ENGLISH

AMS-221F / IP-500
INSTRUCTION MANUAL

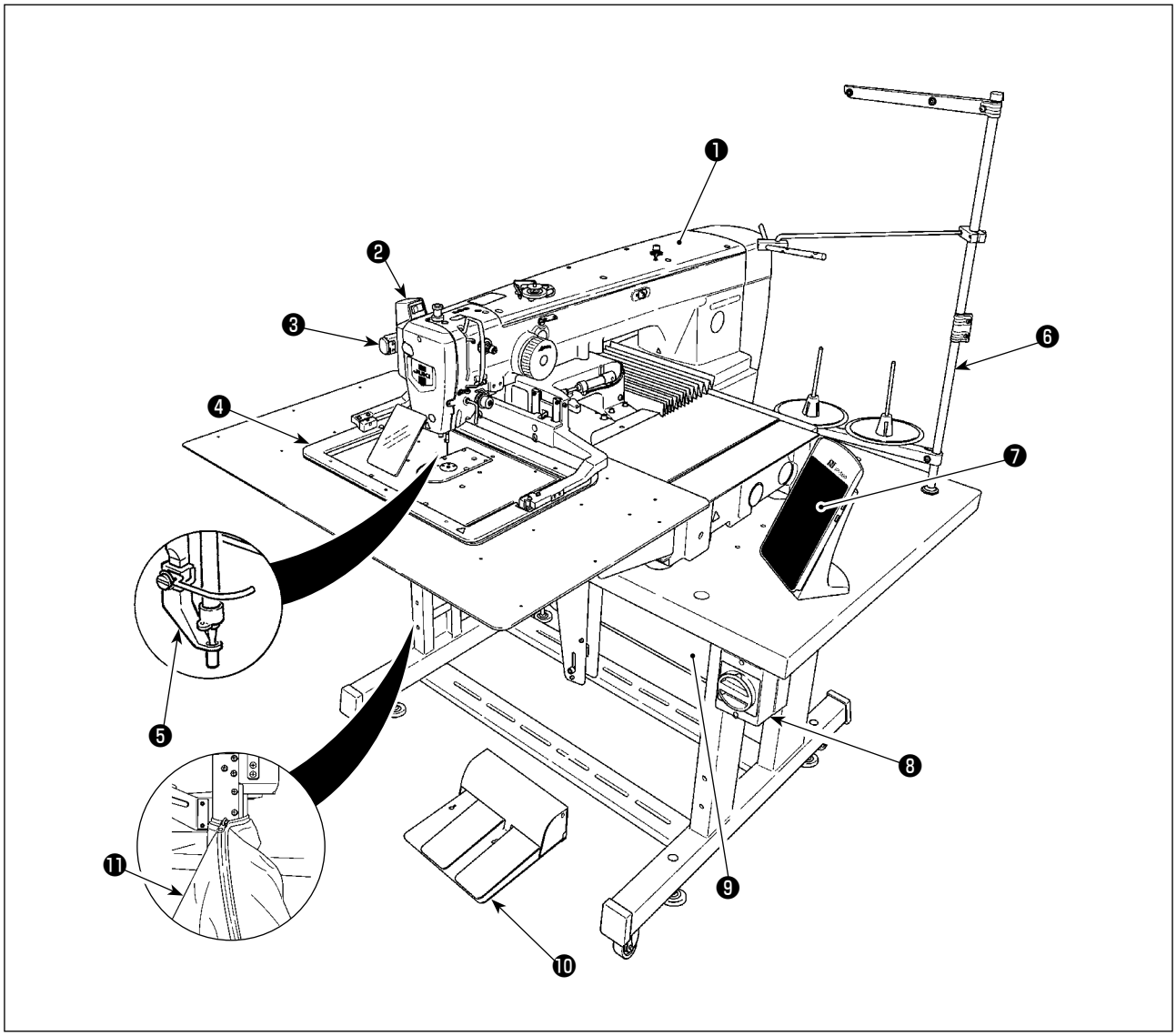
CONTENTS

I. MECHANICAL SECTION (WITH REGARD TO THE SEWING MACHINE)

1. SPECIFICATIONS

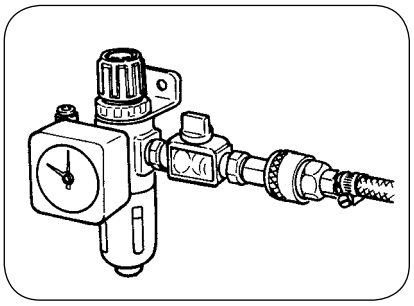
1	Sewing area	X (lateral) direction Y (longitudinal) direction AMS-221F-2516 : 250 mm × 160 mm AMS-221F-3020 : 300 mm × 200 mm
2	Max. sewing speed	2,800 sti/min (When sewing pitch is 3.5 mm or less), 2500 sti/min (G type)
3	Stitch length	0.1 to 12.7 mm (Min. resolution : 0.05 mm)
4	Feed motion of feeding frame	Intermittent feed (2-shaft drive by stepping motor)
5	Needle bar stroke	45.7 mm
6	Needle	GROZ-BECKERT 134, 135×17, ORGAN needle DP×5, DP×17
7	Lift of feeding frame	Max. 30mm
8	Intermediate presser stroke	4 mm (Standard) (0 to 10 mm)
9	Lift of intermediate presser	25 mm
10	Intermediate presser DOWN position variable	Standard 0 to 3.5 mm (Max. 0 to 7.0 mm)
11	Shuttle	Double-capacity semi-rotary hook
12	Lubricating oil	New Defrix Oil No. 2 (Supplied by oiler)
13	Memory of pattern data	Main body, Media • Main body : Max. 999 patterns (Max. 50,000 stitches/pattern) • Media : Max. 999 patterns (Max. 50,000 stitches/pattern)
14	Temporary stop facility	Used to stop machine operation during a stitching cycle.
15	Enlarging / Reducing facility	Allows a pattern to be enlarged or reduced on the X axis and Y axis independently when sewing a pattern. Scale : 1% to 400% times (0.1% steps)
16	Enlarging / Reducing method	Pattern enlargement / reduction can be done by increasing / decreasing either stitch length or the number of stitches. (Increasing/decreasing stitch length only can be performed when pattern button is selected.)
17	Max. sewing speed limitation	200 to 2,800 sti/min (Scale : 100 sti/min steps)
18	Pattern selection facility	Pattern No. / Pattern name selection method (Main body : 1 to 999, Media : 1 to 999)
19	Bobbin thread counter	UP/DOWN method (0 to 9,999)
20	Sewing counter	UP/DOWN method (0 to 9,999)
21	Memory back-up	In case of a power interruption, the pattern being used will automatically be stored in memory.
22	2nd origin setting facility	Using jog keys, a 2nd origin (needle position after a sewing cycle) can be set in the desired position within the sewing area. The set 2nd origin is also stored in memory.
23	Sewing machine motor	Servo-motor
24	Dimensions	AMS-221F-2516 : 1,200mm (W) × 1,000mm (L) × 1,200mm (H) (Excluding thread stand) AMS-221F-3020 : 1,200mm (W) × 1,070mm (L) × 1,200mm (H) (Excluding thread stand)
25	Mass (gross mass)	AMS-221F-2516 : 238 kg AMS-221F-3020 : 247 kg
26	Power consumption	400 VA
27	Operating temperature range	5˚C to 35˚C
28	Operating humidity range	35 % to 85 % (No dew condensation)
29	Line voltage	Rated voltage ±10% 50 / 60 Hz
30	Air pressure used	AMS-221F-2516 : 0.5 to 0.55 MPa (Max. 0.55 MPa) AMS-221F-3020 : 0.35 to 0.4 MPa (Max. 0.55 MPa)
31	Air consumption	2.75 dm^3 / min (ANR)
32	Needle highest position stop facility	After the completion of sewing, the needle can be brought up to its highest position.
33	Noise	- Equivalent continuous emission sound pressure level (L_{pA}) at the workstation: A-weighted value of 82 dB; (Includes K_{pA} = 2.5 dB); according to ISO 10821- C.6.3 -ISO 11204 GR2 at 2,800 sti/min. - Sound power level (L_{WA}); A-weighted value of 91.5 dB; (Includes K_{WA} = 2.5 dB); according to ISO 10821- C.6.3 -ISO 3744 GR2 at 2,800 sti/min Time required for sewing: 2.2 sec, using Pattern No. 102

2. CONFIGURATION

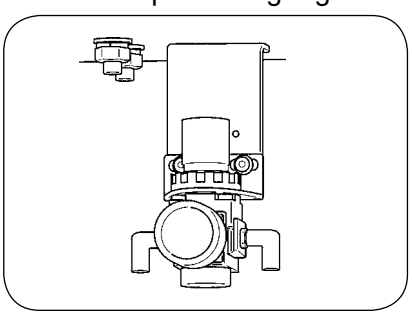


❶ **Machine head**
❷ **Wiper switch**
❸ **Temporary stop switch**
❹ **Feeding frame**
❺ **Intermediate presser**
❻ **Thread stand**
❼ **Operation panel (IP-500)**
❽ **Power switch**
(also used as the emergency stop switch)
❾ **Control box**
❿ **Foot pedal**
⓫ **Cloth chip bag**

Air regulator

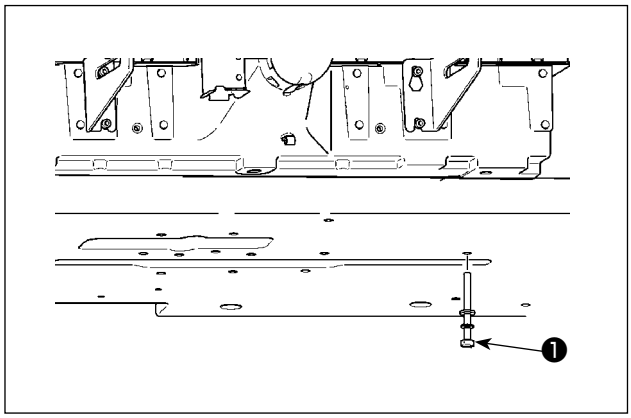


Bird's nest preventing regulator



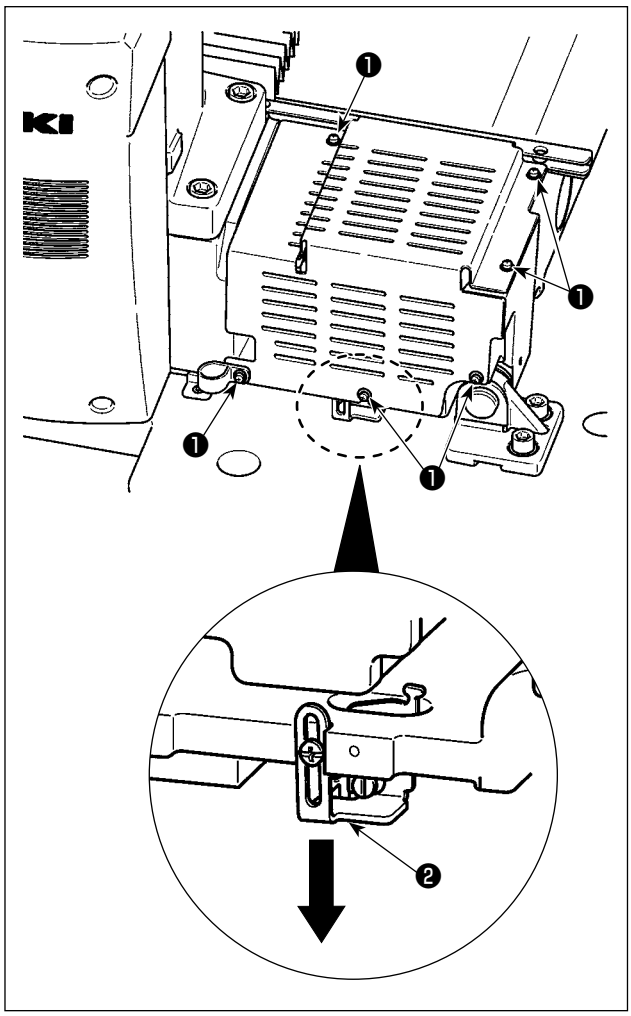
3. INSTALLATION

3-1. Removing the bed fixing bolt



Remove bed fixing bolt ❶ . This bolt is necessary to transport the sewing machine.

3-2. Adjusting the safety switch



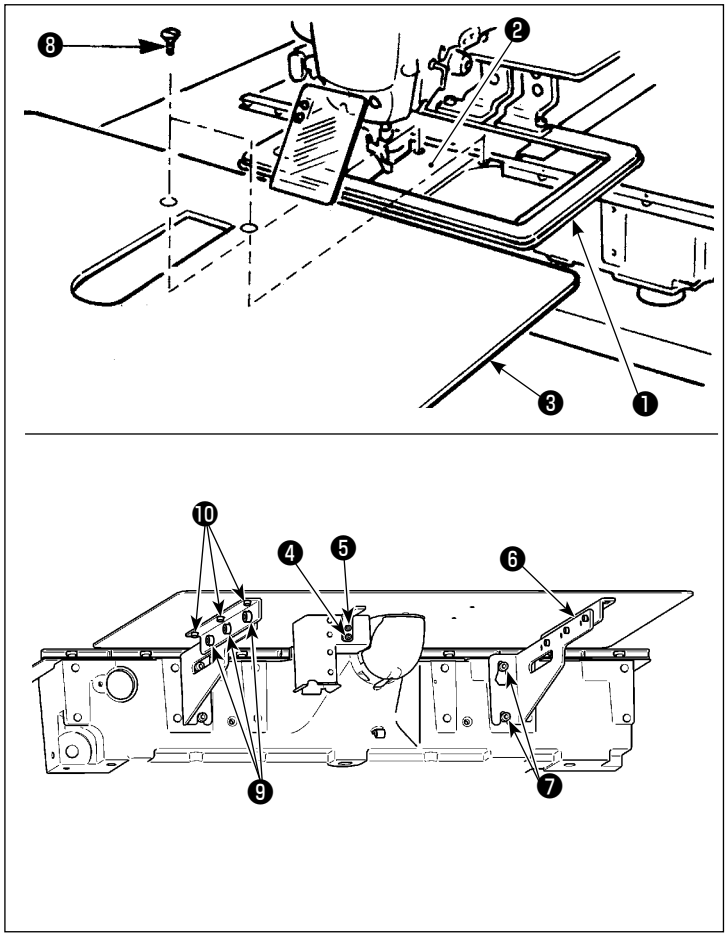
In the case error 302 occurs when the sewing machine runs after setup, remove screws ❶ (six pieces) to detach the cover. Then, loosen the safety switch mounting screw with a screwdriver and move safety switch ❷ downward. In this state, adjust the safety switch.

3-3. Installing the throat plate auxiliary cover

1. The stay and the like are set to the throat plate auxiliary cover and the fitting screws and washers to the bed are packed together with the accessories at the time of delivery.

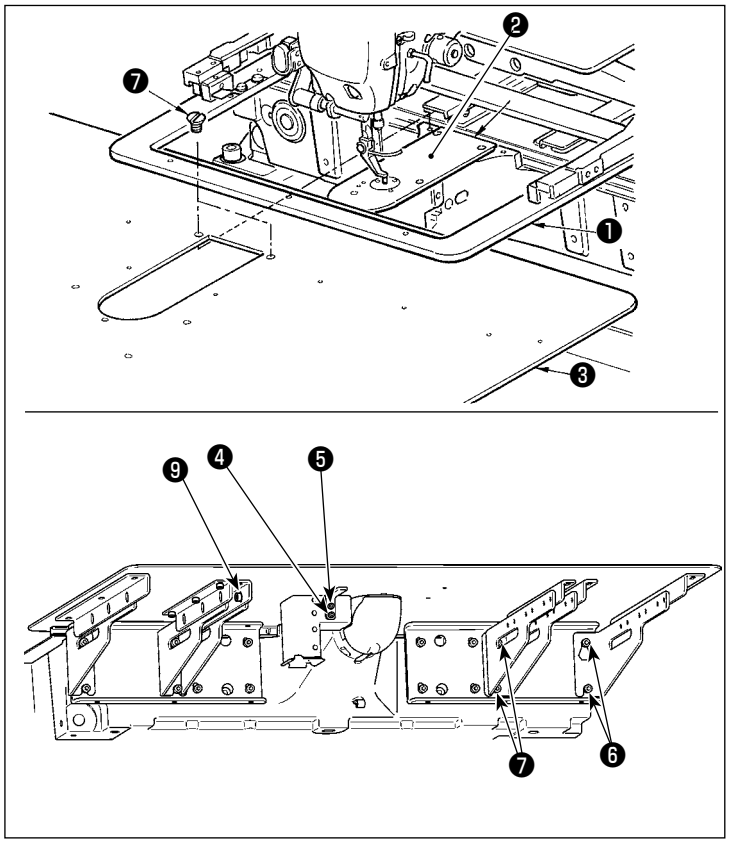
2. When using the cover sheet supplied as accessories, paste it to the throat plate auxiliary cover before installing.

[When using area 2516 (AMS-221F △△ 2516)]

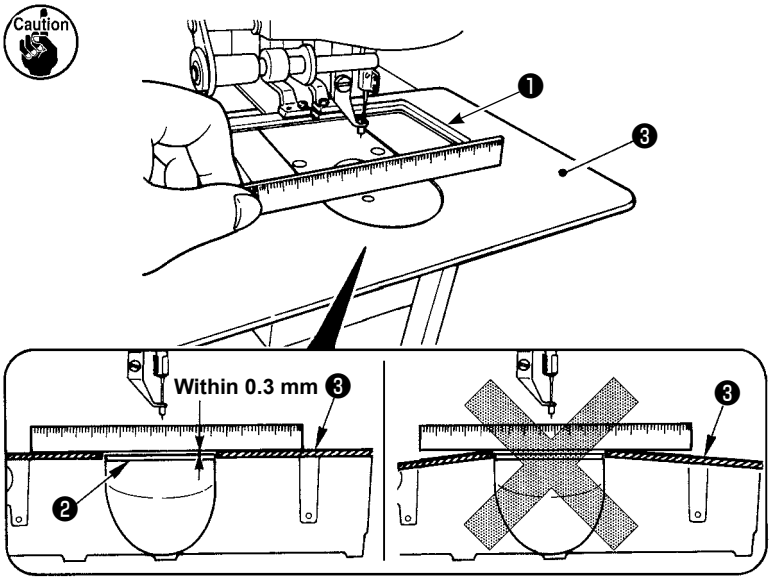


1) Move the cloth feed base to the rear, and place throat plate auxiliary cover ❸ from between lower plate ❶ and throat plate ❷ . At this time, be careful not to bend lower plate ❶ .
2) Temporarily fix throat plate auxiliary cover ❸ with throat plate auxiliary cover setscrew ❺ and washer ❹ .
3) Temporarily fix throat plate auxiliary cover support ❻ to the machine bed with setscrews (M6) ❼ .
4) Fix the throat plate auxiliary cover to the bed with two oval counter-sunk screws ❽ .
5) Refer to the items of the caution, perform positioning of the throat plate auxiliary cover, and fix setscrews ❺ and ❼ . When the positioning is not enough, loosen setscrews ❾ and ❿ once, and perform the positioning.

[When using area 3020 (AMS-221F △△ 3020)]

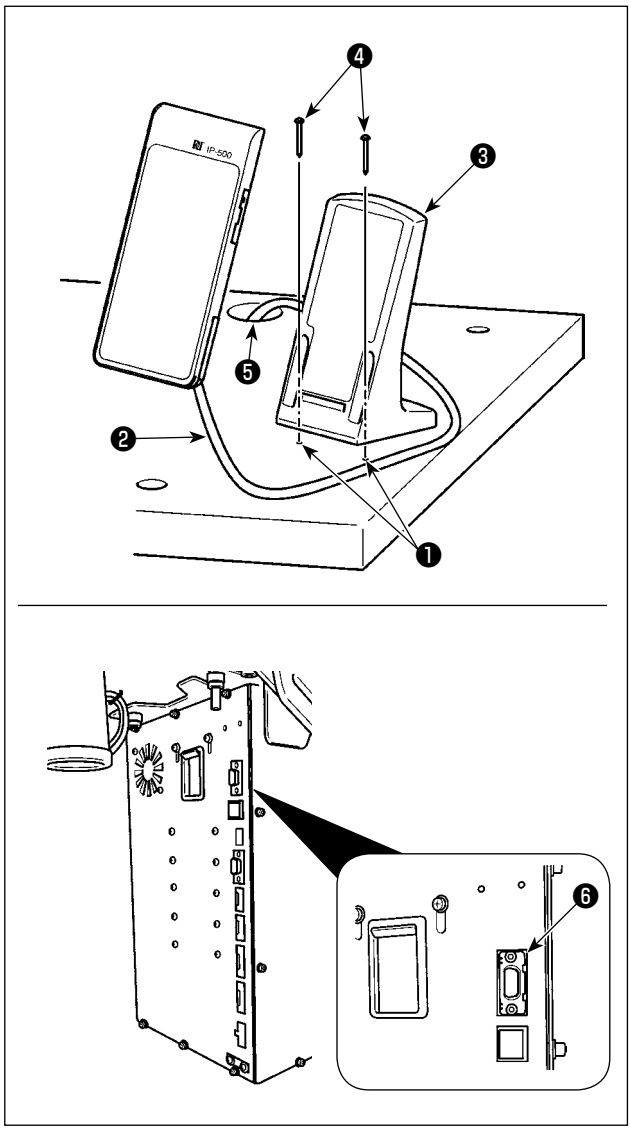


1) Move the cloth feed base to the rear, and place throat plate auxiliary cover (asm.) ❸ from between lower plate ❶ and throat plate ❷ . At this time, be careful not to bend or damage lower plate ❶ .
2) Temporarily fix throat plate auxiliary cover (asm.) ❸ with throat plate auxiliary cover setscrew ❺ and washer ❹ .
3) Temporarily fix throat plate auxiliary cover (asm.) ❸ to the machine bed with throat plate auxiliary cover support setscrews ❻ (10 pcs.).
4) Fix throat plate auxiliary cover (asm.) ❸ to the machine bed with two counter-sunk screws ❼ .
5) Referring to the precautions, adjust the position of the throat plate auxiliary cover and tighten setscrews ❺ and ❻ . If it is difficult to properly position the throat plate auxiliary cover, loosen throat plate auxiliary cover setscrew ❺ and throat plate auxiliary cover base setscrews ❾ once, and correctly adjust the position of the throat plate auxiliary cover.



1. **Fix the throat plate auxiliary cover ❸ so that is higher than the throat plate ❷ (within 0.3 mm). When it is lower than the throat plate ❷ , needle breakage or the like due to the defective feed will be caused.**
2. **Confirm by putting a ruler or the like that the throat plate auxiliary cover ❸ is horizontally installed. If not, throat plate auxiliary cover ❸ and lower plate ❶ come in contact partially with each other, and abnormal worn-out will be caused.**

3-4. Installing the panel

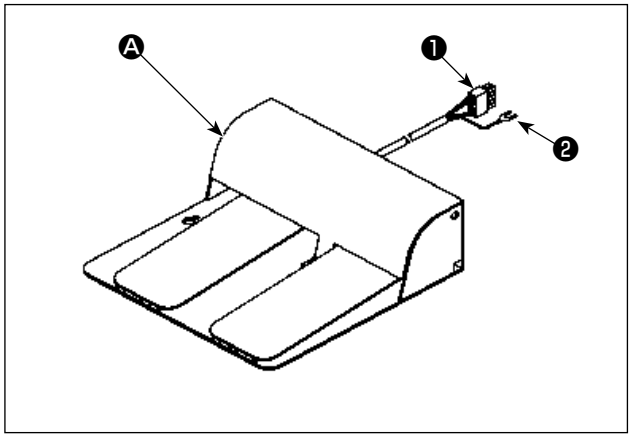


■ Installing the IP-500

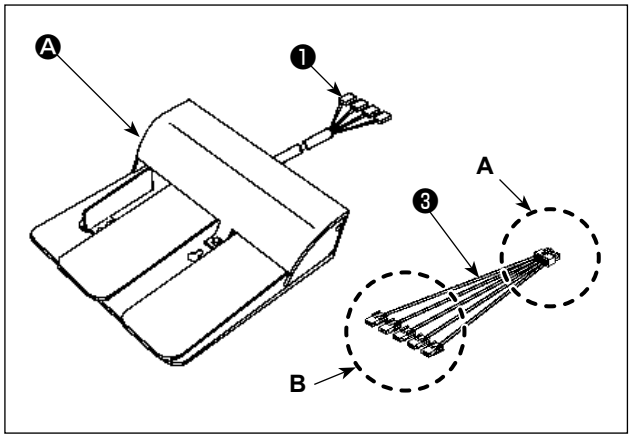
1) Fix operation panel installing plate ❸ to an optional place on the table with two wood screws ❹ .
   As a guide, two perforated holes ❶ (two locations) have been factory-made on the right-hand side of the table.
2) Pass panel cable ❷ through hole ❺ in the table, and connect the cable to the connector CN101 ❻ (uppermost connector) of the electrical box.

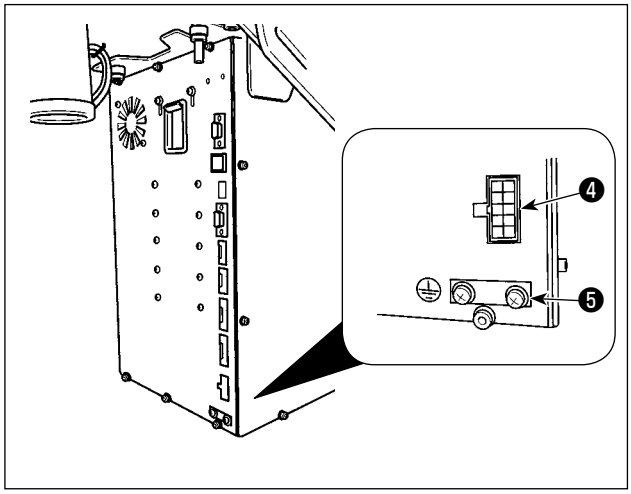
Install the panel at the position where X-move cover or head grip does not interfere with it since breakage of the panel will be caused.

3-5. Installing the foot pedal



1) In the case of two-pedal unit Ⓐ
   Connect connector ❶ of the pedal to connector CN109 ❹ of the electrical box.
   Secure ground wire ❷ of the pedal with setscrew ❺ that is attached to the electrical box.





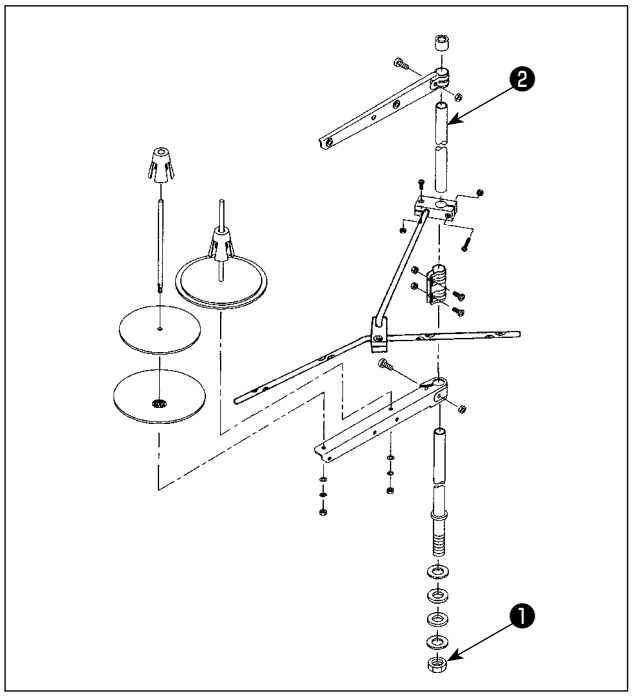
2) In the case of three-pedal unit Ⓑ
Connect connector ❶ of the pedal to the **B** side of accessory junction cable ❸ supplied with the unit as described below.
Secure ground wire ❷ of the pedal with set-screw ❺ that is attached to the electrical box.

Marking on the pedal side		Marking of the junction cable side
1	———	CN1
2	———	CN2
3	———	CN3
4	———	CN4

(* Junction cable CN5 will not connecting.)

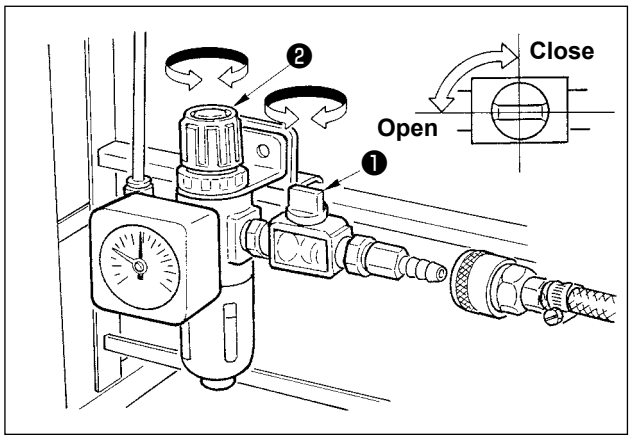
Connect the **A** side of junction cable ❸ to connector CN109 ❹ of the electrical box.

3-6. Installing the thread stand



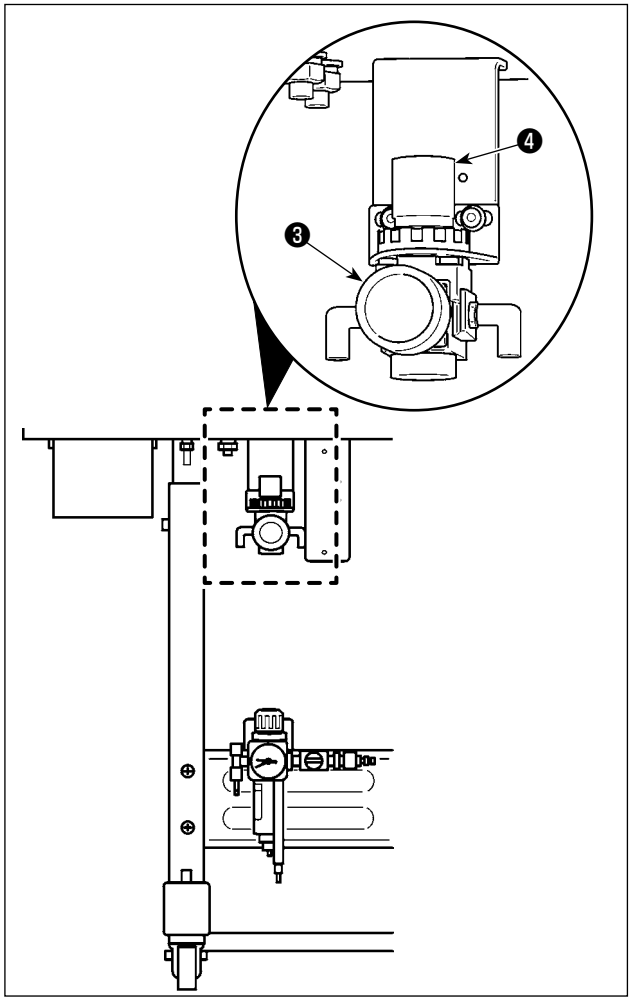
1) Assemble the thread stand, and put it in the hole in the top left corner of the machine table.
2) Tighten locknut ❶ to fix the thread stand.
3) When ceiling wiring is possible, pass the power cord through spool rest rod ❷ .

3-7. Installing the air hose



1) Connecting the air hose
   Connect the air hose to the regulator.
2) Adjustment of air pressure
   Open air cock ❶ , pull up and turn air regulator knob ❷ to adjust the air pressure to 0.5 to 0.55 MPa (for the AMS-221F2516) / 0.35 to 0.4 MPa (for the AMS-221F3020). Then, push down the knob to fix it.

* Close air cock ❶ to expel air.



3) Pull up and turn air regulator knob ❹ of bird's nest preventing regulator ❸ to adjust the air pressure to 0.2 to 0.3 MPa. Then, push down the knob to fix it in that position.

3-8. 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 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.

Standard air supply facility to be prepared by the user

- Air compressor
- After cooler
- Auto-drain
- Air tank
- Main line filter
- Auto-drain
- Air dryer

Quality of the air supply

When the supply air contains a considerable amount of moisture

Ambient environment

When our machine is installed at a place where the temperature greatly changes in the morning and in the evening from that in the daytime or freeze is like to occur

In the aforementioned cases, be sure to install an air dryer.

- Mist separator

When the supply air contains a considerable amount of carbon and dust

(Most troubles in the air solenoid valves are caused by carbon.)

Be sure to install a mist separator.

Standard equipment supplied by JUKI

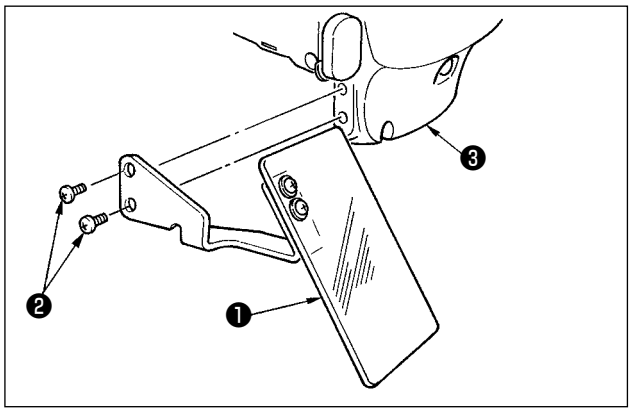
- Filter regulator
- Air solenoid valve
- Air cylinder

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.**

3-9. Installing the eye protection cover

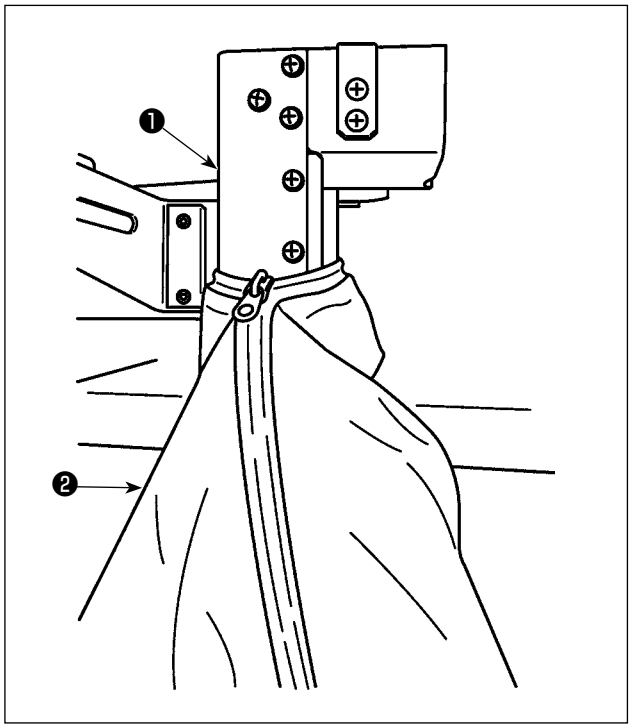
WARNING :
Be sure to attach this cover to protect the eyes from the disperse of needle breakage.



Use eye protection cover ❶ after securely attaching it on face plate cover ❸ with screw ❷ .

If the feeding frame comes in contact with eye protection cover ❶ when the former goes up by its rebound, install eye protection cover ❶ while shifting it upward.

3-10. Installing the cloth chip bag



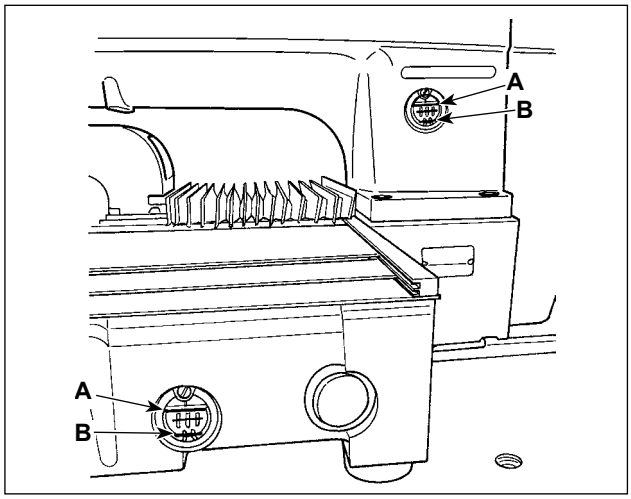
1) The cloth chip bag should be installed when the bird's nest reducing device is used. Refer to **"I-5-3. Bird's nest reducing device" p.19** for the description of the bird's nest reducing device.
2) Attach cloth chip bag ❷ (supplied in the accessory box) to duct ❶ .
3) Putting the cloth chip bag on the projection of duct ❶ , zip the bag to secure it.

4. PREPARATION OF THE SEWING MACHINE

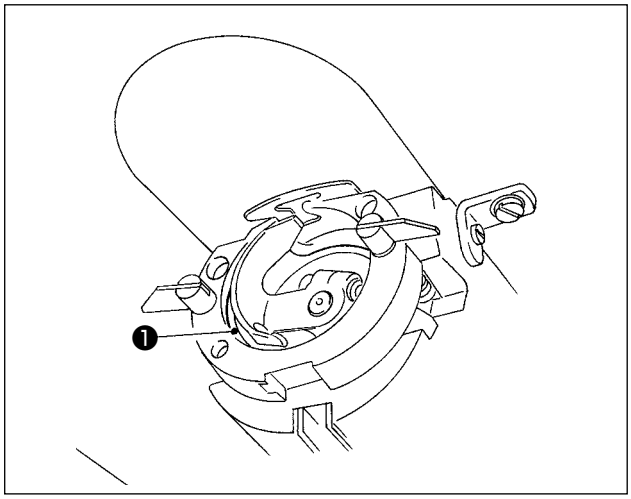
4-1. Lubrication

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

Use [JUKI No. 2 oil] (supplied in the accessory box) for your sewing machine.



1) Check that the place between lower line **B** and upper line **A** is filled with oil. Fill there with oil using the oiler supplied with the machine as accessories when oil is short. (two locations)



2) Apply one drop of oil to the hook race ❶ part to spread on it.

The lower oil tank is used for supplying the oil to the hook section. The upper oil tank is used for supplying the oil to the crank gear section. It is possible to reduce the oil amount when the number of rotation used is low and the oil amount in the hook portion is excessive. (Refer to "III-1-12. Amount of oil supplied to the hook" p.116.)

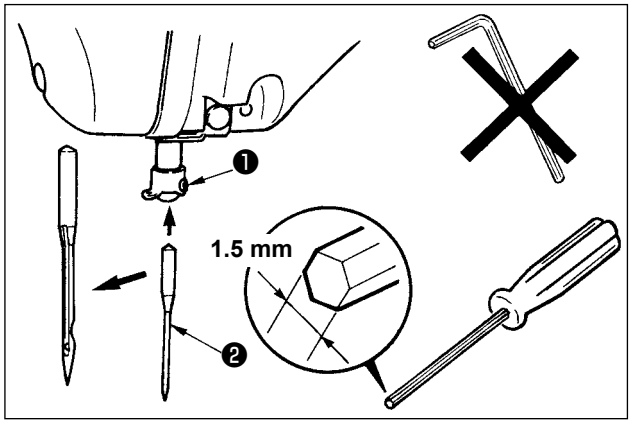
1. **Do not lubricate to the places other than the oil tank and the hook of Caution 2 below. Trouble of components will be caused.**
2. **When using the sewing machine for the first time or after an extended period of disuse, use the machine after lubricating a small amount of oil to the hook portion. (For removing the shuttle, see "III-1-2. Adjusting the needle-to-shuttle relation" p.100.)**

If the oil runs short, purchase the oil according to the table shown below.

Capacity	JUKI part No.
100-cc bottle	B91212200A0
900-cc bottle	MDFRX2001L0
20-l can	MDFRX2020L0

4-2. Attaching the needle

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

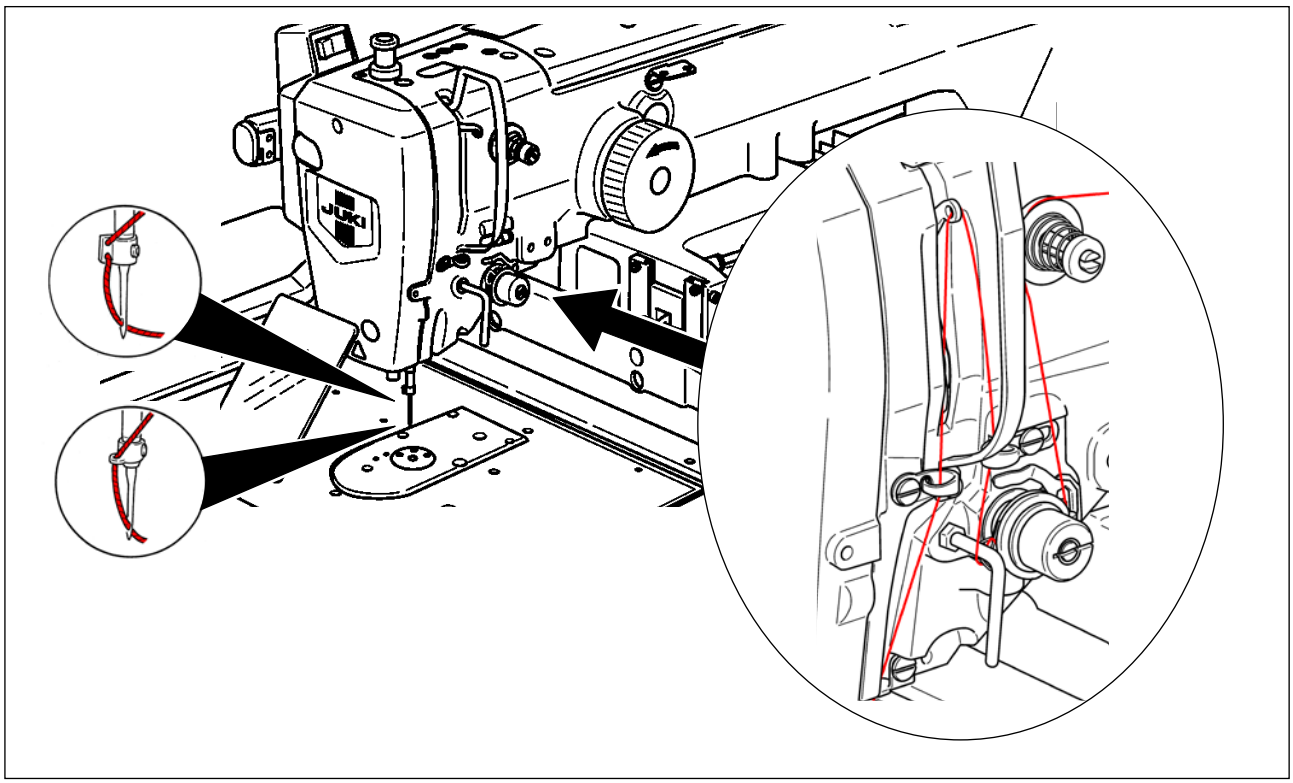


Loosen setscrew ❶ and hold needle ❷ with the long groove facing toward you. Then fully insert it into the hole in the needle bar, and tighten setscrew ❶ .

When tightening setscrew ❶ , be sure to use the screwdriver (Part No. : 40032763) supplied as accessories. Do not use L-shaped hexagon wrench key. There is a danger of breaking setscrew ❶ .

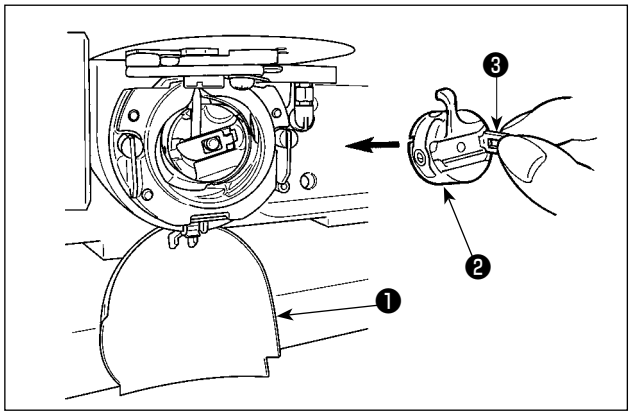
4-3. Threading the machine head

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



4-4. Installing and removing the bobbin case

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

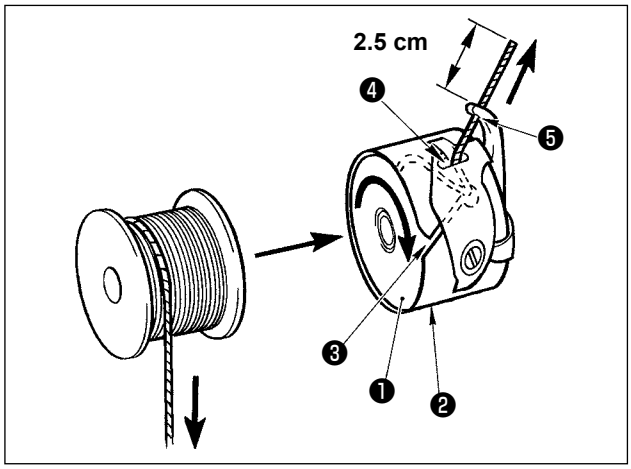


1) Open hook cover ❶ .
2) Raise latch ❸ of bobbin case ❷ , and remove the bobbin case.
3) When entering bobbin case, insert it with the latch tilted until “click” sounds.

If it is not fully inserted, bobbin case ❷ may slip off during sewing.

4-5. Installing the bobbin

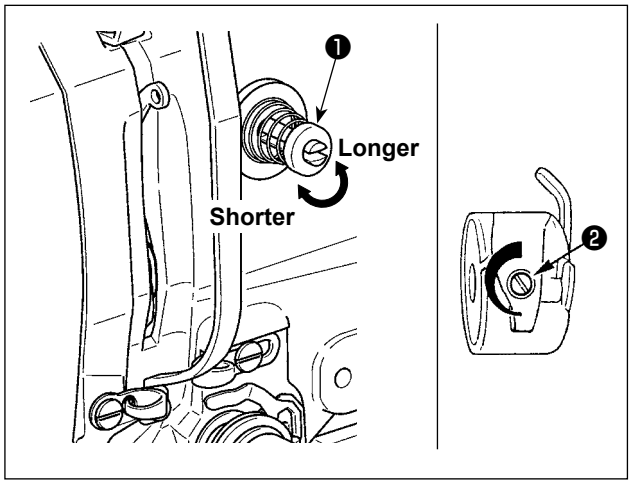
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



1) Set the bobbin ❶ into bobbin case ❷ in the direction shown in the figure.
2) Pass the thread through thread slit ❸ of bobbin case ❷ , and pull the thread as it is. By so doing, the thread will pass under the tension spring and be pulled out from thread hole ❹ .
3) Pass the thread through thread hole ❺ of the horn section, and pull out the thread by 2.5 cm from the thread hole.

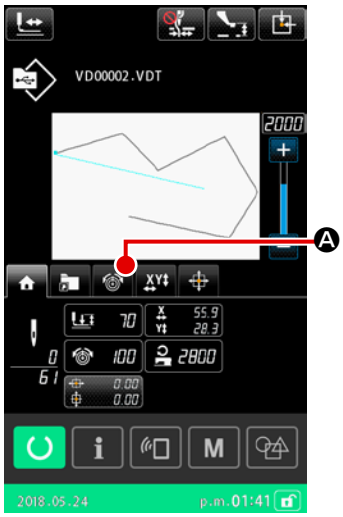
If the bobbin is installed in the bobbin case orienting the reverse direction, the bobbin thread pulling out will result in an inconsistent state.

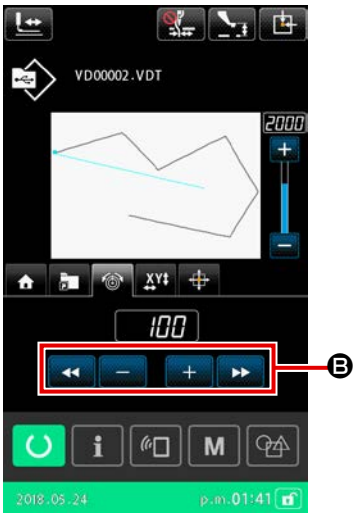
4-6. Adjusting the thread tension



If thread tension controller No. 1 ❶ is turned clockwise, the length of remaining thread on the needle after thread trimming will be shorter. If it is turned counterclockwise, the length will be longer. Shorten the length to an extent that the thread is not slipped off.
Adjust needle thread tension from the operation panel and bobbin thread tension with ❷ .

Adjusting the needle thread tension





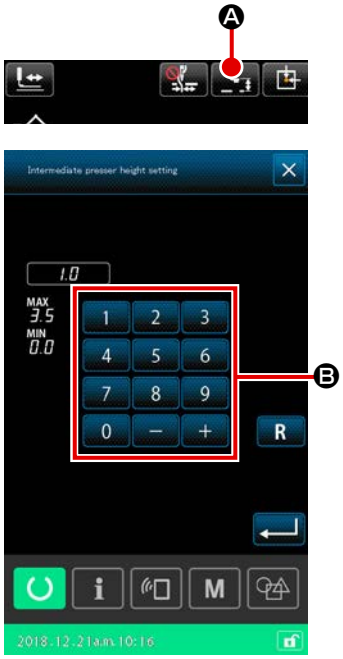
1) Select thread tension tab  Ⓐ on the sewing screen.
2) Set a needle thread tension using PLUS/MINUS (+/–) button Ⓑ. There is a setting range of 0 to 200. When the set value is increased, the tension becomes higher.

* When the set value is 50 at the time of standard delivery, the thread tension is adjusted so that H type is 1.08N and S type is 0.88N (spun thread #50).
(When thread tension No. 1 is released)

4-7. Intermediate presser height

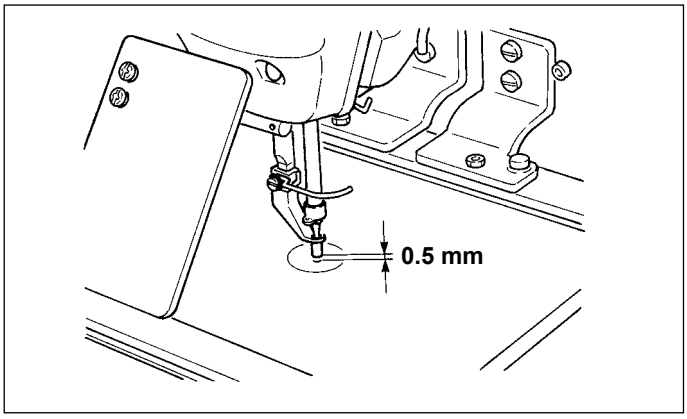
1. When raising the intermediate presser height, turn the pulley by hand to lower the needle bar, and confirm that the needle bar does not interfere with the intermediate presser. (When using DP X 5 needle, use the sewing machine with the height of 3.5 mm or less.)
2. Take care not to get your hands and fingers caught in the feeding frame or intermediate presser.

[IP-500]



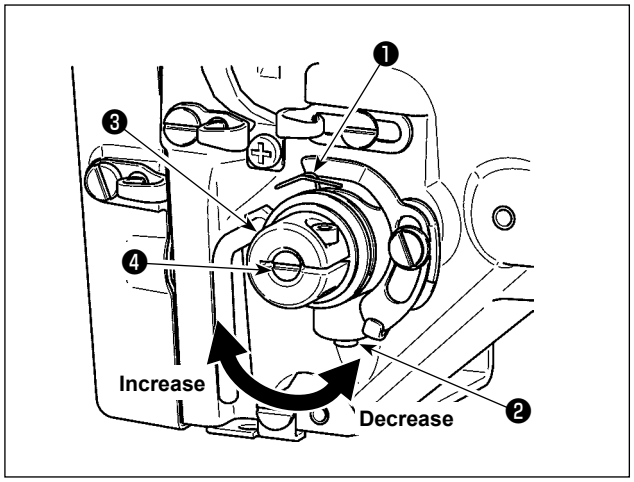
Press INTERMEDIATE PRESSER HEIGHT SETTING button 

Ⓐ. Adjust the clearance provided between the lower end of intermediate presser and the material, when the needle is brought to its lower end, to 0.5 mm (thickness of the thread to be used) using numeric keypad Ⓑ.



1. Setting range of the intermediate presser is up to the standard of 3.5 mm. However, when using DP × 17 needle for H type or the like, the setting range can be changed up to max. 7 mm with memory switch U112 .
2. When increasing the height of intermediate presser or making the needle size thicker, confirm the clearance between the wiper and the components. Wiper cannot be used unless the clearance is secured. Place the memory switch U105 in OFF position. Besides, note that the wiper is set so as to sweep at the position where the intermediate presser is in the lowest position in spite of the setting of intermediate presser height at the time of delivery. (Memory switch U105)

4-8. Adjusting the thread take-up spring

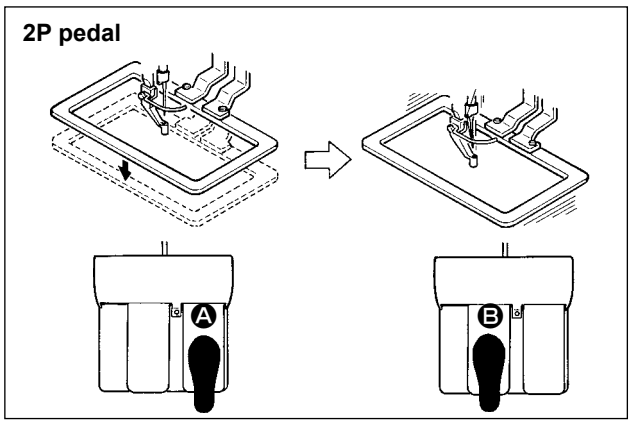


1) Adjusting the stroke
Loosen setscrew ❷ , and turn thread tension asm. ❸ .
Turning it clockwise will increase the moving amount and the thread drawing amount will increase.

2) Adjusting the pressure
To change the pressure of the thread take-up spring ❶ , insert a thin screwdriver into the slot of thread tension post ❹ while screw ❷ is tightened, and turn it. Turning it clockwise will increase the pressure of the thread take-up spring. Turning it counterclockwise will decrease the pressure.

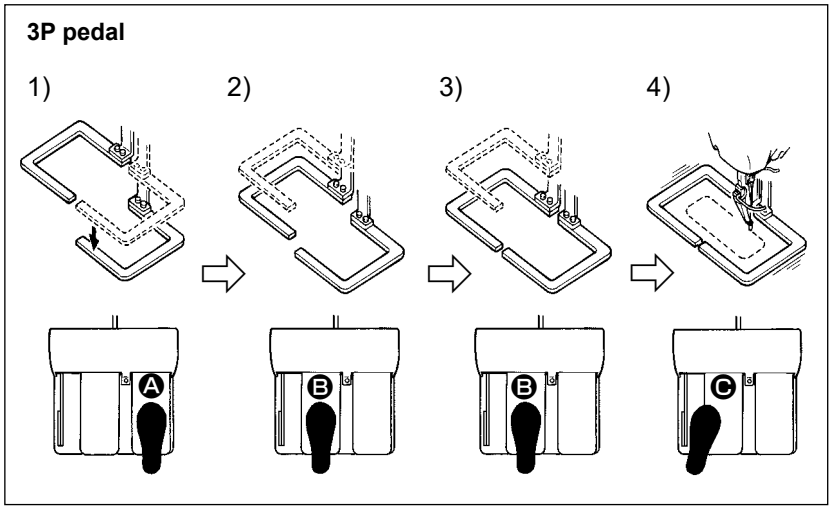
5. OPERATION OF THE SEWING MACHINE

5-1. Sewing



[In case of 2P pedal]

1) Set a workpiece on the sewing machine.
2) Depress the pedal switch Ⓐ, and the feeding frame will come down. Depress it again, and the feeding frame will go up.
3) Depress the pedal switch Ⓑ after the feeding frame has come down and the sewing machine will start sewing.
4) After the sewing machine completes sewing, the needle point will return to the start point and the feeding frame will go up.

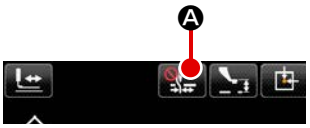


[In case of 3P pedal]

*** Steps 1), 2) and 3) can be operated in the reverse order by setting of memory switch U081.**

1) Place a sewing product under the feeding frame. Depress pedal Ⓐ of the pedal switch, and the feeding frame (right) will come down to clamp the sewing product.
2) Place a workpiece to be sewn on the sewing product under the feeding frame (left). Lightly depress pedal Ⓑ, and the feeding frame (left) will stop in its intermediate stop position. Release the pedal, and the feeding frame (left) will rise back to the initial position.
3) Position the workpiece. Further depress pedal Ⓑ, and the feeding frame (left) will come down to the lowest position to clamp the workpiece. Re-depress pedal Ⓑ until it will go no further, the feeding frame (left) will return to the intermediate stop position.
4) Depress pedal Ⓒ when both frames of the feeding frame rest in the lowest position, and the sewing machine will start sewing.

5-2. Needle thread clamp device



Stitch failures (slip-off of the needle thread, stitch skipping and needle-thread stains) are prevented during the high-speed start procedure as well as consistent sewing performance is ensured by operating the needle thread clamp device. The needle thread clamp device can be turned ON/OFF with THREAD CLAMP button Ⓐ. The thread clamp device cannot be used simultaneously with the bird's nest reducing device. (Refer to **"I-5-3. Bird's nest reducing device" p.19** for details.)

When the memory switch U035 is placed in "disabled", the needle thread clamp device will not operate. Every time THREAD CLAMP button Ⓐ is pressed, the status of the thread clamp device and bird's nest reducing device is changed over as: Thread clamp device ON - Bird's nest reducing device ON - Both devices OFF.

Select one of the three different functions that you want to use at the beginning of sewing as shown in the table given below.
The thread clamp device cannot be used simultaneously with the bird's nest reducing device.

	Thread clamp operation at the beginning of sewing	Thread trimming operation at the beginning of sewing	
Needle thread clamp device ON	ON	OFF	When this device is placed in ON, stable sewing performance is ensured at the beginning of sewing and high-speed start is enabled.
Bird's nest reducing device ON	OFF	ON	When this device is placed in ON, the length of thread remaining on the reverse side of material at the beginning of sewing is reduced.
Both devices OFF	OFF	OFF	It becomes the same sewing start as conventionally.

*** Matters that demand special attention when using the needle thread clamp device**

For the thread clamp unit, there are S type and H type in accordance with the sewing types. Refer the respective types and the contents of the memory switches that can be set to the list below.

Sewing machine type	Thread clamp unit type	Memory switch	
		U069	U070
S type	S type	0 : S type (standard)	0 : Front 1 : Rear (standard)
H type G type	H type	1 : H type thin thread (standard)(#50 to #8) 2 : H type intermediate (#20 to #5) 3 : H type thick thread (#5 to #2)	0 : Front 1 : Rear (standard)

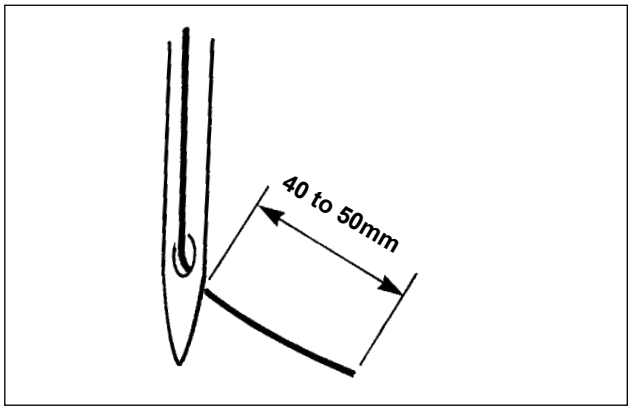
[Regarding H type thread clamp unit]

Change the set value of memory switch U069 in accordance with the thickness of needle thread. The set value has been set to 1 : H type thin thread at the time of delivery. Commendable value is Set value : 1 for thread count #50 to #8, Set value : 2 for thread count #20 to #5, and Set value : 3 for thread count #5 to #2. (The value will change in accordance with the kind and thickness of the actual thread and the kinds of materials to be sewn.) Set the value by adjusting to the state of needle thread on the wrong side of materials.

In addition, it is possible to select the thread clamp position by means of memory switch U070. When using thick thread of thread count #5 to #2, and rolling-in or tucking at the start of sewing occurs, set the set value to 1 : Rear and use the machine. It is recommended to set U070 to “0: Forward” if wrinkles are formed on the material and/or the material cannot be fed smoothly at the beginning of sewing when a light-weight material or the like is used.

Use the set value of the memory switch which is adjusted to the thread clamp unit type. (For S type thread clamp unit, the set value of U069 and U070 can use nothing but only “0”.) When the setting is wrong, the thread clamp fails to properly function. So, be careful.

(1) When with thread clamp (motion), use the sewing machine after adjusting the needle thread length at the start of sewing to 40 to 50 mm. When the needle thread length is too long, the needle thread end held with the needle thread clamp may be rolled in the seams.



In case of with the needle thread clamp, the standard of the length of needle thread is 40 to 50 mm.

- To prevent the thread from slipping off from the needle eyelet at the beginning of sewing or to prevent stitch skipping from the first stitch

→ Adjust the length of needle thread longer within the range.

- To prevent stitch skipping within the second to tenth stitches from the beginning of sewing

→ Adjust the length of needle thread shorter within the range

When needle thread is excessively long at the time of using the thick thread, the end of needle thread held with the needle thread clamp is rolled in the seams, and slip of position of material may occur or needle breakage may be caused.

(2) When the thread clamp is used, and bobbin thread at the sewing start appears on the right side of material, reduce thread tension at the sewing start (2 to 3 stitches) and bobbin thread becomes less conspicuous.

[Example of setting]

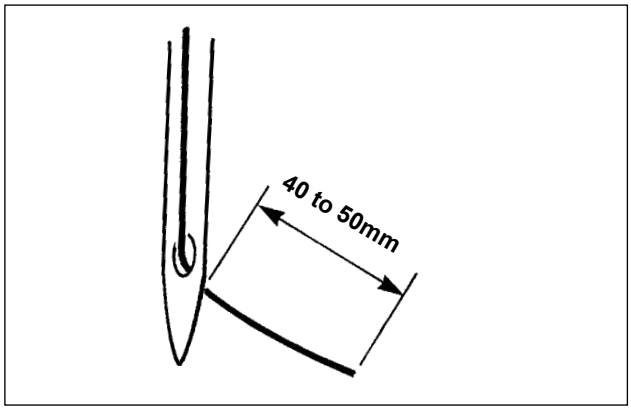
Tension of 1 to 2 stitches at the sewing start is “20” when sewing tension setting is “35”.

* For setting of tension at the start of sewing, refer to **"II-2-6-2. Memory switch" p.67**.

1. **Thread at the start of sewing may be rolled in case of some patterns. When thread is rolled in even after performing adjustment of (1) or (2), use the sewing machine with thread clamp OFF.**
2. **Thread clamp failure may occur in the state that thread waste is jammed in the thread clamp device. Remove the thread waste referring to "III-1-7. Needle thread clamp device" p.108.**

5-3. Bird's nest reducing device

When the bird's nest reducing device is used, the needle thread is trimmed at the beginning of sewing. As a result, the needle thread that remains on the reverse side of material is shortened, thereby reducing the formation of so-called bird's nest (thread tangling) to contribute neater finish of the reverse side of material. The trimmed thread is blown out from the righthand side by the air blower to be collected in the cloth chip bag.

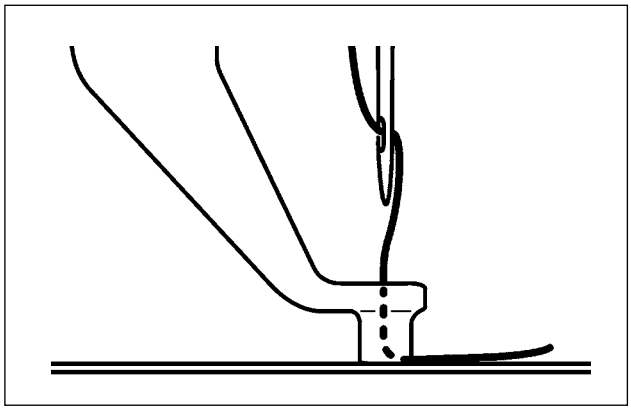


(1) In the case the bird's nest reducing device is turned ON, it is necessary to adjust the needle thread length remaining at the needle at the beginning of sewing to 40 to 50 mm as in the case of operating the thread clamp device. If the aforementioned needle thread length is too long, the trimmed thread may be entangled ivn the hook, causing the sewing machine to be locked. On the other hand, if the aforementioned needle thread length is too short, the trimmed thread (thread waste) cannot be collected but drop on the floor.

(2) Empty the cloth chip collection bag on a regular basis.

1. Be sure to use the wiper whenever the bird's nest reducing device is used. If the intermediate presser accidentally presses the needle thread, only the bobbin thread will be trimmed. As a result, the sewing machine cannot perform sewing at the beginning of sewing. Enable / disable of the wiper can be changed over with the memory switch U051.

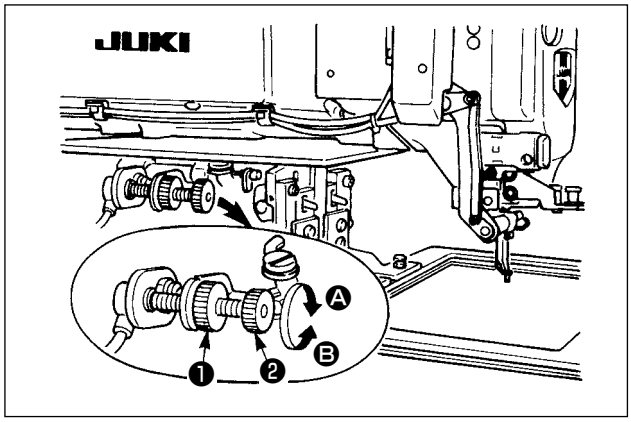
2. In the case the bird's nest reducing device is disabled with the memory switch U035, or in the case the shorter-thread remaining type is selected with the memory switch U322, the bird's nest reducing operation cannot be selected. Refer to "III-1-6. The moving knife and counter knife (Shorter-thread remaining type)" p.107 for the shorter-thread remaining type model.



If the thread tension is excessively low at the beginning of sewing, the length of needle thread to be trimmed will be too long. In such a case, the trimmed thread cannot be blown out by the air blower, but will be liable to remain inside the hook. The thread tension to be applied to the thread when sewing three stitches (at the maximum) at the beginning of sewing can be set with the memory switches U019 to U024. Refer to "II-2-6-2. Memory switch" p.67.

5-4. Adjusting the intermediate stop position of the feeding frame (left) (For the separately-driven feeding frame with a double-stepped stroke function)

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

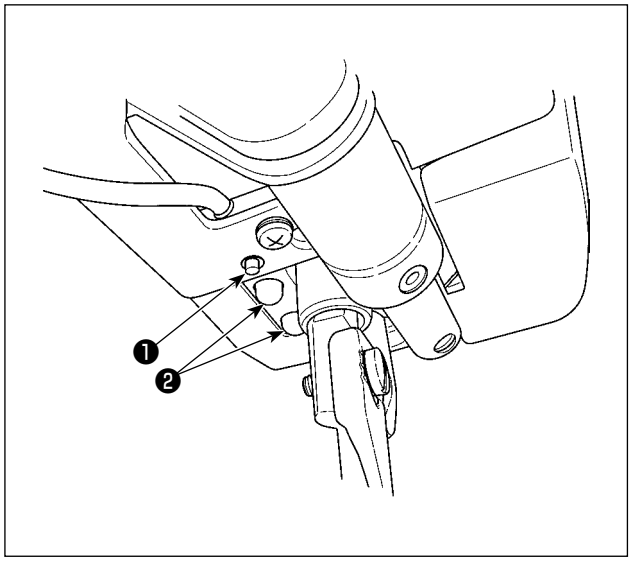


1) Loosen knob ❶ .
2) Adjust the intermediate stop position of the feeding frame by turning knob ❷ so that it stops slightly above the sewing product on the machine.
   Turning knob ❷ in direction Ⓐ will increase the height of the feeding frame in its intermediate stop position or indirection Ⓑ will decrease it.
3) After the adjustment, securely tighten knob ❶ .

Only the feeding frame (left) is capable of stopping in the intermediate stop position.

5-5. LED hand light

WARNING :
In order to prevent injury to persons due to an abrupt start of the sewing machine, neither put your hands near the needle entry area nor put your feet on the pedal when adjusting brightness of the LED light.



This LED light ❷ is only intended for the improvement of operability. It is not intended to be used for maintenance. Dim or turn OFF LED light ❷ if it is dazzling when you are trying to saw a thin material or change the material with a new one. LED light ❷ that illuminates the needle entry area is provided as standard.

Brightness adjustment and turning-OFF of the LED light ❷ can be done with switch ❶ . Every time you press the switch, status (brightness and light-OFF) of the LED light is changed over in six different stages.

[Change in brightness]

1 ⇒ . . . 5 ⇒ 6 ⇒ 1
Bright ⇒ . . . Dark ⇒ Light OFF ⇒ Bright

Thereafter the LED light status is changed over in turn every time you press switch ❶ .

ON / OFF of the LED light during sewing can be selected with the memory switch U404.

II. OPERATION SECTION (WITH REGARD TO THE PANEL)

1. PREFACE

* Service patterns are contained in the main body of sewing machine

φ60 Pitch 3mm
VD00102.VDT 

1) Kind of sewing data handled with IP-500

Pattern name	Description
Users' pattern	Pattern that can be stored in the body. Max. 999 patterns can be registered.
Vector format data	File that extension is ".VDT" Read from media. Max. 999 patterns can be used.
M3 data	Pattern data of AMS-D series Used by copying from floppy disk of AMS-D series to media. Max. 999 patterns can be used.
Sewing standard format	File that extension is ".DAT" Read from media. Max. 999 patterns can be used.

2) Using the data (Vector format data) of AMS-E/EN series with AMS-221F

The vector form data is interchangeable. Copy data from the AMS-EN/IP-420 by means of the USB storage device.

Refer to **"II-2-7. Using communication function" p.81** for how to write the data to the AMS-221F/IP-500.

3) Using the data (M3 data) of AMS-D series with AMS-221F.

There are two ways to use M3 data with AMS-221F.

① Reading by using IP-500

Use PC (personal computer) and copy file (¥AMS¥AMS00×××.M3) of M3 from floppy disk of AMS-D to ¥AMS of media. Insert the media to IP-500, and select Pattern No.××× from M3 data.

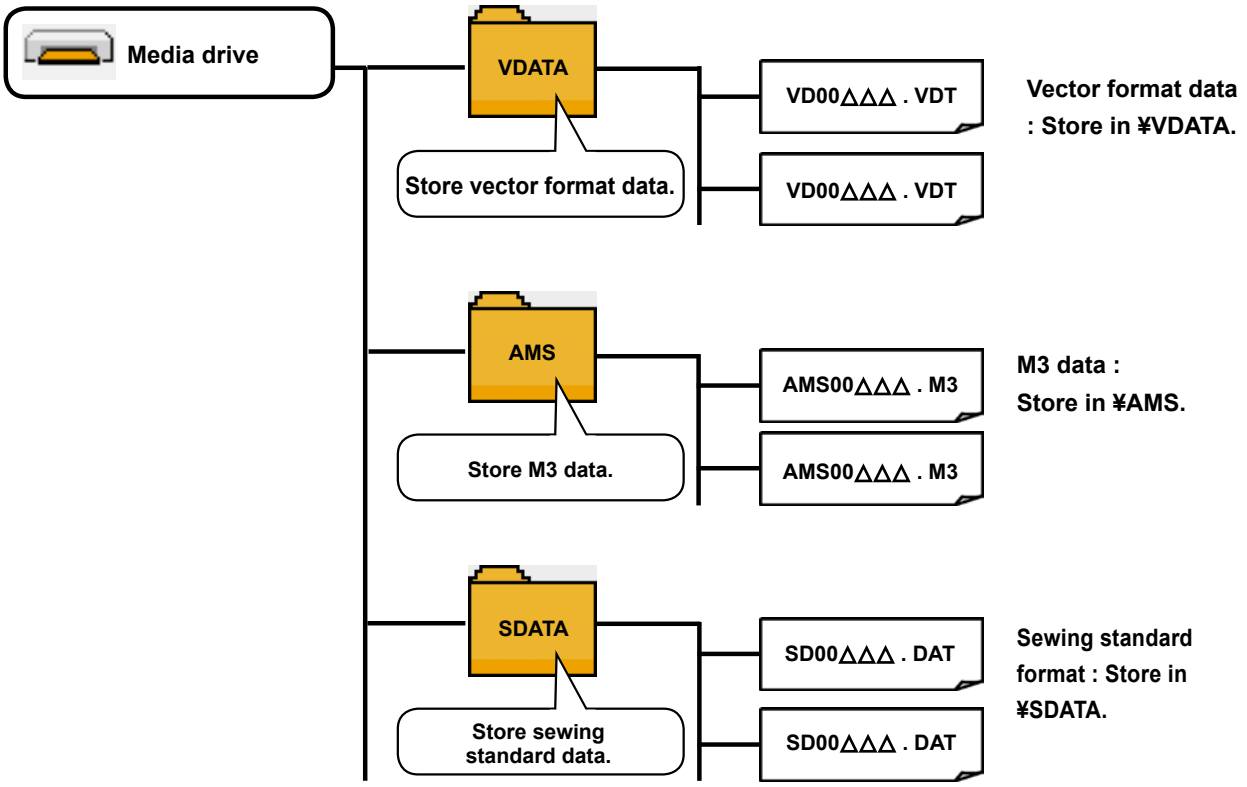
② Changing to vector format data using PM-1

Change to the vector format data with PM-1. (For the details, refer to Help of PM-1.) Copy the changed vector format data to ¥VDATA folder of the media.

Insert the media to IP-500 and select File No.

4) Folder structure of the media

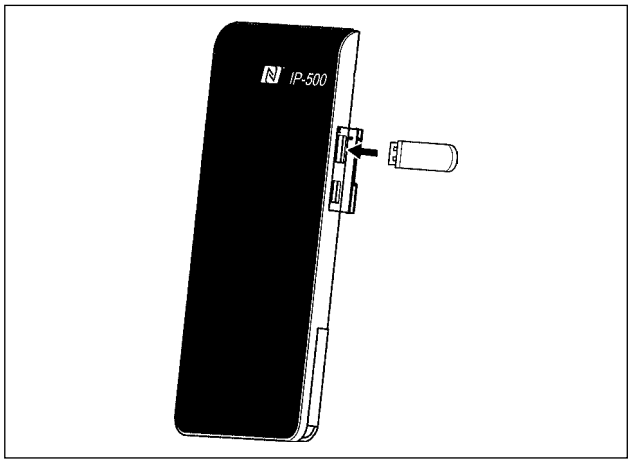
Store each file in the directories below of the media.



Caution **Data that are not stored in the directories above cannot be read. So, be careful.**

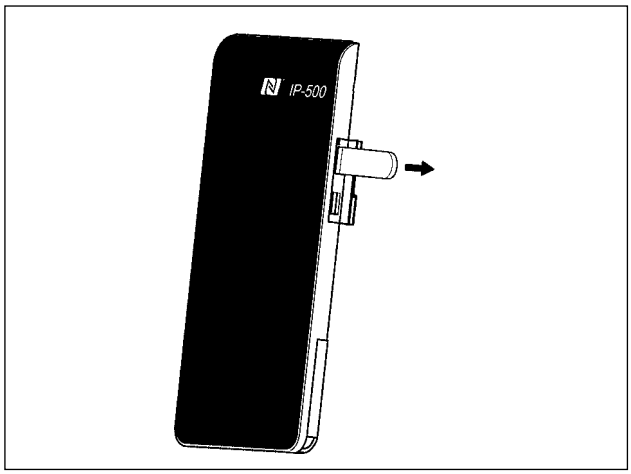
5) USB port

■ Inserting a device into the USB port



Detach the cover from the right side face of the IP-500. Insert a USB thumb drive into the USB port. Then, copy the data to be used from the IP-500 onto the main body of sewing machine.

■ Disconnecting a device from the USB port



Remove the USB device. Put the cover back in place.

Cautions when using the media

- **Do not wet or touch it with wet hands. Fire or electric shock will be caused.**
- **Do not bend, or apply strong force or shock to it.**
- **Never perform disassembling or remodeling of it.**
- **Do not put the metal to the contact part of it. Data may be disappeared.**
- **Avoid storing or using it in the places below.**
  Place of high temperature or humidity / Place of dew condensation /
  Place with much dust / Place where static electricity or electrical noise is likely to occur

① **Precautions to be taken when handling USB devices**

- Do not leave the USB device or USB cable connected to the USB port while the sewing machine is in operation. The machine vibration can damage the port section resulting in loss of data stored on the USB device or breakage of the USB device or sewing machine.
- Do not insert/remove a USB device during reading/writing a program or sewing data.
  It may cause data breakage or malfunction.
- When the storage space of a USB device is partitioned, only one partition is accessible.
- Some type of the USB device may not be properly recognized by this sewing machine.
- JUKI does not compensate for loss of data stored on the USB device caused by using it with this sewing machine.
- When the panel displays the communication screen or pattern data list, the USB drive is not recognized even if you insert a medium into the slot.
- For USB devices and media such as CF(TM) cards, only one device/medium should be basically connected/inserted to/into the sewing machine. When two or more devices/media are connected/inserted, the machine will only recognize one of them. Refer to the USB specifications.
- Insert the USB connector into the USB terminal on the IP panel until it will go no further.
- Do not turn the power OFF while the data on the USB flash drive is being accessed.

② **USB specifications**

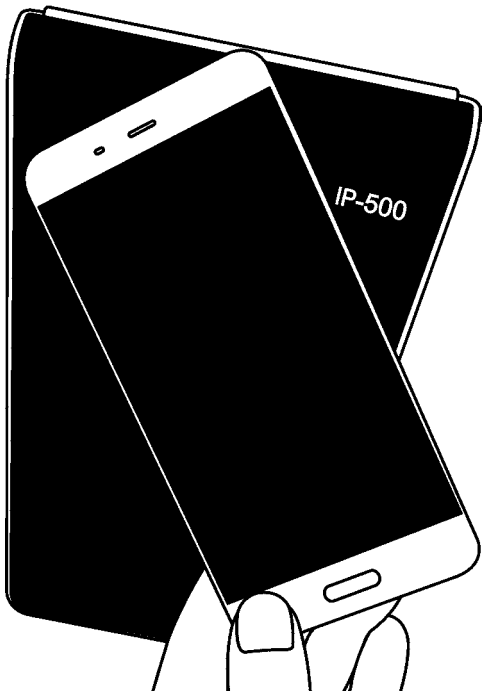
- Conform to USB 2.0 standard
- Applicable devices *1 ____ Storage devices such as USB memory, USB hub, FDD and card reader
- Not-applicable devices ___ CD drive, DVD drive, MO drive, tape drive, etc.
- Format supported _____ FD (floppy disk) FAT 12
  Others (USB memory, etc.), FAT 12, FAT 16, FAT 32
- Applicable medium size ___ FD (floppy disk) 1.44MB, 720KB
  Others (USB memory, etc.), 4.1MB to (2TB)
- Recognition of drives _____ For external devices such as a USB device, the device which is recognized first is accessed. However, when a medium is connected to the built-in media slot, the access to that medium will be given the highest priority. (Example: If a medium is inserted into the media slot even when the USB memory has already been connected to the USB port, the medium will be accessed.)
- Restriction on connection __ Max. 10 devices (When the number of storage devices connected to the sewing machine has exceeded the maximum number, the 11th storage device and beyond will not be recognized unless they are once disconnected and re-connected.)
- Consumption current _____ The rated consumption current of the applicable USB devices is 500 mA at the maximum.

*1 : JUKI does not guarantee operation of all applicable devices. Some device may not operate due to a compatibility problem.

6) NFC

The operation panel supports NFC (Near Field Communication).
With an Android device (tablet / smartphone) that is installed with JUKI Android application software [JUKI Smart App] , various data such as pattern data and maintenance information can be browsed, edited and copied by means of NFC (Near Field communication) communication function included in the JUKI Smart App. Refer to the Instruction Manual for JUKI Smart App for details of JUKI application for Android "JUKI Smart App".

<Fig.1>



<Fig.2>

① Position of the NFC antenna

To carry out communication using the NFC between the IP-500 panel of sewing machine and a tablet / smartphone, bring the antenna of tablet / smartphone closer to the position of NFC mark Ⓐ of the IP-500 as illustrated in <Fig. 2>.

* If the NFC communication has failed, error message will be displayed on the tablet/smartphone screen.

When the error message is displayed on the screen, carry out the NFC communication again.

② IP panel requirement to be met to allow the NFC communication

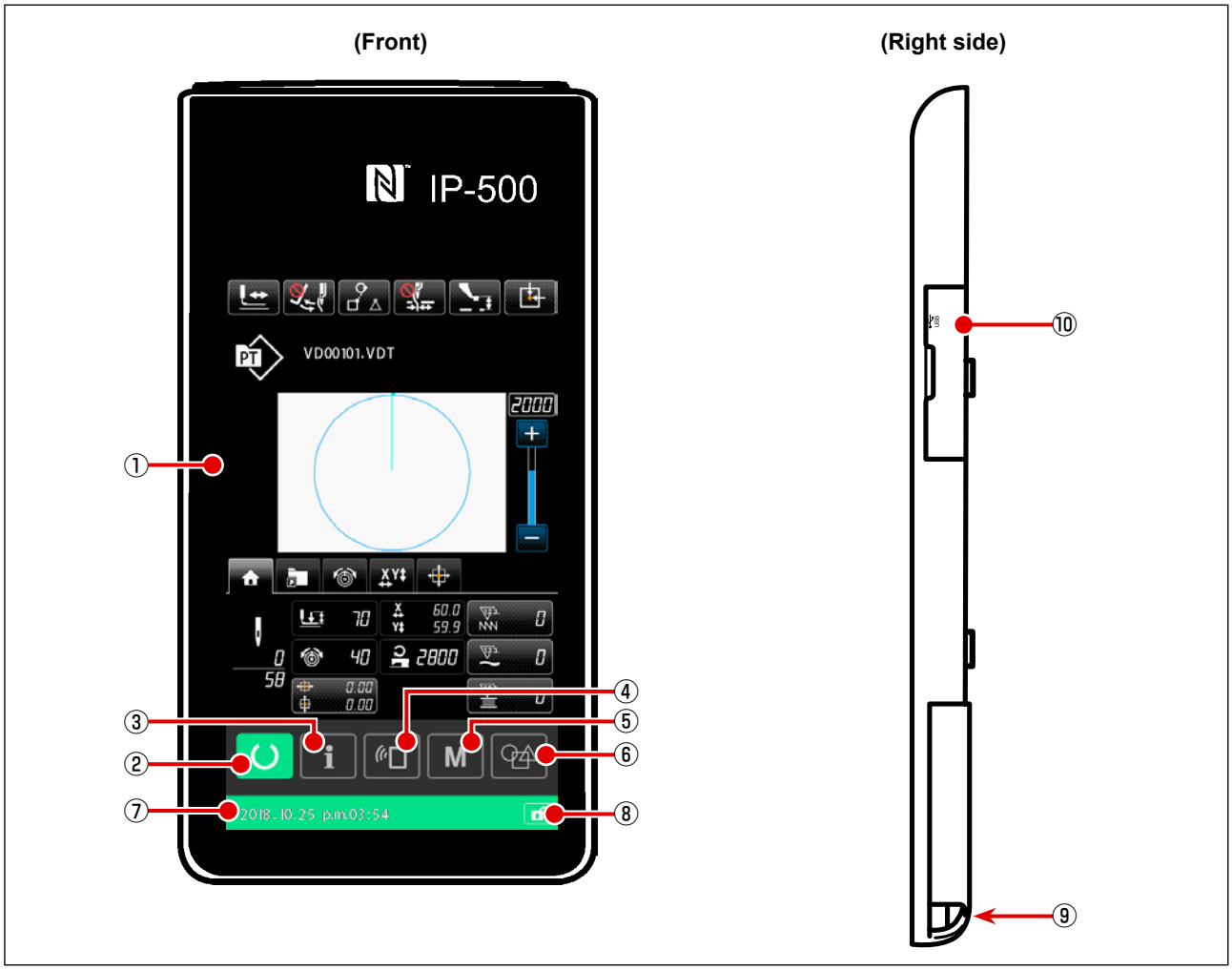
Communication by means of the NFC is only possible in the case the individual sewing setting screen or the cycle sewing setting screen is displayed on the IP-500 panel.
If you attempt to carry out the NFC communication while any screen other than those described above is displayed on the IP-500 panel, the relevant error message will be displayed on the tablet / smartphone.
When the error message is displayed on the tablet / smartphone, it is necessary to change the screen on the IP-500 panel to one of the aforementioned screen that enables the NFC communication. Then, carry out the NFC communication operation again.

③ Precautions to be taken when handling NFC

- The position of the NFC antenna varies according to the tablet/smartphone used.
  Be sure to read the instruction manual of your device before using the NFC communication function.
- To use the NFC communication function, place the NFC communication function setting in "Enable" while referring to the instruction manual for your tablet/smartphone.

2. WHEN USING IP-500

2-1. Name of each section of IP-500



① Touch panel · LCD display section

② READY button → This button is used for changing over the screen between the pattern setting screen and the sewing screen

③ INFORMATION button → This button is used for changing over the screen between the pattern setting screen and the information screen

④ COMMUNICATION button → This button is used for changing over the screen between the pattern setting screen and the communication screen

⑤ M button → Changing over the screen from the pattern setting screen to the list screen on which details can be set.

⑥ MAIN-BODY INPUT SELECTION button → This button is used for shifting the input mode from the pattern setting screen to the main-body input mode.

⑦ Status bar → The background color indicates the status; the pattern setting state (blue) / sewing enable state (green) .

⑧ SIMPLE LOCK button → Enable / disable of all buttons is changed over by keeping this button held pressed for one second.

⑨ Connector for control-box connection

⑩ Connector for connecting the USB thumb drive

2-2. Buttons to be used in common

The buttons which perform common operations in each screen of IP-500 are as follows :

	CANCEL button	→ This button is used for closing the screen. In the case this button is pressed when the parameter setting screen is displayed, the data being changed is cancelled.
	ENTER button	→ This button is used for confirming the changed data and closing the screen.
	UP SCROLL button	→ This button is used for scrolling up the display.
	DOWN SCROLL button	→ This button is used for scrolling down the display.
	RESET button	→ This button performs the release of error.
	INTERMEDIATE PRESSER SETTING button	→ Presser is lowered, and the presser lowering screen is displayed. To lift presser, press presser lift button displayed in the presser lowering screen.
	BOBBIN WINDER button	→ Bobbin thread winding is performed. Refer to **"II-2-4-10. Winding bobbin thread" p.46**.

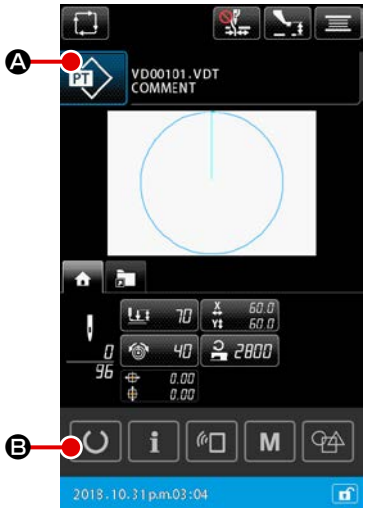
2-3. Basic operation of IP-500

① **Turn ON the power switch**

When the power to the sewing machine is turned ON for the first time after delivery, the language selection screen is displayed.

Select the language you want to use. (The language you select on this screen can be changed afterward with the memory switch U500.)

If the language is left unselected, the language selection screen will be displayed again next time the power is turned ON.



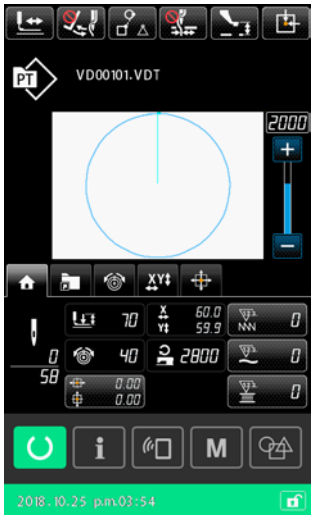
② **Selecting the pattern to be sewn**

When the power is turned ON, the pattern setting screen is displayed.

When SEWING SHAPE button  Ⓐ is pressed, the pattern list screen on which a sewing shape can be selected is displayed.

Refer to **"II-2-4-7. How to select a sewing shape" p.41** for the pattern selection procedure.

When READY button  Ⓑ is pressed, the sewing screen is displayed. On this screen, sewing can be carried out.



③ **Start sewing.**

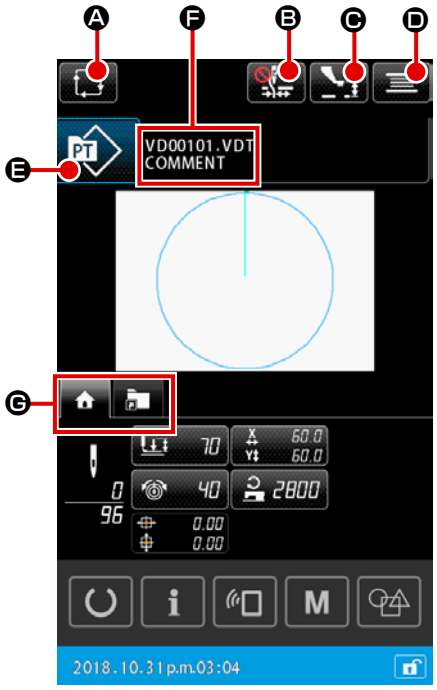
Start sewing referring to **"I-5-1. Sewing" p.16**.

* For the screen, refer to **"II-2-4-2. Sewing screen" p.30**.

1. **When using the exclusive presser, confirm the pattern shape for safety's sake. Should the pattern protrude from the feeding frame, needle interferes with the feeding frame during sewing, and there is a danger of needle breakage or the like.**
2. **Be aware, in the case the feeding frame is in its upper position, that it comes down first, then it travels to the sewing position. In this case, take care not to allow your fingers to be caught in / under the feeding frame.**

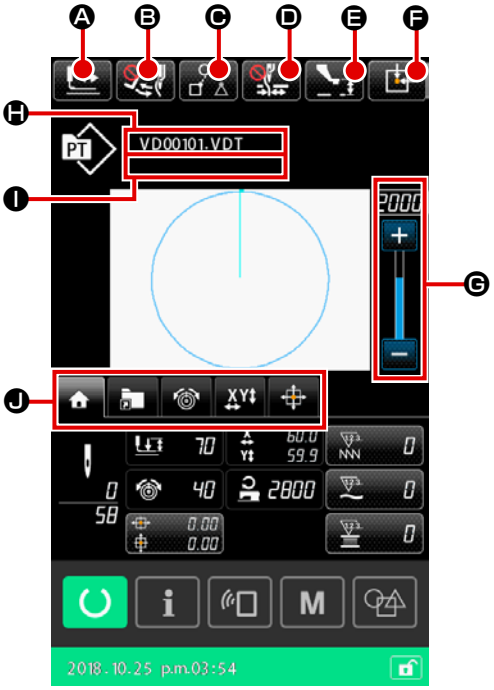
2-4. LCD section during the user pattern selection procedure

2-4-1. Pattern setting screen



	Button and display	Description
Ⓐ	NEW CYCLE PATTERN CREATION button	When this button is pressed, the new cycle pattern creation screen is displayed. → Refer to **"II-2-5-3. How to create a new cycle pattern" p.60**.
Ⓑ	THREAD CLAMP button	Selecting enable / disable of the thread clamp device and enable of the bird's nest preventing device.  : Both the thread clamp device and bird's nest reducing devices are disabled.  : Thread clamp effective  : Bird's nest reducing device is enabled.
Ⓒ	INTERMEDIATE PRESSER HEIGHT SETTING button	When this button is pressed, the intermediate presser is lowered and the intermediate presser height setting screen is displayed. → Refer to **"II-2-4-4. How to change the parameter" p.35**.
Ⓓ	BOBBIN WINDER button	When this button is pressed, the bobbin winding screen is displayed. On this screen, winding of a bobbin can be carried out. → Refer to **"II-2-4-10. Winding bobbin thread" p.46**.
Ⓔ	SEWING SHAPE SELECTION button	The selected pattern type is displayed on the button.  : Users' pattern  : Media pattern When this button is pressed, the pattern list screen is displayed. On this screen, selection of a pattern can be carried out. → Refer to **"II-2-4-7. How to select a sewing shape" p.41**.
Ⓕ	CHARACTER EDIT button	File name and comment of the selected pattern are displayed on the button. When this button is pressed, the character edit screen is displayed.
Ⓖ	MULTIFUNCTION TAB SELECTION button	Tab display can be changed over on a function-by-function basis with this button. → Refer to **"II-2-4-3. Multifunction tab display" p.31**.

2-4-2. Sewing screen



	Button and display	Description
Ⓐ	SHAPE CONFIRMATION button	When this button is pressed, the shape confirmation screen is displayed. On this screen, confirmation of the sewing shape can be carried out. → Refer to **"II-2-4-5. How to check the sewing pattern shape" p.37**.
Ⓑ	WIPER CHANGEOVER button	This button is used for selecting enable / disable of the wiper output.  : Wiper output is disabled  : Wiper output is enabled
Ⓒ	SEWING DATA SKIP button	For each of the sewing data surrounded by jump elements in a pattern, whether the data is to be sewn or not to be sewn can be set with this button. Enable / disable of the function of this button can be set with the memory switch "U407: Enable / disable of the SEWING DATA Botón de AJUSTE DE SALTOS". → Refer to **"II-2-4-12. Setting of the skip of sewing data" p.49**.
Ⓓ	THREAD CLAMP button	Selecting enable / disable of the thread clamp device and enable of the bird's nest preventing device  : Both the thread clamp device and bird's nest reducing devices are disabled.  : Thread clamp effective  : Bird's nest reducing device is enabled.
Ⓔ	INTERMEDIATE PRESSER HEIGHT SETTING button	When this button is pressed, the intermediate presser is lowered and the intermediate presser height setting screen is displayed. → Refer to **"II-2-4-4. How to change the parameter" p.35**.
Ⓕ	FEEDING FRAME INITIAL POSITION button	When this button is pressed while the sewing machine temporarily stops sewing, the feeding frame is returned to the start of sewing and is lifted.
Ⓖ	SPEED variable resistor	Number of rotations of the sewing machine can be changed.
Ⓗ	File name display	File name of the selected pattern is displayed.
Ⓘ	Comment display	Comment for the selected pattern is displayed.
Ⓙ	MULTIFUNCTION TAB SELECTION button	Tab display can be changed over on a function-by-function basis with this button. → Refer to **"II-2-4-3. Multifunction tab display" p.31**.

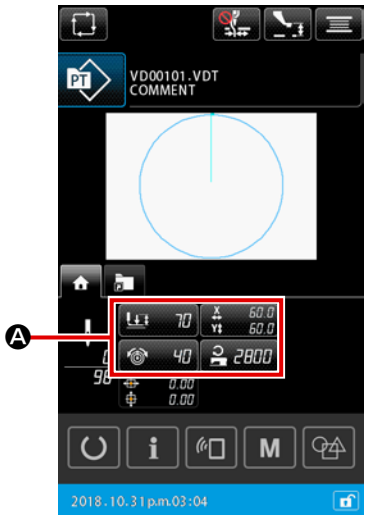
2-4-3. Multifunction tab display

Tab for each function is displayed. The type of tab displayed on the pattern setting screen and that displayed on the sewing screen are different. Select the tab you want to use with the MULTIFUNCTION TAB DISPLAY SELECTION button.

Item	Pattern setting screen	Sewing screen
HOME tab Editing of the pattern parameters is carried out.	Display	Display
Pattern shortcut tab Pattern is changed over without screen transition.	Display	Display
Thread tension tab Reference value of the thread tension is changed during sewing.	Hide	Display
Enlargement / reduction tab Enlargement / reduction ratio is set.	Display	Display
XY travel distance tab Travel distance of the pattern is set.	Hide	Display

(1) HOME tab

Parameters of the selected pattern can be edited.



① **Selecting the parameter to be edited**

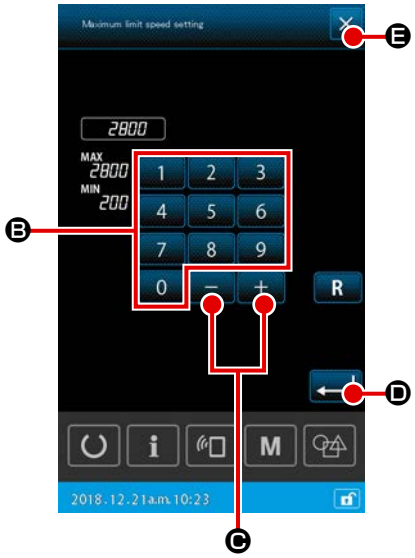
When button  Ⓐ for the parameter to edit is pressed, the parameter edit screen is displayed.

② **Editing the parameter**

Edit the parameter value by pressing the numeric key buttons 0 to 9 Ⓑ, +/- button + − Ⓒ.

③ **Confirming the edited content**

When ENTER button Ⓓ is pressed, the edited content is finalized and the display is returned to the HOME tab display.

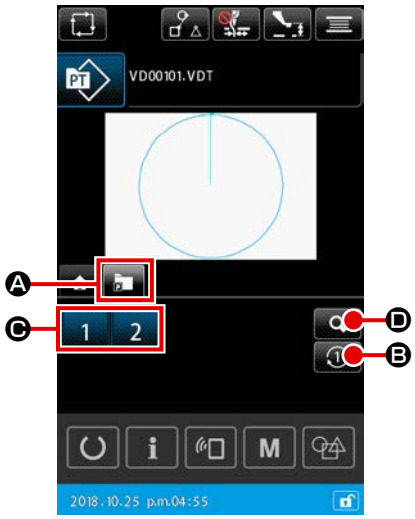


④ **Cancelling the edited content**

When CANCEL button Ⓔ is pressed on the parameter edit screen, the changed content is discarded and the display is returned to the HOME table display.

(2) Pattern shortcut tab

It is possible to directly select a pattern without changing over the screen by registering the pattern on the SHORTCUT button. It is also possible to change over the pattern with ease by registering the patterns that you use frequently on the shortcut buttons. On the pattern shortcut tab display, the folders Nos. 1 to 5 can be changed over. Ten different patterns can be registered at the maximum in one folder.



1) Basic operation

① **Selecting the pattern shortcut tab**

Select the pattern shortcut tab with MULTIFUNCTION TAB DISPLAY SELECTION button Ⓐ.

② **Changing over the display folder**

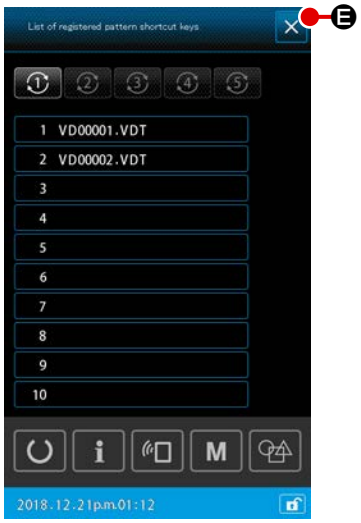
When FOLDER CHANGEOVER button Ⓑ, the displayed folder is changed over.

③ **Selecting a pattern**

When SHORTCUT button 1 2 3 4 Ⓒ is pressed, the pattern is changed over to the pattern that is registered on the SHORTCUT button.

1. SHORTCUT button 1 2 3 4 Ⓒ is not displayed unless a pattern has been registered using "15. Pattern shortcut key registration" function that is included in the list.
→ Refer to "II-2-5-3. How to create a new cycle pattern" p.60.

2. Be aware that the feeding frame travels to the sewing start position for the selected pattern when SHORTCUT button 1 2 3 4 Ⓒ is pressed on the sewing screen.



2) Checking the registered content of the pattern shortcut key

① **Displaying the pattern shortcut registration list**

When PATTERN REGISTRATION DISPLAY button Ⓓ, the pattern shortcut registration list screen is displayed.

② **Checking the patterns**

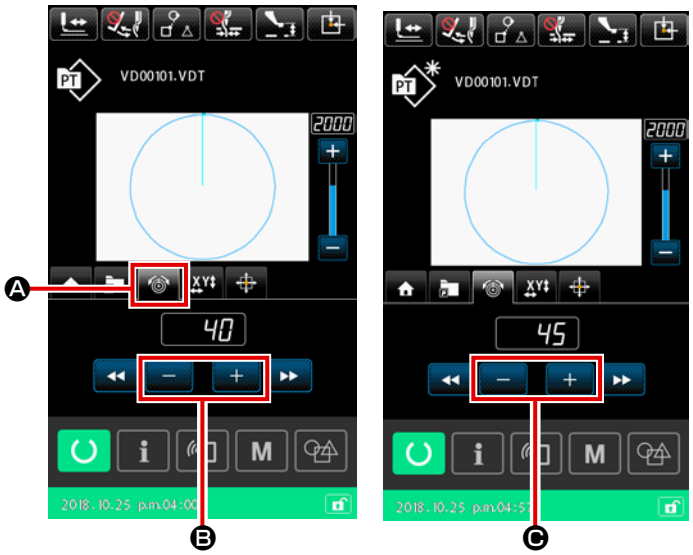
It is possible to select a folder and check the patterns registered in the folder. Nothing will be displayed if no pattern is registered in the folder.

③ **Completing the check procedure**

When CLOSE button Ⓔ, the screen is returned to the previous screen.

(3) Thread tension tab

It is possible to change the reference value of thread tension during sewing.
If the reference value of thread tension for a medium pattern is changed, "*" mark will be added to the pattern type display. → Refer to **"II-2-4-9. Display of the flag during the change procedure" p.45**.



① **Selecting the thread tension tab**

Select thread tension tab Ⓐ with MULTIFUNCTION TAB DISPLAY SELECTION button.

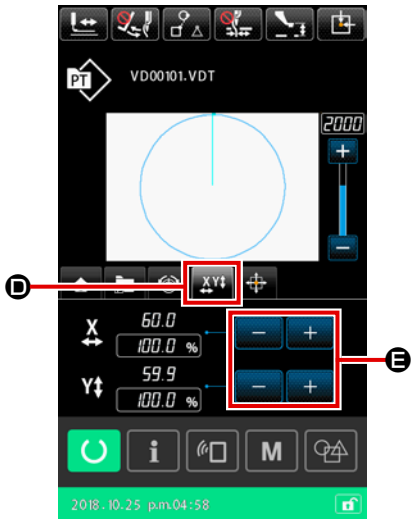
② **Setting the reference value of thread tension**

Set the reference value of thread tension with +/- button Ⓑ.

When +/- button Ⓒ is pressed during sewing, the new reference value of thread tension is immediately reflected.

(4) Enlargement / reduction tab

It is possible to enlarge / reduce the pattern immediately before starting sewing.
Enlargement / reduction of the pattern is computed, in the aforementioned case, by the "number of stitches fixing method (by increasing / decreasing the number of pitches) regardless of the memory switch setting.
In the case enlargement reduction is carried out on the enlargement / reduction tab display, the pedal switch operating method is different from that for the normal sewing only for the first sewing after the enlargement / reduction ratio is changed.
From the second sewing and beyond, the pedal switch can be operated in the method employed for the normal sewing.



① **Selecting the enlargement / reduction tab**

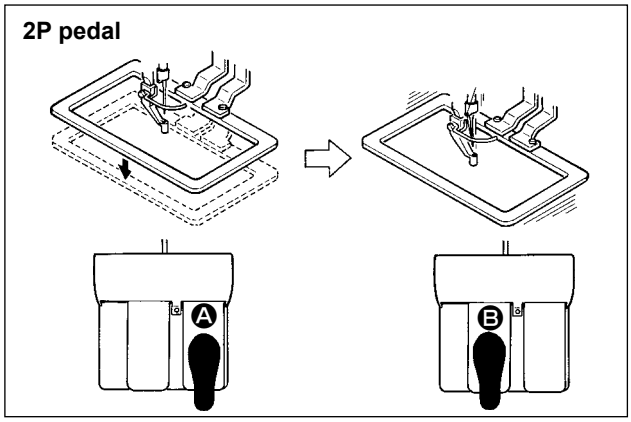
Select enlargement / reduction tab Ⓓ with MULTIFUNCTION TAB DISPLAY SELECTION button.

② **Setting the enlargement / reduction ratio**

Set the enlargement / reduction ratio with +/- button Ⓔ.

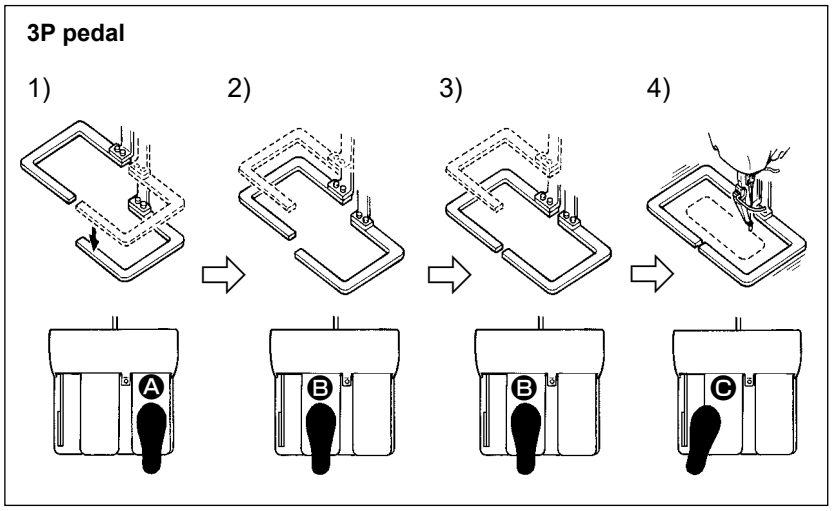
③ **Computing the enlargement / reduction and starting sewing**

Carry out computation of the enlargement / reduction of the pattern by operating the pedal. Then, start sewing by operating the pedal again. (For the operating the pedal, refer to **"5-1. Sewing" p.16** .)



[In case of 2P pedal]

1) Set a workpiece on the sewing machine.
2) Depress the pedal switch Ⓐ, and the feeding frame will come down. Depress it again, and the feeding frame will go up.
3) Lower the feeding frame. Then press pedal switch Ⓑ to carry out computation of the enlargement / reduction of the pattern.
4) Depress pedal switch Ⓑ again to start sewing.
5) After the sewing machine completes sewing, the needle point will return to the start point and the feeding frame will go up.



[In case of 3P pedal]

* The aforementioned steps of procedure 1), 2) and 3) can be carried out in the reverse order by setting the memory switch U081 appropriately.

1) Place a sewing product under the feeding frame. Depress pedal Ⓐ of the pedal switch, and the feeding frame (right) will come down to clamp the sewing product.
2) Place a workpiece to be sewn on the sewing product under the feeding frame (left). Lightly depress pedal Ⓑ, and the feeding frame (left) will stop in its intermediate stop position. Release the pedal, and the feeding frame (left) will rise back to the initial position.
3) Position the workpiece. Further depress pedal Ⓑ, and the feeding frame (left) will come down to the lowest position to clamp the workpiece. Re-depress pedal Ⓑ until it will go no further, the feeding frame (left) will return to the intermediate stop position.
4) When pedal Ⓒ is depressed while all feeding frames are in their lower position, computation of the pattern enlargement / reduction is carried out. When pedal Ⓒ is depressed again, the sewing machine starts sewing.

(5) XY travel distance tab

It is possible to move the pattern in parallel. Lower the feeding frame. Lower the feeding frame. Then, set the travel distance by which the pattern is moved with TRAVEL button. Sewing cannot be performed while this tab is selected. Select a different tab in prior in order carry out sewing,

1) Basic operation

① **Selecting the XY travel distance tab**

Select XY travel distance tab  Ⓐ with MULTIFUNCTION TAB DISPLAY SELECTION button.

② **Setting the XY travel distance**

Operate the pedal to lower the feeding frame. Then, set the travel distance by which the pattern is to be moved with TRAVEL button  Ⓑ.

> **Caution** **The XY travel distance cannot be set unless the feeding frame is in its lower position.**

2) Clearing travel distance

① **Clearing the XY travel distance**

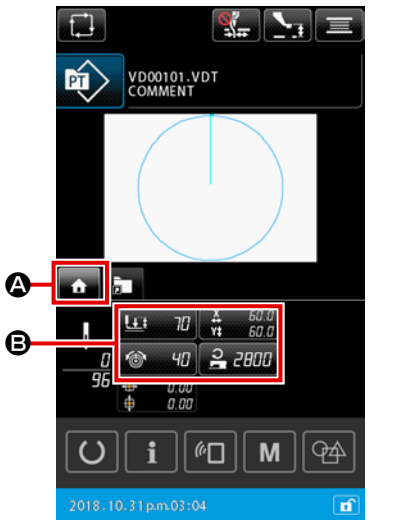
Operate the pedal to lower the feeding frame. Then, press RESET button  Ⓒ shortly to return the travel distance to the previous value, or keep the button held pressed for one second to clear the travel distance to 0.0 mm.

> **Caution** **Be aware that the feeding frame moves when the travel distance is cleared.**

2-4-4. How to change the parameter

Parameters of the selected pattern can be changed.

> **WARNING :**
> **After you have changed the XY enlargement / reduction ratio, be sure to check the pattern shape. If the pattern exceeds the feeding frame size, the needle can interfere with the feeding frame during sewing, posing a risk of needle breakage, etc.**



① **Displaying the HOME tab of the pattern setting screen**

Display the pattern setting screen. Then, select HOME tab  Ⓐ with the MULTIFUNCTION TAB SELECTION button.

② **Displaying the parameter setting screen**

When the parameter Ⓑ to change is selected from HOME tab  Ⓐ, the parameter setting screen is displayed.

Parameters that can be changed are as described below.

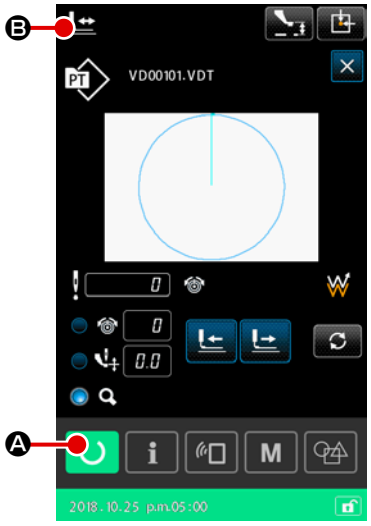
	Item	Input range	Initial value
❶	Two-step stroke	10 to 300(msec)	70(msec)
❷	Thread tension reference value	0 to 200	Set value for pattern
❸	Travel amount in X direction		0.00(mm)
❹	Travel amount in Y direction		0.00(mm)
❺	XY enlargement/reduction ratio	1.00 to 400.00(%)	100.00(%)
❻	Max. speed limitation	200 to 2800(sti/min)	2800(sti/min)
❼	Reference value for the intermediate presser height	0.0 to 3.5(mm) (Max. 0.0 to 7.0(mm))	Set value for pattern
❽	Current value of the sewing counter	0 to 9999	Hide
❾	Current value of the number of pieces counter	0 to 9999	Hide
❿	Current value of the bobbin thread counter	0 to 9999	Hide

* Initial value of the reference value for thread tension and that of the intermediate presser height vary with the pattern to be selected.
* The XY enlargement/reduction ratio can be changed to the actual dimension input by changing the setting of memory switch U064.
* The XY enlargement/reduction ratio input method can be selected with the memory switch U088, either "increase/decrease of the number of stitches" or "increase/decrease of stitch pitch". It should be noted, however, that the pattern consists of point sewing elements, the pattern is always enlarged/reduced by the method of "increase/decrease of stitch pitch" regardless of the setting of the memory switch U088.
* The maximum value of input range and the initial value of the maximum speed limitation are determined by the setting of the memory switch U001.
* The current value of counters are not displayed in the case the counters are set to "Not use".
* The reference value of the intermediate presser height cannot be changed immediately after turning the power ON. Press READY button  to retrieve the origin, first. Then, change the reference value of the intermediate presser height.

1. In the case the computation cannot be carried out due to excessively small reduction ratio, "E045: Pattern data error" will be displayed.
2. If the enlargement/reduction ratio is changed using the "increase/decrease of the number of stitches (with the stitch pitch fixed)" method, mechanical control command(s) entered other than shape point(s) will be deleted.

2-4-5. How to check the sewing pattern shape

It is possible to check the needle entry point positions and to check whether the sewing pattern extends outside the feeding frame.

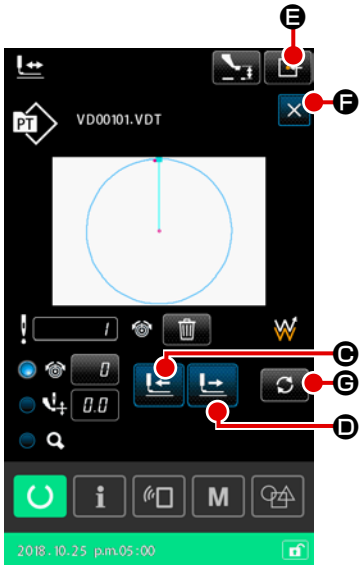


1) Basic operation

① Displaying the sewing screen

Display the patturn setting screen. Press READY button to display the sewing screen on which the sewing machine can start sewing. When READY button Ⓐ is pressed, the feeding frame retrieves the origin and moves to the sewing start position.

If READY button Ⓐ is pressed while the feeding frame is in its upper position, the feeding frame will firstly come down, then will start moving to the sewing start position. In this case, be careful not to allow your fingers to be caught under the feeding frame.



② Displaying the pattern shape confirmation screen

When PATTERN SHAPE CONFIRMATION button Ⓑ is pressed, the pattern shape confirmation screen is displayed. Current point (pink), sewing start position (blue) and sewing end position (pink dot) are displayed on the pattern shape shown at the center of screen.

③ Lowering the feeding frame

When the pedal switch is depressed, the feeding frame comes down.

④ Proceeding stitching to check the position of needle entry points

Check the sewing pattern shape with ONE-STITCH BACKWARD button Ⓒ and ONE-STITCH FORWARD button Ⓓ.

In the case two or more commands have been entered at the needle entry point, the feeding frame will not move but the command display will be moved forward or backward.

⑤ Finishing the pattern shape confirmation

When FEEDING FRAME INITIAL POSITION button Ⓔ is pressed, the feeding frame travels to the sewing start position and goes up. Then, the screen returns to the sewing screen.

When CANCEL button Ⓕ is pressed, the screen returns to the sewing screen while remaining the feeding frame at the current position. In such a case, it is possible to re-start sewing from the midpoint of confirmation procedure by depressing the pedal switch.

2) Selecting the travel method when proceeding stitching

Other than the one-stitch forward/backward method, the feeding frame travel method during stitch proceeding can be selected the following ones.

The travel method can be changed over in sequence by pressing CHANGEOVER button Ⓖ.

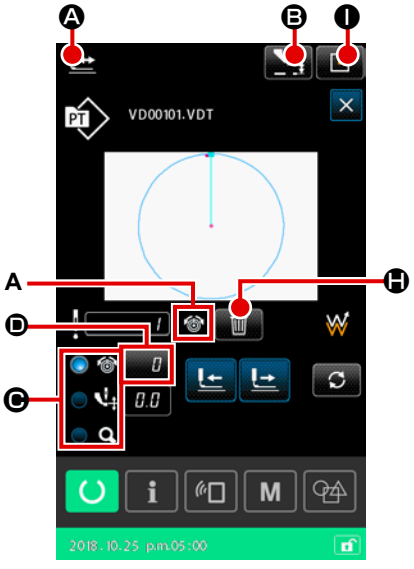
Travel method	Sewing screen
One-stitch forward / backward button	One-stitch forward / backward button The feeding frame travels by stitch.
Element forward / backward button	Element forward / backward button The feeding frame travels to the start position of elements.
Jump forward / backward button	Jump forward / backward button The feeding frame travels to the start position and to the end position of jump in turn.
Mechanical control command forward / backward button	Mechanical control command forward / backward button The feeding frame travels to the beginning or end of a pattern.
Start / end position forward / backward button	Start / end position forward / backward button The feeding frame travels by mechanical control command.

2-4-6. How to correct the needle entry point

For the pattern being selected, the thread tension and the intermediate presser height can be changed. When the thread tension and the intermediate presser height are changed, "*" (asterisk) mark is attached to the pattern type display.

→ Refer to **"II-2-4-9. Display of the flag during the change procedure" p.45**.

In the case of moving the feed forward/backward for such a purpose as to confirmation of needle, the sewing machine will not run unless the feeding frame is lowered. Use the sewing machine after lowering the feeding frame by depressing the pedal switch.



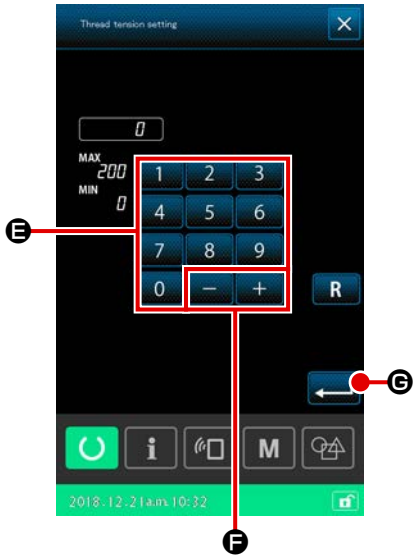
1) How to edit the thread tension

① Displaying the pattern shape confirmation screen

Press PATTERN SHAPE CONFIRMATION button Ⓐ on the sewing screen to display the pattern shape confirmation screen. When INTERMEDIATE PRESER HEIGHT SETTING button Ⓑ is pressed, the intermediate presser is lifted and lowered.

② Changing over to the thread tension mode

Select the thread tension mode with RADIO button Ⓒ. Absolute value of thread tension (reference value of the thread tension + increased/decreased value) is displayed on thread tension Ⓓ.



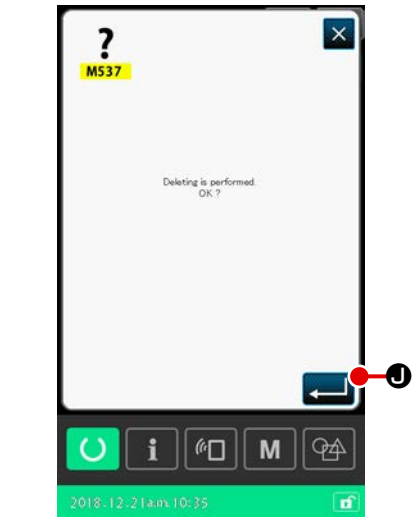
③ **Editing the thread tension**

Lower the feeding frame. Proceed stitching.

When SETTING button [0] Ⓓ is pressed, the thread tension increase/decrease value input screen is displayed.

Enter a desired value on this screen with numeric keypad [0] to [9] Ⓔ and +/- button [+] [−] Ⓕ.

When ENTER button [↵] Ⓖ is pressed, the thread tension increase/decrease value command is inserted to the current needle position and the data is confirmed.



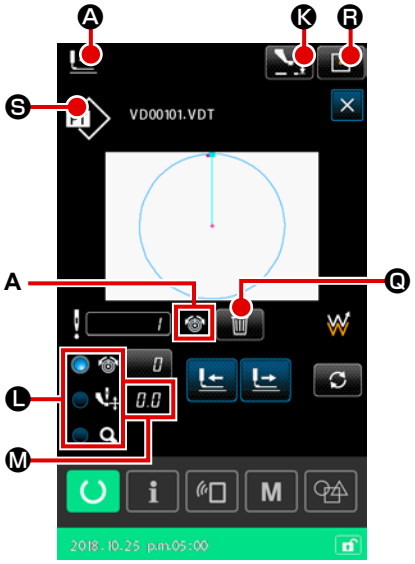
④ **Deleting the command**

In the case there is a thread tension increase/decrease value command at the needle entry point when proceeding stitching, COMMAND DELETE button [🗑] Ⓗ will be displayed. The command displayed in (**A**) is deleted by pressing COMMAND DELETE button [🗑] Ⓗ and pressing ENTER button [↵] Ⓙ on the confirmation screen.

⑤ **Finishing editing of the thread tension**

When FEEDING FRAME INITIAL POSITION button [⊡] Ⓘ is pressed, the feeding frame travels to the sewing start position and goes up. Then, the screen returns to the sewing screen.

2) How to edit the intermediate presser height



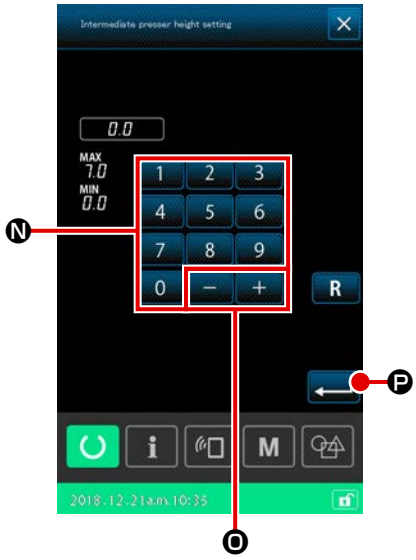
① Displaying the pattern shape confirmation screen

Press PATTERN SHAPE CONFIRMATION button Ⓐ on the sewing screen to display the pattern shape confirmation screen. When INTERMEDIATE PRESER HEIGHT SETTING button Ⓚ is pressed, the intermediate presser is lifted and lowered.

② Changing over to the intermediate presser mode

Select the intermediate presser mode with RADIO button Ⓛ.

The absolute value (reference value of the intermediate presser height + increase/decrease value) of the intermediate presser height is displayed on intermediate presser height Ⓜ.



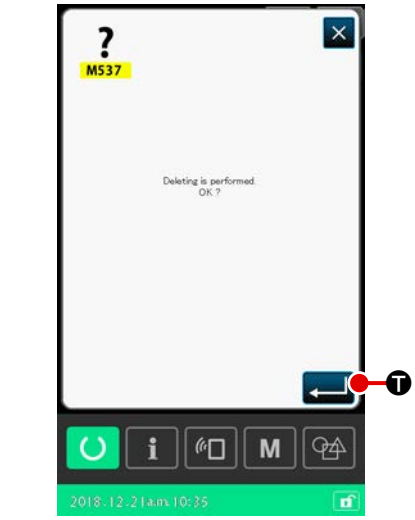
③ Editing the intermediate presser height

Lower the feeding frame. Proceed stitching.

When SETTING button 0 Ⓜ is pressed, the intermediate presser height increase/decrease value input screen is displayed.

Enter a desired value on this screen with numeric keypad 0 to 9 Ⓝ and +/- button + − Ⓞ.

When ENTER button Ⓟ is pressed, the intermediate presser height increase/decrease value command is inserted to the current needle position and the data is confirmed.



④ Deleting the command

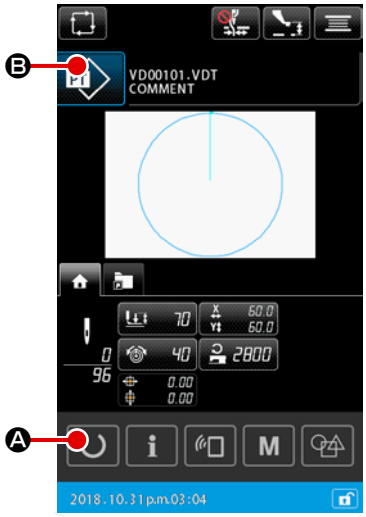
In the case there is a thread tension increase/decrease value command at the needle entry point when proceeding stitching, COMMAND DELETE button Ⓠ will be displayed. The command displayed in (**A**) is deleted by pressing COMMAND DELETE button Ⓠ and pressing ENTER button Ⓣ on the confirmation screen.

⑤ Finishing editing of the intermediate presser height

When FEEDING FRAME INITIAL POSITION button Ⓡ is pressed, the feeding frame travels to the sewing start position. Then, the screen returns to the sewing screen.

2-4-7. How to select a sewing shape

Select the pattern you want to sew.



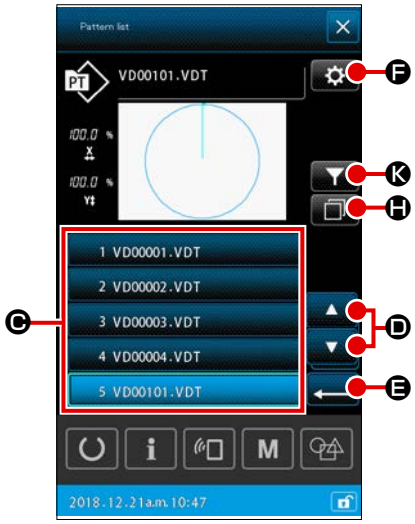
1) Basic operation

① Displaying the pattern setting screen

Only on the pattern setting screen, the sewing shape can be selected. On the sewing screen, press READY button Ⓐ to display the pattern setting screen.

② Displaying the pattern list screen

When SEWING SHAPE button Ⓑ is pressed, the pattern list screen (LIST) is displayed.



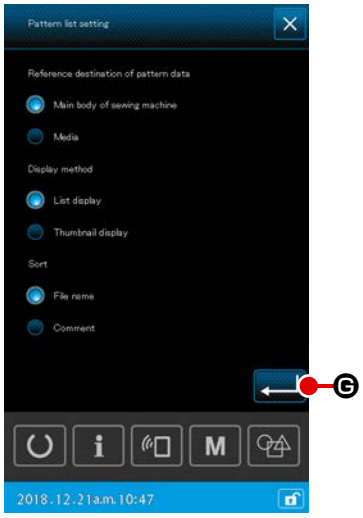
③ Selecting a sewing shape

Select the sewing shape by pressing SEWING SHAPE SELECTION button 1 VD00001.VDT Ⓒ.

When UP/DOWN SCROLL button Ⓓ is pressed, the page of the pattern list screen is changed over correspondingly.

④ Confirming the sewing shape

When ENTER button Ⓔ is pressed, the sewing shape is confirmed. Then, the screen returns to the pattern setting screen.



2) Selecting a medium pattern

① Inserting the medium

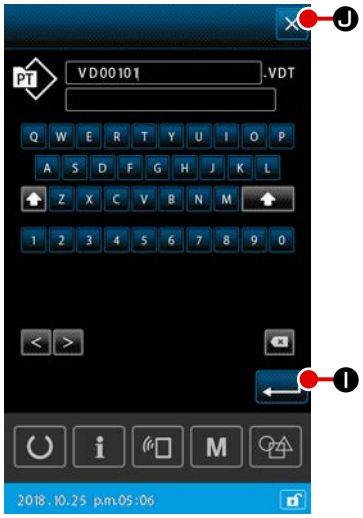
Insert the medium into the sewing machine while the pattern setting screen is displayed.

Press SEWING SHAPE button  Ⓑ to display the pattern list screen.

② Setting the reference destination to the medium

When SETTING button  Ⓕ on the pattern list screen is pressed, the pattern list setting screen is displayed.
Change the reference destination from the main body of sewing machine to the medium. When ENTER button  Ⓖ is pressed, the screen returns to the pattern list screen and the medium patterns are displayed.

In the case of selecting a medium pattern, only the medium patterns with the file name consisting of 12 alphanumeric characters (at the maximum) are displayed on the pattern list screen. If the number of characters of the file exceeds 12 or a character that is not alphabet or numeric figure is used for the file name, those patterns will not be displayed on the pattern list screen. In such a case, re-name the relevant file on the PC in advance.



3) Copying the pattern

① Selecting a copy source pattern

Select a pattern you want to use as the source of copy on the pattern list screen.

② Setting the copy destination file name

When COPY button  Ⓗ is pressed, the copy destination file name input screen is displayed. Enter the copy-destination file name.

③ Executing copy

Press ENTER button  Ⓘ is pressed on the copy destination file name input screen, the copy source pattern is copied to the copy destination file name.

④ Canceling copy

When CANCEL button  Ⓙ is pressed, copy is canceled. Then, the screen returns to the pattern list screen.

4) Narrowing down

Only the patterns, from among the saved sewing patterns, that contain the characters entered for their file names or comments can be displayed.

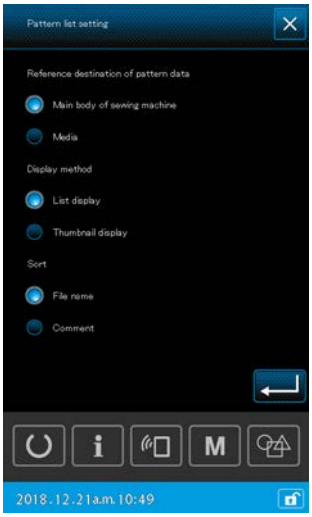
① **Displaying the narrow-down screen**

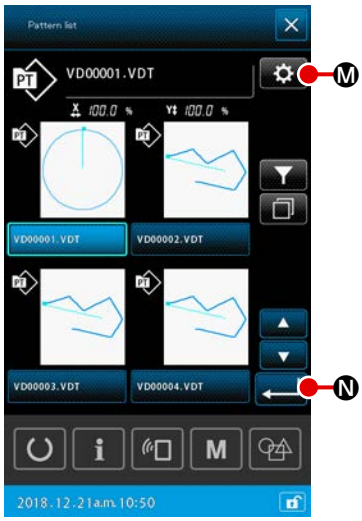
When NARROW DOWN button Ⓚ is pressed on the pattern list screen, the narrow-down screen is displayed.

② **Setting the narrow-down condition**

Set the narrow-down conditions such as the type of pattern, file name and comment.

When ENTER button Ⓛ is pressed, only the patterns that satisfy the narrow-down conditions you have set are displayed on the pattern list screen.





5) Changing over to the thumbnail display

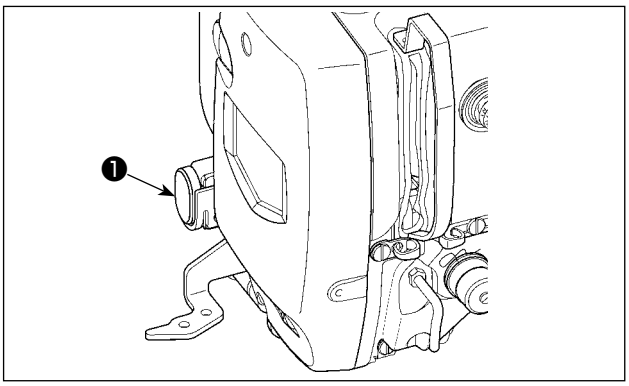
It is possible to change the display style of the pattern list screen to the thumbnail display style.

① **Setting the thumbnail display**

When SETTING button Ⓜ on the pattern list screen is pressed, the pattern list setting screen is displayed.

Change the display style from the list display to the thumbnail display. When ENTER button Ⓝ is pressed, the pattern list screen (THUMBNAIL) is displayed.

2-4-8. How to use temporary stop



The sewing machine can be stopped by pressing the temporary stop switch ❶ during sewing.
At this time, the error screen "E050: Temporary stop error" is displayed to inform that the stop switch has been pressed.

(1) To continue performing sewing from some point in sewing

① **Release the error**

Press RESET button Ⓐ to release the error.

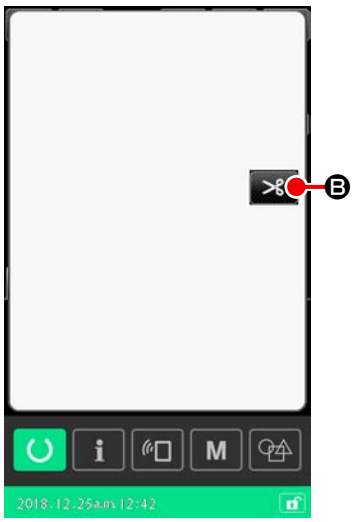
When this error is reset, the thread trimming screen is displayed.

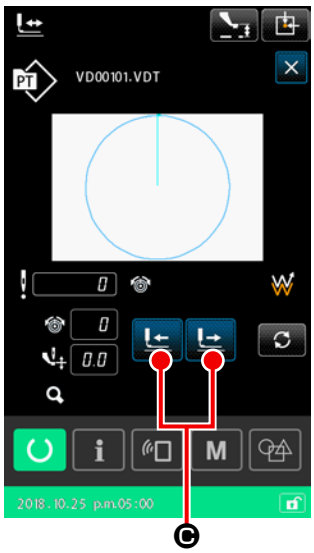
② **Perform thread trimming**

Press THREAD TRIM button Ⓑ to perform thread trimming.

When thread trimming is carried out, the sewing shape confirmation screen is displayed.

* In the case the memory switch "U097: Temporary stop/thread trimming operation" is set to the automatic thread trimming, the sewing machine will automatically carry out thread trimming and the THREAD TRIMMING button will not be displayed.





③ **Adjust the presser to the re-sewing position**

Press FEED FORWARD/BACKWARD button Ⓒ to move the feeding frame to the re-sewing position.

④ **Re-start the sewing**

When the pedal switch is depressed, the sewing machine re-starts sewing.

(2) To perform re-sewing from the start

① **Release the error**

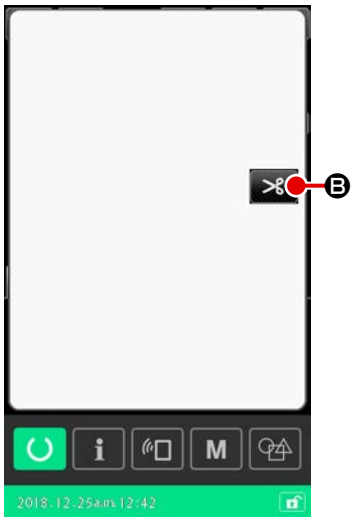
Press RESET button Ⓐ to release the error.

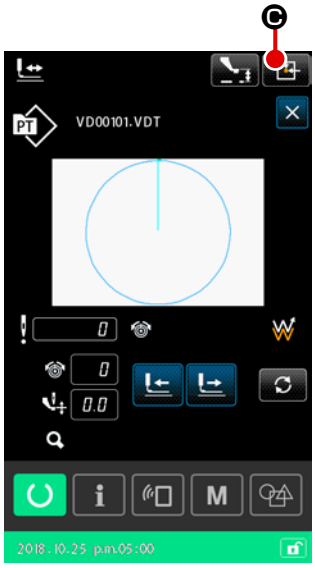
When the error is reset, the thread trimming screen is displayed.

② **Perform thread trimming**

Press THREAD TRIM button Ⓑ to perform thread trimming.

When thread trimming is carried out, the sewing shape confirmation screen is displayed.





③ **Returning to the sewing start position**

When FEEDING FRAME INITIAL POSITION button Ⓒ is pressed, the sewing shape confirmation screen is closed and the sewing screen is displayed. At this time, the feeding frame returns to the sewing start position.

④ **Perform again the sewing work from the start**

When the pedal is depressed, sewing starts again.

2-4-9. Display of the flag during the change procedure

If the thread tension command or intermediate presser height increase/decrease value command for the needle entry point in a user pattern or medium pattern is edited, it will be regarded as a temporary change and will not be reflected to the original pattern. In this case, "*" (asterisk) mark is attached to the pattern type display indicating that a change has been made.

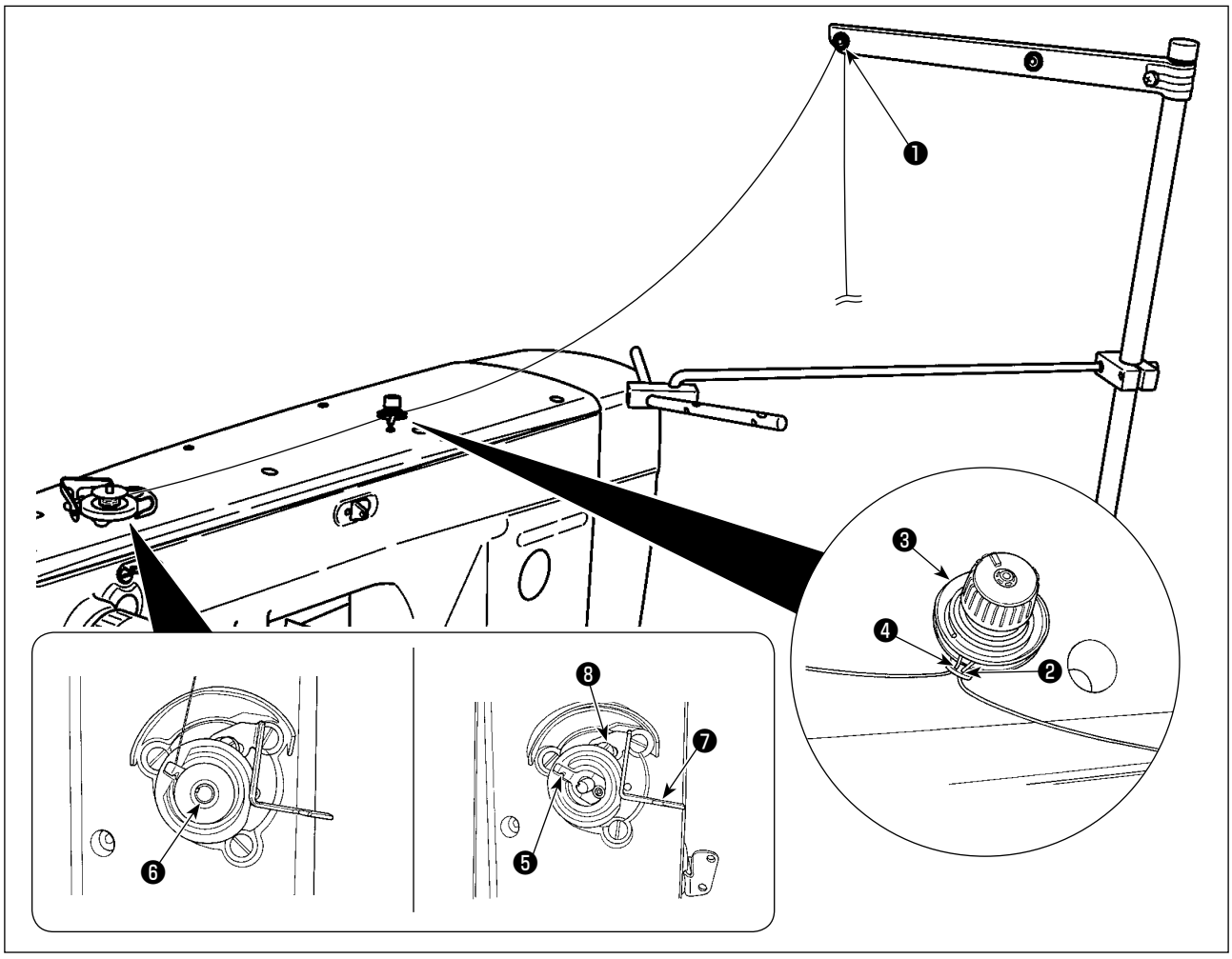
If you try to select another pattern while the pattern type display is attached with "*" mark, "M523: Changed content saving confirmation screen" will be displayed.

When ENTER button is pressed, the changed content is cancelled or the newly selected pattern is displayed after saving the changed content.

When CANCEL button is pressed, changeover to the newly selected pattern is cancelled. In this case, the screen returns to the previous screen.

2-4-10. Winding bobbin thread

(1) When performing winding bobbin thread while performing sewing

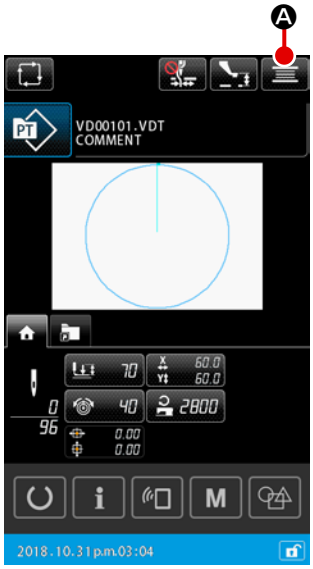


1) Pass the thread in the order of ❶ to ❹ .
2) Insert the thread fully to reach the root of bobbin thread clamp ❺ . Then, trim the thread. (The thread end is retained.)
3) Place a bobbin on bobbin winder shaft ❻ .
4) Push down bobbin winder lever ❼ in the direction of the arrow.
5) When the sewing machine starts, the bobbin rotate and thread is automatically wound on it.
6) Upon completion of winding of the bobbin, bobbin winder lever ❼ automatically comes off and stops.

1. Bobbin thread winding amount can be adjusted by loosening setscrew ❽ . Bobbin thread winding amount is increased by moving bobbin winder lever ❼ up.
2. If the thread comes off the thread tension controller, wind the thread on the intermediate thread guide by one turn.

1. This is the bobbin winding device that is operated with a single push of the bobbin winder lever.
When the bobbin winding operation is completed, bobbin thread clamp ❺ automatically returns to its initial position
2. If you want to terminate winding of the bobbin before it is completed, turn the handwheel to return bobbin thread clamp ❺ to its initial position while slightly lifting bobbin winder lever ❼ .
3. If the thread is not fully inserted to reach the root of bobbin thread clamp, the thread may slip off at the beginning of bobbin winding operation.

(2) When performing winding bobbin thread only



① **Display the bobbin winding screen**

When BOBBIN WINDER button Ⓐ is pressed on the pattern setting screen, the feeding frame comes down. Then, the bobbin winding screen is displayed.

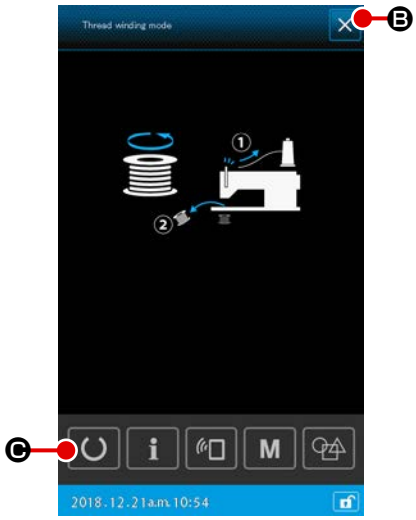
② **Start bobbin winding**

Depress the start pedal, and the sewing machine rotates and starts winding bobbin thread.

③ **Stop the sewing machine**

When CLOSE button Ⓑ is pressed, the sewing machine stops. Then, the screen returns to the pattern setting screen. When the start pedal is depressed again during winding of the bobbin, the sewing machine stops while remaining in the bobbin winding mode.

When the start pedal is depressed again, the sewing machine re-starts winding of the bobbin. Use this function when you want to wind two or more bobbins.

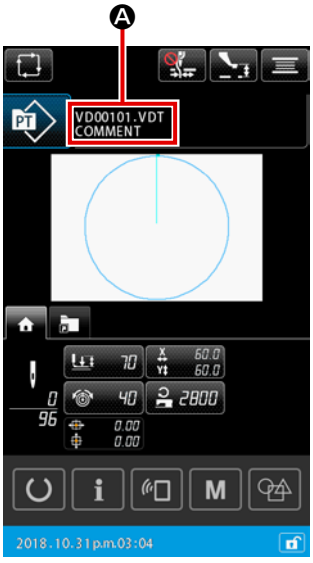


The sewing machine cannot be placed in the bobbin winding mode immediately after turning the power ON.

Select a pattern once. Then, press READY button Ⓒ to display the sewing screen. In this state, the sewing machine can be placed in the bobbin winding mode.

2-4-11. How to edit characters

Characters used in the file name and comment information of the sewing data stored in the sewing machine can be edited.



1) Basic operation

① Displaying the character edit screen

When CHARACTER EDIT button 

Ⓐ is pressed on the pattern setting screen, the character edit screen is displayed.

Vector data on the file name and comment information registered in cycle patterns cannot be edited.

When CHARACTER EDIT button 

Ⓐ is pressed, the disable buzzer sounds and the character editing operation is rejected.

② Selecting the character string to edit and carrying out editing of characters

Press any point in the frame corresponding to the file name Ⓓ or comment information Ⓔ you want to edit.

③ Confirming the edited character string

When ENTER button  Ⓑ is pressed, the edited character string is confirmed. Then, the screen returns to the previous screen.

④ Cancelling the edited character string

When CLOSE button  Ⓒ is pressed, the edited character string is discarded. Then, the screen returns to the previous screen.

2) Restriction on input of edit of characters

The following restrictions are applied to editing of character strings.

* In the file name, the case is ignored.
* In the case of reading the sewing data from the USB thumb drive, the files that are not relevant to the restriction on input are not displayed in the pattern list.

	User pattern	Cycle pattern
File name (alphanumeric characters)	12 characters + (.VDT)	12 characters + (.CSD)
Comment (alphanumeric characters and symbols)	255 characters	14 characters

2-4-12. Setting of the skip of sewing data

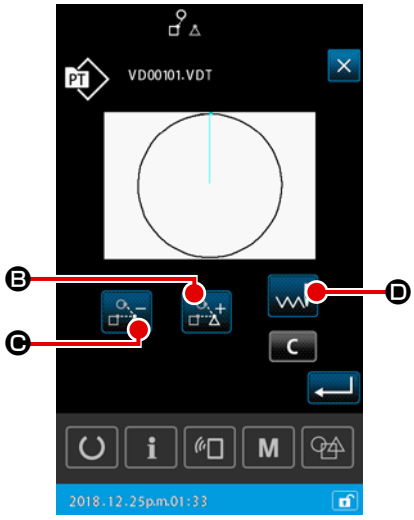
"Sew/not sew" can be set to the pattern consisting of two or more elements that are divided with thread trimming. In the case that two or more materials are used for sewing one piece of pattern data but a part of materials lacks, use this function to sew the lacked material.

This function can be set to "enable/disable" with the memory switch "U407: Enable/disable of sewing data skip setting button". When the function is enabled, SEWING DATA Botón de AJUSTE DE SALTOS  Ⓐ is displayed on the setting screen/sewing screen.

1) Basic operation

① Displaying the sewing data skip setting screen

Set the memory switch "U407" to "enable". Press SEWING DATA Botón de AJUSTE DE SALTOS  Ⓐ on the setting screen/sewing screen to display the sewing data skip setting screen.



② Selecting an element

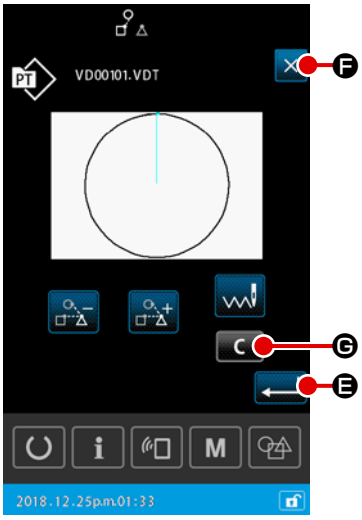
Move the relevant element by pressing ELEMENT FORWARD button  Ⓑ or ELEMENT BACKWARD button  Ⓒ.

③ Selecting "sew/not sew"

When SKIP CHANGEOVER button  Ⓓ is pressed, "sew/not sew" of the selected element can be selected

 : Sew

 : Not sew



④ **Confirming the sewing data skip setting**

When ENTER button Ⓔ is pressed, the sewing data skip setting is saved. Then, the screen returns to the pattern setting screen or the sewing screen.

⑤ **Cancelling the sewing data skip setting**

When CLOSE button Ⓕ is pressed, the sewing data skip setting is discarded. Then, the screen returns to the pattern setting screen or the sewing screen.

2) To clear the sewing data skip setting in whole

When CLEAR button C Ⓖ is pressed on the sewing data skip setting screen, all sewing data are set to "sew".

2-4-13. How to correct the pattern position (Position correction function)

The position correction function can be acquired the correction value by teaching the reference position of the object causing when the pattern data and the material are shifted due to the error of the presser foot and the unit in use.

1) Correction unit for the correction of pattern position

The correction value can be set on the device-by-device, pattern-by-pattern or unit-by-unit basis according to the cause for correction.

Correction unit	Specification of reference position	Storage of correction values
In the unit of device	Arbitrary coordinate	Device parameter
In the unit of pattern	Arbitrary coordinate of vector data	User pattern
Unit of cycle step	Arbitrary coordinate of vector data	Cycle sewing data

2) Relation between the number of reference positions and the correction logic

The reference position can be set to one or more arbitrary coordinate(s).

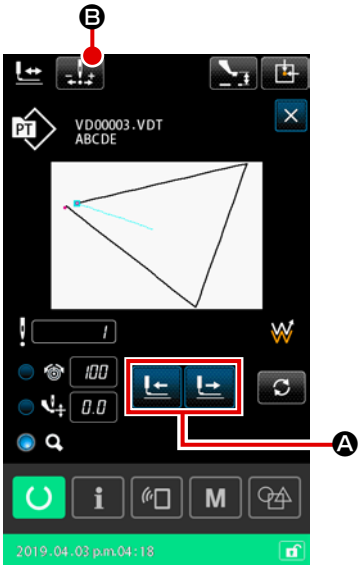
The object of correction procedure differs according to the set number of reference positions.

Correction procedure	Description	Number of reference positions
Correction of position	The entire position of pattern is moved in parallel by the correction amount.	One or more
Correction of inclination	Inclination of the coordinate system is corrected	Two or more
Correction of pitch	Scale in X and Y directions are respectively corrected	Two or more

(1) How to correct the position on the pattern-by-pattern basis / cycle-by-cycle basis

For the correction of position on a pattern-by-pattern / cycle-by-cycle step basis, the correction amount of position can be set with reference to the coordinates of an arbitrary needle entry point of the selected pattern data. Setting can be carried out on the shape confirmation screen.

* To carry out the correction of position on the pattern-by-pattern basis / cycle-by-cycle basis, set the memory switch [U406: Enable/disable of the position correction button] to [Enable].



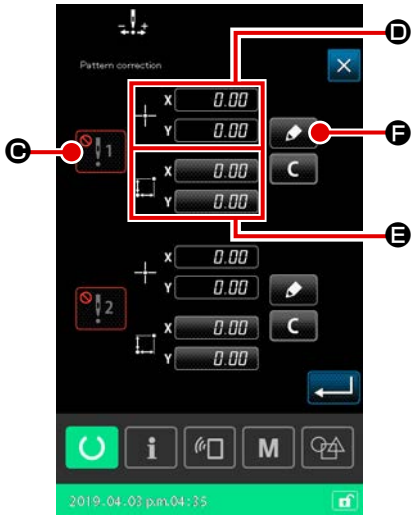
① **Displaying the shape confirmation screen**

Change the current screen over to the sewing screen. Press  to display the shape confirmation screen.

Refer to **"II-2-4-5. How to check the sewing pattern shape" p.37**.

② **Moving the needle entry point to the one that is used as the reference position**

Operate the presser foot pedal to lower the feeding frame. Then, move the needle entry point to the one you want to use as the reference position with  Ⓐ.

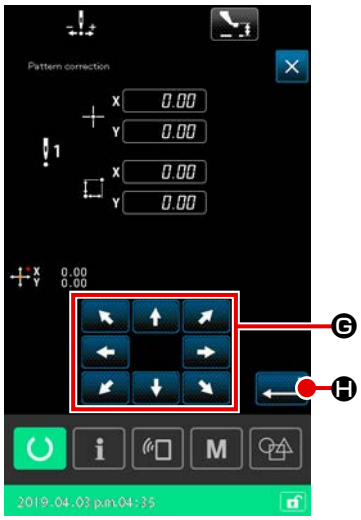


③ Displaying the pattern position correction screen

After the needle entry point you want to use as the reference position is reached, press automatic correction button Ⓑ to display the pattern position correction screen.
For the pattern position correction, as many as two points can be designated as the reference position according to the intended use.
If you want to set two reference points, it is necessary to set them so that each of the reference points has different coordinates.

Items to be set are as described below.

	Setting item for correcting the position
Ⓒ	Enable/disable of the correction value
Ⓓ	Coordinates of the reference position
Ⓔ	Correction amount for the reference-position coordinates



④ Setting coordinates of the reference position Ⓓ

When teaching button Ⓕ is pressed, coordinates of the current needle entry point are set as coordinates of the reference position, and the position correction teaching screen is displayed.
At this time, coordinates of the current needle entry point are set as coordinates of the reference position.

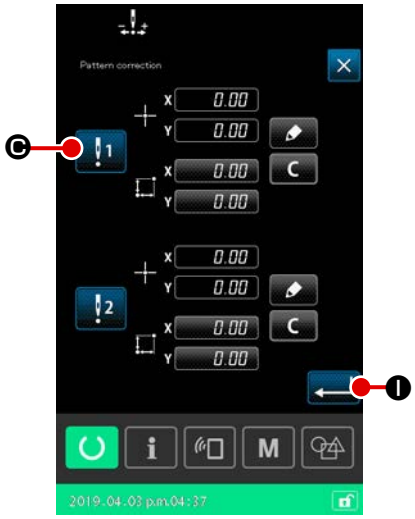
⑤ Teaching correction amount Ⓔ

Input a correction amount for the reference position.

When move button Ⓖ is pressed, the presser foot travels from the reference-position coordinates, and the travel amount is displayed as the correction amount.

⑥ Confirming the correction amount

When enter button Ⓗ is pressed, the reference-position coordinates and the correction amount are confirmed, and the screen returns to the pattern position correction screen.



⑦ **Setting enable/disable Ⓒ of the reference position correction**

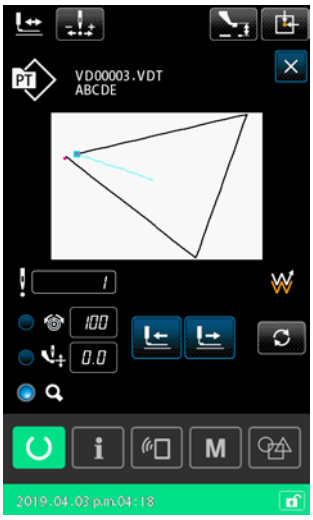
In this step of procedure, enable/disable of the position correction that has been set in the previous procedure is set.
The enable/disable status is changed over by pressing enable/disable changeover button 1 Ⓒ.

[In the case the reference position correction is set to enable 1]

The correction amount for the reference position is applied.
The reference position is corrected according to the effective number of reference positions.

[In the case the reference position correction is set to disable 1]

The correction amount for the reference position is not applied.



⑧ **Confirming enable/disable Ⓒ of the reference position correction**

When enter button ❶ is pressed, enable/disable of the reference position correction is confirmed, and the screen returns to the shape confirmation screen.

(2) How to correct the position on the device-by-device basis

For the correction of position on the device-by-device basis, the position correction amount can be set with reference to arbitrary coordinates. The correction of position can be set on the list screen.

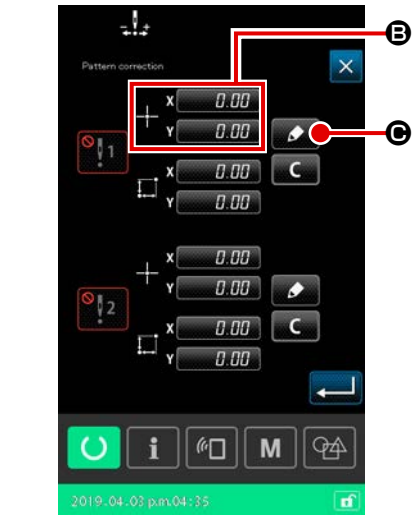
① **Displaying the list screen**

Display the list (maintenance personnel level) screen by keeping M button [M] held pressed for three seconds on the setting screen.

When [21 Pattern correction] Ⓐ is selected, the device-by-device pattern position correction screen is displayed.

1. Immediately after turning the power ON, the "pattern correction" function cannot be selected. It is necessary to select a pattern, and press the ready key to display the sewing screen. Then, the "pattern correction" function is enabled.

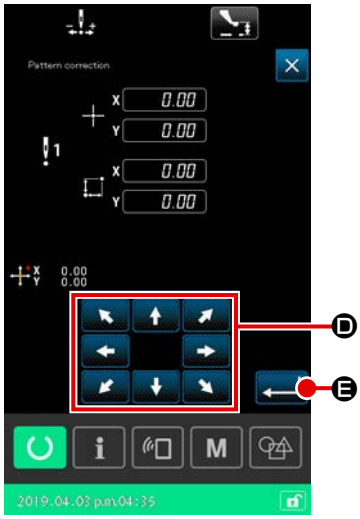
2. If the presser foot is lifted to its upper position when the "pattern correction" function is selected, the presser foot will be brought to its lower position. It is therefore necessary to take care not to allow your fingers to be caught under the presser foot.



② **Setting coordinates of the reference position**

When reference position setting button Ⓑ is pressed, the numeric value input screen is displayed.

Enter coordinates of the reference position of the device by means of the numeric keypad.



③ **Teaching correction amount**

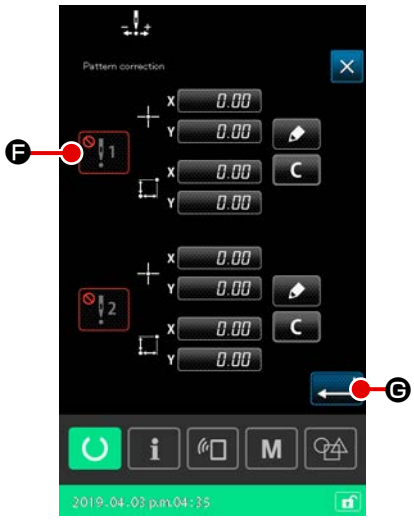
When teaching button  Ⓒ is pressed, the position correction teaching screen is displayed.

When move button  Ⓓ is pressed, the presser foot travels from the reference-position coordinates, and the travel amount is displayed as the correction amount.

When teaching button  Ⓒ is pressed, the presser foot travels to the reference-position coordinates. Take care of this operation of the presser foot.

④ **Confirming the correction amount**

When enter button  Ⓔ is pressed, the correction amount is confirmed, and the screen returns to the pattern position correction screen.



⑤ **Setting enable/disable Ⓕ of the reference position correction**

In this step of procedure, enable/disable of the position correction that has been set in the previous procedure is set.

The enable/disable status is changed over by pressing enable/disable changeover button  Ⓕ.

[In the case the reference position correction is set to enable ]

The correction amount for the reference position of the device is applied.

The reference position is corrected according to the number of effective reference positions.

[In the case the reference position correction is set to disable ]

The correction amount for the reference position of the device is not applied.

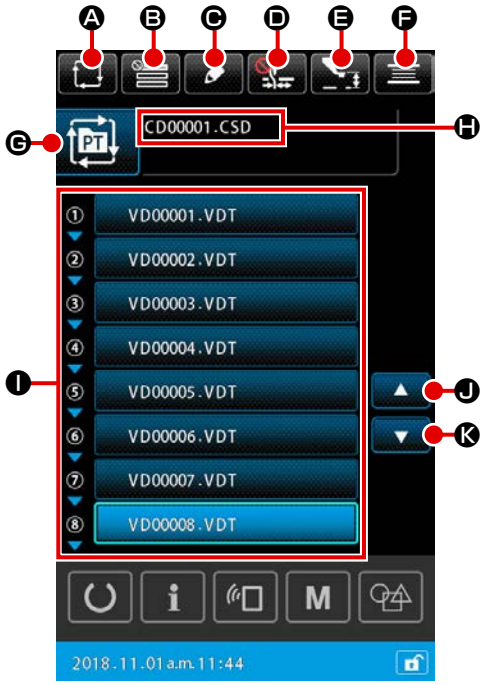
⑥ **Confirming enable/disable Ⓕ of the reference position correction**

When enter button  Ⓖ is pressed, enable/disable of the reference-position correction is confirmed, and the screen returns to the list (maintenance personnel level) screen.

2-5. LCD section when selecting the cycle pattern

This sewing machine is able to combine two or more pattern data and sew them in sequence.
As many as 30 patterns can be registered in one cycle pattern. Use this function when you want to sew several different sewing shapes on a sewn product.
In addition, as many as 20 cycle pattern can be registered. Create a new cycle pattern or copy the existing one depending on your needs.

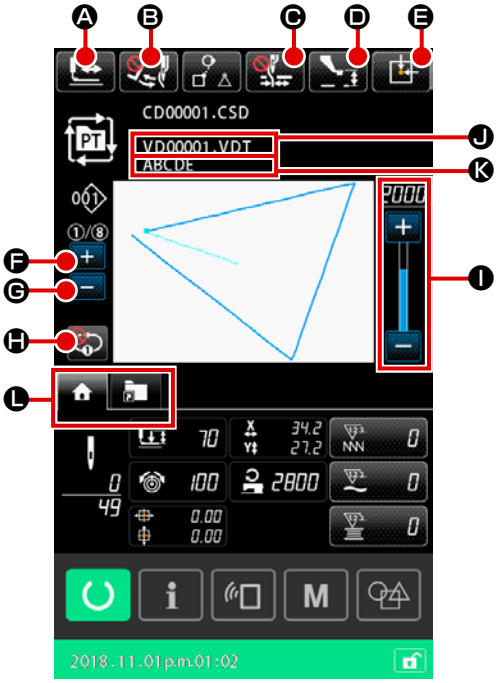
2-5-1. Cycle pattern setting screen



	Button and display	Description
Ⓐ	NEW CYCLE PATTERN CREATION button	When this button is pressed, the new cycle pattern creation screen is displayed. → Refer to **"II-2-5-3. How to create a new cycle pattern" p.60**.
Ⓑ	SKIP SETTING button	When this button is pressed, the cycle step skip setting screen is displayed. → Refer to**"II-2-5-5. How to set skipping of a cycle step(s)" p.64**.
Ⓒ	STEP EDIT button	When this button is pressed, the cycle pattern step edit screen is displayed. Carry out insertion and deletion of a step(s). → Refer to**"II-2-5-4. How to edit steps of the cycle pattern" p.62**.
Ⓓ	THREAD CLAMP button	Selecting enable / disable of the thread clamp device and enable of the bird's nest preventing device  : Both the thread clamp device and bird's nest reducing devices are disabled.  : Thread clamp effective  : Bird's nest reducing device is enabled.
Ⓔ	INTERMEDIATE PRESSER HEIGHT SETTING button	When this button is pressed, the intermediate presser is lowered and the intermediate presser height setting screen is displayed. → Refer to **"II-2-4-4. How to change the parameter" p.35**.

	Button and display	Description
Ⓕ	BOBBIN WINDER button	When this button is pressed, the bobbin winding screen is displayed. On this screen, winding of a bobbin can be carried out. → Refer to **"II-2-4-10. Winding bobbin thread" p.46**.
Ⓖ	SEWING SHAPE SELECTION button	The selected pattern type is displayed on the button.  : Users' pattern  : Media pattern When this button is pressed, the pattern list screen is displayed. On this screen, selection of a pattern can be carried out. → Refer to **"II-2-4-7. How to select a sewing shape" p.41**.
Ⓗ	CHARACTER EDIT button	File name and comment of the selected pattern are displayed on the button. When this button is pressed, the character edit screen is displayed.
Ⓘ	PATTERN SELECTION button	When this button is pressed, the pattern selection screen is displayed. On this screen, a pattern(s) of the registered step(s) can be selected. → Refer to**"II-2-4-7. How to select a sewing shape" p.41**.
Ⓙ	UP SCROLL button	Switch the displayed page to the previous page.
Ⓚ	DOWN SCROLL button	Switch the displayed page to the next page.

2-5-2. Sewing screen



	Button and display	Description
Ⓐ	SHAPE CONFIRMATION button	When this button is pressed, the shape confirmation screen is displayed. On this screen, confirmation of the sewing shape can be carried out. → Refer to **"II-2-4-5. How to check the sewing pattern shape" p.37**.
Ⓑ	WIPER CHANGEOVER button	This button is used for selecting enable / disable of the wiper output.  : Wiper output is disabled  : Wiper output is enabled
Ⓒ	THREAD CLAMP button	Selecting enable / disable of the thread clamp device and enable of the bird's nest preventing device  : Both the thread clamp device and bird's nest reducing devices are disabled.  : Thread clamp effective  : Bird's nest reducing device is enabled.
Ⓓ	INTERMEDIATE PRESSER HEIGHT SETTING button	When this button is pressed, the intermediate presser is lowered and the intermediate presser height setting screen is displayed. → Refer to **"II-2-4-4. How to change the parameter" p.35**.

	Button and display	Description
Ⓔ	FEEDING FRAME INITIAL POSITION button	When this button is pressed while the sewing machine temporarily stops sewing, the feeding frame is returned to the start of sewing and is lifted.
Ⓕ	CURRENT STEP CHANGEOVER button (+)	Step to be sewn can be proceeded to the next one with this button.
Ⓖ	CURRENT STEP CHANGEOVER button (-)	Step to be sewn can be returned to the previous one with this button.
Ⓗ	1-STEP REPEAT button	Enable/disable of the 1-step repeat is selected with this button When the 1-step repeat is set to "enable", the current step can be sewn in repetition even when sewing of the current step is completed.
Ⓘ	SPEED variable resistor	Number of rotations of the sewing machine can be changed.
Ⓙ	File name display	File name of the selected pattern is displayed.
Ⓚ	Comment display	Comment for the selected pattern is displayed.
Ⓛ	MULTIFUNCTION TAB SELECTION button	Tab display can be changed over on a function-by-function basis with this button. → Refer to **"II-2-4-3. Multifunction tab display" p.31**.

2-5-3. How to create a new cycle pattern

A new cycle pattern is created.

① **Displaying the new cycle pattern creation screen**

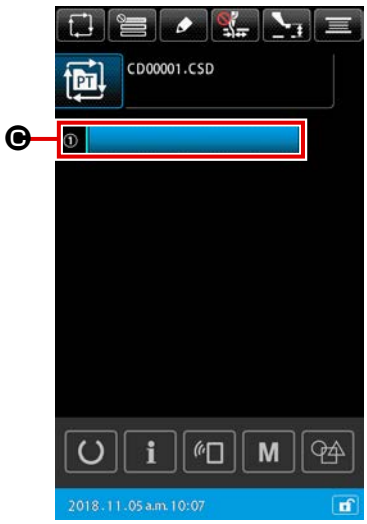
When the NEW CYCLE PATTERN CREATION button  Ⓐ is pressed on the pattern setting screen or the cycle pattern setting screen, the new cycle pattern creation screen is displayed.

② **Creating a new file**

Enter the file name of a new cycle pattern you want to create.

→ Refer to **"II-2-4-11. How to edit characters" p.48**.

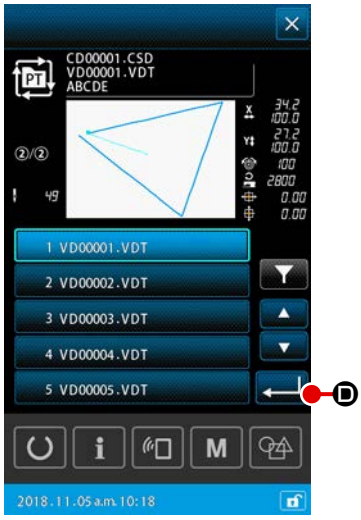
When ENTER button Ⓑ is pressed, the cycle pattern setting screen is displayed.



③ **Registering the pattern in a step**

When PATTERN SELECTION button Ⓒ is pressed, the pattern selection screen is displayed.

Select the pattern you want to register, and press ENTER Ⓓ to register it.



④ **Repeating the step ③ by the number of steps to be registered**

When the registration of the 1st step is completed, PATTERN SELECTION button for the 2nd step is displayed.

Repeat the step ③ by the number of steps you want to register.

2-5-4. How to edit steps of the cycle pattern

Insertion / changeover / deletion of the registered steps of a cycle pattern can be carried out.

1) Basic operation

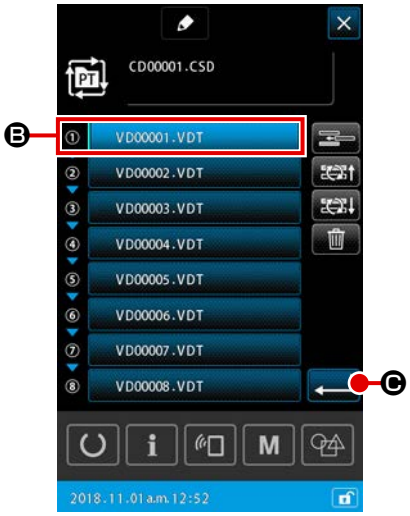
① Displaying the cycle step edit screen

When STEP EDIT button Ⓐ is pressed on the cycle pattern setting screen, the cycle step edit screen is displayed.

② Editing the step(s) of a cycle sewing pattern

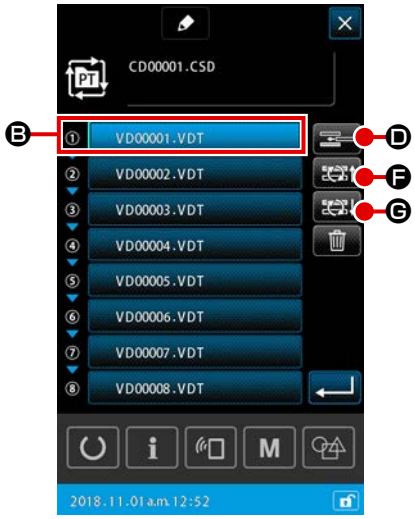
When PATTERN SELECTION button VD00001.VDT Ⓑ is pressed, the pattern becomes the object of editing.
Refer to the following for the step editing procedure:

→ **"2) Inserting a step" p.63**
→ **"3) Changing over the steps" p.63**
→ **"4) Deleting a step" p.63**



③ Confirming the editing of the step(s)

When ENTER button Ⓒ is pressed, the edited contents are finalized. Then, the screen returns to the cycle pattern setting screen.



2) Inserting a step

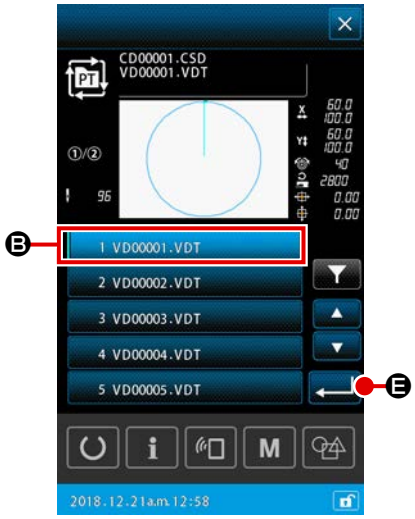
A step is inserted into the position immediately before the pattern that is currently selected with PATTEN SELECTION button VD00001.VDT Ⓑ.

① Selecting a pattern into which a step is inserted

When STEP INSETION button Ⓓ is pressed on the step edit screen, the pattern selection screen is displayed.

② Inserting a step

Select the pattern into which you want to insert a step, and press ENTER button Ⓔ. Then, the step is inserted immediately before the currently-selected pattern, and the screen returns to the step edit screen.



3) Changing over the steps

A step in the pattern that is currently selected with PATTEN SELECTION button VD00001.VDT Ⓑ is changed over to the previous step or the subsequent step in that pattern.

① Changing over the pattern

When STEP CHANGEOVER (BEFORE) button Ⓕ is pressed on the step edit screen, the sewing order of the currently-selected pattern and its previous pattern is changed over.

When STEP CHANGEOVER (AFTER) button Ⓖ is pressed, the sewing order of the currently-selected pattern and its subsequent pattern is changed over.

4) Deleting a step

The pattern that is currently selected with PATTEN SELECTION button is deleted.

① Deleting a pattern

When STEP DELETE button Ⓗ is pressed on the step edit screen, the currently-selected pattern is deleted from the registered cycle step.

2-5-5. How to set skipping of a cycle step(s)

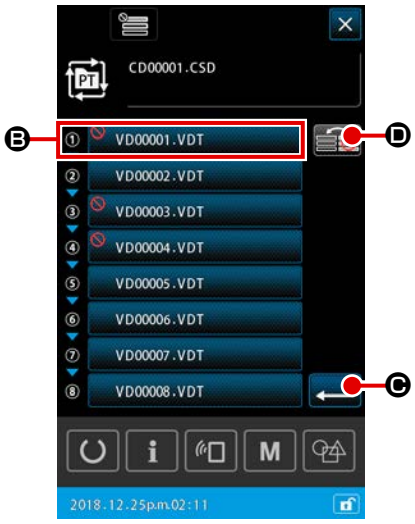
It is possible to set to skip a desired step(s).
Use this function in the case there is a step(s) that you want to temporarily skip without changing the registered step information for the cycle pattern.

① **Displaying the skip setting screen**

When SKIP SETTING button Ⓐ on the cycle pattern setting screen is pressed, the skip setting screen is displayed.

② **Carrying out the skip setting**

When PATTERN SELECTION button Ⓑ is pressed, the prohibition mark is displayed.
The step(s) for which the prohibition mark is displayed is/are skipped when sewing the cycle pattern.
When INVERSION button Ⓓ is pressed, all skip settings are inverted as “SKIP” to “NOT SKIP”.

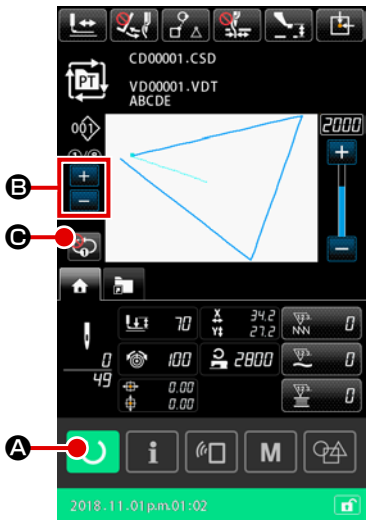


③ **Confirming the skip settings**

When ENTER button Ⓒ is pressed, the setting contents are confirmed. Then, the screen returns to the cycle pattern setting screen.

2-5-6. How to sew one step in repletion

It is possible to sew a desired step registered in a cycle pattern in repetition.
Use this function in the case there is a step(s) that you want to temporarily skip without changing the registered step information for the cycle pattern.



① **Displaying the cycle sewing screen**
Display the cycle pattern screen.
In the case the cycle pattern setting screen is displayed, press READY button Ⓐ to display the cycle pattern sewing screen.

② **Selecting the step to be sewn in repetition**
Select the step you want to sew in repletion by pressing CURRENT STEP CHANGEOVER button Ⓑ.

③ **Placing the sewing machine in the 1-step repeat mode**
When the repeat is enabled by pressing 1-STEP REPEAT button Ⓒ on the cycle pattern sewing screen, the step can be sewn in repletion without changing over the step at the end of sewing.
When the repeat is disabled, the sewing machine returns to the normal cycle pattern sewing operation.

2-6. List

1) Basic operation

① **Displaying the list screen**
When M button is pressed on the pattern setting screen, the list screen is displayed.

② **Exiting the list screen**
When CANCEL button Ⓑ or M button Ⓐ is pressed on the list screen, the list screen closes the list screen. Then, the screen returns to the pattern setting screen.

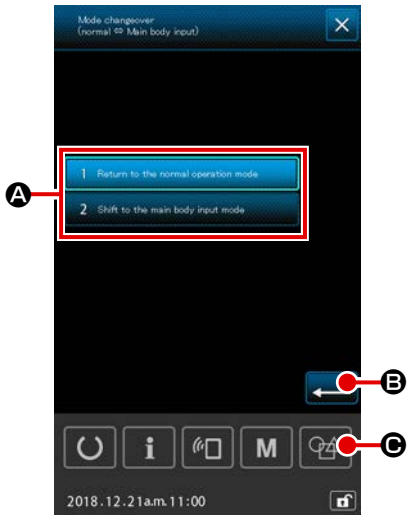
2) Table display list

The below-stated items are shown on the list screen.

No	Name of item	Overview
1	Mode changeover (Normal ⇔ Main-body input)	This item is used for changing over the input mode between the normal mode and the main-body input mode
2	Memory switch	This item is used for setting the memory switch data.
3	Counter setting	This item is used for setting the sewing counter, No. of pcs. counter and bobbin thread counter.
4	Clock setting	This item is used for setting the date and time.
15	Pattern shortcut key registration list	This item is used for registering the pattern shortcut key to a pattern.
16	Multi-function setting	Display / hide of the multi-function tab is set.

2-6-1. Changing over the input mode between the normal mode and the main-body input mode

The input mode can be changed over between the normal mode and the main-body input mode.



① **Displaying the mode changeover screen**
When "MODE CHANGEOVER (NORMAL ⇔ MAIN-BODY INPUT)" button Ⓐ is selected on the list screen, the mode changeover screen is displayed.

② **Confirming the mode**
When the desired mode is selected and confirmed by pressing Ⓑ, the current mode is changed over to the confirmed mode at the time the list screen is closed.

* In the case the memory switch "U405: Enable / disable of the shortcut to the main-body editing" is set to "enable", MAIN-BODY INPUT MOVE button Ⓒ is displayed. The input mode can be moved to the main-body input mode by pressing this key.

2-6-2. Memory switch

Memory switch data are the motion data that the sewing machine has in common and the data that operate on all sewing patterns in common.

(1) How to change the memory switch data

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U001	Max. sewing speed of the sewing machine		200 to 2,800	100 sti/min	2,800						
U002	Sewing speed for the 1st stitch of soft start (With the thread clamp)		200 to 900	100 sti/min	900						
U003	Sewing speed for the 2nd stitch of soft start (With the thread clamp)		200 to 2,800	100 sti/min	2,800						
U004	Sewing speed for the 3th stitch of soft start (With the thread clamp)		200 to 2,800	100 sti/min	2,800						
U005	Sewing speed for the 4th stitch of soft start (With the thread clamp)		200 to 2,800	100 sti/min	2,800						
U006	Sewing speed for the 5th stitch of soft start (With the thread clamp)		200 to 2,800	100 sti/min	2,800						
U008	Thread tension at the time of thread trimming		0 to 200	1	0						
U009	Setting of the tension changeover timing at the time of thread trimming (reference: 28 °) Set with 4 ° (TG resolution) + : Advanced - : Retarded		-24 to 16(°)	1 (°)	0						
U010	Sewing speed for the 1st stitch of soft start (Without the thread clamp)		200 to 900	100 sti/min	200						
U011	Sewing speed for the 2nd stitch of soft start (Without the thread clamp)		200 to 2,800	100 sti/min	600						

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U012	Sewing speed for the 3th stitch of soft start (Without the thread clamp)		200 to 2,800	100 sti/min	1,000						
U013	Sewing speed for the 4th stitch of soft start (Without the thread clamp)		200 to 2,800	100 sti/min	1,500						
U014	Sewing speed for the 5th stitch of soft start (Without the thread clamp)		200 to 2,800	100 sti/min	2,000						
U016	Thread tension changeover timing at the beginning of sewing (in the case of without thread clamping) (reference: 60 °) Set with 4 ° (TG resolution) + : Advanced - : Retarded		-20 to 8(°)	1 (°)	0						
U019	Thread tension for the 1st stitch at the beginning of sewing (With the thread clamp/ With the bird's nest reducing operation)		0 to 200	1	200						
U020	Thread tension for the 2nd stitch at the beginning of sewing (With the thread clamp/ With the bird's nest reducing operation)		0 to 200	1	200						
U021	Thread tension for the 3th stitch at the beginning of sewing (With the thread clamp/ With the bird's nest reducing operation)		0 to 200	1	200						
U022	Thread tension for the 1st stitch at the beginning of sewing (With the thread clamp)		0 to 200	1	0						
U023	Thread tension for the 2nd stitch at the beginning of sewing (With the thread clamp)		0 to 200	1	0						

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U024	Thread tension for the 3th stitch at the beginning of sewing (With the thread clamp)		0 to 200	1	0						
U026	2-step stroke position of the motor-controlled feeding frame		50 to 90	1	70						
U030	Setting of the thread tension output	0: Standard (linear) 1: Low-tension detailed setting 2: Hight-tension detailed setting	0 to 2	-	0						
U032	Buzzer selection	0: Without buzzer sound 1: Panel operating sound 2: Panel operating sound + error	0 to 2	-	2						
U033	Number of stitches to be sewn before the thread clamp releases the thread		1 to 7	1 stitch	2						
U034	Setting the thread clamp driving timing (reference: 80 °) Set with 4 ° (TG resolution) + : Advanced - : Retarded		-40 to 0(°)	1 (°)	0						
U035	Thread handling at the beginning of sewing	0: Thread clamping 1: Thread trimming 2: No handling	0 to 2	-	1						
U037	Selection of lifting of the feeding frame at the end of sewing	0: Feeding frame goes up after returning to the sewing start position 1: Feeding frame goes up and returns to the sewing start position 2: Feeding frame goes up when the feeding frame switch is pressed after returning to the sewing start position 3: Feeding frame goes up when the feeding frame switch is pressed after moving to the sewing start position / sewing machine starts sewing with the start switch	0 to 3	-	0						

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U038	Prohibition of lift of the feeding frame at the end of sewing	0: Normal 1: Prohibition of lift of the feeding frame	0 to 1	-	0						
U039	With/without origin retrieval at the end of sewing (for normal operation)	0: Without origin retrieval 1: With origin retrieval	0 to 1	-	0						
U040	With/without origin retrieval at the end of sewing (in the case of cycle sewing)	0: Without origin retrieval 1: With origin retrieval (on a pattern-by-pattern basis) 2: With origin retrieval (after the end of each cycle)	0 to 2	-	0						
U041	Selection of lift of the feeding frame by the temporary stop command	0: Feeding frame goes up 1: Feeding frame goes up with the feeding frame switch	0 to 1	-	0						
U042	Selection of the needle stop position	0: Upper position 1: Upper dead point position	0 to 1	-	0						
U046	Selection of prohibition of the thread trimming command control	0: Enable 1: Disable	0 to 1	-	0						
U048	Selection of return-to-origin at the time or return-to-origin operation	0: Straight-line return 1: Reverse-tracing of pattern data 2: Origin retrieval → Sewing start point	0 to 2	-	0						
U049	Selection of bobbin winding speed		800 to 2,000	100 sti/min	1,600						
U050	Setting of the length of thread remaining at the end of sewing	0: Standard 1: Long 2: Longer	0 to 2	-	0						
U051	Selection of enable / disable of wiper operation	0: Disable 1: Enable	0 to 1	-	1						
U055	Minimum jump distance to carry out thread trimming		0 to 12.8 mm	0.1 mm	0						

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U064	Method to set the XY enlargement / reduction ratio	0: Set in % 1: Set with actual dimension	0 to 1	-	0						
U068	Thread tension output time during setting of the thread tension value		0 to 20	1 stitch	20						
U069	Selection of bending position of thread clamp	0: S type 1: H type (thin thread) 2: H type (Medium) 3: H type (Thick thread)	0 to 3	-	0						
U070	Selection of thread clamping position	0: Standard (Front position) 1: Back position	0 to 1	-	1						
U071	Selection of enable / disable of thread breakage detection	0: Thread breakage detection is disabled 1: Thread breakage detection is enabled	0 to 1	-	1						
U072	Number of stitches to be sewn while the thread breakage detection is disabled at the beginning of sewing		0 to 15	1 stitch	8						
U073	Number of stitches to be sewn while the thread breakage detection is disabled during sewing		0 to 15	1 stitch	3						
U076	Selection of the feed method	0: Intermittent feed 1: Continuous feed 2: Constant speed feed	0 to 2	-	1						
U077	Setting of the feed timing (reference at the end of sewing)		-10 to 30	1	0						
U078	Setting of the feed timing (continuous feed)		-30 to 30(°)	1 (°)	0						
U079	Setting of the feed timing (constant speed feed)		-30 to 30(°)	1 (°)	0						
U081	Opening / closing of the feeding frame control pedal		0 to 99	1	0						

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U082	Opening / closing of the feeding frame control during temporary stop		0 to 99	1	0						
U084	With / without the latch for pedal switch 1	0: Without 1: With	0 to 1	-	1						
U085	With / without the latch for pedal switch 2	0: Without 1: With	0 to 1	-	1						
U086	With / without the latch for pedal switch 3	0: Without 1: With	0 to 1	-	1						
U087	With / without the latch for pedal switch 4	0: Without 1: With	0 to 1	-	1						
U088	Enlargement / reduction function mode	0: Prohibited 1: Increase / decrease of the number of stitches (pitch is fixed) 2: Increase / decrease of pitch (the number of stitches is fixed)	0 to 2	-	1						
U089	Inching travel function mode	0: Prohibited 1: Parallel travel 2: Travel to the retrofitted 2nd origin	0 to 2	-	2						
U094	Selection of upper dead point of needle during origin-retrieval / return-to-origin	0: Without 1: With	0 to 1	-	0						
U097	Temporary stop / thread trimming operation	0: Automatic thread trimming 1: Manual (thread trimming is carried out by pressing the stop switch again) 2: Manual (operation on the panel only)	0 to 2	-	1						
U101	Main motor XY feed synchronous control speed / pitch	0: 2800sti/min /3.5mm 1: 2200sti/min /3.5mm 2: 1800sti/min /3.5mm 3: 1300sti/min /3.5mm	0 to 3	-	0						

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U103	With / without the intermediate presser control	0: Without (Fixed to lowering) 1: With (Lowering according to the sewing data during operation) 2: With (Lowering regardless of forward / backward travel of the feed)	0 to 2	-	1						
U104	Intermediate presser lowering timing	0: Immediately before the start of sewing machine motor 1: Synchronized to lowering of the presser foot at the end of sewing (lowering if it is the sewing command position) 2: Synchronized to lowering of the presser foot at the end of sewing (always lowering)	0 to 2	-	0						
U105	Position of the intermediate presser / wiper operation	0: Wiper operates above the intermediate presser 1: Wiper operates above the intermediate presser (at the lower end position of intermediate presser) 2: Wiper operates under the intermediate presser	0 to 2	-	1						
U108	With / without the air pressure detection	0: Without 1: With	0 to 1	-	1						
U112	Setting of the lower position of intermediate presser		0 to 7.0	0.1 mm	3.5						
U129	With / without the needle cooler control	0: Without 1: With	0 to 1	-	1						
U145	Count completion closing time (for VER. update)		0 to 99	1 sec	0						
U170	Selection of unit for enlargement / reduction ratio	0: 0.01% 1: 0.1%	0 to 1	-	1						
U171	Reference point for enlargement / reduction	0: Reference point for enlargement / reduction in VDT 1: 2nd origin 2: Mechanical origin 3: Sewing starting position	0 to 3	-	0						

No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U206	Constant speed, feed ratio (5 mm or less)		70 to 100%	1%	100						
U207	Constant speed, feed ratio (more than 5 mm)		70 to 100%	1%	100						
U245	Number of stitches to be sewn before the grease runs out (higher-order 16 bits)	Number of counts increases on a stitch-by-stitch basis Clearing is only effective	0	-	0						
U263	Offset at the position before cutting (outward)		-100 to 100	1 pulse	0						
U264	Offset at the position before cutting (Inward)		-100 to 100	1 pulse	0						
U314	Timing at which the thread trimmer waits and moves before thread trimming at the beginning of sewing		-4 to 6	1	0						
U315	Timing at which the thread trimmer trims the thread at the beginning of sewing		-4 to 6	1	0						
U316	Sewing specification for thread trimming at the beginning of sewing	0: S type (standard) 1: H type (heavy-weight materials) 2: G type (extra heavy-weight materials)	0 to 2	-	S type	H type	S type	H type		S type	H type
U319	Number of stitches to be sewn before thread is trimmed at the beginning of sewing (stitches)		2 to 4	1 stitch	2						
U320	Timing to start the air blower		-90 to 90	1°	0						
U321	Duration of operation of the air blower after thread trimming		10 to 300	1 msec	40						
U322	Type of thread trimming	0: Standard type 1: Shorter-thread remaining type	0 to 1	-	0						
U330	Possible lowering height of the needle bar (degree of an angle from the lower dead point)		0 to 127	1°	84						

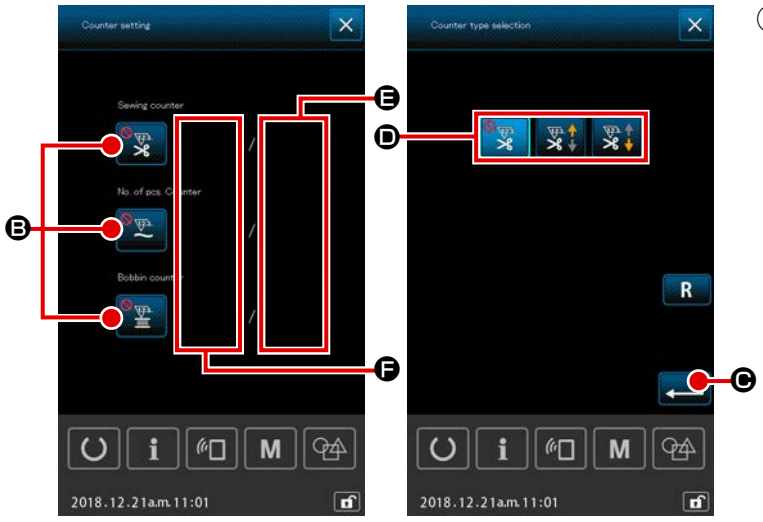
No.	Name	Selection item	Setting range	Unit & Meaning	Initial value						
					SS 2516	HS 2516	SL 2615	HL 2516	HS 3020	SL 2516 FU	HL 2516 FU
U400	Management of file names of patterns	0: Pattern numbers and file names 1: Only the pattern numbers	0 to 1	-	0						
U402	Automatic lock time		0 to 300	1 sec	0						
U403	Period of time to be elapsed before the backlight is turned OFF automatically		0 to 20	1	0						
U404	Period of time to be elapsed from the start of sewing to turning-OFF of the hand light		0 to 300	1	0						
U405	Enable / disable of shortcut to the main-body editing	0: Disable 1: Enable	0 to 1	-	1						
U406	Enable / disable of the position correction button	0: Disable 1: Enable	0 to 1	-	0						
U407	Enable / disable of the sewing data skip setting button	0: Disable 1: Enable	0 to 1	-	0						
U409	Brightness of the back light for operation panel		0 to 9	1	4						
U410	Brightness of the operation panel LED		0 to 9	1	4						
U415	Calendar display method	0: Year / month / day 1: Month / day / year 2: Day / month / year	0 to 2	-	0						
U416	Clock display method	0: 12-hour notation 1: 24-hour notation	0 to 1	-	0						
U500	Selection of language (15 different languages)	• Not selected (English) • Japanese • English • Chinese • Spanish • Portuguese • Italian • French • German • Turkish • Vietnamese • Khmer • Indonesian • Korean • Burmese • Russian	0 to 15	-	0						

2-6-3. Setting the counter

1) Basic operation

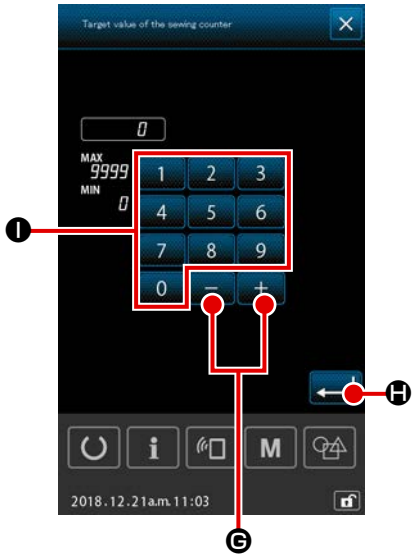
① Setting the counter

When COUNTER SETTING button 3 Counter setting Ⓐ is pressed on the list screen, the counter setting screen is displayed.



② Selecting the type of counter

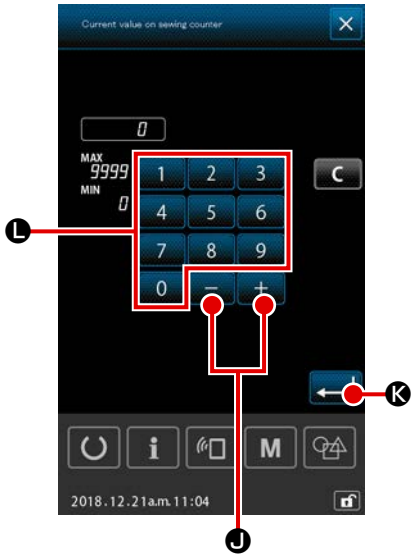
When COUNTER TYPE SELECTION button Ⓑ is pressed, the counter type selection screen is displayed. Select the desired type of counter Ⓓ and press ENTER button Ⓒ to confirm.



③ Setting the target value of counter

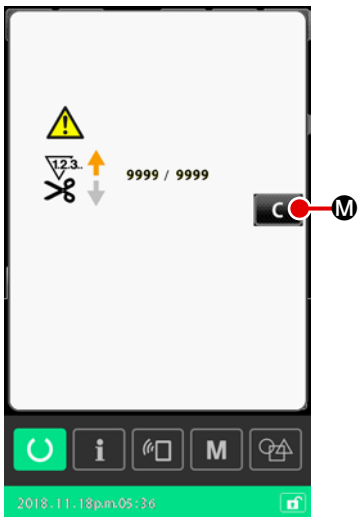
When TARGET VALUE SETTING button 0 Ⓔ is pressed, the counter target value input screen is displayed.

Enter a target value you desire with numeric keypad 0 to 9 Ⓘ, + / - button + – Ⓖ. Then, press ENTER button Ⓗ to confirm.



④ **Setting the current value of counter**

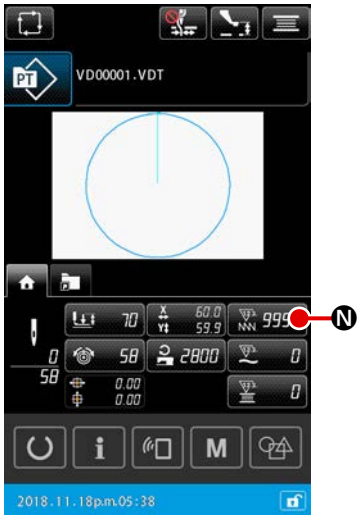
When CURRENT VALUE SETTING button [0] Ⓕ is pressed, the counter current value input screen is displayed. Enter the current value with numeric keypad [0] to [9] Ⓛ, + / - button [+] [–] Ⓙ. Then, press ENTER button [↵] Ⓚ to confirm.



2) "Count complete" error resetting procedure

If the "count complete" condition is reached, the "count complete" error screen will be displayed.
Reset the current value on the counter by pressing CLEAR button [C] Ⓜ. Then, the screen returns to the sewing screen.

In the case the close time has been set with the memory switch "U145: Count completion closing time", CLEAR button [C] Ⓜ will not be displayed.
In the case the close time has been set with the memory switch "U145: Count completion closing time", CLEAR button



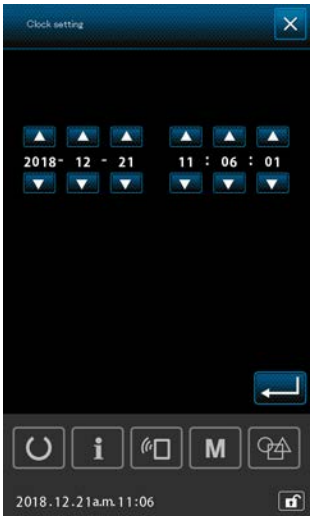
3) Counter current-value changing procedure during sewing

When the COUNTER CURRENT-VALUE button  Ⓝ, which is displayed on the pattern setting screen or on the HOME tab of sewing screen, is pressed, the current value of counter can be changed.

→ Refer to **"II-2-4-4. How to change the parameter" p.35**.

2-6-4. Setting the clock

Date and time of the clock can be set.



① Displaying the time setting screen

When TIME SETTING button  Ⓐ is pressed on the list screen, the time setting screen is displayed.

* It is possible to set the date (year, month, day) display method using the memory switch "U415: Calendar display method".

* It is possible to set the clock display method; either "12-hour notation" or "24-hour notation" using the memory switch "U416: Clock display method".

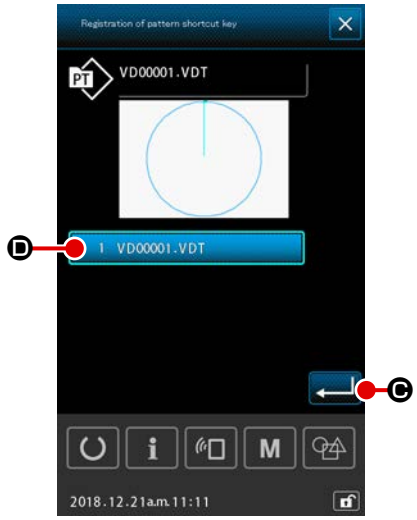
2-6-5. Registering the pattern shortcut key

Pattern that is saved in the sewing machine can be registered to PATTERN SHORTCUT key.
The registered patterns are displayed on the pattern setting screen or on the pattern shortcut tab of sewing screen to allow selection of the pattern.
Vector data and cycle pattern data can be registered to PATTERN SHORTCUT key. It is not possible to register one same pattern twice or more to PATTERN SHORTCUT key within one folder. It is possible, however, to register the same pattern in a different folder.

① **Displaying the pattern shortcut key registration screen**
When PATTERN SHORTCUT key registration button
15 List of registered pattern shortcut keys Ⓐ is selected from the menu list screen, the pattern shortcut registration screen is displayed.

② **Selecting the folder number for registration**
A folder in which a pattern is to be registered can be selected.

③ **Selecting the pattern to register**
When PATTEN REGISTRATION button
1 VD00001.VDT Ⓑ is pressed, the pattern list screen is displayed.



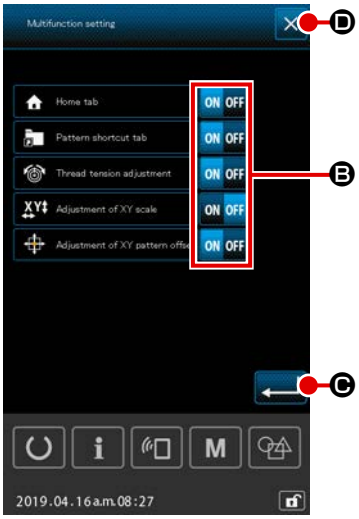
When PATTEN REGISTRATION button VD00001.VDT Ⓓ from the pattern list screen, and press ENTER button Ⓒ to confirm.

2-6-6. Setting the multi-function

For the multifunction setting, display / hide is set to each tab on the pattern setting screen and sewing screen.

① Displaying the multi-function setting screen

When 16 Multifunction setting Ⓐ is selected on the list screen, the multi-function setting screen is displayed.



② Setting display / hide of the tab

Display / hide is set with ON OFF Ⓑ of each tab.

ON OFF : Display

ON OFF : Hide

③ Confirming the content of change

When ↵ Ⓒ is pressed, the content of change is confirmed, and the screen returns to the list screen.

④ Cancelling the content of change

When ✕ Ⓓ is pressed, the change you have made is cancelled, and the screen returns to the list screen.

2-7. Using communication function

Communication function can download the sewing data created with other sewing machine, creation of sewing data and sewing data created by editing device PM-1 to the sewing machine. In addition, the function can upload the aforementioned data to the media.
The USB connection feature is available as the communication means.

2-7-1 Handling possible data

Sewing data that can be handled are 5 kinds below, and the respective data formats are as shown below.

Data name	Extension	Description
Vector data ()	××××××.VDT	It is the data of needle entry point created with PM-1, and the data format that can be operated in common between JUKI sewing machines.
M3 data ()	××××××.M3	Pattern data for the AMS-B, -C and -D Series
Standard format for sewing ()	××××××.DAT	Data of sewing standard format
Cycle pattern data ()	××××××.CSD	Data format containing two or more pieces of vector data.
Simplified program data ()	××××××.PRO	Simplified program data

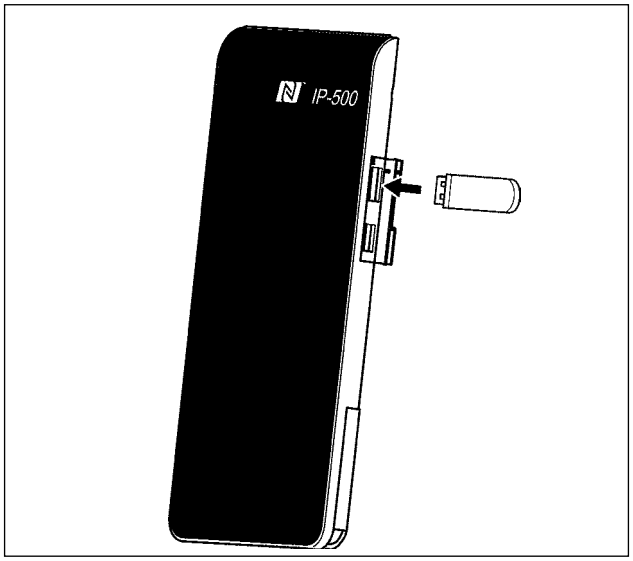
×××××× : Alphanumeric characters (For alphabets, case is ignored. The number of alphanumeric characters that can be entered is 16 or less including the extension.)

* For the simplified program, see the Engineer's Manual.

2-7-2. Performing communication by using the media

For handling way of the media, read **"II-1. PREFACE" p.21**.

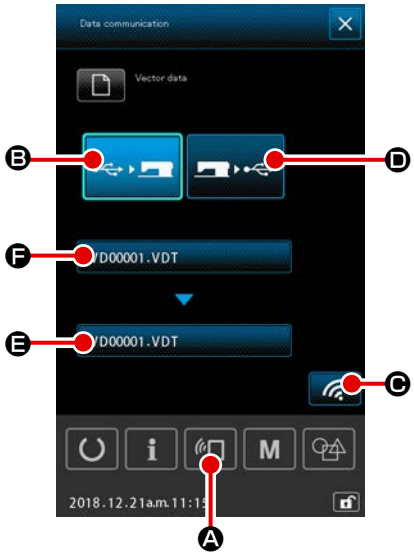
2-7-3. Performing communication by using USB

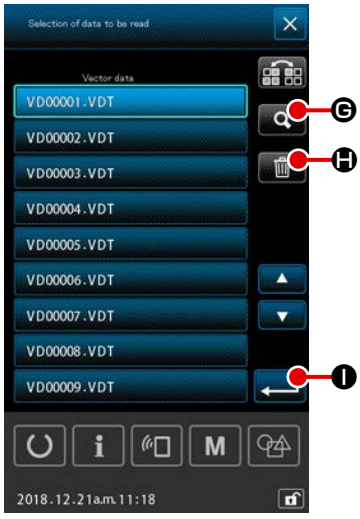


Data can be sent/received to/from a personal computer or the like, by means of a USB cable.

If the contact part becomes dirty, failure of contact will be caused. Do not touch by hand, and control so that dust, oil or other foreign material does not adhere to it. In addition, the inside element is damaged by static electricity or the like. So, be very careful when handling.

2-7-4. How to load data





* The following explanation is described taking the case of file-name management as an example.

① **Display the communication screen**

When communication switch Ⓐ of switch seat section is pressed in the data input screen, the communication screen is displayed.

② **Select the communication procedure**

There are two communication procedures as described below.

Ⓑ Writing data from media to panel

Ⓓ Writing data from panel to media

Select the communication means you want to use.

③ **Selecting the data file**

When Ⓕ is pressed, the write file selection screen is displayed.

Select the file name of the data you want to write.

It is possible to select two or more files. (Refer to the next page for details.)

The file being selected can be unselected by pressing the file name again.

In the case one file is selected, the following function can be used.

When CODE LIST button Ⓖ is pressed, the preview of the selected file is displayed.

When DELETE button Ⓗ is pressed, the selected file is deleted.

④ **Confirming the data file**

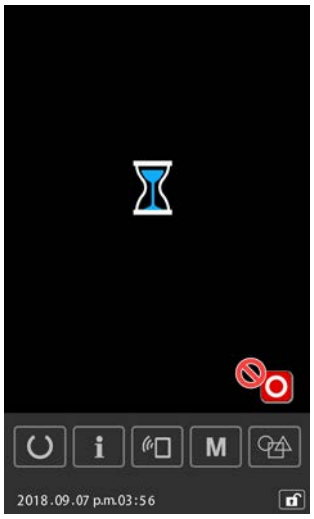
When ENTER button Ⓘ is pressed, the data file selection screen is closed to complete the file selection.

⑤ **Determining the destination file name**

The destination file name on the communication screen displays the file name that is same as the name of file to be written. If you do not want to change the file name, proceed to ⑥ .

When you want to change the file name, press Ⓔ on the communication screen and edit the file name on the destination file name input screen.

When ENTER button Ⓕ is pressed, the destination file name input screen is closed.



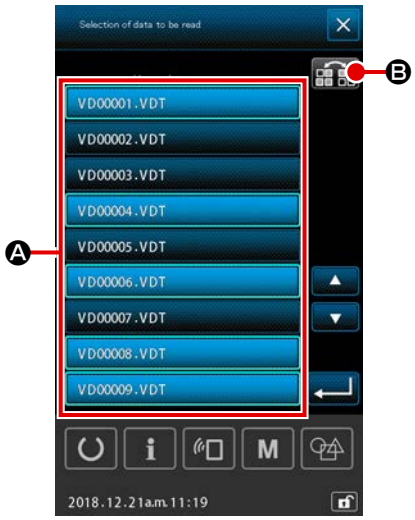
⑥ **Start the communication**

When COMMUNICATION START button Ⓒ is pressed, the data communication starts.

The during communication screen is displayed during communication and the screen returns to the communication screen after the end of communication.

2-7-5. Taking in plural data together

For the vector data, M3 data, sewing standard format data and cycle pattern data, two or more pieces of data can be selected at a time and written collectively.
The write destination file name becomes the same one as the selected file.

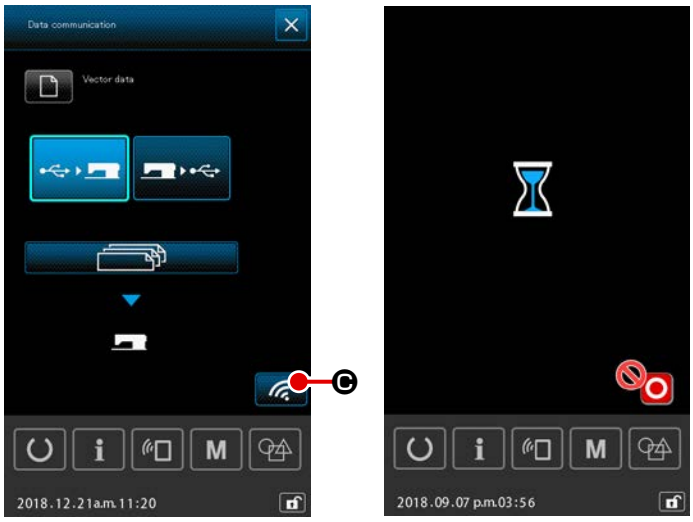


① **Display the data to be written on the file selection screen**

Select file name Ⓐ of the data to be written on the file selection screen.

* Two or more files can be selected.

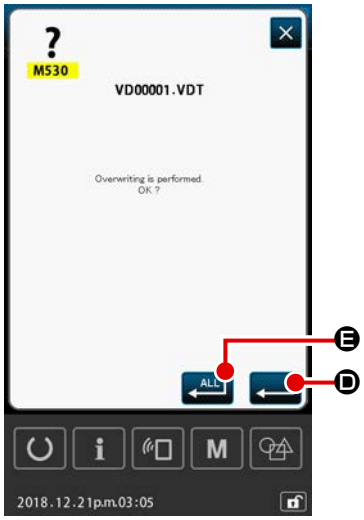
The file being selected can be unselected by pressing the file name again.
The selection status of the button can be displayed in reverse video with INVERSION button Ⓑ.



② **Start the communication**

When COMMUNICATION START button Ⓒ is pressed, the data communication starts.

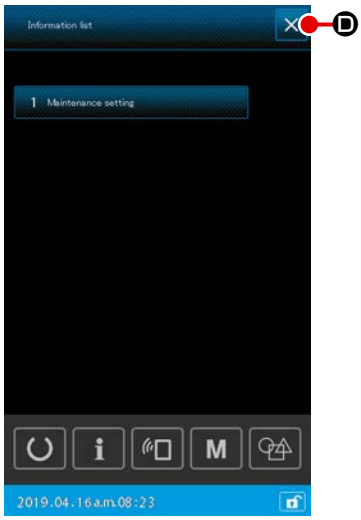
On the screen during communication, the file name(s) that are being communicated, the total number of pieces of written data and the number of pieces of data communication of which are completed are displayed.



* In the case a file is written to the existing file, the overwrite confirmation screen is displayed on a file-by-file basis.
When you want to overwrite the existing file, press ENTER button Ⓓ.

If you want to overwrite all existing data without displaying the overwrite confirmation screen in the subsequent steps of procedure, ENTER ALL button Ⓔ.

2-8. Information list



1) Basic operation

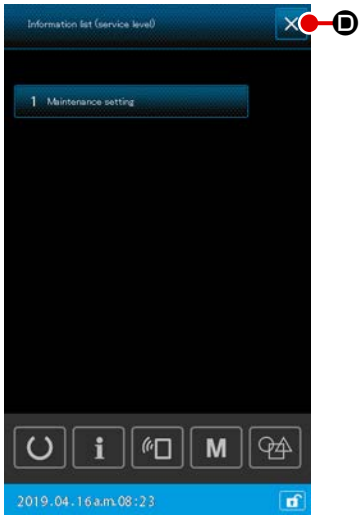
In this step of procedure, the information list screen is displayed. In the case of the operator level display, only the confirmation of set contents and clearing of the current value are possible. Setting cannot be changed on the operator level display.

① Displaying the information list screen

When [i] is pressed on the pattern setting screen, the information list screen is displayed.

② Exiting from the information list screen

When [×] Ⓓ is pressed on the information list screen, the information list screen is closed, and the screen returns to the pattern setting screen.



2) Display of the maintenance personnel level

It is necessary to display the information list screen (maintenance personnel level) in order to carry out setting of functions.

① Displaying the information list screen (maintenance personnel level)

When [i] is held pressed for three seconds on the pattern setting screen, the information list screen (maintenance personnel level) is displayed.

② Exiting from the information list screen (maintenance personnel level)

When [×] Ⓓ is pressed on the information list screen, the information list screen is closed, and the screen returns to the pattern setting screen.

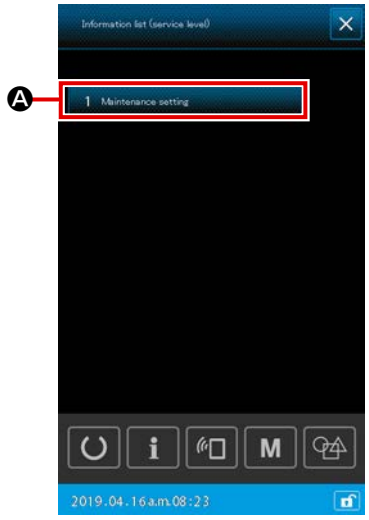
3) Information display list

The following items are displayed on the information list screen.

No	Name of item	Overview
1	Maintenance management setting	The warning screen is displayed according to the warning counter setting.

2-8-1. Maintenance personnel management setting

This is the function to display the warning screen when the counter reaches its target value.
As many as five warning items can be set.



1) Setting the warning counter

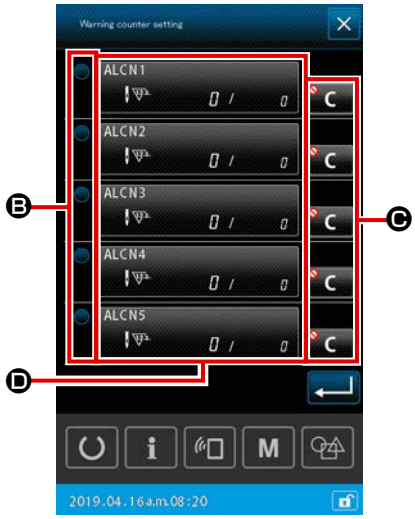
The warning level setting can be carried out on the screen shown in the case of the maintenance personnel level.

① Displaying the warning counter setting screen

When [i] is held pressed for three seconds on the pattern setting screen, the information list screen (maintenance personnel level) is displayed.

② Displaying the warning counter setting screen

When [1 Maintenance setting] Ⓐ is pressed on the information list screen, the warning counter setting screen is displayed.



③ Setting enable / disable of the warning counter

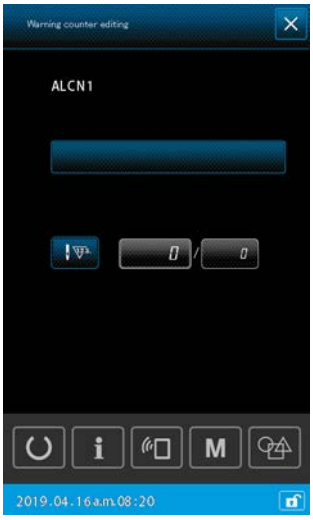
It is possible to select enable / disable of the warning counter with [ ] Ⓑ. Every time [ ] Ⓑ is pressed, enable / disable status of the warning counter is changed over.

- When the warning counter is enabled, the counter carries out counting.
- When the warning counter is disabled, the counter does not carry out counting.

④ Setting display / hide of the clear button when the warning screen is displayed

It is possible to select display / hide of the clear button with [C] Ⓒ when the warning screen is displayed.

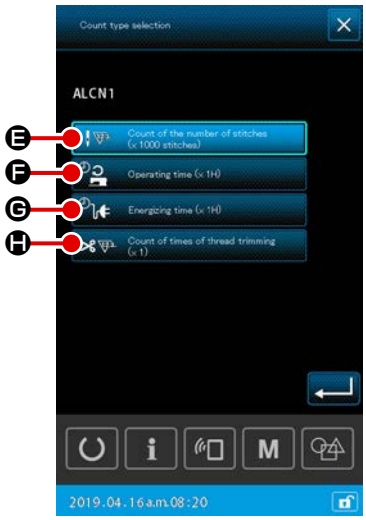
Every time [C] Ⓒ is pressed, display / hide status of the clear button is changed over.



⑤ Editing the warning counter

When Ⓓ is pressed, the warning counter edit screen is displayed.

The following items can be set on the warning counter edit screen.



When the warning counter count condition setting button is pressed, the counter type selection screen is displayed.

On the counter type selection screen, count condition of the warning counter can be selected.

	Count condition	Unit
Ⓔ	Number of stitches	1000 (stitches)
Ⓕ	Operating time	1 H
Ⓖ	Energizing time	1 H
Ⓗ	Thread trimming counting	1 time

3. ERROR CODE LIST

Error code	Description of error	Display message	How to recover	Place of recovery
E007	**Machine lock** Main shaft of the sewing machine fails to rotate due to some trouble	Machine is locked.	Turn OFF the power	
E008	**Head connector abnormality** Memory of machine head cannot be read.	Undefined head is selected.	Turn OFF the power	
E010	**Pattern No. error** Pattern No. which is backed up is not registered to data ROM, or setting of reading inoperative is performed.	Specified pattern does not exist.	Possible to re-enter after reset.	Previous screen
E011	**External media not inserted** External media is not inserted.	Media is not inserted.	Possible to re-enter after reset.	Previous screen
E012	**Read error** Data read from external media cannot be performed.	Data cannot be read.	Possible to re-start after reset.	Previous screen
E013	**Write error** Data write from external media cannot be performed.	Data cannot be written.	Possible to re-start after reset.	Previous screen
E015	**Format error** Format cannot be performed.	Formatting is impossible.	Possible to re-start after reset.	Previous screen
E016	**External media capacity over** Capacity of external media is short.	Capacity is insufficient. (media)	Possible to re-start after reset.	Previous screen
E017	**Machine memory capacity over** Machine memory capacity is insufficient.	Capacity is insufficient. (Machine)	Possible to re-start after reset.	Previous screen
E019	**File size over** File is too large.	Pattern data is too large. (Approx. 50000 stitches)	Possible to re-start after reset.	Previous screen

Error code	Description of error	Display message	How to recover	Place of recovery
E024	**Pattern data size over** Memory size is over.	Memory capacity has run out.	Possible to re-start after reset.	Data input screen
E030	**Needle bar position missing error** Needle bar is not in the predetermined position.	Needle is not in a proper position.	Turn hand pulley to bring needle bar to its predetermined position.	Data input screen
E031	**Air pressure drop** Air pressure is dropped.	Low air pressure.	Re-start is enabled after resetting the machine following the restoration of the air pressure.	Previous screen
E032	**File interchanging error** File cannot be read.	File cannot be read.	Possible to re-start after reset.	Data input screen
E040	**Sewing area over**	Move limit is exceeded.	Possible to re-start after reset.	Sewing screen
E043	**Enlarging error** Sewing pitch exceeds Max. pitch.	Max. Pitch is exceeded.	Possible to re-start after reset.	Data input screen
E045	**Pattern data error**	Pattern data no good.	Possible to re-start after reset.	Data input screen
E050	**Stop switch** When stop switch is pressed during machine running.	Temporary stop switch is pressed.	Possible to re-start after reset.	Step screen
E052	**Thread breakage detection error** When thread breakage is detected.	Thread breakage is detected.	Possible to re-start after reset.	Step screen
E061	**Memory switch data error** Memory switch data is broken or revision is old.	Memory switch data error.	Turn OFF the power	
E080	**External stop switch**	External stop switch has been pressed	Possible to re-start after reset.	Step screen

Error code	Description of error	Display message	How to recover	Place of recovery
E096	**Bobbin thread change neglection error**	Bobbin thread counter was reset. Still, the sensor has detected the error level.	Possible to re-start after reset.	Previous screen
E097	**Reduction of stitch skipping sensor light quantity**	Light quantity of stitch skipping sensor has decreased.	Possible to re-start after reset.	Previous screen
E098	**Detection of incorrect position of stitch skipping sensor**	Stitch skipping sensor is blocked out at an angle that is out of its effective range.	Possible to re-start after reset.	Previous screen
E099	**Stitch skipping error**	Stitch skipping sensor has detected stitch skipping.	Possible to re-start after reset.	Previous screen
E220	**Grease-up warning** When the sewing machine has sewn fifty million stitches. → Refer to **"III-1-10. Replenishing the designated places with grease" p.111**.	Important: Grease is running out. Add grease.	Possible to re-start after reset.	Data input screen
E221	**Grease-up error** When the sewing machine sews sixty million stitches, sewing is disabled. It is possible to clear with memory switch U245 . → Refer to **"III-1-10. Replenishing the designated places with grease" p.111**.	Important: Grease has run out. Add grease.	Possible to re-start after reset.	Data input screen
E302	**Head tilt confirmation** When head tilt sensor is OFF.	Head is tilted.	Possible to re-start after reset.	Previous screen
E307	**External input command time out error** Input is not performed for a fixed period of time with the external input command of vector data.	There is no input for a certain period of time with external input command of vector data.	Possible to re-start after reset.	Data input screen
E308	**Time-out error of wait terminal** There is no input to wait terminal for a certain period of time.	There is no input from wait terminal for a certain period of time.	Turn OFF the power	
E372	**Offset amount error** Offset amount at the time of pattern correction has exceeded the upper limit.	Offset amount is too large. (Correct the pattern)	Possible to re-start after reset.	Previous screen

Error code	Description of error	Display message	How to recover	Place of recovery
E373	**Rotation amount error** Rotation amount at the time of pattern correction has exceeded the upper limit.	Rotation rate is too large. (Correct the pattern)	Possible to re-start after reset.	Previous screen
E374	**Scale ratio error** When the scale ratio does not fall within the specified range at the time of pattern correction.	Scale factor is out of range. (Correct the pattern)	Possible to re-start after reset.	Previous screen
E406	**Password mismatch error**	Password does not match. Re-enter password from the beginning.	Possible to re-start after reset.	Password input screen
E415	**File name null character error** No character is specified for the file name.	Input the file name.	Possible to re-start after reset.	Character input screen
E417	**Keylock reset error** Keylock cannot be reset.	Keylock could not be released	Possible to re-start after reset.	Previous screen
E418	**Renaming disabled error** Renaming is disabled since the original name is used for cycle data.	Data is used for cycle data, therefore cannot be renamed	Possible to re-start after reset.	Previous screen
E703	**Panel is connected to the sewing machine which is not supposed. (Machine type error)** When the machine type code of system is not proper in the initial communication.	Model of sewing machine is different from that of panel.	Possible to rewrite program after pressing down communication switch.	Commu-nication screen
E704	**Inconsistency of system version** System software version is inconsistent in the initial communication.	Version of program incompatible.	Turn the power OFF (Program can be rewritten after pressing the communication button).	Commu-nication screen
E731	**Main motor hole sensor is defective or position sensor is defective.** Hole sensor or position sensor of the sewing machine motor is defective.	Sewing machine motor is defective. (Encoder U V and W phases)	Turn OFF the power	
E733	**Reverse rotation of main shaft motor** When sewing machine motor rotates in reverse direction.	Sewing machine motor runs in the reverse direction.	Turn OFF the power	
E811	**Overvoltage** When input power is more than the specified value.	Input voltage is too high. (Check input voltage.)	Turn OFF the power	

Error code	Description of error	Display message	How to recover	Place of recovery
E813	**Low voltage** When input power is less than the specified value.	Input voltage is too low. (Check input voltage.)	Turn OFF the power	
E814	**24 V overvoltage**	Overvoltage of 24-V power supply is detected	Turn OFF the power	
E815	**33 V overvoltage**	Overvoltage of 33-V power supply is detected	Turn OFF the power	
E816	**24 V low voltage**	Low-voltage of 24-V power supply is detected	Turn OFF the power	
E817	**33 V low voltage**	Low-voltage of 33-V power supply is detected	Turn OFF the power	
E822	**X motor overvoltage error**	Overvoltage of X feed motor is detected	Turn OFF the power	
E823	**Y motor overvoltage error**	Overvoltage of Y feed motor is detected	Turn OFF the power	
E824	**Thread trimming motor overvoltage error**	Overvoltage of thread trimmer motor is detected	Turn OFF the power	
E825	**Thread clamp motor overvoltage error**	Overvoltage of thread clamp motor is detected	Turn OFF the power	
E826	**Intermediate presser motor overvoltage error**	Overvoltage of intermediate presser motor is detected	Turn OFF the power	
E830	**X motor low voltage error**	Low-voltage of X-feed motor is detected	Turn OFF the power	

Error code	Description of error	Display message	How to recover	Place of recovery
E831	**Y motor low voltage error**	Low-voltage of Y-feed motor is detected	Turn OFF the power	
E832	**Thread trimming motor low voltage error**	Low-voltage of thread trimmer motor is detected	Turn OFF the power	
E833	**Thread clamp motor low voltage error**	Low-voltage of thread clamp motor is detected	Turn OFF the power	
E834	**Intermediate presser motor low voltage error**	Low-voltage of intermediate presser motor is detected	Turn OFF the power	
E900	**Main shaft IMP overcurrent protection**		Turn OFF the power	
E902	**Main shaft overcurrent**		Turn OFF the power	
E907	**X feed motor origin retrieval error** When origin sensor signal is not inputted at the time of origin retrieval motion.	Origin of X motor cannot be found. (X origin sensor)	Turn OFF the power	
E908	**Y feed motor origin retrieval error** When origin sensor signal is not inputted at the time of origin retrieval motion.	Origin of Y motor cannot be found. (Y origin sensor)	Turn OFF the power	
E911	**Thread trimming motor origin retrieval error**		Turn OFF the power	
E912	**Main shaft motor speed detection error**		Turn OFF the power	
E913	**Thread clamp origin retrieval error** When origin sensor signal is not inputted at the time of origin retrieval motion.	Origin of thread clamp motor cannot be foun (Thread clamp origin sensor)	Turn OFF the power	

Error code	Description of error	Display message	How to recover	Place of recovery
E914	**Feed defective error** Timing lag between feed and main shaft occurs.	X/Y feed trouble is detected.	Turn OFF the power	
E915	**Communication error between the operation panel and the main CPU** When a communication fault occurs.	Communication is impossible. (Panel – MAIN P.C.B.)	Turn OFF the power	
E918	**MAIN p. c. b. overheat** Overheat of MAIN p. c. b. Turn ON the power again after taking time.	Main P.C.B. temperature is too high.	Turn OFF the power	
E925	**Intermediate presser motor origin retrieval error** Origin sensor of intermediate presser motor does not change at the time of origin retrieval.	Origin of intermediate presser cannot be four (Intermediate presser origin sensor)	Turn OFF the power	
E926	**X motor position slip error**	X-feed motor position is off.	1. In case of error display during sewing Possible to re-start after reset 2. In case of error display after end of sewing Possible to re-start after reset 3. In case of others Turn OFF the power.	1. Step screen 2. Sewing screen 3. -------
E927	**Y motor position slip error**	Y-feed motor position is off.	1. In case of error display during sewing Possible to re-start after reset 2. In case of error display after end of sewing Possible to re-start after reset 3. In case of others Turn OFF the power.	1. Step screen 2. Sewing screen 3. -------
E928	**Thread trimming motor position slip error**	Thread trimming motor position is off.	Turn OFF the power	
E929	**Thread clamp motor out-of-position error**	Thread clamp motor position is off.	Turn OFF the power	

Error code	Description of error	Display message	How to recover	Place of recovery
E930	**Intermediate presser motor position slip error**	Intermdediate presser motor position is off	Turn OFF the power	
E931	**X motor overload error**	X-feed motor overload is excessive.	Turn OFF the power	
E932	**Y motor overload error**	Y-feed motor overload is excessive.	Turn OFF the power	
E933	**Thread trimming motor overload error**	Thread trimming motor overload is excessive	Turn OFF the power	
E934	**Thread clamp motor overload error**	Thread clamp motor overload is excessive.	Turn OFF the power	
E935	**Intermediate presser motor overload error**	Intermediate presser motor overload is excessive.	Turn OFF the power	
E946	**HEAD RELAY p.c.b. trouble** When data writing to HEAD RELAY p.c.b. cannot be performed	Head P.C.B. is defective.	Turn OFF the power	
E980	**X axis travel completion timeout** Operation of the X feed motor has not been completed in time.	Operation of X feed motor has not completed within predetermined time	Turn OFF the power	
E981	**Y axis travel completion timeout** Operation of the Y feed motor has not been completed in time.	Operation of Y feed motor has not completed within predetermined time	Turn OFF the power	
E985	**Main shaft overload error**	Main shaft overload error has occurred	Turn OFF the power	
E986	**X motor overcurrent error**	Overcurrent of X feed motor is detected	Turn OFF the power	

Error code	Description of error	Display message	How to recover	Place of recovery
E987	**Y motor overcurrent error**	Overcurrent of Y feed motor is detected	Turn OFF the power	
E988	**Thread trimming motor overcurrent error**	Overcurrent of thread trimmer motor is detected	Turn OFF the power	
E989	**Thread clamp motor overcurrent error**	Overcurrent of thread clamp motor is detected	Turn OFF the power	
E990	**Intermediate presser motor overcurrent error**	Overcurrent of intermediate presser motor is detected	Turn OFF the power	
E991	**X motor abs encoder communication error**	X feed motor absolute encoder communication error has occurred	Turn OFF the power	
E992	**Y motor abs encoder communication error**	Y feed motor absolute encoder communication error has occurred	Turn OFF the power	
E993	**Thread trimming motor abs encoder communication error**	Thread trimmer motor absolute encoder communication error has occurred	Turn OFF the power	
E994	**Thread clamp motor abs encoder communication error**	Thread clamp motor absolute encoder communication error has occurred	Turn OFF the power	
E995	**Intermediate presser motor abs encoder communication error**	Intermediate presser motor absolute encoder communication error has occurred	Turn OFF the power	
E996	**SPI communication error between the MAIN and PANEL**	SPI communication error between MAIN CPU and Panel has occurred	Turn OFF the power	
E997	**SPI communication error between the MAIN and SUB**	SPI communication error between MAIN CPU and SUB CPU has occurred	Turn OFF the power	

4. MESSAGE LIST

Message No.	Display message	Description
M507	Presser is moved. OK ?	**Confirmation of travel of the presser foot)** Are you sure you want to move the presser foot?
M519	Deleting is performed. OK ?	**Confirmation of deletion of registered NFC terminal**
M520	Erasing is performed. OK ?	**Erase confirmation of Users' pattern** Erase is performed. OK ?
M522	Erasing is performed. OK ?	**Erase confirmation cycle pattern** Erase is performed. OK ?
M523	Pattern data has been changed.	**Confirmation of content of pattern change** Pattern data has been changed. (Cancellation of the change / Storage of the change)
M528	Pattern data has been changed.	**Overwriting confirmation of users' pattern** Overwriting is performed. OK ?
M530	Overwriting is performed. OK ?	**Overwriting confirmation of vector data of panel/ M3 data/sewing standard format data/simplified program data** Overwriting is performed. OK ?
M531	Overwriting is performed. OK ?	**Overwriting confirmation of vector data of media/ M3 data/sewing standard format data/simplified program data** Overwriting is performed. OK ?
M534	Overwriting is performed. OK ?	**Overwriting confirmation of adjustment data of media and all machine data** Overwriting is performed. OK ?

Message No.	Display message	Description
M537	Deleting is performed. OK ?	**Deletion confirmation of thread tension command** Deleting is performed. OK ?
M538	Deleting is performed. OK ?	**Deletion confirmation of intermediate presser increase/decrease value** Deleting is performed. OK ?
M542	Formatting is performed. OK ?	**Format confirmation** Formatting is performed. OK ?
M544	Data does not exist.	**Data corresponding to panel does not exist.** Data does not exist.
M545	Data does not exist.	**Data corresponding to media does not exist.** Data does not exist.
M556	Key-lock customization data are to be initialized. OK?	**Confirmation of initialization of the customized data** Are you sure you want to initialize the customized keylock data?
M557	Erasing is performed. OK ?	**Confirmation of clearance of password setting** Clears password Yes or no
M616	Enter a registration name.	**Confirmation of input of registration of NFC terminal name** Enter the registration name.
M622	Are you sure you want to execute clearing?	**Confirmation of clearing of the warning counter** Are you sure you want to clear the warning counter?

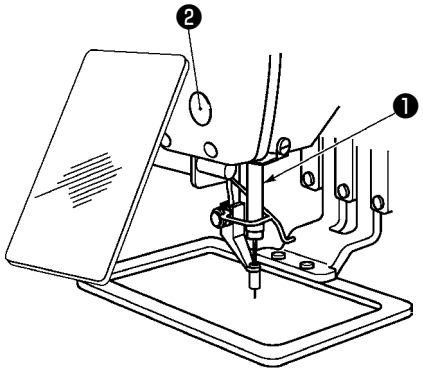
Message No.	Display message	Description
M623	Motor encder is too clse to orgn when passing orgn sensor. Shift its angle by a half turn from current one	**Motor installation angle fault** The motor encode value is too close to the origin when the motor passes the origin sensor. Shift the motor installation angle by a half rotation from the current position.
M624	Detach motor from main body of sewing machine. Then, carry out adjustment	**Confirmation of shift to the magnetic pole detection mode** Firstly detach the motor from the main body of sewing machine. Then, carry out adjustment.
M626	File name to be reset is returned to unregistered. Are you sure you want to do so?	**Confirmation of clearing of the USB resetting file name**
M653	Formatting is performed.	**During formatting** Formatting is performed.
M669	Data is being read.	**During data reading** Data is being read.
M670	Data is being written.	**During data writing** Data is being written.
M671	Data is being converted.	**During data converting** Data is being converted.

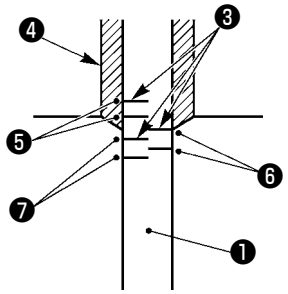
III. MAINTENANCE OF SAWING MACHINE

1. MAINTENANCE

1-1. Adjusting the height of the needle bar (Changing the length of the needle)

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





❺ : Marker line for DP×5
❻ : Market line for DP×17 (with needle count higher than #22)
❼ : Marker line for DP×17 (with needle count lower than #22)

*** Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.**

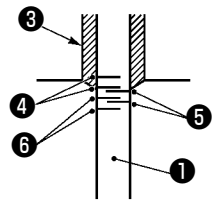
1) Bring needle bar ❶ down to the lowest position of its stroke. Loosen needle bar connection screw ❷ and adjust so that the upper marker line ❸ engraved on the needle bar aligns with the bottom end of the needle bar bushing lower ❹ .
2) As illustrated in the above figure, change the adjusting position in accordance with the needle count.

After the completion of adjustment, turn the hand pulley to check to make sure that there is no torque irregularity.

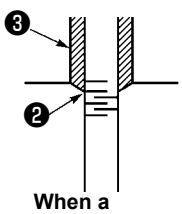
1-2. Adjusting the needle-to-shuttle relation

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

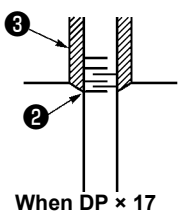
Relation between the needle and the marker lines on the needle bar



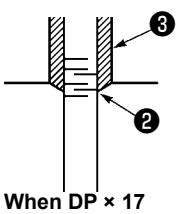
❹ : Marker line for DP × 5 needle
❺ : Marker line for DP × 17 needle (with needle count higher than #22)
❻ : Marker line for DP × 17 needle (with needle count lower than #22)



When a DP × 5 needle is used.



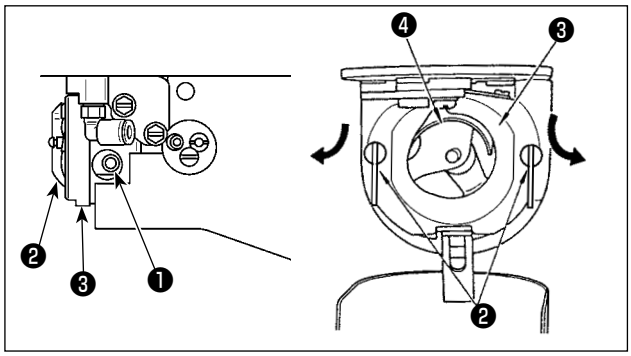
When DP × 17 needle (of which needle count is lower than #22) is used.



When DP × 17 needle (of which needle count is higher than #22) is used.

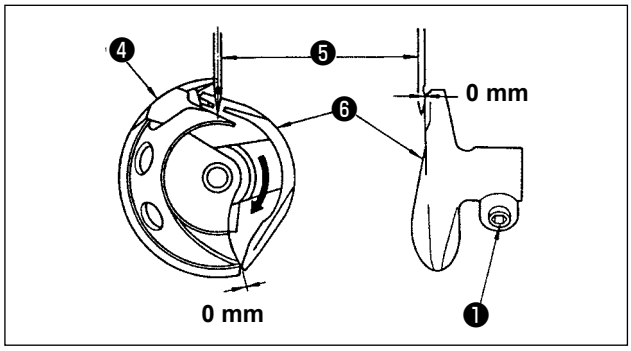
*** Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.**

1) Turn handwheel by hand to ascend the needle bar ❶ .
Adjust so that lower marker line ❷ on the ascending needle bar aligns with the bottom end of the needle bar bushing lower.

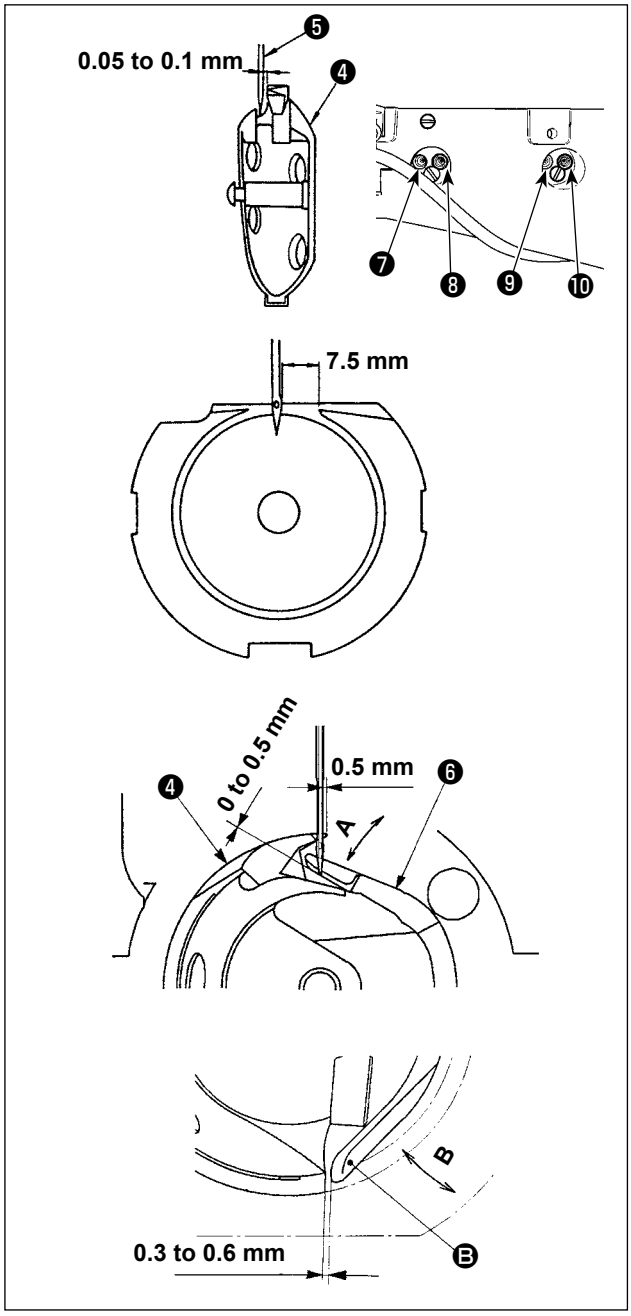


2) Loosen setscrew ❶ in the driver. Drawing bobbin case opening lever hook ❷ toward you, open it to the right and left until bobbin case opening lever ❸ comes off.

> **Caution** **At this time, be careful not to let shuttle ❹ come off and fall.**



3) Driver ❻ receives the needle on its front end face to prevent the needle from bending. Adjust so that the blade point of shuttle ❹ is aligned with the center of needle ❺ and so that a clearance provided between the front end face of driver and the needle becomes almost 0 (zero) mm. Then, tighten setscrew ❶ of driver.



4) Loosen hook driving shaft s ❾ . Adjust the longitudinal position of driver ❻ by turning driver adjustment screw ❿ clockwise or counterclockwise.
Adjust the clearance mentioned in the above step 3) to 0 (zero) mm. Then, tighten hook driving shaft setscrew ❾ .

5) Loosen shuttle race screw ❼ , and adjust the longitudinal position of the shuttle race. To do this adjustment, turn shuttle race adjusting shaft ❽ clockwise or counterclockwise to provide a 0.05 to 0.1 mm clearance between needle ❺ and the blade point of shuttle ❹ .

6) After adjusting the longitudinal position of shuttle race, further adjust to provide a 7.5 mm clearance between the needle and the shuttle race. Then, tighten screw ❼ of shuttle race.

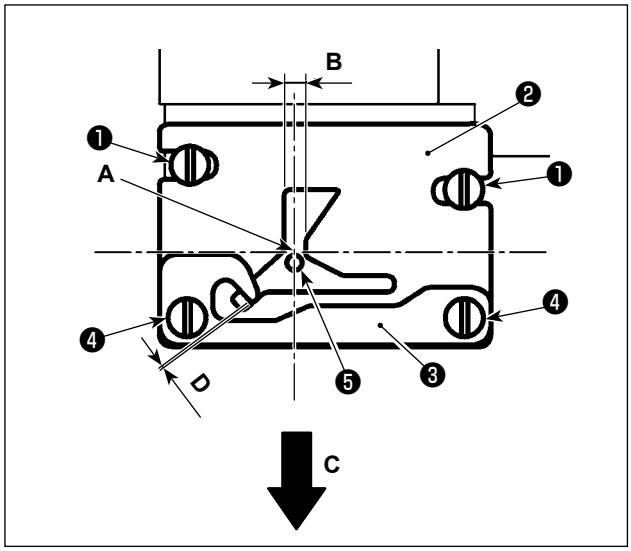
7) When changing the number of needle from the number at the time of standard delivery or using a new driver, perform the adjustment of the height of driver.

[Adjustment of height of driver]

1) Adjust so that the blade point of inner hook ❹ meets the center of needle ❺ and tighten setscrew ❶ .
2) Bend the needle guard section of driver ❻ in the direction of arrow **A** so that the protruding amount from the bottom end of the needle guard section of driver ❻ to the tip of needle ❺ is 0 to 0.5 mm when the blade point of inner hook ❹ is out by 0.5 mm from the right end of needle ❺ .
3) Bend rear end Ⓑ of driver ❻ in the direction **B** so that the clearance between rear end Ⓑ of driver ❻ and inner hook ❹ is 0.3 to 0.6 mm.
4) Carry out adjustment following the steps 3) to 6) on the previous page.

1. When making the needle size thicker, confirm the clearance between the needle tip or the intermediate presser and the wiper. Wiper cannot be used unless the clearance is secured. In this case, turn OFF the wiper switch, or change the set value of memory switch U105.
2. When the height of the needle guard of the driver is not proper, abrasion of the blade point of inner hook or stitch skipping will be caused.

[Adjusting the shuttle race upper spring]



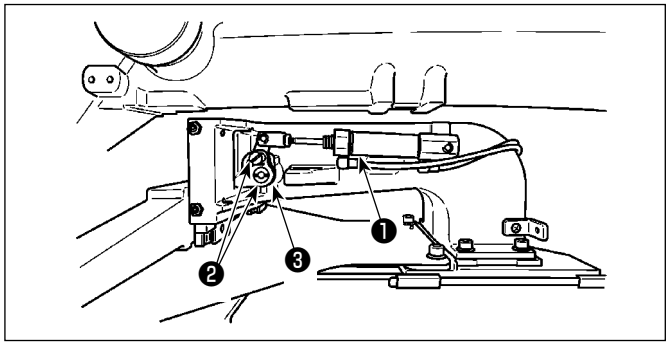
1) Detach throat plate ❶ . Adjust the position of the shuttle race upper spring with setscrews ❷ (two pieces).
For the adjustment of the lateral position of the shuttle race upper spring, align the center ❺ of needle with the center of groove width **B**.
For the adjustment of the longitudinal position of the shuttle race upper spring, align the rear end of needle with corner **A** portion.

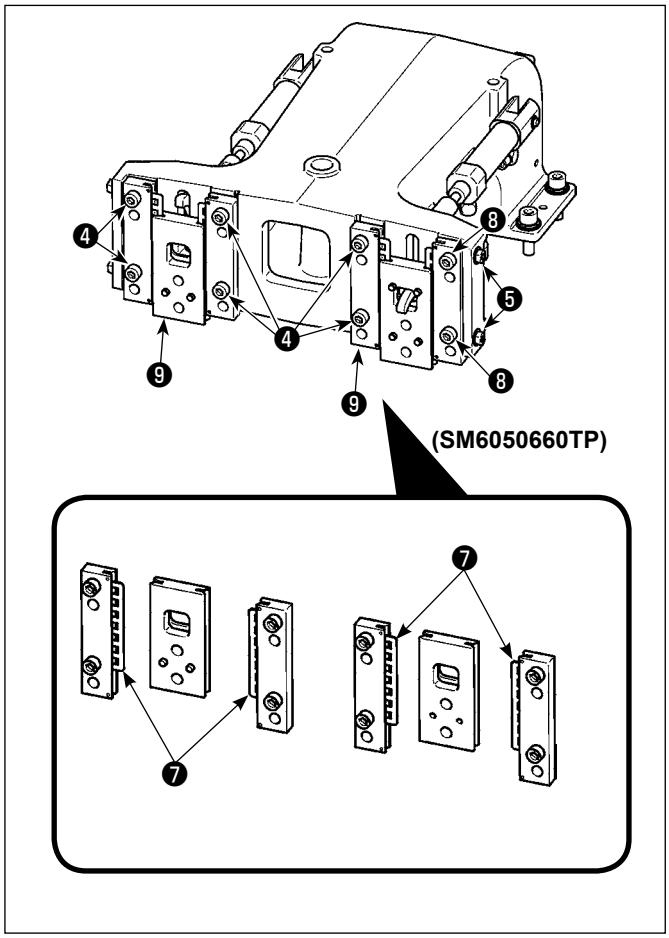
2) Adjust the overlapping amount **D** between bobbin thread retaining plate ❸ and shuttle race upper spring ❷ , with setscrew ❹ , so that the thread can be smoothly passed when the thread is drawn in the direction of arrow **C**. Then, secure the shuttle race upper spring with setscrews ❷ (two pieces).

The lateral position of shuttle race upper spring ❷ is likely to change when adjusting the hook timing. It is, therefore, necessary to adjust the position of shuttle race upper spring ❷ after the completion of adjustment as described in "III-1-2. Adjusting the needle-to-shuttle relation" p.100, 101.

1-3. Adjusting the height of the feeding frame

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





1) Loosen setscrews ❷ located on the right and left sides of feed bracket ❶ . Moving cloth presser link ❸ to the direction A will decrease the height of the feeding frame.
2) After the adjustment of the height of the feeding frame, securely tighten the screws ❷ .

If the feeding frame still interferes with the face plate bearing and the feeding frame height does not change after the adjustment of the position of work clamp link, adjust the pressure applied to the face plate bearing to lower it as far as no lateral play of the feeding frame occur.

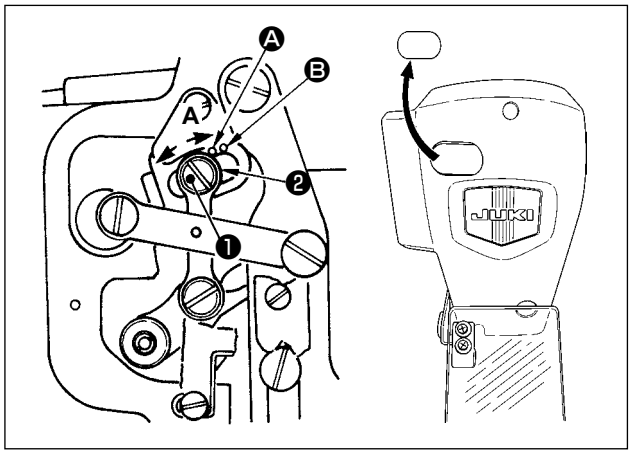
At the time of delivery, work clamp foot has been moved up and down to adjust the torque (sliding torque) of face plate bearing ❼ to 0.98 to 7.84 N (100 to 800 g) applied when work clamp foot starts moving after face plate bearing ❼ has come in contact with the spring pin.

1. Loosen the setscrew ❹ .
2. Loosen nut ❽ . Apply pressure to bed slide bearing ❼ by slightly tightening pressurization adjusting screw ❺ . At that time, move the presser foot face plate ❻ vertically, making sure that uneven application of torque can be avoided.
3. Tighten setscrews ❹ . Tighten nut ❽ .

When the setscrew ❹ is tightened, pressure kept applied to the face plate bearing ❼ is changed. Therefore, when the setscrew ❹ is tightened, examine the amount of the slippage torque.

1-4. Adjusting the vertical stroke of the intermediate presser

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



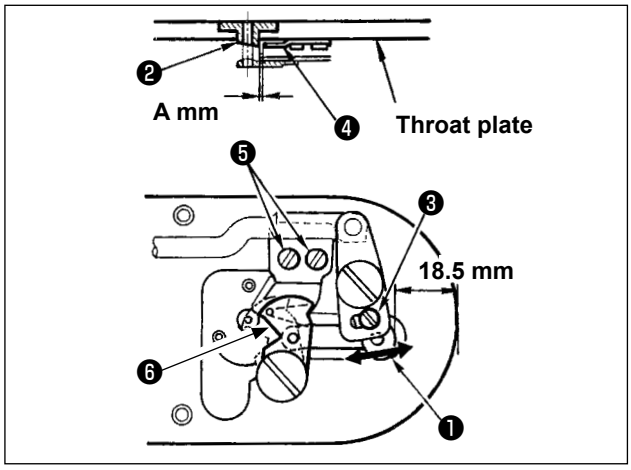
By removing the rubber plug in the face plate cover, adjustment can be performed without removing the face plate cover.

*** Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.**

1) Remove face cover.
2) Turn handwheel to make the needle bar come down to its lowest point.
3) Loosen hinge screw ❶ and move it to the direction **A** to increase the stroke.
4) When marker dot Ⓐ is aligned with the right side of the outer periphery of washer ❷ , the vertical stroke of the intermediate presser becomes 4 mm. And, when marker dot Ⓑ is aligned with the right side of the outer periphery of the washer, it becomes 7 mm. (The vertical stroke of the intermediate presser is factory-set to 4 mm at the time of delivery.)

1-5. The moving knife and counter knife (Bird's nest reducing type)

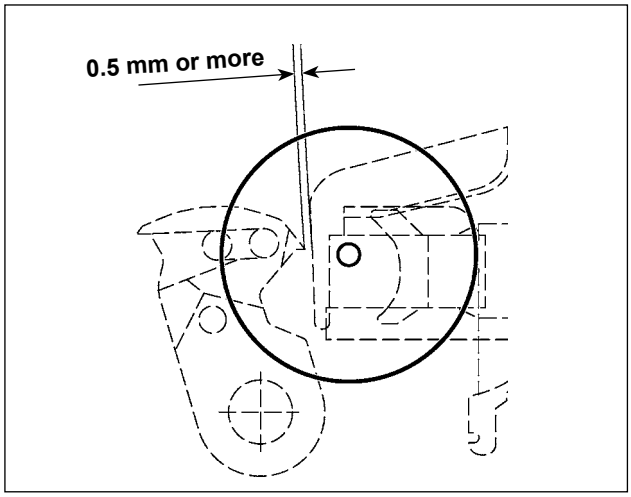
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



1) Carry out adjustment after replacing the thread trimming knife or the needle hole guide.
   Loosen adjusting screw ❶ so that a clearance of 18.5 mm is provided between the front end of the throat plate and the top end of thread trimmer lever, small ❸ . To adjust, move the moving knife in the direction of arrow.
2) Loosen setscrew ❺ so that a clearance of **A** mm is provided between needle hole guide ❷ and counter knife ❹ . To adjust, move the counter knife.

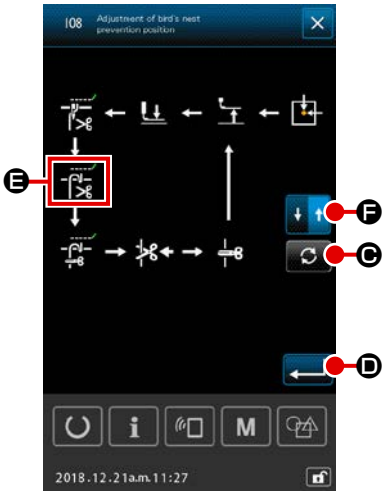
Dimension **A** (mm) varies with the sewing specification (diameter of the needle hole guide).
Adjust dimension **A** referring to the table shown below.

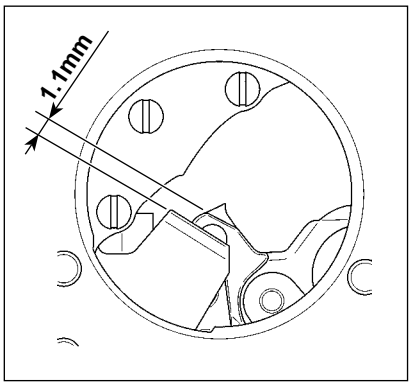
Sewing specification	Type S	Type H	Type G
Diameter of needle hole guide	ø1.6	ø2.0 / 2.4	ø3.0
Part number of needle hole guide	40207753 40196061	40196067 40196007	40196074 40207754 40213030
A mm	1.9 mm	2.3 mm	2.7 mm



After the origin retrieval, press the SET READY key on the IP panel to verify that a clearance of 0.5 mm or more is provided between the top end of moving knife and the top end of needle thread clamp. If a clearance of 0.5 mm or more cannot be secured, adjust the position of moving knife within 18.5 $^{+0.5}_{0}$ mm to secure the specified clearance.

3) In this step of procedure, the position of the bird's nest reducing device is adjusted. Loosen needle hole guide screw ❻ . Detach needle hole guide ❼ .
4) Turn the power to the sewing machine. Keep M button [M] held pressed to select [7 Check program] Ⓐ. Then, the list of check programs is displayed. Select [108 Adjustment of bird's nest prevention position] Ⓑ.
5) Fully depress the start pedal once to retrieve the origin.





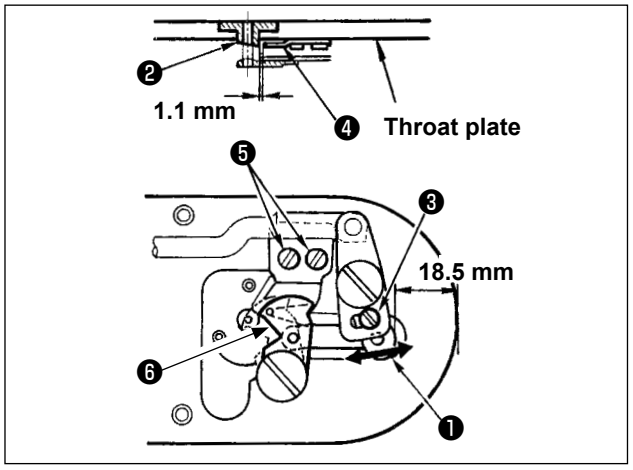
6) Press ROTATE button  Ⓒ four times to put  Ⓔ in the selected state.
At this time, adjust the clearance provided between the counter knife and the moving knife to 1.1 mm. Adjust the clearance with +/- key  Ⓖ until the clearance becomes the specified adjustment value. Then, press TRAVEL DIRECTION CHANGEOVER button  Ⓕ once to change over the direction of travel to the return. For the return, carry out the adjustment following the same steps of procedure described above.
After the completion of adjustment of sewing in the forward direction and that in the return direction, confirm the adjustment by pressing ENTER button  Ⓓ.

1. **Whenever you have changed the throat plate (asm.) or the moving knife, be sure to carry out positioning of them without fail. If the position adjustment is not carried out, needle breakage or the needle cutoff by the knife can occur when using the bird's nest reducing function.**
2. **Dust and thread waste can easily accumulate in the hook cover. Remove the dust and thread waste periodically (once a day) with the air blower or the like.**

1-6. The moving knife and counter knife (Shorter-thread remaining type)

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

Length of thread remaining on the material at the end of sewing can be reduced.
For synthetic filament thread #20, the length of thread remaining on the material at the end of sewing is reduced by approximately 1 mm. It should be noted that the shorter-thread remaining function cannot be used in conjunction with the bird's nest reducing device. The length of thread remaining on the wrong side of the material is shortened only at the end of sewing.
The shorter-thread remaining function can be used simultaneously with the thread clamp function. With these combined functions, stable sewing is ensured even when sewing starts at a high speed.

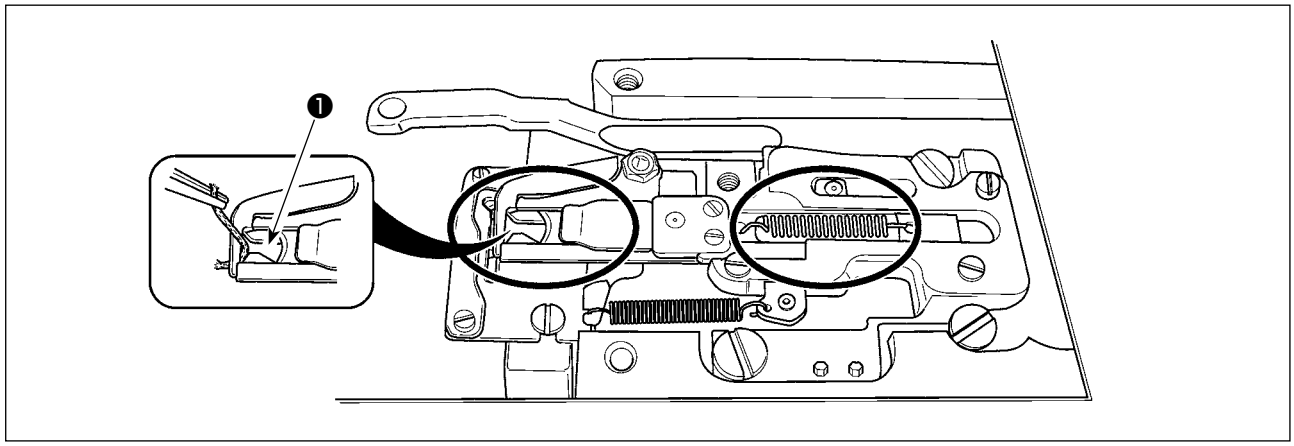


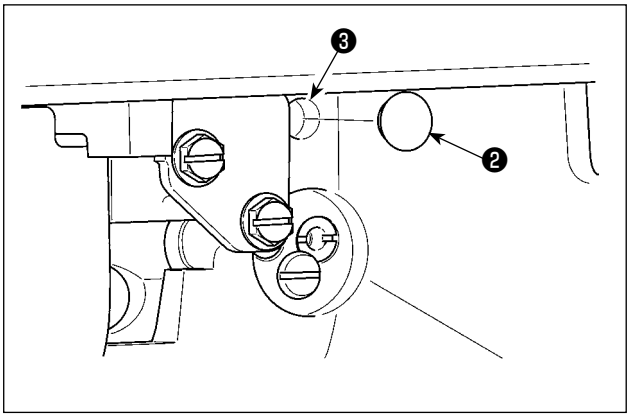
1) Loosen adjusting screw ❶ so that a clearance of 18.5 mm is provided between the front end of the throat plate and the top end of thread trimmer lever, small ❸ . To adjust, move the moving knife in the direction of arrow.
2) Loosen setscrew ❺ so that a clearance of 1.1 mm is provided between needle hole guide ❷ and counter knife ❹ . To adjust, move the counter knife.
3) Change over the setting of the memory switch U322 to "shorter-thread remaining type".

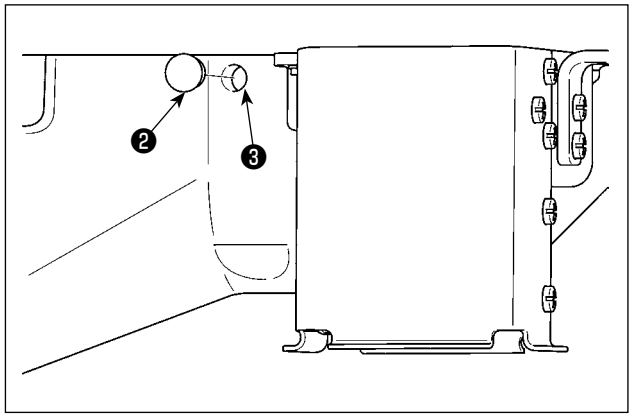
Caution
After changeover of the memory switch setting, the bird's nest reducing function cannot be selected.
In the case the adjusted state of the shorter-thread remaining function does not agree with the memory switch setting, needle breakage can occur.

1-7. Needle thread clamp device

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

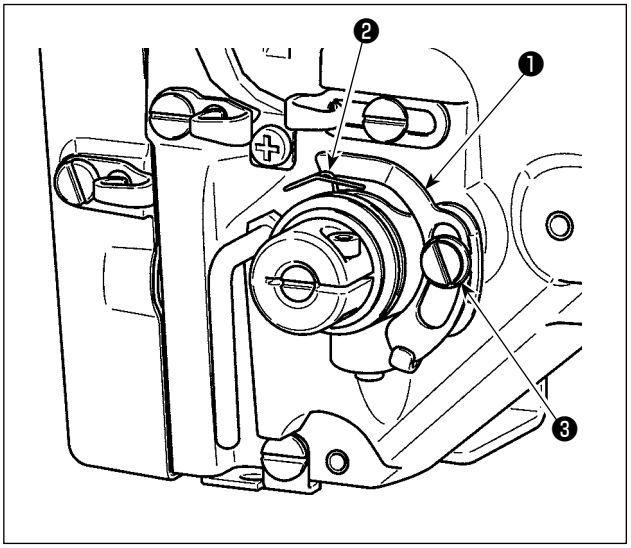






When thread is caught at top end ❶ of the thread clamp, thread clamp becomes incomplete and sewing trouble at the sewing start will be caused. Thread waste and lint are likely to accumulate in the sections which are shown in the circles. The sections should therefore be periodically cleaned by removing the throat plate and by blowing air through hole ❸ by removing rubber plug ❷ (two locations).

1-8. Thread breakage detector plate



1) Adjust so that thread breakage detector plate ❶ is always in contact with thread take-up spring ❷ in the absence of needle thread. (Slack : approx. 0.5 mm)
2) Whenever the stroke of thread take-up spring ❷ has been changed, be sure to readjust thread breakage detector plate ❶ . To make this adjustment, loosen screw ❸ .

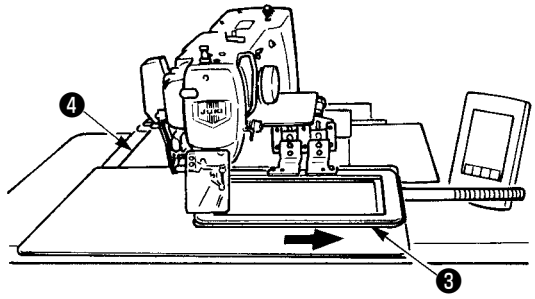
Important
Adjust so that thread breakage detector plate ❶ does not touch any adjacent metallic parts other than thread take-up spring ❷ .

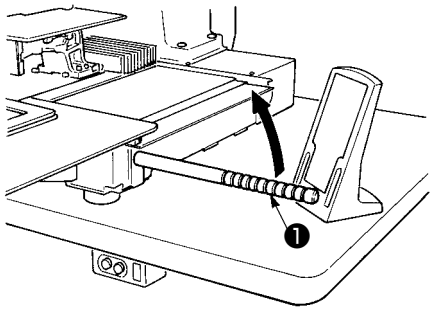
1-9. Raising the machine head

WARNING :

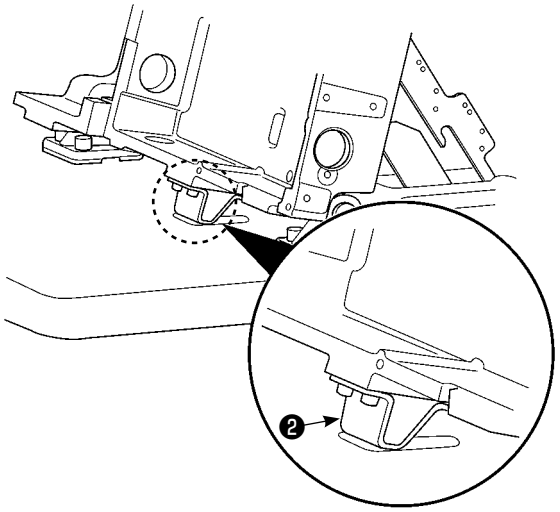
Tilt/raise the sewing machine head with both hands taking care not to allow your fingers to be caught in the head.

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





Maintenance position of the sewing machine



To carry out work with the sewing machine raised, follow the steps of procedure described below.

1. Move feeding fame ❸ to the rightmost position and fix it there. Then mount machine head grip ❶ supplied with the unit by fully screwing it into position.
2. Holding machine head grip ❶ , lift the sewing machine in the direction of the arrow until the maintenance position (where machine head support ❷ comes in contact with the table) is reached.

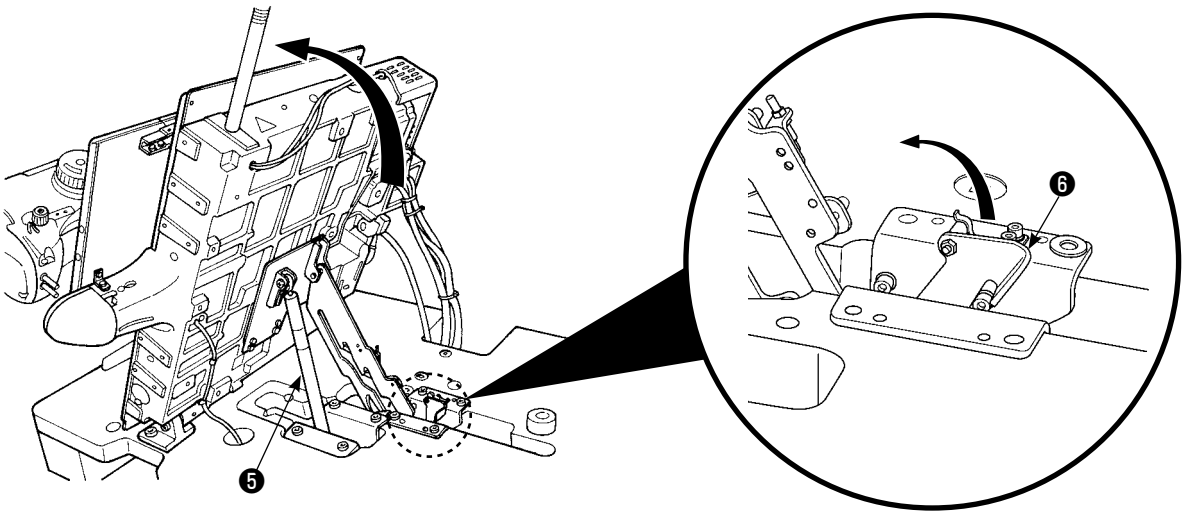
Caution

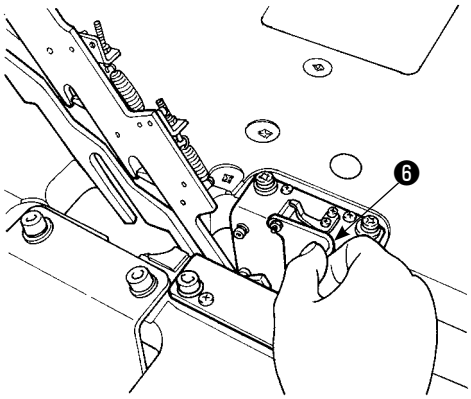
- **If a 20 kg or more load is necessary to be applied to the position of machine head grip ❶ in order to lift the machine head, gas spring ❺ has outgassed. Be sure to replace the gas spring with a new one.**
- **While raising the sewing machine, gas spring ❺ works to move the sewing machine in the direction of the arrow when the sewing machine is inclined by approximately 45 degrees of an angle with respect to the table. It is therefore necessary to lift the sewing machine until the maintenance position is reached while supporting the sewing machine with both hands.**

3. Turn stopper release lever ❻ in the direction of the arrow to secure the sewing machine.

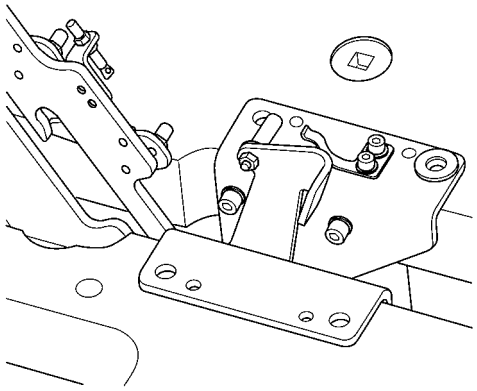
Caution

Never operate stopper release lever ❻ at any position other than the maintenance position so as not to allow your hand or other part of body to be caught between the sewing machine and the table.





Machine head in the fixed state



To return the sewing machine to its initial position, follow the steps of procedure described below.

1. Return stopper release lever ❻ to its initial position. (Return the lever until it is fixed.)
2. Carefully return machine head grip ❶ to its initial position with both hands.

If you return the sewing machine to its initial position swiftly, the sewing machine open/close lock mechanism will work. In this case, slightly lift the sewing machine from the position where it is locked to reset the lock mechanism. Then, carefully return the sewing machine to its initial position again.

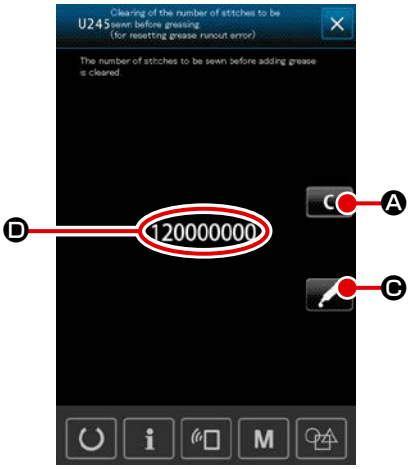
1. **To prevent the sewing machine from falling, be sure to raise the machine head after fixing table/stand (casters) at the leveled place so as to prevent it from moving.**
2. **Be sure to raise the machine after shifting feeding frame ❸ to the rightmost position since X-feed cover ❹ interferes with the machine table causing breakage.**
3. **When the machine is raised, clean portion Ⓐ of the bottom face of the machine to prevent the surface of the machine table from being stained with oil.**
4. **When returning the machine head to its home position, hold the grip only while preventing fingers from getting in the oil pan.**
   Do not place a hand on the oil pipe since the oil pipe can be folded without applying a force.

1-10. Replenishing the designated places with grease

*** Perform grease supplement when the errors below are displayed or once a year (either one which is earlier).**
If grease has decreased due to cleaning of the sewing machine or any other reasons, be sure to immediately add grease.

When the sewing machine has been used for a certain number of stitches, error "E220 Grease-up warning" is displayed. This display informs the operator of the time of replenishing the designated places with grease. Be sure to replenish the places with the grease below. Then call the memory switch U245 , press CLEAR button C Ⓐ and set NUMBER OF STITCHES Ⓓ to "0".
Even after the display of the error "E220 Grease-up warning", when RESET key Ⓑ is pressed, the error is released, and the sewing machine can be continuously used. Afterwards, however, error code "E220 Grease-up warning" is displayed every time the power is re-turning ON.
In addition, when the sewing machine is used further for a certain period of time without replenishing the places with grease after the display of error No. E220, error "E221 Grease-up error" is displayed and the sewing machine fails to operate since the error cannot be released even when the RESET key is pressed.

When error "E221 Grease-up error" is displayed, be sure to replenish the designated places below with grease. Then call the memory switch U245 , press CLEAR button C Ⓐ and set NUMBER OF STITCHES Ⓓ “0”.
When RESET key Ⓑ is pressed without replenishing the designated places with grease, error code "E221 Grease-up warning" is displayed every time the power is re-turning ON afterwards and the sewing machine fails to operate. So, be careful.

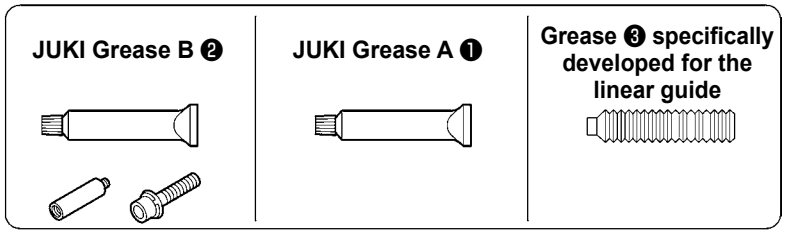


1. **Error code E220 or E221 is displayed again unless UMBER OF STITCHES Ⓓ is changed to "0" after replenishing the designated places with grease.**
   When E221 is displayed, the sewing machine fails to operate. So, be careful.
2. **When GREASE APPLYING POSITION DISPLAY button Ⓒ is pressed in each screen, the grease applying position can be confirmed in the panel display. Be sure, however, to perform the grease applying after turning OFF the power.**

(1) Location where exclusive grease is provided

Two types of grease, i.e., JUKI GREASE A ❶ and GREASE B ❷ , the grease nipple specifically designed for JUKI GREASE B and grease ❸ specifically developed for the linear guide are contained in the accessory box. Add grease periodically (when the grease runout warning No. E220 is displayed on the panel or once a year) to points to be applied with grease. If grease has decreased due to cleaning of the sewing machine or any other reasons, be sure to immediately add grease.

Do not use Grease A and Grease B with mixed. Be sure to use the specified grease without fail. The grease filling coupling and setscrew should be used when applying JUKI Grease B. Do not use the grease nipple and screw with JUKI GREASE A and the grease specifically developed for the linear guide.



When the grease runs short, be sure to purchase new grease.

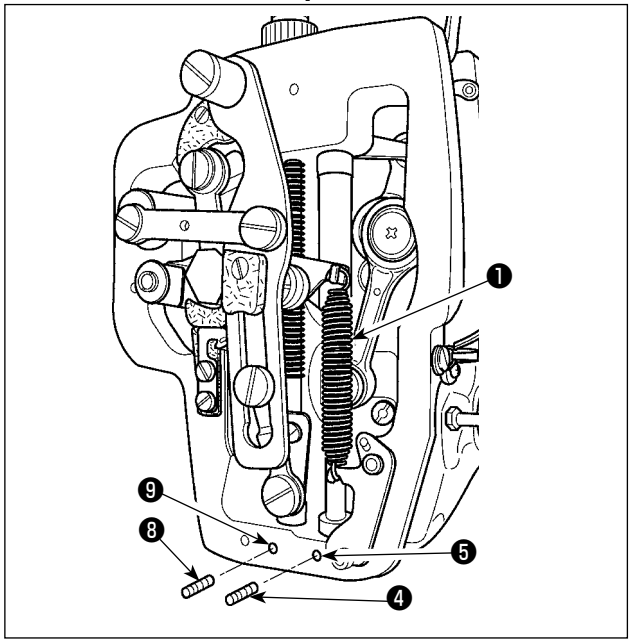
		Spare parts No.
JUKI Grease A	10g tube	40006323
	100g tube	23640204
JUKI Grease B	10g tube	40013640
Grease specifically developed for the linear guide	70g tube	40097886

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine. In addition, attach the covers which have been removed before operation back in place.

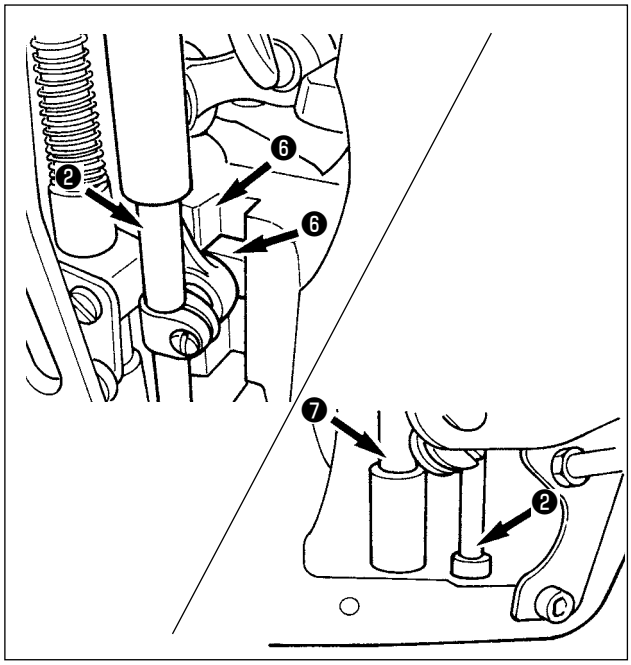
(2) Points to be applied with JUKI Grease A

Use grease tube A (part number: 40006323) supplied with the unit for adding grease to any points other than the points specified below. If any grease other than the specified one is used, the related components can be damaged.

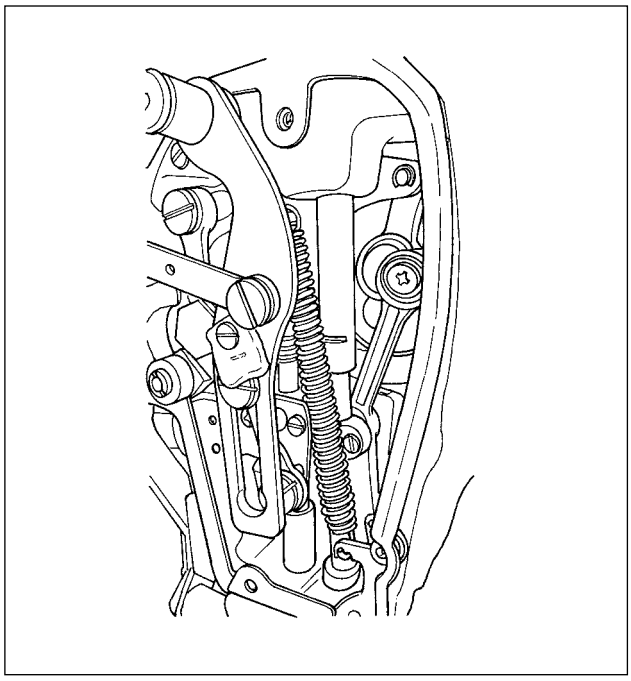
■ **Adding grease to the needle bar upper and lower bushings section, slide block section and intermediate presser bar lower bushing section**



1) Open the frame cover to remove intermediate presser auxiliary spring B ❶ .
2) Apply JUKI Grease A onto periphery of needle bar ❷ . Turn the sewing machine by hand to apply grease onto the entire periphery of the needle bar. Turn needle bar upper bushing grease cover.
   Fill the grease through the grease inlet of the needle bar upper bushing.
   Remove setscrew ❹ of the needle bar lower bushing grease inlet. Put JUKI GREASE A into hole ❺ . Tighten setscrew ❹ . Fill inside of the bushing with JUKI GREASE A.

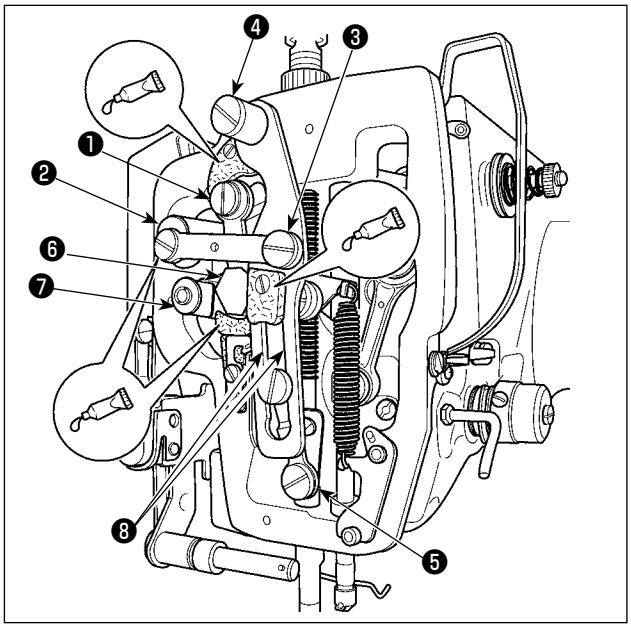


3) Apply JUKI Grease A also onto groove section ❻ of the slide block.
4) Apply JUKI Grease A onto periphery of intermediate presser bar ❼ .
   Remove setscrew ❽ from the intermediate presser bar bushing grease hole. Put JUKI Grease A through inlet ❾ . Tighten screw ❽ to fill inside the bushing with JUKI Grease A.



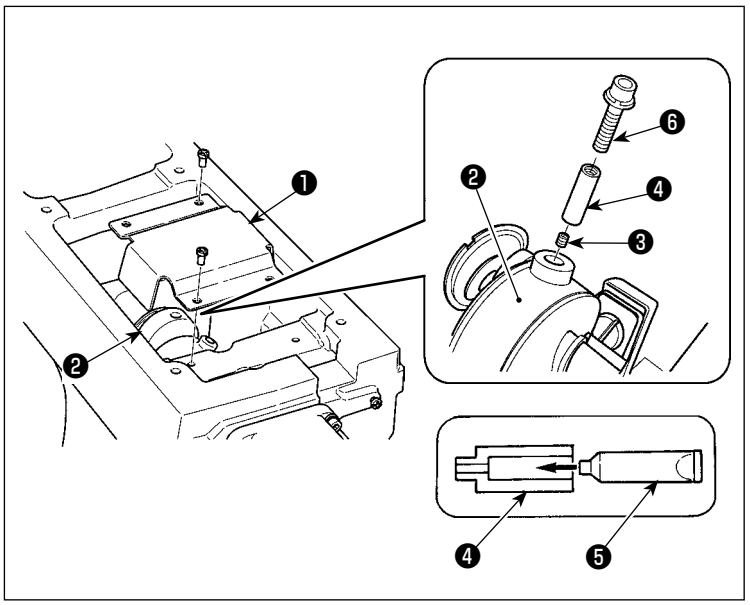
Do not wipe off the grease applied onto the periphery of needle bar inside the frame. If the grease has decreased due to cleaning, air blow or other reasons, apply grease again without exceptions.

■ **Grease supplement to the face plate section**



1) Open the face plate cover.
2) Add the JUKI Grease A onto the felt sections (3 locations), peripheral shoulder screw, fulcrums ❶ to ❼ and guide groove section ❽ .

■ **Adding grease onto the eccentric cam section**



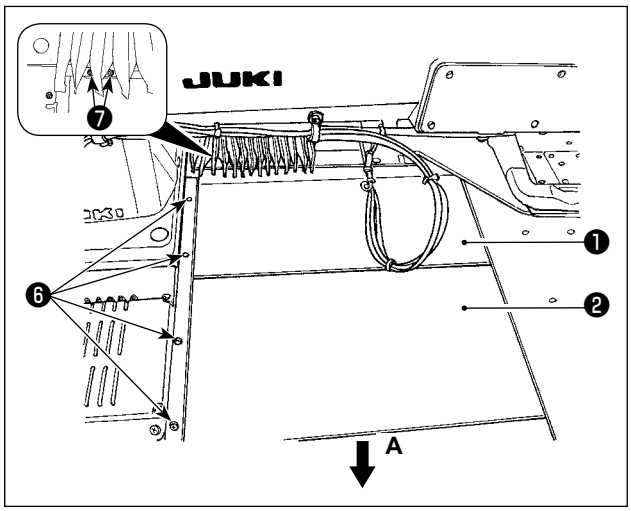
1) Open crank rod cover ❶ .
2) Remove setscrew ❸ from the grease inlet cover located at periphery of crank rod ❷ .
3) Fill coupling ❹ with grease through JUKI Grease A tube ❺ .
4) Sink screw ❻ supplied with the unit into the coupling to add the grease.
5) After adding the grease, securely tighten setscrew ❸ which has been removed.

The eccentric cam section can be sufficiently filled with grease by adding the grease while turning the main shaft of sewing machine.

(3) Portions to which the linear-guide specific grease is applied

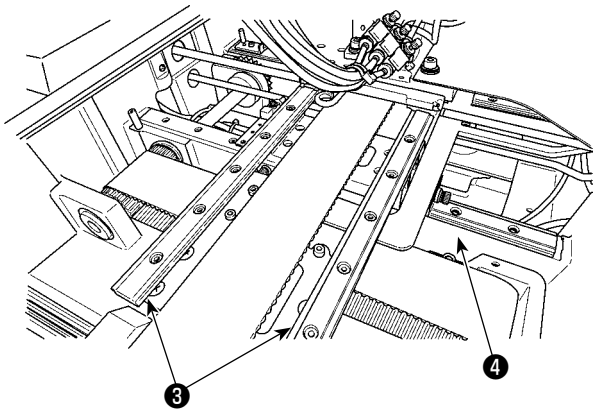
To add grease to the points specified below, use the accessory grease (part number: 40097886) supplied with the unit. If any grease other than the specified one is used, the related components can be damaged.

■ Removing the X-travel bottom cover

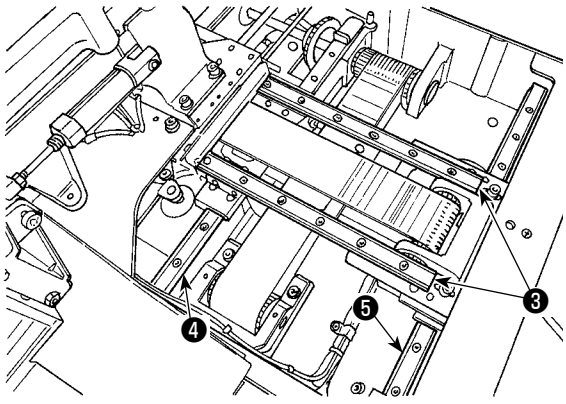


1) Lightly pushing X-travel top cover ❶ upward, pull out X-travel bottom cover ❷ in the direction of arrow **A**.
   Remove rail screw ❻ . Remove accordion cover screw ❼ .
2) Apply the supplied grease (part number: 40097886) to the groove sections on the both side faces of rail of X_linear guides ❸ (two pieces) and Y_linear guide ❹ (two pieces).
   Remove X-travel bottom cover ❷ and apply the grease from both sides.
   In addition, apply the grease while moving the feed bracket back and forth.
3) Manually move the feed bracket back and forth and to the right and left as far as it goes to allow the grease to spread over the entire linear guide.

Left side

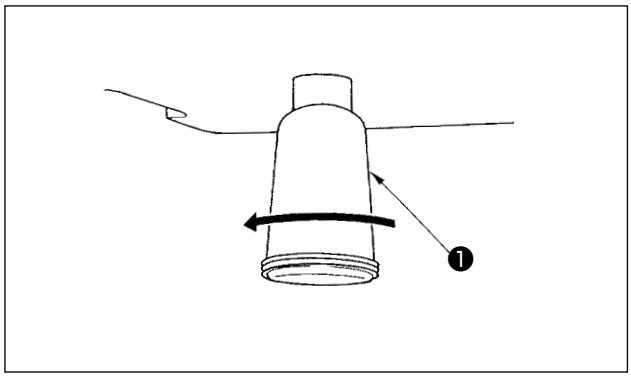


Right side



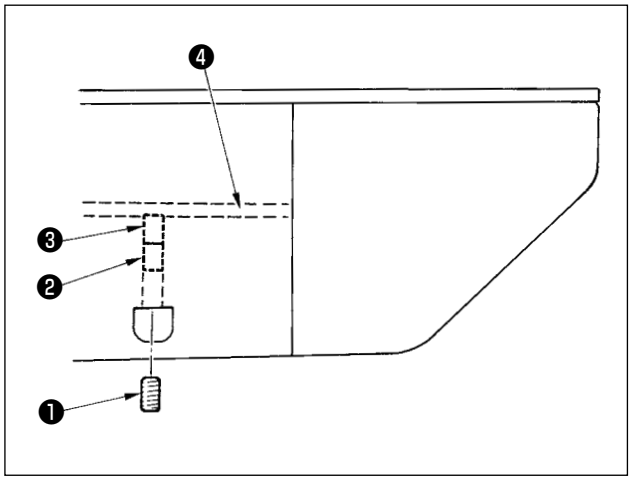
1. **If the grease has decreased due to cleaning, air blow or other reasons, apply grease again without exceptions.**
2. **Do not apply the machine oil to the linear guides. Grease in the linear guides will run out to cause wear of the linear guides.**
3. **When removing X-travel bottom cover ❷ , take care not to break the stopper rubber which is stuck on the cover.**
4. **After having assembled X-travel bottom cover ❷ , move the feed bracket by hand to check to be sure that the X-travel cover smoothly moves without a large backlash and hitch.**

1-11. Draining waste oil



When polyethylene oiler ❶ becomes filled with oil, remove polyethylene oiler ❶ and drain the oil.

1-12. Amount of oil supplied to the hook



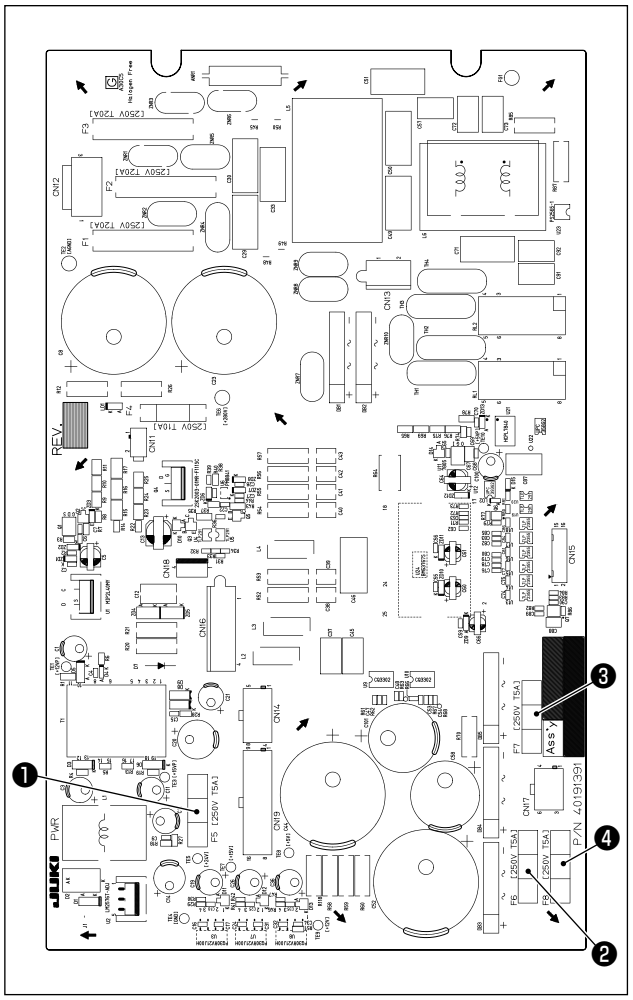
1) Loosen setscrew ❶ and remove setscrew ❶ .
2) When screwing in adjustment screw ❷ , the amount of oil of oil pipe, left ❹ can be reduced.
3) After the adjustment, screw in setscrew ❶ and fix it.

1. The state of standard delivery is the position where ❸ is lightly screwed in and returned by 4 turns.
2. When reducing the amount of oil, do not screw in the screw at once. Observe the state for approximately half a day at the position where ❸ is screwed in and returned by 2 turns. If reducing is excessive, worn-out of the hook will result.

1-13. Replacing the fuse

DANGER :

1. **To avoid electrical shock hazards, turn OFF the power and open the control box cover after about five minutes have passed.**
2. **Open the control box cover after turning OFF the power without fail. Then, replace with a new fuse with the specified capacity.**



The machine uses the following four fuses :

- ❶ Fuse for 24 V control power protection
  5A (time-lag fuse)
- ❷ Fuse for 85 V stepping motor power protection
  5A (time-lag fuse)
- ❸ Fuse for 200 V stepping motor power protection
  5A (time-lag fuse)
- ❹ Fuse for 33 V solenoid power protection
  5A (time-lag fuse)

1-14. Changing over the supply voltage

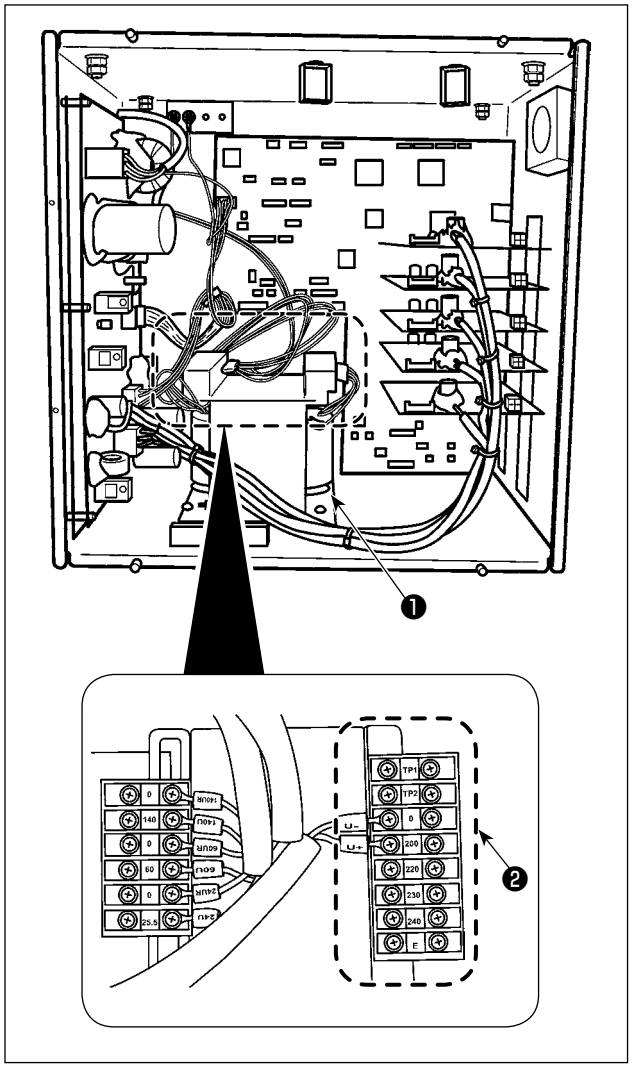
DANGER :

1. To avoid electrical shock hazards, turn OFF the power and open the control box cover after about five minutes have passed.

2. Open the control box cover after turning OFF the power without fail. Then, changing over the supply voltage.

This product can be used with the supply voltages 200/220/230/240 V by changing over connection terminal ❷ of the terminal block supplied with power transformer ❶ .

When changing over the supply voltage, change over terminal ❷ according to the table shown below.

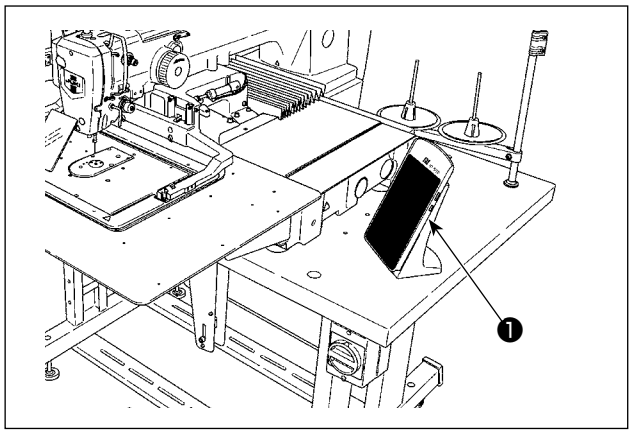


Supply voltage	Connection of terminal	
	V +	V -
200V	200	0
220V	220	0
230V	230	0
240V	240	0

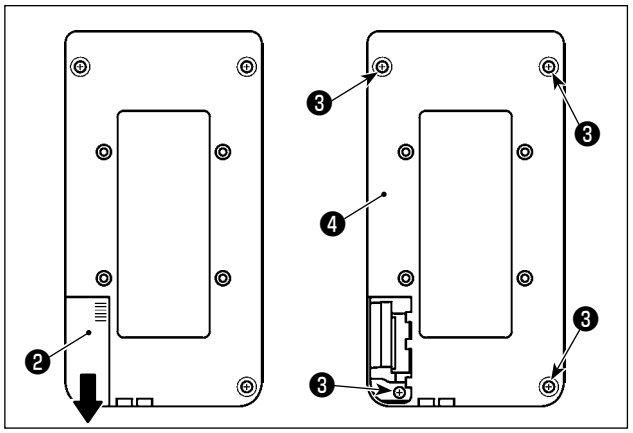
1-15. Disposal of batteries

The operation panel incorporates batteries for operating the clock while the power is turned OFF. Dispose of the batteries appropriately according to the relevant local laws and regulations in your country / region.

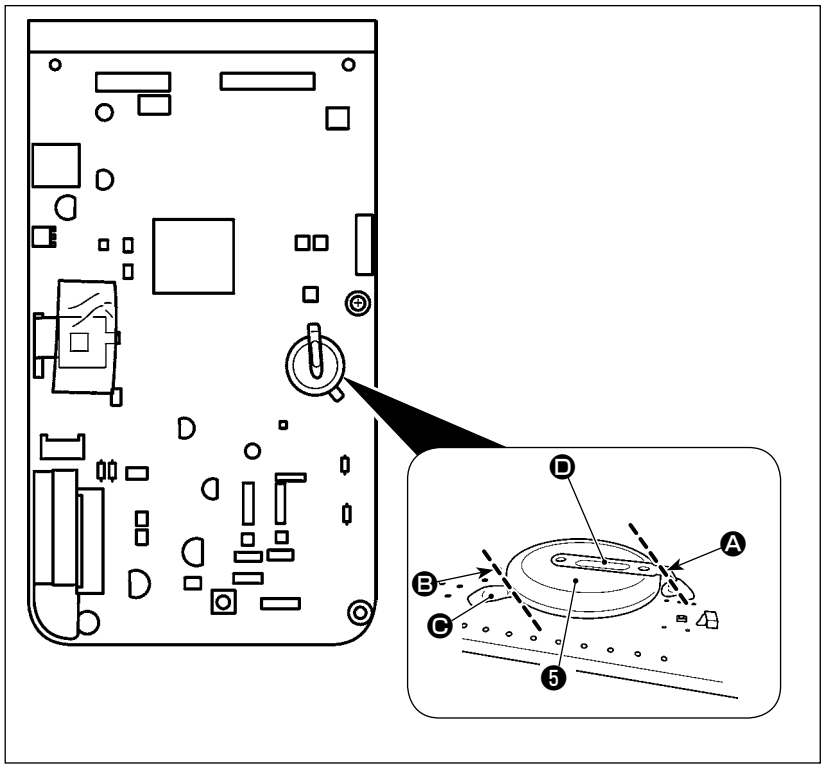
■ How to remove batteries



1) Detach operation panel ❶ from the sewing machine.



2) Slide operation panel power cover ❷ downward to detach it.
3) Remove operation panel lower cover set-screws ❸ (four pieces). Detach operation panel lower cover ❹ .



4) Cut metal plate Ⓓ that secures battery ❺ with nippers or the like at position Ⓐ.

5) Cut metal plate Ⓒ that secures battery ❺ with nippers or the like at position Ⓑ. Then, remove battery ❺ .

Carefully protect your fingers from being cut with the cut edge of the metal plate.

1-16. Troubles and corrective measures (Sewing conditions)

Trouble	Cause	Corrective measures	Page
1. The needle thread slips off at the start of bar-tacking.	① Stitches are slipped at the start.	○ Adjust the clearance between the needle and the shuttle to 0.05 to 0.1 mm.	101
		○ Set soft-start sewing at the start of bartacking.	67
	② The needle thread remaining on the needle after thread trimming is too short.	○ Correct the thread tension release timing of the thread tension controller No. 2.	
		○ Increase the tension of the thread take-up spring, or decrease the tension of the thread tension controller No. 1.	14,15
	③ The bobbin thread is too short.	○ Decrease the tension of the bobbin thread.	14
		○ Increase the clearance between the needle hole guide and the counter knife.	107
	④ Needle thread tension at 1st stitch is too high.	○ Decrease the tension at 1st stitch.	
	⑤ Thread clamp is unstable (material is apt to be expanded, thread is hard to slide, thread is thick, etc.).	○ Decrease the number of rotation at 1st stitch at the sewing start. (Extent of 600 to 1,000 sti/min)	
		○ Increase the number of stitches of thread clamp to 3 to 4 stitches.	
	⑥ Pitch at 1st stitch is too small.	○ Make the pitch at 1st stitch longer.	
		○ Decrease the needle thread tension at 1st stitch.	
	⑦ The bird's nest reducing operation is poorly adjusted. As a result, the thread is not trimmed at the predetermined position.	○ Adjust the position of moving knife before it trims the thread. (1.1 ± 0.1 mm)	107
	⑧ During the bird's nest reducing operation, the number of stitches at which the thread trimmer trims the thread is not correct.	○ Set the number of stitches to be sewn before thread trimming to the correct setting using the memory switch U316. (Thin thread: 3, thick thread: 2)	
	⑨ When the bird's nest reducing function is set to ON, the needle thread end is failed to be brought to the hook side and the bobbin thread is trimmed.	○ Use the wiper.	19
		○ If the wiper wiping operation is defective, the position of wiper should be adjusted.	
		○ Adjust the length of needle thread remaining on the material to the optimum value. (40 mm to 50 mm)	19
2. Thread often breaks or synthetic fiber thread splits finely.	① The shuttle or the driver has scratches.	○ Take it out and remove the scratches using a fine whetstone or buff.	
	② The needle hole guide has scratches.	○ Buff or replace it.	
	③ The needle strikes the intermediate presser foot.	○ Correct the position of the intermediate presser foot.	15
	④ Fibrous dust is in the groove of the shuttle race.	○ Take out the shuttle and remove the fibrous dust from the shuttle race.	
	⑤ The needle thread tension is too high.	○ Reduce the needle thread tension.	14
	⑥ The tension of the thread take-up spring is too high.	○ Reduce the tension.	15
	⑦ The synthetic fiber thread melts due to heat generated on the needle.	○ Use silicone oil.	123
	⑧ When taking up thread, thread is pierced with needle tip.	○ Lower the needle bar height from the engraved marker line by a half of the line to as much as the line.	
		○ Check the rough state of needle tip.	
		○ Use the ball-pointed needle.	

Trouble	Cause	Corrective measures	Page
3. The needle often breaks.	① The needle is bent.	○ Replace the bent needle.	12
	② The needle strikes the intermediate presser foot.	○ Correct the position of the intermediate presser foot.	15
	③ The needle is too thin for the material.	○ Replace it with a thicker needle according to the material.	
	④ The driver excessively bends the needle.	○ Correctly position the needle and the shuttle.	101
	⑤ The position of bird's nest reducing mechanism is poorly adjusted. As a result, the moving knife interferes with the needle.	○ Adjust the position of moving knife before it trims the thread. (1.1 ± 0.1 mm)	107
4. Threads are not trimmed.	① The counter knife is dull.	○ Replace the counter knife.	
	② The difference in level between the needle hole guide and the counter knife is not enough.	○ Increase the bend of the counter knife.	
	③ The moving knife has been improperly positioned.	○ Correct the position of the moving knife.	107
	④ The last stitch is skipped.	○ Correct the timing between the needle and the shuttle.	101
(Bobbin thread only)	⑤ Bobbin thread tension is too low.	○ In crease the bobbin thread tension.	
	⑥ Flopping of cloth	○ Lower the intermediate presser height of the last stitch.	
5. Stitch skipping often occurs.	① The motions of the needle and shuttle are not properly synchronized.	○ Correct the positions of the needle and shuttle.	101
	② The clearance between the needle and shuttle is too large.	○ Correct the positions of the needle and shuttle.	101
	③ The needle is bent.	○ Replace the bent needle.	12
	④ The driver excessively bends the needle.	○ Correctly position the driver.	101
	⑤ Length of needle thread remaining after thread trimming is too long. (In the case of stitch skipping within the 2nd to 10th stitch from the beginning of sewing)	○ Reduce the thread take-up spring pressure or increase the thread tension applied by the thread tension controller No. 1.	14,15
6. The needle thread comes out on the wrong side of the material.	① The needle thread tension is not high enough.	○ Increase the needle thread tension.	14
	② The tension release mechanism fails to work properly.	○ Check whether or not the tension disc No. 2 is released during bar-tracking.	
	③ The needle thread after thread trimming is too long.	○ Increase the tension of the thread tension controller No. 1.	14
	④ Number of stitches is too few.	○ Turn OFF the thread clamp.	
	⑤ When sewing length is short (End of needle thread protrudes on the wrong side of sewing product.)	○ Turn OFF the thread clamp.	
	⑥ Number of stitches is too few.	○ Use the lower plate, the hole of which is larger than the presser.	
7. Thread end of the 1st stitch comes out on the right side of the material.	① Stitch skipping at the 1st stitch	○ Adjust the hook timing faster by a 1/2 stitch.	
	② Needle used and thread used are thick in terms of the inner diameter of the intermediate presser.	○ Increase the inner diameter of intermediate presser.	
	③ Intermediate presser is not properly positioned in terms of the needle.	○ Adjust the eccentricity between intermediate presser and needle so that needle enters in the center of intermediate presser.	
8. Threads break at time of thread trimming.	① The moving knife has been improperly position.	○ Correct the position of the moving knife.	107

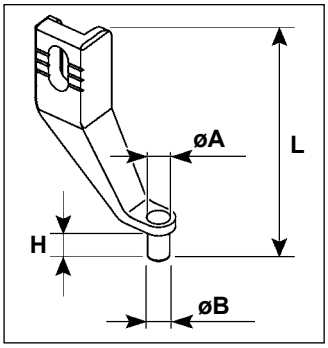
Trouble	Cause	Corrective measures	Page
9. The thread clamp is entangled with needle thread.	① The needle thread at the sewing start is too long.	○ Tighten thread tension controller No. 1 and make the length of needle thread 40 to 50 mm.	18
10. Uneven length of the needle thread	① The tension of thread take-up spring is too low.	○ Increase the tension of the thread take-up spring.	15
11. The length of needle thread does not become short.	① The tension of thread tension controller No. 1 is too low.	○ Increase the tension of thread tension controller No. 1.	107
	② The tension of thread take-up spring is too high.	○ Decrease the tension of thread take-up spring.	14
	③ The tension of thread take-up spring is too low and motion is unstable.	○ Increase the tension of thread take-up spring and lengthen the stroke as well.	15
12. The knotting section of bobbin thread at 2nd stitch at the sewing start appears on the right side.	① Idling of bobbin is large.	○ A just the position of the moving knife.	
	② The bobbin thread tension is too low.	○ Increase the bobbin thread tension.	
	③ The needle thread tension at 1st stitch is too high.	○ Decrease the needle thread tension at 1st stitch.	
		○ Turn OFF the thread clamp.	
13. Wiper fails to work. (Return is defective.)	① Needle entry of the last needle is the same as that of the sewing start, and the resistance of thread and cloth is large.	○ Shift the needle entry point of the last needle.	
14. Thread trimmed at the beginning of sewing is not collected.	① Thread waste accumulates near the thread trimmer connecting bar.	○ Defective air pressure setting may be the cause of trouble. Set the air pressure to the optimum value (0.2 - 0.3 MPa).	
	② Trimmed thread is caught between the shuttle race and the counter knife.	○ Adjust the position of shuttle race.	101
	③ Trimmed thread flies to the operator side. (Or on the left-hand side of the operator)	○ Adjust the position of upper spring.	103
	④ Length of needle thread remaining at the needle is too short. The thread untwists and separates into single yarns.	○ Adjust the length of needle thread remaining at the needle to the optimum value (40 mm to 50 mm)	
15. Thread trimmed at the beginning of sewing is entangled.	① Trimmed thread is connected to the end of needle thread and is entangled.	○ Change the knife or the throat plate asm. with an appropriate one.	
		○ Faulty thread trimming may be the cause. (Refer to "4. Thread is not trimmed".)	
	② Thread blown by the air blower is entangled in the seam.	○ Adjust the position of upper spring.	103
		○ Maximize the gap in the bobbin thread retaining plate through which the thread passes. (In the case of thick thread)	101

2. OPTIONAL

2-1. Table of Needle hole guide

Needle used	Needle hole guide		
Size	Part No.	Needle hole diameter	Application
#09 to #11	40207153	ø 1.6	For knits (OP)
#11 to #14 *1	40196061	ø 1.6	For light-weight to medium-weight materials (S type)
#14 to #18 *2	40196067	ø 2.0	For medium-weight to heavy-weight materials (H type)
#18 to #21	40196071	ø 2.4	For heavy-weight materials (OP)
	40196074	ø 3.0	For heavy-weight materials (G type)
#22 to #25 *3	40207154	ø 3.0 (with a counterbore)	For extra heavy-weight materials (OP) (Supplied with G type models)
#18 to #25	40213021	ø 3.0 (eccentric hole)	For heavy-weight materials to prevent skip-stitching (OP)

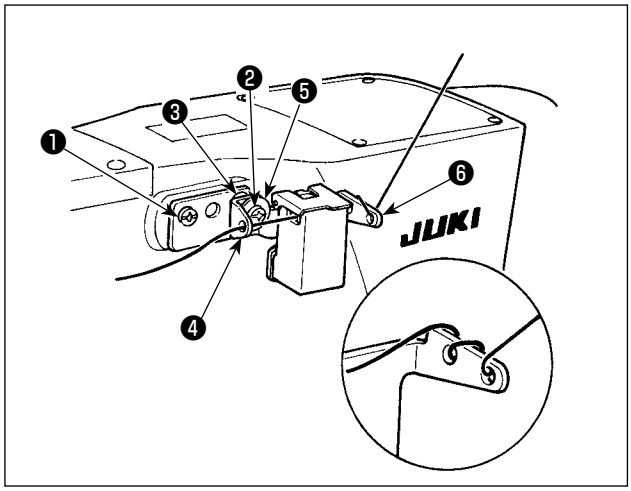
Needle used	Intermediate presser	
Size	Part No.	Size (øA × øB × H × L)
#09 to #11	B1601210D0E (OP)	ø 1.6 × ø 2.6 × 5.7 × 37.0
#11 to #14 *1	40023632 (Standard)	ø 2.2 × ø 3.6 × 5.7 × 38.5
#14 to #18 *2	B1601210D0FA (OP)	ø 2.2 × ø 3.6 × 8.7 × 41.5
#18 to #21	B1601210D0BA (G type)	ø 2.7 × ø 4.1 × 5.7 × 38.5
#22 to #25 *3	B1601210D0CA (OP)	ø 3.5 × ø 5.5 × 5.7 × 38.5
#18 to #25		



* 1 : S type installed needle (DP × 5 #14)
* 2 : H type installed needle (DP × 17 #18)
* 3 : G type installed needle (DP × 17 #23)
· S type : Applicable count of thread : #80 to #20
· H type : Applicable count of thread : #50 to #02
· G type : Applicable count of thread : #20 to #02
· (OP) means the optional.

2-2. Silicon oil tank

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



If the thread twists hard on silicon oil tank base ❻ (40096982), reverse the direction of winding the thread.

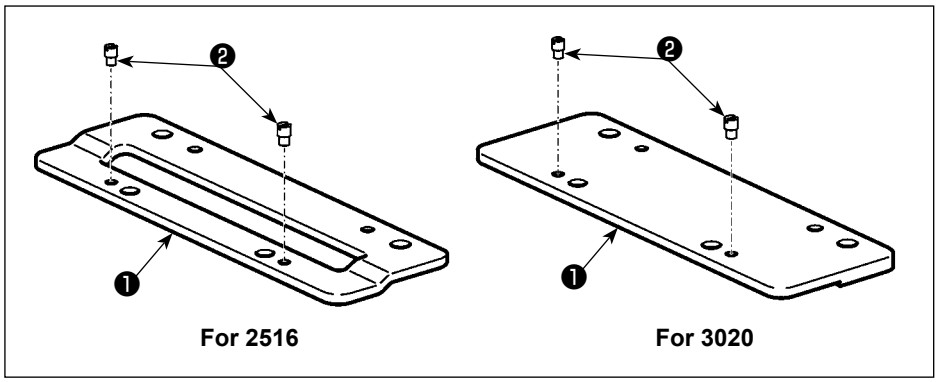
The G type model is provided with silicon oil tank asm. (40097301) as an accessory. (For the types of models other than G type, this device can also be retrofitted as an option.)
The silicon oil tank asm. should be fixed on the sewing machine by means of setscrews ❶ (SM-4041055SP) and ❷ (SM4042055SP) supplied with the unit. To tighten setscrew ❷ , tighten it together with thread guide collar ❸ (11315108), silicon oil tank thread guide ❹ (40010414) and thread guide setscrew washer ❺ (WP0501046SC). Silicon oil tank thread guide ❹ (40010414) should be placed so that it is in parallel with silicon oil tank base ❻ (40096982).

2-3. To use the feed plate of the AMS-221EN Series

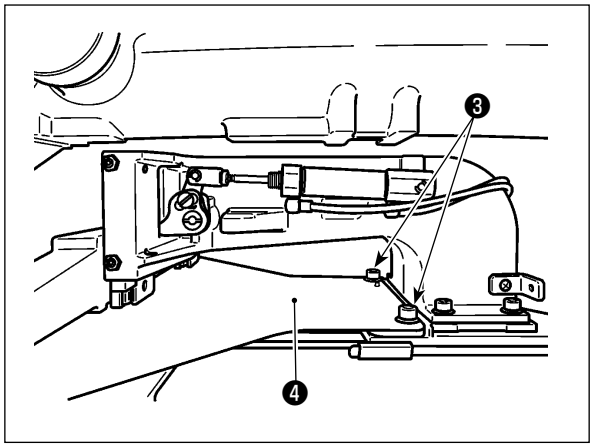
If you want to use the feed plate of the AMS-221EN Series, the optional feed plate interchangeable plate set is required. Place an order for the interchangeable plate set of the following part number.
It should be noted that the feeing frame of the AMS-221EN Series can be used with the AMS-221F as it is.

	JUKI interchangeable plate set part No.
For AMS-221F △△ 3020	40218950
For AMS-221F △△ 2516	40218951

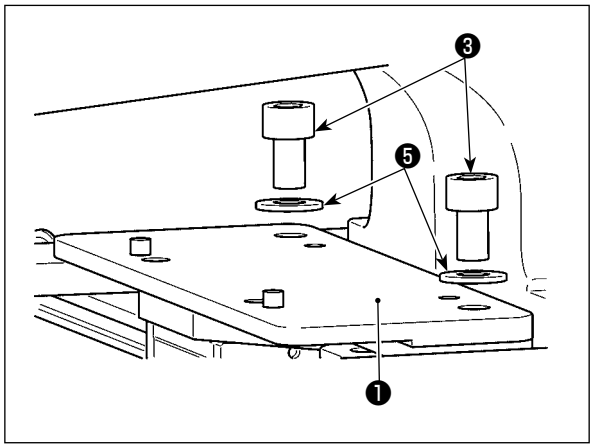
[Installation procedure for the feed plate interchangeable plate set]



1) Attach pin ❷ to feed plate interchangeable plate ❶ .



2) Remove feed plate screw ❸ . Remove feed plate ❹ . This screw will be used later.



3) Install feed plate interchangeable plate ❶ . Install it using screw ❸ you have removed in the aforementioned step 2) and washer ❺ . Spring washer is not used.

* **The feed plate of the AMS-221EN Series should be installed with the screw, washer and spring washer that are included in the set.**