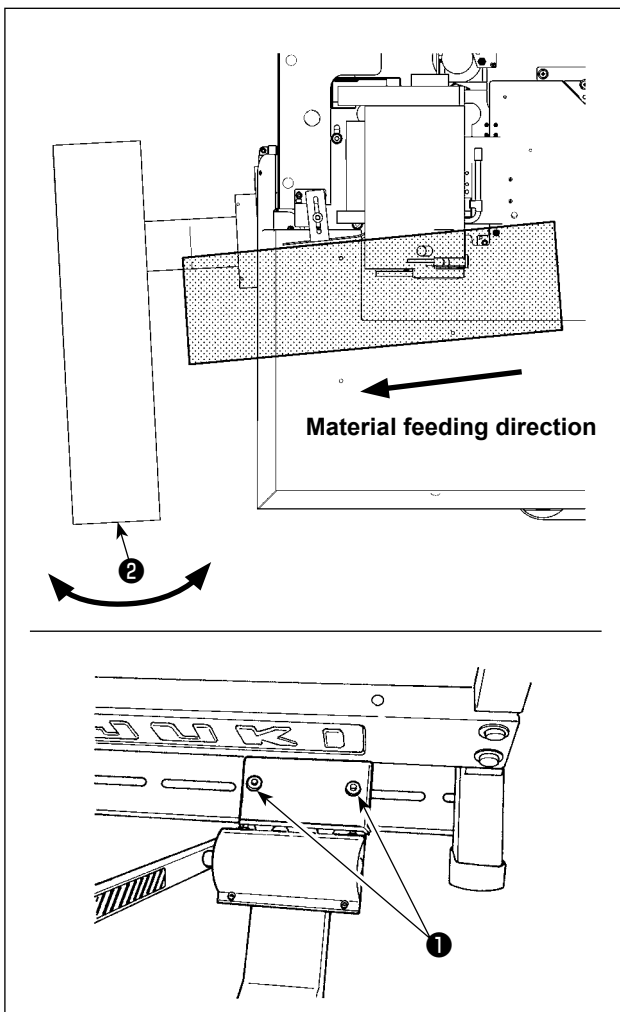
To avoid possible accidents because of abrupt start of the machine or the device, turn OFF the power to the machine, and expel air remaining in the machine by removing the pipe of the air supply before carrying out assembling or adjustment works.

(1) Adjusting the stacker height



- 1) Adjust the support board ① in accordance with the type of material to be used.
- 2) When handle ② is loosened, the support board can be moved up and down. When it is in the correct position, tighten the handle tightly.
- 3) Loosen nut ④ . Loosen hexagon head bolt ③ and adjust work clamp shaft ⑤ in accordance with the support board. After the adjustment, fix the nut by tightening the hexagon head bolt.

(2) Adjusting the orientation of the stacker

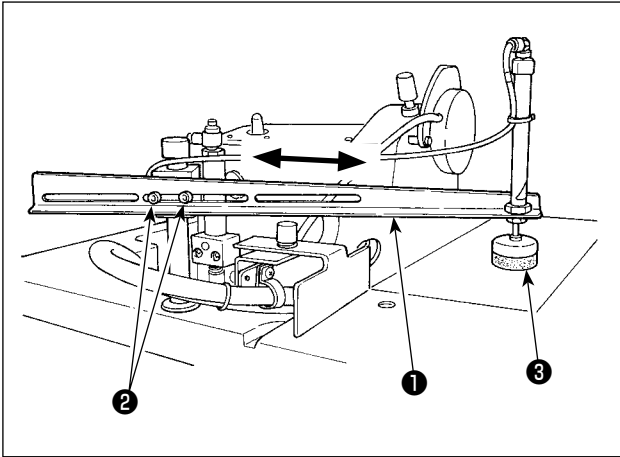


Loosen nuts ① (at two locations) and adjust the orientation of the stacker unit ② .



If the stacked materials are not neatly stacked, adjust the orientation of the stacker unit so that stacker support board ② is at right angles to the stacker cloth guide (material feeding direction).

6-2. Adjusting the position of the thread trimmer presser

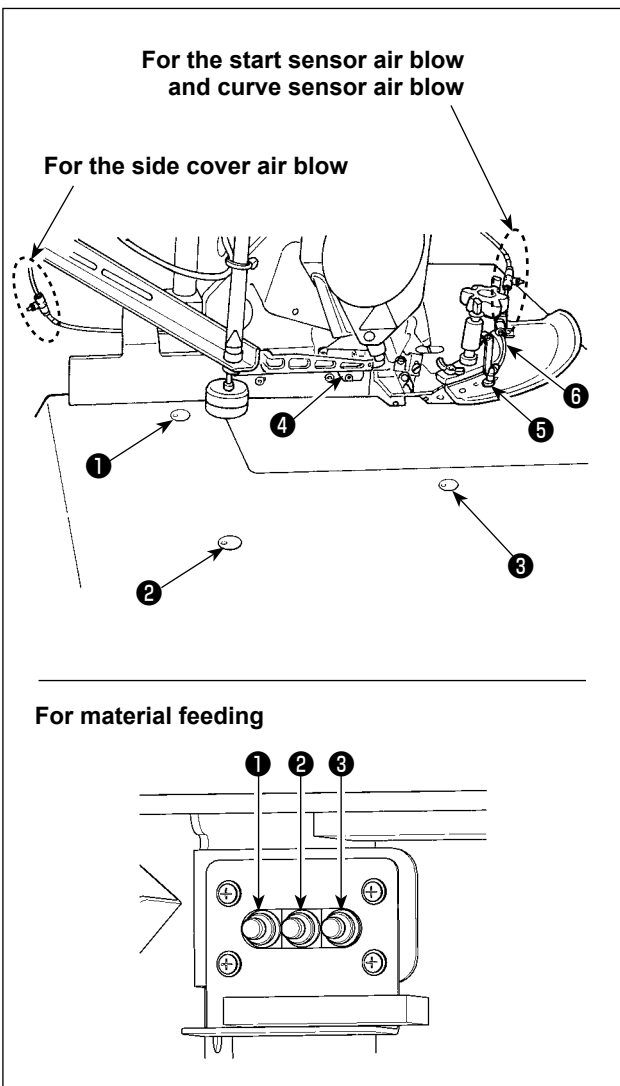


Loosen screws ② (at two locations) which fix cylinder mounting arm ① to adjust the arm to the right or left. Adjust the thread trimmer presser to the position at which it clamps the material to be sewn at the center of its width.



When adjusting, fix the thread trimmer presser so that presser sponge ③ is aligned with the top face of the table with the thread trimming cylinder brought to its lower position. If the cylinder is inclined, the thread trimmer presser may fail to properly clamp the material or a cylinder failure can occur.

6-3. Adjusting the air blow



1) The amount of the following air blow should be adjusted by means of the speed controller according to the type of material and pattern to be sewn.

- ① Cloth feeding air blow
- ② Cloth feeding air blow
- ③ Cloth feeding air blow
- ④ Side cover air blow
- ⑤ Start sensor air blow
- ⑥ Curve sensor air blow (optional)

2) The air blowing amount is reduced by turning the adjusting knob clockwise.

3) The air blowing direction of the cloth feeding blow can be changed by loosening the M4 nut mounted underside of the table.

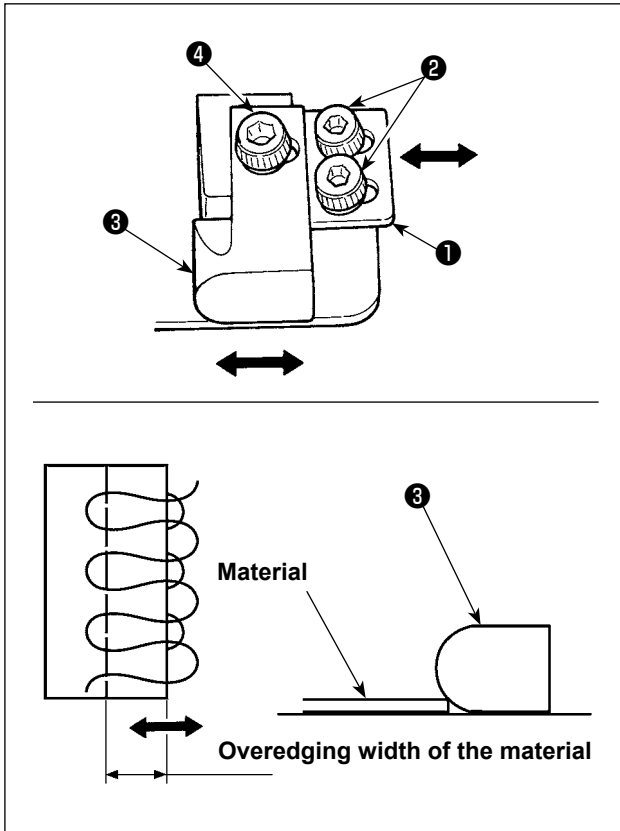
After changing the air blowing direction, be sure to tighten the nut to fix it. In addition, check to be sure that the air hoses are fully tightened with a clip band.

6-4. Adjusting the edge guide



CAUTION :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

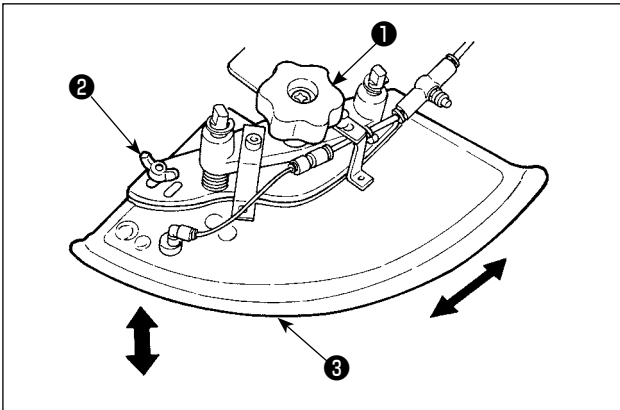


- 1) Edge guide ❶ works to adjust the overedging width of the material. Adjust the overedging width by adjusting edge guide ❶ to the right or left using screws ❷ .
- 2) Curl guide ❸ works to prevent the material edge from curling. Adjust the curl guide with screw ❹ according to the cloth thickness.

6-5. Adjusting the cloth guide

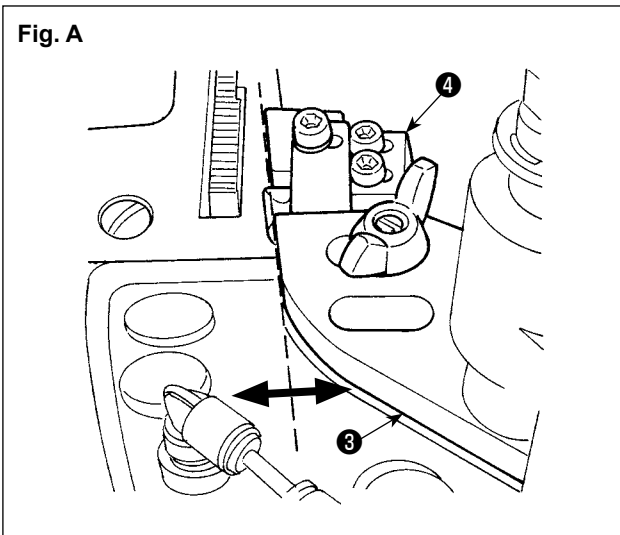


CAUTION :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



- 1) By loosening two screws ②, cloth guide position can be adjusted in the direction shown by arrow. After the adjustment of overedging width of the material with edge guide ④, adjust the surface of edge guide ④ and that of cloth guide ③ (Fig. A) are flush with each other.
- 2) If the knob ① is turned to the right, cloth guide ③ is lowered, and if the knob is turned to the left, cloth guide is raised. Make adjustment according to the cloth thickness.

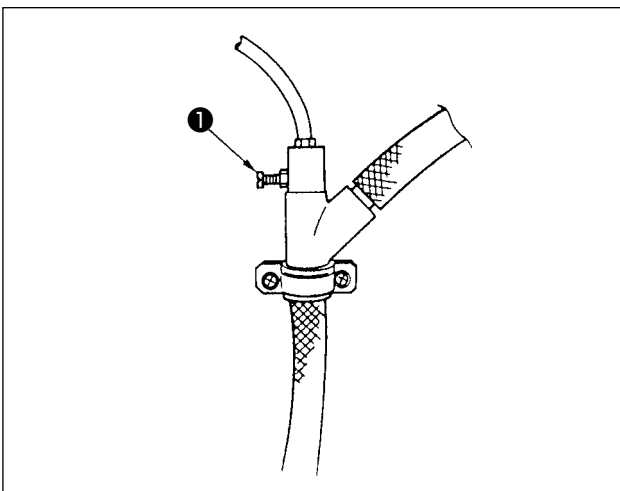
Fig. A



6-6. Regulator adjustment



CAUTION :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



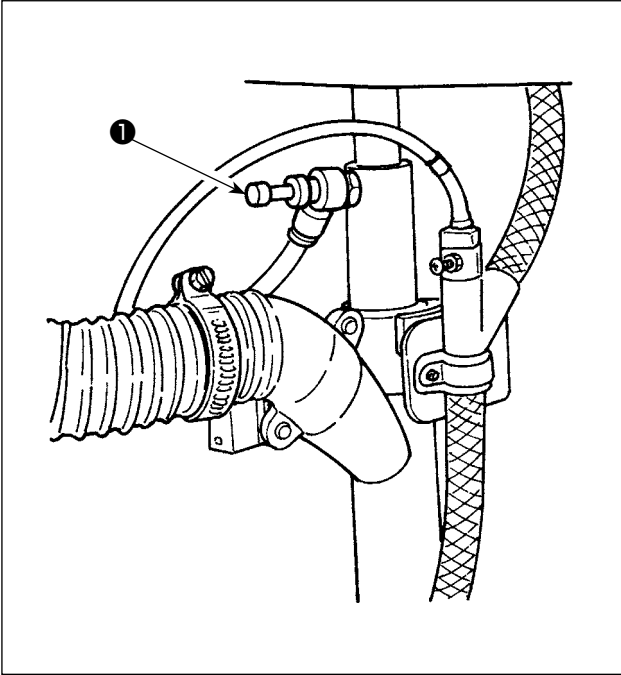
Tightening adjustment screw ① weakens the chain-off thread suction power; loosening the screw strengthens it.

6-7. Adjusting the cloth chip suction force



CAUTION :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



Tightening adjustment screw ❶ weakens the chain-off thread suction power; loosening the screw strengthens it.



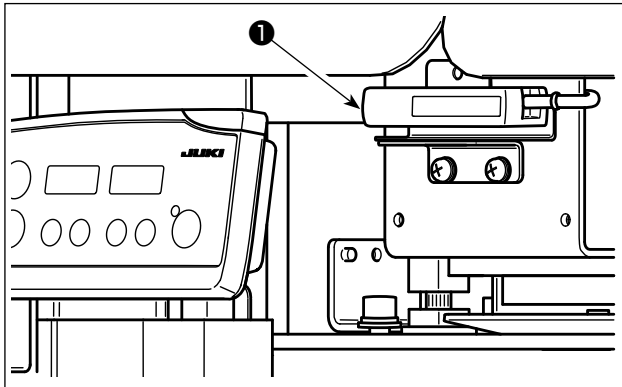
The suction force for the cloth chip collector and the dust collector mounted on the upper looper bracket is adjusted by means of the same adjusting screw.

6-8. Adjusting the sensors

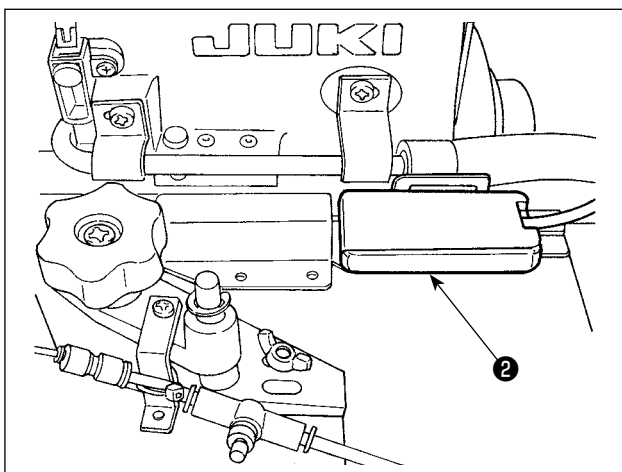
Once the cloth guide has been adjusted to 5 mm position, check to be sure that the numeric value on the main digital display shown on the amplifier is 8000 or more when no material is placed under the sensor unit, and that the numeric value on the main digital display is 6200 or less when the material is placed under the sensor unit.



If the aforementioned requirements are not satisfied, the machine can malfunction. It is therefore necessary to adjust the threshold of the amplifier.



Startup sensor amplifier ① is located at the position as illustrated in the figure.



Amplifier ② for the curve sensor is located at the rightmost position on the top face of the cloth plate.

DPC indicator
Turns ON when Dynamic power control is effective.
* This function is not used by this sewing machine.

△ L/D button
This button is used for changing over the status of L/D between "ON (L) when the light enters" and "ON (D) when the light is shielded".
* The startup sensor has been set to the state "ON (D) when the light is shielded". The curve sensor has been set to the state "ON (L) when the light enters".

L/D indicator
Setting status of L/D between "ON (L) when the light enters" and "ON (D) when the light is shielded" is displayed.

ST indicator
Turns ON when Smart tuning is in progress.

STUNE button
Set value for the light projecting power is automatically set.

Threshold
Green digital display

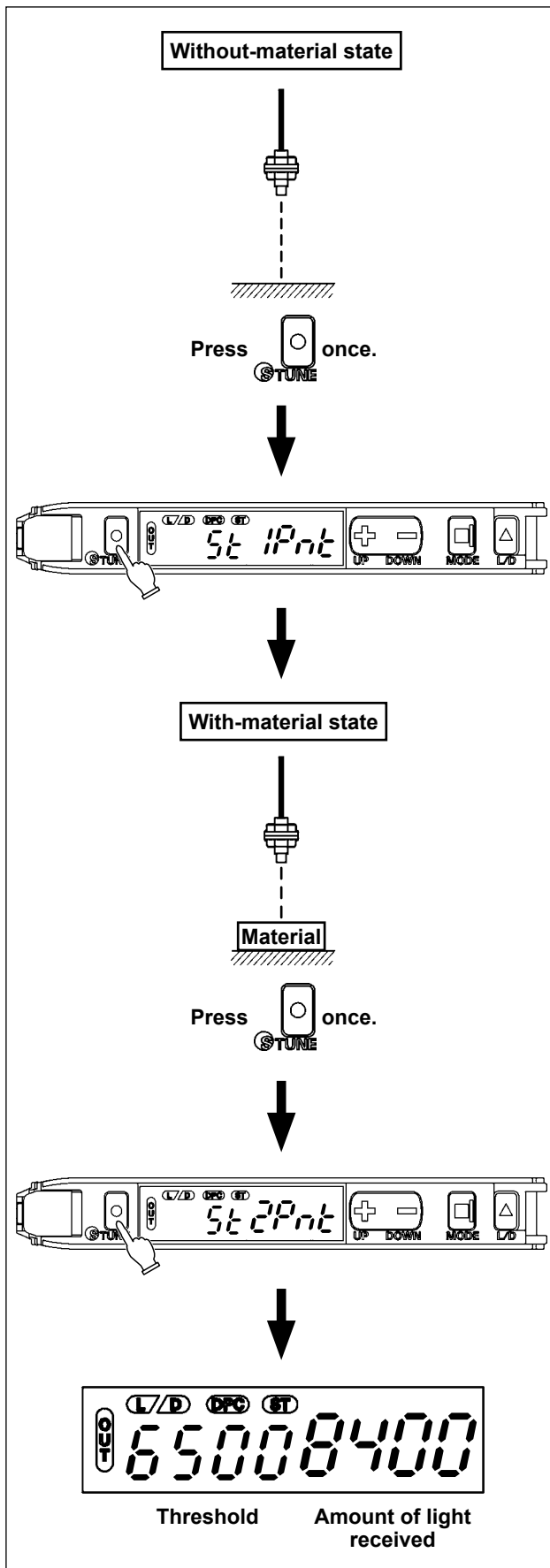
Amount of light received
Red digital display

+/- UP/DOWN button
This button is used for finely adjusting the threshold and changing the configuration parameter.

MODE button
This button is used for changing over the mode between the detection mode and the setting mode.

(1) Setting thresholds for the start sensor and curve sensor

It is possible to detect two amounts of light received; i.e., the amount of light received when there is no material and that when there is a material. The intermediate value between those two amounts of light received can be set as the threshold.



- 1) Adjust the clearance provided between the cloth guide and cloth plate to 5 mm before starting adjustment.

Turn on the power to the machine.



Be sure to carry out adjustment under the machine setting mode in order to prevent accidents caused by abrupt start of the machine.

- 2) Open the sensor amplifier cover.
- 3) Place no object to be detected at the sensor irradiation position.
- 4) Press the **STUNE** button once.
St 1Pnt is displayed with lighted.
- 5) Place a sheet of white paper (substitute for the material) at the sensor irradiation positions respectively on the cloth guide and on the cloth plate. Then, press the **STUNE** button once.
St 2Pnt is displayed with lighted.
- 6) The setting is completed when the screen is restored to the one on which the specified threshold and the current amount of light received are displayed.
- 7) Close the sensor amplifier cover.
- 8) Insert the material into the cloth guide unit. Check to be sure that the amount of light received do not exceed the threshold.

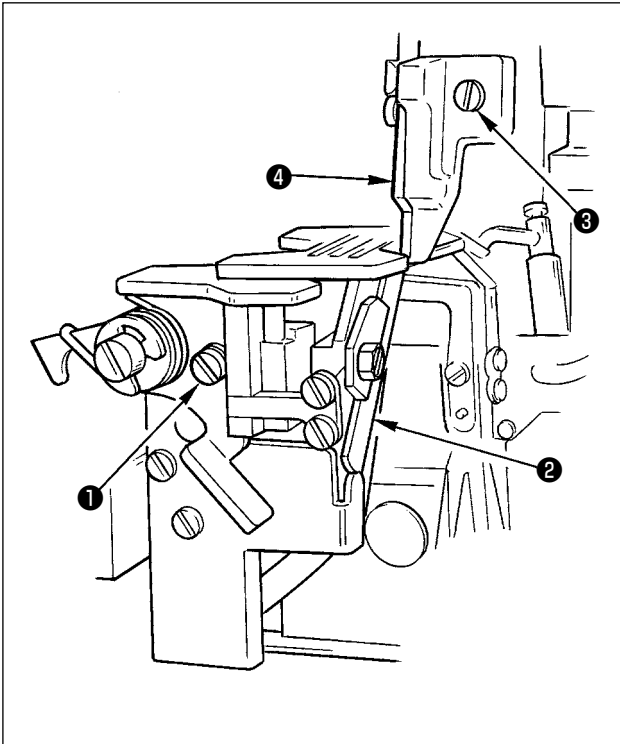
7. MAINTENANCE

7-1. Adjusting the knife

CAUTION :



- To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.
- To protect against possible personal injury, never touch the blade of the knife with fingers and hands.
- To prevent possible accidents caused by inexperienced persons and those resulting from maladjustment, adjustment work should only be carried out by maintenance personnel who have received safety training and are familiar with the sewing machine.



To adjust the extent of cutting fluff at the overedged edge of the material :

- 1) Loosen setscrew ❶ . Tighten the setscrew with lower knife ❷ pressed to the left.
- 2) Loosen setscrew ❸ . Move upper knife as far as needed and secure with the setscrew ❹ .
- 3) Lower the upper knife to its lower end position. Loosen setscrew ❶ to adjust so that the lower knife comes in contact with the upper knife, then tighten setscrew ❶ .



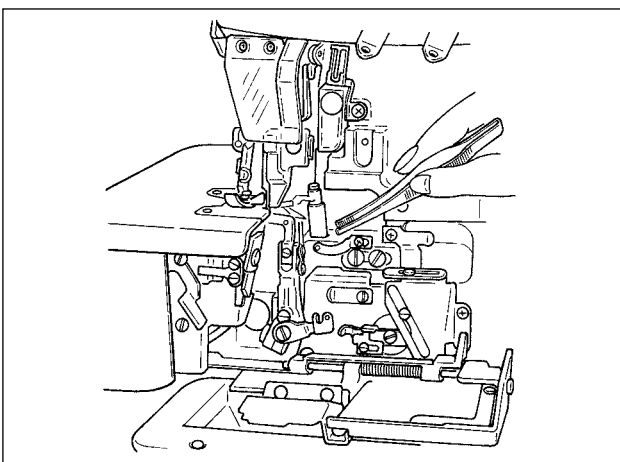
1. Be sure to tighten screw ❶ before operating machine.
2. After the completion of adjustment, make the knives cut a thread to check for sharpness of the knives.

7-2. Cleaning the machine head



CAUTION :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

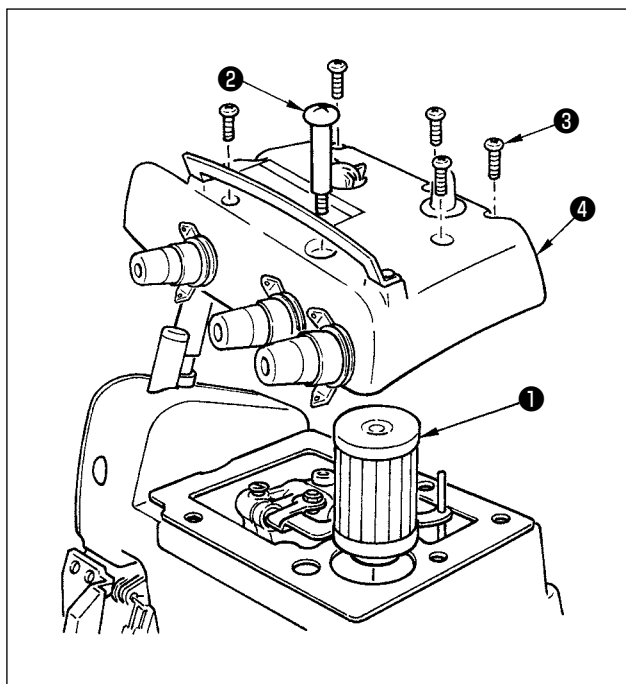


Clear lint from inside the looper cover and the needle bar and components about once or twice a day. If not, oil may leak the sewing material will be soiled.



Do not wipe the coated surface of the machine head with lacquer thinner. Doing so will damage the coated surface.

7-3. Checking the cartridge filter and replacing it



1. After a long period of usage, cartridge filter ❶ may become clogged with dust. If the machine is left in this state, the dirty oil may fail to pass through cartridge filter ❶, and the machine may wear out abnormally, or a seizure may result.
 - ※ Cartridge filter ❶ should normally be checked once every six months, and cleaned or replaced accordingly.
2. How to inspect the cartridge filter and replace it.
 - 1) Remove first oil discharging screw ❷.
 - 2) Remove screws ❸, and lift top cover ❹ just above until it comes off.



If top cover ❹ is shifted sideward, the oil amount pointer bar and the cartridge filter may be damaged.

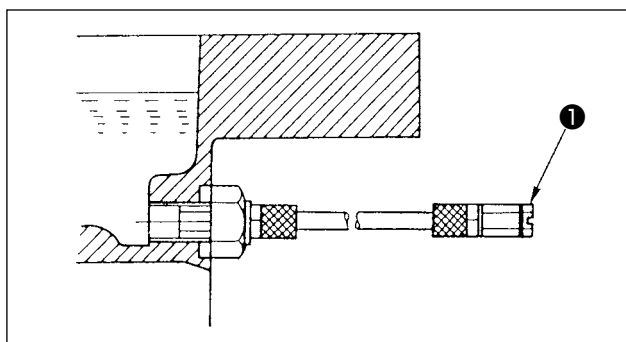
- 3) Remove cartridge filter ❶ and check it. If the filter is found to be abnormal, clean the relevant components, or replace cartridge filter ❶.
- 4) Re-insert cartridge filter ❶ into its proper position and return the cover. Do not forget to put back the setscrews and tighten them up.

7-4. Changing the machine oil



CAUTION :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



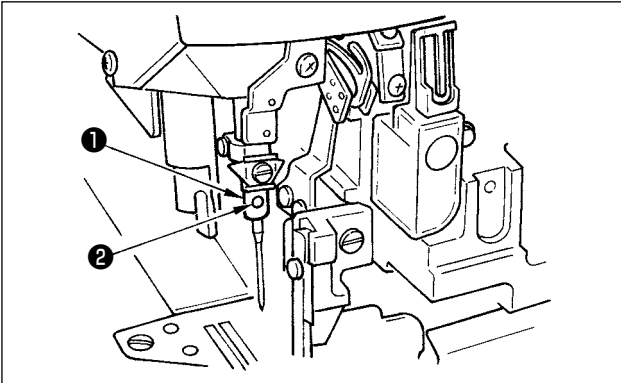
- 1) Use JUKI MACHINE OIL 18 in the machine head.
- 2) To change the oil, first drain the oil out by unscrewing screw ❶ on the tip of the oil drain hose connected to the oil pan. At this time, remove the cover from the oil inlet hole on top of the machine head.
- 3) Refer to "[4-2. Lubrication](#)" p.15 for how to lubricate the machine.

7-5. Changing needles



CAUTION :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



The standard needle is DC×27 #11. You can also use the DC×1 needle. In this case, however, the clearance provided between the needle and the looper may be required to be adjusted. If sewing need to be carried out with a finely adjusted thread tension, use the DC×27 needle.

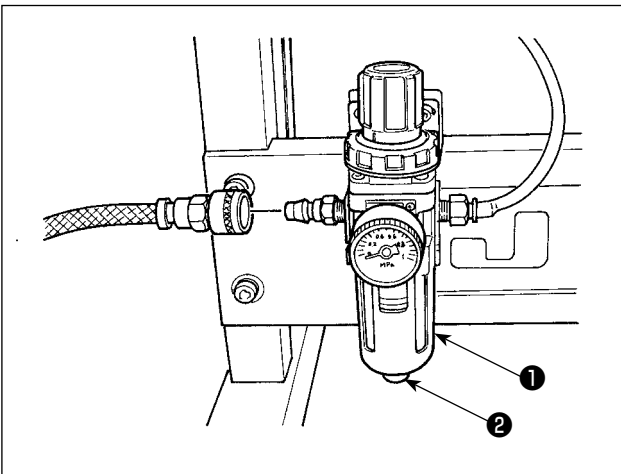
- 1) Bring needle clamp ❶ to the highest position.
- 2) Loosen needle clamp screw ❷, and fully insert the needle into the needle clamp hole with the needle recess facing backwards as viewed from the operator's side.
- 3) Tighten the needle clamp screw ❷.

7-6. Drainage of filter regulator



CAUTION :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



- 1) Drainage of regulator ❶ must take place before usage, and water must be eliminated. (Loosen knob ❷, then drain the water.)
- 2) Be careful about moisture as it is harmful to air control system.



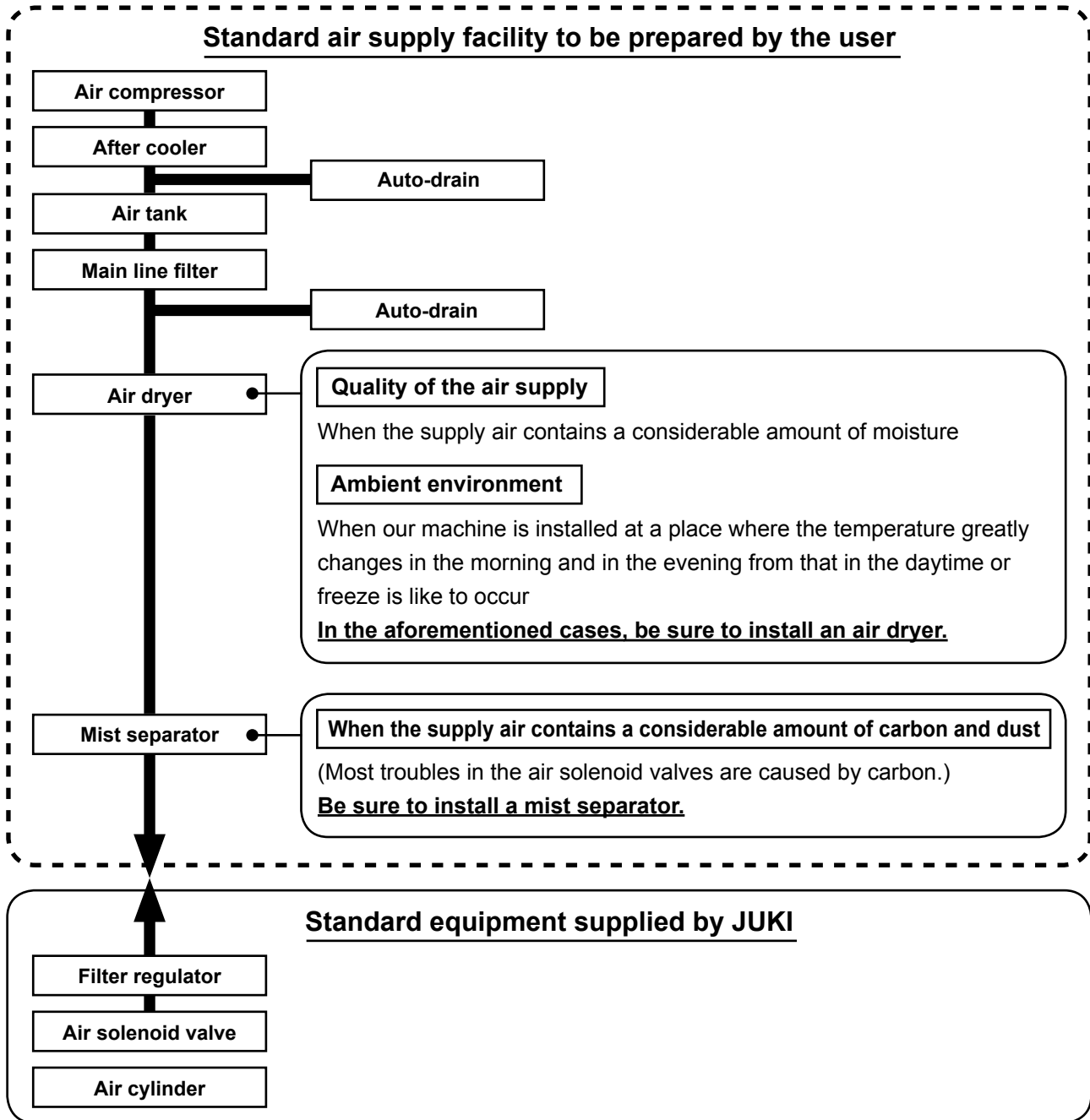
If the amount of water is enormous, check in addition the main unit of the compressor for water.

7-7. Cautions for the compressed air supply (source of supply air) facility

As large as 90 % of failures in pneumatic equipment (air cylinders, air solenoid valves) are caused by "contaminated air."

Compressed air contains lots of impurities such as moisture, dust, deteriorated oil and carbon particles. If such "contaminated air" is used without taking any measures, it can be a cause of troubles, inviting reduction in productivity due to mechanical failures and reduced availability.

Be sure to install the standard air supply facility shown below whenever the machine provided with pneumatic equipment is used.



Cautions for main piping

- Be sure to slope main piping by a falling gradient of 1 cm per 1 m in the direction of air flow.
- If the main piping is branched off, the outlet port of the compressed air should be provided at the top part of the piping using a tee in order to prevent drain settling inside the piping from flowing out.
- Auto drains should be provided at all lower points or dead ends in order to prevent the drain from settling in those parts.



7-8. Dust collector box



CAUTION :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

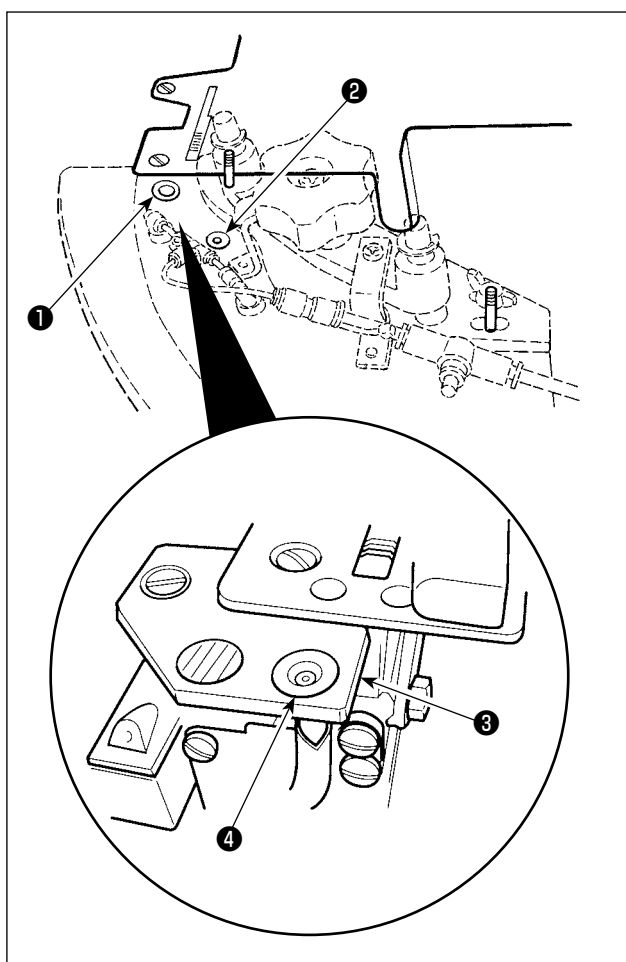
- 1) Throw away waste cloth chips inside the dust collector box at least once a day. At this time, also clean up the filter.
- 2) Fine cloth chip adhere to the suction port inside the box; blow them away with an air gun.
- 3) If a great deal of lint adheres to the intake, the suction power may be reduced.

7-9. Cleaning the sensor



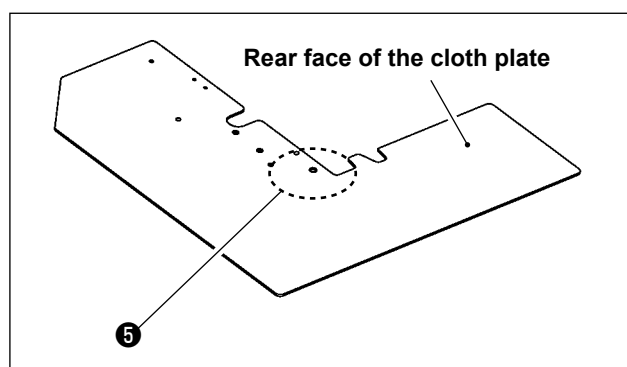
CAUTION :

Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



When dust gathers around irradiating position for the start sensor and curve sensor, the sensor may make erroneous detection resulting malfunction of the machine. To avoid this, be sure to remove dust from the following four parts by blowing air with an air gun.

- Irradiating point ① for the start sensor on the top face of the cloth plate
- Irradiating point ② for the curve sensor on the top face of the cloth plate
- Irradiating point ④ for the start sensor on the throat plate base A ③
(Remove the cloth plate to carry out the dust removal procedure.)
- Irradiating point ⑤ for the start sensor on the rear face of the cloth plate
(Remove the cloth plate to carry out the dust removal procedure.)



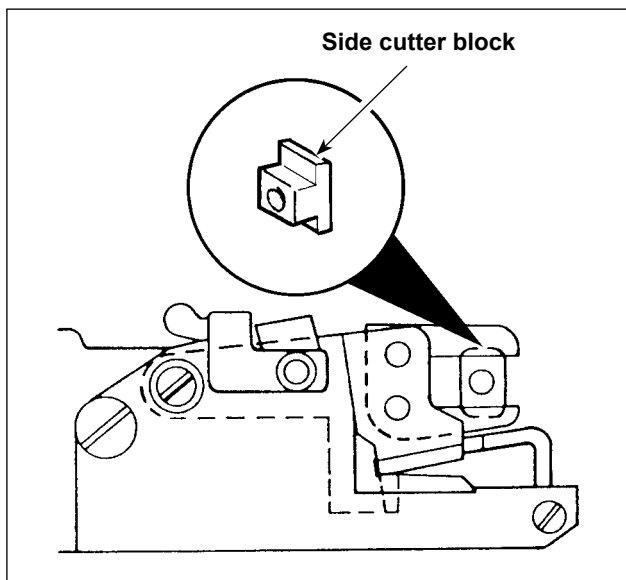
7-10. Consumable parts to be replaced

CAUTION :



- Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.
- To protect against possible personal injury, never touch the blade of the knife with fingers and hands.
- To prevent possible accidents caused by inexperienced persons and those resulting from maladjustment, adjustment work should only be carried out by maintenance personnel who have received safety training and are familiar with the sewing machine.

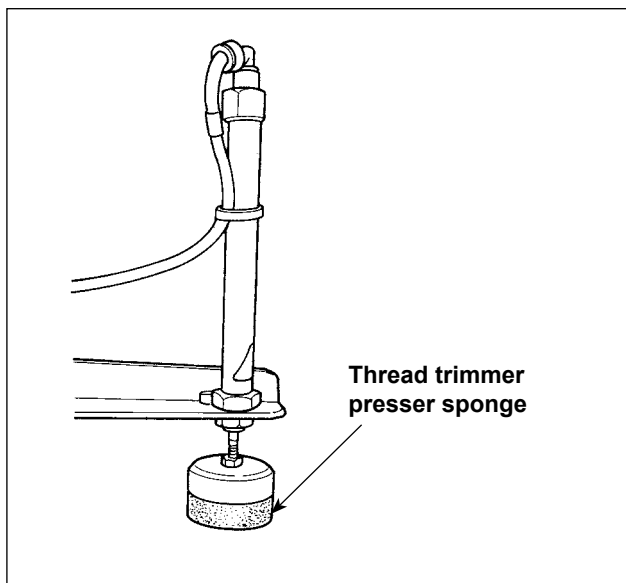
The following parts are consumables. Be sure to periodically replace them with new ones.



- **Side cutter block**

(Part number : MAT02503000)

If the block is not periodically replaced with a new one, it can wear out to fail to trim chain-off thread sharply, affecting the quality of thread trimming at the end of sewing.



- **Thread trimmer presser sponge**

(Part number : 18072603)

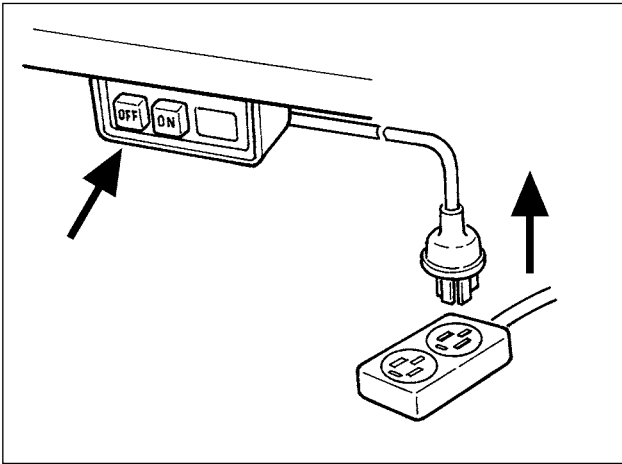
If the sponge is not periodically replaced with a new one, it can fail to clamp the material adequately, affecting the quality of thread trimming at the end of sewing.

7-11. Replacing the fuse

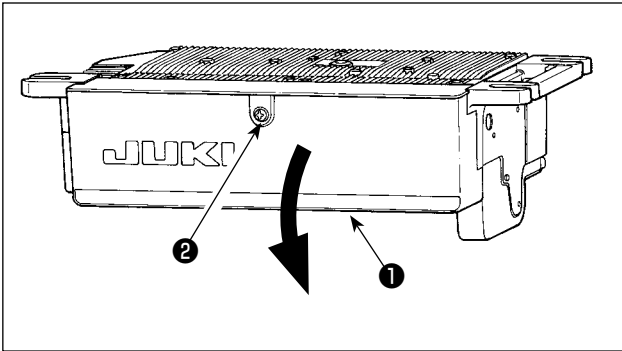


DANGER :

To prevent personal injuries caused by electric shock hazards or abrupt start of the sewing machine, remove the cover after turning OFF the power switch and a lapse of 5 minutes or more. To prevent personal injuries, when a fuse has blown out, be sure to replace it with a new one with the same capacity after turning OFF the power switch and removing the cause of the blown-out of the fuse.



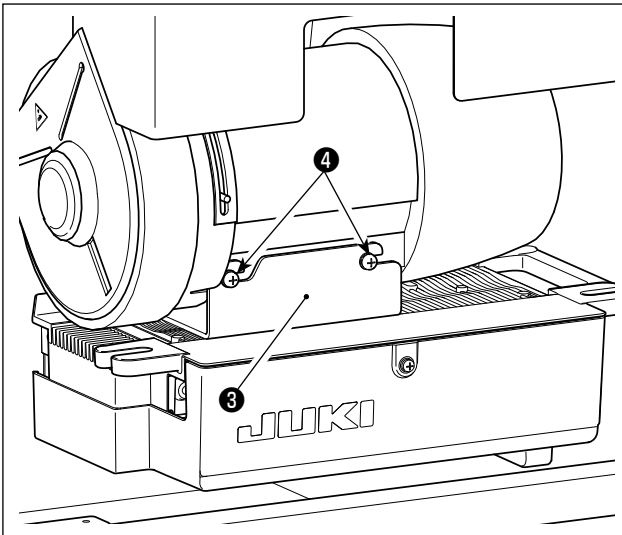
- 1) Press the OFF button of the power switch to turn OFF the power after confirming that the sewing machine has stopped.
- 2) Draw out the power cord coming from the power plug socket after confirming that the power switch is turned OFF. Perform the work of step 3) after confirming that the power has been cut and it has passed for 5 minutes or more.



- 3) Loosen setscrew ② in cover ①. Open cover ①.



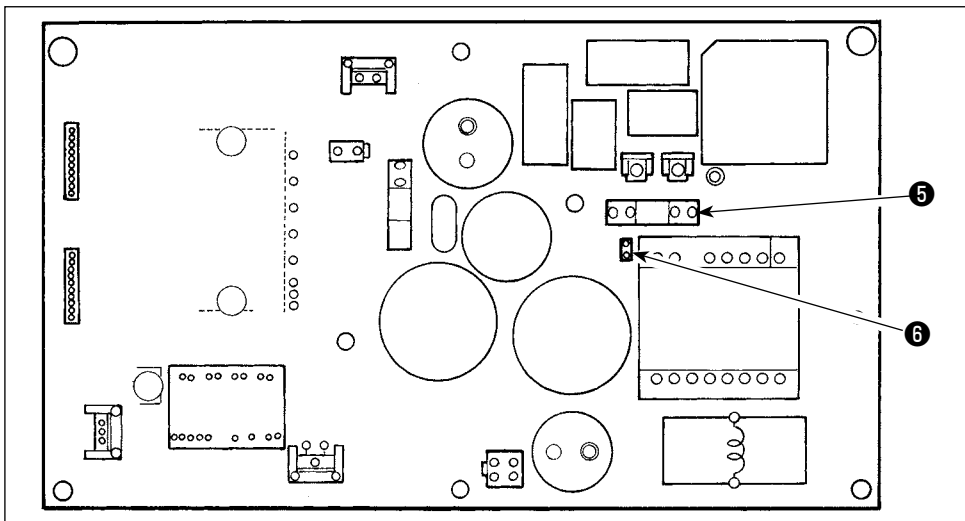
Be sure to open/close cover ① while putting a hand on it.



- 4) Remove all the cables which are connected to the control box.
- 5) Loosen setscrews ④ of control box mounting plate ③. Detach the control box from the motor.

[Replacing fuse on PWR-T circuit board]

(Caution) The illustration below shows the PWR-T PCB. The type of PCB differs by destination.



6) Holding the glass section of fuse 5, remove the fuse.

(Caution) There is a risk of electrical shock when removing the fuse. Be sure to remove the fuse after LED 6 has totally gone out.

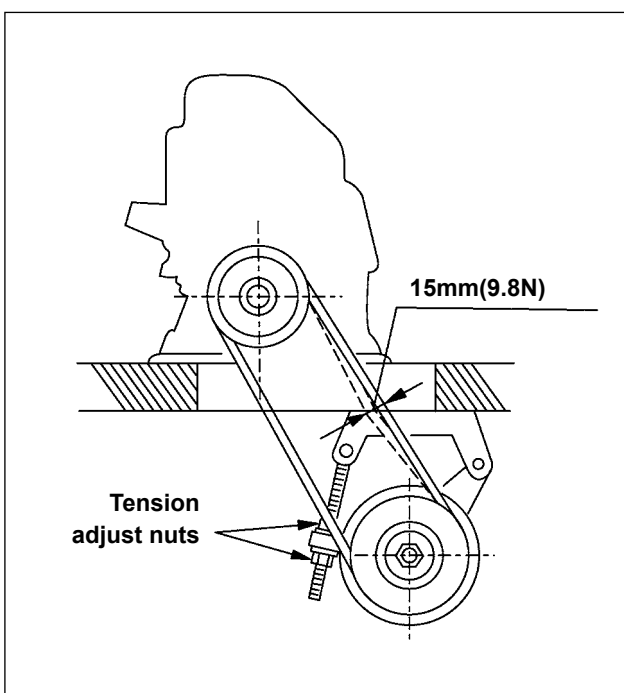
5) Be sure to use a fuse with the designated capacity.

- 5 : 3.15 A/250 V Time-lag fuse
(Power circuit protective fuse)
Part number: KF000000080

8) Install the control box to the motor.

9) Connect all the cables to the control box. (Refer to "7-13. Destination of connection for input/output connectors" p.44.)

7-12. Adjusting the belt tension



The belt tension should be adjusted by turning the tension adjust nuts to change height of the motor, so that the belt sinks down by about 15 mm (9.8N) when it is depressed by band at the center of the belt span.

If the belt tension is not adequate, the sewing machine may not rotate with consistency at the low- to medium-speed operation.

Caution
The belt can increase in length as a result of use. Be sure to periodically check and adjust the belt tension appropriately.

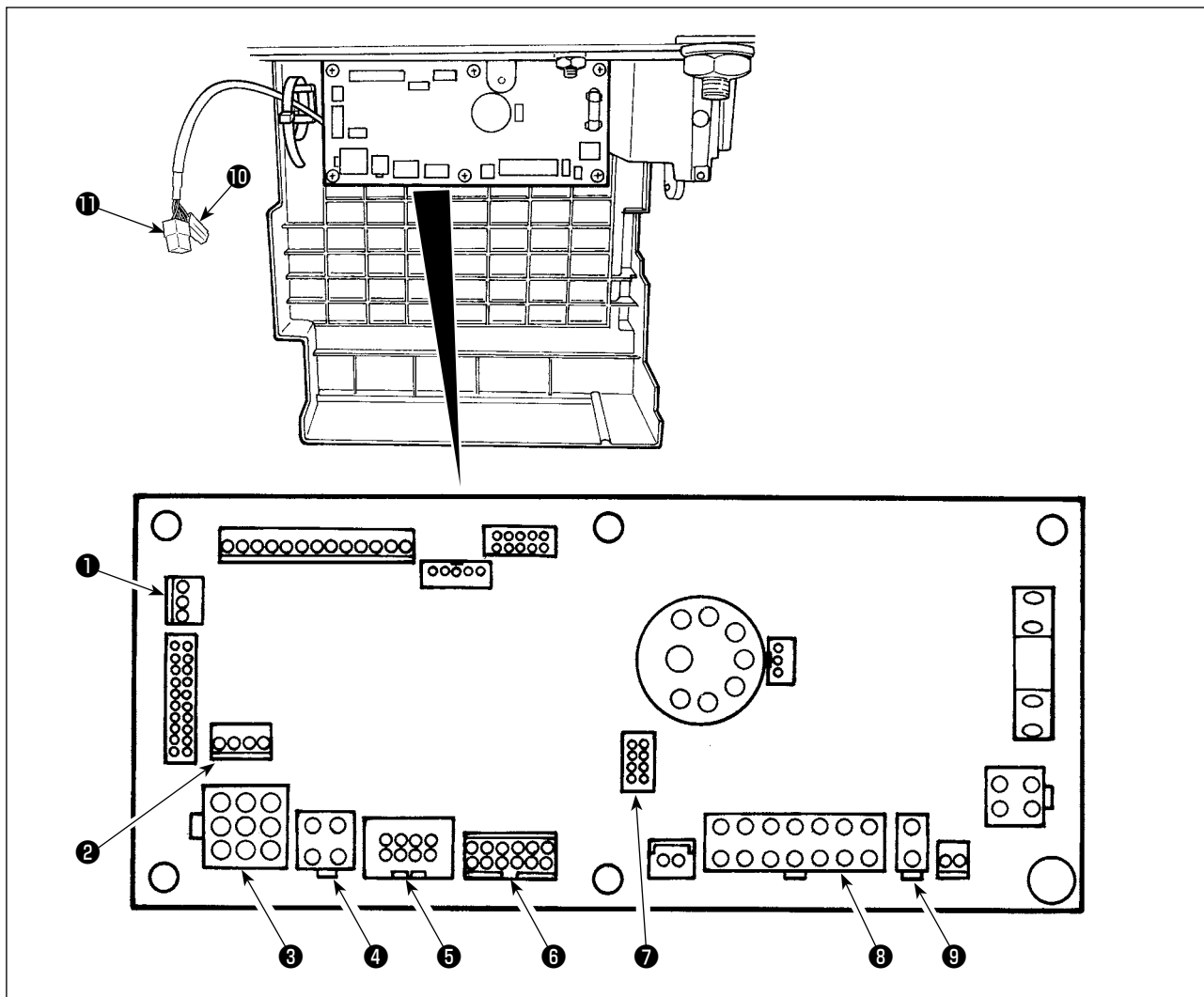
7-13. Destination of connection for input/output connectors



CAUTION :

- To prevent personal injury caused by abrupt start of the sewing machine, carry out the work after turning OFF the power switch and a lapse of 5 minutes or more.
- To prevent damage of device caused by maloperation and wrong specifications, be sure to connect all the corresponding connectors to the specified places.
- To prevent personal injury caused by maloperation, be sure to lock the connector with lock.
- As for the details of handling respective devices, read carefully the Instruction Manuals supplied with the devices before handling the devices.

Solenoid valves and sensors used with ASN-690 are connected to the connectors inside the control box as described below: Connection state of the connectors can be checked by loosening front-cover fixation screws and opening the front cover.



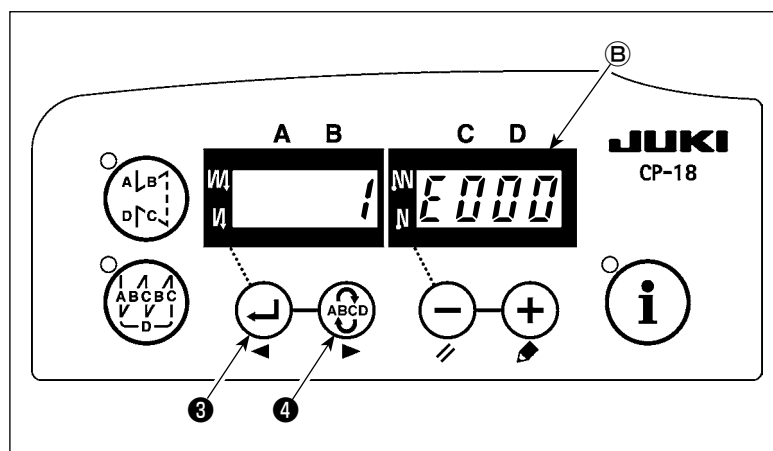
- | | |
|---------|---|
| ① CN42 | Curve sensor |
| ② CN54 | Startup sensor |
| ③ CN30 | Motor signal connector |
| ④ CN48 | Connector for the cloth plate open/close switch and halt switch |
| ⑤ CN38 | Operation panel CP-18 |
| ⑥ CN39 | Connector for pedal junction cable |
| ⑦ CN56 | Connector for solenoid valve |
| ⑧ CN36 | Connector for solenoid valve |
| ⑨ CN37 | Connector for solenoid valve |
| ⑩ CN201 | Connector for starting pedal |
| ⑪ CN206 | Connector for 3-pedal unit (optional) |

7-14. Error codes




In case of the following, check again before you judge the case as trouble.



Phenomenon	Cause	Corrective measure
When tilting the sewing machine, the buzzer beeps and the sewing machine cannot be operated.	When tilting the sewing machine without turning OFF the power switch, action given on the left side is taken for safety sake.	Tilt the sewing machine after turning OFF the power.
Solenoids for thread trimming, reverse feed, wiper, etc. fail to work. Hand lamp does not light up.	When the fuse for solenoid power protection has blown out	Check the fuse for solenoid power protection.
Presser foot does not go up even when auto-lifter device is attached.	Auto-lifter function is OFF.	Select "FL ON" by auto-lifter function selection.
	Cord of auto-lifter device is not connected to connector (CN37).	Connect the cord properly.
Sewing machine fails to run.	Motor output cord (4P) is disconnected.	Connect the cord properly.
	Connector (CN30) of motor signal cord is disconnected.	Connect the cord properly.

In addition, there are the following error codes in this device. These error codes interlock (or limit function) and inform the problem so that the problem is not enlarged when any problem is discovered. When you request our service, please confirm the error codes.



[Checking procedure of the error code]

- 1) Turn ON the power switch with  switch **3** held pressed.
 - 2) The latest error number is displayed on indicator **B** with a blip.
 - 3) Contents of previous errors can be checked by pressing  switch **3** or  switch **4**.
- (When the confirmation of the contents of previous error advanced to the last, the warning sound peeps in single tone two times.)

(Caution) When  switch **3** is pressed, the previous error code of the currently displayed one is displayed. When  switch **4** is pressed, the next error code of the currently displayed one is displayed.

7-15. Error code list

No.	Description of error detected	Cause of occurrence expected	Items to be checked
E000	Execution of data initialization (This is not the error.)	<ul style="list-style-type: none"> When the machine head is changed. When the initialization operation is executed. 	
E003	Disconnection of synchronizer connector	<ul style="list-style-type: none"> When position detection signal is not input from the sewing machine head synchronizer. 	<ul style="list-style-type: none"> Check the synchronizer connector (CN33, CN43) for loose connection and disconnection. Check whether the belt is loose. Check whether the synchronizer cord has broken since the cord is caught in the machine head. Check the belt tension. Check the setting of the machine head. Check the setting of the motor pulley.
E004	Synchronizer lower position sensor failure	<ul style="list-style-type: none"> When the synchronizer has broken. 	
E005	Synchronizer upper position sensor failure	<ul style="list-style-type: none"> Belt is loose. Machine head is not proper. Motor pulley is not proper. 	
E007	Overload of motor	<ul style="list-style-type: none"> When the machine head is locked. When sewing extra-heavy material beyond the guarantee of the machine head. When the motor does not run. Motor or driver is broken. 	<ul style="list-style-type: none"> Check whether the thread has been entangled in the motor pulley. Check the motor output connector (4P) for loose connection and disconnection. Check whether there is any holdup when turning the motor by hand.
E050	The pause switch is pressed	<ul style="list-style-type: none"> The connector of the switch has come off. 	<ul style="list-style-type: none"> Check the connector of the pause switch for loose connection and disconnection.
E070	Slip of belt	<ul style="list-style-type: none"> When the machine head is locked. Belt is loose. 	<ul style="list-style-type: none"> Check whether there is any holdup when turning the motor by hand. Check the belt tension.
E071	Disconnection of motor output connector	<ul style="list-style-type: none"> Disconnection of motor connector 	<ul style="list-style-type: none"> Check the motor output connector for loose connection and disconnection.
E302	Opening of the cloth plate is detected.	<ul style="list-style-type: none"> The cloth plate is not installed on the table. 	<ul style="list-style-type: none"> Check whether the cloth plate is set on the table
E333	The material is inserted on the start sensor.	<ul style="list-style-type: none"> Dust on the sensor Sensitivity of the sensor 	<ul style="list-style-type: none"> Dust around the sensor Adjustment of the sensitivity of the sensor. Setting of the L/D
E334	The material is inserted on the curve sensor.		
E730	Encoder failure	<ul style="list-style-type: none"> When the motor signal is not properly inputted. 	<ul style="list-style-type: none"> Check the motor signal connector (CN30) for loose connection and disconnection. Check whether the motor signal cord has broken since the cord is caught in the machine head.
E731	Motor hole sensor failure		
E733	Inverse rotation of motor	<ul style="list-style-type: none"> This error occurs when the motor is running at 500 rpm or more in the opposite direction of that of rotation indication during motor is running. 	<ul style="list-style-type: none"> Connection of the encoder of main shaft motor is wrong. Connection for the electric power of main shaft motor is wrong.
E811	Overvoltage	<ul style="list-style-type: none"> When voltage higher than guaranteed one is inputted. 220V has been inputted to SC-510 of 110V specifications. 400V is applied to the box of 220V (230V). 	<ul style="list-style-type: none"> Check whether the applied power voltage is higher than the rated voltage + (plus) 10% or more. Check whether 110V/220V changeover switch is improperly set. <p>In the aforementioned cases, POWER p.c.b is broken.</p>
E813	Low voltage	<ul style="list-style-type: none"> When voltage lower than guaranteed one is inputted. 110V has been inputted to SC-510 of 220V specifications. 110V is applied to the box of 220V. Inner circuit is broken by the applied overvoltage. 	<ul style="list-style-type: none"> Check whether the voltage is lower than the rated voltage – (minus) 10% or less. Check whether 110V/220V changeover switch is improperly set. Check whether fuse or regenerative resistance is broken.
E924	Motor driver failure	<ul style="list-style-type: none"> Motor driver has broken. 	