ENGLISH

AMS-251 / IP-420
INSTRUCTION MANUAL

CONTENTS

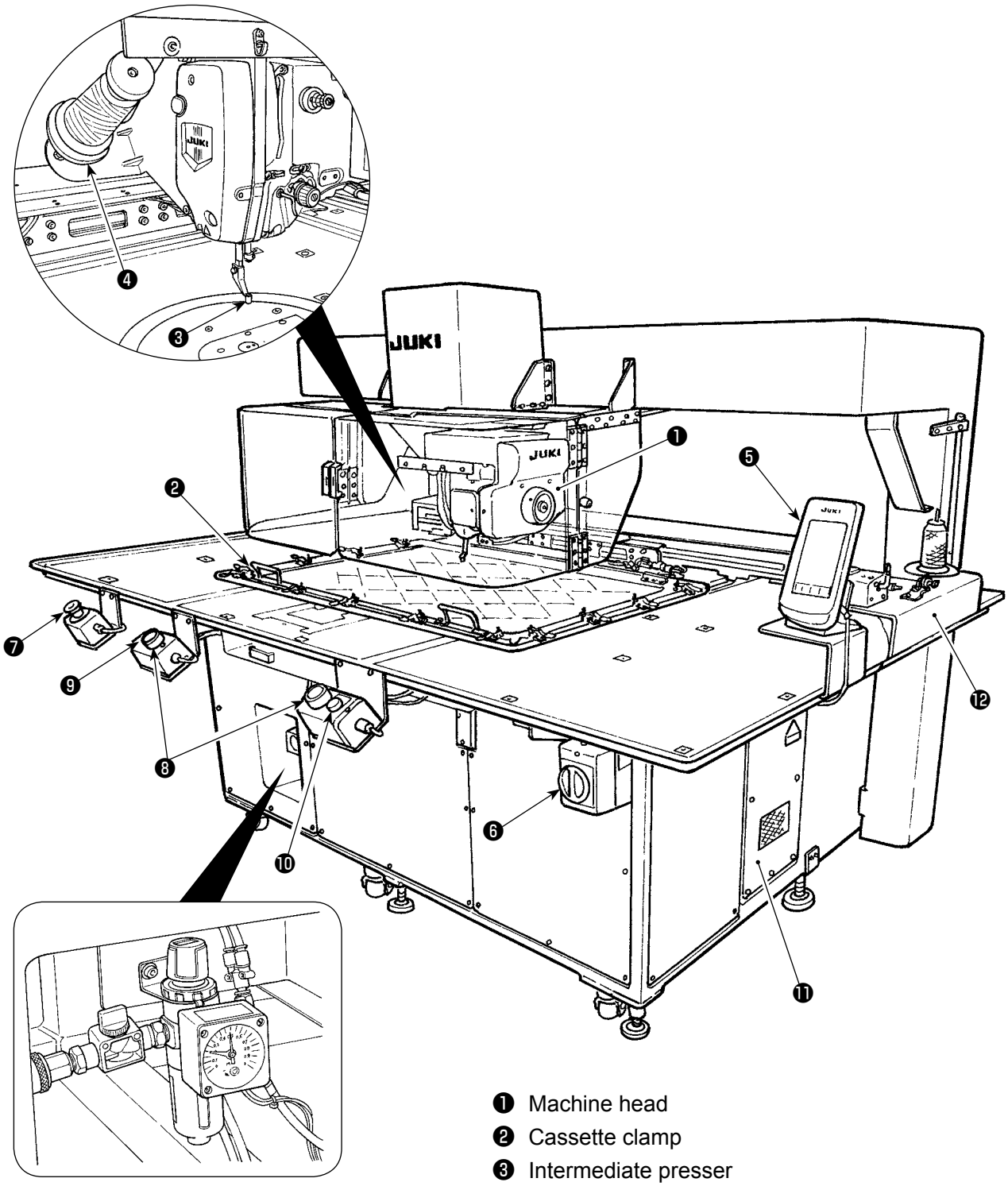
I. MECHANICAL SECTION (WITH REGARD TO THE SEWING MACHINE)

1. SPECIFICATIONS

1	Sewing area	X (lateral) direction Y (longitudinal) direction 1,000 mm × 600 mm
2	Max. sewing speed	2,500 sti/min (When sewing pitch is 3 mm or less)
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	41.2 mm
6	Needle	GROZ-BECKERT 135x17, ORGAN needle DPx17
7	Amount of lift of the machine head unit goes up	50 mm
8	Intermediate presser stroke	4 mm (Standard) (0 to 10 mm)
9	Lift of intermediate presser	20 mm
10	Intermediate presser DOWN position variable	Standard 0 to 3.5 mm (Max. 0 to 7.0 mm)
11	Shuttle	Full-rotary three-fold capacity 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 2,500 sti/min (Scale : 100 sti/min steps)
18	Pattern selection facility	Pattern No. 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	2,400 mm (W) × 1,800 mm (L) × 1,600 mm (H)
25	Mass (gross mass)	947 kg
26	Power consumption	800 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	Standard 0.35 to 0.5 MPa (Max. 0.55 MPa)
31	Air consumption	1.8 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 78.2 dB; (Includes K_{pA} = 2.5 dB); according to ISO 10821-C.6.2 -ISO 11204 GR2 at 2,500 sti/min [*1].

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

2. CONFIGURATION

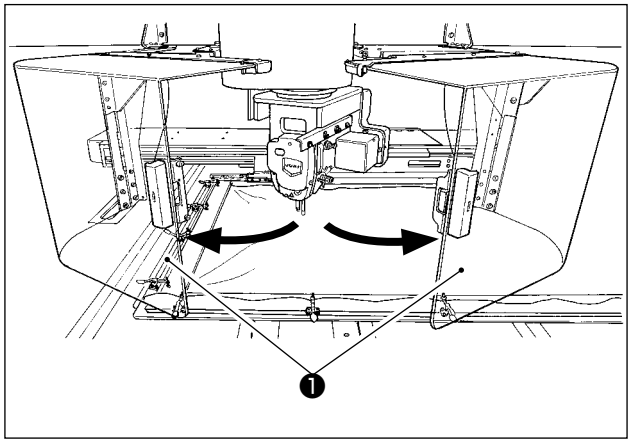


Air regulator

❶ Machine head
❷ Cassette clamp
❸ Intermediate presser
❹ Thread stand
❺ Operation panel (IP-420)
❻ Power switch
❼ Emergency stop switch
❽ Start switch (green)
❾ Pause switch (white)
❿ Eject switch (blue)
⓫ Control box
⓬ Bobbin winder

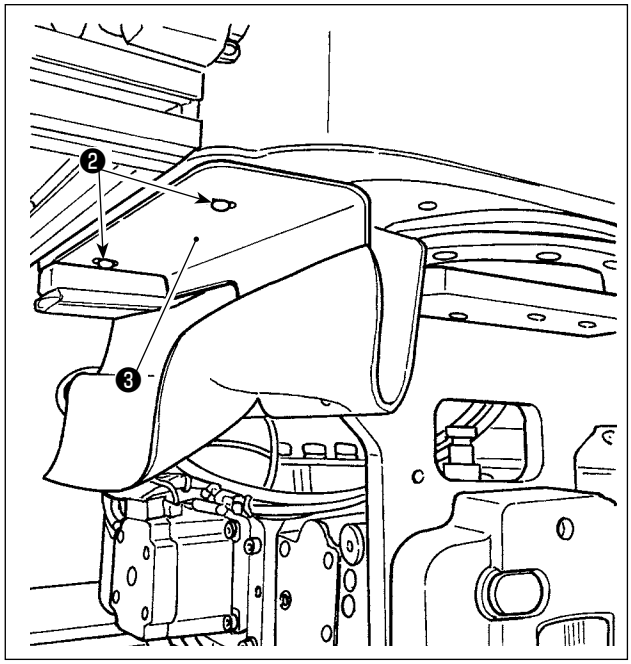
3. INSTALLATION

3-1. Removing the machine head fixing plate



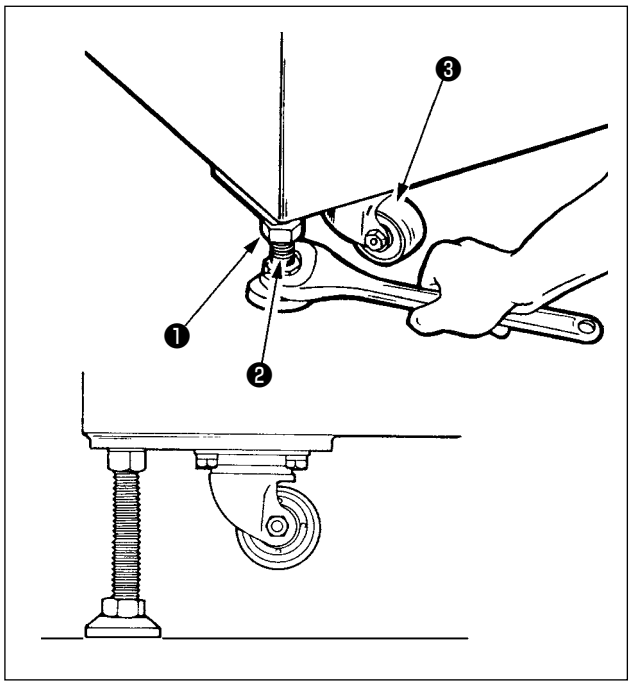
1) Open machine head safety cover ❶ .

> **Keep the machine head safety cover ❶ closed while the sewing machine is in operation.**



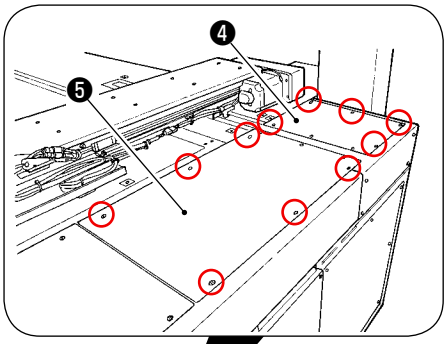
2) Remove two setscrews ❷ . Detach machine head fixing plate ❸ .
3) Re-tighten two setscrews ❷ which you have removed in step 2) back in their tapped holes.

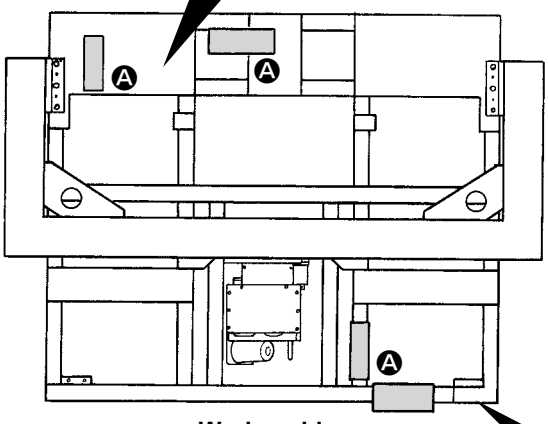
3-2. Setting up the machine



1) Install the machine on a flat place with leveled.
2) Loosen nut ❶ and turn level adjuster ❷ to lift the machine until caster ❸ idles.
3) After the machine has been set up properly, tighten nut ❶ and fix level adjuster ❷ .

Use 0.3-mm/m levels for leveling the main body of device.



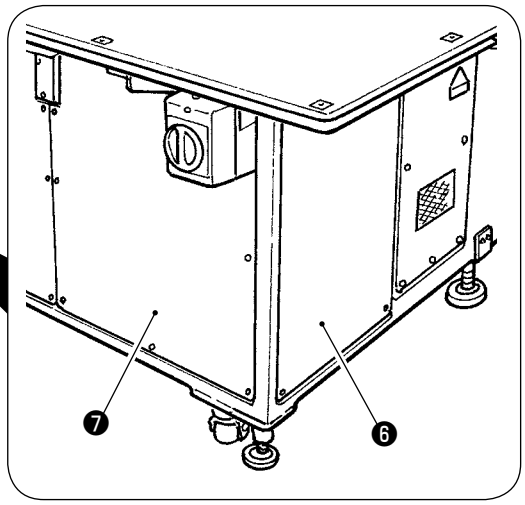


Worker side

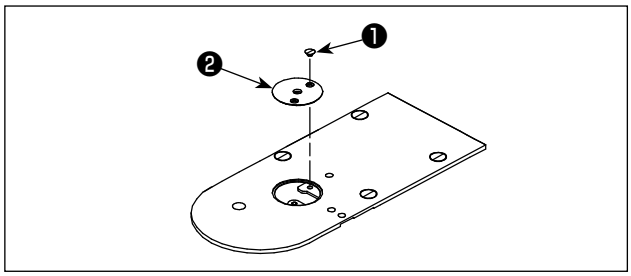
Overhead view

[Positions to check with levels]

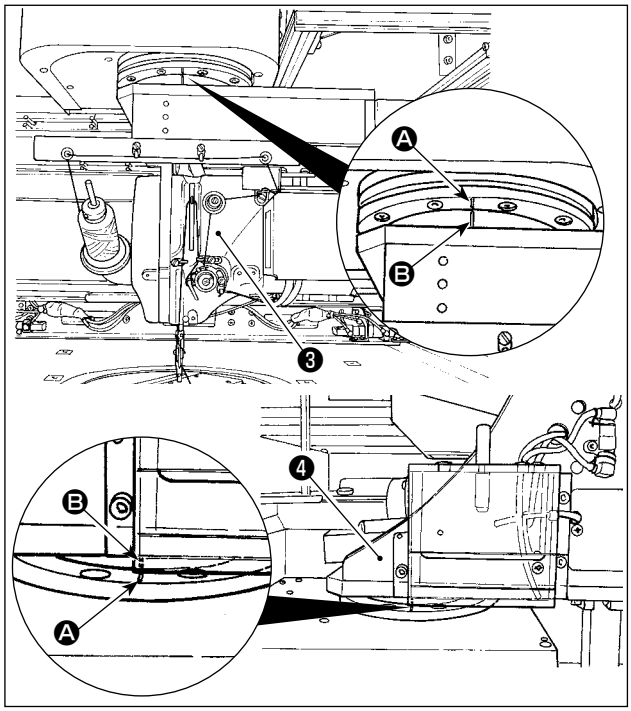
1) Detach covers ❹ , ❺ , ❻ and ❼ of the main body of device at four locations by removing their screws.
2) Place a level respectively at positions Ⓐ indicated in the figure. Adjust the adjusters mounted at four corners so that the number of lines indicated on the level scale plate is within two.
   After checking the levelness, adjust the adjuster located at the center section of each strut until it is stretched. Then, give it a 1/8 turn to further stretch it. In this state, fix each adjuster.
3) After the adjustment, re-place the covers back in place.



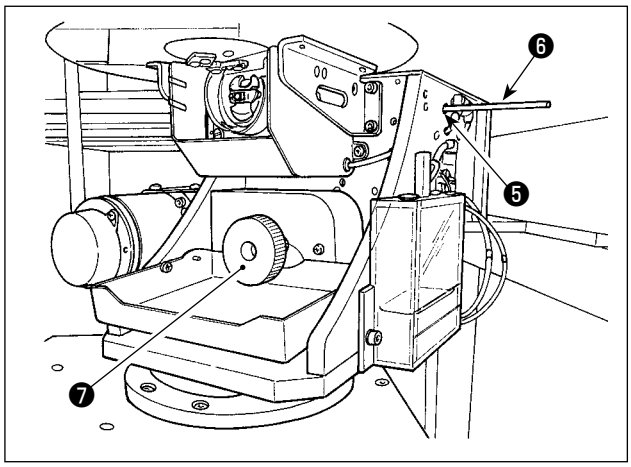
[Checking the needle entry]



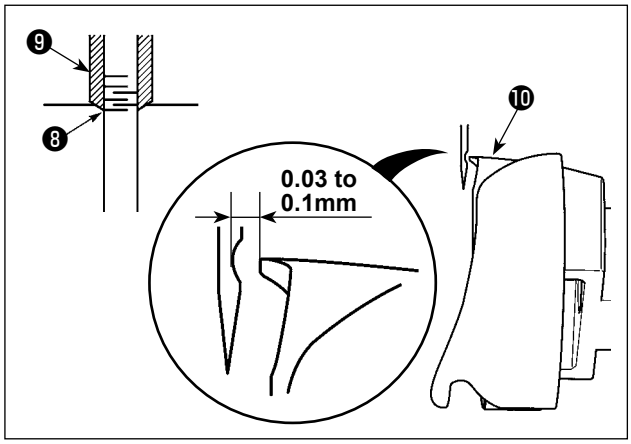
1) Remove screw ❶ . Detach needle hole guide ❷ .



2) Turn machine head ❸ and hook section ❹ so that they face the front.
Align marker line Ⓐ on the bearing with marker line Ⓑ on gear ring.

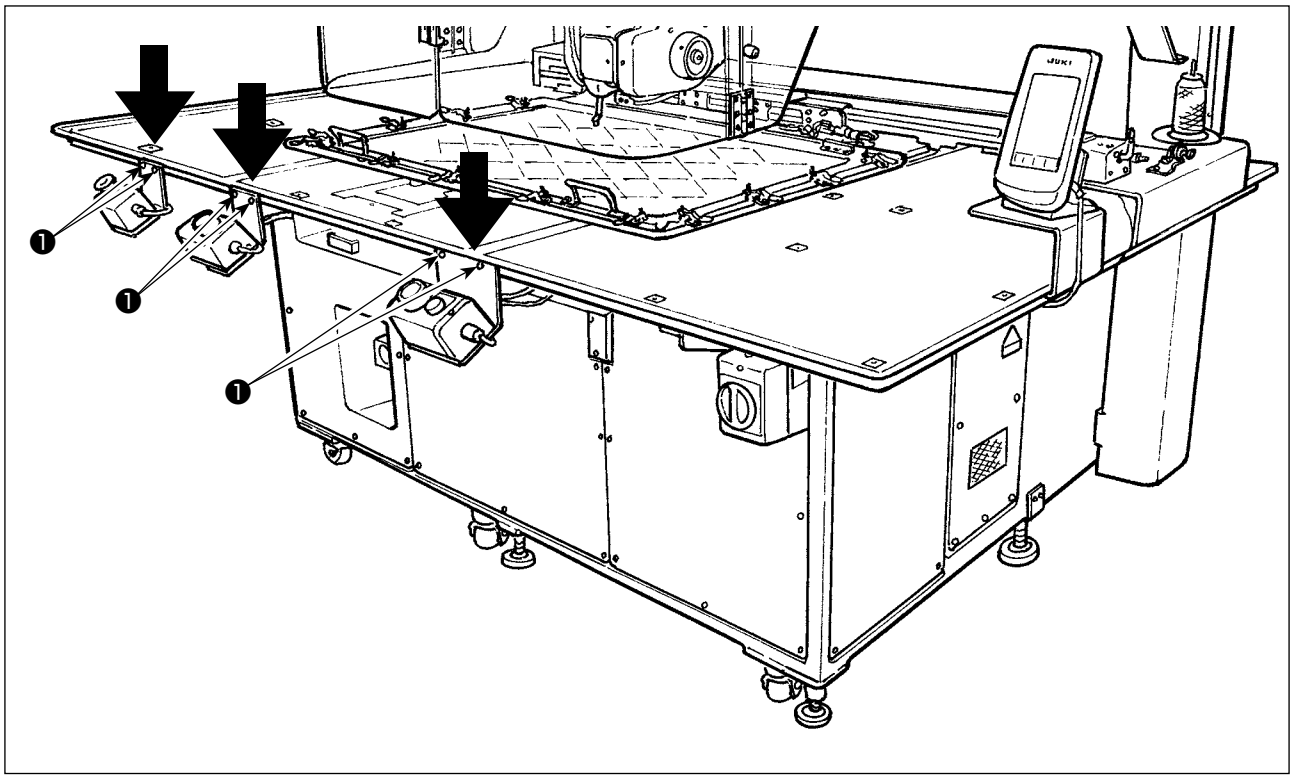


3) Inserting hook shaft fixing rod ❻ into hook shaft fixing rod insertion hole ❺ , turn pulley ❼ until hook shaft fixing rod ❻ is fully inserted into the hole. (As a guide, turn the pulley until the hook blade point is brought to the position at which it faces upward.)



4) Turn the hand pulley of machine head until needle-bar marker line ❽ is aligned with the lower end of needle bar bushing ❾ .
5) Check to make sure that a clearance of 0.03 to 0.1 mm is provided between the needle and the hook blade point ❿ when the hook blade point is aligned with the center of needle.
For each of four directions, check steps 2) to 4) by turning the machine head and hook section in steps of 90 degrees.
If the clearance of 0.03 to 0.1 mm is not provided between the needle and the hook blade point, re-adjust the levelness of the main body of device.

3-3. Preparations of switches

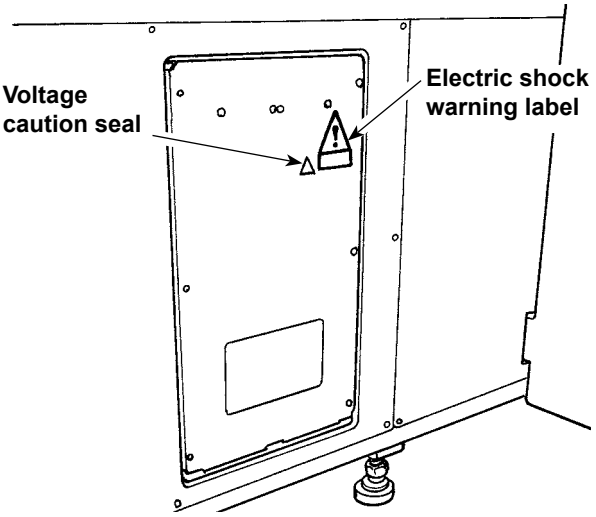


Loosen respective screws ❶ of the power switch, start switch and emergency stop switch which are placed upside down. Then, place the switches so that they face the worker side and re-tighten the screws.

3-4. Connecting the power switch

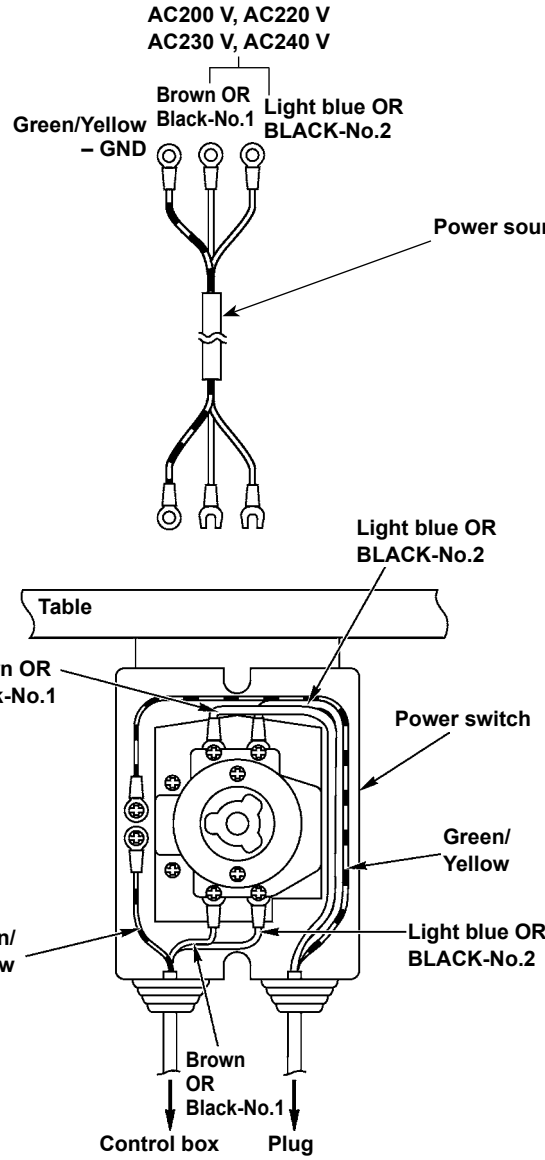
Connecting the power source cord

The factory default voltage type is indicated on the voltage indication plate. Connect the cord in accordance with the specifications.

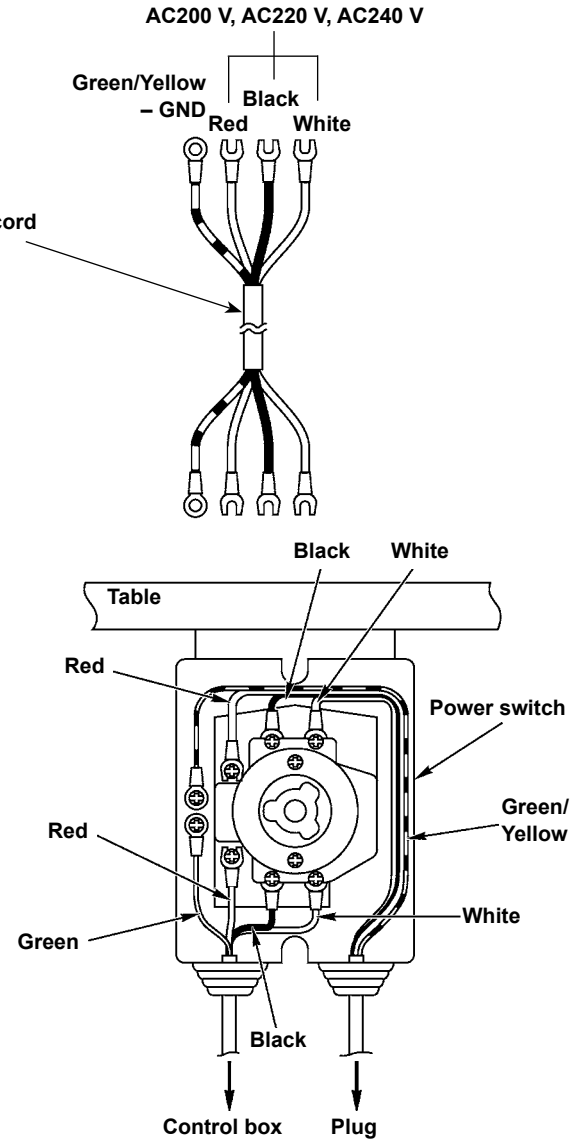


Caution **Never use under the wrong voltage and phase.**

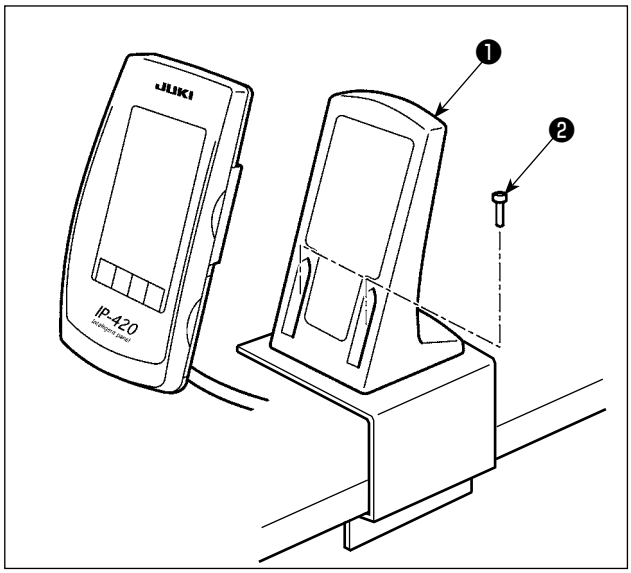
- **Connecting single phase 200V, 220V, 230V and 240V**



- **Connecting three phase 200V, 220V and 240V**



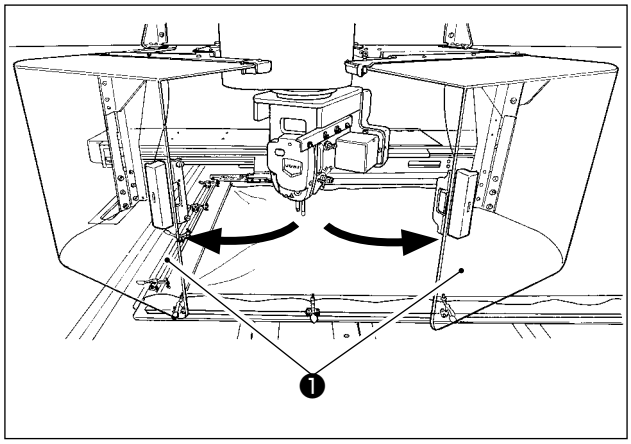
3-5. Installing the panel



1) Fix operation box mounting plate ❶ with two wood screws ❷ .

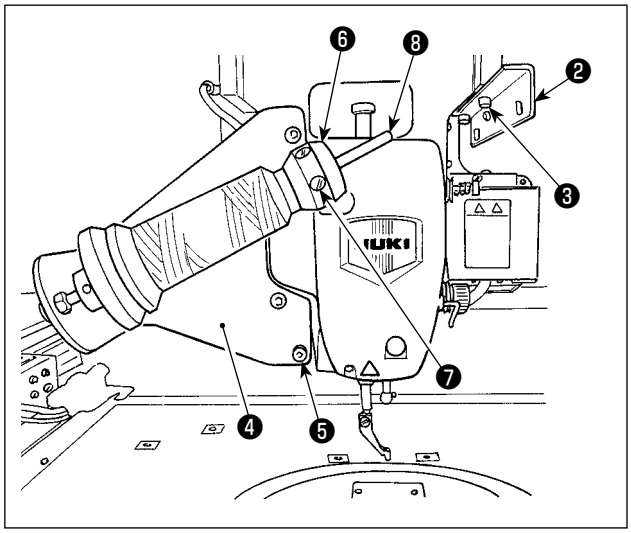
Caution
Install the panel at the position where X-move cover or head grip does not interfere with it since breakage of the panel will be caused.

3-6. Installing the thread stand



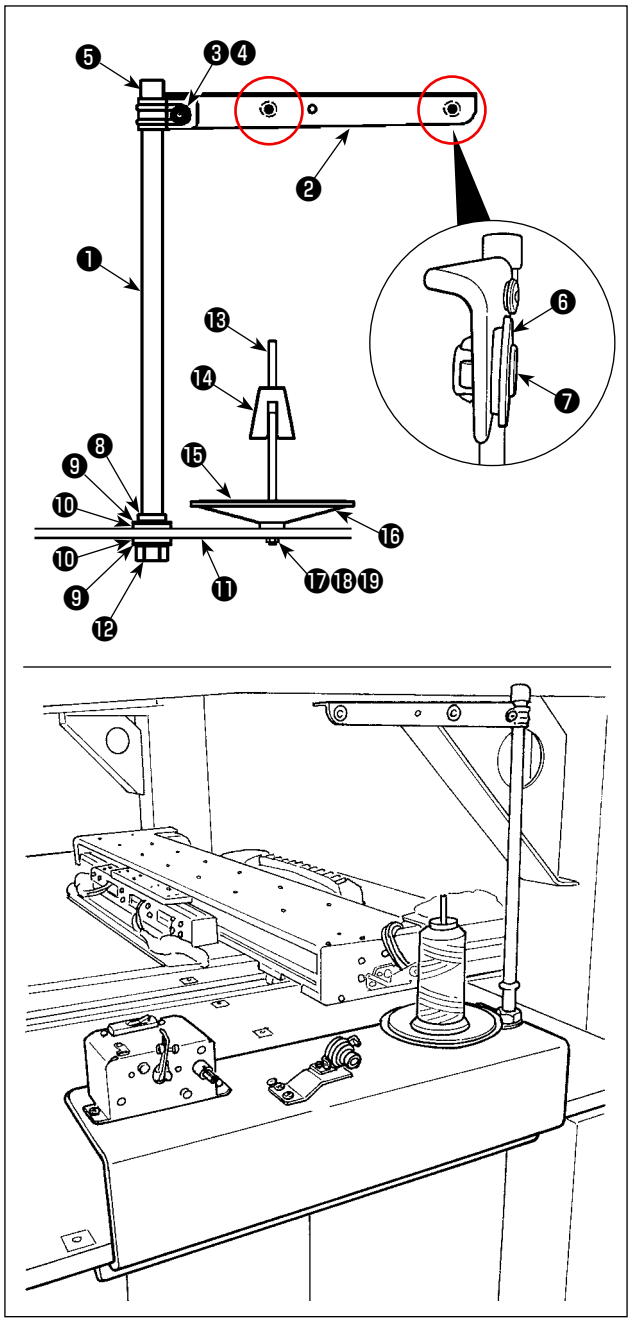
1) Open machine head safety cover ❶ .

Caution
Keep the machine head safety cover ❶ closed while the sewing machine is in operation.



2) Fix thread guide plate ❷ with setscrews ❸ (two small screws).
3) Fix thread stand mounting plate ❹ with set-screws ❺ (three large screws).
4) Attach setscrew ❼ in thread winder support block ❻ .
5) Put the thread on bobbin winder support rod ❽, Insert bobbin winder support block ❻ into bobbin winder support rod ❽ and fix with setscrew ❼ .

3-7. How to install the thread stand for bobbin winding



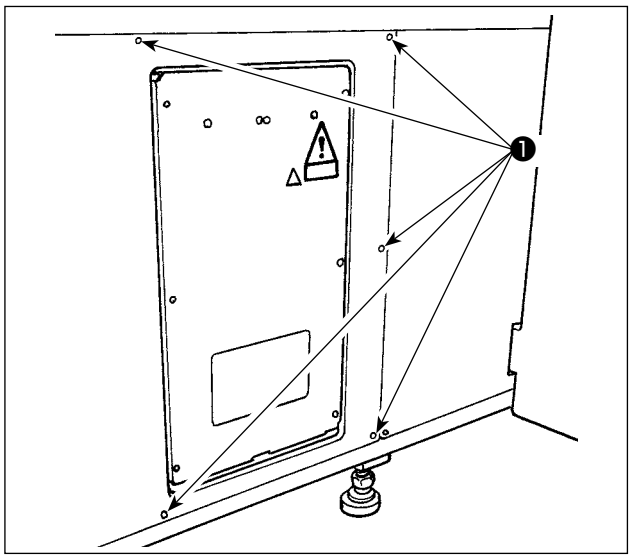
1) Pass thread stand arm ❷ over spool rest rod ❶ and fix with thread stand arm setscrew ❸ and thread stand arm lock nut ❹ .
   Fit thread stand protection cap ❺ over the top end of thread stand ❶ .
2) Put thread path bush ❻ and thread path ❼ in holes (two locations) in thread stand arm ❷ in the written order.
3) Attach spool rest rod lock nut (small) ❽ , rubber washer ❾ and thread stand lock washer ❿ to the lower end of spool rest rod ❶ . Then, fit the spool rest rod in the hole in bobbin winder base ⓫ and fix with thread spool rest rod lock nut (large) ⓬ .
4) Attach bobbin winder anti-vibrator ⓮ , bobbin winder tray cushion ⓯ and bobbin winder tray ⓰ to bobbin winder support rod ⓭ . Then, fix them on bobbin winder base ⓫ with a screw.
5) Attach bobbin winder support rod lock plain washer ⓱ , bobbin winder support rod lock spring washer ⓲ and bobbin winder support rod lock nut ⓳ to the section of screw that protrudes from the undersurface of bobbin winder base ⓫ and fix them.

3-8. Connecting the cord

DANGER :

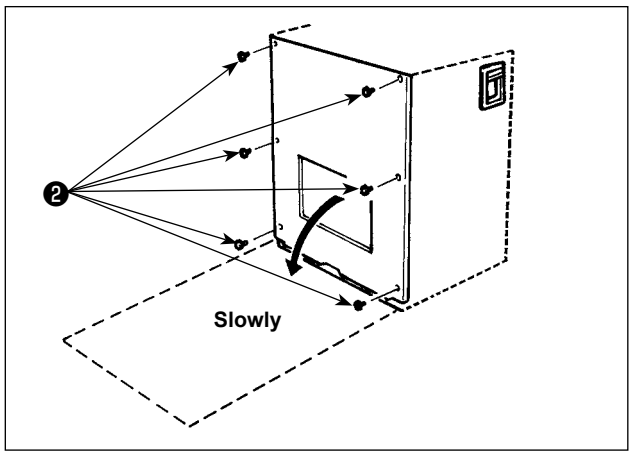
1. To prevent personal injuries caused by electric shock hazards or abrupt start of the sewing machine, carry out the work after turning OFF the power switch and a lapse of 5 minutes or more.

2. To prevent accidents caused by unaccustomed work or electric shock, request the electric expert or engineer of our dealers when adjusting the electrical components.



[How to detach the cover]

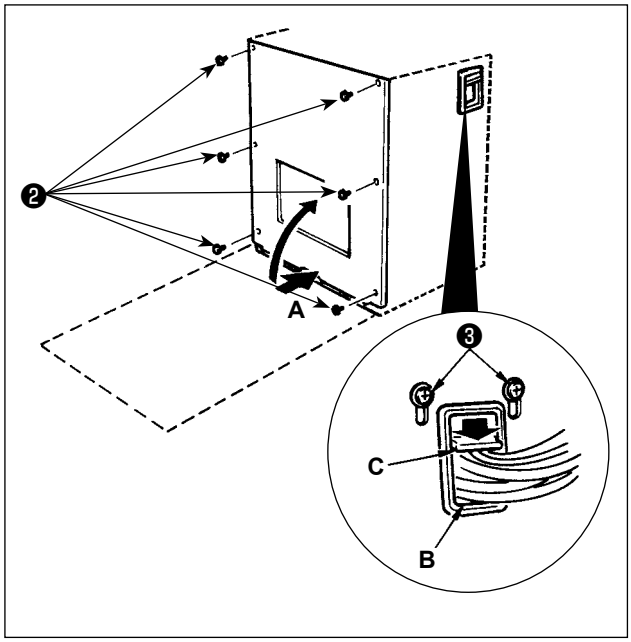
Remove eight setscrews ❶ of the side cover.



[How to open the control box]

Remove six screws ❷ which secure the front cover of control box. When opening the front cover, open it by holding it and turning carefully by approximately 90°until it will go no further, as shown in the figure.

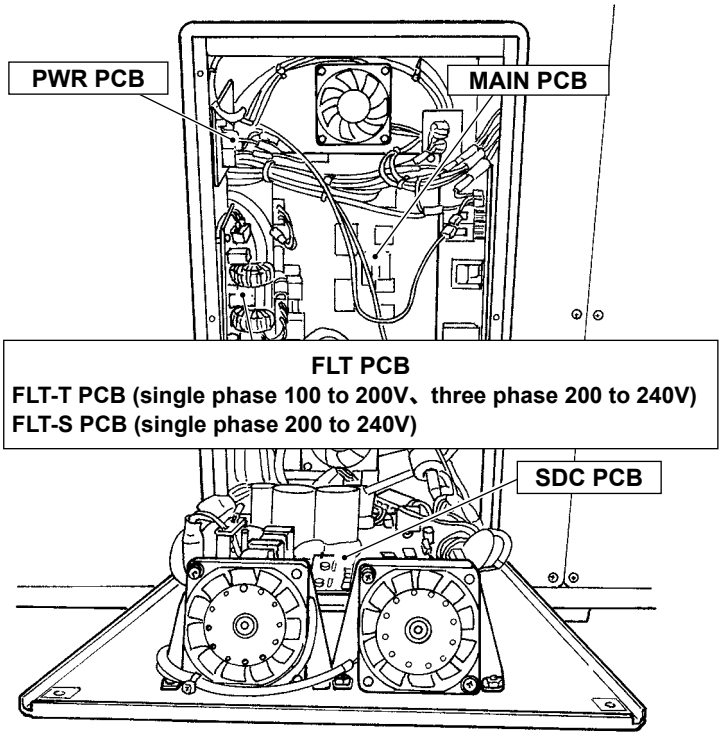
Be sure to hold the cover with hands in order to prevent it from dropping. In this case, do not apply an extra load to the front cover you have opened.

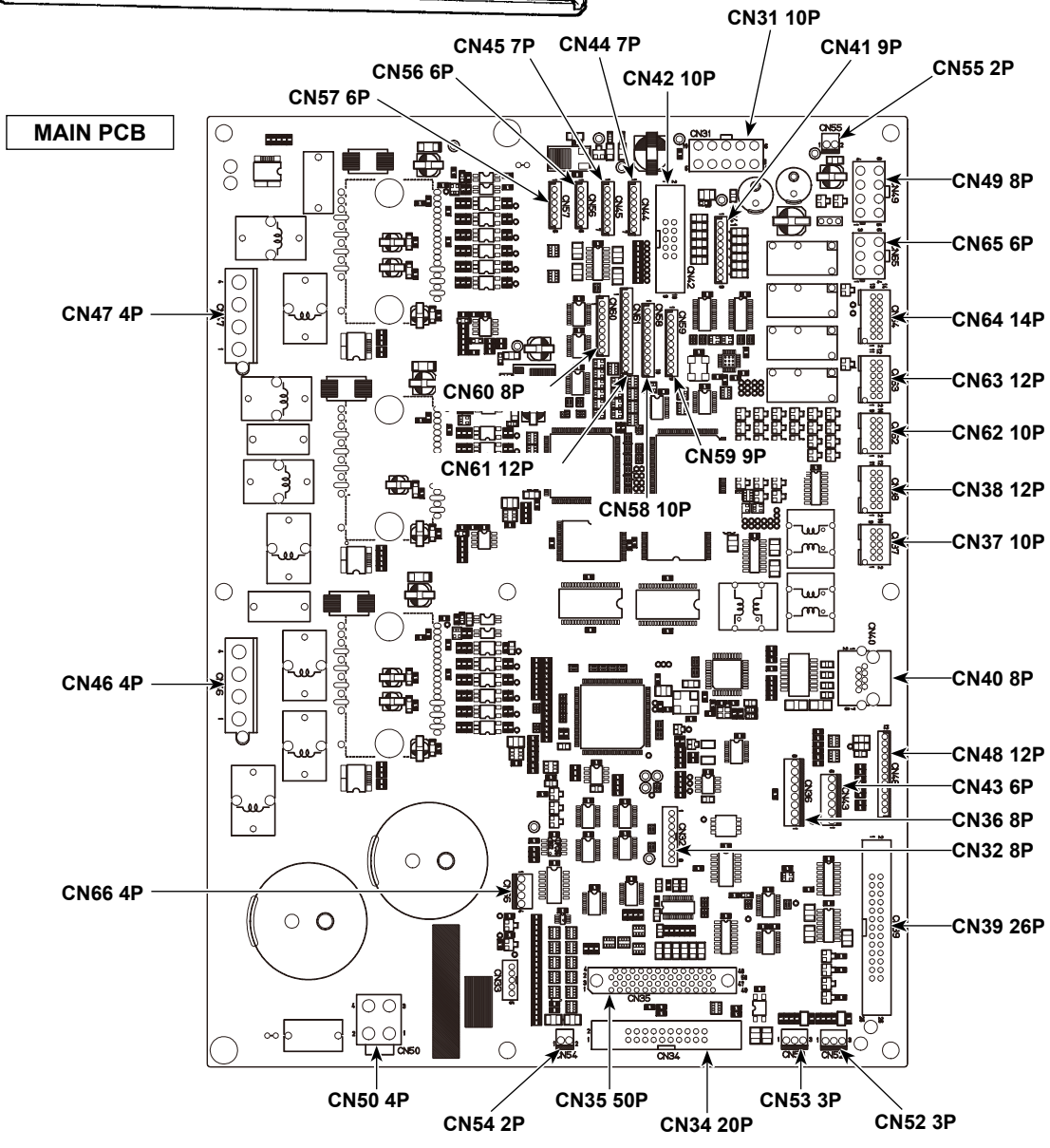


[How to close the control box]

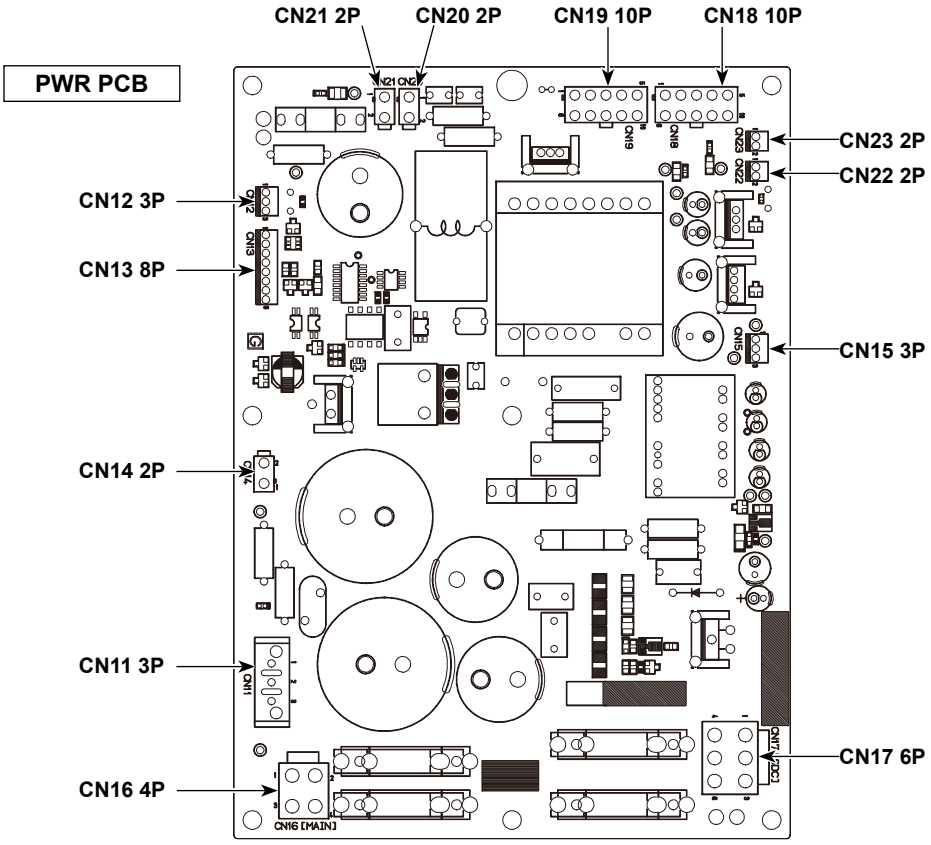
1) Close the front cover by pushing its lower side **A** and fix with six screws ❷ while adding special care not to allow cables to be caught between the front cover and the control box.
2) Lower downward the cord located on the side of the control box and cord presser plate **C** in the push hole **B**, press the cord and tighten screws ❸ .

[Inside of the control box]

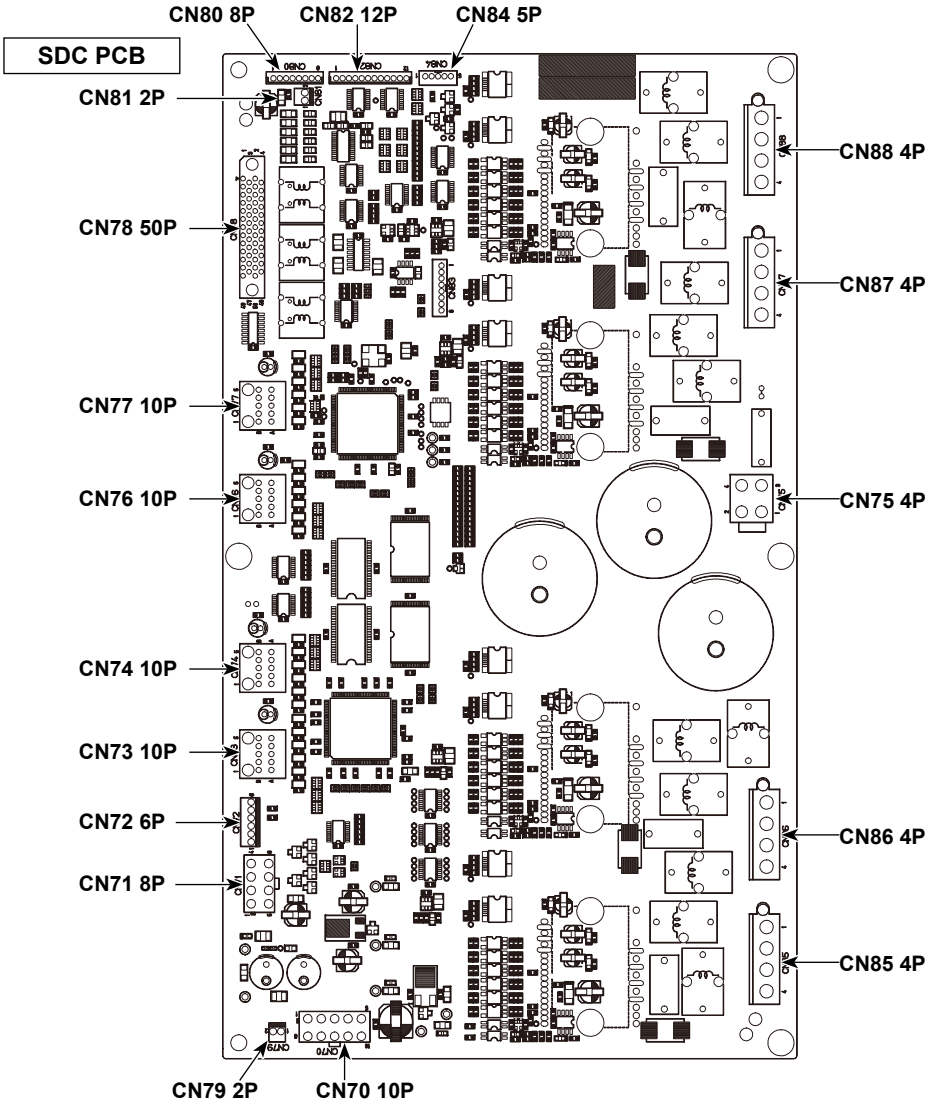




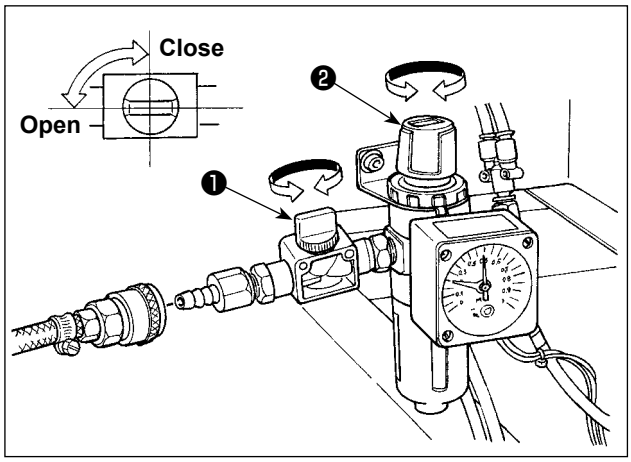
PWR PCB



SDC PCB



3-9. Installing the air hose

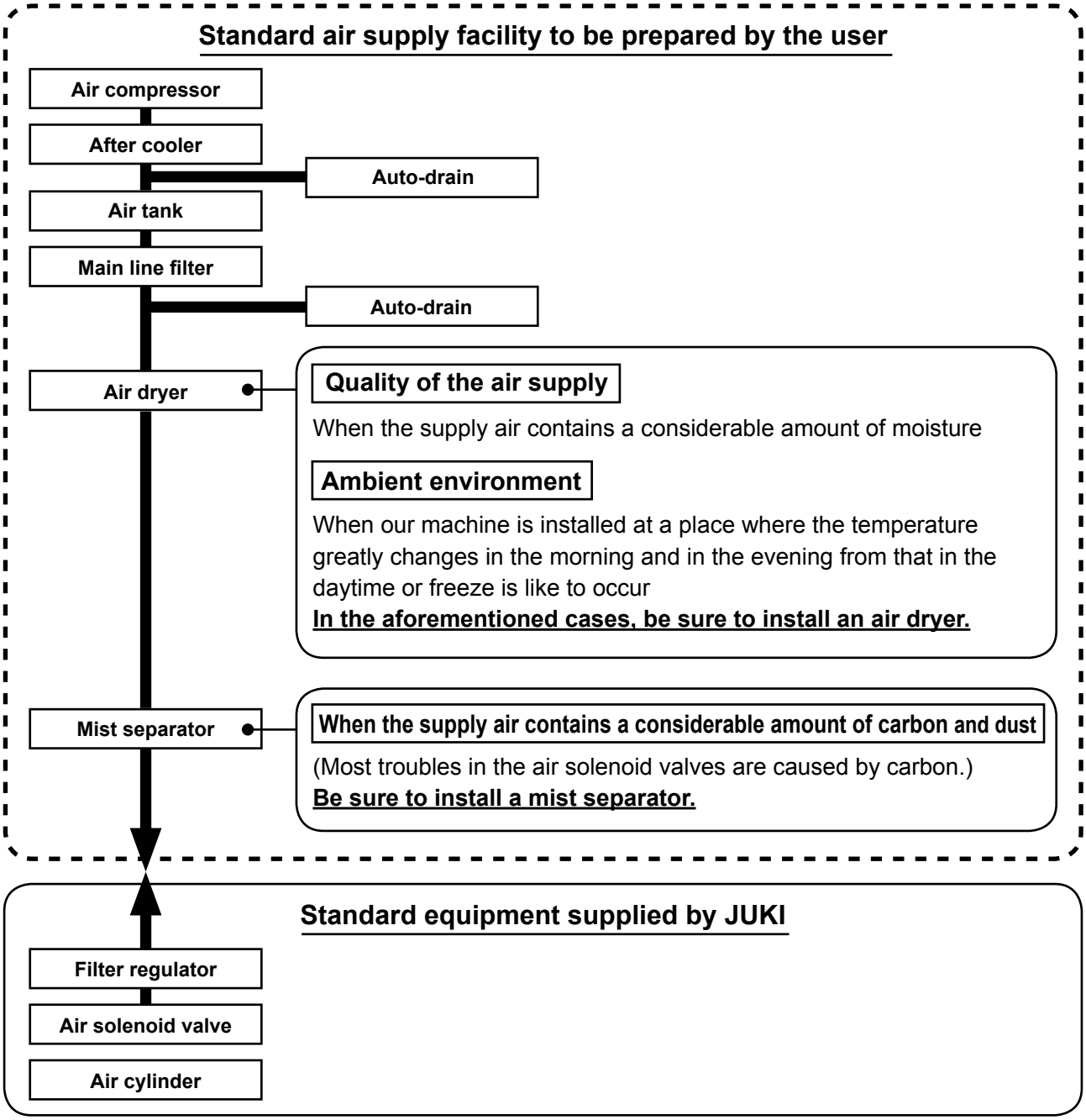


1) Connecting the air hose
   Connect the air hose to the regulator.
2) Adjustment of air pressure
   Open air cock ❶ , pull up and turn air adjustment knob ❷ and adjust so that air pressure indicates 0.45 to 0.5 MPa (Max. 0.55 MPa). Then lower the knob and fix it.

* Close air cock ❶ to expel air.

3-10. 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.



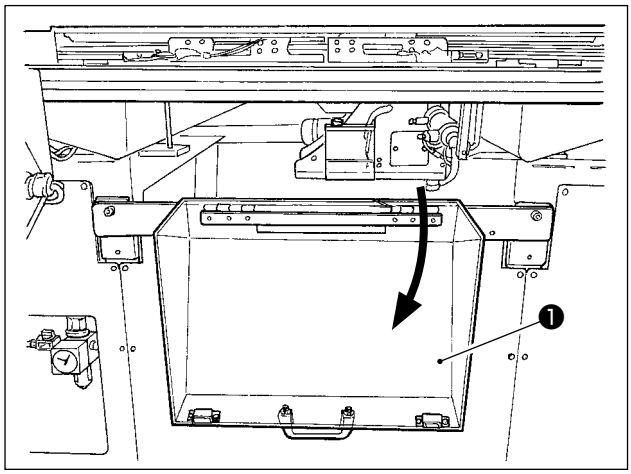
Cautions for main piping

- **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.**

4. PREPARATION OF THE SEWING MACHINE

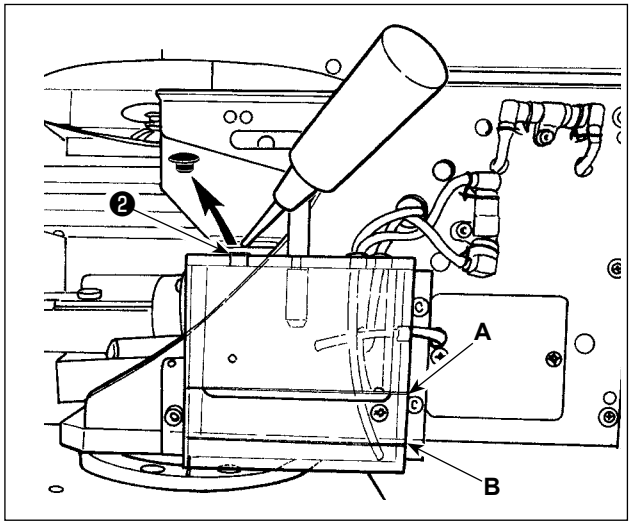
4-1. Lubrication

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



1) Open hook section safety cover ❶ .

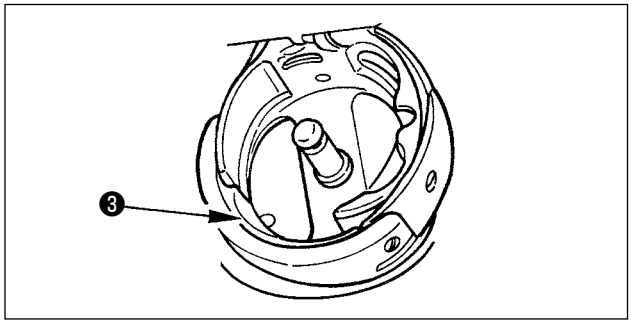
Keep hook section safety cover ❶ closed while the sewing machine is in operation.



2) Remove rubber cap ❷ . Add JUKI New Defrix Oil No. 2 supplied with the unit into the oil tank. The oil surface in the oil tank must not exceed upper line **A**.
3) Periodically check to make sure that the oil surface in the oil tank remains between lower line **B** and upper line **A** while using the sewing machine. Fill there with oil using the oiler supplied with the machine as accessories when oil is short.

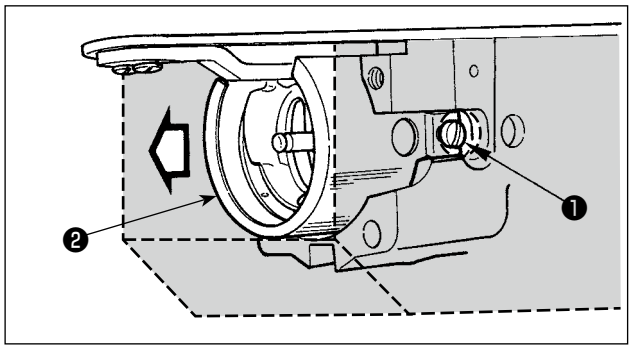
The oil tank which is filled with oil is only for lubricating to the hook portion. It is possible to reduce the oil amount when the number of rotation used is low and the oil amount in the hook portion is excessive. (Refer to "III-1-6. Amount of oil supplied to the hook" p.119 .)

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. In addition, use the sewing machine for sewing after having it run idle for approximately two minutes at 1,000 sti/min. (Refer to "III-1-2. Adjusting the needle-to-shuttle relation" p.116 .)



When you use the sewing machine for the first time after the purchase, lubricate hook race surface ❸ until a drop of oil can be observed.

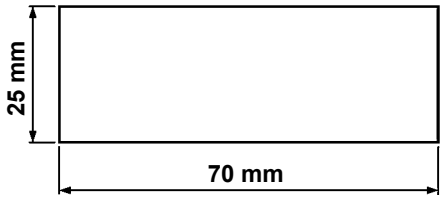
4-2. Adjusting the oil quantity in the hook



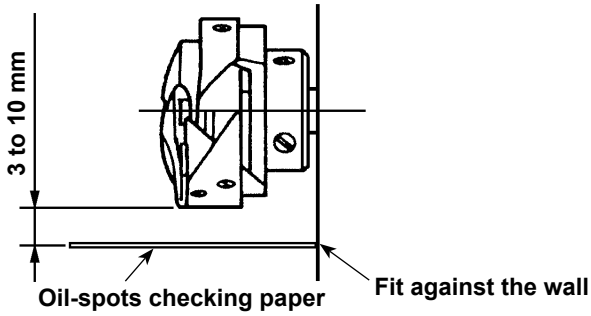
1) Loosen setscrews ❶ (right and left). Detach oil shield ❷ .
   At this time, do not attempt to forcibly remove the oil shield. Before removing the oil shield, turn the pulley until the needle stops at its upper end. Then, remove the oil shield.
2) Turn the hook section so that it faces the front.

(1) Checking the oil quantity in the hook

① **Paper for checking the oil quantity (oil spots)**



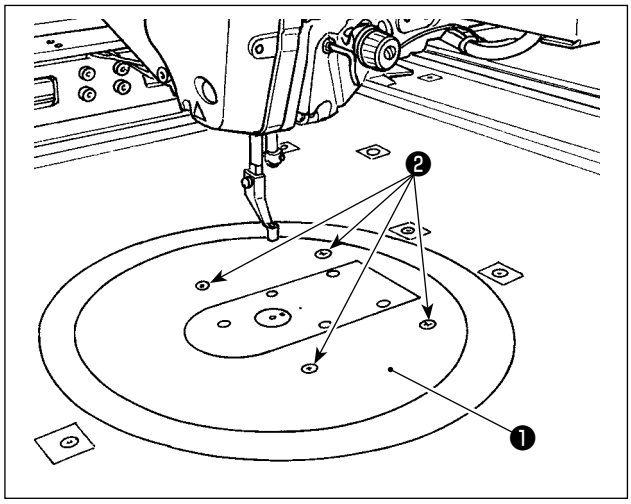
② **Position at which the oil quantity (oil spots) is checked**

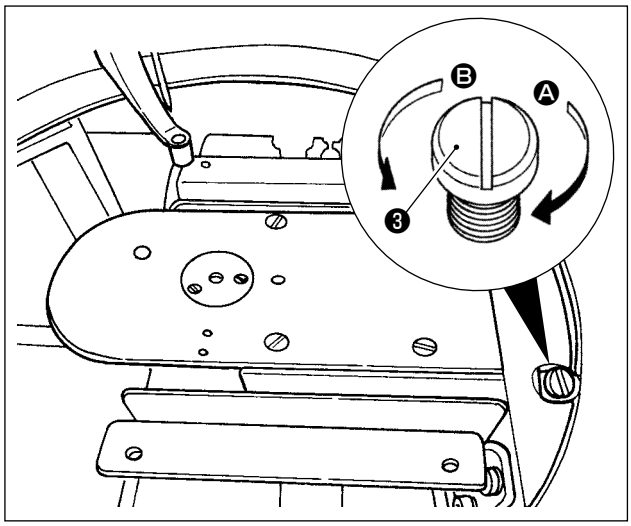


* When carrying out the following work described in step 2), take added care not to allow your fingers to come in contact with the hook.

1) In the case the machine head is cold, run it idle for approximately three minutes. (Low-speed operation)
2) Insert a sheet of paper for checking the oil quantity (oil spots) in the check position while the sewing machine is in operation.
3) Check to make sure that the oil surface in the oil tank is at the level between the upper and lower lines.
4) Check the oil quantity (oil spots) for five seconds. (Measure with a watch.)

(2) Adjusting the hook oil quantity (oil spots)

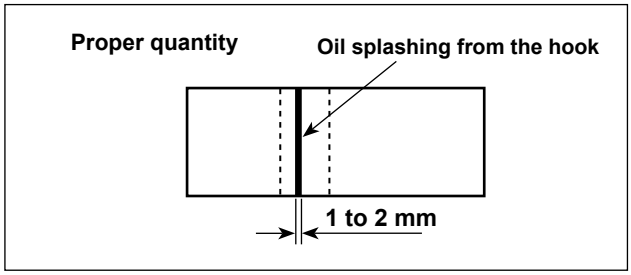




1) Remove four setscrews ❷ of round table ❶ . Detach round table ❶ .
2) Turn oil quantity adjustment screw ❸ clockwise Ⓐ until it is fully tightened.
3) Turn the screw counterclockwise Ⓑ by half.
4) The oil quantity (oil spots) is increased by turning oil quantity adjustment screw ❸ counterclockwise Ⓑ or is decreased by turning it clockwise Ⓐ.

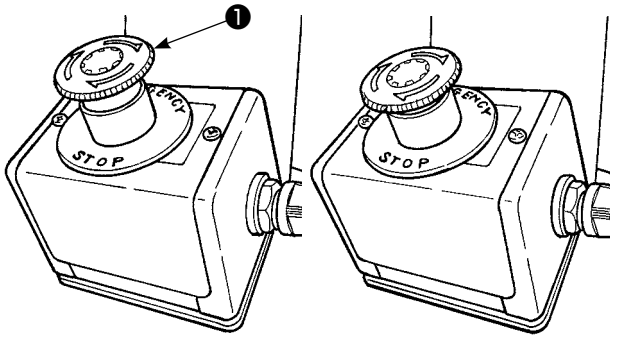
   Carry out the adjustment in the following cases.
   a. Decrease the hook oil quantity when the oil in the oil tank at the bed side reduces quickly.
   b. Decrease the hook oil quantity when the quantity of oil splashing from the hook is large or when oil leaks from the hook cover.
   c. Increase the hook oil quantity when the hook generates a large noise.
   d. Increase the hook oil quantity if the needle thread is not adequately drawn up due to the oil shortage.
5) After the adjustment of oil quantity, attach round table ❶ in place and fix with four setscrews ❷ .

(3) Sample of proper quantity of hook oil (oil spots)



1) The state shown in the figure represents the proper quantity of oil (oil spots). Adjustment may be required depending on the sewing process. However, it is important not to excessively increase/decrease the oil quantity. (Smaller quantity of oil = Hook seizure (hook becomes hot); Larger quantity of oil = Oil stains on the sewn products)
2) Check the oil quantity (oil spots) three times (with three sheets of paper).

4-3. Checking the emergency stop switch

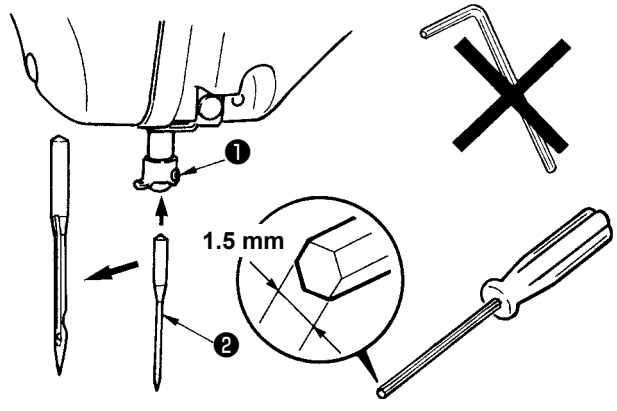


Emergency stop switch OFF state **Emergency stop switch ON state**

When the red button of emergency stop switch ❶ is strongly pressed as far as it goes, the switch is placed in its ON state. When the button is turned clockwise, the switch is placed in its OFF state.
Check to be sure that emergency stop switch ❶ is in its OFF state.
If emergency stop switch ❶ is in its ON state, the operation panel screen will not light up even if the power switch is turned ON.

4-4. Attaching the needle

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



Loosen setscrew ❶. Insert needle ❷ into the hole in needle bar until it will go no further while facing its long groove toward the frame. Then, 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 set-screw ❶ .

4-5. Needle size and gauge

When changing the needle size, it is necessary to adjust the hook and to replace the gauge.

(1) Adjustment

In the standard delivery state, the hook has been factory-adjusted to DP × 17 #23 needle.

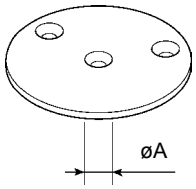
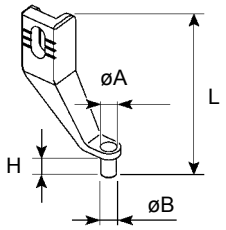
When changing the thickness of the needle, perform the adjustment of **"III-1-2. Adjusting the needle-to-shuttle relation" p.116** .

When changing the length of the needle, perform the adjustment of **"III-1-1. Adjusting the height of the needle bar (Changing the length of the needle)" p.115** .

When the adjustment of hook and driver is not fit to the thickness of the needle, sewing troubles such as stitch skipping and the like or abrasion of the blade point of hook will be caused.

(2) Gauge

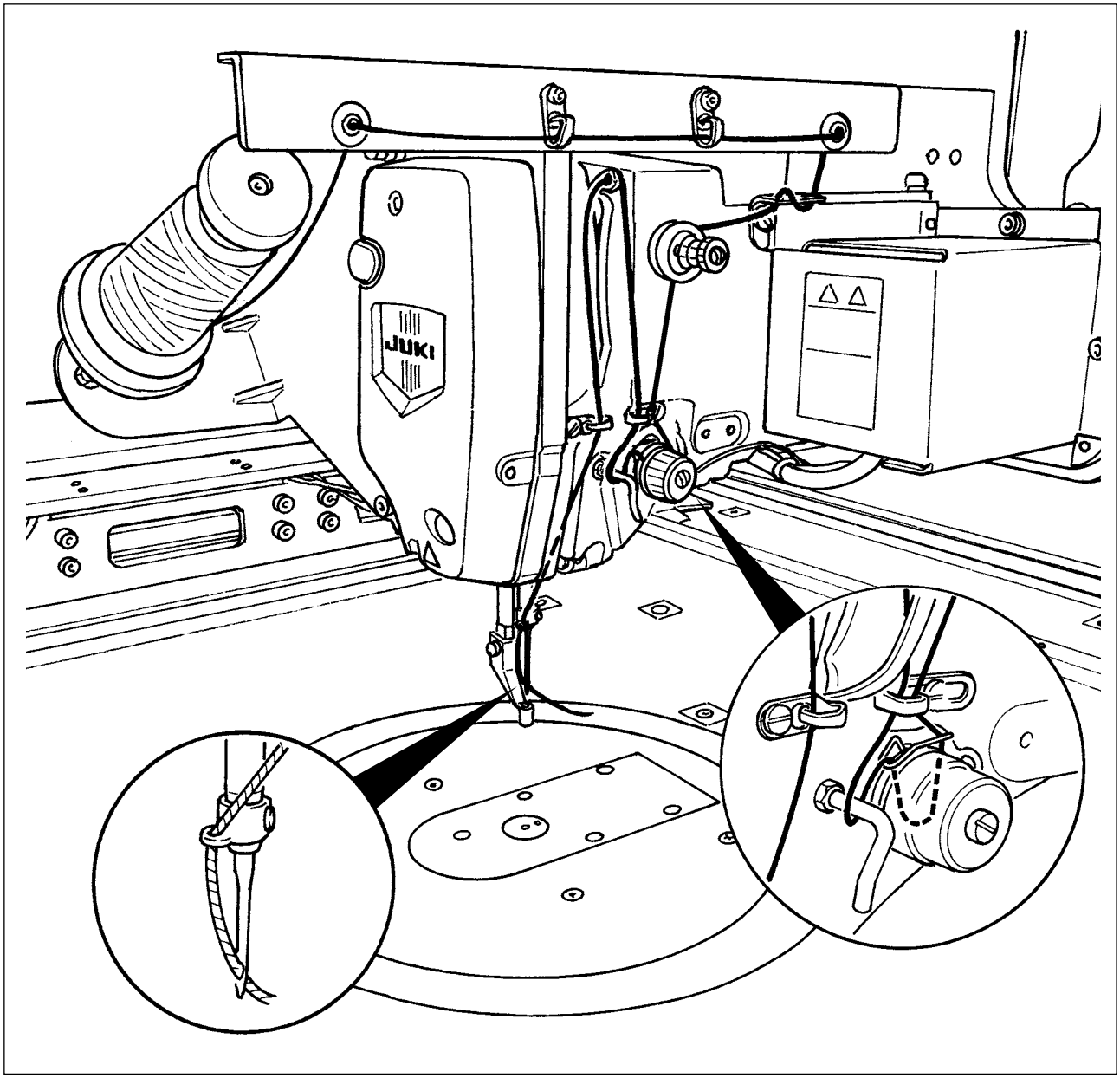
When changing the needle size, replace the gauge with the optional gauge of the correspondence table.

Needle	Needle hole guide		Intermediate presser	
				
Number (Thickness)	Part No.	Needle hole diameter (øA)	Part No.	Dimension (øA × øB × H × L)
#18 to #21	14439509	ø2.3	B1601210D0BA	ø2.7 × ø4.1 × 5.7 × 38.5
#20 to #23	14439608	ø3.0		
#23 or thicker	14439707	ø4.0	B1601210D0CA	ø3.5 × ø5.5 × 5.7 × 38.5

1. **The table above describes the typical optional gauges.**
   For the other special gauges, ask our sales distributors.
2. **When using the gauge that is not fit for the thickness of the needle, needle breakage, abrasion of components such as inner hook and the like, sewing trouble such as stitch skipping and the like will be caused.**
   Example : When sewing the sports shoes with a big size needle guide or inner hook presser, needle thread loop becomes unstable and stitch skipping or thread breakage may occur.

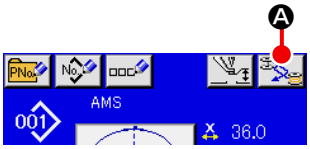
4-6. Threading the machine head

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

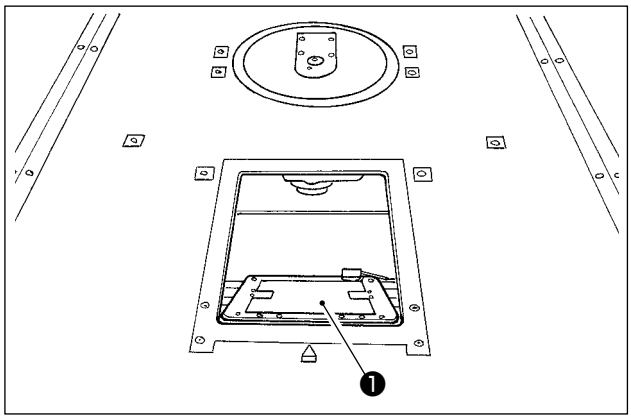


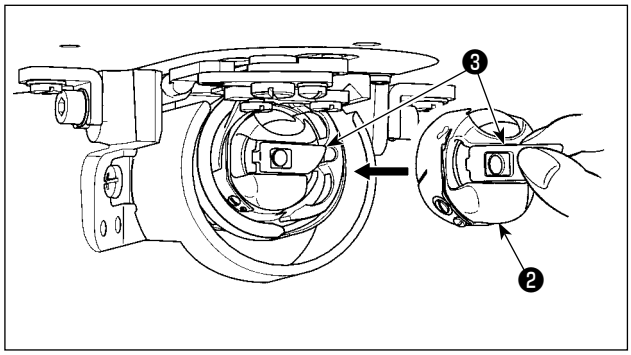
4-7. Installing and removing the bobbin case

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start or the sewing machine.
In addition, be sure to close the bobbin replacement cover when re-starting operation in order to prevent personal injury.



1) When button ❹ is pressed, the turning section rotates to allow the hook to face the front face and bobbin replacement cover ❶ to open.



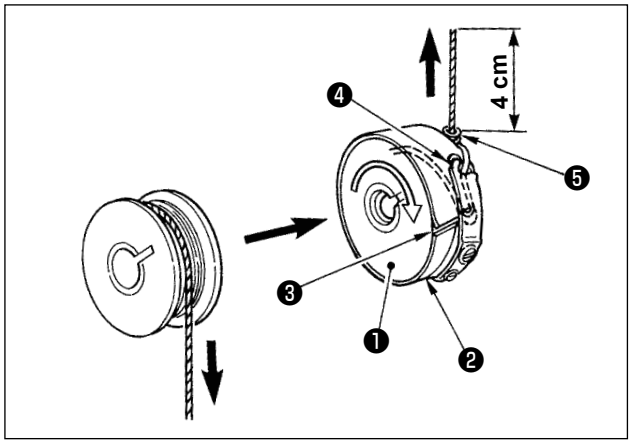


2) Raise latch ❸ of bobbin case ❷ , and remove the bobbin case.
3) When entering bobbin case, insert it with the latch tilted until "click" sounds.

If bobbin case ❷ is not adequately fitted in the hook, it can drop off the hook or needle can break during sewing.

4-8. Installing the bobbin

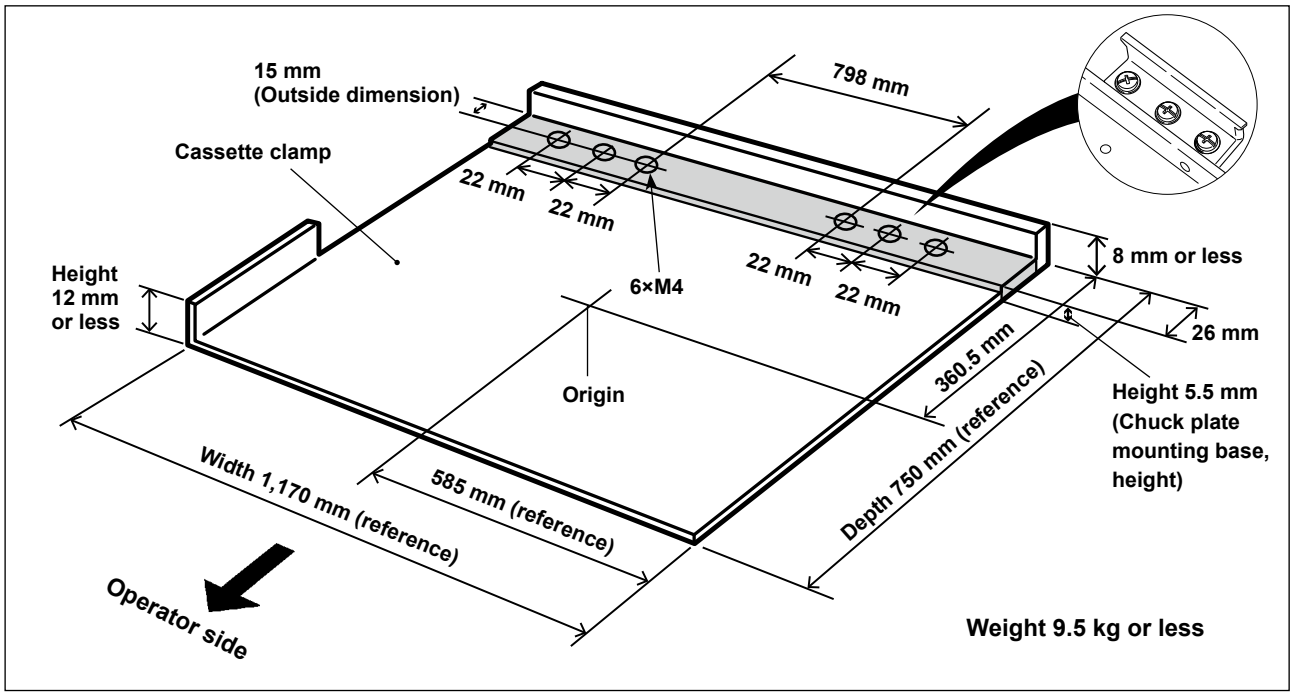
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start or the sewing machine.



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 under bobbin thread guide ❺ and draw the thread by 4 cm out from the bobbin thread guide.

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

4-9. Preparing the cassette clamp

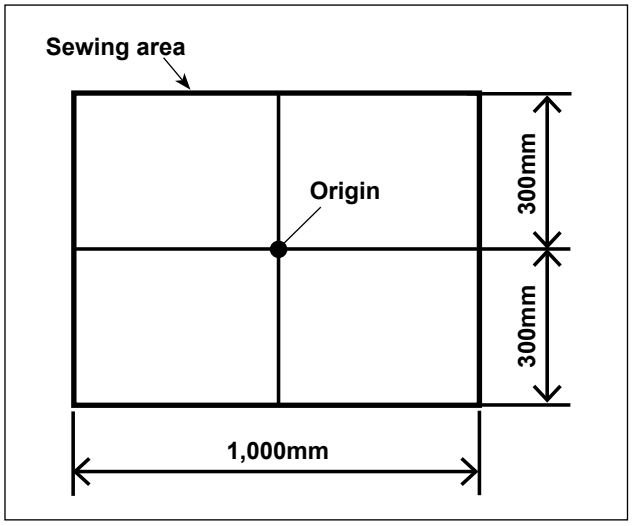


1) The cassette clamp is separately available by a special order.
   In the case the customer prepares a cassette clamp, the cassette clamp which is shown in the above figure must be prepared.

2) Stick a piece of Teflon sheet (option: 40123146) or the like on the undersurface of cassette clamp.

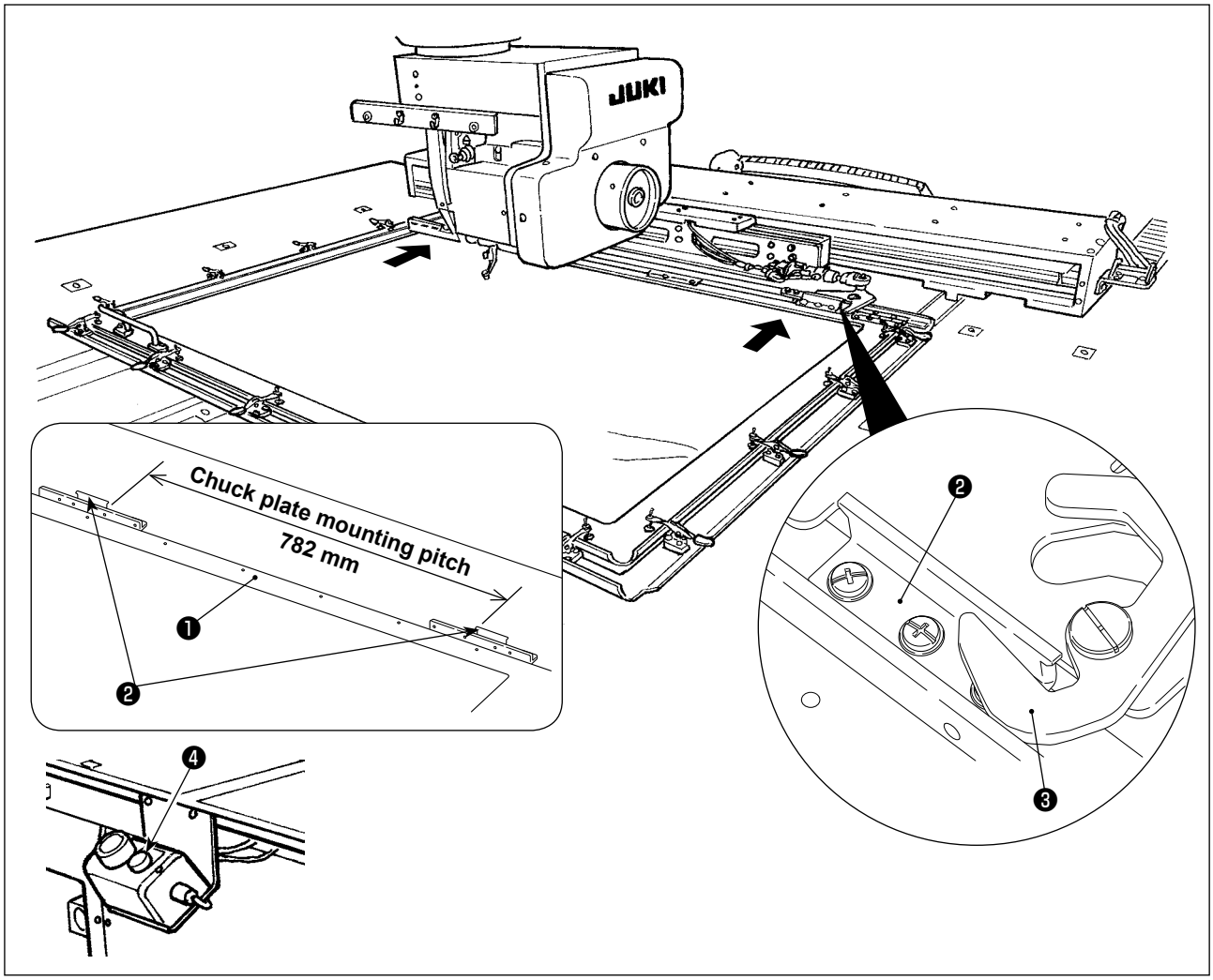
1. If a piece of Teflon sheet or the like is not stuck on the undersurface of cassette clamp, the top surface of throat plate can get dirty to cause stains on the sewing material. The Teflon sheet is a consumable part. It is necessary therefore periodically inspect it and change it with a new one if it has worn out.
2. Clean the undersurface and material retaining surface of cassette clamp and the top surface of throat plate auxiliary cover before use. After the cleaning, check to be sure that the aforementioned sections are free from dirt. Then, start using the sewing machine.

[Sewing area]



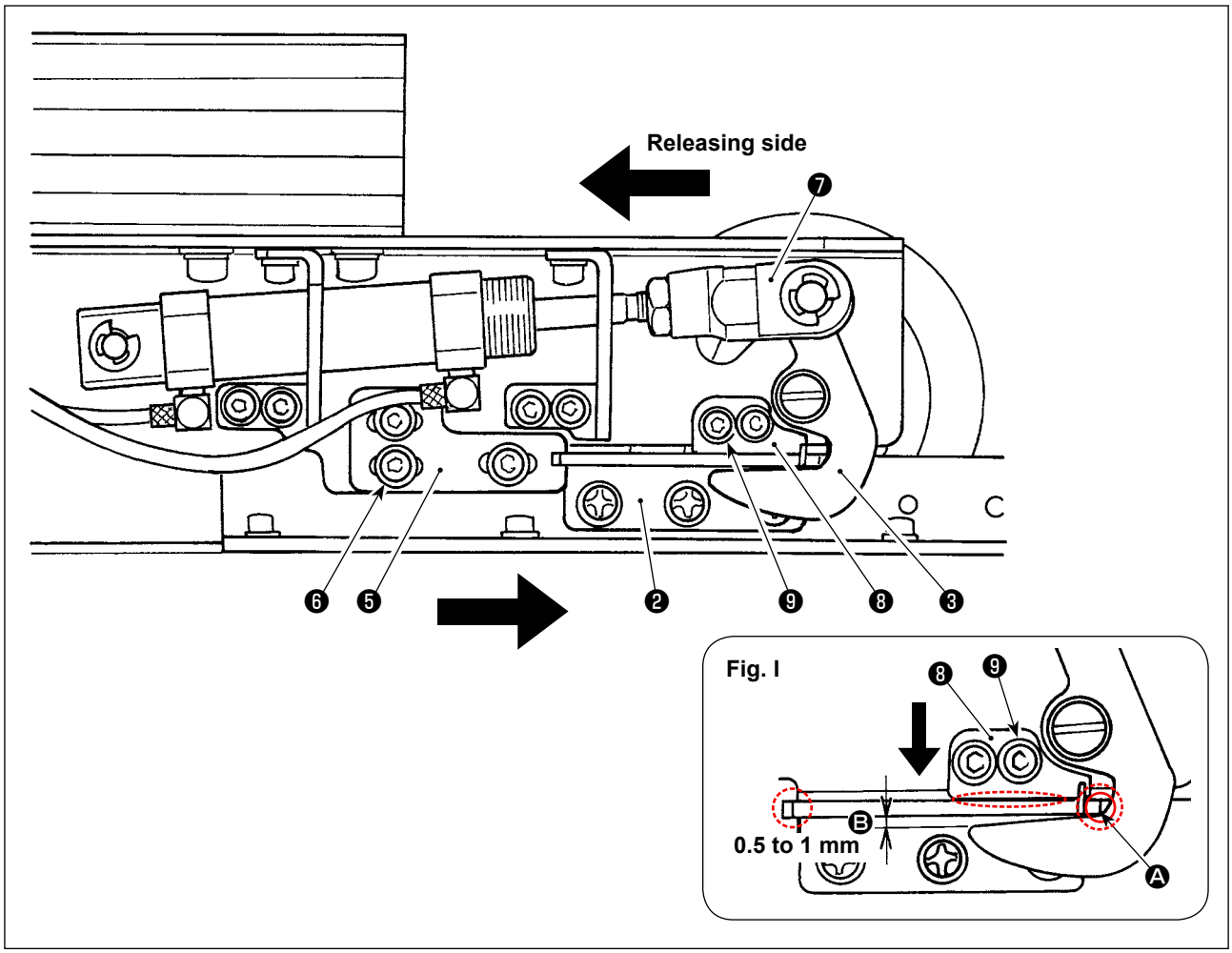
The sewing area has been factory set to the area (1,000 x 600) as shown in the figure at the time of shipment.

In the case of using the sewing area that is 600 mm in longitudinal direction, the cassette clamp may protrude the throat plate auxiliary cover when the material is fed in Y direction. So, be careful.



3) Temporarily fix chuck plates (40181516) ❷ at the 782-mm pitch positions of cassette clamp ❶ with setscrews and washers. (Chuck plates, setscrews and washers are packed in the accessory box.)
4) While fitting chuck plate ❷ against chuck ❸ , attach the cassette clamp in place. Then, securely fix chuck plates ❷ with setscrews.
   To detach the cassette clamp, press eject switch ❹ (blue).
5) Attach and detach the cassette clamp several time in repetition to check whether it can be completely attached in place.
   After attaching the cassette clamp in place, move it back and forth to check whether there is a backlash.

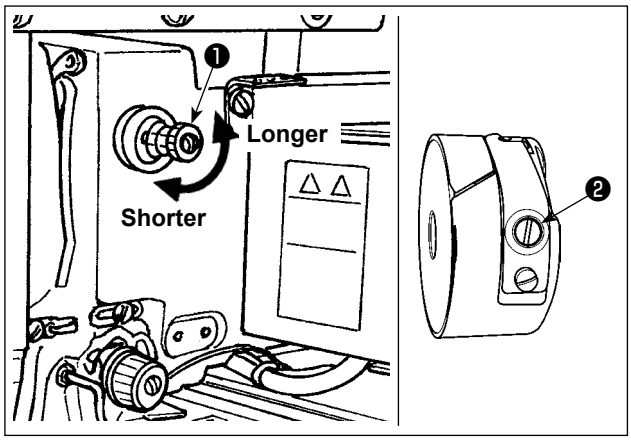
[In the case there is a backlash]



1) Loosen screws ❻ (3 pieces). Press chuck plate bracket A ❺ against chuck plate ❷ of the cassette clamp and fix with screw ❻ .
   Adjust the position of chuck plate bracket A ❺ also on the opposite side in the same manner. At this time, adjust so that right and left chuck plates ❷ and chuck plate brackets A ❺ are symmetrically positioned.
2) Then, pressing cylinder knuckle ❼ toward the releasing side, loosen screws ❾ (2 pieces) of chuck plate bracket B ❽ . Adjust the positional relationship between chuck plate ❷ and chuck ❸ so that they are positioned as illustrated in Fig. I.
   Adjust, by pressing chuck plate bracket B ❽ in the direction of the arrow, so that a clearance of 0.5 to 1 mm is provided in section Ⓑ when the chuck is aligned with the chuck plate at section Ⓐ. Then, fix the chuck plate Ⓑ with screws ❾ .

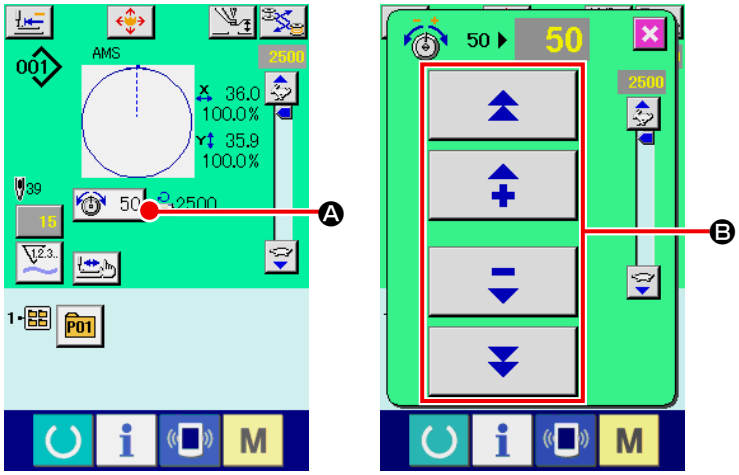
* Apply JUKI Grease A to the contact section indicated in a dotted circle in Fig. I.

4-10. 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]

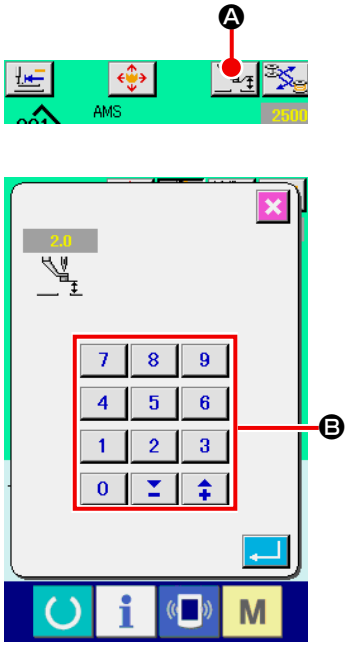


1) Select THREAD TENSION button 50 Ⓐ in the sewing screen.
2) Set needle thread tension with SCROLL button Ⓑ. There is a setting range of 0 to 200. When the set value is increased, the tension becomes higher.

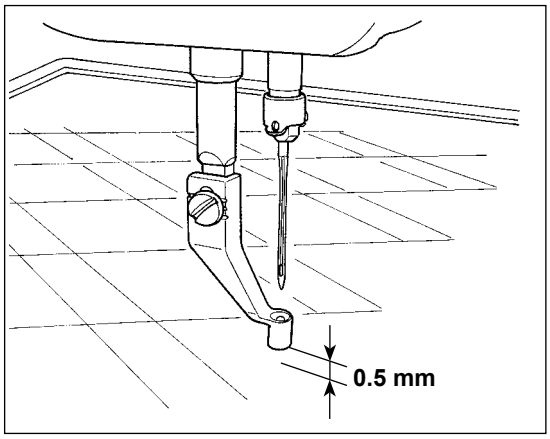
* When the set value is 50 at the time of standard delivery, the thread tension is adjusted to 2.35N (spun thread #50). (When thread tension No. 1 is released)

4-11. 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.
2. Take care not to allow your hands and fingers to be caught in the cassette clamp or the intermediate presser.

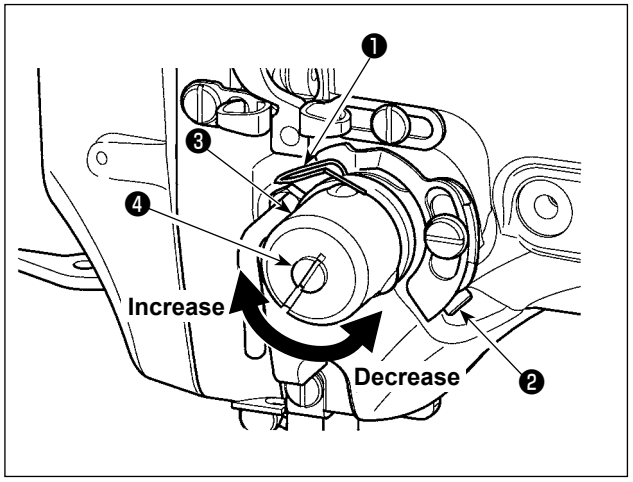


Press INTERMEDIATE PRESSER SETTING button Ⓐ and adjust with TEN keys Ⓑ so that the clearance between the bottom end of intermediate presser and the cloth is 0.5 mm (thickness of thread used).



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. In this case, turn OFF the wiper switch, or change the set value of memory switch U105 .
(Wiper is optionally available.)

4-12. Adjusting the thread take-up spring



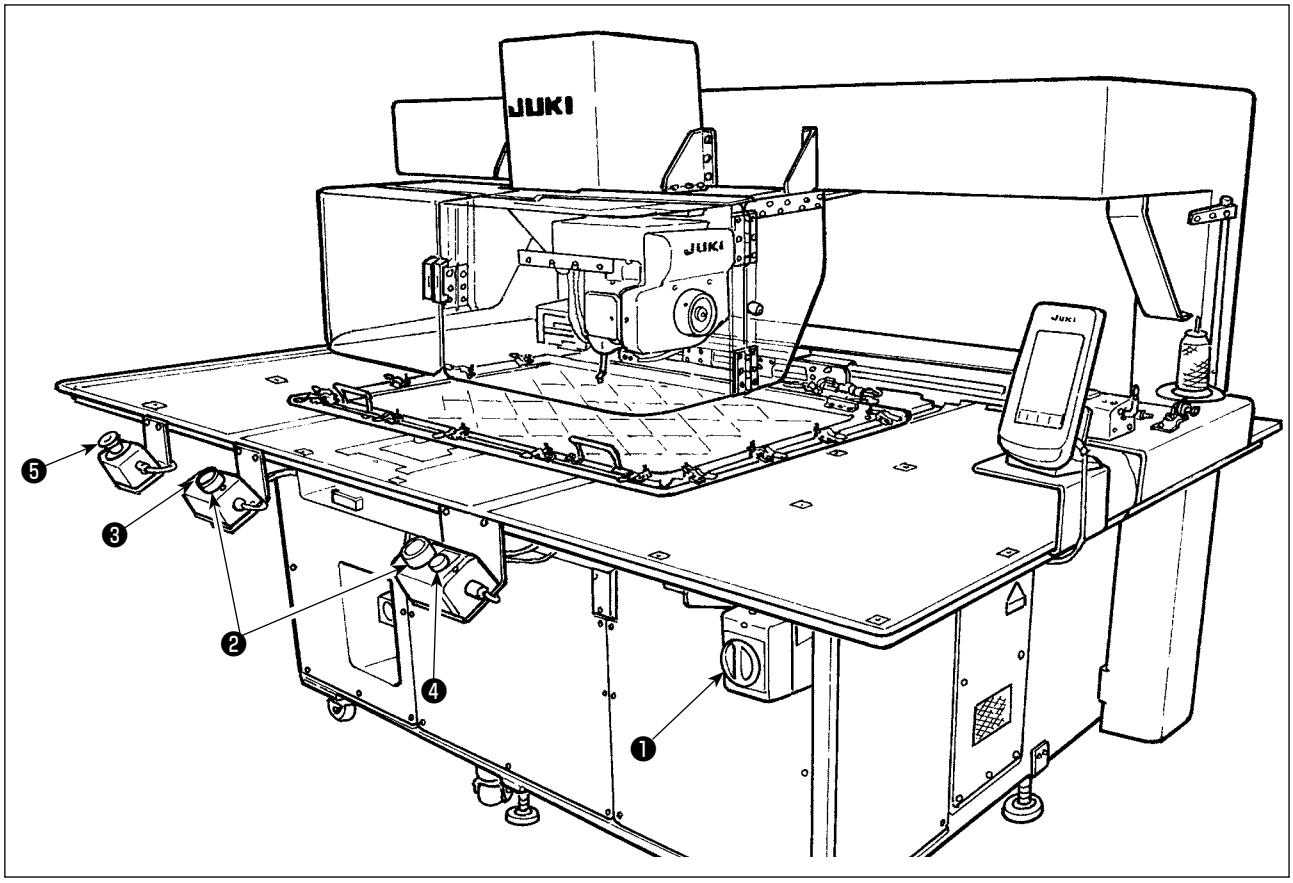
1) Adjusting the stroke
Loosen setscrew ❷ , and turn thread tension asm. ❸ .
Turning it clockwise will increase the moving amount and the thread drawing amount will increase.
2) Adjusting the pressure
To change the pressure of the thread take-up spring ❶ , insert a thin screwdriver into the slot of thread 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

WARNING :
Take added care not to press a wrong button in order to prevent an accident caused by sudden start of the sewing machine.

5-1. Sewing

Take care not to allow your hands and fingers in the intermediate presser and cassette clamp when they move. In addition, take care not to allow your hands and fingers to be hit by the intermediate presser and cassette clamp since they move at a high speed.



1) Place the sewing material on the sewing machine.
2) Press power switch ❶ .
3) When both of two start switches ❷ are pressed simultaneously, the intermediate presser comes down and the sewing machine starts sewing.
4) Press pause switch ❸ (white) to stop the sewing machine temporarily.
   Refer to **"II-2-9. How to use temporary stop" p.46** for how to use it.
   * When eject switch ❹ (blue) is pressed, the cassette clamp is ejected to the front of the device.
5) Once the sewing machine completes sewing, the needle tip returns to the sewing start position and the intermediate presser goes up. Then, the cassette clamp is ejected to the front of the device.
6) To stop the sewing machine at an emergency, press emergency stop switch ❺ .

When the eject switch ❹ is pressed or the sewing machine completes sewing, the cassette clamp is ejected to the front of the device. If you place an article or your hand(s) on the top surface of table, the cassette clamp can accidentally come in contact with the article or your hand(s) when it is ejected. So, be careful.

II. OPERATION SECTION (WITH REGARD TO THE PANEL)

1. PREFACE

* The medium supplied with the unit as an accessory contains the service patterns shown in the table given below.

Kind / Area	H
10060	ø 60 Pitch 3.0 mm Pattern No. 110 

1) Kind of sewing data handled with IP-420

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-210D series Used by copying from floppy disk of AMS-210D 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 (M3 data) of AMS-210D series with AMS-251

There are two ways to use M3 data with AMS-251.

① **Reading by using IP-420**

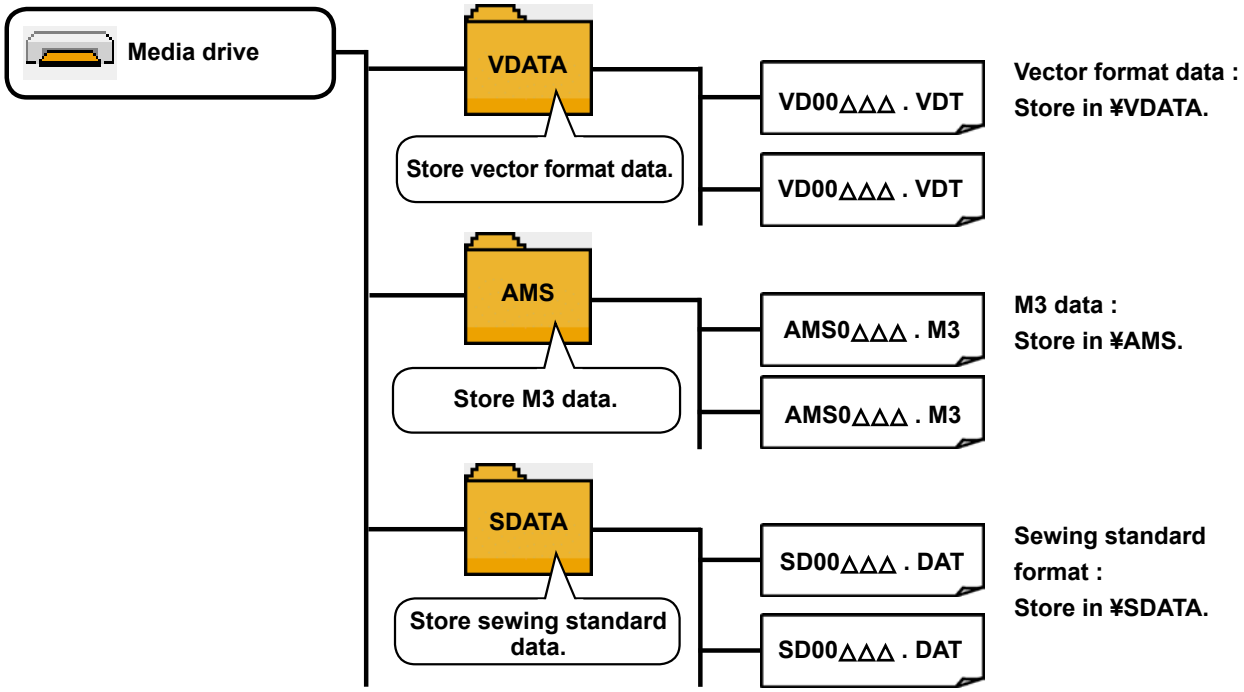
Use PC (personal computer) and copy file (¥AMS¥AMS00xxx.M3) of M3 from floppy disk of AMS-D to ¥AMS of media. Insert the media to IP-420, and select Pattern No.xxx from M3 data.

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-420 and select Pattern No.

3) Folder structure of the media

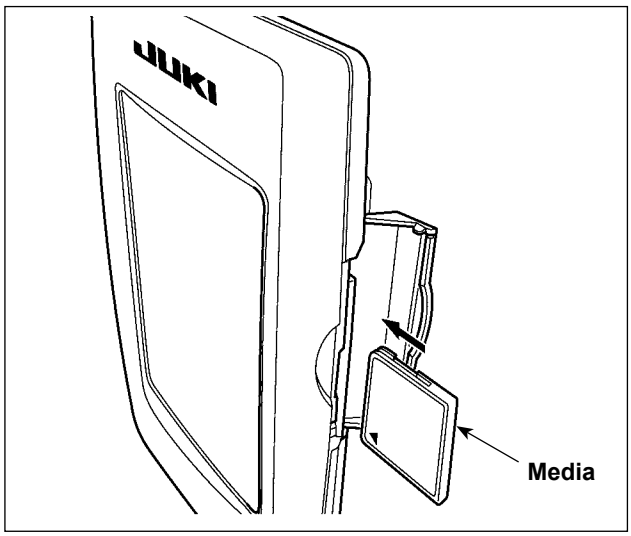
Store each file in the directories below of the media.



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

4) CompactFlash (TM)

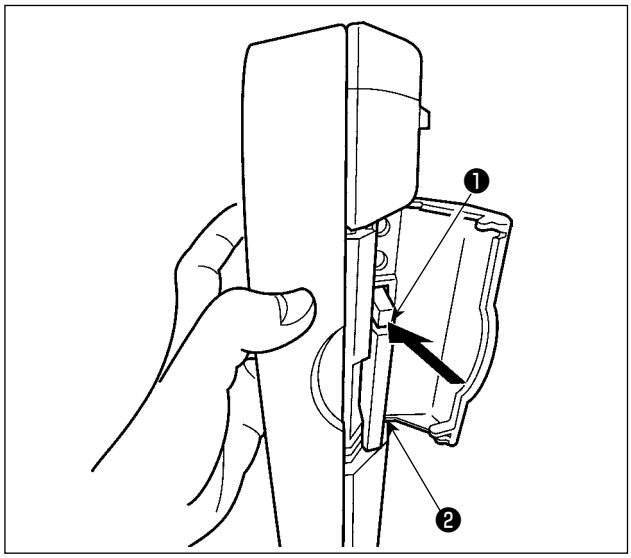
■ Inserting the CompactFlash (TM)



1) Turn the label side of the CompactFlash(TM) to this side (place the notch of the edge to the rear.) and insert the part that has a small hole into the panel.
2) After completion of setting of the media, close the cover. By closing the cover, it is possible to access. If the media and the cover come in contact with each other and the cover is not closed, check the following matters.
   - Check that the media is securely pressed until it goes no further.
   - Check that the inserting direction of the media is proper.

1. **When the inserting direction is wrong, panel or media may be damaged.**
2. **Do not insert any item other than the CompactFlash (TM).**
3. **The media slot in the IP-420 accommodates to the CompactFlash (TM) of 2 GB or less.**
4. **The media slot in the IP-420 supports the FAT16 which is the format of the Compact-Flash (TM). FAT32 is not supported.**
5. **Be sure to use the CompactFlash (TM) which is formatted with IP-420. For the formatting procedure of the CompactFlash (TM), see "II-2-28. Performing formatting of the media" p.91 .**

■ **Removing the CompactFlash (TM)**



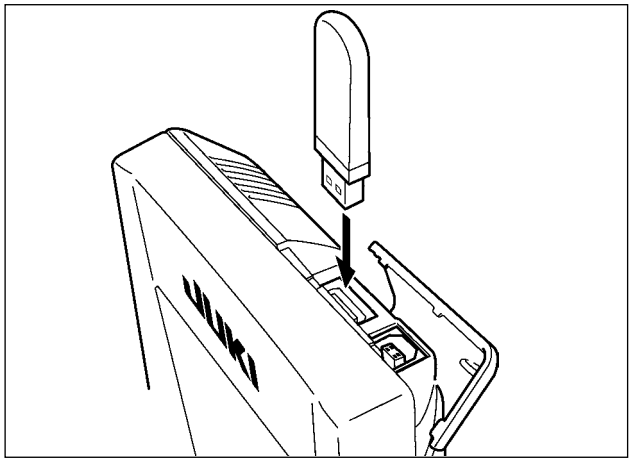
1) Hold the panel by hand, open the cover, and press the media ❷ removing lever ❶ . The media is eject.

When the lever ❶ is strongly pressed, the media ❷ may be broken by protruding and falling.

2) When the media ❷ is drawn out as it is, removing is completed.

5) USB port

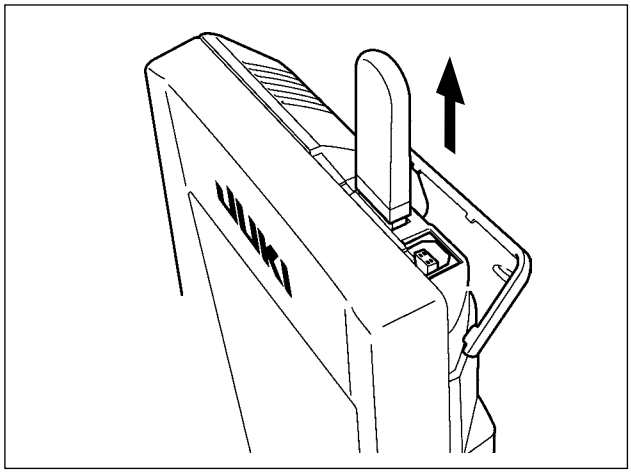
■ **Inserting a device into the USB port**



Slide the top cover and insert the USB device into the USB port. Then, copy data to be used from the USB device onto the main body.
After completion of copying the data, remove the USB device.

To protect the USB terminal, do not perform sewing by 10 times or more with the USB thumb drive connected to the 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 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.

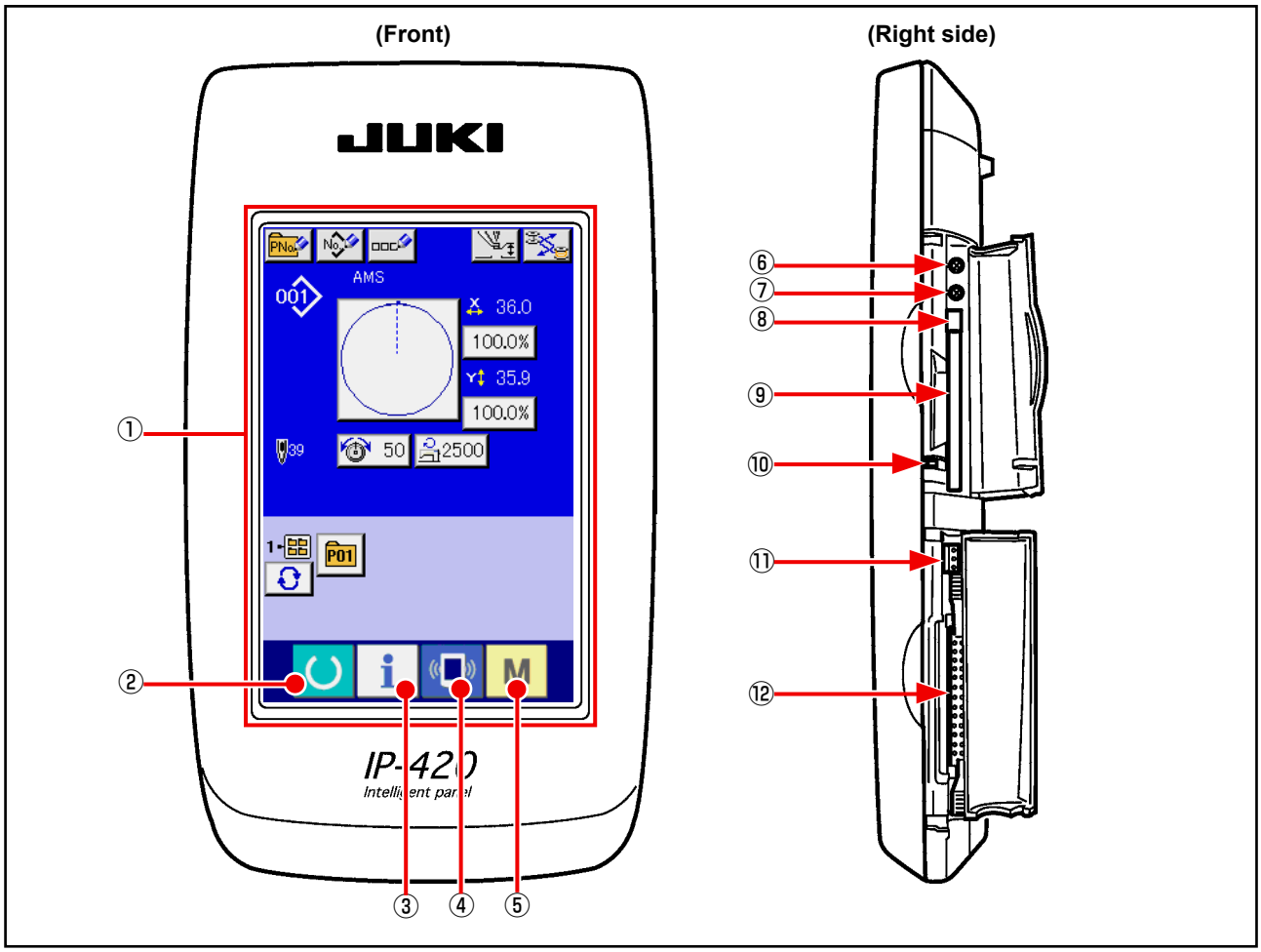
② **USB specifications**

- Conform to USB 1.1 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 ~ (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.

2. WHEN USING IP-420

2-1. Name of each section of IP-420



① Touch panel · LCD display section

② READY key → Changeover of the data input screen and the sewing screen can be performed.

③ INFORMATION key → Changeover of the data input screen and the information screen can be performed.

④ COMMUNICATION key → Changeover of the data input screen and the communication screen can be performed.

⑤ MODE key → Changeover of the data input screen and the mode changeover screen which performs various detail settings can be performed.

⑥ Contrast control
⑦ Brightness control
⑧ CompactFlash (TM) eject button
⑨ CompactFlash (TM) slot
⑩ Cover detection switch
⑪ Connector for external switch
⑫ Connector for control-box connection

2-2. Buttons to be used in common

The buttons which perform common operations in each screen of IP-420 are as follows :


CANCEL button → This button closes the pop-up screen.
In case of the data change screen, the data being changed can be cancelled.


ENTER button → This button determines the changed data.


UP SCROLL button → This button scrolls the button or the display in the upward direction.


DOWN SCROLL button → This button scrolls the button or the display in the downward direction.


RESET button → This button performs the release of error.

NUMERAL INPUT button → This button displays ten keys and input of numerals can be performed.


CHARACTER INPUT button → This button displays the character input screen.
→ Refer to **"II-2-14. Naming users' pattern" p.55** .


RESSER LOWERING button → Presser is lowered, and the presser lowering screen is displayed. To lift presser, press presser lift button displayed in the presser lowering screen.

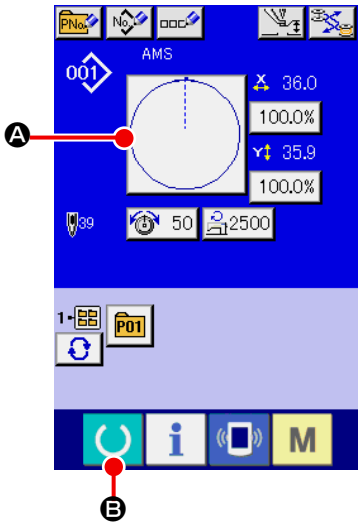

Bobbin replacement button → Bobbin replacement is carried out.
→ Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .

2-3. Basic operation of IP-420

① **Turn ON the power switch**

When the power is turned ON first, the language selection screen is displayed. Set the language you use. (It is possible to change with Memory switch U500 .)

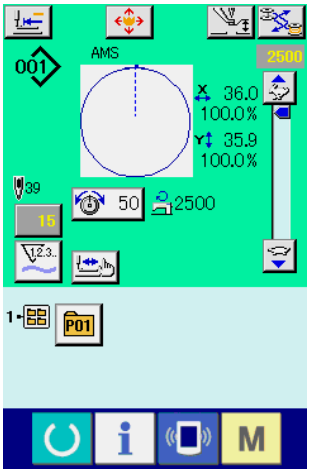
When ending the selection screen with CANCEL button or ENTER button without performing the language selection, the language selection screen is displayed whenever the power is turned ON.



② **Select the pattern No. you desire to sew.**

When the power is turned ON, the data input screen is displayed. Pattern No. button Ⓐ whichs selected at present is displayed in the center of the screen. Press the button to select the sewing shape. For selecting procedure of the sewing shape, refer to **"II-2-5. Performing sewing shape selection" p.39** .

When READY key Ⓑ is pressed, the back color of LCD display is changed to green, and the sewing machine is set to the sewing possible state.



③ **Start sewing.**

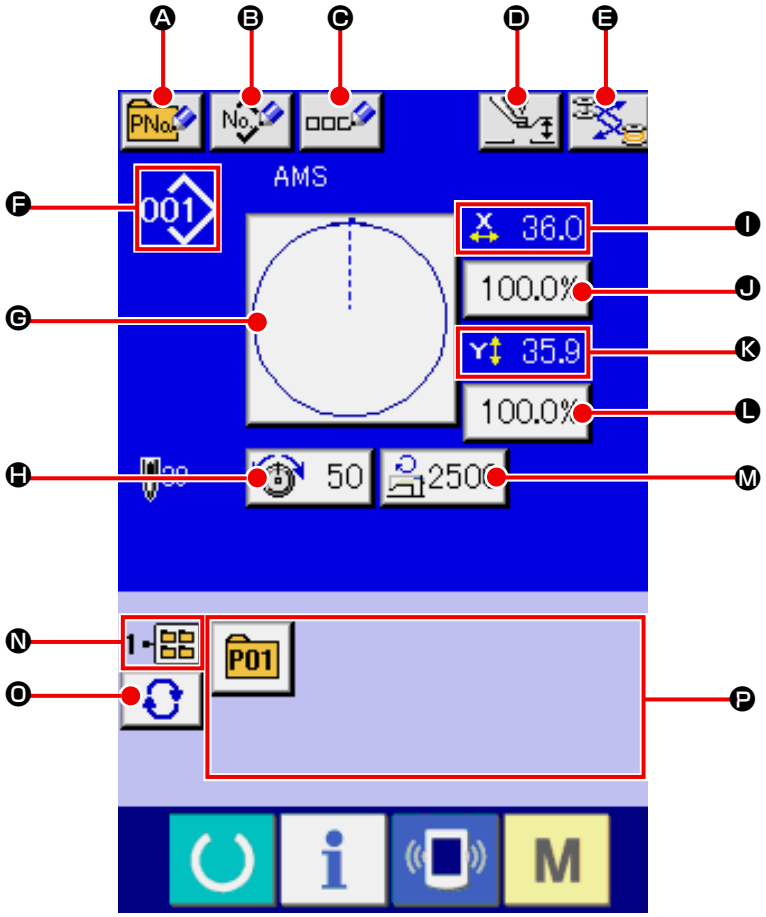
Start sewing referring to **"I-5-1. Sewing" p.27** .

* For the screen, refer to **"II-2-4. LCD display section at the time of sewing shape selection" p.35** .

1. **In the case an exclusive cassette clamp is used, check the pattern shape for the purpose of confirmation. If the pattern lies off the cassette clamp, the needle can interfere with the cassette clamp during sewing causing danger such as needle breakage.**
2. **When turning OFF the power without pressing READY key , the set value of "Pattern No.", "X enlargement/reduction ratio", "Y enlargement/reduction ratio", "Max. sewing speed", "Thread tension" or "Intermediate presser height" is not stored in memory.**

2-4. LCD display section at the time of sewing shape selection

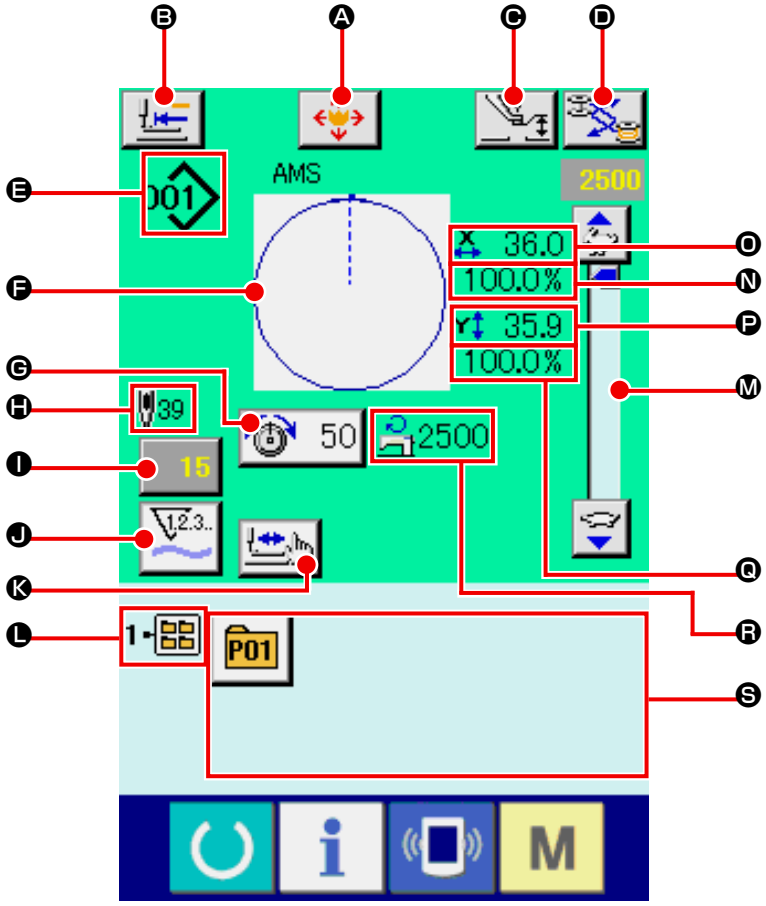
(1) Sewing shape data input screen



	Button and display	Description
Ⓐ	PATTERN BUTTON NEW REGISTER button	Pattern button new register screen is displayed. → Refer to **"II-2-15. Performing new register of pattern button" p.56** .
Ⓑ	USERS' PATTERN NEW REGISTER button	Users' pattern new register screen is displayed. → Refer to **"II-2-13. Performing new register of users' pattern" p.54** .
Ⓒ	PATTERN BUTTON NAME SETTING button	Pattern button name input screen is displayed. → Refer to **"II-2-14. Naming users' pattern" p.55** .
Ⓓ	INTERMEDIATE PRESSER SETTING button	Intermediate presser is lowered and the intermediate presser reference value change screen is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓔ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .

	Button and display	Description
Ⓕ	SEWING SHAPE NO. display	Kind and No. of the sewing shape being selected at present is displayed. There are 4 kinds below of the kinds of sewing shape.  : Users' pattern  : Vector format data  : M3 data  : Sewing standard format * Be sure to use the media that has been formatted with IP-420. For the formatting procedure of the media, refer to **"II-2-28. Performing formatting of the media" p.91** .
Ⓖ	SEWING SHAPE SELECTION button	Sewing shape being selected at present is displayed on this button and when the button is pressed, the sewing shape selection screen is displayed. → Refer to **"II-2-5. Performing sewing shape selection" p.39** .
Ⓗ	NEEDLE THREAD TENSION SETTING button	Needle thread tension value which is set to the pattern data being selected at present is displayed on this button and when the button is pressed, the item data change screen is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓘ	X ACTUAL SIZE VALUE display	Actual size value in X direction of sewing shape being selected at present is displayed. When the actual size value input is selected by setting memory switch U064 , X actual size value setting button is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓙ	X SCALE RATE SETTING button	Scale rate in X direction of sewing shape being selected at present is displayed on this button. When the scale input is set to non-selection by setting memory switch U064 , the button goes out and the X scale is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓚ	Y ACTUAL SIZE VALUE display	Actual size value in Y direction of sewing shape being selected at present is displayed. When the actual size value input is selected by setting memory switch U064 , Y actual size value setting button is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓛ	Y SCALE RATE SETTING button	Scale rate in Y direction of sewing shape being selected at present is displayed on this button. When the scale input is set to non-selection by setting memory switch U064 , the button goes out and the Y scale is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓜ	MAX. SPEED LIMITATION	Maximum speed limitation which is set at present is displayed on this button and when the button is pressed, the item data change screen is displayed. (However, maximum speed limitation which is displayed is different from the maximum number of revolutions in the pattern.) → Refer to **"II-2-6. Changing item data" p.41** .
Ⓝ	FOLDER NO. display	Pattern register button which is displayed indicates the folder No. which has been stored.
Ⓞ	FOLDER SELECTION button	Folders to display the patterns are displayed in order.
Ⓟ	PATTERN REGISTER button	PATTERN REGISTER buttons stored in Ⓝ FOLDER NO display are displayed. → Refer to **"II-2-15. Performing new register of pattern button" p.56 .** * This button is not displayed unless the new register to the pattern button is performed.

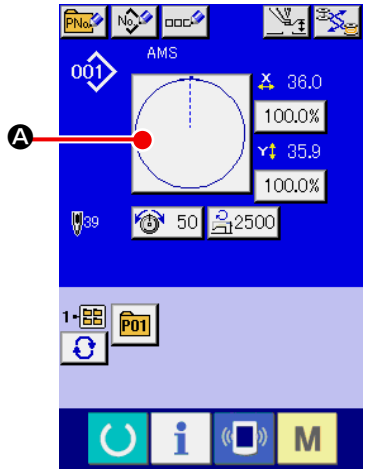
(2) Sewing screen



	Button and display	Description
Ⓐ	PATTERN BUTTON MOVE button	The pattern button move screen is displayed. → Refer to **"II-2-10. When setting of sewing product is difficult because of interruption of needle tip" p.48** .
Ⓑ	RETURN TO ORIGIN button	This button returns the presser to the start of sewing and raises the presser at the time of temporary stop.
Ⓒ	INTERMEDIATE PRESSER SETTING button	Intermediate presser is lowered and the intermediate presser reference value change screen is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓓ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .

	Button and display	Description
Ⓔ	SEWING SHAPE NO. display	Kind and No. of the sewing shape being selected at present is displayed. There are 4 kinds below of the kinds of sewing shape.  : Users' pattern  : Vector format data  : M3 data  : Sewing standard format * Be sure to use the media that has been formatted with IP-420. For the formatting procedure of the media, refer to **"II-2-28. Performing formatting of the media" p.91** .
Ⓕ	SEWING SHAPE display	Sewing shape being selected at present is displayed.
Ⓖ	NEEDLE THREAD TENSION SETTING button	Needle thread tension value which is set to the pattern data being selected at present is displayed on this button and when the button is pressed, the item data change screen is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓗ	TOTAL NUMBER OF STITCHES OF SEWING SHAPE display	Total number of stitches of the sewing shape being selected at present is displayed.
Ⓘ	COUNTER VALUE CHANGE button	Existing counter value is displayed on this button. When the button is pressed, the counter value change screen is displayed. → Refer to **"II-2-12. Using counter" p.51** .
Ⓙ	COUNTER CHANGE OVER button	The counter display can be changed over among the sewing counter, No. of pcs. counter and bobbin counter. → Refer to **"II-2-12. Using counter" p.51** .
Ⓚ	STEP SEWING button	Step sewing screen is displayed. Checking of the pattern shape can be performed. → Refer to **"II-2-7. Checking pattern shape" p.43** .
Ⓛ	FOLDER NO. display	Pattern register button which is displayed indicates the folder No. which has been stored.
Ⓜ	SPEED variable resistor	Number of rotations of the sewing machine can be changed.
Ⓝ	X SCALE RATE display	Scale rate in X direction of sewing shape being selected is displayed.
Ⓞ	X ACTUAL SIZE VALUE display	Actual size value in X direction of sewing shape being selected is displayed.
Ⓟ	Y ACTUAL SIZE VALUE display	Actual size value in Y direction of sewing shape being selected is displayed.
Ⓠ	Y SCALE RATE display	Scale rate in Y direction of sewing shape being selected is displayed.
Ⓡ	MAX. SPEED LIMITATION display	Maximum speed limitation which is set at present is displayed. However, the display is different from the maximum number of revolutions in the pattern. However, the display is different from the maximum number of revolutions in the pattern.
Ⓢ	PATTERN REGISTER button	Pattern register buttons stored in Ⓛ FOLDER NO. display are displayed. → Refer to **"II-2-15. Performing new register of pattern button" p.56** . * This button is not displayed in the initial state.

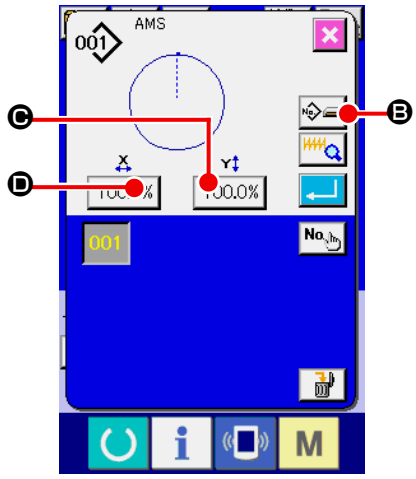
2-5. Performing sewing shape selection



① **Display the data input screen.**
Only in case of the data input screen (blue), the selection of sewing shape can be performed. In case of the sewing screen (green), press READY key and display the data input screen (blue).

② **Call the sewing shape selection screen.**
Press SEWING SHAPE button Ⓐ and the sewing shape selection screen is displayed.

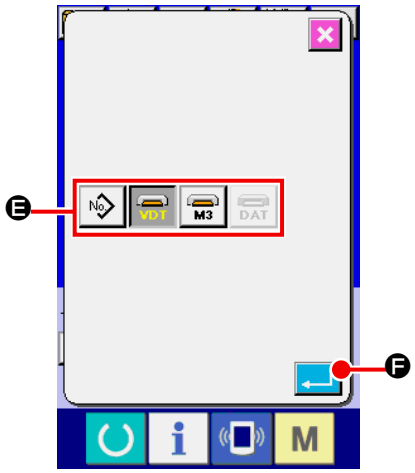
③ **Select the sewing shape.**
There are 4 kinds of the sewing shape.
Press SEWING SHAPE SELECTION button Ⓑ.



When button Ⓒ or Ⓓ 100.0% is pressed in this screen, X or Y enlarging/reducing ratio can be changed. For the details, refer to "II-2-6. Changing item data" p.41 .

④ **Determine the kind of sewing shape.**
There are 4 kinds below of the sewing shape. Select the kind you desire from among them.

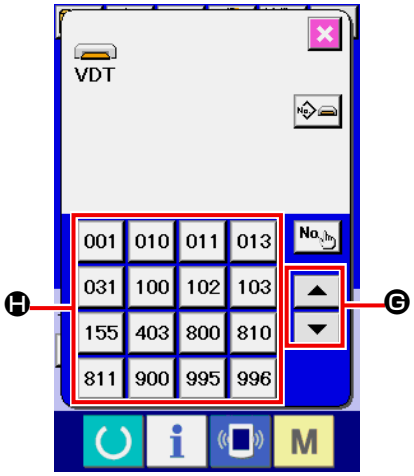
Pictograph	Name	Maximum number of patterns
001	Users' pattern	999
VDT	Vector format data	999
M3	M3 data	999
DAT	Sewing standard format	999



Be sure to use the media that has been formatted with IP-420.
For the formatting procedure of the media, refer to "II-2-28. Performing formatting of the media" p.91 .

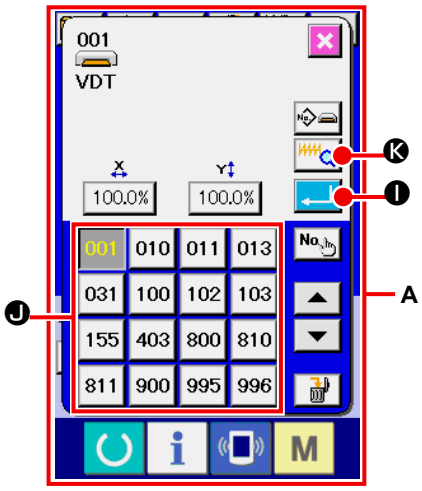
Select the sewing shape you desire from SEWING SHAPE SELECTION buttons Ⓔ and press ENTER Ⓕ button.

The sewing shape list screen corresponding to the kind of sewing shape you selected is displayed.



⑤ **Select the sewing shape.**

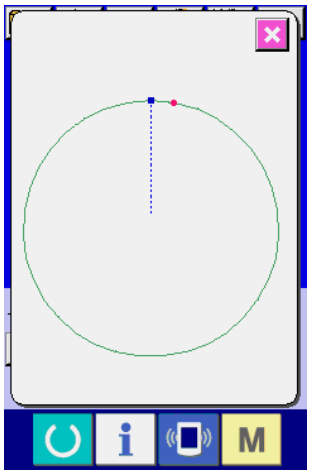
When UP or DOWN SCROLL button  Ⓖ is pressed, the SEWING SHAPE buttons Ⓗ are changed over in order.



⑥ **Determine the sewing shape.**

When ENTER button  Ⓘ is pressed, the sewing shape is determined and the data input screen is displayed.

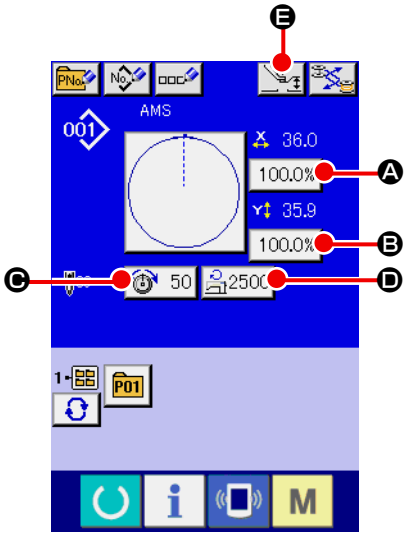
When the sewing shape is users' pattern, the screen as **A** is displayed.
PATTERN NO. SELECTION button Ⓙ that is registered to users' pattern is displayed. Press the button of PATTERN NO. you desire to select.



When VIEWER button  Ⓚ is pressed, the shape of the pattern No. selected is displayed and you can confirm it.

2-6. Changing item data

WARNING :
Be sure to confirm the shape of pattern after the change of X/Y enlargement/reduction ratio. There may be a dangerous case such as needle breakage by interference of needle with the presser or the like according to the set value.



① **Display the data input screen.**
In case of the data input screen, the change of item data can be changed. In case of the sewing screen (green), press READY switch to display the data input screen (blue).

* **The thread tension and the intermediate presser height can be changed even on the sewing screen.**

② **Display the item data input screen.**
When the button of the item data you desire to change is pressed, the item data input screen is displayed.
Item data are 5 items below.

	Item range	Input range	Initial value
Ⓐ	Scale rate in X direction	1.0 to 400.0 (%)	100.0 (%)
Ⓑ	Scale rate in Y direction	1.0 to 400.0 (%)	100.0 (%)
Ⓒ	Thread tension	0 to 200	Pattern set value
Ⓓ	Max. speed limitation	200 to 2,500 (sti/min)	2,500 (sti/min)
Ⓔ	Intermediate presser height	0.0 to 3.5 (mm) (Max 0.0 to 7.0 (mm))	Pattern set value

* Thread tension value and intermediate presser reference value will change with every pattern to be selected.

* Ⓐ Scale rate in X direction and Ⓑ Scale rate in Y direction can be changed to actual size value input by selection of the memory switch U064 .

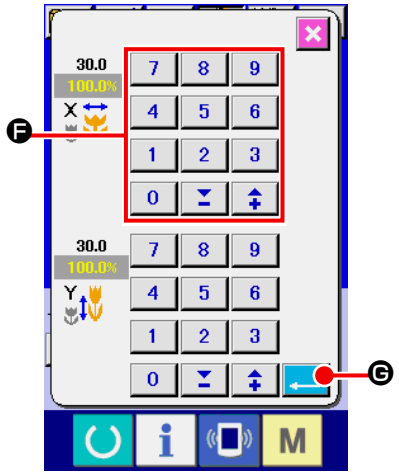
* There are two ways below to perform X/Y enlargement/reduction.
- The data already read in this data input screen can be repeatedly enlarged or reduced.
- X/Y scale rate can be set and read when selecting the pattern. See **"II-2-5. Performing sewing shape selection" p.39** .

* In case of the point sewing, even when increase/decrease of number of stitches is set under U088 Enlargement and reduction function mode, enlargement and reduction can be performed with increase/decrease of pitch.

* When X/Y scale rate is individually set in case of circle or arc, or X/Y enlargement and reduction are repeated, the sewing is changed to point sewing and the shape may not be kept. Enlargement and reduction can be performed by increase/decrease of pitch. In this case, set and read X/Y scale rate in the pattern list screen.

* Max. input range and initial value of max. speed limitation Ⓓ are determined with memory switch U001.

* Change of the intermediate presser height cannot be performed immediately after turning ON the power or immediately after moving from the main unit input. Use the machine after pressing READY key and performing the origin retrieval.



For example, input X scale rate.

Press 100.0% Ⓐ to display the item data input screen.

③ **Input the data.**

Input the value you desire with ten keys and + / – keys Ⓕ.

④ **Determine the data.**

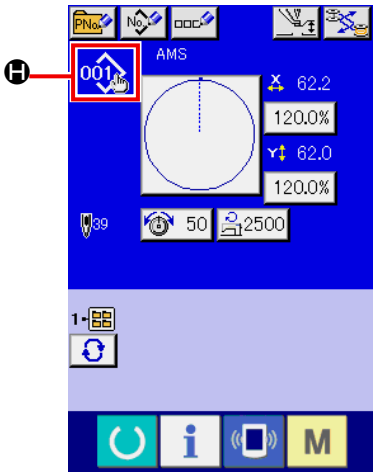
When ENTER button Ⓖ is pressed, the data is determined.

* **For the other item data, the data can be changed by the same operation.**

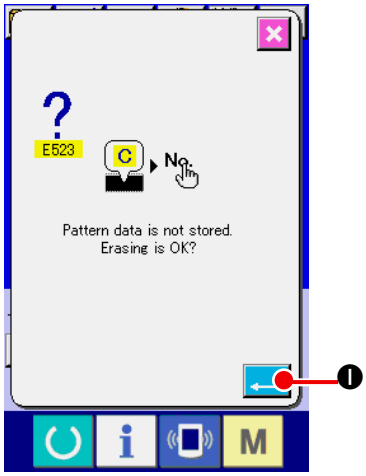
* **It is possible to input X/Y value of enlargement/reduction ratio and actual size value with one screen.**

Important

1. **When turning OFF the power without pressing READY key , the set value of "Pattern No.", "X enlargement/reduction ratio", "Y enlargement/reduction ratio", "Max. sewing speed", "Thread tension" or "Intermediate presser height" is not stored in memory.**
2. **When operation processing cannot be performed since the reduction ratio is excessively small, E045 Pattern data error is displayed.**
3. **When the scale rate is changed with increase/decrease of number of stitches (pitch is fixed), mechanical control command inputted to the points other than the shape point is deleted.**



When X/Y enlargement/reduction ratio, thread tension, intermediate presser, adding/deleting of thread tension command, or adding/deleting of increase/decrease value of intermediate presser of users' pattern or media pattern is performed, the pattern kind section becomes change display Ⓗ.



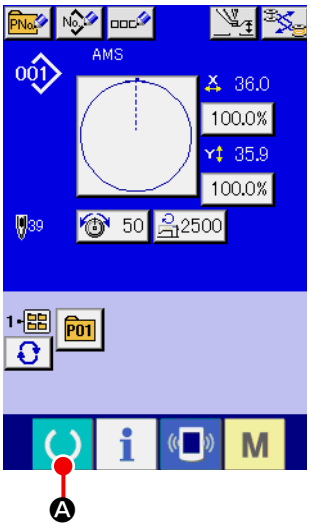
In case of change display Ⓗ, the change confirmation screen is displayed at the time of the change of pattern.

When ENTER button Ⓘ is pressed, the information on the current pattern is invalidated and the pattern No. is changed.

To store the changed pattern, refer to **"II-2-13. Performing new register of users' pattern" p.54** .

2-7. Checking pattern shape

WARNING :
Make sure without fail of the contour of the sewing pattern after selection of the sewing pattern. If the sewing pattern extends outside the work clamp feet, the needle will interfere with the work clamp.



① **Display the sewing screen.**

Display the data input screen (blue) and press READY key Ⓐ. Then the back-light of LCD changes to green and sewing is possible. When the work clamp is in its upper position, the work clamp first comes down to its lower position and then moves to the sewing start point.

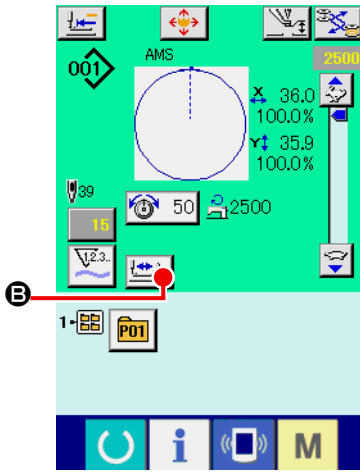
Be careful not to get your fingers caught between the work clamp and the throat plate.

② **Display the step sewing screen.**

When STEP SEWING button Ⓑ is pressed, the step sewing screen is displayed.

③ **Lower the presser with the foot switch.**

The sewing machine does not start even when the foot switch is depressed with this mode.



④ **Proceed stitching with the presser lowered.**

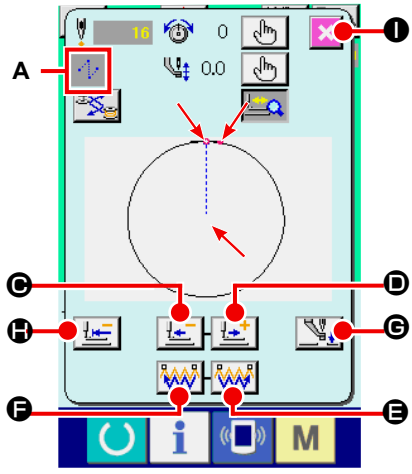
The sewing shape is displayed at the center of the screen. The current point, sewing start position and sewing end position are respectively represented by (pink circle), (blue dot) and (pink dot).

Check the sewing shape using ONE-STITCH BACKWARD button Ⓒ and ONE-STITCH FORWARD button Ⓓ. When two or more commands have been entered, the feed position does not change but the command display **A** is moved forward and backward. When you keep pressing the ONE-STITCH FORWARD or BACKWARD button, the moving speed increases.

When the COMMAND SEARCH FORWARD button Ⓔ is pressed, the feed automatically moves to the sewing end position. When the COMMAND SEARCH BACKWARD button Ⓕ is pressed, the feed automatically moves to the sewing start position.

To stop the feed, press button Ⓒ, Ⓓ, Ⓔ, Ⓕ, Ⓖ or Ⓗ.

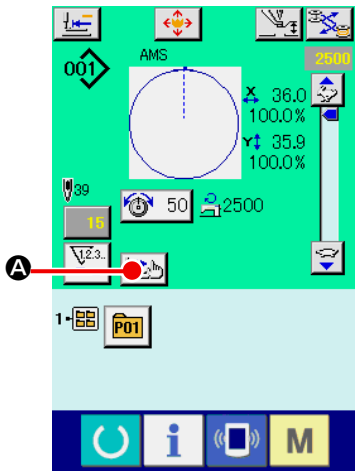
When INTERMEDIATE PRESSER button Ⓖ is pressed, the intermediate presser is raised or lowered. (This button is not displayed when MEMORY switch U103 is set at .)



⑤ **Finish checking the shape.**

When PRESSER INITIAL POSITION button Ⓗ is pressed, the work clamp moves to the sewing start position and the screen is restored to the sewing screen. When CANCEL button Ⓘ is pressed, the screen is also restored to the sewing screen. When the work clamp does not rest at the sewing start or end position, sewing can be started by depressing the foot switch before sewing shape checking is not completed.

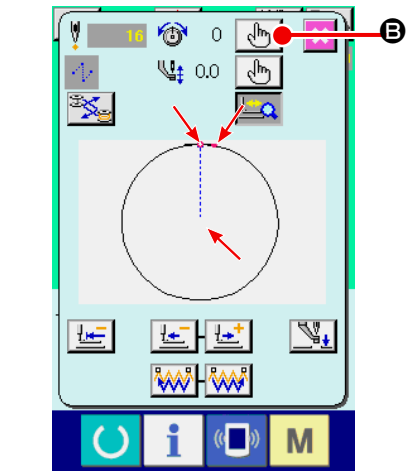
2-8. Performing modification of needle entry point



(1) Editing the thread tension

Press STEP SEWING button Ⓐ on the sewing screen to display the step sewing screen.

> **Important**
> **When it is necessary to move the feed forward or backward such as in the case of needle checking, the feed does not move unless the work clamp is lowered. Be sure to check the needle or other relevant operation after having lowered the work clamp.**

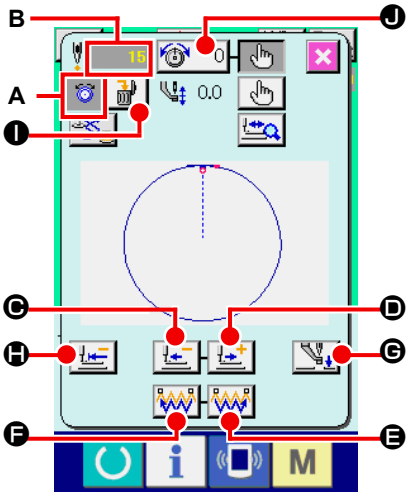


The sewing shape is displayed at the center of the screen. The current point, sewing start position and sewing end position are respectively represented by ● (pink circle), ▪ (blue dot) and ▪ (pink dot).

Press the MODE SELECT button Ⓑ to select the thread tension mode.

When ONE-STITCH BACKWARD button Ⓒ or FORWARD button Ⓓ is pressed, the feed (current point ●) moves backward or forward by one stitch. When two or more commands have been entered, the feed position does not change but the command display **A** is moved forward and backward. When you keep pressing the button Ⓒ or Ⓓ, the moving speed increases.

Indicated value **B** is the absolute value (Thread tension value + Thread tension command value).

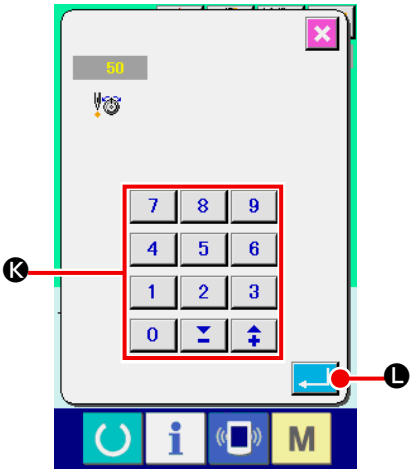


When COMMAND SEARCH FORWARD button Ⓔ or BACKWARD button Ⓕ is pressed, the feed moves forward or backward from the current point to reach the needle entry point where the first thread tension command is found. To stop the feed, press button Ⓒ, Ⓓ, Ⓔ, Ⓕ, Ⓖ or Ⓗ.

When INTERMEDIATE PRESSER button Ⓖ is pressed, the intermediate presser is raised or lowered. (This button is not displayed when MEMORY switch U103 is set at .)

When PRESSER INITIAL POSITION button Ⓗ is pressed, the work clamp moves to its origin and the screen is restored to the sewing screen.

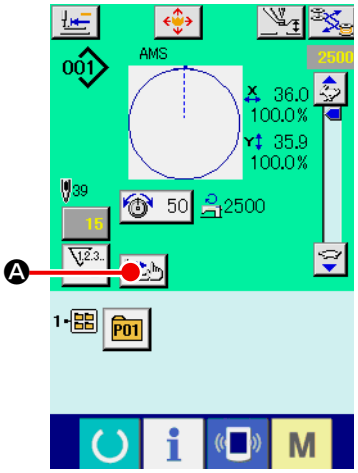
When COMMAND DELETE button Ⓘ is pressed, the screen for deleting the command as shown in **A** is displayed.

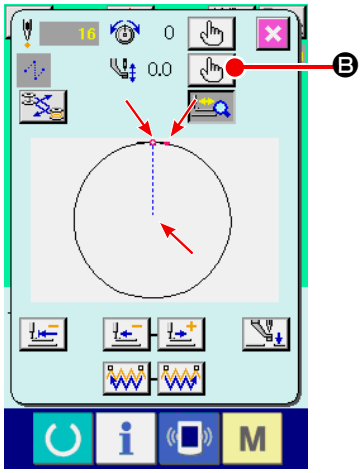


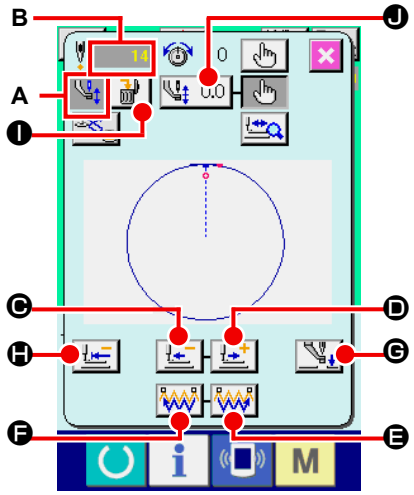
When 50 Ⓙ is pressed, the thread tension value increase/decrease input screen is displayed.

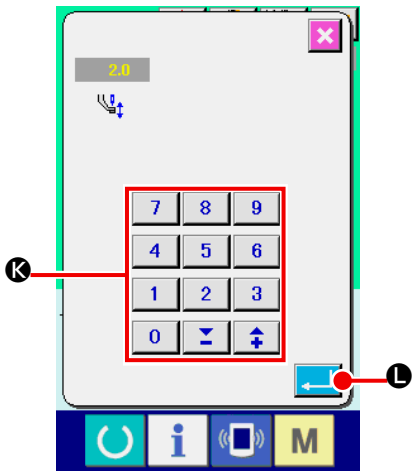
Input a desired value on the thread tension value increase/decrease input screen using numeric keypad and +/– keys Ⓚ.

When ENTER button Ⓛ is pressed, the data is confirmed.









(2) Editing the intermediate presser height

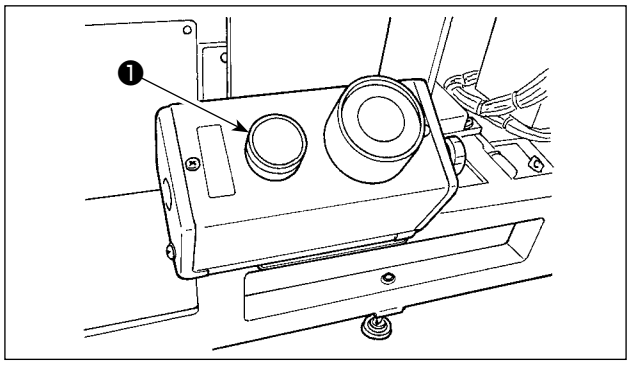
Press STEP SEWING button Ⓐ on the sewing screen to display the step sewing screen.
The sewing shape is displayed at the center of the screen. The current point, sewing start position and sewing end position are respectively represented by (pink circle), (blue dot) and (pink dot).
Press MODE SELECT button Ⓑ to select the intermediate presser mode.
When ONE-STITCH BACKWARD button Ⓒ or FORWARD button Ⓓ is pressed, the feed (current point) moves backward or forward by one stitch. When two or more commands have been entered, the feed position does not change but the command display **A** is moved forward and backward. When you keep pressing the button Ⓒ or Ⓓ, the moving speed increases.
Indicated value **B** is the absolute value (Intermediate presser height value + Intermediate presser height increased/decreased value).
When COMMAND SEARCH FORWARD button Ⓔ or BACKWARD button Ⓕ is pressed, the feed moves forward or backward from the current point to reach the needle entry point where the first intermediate presser command is found. To stop the feed, press button Ⓒ, Ⓓ, Ⓔ, Ⓕ, Ⓖ or Ⓗ.
When INTERMEDIATE PRESSER button Ⓖ is pressed, the intermediate presser is raised or lowered. (This button is not displayed when MEMORY switch U103 is set at .)
When PRESSER INITIAL POSITION button Ⓗ is pressed, the work clamp moves to its origin and the screen is restored to the sewing screen.
When COMMAND DELETE button Ⓘ is pressed, the screen for deleting the command as shown in **A** is displayed.
When 2.0 Ⓙ is pressed, the intermediate presser height increase/decrease input screen is displayed. Input a desired value on this screen using numeric keypad and +/- keys Ⓚ.
When ENTER button Ⓛ is pressed, the data is confirmed.

Caution

1. **When checking the needle, or performing the feed forward or backward, the machine fails to work unless the presser is lowered. Use the machine after lowering the presser.**
2. **When the intermediate presser rests at its lower position, the movement of the intermediate presser and needle differ depending on the setting of MEMORY switch U103 .**
3. **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. In this case, turn OFF the wiper switch, or change the set value of memory switch U105 .**

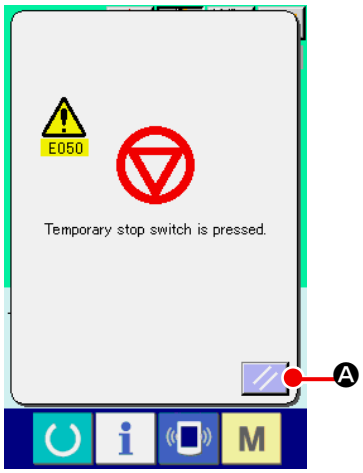
Refer to "II-3. MEMORY SWITCH DATA LIST" p.94 for the memory switch settings.

2-9. How to use temporary stop



When TEMPORARY STOP switch ❶ is pressed during sewing, the sewing machine can be stopped. At this time, the error screen 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.**

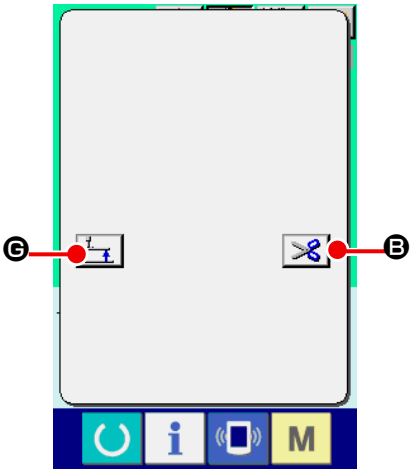
Press RESET button Ⓐ to release the error.

② **Perform thread trimming.**

Press THREAD TRIM button Ⓑ to perform thread trimming.

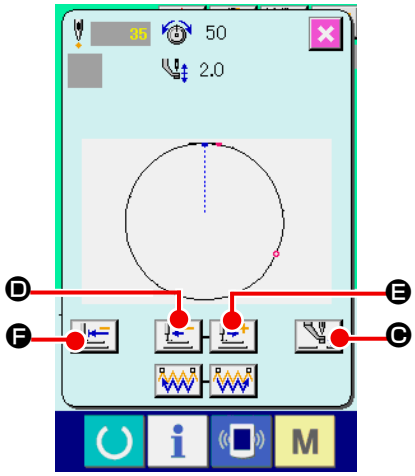
When PRESSER UP button Ⓒ is pressed, the presser goes up. Turn OFF the power since the operation afterwards cannot be performed.

When thread trimming is performed, INTERMEDIATE PRESSER UP/DOWN button Ⓒ, FEED BACKWARD button Ⓓ, FEED FORWARD button Ⓔ, and RETURN TO ORIGIN button Ⓕ are displayed in the screen.



Reference

1. **When the presser is raised and the operation is stopped on the way because of the trouble of forgetting to enter the bobbin case or the like, press PRESSER UP button Ⓒ and turn OFF the power.**
2. **PRESSER UP button Ⓒ is not displayed when the presser is of pneumatic type.**



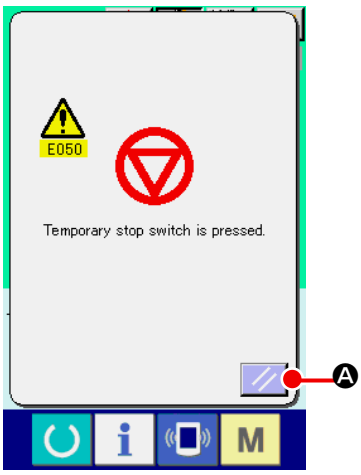
③ **Adjust the presser to the re-sewing position.**

When FEED BACK button Ⓓ is pressed, the presser returns stitch by stitch and when FEED FORWARD button Ⓔ is pressed, it advances stitch by stitch. Move the presser to the re-sewing position.

④ **Re-start the sewing.**

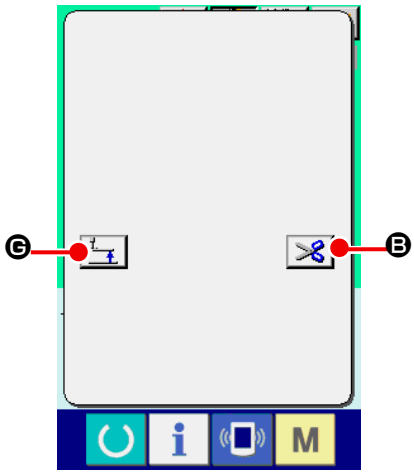
When the start switch is pressed, the sewing machine re-starts sewing.

(2) To perform re-sewing from the start



① **Release the error.**

Press RESET button Ⓐ to release the error.

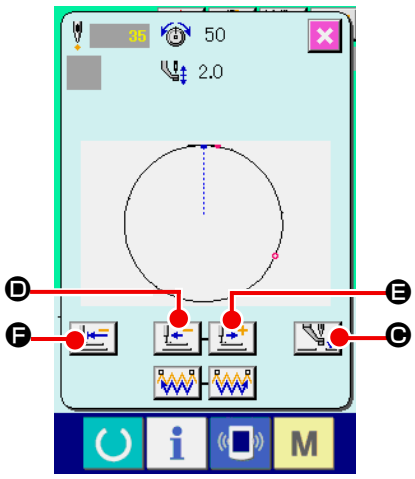


② **Perform thread trimming.**

Press THREAD TRIM button Ⓑ to perform thread trimming.

When PRESSER UP button Ⓖ is pressed, the presser goes up. Turn OFF the power since the operation afterwards cannot be performed.

When thread trimming is performed, INTERMEDIATE PRESSER UP/DOWN button Ⓒ, FEED BACKWARD button Ⓓ, FEED FORWARD button Ⓔ, and RETURN TO ORIGIN button Ⓕ are displayed in the screen.



1. When the presser is raised and the operation is stopped on the way because of the trouble of forgetting to enter the bobbin case or the like, press PRESSER UP button Ⓖ and turn OFF the power.

2. PRESSER UP button Ⓖ is not displayed when the presser is of pneumatic type.

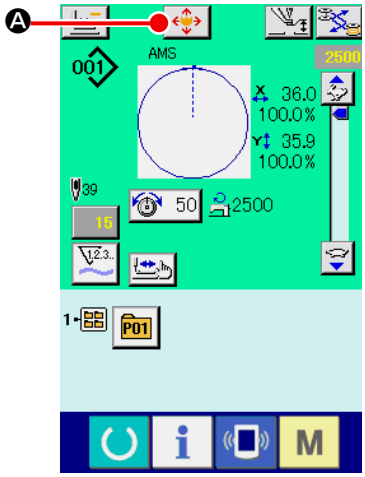
③ **Return to the origin.**

When RETURN TO ORIGIN button Ⓕ is pressed, the pop-up is closed, the sewing screen is displayed and the machine returns to the position of the start of sewing.

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

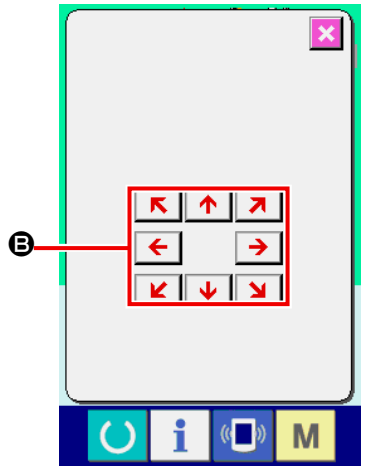
When the start switch is pressed, the sewing machine re-starts sewing.

2-10. When setting of sewing product is difficult because of interruption of needle tip



① **Display the pattern move screen.**

When PATTERN MOVE button  Ⓐ is pressed, the pattern button move screen is displayed.

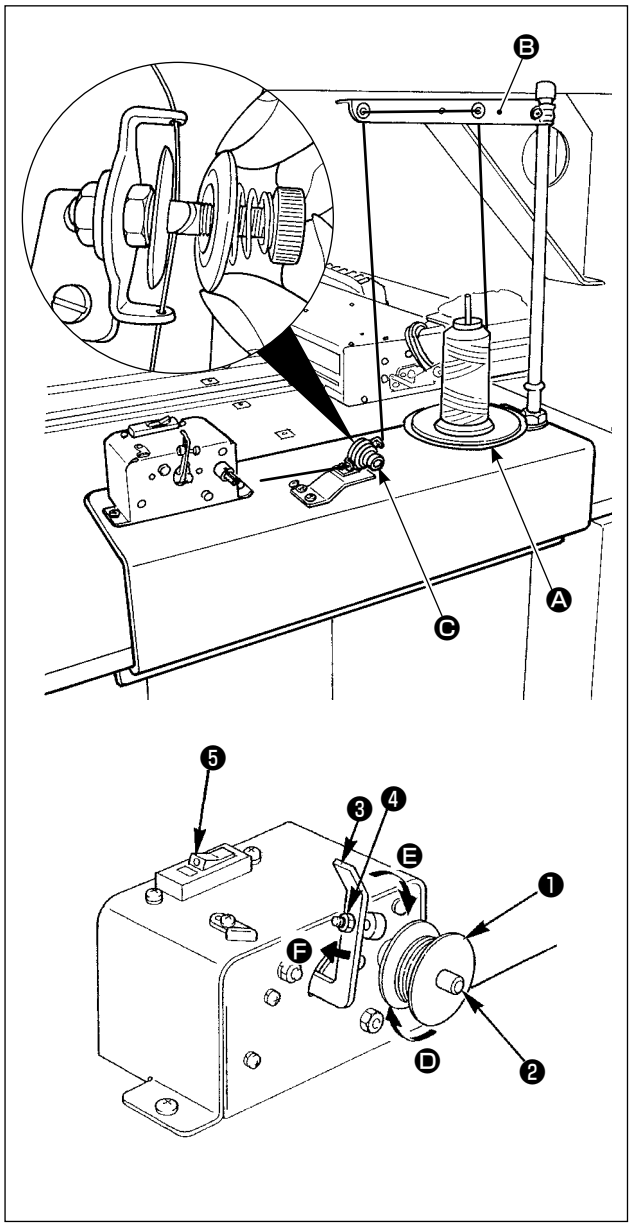


② **Move the pattern.**

Lower the presser, and input the move direction with DIRECTION key Ⓑ.

The moving amount set can be effective only in the sewing screen.
When the screen returns to the input screen by pressing down READY key, the moving amount set is erased.

2-11. Winding bobbin thread



(1) How to wind thread on a bobbin

Pass thread coming from the thread stand through tension controller Ⓒ and wind the thread on the bobbin.

When passing thread in the thread tension controller, route it in the slot on the shaft.

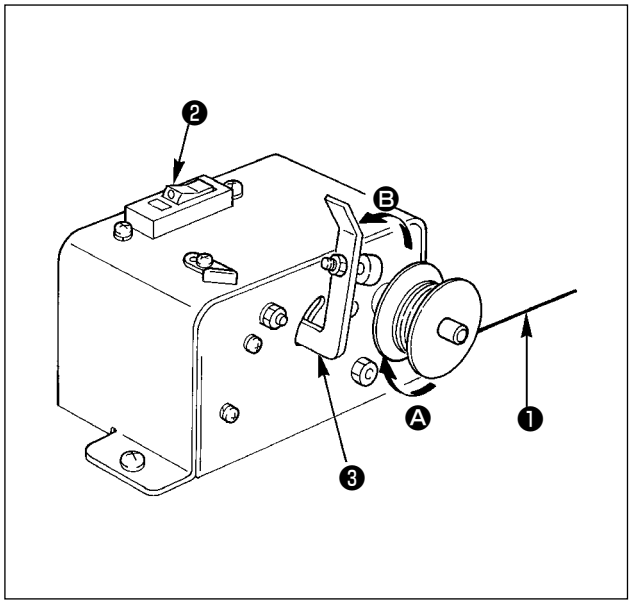
1) Fit bobbin ❶ over bobbin winding shaft ❷ .
2) Pass the thread as illustrated in the figure, and wind the thread round bobbin four or five times in the direction of arrow Ⓓ.
3) Push bobbin presser ❸ toward the bobbin (in the direction of arrow Ⓔ), and the bobbin winder will start winding the bobbin. It will automatically stop winding the bobbin when the predetermined amount of thread has been wound round the bobbin (80% of the outside diameter of bobbin).
4) To adjust the amount of thread to be wound round the bobbin, loosen screw ❹ and change the position of the bobbin presser. (Moving the bobbin presser in the direction of arrow Ⓕ will increase the amount of thread to be wound round the bobbin.)

1. The bobbin winder will not actuate unless breaker ❺ of the seesaw type switch is in its ON state (where the white engraved marker dot can be observed). It means that you can use breaker ❺ as the bobbin winder switch.

2. There are times when even when breaker ❺ is ON (the white dot is visible), the bobbin winder fails to operate. This means that inside, the breaker is actually OFF. Turn the breaker OFF and back ON.

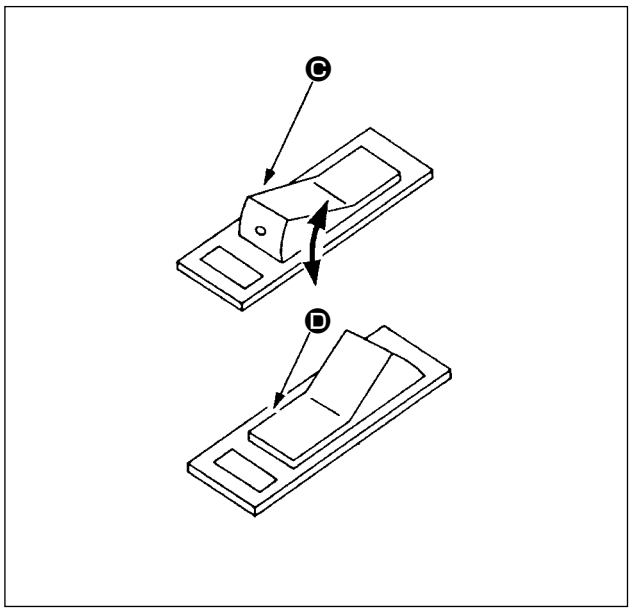
3. Be sure to use the JUKI' s genuine bobbins and bobbin cases.

4. When threading the bobbin thread from thread guide arm Ⓑ to tension controller Ⓒ, fix thread stand disc Ⓐ in such a position that the disc Ⓐ and arm do not interfere with the bobbin thread path between Ⓑ and Ⓒ.



(2) Bobbin winder circuit protector

1) When the bobbin winder is operated, it sometimes happens that thread ❶ catches on something, producing a force that tends to stop it from winding (Ⓐ direction).
2) In such a case, to prevent the motor from burning out, circuit protector ❷ operates to temporarily break the circuit inside the bobbin winder, stopping the winder.

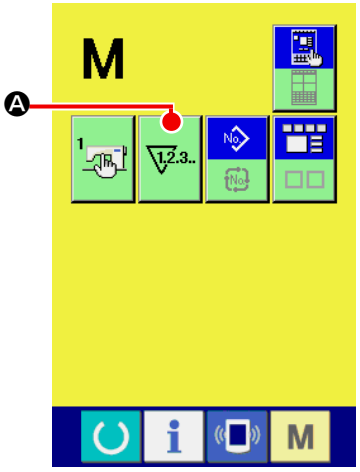


(3) Restoring the bobbin winder to operation after it stops

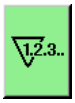
1) First flip bobbin presser ❸ in the direction of arrow Ⓑ, then turn the bobbin winder switch OFF.
2) Remove the cause of the force that tends to stop the thread from winding.
3) Temporarily flip the circuit protector switch from position Ⓒ to Ⓓ , then return it to Ⓒ.
4) Step 3) restores the circuit protector to its original status. When bobbin presser ❸ is flipped back to the bobbin side and the bobbin winder switch is turned ON, the winder resume operation.

2-12. Using counter

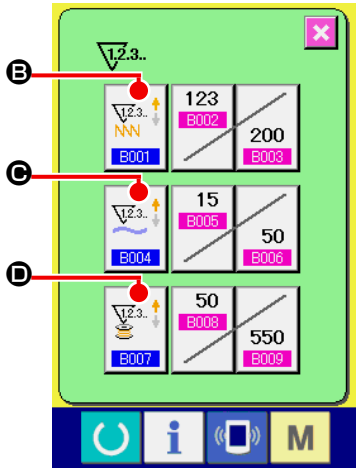
(1) Setting procedure of the counter



① **Display the counter setting screen.**

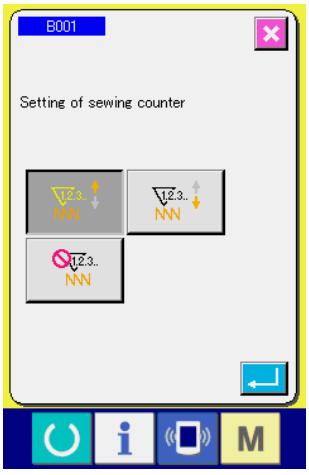
Press M switch and the COUNTER SETTING button 

Ⓐ is displayed on the screen. When this button is pressed, the counter setting screen is displayed.

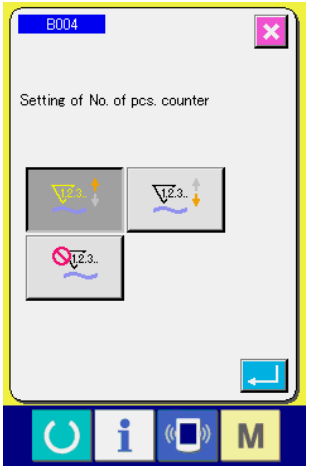


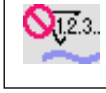
② **Selection of kinds of counters**

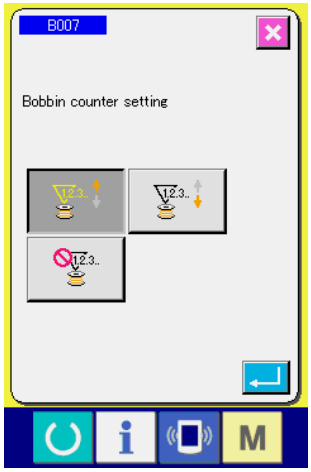
This sewing machine has three different counters; i.e., the sewing counter, No. of pcs. counter and bobbin counter. When SEWING COUNTER TYPE SELECT button  Ⓑ, NO. OF PCS. COUNTER TYPE SELECT button  Ⓒ or BOBBIN COUNTER TYPE SELECT button  Ⓓ is pressed, the corresponding counter type select screen is displayed. On this screen, the counter type can be selected individually.



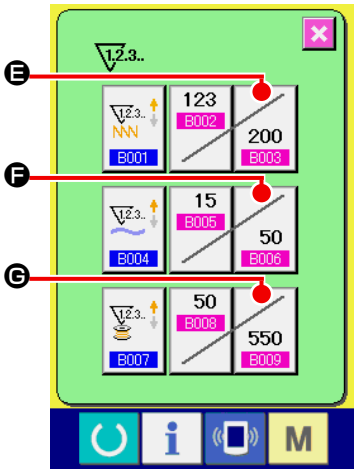
[Sewing counter]	
	**UP counter:** Every time the sewing of one shape is performed, the existing value is counted up. When the existing value is equal to the set value, the count-up screen is displayed.
	**DOWN counter:** Every time the sewing of one shape is performed, the existing value is counted down. When the existing value is reached to “0”, the count-up screen is displayed.
	**Counter disuse:** The sewing counter does not count a finished shape even when the machine has sewn the shape. The counter screen of the sewing counter is not displayed.



[No. of pcs. Counter]	
	**UP counter:** Every time one combination sewing is performed, the existing value is counted up. When the existing value is equal to the set value, the count-up screen is displayed.
	**DOWN counter:** Every time one combination sewing is performed, the existing value is counted down. When the existing value is reached to “0”, the count-up screen is displayed.
	**Counter disuse:** The No. of pcs. counter does not perform counting. The counter screen of the No. of pcs. counter is not displayed.

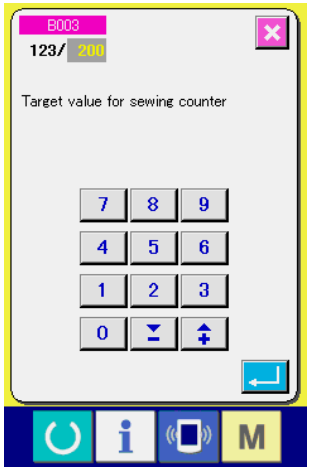


[Bobbin counter]	
	UP counter: The counter increases the existing value by one every time the machine has sewn 10 stitches. When the existing value is equal to the set value, the count-up screen is displayed.
	DOWN counter: The counter decreases from the existing value by one every time the machine has sewn 10 stitches. When the existing value is reached to “0”, the count-up screen is displayed.
	Counter disuse: The bobbin counter does not perform counting. The counter screen of the bobbin counter is not displayed.

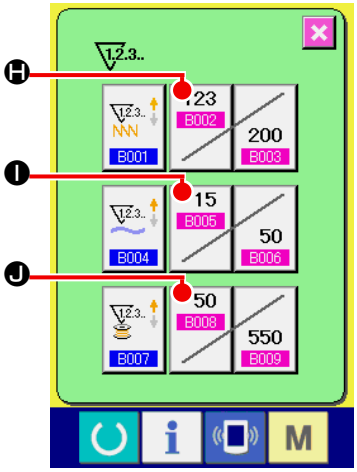


③ Change of counter set value

Press button 200 B003 Ⓔ for the sewing counter, button 50 B006 Ⓕ for the No. of pcs. counter or button 550 B009 Ⓖ for the bobbin counter to display the corresponding counter set value input screen.

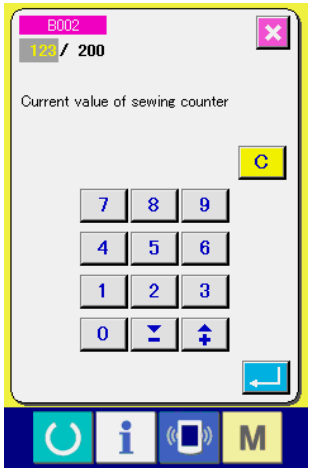


Here, input the set value.
When “0” is inputted in the set value, the display of count-up screen is not performed.



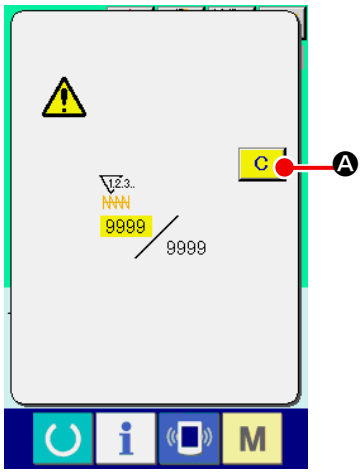
④ Change of counter existing value

Press button 123 B002 Ⓗ for the sewing counter, button 15 B005 Ⓘ for the No. of pcs. counter or button 50 B008 Ⓙ for the bobbin counter to display the corresponding counter current value input screen.



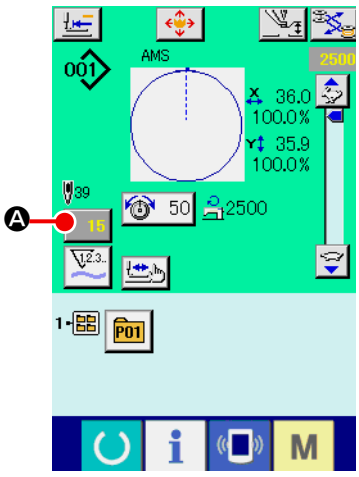
Here, input the existing value.

(2) Count-up releasing procedure

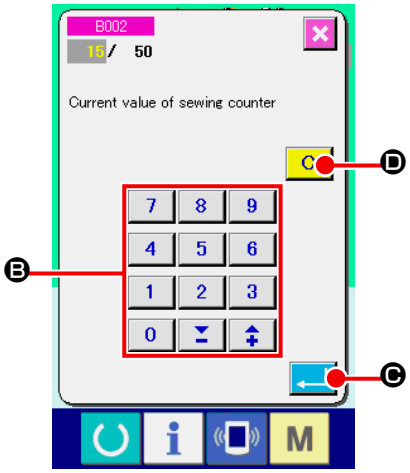


When the count-up condition is reached during sewing work, the count-up screen is displayed and the buzzer beeps. Press CLEAR button C Ⓐ to reset the counter and the screen returns to the sewing screen. Then the counter starts counting again.

(3) How to change the counter value during sewing



① **Display the counter value change screen.**
When you desire to revise the counter value during sewing work due to the mistake or the like, press COUNTER VALUE CHANGE button 15 Ⓐ on the sewing screen. The counter value change screen is displayed.



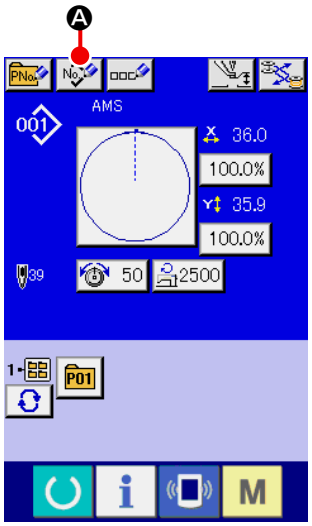
② **Change the counter value.**
Input the value you desire with ten keys, or "+" or "–" key Ⓑ.

③ **Determine the counter value.**
When ENTER button Ⓒ is pressed, the data is determined.
When you desire to clear the counter value, press CLEAR button C Ⓓ.

2-13. Performing new register of users' pattern

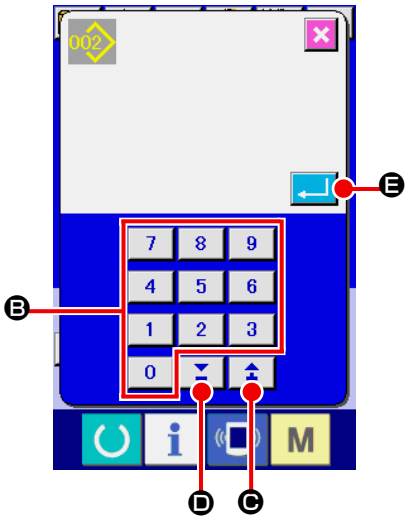
① **Display the data input screen.**

Only in case of the data input screen (blue), new register of the pattern can be performed. In case of the sewing screen (green), press READY switch and display the data input screen (blue).



② **Call the new register of users' pattern screen.**

Press NEW REGISTER button Ⓐ and the new register of users' pattern screen is displayed.



③ **Input the users' pattern No.**

Input the users' pattern No. you desire to newly register with the ten keys Ⓑ. It is possible to retrieve the users' pattern No. which has not been registered with the + or – button (Ⓒ and Ⓓ).

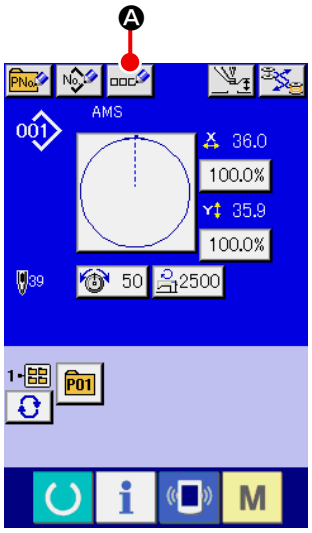
④ **Determine the users' pattern No.**

Press ENTER button Ⓔ to determine the users' pattern NO. to be newly registered and the data input screen at the time of users' pattern selection is displayed.

When the existing users' pattern No. is inputted and ENTER button is pressed, the overwriting confirmation screen is displayed.

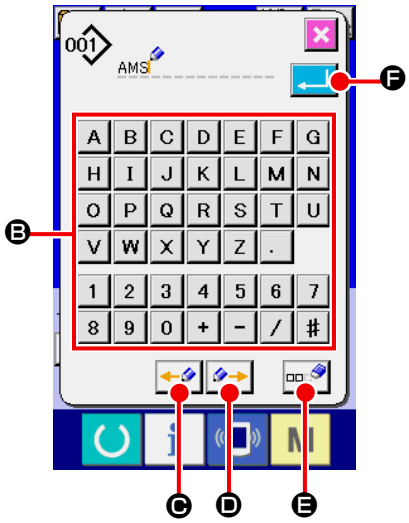
2-14. Naming users' pattern

As many as 255 characters can be input for each user's pattern.



① **Display the data input screen.**
Only in case of the data input screen (blue) at the time of pattern button selection, it is possible to input the name of pattern button. In case of the sewing screen (green), press READY switch to display the data input screen (blue).

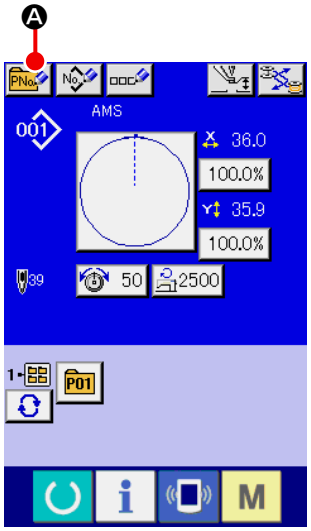
② **Call the character input screen.**
When CHARACTER INPUT button Ⓐ is pressed, the character input screen is displayed.



③ **Input the character.**
Press CHARACTER button Ⓑ you desire to input and the input of character can be performed.
As many as 255 characters (A to Z and 0 to 9) and symbols (+ , - , / , # , .) can be input. The cursor can be moved with CURSOR LEFT TRAVEL button Ⓒ and CURSOR RIGHT TRAVEL button Ⓓ. When you desire to delete the inputted character, adjust the cursor to the position of the character you desire to delete and press DELETE button Ⓔ.

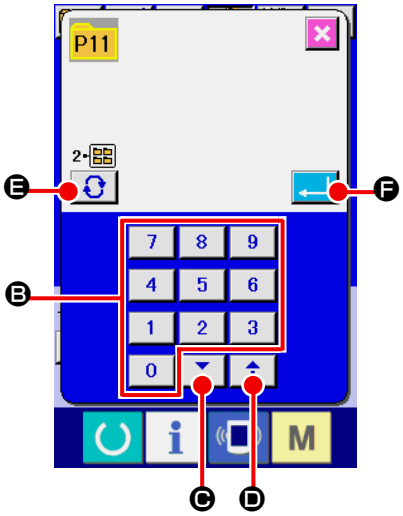
④ **Finish the input of character.**
When ENTER button Ⓕ is pressed, the input of character is finished. After the finish, the inputted character is displayed on the upper part of the data input screen (blue).

2-15. Performing new register of pattern button



① **Display the data input screen.**
Only in case of the data input screen (blue), new register of the pattern button can be performed. In case of the sewing screen (green), press READY switch and display the data input screen (blue).

② **Call the new register of pattern button screen.**
Press NEW REGISTER button Ⓐ and the new register of pattern button screen is displayed.



③ **Input the pattern button No.**
Input the pattern button No. you desire to newly register with the ten keys Ⓑ. New register to the pattern button No. which has been already registered is prohibited.
It is possible to retrieve the pattern button No. which has not been registered with the "+" or "–" button (Ⓒ and Ⓓ).

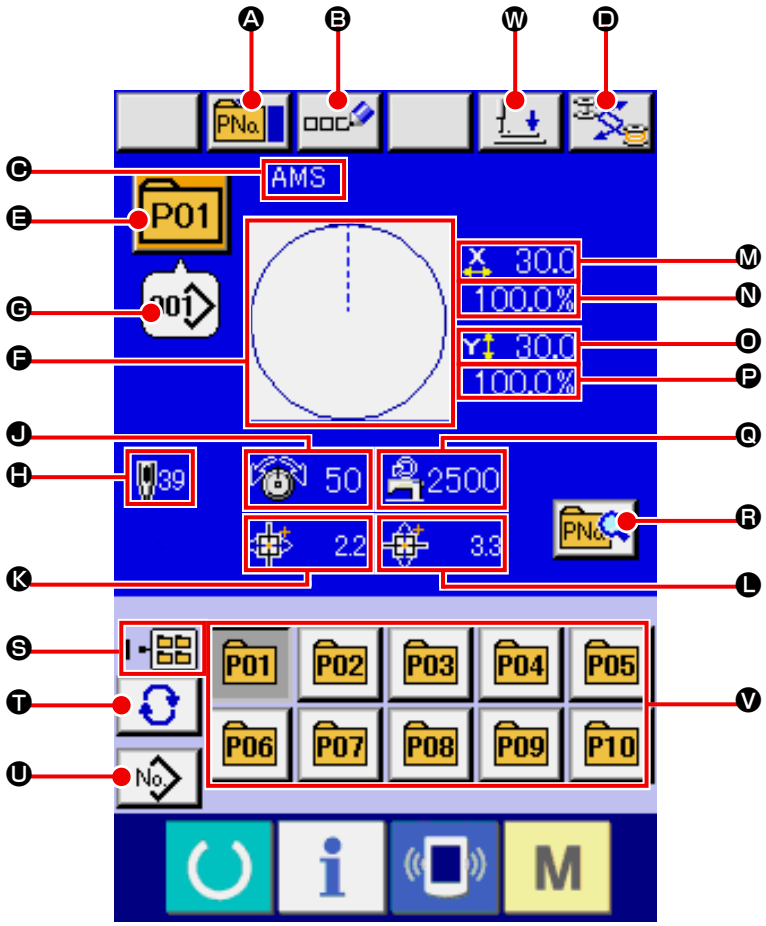
④ **Select the folder to be stored.**
It is possible for the pattern buttons to be stored in five folders. As many as 10 pattern buttons can be stored for one folder. The folder to store the button can be selected with FOLDER SELECTION button Ⓔ.

⑤ **Determine the pattern No.**
Press ENTER button Ⓕ to determine the pattern button No. to be newly registered and the data input screen at the time of pattern button selection is displayed.

Press P1 to P50 key while the sewing screen is displayed and the presser comes down. Be careful that your fingers are not caught in the presser.

2-16. LCD display section at the time of pattern button selection

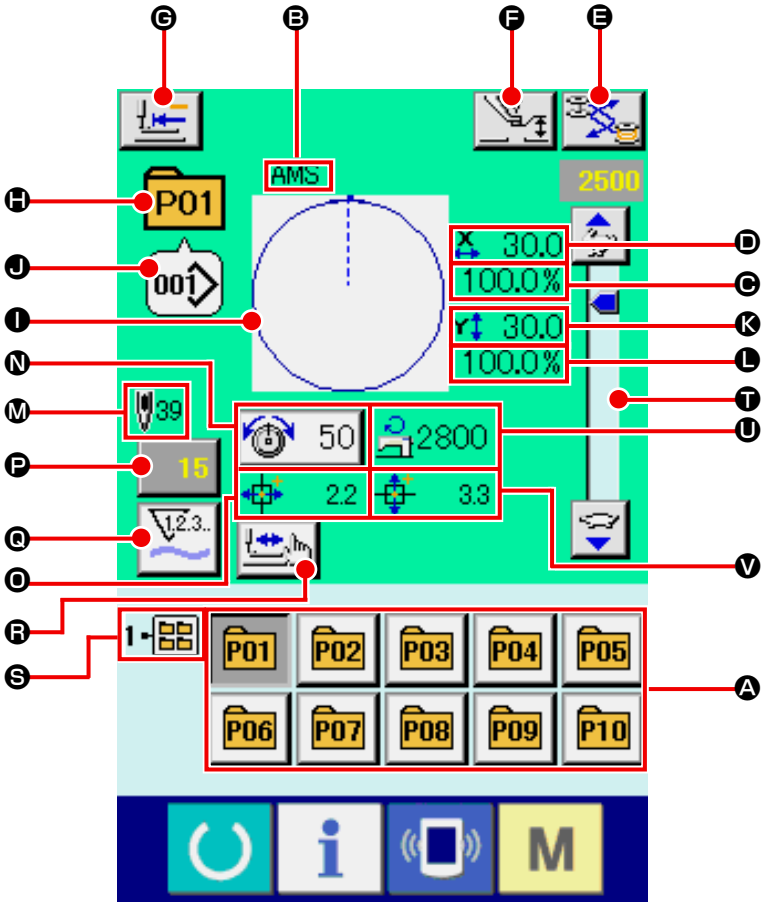
(1) Pattern button data input screen



	Button and display	Description
Ⓐ	PATTERN BUTTON COPY button	Pattern button copy screen is displayed. → Refer to **"II-2-19. Copying pattern button" p.64** .
Ⓑ	PATTERN BUTTON NAME SETTING button	Pattern button name input screen is displayed. → Refer to **"II-2-14. Naming users' pattern" p.55** .
Ⓒ	PATTERN BUTTON NAME display	Character which is registered to the pattern button No. being selected is displayed.
Ⓓ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .
Ⓔ	PATTERN BUTTON NO. display	Pattern button No. being selected at present is displayed on this button and when the button is pressed, the pattern button No. selection screen is displayed. → Refer to **"II-2-17. Performing pattern button No. selection" p.61** .
Ⓕ	SEWING SHAPE	Sewing shape which is registered to the pattern button No. being selected is displayed.

	Button and display	Description
Ⓖ	SEWING SHAPE NO. display	Kind and No. of the sewing shape being selected at present is displayed. There are 4 kinds below of the kinds of sewing shape.  : Users' pattern  : Vector format data  : M3 data  : Sewing standard format * Be sure to use the media that has been formatted with IP-420. For the formatting procedure of the media, refer to **"II-2-28. Performing formatting of the media" p.91** .
Ⓗ	TOTAL NO. OF STITCHES	Total number of stitches of the pattern which is registered to the pattern button No. being selected is displayed.
Ⓙ	THREAD TENSION display	Thread tension value which is registered to the pattern button No. being selected is displayed.
Ⓚ	TRAVEL AMOUNT IN X DIRECTION display	Travel amount in X direction which is registered to the pattern button No. being selected is displayed.
Ⓛ	TRAVEL AMOUNT IN Y DIRECTION display	Travel amount in Y direction which is registered to the pattern button No. being selected is displayed.
Ⓜ	X ACTUAL SIZE VALUE display	X actual size value which is registered to the pattern button No. being selected is displayed.
Ⓝ	X SCALE RATE display	X scale rate which is registered to the pattern button No. being selected is displayed.
Ⓞ	Y ACTUAL SIZE VALUE display	Y actual size value which is registered to the pattern button No. being selected is displayed.
Ⓟ	Y SCALE RATE display	Y scale rate which is registered to the pattern button No. being selected is displayed.
Ⓠ	MAX. SPEED LIMITATION	Maximum speed limitation which is registered to the pattern button No. being selected is displayed.
Ⓡ	PATTERN BUTTON EDIT button	Pattern button edit screen is displayed.
Ⓢ	FOLDER NO. display	Folder No. in which the displayed pattern buttons are stored is displayed.
Ⓣ	FOLDER SELECTION button	Folders to display the pattern button are displayed in order.
Ⓤ	SEWING SHAPE SELECTION DATA INPUT SCREEN DISPLAY button	Sewing shape data input screen is displayed. → Refer to **"II-2-4.(1) Sewing shape data input screen" p.35** .
Ⓥ	PATTERN button	Pattern buttons stored in Ⓢ Folder No. are displayed. → Refer to **"II-2-15. Performing new register of pattern button" p.56** .
Ⓦ	PRESSER DOWN button	Presser can be lowered and the presser down screen is displayed. To raise the presser, press the presser up button which is displayed in the presser down screen.

(2) Sewing screen

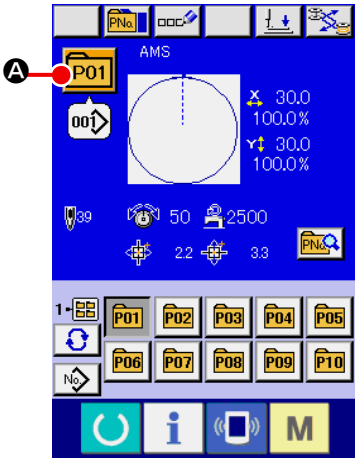


	Button and display	Description
Ⓐ	PATTERN REGISTER button	Pattern button which is stored in Ⓢ FOLDER NO. is displayed. → Refer to **"II-2-15. Performing new register of pattern button" p.56 .**
Ⓑ	PATTERN BUTTON NAME display	Character which is registered to the pattern button No. being sewn is displayed.
Ⓒ	X SCALE RATE display	Scale rate in X direction which is registered to the pattern button No. being sewn is displayed.
Ⓓ	X ACTUAL SIZE VALUE display	Actual size value in X direction which is registered to the pattern button No. being sewn is displayed.
Ⓔ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .
Ⓕ	INTERMEDIATE PRESSER SETTING button	The intermediate presser is lowered and the intermediate presser reference value change screen is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓖ	RETURN TO ORIGIN button	Presser is returned to the start of sewing and is raised at the time of temporary stop.

	Button and display	Description
ⓗ	PATTERN NO. display	Pattern button No. being sewn is displayed.
ⓘ	SEWING SHAPE display	Sewing shape being sewn is displayed.
ⓙ	SEWING SHAPE NO. display	Kind of sewing and sewing shape No. which are registered to the pattern being sewn are displayed.
ⓚ	Y ACTUAL SIZE VALUE display	Actual Y size value which is registered to the pattern button No. being selected is displayed.
ⓛ	Y SCALE RATE display	Y scale rate which is registered to the pattern button No. being sewn is displayed.
ⓜ	TOTAL NO. OF STITCHES OF SEWING SHAPE display	Total number of stitches of sewing shape which is registered to the pattern button No. being sewn is displayed.
ⓝ	NEEDLE THREAD TENSION SETTING button	Needle thread tension value which is set to the pattern data being selected at present is displayed on this button and when the button is pressed, the item data change screen is displayed. → Refer to **"II-2-6. Changing item data" p.41** .
ⓞ	TRAVEL AMOUNT IN X DIRECTION display	Travel amount in X direction which is registered to the pattern button No. being sewn is displayed.
ⓟ	COUNTER VALUE CHANGE button	Existing counter value is displayed on this button. When the button is pressed, the counter value change screen is displayed. → Refer to **"II-2-12. Using counter" p.51** .
ⓠ	COUNTER CHANGEOVER button	The counter display can be changed over among the sewing counter, No. of pcs. counter and bobbin counter. → Refer to **"II-2-12. Using counter" p.51** .
ⓡ	STEP SEWING button	The step sewing screen is displayed. Checking the pattern shape can be performed. → Refer to **"II-2-7. Checking pattern shape" p.43** .
ⓢ	FOLDER NO. display	Folder No. in which the displayed pattern register buttons are stored is displayed.
ⓣ	SPEED variable resistor	Number of revolutions of the sewing machine can be changed.
ⓤ	MAX. SPEED LIMITATION display	Maximum speed limitation which is registered to the pattern button No. being sewn is displayed.
ⓥ	TRAVEL AMOUNT IN Y DIRECTION display	Travel amount in Y direction which is registered to the pattern button No. being sewn is displayed.

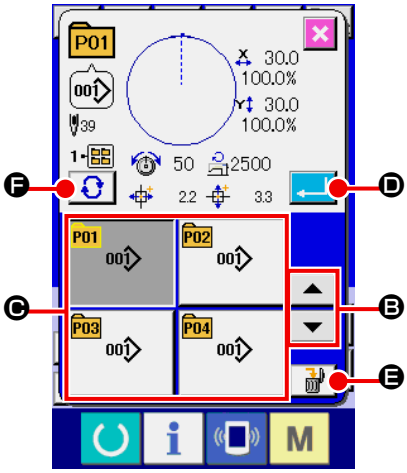
2-17. Performing pattern button No. selection

(1) Selection from the data input screen



① **Display the data input screen.**
In case of the data input screen (blue), it is possible to select the pattern button No. In case of the sewing screen (green), press READY switch to display the data input screen.

② **Call the pattern button No. selection screen.**
When PATTERN BUTTON NO. SELECTION button P01 Ⓐ is pressed, the pattern button No. selection screen is displayed. Pattern button No. which is selected at present and the contents are displayed on the upper part of the screen, and the list of the pattern button No. buttons which have been registered is displayed on the lower part of the screen.



③ **Select the pattern button No.**
When UP or DOWN SCROLL button Ⓑ is pressed, pattern button No. button Ⓒ which have been registered are changed over in order. The contents of sewing data which have been inputted in the pattern button No. are displayed in the button. Here, press the pattern button No. button Ⓒ you desire to select.

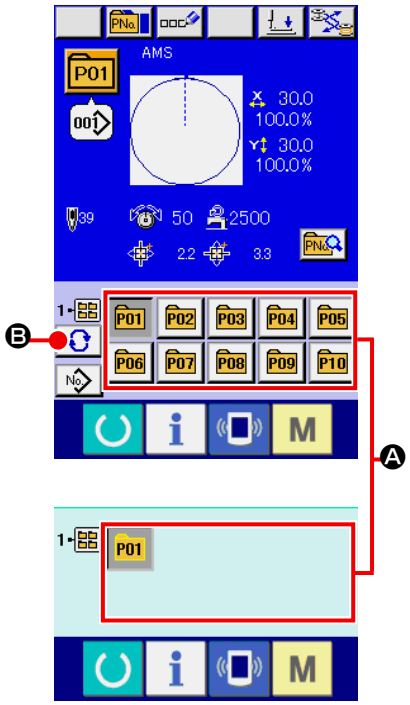
④ **Determine the pattern button No.**
When ENTER button Ⓓ is pressed, the pattern button No. selection screen is closed and the selection is finished. However, the pattern buttons which are registered to the combination sewing cannot be deleted.

* When you desire to delete the pattern button which has been registered, press DELETE Ⓔ button. However, the pattern buttons which are registered to the combination sewing cannot be deleted.

* For the pattern No. to be displayed, press FOLDER SELECTION Ⓕ button and pattern button Nos. which have been stored in the specified folder are displayed in the list. When the folder No. is not displayed, all pattern Nos. which have been registered are displayed.

(2) Selection by means of the shortcut button

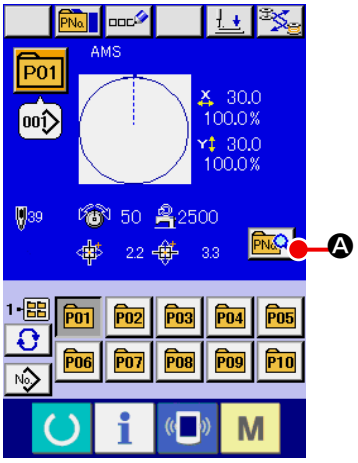
WARNING :
Make sure without fail of the contour of the sewing pattern after selection of the sewing pattern. If the sewing pattern extends outside the work clamp feet, the needle will interfere with the work clamp.



① **Display the data input screen or the sewing screen.**
When the pattern is registered to the folder, pattern buttons Ⓐ are surely displayed on the lower side of the screen of the data input screen or sewing screen.

② **Select the pattern No.**
Pattern button is displayed with every folder which is specified when the pattern is newly created.
When FOLDER SELECTION button Ⓑ is pressed, the pattern button to be displayed is changed. Display and press the button of the pattern button No. you desire to sew. When it is pressed, the pattern button No. is selected.

2-18. Changing contents of pattern button

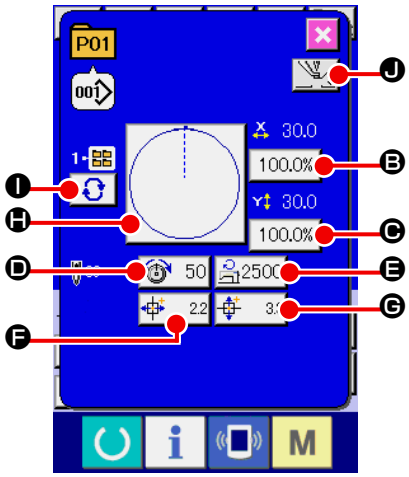


① **Display the data input screen at the time of pattern button selection.**

Only in case of the data input screen (blue) at the time of pattern selection, it is possible to change the contents of pattern. In case of the sewing screen (green), press READY switch  to display the data input screen at the time of pattern button selection.

② **Display the pattern button data change screen.**

When PATTERN BUTTON DATA CHANGE button  Ⓐ is pressed, the pattern button data change screen is displayed.



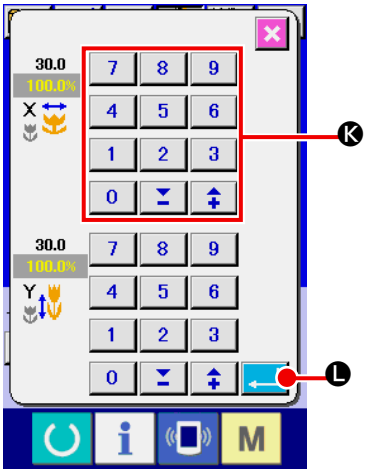
③ **Display the input screen of the item data you desire to change.**

Data that can be changed are 9 items below.

	Item	Input range	Initial value
Ⓑ	Scale rate in X direction	1.0 to 400.0(%)	100.0
Ⓒ	Scale rate in Y direction	1.0 to 400.0(%)	100.0
Ⓓ	Thread tension	0 to 200	Pattern set value
Ⓔ	Max. speed limitation	200 to 2500 (sti/min)	2500
Ⓕ	Travel amount in X direction	–501 to 501 (mm)	0.0
Ⓖ	Travel amount in Y direction	–301 to 301 (mm)	0.0
Ⓗ	Sewing shape	-	-
Ⓘ	Folder No.	1 to 5	-
Ⓙ	Intermediate presser	0.0 to 3.5 (mm) (Max. 0.0 to 7.0 (mm))	Pattern set value

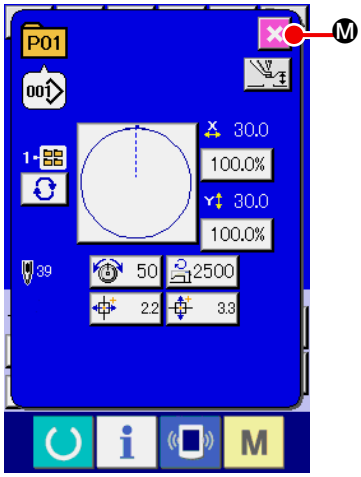
When pressing each button of Ⓑ through Ⓗ and Ⓙ, the item data input screen is displayed. When the buttons of Ⓘ is pressed, Folder Nos. and With/without thread clamp are changed over.

* Ⓑ Scale rate in X direction and Ⓒ Scale rate in Y direction can be changed to the actual size value input by selection of memory switch U064 .
* Max. input range and initial value of max. speed limitation Ⓓ are determined with memory switch U001 .
* The input range of travel amount in X direction Ⓕ and travel amount in Y direction Ⓖ differs according to the sewing range.



④ **Determine the change of item data.**

For example, input X scale rate. Press 100.0% Ⓑ to display the item data input screen. Input the value you desire with the ten keys or + or – key Ⓚ. When ENTER button Ⓛ is pressed, the data is determined.



⑤ **Close the pattern button data change screen.**

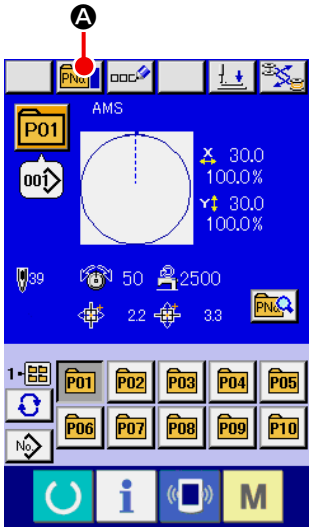
When the change is over, press CLOSE button Ⓜ. The pattern button data change screen is closed and the screen returns to the data input screen.

* It can be performed to change the other item data by the same operation.

2-19. Copying pattern button

The sewing data of the pattern button No. which has already been registered can be copied to the pattern button No. which is not registered. Overwriting copy of the pattern button is prohibited. When you desire to overwrite, perform it after deleting the pattern button once.

→ Refer to **"II-2-17. Performing pattern button No. selection" p.61** .

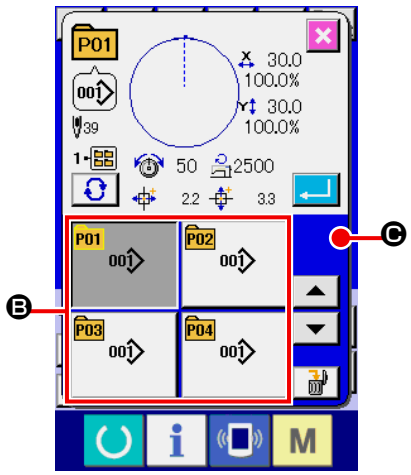


① **Display the data input screen.**

Only in case of the data input screen (blue) at the time of pattern button selection, it is possible to copy. In case of the sewing screen (green), press READY switch to display the data input screen (blue).

② **Call the pattern copy screen.**

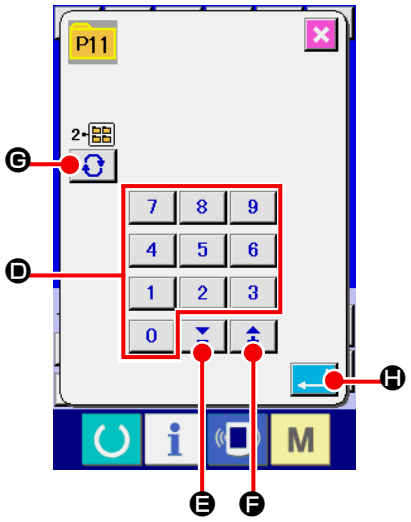
When PATTERN BUTTON COPY button Ⓐ is pressed, the pattern button copy (copy source selection) screen is displayed.



③ **Select the pattern No. of copy source.**

Select the pattern button No. of copy source from the pattern button list button Ⓑ.

Next, press COPY DESTINATION INPUT button [No.] Ⓒ and the copy destination input screen is displayed.



④ **Input the pattern No. of copy destination.**

Input the pattern button No. of copy destination with ten keys Ⓓ. Pattern button No. which is not used yet can be retrieved with – and + buttons [▼] [▲] (Ⓕ and Ⓔ).

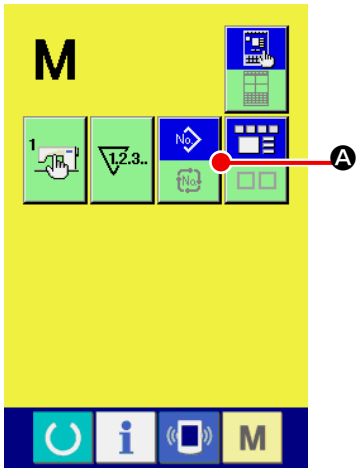
In addition, the folder to be stored can be selected with FOLDER SELECTION button [↻] Ⓖ.

⑤ **Start copying.**

When ENTER button [↵] Ⓗ is pressed, copying starts. The copied pattern button No. in the selection state returns to the pattern button copy (copy source selection) screen after approximately two seconds.

* Combination data can be copied in the same way.

2-20. Changing sewing mode



① **Select the sewing mode.**

When [M] switch is pressed in the state that the pattern has been registered, SEWING MODE SELECTION button [No.] Ⓐ is displayed on the screen. When this button is pressed, the sewing mode changes alternately the individual sewing and the combination sewing. (When the pattern button is not registered, the sewing mode cannot be changed to the combination sewing even when the button is pressed.)

* The image of the button of sewing mode selection button changes according to the sewing mode which is selected at present.

When individual sewing is selected : [No.]

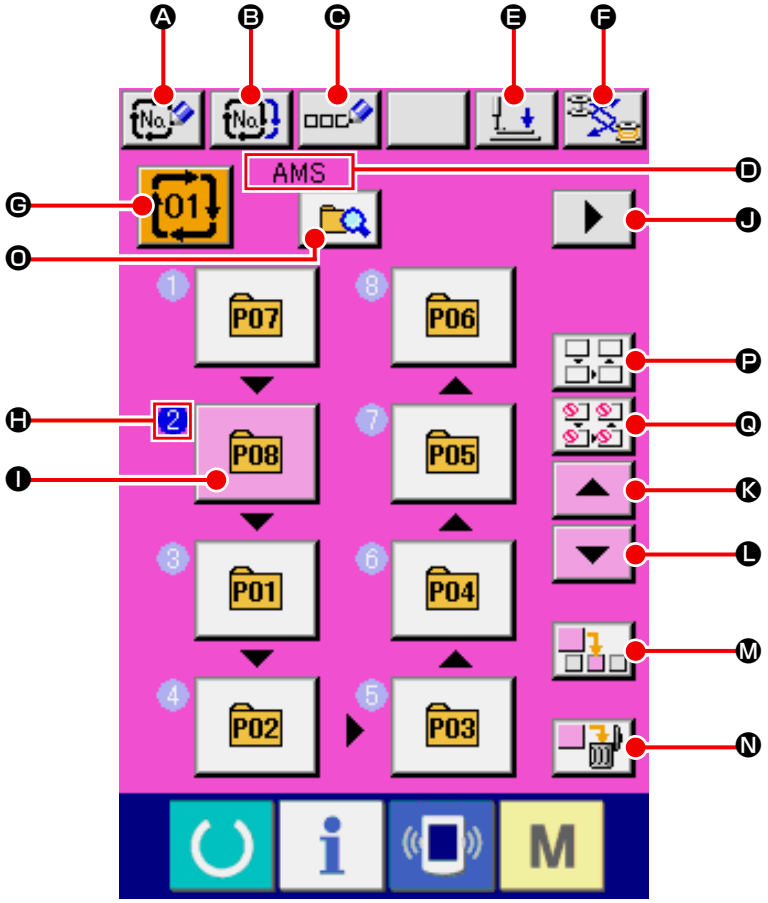
When combination sewing is selected : [No.]

2-21. LCD display section at the time of combination sewing

The sewing machine is capable of sewing in order by combining the plural pattern data. As many as 30 patterns can be inputted. Use this function when sewing plural different shapes on the sewing product. In addition, it is possible to register as many as 20 of the combination sewing data. Use this function for new creation and copying in case of need.

→ Refer to **"II-2-15. Performing new register of pattern button" p.56** and **"II-2-19. Copying pattern button" p.64** .

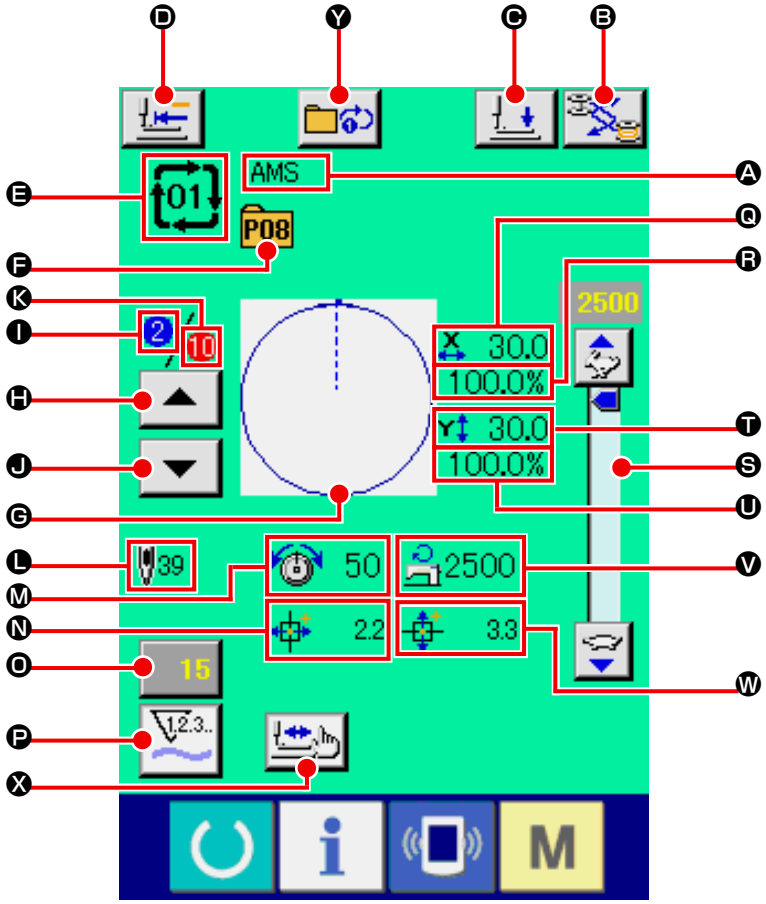
(1) Pattern input screen



	Button and display	Description
Ⓐ	COMBINATION DATA NEW REGISTER button	Combination data No. new register screen is displayed. → Refer to **"II-2-15. Performing new register of pattern button" p.56** .
Ⓑ	COMBINATION DATA COPY button	Combination pattern No. copy screen is displayed. → Refer to **"II-2-19. Copying pattern button" p.64** .
Ⓒ	COMBINATION DATA NAME INPUT button	Combination data name input screen is displayed. → Refer to **"II-2-14. Naming users' pattern" p.55** .
Ⓓ	COMBINATION DATA NAME display	Name which is inputted in the combination data being selected is displayed.
Ⓔ	PRESSER DOWN button	Presser can be lowered and the presser down screen is displayed. To raise the presser, press the presser up button displayed in the presser down screen.
Ⓕ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .

	Button and display	Description
Ⓖ	COMBINATION DATA NO. SELECTION button	Combination data No. being selected is displayed in the button. When the button is pressed, the combination data No. selection screen is displayed.
Ⓗ	SEWING ORDER display	Sewing order of the inputted pattern data is displayed. When the screen is changed over to the sewing screen, the pattern which is sewn first is displayed in blue color. * As many as the number of inputted patterns is displayed in Ⓗ and Ⓘ, display and button.
Ⓘ	PATTERN SELECTION button	Pattern No., shape, number of stitches, etc. which are registered in Ⓗ SEWING ORDER are displayed on the button. The sewing machine operates as described below when this button is pressed: In the case Ⓞ is the pattern registration mode: The pattern select screen is displayed. → Refer to **"II-2-22.(2) Creating procedure of the combination data" p.71.** In the case Ⓞ is the skip setting mode: The sewing of each step is changed over between "Skip" ⇔ "Not skip". → Refer to **"II-2-22.(5) Setting of the skip of steps" p.73**.
Ⓙ	NEXT PAGE DISPLAY button	This button is displayed when the number of patterns registered to combination data has reached eight or more.
Ⓚ	UP SCROLL button	The pattern No. which is previous to the current one is selected.
Ⓛ	DOWN SCROLL button	The pattern No. which is next to the current one is selected.
Ⓜ	STEP INSERT button	A step is inserted before the pattern No. which is being selected.
Ⓝ	STEP DELETE button	A step which is being selected is delete.
Ⓞ	Mode changeover button	Every time this button is pressed, the mode is changed over between the pattern registration mode and the skip setting mode.  : Pattern registration mode  : Skip setting mode
Ⓟ	All-skip reset button	All steps registered in combination data are set to "Not skip". → Refer to **"II-2-22.(5) Setting of the skip of steps" p.73**.
Ⓠ	All skip button	All steps registered in combination data are set to "Skip". → Refer to **"II-2-22.(5) Setting of the skip of steps" p.73**.

(2) Sewing screen



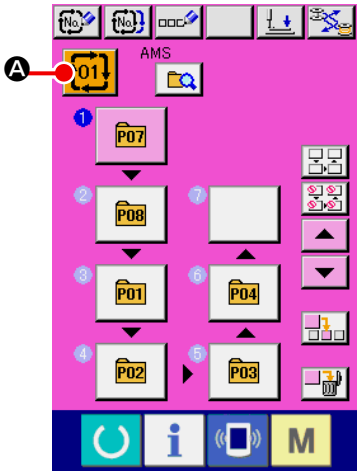
	Button and display	Description
Ⓐ	COMBINATION DATA NAME display	Name which is inputted in the combination data being selected is displayed.
Ⓑ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .
Ⓒ	PRESSER DOWN button	Presser can be lowered and the presser down screen is displayed. To raise the presser, press the presser up button displayed in the presser down screen.
Ⓓ	RETURN TO ORIGIN button	This button returns the presser to the start of sewing and raises the presser when the present presser position is on the way of sewing.
Ⓔ	COMBINATION DATA NO. display	Combination data No. being selected is displayed.
Ⓕ	PATTERN BUTTON NO. display	Pattern button No. being sewn is displayed.
Ⓖ	SEWING SHAPE display	Sewing shape which is registered to pattern button No. being sewn is displayed.
Ⓗ	SEWING ORDER RETURN button	Pattern to be sewn can be returned by one.
Ⓘ	SEWING ORDER display	Sewing order being sewn at present is displayed.

	Button and display	Description
ⓙ	SEWING ORDER ADVANCE button	Pattern to be sewn can be advanced by one.
ⓚ	TOTAL NUMBER OF REGISTERS display	Total number of patterns which is registered to combination No. being sewn is displayed.
ⓛ	TOTAL NUMBER OF STITCHES display	Total number of stitches of sewing shape being sewn is displayed.
ⓜ	THREAD TENSION display	Thread tension value which is registered to pattern button No. being sewn is displayed.
ⓝ	TRAVEL AMOUNT IN X DIRECTION display	Travel amount in X direction which is registered to the pattern button No. being sewn is displayed.
ⓞ	COUNTER VALUE CHANGE button	Existing counter value is displayed on this button. When the button is pressed, the counter value change screen is displayed. → Refer to **"II-2-12. Using counter" p.51** .
ⓟ	COUNTER CHANGEOVER button	The counter display can be changed over among the sewing counter, No. of pcs. counter and bobbin counter. → Refer to **"II-2-12. Using counter" p.51** .
ⓠ	X ACTUAL SIZE AMOUNT display	Actual X size value of the sewing shape which is registered to the pattern button No. being sewn is displayed.
ⓡ	X SCALE RATE display	X scale rate of the sewing shape which is registered to the pattern button No. being sewn is displayed.
ⓢ	SPEED variable resistor	Number of revolutions of the sewing machine can be changed.
ⓣ	Y ACTUAL SIZE AMOUNT display	Actual Y size value of the sewing shape which is registered to the pattern button No. being sewn is displayed.
ⓤ	Y SCALE RATE display	Y scale rate of the sewing shape which is registered to the pattern button No. being sewn is displayed.
ⓥ	MAX. SPEED LIMITATION display	Maximum speed limitation which is registered to pattern button No. being sewn is displayed.
ⓦ	TRAVEL AMOUNT IN Y DIRECTION display	Travel amount in Y direction which is registered to the pattern button No. being sewn is displayed.
ⓧ	STEP SEWING button	The step sewing screen is displayed. Checking the pattern shape can be performed. → Refer to **"II-2-7. Checking pattern shape" p.43** .
ⓨ	1-STEP REPEAT button	Enable/disable of the 1-step repetition is selected.  : 1-step repeat is disabled  : 1-step repeat is enabled

2-22. Performing combination sewing

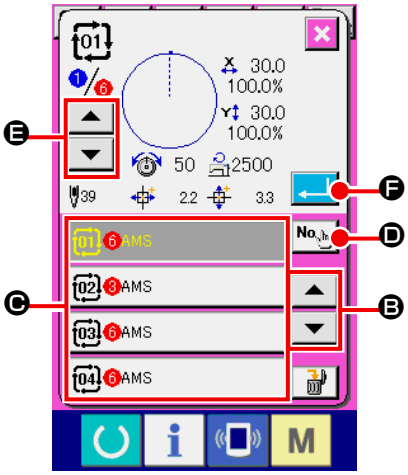
First, change the sewing mode to the combination sewing before performing setting.
→ Refer to "II-2-20. Changing sewing mode" p.65 .

(1) Selection of combination data



① **Display the data input screen.**
Only in case of the data input screen (pink), it is possible to select the combination data No.
In case of the sewing screen (green), press READY switch to display the data input screen (pink).

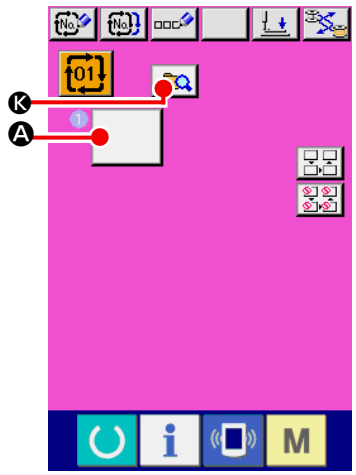
② **Call the combination data No. screen.**
When COMBINATION DATA NO. button 01 Ⓐ is pressed, the combination data No. selection screen is displayed. Combination data No. which is selected at present and the contents are displayed in the upper part of the screen, and other combination data No. buttons which have been registered are displayed in the lower part of the screen.



③ **Select the combination data No.**
When UP/DOWN button ▲ ▼ Ⓑ is pressed, combination data No. buttons Ⓒ which have been registered are changed over in order.
It is also possible to display the combination data No. input screen using NUMBER INPUT button No. Ⓓ and input a combination data No. directly.
Here, press the combination data No. buttons Ⓒ you desire to select.
When STEP CONFIRMATION button ▲ ▼ Ⓔ is pressed, the sewing shapes of patterns which have been registered in the combination data and the like are changed over in order and displayed.

④ **Determine the combination data No.**
When ENTER button Ⓕ is pressed, the combination data No. selection screen is closed and the selection is finished.

(2) Creating procedure of the combination data



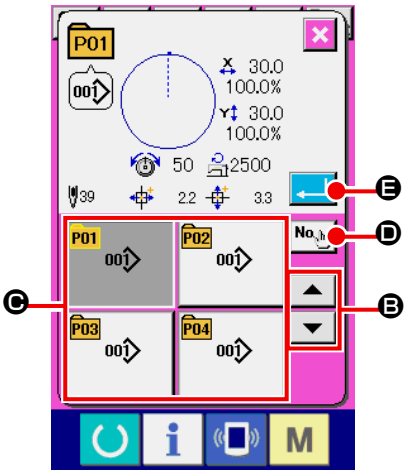
① **Display the data input screen.**

Only in case of the data input screen (pink) it is possible to input the combination data. In case of the sewing screen (green), press READY switch to display the data input screen (pink). Pattern No. has not been registered in the initial state, and the first pattern selection button is displayed in the blank state.

② **Display the pattern No. selection screen.**

When PATTERN SELECTION button Ⓐ is pressed, the pattern No. selection screen is displayed.

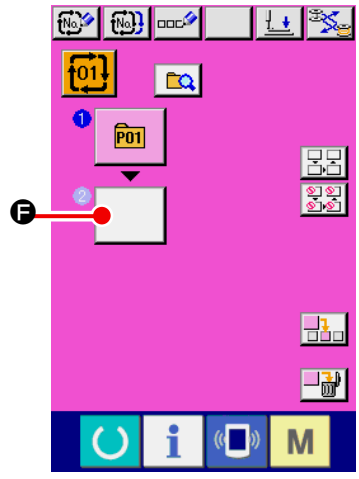
> **Caution** **Check to be sure that the selected-mode changeover button Ⓚ is set to the pattern registration mode. If the mode is not the pattern registration mode, press the selected-mode changeover button Ⓚ.**



③ **Select the pattern No.**

When UP/DOWN SCROLL button Ⓑ is pressed, pattern No. buttons Ⓒ which have been registered are changed over in order.

It is also possible to display the pattern No. input screen by means of NUMBER INPUT button Ⓓ and input a pattern No. directly. The contents of pattern data are displayed in the buttons. Here, press the pattern No. buttons you desire to select.



④ **Determine the pattern No.**

When ENTER button Ⓔ is pressed, the pattern No. selection screen is closed and the selection is finished.

⑤ **Repeat steps ② through ④ as many as the number of pattern Nos. you desire to register.**

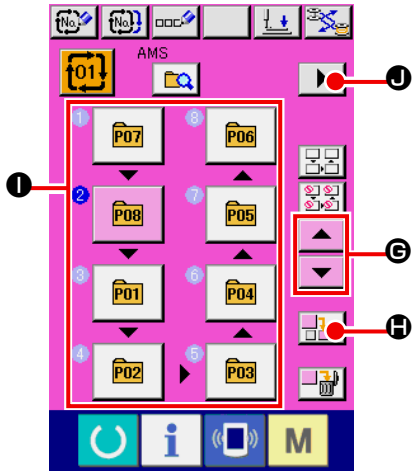
When the first register is determined, the second pattern selection button Ⓕ is displayed.

Repeat steps ② through ④ as many as the number of pattern Nos. you desire to register.

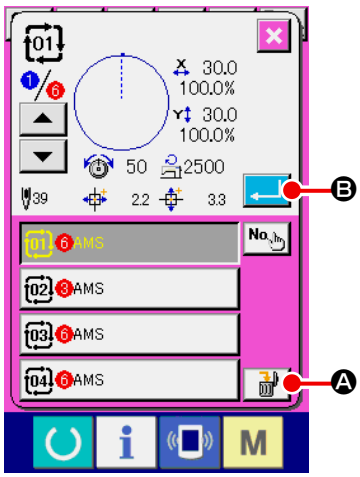
When UP or DOWN SCROLL button Ⓖ is pressed, the PATTERN NO. button can be selected. The selected PATTERN NO. button is displayed in pink P01.

When the PATTERN NO. INSERT button Ⓗ is pressed, a step is inserted before the pattern No. being selected (displayed in pink). When PATTERN NO. button Ⓘ being displayed is pressed to select a different pattern No., the pattern No. is changed over.

If the programmed combination data extends over two or more screens, the next screen can be displayed by means of SCREEN SCROLL button Ⓙ.



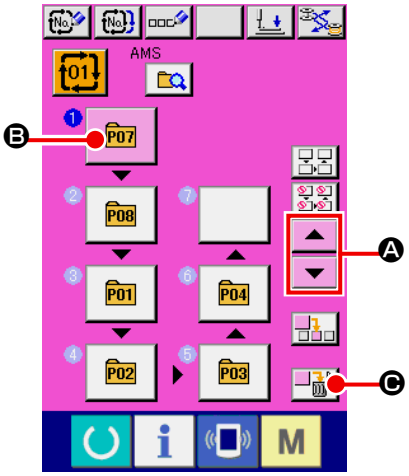
(3) Deleting procedure of the combination data

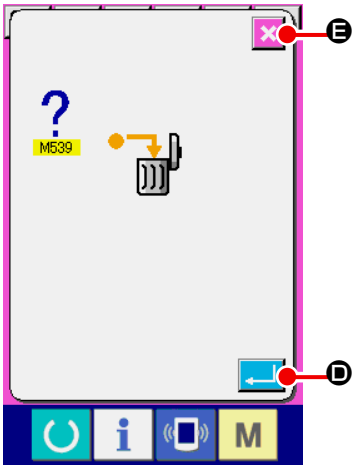


① **Select the combination data No.**
Perform steps ① to ③ of **"II-2-22(1) Selection of combination data" p.70** to display the combination data to be deleted.

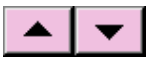
② **Performing deleting the combination data.**
When DATA DELETION button  Ⓐ is pressed, the combination data deletion confirmation pop-up is displayed. Here, press ENTER button  Ⓑ, and the selected combination data is deleted.

(4) Deleting procedure of the step of the combination data





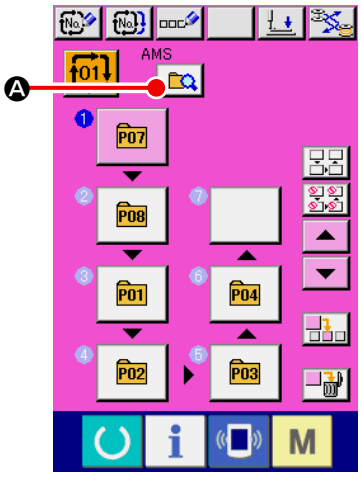
① **Select the combination data No.**
Perform steps ① to ② of **"II-2-22(1) Selection of combination data" p.70** to make the state that the combination data including the step you desire to delete has been selected.

② **Display the pattern No. selection screen.**
Press UP/DOWN SCROLL button  Ⓐ to bring the PATTERN SELECT button for the step to be deleted under the selected state  Ⓑ. Then, when STEP DELETE button  Ⓒ is pressed, the data step delete popup window is displayed.

③ **Performing deleting the step of the selected combination data.**
When ENTER button  Ⓓ is pressed, the selected combination data step is deleted.
When the CANCEL button  Ⓔ is pressed, no data is deleted and the screen is restored to the data input screen.

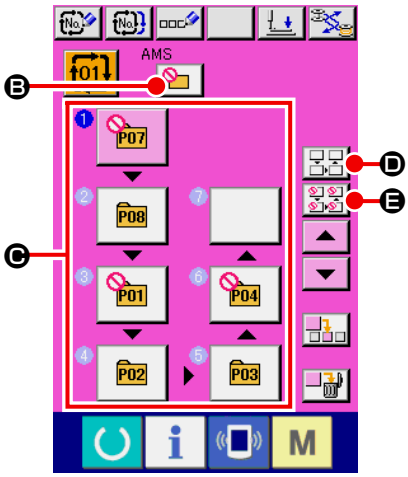
(5) Setting of the skip of steps

It is possible to set the skipping of sewing of a given step.
If you want to skip the sewing of a certain step within the combination data, use this function.



① **Entering the skip setting mode**

Press mode changeover button  Ⓐ to select skip setting mode  Ⓑ.



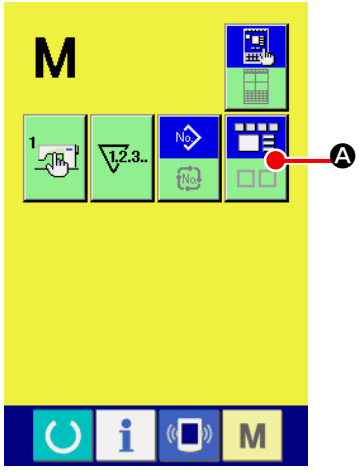
② **Pressing the button of the step to be skipped.**

Press button Ⓒ of the step to display ⃠. The step is set to "Skip". Another press on the button resets the skip setting. It is possible to set two or more steps to "Skip".

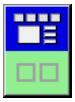
When all skip button  Ⓔ or all skip reset button  Ⓓ is pressed, the skip can be set for all steps or the skip setting can be reset for all steps. Note that the sewing screen is not displayed even by pressing the set ready key when all steps are set to "Skip".

2-23. Using the simple operation mode

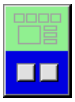
With IP-420, the SIMPLE OPERATION mode is available.



① **Select the sewing mode.**

When the M key is pressed, SCREEN MODE SELECT button  Ⓐ is displayed on the screen. When this button is pressed, the screen mode is changed over between the normal operation and the simple operation.

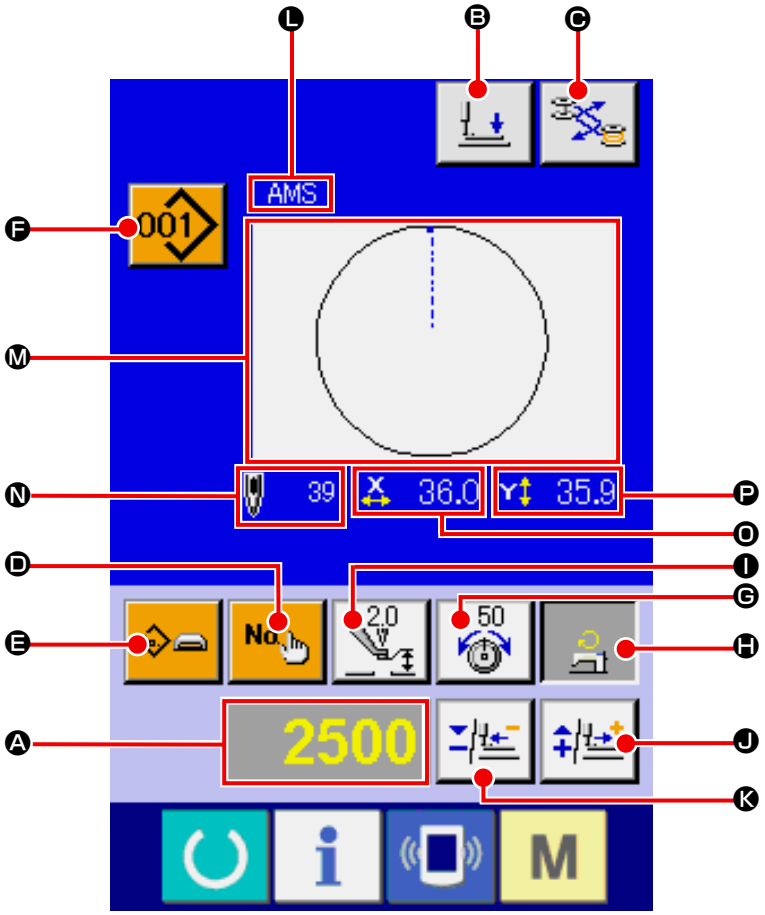
When the normal operation is selected: 

When the simple operation is selected: 

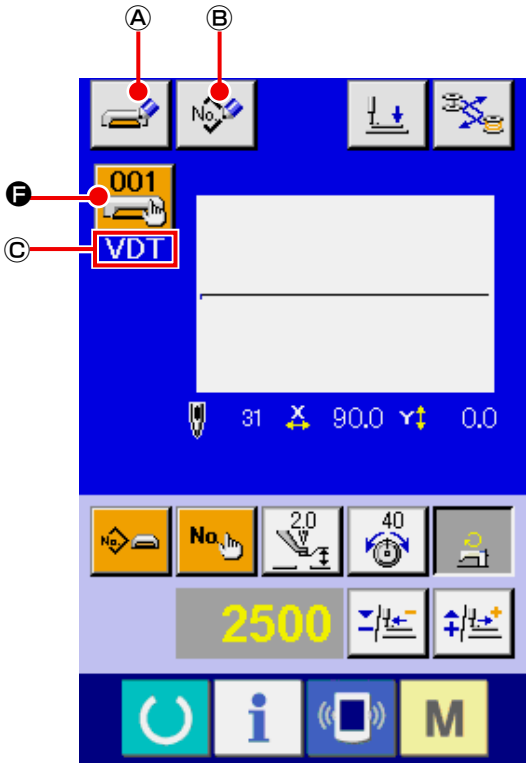
2-24. LCD display when the simple operation is selected

(1) Data input screen (individual sewing)

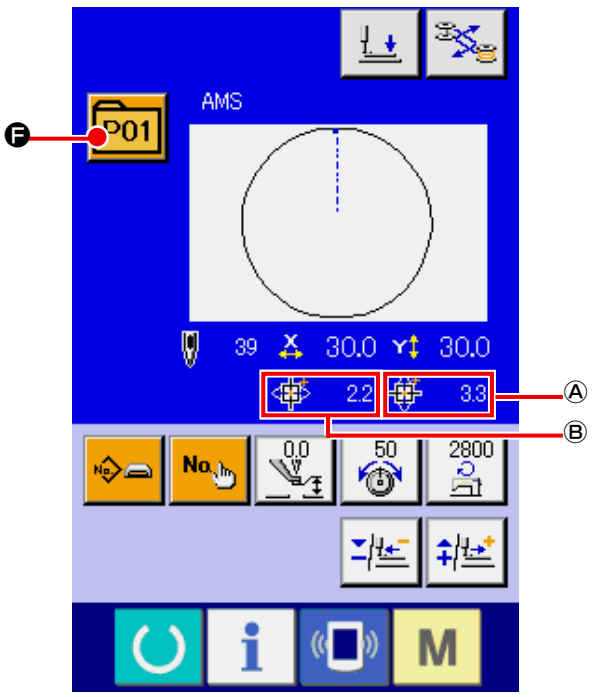
[User's pattern]



[Media pattern]



[Direct pattern]

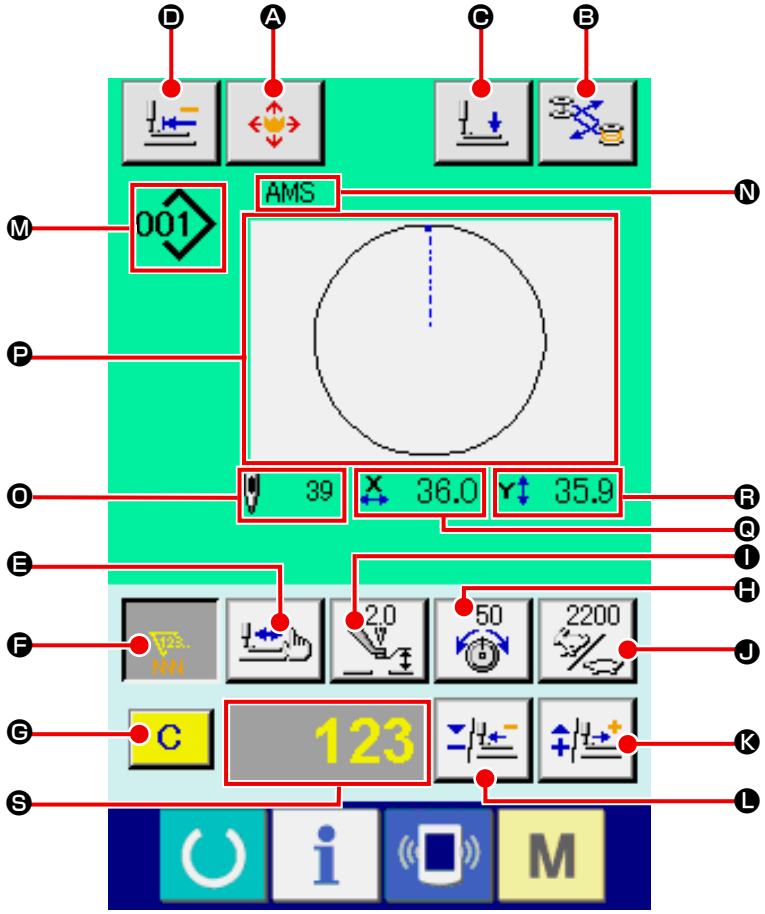


	Button and display	Description
Ⓐ	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.
Ⓑ	PRESSER DOWN button	This button is used for lowering the cassette clamp and intermediate presser and displaying the work clamp lowering screen.
Ⓒ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .
Ⓓ	PATTERN NO. SETTING button	Pattern No. is set. Registered pattern No. is retrieved using PLUS button Ⓙ and MINUS button Ⓚ.
Ⓔ	PATTERN TYPE SETTING button	Pattern type is specified. The pattern type is changed over among the following three different ones using PLUS button Ⓙ and MINUS button Ⓚ to select a desired one.  : User's pattern  : Vector form data  : M3 data  : Standard format of sewing  : Direct pattern The selected pattern type is indicated on edit data display Ⓠ. *A type to which no pattern is registered cannot be selected.
Ⓕ	PATTERN LIST button	Pattern No. and type which are currently selected are indicated on the button. When the button is pressed, the selected pattern list screen is displayed for the pattern selection.
Ⓖ	NEEDLE THREAD TENSION SETTING button	The current needle thread tension reference value is indicated on the button. When the button is pressed, the thread tension reference value can be changed. During the setting procedure, the thread tension reference value is indicated on edit data display Ⓠ. The thread tension value is increased/decreased in increments of 1 using PLUS button Ⓙ or MINUS button Ⓚ. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓗ	MAX SPEED LIMITATION SETTING button	The current max. speed limitation is indicated on the button. When the button is pressed, the max. speed limitation can be changed. During the setting procedure, the max. speed limitation is indicated on edit data display Ⓠ. The max. speed limitation is increased/decreased in increments of 100 sti/min using PLUS button Ⓙ or MINUS button Ⓚ. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓘ	INTERMEDIATE PRESSER HEIGHT REFERENCE VALUE SETTING button	The current intermediate presser height reference value is indicated on the button. When the button is pressed, the intermediate presser height reference value can be changed. During the setting procedure, the intermediate presser height reference value is indicated on edit data display Ⓠ. The intermediate presser height reference value is increased/decreased in increments of 0.1 mm using PLUS button Ⓙ or MINUS button Ⓚ. → Refer to **"II-2-6. Changing item data" p.41** .
Ⓙ	PLUS button	The value for the selected item is increased in increments of the reference unit.
Ⓚ	MINUS button	The value for the selected item is decreased in increments of the reference unit.
Ⓛ	PATTERN NAME display	The name of the currently selected pattern is displayed.
Ⓜ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed
Ⓝ	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.

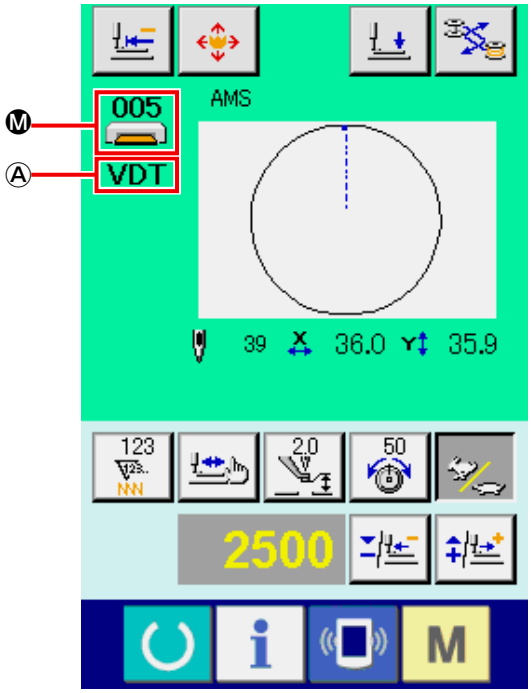
	Button and display	Description
ⓞ	X ACTUAL SIZE VALUE display	The actual X size value of the sewing shape which is being selected is displayed. When an actual value input is selected, the X ACTUAL VALUE SETTING button is displayed according to the setting of MEMORY switch U064 . → Refer to **"II-2-6. Changing item data" p.41** .
ⓟ	Y ACTUAL SIZE VALUE display	The actual Y size value of the sewing shape which is being selected is displayed. When an actual value input is selected, the Y ACTUAL VALUE SETTING button is displayed according to the setting of MEMORY switch U064 . → Refer to **"II-2-6. Changing item data" p.41** .
Ⓐ	MEDIA PATTERN WRITE button	Data on a media pattern is written. When this button is pressed, the new media pattern registration screen is displayed. * This button is displayed when the media pattern is selected.
Ⓑ	USER'S PATTERN WRITE button	Data on a user's pattern is written. When this button is pressed, the new user's pattern registration screen is displayed. * This button is displayed when the media pattern is selected.
Ⓒ	SEWING DATA TYPE display	The type of data read from a medium is displayed. VDT : Vector form data M3 : M3 data DAT : Standard format of sewing * This display is given when the media pattern is selected.
A	TRAVEL AMOUNT IN X DIRECTION display	The amount of travel in the X direction which is registered to the pattern button No. being selected is displayed. * This display is given when a direct pattern is selected.
B	TRAVEL AMOUNT IN Y DIRECTION display	The amount of travel in the Y direction which is registered to the pattern button No. being selected is displayed. * This display is given when a direct pattern is selected.

(2) Sewing screen (individual sewing)

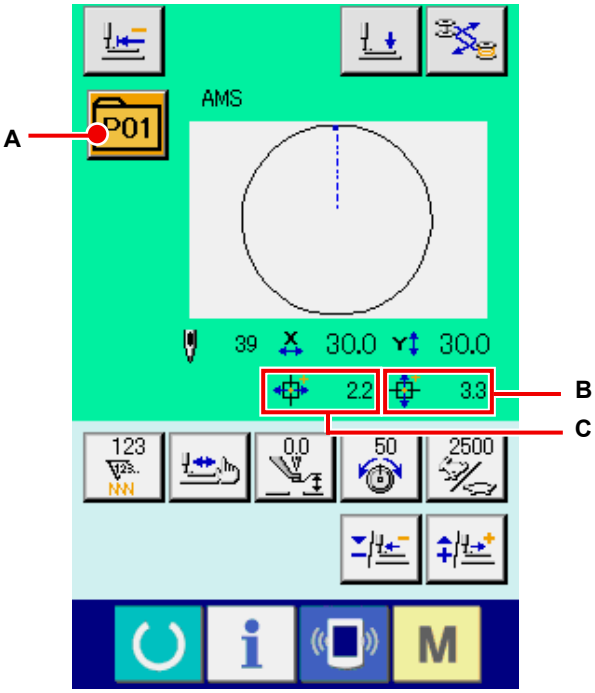
[User's pattern]



[Media pattern]



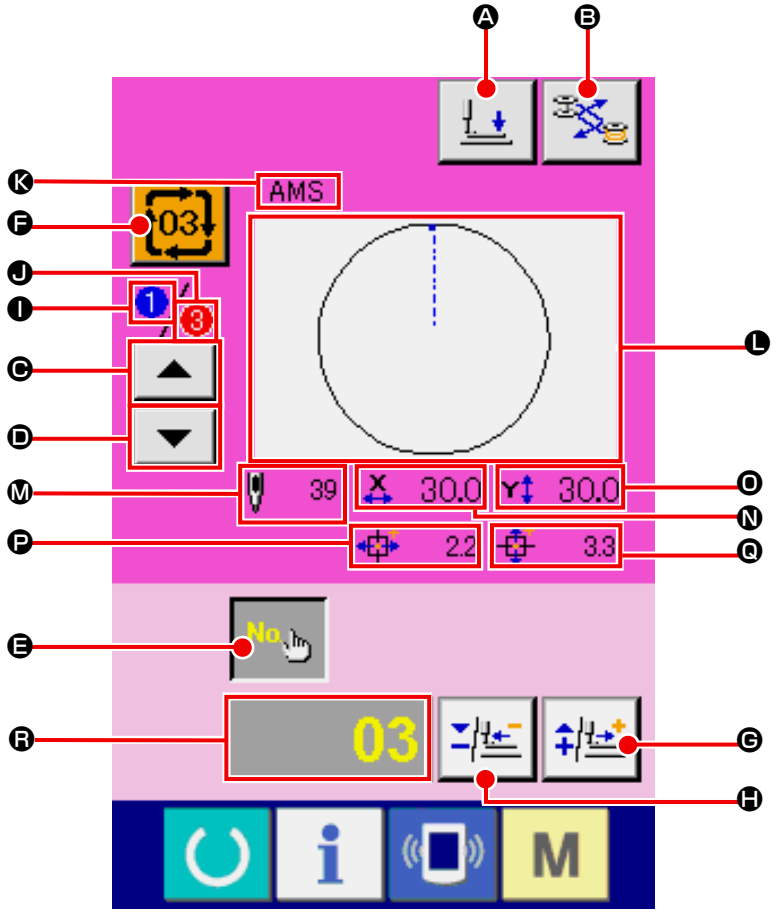
[Direct pattern]



	Button and display	Description
Ⓐ	PATTERN BUTTON MOVE button	The pattern button move screen is displayed. → Refer to **"II-2-10. When setting of sewing product is difficult because of interruption of needle tip" p.48** .
Ⓑ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to **"I-4-7. Installing and removing the bobbin case" p.21** .
Ⓒ	PRESSER DOWN button	This button is used for lowering the cassette clamp and intermediate presser and displaying the work clamp lowering screen.
Ⓓ	RETURN TO ORIGIN button	The work clamp is returned to the start of sewing and raised to its upper position at the time of a temporary stop.
Ⓔ	SHAPE CHECK button	The shape of the pattern which is being selected is checked using PLUS button Ⓚ or MINUS button Ⓛ. The current number of stitches is indicated on edit data display Ⓢ. → Refer to **"II-2-7. Checking pattern shape" p.43** .
Ⓕ	COUNTER VALUE CHANGE button	The counter value is changed using PLUS button Ⓚ or MINUS button Ⓛ. The counter value is indicated on the button. When the button is pressed, Ⓖ is displayed to allow the counter value to be changed. The current counter value is indicated on edit data display Ⓢ. → Refer to **"II-2-12. Using counter" p.51** .
Ⓖ	CLEAR button	The counter value is cleared. * This button is displayed only when COUNTER VALUE CHANGE button Ⓕ is being selected.
Ⓗ	NEEDLE THREAD TENSION SETTING button	The current needle thread tension reference value is indicated on the button. When the button is pressed, the reference value of the thread tension can be set. During the setting procedure, the thread tension reference value is indicated on edit data display Ⓢ. The thread tension value is increased/decreased in increments of 1 using PLUS button Ⓚ or MINUS button Ⓛ. The thread tension can be changed even during sewing.
Ⓘ	INTERMEDIATE PRESSER HEIGHT REFERENCE VALUE SETTING button	The current intermediate presser height reference value is indicated on the button. When the button is pressed, the intermediate presser height reference value can be set. During the setting procedure, the intermediate presser height reference value is indicated on edit data display Ⓢ. The intermediate presser height reference value is increased/decreased in increments of 0.1 mm using PLUS button Ⓚ or MINUS button Ⓛ.
Ⓙ	SPEED CHANGE button	The speed of stitch of the sewing machine is indicated on the button. When the button is pressed, the speed of stitch can be changed. During the setting procedure, the current speed of the sewing machine is indicated on edit data display Ⓢ. The max. speed limitation is increased/decreased in increments of 100 sti/min using PLUS button Ⓚ or MINUS button Ⓛ.
Ⓚ	PLUS button	The value for the selected item is increased in increments of the reference unit or the needle is moved forward by one stitch.
Ⓛ	MINUS button	The value for the selected item is decreased in increments of the reference unit or the needle is moved backward by one stitch.
Ⓜ	PATTERN NO./TYPE display	The pattern No. and type of the pattern which is being selected are displayed.
Ⓝ	PATTERN NAME display	The name of the currently selected pattern is displayed.

	Button and display	Description
ⓞ	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.
ⓟ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed.
ⓠ	X ACTUAL SIZE VALUE display	The actual X size value of the sewing shape which is being selected is displayed.
ⓡ	Y ACTUAL SIZE VALUE display	The actual Y size value of the sewing shape which is being selected is displayed.
ⓢ	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.
Ⓐ	SEWING DATA TYPE display	The type of data read from a medium is displayed. VDT : Vector form data M3 : M3 data DAT : Standard format of sewing * This display is given when the media pattern is selected.
A	PATTERN LIST button	Pattern No. and type which are currently selected are indicated on the button. When the button is pressed, the selected pattern list screen is displayed for the pattern selection.
B	TRAVEL AMOUNT IN X DIRECTION display	The amount of travel in the X direction which is registered to the pattern button No. being selected is displayed. * This display is given when a direct pattern is selected.
C	TRAVEL AMOUNT IN Y DIRECTION display	The amount of travel in the Y direction which is registered to the pattern button No. being selected is displayed. * This display is given when a direct pattern is selected.

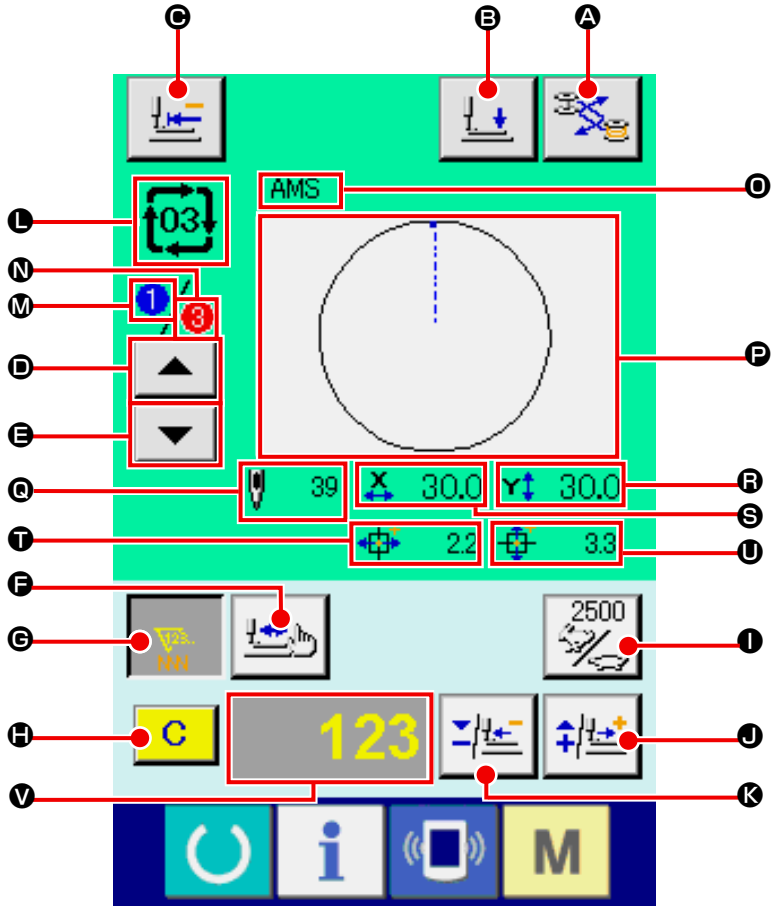
(3) Data input screen (combination sewing)



	Button and display	Description
Ⓐ	PRESSER DOWN button	This button is used for lowering the cassette clamp and intermediate presser and displaying the work clamp lowering screen.
Ⓑ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to "I-4-7. Installing and removing the bobbin case" p.21 .
Ⓒ	SEWING ORDER RETURN button	The pattern No. to be sewn first can be returned to the previous sewing order. The pattern information shown at the upper part of the screen is updated.
Ⓓ	SEWING ORDER ADVANCE button	The pattern No. to be sewn first can be advanced to the next sewing order. The pattern information shown at the upper part of the screen is updated.
Ⓔ	PATTERN No. SETTING button	Pattern No. is set. Registered pattern No. is retrieved using PLUS button Ⓖ and MINUS button Ⓗ.
Ⓕ	PATTERN LIST button	Pattern No. and type which are currently selected are indicated on the button. When the button is pressed, the selected pattern list screen is displayed for the pattern selection.
Ⓖ	PLUS button	The value for the selected item is increased in increments of the reference unit.
Ⓗ	MINUS button	The value for the selected item is decreased in increments of the reference unit.
Ⓘ	SEWING ORDER display	The sewing order of the currently selected pattern data is displayed.
Ⓙ	TOTAL NUMBER OF REGISTERS display	The total number of patterns registered to the cycle pattern which is currently being selected is displayed.

	Button and display	Description
ⓚ	PATTERN NAME display	The name of the currently selected pattern is displayed.
ⓛ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed.
ⓜ	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.
ⓝ	X ACTUAL SIZE VALUE display	The actual X size value of the currently selected pattern is displayed.
ⓞ	Y ACTUAL SIZE VALUE display	The actual Y size value of the currently selected pattern is displayed.
ⓟ	TRAVEL AMOUNT IN X DIRECTION display	The amount of travel in the X direction of the currently selected pattern is displayed.
ⓠ	TRAVEL AMOUNT IN Y DIRECTION display	The amount of travel in the Y direction of the currently selected pattern is displayed.
ⓡ	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.

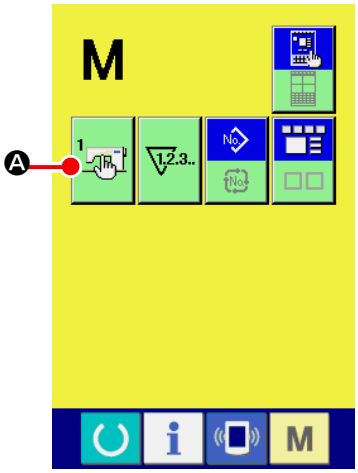
(4) Sewing screen (combination sewing)



	Button and display	Description
Ⓐ	BOBBIN REPLACEMENT button	Bobbin replacement is carried out. → Refer to "I-4-7. Installing and removing the bobbin case" p.21 .
Ⓑ	PRESSER DOWN button	This button is used for lowering the cassette clamp and intermediate presser and displaying the work clamp lowering screen.
Ⓒ	RETURN TO ORIGIN button	The work clamp is returned to the start of sewing and raised to its upper position at the time of a temporary stop.
Ⓓ	SEWING ORDER RETURN button	The pattern to be sewn can be returned to the previous one.
Ⓔ	SEWING ORDER ADVANCE button	The pattern to be sewn can be advanced to the next one.
Ⓕ	SHAPE CHECK button	The shape of the pattern which is being selected is checked using PLUS button Ⓙ or MINUS button Ⓚ. The current number of stitches is indicated on edit data display Ⓥ. → Refer to "II-2-7. Checking pattern shape" p.43 .
Ⓖ	COUNTER VALUE CHANGE button	The counter value is changed using PLUS button Ⓙ or MINUS button Ⓚ. The counter value is indicated on the button. When the button is pressed, Ⓗ is displayed to allow the counter value to be changed. The current counter value is indicated on edit data display Ⓥ. → Refer to "II-2-12. Using counter" p.51 .

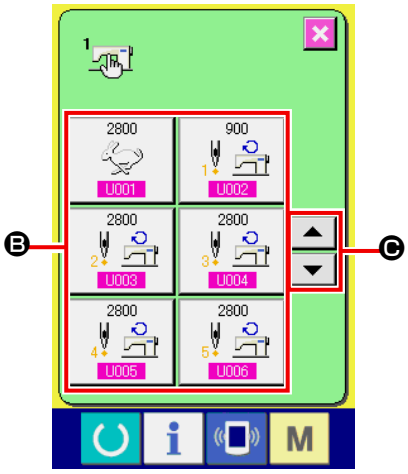
	Button and display	Description
ⓗ	CLEAR button	The counter value is cleared. * This button is displayed only when COUNTER VALUE CHANGE button ⓖ is being selected.
ⓘ	SPEED CHANGE button	The speed of stitch of the sewing machine is changed. The speed of stitch can be changed even during sewing. When this button is pressed, the current speed of stitch of the sewing machine is indicated on edit data display ⓥ. The speed of stitch is increased/decreased in increments of 100 sti/min using PLUS button ⓙ and MINUS button ⓚ.
ⓙ	PLUS button	The value for the selected item is increased in increments of the reference unit or the needle is moved forward by one stitch.
ⓚ	MINUS button	The value for the selected item is decreased in increments of the reference unit or the needle is moved backward by one stitch.
ⓛ	PATTERN NO./TYPE display	The pattern No. and type of the pattern which is being selected are displayed.
ⓜ	SEWING ORDER display	The sewing order of currently selected pattern data is displayed.
ⓝ	TOTAL NUMBER OF REGISTERS display	The total number of patterns registered to the cycle pattern which is currently being selected is displayed.
ⓞ	COMBINATION DATA NAME display	The name input in the combination data which is being selected is displayed.
ⓟ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed.
ⓠ	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.
ⓡ	X ACTUAL SIZE VALUE display	The actual X size value of the currently selected pattern is displayed.
ⓢ	Y ACTUAL SIZE VALUE display	The actual Y size value of the currently selected pattern is displayed.
ⓣ	TRAVEL AMOUNT IN X DIRECTION display	The amount of travel in the X direction of the currently selected pattern is displayed.
ⓤ	TRAVEL AMOUNT IN Y DIRECTION display	The amount of travel in the Y direction of the currently selected pattern is displayed.
ⓥ	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.

2-25. Changing memory switch data



① **Display the memory switch data list screen.**

When MODE key M is pressed, memory switch button Ⓐ is displayed on the screen. When this button is pressed, the memory switch data list screen is displayed.

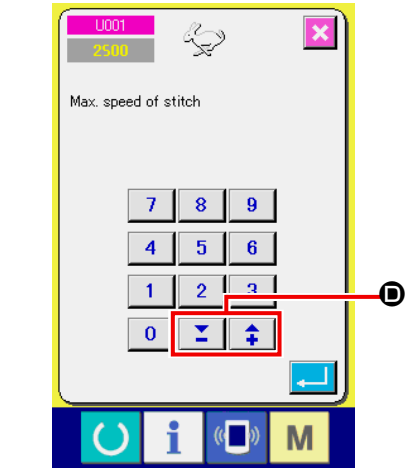


② **Select the memory switch button you desire to change.**

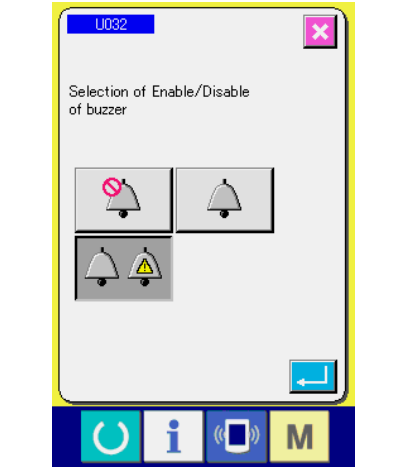
Press UP/DOWN SCROOL button Ⓒ and select the data item button Ⓑ you desire to change.

③ **Change the memory switch data.**

There are data items to change numerals and those to select pictographs in the memory switch data.



No. in pink color such as U001 is put on the data items to change numerals and the set value can be changed with Ⓓ buttons displayed in the change screen.



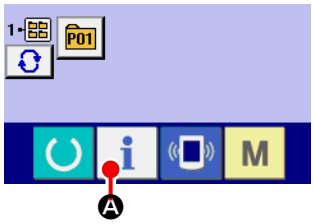
No. in blue color such as U032 is put on the data items to select pictographs and the pictographs displayed in the change screen can be selected.

→ For the details of memory switch data, refer to **"II-3. MEMORY SWITCH DATA LIST" p.94** .

2-26. Using information

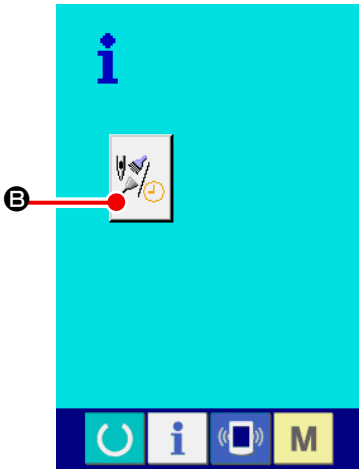
Oil replacement (grease-up) time, needle replacement time, cleaning time, etc. can be specified and the warning notice can be performed after the lapse of the specified time.

(1) Observing the maintenance and inspection information



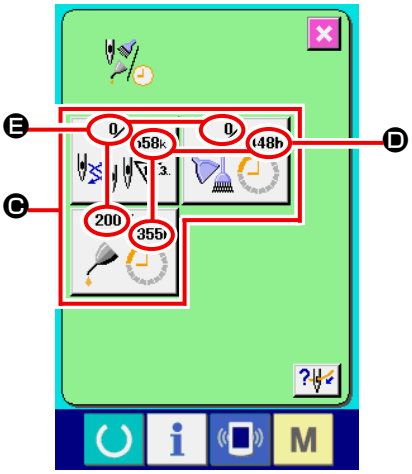
① **Display the information screen.**

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



② **Display the maintenance and inspection information screen.**

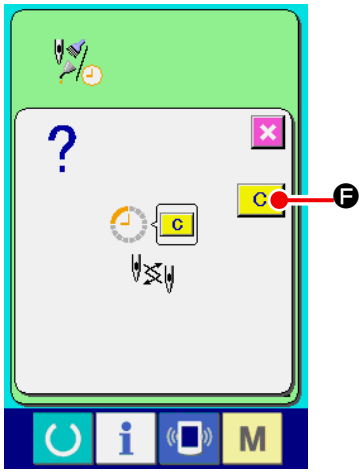
Press maintenance and inspection information screen display button  Ⓑ in the information screen.



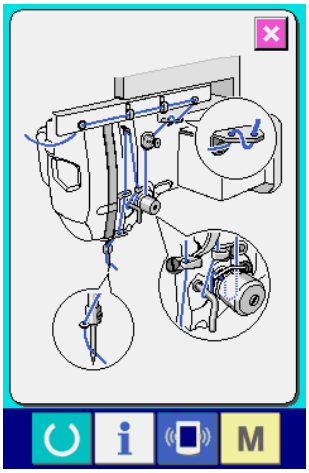
Information on the following three items is displayed in the maintenance and inspection information screen.

- Needle replacement (1,000 stitches) : 
- Cleaning time (hour) : 
- Oil replacement time (hour) : 

The interval to inform of the inspection for each item in button Ⓒ is displayed at Ⓓ, and remaining time up to the replacement is displayed at Ⓔ. In addition, remaining time up to the replacement can be cleared.

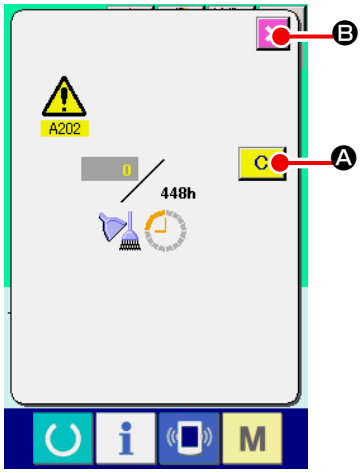


③ **Perform clearing remaining time up to the replacement.**
When button Ⓒ of the item you desire to clear is pressed, the time of replacement clear screen is displayed.
When CLEAR button C Ⓕ is pressed, the remaining time up to the replacement is cleared.



④ **Display the threading diagram.**
When threading button Ⓖ displayed in the maintenance and inspection screen is pressed, the needle thread threading diagram is displayed.
Observe it when performing threading.

(2) Releasing procedure of the warning



When the designated inspection time is reached, the warning screen is displayed.
In case of clearing the inspection time, press CLEAR button C Ⓐ. The inspection time is cleared and the pop-up is closed. In case of not clearing the inspection time, press CANCEL button Ⓑ and close the pop-up. Every time one sewing is completed, the warning screen is displayed until the inspection time is cleared.
Warning Nos. of the respective items are as follows.

- Needle replacement : A201
- Cleaning time : A202
- Oil replacement time : A203

For the grease-up portion, refer to the item of "III-1-9. Replenishing the designated places with grease" p.121 .

2-27. 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 or personal computer.
As the means of communication, a media slot and USB port are prepared.

* However, SU-1 (data server utility) is necessary to perform download/upload from the personal computer.

(1) Handling possible data

Sewing data that can be handled are 4 kinds below, and the respective data formats are as shown below.

Data name		Extension	Description of data
Vector format data		VD00XXX.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		AMS0XXX.M3	Pattern data for the AMS-B, -C and -D Series
Sewing standard format data		SD00XXX.DAT	Data of sewing standard format
Simplified program data		AMS0XXX.PRO	Simplified program data

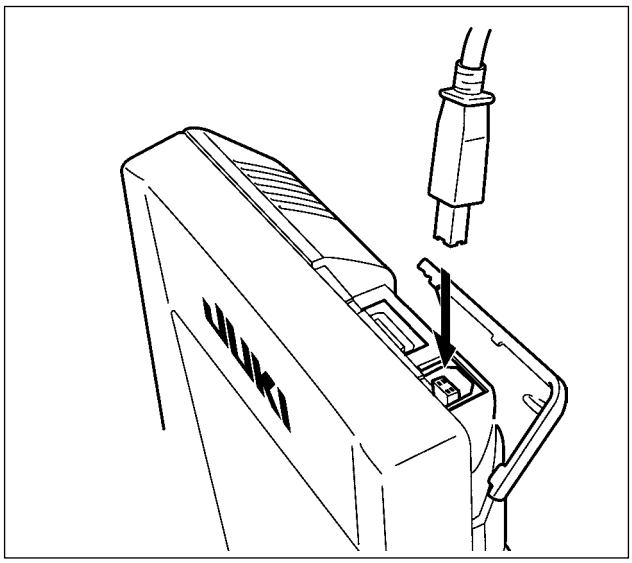
XXX : file No.

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

(2) Performing communication by using the media

For handling way of the media, read **"II-1. PREFACE" p.28** .

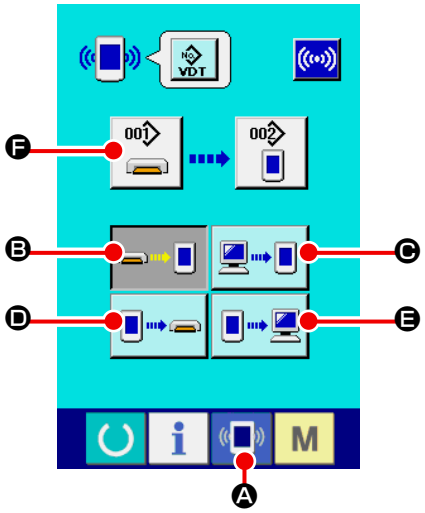
(3) Performing communication by using USB



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.

(4) Take-in of the data



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 four communication procedures as described below.

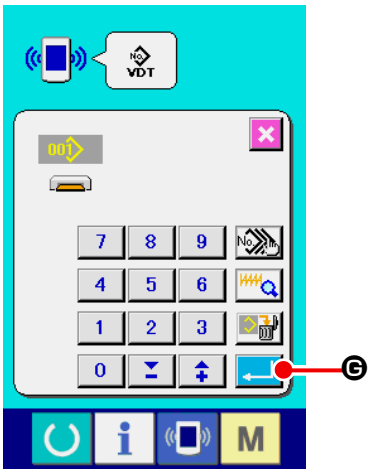
Ⓑ Writing data from media to panel

Ⓒ Writing data from personal computer (server) to panel

Ⓓ Writing data from panel to media

Ⓔ Writing data from panel to personal computer (server)

Select the button of communication procedure you desire.

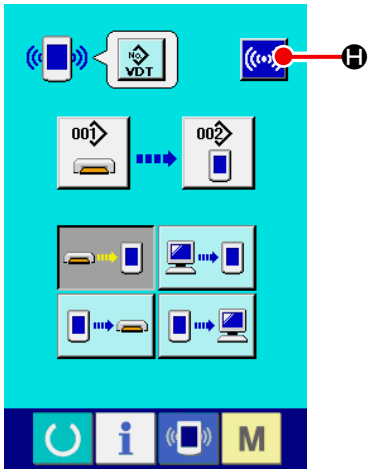


③ **Select the data No.**

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

Input the file No. of the data you desire to write. For the file No., input the numerals of the part xxx of VD00xxx .vdt of the file name.

Designation of the pattern No. of writing destination can be performed in the same way. When the writing destination is the panel, pattern Nos. which have not been registered are displayed.

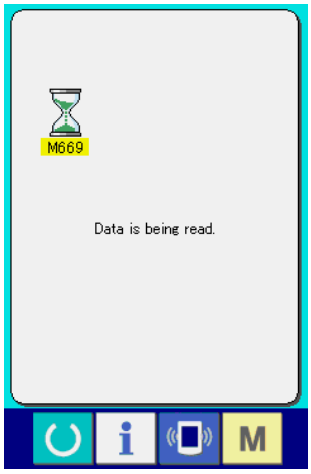


④ **Determine the data No.**

When ENTER button  Ⓖ is pressed, the data No. selection screen is closed and the selection of the data No. has been completed.

⑤ **Start communication.**

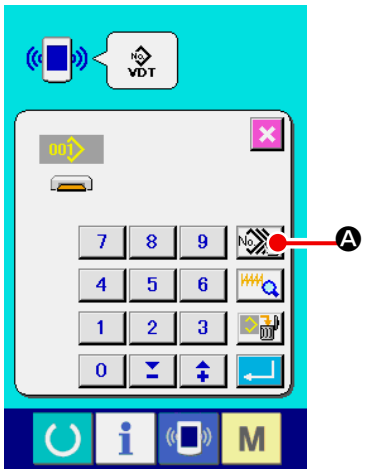
When COMMUNICATION START button  Ⓗ is pressed, the data communication starts. The during communication screen is displayed during communication and the screen returns to the communication screen after the end of communication.



Caution **Do not open the cover during reading the data. Data may not be read in.**

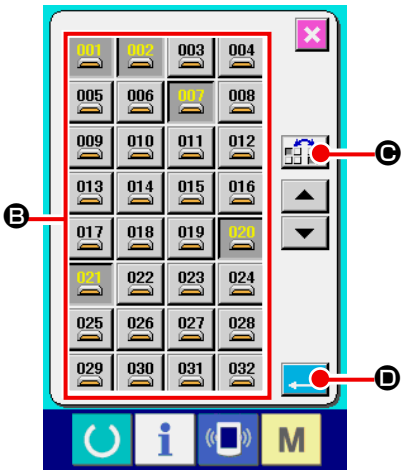
(5) Taking in plural data together

It is possible for vector data, M3 data and sewing standard format data to select plural writing data and write them together. Pattern No. of writing destination will become the same No. of the selected data No.



① **Display the writing file selection screen.**

When PLURAL SELECTION button Ⓐ is pressed, the data No. plural selection screen is displayed.

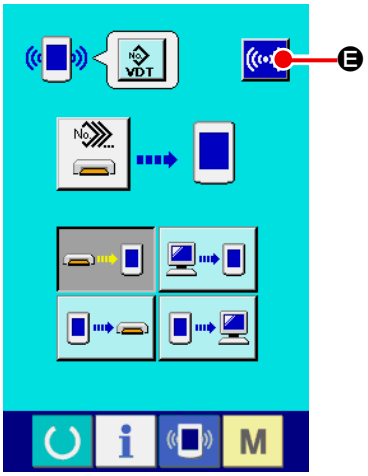


② **Perform the data No. selection.**

Since the list of existing data file numbers is displayed, press FILE NO. button Ⓑ you desire to write. It is possible to invert the selected state of the button with INVERSION button Ⓒ.

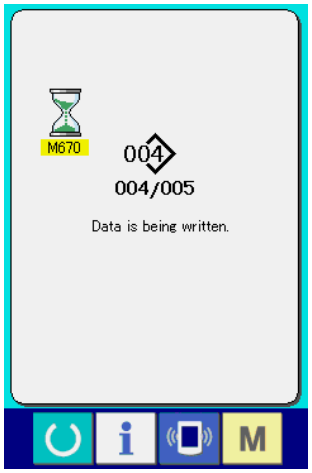
③ **Determine the data No.**

When ENTER button Ⓓ is pressed, the data No. plural selection screen is closed and the data selection ends.

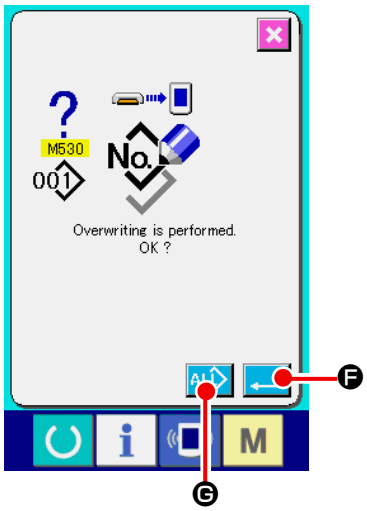


④ **Start the communication.**

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



Data No. during communication, total number of writing data and number of data that have ended the data communication are displayed in the during communication screen.

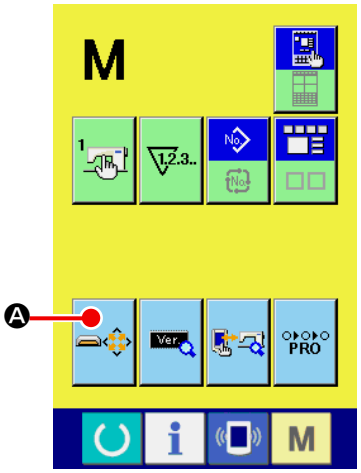


* When performing writing to the pattern No. which already exists, the overwriting confirmation screen is displayed before writing. When performing overwriting, press ENTER button Ⓕ.

When performing overwriting all without displaying the overwriting confirmation screen, press OVERWRITING button Ⓖ in all cases.

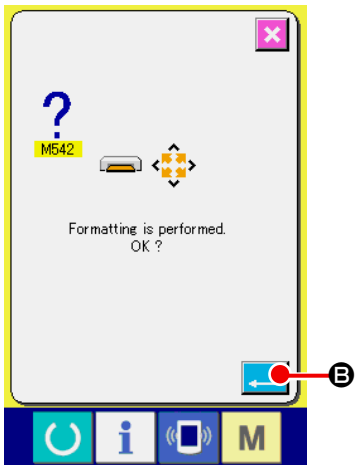
2-28. Performing formatting of the media

To re-format a medium, the IP-420 has to be used. The IP-420 is not able to read any medium which is formatted on a personal computer.



① **Display the media format screen.**

When M switch is held pressed for three seconds, MEDIA FORMAT button Ⓐ is displayed on the screen. When this button is pressed, the media format screen is displayed.



② **Start formatting of the media.**

Set the media you desire to format to the media slot, close the cover, press ENTER button Ⓑ and formatting starts.

Save necessary data in the media to the other media before formatting. When formatting is performed, the inside data are deleted.

When two or more media are connected to the sewing machine, the medium to be formatted is determined by the predetermined priority order.

High ← Low

CF(TM) slot ← USB device 1 ← USB device 2 ← ....

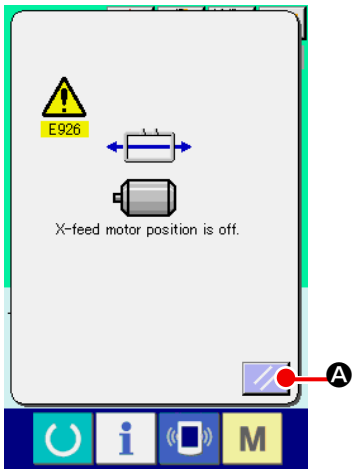
When a CompactFlash (TM) is inserted in the CF(TM) slot, the CompactFlash (TM) will be formatted according to the priority order as shown above.

Refer to the USB specifications for the priority order of access.

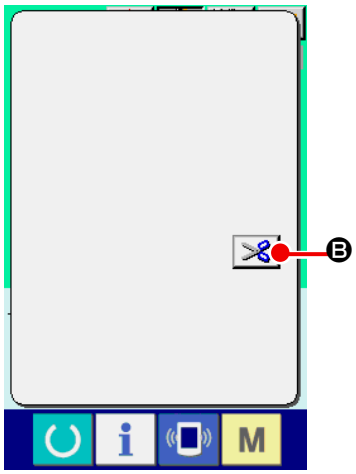
2-29. Operation at the time of X/Y motor position slip

When X/Y motor detects the position slip, the error screen is displayed.
Timing of error display can be changed with the selection of memory switch. For the details, refer to the Engineer's Manual.

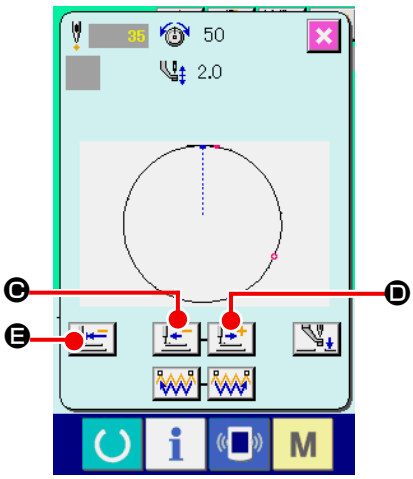
(1) When the error is displayed during sewing



① **Release the error.**
Press RESET button Ⓐ to release the error and the thread trimming pop-up is displayed.



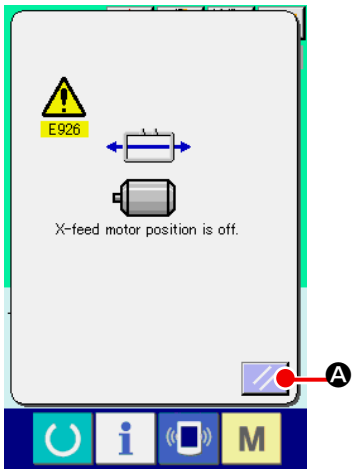
② **Perform thread trimming.**
Check the finished seam. If the seam has no problem, press the start switch to re-start sewing in the as is state.
If not, press THREAD TRIM button Ⓑ and perform thread trimming.
When performing thread trimming, the feed forward/back pop-up is displayed.



③ **Adjust the presser to the re-sewing position.**
Every time FEED BACK button Ⓒ is pressed, the presser returns by one stitch. Every time FEED FORWARD button Ⓓ is pressed, the presser moves forward by one stitch.
Move the presser up to the re-sewing position.
In addition, when RETURN TO ORIGIN button Ⓔ is pressed, the pop-up is closed, the sewing screen is displayed, and the presser returns to the sewing start position.

④ **Re-start sewing.**
When the start switch is pressed, the sewing machine re-starts sewing.

(2) When the error is displayed after end of sewing



① **Release the error.**

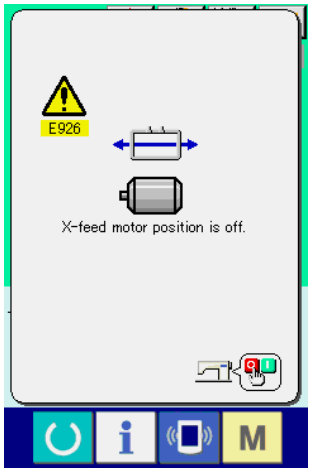
When RESET button Ⓐ is pressed, and the error is released, the sewing screen is displayed.

② **Perform sewing work again from the start.**

When the start switch is pressed, the sewing machine starts sewing.

(3) When the rest switch is not displayed

When a large slip is detected, the reset switch is not displayed.

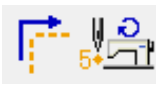
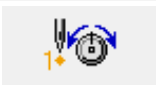


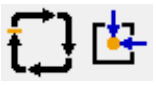
① **Turn OFF the power.**

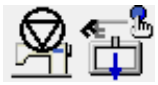
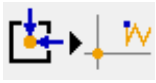
3. MEMORY SWITCH DATA LIST

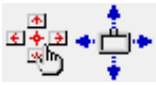
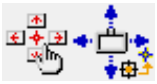
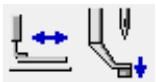
Memory switch data are the motion data that the sewing machine has in common and the data that operate on all sewing patterns in common.

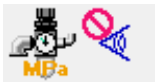
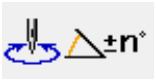
3-1. Data list

No.	Item	Setting range	Edit unit
U001	**Maximum sewing speed** 	200 to 2500	100 sti/min
U002	**Sewing speed of 1st stitch** 	200 to 1500	100 sti/min
U003	**Sewing speed of 2nd stitch** 	200 to 2500	100 sti/min
U004	**Sewing speed of 3rd stitch** 	200 to 2500	100 sti/min
U005	**Sewing speed of 4th stitch** 	200 to 2500	100 sti/min
U006	**Sewing speed of 5th stitch** 	200 to 2500	100 sti/min
U008	**Thread tension setting at the time of thread trimming** 	0 to 200	1
U009	**Thread tension changeover timing at the time of thread trimming** 	– 6 to 4	1
U010	**Sewing speed of 1st stitch** Acceleration/deceleration at the corner section 	200 to 900	100 sti/min
U011	**Sewing speed of 2nd stitch** Acceleration/deceleration at the corner section 	200 to 2500	100 sti/min
U012	**Sewing speed of 3rd stitch** Acceleration/deceleration at the corner section 	200 to 2500	100 sti/min
U013	**Sewing speed of 4th stitch** Acceleration/deceleration at the corner section 	200 to 2500	100 sti/min
U014	**Sewing speed of 5th stitch** Acceleration/deceleration at the corner section 	200 to 2500	100 sti/min
U015	**Thread tension of 1st stitch** 	0 to 200	1
U016	**Thread tension changeover timing at the time of sewing start** 	– 5 to 2	1

No.	Item	Setting range	Edit unit
U018	**Counter motion selection**  Sewing counter  No. of pcs. counter  Bobbin counter	---	---
U032	**Buzzer sound can be prohibited**  Without buzzer sound  Panel operating sound  Panel operating sound + error	---	---
U036	**Feed motion timing is selected** Set the timing in "–" direction when stitch is not well-tightened. 	– 8 to 16	1
U037	**This memory switch is used for selecting the releasing method of the cassette clamp after the completion of sewing**  Cassette clamp is released after the clamp has returned to the sewing start position.  Cassette clamp is released first and it returns to the sewing start position.  Cassette clamp is released with the eject switch after it has returned to the sewing start position.  Cassette clamp is released with the eject switch after it has returned to the sewing start position. The sewing machine starts sewing with the start switch.	---	---
U038	**This memory switch is used for setting the release of cassette clamp at the end of sewing**  Normal  Release of the cassette clamp is prohibited.	---	---
U039	**Origin retrieval can be performed every time after end of sewing (other than combination sewing)**  Without origin retrieval  With origin retrieval	---	---
U040	**Origin retrieval in combination sewing can be set**  Without origin retrieval  Every time 1 pattern is finished.  Every time 1 cycle is finished.	---	---

No.	Item	Setting range	Edit unit
U041	**This memory switch is used for selecting the clamp status in the case sewing is stopped with the pause command**  Clamp is released  Presser foot goes up and the clamp is released with the eject switch.	---	---
U042	**Needle stop position is set**  UP position  Upper dead point	---	---
U046	**Thread trimming can be prohibited**  Normal  Thread trimming prohibited	---	---
U048	**Route of return to origin by return to origin button can be selected**  Linear return  Reverse return of pattern  Origin retrieval → Sewing start point	---	---
U051	**Motion method of wiper can be selected**  Invalid  Magnet typewiper	---	---
U064	**Unit of sewing shape size change can be selected**  %input  Actual size input	---	---
U068	**Thread tension output time when setting thread tension can be set** 	0 to 20	1 S
U071	**Thread breakage detection selection**  Thread breakage detection invalid  Thread breakage detection valid	---	---
U072	**Number of invalid stitches at the start of sewing of thread breakage detection** 	0 to 15 stitches	1 stitch
U073	**Number of invalid stitches during sewing of thread breakage detection** 	0 to 15 stitches	1 stitch

No.	Item	Setting range	Edit unit
U088	**Enlarging/reducing function mode**  Prohibited  Increasing/decreasing number of stitches (Pitch is fixed.)  Increasing/decreasing pitch (Number of stitches is fixed.)	---	---
U089	**Jog move function mode**  Prohibited  Parallel move  2nd origin specified later	---	---
U091	**Retainer compensation motion : selection of motion**  Without motion  With motion	---	---
U094	**Selection of needle upper dead point at the time of origin retrieval/return to origin**  Without  With	---	---
U097	**Temporary stop : thread trimming operation**  Automatic thread trimming  Manual (Thread trimming by turning Stop SW ON again)	---	---
U101	**Main motor X/Y feed synchronized control : speed/pitch**  2500 sti/min/ 3.0 mm  2200 sti/min/ 3.0 mm  1800 sti/min/ 3.0 mm  1400 sti/min/ 3.0 mm	---	---
U103	**Intermediate presser with/without control**  Without (Lowering fixed)  With (Lowering with sewing data at the time of operation)  With (Lowering even at the time of feed forward/backward)	---	---
U104	**Intermediate presser lowering timing**  Immediately before start-up of machine head  Synchronized with the cassette clamp	---	---
U105	**Intermediate presser : wiper sweeping position**  Sweeping above intermediate presser  Sweeping above intermediate presser (position where intermediate presser lowers most)  Sweeping below intermediate presser	---	---

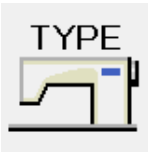
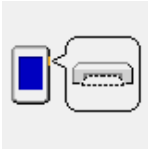
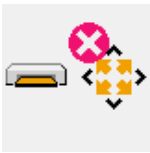
No.	Item	Setting range	Edit unit
U108	**With/without air pressure detection**  Without  With	---	---
U112	**Intermediate presser DOWN position setting** → Refer to **"I-4-11. Intermediate presser height" p.26** . 	0 to 7.0 mm	0.1 mm
U129	**With/without needle cooler control**  Without  With	---	---
U145	**The time to automatically exit from the count-up screen can be set** 	0 to 99	1
U146	**Selection of needle upper dead point at the time of origin retrieval/return to origin**  Without  With	---	---
U210	**This memory switch is used for selecting the direction.**  Perfect stitch  Hitch stitch  No turning	---	---
U211	**This memory switch is used for offsetting the angel** Angle offset value of the turning shaft on the arm side with respect to the turning shaft on the bed side is set. 	-180 to 180	1°
U245	**Grease-up error** Clearing of number of stitches of grease-up is performed. → Refer to **"III-1-9. Replenishing the designated places with grease" p.121** . 	---	---
U275	**Number of revolutions of the slip ring** The number of revolutions of the slip ring is cleared. → Refer to the Engineer's Manual. 	---	---
U500	**Language selection** 日本語 Japanese English English 中文繁體字 Chinese (traditional) 中文简体字 Chinese (simplified) Español Spanish Italiano Italian Français French Deutsch German Português Portuguese Türkçe Turkish Tiếng Việt Vietnamese 한국어 Korean Indonesia Indonesian Русский Russian	---	---

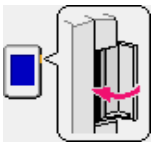
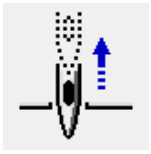
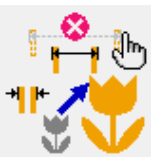
3-2. Initial value list

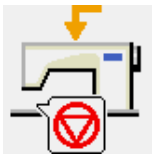
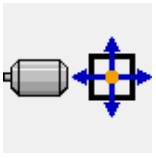
No.	Item	Initial value	Edit unit
U001	Maximum sewing speed	2500	100 sti/min
U002	Sewing speed of 1st stitch	200	100 sti/min
U003	Sewing speed of 2nd stitch	500	100 sti/min
U004	Sewing speed of 3rd stitch	500	100 sti/min
U005	Sewing speed of 4th stitch	500	100 sti/min
U006	Sewing speed of 5th stitch	1000	100 sti/min
U008	Thread tension setting at the time of thread trimming	0	1
U009	Thread tension changeover timing at the time of thread trimming	0	1
U010	Sewing speed of 1st stitch (Acceleration/deceleration at the corner section)	200	100 sti/min
U011	Sewing speed of 2nd stitch (Acceleration/deceleration at the corner section)	500	100 sti/min
U012	Sewing speed of 3rd stitch (Acceleration/deceleration at the corner section)	500	100 sti/min
U013	Sewing speed of 4th stitch (Acceleration/deceleration at the corner section)	500	100 sti/min
U014	Sewing speed of 5th stitch (Acceleration/deceleration at the corner section)	1000	100 sti/min
U015	Thread tension of 1st stitch	0	1
U016	Thread tension changeover timing at the time of sewing start	–5	1
U018	Counter motion selection		---
U032	Buzzer sound can be prohibited		---
U036	Feed motion timing is selected	3	1
U037	This memory switch is used for selecting the releasing method of the cassette clamp after the completion of sewing		---
U038	This memory switch is used for setting the release of cassette clamp at the end of sewing.		---
U039	Origin retrieval can be performed every time after end of sewing (other than combination sewing)		---
U040	Origin retrieval in combination sewing can be set		---
U041	This memory switch is used for selecting the clamp status in the case sewing is stopped with the pause command		---
U042	Needle stop position is set		---
U046	Thread trimming can be prohibited		---
U048	Route of return to origin by return to origin button can be selected		---

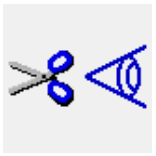
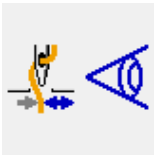
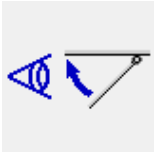
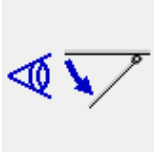
No.	Item	Initial value	Edit unit
U051	Motion method of wiper can be selected		---
U064	Unit of sewing shape size change can be selected		---
U068	Thread tension output time when setting thread tension can be set	20	1 S
U071	Thread breakage detection selection		---
U072	Number of invalid stitches at the start of sewing of thread breakage detection	8	1 stitch
U073	Number of invalid stitches during sewing of thread breakage detection	3	1 stitch
U088	Enlarging/reducing function mode		---
U089	Jog move function mode		---
U091	Retainer compensation motion : selection of motion		---
U094	Selection of needle upper dead point at the time of origin retrieval/return to origin		---
U097	Temporary stop : thread trimming operation		---
U101	Main motor X/Y feed synchronized control : speed/pitch		---
U103	Intermediate presser with/without control		---
U104	Intermediate presser lowering timing		---
U105	Intermediate presser : wiper sweeping position		---
U108	With/without air pressure detection		---
U112	Intermediate presser DOWN position setting	3.5	0.1 mm
U129	With/without needle cooler control		---
U145	The time to automatically exit from the count-up screen can be set	0	1
U146	Enable/disable of shape display at the time of pattern selection		---
U210	This memory switch is used for selecting the direction		---
U211	This memory switch is used for offsetting the angel	0	1°
U245	Grease-up error	-	---
U275	Number of revolutions of the slip ring	-	---
U500	Language selection	Not set	---

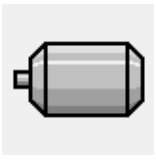
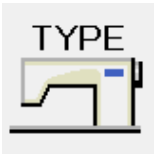
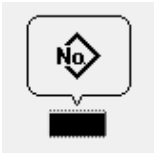
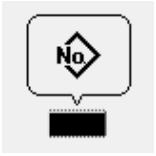
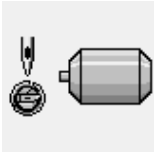
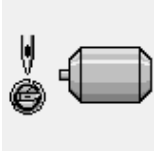
4. ERROR CODE LIST

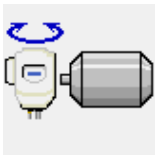
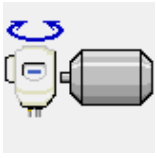
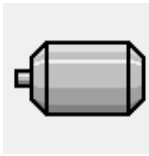
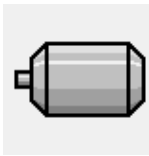
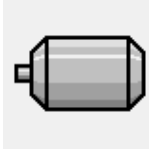
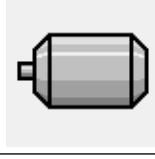
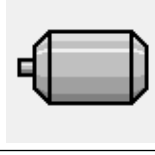
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E007		**Machine lock** Main shaft of the sewing machine fails to rotate due to some trouble.	Machine is locked.	Turn OFF the power	
E008		**Head connector abnormality** Memory of machine head cannot be read.	Undefined 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
E024		**Pattern data size over** Memory size is over.	Memory capacity has run out.	Possible to re-start after reset.	Data input screen

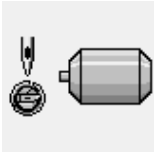
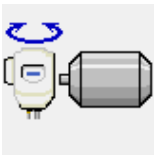
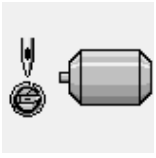
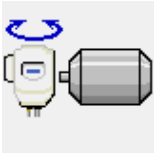
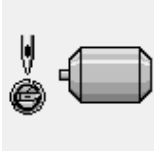
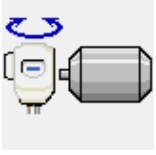
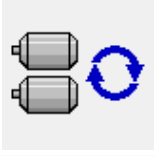
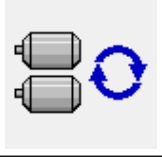
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E027		**Read error** Data read from server cannot be performed.	Data cannot be read.	Possible to re-start after reset.	Previous screen
E028		**Write error** Data write from server cannot be performed.	Data cannot be written.	Possible to re-start after reset.	Previous screen
E029		**Media slot release error** Lid of media slot is open.	Cover of media slot is open.	Possible to re-start after reset.	Previous 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.	Possible to re-start after reset.	Data input 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

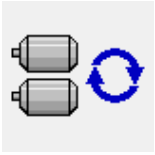
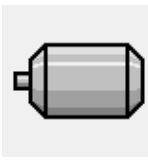
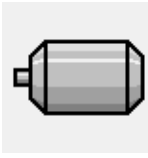
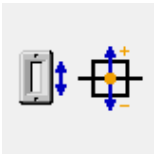
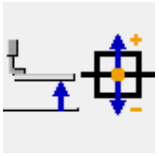
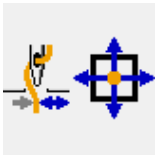
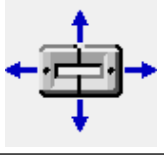
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E061		**Memory switch data error** Memory switch data is broken or revision is old.	Memory switch data error.	Turn OFF the power	
E080		**External stop switch**	External stop switch has been pressed	Possible to re-start after reset.	Step screen
E101		**Safety cover sensor error**	Safety cover is open	Close the safety cover.	Previous screen
E204		**USB connection error** With the number of times of sewing has reached 10 or more, with a USB device connected to the sewing machine	Never connect USB storage device to the machine during sewing.	Possible to re-start after reset.	Sewing screen
E220		**Grease-up warning** At the time of operation of 100 million stitches → Refer to **"III-1-9. Replenishing the designated places with grease" p.121** .	Important: Grease is running out. Add grease.	Possible to re-start after reset.	Data input screen
E221		**Grease-up error** At the time of operation of 120 million stitches The sewing machine is put in the sewing-impossible status. It is possible to clear with memory switch U245 . → Refer to **"III-1-9. Replenishing the designated places with grease" p.121** .	Important: Grease has run out. Add grease.	Possible to re-start after reset.	Data input screen
E298		**Warning against maintenance of slip ring**	(Important) Slip ring is filled with dust Clean up	Possible to re-start after reset.	Data input screen
E299		**Slip ring maintenance error**	(Important) Slip ring is filled with dust Clean up to prevent malfunction	Possible to re-start after reset.	Data input screen
E303		**Meniscal sensor error**	Main shaft motor origin cannot be found	Turn OFF the power	

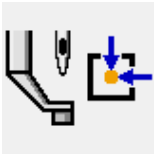
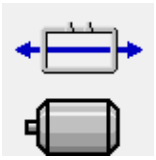
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E305		**Cloth cutting knife position error** Cloth cutting knife is in the regular position.	Thread trimmer knife sensor cannot be detected.	Turn OFF the power	Data input screen
E306		**Thread clamp position error** Thread clamp unit is not in the regular position.	Thread clamp sensor cannot be detected.	Turn OFF the power	
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	
E310		**Hook cover sensor error**	Hook cover is open	Close the hook cover.	Previous screen
E311		**Hook motor origin sensor error**	Hook motor origin cannot be found	Turn OFF the power	
E312		**Machine-head turning motor origin sensor error**	Head turning motor origin cannot be found	Turn OFF the power	
E313		**Hook turning motor origin sensor error**	Hook turning motor origin cannot be found	Turn OFF the power	
E374		**Intermediate presser down sensor error**	Intermediate presser has not come down	Turn OFF the power	
E375		**Bobbin replacement door-close sensor error**	Bobbin change window cannot be closed	Turn OFF the power	
E376		**Bobbin replacement door-open sensor error**	Bobbin change window cannot be opened	Turn OFF the power	

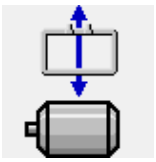
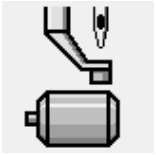
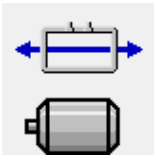
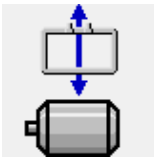
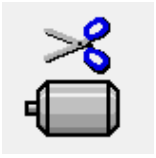
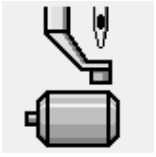
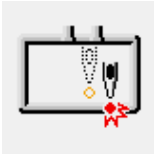
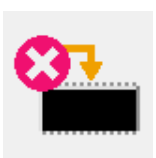
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E378		**Machine head down sensor error**	Machine head has not come down	Turn OFF the power	
E379		**Machine head up sensor error**	Machine head has not gone up	Turn OFF the power	
E406		**Password mismatch error**	Password does not match. Re-enter password from the beginning.	Possible to re-start after reset.	Pass-word input screen
E701		**Motor electrical-angle reference sensor error**	Main shaft motor fault (Encoder Z-phase)	Turn OFF the power	
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 pro-gram after pressing down com-munication switch.	Commu-nication screen
E704		**Inconsistency of system version** System software version is inconsistent in the initial communication.	Version of program incompatible.	Possible to rewrite pro-gram after pressing down com-munication switch.	Commu-nication screen
E707		**NAND flash ROM is not formatted**	Pattern-data storage memory unformatted	Turn OFF the power	
E708		**NAND flash ROM is inaccessible**	Pattern-data storage memory is inaccessible	Possible to re-start after reset.	Previous screen
E721		**Hook motor encoder failure**	Hook motor fault (Encoder A-/B-phase)	Turn OFF the power	
E722		**Hook motor hall sensor failure**	Hook motor fault (Encoder U-/V-/W-phase)	Turn OFF the power	

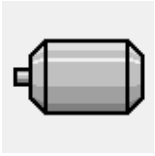
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E723		**Machine-head turning motor hall sensor failure**	Head turning motor fault (Encoder U-/V-/W-phase)	Turn OFF the power	
E724		**Hook turning motor hall sensor failure**	Hook turning motor fault (Encoder U-/V-/W-phase)	Turn OFF the power	
E725		**Hook motor reverse rotation**	Hook motor reverse rotation	Turn OFF the power	
E726		**Machine-head turning motor reverse rotation**	Head turning motor reverse rotation	Turn OFF the power	
E727		**Hook turning motor reverse rotation**	Hook turning motor reverse rotation	Turn OFF the power	
E730		**Main-shaft motor encoder failure/open-phase** In the case the sewing machine motor encoder is in the abnormal condition.	Main shaft motor fault (Encoder A-/B-phase)	Turn OFF the power	
E731		**Main motor hole sensor is defective or position sensor is defective.** Hole sensor or position sensor of the sewing machine motor is defective.	Main shaft motor fault (Encoder U-/V-/W-phase)	Turn OFF the power	
E733		**Reverse rotation of main shaft motor** When sewing machine motor rotates in reverse direction.	Main shaft motor reverse rotation	Turn OFF the power	
E802		**Power electrical discontinuity detection**	Power instantaneously lost.	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	
E813		**Low voltage** When input power is less than the specified value.	Input voltage is too low. (Check input voltage.)	Turn OFF the power	

Error code	Display	Description of error	Display message	How to recover	Place of recovery
E822		**Hook motor overload error**	Hook motor is overloaded	Turn OFF the power	
E823		**Machine-head turning motor overload error**	Head turning motor is overloaded	Turn OFF the power	
E824		**Hook turning motor overload error**	Hook turning motor overload	Turn OFF the power	
E825		**Hook motor overcurrent**	Hook-motor overcurrent is detected	Turn OFF the power	
E826		**Machine-head turning motor overcurrent**	Head turning-motor overcurrent is detected	Turn OFF the power	
E827		**Hook turning motor overcurrent**	Hook turning-motor overcurrent is detected	Turn OFF the power	
E828		**Hook motor current sensor failure**	Hook-motor current sensor is broken	Turn OFF the power	
E829		**Machine-head motor current sensor failure**	Head turning-motor current sensor is broken	Turn OFF the power	
E830		**Hook turning motor current sensor failure**	Hook turning-motor current sensor is broken	Turn OFF the power	
E831		**Turning-motor position excessive-deviation error**	Turning motor fails to run as commanded	Turn OFF the power	
E832		**Main shaft/hook synchronization error**	Main shaft motor and hook motor are out of synchronization	Turn OFF the power	

Error code	Display	Description of error	Display message	How to recover	Place of recovery
E833		**Turning-motor synchronization error**	Head turning motor and hook turning motor are out of synchronization	Turn OFF the power	
E901		**Main shaft motor IPM abnormality** When IPM of servo control p.c.b. is abnormal.	SDC P.C.B. is defective. (IPM)	Turn OFF the power	
E903		**Stepping motor power abnormality** When stepping motor power of SERVO CONTROL p. c. b. fluctuates more than ± 15%.	Power of SDC P.C.B. is defective. (Stepping motor power 85 V)	Turn OFF the power	
E904		**Solenoid power abnormality** When solenoid power of SERVO CONTROL p. c. b. fluctuates more than ± 15%.	Power of SDC P.C.B. is defective. (Solenoid power 33 V)	Turn OFF the power	
E905		**Heat sink temperature for SERVO CONTROL p. c. b. abnormality** Turn ON the power again after taking overheat time of SERVO CONTROL p. c. b.	Temperature of SDC P.C.B. is too high.	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	
E910		**Presser motor origin retrieval error** When origin sensor signal is not inputted at the time of origin retrieval motion.	Origin of presser thread trimmer motor cannot be found. (Presser thread trimmer origin sensor)	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 found. (Thread clamp origin sensor)	Turn OFF the power	
E914		**Feed defective error** Timing lag between feed and main shaft occurs.	X/Y feed trouble is detected.	Turn OFF the power	

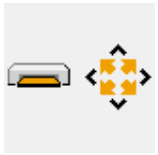
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E915		**Communication abnormality between operation panel and MAIN CPU** When abnormality occurs in data communication.	Communication is impossible. (Panel - MAIN P.C.B.)	Turn OFF the power	
E916		**Communication abnormality between MAIN CPU and main shaft CPU** When abnormality occurs in data communication.	Communication is impossible. (MAIN P.C.B. - SDC P.C.B.)	Turn OFF the power	
E917		**Communication failure between operation panel and personal computer** When abnormality occurs in data communication.	Communication is impossible. (Panel - PC)	Possible to re-start after reset.	
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 found. (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. -------

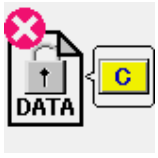
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E927		**Y motor position slip error**	Y-feed motor position is off.	1. In case of error display during sewing Possible to re-start after reset 2. In case of error display after end of sewing Possible to re-start 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	
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	
E935		**Intermediate presser motor overload error**	Intermediate presser motor overload is excessive.	Turn OFF the power	
E936		**X/Y motor out of range error**	Feed motor position has exceeded the sewing area.	Turn OFF the power	
E943		**MAIN CONTROL p.c.b trouble** When data writing to MAIN CONTROL p.c.b. cannot be performed.	MAIN P.C.B. is defective.	Turn OFF the power	

Error code	Display	Description of error	Display message	How to recover	Place of recovery
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	
E993		**SPI communication error (SDC)**	SPI communication is impossible (SDC PCB-Main PCB)	Turn OFF the power	
E994		**SPI communication error (HEAD UP)**	SPI communication is impossible (Head upper-PCB-Main PCB)	Turn OFF the power	
E995		**SPI communication error (HEAD DOWN)**	SPI communication is impossible (Head lower-PCB-Main PCB)	Turn OFF the power	
E996		**SPI communication error (others)**	SPI communication is impossible	Turn OFF the power	
E997		**XY motor driver error (IPM temperature error, IPM error)**	XY motor output element fault (IPM temperature error, IPM error)	Turn OFF the power	

5. MESSAGE LIST

Message No.	Display	Display message	Description
M520		Erasing is performed. OK ?	**Erase confirmation of Users' pattern** Erase is performed. OK ?
M521		Erasing is performed. OK ?	**Erase confirmation of pattern button** Erase is performed. OK ?
M522		Erasing is performed. OK ?	**Erase confirmation cycle pattern** Erase is performed. OK ?
M523		Pattern data is not stored. Erasing is OK?	**Erase confirmation of backup data** Pattern data is not stored in memory. Erase is OK ?
M528		Overwriting is performed. OK ?	**Overwriting confirmation of users' pattern** Overwriting is performed. OK ?
M529		Overwriting is performed. OK ?	**Overwriting confirmation of media** 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 ?
M532		Overwriting is performed. OK ?	**Overwriting confirmation of vector data on personal computer/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	Display message	Description
M535		Overwriting is performed. OK ?	**Overwriting confirmation of adjustment data on personal computer and all machine data** Overwriting is performed. OK ?
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.
M546		Data does not exist.	**Data corresponding to personal computer does not exist.** Data does not exist.
M547		Overwriting cannot be performed since data exists.	**Overwriting prohibition on pattern data** Overwriting cannot be performed since data exists.
M548		Overwriting cannot be performed since data exists.	**Overwriting prohibition on media data** Overwriting cannot be performed since data exists.
M549		Overwriting cannot be performed since data exists.	**Overwriting prohibition on data on personal computer** Overwriting cannot be performed since data exists.
M550		There is back-up data of body input.	**Backup data information on main body input** There is back-up data of body input.

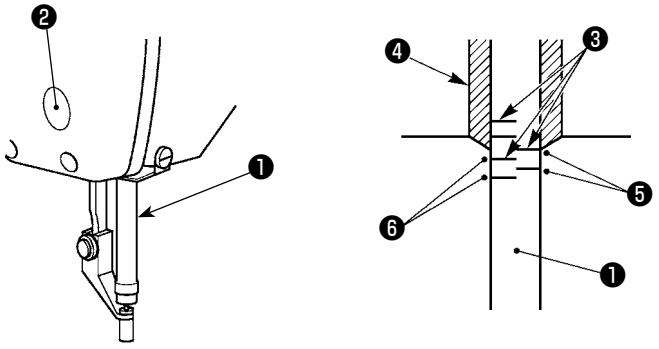
Message No.	Display	Display message	Description
M554		Key-lock customization data have been initialized.	**Customized data initialization notice** Customized key-lock data has been initialized.
M555		Key-lock customization data are broken. Initializing is OK?	**Customized data breakage** Customized key-lock data has broken. Initialization is performed. OK?
M556		Key-lock customization data are to be initialized. OK?	**Initialization confirmation of customized data** Customized key-lock data is initialized. OK?
M557		Clears password Yes or No?	**Confirmation of clearance of password setting** Clears password Yes or no
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 or the sewing machine.



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

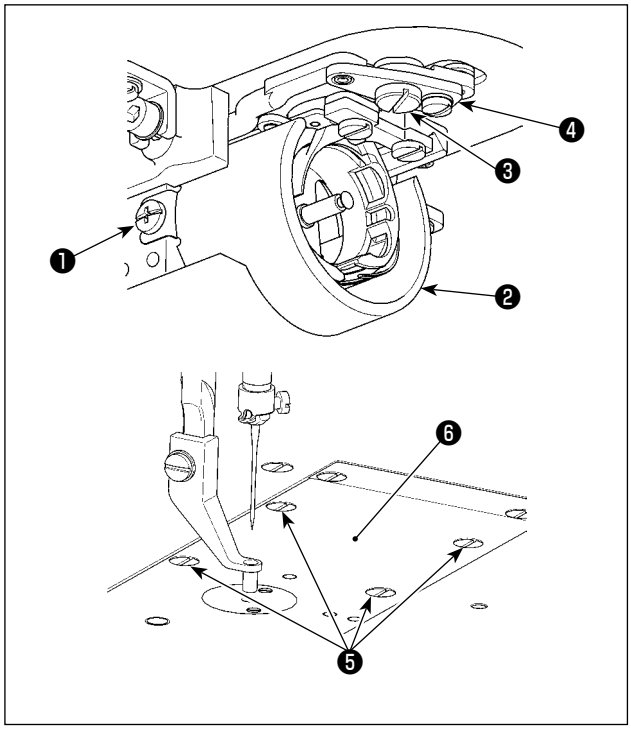
*** Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.**

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.

Important **After the adjustment, turn the pulley to check for an extra load.**

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

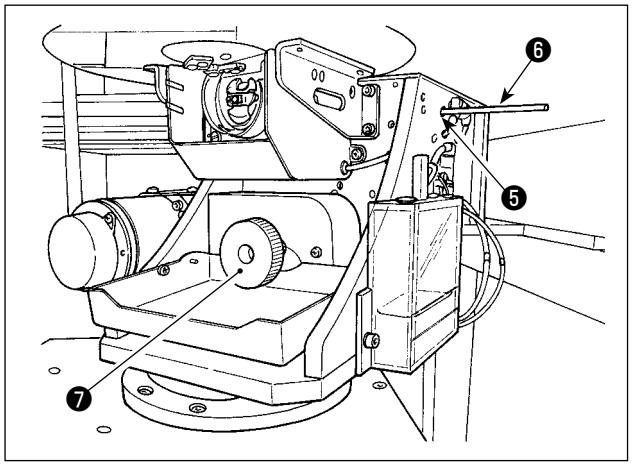
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start or the sewing machine.



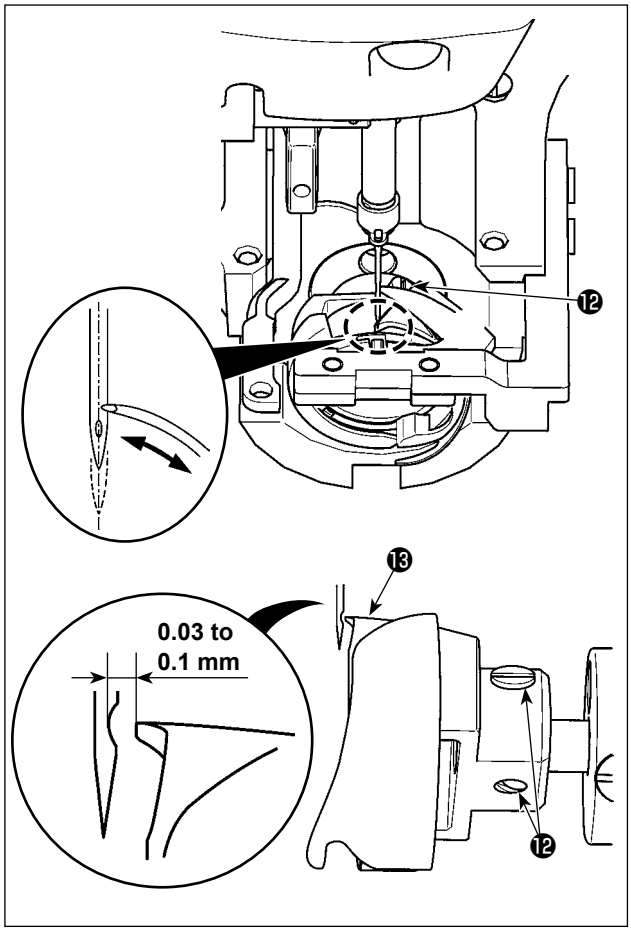
*** Turn ON the power once, and turn OFF the power again after making the intermediate presser in the lowered state.**

1) Loosen setscrews ❶ (right and left). Pull out oil shield ❷ toward you to remove it.
2) Loosen hinge screw ❸ . Remove thread trimming lever asm. ❹ .

3) Loosen four setscrews ❺ . Remove throat plate asm. ❻ .



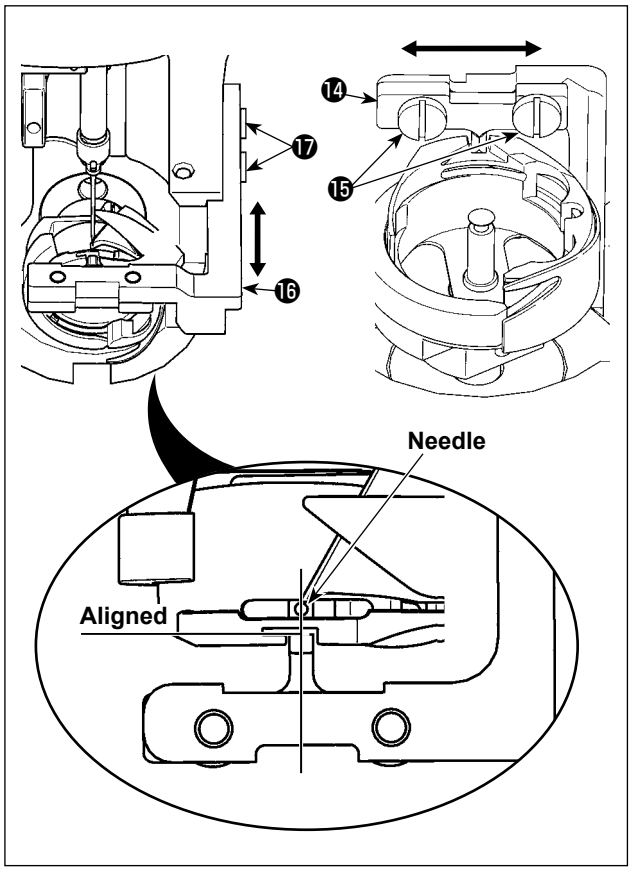
4) Fix the lower shaft. Turn pulley ❾ while inserting hook driving shaft fixing rod ❽ into hook driving shaft fixing rod insertion hole ❼ until hook driving shaft fixing rod ❽ is brought to the position where it can be inserted deeply.



5) Loosen hook setscrew ⓬ . Move the hook to adjust so that the blade point of hook is aligned with the center of needle.

6) Adjust the longitudinal position of the hook so that a clearance of 0.03 to 0.1 mm is provided between the needle and blade point ⓭ of hook when the blade point of hook is aligned with the center of needle. Then, tighten setscrew ⓬.

[Adjusting the bobbin case holder position bracket]

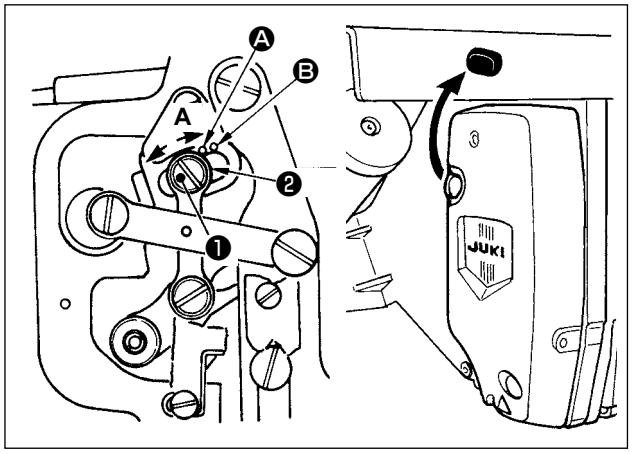


7) Loosen setscrews ⓯ of bobbin case holder position bracket ⓮ .
8) Move bobbin case holder position bracket ⓮ to the right or left to adjust so that the center of bobbin case holder position bracket ⓮ is aligned with the center of needle. Then, tighten setscrews ⓯ .
9) Loosen setscrews ⓱ of bobbin case holder position bracket base ⓰ .
10) Move bobbin case holder position bracket base ⓰ back or forth to adjust so that the end face of bobbin case holder position bracket ⓮ is aligned with the end face of notch in the slot of bobbin case holder. Then, tighten setscrews ⓱ .

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 .

1-3. 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 or the sewing machine.



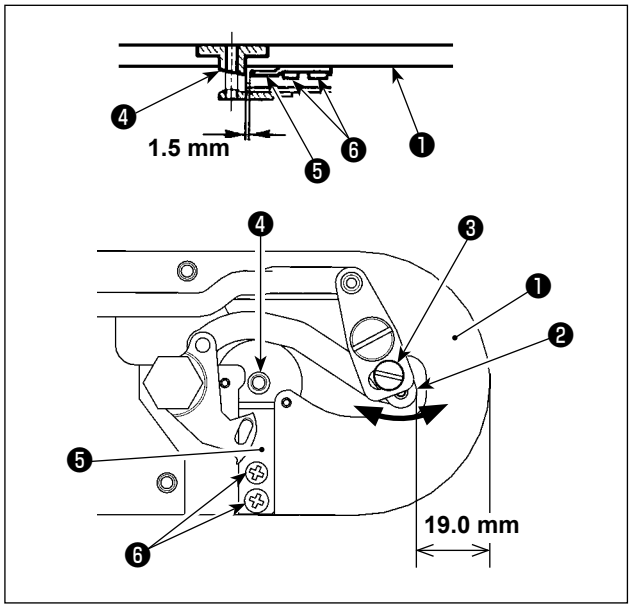
By removing the rubber plug in the face plate cover, adjustment can be performed without removing the face plate cover.

*** 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.)

1-4. The moving knife and counter knife

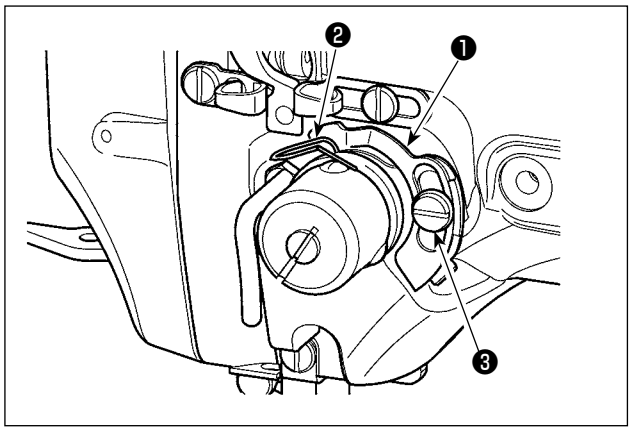
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start or the sewing machine.



Position of the moving knife
Loosen adjustment screw ❸. Move the moving knife in the direction of arrow to adjust so that the tip of thread trimming lever (small) ❷ is spaced 19.0 mm from the front end of throat plate ❶ before the thread trimming operates (in the standby state).

Position of the counter knife
Loosen setscrew ❻. Move the counter knife so that a clearance of 1.5 mm is provided between needle hole guide ❹ and counter knife ❺.

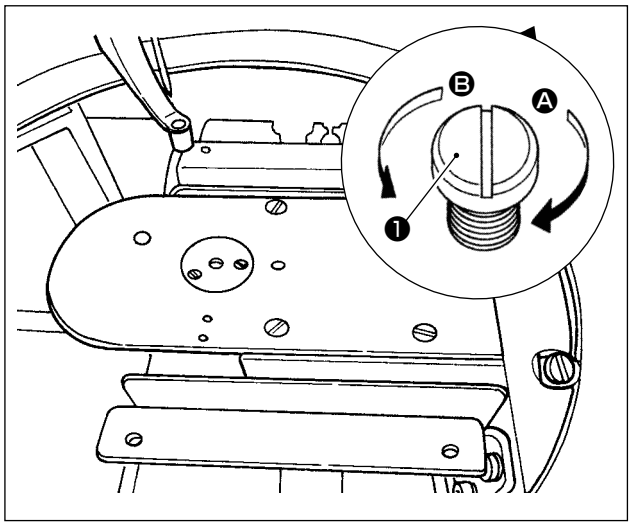
1-5. Thread breakage detector plate



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 .

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

1-6. Amount of oil supplied to the hook

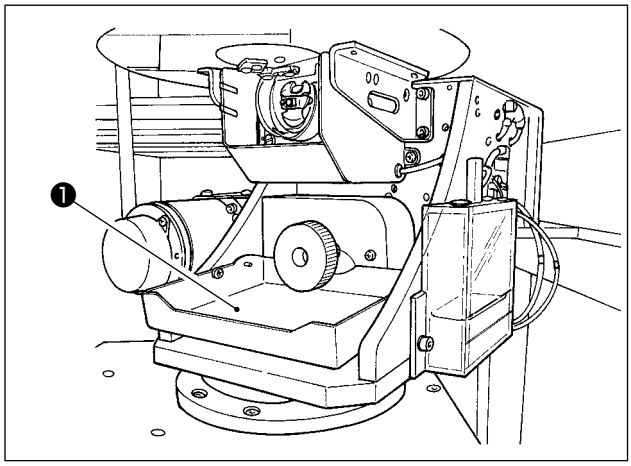


The oiling quantity can be reduced by tightening adjustment screw ❶.

1. **In the standard adjustment state at the time of shipment, the position of adjustment screw ❶ has been adjusted by fully tightening it first, then loosening it by a half turn.**
2. **In the case you need to reduce the oiling quantity, do not tighten the adjustment screw fully at a time. Excessively reducing the oiling quantity can cause the hook to wear.**

For the adjusting the oil quantity in the hook, refer to the item of **"I-4-2. Adjusting the oil quantity in the hook" p.16** .

1-7. Periodical cleaning of the oil shield

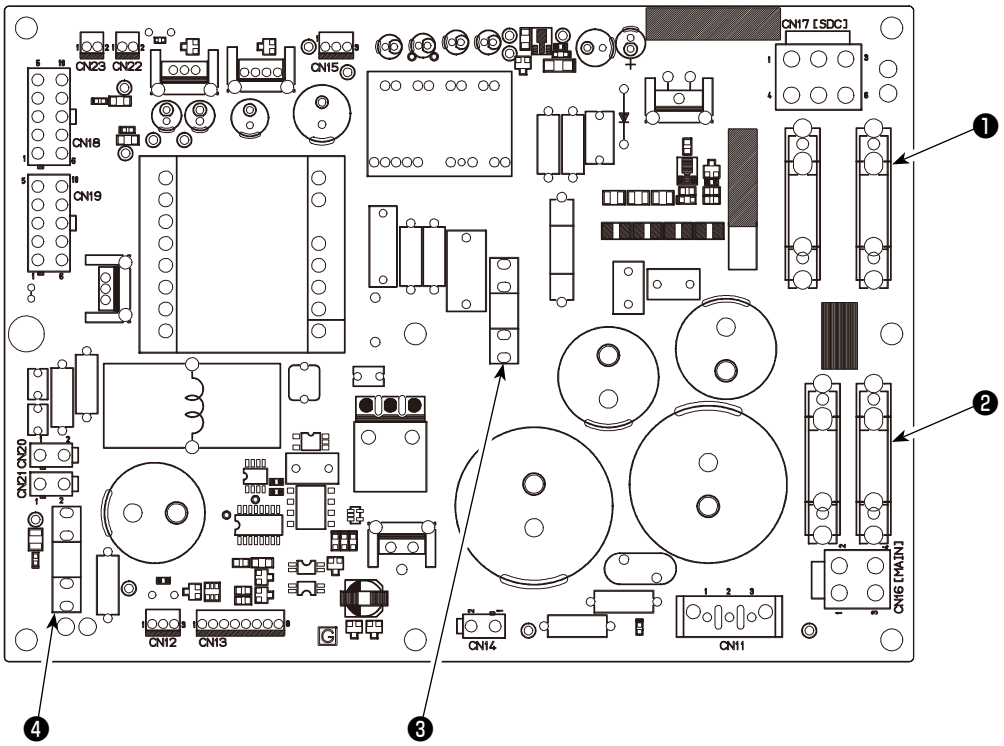


Periodically wipe oil shield ❶ to clean it up.

1-8. 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.**



Four fuses are used.

❶ For the protection of the AC servomotor power
15A (time-lag fuse)

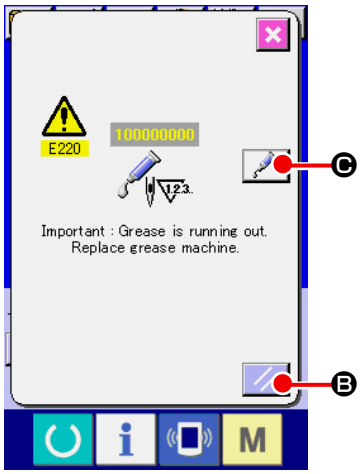
❷ For pulse motor power supply protection
10A (time-lag fuse)

❸ For control power supply protection
3.5A (time-lag fuse)

❹ For solenoid and pulse motor power supply protection
10A (time-lag fuse)

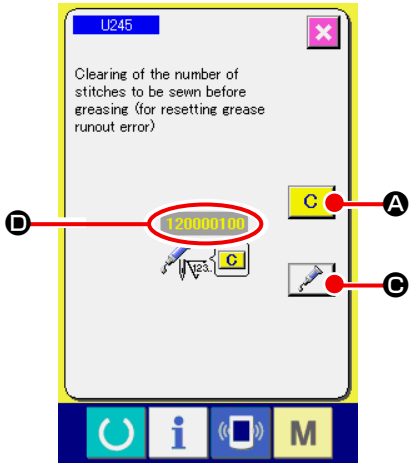
1-9. Replenishing the designated places with grease

*** 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 Ⓓ to "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) Types of grease

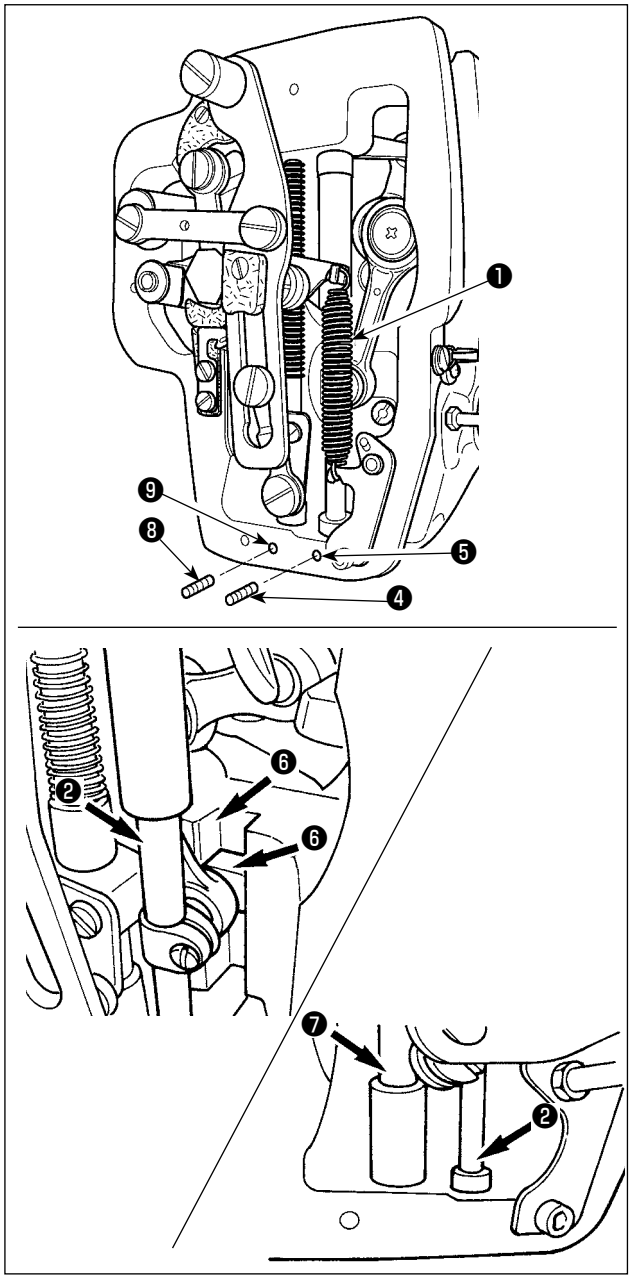
		Spare parts No.
JUKI Grease A	10g tube	40006323
	100g tube	23640204
JUKI Grease B	10g tube	40013640

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

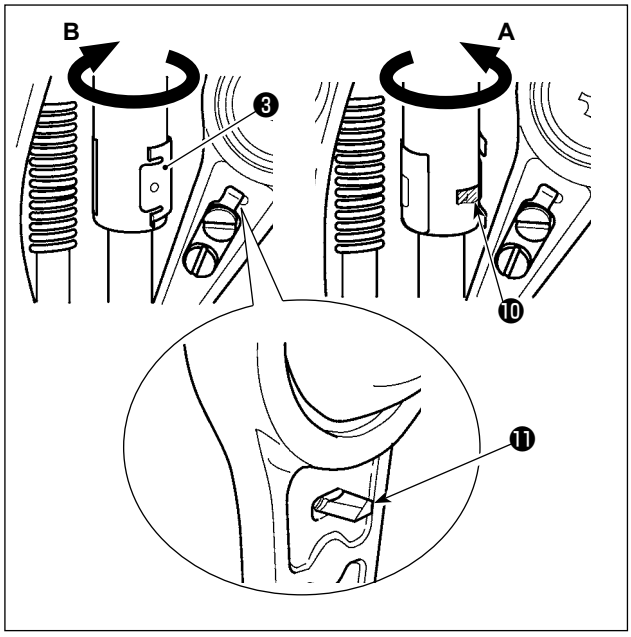
(2) Points to be applied with JUKI Grease A

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 ❸ in the direction of arrow **A** to add grease through the grease inlet. After completion of the procedure, turn the needle bar upper bushing grease cover in the direction of arrow **B** to return to its home position.
   Remove setscrew ❹ from the needle bar lower bushing grease hole. Put JUKI Grease A through hole ❺ and tighten setscrew ❹ to fill inside the busing with the grease.
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.

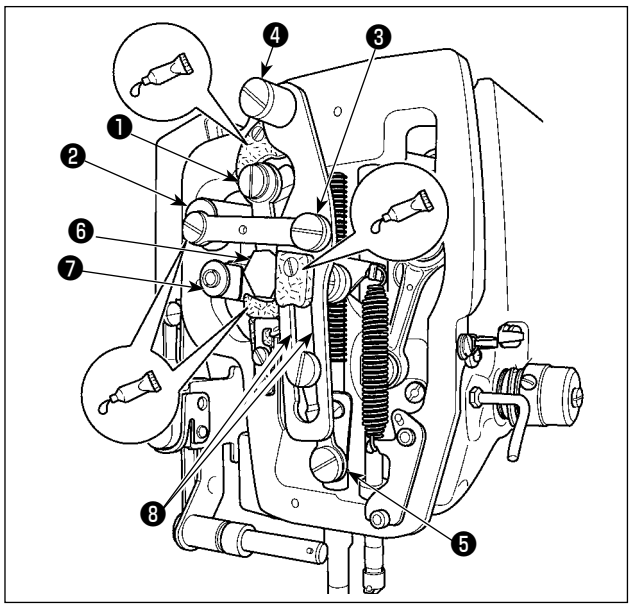


1. Do not wipe off the grease applied onto the periphery of needle bar inside the frame. If the grease has decreased due to cleaning, air blow or other reasons, apply grease again without exceptions.

2. When operating the sewing machine, turn the needle bar upper bushing grease cover in direction B to close grease inlet ⓾ .

3. The rear face of the needle bar crank rod has projection ⓫ with a sharp edge. So, care should be taken to the projection. Never put your finger to the rear face of the needle bar crank rod during greasing procedure.

■ Grease supplement to the face plate section



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

1-10. 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 0.03 to 0.1 mm.	117
		○ Set soft-start sewing at the start of bartacking.	94
	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. 1.	
		○ Increase the tension of the thread take-up spring, or decrease the tension of the thread tension controller No. 1.	25,26
	③ The bobbin thread is too short.	○ Decrease the tension of the bobbin thread.	25
		○ Increase the clearance between the needle hole guide and the counter knife.	118
	④ Needle thread tension at 1st stitch is too high.	○ Decrease the tension at 1st stitch.	
	⑤ Pitch at 1st stitch is too small.	○ Make the pitch at 1st stitch longer.	
		○ Decrease the needle thread tension at 1st stitch.	
2. Thread often breaks or synthetic fiber thread splits finely.	① The hook has scratches on it.	○ 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.	26
	④ The needle thread tension is too high.	○ Reduce the needle thread tension.	25
	⑤ The tension of the thread take-up spring is too high.	○ Reduce the tension.	26
	⑥ 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.	
3. The needle often breaks.	① The needle is bent.	○ Replace the bent needle.	18
	② The needle strikes the intermediate presser foot.	○ Correct the position of the intermediate presser foot.	26
	③ The needle is too thin for the material.	○ Replace it with a thicker needle according to the material.	
	④ There is no clearance between the needle and hook.	○ Correctly position the needle and the shuttle.	117
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.	118
	④ The last stitch is skipped.	○ Correct the timing between the needle and the shuttle.	117
(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.	

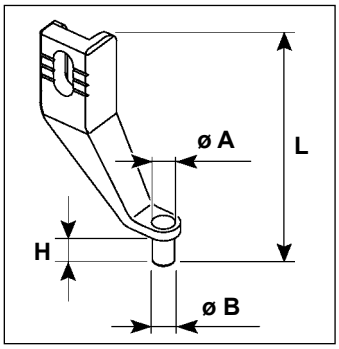
Trouble	Cause	Corrective measures	Page
5. Stitch skipping often occurs.	① The motions of the needle and shuttle are not properly synchronized.	○ Correct the positions of the needle and shuttle.	117
	② Clearance between the needle and hook is large.	○ Correct the positions of the needle and shuttle.	117
	③ The needle is bent.	○ Replace the bent needle.	18
	④ 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.	25,26
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.	25
	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.	25
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.	118
9. 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.	26
10. 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.	25
	② The tension of thread take-up spring is too high.	○ Decrease the tension of thread take-up spring.	26
	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.	
11. 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.	118
	② The bobbin thread tension is too low.	○ Increase the bobbin thread tension.	25
	③ The needle thread tension at 1st stitch is too high.	○ Decrease the needle thread tension at 1st stitch.	

2. OPTIONAL

2-1. List of the needle hole guides and intermediate pressers

Needle used	Needle hole guide		
Size	Part No.	Needle hole diameter	Application
#18 to #21	14439509	ø 2.3	For heavy-weight materials
#20 to #23 *	14439608	ø 3.0 (with a counterbore)	For extra heavy-weight materials
#23 or thicker	14439707	ø 4.0 (eccentric hole)	For heavy-weight materials to prevent skip-stitching

Needle used	Intermediate presser	
Size	Part No.	Size (øA × øB × H × L)
#18 to #21	B1601210D0BA	ø 2.7 × ø 4.1 × 5.7 × 38.5
#20 to #23 *		
#23 or thicker	B1601210D0CA	ø 3.5 × ø 5.5 × 5.7 × 38.5



* : Standard installed needle (DP X 17 #23)

· H type : Applicable count of thread : #30 to #05

2-2. Bar code reader

WARNING:
- **Do not look directly into the laser beam of the bar code reader. The laser beam can damage eyes.**
- **Do not emit laser beam toward human eyes. The laser beam can damage eyes.**
- **Do not look into the laser beam directly using an optical device. The laser beam can damage eyes.**

CAUTION:
- **Be sure to use the sewing machine within the specified temperature range and the specified humidity range.**
- **Do not connect/remove connectors with the power supplied to the sewing machine.**

Bar code function is a function to read the bar code and to switch to the corresponding sewing pattern for the applications such as the cassette identification etc.
By reading the bar code, switching to 999 user patterns stored in the sewing machine memory and to 50 sewing data registered in the pattern button can be made.
To use this function, AMS-EN bar code option (40089238) will be required.
Refer to the Instruction Manual/Parts List (40089259) for the Bar-code Reader (optional) of the AMS-EN Series for details.

Specifications for the barcode reader
Class 2 laser product
Maximum output: 1.0mW
Wave length: 650nm

Safety standard
JIS C 6802:2005
IEC60825-1+A2:2007