

***ENGLISH***

**DU-1481 Series  
INSTRUCTION MANUAL**

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# 1. Overview of the sewing machine

The top & bottom feed, lockstitch machine with high and long arm and an automatic thread trimmer has adopted the long-nose design to provide a wider space under the arm for easier handling of the material. It also has a longer needle stroke and the broader setting range of amount of the alternating vertical movement of the walking foot and presser foot. With these features, this model of sewing machine demonstrates substantially improved sewing performance particularly when sewing heavy-weight materials with thick threads.

The sewing machine comes with an automatic lubrication system, thereby achieving smooth feed of material with reduced noise and vibration. It is especially suited to the sewing of car seats, tents, sofas, heavy-weight materials such as leather products and canvass materials as well as belt-shaped products.

## 2. Specifications

### 2-1. Specifications

Model	DU-1481-7	
Application	Medium- to heavy-weight materials	
Maximum sewing speed	2200 sti/min	
Maximum stitch length	9 mm	
Needle bar stroke	38 mm	
Thread take-up lever stroke	138 mm	
Amount of the alternating vertical movement of the walking foot and presser foot	2.0 to 5.5 mm	
Needle (standard)	DP × 17, #23 (#18 to #23)	
Lubricating oil	JUKI MACHINE Oil (40226742)	
Hook	Lubrication of hook (thread trimming)	
Lubricating method	Automatic lubrication	
Thread trimming device	Provided	
Reverse-feed sewing device	Provided	
Amount of lift of the presser foot	Manual operation	6 mm
	Knee-lifter	15 mm
Noise	- Equivalent continuous emission sound pressure level (L <sub>pA</sub> ) at the workstation: A-weighted value of 75.3 dB ; (Includes K <sub>pA</sub> = 2.5 dB) ; according to ISO 10821- C.6.2 -ISO 11204 GR2 at 2,200 sti/min.	

## 2-2. Operation environment for the electrical box

**2-2-1. When using this product, install it away from equipment that generates high-frequency electromagnetic waves and electrical waves in order to prevent malfunctions caused when affected by those waves.**

**2-2-2. Temperature in the product operating environment**

- a: Use the product at such a place in which the room temperature is equal to or higher than 5 °C and equal to or lower than 35 °C.
- b: Do not operate the product at such a place that is exposed to the direct sunlight or outdoors.
- c: Do not operate the product near a heater (electric stove).
- d: Carry out work at a relative humidity ranging from 35 % to 85 %.
- e: Do not carry out work near combustible gas or explosive substances.

**2-2-3. Rated voltage**

Supply voltage	Single phase 220 to 240V	3-phase 200 to 240V Single phase 100 to 120V
Frequency	50Hz/60Hz	
Input	250VA	

**2-2-4. Earth resistance of the system: 4 Ω or less**

Motor output: 750W

Maximum sewing speed setting range: 100 to 2200 sti/min

Low sewing speed setting range: 80 to 400 sti/min

Speed regulating method: Stepless speed variation, automatic constant-speed operation

Number of input signals: 2 systems; compensation stitching switch, safety switch including the manual BT switch

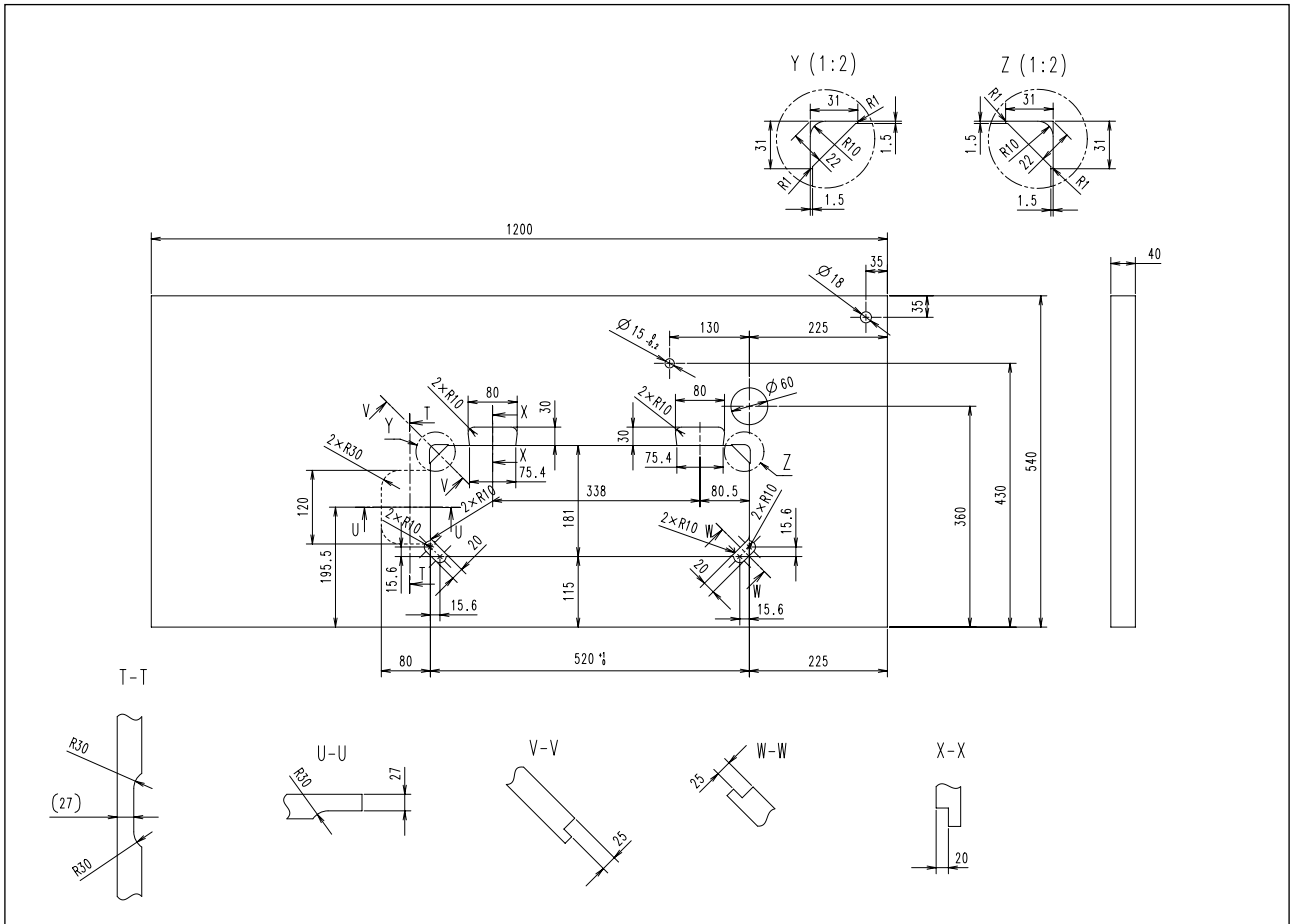
Number of output signals: 5 systems; solenoids of the thread trimmer, wiper, thread clamp, reverse feed stitching device and presser foot lifter

Fault detection: Overcurrent, overheat, short-circuit, rotation fault

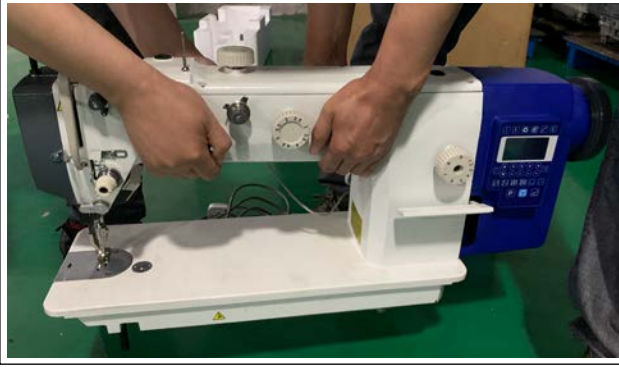
Time required to detect a rotation fault: 1.5 sec

### 3. Preparation for operation

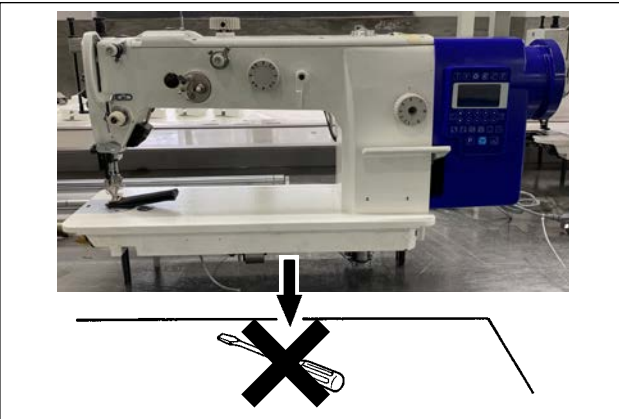
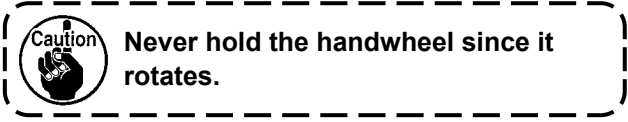
#### 3-1. Drawing of table



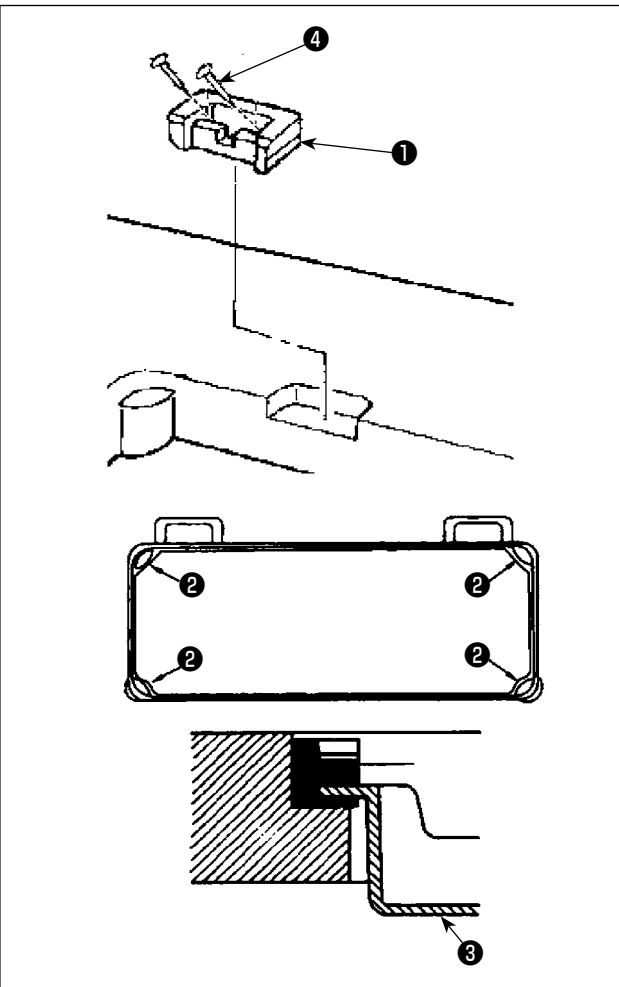
### 3-2. Installation of the sewing machine



- 1) To prevent possible accidents caused by the full of the sewing machine, perform the work by two persons or more when the machine is moved.



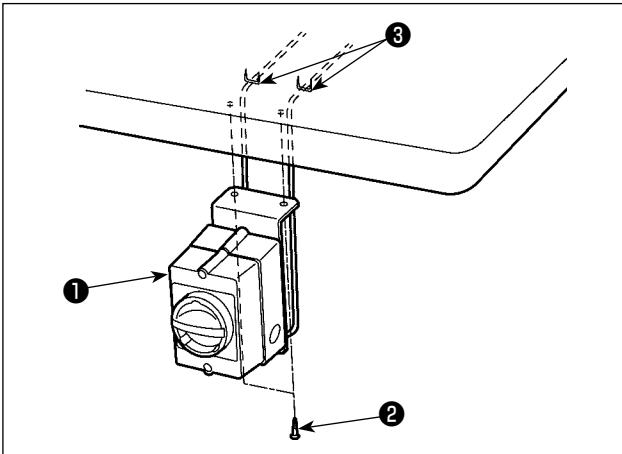
- 2) Place the sewing machine on a horizontal and plane place when placing it and do not place any protruding thing such as a screwdriver or the like.



- 3) Attach four rubber cushions ② to four corners of the table socket.
- 4) Put oil pan ③ on the rubber cushions.
- 5) Secure machine head hinge seat ① on the table with nails (two pieces) ④ as illustrated in the figure.
- 6) Attach the hinge to the machine head. Put the hinge on the hinge rubber seats.

### 3-3. Installing and connecting the power switch

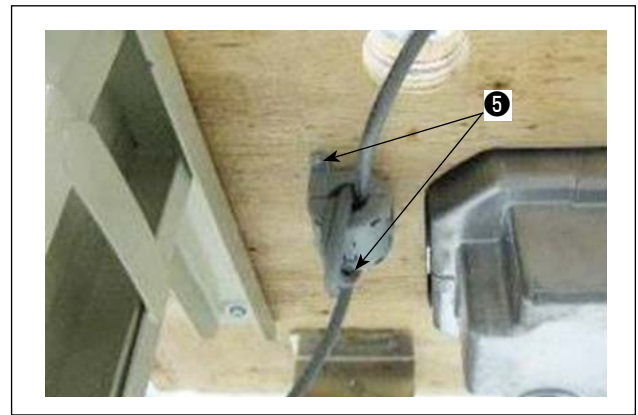
Only for the JE type models



- 1) Installing the power switch  
Fix power switch ① under the machine table with wood screws ② .  
Fix the cable with staples ③ supplied with the machine as accessories in accordance with the forms of use.

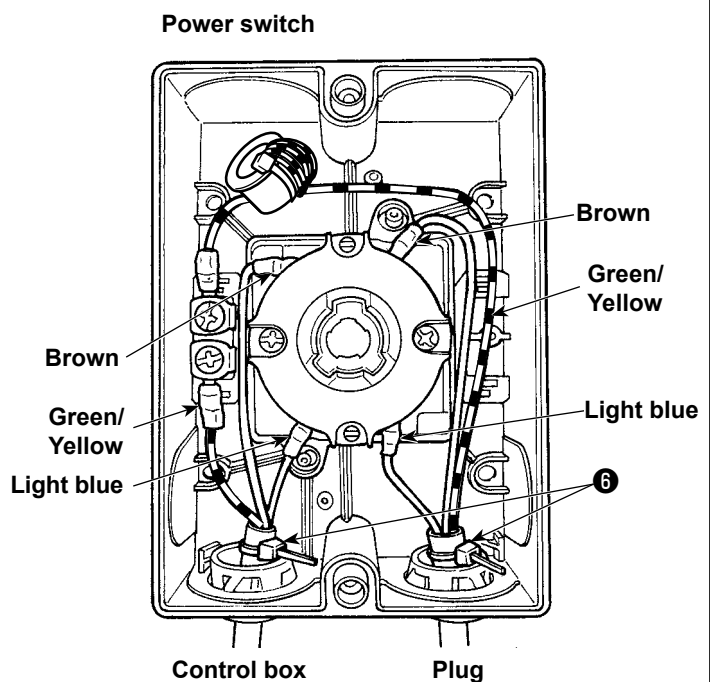
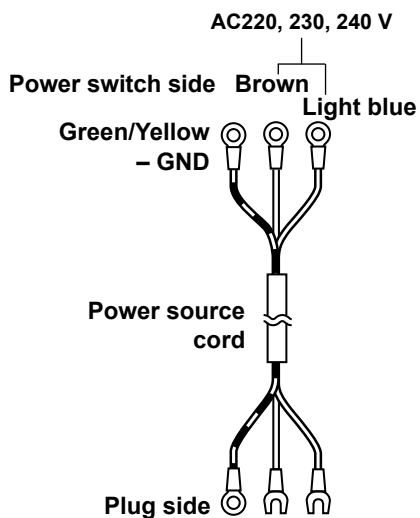


- 2) Wind the power cable that connects the power switch with the electrical box on ferrite core ④ by two turns.



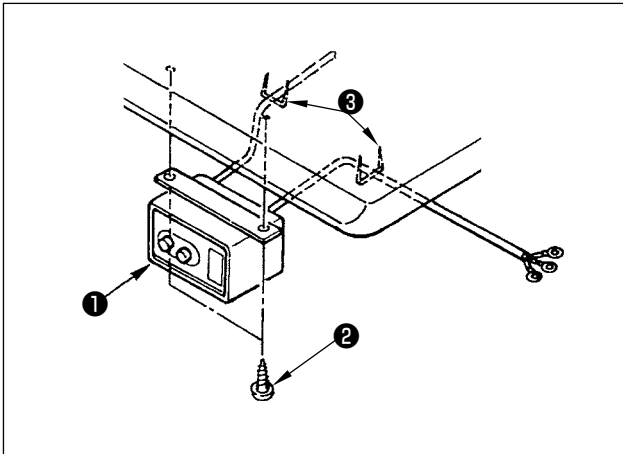
- 3) Secure the ferrite core to the undersurface of the table with wood screws ⑤ (at two locations).

#### • Connecting single phase 220V, 230 and 240V



- 4) Attach accessory cable clip bands ⑥ to the cable as illustrated in the figure (at two locations).

**Only for the 3-phase type models**



1) Installing the power switch

Fix power switch ① under the machine table with wood screws ② .

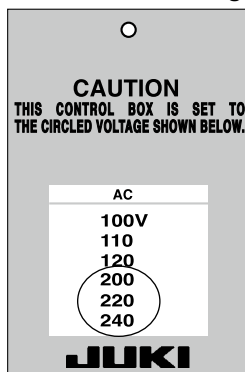
Fix the cable with staples ③ supplied with the machine as accessories in accordance with the forms of use.

2) Connecting the power source cord

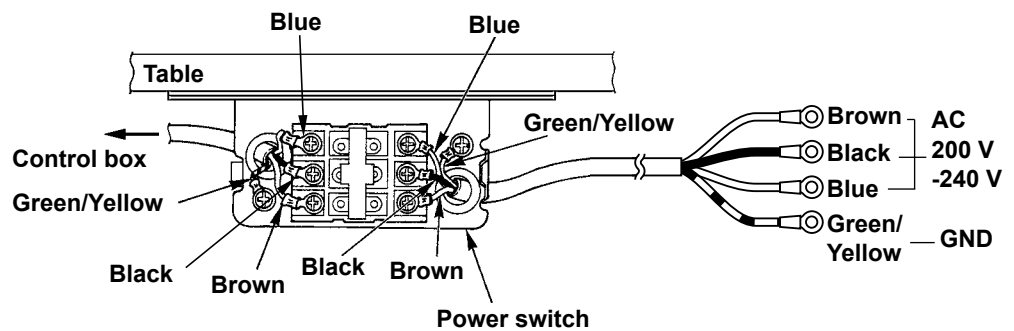
Voltage specifications at the time of delivery from the factory are indicated on the voltage indication seal. Connect the cord in accordance with the specifications.

• Connecting 3-phase 200 to 240V

Power indication tag

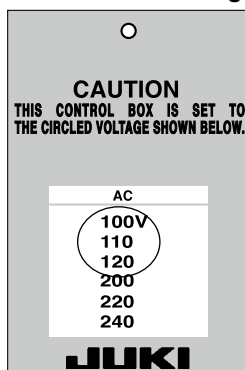


(For example: In the case of 200V)

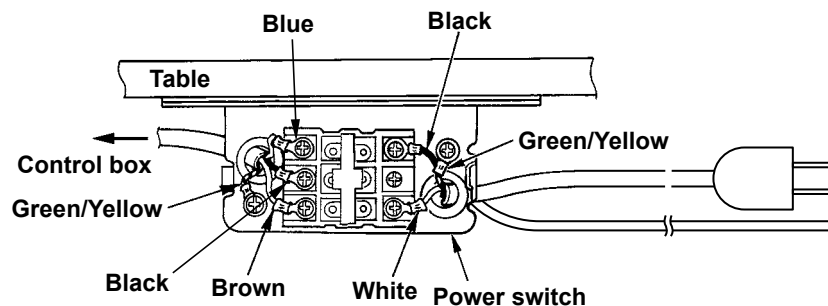


• Connecting 1-phase 100 to 120V

Power indication tag

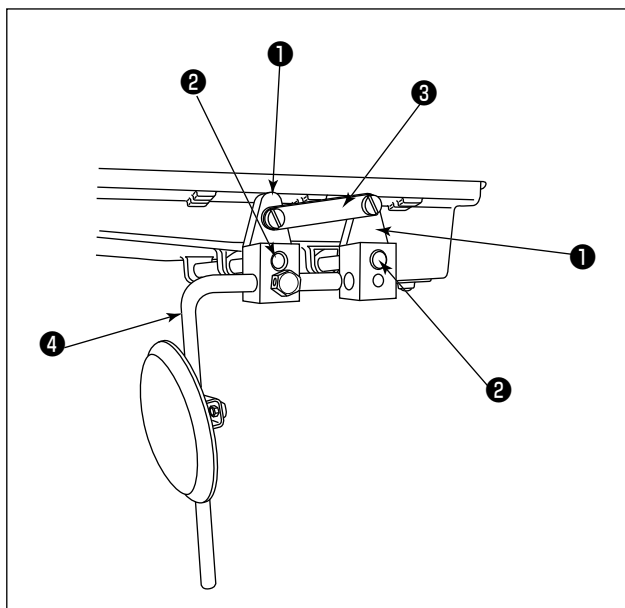


(For example: In the case of 100V)





### 3-4. Installing the knee-lifter



- 1) Set up knee-lifter shafts ② while fully pulling this side of the shafts respectively until it will go no further.
- 2) Attach driving arms ① to knee-lifter shafts ② .
- 3) Connect right and left driving arms ① with links ③ .
- 4) Attach knee-lifter lever ④ to driving arm ① .

Reference amount of lift of the presser foot with the knee lifter is 15 mm in the case the alternating vertical movement amount is 2 mm.

As the alternating vertical movement is increased, the amount of lift of the presser foot is decreased.



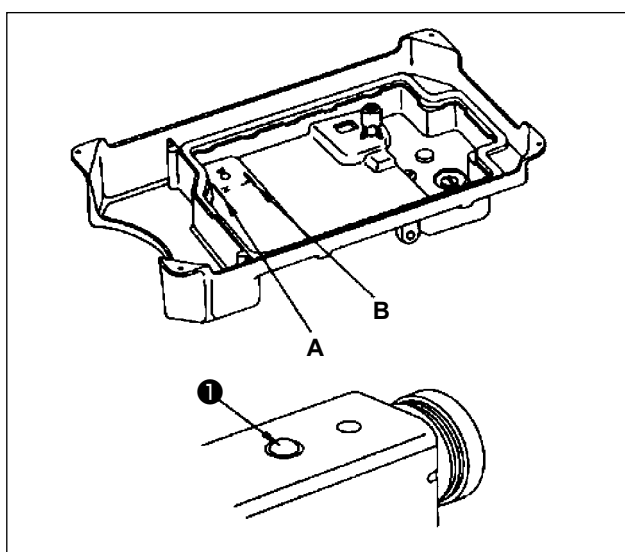
### 3-5. Lubricating method

#### WARNING :

After the completion of lubrication, insert the power plug. In the case the power plug is inserted ahead of lubrication, the sewing machine can automatically start running when the operator depresses the pedal by mistake, causing a serious injury.



When handling the lubricating oil, be sure to wear protective goggles and gloves to prevent the lubricating oil from contacting the eyes and skin. Contact with the lubricating oil can lead to inflammation or irritation of the eyes and skin. The lubricating oil is not drinkable. Drinking the lubricating oil can cause vomiting and diarrhea. Be sure to keep the lubricating oil out of reach of children. When you use the sewing machine for the first time after the delivery or after a prolonged period of disuse, it is necessary to lubricate the sewing machine and run it at a low speed until the entire sewing machine is fully lubricated.



Pour new special-purpose oil into the oil pan until the oil surface reaches the line A of the oil pan. Carry out lubrication while carefully checking the oil amount in the oil pan. After the completion of lubrication of the oil pan, make sure that the oil surface is aligned with the line A.



While the sewing machine is in operation, check the state of lubricating oil through oil sight window ① .



Apply an appropriate amount of oil to the portion indicated with an arrow.

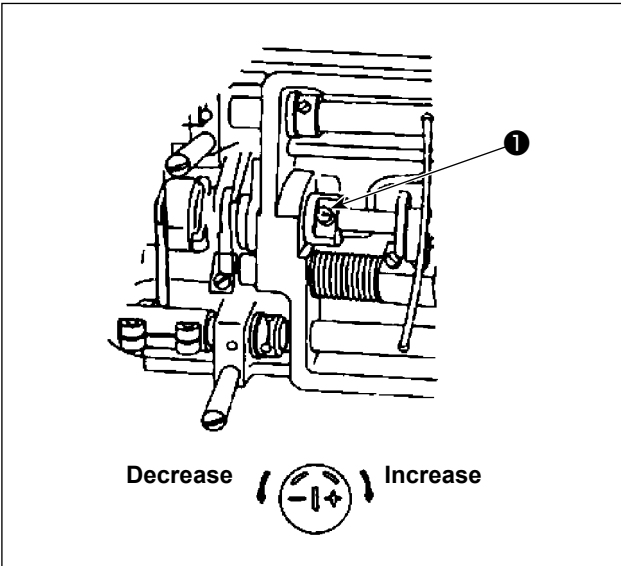
(Be sure to apply an appropriate amount of oil once a day.)

### 3-6. Adjusting the oil amount in the hook



**WARNING :**

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.



Adjust the oil amount with oil amount adjustment screw ❶ that is located on the front bushing of hook driving shaft. The oil amount is increased by turning adjustment screw ❶ clockwise (+) or decreased by turning it counterclockwise (-).



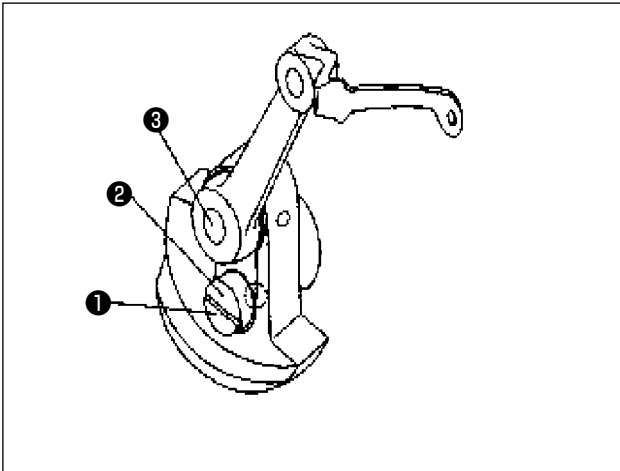
After the completion of adjustment of the oil amount, run the sewing machine for 30 seconds or more. Then, check whether the hook is adequately lubricated.

### 3-7. Adjusting the oil amount in the frame



#### WARNING :

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.



Adjust the amount of oil in the frame by turning oil amount adjustment pin ① .

Oil amount is maximized:

When marker dot ② of oil amount adjustment pin ① is brought close to thread take-up crank shaft ③

Oil amount becomes 0 (zero):

When marker dot ② of oil amount adjustment pin ① is brought to the position that is opposite to thread take-up crank shaft ③



After the completion of adjustment of the oil amount, run the sewing machine for 30 seconds or more. Then, check whether the frame is adequately lubricated.

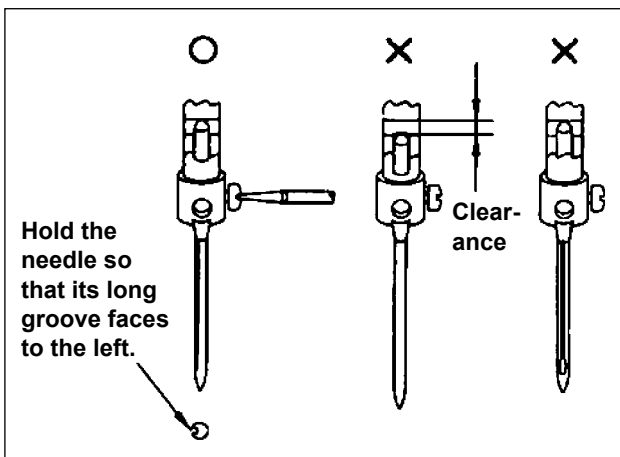
## 4. How to use / adjust the sewing machine

### 4-1. Changing the needle



#### WARNING :

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.



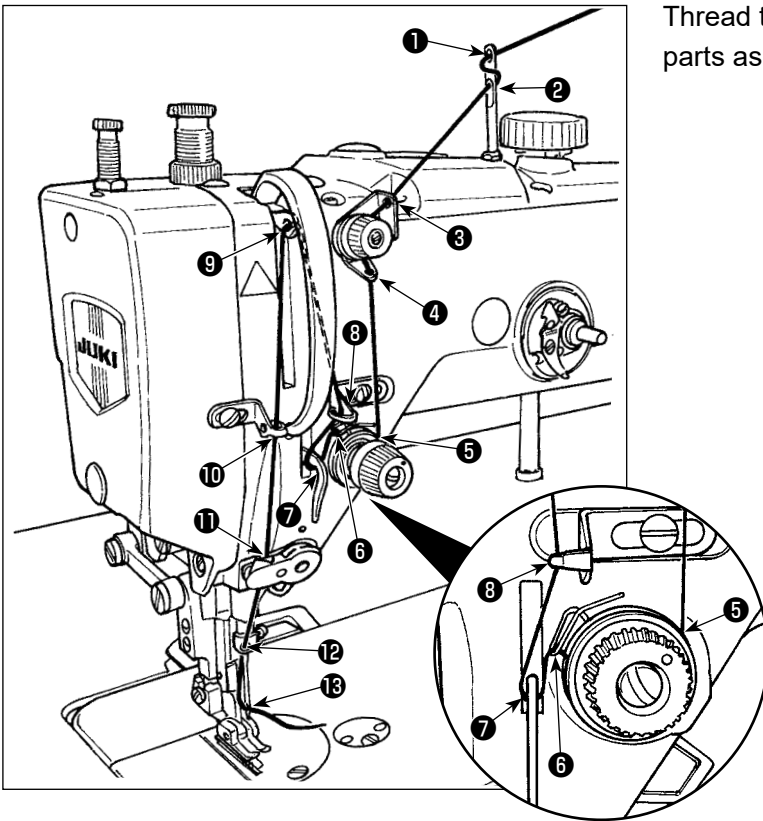
Insert the needle into the needle bar until it will go no further. Then, tighten the screw. It is necessary, when attaching the needle, to face the long groove in the needle to the left as observed from the operator.

## 4-2. Threading the machine head



### WARNING :

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.



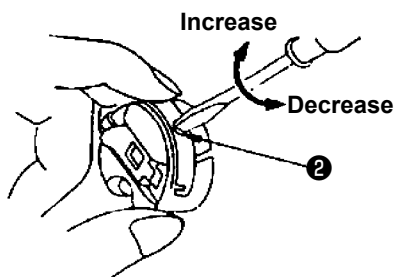
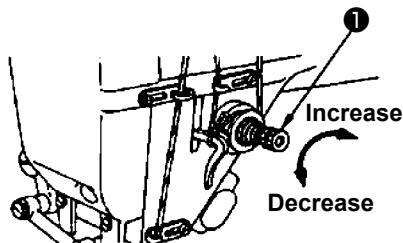
Thread the thread take-up lever and the relevant parts as illustrated in the figure.

## 4-3. Adjusting the thread tension

(Adequate) ○

Needle thread tension is excessively high ×

Needle thread tension is excessively low ×



### 1. Thread tension (needle thread)

The needle thread tension is increased by turning thread tension screw ① clockwise or decreased by turning it counterclockwise as shown in the figure. Finished state of sewn products varies depending on sewing conditions such as the material, thread and stitch length. It is therefore necessary to adjust the thread tension appropriately according to the sewing conditions.

### 2. Bobbin thread

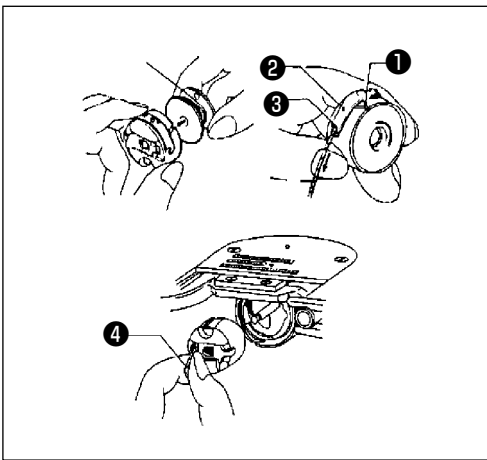
Turn thread tension screw of the bobbin with a screwdriver while fitting the screwdriver in screw slot ② as shown in the figure. The thread tension is increased by turning the thread tension screw with the screwdriver clockwise or decreased by turning it counterclockwise.

## 4-4. Installing a bobbin



### WARNING :

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.



### 1. Installing a bobbin

Firstly, fit a bobbin in the bobbin case. Draw the bobbin thread from the bobbin to the right. Then, pull the thread through threading openings ① to ③.

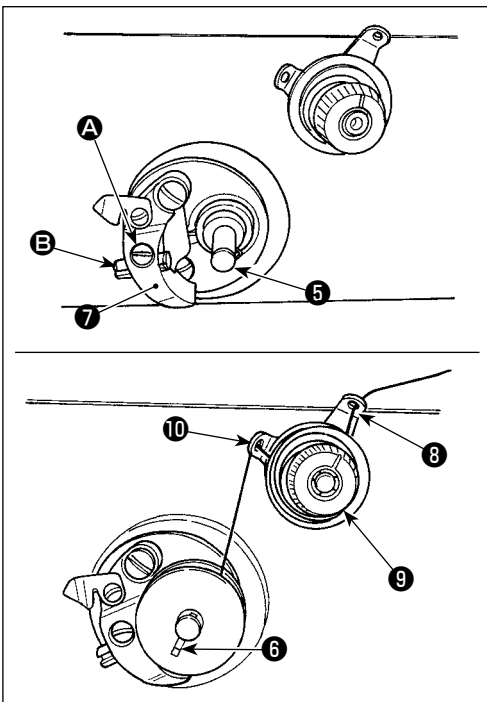
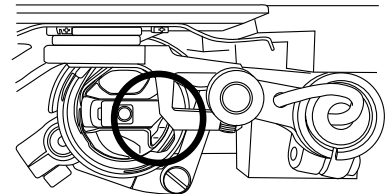
After pulling out the bobbin thread, observe the bobbin from the bobbin side (not from the bobbin case side) to check whether or not the bobbin turns clockwise.

The bobbin thread tension can be adjusted with spring ②. Open bobbin cap ④. Fit the hook in position.

In the case the feed dog base overlaps the bobbin case when the sewing machine stops, the bobbin case may not be removed smoothly.



In such a case, turn the hand-wheel in the reverse direction and remove the bobbin case.



### 2. Winding a bobbin

1) Put a bobbin on bobbin winder shaft ⑤.

At this time, align the spring of bobbin winder shaft ⑤ with groove ⑥ on this side.

2) Pass the thread in the order of ⑧ to ⑩ and wind the thread on the bobbin.

3) Bobbin winder frame ⑦ is set in position by pushing the bobbin.

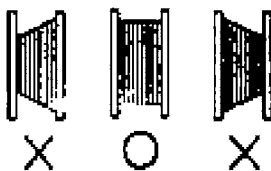
4) Run the sewing machine. Then, the bobbin rotates to automatically wind the thread on the bobbin.

5) When the bobbin is fully wind with the thread, bobbin winder frame ⑦ comes off to stop automatically.



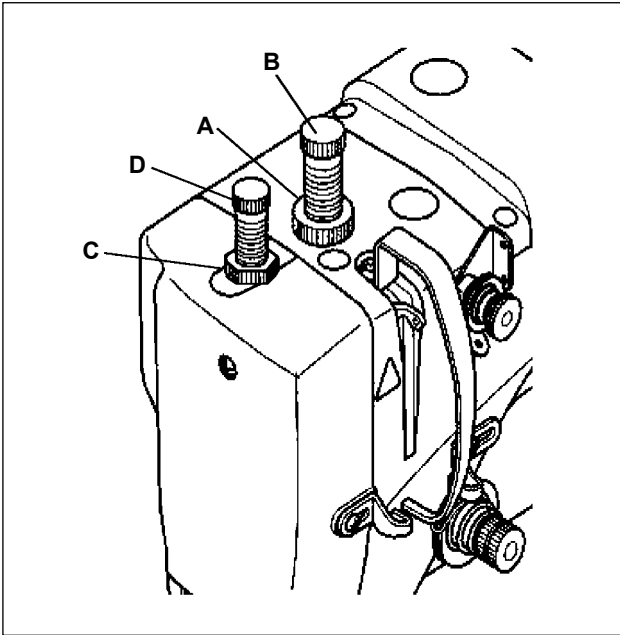
Loosen screw A of bobbin winder frame ⑦ and adjust the amount of thread wound on a bobbin by moving pin B.

80%  
Standard amount of thread wound on a bobbin



The amount of thread wound on a bobbin must be 80 % of the full capacity of the bobbin.

## 4-5. Presser foot pressure



### 1. Adjusting the presser foot pressure

- 1) Loosen locknut **A** of the presser spring regulator.
- 2) Adjust the presser foot pressure by turning presser spring regulator **B**.  
The presser foot pressure should be minimized as long as the material does not slip under the presser foot.
- 3) Tighten locknut **A** of the presser spring regulator.

### 2. Adjusting the feeding pressure

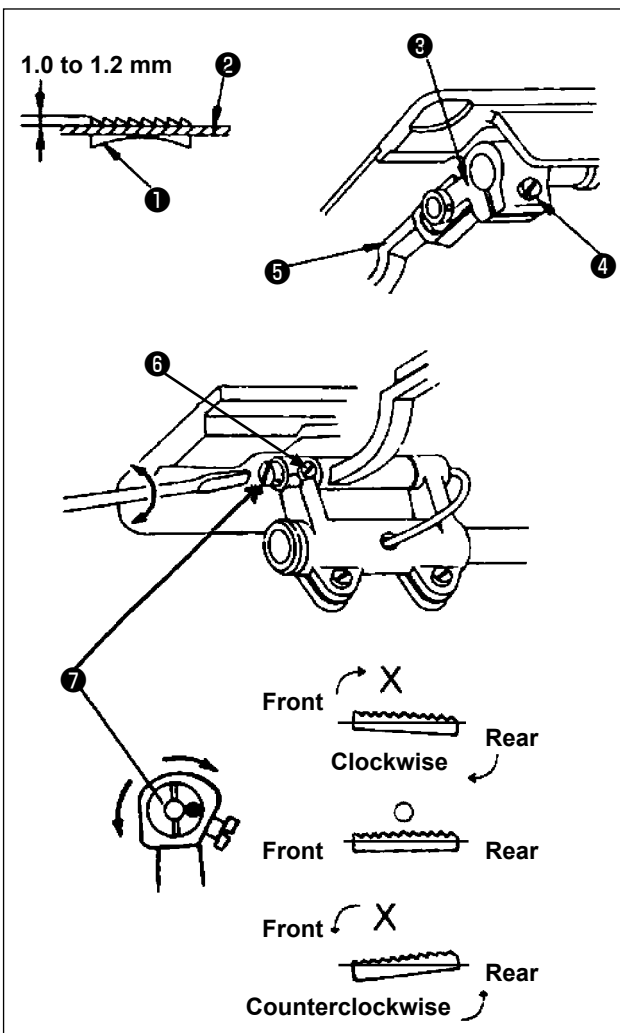
- 1) Loosen feed pressure adjustment screw locknut **C** with a spanner.
- 2) Adjust the feed pressure by turning feed pressure adjustment screw **D**.
- 3) Tighten feed pressure adjustment screw locknut **C** with a spanner.

## 4-6. Adjusting the feed dog



### WARNING :

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.



### 1. Adjusting the feed dog height

Adjust the height of feed dog **1** so that it is 1.0 mm higher than the top surface of throat plate **2**. Adjust the feed dog height as described below.

- 1) Loosen screw **4** of feed lifting rock arm **3**.  
Move feed bar **5** up and down.
- 2) After the completion of adjustment, tighten screw **4**.

### 2. Adjusting inclination of the feed dog

- 1) Turn the handwheel until the feed dog reaches the highest position.
- 2) Loosen screw **6** of the feed rocking arm.
- 3) Turn eccentric shaft **7** to change inclination of the feed dog.
- 4) After the completion of adjustment, tighten screw **6** of the feed rocking arm.



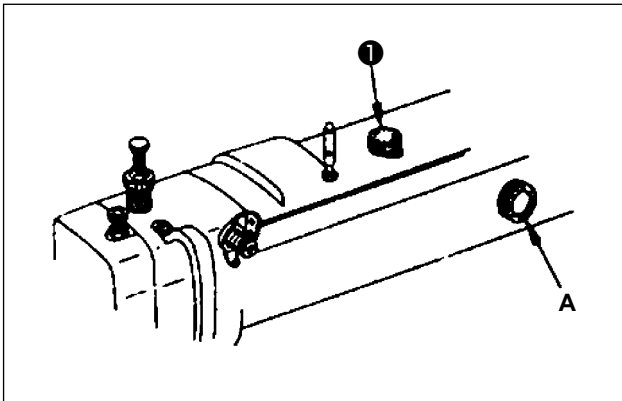
The feed dog height may change after the adjustment of inclination of the feed dog. It is therefore necessary to check the feed dog height again.

## 4-7. Adjusting the presser foot and the walking foot



### WARNING :

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.

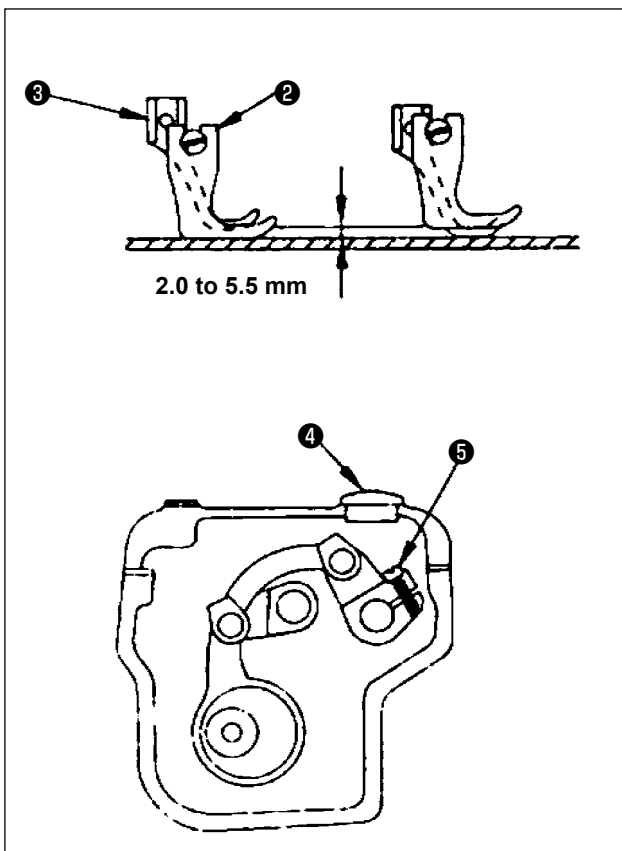


### 1. Adjusting the amount of alternating vertical movement of the walking foot and presser foot

- 1) The amount of alternating vertical movement of the walking foot and presser foot must be 2 to 5.5 mm.
- 2) The amount of alternating vertical movement of the walking foot and presser foot can be easily adjusted with dial **A** mounted on the front surface of sewing machine.
- 3) Knob **1** mounted on the top surface of sewing machine locks the operation of dial **A** by setting the former to the same value with the latter.

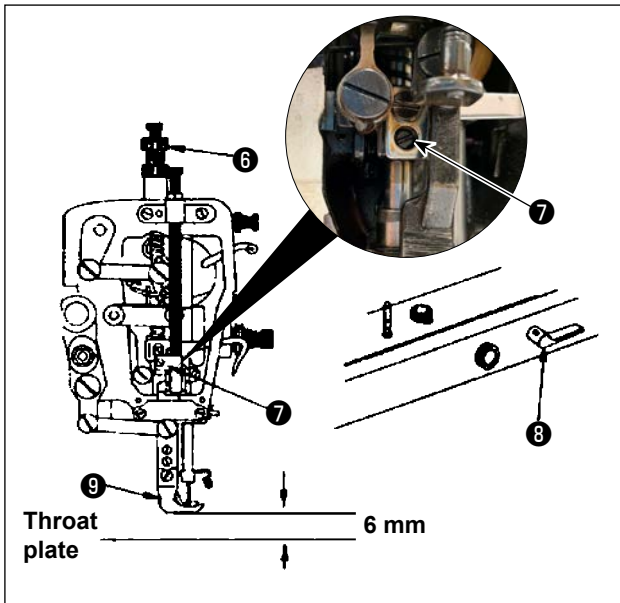


To adjust the amount of alternating vertical movement of the walking foot and presser foot from a smaller value to a larger value, set knob **1** to a larger value to unlock it. Then, adjust dial **A** appropriately. After adjusting dial **A**, turn knob **1** to lock dial **A**. Similarly, to adjust the amount of alternating vertical movement of the walking foot and presser foot from a larger value to a smaller value, adjust dial **A** first, and turn knob **1** to lock dial **A**.



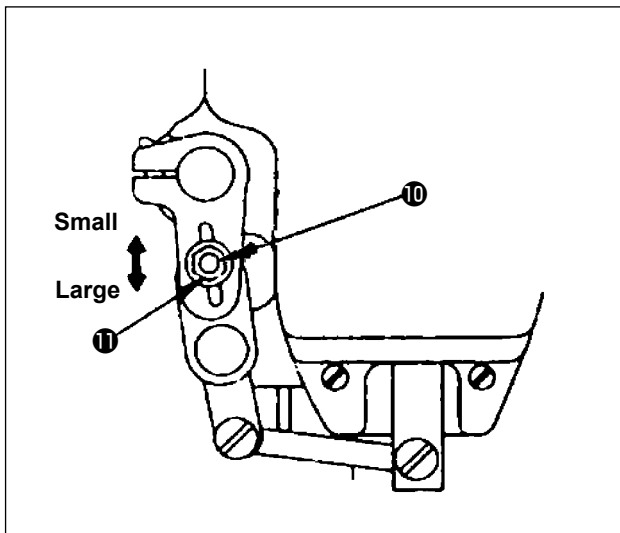
### 2. Adjusting a balance of the alternating vertical movement between the walking foot and the presser foot

- (1) In the case of increasing the height of walking foot **2** and decreasing the height of presser foot **3**
  - 1) Detach rubber plug **4**.
  - 2) Turn the handwheel until presser foot **3** goes up above the throat plate.
  - 3) Loosen screw **5**.
  - 4) Presser foot **3** comes down to reach the throat plate. Then, tighten screw **5**.
  - 5) As described above, decrease the height of presser foot **3** to an appropriate lower value. Continue this procedure until the amount of lift of the presser foot becomes almost equal to that of walking foot **2**.
- (2) In the case of decreasing the height of walking foot **2** and increasing the height of presser foot **3**
  - 1) Turn the handwheel until walking foot **2** goes up above the throat plate.
  - 2) Loosen screw **5**.
  - 3) Walking foot **2** comes down to reach the throat plate. Then, tighten screw **5**.



### 3. Adjusting the amount of lift of the presser foot

- 1) Loosen presser spring regulator **6** and bracket fixing screw **7**.
- 2) Lift the presser foot by means of presser foot lifting lever **8**. Adjust bracket fixing screw **7** up and down until presser foot **9** is positioned 6 mm above the throat plate.
- 3) After the completion of adjustment, securely tighten bracket fixing screw **7** and adjust presser spring regulator **6** appropriately.



### 4. Adjusting the feed amount of walking foot

Normally, the ratio of feed amount between the feed dog and walking foot is 1:1. The feed amount of walking foot can be adjusted according to the sewing condition to be used.

- 1) Loosen nut **10**.
- 2) Adjust the installed position of vertical movement control shaft **11**. The feed amount of walking foot is decreased by moving vertical movement control shaft **11** upward. The feed amount of walking foot is increased by moving vertical movement control shaft **11** downward.
- 3) After the completion of adjustment, tighten nut **10**.

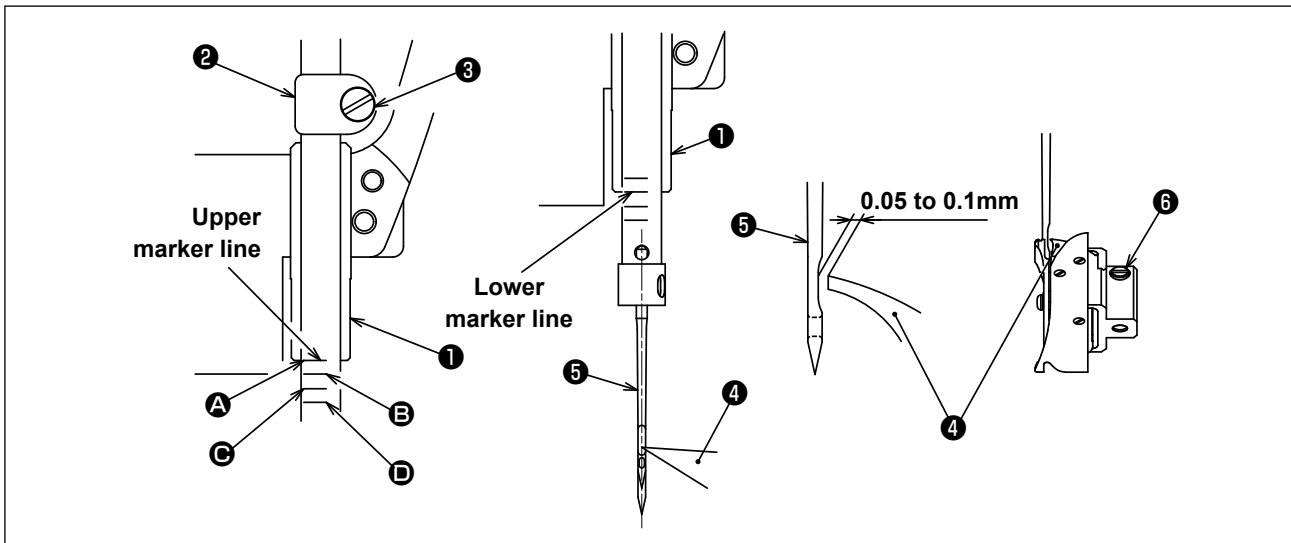


## 4-8. Needle-to-hook relationship



### WARNING :

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.



### 1) Positioning the needle bar.

Tighten needle bar connection screw ③ in needle bar connection ② so that the marker line of the needle bar aligns with the bottom end of needle bar lower bushing ① at the lowest position of the needle bar.

(Fourth line ① from the bottom for a DB x 1, second line ② from the bottom for DP x 17)



**After the height of the needle bar has been properly adjusted, check that the needle bar does not come in contact with the walking foot.**

### 2) Position the needle and the hook.

Adjust so that the specified marker line (third line ③ from the bottom for a DB x 1 needle, or line ④ at the bottom for a DP x 17 needle) on the ascending needle bar aligns with the bottom end of lower bushing ①. Further adjust to make hook point ④ nearly meet the center of needle ⑤, and adjust the clearance between needle ⑤ and hook point ④ to 0.05 to 0.1 mm. Then tighten hook screw ⑥.

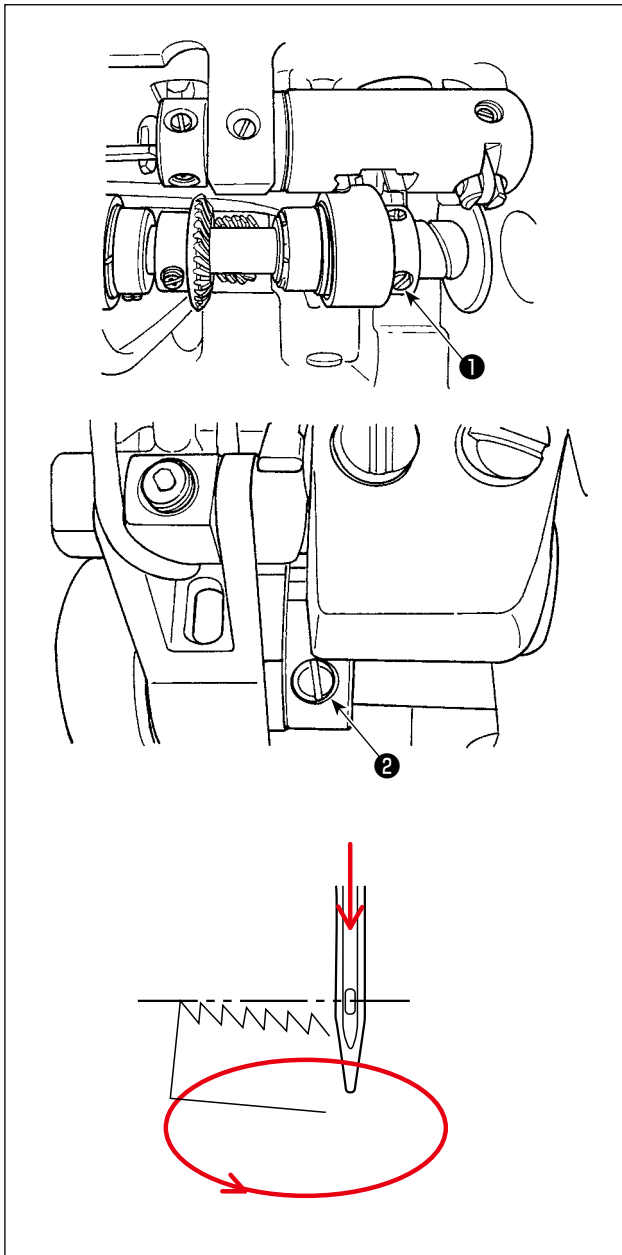
### 3) To adjust the hook, remove the throat plate first. Loosen hook setscrew ⑥ with a screwdriver and adjust the hook position from the throat plate side.

## 4-9. Adjusting the feed timing



### WARNING :

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.



- 1) Remove the top cover.
- 2) Turn the handwheel to bring the needle to the upper dead point.
- 3) At this time, adjust so that screw No. 1 (1) is positioned at eleven o'clock position as viewed from the handwheel side. Then, tighten the screw No. 1.
- 4) Adjust the position of the walking bar lifting eccentric so that screw No. 1 (1) of the feed cam and screw No. 1 (2) of the walking bar lifting eccentric are flush with each other. Then, tighten the screws.



When the feed dog comes down until the top end of feed dog is aligned with the top surface of throat plate, the center of needle eyelet in descending needle is aligned with the top surface of throat plate.

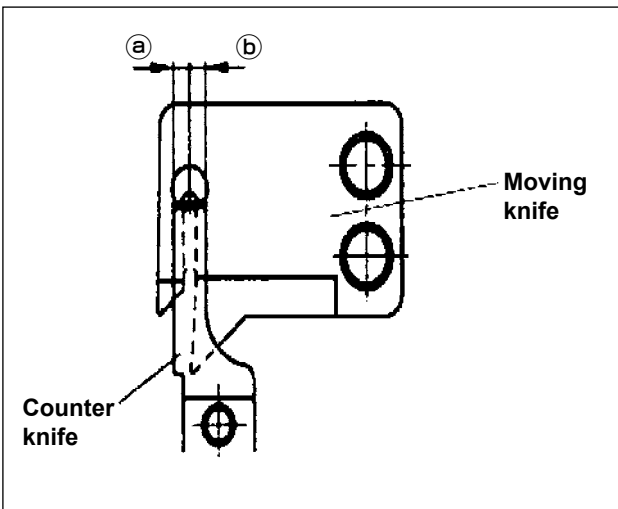
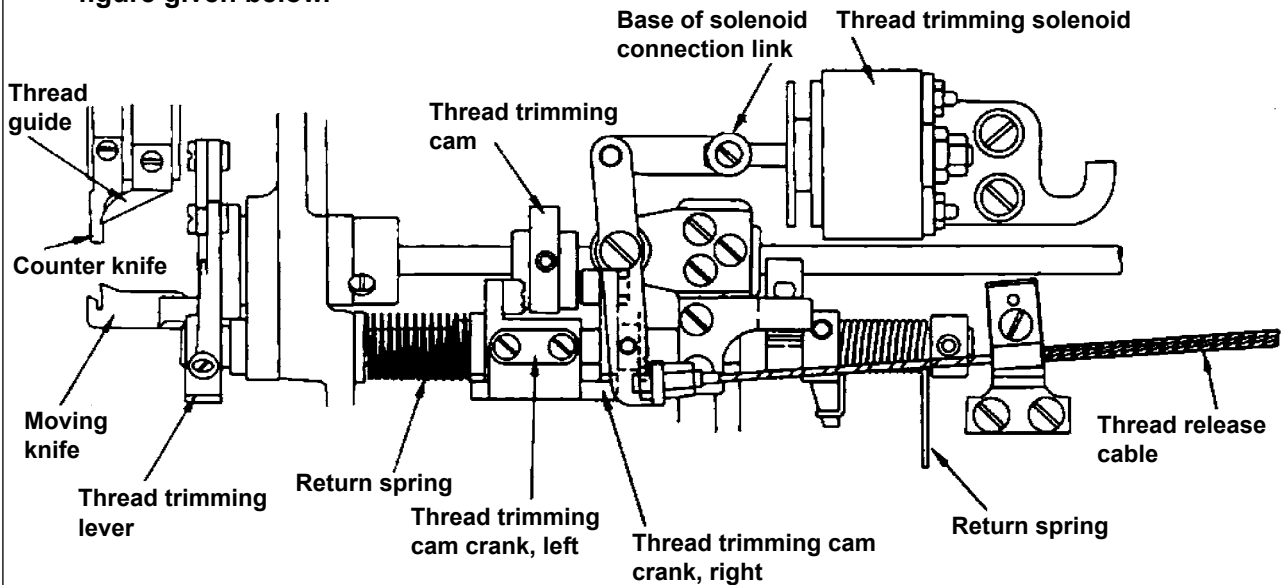
## 4-10. Adjusting the thread trimming device



### WARNING :

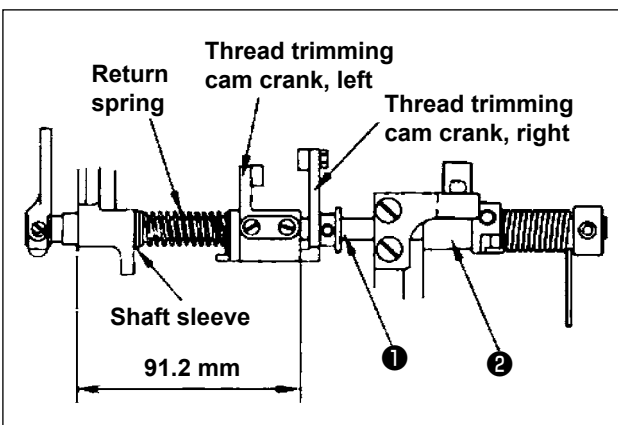
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

1. The structure of the thread trimming device of this sewing machine is as shown in the figure given below.



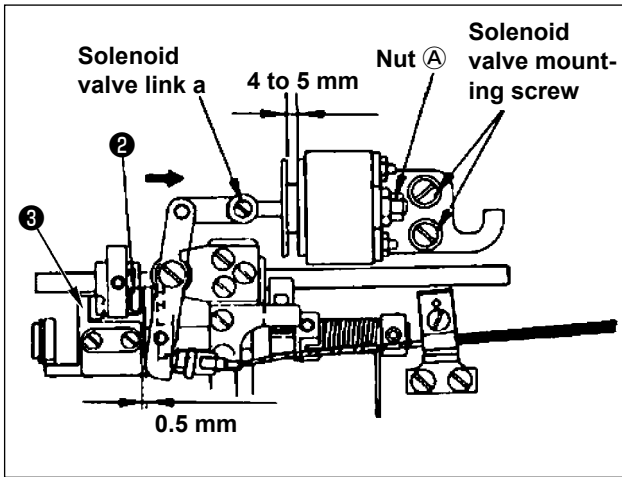
### 2. Adjusting the counter knife and moving knife

- 1) The standard mounting position of the counter knife and moving knife is the position at which the center line of cutting portion of moving knife is aligned with the center line of eye of counter knife as illustrated in the figure.
- 2) If portion ① of counter knife is larger than the standard, three threads will be trimmed instead of two threads in failure. If this phenomenon occurs, threads will not be brought to the normal position after thread trimming. If portion ② is larger than the standard, the knives cannot trim the threads. It is therefore necessary to adjust the knives to the correct position.



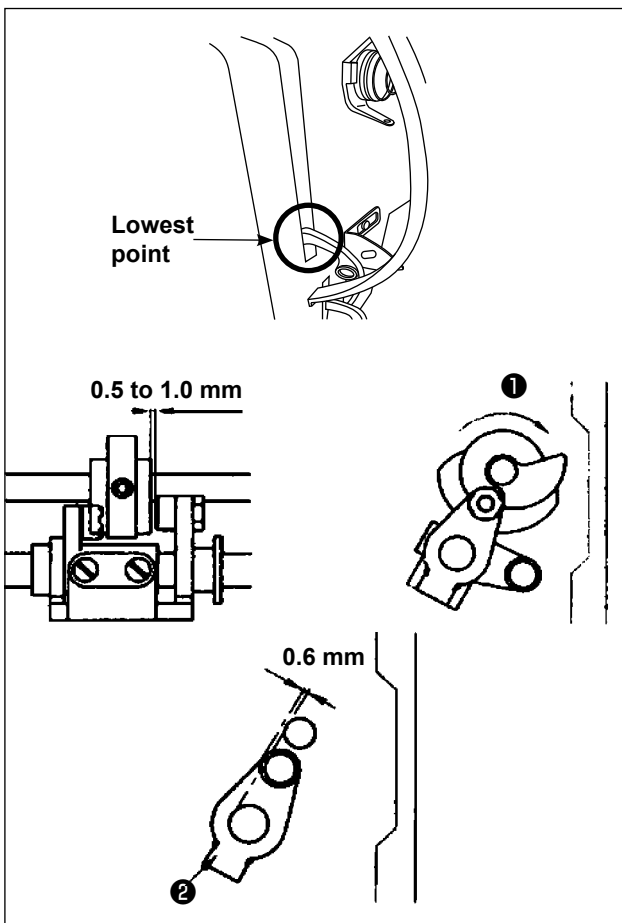
### 3. Adjusting the thread trimming cam crank

- 1) Align the thread trimming cam cranks, right and left with the flat position of thread trimming cam crank shaft in the arrangement as shown in the figure.
- 2) Slowly turning thread trimming cam crank shaft ①, align stopper lever ② with the flat portion on thread trimming cam crank shaft ①.



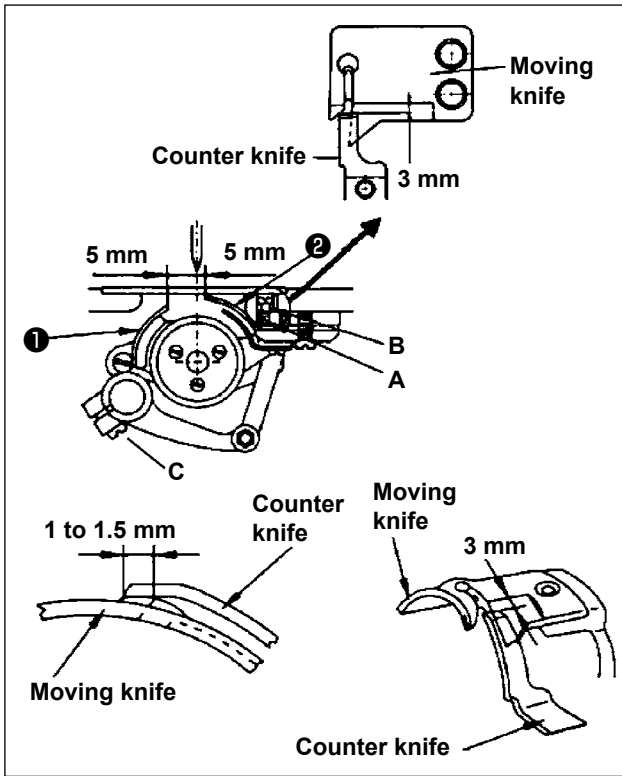
#### 4. Installing the thread trimming device

- 1) Adjusting the operating quantity of the thread trimming solenoid
  - A. The operating quantity of the thread trimming solenoid is 4 to 5 mm.
  - B. The operating quantity of the thread trimming solenoid is adjusted by adjusting nut **A**.
- 2) Adjusting the installation of the thread trimming solenoid
  - A. A 0.5 mm clearance is provided between thread trimming cam crank, left **3** and thread trimming cam crank, right **2** in the case the thread trimming solenoid is operated in the aforementioned conditions. (Standard installation position)
  - B. To adjust the thread trimming solenoid, push the cylinder portion of thread trimming solenoid in the direction of the arrow as shown in the figure.



#### 5. Installing the thread trimming cam

- 1) Bring the thread take-up lever to its lowest point as shown in the figure.
- 2) Turn thread trimming cam **1** clockwise while keeping the cylinder of thread trimming solenoid held pushed, until thread trimming cam **1** comes in contact with the roller. At this position, tighten the screw.
- 3) When the cylinder of thread trimming solenoid is no longer pushed, the right-thread cam crank returns to its home position. Adjust so that a clearance of 0.5 to 1.0 mm is provided between thread trimming cam **1** and the roller. (Standard installation position)



## 6. Adjusting the engagement between the knives

- 1) Adjusting the position of the moving knife and counter knife  
 The standard initial position of moving knife ① is 5 mm from the center of needle. The standard initial position of counter knife ② is 5 mm from the center of needle.  
 Loosen screw **C** and adjust the position of the knives.
- 2) Adjusting the forward travel amount of the moving knife  
 When you turn the handwheel in the reverse direction while pushing the cylinder of thread trimming solenoid, moving knife ① is rotated by the thread trimming cam. At this time, adjust the position of moving knife ① so that its end portion moves away from the end portion of counter knife ② by 1.0 to 1.5 mm when the forward travel amount of moving knife ① is maximized. (Standard installation position)

### 3) Adjusting the counter knife pressure

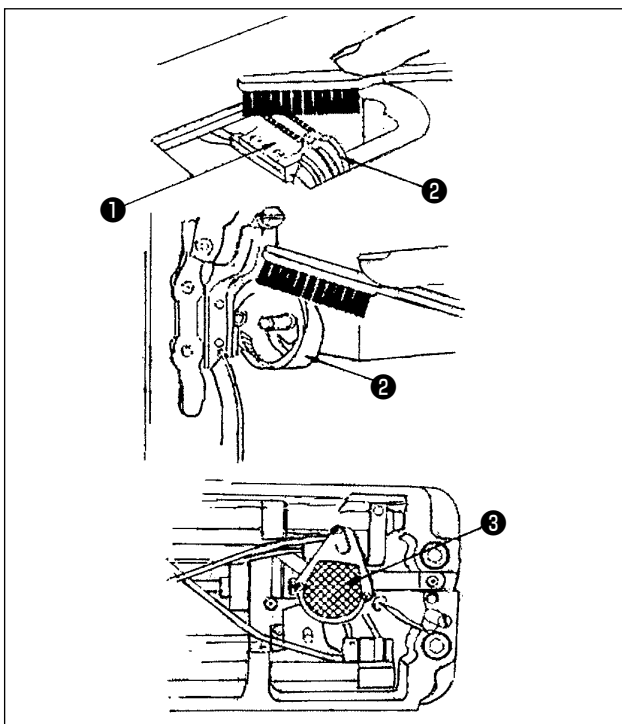
- A. The standard adjustment position of the knives is achieved when the moving knife and counter knife come in light contact with each other, as shown in the figure.
- B. Especially when using thick threads, the knives cannot trim them sharply. In this case, increase the pressure applied to the counter knife.
- C. To adjust the pressure applied to the counter knife, loosen locknut **B** with a box wrench and adjust the pressure applied to the counter knife with screw **A**.  
 After the completion of adjustment, tighten locknut **B**.

## 4-11. Periodical cleaning of the sewing machine

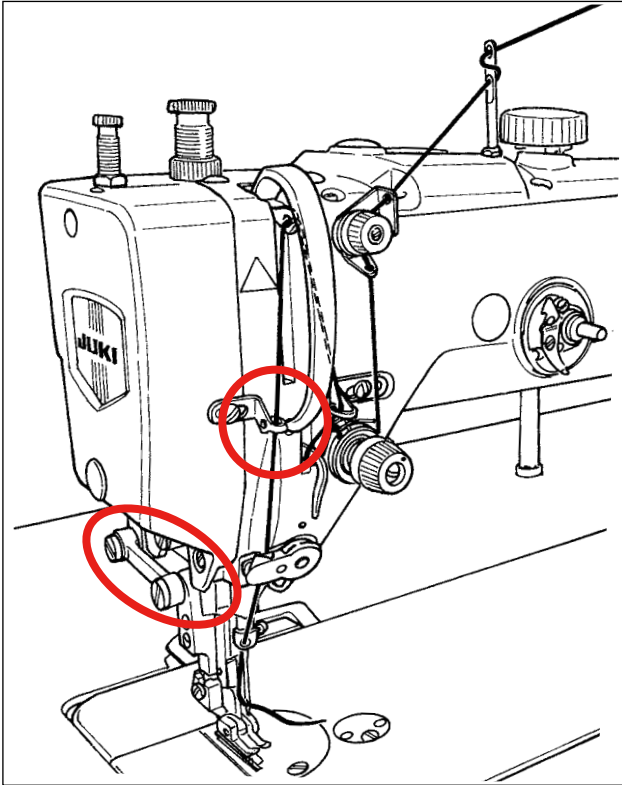


### WARNING :

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.




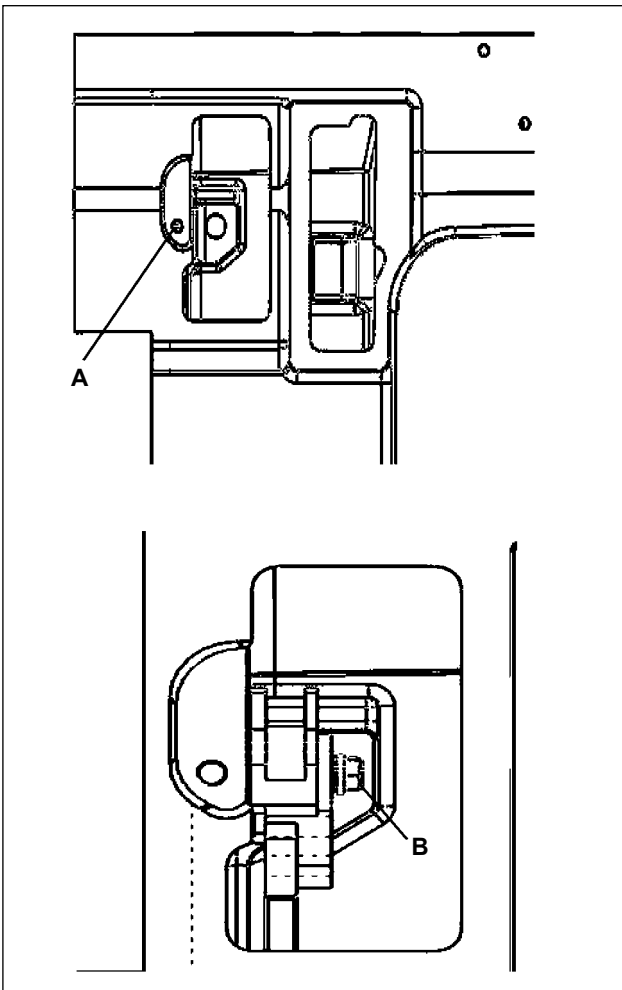
Feed dog ① , hook ② and pump ③ should be periodically cleaned.



Oil may accumulate in the lower portion of face plate or inside the thread take-up cover while using the sewing machine  
 Be sure to wipe out oil periodically.  
 Regularly clean the feeding foot, presser foot and throat plate.

**4-12. Adjusting the reverse feed pitch**

**WARNING :**  
 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.



- 1) Detach the reverse feed solenoid cover.
- 2) Loosen fixing screw **A**. Turn eccentric adjustment pin **B**.
- 3) Tighten fixing screw **A**.








## 5. Display screen and operation

### 5-1. Buttons and their functions









The operation screen is as illustrated below.



Function	Button	Explanation of sewing machine operation
Selection of reverse feed stitching at the beginning of sewing		The number of stitches set to the reverse feed stitching at the beginning of sewing (A, B) is sewn twice.
		The number of stitches set to reverse feed stitching at the end of sewing (A, B) is sewn once.
Selection of reverse feed stitching at the end of sewing		The number of stitches set to the reverse feed stitching at the beginning of sewing (C, D) is sewn twice.
		The number of stitches set to reverse feed stitching at the end of sewing (C, D) is sewn once.
Constant-dimension sewing		Function to sew the constant-dimension sewing (E) is carried out. When the front part of part is depressed, the sewing machine automatically sews the preset number of stitches E and stops.
Polygonal shape stitching		For the polygonal shape stitching, the process is set with 1-digit on the left, and the number of stitches is set with three-digit value (G) on the right. When you depress the front part of pedal, the sewing machine sews the number of stitches for the first process and stops. When you depress the front part of pedal again, the sewing machine sews the number of stitches for the next process. When the sewing machine sews the number of stitches for the final process, the polygonal shape stitching is completed.
Free stitching		1) When the front part of pedal is depressed, the sewing machine performs sewing. When the pedal is returned to its neutral position, the sewing machine stops. 2) When the front part of pedal is depressed, the sewing machine automatically performs thread trimming and related operations such as thread wiping.
Overlapped stitching		When the front part of pedal is depressed, the sewing machine automatically performs overlapped stitching. The number of repetitions is (E). When the front part of the pedal is depressed, the sewing machine automatically performs this stitching, trims the thread and stops. The sewing machine repeats this operation sequence until it is reset by depressing the back part of pedal.



Function	Button	Explanation of sewing machine operation
Selection of the number of stitches setting		<p>For the reverse-feed stitching, the number of stitches is set with A, B, C and D. The number of stitches can be set within the range of 0 to 9.</p> <p>For the constant-dimension sewing, the number of stitches is set with E. The number of stitches can be set within the range of 0 to 99.</p> <p>For the polygonal shape stitching, the number of stitches is set with G. The number of stitches can be set within the range of 0 to 200.</p> <p>Setting of the number of stitches and display can be changed over by pressing  key to A, B, C or D, or E or G.</p> <p>While the memory switch is displayed, the stored values can be checked by pressing  key.</p>
Needle bar lifting setting		<ol style="list-style-type: none"> <li>1) Free stitching style: When this button is pressed, the needle bar goes up and the sewing machine advances by a half step to enable the compensation stitching operation. (Practically, the sewing machine continues compensation stitching operation as appropriate.)</li> <li>2) Constant-dimension sewing style (except for the overlapped stitching) <ol style="list-style-type: none"> <li>a. When the key is pressed while the sewing machine stops at the midpoint of each process, the needle goes up.</li> <li>b. When the key is pressed while the sewing machine is at rest at the end of each process, one correction stitch can be sewn. (Practically, the sewing machine continues compensation stitching operation as appropriate.)</li> </ol> </li> </ol>
One-shot switch		<ol style="list-style-type: none"> <li>1) Free stitching and overlapped stitching This stitching is not enabled even if this key is pressed.</li> <li>2) Constant-dimension sewing: Press this key. This function is initiated by pressing the front part of pedal. Then, the sewing machine automatically sews the number of stitches set for (E) and stops.</li> <li>3) Polygonal shape stitching: Press this key. The one-shot switch is activated by depressing the front part of pedal. Then, the sewing machine automatically performs sewing of the number of stitches set with the right-side value (G) and stops. When the front part of pedal is depressed again, the sewing machine automatically performs sewing of the next process and stops. The sewing machine repeats this procedure until it finishes sewing of the last process. After the completion of last process, the sewing machine automatically performs thread trimming.</li> </ol>
Thread trimming switch		<p>Setting enable / disable of thread trimming: As long as this switch is displayed on the screen, the sewing machine carries out thread trimming. If this switch is not displayed on the screen, the sewing machine will not carry out thread trimming.</p>
Soft start		<ol style="list-style-type: none"> <li>1) In the case this function is enabled, the sewing machine firstly operates at a low speed when the motor starts by depressing the front part of pedal. When the sewing machine has sewn the predetermined number of stitches, it runs at the normal sewing speed. When the motor is re-started without thread trimming after the sewing machine has stopped in the middle of sewing, the soft start function is not activated. On the other hand, the soft start function is activated when the motor is re-started after thread trimming.</li> <li>2) The setting of sewing speed for the soft start function can be adjusted with [007.S].</li> <li>3) The setting of the number stitches for the soft start function can be adjusted with [008.SLS].</li> </ol>






Function	Button	Explanation of sewing machine operation
Setting the needle stop position		Setting the needle stop position when the motor stops As long as this button is displayed on the LCD, the needle stop position when the motor stops is set to the "upper position". In the case this button is not displayed on the LCD, the needle stop position when the motor stops is set to the "lower position"
Setting the automatic lifting of presser foot after thread trimming		Changeover between enable / disable of the presser foot lifting after thread trimming As long as this button is displayed on the LCD, the presser foot automatically goes up after thread trimming. In the case this button is not displayed on the LCD, the presser foot remains lowered after thread trimming.
Setting of the automatic presser foot lifting when the sewing machine stops in the middle of sewing		Changeover between enable / disable of the presser foot lifting when the sewing machine stops at the midpoint As long as this button is displayed on the LCD, the presser foot automatically goes up when the sewing machine stops in the middle of sewing. In the case this button is not displayed on the LCD, the presser foot remains lowered when the sewing machine stops in the middle of sewing.
Gradual increase of the set number	 	Increase of the set number of stitches For the selection display of the memory switch, the gradual increase key of the memory switch number For the content display of the memory switch, the gradual increase key of the set value
Gradual decrease of the set number	 	Decrease of the set number of stitches For the selection display of the memory switch, the gradual decrease key of the memory switch number For the content display of the memory switch, the gradual decrease key of the set value
Starting the memory switch		When this key is held pressed while the sewing machine has already started, the user level mode is started. When this key is held pressed again, the user level mode is terminated. In the case of selecting the memory switch, this key can be used as the gradual increase key of the memory switch.

## 5-2. Counter function

### Counting the number of pieces:

In the case the memory switch [041, TM] is set to "0 (zero)" and  is held pressed for two seconds, the display will be changed over. 1N: In the case of counting the number of times of thread trimming, the number shown on the counter will be returned to 0 (zero) by pressing  key.

### Counting the bobbin thread:

In the case the memory switch [041, TM] is set to "(Other than 0 (zero))" and  is held pressed for two seconds, the display will be changed over. 1N: For the bobbin thread counter, the counter is reset to the bobbin thread count number set with [021, CS] by pressing  key. If the bobbin thread counter reaches 0 (zero) during sewing, "E\_\_" will be displayed and the alarm will sound. When  key is pressed while the alarm is sounding, the alarm is stopped and the bobbin counter is reset.





#### [041, TM] value


1: Counting down by one for every stitch

10: Counting down by one for every 10 stitches



100: Counting down by one for every 100 stitches

### Counting the number of stitches:

In the case the memory switch [041, TM] is set to "0 (zero)" and  is held pressed for two seconds, the display will be changed over and the number of times of thread trimming is displayed. When  key is further pressed, the number of stitches is displayed on the counter.

2N: When  key is pressed, the number of stitches counter is reset to "0 (zero)".


## 5-3. Initialization


When the power is turned ON while  key and  key are pressed simultaneously, the display gives the indication "3-xxxx" and the panel parameters are initialized to the factory-set values within five seconds. (The initial factory-set values are the default values stored in the operation panel.)

Turn the power OFF once after the completion of initialization.

## 6. List of memory switches

### (1) User level

When  key is held pressed for two seconds or more with the sewing machine started, the memory switches can be set.


Every time one memory switch is changed, the changed value is stored in memory by pressing  key.


Parameter code	Description of parameter	Range	Initial value	Explanation of the content represented by the value
001.H	Maximum sewing speed	100 to 2200	2200 sti/min	Setting of the maximum number of revolutions while the sewing machine is in operation Depending on the minimum sewing speed No. 60
002.PSL	Adjustment of acceleration curve	30 to 100	80%	Setting of the percentage of rise of acceleration
003.NUD	Selection of home position of needle when the sewing machine is stopped	UP/DN	UP	UP (upper stop position) / DN (lower stop position)
004.N	Sewing speed at the start of reverse feed stitching	100 to 2200	1200 sti/min	Setting of the sewing speed to be employed at the start of reverse feed stitching
005.V	Sewing speed at the end of reverse feed stitching	100 to 2200	1200 sti/min	Setting of the sewing speed to be employed at the end of reverse feed stitching
006.B	Sewing speed of overlapped stitching	100 to 2200	1200 sti/min	Setting of the sewing speed to be employed at the end of overlapped stitching
007.S	Soft start speed	100 to 2200	400 sti/min	Setting of the soft start speed
008.SLS	Number of stitches for the soft start	0 to 99	Two (stitches)	Setting of the number of stitches for the start start
009.A	Sewing speed for constant-dimension sewing	100 to 2200	1500 sti/min	Setting of the sewing speed to be employed when the AUTO key on the operation panel box is pressed
010.ACD	Function to automatically finish reverse feed stitching after sewing of the constant-dimension sewing (compensation stitching function is not set)	ON/OFF	ON	ON: The sewing machine carries out sewing of the constant-dimension sewing for the last step, and automatically performs reverse feed stitching and stops. Because of this operation sequence, compensation stitching function cannot be used before finishing reverse feed stitching. OFF: The sewing machine carries out sewing of the constant-dimension sewing for the last step, and stops without automatically performing reverse feed stitching. In this case, it is necessary to operate the pedal again in order to carry out thread trimming. It should be remembered, however, that compensation stitching function can be used.
011.RVM	Selection of the mode for reverse feed stitching	ON/OFF	ON	The reverse feed stitching switch: ON: Operation is enabled both while the sewing machine is in operation and when it is at rest. OFF: Operation is enabled on while the sewing machine is in operation.
012.SMS	Selection of reverse feed stitching starting mode	A/M	A	A: The sewing machine automatically carries out the constant-dimension sewing operation when the pedal is lightly depressed. M: It is possible to select start or stop of the sewing machine as desired depending on the depressing depth of the pedal.

Parameter code	Description of parameter	Range	Initial value	Explanation of the content represented by the value
013.TYS	Selection of the operation mode after starting reverse feed stitching	CON/STP	CON	CON: The sewing machine automatically proceeds to the next operation when it carries out reverse feed stitching. STP: The sewing machine halts sewing every time it completes reverse feed stitching for one step. It is therefore necessary to operate the pedal every time the sewing machine halts sewing at the end of each step.
014.SBT	Not used			
015.SBA	Retaining force of the solenoid	0 to 15	7	Retaining force of the thread clamp device
016.BB	Not used			
017.SBN	Setting the number of times to start reverse feed stitching	0 to 2	Twice	Setting of the number of to-and-from times of starting reverse feed stitching
018.BT1	Correction of sewing starting of reverse feed stitching 1	0 to 999	7	BT1, BT2 = 0, disabled BT1, BT2 = 1 - 16, operation timing is advanced (in increments of 1/8 stitches) BT1, BT2 = 17 - 31, operation timing is retarded (in increments of 1/8 stitches) BT1, BT2 = 32 to 999 Not used
019.BT2	Correction of sewing starting of reverse feed stitching 2		6	
020.SME	Not used			
021.CS	Setting of the number of counts of bobbin thread	0 to 9999	5000	Number of counts of bobbin thread under the bobbin thread count mode is set.
022.EBC	Adjustment parameter for the pedal stroke when the back part of pedal is lightly depressed	70 to 130	100	Fine adjustment of the pedal stroke when the back part of pedal is lightly depressed
023.EBD	Adjustment parameter for the pedal stroke when the back part of pedal is depressed	70 to 130	100	Fine adjustment of the pedal stroke when the back part of pedal is depressed
024.EBN	Setting of the number of times of ending of reverse feed stitching	0 to 2	2	Setting of the number of times of repeating ending of reverse feed stitching
025.BT3	Correction of sewing ending of reverse feed stitching 3	0 to 999	5	BT3, BT4 = 0, disabled BT3, BT4 = 1 - 16, operation timing is advanced (in increments of 1/8 stitches) BT3, BT4 = 17 - 31, operation timing is retarded (in increments of 1/8 stitches) BT3, BT4 = 32 to 999 Not used
026.BT4	Correction of sewing ending of reverse feed stitching 4		6	
027.CT	Not used			
028.PNS	Not used			
029.DS	Not used			
030.BCC	Not used			
031.SMB	Not used			
032.BAR	Overlapped stitching parameter setting method	0 to 9	0	0: Number of times of overlapped stitching for A, BD (Max. 9 stitches) 1: Number of times of overlapped stitching for AB, CD-F (Max. 99 stitches) 2: Number of times of overlapped stitching for A, B-F + C, D (Max. 9 stitches)
033.	Not used			
034.PZO	Adjustment of low-speed range of pedal	20 to 500	100	Contraction / Expansion of the low-speed range of pedal. 50 % represents a half of the original range. 200 % represents twice as wide as the original range.

Parameter code	Description of parameter	Range	Initial value	Explanation of the content represented by the value
035.BT5	Correction to the overlapped stitching 5	0 to 999	6	BT5, BT6 = 0, disabled BT5, BT6 = 1 - 16, operation timing is advanced (in increments of 1/8 stitches) BT5, BT6 = 17 - 31, operation timing is retarded (in increments of 1/8 stitches) BT5, BT6 = 32 to 999 Not used
036.BT6	Correction to the overlapped stitching 6		5	
037. SMP	Selection of the constant-dimension sewing mode	A/M	A	A: The sewing machine automatically performs the constant-dimension sewing operation when the pedal is lightly depressed M: It is possible to select start or stop of the sewing machine as desired depending on the depressing depth of the pedal.
038.PM	Pedal curve select function	0 to 30	10	0 - 9: The sewing machine runs at a low speed at the beginning of sewing, then it changes the speed to a high speed. 10 (medium value): No change in sewing speed 11 - 30: The sewing machine runs at a high speed at the beginning of sewing, then it changes the speed to a low speed.
039.PS	Reverse feed stitching button compensation stitching function	0 / 1	0	It is enabled only in the case [011.RVM] is set to OFF. 0: Compensation stitching is not carried out with the reverse feed stitching button 1: Compensation stitching is carried out with the reverse feed stitching button
040.WON	Setting of the thread wiping / thread clamping output function	0 to 6	2	0: Neither the thread wiping operation nor the thread clamping operation are carried out 1: The thread wiping operation is carried out, and the thread clamping operation is not carried out 2: The thread wiping operation is not carried out, and the thread clamping operation is carried out. 3: Both the thread wiping operation and the thread clamping operation are carried out. 4 to 6: Not used Setting of the wiper operation: [071.W1] [072.W2] Setting of the thread clamp operation: [067.T1] [068.T2]
041.TM	Setting of statistics of the number of pieces / bobbin thread counts	0 to 100	0	0: Number of pieces count mode; the counter counts up when the number of sewn pieces of product. Other than 0: Bobbin thread count mode; the set value of [021.CS] counts down according to the number of stitches. (Example) 1: Counting down by one for every stitch 10: Counting down by one for every 10 stitches 100: Counting down by one for every 100 stitches
042.FSM	Selection of the presser foot lifting operation when the sewing machine stops in the middle of sewing	OFF/ON	OFF	OFF: The presser foot does not go up ON: Presser foot goes up.
043.FTM	Selection of the presser foot lifting operation after thread trimming	OFF/ON	OFF	OFF: The presser foot does not go up. ON: Presser foot goes up.
044.PN	Display of the number of completed pieces of product	0 to 9999	0	Enabled when [041.TM] is set to 0 (zero).
045.SS	Setting of enable / disable of soft start	OFF/ON	OFF	OFF: Soft starting function is placed in OFF ON: Soft starting function is placed in ON

## (2) Maintenance personnel level

When  key is held pressed for two seconds or more with the sewing machine started, the memory switches can be set.

Every time one memory switch is changed, the changed value is stored in memory by pressing  key.

Parameter code	Description of parameter	Range	Initial value	Explanation of the content represented by the value		
046.DIR	Not used					
047.MAC	Sewing machine type code	0 to 999	6	Less than 80: Lockstitch type (9: Special-purpose lockstitch type (provided with 1-stitch low speed starting function): When the low-speed start display is cancelled, the first stitch of free stitching is sewn at a low speed.)		
048.SYM	Not used					
049.SPD	Not used					
050.MPD	Not used					
051.CHK	Setting of the energization self-check function (Detection of the pedal signal and power failure)	0 to 10	2		Energization self-check function	Rotation fault determination time
				0	Disabled	1 second
				1	Enabled	2 seconds
				2		3 seconds
				}		}
				9		10 seconds
10		11 seconds				
052.PA	Setting of the pedal response when depressing the front part of pedal	20 to 400	80%	Set the pedal response according to the operator's skill. 20 %: Slowest to respond to the speed input with the pedal 400 %: Fastest to respond to the speed input with the pedal		
053.FT	Presser foot lift delay time in the case of lightly depressing the back part of pedal when sewing machine stops in the middle of sewing	0 to 2000	100ms	In the case the sewing machine is provided with the presser foot lifting device: Adjust the delay time according to the sensitivity of the pedal.		
054.BK	With / without retaining of the motor shaft when the sewing machine stops	OFF/ON	OFF	ON: The motor shaft angle is retained when the sewing machine stops. OFF: Not retained		
055.TOT	Total limit time of the motor operation	1 to 800	8Hrs	In the case [058.UTD] is set to ON Maximum of 33 days (880 hours)		
056.TM1	Motor running time	1 to 999	2s	In the case [058.UTD] is set to ON Operating time of free stitching at the time of aging		
057.TM2	Motor stopping time	1 to 999	51s	In the case [058.UTD] is set to ON Stop time between cycles at the time of aging		
058.UTD	Aging function	OFF/ON	OFF	Aging starts The sewing machine runs under the sewing mode set on the operation panel.		
059.T	Setting of the thread trimming speed	80 to 400	300 sti/min	Adjustment of the thread trimming operation speed If the thread trimming speed is too low: Thread trimming cannot be carried out normally. If the thread trimming speed is too high: Stopping performance is impaired.		
060.L	Sewing speed under the low speed mode	80 to 400	200 sti/min	Adjust the sewing speed at which the sewing machine runs under the low speed mode		

Parameter code	Description of parameter	Range	Initial value	Explanation of the content represented by the value
061.FO	Full output time of the presser foot / reverse feed stitching solenoids at the initial stage	0 to 2000	250ms	Time during which the sewing machine runs with the full output of the presser foot / reverse feed stitching solenoids (at the beginning of operation)
062.FC	Output signal frequency of the presser foot / reverse feed stitching solenoids	0 to 100	38%	Frequency of the output signal of the presser foot / reverse feed stitching solenoids Reduction of power consumption and prevention of overheat of the solenoid
063.FD	Motor start delay according to the presser foot lifting timing	0 to 990	50	The starting time of the motor is adjusted to time the start of motor by depressing the pedal to the presser foot lift by the solenoid.
064.HHC	Selection of the presser foot lifting operation when the back part of pedal is lightly depressed	OFF/ON	OFF	ON: The sewing machine carries out thread trimming without lifting the presser foot when the back part of pedal is lightly depressed OFF: The sewing machine lifts the presser foot and does not perform thread trimming when the back part of pedal is lightly depressed. (The sewing machine carries out thread trimming when the pedal is fully depressed.)
065.SFM	Signaling of the safety switch	0 to 5	0	0: The safety switch input signal is always on state (high) 1: The safety switch input signal is always off state (low) 2 to 5: Safety switch is disabled.
066.LTM	Thread trimming mode	0/1/2/3	2	0: Not used 1: Not used 2: Thread trimming mode for the flat-bed sewing machine (Thread trimmer operates when the sewing machine stops at the lower home position and goes up to the upper home position) 3: Interlocked thread trimming mode (Thread trimmer operates when the sewing machine stops at the upper stop position)
067.T1	Operating position of the thread clamp	0 to 990	110	Angle at which the thread clamp device is operated
068.T2	Retaining angle of operation of the thread clamp	0 to 990	240	Angle at which the thread clamp operation is retained
069.M	Setting the sewing speed in the case of stopping the sewing machine in the middle of sewing	0 to 1250	900	Setting of the speed to be employed when the sewing machine stops in the middle of sewing without performing thread trimming
070.NC	Setting the angle of reverse-rotation needle-up operation after thread trimming	0 to 280	0	0: Reverse-rotation needle-up function is not used 1 to 280: The sewing machine performs reverse-rotation needle-up. Set value "4" means "once". (Example) Set value 4: Needle lifting angle: 1 degree Set value 140: Needle lifting angle: 35 degrees Set value 280: Needle lifting angle: 70 degrees
071.W1	Thread wiping operation delay time	0 to 980	10ms	Time to be elapsed until thread drawing / thread wiping operation is started after detection of the upper stop position
072.W2	Thread wiping operating time	0 to 9990	70ms	Operating time of thread drawing / thread wiping operation
073.WF	Presser foot lifting operation delay time	0 to 990	50ms	Time to be elapsed until the presser foot lifting operation is standard after the completion of thread drawing / thread wiping operation

Parameter code	Description of parameter	Range	Initial value	Explanation of the content represented by the value
074.FHT	Operation maintaining time of the reverse-feed stitching / presser foot lifting solenoid	1 to 400	30s	In the case the reverse-feed stitching solenoid is held in the ON state until the set time is reached, the output power to the reverse-feed stitching solenoid is turned OFF to protect the circuit. To activate the solenoid again, manually press the reverse feed stitching switch. In the case the presser foot lifting solenoid is held in the operating state by slightly depressing the back part of pedal, the output power to the presser foot lifting solenoid is turned OFF to protect the circuit. To activate the solenoid again, return the pedal to its neutral position once, and slightly depress the back part of pedal again.
075.UEG	Upper stop position of the needle	0 to 250	60	Fine adjustment of the upper stop position angle of needle Take "40" as zero point. When this value is decreased, the needle stops at a lower position. When this value is increased, the needle stops at a higher position.
076.DRU	Degree between the needle-down position and needle-up position	1 to 360	165	The degree by which the sewing machine is rotated in the reverse direction until the needle-up position is reached can be set as desired while using the needle-down stop position as the base point.
077.ANU	Automatic retrieval of the needle-up stop position by turning the power ON	OFF/ON	ON	ON: When the power to the sewing machine is turned ON, the sewing machine automatically retrieves the needle-up stop position and stops. OFF: When the power to the sewing machine is turned ON, the sewing machine does not automatically retrieve the needle-up stop position.
078.URU	Degree between the origin and the needle-up stop position	0 to 360	0	The degree by which the sewing machine is rotated in the reverse direction until the needle-up position is reached can be set as desired while using the origin as the base point.



## 7. Table of error codes

Error code	Meaning of the code	Possible problem that has occurred	Corrective measure	
Serious trouble	ERR-00	Input signal self-check error	<ol style="list-style-type: none"> <li>1. The pedal circuit may have a problem or the pedal is in the depressed state when energizing or self-checking it.</li> <li>2. DC voltage, low voltage</li> <li>3. Abnormal signal from the drive module</li> </ol>	<ol style="list-style-type: none"> <li>1. Return the pedal to its neutral position.</li> <li>2. Check the pedal signal line for problem.</li> </ol>
	ERR-01	Machine head signal feedback fault	<ol style="list-style-type: none"> <li>1. Synchronizer fault, or detection of the upper home position is not possible</li> <li>2. Sensor magnet has dropped</li> <li>3. Toothed belt jumping or slack</li> </ol>	
	PWROFF	Power failure	<ol style="list-style-type: none"> <li>1. 30 V fuse has blown out</li> <li>2. System power failure</li> </ol>	In the case of a power failure, check each fuse and re-energize the sewing machine.
	ERR-03	Sewing machine head operation fault	<ol style="list-style-type: none"> <li>1. Synchronizer fault, or detection of the lower home position is not possible</li> <li>2. Sensor magnet has dropped</li> <li>3. Toothed belt jumping or slack</li> </ol>	
	ERR-04	Overcurrent, overvoltage or inadequate voltage	<ol style="list-style-type: none"> <li>1. Motor power system trouble</li> <li>2. Instantaneous power failure</li> </ol>	
	ERR-05	DC voltage, overvoltage	<ol style="list-style-type: none"> <li>1. Brake resistance has broken, or brake fuse has blown out</li> <li>2. Instantaneous power failure</li> </ol>	Turn OFF the power to the system, and carry out investigation
	ERR-06	Solenoid input power, overcurrent	<ol style="list-style-type: none"> <li>1. Overload or short-circuit of solenoid</li> <li>2. Drive circuit failure</li> <li>3. Instantaneous power failure</li> </ol>	Turn OFF the power to the system, and carry out investigation
	ERR-07	Rotation fault	<ol style="list-style-type: none"> <li>1. Mechanical hitching</li> <li>2. Thread trimming mechanism trouble</li> <li>3. Encode signal fault</li> </ol>	Turn OFF the power to the system, and carry out investigation and inspect whether or not the mechanical characteristics of sewing machine are normal.

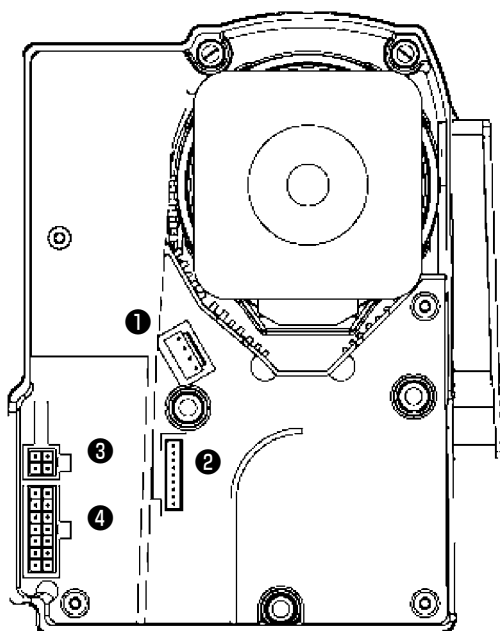
Error code	Meaning of the code	Possible problem that has occurred	Corrective measure	
Warning in general	A	Pulley stop position fault	<ol style="list-style-type: none"> <li>1. Parameter setting for the MPD or SPD is not correct.</li> <li>2. Overload</li> <li>3. Encoder signal fault</li> <li>4. Unstable synchronizer signal</li> <li>5. Motor failure, or drive power shortage</li> </ol>	Turn OFF the power and check whether or not the sewing machine motor is normal.
	B	Excessive maximum sewing speed	<ol style="list-style-type: none"> <li>1. Sewing speed has exceeded the maximum sewing in the same direction</li> <li>2. Sewing speed has exceeded 300 r/min in the reverse direction</li> <li>3. Encoder signal fault</li> <li>4. Motor failure (degauss, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the connection of drive line U / V/ W between the power box and motor</li> <li>2. Ground the system</li> </ol>
	C	Synchronizer self-check fault	Synchronizer is not installed	<ol style="list-style-type: none"> <li>1. Turn the power OFF. Re-install the synchronizer. Re-turn the power ON.</li> <li>2. Change the synchronizer with a new one.</li> </ol>
	D	EEPROM error	EEPROM which stores parameters has a problem.	Change the EEPROM with a new one.
	E	EEPROM parameter fault	Parameters in the EEPROM are not correct.	Re-start the sewing machine
	F	Motor encode signal fault	In the case "F" alarm continues, the encoder in the motor has failed.	Check the motor signal line for disconnection and poor contact.

If any failure has been detected, turn OFF the power to the system first. Then, check the ground wire of the control system.

Wait for 30 seconds. Then, re-turn ON the power to the system to check whether or not the system operates normally.

If the failure has not been corrected, repeat the aforementioned procedure several times. If the failure still continues, contact your distributor.

## 8. Names of connectors



- ❶ Motor power connector
- ❷ Motor encoder connector
- ❸ Pedal switch connector
- ❹ Solenoid connector

Check to make sure that the connectors are locked after connection.

## 9. Troubleshooting

No.	Phenomenon	Item to be checked	Cause	Corrective measure
1	Needle breakage	Orientation and height of needle	Needle insertion position is not correct.	Re-insert the needle properly.
		Needle	The needle is bent.	Change the needle with a new one.
		Feed dog timing	Feed dog timing is wrong	Adjust the feed dog timing appropriately.
		Needle bar lifting position	Timing between the needle and the hook is not correct.	Adjust the needle-to-hook timing appropriately.
		Needle height	The needle bar lower dead point is not correct	Adjust the needle bar lower dead point appropriately.
		Clearance between the needle and the hook	The clearance provided between the needle and the hook is not correct.	Adjust the clearance provided between the needle and the hook appropriately.
2	Thread breakage	Threading of the machine head	Machine head is not threaded correctly.	Correctly thread the machine head.
		Needle	The needle is bent or the needle tip has broken.	Change the needle with a new one.
		Orientation and height of needle	Needle insertion position is not correct.	Re-insert the needle properly.
		Needle thread tension	The needle thread tension is too high.	Decrease the needle thread tension.
		Bobbin thread tension	The bobbin thread tension is too high.	Decrease the bobbin thread tension.
		Operating quantity of the thread take-up spring	The operating quantity of the thread take-up spring is too large.	Adjust the thread take-up spring appropriately.
3	Sewing performance failure	Thread tension	The needle / bobbin thread tensions are not correct.	Adjust the needle / bobbin thread tensions appropriately.
		Tension of the thread take-up spring	Tension of the thread take-up spring is inadequate.	Adjust the tension of the thread take-up spring appropriately.
		Clearance between the inner hook holder and the hook	The clearance provided between the inner hook holder and the hook is not adequate.	Adjust the clearance provided between the inner hook holder and the hook appropriately.
4	Slip-off of thread or stitch skipping at the beginning of sewing	Orientation and height of needle	Needle insertion position is not correct.	Re-insert the needle properly and push it up until it will go no further.
		Needle	The needle is bent.	Change the needle with a new one.
		Threading of the machine head (needle)	Threading direction is wrong.	Insert the thread following the correct threading procedure.
		Clearance between the needle and the hook	The timing between the needle and the hook is not correct.	Adjust the needle-to-hook timing appropriately.
		Length of needle thread remaining at the needle (on the material)	The length of needle thread remaining at the needle (on the material) is too short.	Decrease the thread tension provided by the tension controller No.1.
		Check the upper stop position of the needle.	The thread take-up lever draws thread out of the needle eyelet due to improper upper stop position of the needle.	Re-adjust the upper stop position of the needle appropriately.

No.	Phenomenon	Item to be checked	Cause	Corrective measure
5	Thread trimming failure	Clearance between the moving knife and the hook	Height of the moving knife and that of the hook do not match.	Re-adjust the installation position of the moving knife.
		Check the pressure applied to the counter knife	The moving knife and the counter knife do not match with respect to their pressure and position.	Correct the pressure applied to the moving knife and counter knife, as well as correct the installation of those knives.
		Orientation of the needle	The needle is not inserted correctly.	Re-insert the needle correctly.
		Blades of the moving knife and counter knife	The moving knife and counter knife have flaws and worn out.	Change the moving knife or the counter knife with a new one.
		Thread trimming cam timing	The timing of thread trimming cam is not correct.	Adjust the timing of thread trimming cam appropriately.
		Tension releaser stroke	The stroke of tension releaser is too small.	Re-adjust the stroke of tension releaser appropriately.
6	The length of needle thread remaining at the needle (on the material) is too short.	Thread trimming timing	Thread trimming timing is not correct.	Adjust the timing of thread trimming appropriately.
		Opening of the thread nipper bar	Opening of the thread nipper bar is too small.	Increase the opening of the thread nipper bar.
		Thread tension of the tension controller No. 1	Thread tension provided by the tension controller No.1 is too strong	Decrease the thread tension provided by the tension controller No.1.
		Operating quantity of the thread take-up spring	The operating quantity of the thread take-up spring is too large.	Adjust the thread take-up spring appropriately.

Table of comparison between the numerical characters shown on the control box and the actual numerical characters

Numerical character portion:

Actual numerical value	0	1	2	3	4	5	6	7	8	9
Font of the displayed numerical character	0	1	2	3	4	5	6	7	8	9

Alphabetic character portion:

Actual alphabetical character	A	B	C	D	E	F	G	H	I	J
Font of the displayed alphabetical character	A	B	C	D	E	F	G	H	I	J
Actual alphabetical character	K	L	M	N	O	P	Q	R	S	T
Font of the displayed alphabetical character	K	L	M	N	O	P	Q	R	S	T
Actual alphabetical character	U	V	W	X	Y	Z				
Font of the displayed alphabetical character	U	V	W	X	Y	Z				