CBL Service Manual

Applicable for
CBL-901/1201/1501/1801/902/1202/1502/1802SC

Dongguan Baolun Computerized Embroidery Machinery Co.Ltd.

Contents

Chapter 1. Safe Operation, Key Parameters and Features

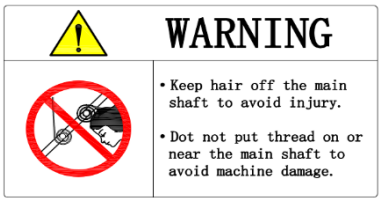
1.1. Safety Warnings and Precautions

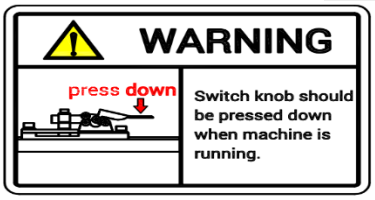
To prevent the risk of fire, electric shock or personal injury, the following basic safety precautions shall be observed all the time during operation of the machine.

Precautions for Transport and Handling	
⚠ Caution	Be sure to keep the machine moving smoothly during handling and transport; otherwise, the machine may overturn, causing damage to the machine or personal injuries.
⚠ Caution	Please strictly abide by the requirements and warnings marked on this product to ensure the safety of personnel and properties.
⚠ Compulsory	Overloading the product may cause it to collapse. Please load the machine based on the label on the outer packing case.
Precautions for Installation and Operation	
⊘ Prohibitory	The machine shall not be stored and operated in places with high humidity, dust, corrosive gas, strong magnetic interference, flammable and explosive gases; otherwise, electric shock, fire or machine failure may occur.
⚠ Caution	Please confirm that the power supply specifications are normal: Use a multimeter to measure and confirm the type of power supply, which should be consistent with the nominal data on the nameplate. Where the grid voltage fluctuations exceed -10%~+10% of the nominal voltage, a stabilized power supply with grounding (with a voltage stabilizer) must be used.
⚠ Caution	The machine shall be reliably connected to the ground wire, and the ground resistance must be less than 10 ohms.
⊘ Prohibitory	Do not touch any moving part when the machine is running; otherwise, personal injury may happen.
⚠ Danger	The machine shall not be operated with defective protective cover for moving part.

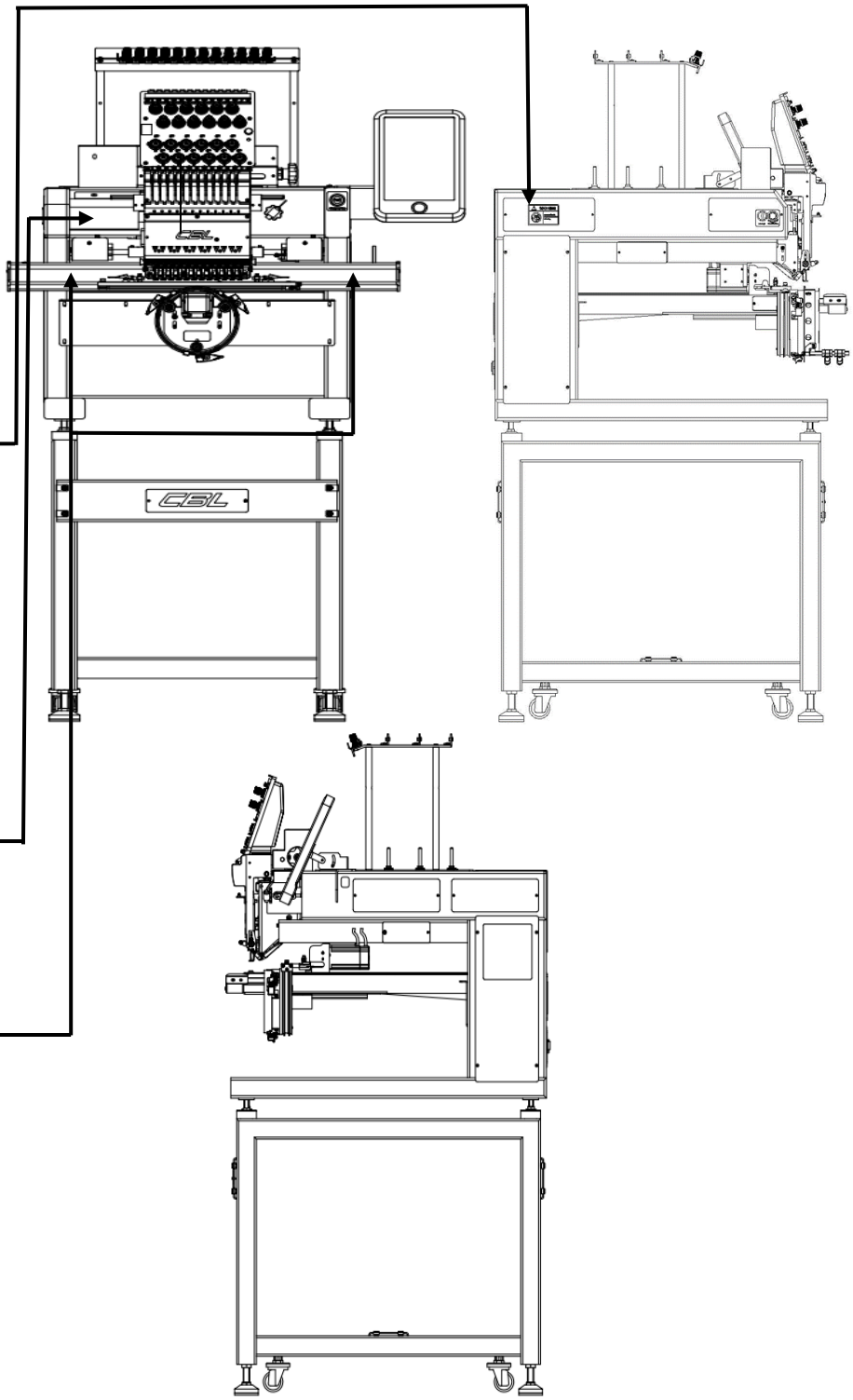
⚠Danger	It is forbidden to open the protective cover during operation of the machine; there are deadly high voltages or moving parts that may frequently cause accidental personal injuries at certain parts of the machine.
⚠Caution	The LCD screen is fragile. To guarantee the service life and normal display of screen, it's not allowable to poke at it with sharp or hard objects.
⚠Caution	Pay attention to the inserting orientation of the USB flash disk during operation. Do not apply force in case of wrong inserting orientation, since this may lead to the damage of USB port and USB flash disk.
⚠Caution	The power switch of this product is designed with overcurrent protection. If the overcurrent protection switch is activated, it must not be closed again within three minutes.
⚠Caution	In case of alarm, please eliminate the cause, ensure the safety, and reset the alarm before resuming operation.
⚠Caution	Please strictly abide by the requirements and warnings marked on the machine to ensure the safety of personnel and properties.
Precautions for Maintenance and Inspection	
⚠Warning	When it is really necessary to open the protective cover, the power supply should be switched off first. Even if the power supply is switched off, the DC capacitor is still dangerous, so it is only allowed to open the electric cabinet 1 minute after the power supply is switched off.
⚠Caution	Machines that are temporarily out of use shall be powered on regularly (once every 2 to 3 days recommended), and the duration of each power-on should be more than 1 hour.
⚠Caution	If the machine has not been used for a long time, professional technicians should be requested to perform inspection before the machine is powered on.

Warning Labels





Warning labels are affixed to the machine for safe operation. During operation of the machine, the labels' instructions should be strictly observed while the labels should be protected from falling off or being blocked by other objects.



1.2. Key Parameters

1.2.1. Maximum number of stored patterns: 500

1.2.2. Storage capacity: 200 million stitches

1.2.3. Display resolution: 1280*800

1.2.4. Network interface speed: 100 Mbps

1.2.5. Supported means of data exchange: USB flash disk, and network

1.2.6. Control accuracy: The minimum controllable stitch length is 0.1 mm

1.2.7. Range of stitch code: 0.1 mm ~ 12.7 mm

1.2.8. Input power supply voltage & frequency: AC100V~240V/50~60Hz

1.2.9. TOP STOP axis angle scale: 0°

1.2.10. LOWER STOP axis angle scale: 176°~178°

1.2.11. Needle-rotary hook sync. axis angle scale: 201°~203°

1.2.12. Main shaft speed: 250~1200 rpm

1.2.13. Pattern format: Tajima DST ternary; Barudan DSB binary

1.3. Key Features

1.3.1. User-friendly Touch Screen

Touch screen offers easier operation.

1.3.2. Ultra-large Pattern Storage Space

The pattern storage capacity on computer is 200 million stitches, which meet the requirements of various users.

1.3.3. Multiple Languages Supported

Languages as Chinese, English, Arabic, Spanish, Turkish, Russian, Portuguese, French, Thai, Italian, German, Dutch, and Polish are available.

1.3.4. Pattern Output

The patterns stored on computers can be output and stored on a USB disk. The Tajima ternary format is used as the pattern output format for the product. Patterns can be transferred directly via the Internet (some other formats cannot be directly transferred).

1.3.5. Automatic Pattern Generation

There are 26 types of English alphabet libraries, Arabic numeral libraries, and Chinese libraries in the system. Letters can be selected for combination according to needs, and various arrangements and scaling can be performed freely to automatically generate alphabet patterns, Arabic numeral patterns, Chinese patterns, portrait embroidery patterns, and signature embroidery patterns.

1.3.6. Automatic Speed Regulation

The maximum rotating speed of embroidery can be predefined, and the speed is automatically regulated with the change of stitch length during the embroidery operations.

1.3.7. Automatic Thread Trimming

Thread trimming can be manually controlled, and can be automatically performed at the end of embroidery or during color-change for embroidery.

1.3.8. Thread Break Detection

When the threads break or the base threads run out during embroidery, the machine automatically stops and lights up for alarm.

1.3.9. Automatic Color-Change

Colors can be manually switched at the color-change points; or alternatively, colors are switched in the predefined sequence automatically.

1.3.10. IR Positioning

When the embroidery is positioned on the frame, the IR positioning lamp indicates the stitch start point of current needle.

1.3.11. Ordinary Border Embroidery

Various border embroideries are available with dedicated frames for border embroidery.

1.3.12. Finished Cap Embroidery

Finished caps can be embroidered with dedicated embroidering requisites.

1.3.13. Garment Embroidery

Cylindrical garment can be embroidered with dedicated embroidering requisites.

1.3.14. Portrait Embroidery

When a head portrait is entered, the computer automatically generates the pattern; then, embroidery operation is available with appropriate red, yellow, blue, and black embroidery threads.

1.3.15. Ribbon Embroidery (Optional)

Ribbon can be embroidered with dedicated embroidering requisites.

1.3.16. Shoe Embroidery (Optional)

Shoes can be embroidered with dedicated embroidering requisites.

1.3.17. Safety Light Curtain (Optional)

When the hand reaches the areas where the machine head moves up and down during embroidery operation, the machine stops automatically.

1.3.18. Sequin Embroidery (Optional)

Sequin embroidery is available by mounting 1-, 2-, 3-, 4-, 5-, 6-, and 8-sequin devices.

1.3.19. Simple Cording Embroidery (Optional)

Cording embroidery is available by mounting a simple cording embroidery device.

1.3.20. Bead Embroidery (Optional)

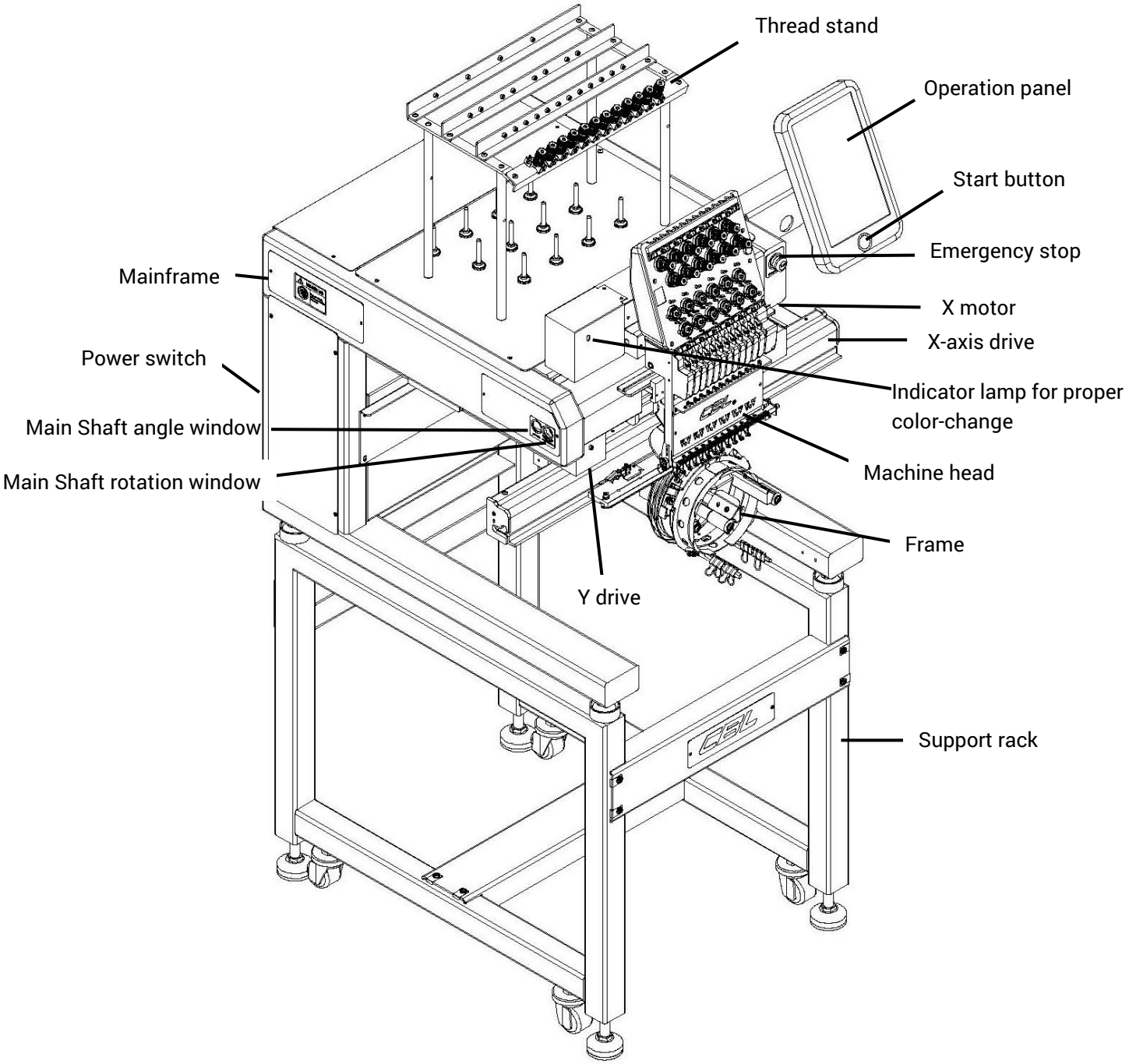
Bead embroidery is available by mounting a bead device.

1.3.21. Laser Embroidery (Optional)

Laser cutting or ablative embroidery is available by mounting a laser device.

Chapter 2. Installation and Debugging

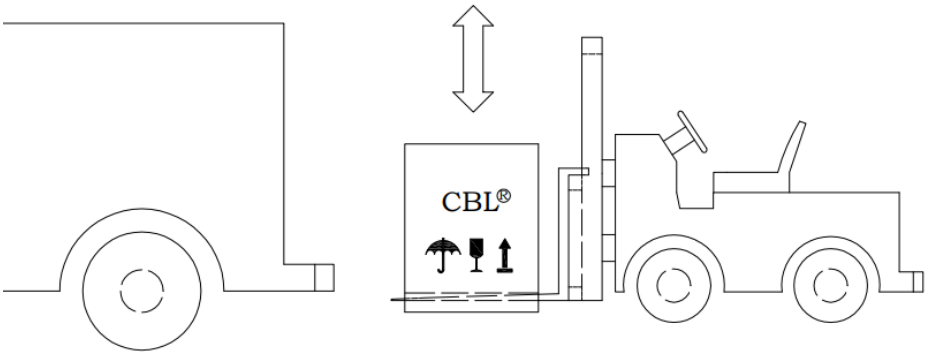
2.1. Structure Diagram



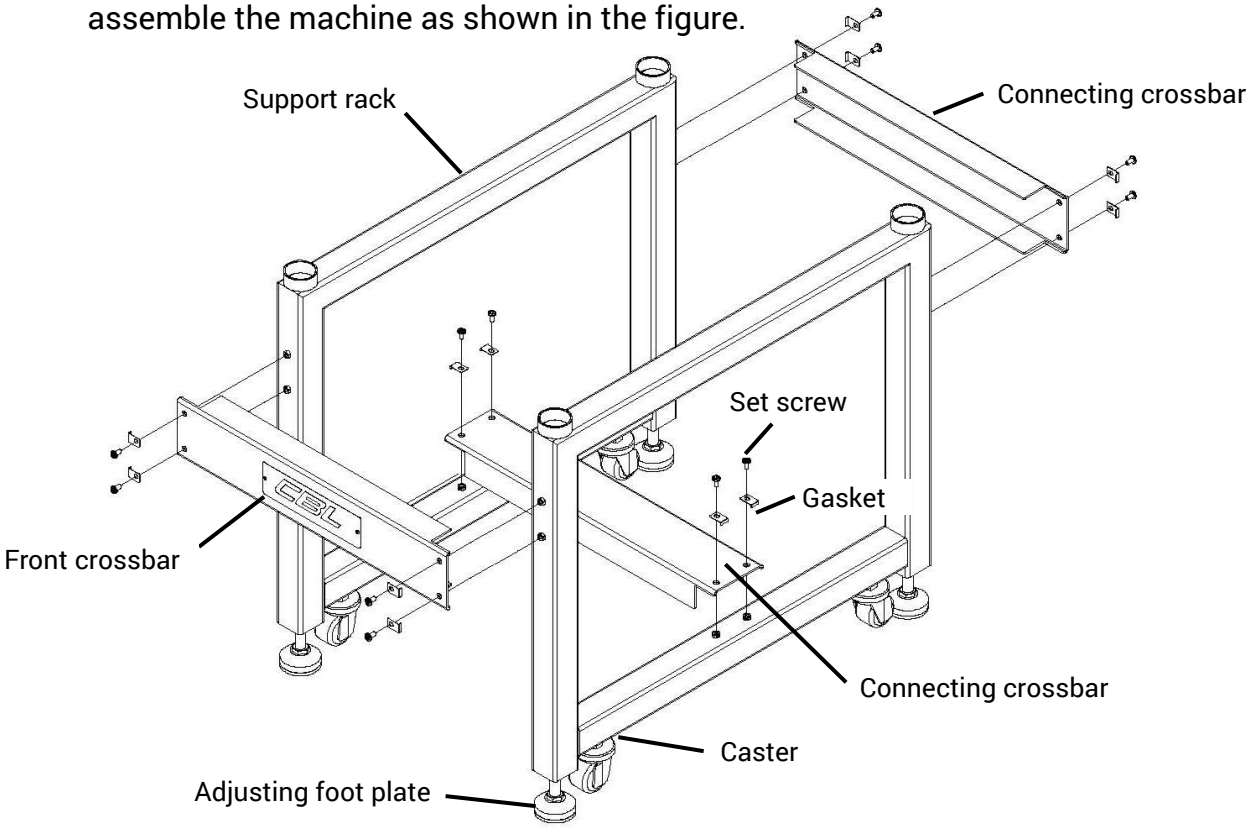
2.2. Assembly & Installation and Power-on Test of Machine

2.2.1. Machine Assembly and Installation

1. Use a forklift to move the wooden case containing the machine from the truck; the wooden case must be kept in balance during handling; avoid tilt, so as not to cause the machine in the wooden case to tip over and lead to an accident.

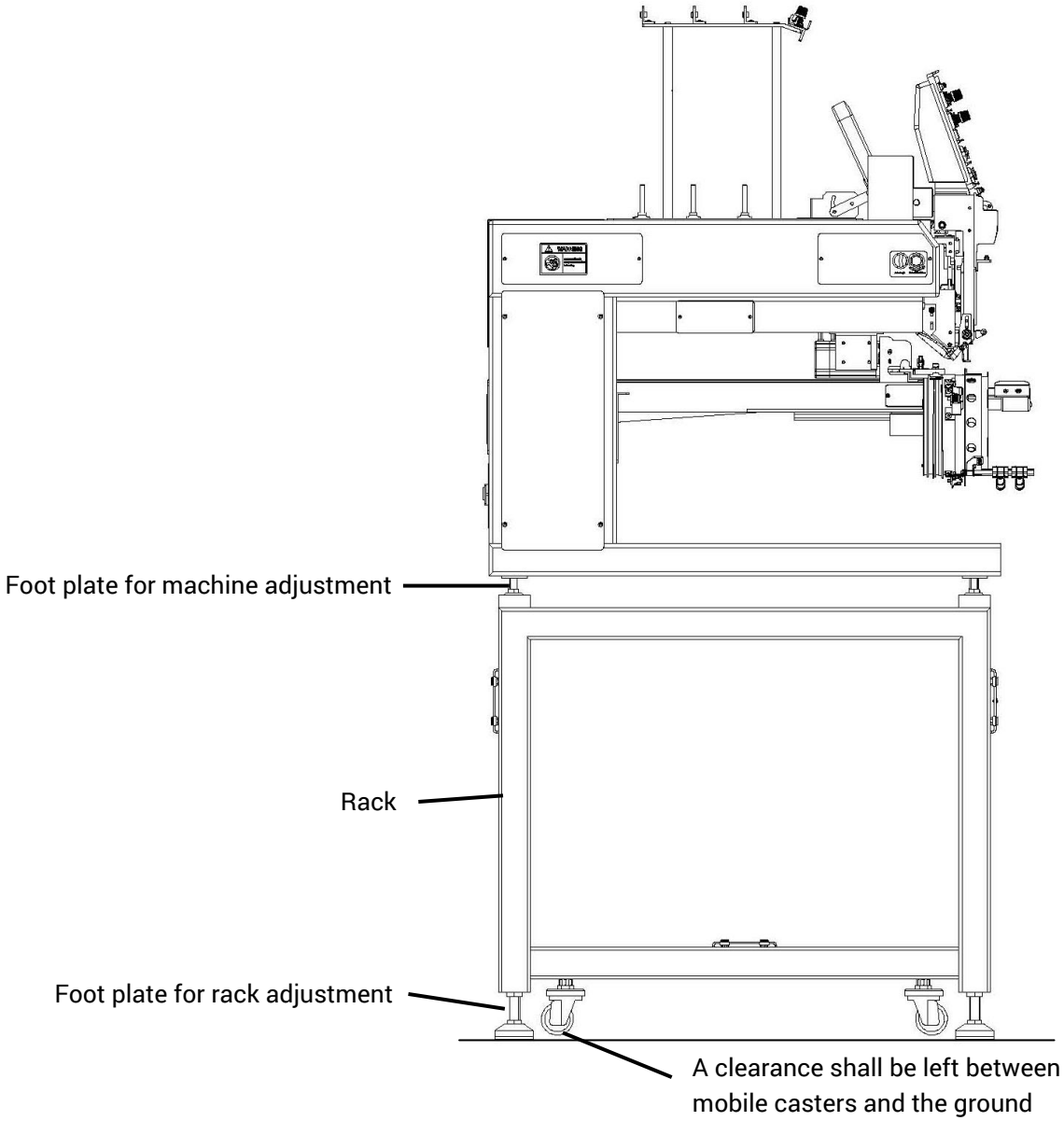


2. Open the packing case, take out the support rack accessories, and assemble the machine as shown in the figure.



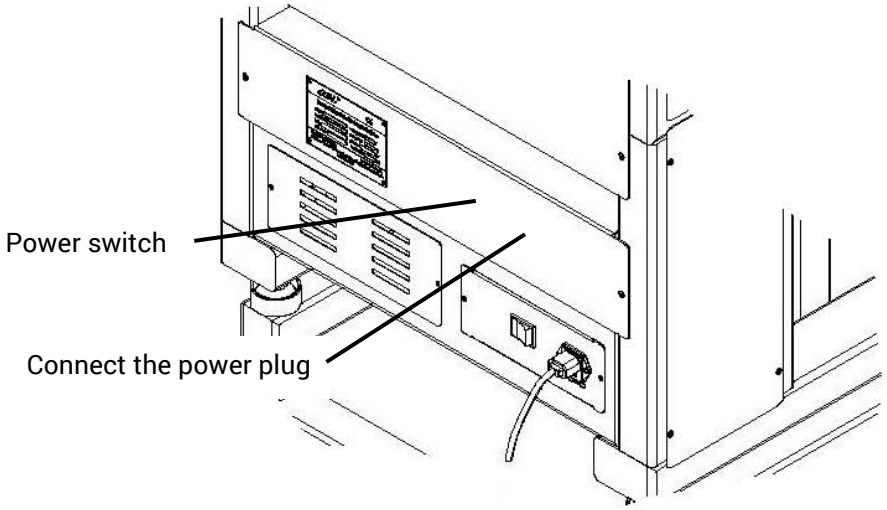
3. For the operational preparation, it's necessary to put the assembled rack at the desired position; adjust the 4 foot plates of rack until they reach the same level, and get the 4 casters off the ground to avoid machine vibration; put the machine body on the rack, and properly adjust the heights of the 4 foot plates on machine body so that they are evenly stressed on the rack. To move the machine, it's necessary to loosen the 4 foot plates for rack adjustment, get them off the ground, and have the casters come into contact with the ground.

Caution: The 4 casters shall be evenly stressed to prevent the machine from tilting so as to avoid personal injuries when the machine is being moved.

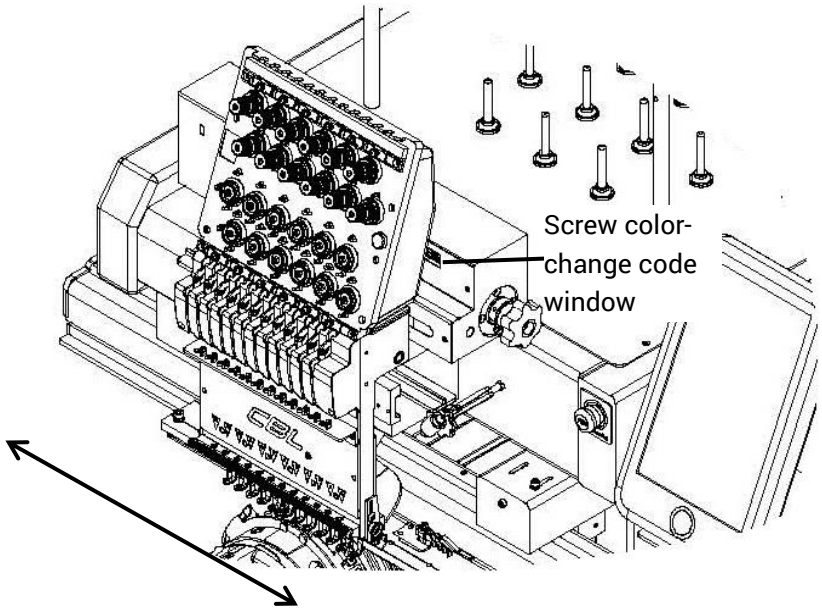


2.2.2. Power-on Debugging

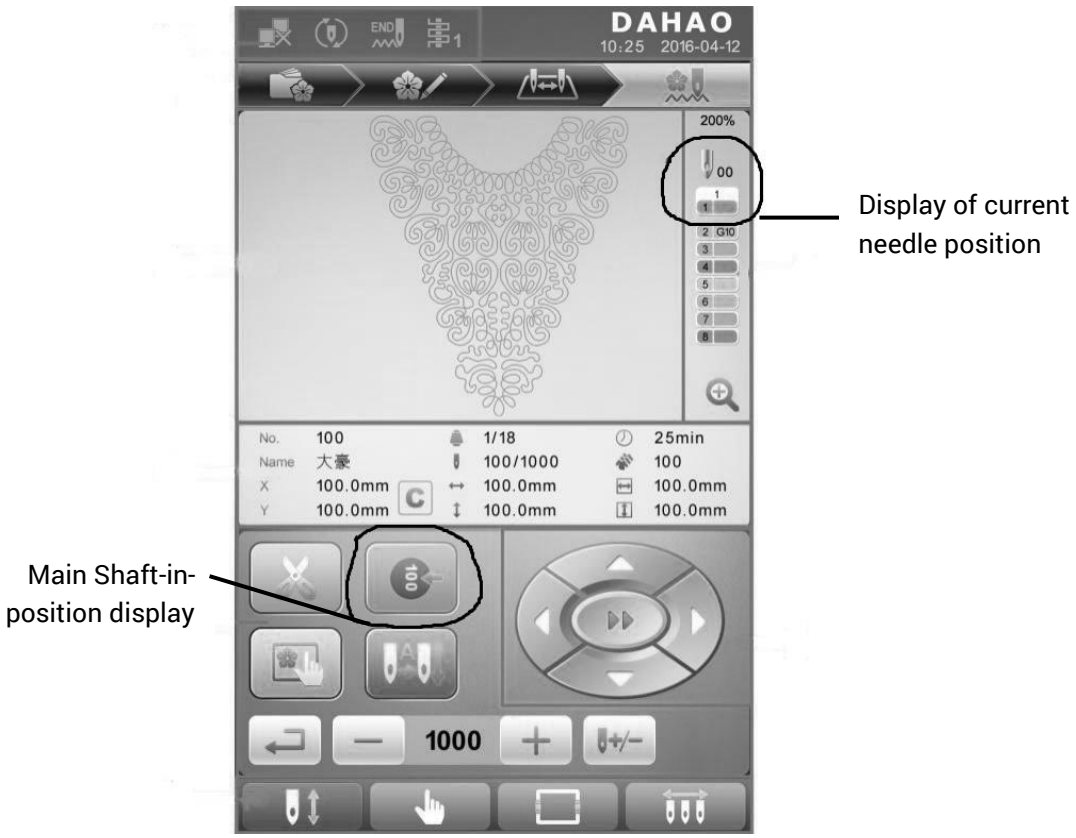
1. Ensure the machine is free of open circuit before connected to the power supply. It's essential to check whether the local grid voltage is suitable for the machine before plugging in power. The default single-phase voltage should be 100V~240V, which helps avoid damage to the machine! Properly connect the power plug, turn on the power switch, perform a power-on test for leakage check, and check whether the machine runs normally.



2. After the machine is powered up, the color-change motor automatically rotates to find the nearest current needle position, and rests on the found current needle position. The current needle position number shown on computer operating screen is identical with the number shown in the screw color-change code window.



3. View the main interface of screen to check whether the main shaft-100° is properly positioned, and whether the normal needle position is displayed.



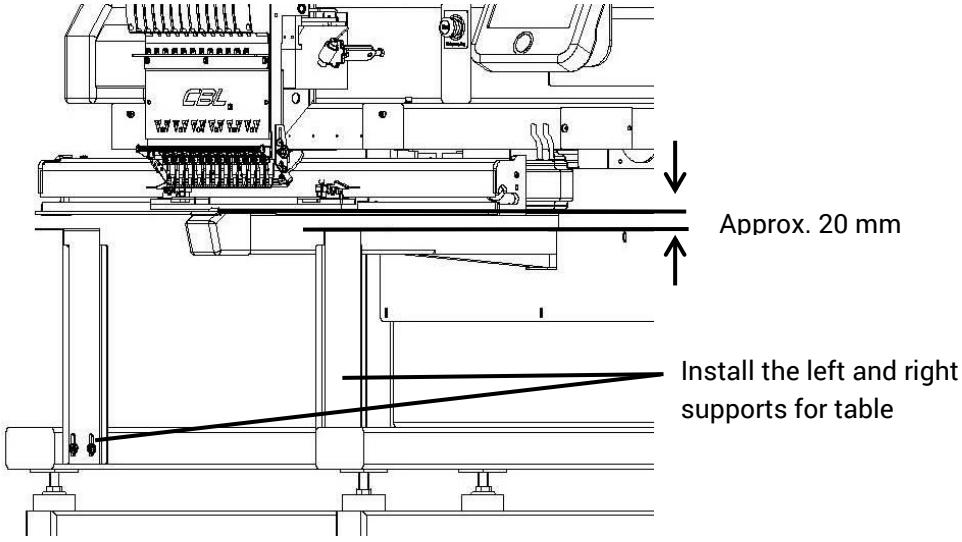
4. When the main shaft-100° is properly positioned on the main interface of screen, while the current needle position is displayed normally, the key should be pressed; press OK, when the main shaft will rotate by one revolution. Press , and the frame will move in the direction indicated by the arrow. Click and confirm to trim the base threads or only; choose a trimming method; when the main shaft rotates one revolution, the needle bar drops a stitch for thread trimming.

5. If the machine can perform above-noted actions properly, it will be regarded as a normal state, so preparation can be made for embroidery.

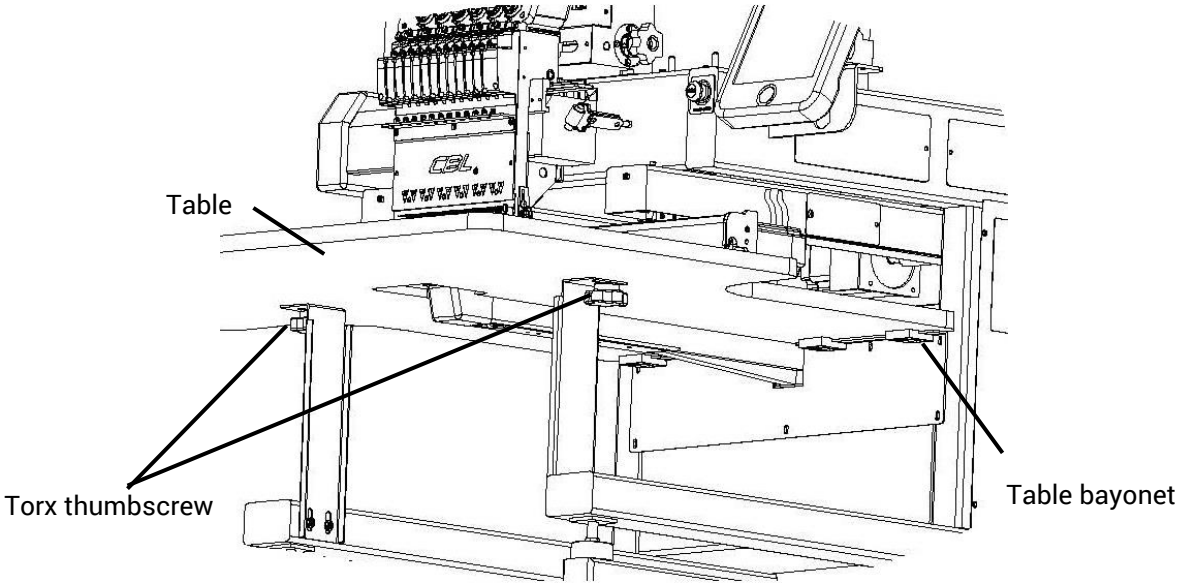
2.3 Installation of Frame

2.3.1. Installation of Border Frame

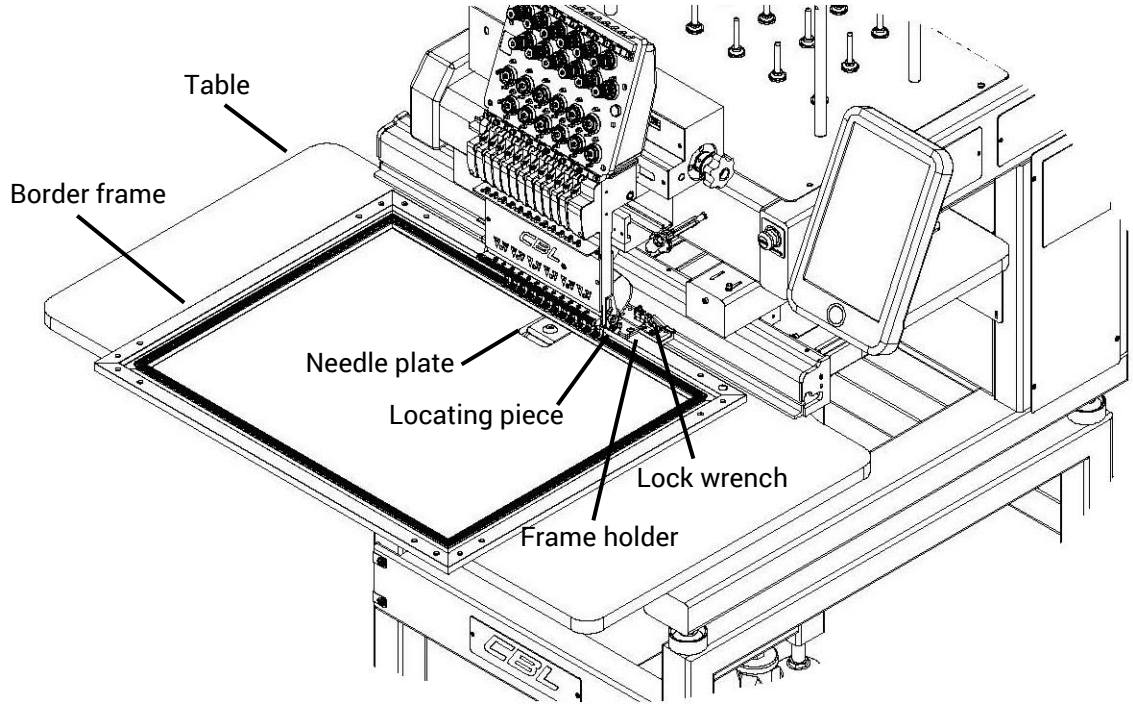
1. Fasten the left and right supports of table respectively to the inner side of machine legs on both sides of the main rack, as shown in the figure, so that the upper surface of support is approx. 20 mm away from the needle plate surface.



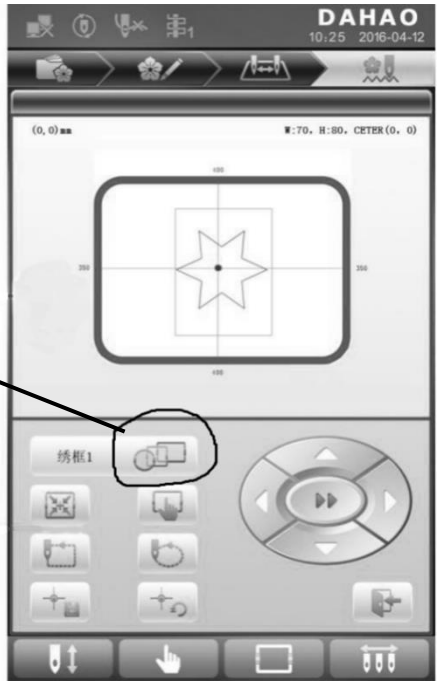
2. Put the table on the left and right supports and push it forward to the end so that the table bayonet grasps the iron plate behind; fasten the table with torx thumbscrews to the left and right supports.



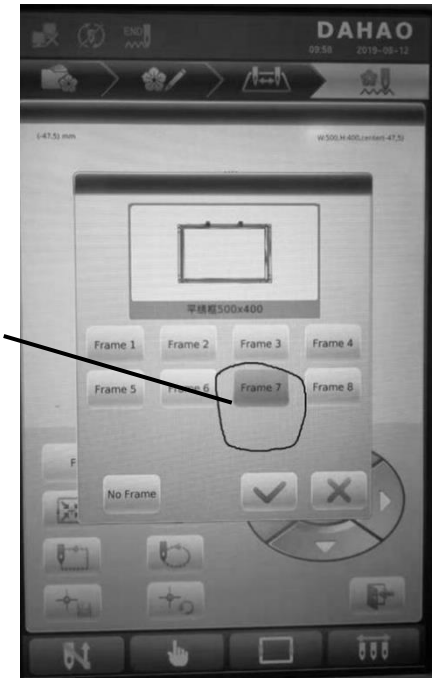
3. Finely adjust the heights of left and right supports to make the surface of table as high as that of the needle plate; put the border frame on table, insert the locating piece into the frame holder, and press the wrench to lock it up.



4. Power on the machine, click  on the main interface to enter the frame operation interface, click  to choose frame 7 (border frame), and click OK; then, the frame will move back & forth or to the left & right, and stop at the center of frame.



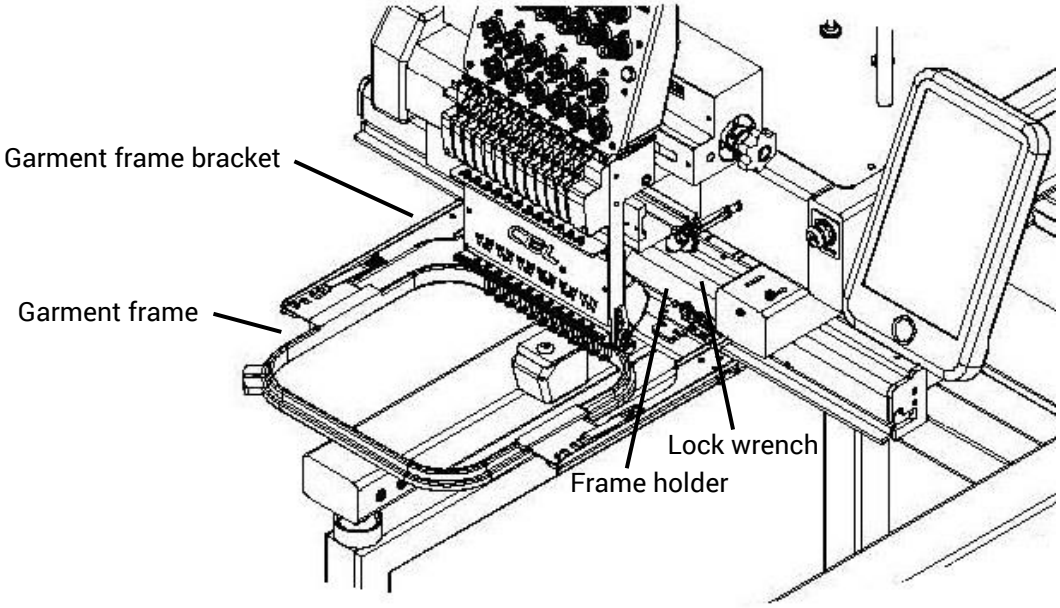
Frame Type Selection key



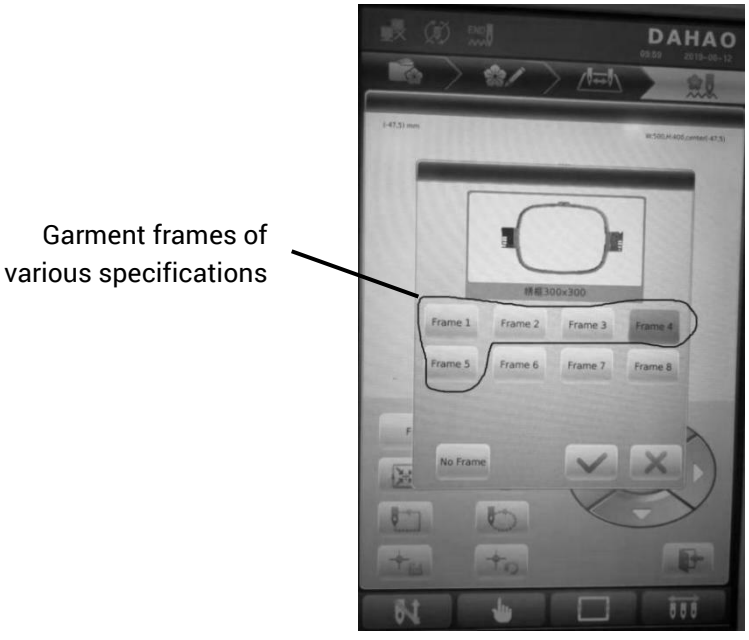
Frame 7

2.3.2. Installation of Garment Frame

1. Insert the locating piece on the garment frame bracket into the frame holder, press the wrench to lock it up, and then mount the needed garment frame on the bracket.

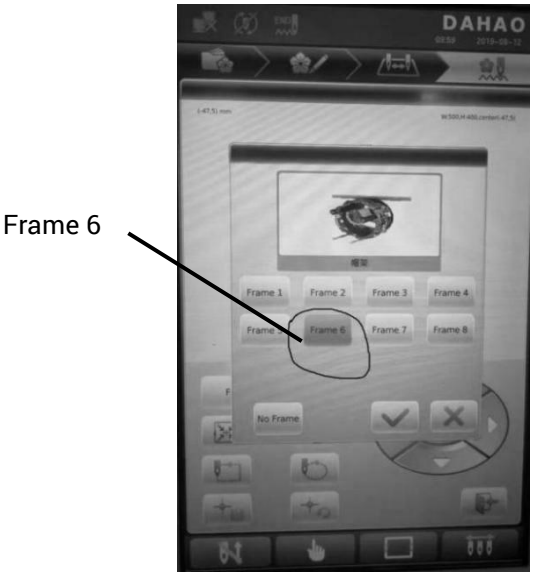


2. Power on the machine, and click on the main interface to get into the frame operation interface; click for frame selection, choose appropriate frames 1-5 (garment frames) depending on the model number of frame, and click OK; then, the frame will move back & forth or to the left & right, and stop at the center of frame.

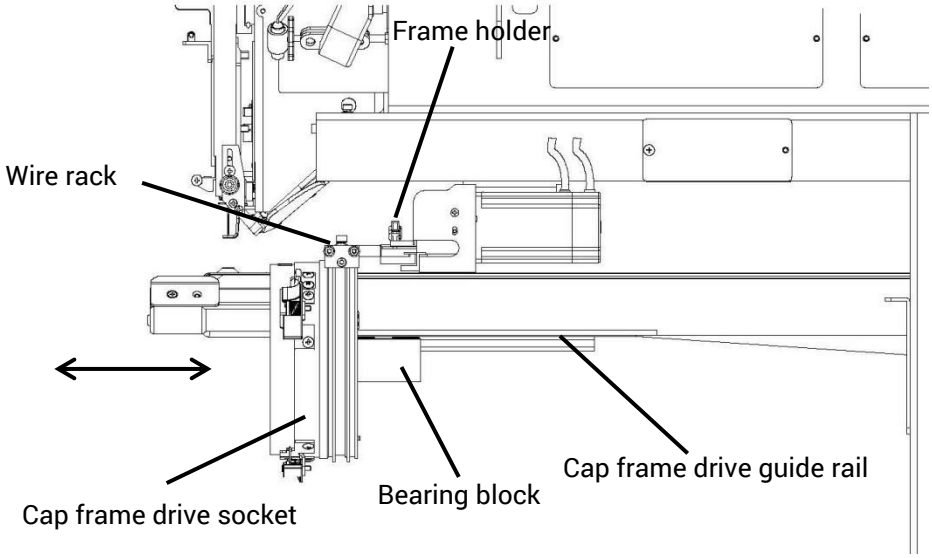


2.3.3. Installation of Cap Frame

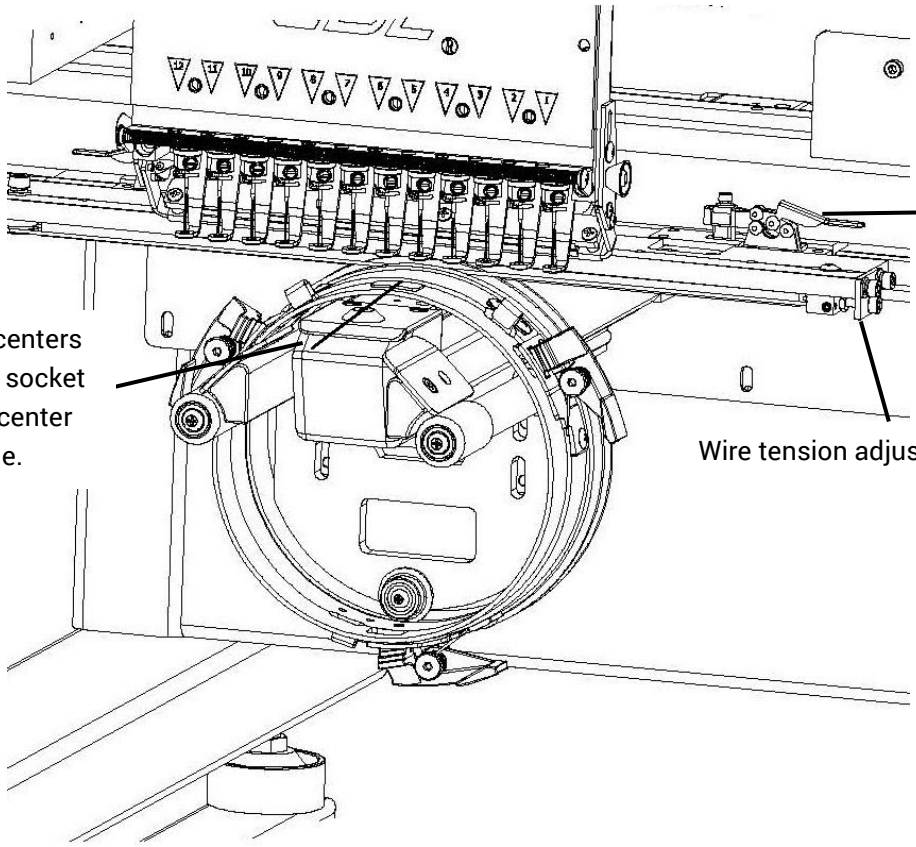
1. After the machine is powered up, click  on the main interface to enter the frame operation interface, click  to choose frame 6 (cap frame), and click OK; then, the XY drive will move back & forth or to the left & right, and then stop at the center of cap frame.



2. Attach the cap frame drive socket onto the rotary hook case in the direction of arrow, and fit the U-shaped bearing groove to the guide rail below rotary hook case, so that it can slide back and forth on the guide rail. Insert the locating piece on wire rack into the frame holder, and press the wrench to lock it up.



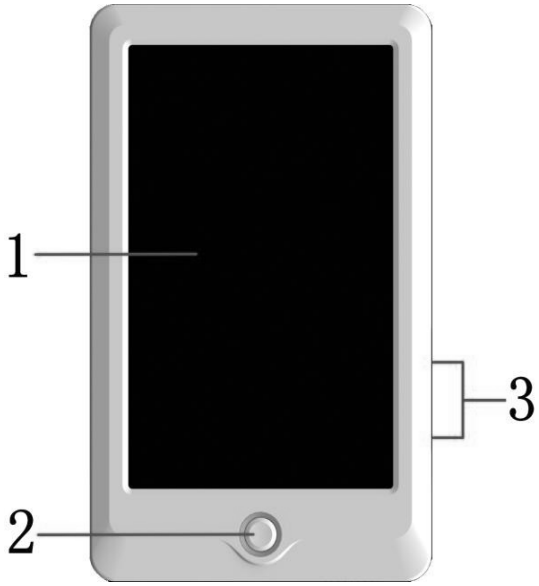
3. Check whether the left and right centers of cap frame drive socket are aligned with the center of needle plate hole; if they are not in the same straight line, it's necessary to loosen the wire tension adjusting screw on wire rack, rotate the left and right centers of cap frame drive socket until they are aligned with the center of needle plate hole, and tension the wire rope (note that the wire rope tension should be moderate; inadequately tensioned wire rope may cause the embroidery to run off position, and excessively tensioned wire rope may cause the drive resistance to increase, which may frequently lead to the wear of wire rope).



Chapter 3. Embroidery Operation

3.1. Structure and Operating Instructions of Control Box

3.1.1. Structure of Control Box



1. Touch screen

   This machine is designed with a touch screen operation interface.

2. Operating buttons (Start; Stop)

   When the button is pressed in the embroidery confirmation state, the machine is started for embroidery; when the button is pressed during embroidery operation, the machine stops.

3. USB port

   The data can be imported and exported with a USB flash disk.

3.1.2. Operating Instructions for Touch Screen

The present model uses touch screen as input device; to ensure the service life and performance of touch screen, overexertion shall be avoided during operation, and the screen should never be hit with sharp and hard objects.

3.1.3. Operating Instructions for USB Disk

1. Take particular care of electrostatic prevention when using the USB disk. Please touch the metal rack or frame by hand for discharge before plugging and unplugging the USB disk.

2. The USB disk is directional when inserted. Avoid unplugging the USB flash disk suddenly when writing data; the unplugging of USB disk during writing or sudden power-off may cause data loss; it's essential to check the integrity of the USB disk data on the computer, and repair the data before resumption.

Caution: Sudden power failure or removal of the USB disk during the formatting may cause the USB disk to be unusable.

3.2. Description of Operation Interface for Electric System

Operation interfaces of the electric system are principally classified into "main operation interface", "stored pattern management interface", "pattern parameter setup interface", and "needle bar color-change sequence setup interface".

Each operation interface comprises various functional areas; the "main operation interface" comprises operation contents of "Chapter 4. Auxiliary Features", "Chapter 5. Other Features", and "Chapter 6. Embroidery Parameters Setup";

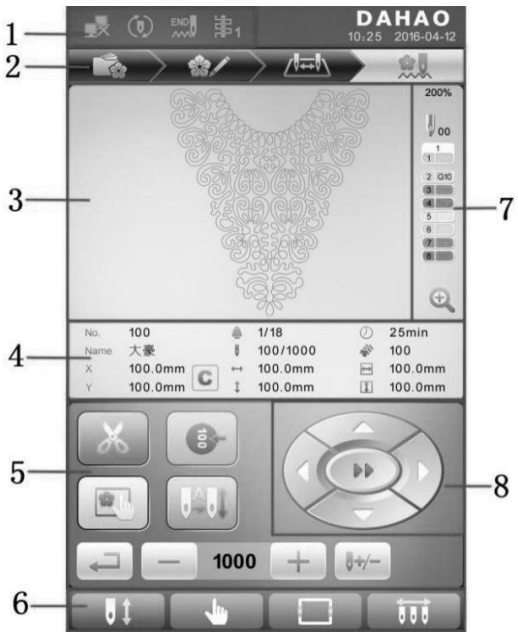
The "stored pattern management interface" contains concrete operation contents of "Chapter 7. Stored Pattern Management";

The "pattern parameter setup interface" contains concrete operation contents of "Chapter 8. Pattern Parameters Setup";

The "needle bar color-change sequence setup interface" contains concrete operation contents of "Chapter 9. Instructions for Needle Bar Color-Change Sequence Setup".

3.2.1. Main Operation Interface

Refer to Chapter 4, Chapter 5, and Chapter 6 for detailed description of the features.



Number	Display	Name	Description
1		Network connection failed	Network state (disconnected; connected; registered successfully)
		Cycle embroidery prompt	The machine incorporates cycle embroidery. The settings for cycle embroidery can be modified by clicking user parameter or expert parameter to get into the parameter setup interface.
		Thread break prompt	This state is displayed when the machine stops running with thread break.
2		Stored Pattern Management	"Stored pattern management" interface
		Parameter setup	"Parameter setup" interface
		Needle bar color-change sequence setup	"Needle bar color-change sequence setup" interface
		Main operation interface	Main operation interface

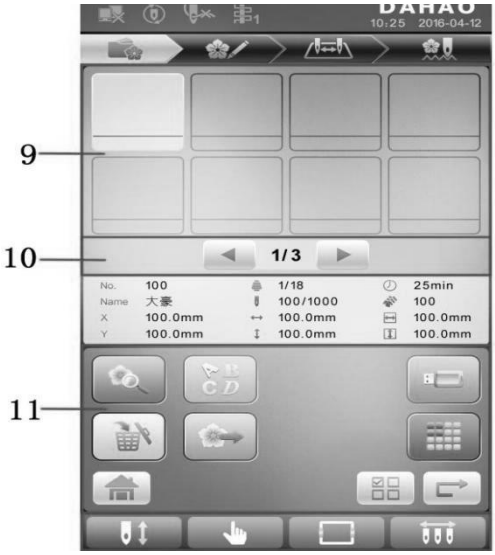
Number	Display	Name	Description
3		Pattern display area	This area shows embroidery pattern.
4		General information on pattern	Show general information on current pattern.
		XY displacement clearing	It's used to clear the current X and Y displacement values of the system.
5		Manual Trimming	Manual trimming can be performed by clicking on this key after machine shutdown. (Including the trimming of base threads)
		Main Shaft Jog	If the main shaft is not in place after shutdown,  It can be brought into place by clicking  .
		Selection and Position of Frame	Selection and Position of Frame
		Automatic color-change; automatic start	If the machine is set to "automatic color-change", the needle bar color-change sequence shall be defined before embroidery operation. If the Start key is pressed to start the embroidery operation, the needles will be switched in the automatic color-change sequence before embroidery, whatever needle position is the current needle bar resting at. When a color-change code is encountered during embroidery operation, the machine automatically stops; the needles will automatically go to the specified positions based on the automatic color-change sequence. If automatic start is activated here, the machine will start embroidering automatically; if manual start is activated, the embroidery operation will be started by clicking the Start key by the operator.
		Manual color-change and manual start	Before embroidering starts in this state, it's necessary to manually change the color (), choose the needle position, and click the Start key for the embroidery operation.

Number	Display	Name	Description
			When a color-change code is encountered during embroidery operation, the machine automatically stops; the color-change icon appears, while the machine waits for manual color-change. Here, the operator needs to change the needle manually ( ). After the desired needle position is achieved, click Start key to start embroidery operation (manual start).
5		Previous	Go to the previous operation interface.
		Main Shaft speed-up, and main shaft speed-down	Used for the main shaft speed-up and speed-down setup of embroidery machine: This key is of no effect after the main shaft reaches its max. or min. rotation speed.
		Idle	According to the user's requirements, the machine does not perform embroidery operation and moves the frame to a designated position.
6		State of preparation, and readiness confirmation	In the embroidery preparation state, all kinds of preparations (e.g., selection of embroidery pattern, and setup of scale and repetition parameters) are available for embroidery. Click this key and click OK, and the machine will go from embroidery preparation state to embroidery confirmation state .
		Embroidery confirmation state; readiness cancelled	The machine is in embroidery confirmation state, where the Start key can be clicked at any time to start the embroidery operation. Click this key at stop and click OK, and the machine will cancel the embroidery confirmation state, and will return from embroidery confirmation state to embroidery preparation state .
6		Operation of Other Features	Click to enter the operation interface of other features, including statistical query, frame origin setup, user parameter setup, and language setup.

Number	Display	Name	Description
			power failure recovery, soft limit setup, machine permission management, touch screen calibration, time management, etc.
		Manual color-change	The click action is effective when the machine is stopped and the main shaft-100° is properly positioned; then, go to the manual color-change interface, and click on the corresponding needle position number for color-change.
7		Current needle position	The number indicates current actual needle position. Number 0 indicates invalid needle position.
		The number of current color-change cycles	The initial numerical value is 1; this value increases by 1 upon every successful cycle of color-change after the embroidery is started.
		Color-change sequence	This numerical sequence represents the needle bar sequence for color-change; the stereo-icon indicates the needle position of current embroidery operation.
		Pattern magnification;	Enlarge the pattern design in the pattern preview display area. Press and hold for 2s to activate pattern minification;
8		Manual frame movement	The frame travel direction is consistent with the panel direction key during operation.

3.2.2. Description of Stored Pattern Management Interface

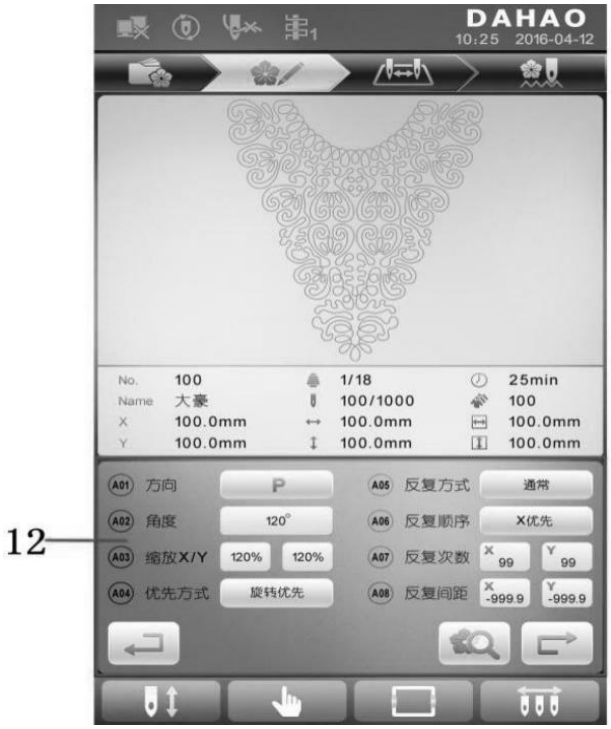
Refer to Chapter 7 for detailed description of the features.



Number	Display	Name	Description
9		Pattern list	The pattern files in the memory are displayed through icons so that appropriate files can be selected.
10		To previous page; to next page	Stored patterns are displayed in different pages.
11		Pattern preview	Pattern details can be viewed; patterns can be zoomed in, zoomed out, moved or analog-displayed.
		Letter pattern operation	alphabet embroidery pattern and parameter setup.
		Delete pattern	Delete the chosen pattern.
		Pattern output	The patterns in memory can be exported into a USB disk.
		Go back to the main interface	
		USB flash disk management	Enter the USB flash disk management interface, where the USB disk is subjected to related operations.
		Other features	Click to open other operation windows of stored pattern, where the patterns can be copied, deleted, combined and edited.
		Single selection/multiple selection switching	Switch between the single-selection mode and multi-selection mode.
		Next	Go to the next-step operation interface.

3.2.3. Description of Pattern Parameter Setup Interface

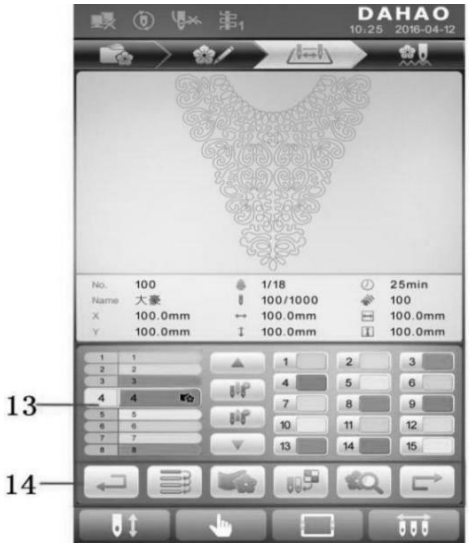
Refer to Chapter 8 for detailed description of the features.



Number	Display	Name	Description
12		Common parameters setup	Users are allowed to control the final embroidery operation result of patterns by adjusting these parameters.
		Pattern preview	Read the selected patterns, show the pattern information, and draw the pattern icon.

3.2.4. Description of Needle Bar Color-Change Sequence Setup Interface

Refer to Chapter 9 for detailed description of the features.

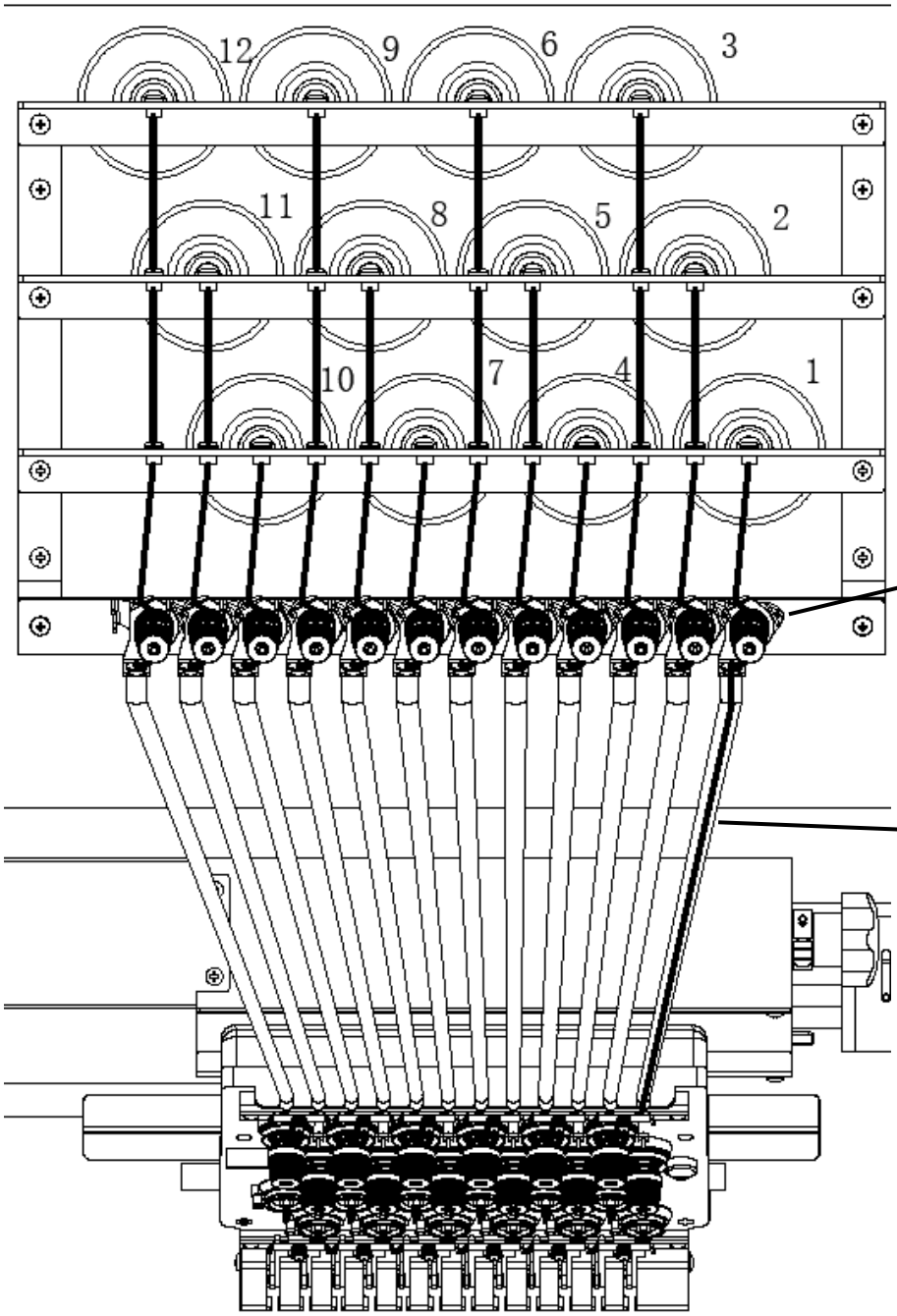


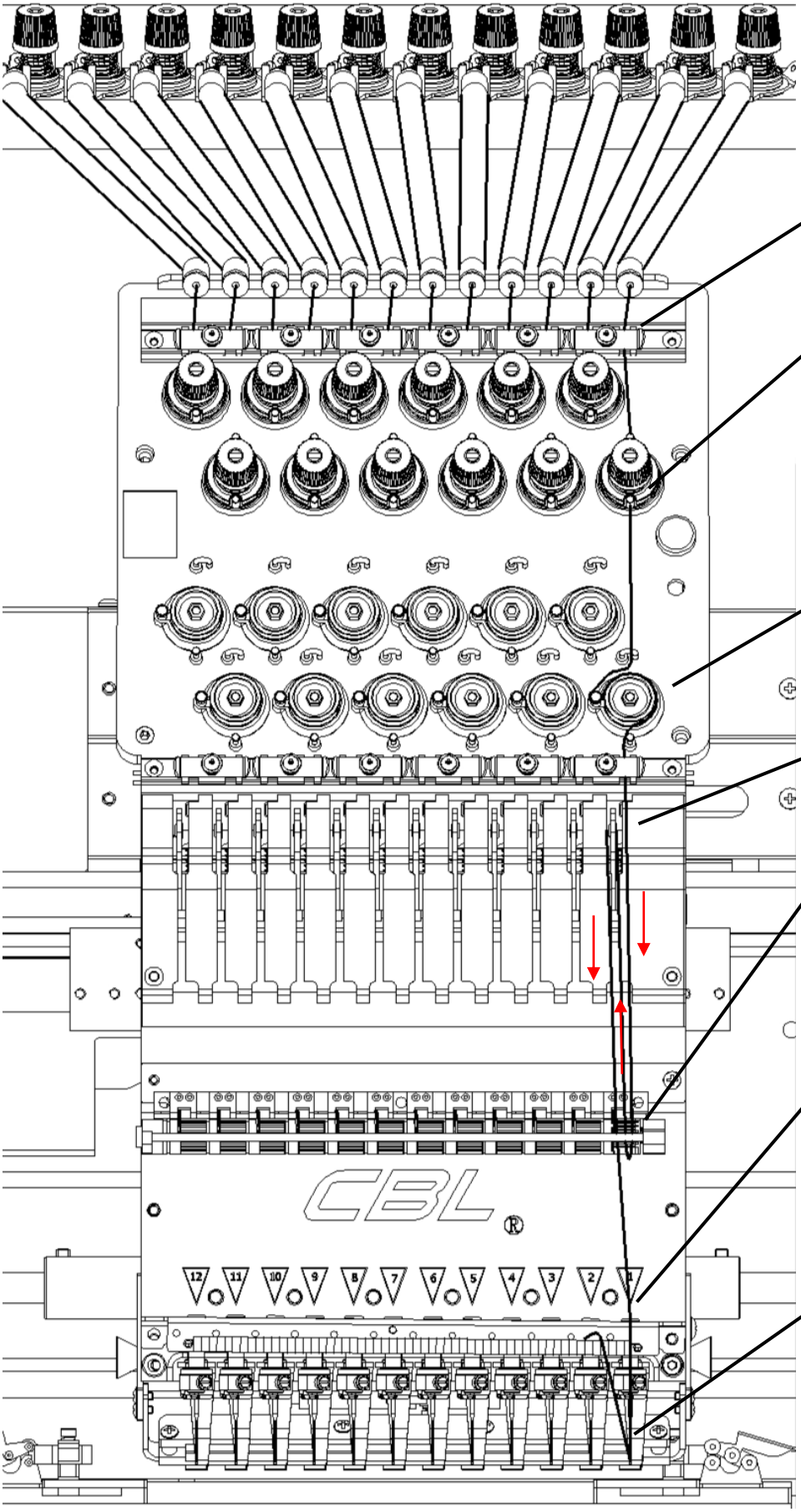
Number	Display	Name	Description
13		Current operating position	Needle bar number can be set, inserted or deleted at this position.
		Color block number list	Indicating the serial number of each color block in the pattern.
		Needle bar number and color	Show the needle bar number and embroidery thread color corresponding to each color block in pattern.
		Shift-up button	Shift up the color-change list to choose the color block to be set up.
		Insert the needle bar number	Click this key and then click on the needle bar number, when a needle bar number is inserted into the current needle bar number list.
		Delete needle bar number	Delete the needle bar number for current operating position from the needle bar number list.
		Shift-down button	Shift down the color-change list to choose the color block to be set up.
		Needle bar number color selection area	Choose the needle bar number color to be set here.
14		Repeat	Repeated color-change sequence
		Applique	Set to applique pattern
		Needle bar color setup	Set each needle bar color by choosing colors from the default ones.

3.3. Basic Operation of Embroidery

3.3.1. Preparation for Embroidery

1. Installation of Upper threads





The upper thread passes below the crimping tabs.

The upper thread passes through the left side of the upper and lower nails, the right side of the pillar, and the middle of the two crimping tabs.

The upper thread goes around 3/4 of the wheel.

The upper thread passes through the hole of take-up lever.

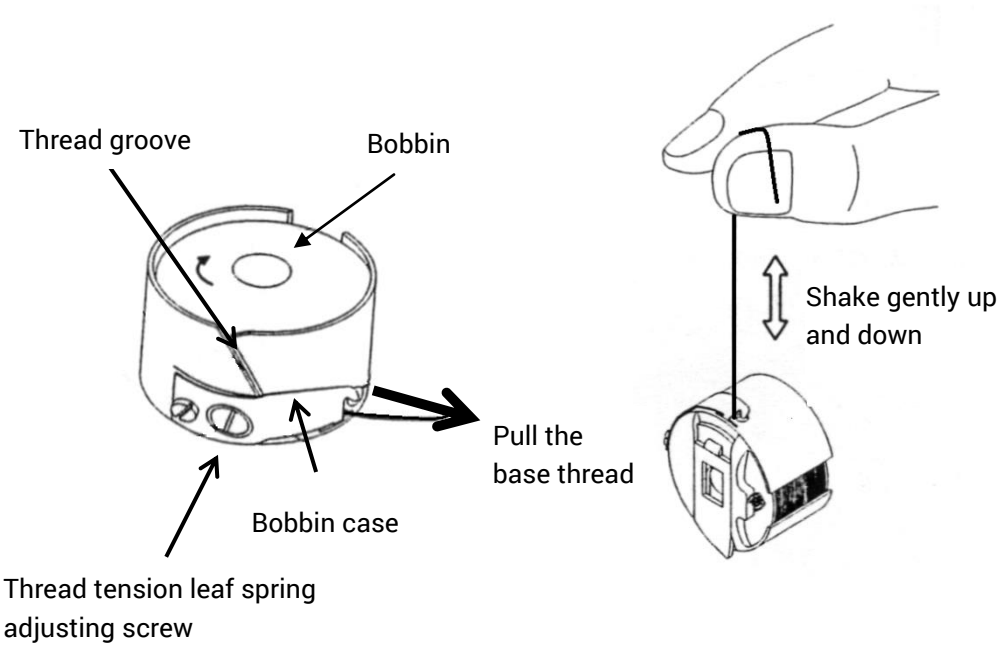
The upper thread passes through the take-up spring and then goes up.

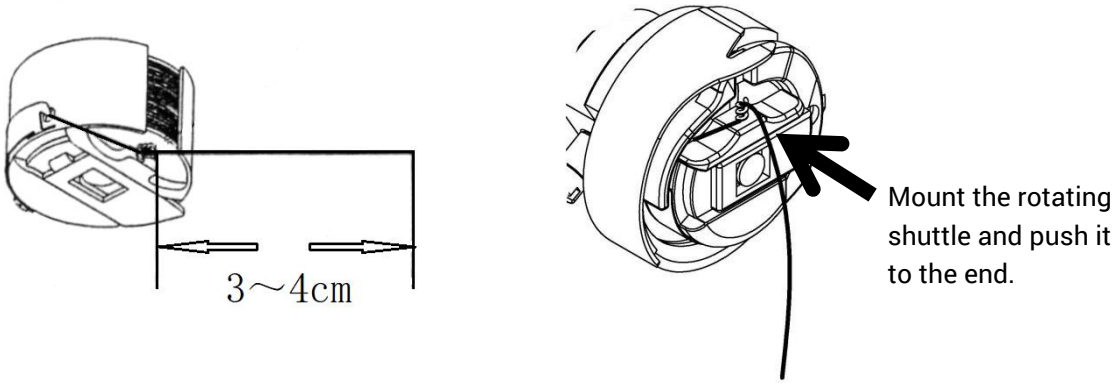
The upper thread passes through the thole and the space between clamping block and groove.

The thread end is clipped to the spring after the upper thread passes through the pinhole from front to the back.

2. Installation of Based Thread

Mount the bobbin into the bobbin case; lead the thread end through the thread groove and put it out below the leaf spring; pull the thread end and check whether the rotation direction of bobbin is identical with the rotating direction of rotary hook, as shown in the figure below. Pinch the thread end with the hand and gently shake it up and down so that the bobbin case and bobbin slide down together by gravity; if they slide too fast or fail to slide, the leaf spring tension must be readjusted so that the thread end goes around the thread hook with a 3~4 cm-long piece of thread end left; put the bobbin case into the hook and press it all the way to the end; when a click is heard, it means the base thread has been properly fitted.

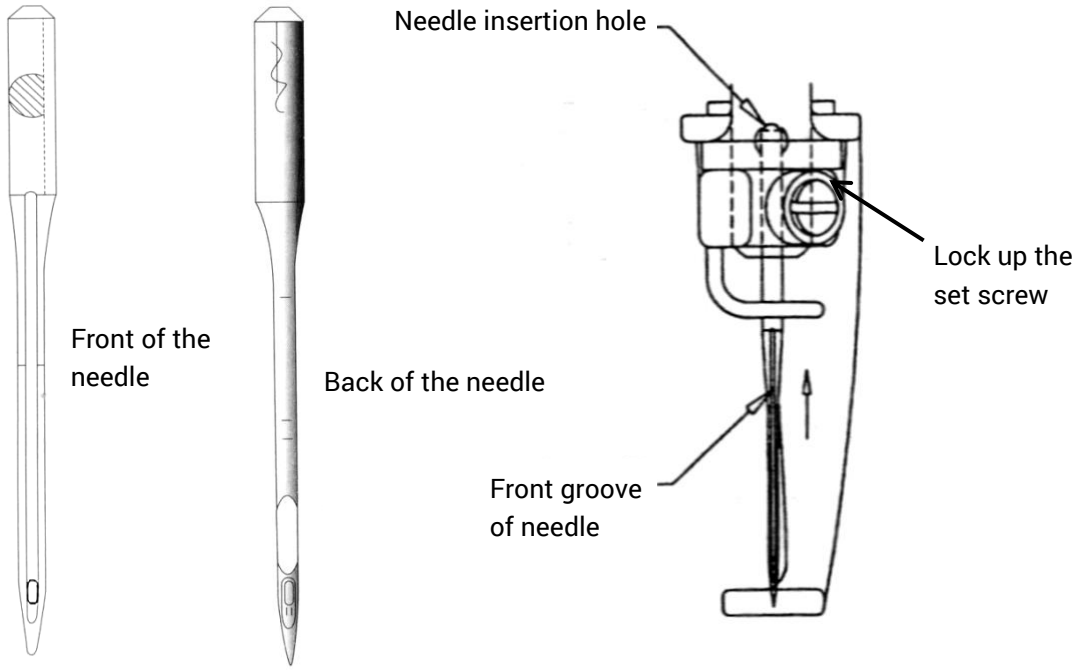




3. Installation of Needle

Needle may be changed from time to time as needed during embroidery operation. Check the appropriate model number of needle (the factory configuration model number is normally DB×K5, 75/11) before needle change; identify the front and back sides of needle before its installation, align the grooved front side of needle to the front of machine, insert the needle handle into the needle bar hole, and push the needle up to the end of the hole, before locking up the set screws.

Note: Where a needle of a model number that is different from the factory configuration model number is used, it's necessary to readjust the clearance between rotary hook and needle.



4. Needle Bar TOP STOP and LOWER STOP Adjustment

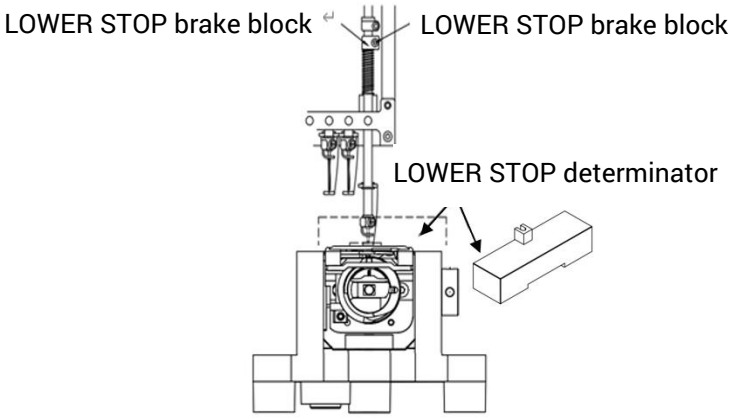
4-1. Needle Bar LOWER STOP Adjustment

When the needle is located at the LOWER STOP, it should be possible for the needle to show half or all of the needle eye through the insert portion of rotary hook.

The LOWER STOP of needle bar is the lowest point formed by the needle bar in descent. Since it's the important synchronization time between the needle and rotary hook, it's essential to accurately set the TOP STOP and LOWER STOP positions. No adjustment is needed under normal circumstances, but if the LOWER STOP of needle bar changes, an adjustment should be made in the following order:

A. Loosen the front needle plate screws, lift up the needle plate, and use a socket wrench to set the main shaft angle to 178°;

B. Install a LOWER STOP determinator as shown in the figure; press the needle bar to the lowest point, loosen the needle bar LOWER STOP brake block screws, and tighten the screws when the LOWER STOP determinator is just in contact with the bottom of the needle bar.

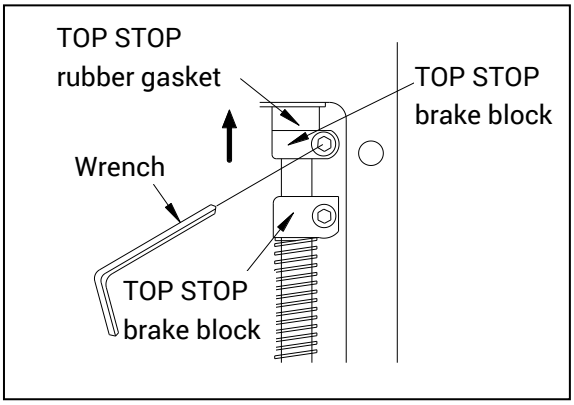


Note: The LOWER STOP determinator shall be used with the DB×K5 #11 needle and the standard original needle bar. Needles of other specifications and non-standard needle bars shall in no case be used.

4-2. Needle Bar TOP STOP Adjustment

The TOP STOP of needle bar needs to be readjusted after the adjustment of needle bar LOWER STOP.

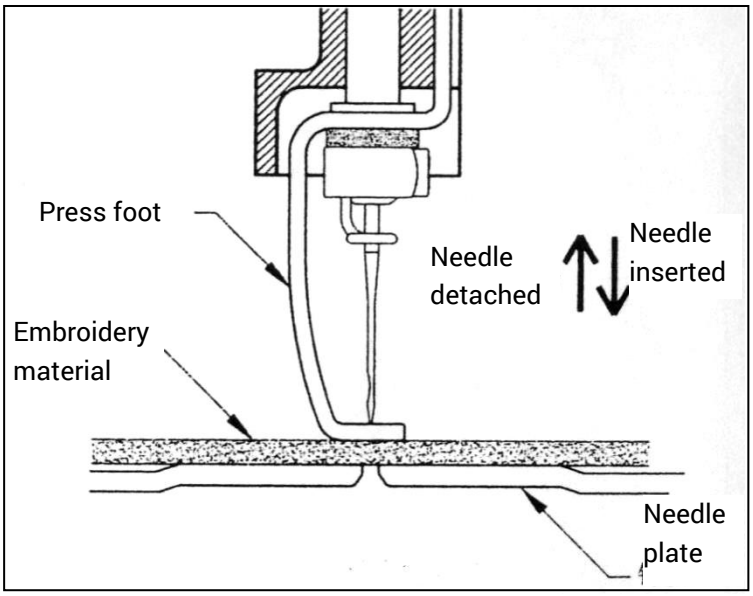
Loosen the screws of TOP STOP brake block, and use a socket wrench to set the main shaft angle to 0°. As shown in the figure, the needle bar shall be pressed down and the TOP STOP brake block and rubber pad shall cling to the needle bar case; the screws shall be tightened when the TOP STOP gets into a state of front-back levelness.



5. Press Foot Height Adjustment

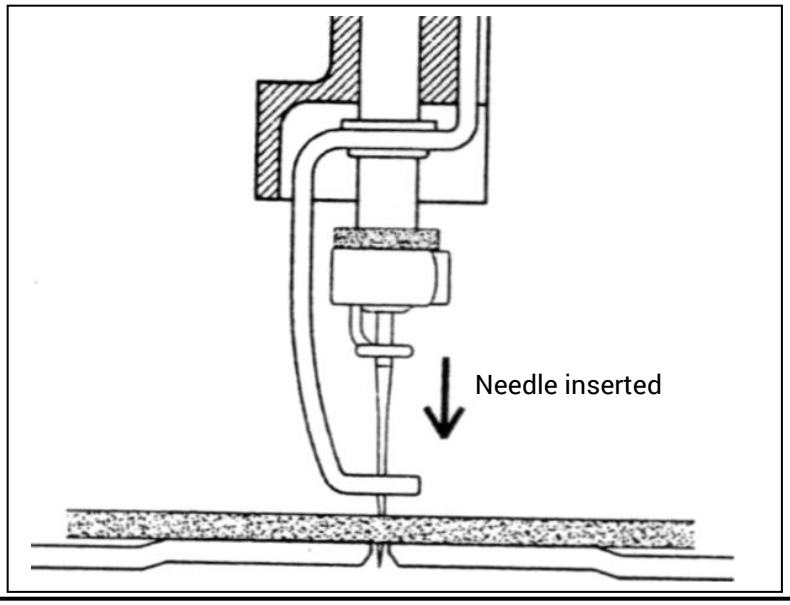
5-1. Relation between the Press Foot and the Needle and Embroidery Material

Before the insertion of the needle into the embroidery material, the press foot is pressed against embroidery material so that the needle and upper frames thread penetrate the embroidery material in a stable state. Furthermore, at the detachment from the embroidery material, the relationship between the press foot and the needle should be the same as when inserted.

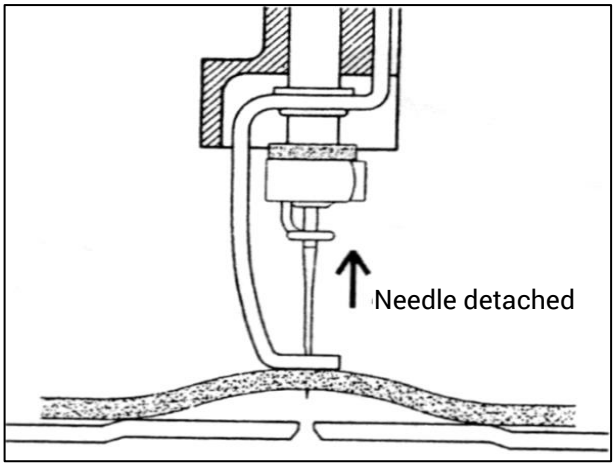


5-2. Excessively High Press Foot

As shown in the figure, when the needle penetrates the embroidery material, the press foot fails to pin against the embroidery material; therefore, the needle penetrates the embroidery material in an unstable state.

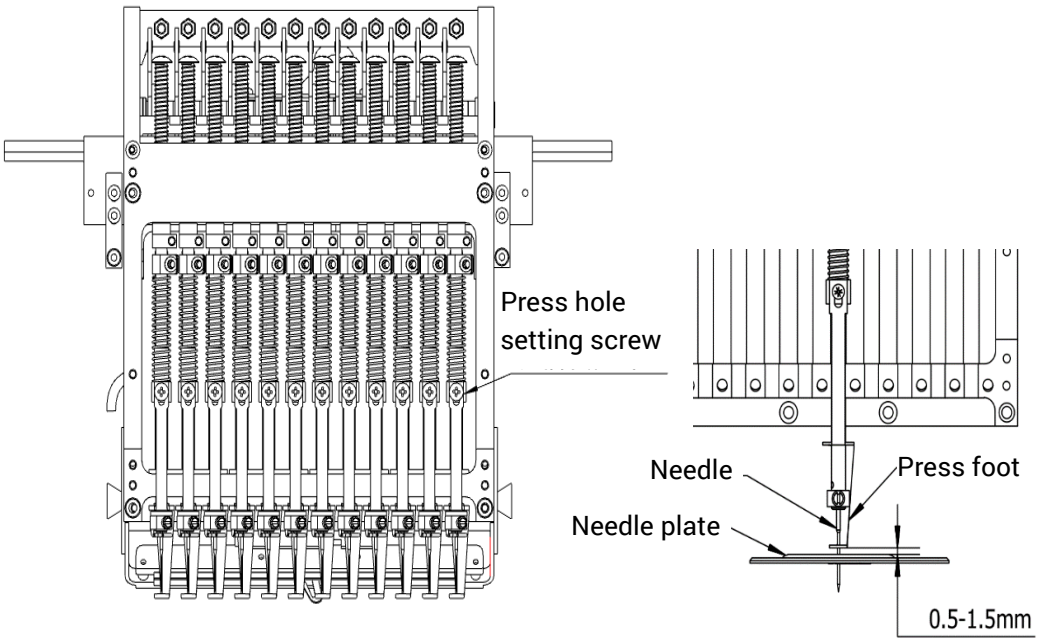


As shown in the figure, the needle fails to hold down the fabric when it gets detached from the embroidery material; as a result, the embroidery material and needle are lifted simultaneously, which brings about a space between embroidery material and needle plate. Such phenomena may lead to thread break, thread skip, and other problems.



5-3. Method of Press Foot Height Adjustment

When the press foot height is adjusted, the press foot setting screw is locked up after the location relationship between press foot and needle for the embroidery material when the main shaft is rotated by a socket wrench to the lowest point of press foot (178°) (the needle plate is normally 0.5 mm~1.5 mm away from the press foot).



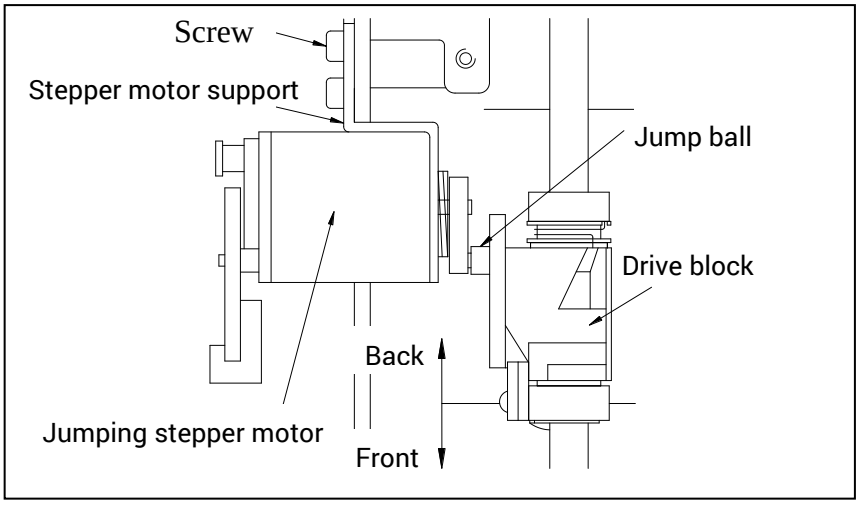
6. Jump Device Adjustment

6-1. Jumping stepper Motor Adjustment

Adjust the start waiting position (the assembly of jumping stepper motor and motor bracket):

A. Loosen the stepper motor screws with a wrench, adjust the ball to the proper position and tighten the screws.

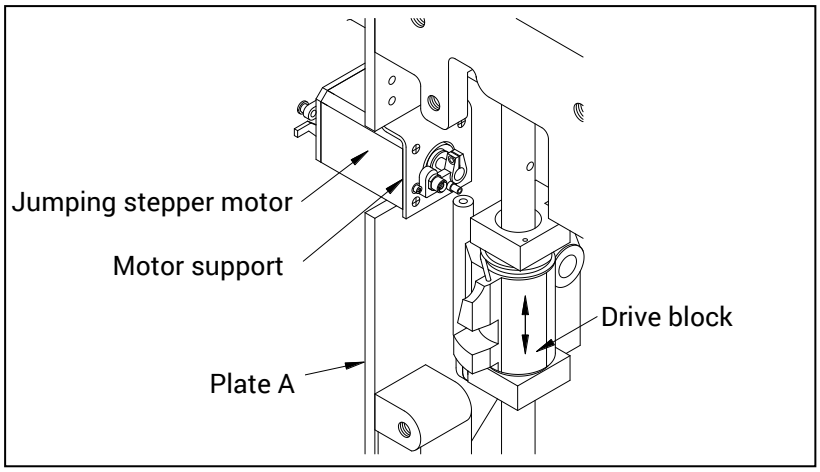
B. If the position of the jump ball is too far forward, the drive block will be affected by the jump ball and thus cannot be reset, resulting in skipping stitches or the stop of needle bar. If the jump ball moves too far back, the LOWER STOP of needle bar will not be able to escape from the drive block, and the needle will get connected or the press foot will drop.



6-2. Installation Position Adjustment

A. As shown in the figure, it's necessary to adjust the position of the motor bracket, and then tighten it.

B. If the installation position is not adjusted properly, the drive block will touch the needle bar for jumping, and the needle bar may drive slightly or the needle does not move or shake sometimes.



7. Upper thread tension adjustment:

Note:

① Thread tension adjustment is an important factor affecting embroidery quality; generally, if 2/3 of the upper threads and 1/3 of the base threads can be seen on the bottom of the embroidery, then the tension adjustment is considered acceptable.

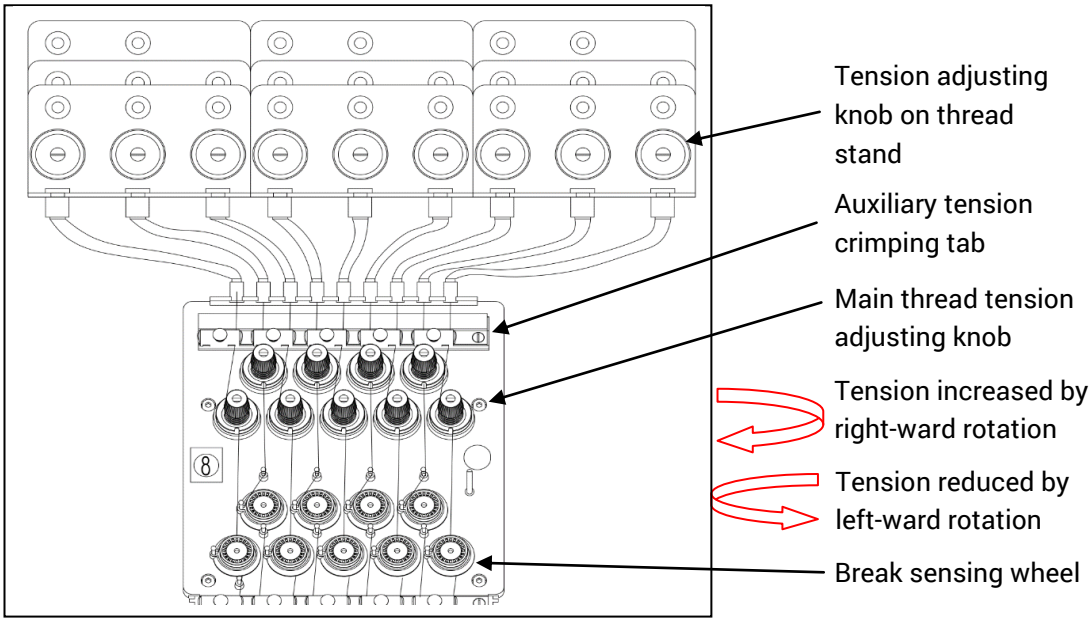
② If the upper thread tension is too weak, the embroidery will develop looseness and loops, and thread-feeding and thread break may occur.

③ If the upper thread tension is too high, it will cause wrinkles in the embroidery material, frequent exposure of the base thread, frequent damage to the needle, and frequent thread break.

A. The tension of upper thread is adjusted by the adjusting knob; if the adjusting knob is turned clockwise, the tension will increase; if the knob is turned counterclockwise, the tension will decrease.

B. The tension adjustment by the small knob of thread stand is about 2/3 of the tension of upper thread; the tension of the auxiliary tension crimping tab is

1/3 which is fixed; the tension of the main thread tension adjusting device is adjusted to 2/3. The tension of the adjusting device shall be such that the smart sensing wheel can rotate smoothly with the upper thread.



[Note]

① When the tension of the adjusting device is too weak, the break sensing wheel may not run smoothly and the light may be lit; therefore, the tension cannot be excessively weak.

② After the adjustment, the upper thread should be able to be pulled up with a certain strength. The appropriate strength at this point is 100 g ~ 120 g.

[Note]

① After the adjustment, pull the upper thread to check whether the smart sensing wheel runs smoothly, otherwise a false alarm may occur.

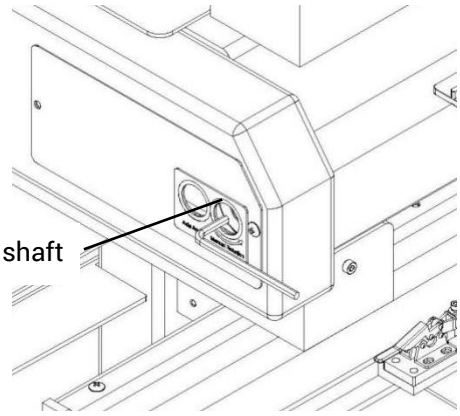
② The thread tension is adjusted accordingly with the changes in embroidery factors such as the threads used, the stitch length and the fabric thickness.

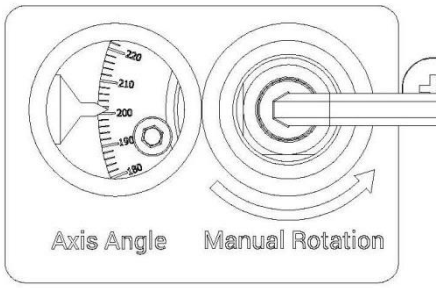
8. Adjustment of Hook Clearance

During the embroidering, the needles of different sizes are changed as needed from time to time; for different needle sizes, the gap between the needle and the hook will be different, so it's necessary to readjust the position of the hook.

Note: To avoid personal injury caused by misoperation during adjustment of the rotary hook, the power supply of the machine must be turned off.

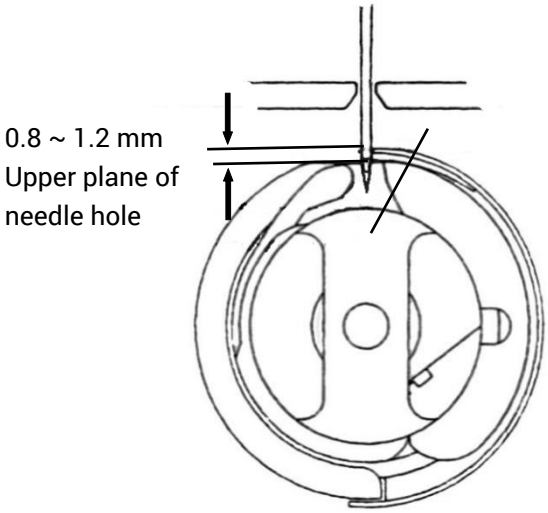
① Open the needle plate, loosen the 3 set screws of rotary hook, and use a wrench to set the main shaft to 201°.

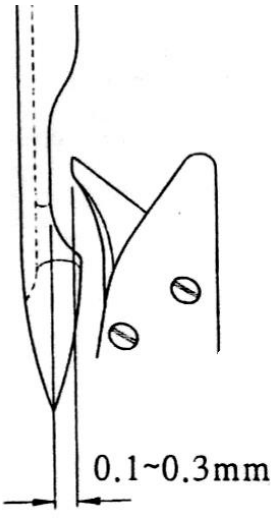




② Press down the current needle bar and rotate the hook by hand until the plane of the hook tip is aligned

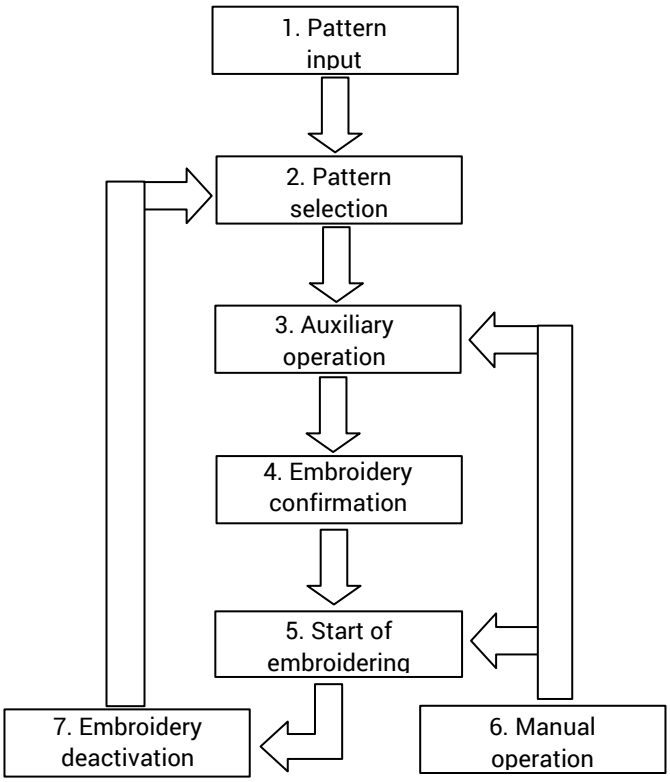
with the needle of the machine. Then adjust the position of the rotary hook back and forth, so that the gap between the hook tip plane and the bottom of the needle groove Lower plane of hook tip and that the depth of the lower plane of the hook tip and the upper plane of the needle hole is 0.8 mm ~ 1.2 mm; lock up the rotary hook setting screws.





3.3.2. Basic Procedure of Embroidery Setup

Basic procedure of embroidery setup



1. Pattern Input

Users can enter patterns into the computer of embroidery machine via the network or USB disk. To upload a pattern to the computer of the embroidery machine via the network, it must be done with the embroidery machine registered successfully. For the import from a USB flash disk, it's necessary to insert the USB flash disk, and then select the USB flash disk management key in the pattern management interface to import the pattern.

2. Pattern Selection

In the pattern management interface, select the desired pattern in the embroidery machine's memory as the pattern to be embroidered.

3. Auxiliary Operation

After selecting the embroidery pattern, the user can perform auxiliary operations before embroidering as required.

①. Set repeat, rotate, and zoom - Click  to get into the parameter management interface.

②. Set color-change sequence – Click  to enter the color-change sequence setup interface.

③. Set applique – Click  to enter the color-change setup interface, and follow the prompts to set the applique.

④. Query periphery, idle periphery, and embroidery pattern contour - Click  to activate the frame selection and position operation.

⑤. Positioning the embroidery pattern at the center of frame - Click  to activate the selection and position operation of frame. Please note that this feature is to position the pattern at the center of frame area set by the soft limit.

⑥. Set cycle embroidery - Click  to activate other functional operations. Click  to enter.

⑦. Parameter management interface. Click "Auxiliary Parameters for Embroidery", and follow the prompts to set up cycle embroidery.

4. Embroidery Confirmation

When the auxiliary operation is completed, the  key can be clicked. Then a prompt window appears. When  is selected for confirmation,  "readiness cancelled" becomes  "embroidery confirmed", indicating that the machine has entered the embroidery confirmation state; **press the Start  , and the embroidery machine will start to run.**

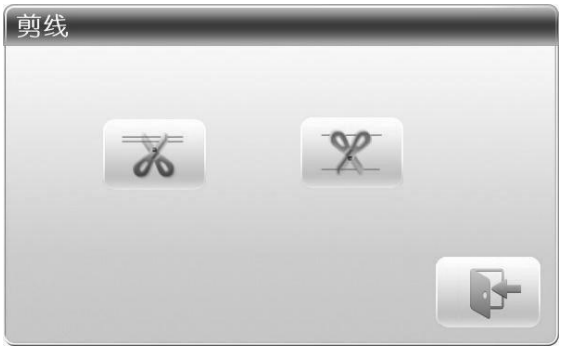
If  is selected, the embroidery machine will still be in the "embroidery cancelled" state. At this point, the machine will not run even if you press the Start key  , and a prompt window will appear, asking you to confirm the embroidery.

5. Start embroidery operation (set the color-change and start method)

You can switch between "automatic color-change/automatic start" and "manual color-change/manual start".

6. Manual Operation

①. Manual trimming: In the stopped state, click in the main screen, when a prompt window appears; click the "Trim Upper and Lower Threads Simultaneously" key to start trimming. If you click the "Lower Threads Only" key, the lower threads will be trimmed. Click to exit the trimming operation.



②. Manual frame movement: Press the direction keys on the panel in the stopped state, and the frame will move in the corresponding direction. Press and hold the two adjacent direction keys, and the frame will move in the direction of the angle between the two keys. The key surrounded by the direction keys is the Manual Movement Speed key. The Manual Movement Speed is divided into high speed and low speed; each time you press , the speed changes.

③. Clear the display coordinates of frame: In the stopped state, you can click the Clear XY Displacement button on the main screen to clear the XY displacement of frame displayed in the main screen. It can be used with manual frame movement.

④. Manual color-change: In the stopped state, you can click on the main screen to get into the color-change interface. Click the serial number of the needle position to be color-switched, and the machine head will automatically move to the corresponding needle position. However, please note that, if manual color-change is to be automatically recorded in the color-change sequence, it must be operated on the manual color-change interface on the touch screen.

⑤. Main Shaft jog: Generally, the main shaft needs to be stopped at 100 degrees for needle bar color-change, frame movement, and embroidery start. If the main shaft does not stop at 100 degrees, main shaft jog can be performed to get into place. Click to perform jog in the main interface. After the jogging, the "main shaft not in place" state shall turn into the "main shaft in place" state .

⑥. Return to the embroidery start point: Click to enter the idle interface in the main interface. Click key, and the frame will return to the embroidery start point.

⑦. Return to the embroidery stop point: Click to enter the idle interface in the main interface. Click key, and the frame will return to the embroidery stop point.

⑧. Positioned idling: This feature is used after embroidery is confirmed. The positioned idling feature can make the machine not embroider and move the frame to the designated position according to the user's requirements. By clicking , the user can set the color-change code and stop code for 1 stitch of positioned idling forward or backward, or for continuous idling.

7. Embroidery Deactivation

Click key in the stopped state, when a prompt window appears; select , and "embroidery confirmed" will change to "embroidery deactivated".

3.4 Normal Embroidery, Retreat, and Patching

Click  key in the embroidery confirmed state (icon appears), and the machine will start the normal embroidery. Click during embroidering, when the machine stops embroidering.

When the Low-speed Idle & Retreat key is clicked after the embroidering is stopped, the frame retreat along the original path of embroidery. Click once to go back one stitch; press and hold for 2 seconds to retreat continuously; continuous retreat is also possible by releasing the key. The retreat can be stopped by clicking again during continuous retreat.

Retreat is normally performed to make up the embroidery; when the retreat stops, the machine embroiders normally by clicking .

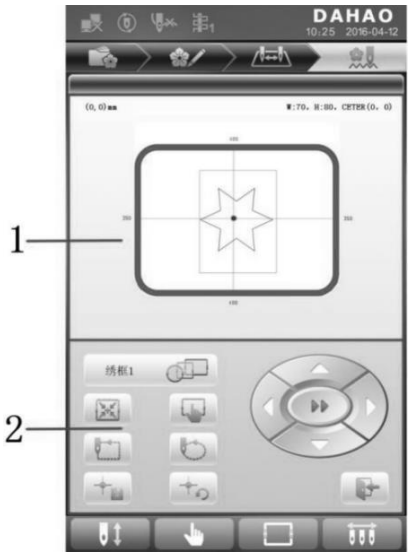
Note: The patching is impossible unless the state indicator lamp of machine head is red; if the machine head indicator lamp is yellow, the machine head lever switch can be manually moved up to have the lamp turn red; at such point, the machine head gets into the patching state; click , and the machine head will perform patching.

Chapter 4. Auxiliary Embroidery Features

The auxiliary embroidery is realized with the keys on the auxiliary embroidery operation interface, where users can use the keys for some common auxiliary operations.

4.1. Selection of Frame

Click  in the main interface to get into the frame operation interface.



Number	Display	Name
1		Pattern format display
2		Frame type selection
		Position the embroidery pattern at the center of frame
		Frame parameter setup
		Move the frame along the pattern perimeter
		Move the frame along the pattern contour
		Memorize pattern origin
		Recover pattern origin
		Manual pattern movement
		Exit

4.2. Clear XY Displacement

This feature is used to clear the current X and Y displacement values in the system.

1. Click on the main operation interface .

2. Click , and the system will clear the current XY displacement values to 0.

4.3. Positioned Idling

Positioned idling-related operations must be performed in the embroidery confirmation state  .

The positioned idling feature enables the machine not to operate the needle and move the frame to a designated position based on user's requirements; the user is allowed to choose color-change code and stop code forward and backward positioned idling.

4.3.1. Low-speed Idling Forward

1. Click idle key  on the main operation interface  .

2. Click the "Low-speed Idling Forward" key  :

①. Click  to idle forward for 1 stitch;

②. Hold  2 seconds for continuous idling forward;

4.3.2. Low-speed Idle & Retreat

1. Click idle key  on the main operation interface  .

2. Click the "Low-speed Idle & Retreat" key  :

①. Click  to retreat for 1 stitch;

②. Hold  2 seconds for continuous retreat;

4.3.3. High-speed Idling Forward

1. Click idle key  on the main operation interface  .

2. Click the "High-speed Idling Forward" key  for high-speed idling forward.

Note: Since the operation of high-speed idle & retreat is similar to that of the high-speed idling forward, it's not described in detail here.

4.3.4. Position to the Next Color-Change Code

1. Click idle key  on the main operation interface  .

2.Click the "Color-Change Code Idle" key  for high-speed idling forward.

Note: Since the operation procedure of "position to the previous color-change code" is similar to that of above-noted operation, it's not described in detail here.

Chapter 5. Other Features

These are some features that may be used during operation of the machine, including the machine maintenance, the statistical information query, and some system settings.

Click Other Features key  on the main operation interface to get into the Other Features interface, where the list of keys for other features is displayed; functions can be implemented by clicking on these keys.

5.1. Date and Time

5.1.1. Click the Other Features key  on the interface to enter the Other Features interface.

5.1.2. Click the "Date Settings" icon to activate the Show Date Settings interface of the system.

5.2. View Statistics

5.2.1. Click the Other Features key  on the interface to enter the Other Features interface.

5.2.2. Click the "Statistics" icon  to activate the Show Statistics interface of the system.

Statistical data in the system is displayed in tabular form in the Statistics interface; to view the information on individual patterns, click  to get into the interface of information on individual patterns.

Click  to clear the statistical information, or click  to go back.

5.3. Change Language

The system software supports the change of languages such as Chinese, English, Arabic, Spanish, Turkish, Russian, Portuguese, and French.

5.3.1. Click the Other Features key on the interface to enter the Other Features interface.

5.3.2. Click "Language" key to choose the desired language, and enter the corresponding main screen of language display.

5.4. Display Machine Information

The operation procedure is as follows:

5.4.1. Click the Other Features key on the interface to enter the Other Features interface.

5.4.2. Click the Information icon , when the system information interface is shown.

5.5. Debugging

Such operations are available only for professionals; since the operations may deal with the motion of some mechanical parts, personal safety and equipment safety should be taken care of during the operation.

The debugging feature is principally used for the testing, maintenance and troubleshooting of the machine.

Click the Other Features key on the interface and then click to enter the Debugging interface.

Name	Description
Main Shaft	Photoelectric encoder test
	Main Shaft speed test
	Rotate the main shaft from 100 degrees to a certain angle
Trimming	Trimming electromagnet/motor test
	Holding electromagnet test
	Hooking electromagnet/motor test
break detection	Needle position switching, needle bar color change, and main shaft jog
Machine head electromagnet/motor	Up, down, combination test

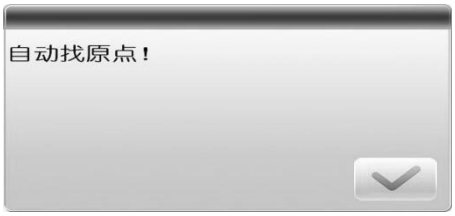
Name	Description
Drive parameter testing	X-axis parameter testing
	Y-axis parameter testing
	Main Shaft parameter testing
	Saving drive parameters
	Loading drive parameters
Sensor state detection	Such features as pull-rod operator, frame limit, scissors origin, scissors maximum point, hooking origin, and needle position display are tested.
Management of peripheral version for the machine	Peripheral version update
Boot Loader update	
Automatic origin finding	Mechanical origin of XY frame drive of the machine
Miscellaneous	Peripheral CAN communication test
	Peripheral communication test
	Touch screen calibration
Parameter import & export	Machine parameter import
	Machine parameter export
Parameter initialization	

5.5.1. Automatic Origin Finding (XY Drive Origin)

The XY drive origin is identified as follows: After the limit optocoupler on XY drive base senses the sensing iron tab mounted on the XY drive slider, the signal is fed back to the electric system; the electric system sends a command to stop the XY drive slider at a certain position, which is the XY drive origin. When the Automatic Origin Finding key is clicked, the system automatically moves the XY drive slider and then identifies the origin of XY drive based on the mounted position of limit optocoupler.

1. Click the Move Frame key to move the X-axis drive slider to the far right of the drive, and move the Y drive slider to the forefront of the drive.
2. Click the Other Features key  on the interface to enter the Other Features interface.
3. Click the Debug key  to enter the debugging operation interface.

4. Choose the Automatic Origin Finding option and confirm with  key.



5. The X-axis drive slider moves to the left, while the Y drive slider moves backward; they stop when reaching their origins.

5.5.2. Automatic Frame Limit

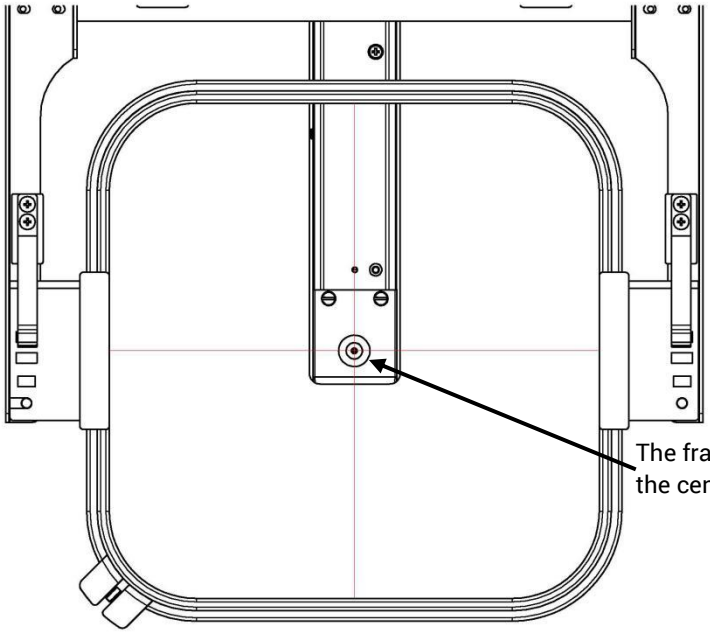
The Automatic Frame Limit feature is designed to determine the embroidering scope of frame by setting the distance between the center of frame and the drive origin and the size of frame (mm); outside such range, the frame automatically stops and gives an alarm to protect the mechanical parts against damage. (The frame parameters of machine configuration are properly defined before delivery) Users who set up their own frames need to properly set the frame parameters following the steps below; in so doing, the frame is positioned in an extremely convenient fashion during embroidery operation.

1. Find the drive origin through automatic origin finding.
2. Mount the desired frame.
3. Clear XY Displacement

Click C to clear the XY data in the main interface.

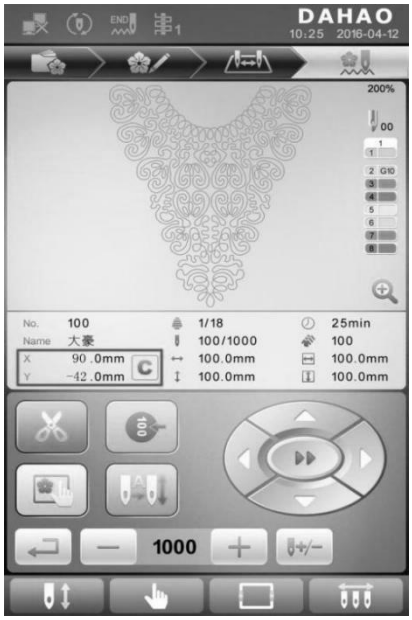
4. Manual Frame Movement

Click  in the main interface for manual frame movement; take measurement with a ruler so that the frame center coincides with the needle hole. (Indicating that this is the center of this frame)



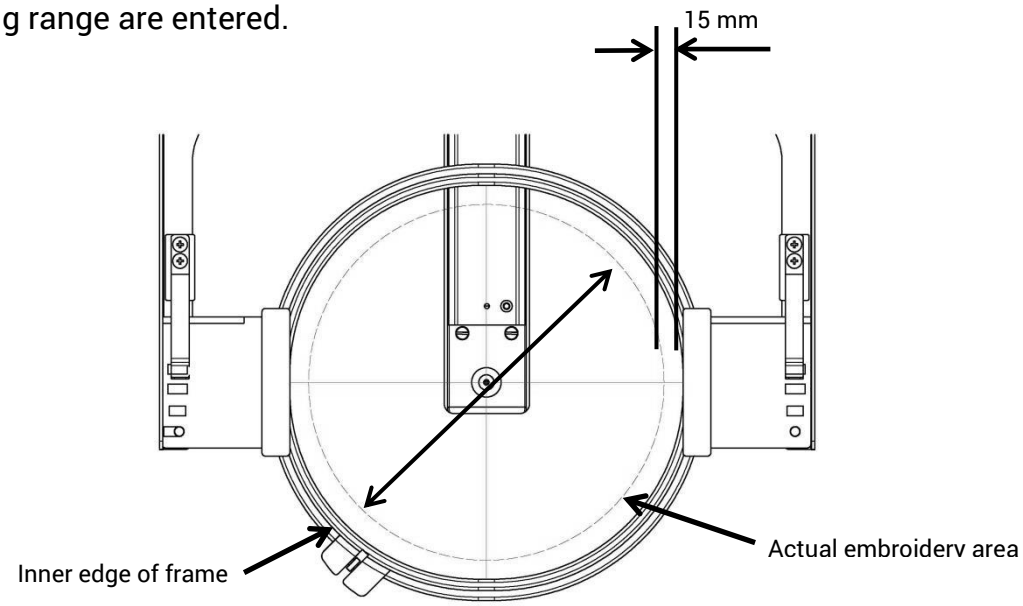
5. Setup of the frame center and frame size

View the frame XY coordinates in the main interface, which represent the frame center.

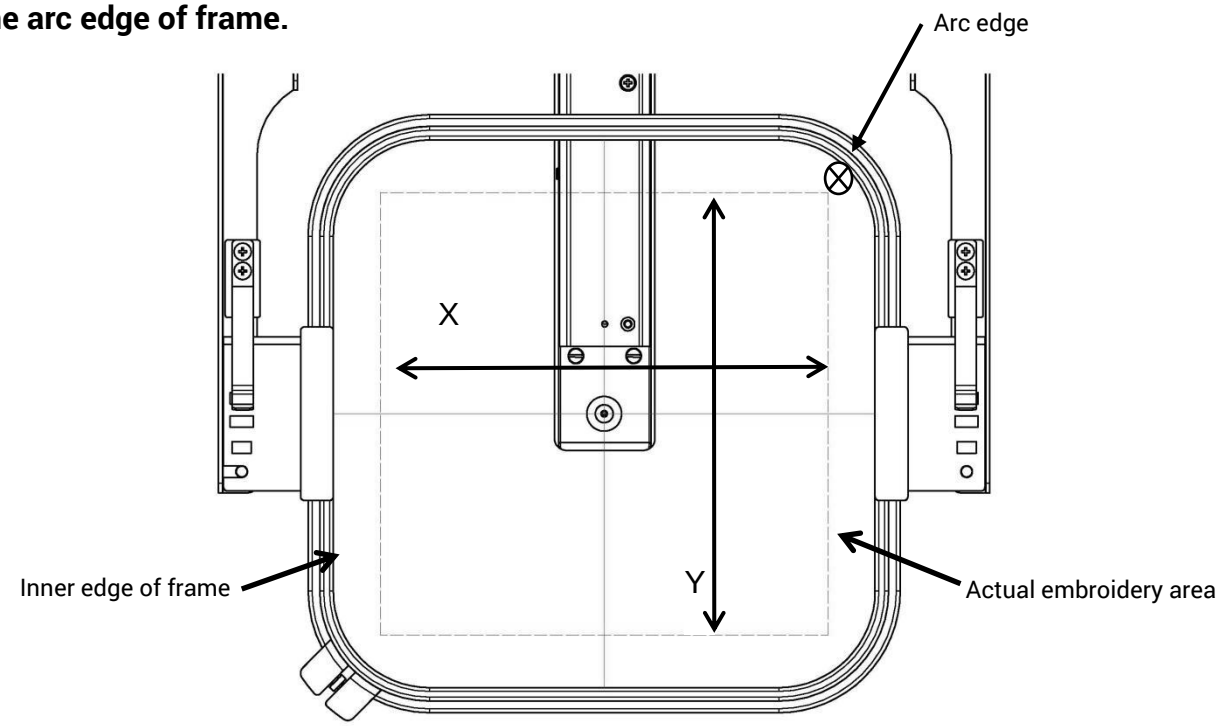


6. Click  to enter the frame operation interface. Click  to get into the interface for setup of frame-related parameters: Fill the XY center with the XY coordinates shown under the main interface.

The type of frame is set based on its shape, and there are 2 types, i.e., round and rectangular frames; the frame size refers to the max. embroidering size of such frames, rather than the outer size of frame. (The distance between the actual maximum range of embroidery and the inner edge of frame is recommended to be 15 mm in most cases) For round frames, the diameter of the embroidering range is entered; for rectangular frame, the X (length) and Y (width) dimensions of the embroidering range are entered.



Note: Since rectangular frames are often not right-angled, the actual embroidering area shall be so defined that the needle shall not come into contact with the arc edge of frame.



7. Cancellation of Automatic Frame Limit

Set the "Frame Selection" to "None"; that is, the Automatic Frame Limit can be deactivated

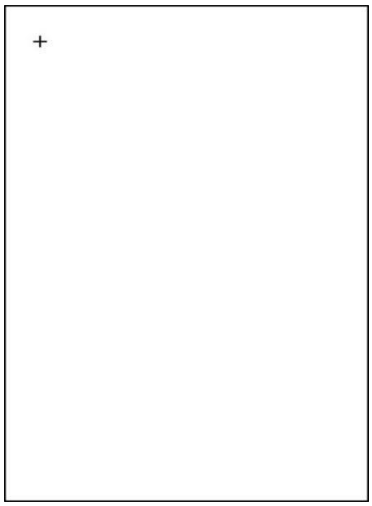
5.5.3. Touch Screen Calibration

Data drift may develop after the touch screen is used for a period of time, and may bring about inaccurate key click;

This problem can be resolved by calibrating the touch screen. During calibration of the touch screen, the click point on screen must be identical with the displayed cross center;

otherwise, the future touch screen operations may be impaired.

1. Click the Other Features key on the interface to enter the Other Features interface.
2. Click the Debug icon to get into the debug interface, where user could click "Miscellaneous" option to activate the "Miscellaneous" interface.
3. Click the Touch Screen Calibration key to enter the Touch Screen Calibration interface.
4. Click on the cross centers in the calibration interface one by one.



There will be a number of small crosses in different positions in the interface during calibration; the user should click their centers in turn, and the system will obtain the position data of such points as the basis for calibration.

5. The system performs calibration based on the point coordinate clicked by the user

The system performs calibration based on the point data entered by user in the previous step, and automatically returns to other features operation interface.

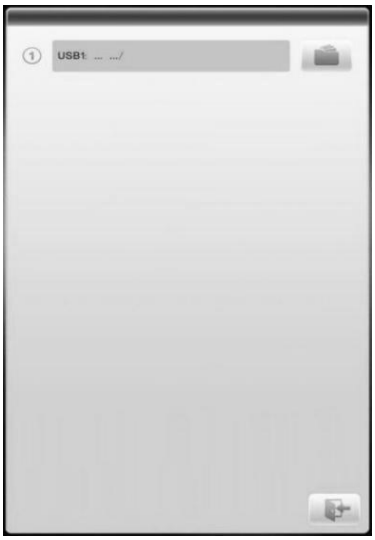
5.5.4. Peripheral Version Software Update of the Machine

1. Click the Other Features key on the main operation interface to enter the Other Features interface.

2. Click .

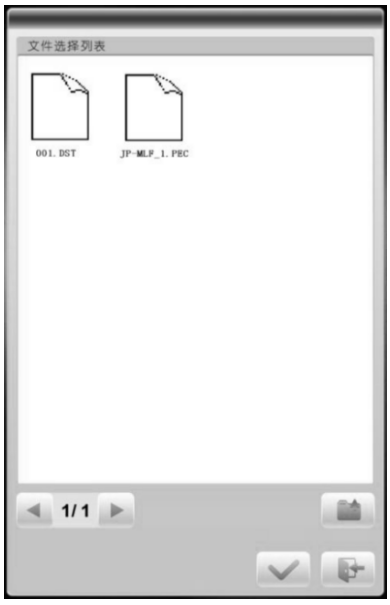
3. Choose Machine Peripheral Version Management, get into the peripheral version management interface, and select Peripheral Version Update.

4. Click Select File key  .



5. Choose the USB Disk.

6. Select the program to be updated, and click  .



7. A text reading "Succeeded" appears, which indicates the update completed.

Chapter 6. Instructions for Embroidery Parameters Setup

Embroidery parameters are classified into "user parameters" and "expert parameters" by preferences; the "user parameters" fall into "machine configuration parameters" and "embroidery auxiliary parameters"; in addition to including the two categories of the "user parameters", the "expert parameters" include "main shaft-related parameters", "frame-related parameters", "break detection-related parameters", and "trimming-related parameters"; where the machine is fitted with additional devices, there should be additional device parameters.

Click the Other Features operation key on the main operation interface, and click on User Parameters or Expert Parameters to get into the parameter setup interface.

6.1 Embroidery Parameter Setup

6.1.1. Select the type of parameter to be modified.

Users are allowed to use the Parameter Classification key and the Page-up/Page-down key at the bottom of interface to seek parameters to be modified.

6.1.2. Click the parameters to be modified, and click on Click Number Keys to Modify Current Parameter in the parameter modification window.

6.1.3. Click  to confirm the modification. Parameter

6.2. List of Embroidery Parameters

No.	Parameter name	Common value	Optional value	Note
Machine configuration parameters				
D01	Number of needles per model	12	1~18	Depending on conditions of the machine, exceptional color-change may occur where the set value does not match the number of needles.
D12	Stepping color-change speed	12	0~30	
C49	Mechanical X clearance compensation	0	0,1	
C50	Mechanical Y clearance compensation	0	0,1	
C29	Needle position of eyelet embroidery	None	None, 1~7	
C30	Displacement of eyelet embroidery	0mm	0mm, 12mm	
E1	Test DIP1	0	0~255	
E2	Test DIP2	0	0~255	
E3	Test DIP3	0	0~255	
E4	Test DIP4	0	0~255	
E05	Turn on the needle	Yes	No, Yes	
H06	Drive fault monitoring	Yes	No, Yes	
C44	Server IP address			Set the IP address of the server when PC is networked with.
C45	Subnet mask			Set the subnet mask of the embroidery machine's IP address when PC is networked with.
C46	Gateway address			Set the gateway address of embroidery machine when PC is networked with.

No.	Parameter Name	Common value	Optional value	Note
Auxiliary Parameters for Embroidery				
B01	Return to the origin after embroidery operation	Yes	No, Yes	
B02	Cycle embroidery?	No	No, Yes	Restart the embroidery operation automatically after the embroidering is finished? Working with repeat or special pattern making (see "6.2.1 Functional Description of Cycle Embroidery"
B13	Automatically started in case of the same color?	Yes	No, Yes	Color-change start method adopted when the current needle position is identical with the previous one in the color-change sequence?
D15	Number of jogged stitches after applique	0	0~3000	
D16	Jog speed after applique	850	80~1000	
B18	Stereoscopic display of pattern supported?	Yes	No, Yes	
C77	Filter the short stitches when embroidering patterns?	Yes	No, Yes	
C78	Filter short stitch length during embroidering	0.1 5	0.1~0.6	
C80	Automatic jump stitch length	8.0 mm	6.0~12.0	
U57	High-speed idling speed	5	1~10	

No.	Parameter name	Common value	Optional value	Note
Main Shaft-related parameter				
C07	Maximum rpm	1200	250~1200	
C09	Minimum speed	400	250~600	
C08	Switching stitch length	3	1~8	The machine slows down when the stitch length is greater than this value
C10	Jump speed limit	500	400~1200	Set the speed for stitch skip
C13	Cast-on speed setup	80	80~150	
C12	Number of jogged stitches for cast-on	3	1~9	Speed up after a few jogged stitches
D02	Cast-on acceleration	15	1~30	Increase this parameter, and press the Start key to speed up the machine faster.
C25	Stop position compensation	15	0~30	Where the stop position is not at 100 degrees, the compensation can be made by choosing a number between 0 and 30.
D14	The main shaft should reach the desired position before rod pull	Yes	No, Yes	
C05	Compensation value for embroidering thick material	0	0~3	
C26	Needle stop position adjustment	15	0~30	
D53	Lock the main shaft when the machine is stopped?	Yes	No, Yes	

No.	Parameter name	Common value	Optional value	Note
Trimming-related parameter				
C01	Jump trimming	3-stitch trimming	No trimming; 1~7-stitch trimming	
C18	Trim length	7	1~8	"1" means the shortest trimming, and "8" means the longest trimming
D05	Rotation speed during trimming	80	80~250	
C20	Lock needle for trimming?	Yes	No, Yes	
D04	Cast-on speed after trimming	80	60~150	This parameter sets the speed for needle locking
C11	Number of jogged stitches after trimming	3	1~7 stitches	
C21	Needle lock length (mm)	0.6	0.3~1.5	
C19	Number of locked stitches after trimming	2	0~3	This parameter is used to set the number of locked stitches for rod-pull embroidery after trimming
D06	The number of revolutions of main shaft after which the machine stops after trimming	1	1，2	Set to 2 for general machines, or to 1 for small-sized machines or machines designed with servo motor as the main shaft
C23	Action method after trimming	Y-axis frame movement	X-axis frame movement, Y-axis frame movement, and needle position movement	
C22	Move the frame after trimming?	Yes	No, Yes	
D03	Cast-on holding angle compensation	3	-4~3	
D07	Detect proper trimming?	Yes	No, Yes	
E39	Stepping hooking travel	160	0~180	
C17	Temporarily shut down the trimming?	No	No, Yes	
D48	Needle lock length before trimming	0.7	0.3~2.0	

No.	Parameter name	Common value	Optional value	Note
D49	Number of locked stitches before trimming	2	0~2	
C81	Starting angle adjustment for trimming	19	0~20	Applicable for models with step trimming
C82	Cutter-back angle adjustment for step trimming	15	0~30	As above
C83	Retainer return angle adjustment for trimming	1	0~99	As above
C84	Voltage adjustment for holding electromagnet	1	1~10	As above
C95	Speed of the first stitch before trimming	400	60~600	
C96	Speed of the second stitch before trimming	80	60~500	
C93	Action method of surface clamp during trimming	1 time	NO, 1 time, 2 times	
C94	Action method of surface clamp at embroidery start	2 times	NO, 1 time, 2 times	
E99	Surface clamp fully opened during patching	No	No, Yes	
H05	Type of trimming device	Direct trimming by stepper motor	Direct trimming by stepper motor; trimming by electromagnet	

No.	Parameter name	Common value	Optional value	Note
break detection-related parameter				
B05	Thread break detection	Yes	No, Yes	
B11	The number of stitches where break detection is performed at the start of embroidery	8	0 ~15	
B06	Stop the machine after threat break detection?	Yes	No, Yes	
B08	The number of withdrawing stitches upon threat break	0 stitches	0~7 stitches	
B09	The number of stitches for retreat & patching	2 stitches	1~10 stitches	The number of patching stitches before the break point
B10	Action method at the end of patching	Speed reduction	No speed change; speed reduction; stop	
B14	Set up all machine head patching	No	No, Yes	When it is set to “Yes”, all the machine heads that are not closed during patching are subjected to patching
B12	Perform break detection at jump?	No	No, Yes	
C28	The number of de-shaking stitches for break detection	1	1 ~10	
C67	Upper thread detection sensitivity	3	1~10	
C68	Base thread detection sensitivity	6	1~10	
C69	The number of de-shaking stitches for upper thread detection	3 stitches	1~10 stitches	
C70	The number of de-shaking stitches for base thread detection	6 stitches	1~10 stitches	
C90	Type of break detection device	Wheel-type	Spring-type, wheel-type, spring + wheel	
C91	Operation angle of machine head motor	2	0~10	

No.	Parameter name	Common value	Optional value	Note
Frame-related parameter				
C06	Moving frame curve	F4	F1~F6	
B03	Cross the frame step by step?	No	No, Yes	
C15	Speed of the high-speed frame movement	16	1~30	
C16	Speed of the low-speed frame movement	15	1~30	
D13	Speed of frame crossing	16	1~30	
C74	Moving frame angle A in X direction	245	230~280	
C75	Moving frame angle B in X direction	250	230~280	
C76	Moving frame angle A in Y direction	245	230~280	
C85	Moving frame angle B in Y direction	250	230~280	

6.3. Instructions for Cycle Embroidery

1. Cycle embroidery is a feature set to improve the efficiency of embroidery.

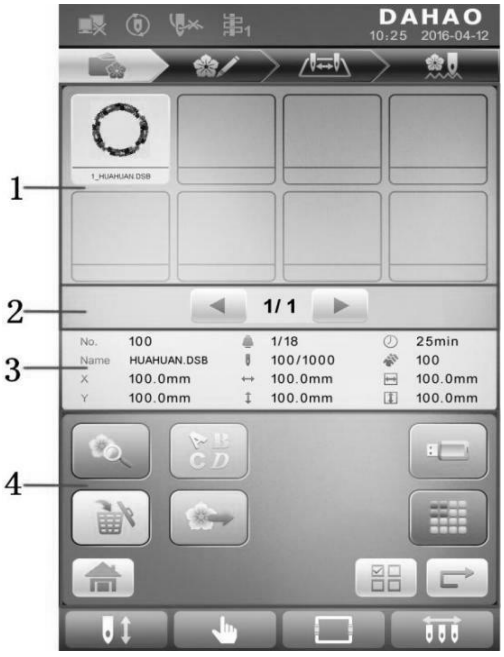
2. When parameter "Cycle embroidery?" is set to "Yes", the system activates the cycle embroidery feature, when the main screen of the system shows icon . When cycle embroidery is activated for the machine, the embroidering of the set pattern is restarted automatically without need for any operation after the embroidering of selected pattern is finished.

3. Under normal circumstances, cycle embroidery operation shall work with repeated embroidering or special pattern making; moreover, the parameter "go back to origin after embroidering" shall also be set to "Yes". In this way, the front patches can be changed when the machine embroiders the rear patches. After embroidering of the selected pattern, the frame automatically returns to the embroidery start point, and automatically restarts the embroidering of front patch in the set pattern; at this point, the rear patches can be replaced.

Chapter 7. Instructions for Stored Pattern Management

The stored pattern management comprises six features, i.e., "stored pattern preview", "letter pattern operation", "delete pattern", "pattern output", "USB flash disk management" and "other features". "Other features" include eight features, i.e., "copy pattern", "generate contour pattern", "generate high-speed pattern", "pattern split", "generate parameter pattern", "pattern splicing", "generate combination pattern", and "satin stitch width adjustment".

7.1. Stored Pattern Management Interface



Number	Display	Name	Description
1		Stored pattern thumbnail display area	The pattern files in the memory are displayed through icons so that appropriate files can be selected.
2		To previous page; to next page	Used to quickly switch to the stored pattern list of the specified number of pages.
3		Information bar	Used to display the details of the selected pattern and the memory usage information, etc.

Number	Display	Name	Description
4		Stored pattern preview	Pattern details can be viewed; patterns can be zoomed in, zoomed out, moved or analog-displayed.
		Letter Pattern Operation	alphabet embroidery pattern and parameter setup.
		Delete pattern	Delete the chosen pattern.
		Pattern output	The patterns in memory can be exported into a USB disk.
		Go back to the main interface	
		USB flash disk management	Press this button to enter the USB flash disk management interface. It includes the related operations on the USB disk.
		Other features	Click to open other operation windows of stored pattern, where the patterns can be copied, split, spliced and combined, etc.
		Single selection/multiple selection switching	Switch between the single-selection mode and multi-selection mode.
		Next	Go to the next operation interface.

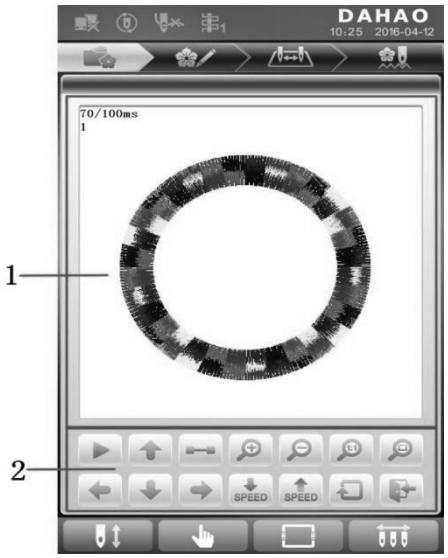
7.1.1. Click on the "pattern management" interface to get into the stored pattern management interface.

7.1.2. Click the Other Features key to enter the "other stored patterns" operation interface for operation of other stored patterns. (For single original pattern processing, the pattern to be processed should be selected first)

7.1.3. Click for page turning, and click to return to the stored pattern management interface.

7.2. Stored Pattern Preview

In the stored pattern preview interface, the selected pattern can be previewed and displayed in a specified manner, which is convenient for viewing the pattern details.



Number	Display	Name	Description
1		Pattern preview area	In this pattern display area, the selected pattern is displayed by the specified means at the designated speed.
2		Draw/pause switching	Used to switch between pattern drawing and pattern pause display.
		Pattern shift-up	Shift up the pattern display in the pattern preview display area.
		Single step display	Draw patterns in a single step by clicking
		Zoom-in	Enlarge the pattern design in the pattern preview display area.
		Zoom-out	Minify the pattern design in the pattern preview display area.
		Actual display	Display letter patterns in actual size. At this point, the size of the pattern on the screen is approximately equal to the actual size of the pattern embroidered.
		Window fit	Adapt to the window size for pattern display in the pattern preview display area.

		Pattern to left	Move the pattern display to the left in the pattern preview display area.
		Pattern shift-down	Move the pattern down in the pattern preview display area.
		Pattern to right	Move the pattern display to the right in the pattern preview display area.
		Display at reduced speed	Reduce the speed of pattern display
		Display at increased speed	Increase the speed of pattern display
		Re-draw	Redisplay the selected pattern
		Exit	Exit the operation of the stored pattern preview interface

7.2.1. Click on the "pattern management" interface  to get into the stored pattern management interface.

7.2.2. Choose the pattern to be handled in the stored pattern thumbnail display area in the stored pattern management interface.

7.2.3. Click  to open the stored pattern preview interface.

7.2.4. Click  to control the size of pattern display. Click the move control key  to show the local areas of pattern. Click the speed adjustment key  to automatically switch to the pause state for single-step display of the pattern. Click  to redisplay the selected pattern.

7.3. Pattern Output

Users are allowed to output the pattern data in the system memory to the current USB flash disk.

7.3.1. Click on the "pattern management" interface  to get into the stored pattern management interface.

7.3.2. Select the stored pattern to be output.

7.3.3. Click pattern output key  .

7.3.4. The system will display the "USB Flash Disk Selection" window; click to select the icon of the USB flash disk to be operated.

7.3.5. Enter USB flash disk pattern number and name.

When entering the interface for inputting the stored pattern number and name, the system uses the smallest pattern number available in the memory and the USB flash disk file name as default; users are allowed to modify the corresponding values with the keypad below.

7.3.6. Click  , and a prompt will appear that the pattern export is completed.

7.3.7. Click  to return to the pattern management interface.

7.4. Operation of Alphanumeric, Numeric, and Chinese Character Embroidery Patterns

This feature can create pattern files based on letters through the font library built in the system.

7.4.1. Click  in the main interface of pattern management to get into the alphabet embroidery operation interface.

7.4.2. Click the character string  on the main interface of alphabet embroidery to enter the alphabet string input interface.

The upper side of the window is the parameter display window, and the lower side is the parameter operation area. After entering the alphabet string, click  to save the change.

7.4.3. Letter Pattern Adjustment

The operation keys in the interface are divided into 4 rows; the first and second rows show the file and view keys; the third row shows the adjustment keys for the overall arrangement of letters;

the fourth row shows the adjustment keys for the selected letter object. The middle part of the interface is the letter pattern display area.

Under normal circumstances, it's necessary to set the overall arrangement of the alphabetic strings, the rotation angle, the letter spacing and other parameters; then to select the specific letters and adjust the arrangement parameters of individual letters.

Letter pattern display window: The cross in the middle represents the coordinates, and the intersection is the origin (0,0). The letters are automatically arranged around the origin.

. Select the letter adjustment key

 "Alphabetic string": Preparing letter patterns.

 "Change font": Change the font of the selected letter object. Click this key, and a font selection dialog box will pop up; select a desired font, and confirm.

 "Color-change": Set or de-set the color-change before the selected letter objects.

 "Selection switching": Switching the selected letter. A letter must be selected before it can be edited. When there is a red "+" in the center of the letter, it means the letter is selected; e.g.,  . All letters are selected by default. Click the Selection Switching key and select the first letter; click again to choose the second; and so on. After the ending letter is selected, all the letters will be selected again by clicking the Selection Switching key again.

 "Increase width": Increases the width of the selected letter object; e.g.: 

 "Reduce width": reduce the width of the selected letter object. For instance:

 "Increase height": Increases the height of the selected letter object. 

 "Reduce height": Reduce the height of the selected letter object. For instance:

 "Horizontal flip": Flip the selected letter left and right.

 "Vertical flip": Flip the selected letter up and down.

 "Clockwise rotation": Rotate the selected letter object clockwise from the center of the letter (the "+" in the center of the letter). For instance: 

②. View and file operations

 "Character density": The density of characters can be adjusted. Click this key to show the character density dialog box, where stitch, density increase, and density decrease operations can be performed.

 "Stitch": Show/hide stitches; hiding stitches can improve the calculation speed.


 "Density increase": Increase satin stitch density of the generated letter patterns. For instance: 

 "Density decrease": Decrease satin stitch density of the generated letter patterns. For instance: 

 "Left", "Right", "Up" and "Down": Move letter patterns in all directions.

 "Zoom out": Shrink the letter pattern display window.

 "Zoom in": Enlarge the display window to see the details of letter patterns.

 "Actual": Display letter patterns in actual size. At this point, the size of the pattern on the screen is approximately equal to the actual size of the pattern embroidered.

 "Center": Zoom the view and display the entire pattern for easy view.

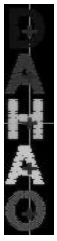
 "Save": Used to save the letter pattern being edited. After this key is clicked, a window for inputting the pattern number and name appears. Modify the pattern name and number as needed (number modification is not recommended in most cases), and then click OK to save.

 "Exit": Exit the "Create Letter Pattern" interface.

③. Overall arrangement of adjustment keys

If you edit individual letters and then adjust the overall arrangement, the editing of a single letter may be overwritten.

 "Horizontal": Alphabetic strings  are arranged horizontally
Click this key to switch among "vertical", "upper arc" and "lower arc". Only when "upper arc" or "lower arc" is activated, can the "fixed letter direction", "radian increase" and "radian decrease" can be adjusted.

 "Vertical": Alphabetic strings are arranged in a vertical manner. 

 "Upper arc": Alphabetic strings are arranged in the form of upward curved arc.


 "Lower arc": Alphabetic strings are arranged in the form of downward curved arc.


 "Fixed letter direction": When a string of letters is arranged in a circular arc, the angle of letters do not change with the position of the arc, but is constantly equal to a certain angle. 

 "Radian increase": When the string of letters is arranged in a circular arc, the radian of the reference arc is increased.

 "Radian decrease": When the string of letters is arranged in a circular arc, the radian of the reference arc is reduced. 

 "Clockwise rotation as a whole": Rotate the entire letter string clockwise.


 "Increase letter spacing": Increase the distance between letters. 

 "Reduce letter spacing": Reduce the distance between letters. 

7.4.4. Save Letter Pattern

Click  after the letter pattern is edited. Specify the pattern number and name in the pop-up window, and then click  to save.

Confirm saving and return to the main interface of alphabet embroidery.

If there is no need to continue editing the letter pattern, click  to exit, when the following message will pop up.

Click  to confirm saving, or click  to cancel saving operation; return to the Pattern Management interface.

7.5. USB Flash Disk Management

In the USB flash disk management interface, users are allowed to input the pattern data on the disk into the machine, and to carry out some common USB flash disk management tasks (e.g., removal of directories or files from USB flash disk, formatting of USB flash disk, etc.) The system supports the directory operation of USB flash disk; users may store the pattern data in different directories on the USB flash disk for management by category. The pattern data formats that the system can read include DSB, DST and DSZ; when the pattern data is output, it's stored on the USB flash disk in DSB format.

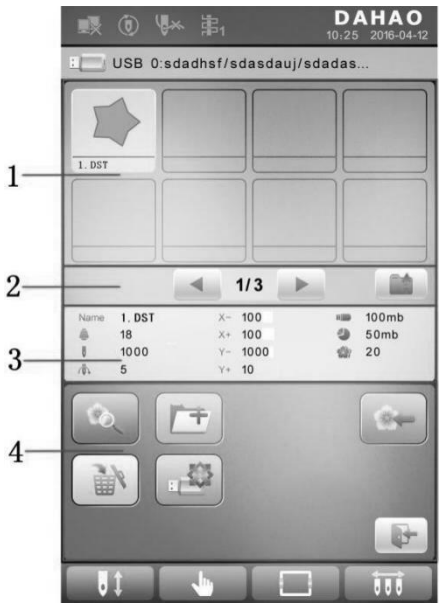
7.5.1. USB Flash Disk Selection

Since the system supports operations on multiple storage devices, users should select the USB flash disk device to be operated on first.

1. Click the USB flash disk operation key  under the pattern management interface.

2. The system will display the "USB Flash Disk Selection" window; click to select the icon of the USB flash disk to be operated.

3. The system opens the USB flash disk operation interface



Number	Display	Name	Description
1		File list in USB flash disk	The pattern files and folders in the USB flash disk are displayed through icons so that appropriate files can be selected.
2		Page information	The information on current page and total page count.
		Back to the parent directory	Return to the parent directory.
3		General information on pattern	Show general information on current pattern.
4		Pattern preview	The selected pattern is read; pattern details can be viewed; patterns can be zoomed in, zoomed out, moved or analog-displayed.
		Create a directory	Create a new folder.
		Delete	Delete folders or files.
		Format the USB flash disk	Format the USB disk.
		Pattern input	The patterns in USB disk can be imported into the memory.
		Exit	Exit the USB flash disk operation.

7.5.2. Input of Patterns from USB flash disk

The pattern data on the USB flash disk can be input into the memory of the machine; users must first select the pattern file to be input, and then input the pattern number and name in the memory.

1. Choose a pattern in the USB flash disk;

2. Click pattern input key  , and the system will request users to enter the stored pattern number and name.

3. Users enter the stored pattern number and name.

When entering the stored pattern number and name input interface, the system uses the smallest available pattern number in the memory and the file name in USB flash disk as the default; users may use the keyboard below to modify the corresponding values.

4. Click 

5. The system enters the pattern data on the USB flash disk into the memory

7.5.3. Directory Operations

1. Enter the directory:

Double-click (click twice quickly) the directory object icon to enter the directory; the system reads the list of objects in the directory and refreshes the display interface.

2. Return to the parent directory:

Click  , and the system will return to the parent directory and refresh the display interface.

7.5.4. Format the USB Flash Disk

1. Select the USB flash disk device to be formatted
2. Click  to format the USB flash disk

3. Click 

The system starts to format the USB flash disk. After the formatting is successfully completed, the system automatically returns to the USB flash disk operation screen.

Note: The system will format the USB flash disk in the DOS format

7.5.5. Delete USB flash disk objects (including pattern files and directories)

1. Choose the object to be deleted
2. Click Delete key 

3. The system prompts the user to confirm the deletion

Note: If the user selects a directory to delete, the system will delete all files and subdirectories in the directory. If the file on the USB flash disk is read-only or the disk is write-protected, the file cannot be deleted.

7.5.6. Create a directory in the current directory

1. The user clicks  to create a directory.

2. The user enters a new directory name.

3. The user clicks confirmation key  .

The system will create a corresponding directory on the USB flash disk and refresh the current object display list.

7.6. Pattern and Other Edit Features

7.6.1. Copy Stored Patterns

1. Click on the "pattern management" interface  to get into the stored pattern management interface.

2. Choose the pattern to be handled in the stored pattern thumbnail display area in the stored pattern management interface.

3. Click Other Features key  under the stored pattern management interface to enter the memory operation selection interface.

4. Click Copy Pattern to get into the stored pattern copy interface. At this point, the system automatically provides the smallest available pattern number and default pattern name; if no modification is needed, the confirmation key  can be pressed directly.

5. To enter other new pattern numbers, click the function item New Pattern Number, and an input window will pop up on the interface; just enter the new pattern number.

6. To enter a new pattern name, click the function item New Pattern Name, and an input window will pop up on the interface; just enter the new pattern name.

7. Click  to choose Copy Pattern, or click  to undo the pattern copy operation and return to the pattern operation selection interface.

7.6.2. Generate Contour Pattern

This operation generates a new pattern based on the contour of the selected pattern.

1. Click on the "pattern management" interface  to get into the stored pattern management interface.

2. Choose the pattern to be handled in the stored pattern thumbnail display area in the stored pattern management interface.

3. Click Other Features key  under the stored pattern management interface to enter the memory operation selection interface.

4. Click Generate Contour Pattern to get into the contour pattern operation interface.

5. If the default values provided by the system are not adopted, users could click the new pattern number and the new pattern name for modification.

6. Click  to generate contour pattern. Click  to undo the generation of contour pattern and return to the pattern operation selection interface.

7.6.3. Generate High-speed Patterns

This operation splits the long stitches in the pattern into short stitches, so that the embroidering does not slow down due to long stitches.

1. Click on the "pattern management" interface  to get into the stored pattern management interface.

2. Choose the pattern to be handled in the stored pattern thumbnail display area in the stored pattern management interface.

3. Click Other Features key  to enter the memory operation selection interface.

4. Click Generate High-speed Pattern to get into the high-speed pattern operation interface.

5. If the default values provided by the system are not adopted, users could click the new pattern number and the new pattern name for modification.

6. Click  to generate high-speed pattern. Click  to undo the generation of high-speed pattern and return to the pattern operation selection interface.

7.6.4 Split Pattern

This operation splits a pattern into two bounded by a specified number of stitches.

1. Click on the "pattern management" interface  to get into the stored pattern management interface.

2. Choose the pattern to be handled in the stored pattern thumbnail display area in the stored pattern management interface.

3. Click Other Features key  to enter the memory operation selection interface.

4. Click Split Pattern to enter the pattern split operation interface.

5. If the default values provided by the system are not adopted, users could click the new pattern number and the new pattern name for modification.

6. Click the Number of Split Stitches and enter the number.

7. Click  to split the pattern. Click  to undo the pattern splitting and return to the pattern operation selection interface.

7.6.5. Generate Parameter Pattern

This operation transforms the selected pattern along with its separately stored zoom, repeat and other commonly used parameters and the needle bar color-change sequence to generate a new pattern.

1. Click on the "pattern management" interface  to get into the stored pattern management interface.

2. Choose the pattern to be handled in the stored pattern thumbnail display area in the stored pattern management interface.

3. Click Other Features key  under the stored pattern management interface to enter the memory operation selection interface.

4. Click Generate Parameter Pattern to get into the operation interface for generating patterns from parameters.

5. If the default values provided by the system are not adopted, it's allowable to click function item New Pattern Number or New Pattern Name to enter the new pattern number and name.

6. Click  to generate patterns from parameters. Click  to undo the generation of pattern from parameters and return to the pattern operation selection interface.

7.6.6. Pattern Splicing

This operation splices two patterns to generate a new pattern. The spacing between patterns refers to the distance from the end point of the first pattern to the start point of the second one.

1. Click on the "pattern management" interface  to get into the stored pattern management interface.

2. Select the two patterns to be spliced, and record their numbers.

3. Click Other Features key  to enter the memory operation selection interface.

4. Click Pattern Splicing to enter the pattern splicing operation interface.

5. If the default values provided by the system are not adopted, users could click the new pattern number and the new pattern name for modification.

6. Click the X Spacing between Patterns and enter a value. Click the Y Spacing between Patterns and enter a value.

7. Click  for pattern splicing, or click  to undo the splicing operation and return to the pattern operation selection interface.

7.6.7. Generate Combination Patterns

Combination pattern means a number of stored patterns (no more than 99 patterns) are combined into a group of parameters after setting their own parameters for saving. To embroider a combination pattern, edit Generate Combination Pattern, go back to the stored pattern management interface, click to choose the combination pattern to be embroidered, and then confirm the embroidery before clicking the Start key for embroidering.

1. Click on the "pattern management" interface  to get into the stored pattern management interface.

2. To edit a stored combination pattern, select the combination pattern; to create a combination pattern, perform the following operations.

3. Click Other Features key  to enter the memory operation selection interface.

4. Click Generate Combination Pattern to get into the combination pattern operation interface.

5. The serial number indicates the number of patterns composing the current combination pattern and the pattern being operated and set; the display format is "current pattern number (the total number of patterns in the combination)".

6. Set up the parameters of the first pattern, including zoom factor, rotation angle, pattern direction, and priority mode.

7. Click to set a number of patterns to be combined; by clicking , you can return to modify the pattern parameters of each combination.

When the pattern being manipulated is not the first one in the combination, the distance between the pattern and the first pattern needs to be set.

8. Click , and the screen will prompt the user to enter the new pattern number and name.

9. Click to save the combination pattern, or click to undo the saving operation and return to the pattern operation selection interface.

7.6.8. Satin Stitch Width Adjustment

This operation fine-tunes the width of satin stitch in the pattern to achieve the desired effect.

1. Click on the "pattern management" interface to get into the stored pattern management interface.

2. Choose the pattern to be handled in the stored pattern thumbnail display area in the stored pattern management interface.

3. Click Other Features key under the stored pattern management interface to enter the memory operation selection interface.

4. Click Satin Stitch Width Adjustment to get into the satin stitch width adjustment interface.

5. If the default values provided by the system are not adopted, users could click the new pattern number and the new pattern name for modification.

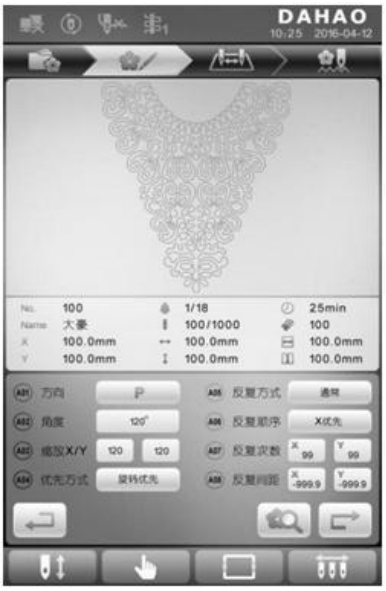
6. Click X Adjustment Value and enter the data; click Y Adjustment Value and enter the data.

7. Click for satin stitch width adjustment, or click to undo the satin stitch width adjustment and return to the pattern operation selection interface.

Chapter 8. Instructions for Pattern Parameters Setup

In this feature, the frequently used parameters such as zoom and repeat for pattern embroidering are stored separately with each pattern. When a new embroidery pattern is selected, the pattern parameters stored at the same time as the embroidery pattern become effective. Pattern parameters include direction, angle, zoom X/Y, priority mode, repeat mode, repeating sequence, repetition times, and repeated spacing. Users are allowed to control the final embroidery operation result of patterns by adjusting these parameters.

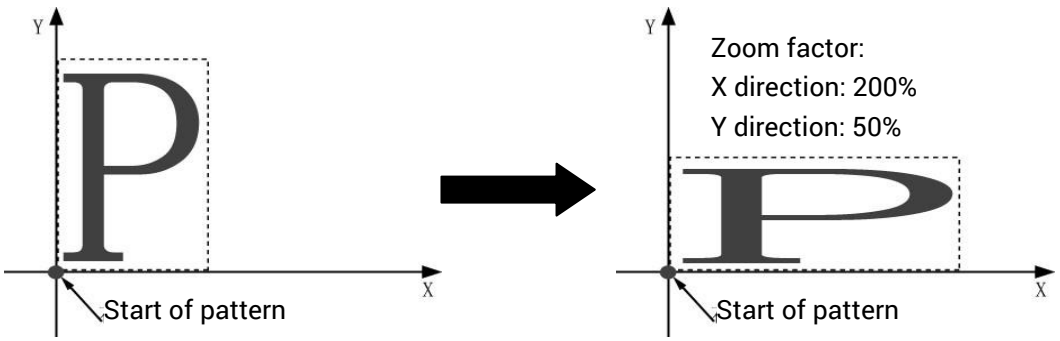
Click the Parameter Setup interface  to enter the pattern parameter setup interface:



8.1. X-Y Zoom Factor Setup

This parameter controls the zoom factor of pattern in the X (horizontal) and Y (vertical) directions in percentage;

Modifying this parameter can enlarge and reduce the pattern.



8.1.1. Click the Function Item Zoom X/Y

When the user clicks the "Zoom X/Y" function item in the parameter list interface, the interface separately displays the parameter modification window for X-direction zoom and Y-direction zoom. The X and Y zoom parameters need to be set separately.

8.1.2. Modify the "Zoom X/Y" parameter.

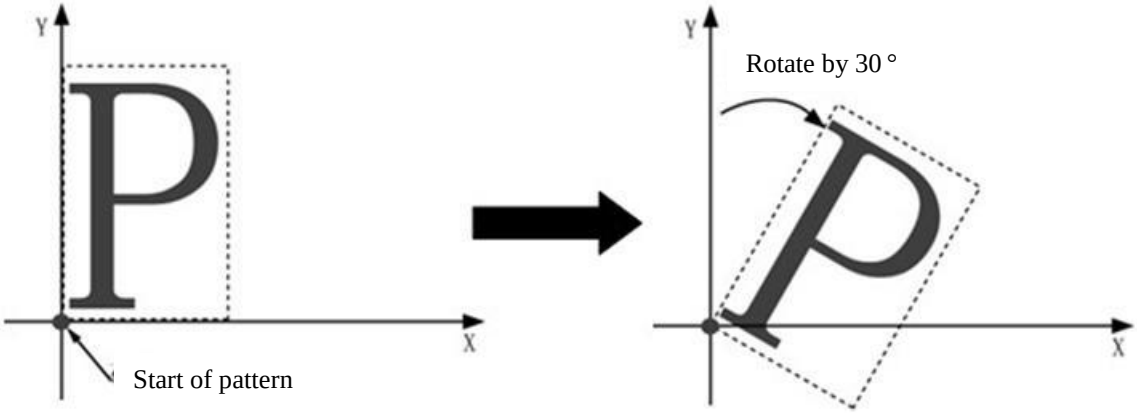
Click the numeric keyboard in the X-direction parameter modification window to modify the X-direction zoom factor; click ⌫ to erase a number just entered; click to C erase all the entered numbers.

8.1.3. Click ✓ to save the modified parameters.

The Y-direction zoom factor is handled in the same way as the X-direction zoom factor, so no detailed description is given here.

8.2. Rotation Angle Setup

This parameter can be used to rotate the pattern by a certain angle.



8.3. Pattern Direction

Pattern direction	p	ɒ	d	ɒ	q	ɒ	b	ɒ	p
Embroidery result	F	Ⅎ	Ⅎ	Ⅎ	Ⅎ	Ⅎ	Ⅎ	Ⅎ	F

8.4. Priority Mode

Both rotation priority and zoom priority is available; when the user sets the zoom and rotation parameters,

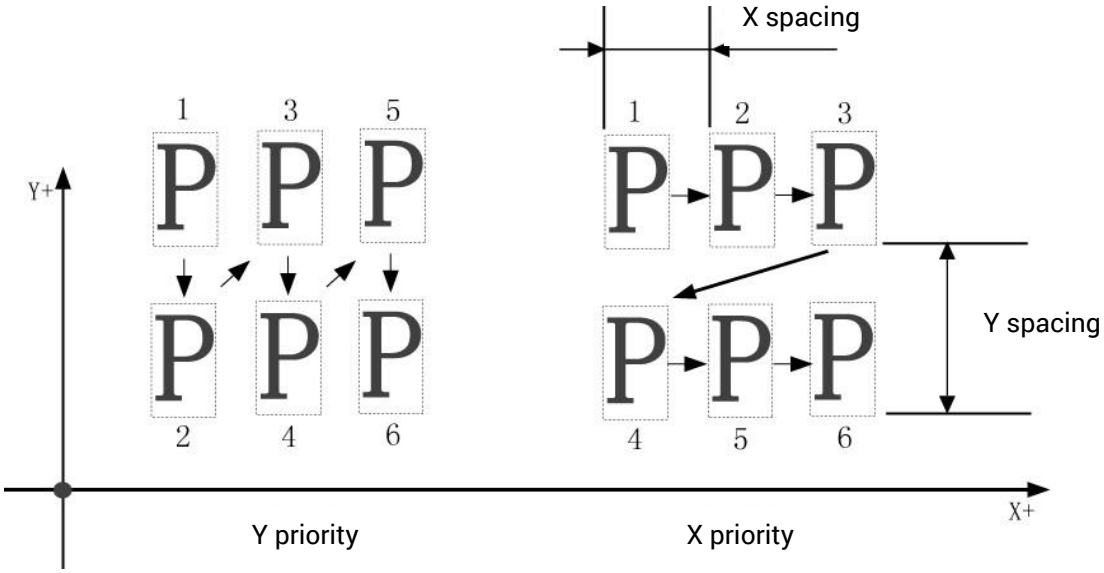
if the priority mode is set to rotation priority, the pattern will first rotate and then zoom; otherwise, it will first zoom and then rotate.

8.5. Repetition Mode

General repetition and local repetition are available.

8.6. Repeating Sequence

X priority and Y priority are available.



8.7. X-Y Repetition Times

X repetition times correspond to the number of columns in repetition, while Y repetition times correspond to the number of rows in repetition. In the figure above, the number of X repetitions is 3, and the number of Y repetitions is 2. The max. value combination is 99*99.

8.8. X-Y Repeated Spacing

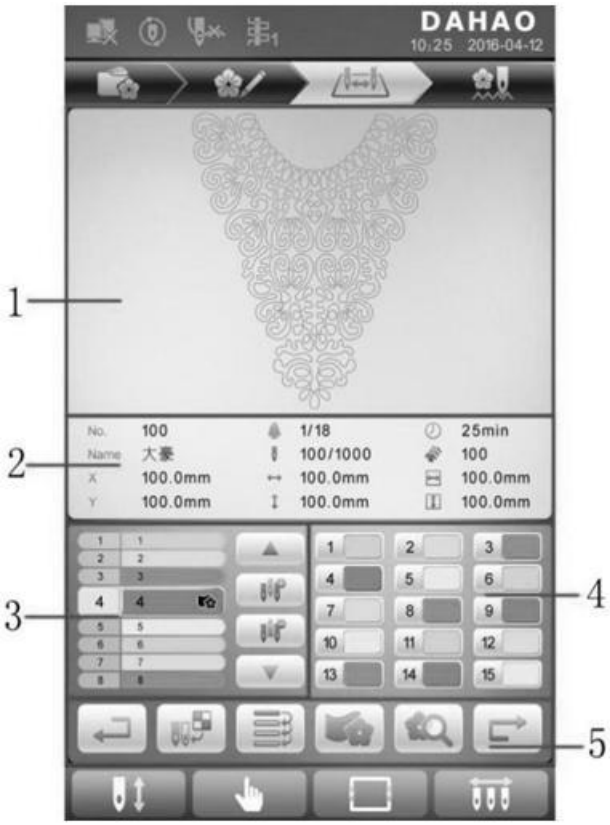
The figure above illustrates the meaning of X-Y repeated spacing.

Chapter 9. Instructions for Needle Bar Color-Change Sequence Setup

The needle bar color-change sequence defined in this feature is stored separately with each pattern. When a new embroidery pattern is selected, the needle bar color-change sequence stored at the same time as the embroidery pattern become effective.

Click  to enter the needle bar color-change sequence setup interface.

9.1. Needle Bar Color-Change Sequence Setup Interface



Number	Display	Name	Description
1		Pattern display area	The pattern is displayed in real time depending on the needle bar color-change sequence; the effect of color-change is previewed.
2		General information on pattern	Show general information on pattern.
3		Current operating position	Needle bar number can be set, inserted or deleted at this position.
		Color block number list	Indicating the serial number of each color block in the pattern.
		Needle bar number and color	Show the needle bar number and embroidery thread color corresponding to each color block in pattern
		Shift-up button	Shift up the color-change list to choose the color block to be set up.
		Insert the needle bar number	Click this key and then click on the needle bar number, when a needle bar number is inserted into the current needle bar number list.
		Delete needle bar number	Delete the needle bar number for current operating position from the needle bar number list.
		Shift-down button	Shift down the color-change list to choose the color block to be set up.
4		Needle bar number color selection area	Choose the needle bar number color to be set here.
5		Previous	Go to the previous operation interface.
		Repeat	Repeated color-change sequence
		Applique	Set to applique pattern
		Needle bar color setup	Set each needle bar color by choosing colors from the default ones.
		Pattern preview	Read the selected patterns, show the pattern information, and draw the pattern icon.
		Next	Go to the next operation interface.

9.2. Needle Bar Color-Change Sequence Setup

9.2.1. Click the needle bar color-change sequence setup interface  to enter the needle bar color-change setup interface.

9.2.2. Enter the needle bar numbers one by one in the needle bar number selection area. After each needle bar number is entered, the pattern display in the pattern display area is updated, while the color list in the color-change sequence display area is simultaneously updated.

9.2.3. Click the shift-up and shift-down keys  to check whether the entered color-change sequence is correct.

9.2.4. To modify a needle bar number in the color-change sequence, click  to move the sequence list so that the item to be modified is at the current operating position. Then, click the new needle bar number.

9.2.5. To insert a needle bar number in the color-change sequence, click  to move the sequence list so that the next item at the position to be inserted is at the current operating position. Then, click  and then click the needle bar number to be inserted.

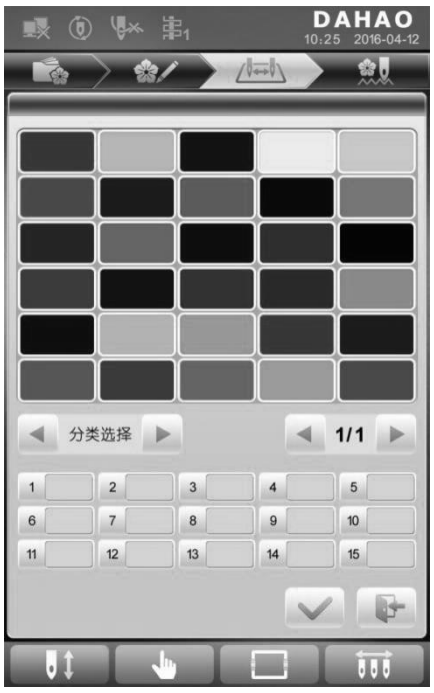
9.2.6. To delete a needle bar number from the color-change sequence, just click  .

9.3. Needle Bar Color Setup

To make the display color of the pattern on the screen the closest to the actual embroidery pattern color, the system sets the color of each needle bar used for the current pattern. This set of needle bar colors will be stored together with the pattern in the color-change sequence.

9.3.1. Click the Needle Bar Color-Change Sequence Setup key to enter the needle bar color-change setup interface.

9.3.2. Click the Needle Bar Color Setup key to set the needle bar color; in the needle bar color setup interface, there are 45 default needle bar colors to choose from.



9.3.3. To set the needle bar color, click to select the needle bar to be set, and then click to select the color from the 45 default color blocks provided; upon successful setup, the corresponding color is updated on the needle bar key to be set.

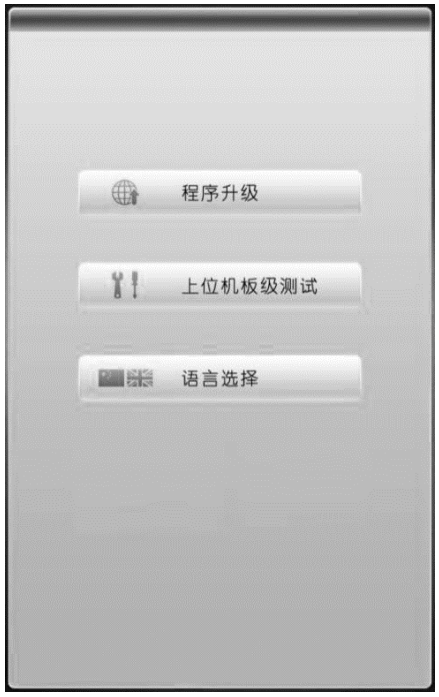
9.3.4. Click to save the needle bar color settings and return to the pattern color-change sequence setup interface; click to undo the needle bar color settings and return to the pattern color-change sequence setup interface.

Chapter 10. Main Control Software Update

Update procedure:

10.1. Press and hold  while powering the machine up.

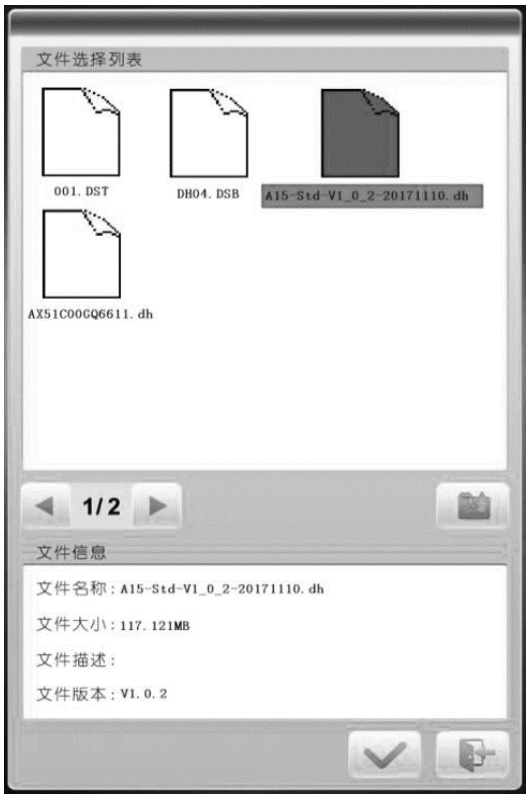
10.2. The following screen appears in the operation panel; select "Program Update".



10.3. Select local USB flash disk update 

10.4. The system will display the "USB Flash Disk Selection" window; click to select the icon of the USB flash disk to be operated.

10.5. Select the program to be updated after entering the page.



10.6. Click  for update.

10.7. When the automatic update is completed, the screen presents a prompt reading "Update completed. Please restart if there are no other updates"; power off and restart the machine.

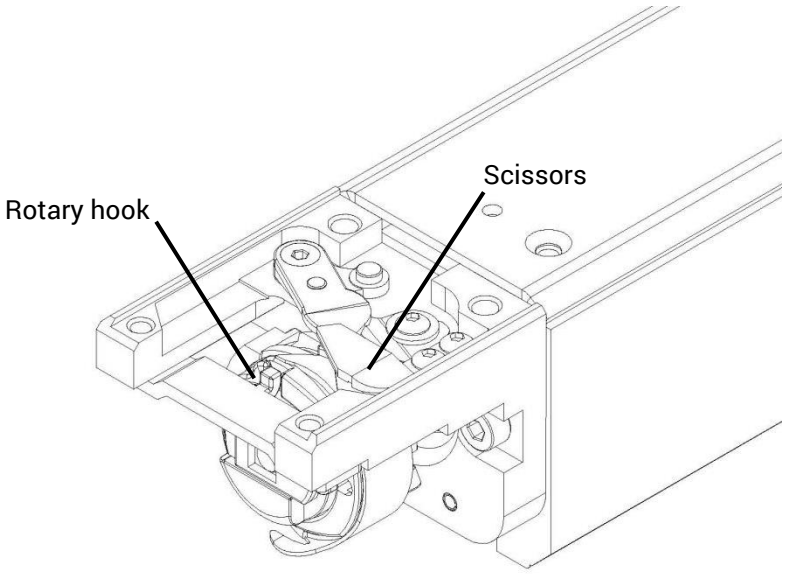
Chapter 11. Maintenance and Servicing

Once the machine is used for a period of time, some dust, cloth scraps, thread ends and other foreign objects may build up in some parts; hence, regular or irregular cleaning is needed. Regular maintenance shall also be performed for mechanical operational parts, and lubricating oil shall be applied; otherwise, the operating parts may malfunction and get out of service. Favorable maintenance and servicing are the prior condition for the machine to function properly.

11.1. Cleanup

11.1.1. Since the rotary hook may accommodate some scraps of backing paper and fabric because the needle constantly pierces into the fabric, the hook needs to be cleaned up from time to time.

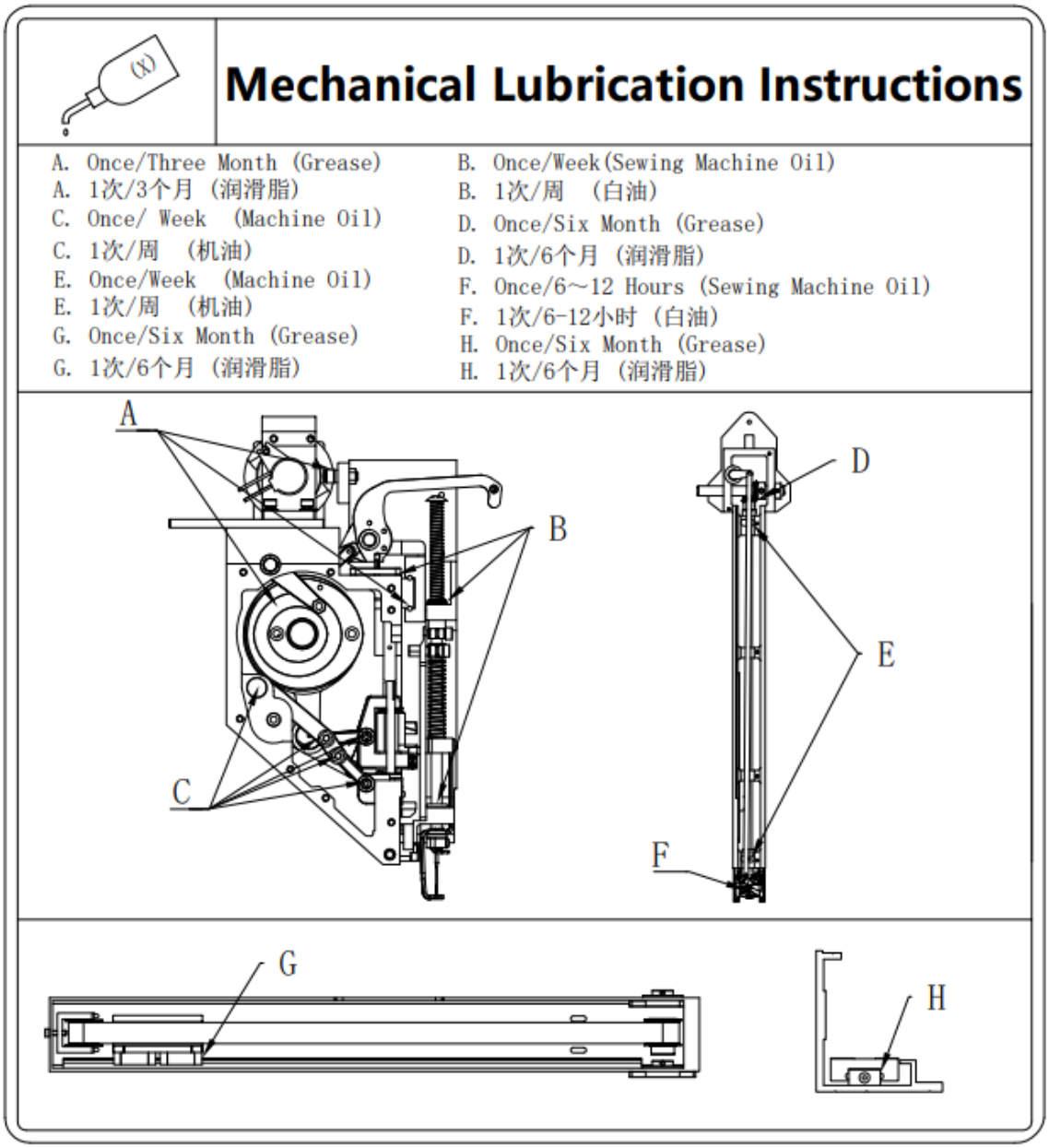
11.1.2. The scissors need to be cleaned up every half a month, since their trimming operations may frequently build up some thread ends and lint, etc.



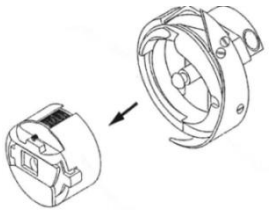
11.1.3. To perform the cleanup, it's necessary to turn off the power, remove the cover, and remove the foreign matter with a small brush; If possible, the foreign matter can also be removed with compressed air for better results.

11.2. Lubrication

Lubricate and maintain the mechanical parts according to the application instructions on the machine.



Note: The bobbin case and bobbin shall be taken out when lubricating the rotary hook (F); excessive lubrication may contaminate threads and embroidery materials; the machine shall run idling for 2-3 minutes after lubrication. Cold-resistant and heat-resistant lithium-based grease, automotive engine oil, and grade-AA #20 white oil shall be used.



Chapter 12. Troubleshooting

Symptoms	Causes	Solutions
The machine is out of power	The main power supply is dead	Check whether the power supply of the main outlet is available
	The power plug is not plugged in properly	Replug the power plug
	Emergency stop switch is ON	Turn the emergency stop switch to the reset state
	Fuse blown	Replace
	Power switch damaged	Replace
	Power supply for cabinet damaged	Replace
Main Shaft timeout	Mechanical jamming	Rotate the main shaft manually to identify the stuck point
	Broken main shaft belt	Replace
	Zero optocoupler damaged	Replace
	Fracture or poor contact of zero optocoupler	Check and replace
	Fracture or poor contact of main shaft motor cable	Check and replace
	Main Shaft motor damaged	Replace
	Control cabinet damaged	Replace
Color-change timeout	Mechanical jamming	Identify and remove the stuck point
	Fracture or poor contact of color-change motor cable	Check and replace
	Color-change motor damaged	Replace
	Control cabinet damaged	Replace
	Damage or poor position contact of the electronic sensing board for color-change	Replace the electronic board or adjust the position of magnetic sensor (front, back, left and right)

Symptoms	Causes	Solutions
No break alarm or constant break alarm	Wrong parameter settings	Re-set
	Wrong installation of upper thread/base thread	Install upper thread/base thread again
	Fracture or poor contact of break detection board cable	Check and replace
	Break detection board damaged	Replace
	Control cabinet damaged	Replace
Broken needle	Incorrect synchronization time between needle and rack	Adjust the needle hole parameters until neatness is achieved
	Needle not installed correctly	Reinstall the needle correctly
	Needle deformation	Replace
	The needle does not match the fabric	Use appropriate needle and fabric
	The needle bar case is offset or the needle bar is incorrect	Move the needle bar case to the center of needle plate hole
	Incorrect synchronization time between rotary hook and needle	Adjust the rotary hook to the correct position
	Incorrect position of the scissors	Adjust the position of the scissors
High thread break rate	Pattern not well made	Modify the short stitch step of pattern
	Needle deformation	Replace
	The needle does not match the thread	Use appropriate needle and thread
	Poor thread tension adjustment	Adjust thread tension
	Needle not installed correctly	Reinstall
	Poor-quality embroidery threads used	Use quality threads
	The rotary hook has not been lubricated for a long time	Lubricate
	Incorrect synchronization time between needle and rotary hook	Adjust the position of rotary hook, and check whether the TOP STOP and LOWER STOP are correct

Chapter 13. Block Diagram of Electronic Control A15 System