SWF

USER'S MANUAL

KX-Series AUTOMATIC EMBROIDERY MACHINE

SWF/KX-Series

MME-220928

SunStar CO., LTD.

1. THIS IS AN INSTRUCTION FOR SAFE USE OF SWF AUTOMATIC EMBROIDERY MACHINES. READ THOROUGHLY BEFORE USE.

2. CONTENTS IN THIS INSTRUCTION MAY CHANGE, WITHOUT PRIOR NOTICE, FOR IMPROVEMENT OF MACHINE QUALITY AND THUS MAY NOT CORRESPOND TO THE MACHINE YOU PURCHASED. CONTACT YOUR SALES AGENT FOR INQUIRIES.

3. THIS IS DESIGNED AND MANUFACTURED AS AN INDUSTRIAL MACHINE. IT SHOULD NOT BE USED FOR OTHER THAN INDUSTRIAL PURPOSE.

CONTENTS

CHAPTER 1 SAFETY RULES ····· 4

·KX-Single Head

1-1) MACHINE DELIVERY ····· 4
1-2) MACHINE INSTALLATION ····· 5
1-3) MACHINE OPERATION ····· 5
1-4) MACHINE OPERATION ····· 6
1-5) MACHINE REPAIR ····· 6
1-6) PLACEMENT OF WARNING STICKERS ····· 7
1-7) CONTENTS OF WARNING STICKERS ····· 8

·KX-Tubular

1-1) MACHINE DELIVERY ····· 9
1-2) PLACEMENT OF WARNING STICKERS ····· 11

CHAPTER 2 INSTALLATION AND MACHINE ASSEMBLY ····· 12

·KX-Single Head

2-1) ENVIRONMENT ····· 12
2-2) ELECTRICITY ····· 12
2-3) LEVELING THE MACHINE ····· 13
2-4) ASSEMBLY OF PERIPHERAL DEVICES ····· 14

·KX-Tubular

2-1) LEVELING THE MACHINE ····· 18
2-2) ASSEMBLY OF PERIPHERAL DEVICES ····· 19

CHAPTER 3 PARTS OF THE MACHINE ····· 25

CHAPTER 4 FUNCTIONS FOR BASIC MACHINE OPERATION ····· 26

·KX-Single Head

4-1) POWER OPERATION SWITCH EMERGENCY STOP SWITCH ····· 26
4-2) ENABLING AND DISABLING EMERGENCY STOP ····· 26
4-3) LAMP SWITCH FUNCTION OF THREAD TENSION ADJUSTMENT PLATE ····· 27
4-4) UPPER THREADING ····· 28
4-5) LOWER (BOBBIN) THREADING AND TENSION ADJUSTMENT ····· 29
4-6) NEEDLE-HOOK TIMING CONTROL ····· 30

·KX-Tubular

4-1) HOW TO OPERATE START/ STOP SWITCH ····· 32

CHAPTER 5 MAINTENANCE AND INSPECTION ····· 34

·KX-Single Head

5-1) CHECK POINTS FOR REGULAR INSPECTION ····· 34
5-2) CLEANING ····· 34
5-3) OIL SUPPLY ····· 36

·KX-Single Head

5-1) Oiling via Pump ····· 39
5-2) DRIVE BELT TENSION ····· 42

CHAPTER 6 BLOCK DIAGRAM ····· 43

CHAPTER 1

SAFETY RULES

The following set of safety rules categorized as DANGER, WARNING, and CAUTION indicates possibilities of physical or property damages if not fully observed.

DANGER : These safety instructions MUST be observed to be safe from danger when installing, delivering, or repairing the machine.

WARNING : These safety instructions MUST be observed to be safe from machine injuries.

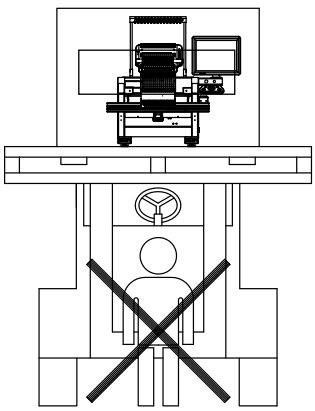
CAUTION : These safety instructions MUST be observed to prevent predictable machine errors.

· KX−Single Head

1-1) MACHINE DELIVERY



DANGER



※ Make sure all persons and obstacles are out of the way of the moving equipment.

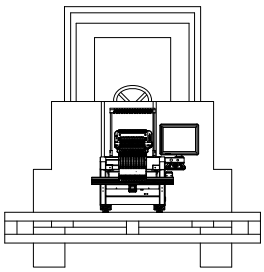
Only trained and experienced persons, familiar with the relevant safety instructions, should deliver the machine. Make sure to fully observe following instructions.

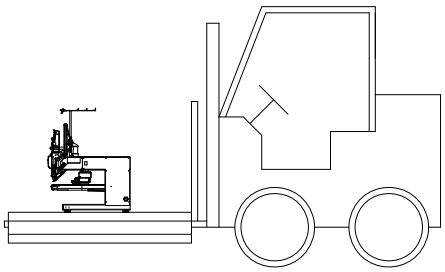
1) Delivery by Workers

Make sure to wear safety shoes, and hold the machine firmly by the handles the left and right sides.

2) Using a Forklift

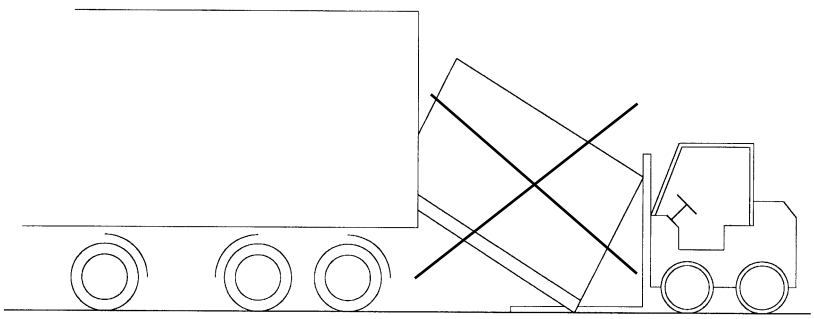
Make sure that size and weight of the forklift is sufficient to support the machine. Use the pallet to place the machine so that its center is on the forklift arm and carefully lift the machine.





[Warning]

Make sure to maintain the weight balance in machine deliveries, especially when unloading machine from a forklift or crane, in order to prevent injury or machine damages.



1-2) MACHINE INSTALLATION



CAUTION

Installation environment may incur machine malfunction or breakdown. Make sure to meet the following conditions.

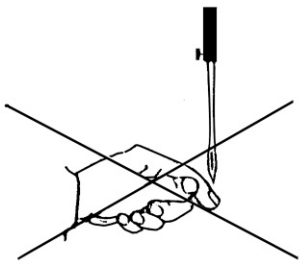
1) The foundation under the machine, i.e. table or desk, must be strong enough to support the weight of the machine.
2) Air conditioning can eliminate dust and humidity that can cause pollution and corrosion of the machine. Make sure your machine is regularly cleaned.
3) Long exposure to direct sunlight can cause the paint of the machine to fade or change of machine shape.
4) Allow at least 50cm (20 inches) of space on each side of the machine for convenient maintenance.

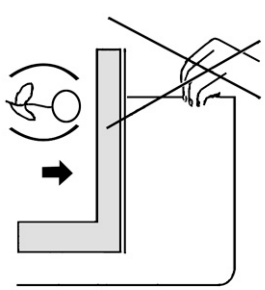
* Please refer to 2. Machine Installation and Assembly for installation details.

1-3) MACHINE OPERATION



WARNING





The SWF Automatic Embroidery Machine is designed for applying embroidery to fabric and other similar materials.

Pay careful attention to the CAUTION and WARNING stickers placed on the machine. While operating the machine, please observe the following:

1) Read thoroughly and fully understand the manual before operating the machine.
2) Dress for safety. Long and unbound hair, jewelry such as necklaces, bracelets, and wide sleeves can get caught in the machine. Wear shoes with non-slip soles.
3) Clear all persons from the machine before turning on the power.
4) Keep your hands or head away from the moving parts of the machine such as needle, hook, take-up lever, and pulley when the machine is in operation.
5) Do not remove the safety cover on the pulley or shaft when the machine is in operation.
6) Be sure the main power is turned off and the power switch is set to OFF before opening the cover of any electrical component or control box.
7) Be sure the main switch is OFF before manually turning the main shaft.
8) Turn the machine off when threading needles or inspecting the finished embroidery.
9) Do not lean against the cradle or place your fingers near the guide grooves of the frame.

1-4) MACHINE OPERATION



CAUTION

Observe the following to avoid damage to the machine or functional failures.

1) Do not put any objects on the table of the embroidery machine.
2) Do not use a bent or damaged needle.
3) Change your needle plate when switching from caps to flats and vice versa.

1-5) MACHINE REPAIR



DANGER

Only SWF-trained and selected repair engineers should do repair work.

1) Before cleaning or repairing the machine, make sure the main power is turned off and wait for 10 minutes so that the machine electricity is completely discharged.

[Notice]

It takes about 10 minutes after turning off the main switch before the electricity is fully discharged from X/Y main shafts and drive.

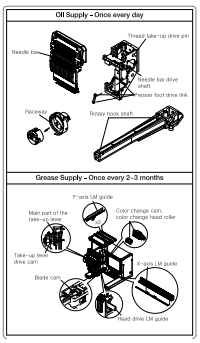
2) Do not change the settings or any parts on the machine without confirmation from SWF. Such change may cause safety accidents.
3) Use only SWF parts when repairing your machine.
4) Replace all safety covers when you are finished with your cleaning or repairs.

1-6) Placement of Warning Stickers

Observe the directions on ANY warning stickers placed on the machine as reminders for your safe operation of the machine.

1) Placement of Warning Stickers





WARNING

Moving parts can cause serious injury during machine operation
Stop machine before Threading, Removing or changing Needles as serious injury may be caused.

WARNING

Moving parts can cause serious injury during machine operation
* Turn off machine power before cleaning, lubricating, adjusting, or repairing as serious injury may be caused.

WARNING

Moving parts can cause serious injury during machine operation
* Do not put your hands near or on embroidery machine shaft during machine operation

WARNING

Fire, Death or Serious Electrical Shock may be caused by high voltage electric if safety procedures are not correctly followed.
* Disconnect main power & wait 6 minutes prior to removing cover.
* Recommended cover removal from a qualified & authorised SWF service technician only
* Once maintenance completed, replace & secure cover before operating the machine.

WARNING

Do not raise or lower the presser foot manually.
When raising/lowering the presser foot, use the up(▲)/down(▼) buttons on the top right of the tension plate.

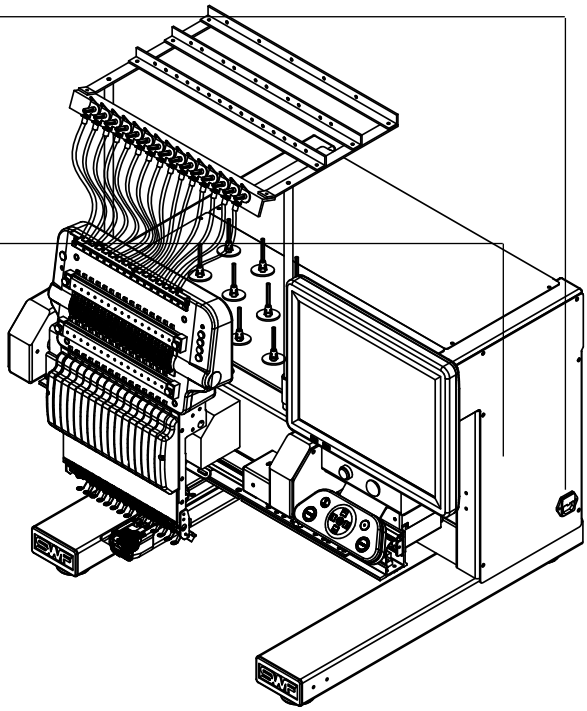
WARNING

① Turn off the main power before rotating the main shaft by hand!

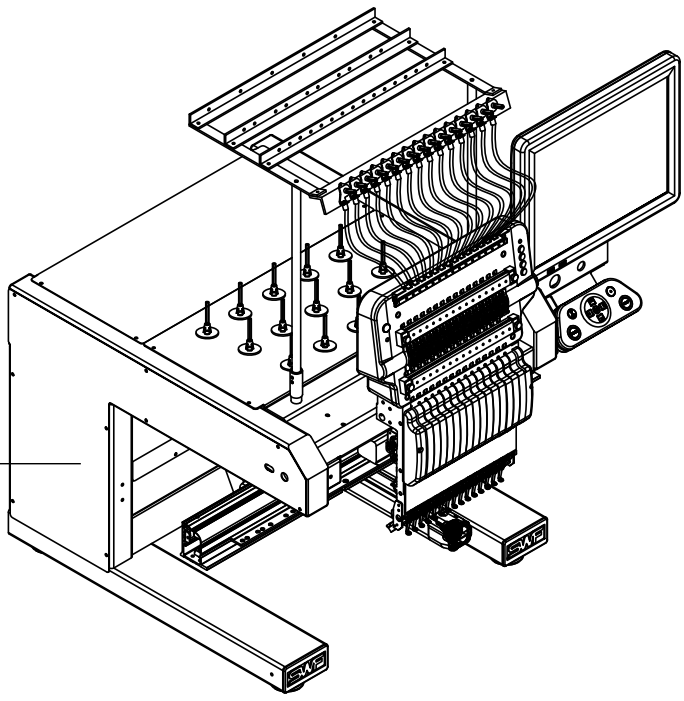
② Do not remove covers during operation!

③ Turn off the main power before opening electricity – related boxes!

[from front right]



[from front left]



1-7) Contents of Warning Stickers

A) WARNING

WARNING



Moving parts can cause serious injury during machine operation
Stop machine before Threading, Removing or changing Needles as serious injury may be caused.

WARNING



Moving parts can cause serious injury during machine operation
* Turn off machine power before cleaning, lubricating, adjusting, or repairing as serious injury may be caused.

WARNING



Moving parts can cause serious injury during machine operation
* Do not put your hands near or on embroidery machine shaft during machine operation

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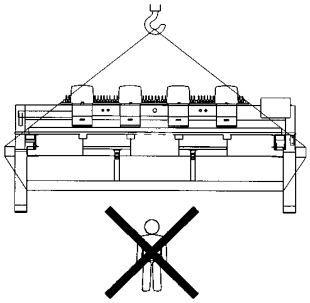
③ Turn off the main power before opening electricity – related boxes!

· KX−Tubular

1-1) DELIVERY OF YOUR MACHINE



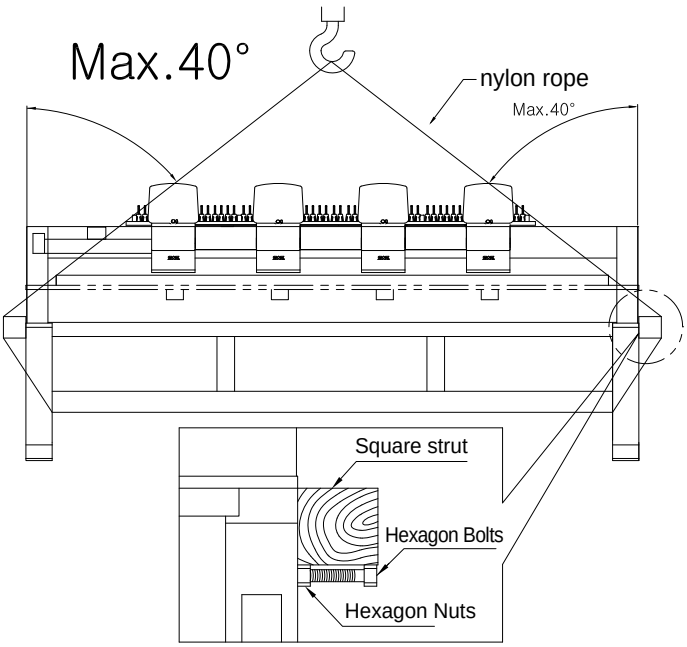
DANGER



※ Make sure all persons and obstacles are out of the way of the moving equipment.

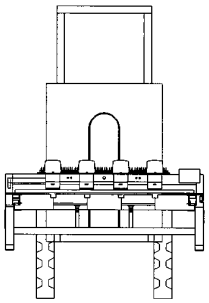
ONLY TRAINED AND EXPERIENCED PERSONS, FAMILIAR WITH THE RELEVANT SAFETY INSTRUCTIONS, SHOULD HANDLE THE MACHINE. MAKE SURE TO FULLY OBSERVE THE FOLLOWING INSTRUCTIONS.

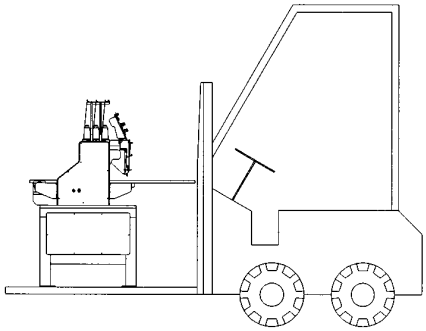
1) **Using a crane**
Make sure that the crane is large enough to hold the machine. Use a nylon rope of sufficient strength. Place a wooden block at either side of the machine before tying the rope. The angle should be 40°Δ or less. Make sure that the rope does not touch the table.



2) **Using a Forklift**

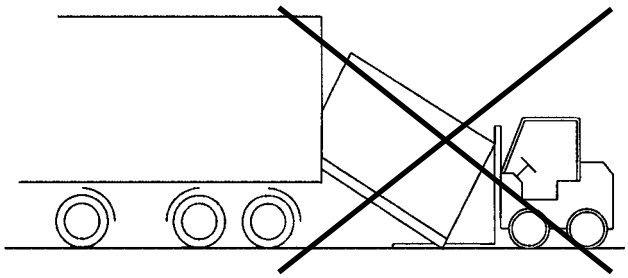
Make sure that size and weight of the forklift is sufficient to support the machine. Use the pallet to place the machine so that its center is on the forklift arm. Lift the machine carefully so that the machine does not tilt to either side.





[WARNING]

Make sure to maintain the weight balance in machine deliveries, especially when unloading the machine from a forklift or crane, in order to prevent injury or machine damages.



1-2) Placement of Warning Stickers

KX-Tubular

WARNING

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Stop machine before Threading. Removing or changing Needles as serious injury may be caused.

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Moving parts can cause serious injury during machine operation
* Turn off machine power before cleaning, lubricating, adjusting, or repairing as serious injury may be caused.

WARNING

Moving parts can cause serious injury during machine operation
* Do not put your hands near or on embroidery machine shaft during machine operation

WARNING

Fire, Death or Serious Electrical Shock may be caused by high voltage electric if safety procedures are not correctly followed.
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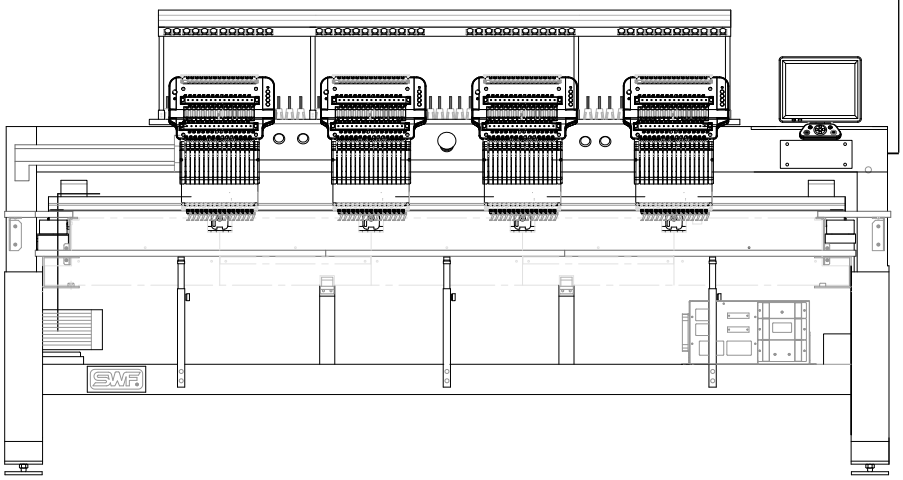
WARNING

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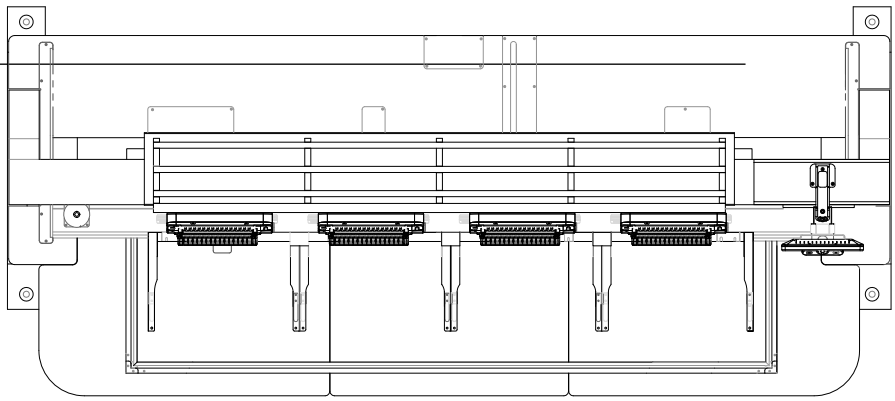
② Do not remove covers during operation!

③ Turn off the main power before opening electricity – related boxes!

[Front]



[From top]



CHAPTER 2

INSTALLATION AND MACHINE ASSEMBLY

Install your machine in an appropriate environment and with adequate electrical supply. Failure to follow the directions may result in machine malfunction.

· KX−Single Head

2-1) ENVIRONMENT

1) Temperature:
   (1) 15~40°C (59~104°F) when machine is in operation
   (2) –25~55°C (-13~131°F) when the machine is not in operation
2) Humidity: 45~90% (relative)

[Caution]
- Do not let moisture drops on the machine.
- Provide air conditioning to control humidity and to eliminate dust and corrosion.

3) Grounding: Ensure the electricity is properly grounded.



Properly ground the machine to avoid a possibility of electric shock. Use three-wire grounding (grounding resistance below 100 ohms).

4) Close any doors and windows near the machine to prevent direct light, dust, and humidity.
5) Foundation under the machine must be strong enough to support the weight of the machine.
   => It is recommended to use the SWF stand.

2-2) ELECTRICITY

Check if the input voltage of the machine is in the right range of the voltage supply before installing or operating the machine. The input voltage is as follows:

1) Input voltage (adjust when installing): 100V, 110V, 120V, 200V, 220V, 240V
2) Allowed range of voltage: within 10% of the voltage set.
3) Electric capacity and Minimum input voltage: 600VA (400W)
4) Insulation resistance: over 10M ohms (measured with 500V insulation tester)

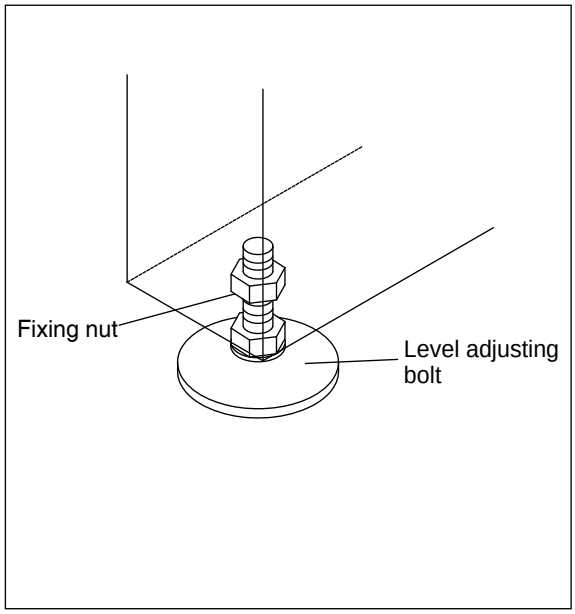


- Check the voltage supply where the machine will be installed.
- Install the cable away from the operator's work space to prevent accident or injury.

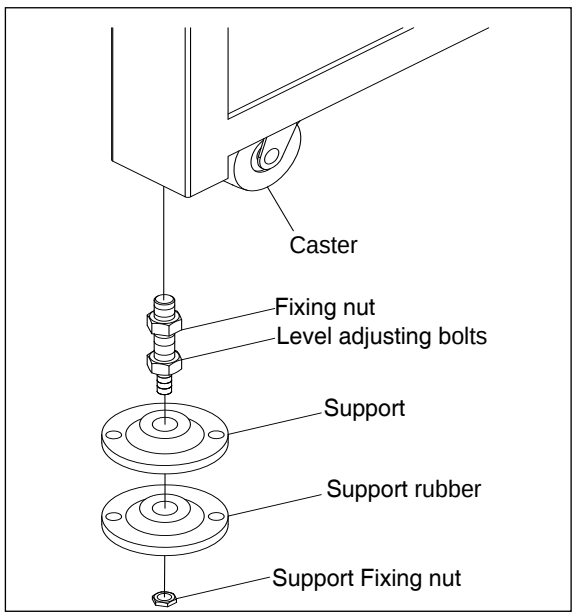
2-3) LEVELING THE MACHINE

The machine must be accurately leveled (horizontally balanced) when installed to prevent the needle from moving out of position.

1) If there is no stand attached, adjust the front, rear, left and right of the machine using the bolts. Tighten the bolts when the machine is leveled.



2) If there is a stand attached, insert the four horizontal adjusting bolts into the holes on the stand. Adjust the bolts until the caster is raised above the floor level and the machine is level on all four sides. When the machine is level, tighten the bolts.



[Caution]

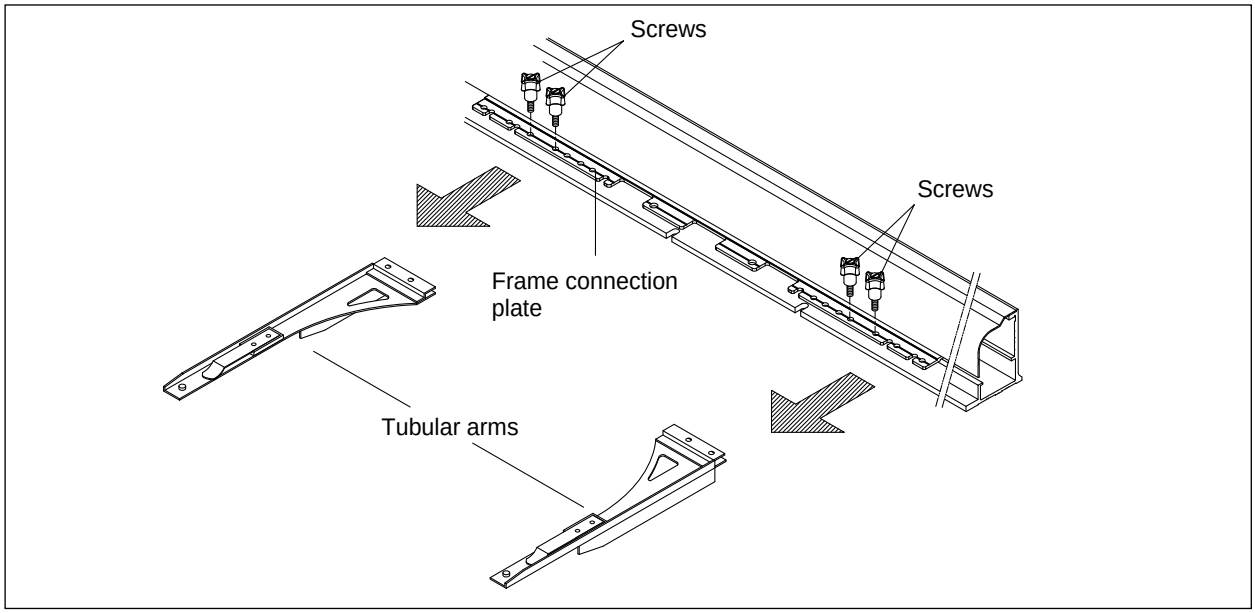
- The machine must be horizontally balanced on all four sides: front, back, left, and right.
- If the difference in heights of the four bolts is over 10mm, place spacers beneath the lower adjusting bolts to make the heights even.

2-4) ASSEMBLY OF PERIPHERAL DEVICES

1) Conversion from Tubular Frame to Boarder Frame

① Disassemble the tubular arms

Unfasten the screws and disassemble the tubular arms from frame connection plate.

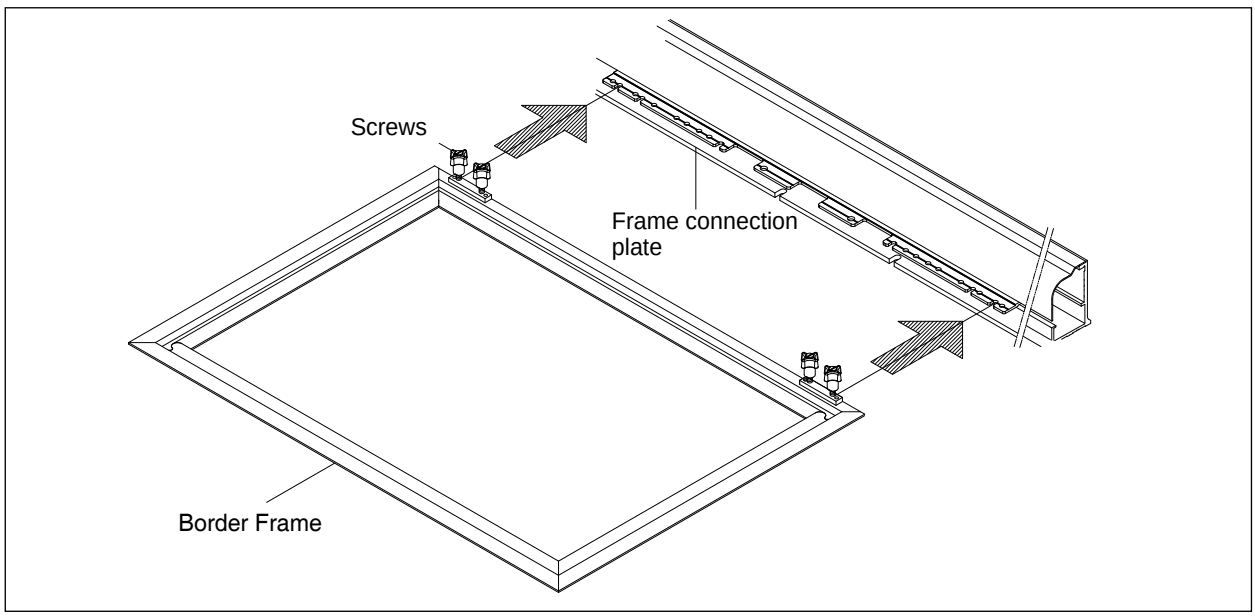


[Caution]

Put the disassembled screws in a safe place to use when attaching the border frame.

② Assemble the border frame

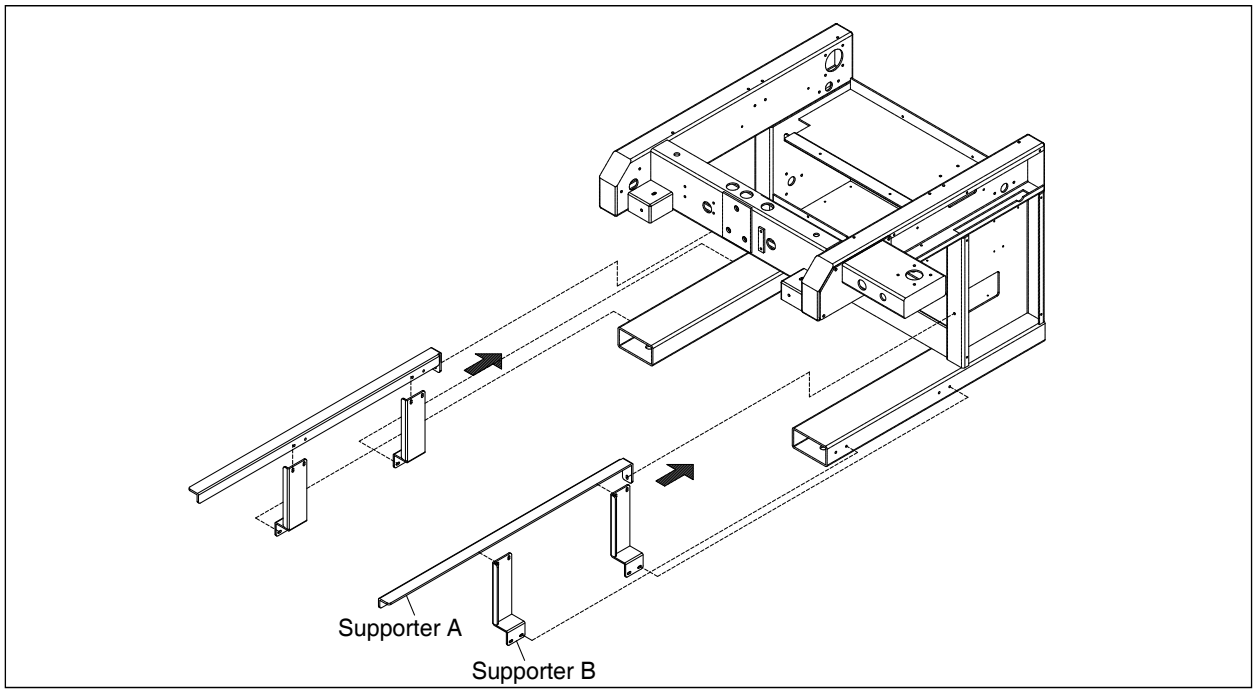
Fasten the frame to the connection plate with the screws. Tighten the screws.



2) Assemble the Table

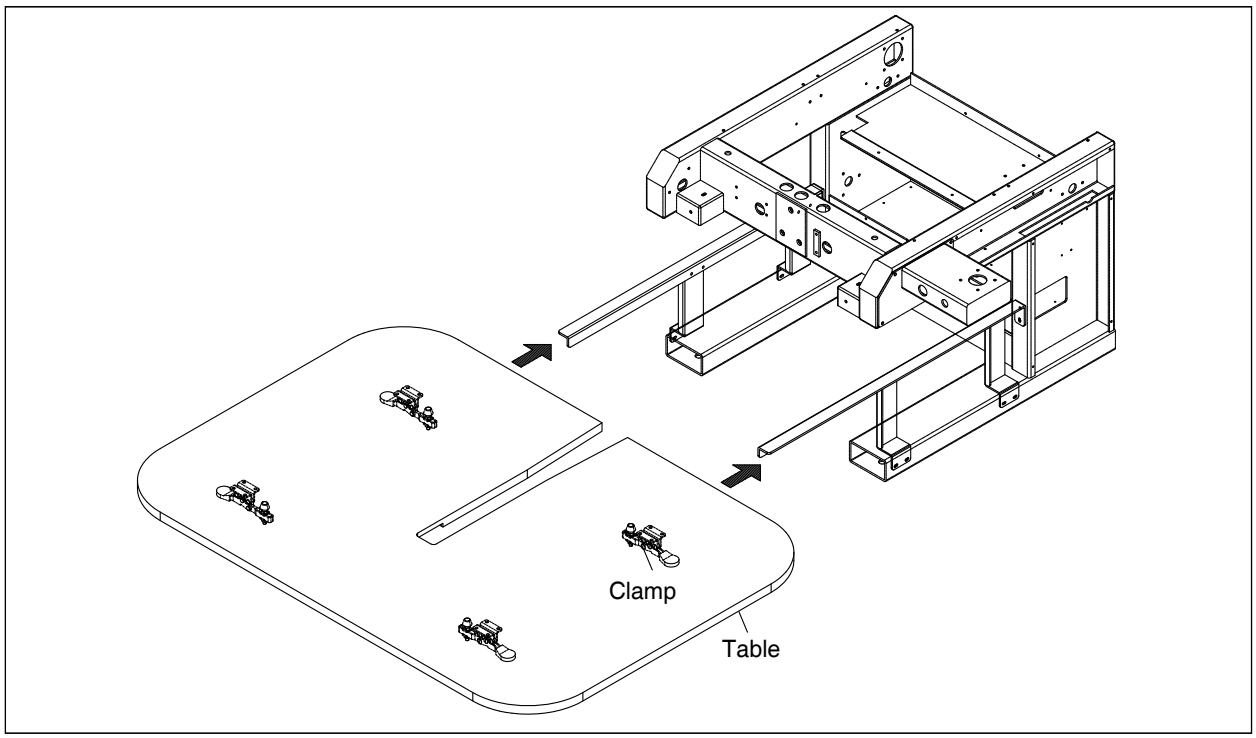
① Assemble the table support

Fix the supporter A and supporter B that support the table to the body using fixing screws.



① Table fixed

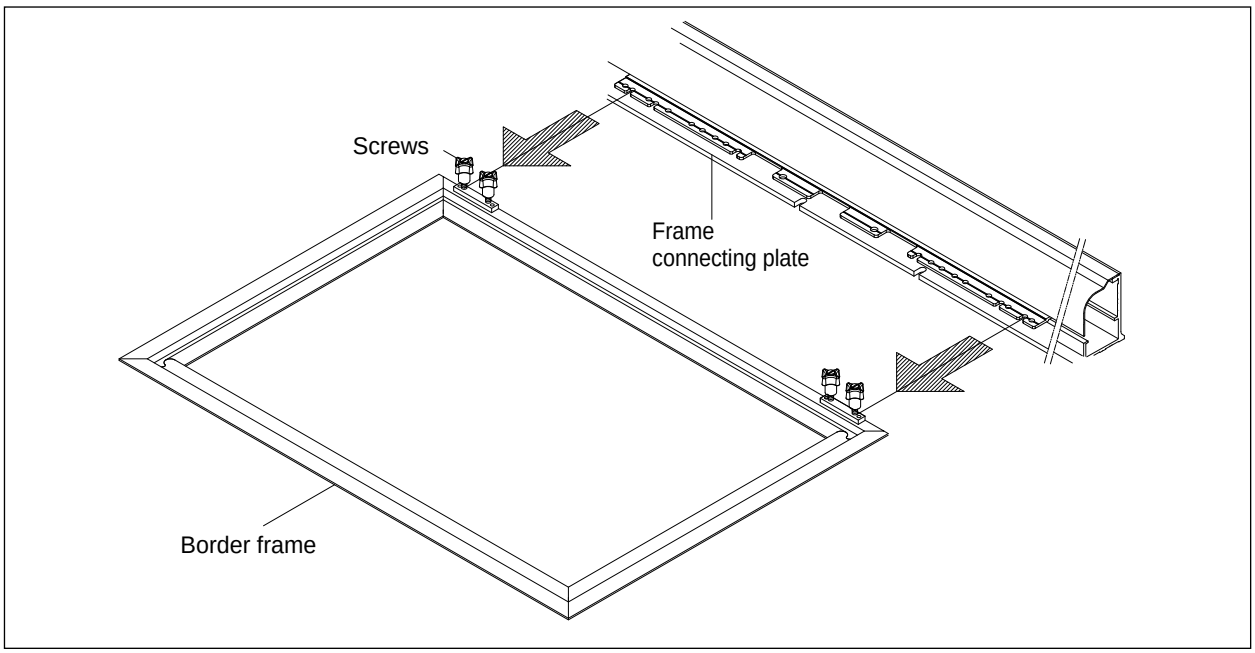
Put the table on the support A and fix it to the support A using the clamp under the table. Adjust the support so that the height of the table top and the bed cover top are the same.



3) Conversion from Border Frame to Round tubular frame

① Disassemble the border frame

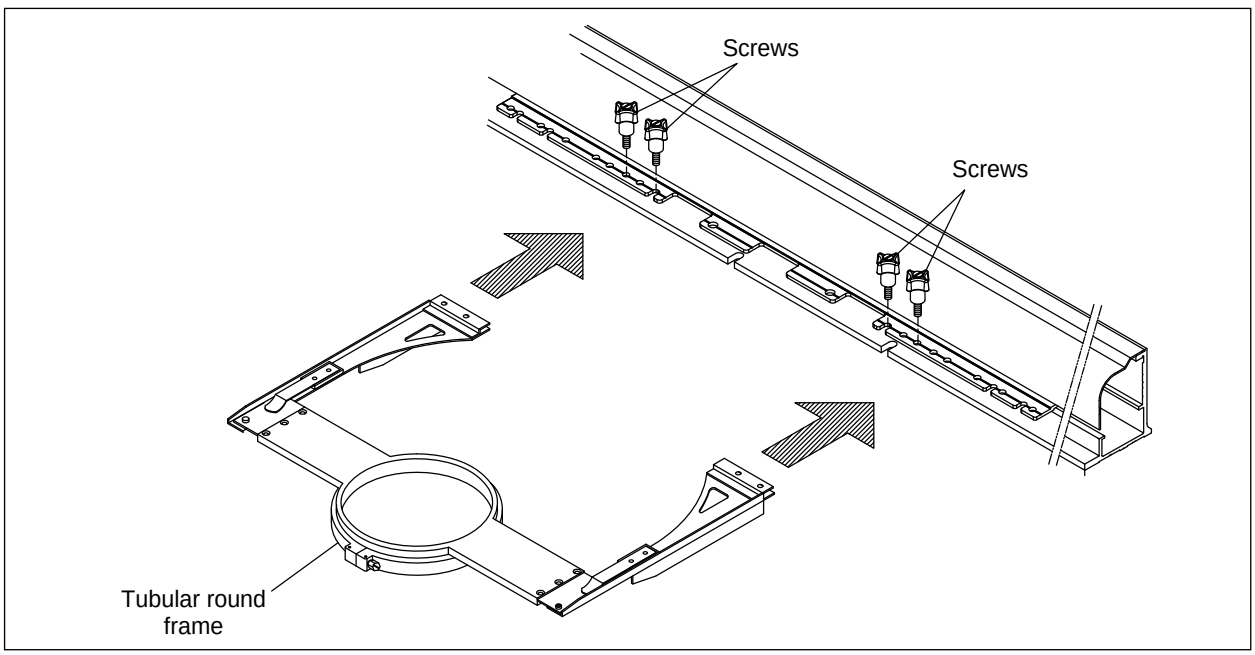
Unfasten the screws to disassemble the border frame from the connecting plate.



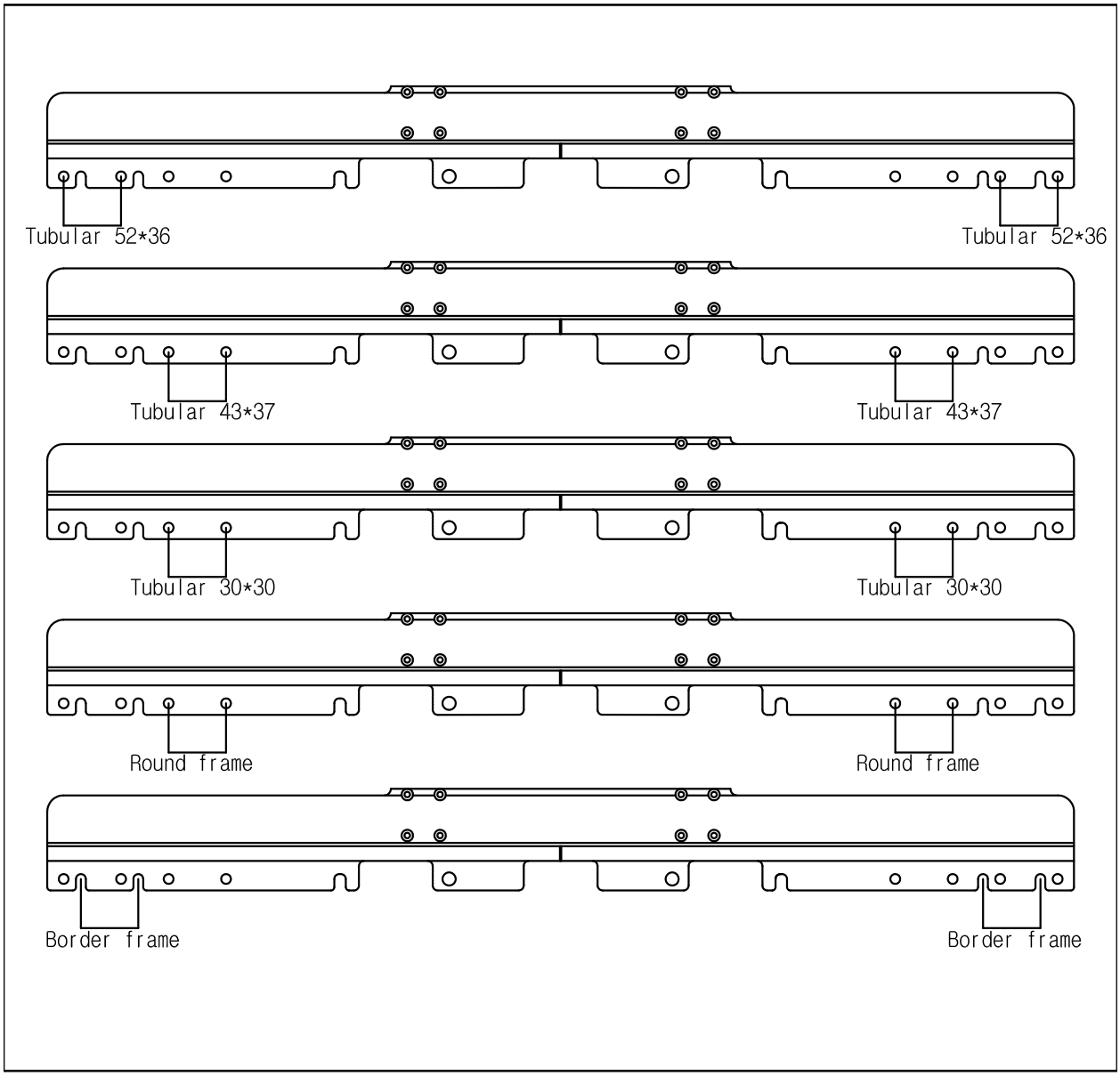
[Caution]

Put the disassembled screws in a safe place to use when attaching the tubular frame.

② attach the left tubular frame arm to the holes for the round frame.



* Frame support plate mounting hole location

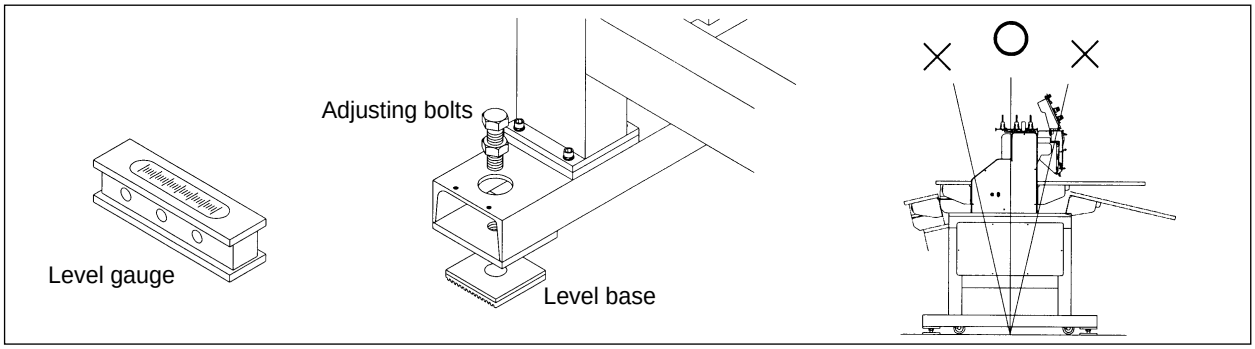


· KX−Tubular

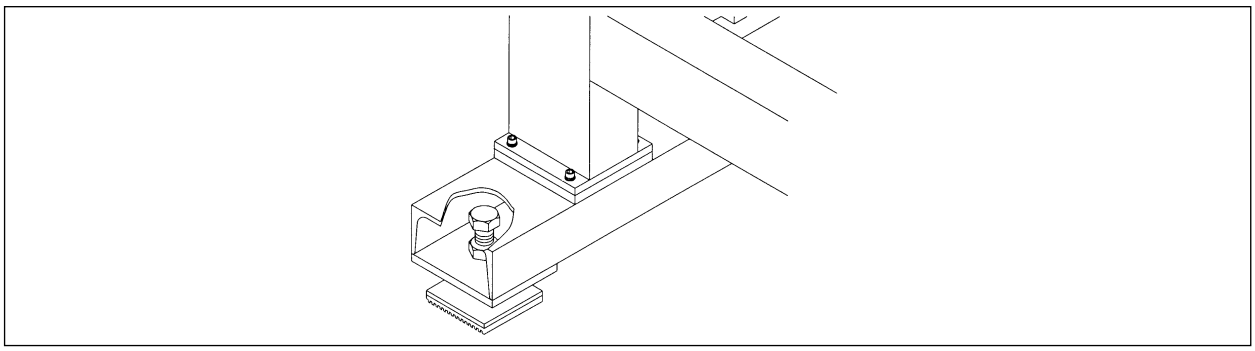
2-1) LEVELING THE MACHINE

The machine must be accurately leveled (especially front and back) to prevent the needle from moving out of position.

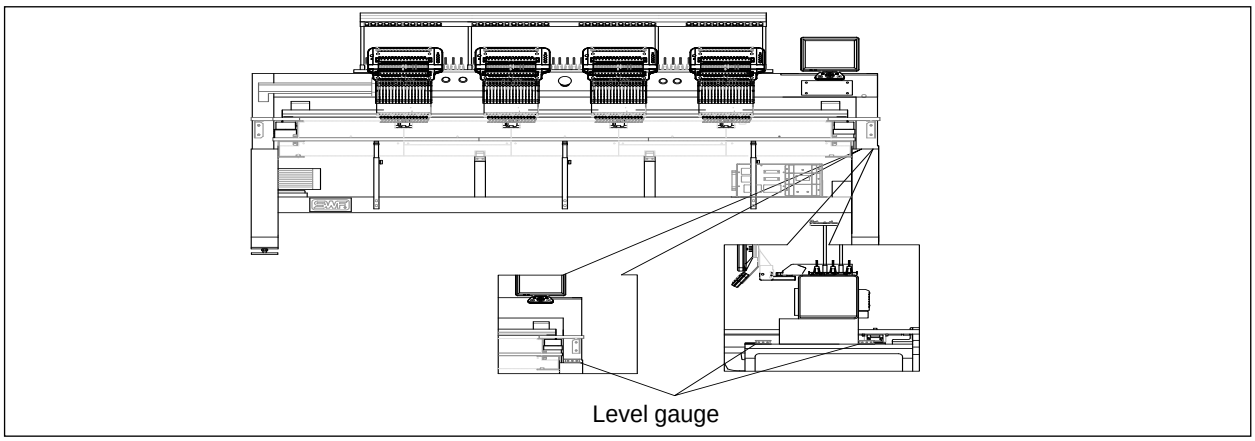
1) Use the adjusting bolts installed at the four stands to level the machine (front, rear, left, and right). Use a level gauge.
   ① Check the voltage supply where the machine will be installed.
   ② Install the cable away from the operator's work space to prevent accident or injury.
   ③ If the difference in heights of the four bolts is over 10mm, place spacers beneath the lower adjusting bolts to make the heights even.



2) The machine must be horizontally balanced on all four sides - front, rear, right, and left.



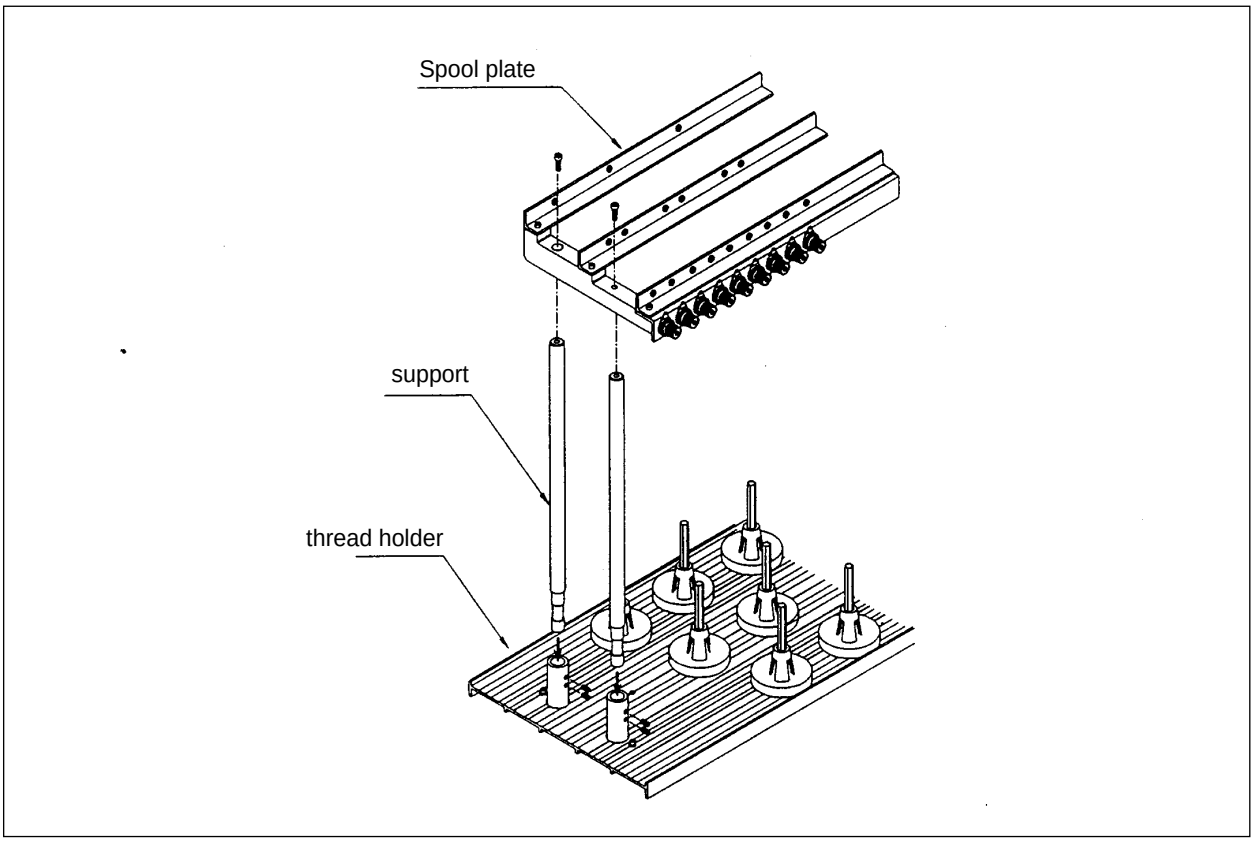
3) Using the level gauge
   Use a nut to fully fasten the adjusting bolts when the machine is leveled.



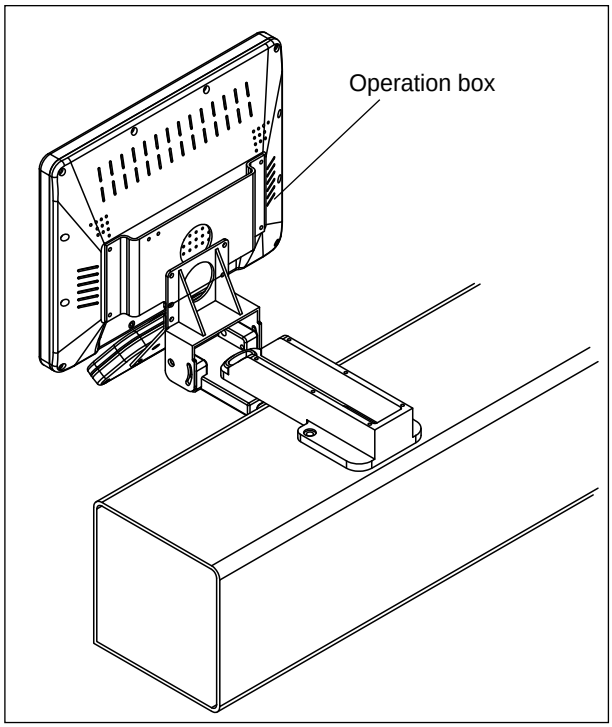
[CAUTION]
The level gauge does not measure accurately on a square pipe or a table.

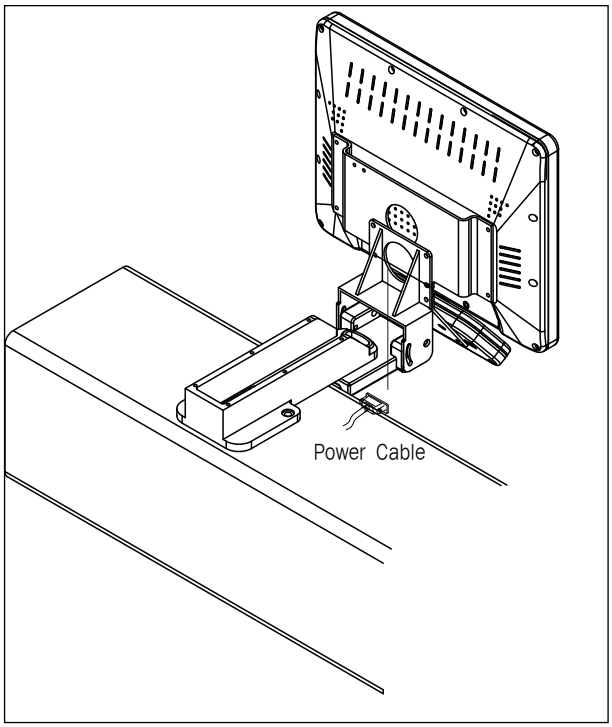
2-2) ASSEMBLY OF PERIPHERAL DEVICES

1) Assembling Upper Thread Stand



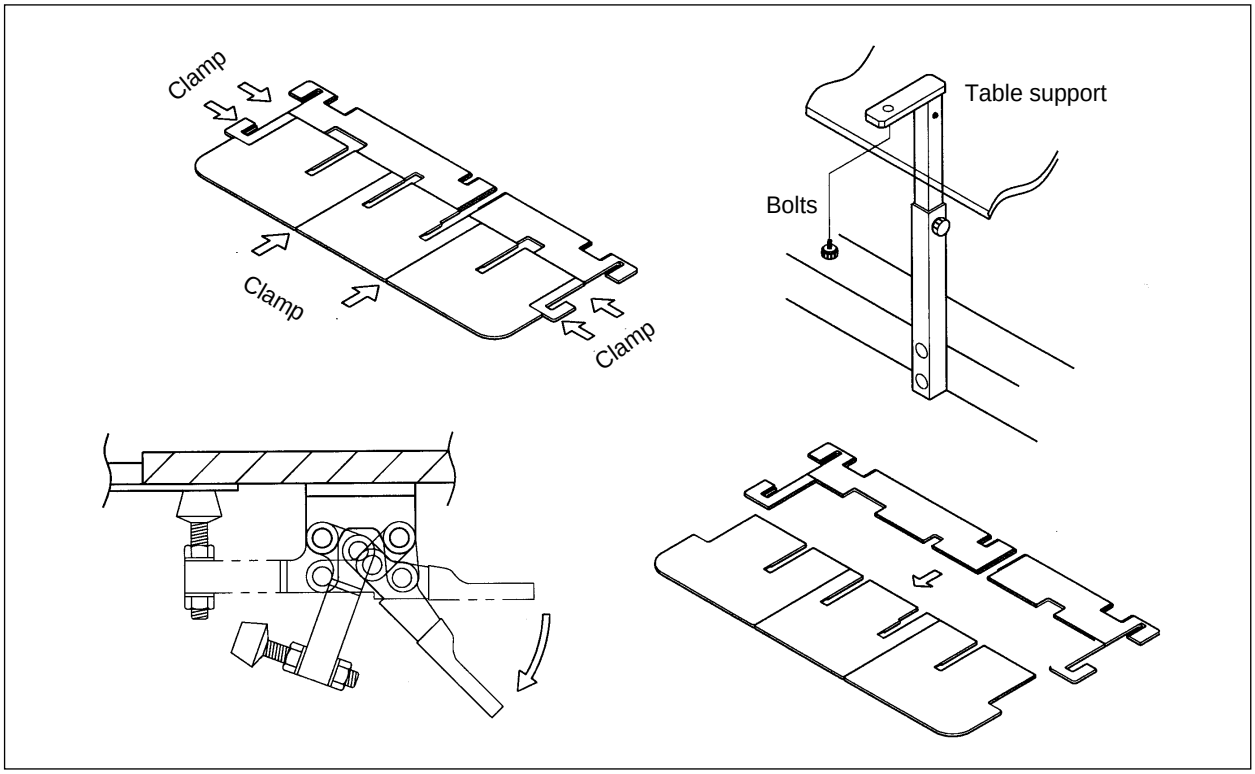
2) Assembling Operation Box





3) TABLE ASSEMBLY

①Unscrew the eight clamps underneath the table and the bolts to disassemble the table.



② Adjust the table support at an appropriate height and fasten the bolts.

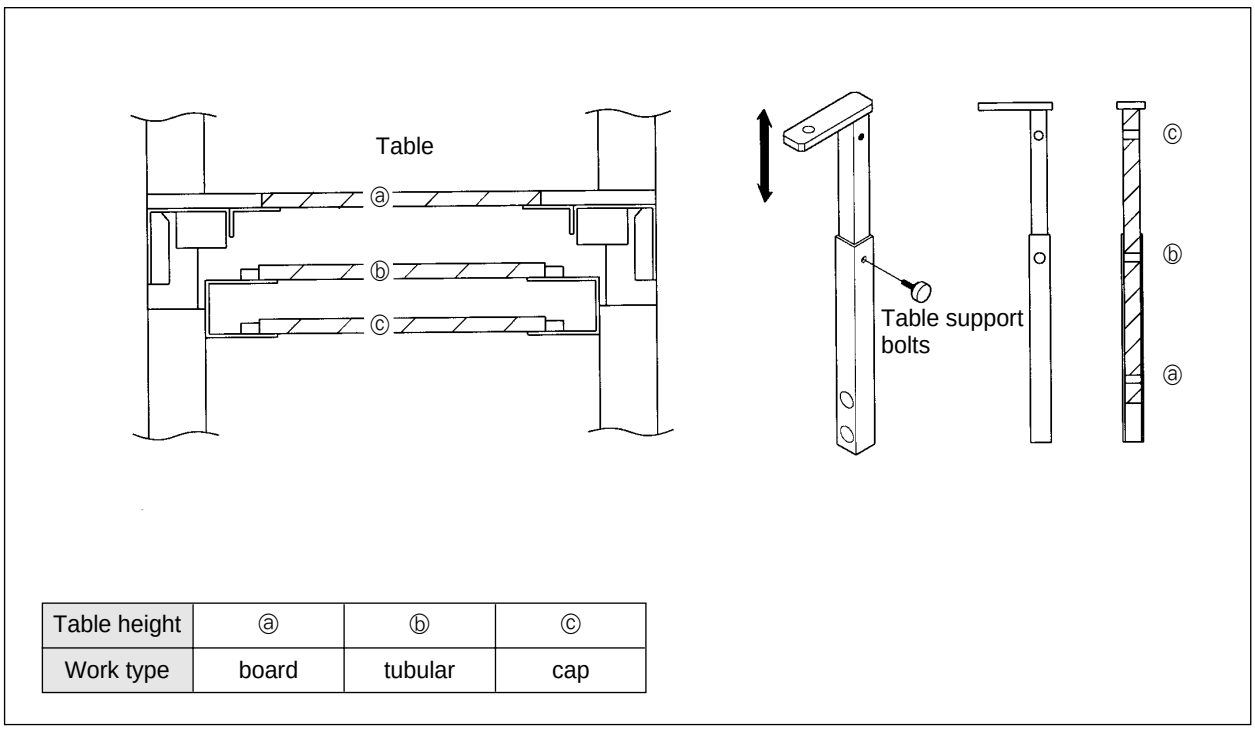
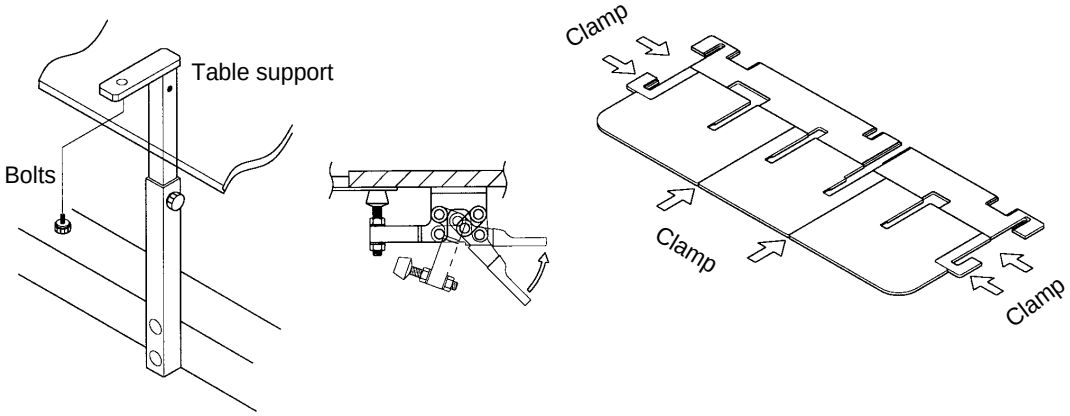


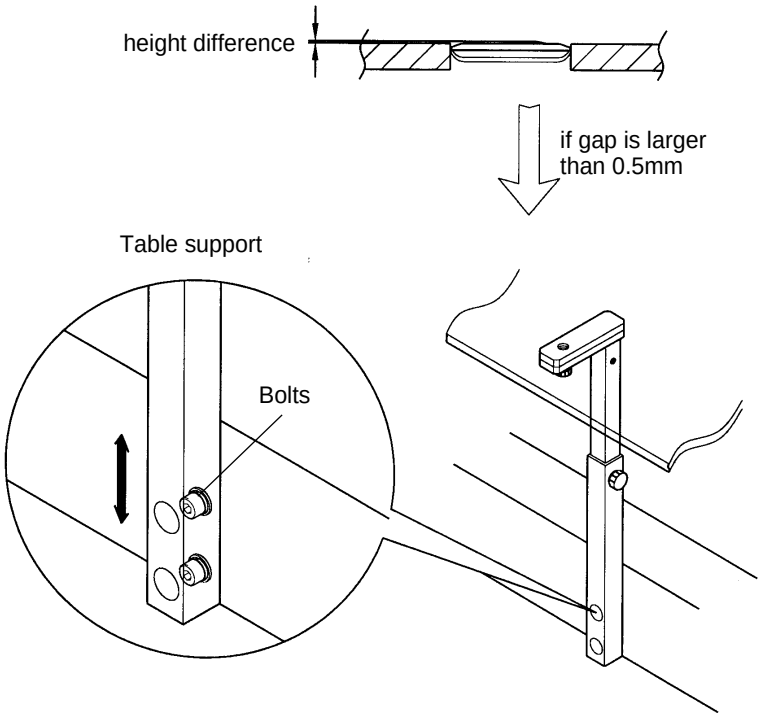
Table height	ⓐ	ⓑ	ⓒ
Work type	board	tubular	cap

③ Insert the table and fasten the bolts and the clamps.



[CAUTION]

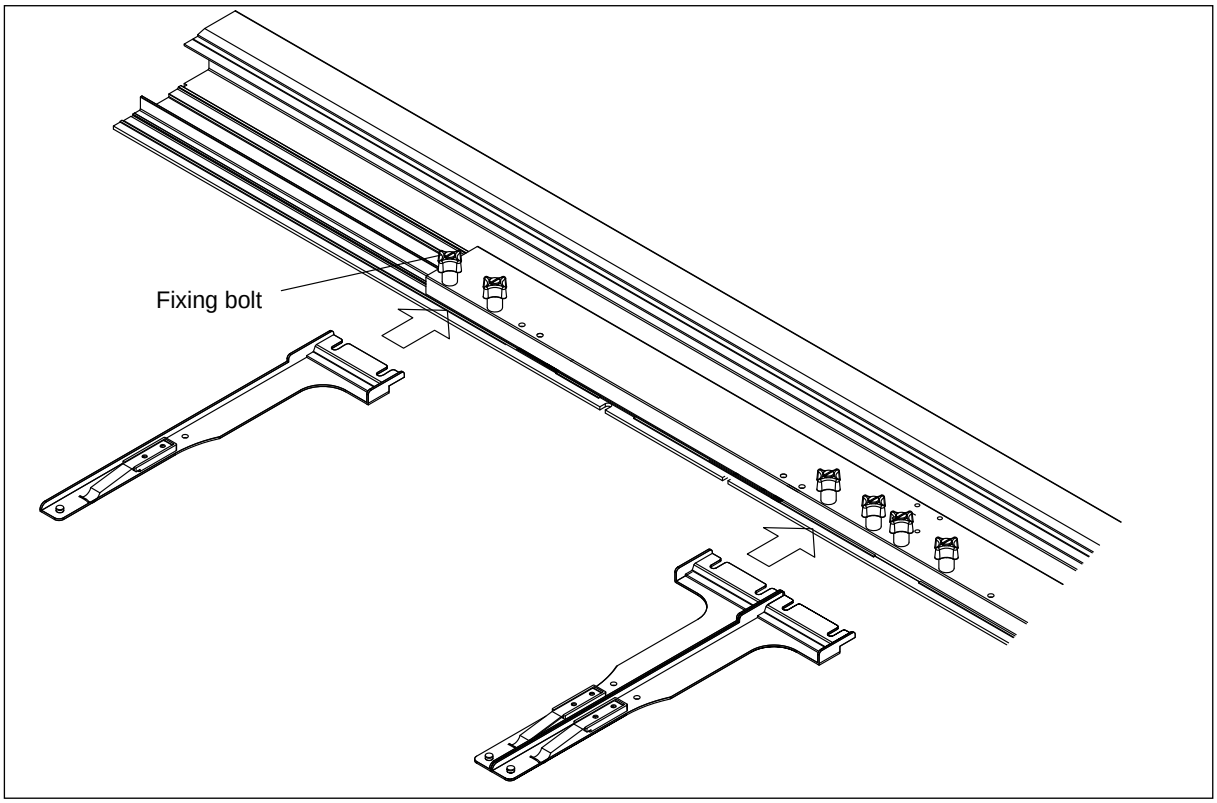
The table should not be higher than the upper side of the needle plate by 0.5mm for board frame work. If the height difference is over 0.5mm, unfasten the table support bolts, adjust the height, and fasten the bolts back.



4) FRAME ASSEMBLY

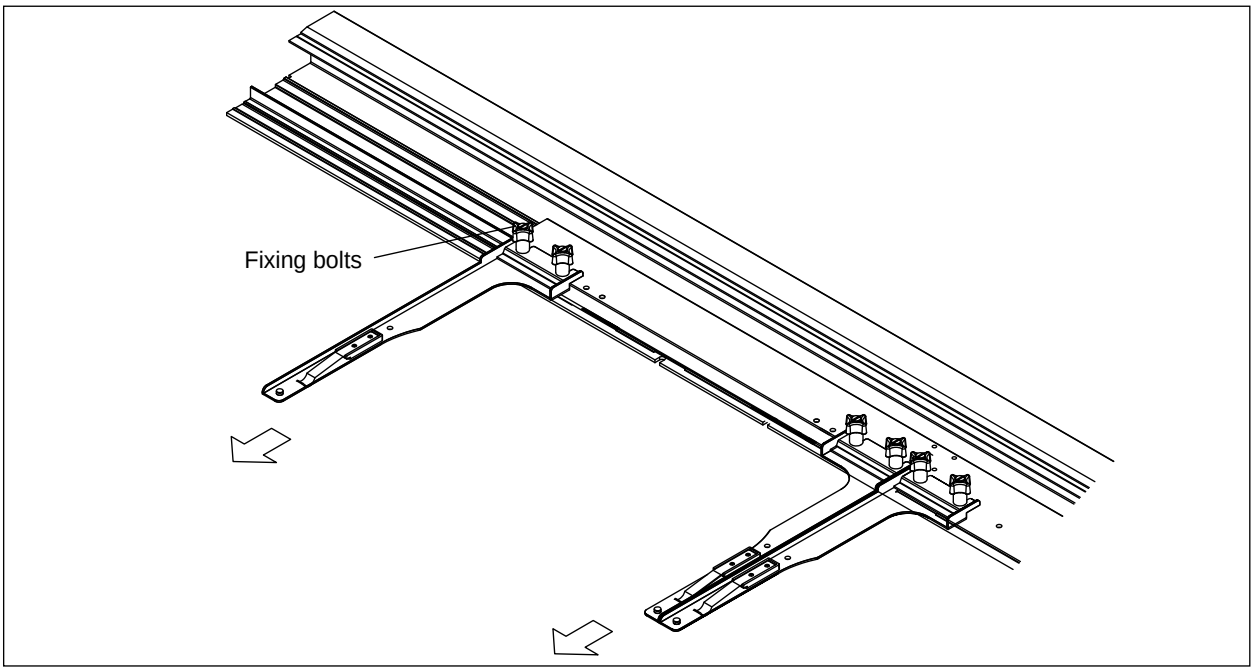
① Tubular Frame

Loosen 2/3 of the fixing screw of the tubular frame, insert it into the groove of the tubular frame mounting plate, and then fasten the screw.

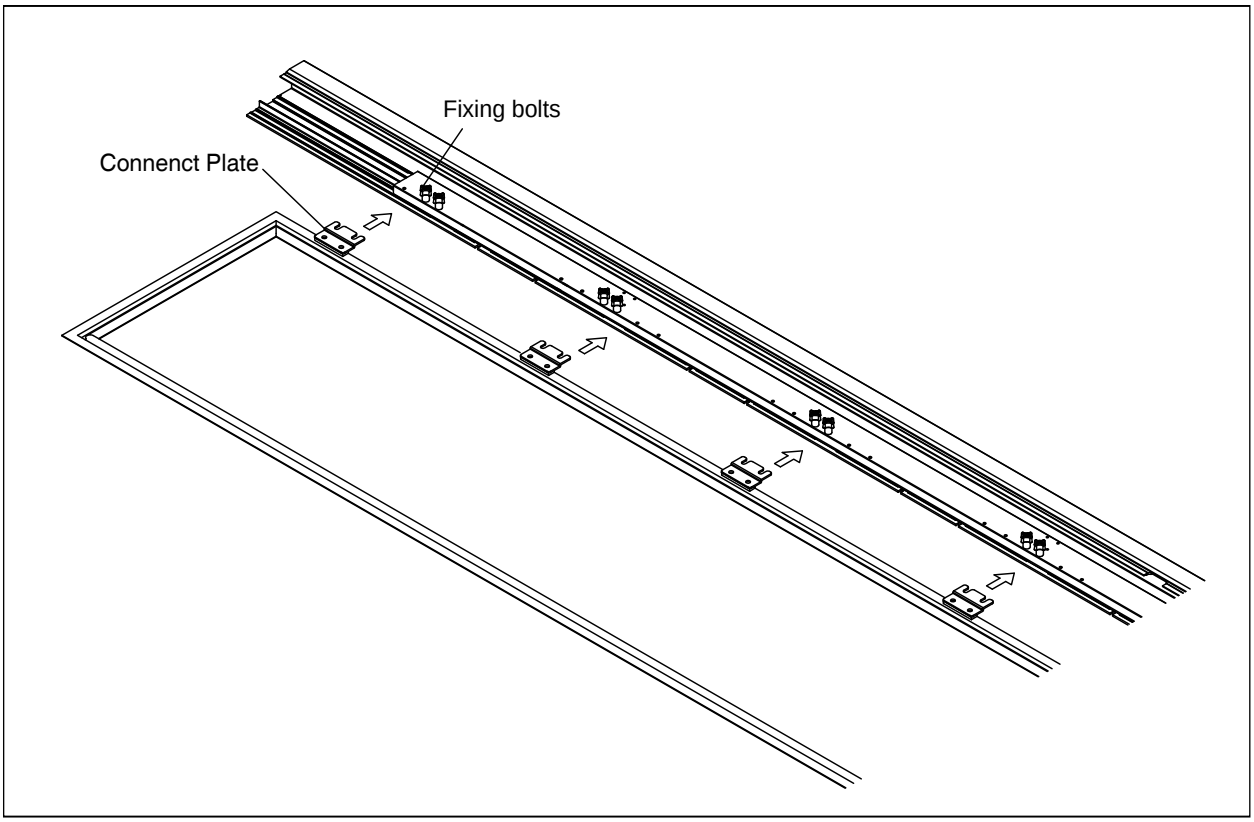


② Border Frame

a . Loosen 2/3 of the fixing screws of the tubular frame and then remove the tubular frame attachment plate.



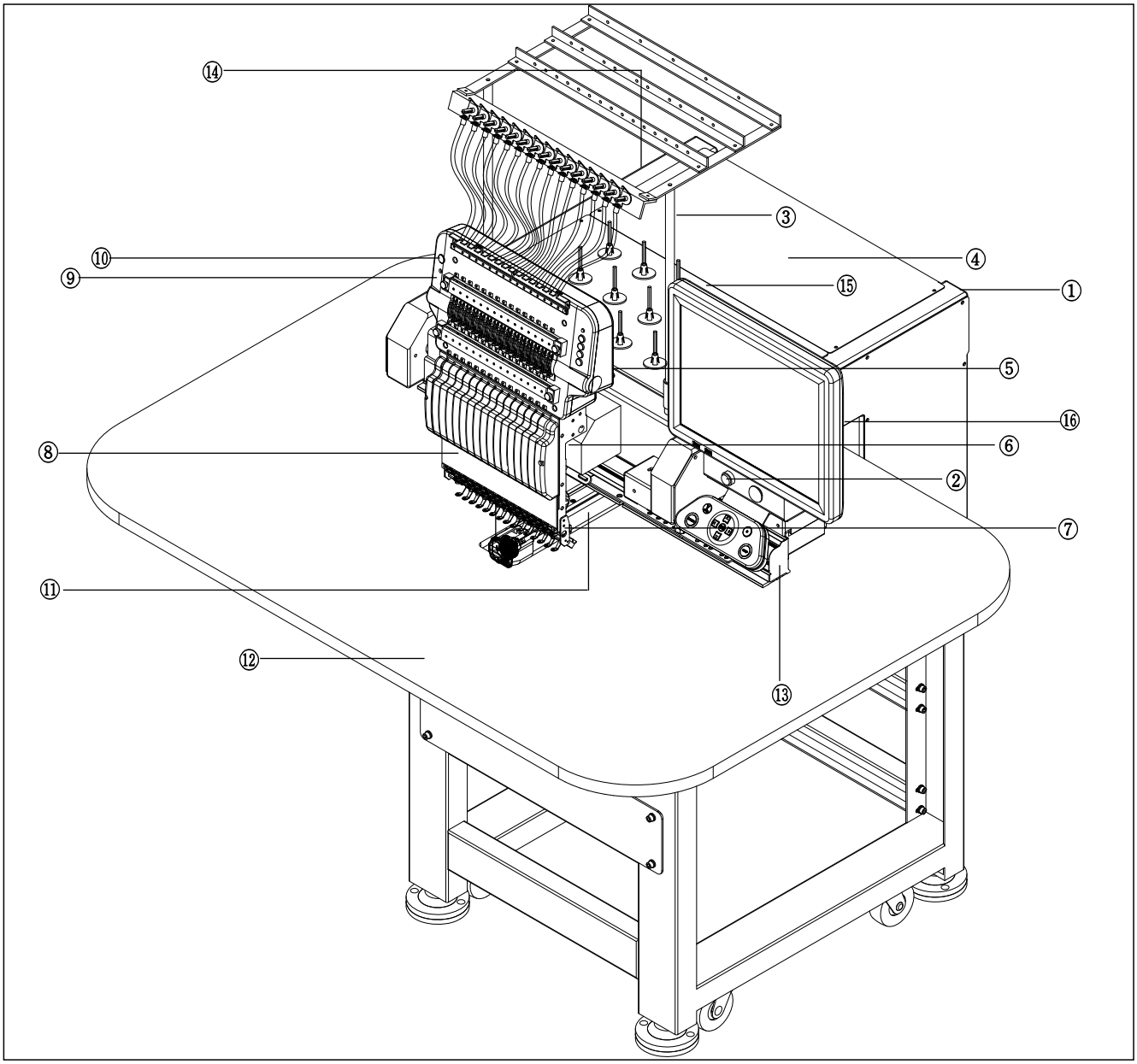
b. Assemble the table to the position for border frame work.
[Refer to the 3) table assembly method]
c. Loosen the tubular frame fixing screws, and tighten 2/3 of the screws to the corresponding positions on the X-transfer frame. Then, insert it into the groove of the connecting plate of the border frame and tighten the fixing screw.



CHAPTER 3

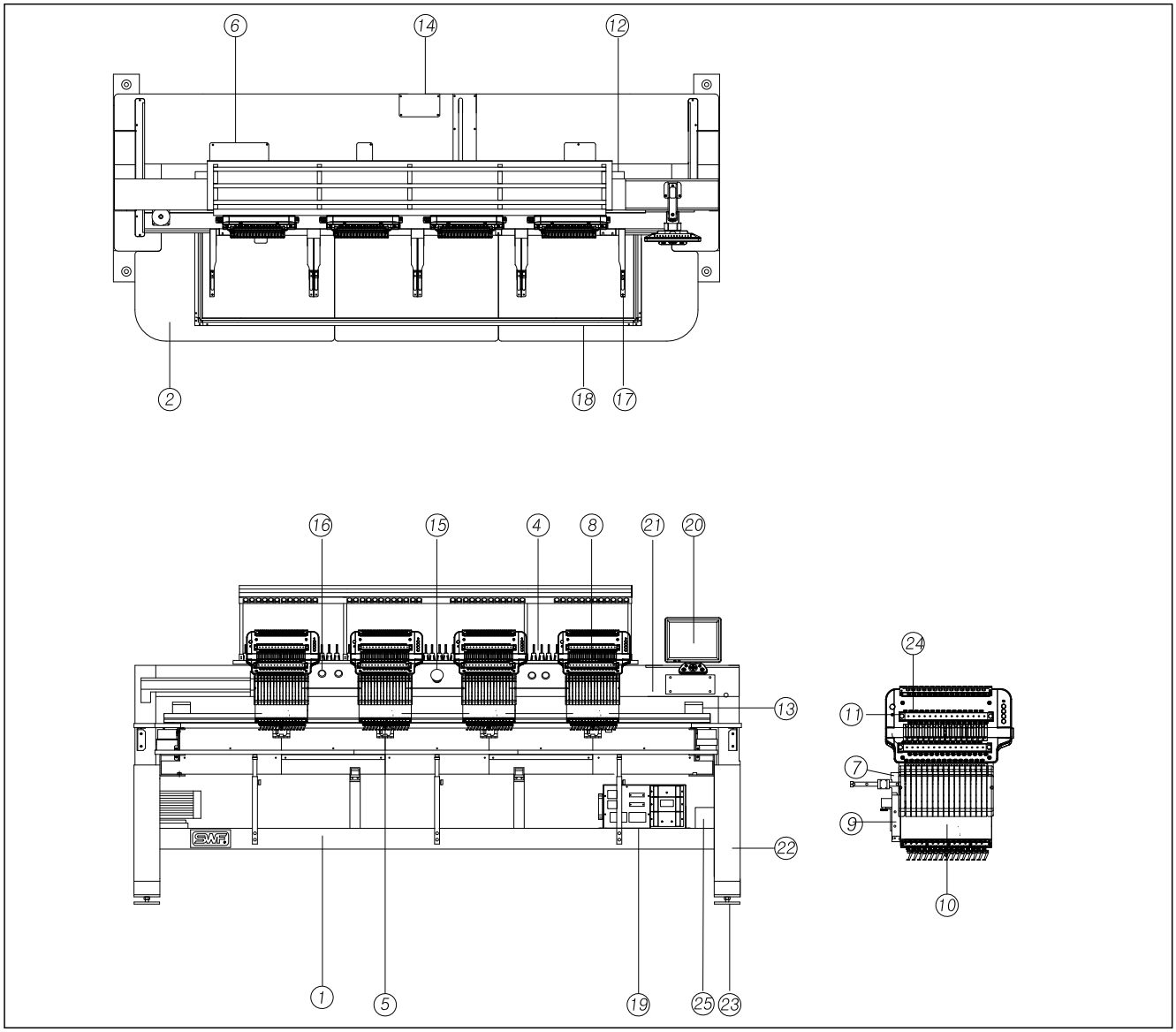
PARTS OF THE MACHINE

· KX−Single Head



① Body
② Main power switch
③ Upper thread stand
④ Main shaft drive motor
⑤ Color change box
⑥ Arm
⑦ Upper thread catcher
⑧ Head
⑨ Thread tension adjusting plate
⑩ Lamp switch
⑪ Cylinder bed
⑫ Table
⑬ X-shaft feed
⑭ Y-shaft feed
⑮ Control box
⑯ Power supply unit

· KX−Tubular



① Machine Body	⑧ Color Change	⑭ Y-axis driving system	㉑ Encoder
② Table	⑨ Upper thread holder	⑮ Emergency stop	㉒ Main power switch
③ Upper thread stand	⑩ Head	⑯ S/B button	㉓ Leveling base
④ Main shaft drive motor	⑪ Thread tension adjustment board	⑰ Tubular frame	㉔ Thread detector
⑤ Rotary hook base	⑫ Sub-controller	⑱ Border frame	㉕ Emergency power
⑥ Trimming cam box	⑬ X-axis driving system	⑲ Controller box	㉖ Transformer box
⑦ Arm		⑳ Operation box	

CHAPTER 4

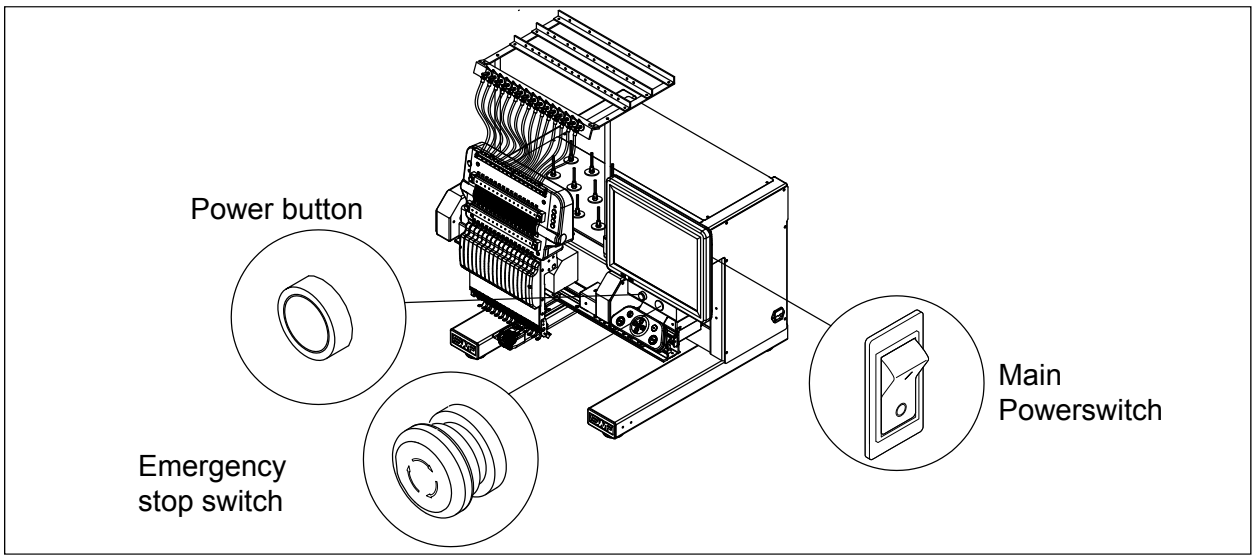
FUNCTIONS FOR BASIC MACHINE OPERATION

· KX−Single Head

4-1) Power operation switch and emergency stop switch

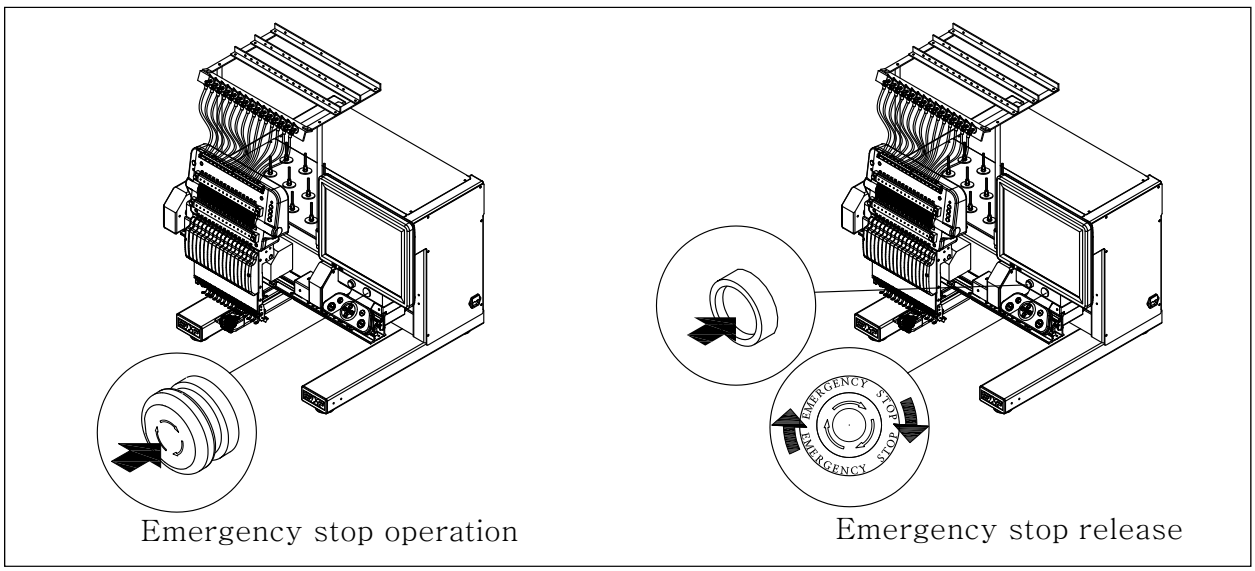
The power operation switch and emergency stop switch are located on the front of the machine, and the main power switch is on the side of the body behind the OP.
Raise the main power switch and press the power button to start the machine.
Press the emergency stop switch when the machine needs to be stopped immediately to avoid injury or other danger.

Caution
When using the machine for the first time, check the position of the emergency stop switch.
Do not use the emergency stop switch in place of the normal power switch.



4-2) Emergency stop operation and release

The machine stops immediately when the emergency stop switch is pressed.
Turn the emergency stop switch to the right to release it and press the power push button to turn on the machine.



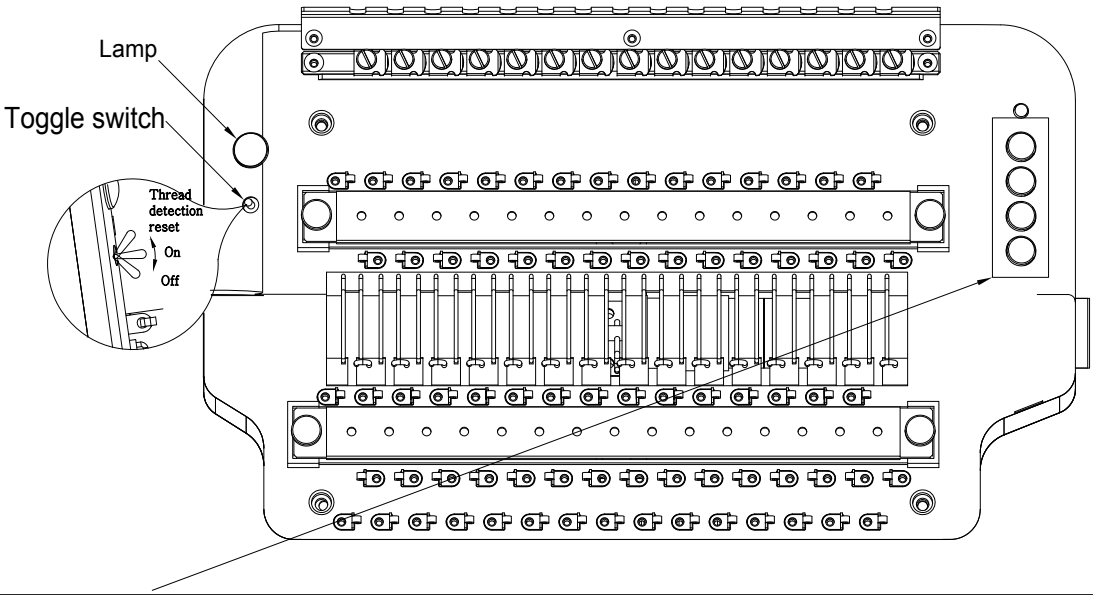
Emergency stop operation　　Emergency stop release

4-3) LAMP ON THREAD TENSION ADJUSTMENT BOARD

1) Switch

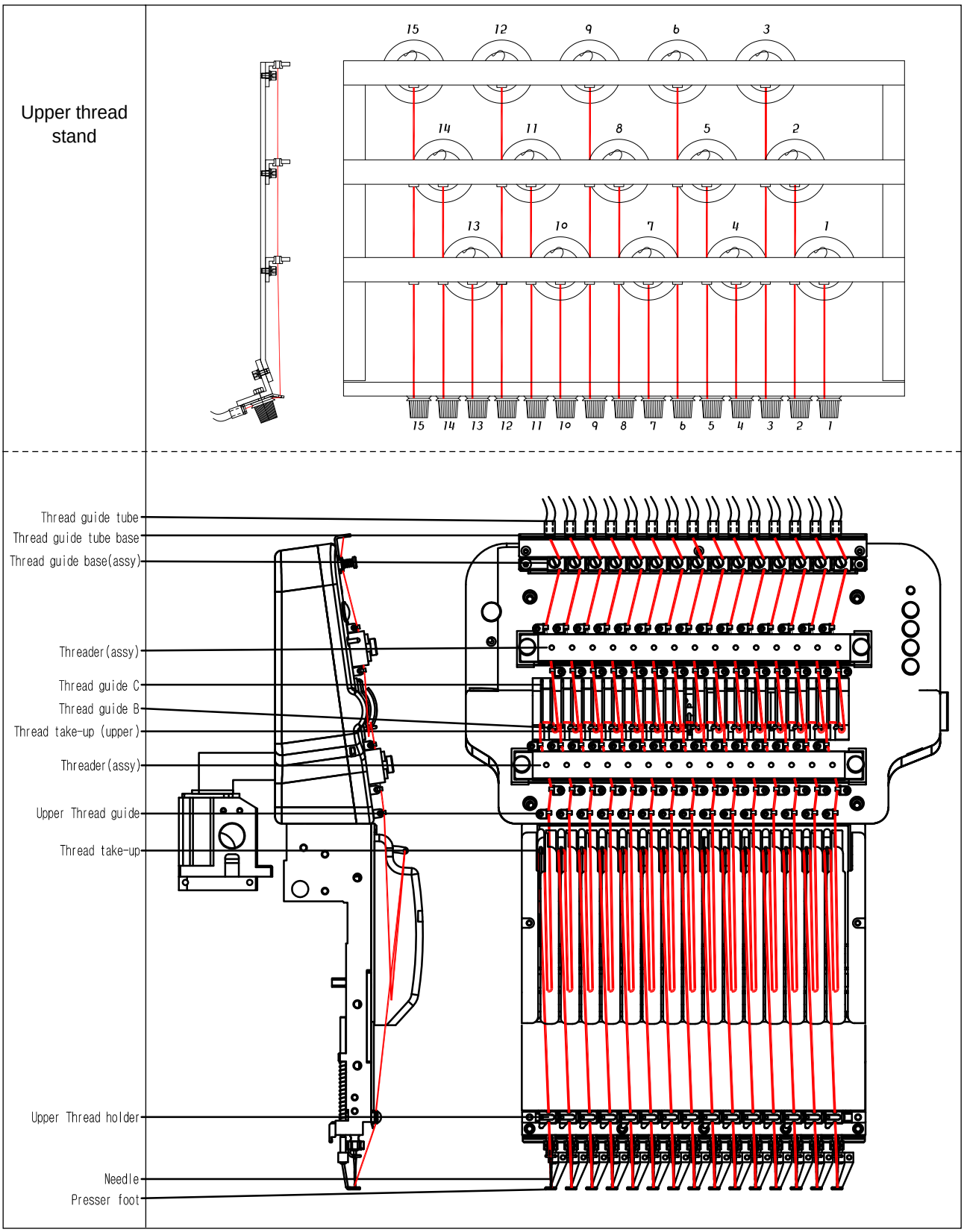
- For normal operation, turn the toggle switch on to turn on the indicator lamp.
- If the machine stopped after detecting a thread break, move the frame back to the location of the thread break using STOP button and restart the machine to pick up stitching (design edit).

  ※ If you want to move the frame back for any reason when a thread break has NOT occurred, press the toggle twice.



⊕	Data return button If you press the button to return to the saved auto-stop position (manual frame transfer, etc.) when it is out of the stored embroidery work (manual frame transfer, etc.)
T	Trimming button If you press the button, the automatic trimming function confirmation window appears, and you can select whether or not to trim the trimming.
▲	SAP presser foot origin position move button Press the button to move the SAP presser foot to the origin. If the SAP presser foot is already at the origin position, the button does not work.
▼	SAP Presser foot ready/lowering position move button When the button is pressed, the SAP presser foot moves to the ready position when the SAP foot is in the origin position. When the button is pressed again, the SAP presser foot moves to the lowered position. If the SAP presser foot is already in the lowered position, the button does not work.

4-4) UPPERTHREADING



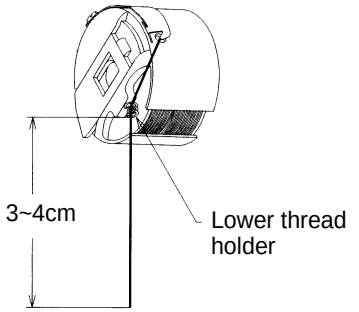
4-5) LOWER (BOBBIN) THREADING AND TENSION ADJUSTMENT

1) Lower Threading

① Use cotton yarn (#80-#120) for your lower thread.

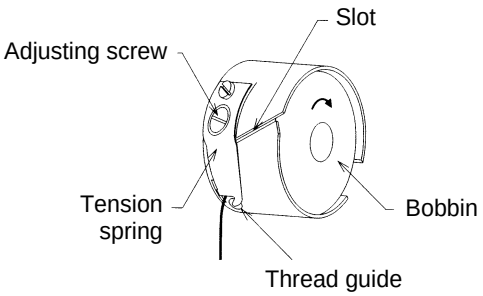
② Threading the bobbin:

- Insert the bobbin into the bobbin case with the thread coming out from the case slot. Pull the thread through the thread guide. When you pull the thread, check if the bobbin is rotating.
- Thread the lower thread holder and trim the thread to 3-4cm before inserting the bobbin and the case into the hook assembly. Long tail can cause the bobbin thread to tangle during stitching.



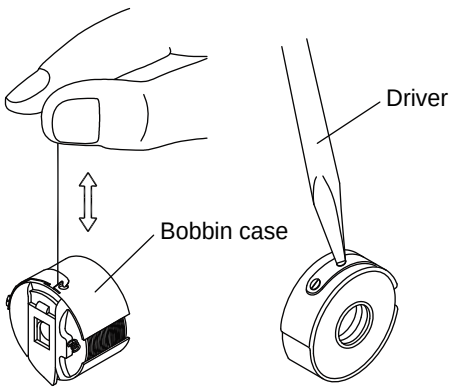
[Caution]

Make sure that the bobbin rotates clockwise when you pull the thread holding the bobbin case in your left hand.



2) Lower Thread Tension Adjustment

Adjust the tension of the bobbin thread using the nut on the tension spring on the bobbin case. Turn the nut clockwise to increase the tension and counterclockwise to decrease the tension.



[Caution]

For adequate bobbin thread tension, hold a thread from the bobbin and jiggle the bobbin case lightly up and down. The case should drop and the tension should be 25-35g.

4-6) NEEDLE-HOOK TIMING CONTROL

1) Needle

① It is very important to select the right needle for the type of thread and fabric used.

② Inappropriate needle may cause ill-embroidery, thread breaks, skipped stitches, etc.

③ For normal embroidery, use a DB × K5 needle.

[CAUTION]

DB × K5 needle has an eye twice larger than that of DB1 (used for normal sewing). Use DB × K5 for normal embroidery.

2) Relationship between Needle and Thread

① Inadequate selection of thread and needle may result in thread breaks, skipped stitches, as well as in bad-quality embroidery.

② Refer to the following table of threads and needles used normally used for embroidery.

Needle Size			Thread Size		
US	Japan	Germany	Cotton	Polyester	Rayon
0.25	9	65	70~80	70~100	70~100
0.27	10	70			
0.29	11	75	50~60	100~130	100~130
0.32	12	80			
0.34	13	85	36~40	130~150	130~150
0.36	14	90			

[CAUTION]

Needle and thread most commonly used in embroidery are DB × K5 #11 and rayon yarn.

3) Changing the Needle

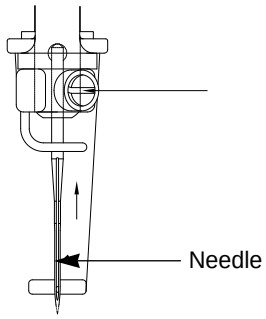
① Make sure the needle is clear of the needle plate before attempting to change it. If the needle is not clear of the plate, manually turn the hand lever to raise and put the needle in the right location for change.

[CAUTION]

Stop the machine before turning the hand wheel manually.

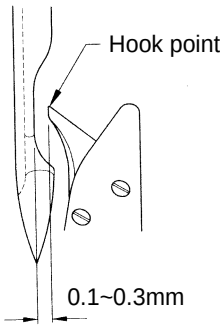
① Hold the needle with your hand and use the provided flat-blade screwdriver to loosen the screw and remove the needle.

* During exchange, you must hold the needle by hand. Otherwise, the needle may fall down and enter the needle plate hole.



② Adjusting Gap between Needle and Hook Point

- Gap between the hook point and the scarf of the needle should be between 0.1-0.3 mm.
- Thread skip occurs due to thread looping or inadequate balance or gap between the needle and the hook. If the hook point is closer to the needle, the hook point will be inside the loop and threading will be more stable.



· KX−Tubular

4-1) HOW TO OPERATE START/ STOP SWITCH

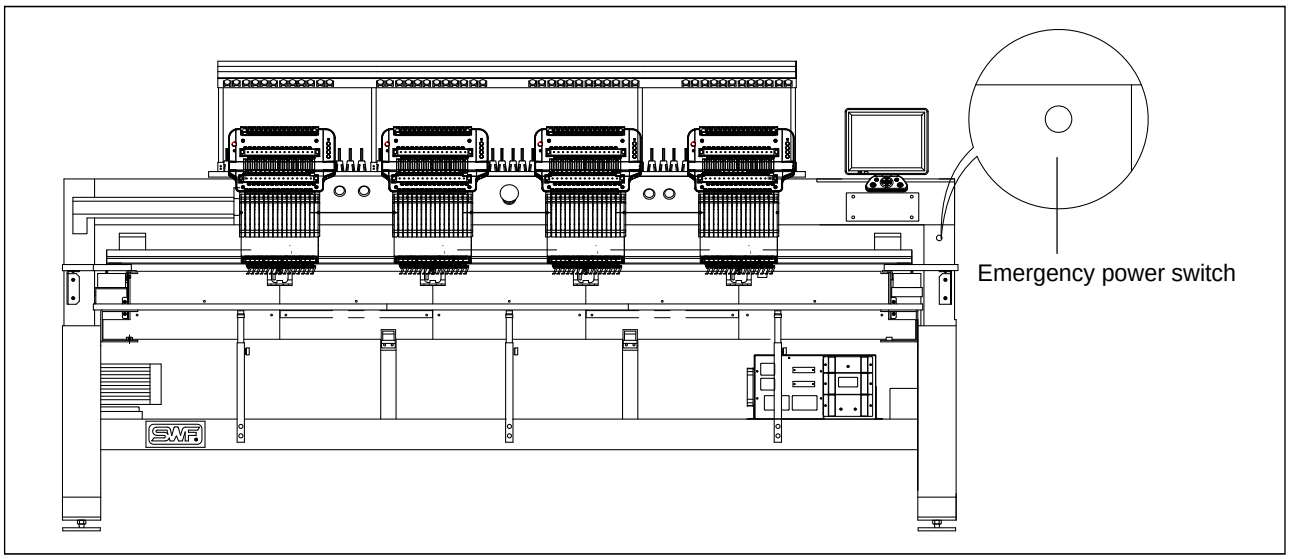
4-1-1) Emergency Power Switch

Starting the machine in the initial stage

① Turn on the main power.

② Press the emergency power switch about 1 second (green color).

③ Emergency power switch will not turn on if the main power is off.

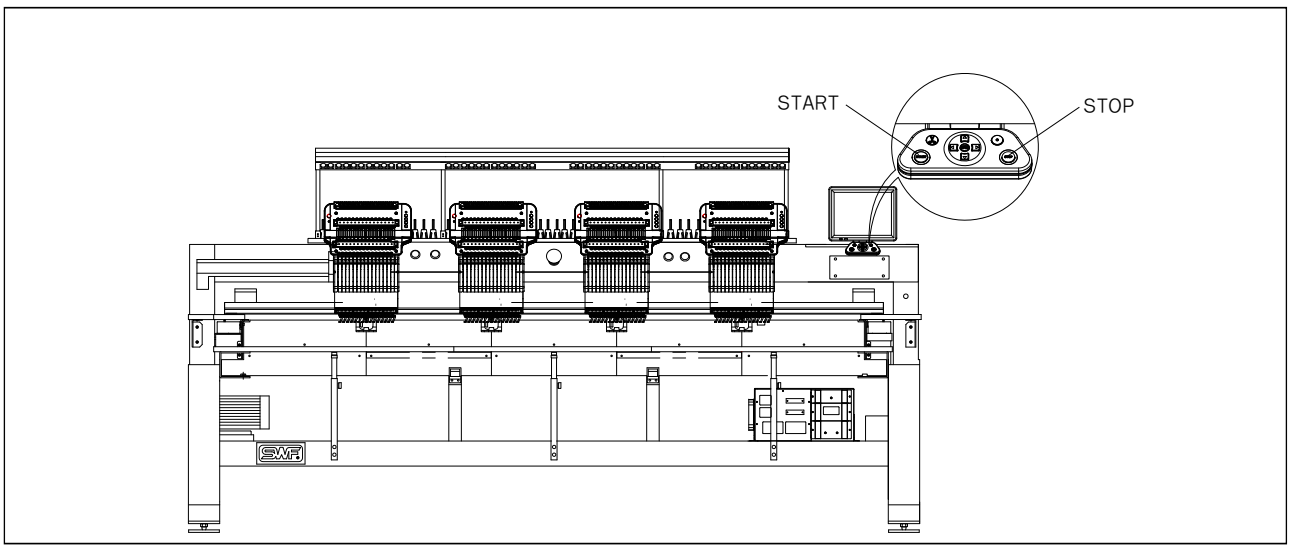


[NOTE]

Emergency power switch detects emergency stop failures and prevents accidents.

Emergency power function detects the failure of the emergency stop function and prevents the machine from being switched on.

4-1-2) Please operate start/stop switches as shown in the following figure.



The cases for start/ stop switches operations are as follows:

① Start the embroidery work or stop the machine during operation.

② Move the frame back during machine stop.

③ Move forward in design during machine stop (non-stitching)

④ Move backward in design during machine stop (non-stitching)

⑤ Do work other than embroidery

① START/STOP for starting embroidery and stopping the machine

BUTTON OPERATION	MACHINE OPERATION
Press START	Machine starts and embroidery work begins.
Hold START	Machine "inches (see Note1)" until you release the button.
Press STOP	Machine stops.

[NOTE 1]

You cannot perform non-stitching (floating) at the start of the embroidery because the function is not in the start menu. To perform floating at the start, press STOP to put the machine in STOP MODE. Then press  button to select the non-stitching function.

② START/STOP during machine stop

BUTTON OPERATION	MACHINE OPERATION
Press STOP	Frame moves backward in selected movement units (see Note 2).
Hold STOP	Frame starts to move backward. If you press STOP before the machine goes 10 of the selected stitches, the machine will stop immediately (the machine moves back in the selected movement units). If you press STOP after the machine traveled 10 of the selected stitches, the machine will continue to move back.
Press STOP again	Press STOP one more time and the machine will stop moving backward.

③ START/STOP during forward non-stitching (during machine stop)

BUTTON OPERATION	MACHINE OPERATION
Press START	Frame moves forward in selected movement units (see Note 2)
Hold START	Frame starts to move forward. If you press START before the machine goes 10 of the selected stitches, the machine will stop immediately (the machine moves back in the selected movement units). If you press START after the machine traveled 10 of the selected stitches, the machine will continue to move forward.
Press START again	Press START one more time and the machine will stop moving forward.

④ START /STOP during backward non-stitching (during machine stop)

See (2) START/STOP during machine stop.

⑤ Performing Work Other Than Embroidery

If you want to perform a solenoid test, a thread break sensor test, or manual trimming, select the function and press START.

Select function → Press START

[NOTE 1]

"Inching" refers to low-speed embroidery at a 100 rpm range, performed for stable stitching when the machine is re-started after stop.

[NOTE 2]

"Frame movement unit" refers to the "BK STITCH UNIT" in "EMB FUNCTION." You can select from 1 to 10 stitches (by 1 stitch).

CHAPTER 5

MAINTENANCE AND INSPECTION

Consumable parts shall not be guaranteed even in warranty period.

· KX−Single Head

5-1) CHECK POINTS FOR REGULAR INSPECTION

CAUTION

Safety rules must be observed during the inspection.

1) Clean, oil, and grease the set parts of the machine on a regular basis.
2) Inspect tension of each driver belt.
3) Failure to perform regular inspections may cause the following:
   • Corrosion of P/C circuit board
   • Damage to the semi-conductor on P/C circuit board
   • Ill connection of the connector
   • Abnormal wear-out of machine parts due to insufficient oiling and greasing

5-2) CLEANING

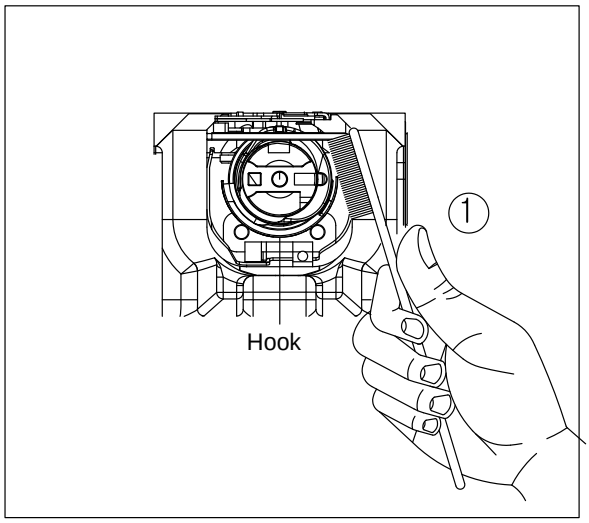
CAUTION

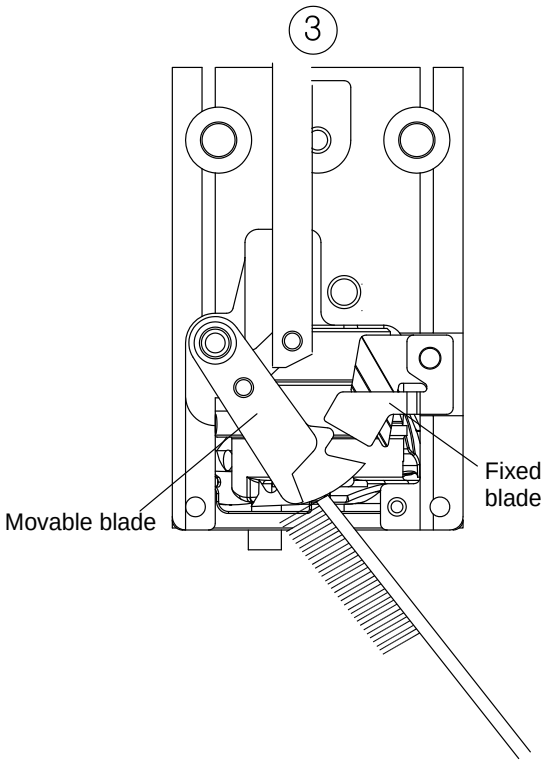
SWF is not responsible for machine damages or malfunction due to no or irregular machine inspections including cleaning and oiling.

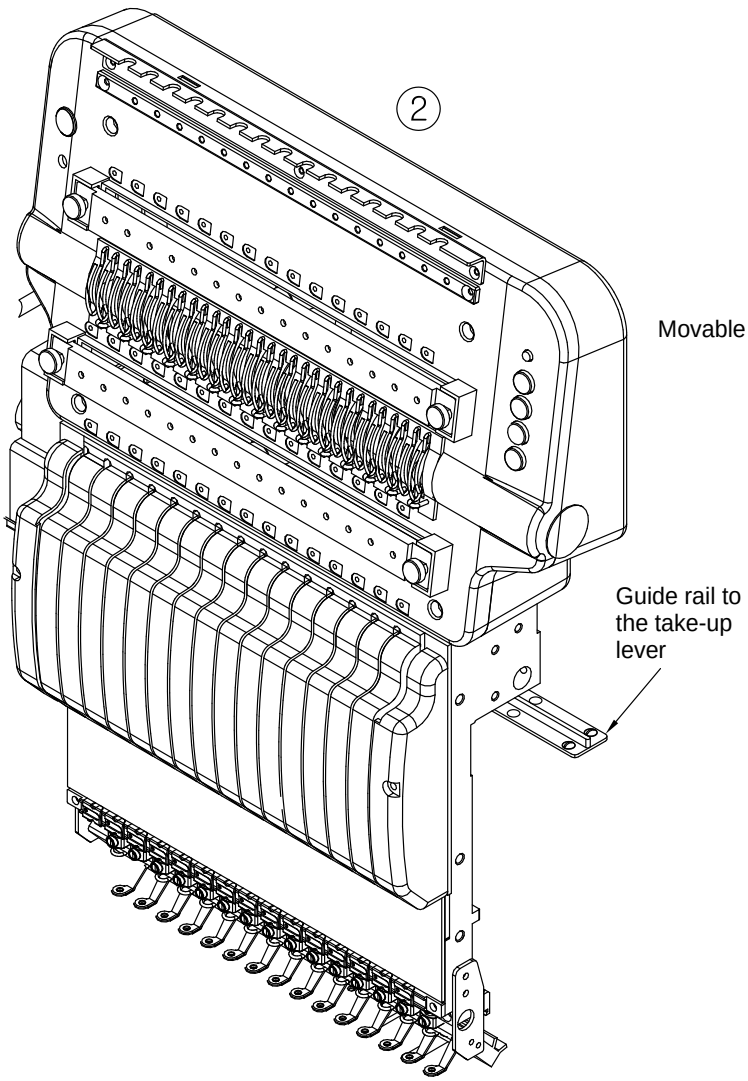
CAUTION

Make sure the main power is turned off before inspection or cleaning.
Set your regular cleaning timetable according to the machine conditions and environment.

NO	Important Parts to Clean	Cleaning cycle	Reference Fig.
1	Around the hook	Every day	①
2	Guide rail to the take-up lever	Once a week	②
3	Around the movable blade and the fixed blade [How to Clean] ※ Remove the needle plate and pull the movable blade forward. ※ Use the SWF brush to remove dirt and dust.	Once in 3-7 days	③


①
Hook


③
Movable blade
Fixed
blade


②
Guide rail to
the take-up
lever

5-3) OIL SUPPLY

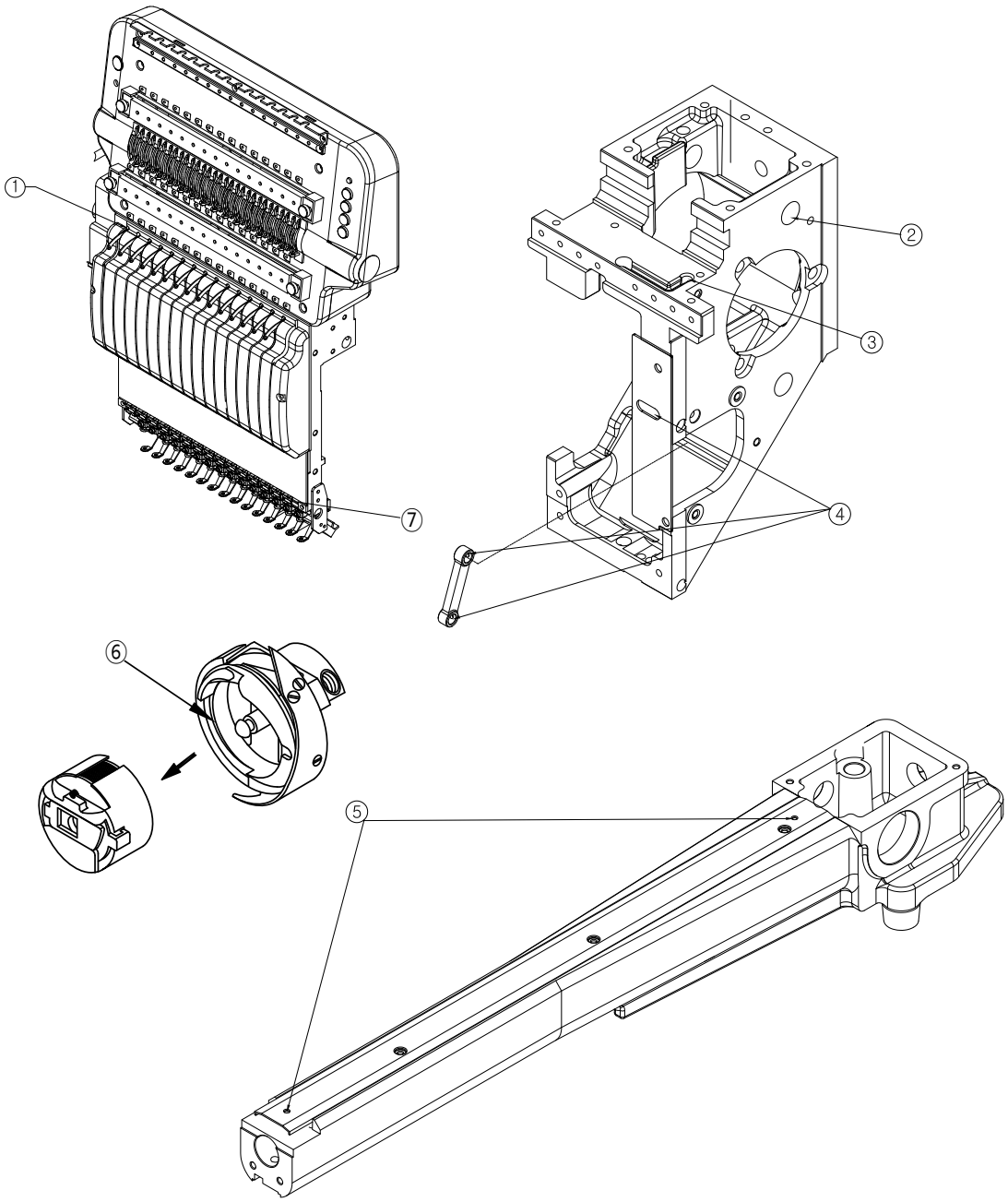
CAUTION

Make sure to turn the power off during oil supply.
SWF is not accountable for machine damages due to poor oiling.

1) Oil supply

Use the SWF sewing machine oil (Spindle Oil) or ISO-standard VG18.
Supply oil to the following areas once a day.

① Needle bar
② Thread take-up drive pin
③ Needle bar drive shaft
④ Presser foot drive link
⑤ Rotary hook shaft
⑥ Hook Raceway
⑦ Presser foot shaft



2) Grease Supply

CAUTION

Make sure to turn off the main power during the grease supply.

Use high-quality mineral-based lithium grease.

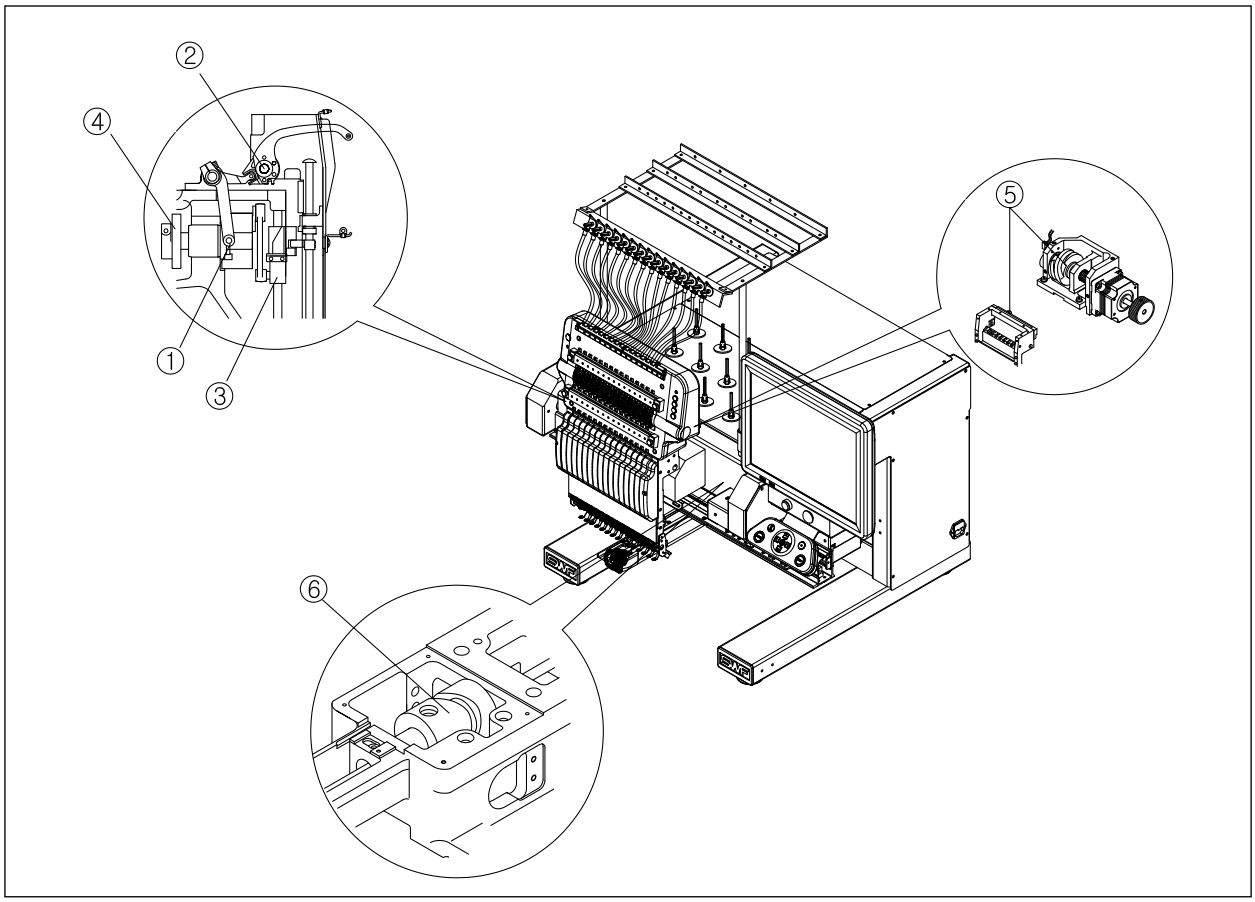
NO	Where to Grease	Greasing cycle	Reference Fig.
1	Inside of the arm Take-up lever drive cam Main part of the take-up lever Needle bar reciprocator Pesser foot drive cam	Once in 3 months	① ② ③ ④
2	Blade cam	Once in 3 months	⑥

Places for supplying synthetic TM grease

NO	Where to Grease	Greasing cycle	Reference Fig.
1	Color change cam, color change head roller	Once in 3 months	⑤

[CAUTION]

Regular greasing prevents machine noise and abnormal wear-out.



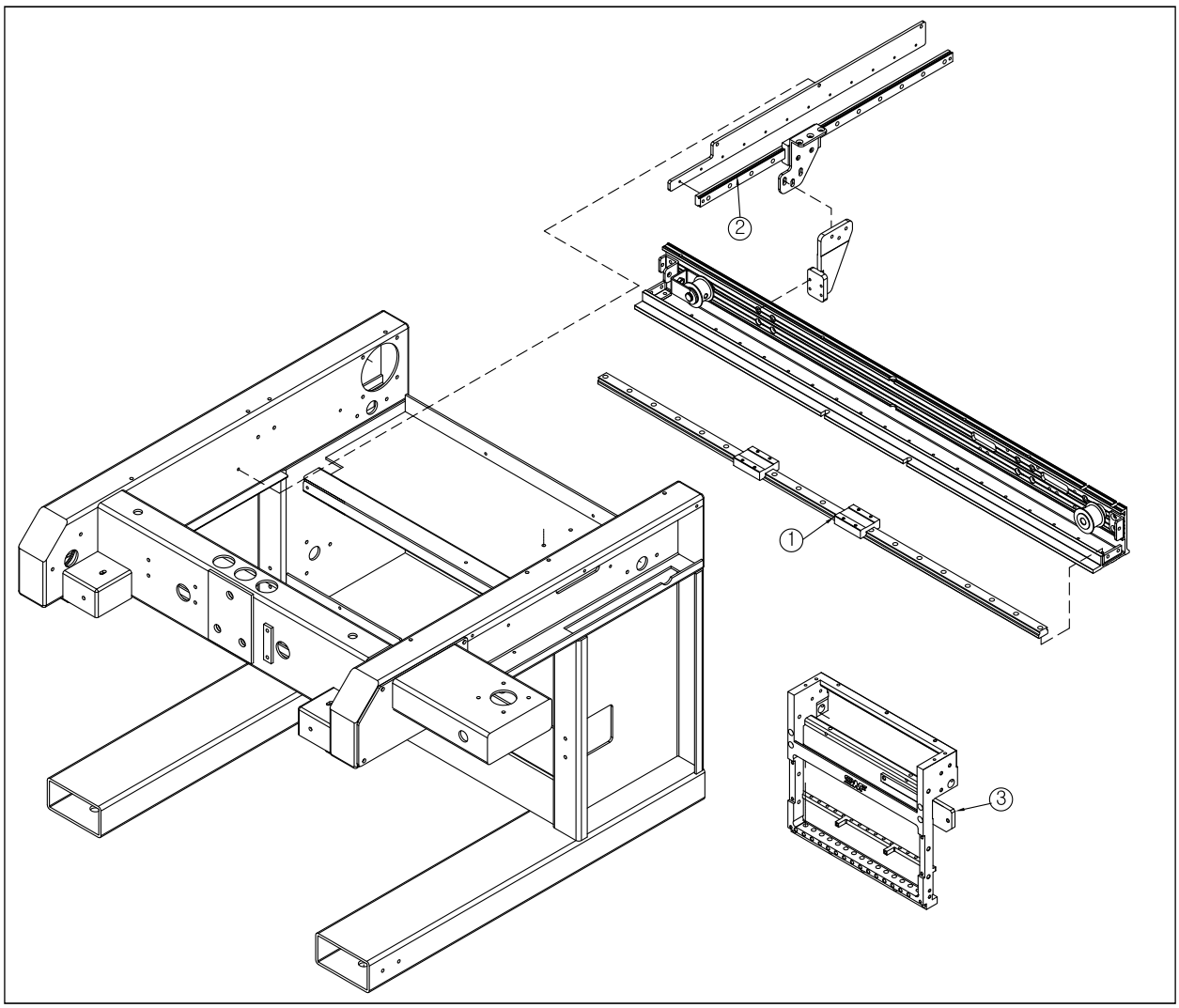
CAUTION	Make sure to turn off the main power during the grease supply.

Use lithium-type grease (JIS No.2) - Albania No.2.

NO	Where to Grease	Greasing cycle	Reference Fig.
1	X-axis LM guide	Once a month	①
2	Y-axis LM guide (2 on each side)	Once a month	②
3	Head drive LM guide	Once a month	③

[CATUION]

Do NOT grease the parts not indicated (needle bar, hook, etc.)

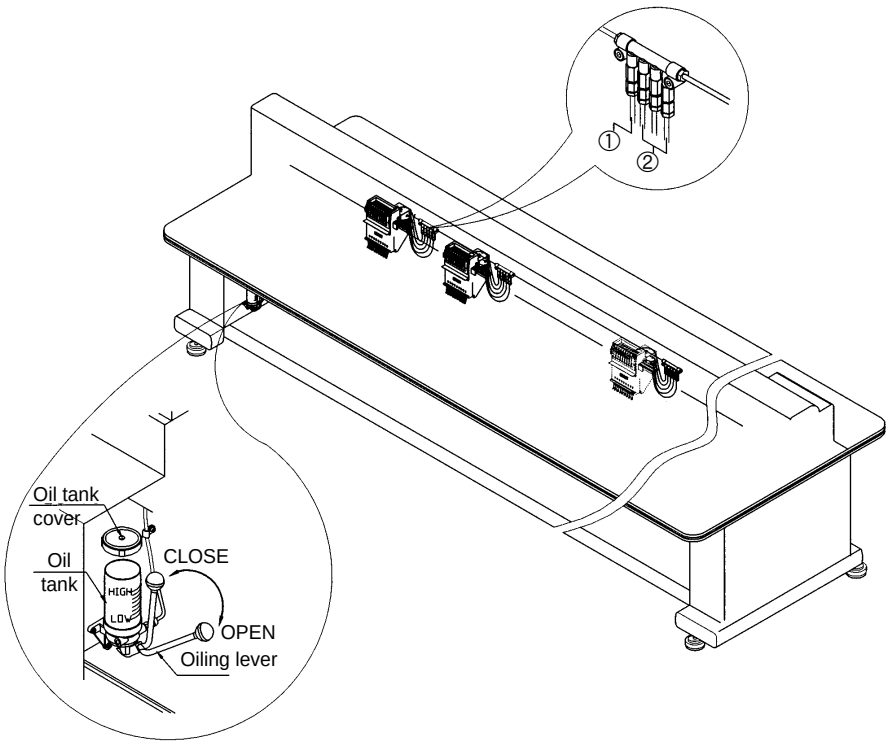


· KX−Tubular

5-1) Oiling via Pump

① Location and Cycle of Oiling

No.	Where to oil	Oiling cycle	Reference Fig.
1	Needle bar	Twice a day	①
2	Inside arm a. driver pin of take-up lever b. driver pin of presser foot c. driver shaft of needle bar		②



[CAUTION]

- Use the SWF sewing machine oil (Spindle Oil) or ISO-standard VG18.
- Make sure to fill the oil tank to the middle point between HIGH and LOW.
- Do not oil with both of the ① and ② levers open.

② Grease supply

CAUTION	Make sure to turn OFF the main power during the grease supply.

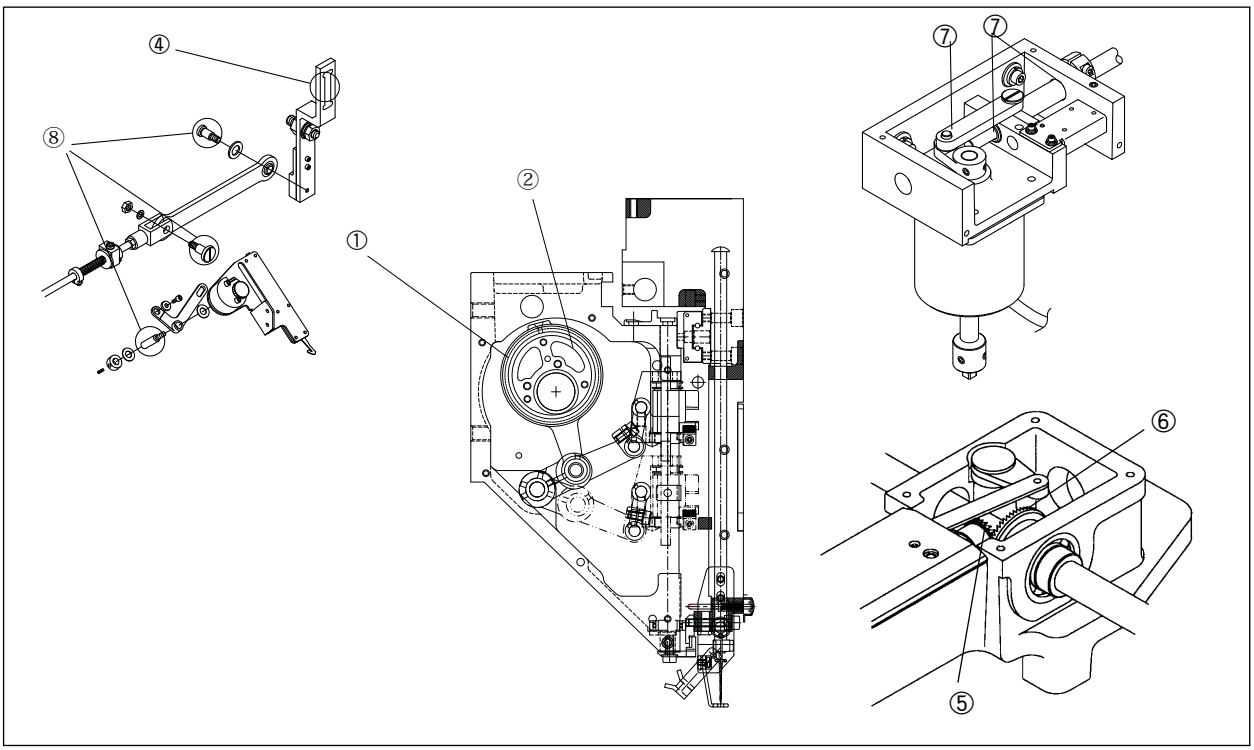
Use high-quality mineral-based lithium grease.

NO	Where to Grease	Greasing cycle	Reference Fig.
1	Inside the arm Take-up lever drive cam Needle bar drive cam	Once in 3 months	① ②
2	Driving plate for the upper thread holder	Once in 3 months	④
3	Hook gear and lower gear in the rotary hook base Once in 3 months	Once in 3 months	⑤ ⑥
4	Trimmer driving link and trimmer driving shaft bushing	Once in 3 months	⑦

Places for supplying synthetic TM grease

NO	Where to Grease	Greasing cycle	Reference Fig.
1	Hinge screw	Once in 1 months	⑧

[CAUTION]
Regular greasing prevents machine noise and abnormal wear-out.



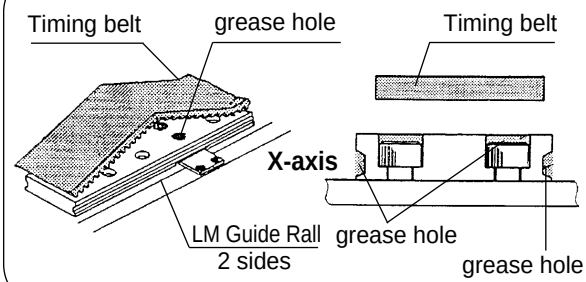
CAUTION	Turn OFF the main power during the grease supply.

Use lithium-type grease (JIS No.2) - Albania No.2.

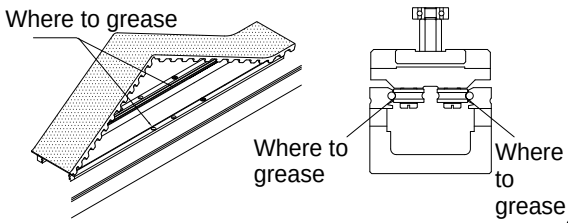
NO	Where to Grease	Greasing cycle	Reference Fig.
1	X-axis LM guide (2 on each side)	Once in 2 months	①
2	Y-axis LM guide (2 on each side)	Once in 2 months	②
3	Sub Y drive LM guide (1 on one side)	Once in 2 months	③
4	Head drive LM guide	Once in 2 months	④

[CATUION]
Do NOT grease the parts not indicated (needle bar, hook, etc.)

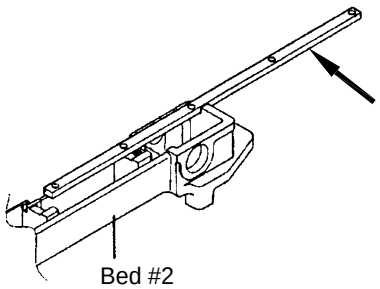
① X-axis LM guide (4 spots)



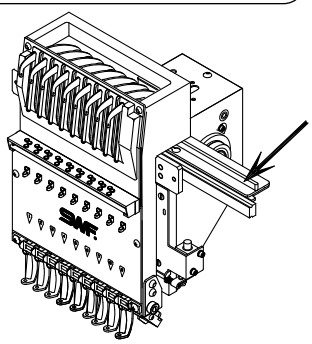
② Y-axis LM guide (4 spots)



③ Sub Y drive LM guide (1 spots)



④ Head drive LM guide (upper cover opened)



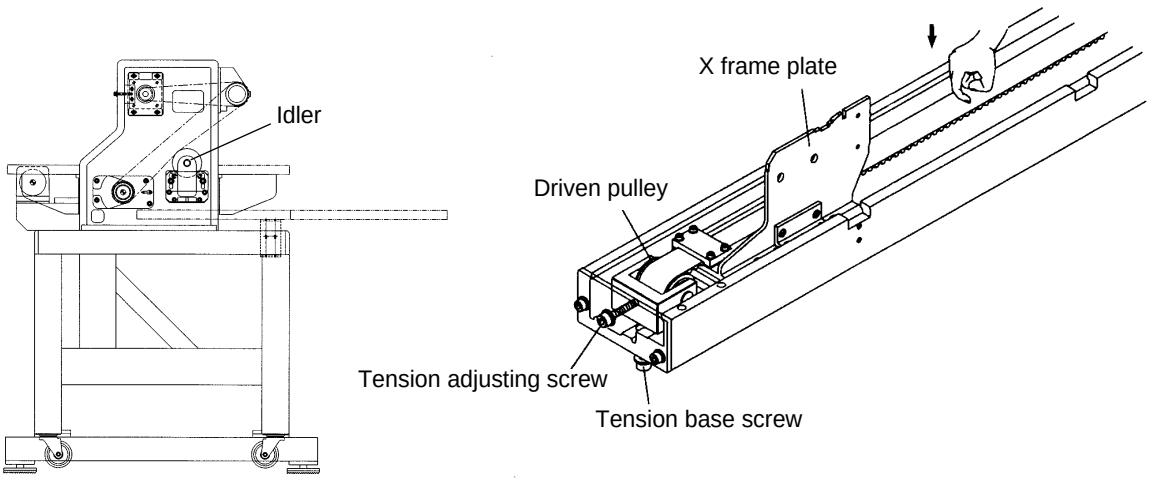
5-2) DRIVE BELT TENSION

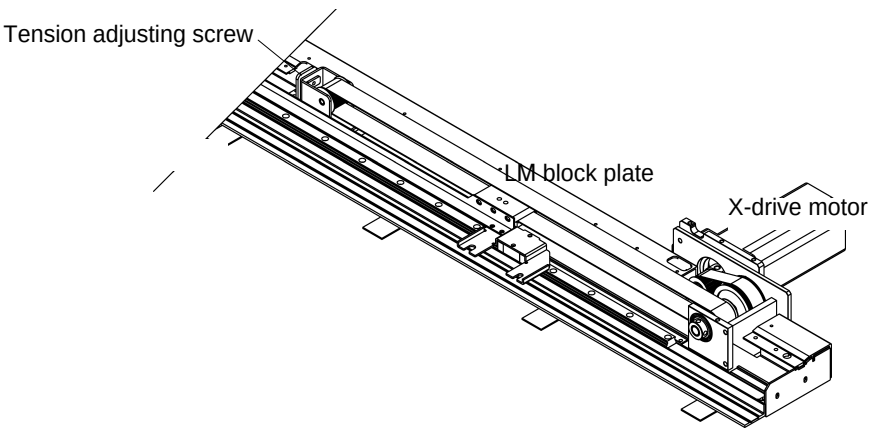
CAUTION	Turn OFF the main power when inspecting drive belt tension.

Too weak or too tight tension on the drive belt may cause machine malfunction or damages (abnormal wear-out of drive unit). Inspect the driver belt on a regular basis.

NO	Location for inspection	Inspection cycle	Reference
1	Belt on main shaft motor	Once in 3 months	① check belt tension ② check for belt crack ③ check for belt wear-out ④ check for bearing damage ⑤ check for wear-outs of rotating & sliding parts
2	Belt on main shaft motor	Once in 3 months	
3	Others	Once in 3 months	

[CAUTION]
Inspect the tension in the direction of the arrows in the picture below.

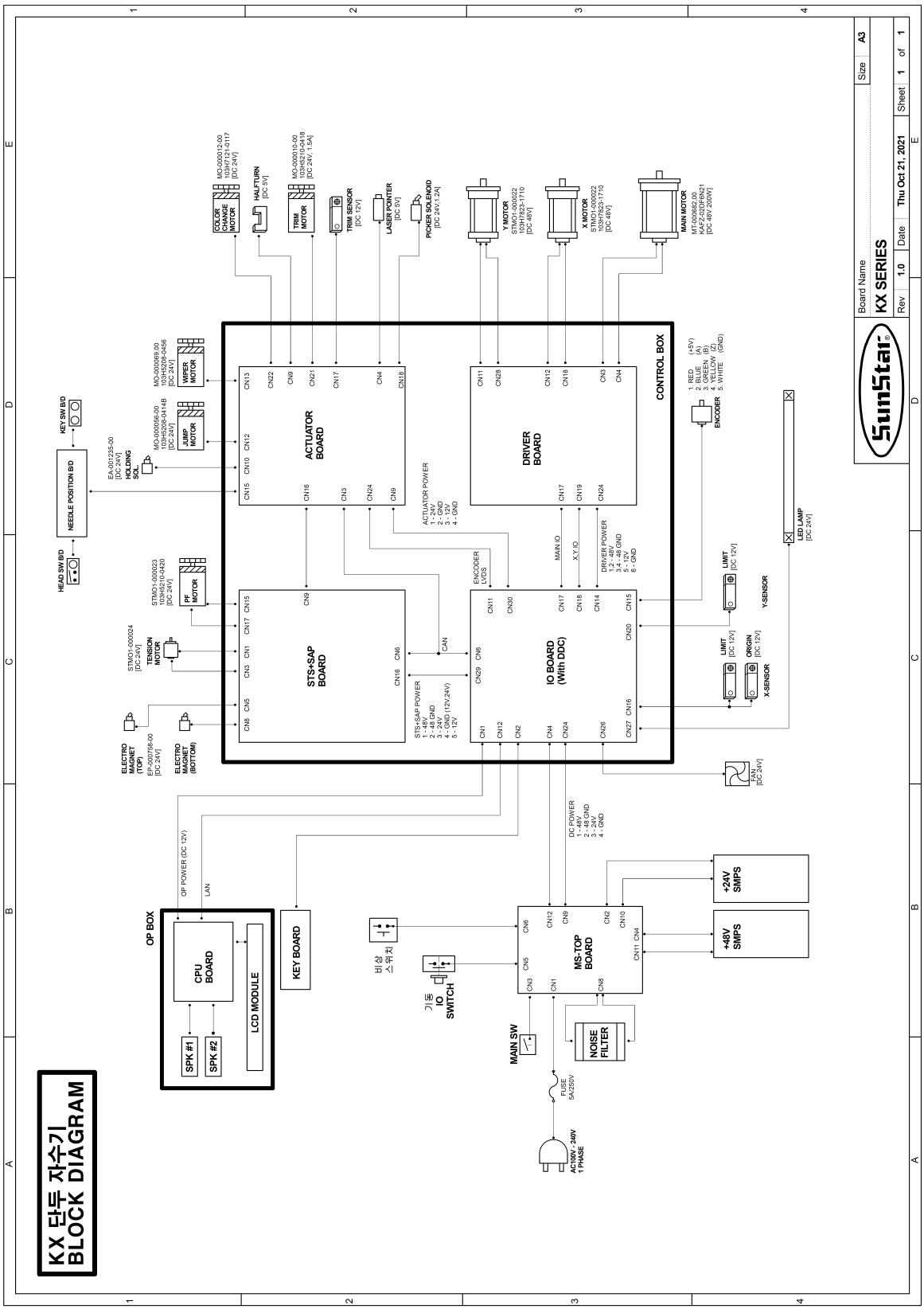




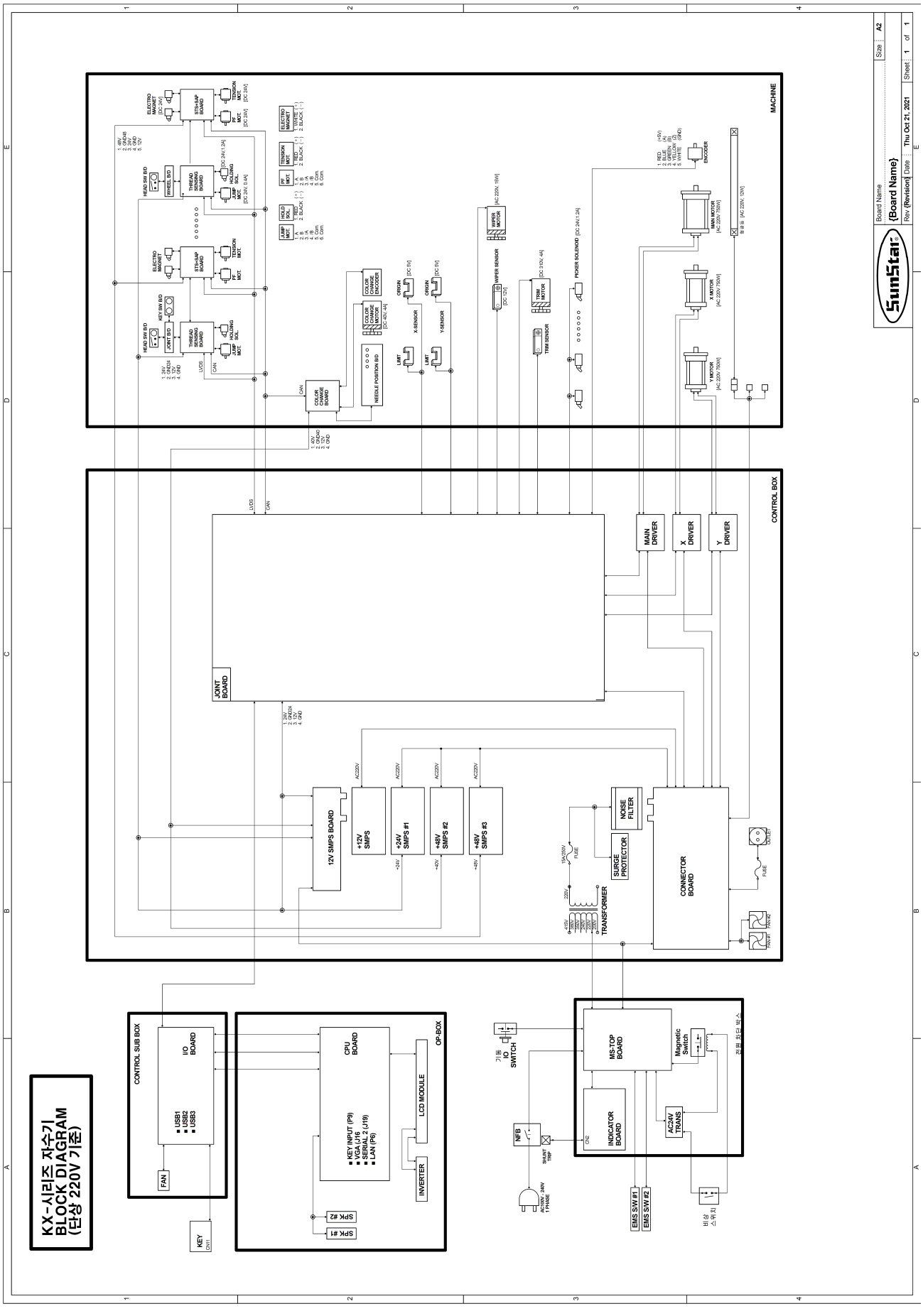
CHAPTER 6

BLOCK DIAGRAM

· KX−Single Head



· KX－Tubular


KX-시리즈 자수기
BLOCK DIAGRAM
(단상 220V 기준)
MACHINE
CONTROL BOX
CONTROL SUB BOX
OP-BOX
JOINT BOARD
I/O BOARD
CPU BOARD
LCD MODULE
INVERTER
FAN
KEY
SPK #1
SPK #2
12V SMPS BOARD
+12V SMPS
+24V SMPS #1
+48V SMPS #2
+48V SMPS #3
MAIN DRIVER
X DRIVER
Y DRIVER
NOISE FILTER
SURGE PROTECTOR
TRANSFORMER
CONNECTOR BOARD
MS-TOP BOARD
INDICATOR BOARD
Magnetic Switch
AC24V TRANS
NFB
IO SWITCH
EMS SW #1
EMS SW #2
COLOR CHANGE BOARD
NEEDLE POSITION BD
THREAD STAND BOARD
THREAD HANG BOARD
WHEEL BD
JOINT BD
KEY SW B/D
ELECTRO MAGNET
TENSION MOT.
PF MOT.
HOLD SOL.
JUMP MOT.
JUMP SOL.
HEAD SW B/D
COLOR CHANGE MOTOR
ORIGIN
X-SENSOR
Y-SENSOR
LIMIT
WIPER MOTOR
WIPER SENSOR
TRIM MOTOR
TRIM SENSOR
PICKER SOLENOID
ENCODER
MAIN MOTOR
X MOTOR
Y MOTOR
Board Name
{Board Name}
Rev {Revision}
Date
Thu Oct 21, 2021
Sheet 1 of 1
Size A2
SunStar